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February 23, 2022

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PPPO-02-10020320-22B

Ms. Jamie Nielsen
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Dear Mr. Hendricks and Ms. Nielsen:

**C-746-U CONTAINED LANDFILL FOURTH QUARTER CALENDAR YEAR 2021
(OCTOBER–DECEMBER) COMPLIANCE MONITORING REPORT, PADUCAH
GASEOUS DIFFUSION PLANT, PADUCAH, KENTUCKY, FRNP-RPT-0192/V4,
PERMIT NUMBER SW07300014, SW07300015, SW07300045, AGENCY INTEREST ID
NO. 3059**

The subject report for the fourth quarter calendar year (CY) 2021 has been uploaded to the KY 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, surface water analytical data, a validation summary, groundwater flow rate and direction determination, figures depicting well locations, and methane monitoring results. Monitoring well MW363 had a statistically significant exceedance of nitrate as nitrogen over background levels as well as an exceedance of the Kentucky maximum contaminant level for nitrate as nitrogen.

The statistical analyses on the fourth quarter CY 2021 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 fourth quarter CY 2021, in accordance with Monitoring Condition GSTR0001, Standard Requirement 5, of the Permit.

If you have any questions or require additional information, please contact David Dollins at (270) 441-6819.

Sincerely,

Tracey L. Duncan

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Tracey Duncan
Acting Paducah Site Lead
Portsmouth/Paducah Project Office

Enclosure:

*C-746-U Contained Landfill Fourth Quarter Calendar Year 2021 (October–December)
Compliance Monitoring Report, Paducah Gaseous Diffusion Plant, Paducah, Kentucky,
FRNP-RPT-0192/V4*

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**C-746-U Contained Landfill
Fourth Quarter Calendar Year 2021
(October-December)
Compliance Monitoring Report,
Paducah Gaseous Diffusion Plant,
Paducah, Kentucky**



This document is approved for public release per review by:

David Hayden
FRNP Classification Support

02-17-2022
Date

**C-746-U Contained Landfill
Fourth Quarter Calendar Year 2021
(October-December)
Compliance Monitoring Report,
Paducah Gaseous Diffusion Plant,
Paducah, Kentucky**

Date Issued—February 2022

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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ACRONYMS

<i>CFR</i>	<i>Code of Federal Regulations</i>
CY	calendar year
<i>KAR</i>	<i>Kentucky Administrative Regulations</i>
KDWM	Kentucky Division of Waste Management
<i>KRS</i>	<i>Kentucky Revised Statutes</i>
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 Fourth Quarter Calendar Year 2021 (October-December) Compliance Monitoring Report, Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, is being submitted in accordance with Solid Waste Permit Number 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 recorded on the Kentucky Division of Waste Management (KDWM) Groundwater Sample Analyses forms, 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 and written comments 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. Micropurging 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 Number 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 and 5, with Phases 6 and 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 except MW376 and MW377 (both screened in the UCRS), which had an insufficient amount of water to obtain samples; therefore, there are no laboratory analysis results for these locations.

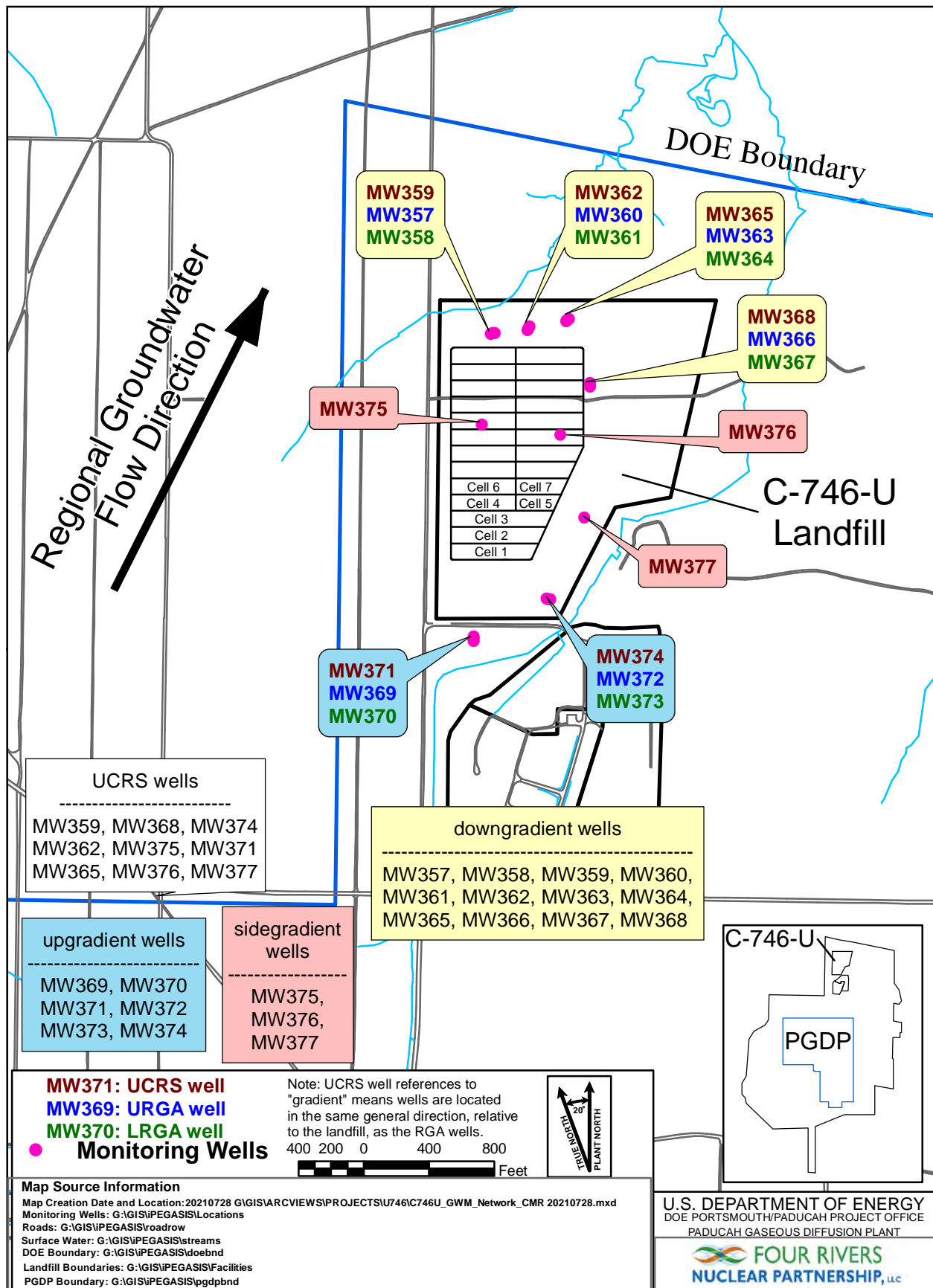


Figure 1. C-746-U Landfill Groundwater Monitoring Well Network

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 fourth quarter 2021 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 fourth quarter 2021 was conducted in October and December 2021. 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 October 26, 2021, 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 38 vicinity wells define the potentiometric surface for the RGA. Typical regional flow in the RGA is northeastward, toward the Ohio River. During October, 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 October was 5.21×10^{-4} ft/ft (see Appendix E, Table E.2). The hydraulic gradients for the URGA and LRGA at the C-746-U Landfill were 1.08×10^{-3} ft/ft and 1.12×10^{-3} ft/ft, respectively (see Appendix E, Table E.2). Calculated groundwater flow rates (average linear velocity) at the C-746-U Landfill range from 1.84 to 3.14 ft/day for the URGA and 1.91 to 3.26 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 December 2, 2021. See Appendix H for a map (see Appendix H, Figure H.1) of the monitoring locations. Monitoring identified all locations to be 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 Log 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 at three locations (see Figure 2) monitored for the C-746-U Landfill: (1) instream location, L154; (2) downstream location, L351; and (3) instream location L150. 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 UTL¹ during the fourth quarter 2021, 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	MW363: Nitrate as Nitrogen	MW361: Trichloroethene
		MW364: Trichloroethene
		MW373: Trichloroethene

Table 2. Exceedances of Statistically Derived Historical Background Concentrations

UCRS*	URGA	LRGA
MW359: Dissolved oxygen, oxidation-reduction potential, sulfate	MW357: Oxidation-reduction potential	MW358: Oxidation-reduction potential
MW362: Oxidation-reduction potential, sulfate	MW360: Oxidation-reduction potential	MW361: Oxidation-reduction potential, technetium-99
MW365: Dissolved oxygen, oxidation-reduction potential, sulfate	MW363: Nitrate as nitrogen, Oxidation-reduction potential	MW364: Oxidation-reduction potential, technetium-99
MW368: Oxidation-reduction potential, sulfate	MW366: Oxidation-reduction potential	MW367: pH, oxidation-reduction potential
MW371: Dissolved oxygen, oxidation-reduction potential	MW369: Oxidation-reduction potential	MW370: Dissolved oxygen, oxidation-reduction potential
MW374: Oxidation-reduction potential	MW372: Calcium, dissolved solids, magnesium, oxidation-reduction potential, sulfate	MW373: pH, oxidation-reduction potential
MW375: Oxidation-reduction potential, sulfate		

*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.

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

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.

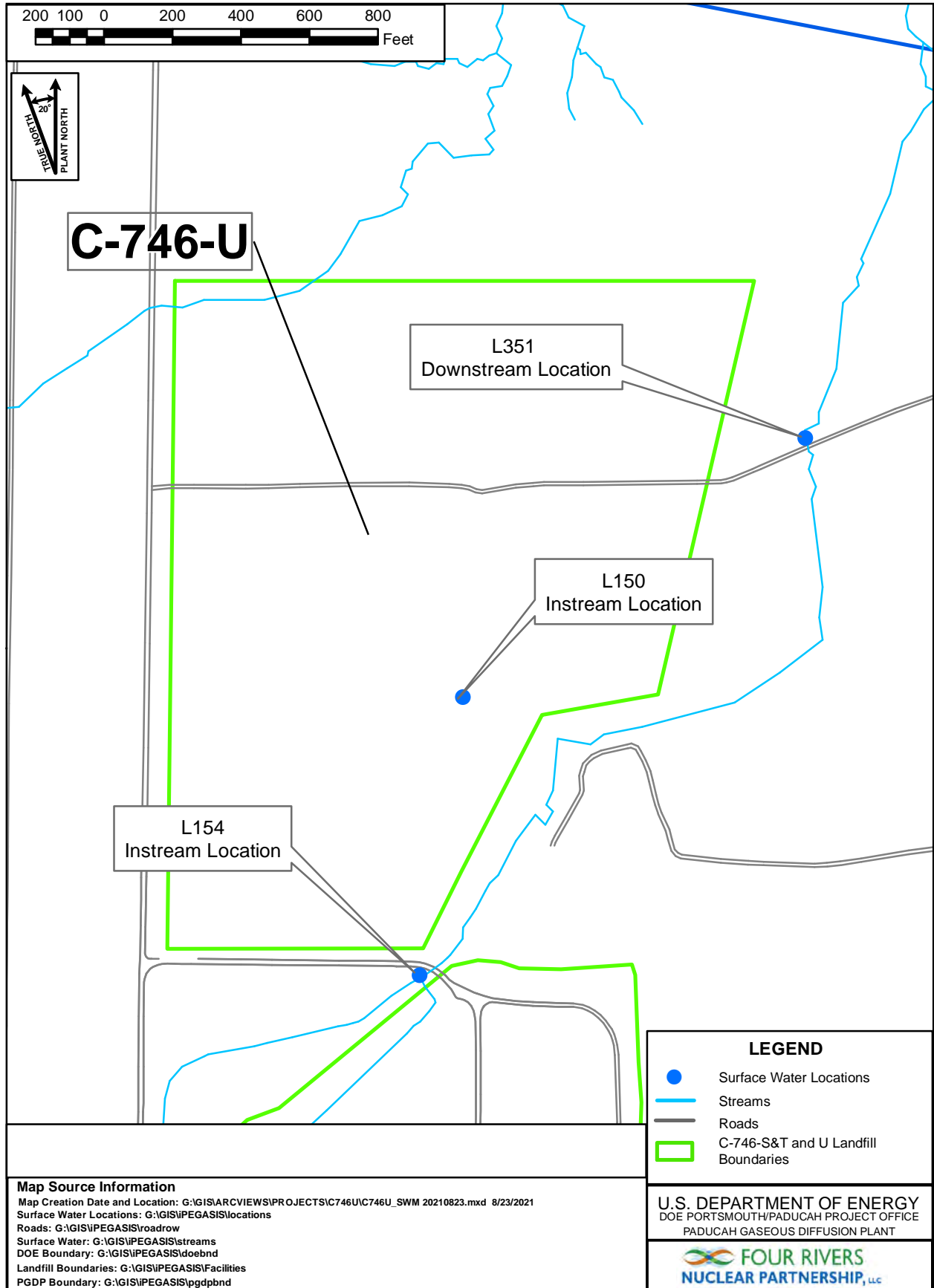


Figure 2. C-746-U Landfill Surface Water Monitoring Locations

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

URGA	LRGA
MW363: Nitrate as nitrogen	None

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

The constituents that exceeded their MCL in a downgradient well were subjected to a comparison against the UTL concentrations calculated using historical concentrations from wells identified as background. In accordance with the approved Groundwater Monitoring Plan, the MCL exceedances for trichloroethene in MW361 and MW364 (downgradient wells) do not exceed the historical background concentration and are considered to be a Type 1 exceedance—not attributable to the C-746-U Landfill.

This report is the notification of parameters that had statistically significant increased concentrations relative to historical background concentrations, as required by Permit Number 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 a Type 1 exceedance (not attributable to the C-746-U Landfill). Except for nitrate as nitrogen in MW363, all MCL and UTL exceedances reported for this quarter were evaluated and considered to be Type 1 exceedances—not attributable to the C-746-U Landfill.

Nitrate as nitrogen in MW363 (downgradient well) was shown to exceed both the historical background UTL and the current background UTL; therefore, preliminarily it was considered to be a Type 2 exceedance. To evaluate the preliminary Type 2 exceedance further, the parameter was subjected to the Mann-Kendall statistical test for trend using the most recent eight quarters of data. The results have been summarized in Table 4. MW363 showed an increasing Mann-Kendall trend for nitrate as nitrogen and is considered to be a Type 2 exceedance—source unknown. Further assessment will be necessary to determine the source of the current nitrate as nitrogen trend.

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

Location	Well ID	Parameter	Sample Size	Alpha¹	p-Value²	S³	Decision⁴
C-746-U Landfill	MW363	Nitrate as nitrogen	8	0.05	0.001	24	Increasing

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.

The statistical evaluation of current UCRS concentrations against the current UCRS background UTL identified a sulfate value in UCRS well MW368 that exceeded both the historical and current backgrounds (Table 5). Because UCRS wells are not hydrogeologically downgradient of the C-746-U Landfill, this exceedance is not attributable to C-746-U Landfill sources and is considered to be a Type 1 exceedance—not attributable to the C-746-U Landfill.

**Table 5. Exceedances of Current Background
UTL in Downgradient UCRS Wells***

UCRS
MW368: sulfate

*In the same direction (relative to the landfill) as RGA wells.

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2. DATA EVALUATION/STATISTICAL SYNOPSIS

The statistical analyses conducted on the fourth quarter 2021 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 historically in the statistical analyses are listed in Table 5.

Table 6. Monitoring Wells Included in Statistical Analysis^a

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

^a Map showing the monitoring well 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, 24 parameters, including those with MCLs, required statistical analysis in the UCRS. During the fourth quarter, dissolved oxygen, oxidation-reduction potential, and sulfate displayed concentrations that exceeded their respective historical UTL and are listed in Table 2. Sulfate exceeded the current background UTL in downgradient UCRS well MW368.

2.1.2 Upper Regional Gravel Aquifer

In this quarter, 25 parameters, including those with MCLs, required statistical analysis in the URGA. During the fourth quarter, calcium, dissolved solids, magnesium, nitrate as nitrogen, oxidation-reduction potential, and sulfate displayed concentrations that exceeded their respective historical UTL and are listed in Table 2. Nitrate as nitrogen exceeded the current background UTL in downgradient URGA well MW363.

2.1.3 Lower Regional Gravel Aquifer

In this quarter, 26 parameters, including those with MCLs, required statistical analysis in the LRGA. During the fourth quarter, dissolved oxygen, oxidation-reduction potential, pH, and technetium-99 displayed concentrations that exceeded their respective historical UTL and are listed in Table 2. There were no constituents that exceeded the current background UTL in downgradient LRGA wells.

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. Validation qualifiers are not requested on the groundwater reporting forms.

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, except for *cis*-1,3-dichloropropene in MW357 were considered usable. Monitoring well MW357 was resampled on December 16, 2021, for *cis*-1,3-dichloropropene only. Results of the resample were validated and considered acceptable. The resample results were used in the statistical analysis.

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3. PROFESSIONAL GEOLOGIST AUTHORIZATION

DOCUMENT IDENTIFICATION: *C-746-U Contained Landfill Fourth Quarter Calendar
Year 2021 (October–December) Compliance Monitoring Report,
Paducah Gaseous Diffusion Plant, Paducah, Kentucky
(FRNP-RPT-0192/V4)*

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



PG113927
K. Davis
2-17-2022

Kenneth R. Davis
Kenneth R. Davis

PG113927

February 17, 2022
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, Number 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, Number 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, Number 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 Activity: C-746-U Contained Landfill
(As officially shown on DWM Permit Face)

Permit No: SW07300014, Finds/Unit No: _____ Quarter & Year 4th Qtr. CY 2021
SW07300015,
SW07300045

Please check the following as applicable:

_____ Characterization ☒ Quarterly _____ Semiannual _____ Annual _____ Assessment

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

_____ Leachate ☒ 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 Statutes 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

2/23/22
Date



Tracey Duncan, Acting Paducah Site Lead
U.S. Department of Energy

2/23/22
Date

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APPENDIX B
FACILITY INFORMATION SHEET

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FACILITY INFORMATION SHEET

Sampling Date:	Groundwater: October and December 2021 Surface water: October and December 2021 Methane: December 2021	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:	US 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:	GEO Consultants Corporation		
Contact Person:	Jason Boulton	Phone No:	(270) 816-3415
Mailing Address:	199 Kentucky Avenue 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	N/A City/State	N/A 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	N/A City/State	N/A Zip

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APPENDIX C

**GROUNDWATER SAMPLE ANALYSES
AND WRITTEN COMMENTS**

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Division of Waste Management
Solid Waste Branch
14 Reilly Road
Frankfort, KY 40601 (502)564-6716

RESIDENTIAL/CONTAINED-QUARTERLY
Facility: US DOE - Paducah Gaseous Diffusion Plant
Permit Number: SW07300014, SW07300015, SW07300045

FINDS/UNIT: KY8-890-008-982 / 1
LAB ID: None

GROUNDWATER SAMPLE ANALYSIS(S)

AKGWA NUMBER ¹ , Facility Well/Spring Number					8004-4798	8004-4799	8004-0981	8004-4800					
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					357	358	359	360					
Sample Sequence #					1	1	1	1					
If sample is a Blank, specify Type: (F)ield, (T)rip, (M)ethod, or (E)quipment					NA	NA	NA	NA					
Sample Date and Time (Month/Day/Year hour:minutes)					10/11/2021 10:00	10/11/2021 11:11	10/11/2021 11:57	10/11/2021 07:42					
Duplicate ("Y" or "N") ²					N	N	N	N					
Split ("Y" or "N") ³					N	N	N	N					
Facility Sample ID Number (if applicable)					MW357UG1-22	MW358UG1-22	MW359UG1-22	MW360UG1-22					
Laboratory Sample ID Number (if applicable)					558545001	558545003	558545005	558545007					
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis					10/16/2021	10/16/2021	10/16/2021	10/16/2021					
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)					DOWN	DOWN	DOWN	DOWN					
CAS RN ⁴		CONSTITUENT	T D S	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S ⁷	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
24959-67-9		Bromide	T	mg/L	9056	0.363		0.417		<0.2		0.192	J
16887-00-6		Chloride(s)	T	mg/L	9056	30	J	27.3	J	1.1	J	9.12	J
16984-48-8		Fluoride	T	mg/L	9056	0.159	J	0.184	J	0.135	J	0.211	J
S0595- -		Nitrate & Nitrite	T	mg/L	9056	1.04	J	0.593	J	0.381	J	0.675	J
14808-79-8		Sulfate	T	mg/L	9056	38.6		53		38.5		12.4	
NS1894		Barometric Pressure Reading	T	Inches/Hg	Field	29.76		29.75		29.75		29.8	
S0145- -		Specific Conductance	T	µMH0/cm	Field	283		353		180		272	

¹AKGWA # is 0000-0000 for any type of blank.

²Respond "Y" if the sample was a duplicate of another sample in this report.

³Respond "Y" if the sample was split and analyzed by separate laboratories.

⁴Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.

⁵"T" = Total; "D" = Dissolved

⁶"<" indicates a non-detect; do not use "ND" or "BDL". Value shown is Practical Quantification Limit.

⁷Flags are as designated, do not use any other type. Use "*", " then describe on "Written Comments Page."

STANDARD FLAGS:

* = See Comments

J = Estimated Value

B = Analyte found in blank

A = Average value

N = Presumptive ID

D = Concentration from analysis of a secondary dilution

RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045

LAB ID: None

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number					8004-4798		8004-4799		8004-0981		8004-4800		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)					357		358		359		360		
CAS RN ⁴		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
S0906 - -		Static Water Level Elevation	T	Ft. MSL	Field	323.8		323.82		330.43		323.78	
N238		Dissolved Oxygen	T	mg/L	Field	5.16		1.13		6.05		2.8	
S0266- -		Total Dissolved Solids	T	mg/L	160.1	217	*	267	*	149	*	221	*
S0296- -		pH	T	Units	Field	6.22		6.1		6.2		6.14	
NS215		Eh	T	mV	Field	376.8		158.7		264.2		379.5	
S0907 - -		Temperature	T	°C	Field	16.67		16.61		18.61		15.94	
7429-90-5		Aluminum	T	mg/L	6020	<0.05		0.0194	J	0.101		0.023	J
7440-36-0		Antimony	T	mg/L	6020	<0.003		<0.003		<0.003		<0.003	
7440-38-2		Arsenic	T	mg/L	6020	<0.005		0.00298	J	<0.005		<0.005	
7440-39-3		Barium	T	mg/L	6020	0.0748		0.0639		0.0276		0.207	
7440-41-7		Beryllium	T	mg/L	6020	<0.0005		<0.0005		<0.0005		<0.0005	
7440-42-8		Boron	T	mg/L	6020	0.392		0.339		0.00956	J	0.0416	
7440-43-9		Cadmium	T	mg/L	6020	<0.001		<0.001		<0.001		<0.001	
7440-70-2		Calcium	T	mg/L	6020	25.4		31.6		5.82		18.5	
7440-47-3		Chromium	T	mg/L	6020	<0.01		<0.01		<0.01		<0.01	
7440-48-4		Cobalt	T	mg/L	6020	<0.001		0.0157		0.000407	J	0.00265	
7440-50-8		Copper	T	mg/L	6020	0.00287	*	0.00108	J*	0.00199	J*	0.00354	*
7439-89-6		Iron	T	mg/L	6020	0.039	J	4.82		0.206		0.453	
7439-92-1		Lead	T	mg/L	6020	<0.002		<0.002		<0.002		<0.002	
7439-95-4		Magnesium	T	mg/L	6020	11.4		15		3.34		8.26	
7439-96-5		Manganese	T	mg/L	6020	0.00222	J	0.786		0.00494	J	0.0337	
7439-97-6		Mercury	T	mg/L	7470	<0.0002		<0.0002		<0.0002		<0.0002	

RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045

LAB ID: None

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number						8004-4798		8004-4799		8004-0981		8004-4800		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						357		358		359		360		
CAS	RN ⁴		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
7439-98-7			Molybdenum	T	mg/L	6020	<0.001		0.000303	J	<0.001		<0.001	
7440-02-0			Nickel	T	mg/L	6020	0.000928	J	0.0271		0.00193	J	0.00443	
7440-09-7			Potassium	T	mg/L	6020	1.88		2.86		0.144	J	0.785	
7440-16-6			Rhodium	T	mg/L	6020	<0.005		<0.005		<0.005		<0.005	
7782-49-2			Selenium	T	mg/L	6020	<0.005		<0.005		<0.005		<0.005	
7440-22-4			Silver	T	mg/L	6020	<0.001		<0.001		<0.001		<0.001	
7440-23-5			Sodium	T	mg/L	6020	40.7		37.1		32.8		58.9	
7440-25-7			Tantalum	T	mg/L	6020	<0.005		<0.005		<0.005		<0.005	
7440-28-0			Thallium	T	mg/L	6020	<0.002		<0.002		<0.002		<0.002	
7440-61-1			Uranium	T	mg/L	6020	<0.0002		<0.0002		0.000081	J	0.000077	J
7440-62-2			Vanadium	T	mg/L	6020	0.00518	BJ	0.00526	BJ	0.00632	BJ	0.00535	BJ
7440-66-6			Zinc	T	mg/L	6020	0.0041	J	0.00697	J	0.00615	J	0.016	J
108-05-4			Vinyl acetate	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
67-64-1			Acetone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
107-02-8			Acrolein	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
107-13-1			Acrylonitrile	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
71-43-2			Benzene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
108-90-7			Chlorobenzene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
1330-20-7			Xylenes	T	mg/L	8260	<0.003		<0.003		<0.003		<0.003	
100-42-5			Styrene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
108-88-3			Toluene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
74-97-5			Chlorobromomethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	

RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045 LAB ID: None

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number					8004-4798		8004-4799		8004-0981		8004-4800	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					357		358		359		360	
CAS RN ⁴	CONSTITUENT	T D ⁵	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
75-27-4	Bromodichloromethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-25-2	Tribromomethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
74-83-9	Methyl bromide	T	mg/L	8260	<0.001	*	<0.001	*	<0.001	*	<0.001	*
78-93-3	Methyl ethyl ketone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
110-57-6	trans-1,4-Dichloro-2-butene	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
75-15-0	Carbon disulfide	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
75-00-3	Chloroethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
67-66-3	Chloroform	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
74-87-3	Methyl chloride	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
156-59-2	cis-1,2-Dichloroethene	T	mg/L	8260	<0.001		0.00038	J	<0.001		<0.001	
74-95-3	Methylene bromide	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-34-3	1,1-Dichloroethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
107-06-2	1,2-Dichloroethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-35-4	1,1-Dichloroethylene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
106-93-4	Ethane, 1,2-dibromo	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
79-34-5	Ethane, 1,1,2,2-Tetrachloro	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
71-55-6	Ethane, 1,1,1-Trichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
79-00-5	Ethane, 1,1,2-Trichloro	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
630-20-6	Ethane, 1,1,1,2-Tetrachloro	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-01-4	Vinyl chloride	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
127-18-4	Ethene, Tetrachloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
79-01-6	Ethene, Trichloro-	T	mg/L	8260	0.00258		0.00165		<0.001		0.00078	J

RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045

LAB ID: None

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number						8004-4798		8004-4799		8004-0981		8004-4800	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						357		358		359		360	
CAS RN ⁴		CONSTITUENT	T D ⁵	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
100-41-4		Ethylbenzene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
591-78-6		2-Hexanone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
74-88-4		Iodomethane	T	mg/L	8260	<0.005	*	<0.005	*	<0.005	*	<0.005	*
124-48-1		Methane, Dibromochloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
56-23-5		Carbon Tetrachloride	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-09-2		Dichloromethane	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
108-10-1		Methyl isobutyl ketone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
96-12-8		Propane, 1,2-Dibromo-3-chloro	T	mg/L	8011	<0.0000185		<0.0000185		<0.0000192		<0.0000186	
78-87-5		Propane, 1,2-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
10061-02-6		trans-1,3-Dichloro-1-propene	T	mg/L	8260	<0.001	*	<0.001	*	<0.001	*	<0.001	*
10061-01-5		cis-1,3-Dichloro-1-propene	T	mg/L	8260		*	<0.001	*	<0.001	*	<0.001	*
156-60-5		trans-1,2-Dichloroethene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-69-4		Trichlorofluoromethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
96-18-4		1,2,3-Trichloropropane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
95-50-1		Benzene, 1,2-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
106-46-7		Benzene, 1,4-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
1336-36-3		PCB, Total	T	ug/L	8082	<0.0996		<0.101		<0.103		<0.0989	
12674-11-2		PCB-1016	T	ug/L	8082	<0.0996		<0.101		<0.103		<0.0989	
11104-28-2		PCB-1221	T	ug/L	8082	<0.0996		<0.101		<0.103		<0.0989	
11141-16-5		PCB-1232	T	ug/L	8082	<0.0996		<0.101		<0.103		<0.0989	
53469-21-9		PCB-1242	T	ug/L	8082	<0.0996		<0.101		<0.103		<0.0989	
12672-29-6		PCB-1248	T	ug/L	8082	<0.0996		<0.101		<0.103		<0.0989	

RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045

LAB ID: None

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number					8004-4798		8004-4799		8004-0981		8004-4800		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					357		358		359		360		
CAS RN ⁴		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
11097-69-1		PCB-1254	T	ug/L	8082	<0.0996		<0.101		<0.103		<0.0989	
11096-82-5		PCB-1260	T	ug/L	8082	<0.0996		<0.101		<0.103		<0.0989	
11100-14-4		PCB-1268	T	ug/L	8082	<0.0996		<0.101		<0.103		<0.0989	
12587-46-1		Gross Alpha	T	pCi/L	9310	-1.63	*	-1.87	*	1.6	*	3.85	*
12587-47-2		Gross Beta	T	pCi/L	9310	16.7	*	16.5	*	10.4	*	6.35	*
10043-66-0		Iodine-131	T	pCi/L			*		*		*		*
13982-63-3		Radium-226	T	pCi/L	AN-1418	-0.265	*	0.0374	*	0.366	*	0.224	*
10098-97-2		Strontium-90	T	pCi/L	905.0	-1.19	*	0.468	*	1.92	*	7.08	*
14133-76-7		Technetium-99	T	pCi/L	Tc-02-RC	32.7	*	35.1	*	14.4	*	14.7	*
14269-63-7		Thorium-230	T	pCi/L	Th-01-RC	0.0797	*	-0.0462	*	0.103	*	0.129	*
10028-17-8		Tritium	T	pCi/L	906.0	60.2	*	-22.7	*	111	*	45.2	*
S0130- -		Chemical Oxygen Demand	T	mg/L	410.4	<20		11.3	J	<20		<20	
57-12-5		Cyanide	T	mg/L	9012	<0.2		<0.2		<0.2		<0.2	
20461-54-5		Iodide	T	mg/L	300.0	<0.5		<0.5		<0.5		<0.5	
S0268- -		Total Organic Carbon	T	mg/L	9060	1.03	J	2.79		1.39	J	1.44	J
S0586- -		Total Organic Halides	T	mg/L	9020	0.00904	J	<0.01		0.00412	J	0.0042	J

Division of Waste Management
Solid Waste Branch
14 Reilly Road
Frankfort, KY 40601 (502)564-6716

RESIDENTIAL/CONTAINED-QUARTERLY
Facility: US DOE - Paducah Gaseous Diffusion Plant
Permit Number: SW07300014, SW07300015, SW07300045

FINDS/UNIT: KY8-890-008-982 / 1
LAB ID: None

GROUNDWATER SAMPLE ANALYSIS(S)

AKGWA NUMBER ¹ , Facility Well/Spring Number					8004-4795	8004-0986	8004-4796	8004-4797					
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					361	362	363	364					
Sample Sequence #					1	1	1	1					
If sample is a Blank, specify Type: (F)ield, (T)rip, (M)ethod, or (E)quipment					NA	NA	NA	NA					
Sample Date and Time (Month/Day/Year hour:minutes)					10/11/2021 09:10	10/11/2021 08:23	10/12/2021 06:04	10/12/2021 07:08					
Duplicate ("Y" or "N") ²					N	N	N	N					
Split ("Y" or "N") ³					N	N	N	N					
Facility Sample ID Number (if applicable)					MW361UG1-22	MW362UG1-22	MW363UG1-22	MW364UG1-22					
Laboratory Sample ID Number (if applicable)					558545009	558545011	558733001	558733003					
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis					10/16/2021	10/16/2021	10/19/2021	10/19/2021					
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)					DOWN	DOWN	DOWN	DOWN					
CAS RN ⁴		CONSTITUENT	T D S	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S ⁷	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S		
24959-67-9		Bromide	T	mg/L	9056	0.472		0.112	J	0.17	J	0.587	
16887-00-6		Chloride(s)	T	mg/L	9056	34.2	J	3.02	J	40.2	J	36.6	J
16984-48-8		Fluoride	T	mg/L	9056	0.158	J	0.357	J	0.206	J	0.19	J
S0595- -		Nitrate & Nitrite	T	mg/L	9056	1	J	0.379	J	10.5		1.11	J
14808-79-8		Sulfate	T	mg/L	9056	79.2		28.4		24.3		74.4	
NS1894		Barometric Pressure Reading	T	Inches/Hg	Field	29.78		29.79		29.98		29.99	
S0145- -		Specific Conductance	T	µMH0/cm	Field	355		468		418		412	

STANDARD FLAGS:

* = See Comments
J = Estimated Value
B = Analyte found in blank
A = Average value
N = Presumptive ID
D = Concentration from analysis of a secondary dilution

¹AKGWA # is 0000-0000 for any type of blank.

²Respond "Y" if the sample was a duplicate of another sample in this report.

³Respond "Y" if the sample was split and analyzed by separate laboratories.

⁴Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.

⁵"T" = Total; "D" = Dissolved

⁶"<" indicates a non-detect; do not use "ND" or "BDL". Value shown is Practical Quantification Limit.

⁷Flags are as designated, do not use any other type. Use "*", then describe on "Written Comments Page."

RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045

LAB ID: None

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number						8004-4795		8004-0986		8004-4796		8004-4797		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)						361		362		363		364		
CAS	RN ⁴		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
S0906	-	-	Static Water Level Elevation	T	Ft. MSL	Field	323.62		337.68		323.49		322.69	
N238			Dissolved Oxygen	T	mg/L	Field	3.83		2.59		0.86		3.2	
S0266	-	-	Total Dissolved Solids	T	mg/L	160.1	279	*	406	*	274	B	254	B
S0296	-	-	pH	T	Units	Field	6.03		6.69		6.36		5.83	
NS215			Eh	T	mV	Field	370.4		220.4		272		331	
S0907	-	-	Temperature	T	°C	Field	16.22		16.06		14.72		15.11	
7429-90-5			Aluminum	T	mg/L	6020	<0.05		0.0293	J	<0.05		<0.05	
7440-36-0			Antimony	T	mg/L	6020	<0.003		<0.003		<0.003		<0.003	
7440-38-2			Arsenic	T	mg/L	6020	<0.005		<0.005		<0.005		<0.005	
7440-39-3			Barium	T	mg/L	6020	0.0565		0.107		0.177		0.0605	
7440-41-7			Beryllium	T	mg/L	6020	<0.0005		<0.0005		<0.0005		<0.0005	
7440-42-8			Boron	T	mg/L	6020	0.122		0.018		0.0205		0.0796	
7440-43-9			Cadmium	T	mg/L	6020	<0.001		<0.001		<0.001		<0.001	
7440-70-2			Calcium	T	mg/L	6020	32.7		20.5		30.1		29.9	
7440-47-3			Chromium	T	mg/L	6020	<0.01		<0.01		<0.01		0.00614	J
7440-48-4			Cobalt	T	mg/L	6020	<0.001		0.000868	J	0.000777	J	<0.001	
7440-50-8			Copper	T	mg/L	6020	0.00145	J*	0.00139	J*	0.000998	J	0.00101	J
7439-89-6			Iron	T	mg/L	6020	<0.1		0.206		0.058	J	0.0612	J
7439-92-1			Lead	T	mg/L	6020	<0.002		<0.002		<0.002		<0.002	
7439-95-4			Magnesium	T	mg/L	6020	14.6		9.29		11.9		12.8	
7439-96-5			Manganese	T	mg/L	6020	0.00551		0.0406		0.089		0.00571	
7439-97-6			Mercury	T	mg/L	7470	<0.0002		<0.0002		0.000203	B	0.000196	BJ

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RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045

LAB ID: None

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number						8004-4795		8004-0986		8004-4796		8004-4797	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						361		362		363		364	
CAS RN ⁴		CONSTITUENT	T D ⁵	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
7439-98-7		Molybdenum	T	mg/L	6020	<0.001		0.000474	J	0.000308	J	0.000461	J
7440-02-0		Nickel	T	mg/L	6020	0.00149	J	0.00127	J	0.0437		0.00475	
7440-09-7		Potassium	T	mg/L	6020	2.74		0.375		2.87		2.31	
7440-16-6		Rhodium	T	mg/L	6020	<0.005		<0.005		<0.005		<0.005	
7782-49-2		Selenium	T	mg/L	6020	<0.005		<0.005		<0.005		<0.005	
7440-22-4		Silver	T	mg/L	6020	<0.001		<0.001		<0.001		<0.001	
7440-23-5		Sodium	T	mg/L	6020	44.4		134		40.5		41	
7440-25-7		Tantalum	T	mg/L	6020	<0.005		<0.005		<0.005		<0.005	
7440-28-0		Thallium	T	mg/L	6020	<0.002		<0.002		<0.002		<0.002	
7440-61-1		Uranium	T	mg/L	6020	<0.0002		0.00324		<0.0002		<0.0002	
7440-62-2		Vanadium	T	mg/L	6020	0.005	BJ	0.00558	BJ	<0.02		<0.02	
7440-66-6		Zinc	T	mg/L	6020	0.00535	J	0.00687	J	<0.02		0.00928	J
108-05-4		Vinyl acetate	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
67-64-1		Acetone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
107-02-8		Acrolein	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
107-13-1		Acrylonitrile	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
71-43-2		Benzene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
108-90-7		Chlorobenzene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
1330-20-7		Xylenes	T	mg/L	8260	<0.003		<0.003		<0.003		<0.003	
100-42-5		Styrene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
108-88-3		Toluene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
74-97-5		Chlorobromomethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	

RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045 LAB ID: None

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number					8004-4795		8004-0986		8004-4796		8004-4797	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					361		362		363		364	
CAS RN ⁴	CONSTITUENT	T D ⁵	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
75-27-4	Bromodichloromethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-25-2	Tribromomethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
74-83-9	Methyl bromide	T	mg/L	8260	<0.001	*	<0.001	*	<0.001		<0.001	
78-93-3	Methyl ethyl ketone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
110-57-6	trans-1,4-Dichloro-2-butene	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
75-15-0	Carbon disulfide	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
75-00-3	Chloroethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
67-66-3	Chloroform	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
74-87-3	Methyl chloride	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
156-59-2	cis-1,2-Dichloroethene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
74-95-3	Methylene bromide	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-34-3	1,1-Dichloroethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
107-06-2	1,2-Dichloroethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-35-4	1,1-Dichloroethylene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
106-93-4	Ethane, 1,2-dibromo	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
79-34-5	Ethane, 1,1,2,2-Tetrachloro	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
71-55-6	Ethane, 1,1,1-Trichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
79-00-5	Ethane, 1,1,2-Trichloro	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
630-20-6	Ethane, 1,1,1,2-Tetrachloro	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-01-4	Vinyl chloride	T	mg/L	8260	<0.001		<0.001		<0.001	*	<0.001	*
127-18-4	Ethene, Tetrachloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
79-01-6	Ethene, Trichloro-	T	mg/L	8260	0.00631		0.00043	J	<0.001		0.00607	

RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045

LAB ID: None

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number						8004-4795		8004-0986		8004-4796		8004-4797	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						361		362		363		364	
CAS RN ⁴		CONSTITUENT	T D ⁵	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
100-41-4		Ethylbenzene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
591-78-6		2-Hexanone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
74-88-4		Iodomethane	T	mg/L	8260	<0.005	*	<0.005	*	<0.005	*	<0.005	*
124-48-1		Methane, Dibromochloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
56-23-5		Carbon Tetrachloride	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-09-2		Dichloromethane	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
108-10-1		Methyl isobutyl ketone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
96-12-8		Propane, 1,2-Dibromo-3-chloro	T	mg/L	8011	<0.0000186		<0.0000189		<0.0000189		<0.0000187	
78-87-5		Propane, 1,2-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
10061-02-6		trans-1,3-Dichloro-1-propene	T	mg/L	8260	<0.001	*	<0.001	*	<0.001	*	<0.001	*
10061-01-5		cis-1,3-Dichloro-1-propene	T	mg/L	8260	<0.001	*	<0.001	*	<0.001	*	<0.001	*
156-60-5		trans-1,2-Dichloroethene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-69-4		Trichlorofluoromethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
96-18-4		1,2,3-Trichloropropane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
95-50-1		Benzene, 1,2-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
106-46-7		Benzene, 1,4-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
1336-36-3		PCB, Total	T	ug/L	8082	<0.0978		<0.0965		<0.105		<0.103	
12674-11-2		PCB-1016	T	ug/L	8082	<0.0978		<0.0965		<0.105		<0.103	
11104-28-2		PCB-1221	T	ug/L	8082	<0.0978		<0.0965		<0.105		<0.103	
11141-16-5		PCB-1232	T	ug/L	8082	<0.0978		<0.0965		<0.105		<0.103	
53469-21-9		PCB-1242	T	ug/L	8082	<0.0978		<0.0965		<0.105		<0.103	
12672-29-6		PCB-1248	T	ug/L	8082	<0.0978		<0.0965		<0.105		<0.103	

RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045 LAB ID: None

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number					8004-4795		8004-0986		8004-4796		8004-4797		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					361		362		363		364		
CAS RN ⁴		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
11097-69-1		PCB-1254	T	ug/L	8082	<0.0978		<0.0965		<0.105		<0.103	
11096-82-5		PCB-1260	T	ug/L	8082	<0.0978		<0.0965		<0.105		<0.103	
11100-14-4		PCB-1268	T	ug/L	8082	<0.0978		<0.0965		<0.105		<0.103	
12587-46-1		Gross Alpha	T	pCi/L	9310	-0.0941	*	1.93	*	4.22	*	8.26	*
12587-47-2		Gross Beta	T	pCi/L	9310	37	*	4.21	*	5.98	*	35.2	*
10043-66-0		Iodine-131	T	pCi/L			*		*		*		*
13982-63-3		Radium-226	T	pCi/L	AN-1418	0.317	*	0.695	*	0.32	*	0.48	*
10098-97-2		Strontium-90	T	pCi/L	905.0	2.67	*	3.57	*	2.48	*	0.804	*
14133-76-7		Technetium-99	T	pCi/L	Tc-02-RC	55.5	*	7.54	*	-1.73	*	55.3	*
14269-63-7		Thorium-230	T	pCi/L	Th-01-RC	0.982	*	-0.115	*	-0.121	*	-1.21	*
10028-17-8		Tritium	T	pCi/L	906.0	3.04	*	41.3	*	-14.7	*	102	*
S0130- -		Chemical Oxygen Demand	T	mg/L	410.4	<20		<20		20.3	B	20.3	B
57-12-5		Cyanide	T	mg/L	9012	<0.2		<0.2		<0.2		<0.2	
20461-54-5		Iodide	T	mg/L	300.0	<0.5		<0.5		<0.5		<0.5	
S0268- -		Total Organic Carbon	T	mg/L	9060	0.967	J	2.36		0.896	J	1.07	J
S0586- -		Total Organic Halides	T	mg/L	9020	0.00568	J	0.0168		0.00344	J	0.00648	J

Division of Waste Management
Solid Waste Branch
14 Reilly Road
Frankfort, KY 40601 (502)564-6716

RESIDENTIAL/CONTAINED-QUARTERLY
Facility: US DOE - Paducah Gaseous Diffusion Plant
Permit Number: SW07300014, SW07300015, SW07300045

FINDS/UNIT: KY8-890-008-982 / 1
LAB ID: None

GROUNDWATER SAMPLE ANALYSIS(S)

AKGWA NUMBER ¹ , Facility Well/Spring Number					8004-0984	8004-0982	8004-4793	8004-0983					
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					365	366	367	368					
Sample Sequence #					1	1	1	1					
If sample is a Blank, specify Type: (F)ield, (T)rip, (M)ethod, or (E)quipment					NA	NA	NA	NA					
Sample Date and Time (Month/Day/Year hour: minutes)					10/12/2021 07:49	10/12/2021 08:32	10/12/2021 09:17	10/12/2021 10:22					
Duplicate ("Y" or "N") ²					N	N	N	N					
Split ("Y" or "N") ³					N	N	N	N					
Facility Sample ID Number (if applicable)					MW365UG1-22	MW366UG1-22	MW367UG1-22	MW368UG1-22					
Laboratory Sample ID Number (if applicable)					558733005	558733007	558733011	558733013					
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis					10/19/2021	10/19/2021	10/19/2021	10/19/2021					
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)					DOWN	DOWN	DOWN	DOWN					
CAS RN ⁴		CONSTITUENT	T D S	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S ⁷	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
24959-67-9		Bromide	T	mg/L	9056	<0.2		0.428		0.109	J	<0.2	
16887-00-6		Chloride(s)	T	mg/L	9056	2.23	J	37	J	7.72	J	2.82	J
16984-48-8		Fluoride	T	mg/L	9056	0.302	J	0.214	J	0.132	J	0.229	J
S0595- -		Nitrate & Nitrite	T	mg/L	9056	0.723	J	0.832	J	<10		0.0904	J
14808-79-8		Sulfate	T	mg/L	9056	59.3		41		21.9		101	
NS1894		Barometric Pressure Reading	T	Inches/Hg	Field	29.99		30.02		30.03		30.03	
S0145- -		Specific Conductance	T	µMH0/cm	Field	300		390		200		501	

¹AKGWA # is 0000-0000 for any type of blank.

²Respond "Y" if the sample was a duplicate of another sample in this report.

³Respond "Y" if the sample was split and analyzed by separate laboratories.

⁴Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.

⁵"T" = Total; "D" = Dissolved

⁶"<" indicates a non-detect; do not use "ND" or "BDL". Value shown is Practical Quantification Limit.

⁷Flags are as designated, do not use any other type. Use "*", then describe on "Written Comments Page."

STANDARD FLAGS:

* = See Comments

J = Estimated Value

B = Analyte found in blank

A = Average value

N = Presumptive ID

D = Concentration from analysis of a secondary dilution

RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045

LAB ID: None

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number					8004-0984		8004-0982		8004-4793		8004-0983		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)					365		366		367		368		
CAS RN ⁴		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
S0906 - -		Static Water Level Elevation	T	Ft. MSL	Field	329.13		323.65		323.63		328.43	
N238		Dissolved Oxygen	T	mg/L	Field	3.66		3.88		0.8		2.4	
S0266- -		Total Dissolved Solids	T	mg/L	160.1	206	B	223	B	106	B	334	B
S0296- -		pH	T	Units	Field	6.03		5.96		5.7		6.21	
NS215		Eh	T	mV	Field	336		355		217		242	
S0907 - -		Temperature	T	°C	Field	15		15.94		15.94		15.89	
7429-90-5		Aluminum	T	mg/L	6020	<0.05		<0.05		<0.05		0.0613	
7440-36-0		Antimony	T	mg/L	6020	<0.003		<0.003		<0.003		<0.003	
7440-38-2		Arsenic	T	mg/L	6020	<0.005		<0.005		0.00217	J	0.00256	J
7440-39-3		Barium	T	mg/L	6020	0.0907		0.106		0.129		0.0543	
7440-41-7		Beryllium	T	mg/L	6020	<0.0005		<0.0005		<0.0005		<0.0005	
7440-42-8		Boron	T	mg/L	6020	0.00699	J	0.057		0.0173		0.00653	J
7440-43-9		Cadmium	T	mg/L	6020	<0.001		<0.001		<0.001		<0.001	
7440-70-2		Calcium	T	mg/L	6020	16		26.5		12.1		58.4	
7440-47-3		Chromium	T	mg/L	6020	<0.01		<0.01		<0.01		<0.01	
7440-48-4		Cobalt	T	mg/L	6020	0.00111		<0.001		0.00596		<0.001	
7440-50-8		Copper	T	mg/L	6020	0.00187	J	0.000798	J	0.000679	J	0.000967	J
7439-89-6		Iron	T	mg/L	6020	<0.1		<0.1		6.31		0.0609	J
7439-92-1		Lead	T	mg/L	6020	<0.002		<0.002		<0.002		<0.002	
7439-95-4		Magnesium	T	mg/L	6020	8.17		11		6.88		12.9	
7439-96-5		Manganese	T	mg/L	6020	0.00371	J	0.00113	J	1.3		0.00877	
7439-97-6		Mercury	T	mg/L	7470	0.000119	BJ	0.000204	B	0.000257	B	0.000192	BJ

RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045

LAB ID: None

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number						8004-0984		8004-0982		8004-4793		8004-0983	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						365		366		367		368	
CAS RN ⁴		CONSTITUENT	T D ⁵	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
7439-98-7		Molybdenum	T	mg/L	6020	0.000963	J	0.00029	J	<0.001		0.00061	J
7440-02-0		Nickel	T	mg/L	6020	0.00458		0.000631	J	0.00273		0.00128	J
7440-09-7		Potassium	T	mg/L	6020	0.255	J	2.14		3		0.52	
7440-16-6		Rhodium	T	mg/L	6020	<0.005		<0.005		<0.005		<0.005	
7782-49-2		Selenium	T	mg/L	6020	<0.005		0.00322	J	<0.005		<0.005	
7440-22-4		Silver	T	mg/L	6020	<0.001		<0.001		<0.001		<0.001	
7440-23-5		Sodium	T	mg/L	6020	42.7		42.5		15.6		46.7	
7440-25-7		Tantalum	T	mg/L	6020	<0.005		<0.005		<0.005		<0.005	
7440-28-0		Thallium	T	mg/L	6020	<0.002		<0.002		<0.002		<0.002	
7440-61-1		Uranium	T	mg/L	6020	0.000083	J	<0.0002		<0.0002		0.00033	
7440-62-2		Vanadium	T	mg/L	6020	<0.02		<0.02		<0.02		0.00441	J
7440-66-6		Zinc	T	mg/L	6020	0.0038	J	<0.02		0.0122	J	0.00413	J
108-05-4		Vinyl acetate	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
67-64-1		Acetone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
107-02-8		Acrolein	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
107-13-1		Acrylonitrile	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
71-43-2		Benzene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
108-90-7		Chlorobenzene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
1330-20-7		Xylenes	T	mg/L	8260	<0.003		<0.003		<0.003		<0.003	
100-42-5		Styrene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
108-88-3		Toluene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
74-97-5		Chlorobromomethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	

RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045 LAB ID: None

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number					8004-0984		8004-0982		8004-4793		8004-0983	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					365		366		367		368	
CAS RN ⁴	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
75-27-4	Bromodichloromethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-25-2	Tribromomethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
74-83-9	Methyl bromide	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
78-93-3	Methyl ethyl ketone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
110-57-6	trans-1,4-Dichloro-2-butene	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
75-15-0	Carbon disulfide	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
75-00-3	Chloroethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
67-66-3	Chloroform	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
74-87-3	Methyl chloride	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
156-59-2	cis-1,2-Dichloroethene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
74-95-3	Methylene bromide	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-34-3	1,1-Dichloroethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
107-06-2	1,2-Dichloroethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-35-4	1,1-Dichloroethylene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
106-93-4	Ethane, 1,2-dibromo	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
79-34-5	Ethane, 1,1,2,2-Tetrachloro	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
71-55-6	Ethane, 1,1,1-Trichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
79-00-5	Ethane, 1,1,2-Trichloro	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
630-20-6	Ethane, 1,1,1,2-Tetrachloro	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-01-4	Vinyl chloride	T	mg/L	8260	<0.001	*	<0.001	*	<0.001		<0.001	
127-18-4	Ethene, Tetrachloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
79-01-6	Ethene, Trichloro-	T	mg/L	8260	<0.001		0.00309		<0.001		<0.001	

RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045

LAB ID: None

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number						8004-0984		8004-0982		8004-4793		8004-0983	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						365		366		367		368	
CAS RN ⁴		CONSTITUENT	T D ⁵	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
100-41-4		Ethylbenzene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
591-78-6		2-Hexanone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
74-88-4		Iodomethane	T	mg/L	8260	<0.005	*	<0.005	*	<0.005		<0.005	
124-48-1		Methane, Dibromochloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
56-23-5		Carbon Tetrachloride	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-09-2		Dichloromethane	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
108-10-1		Methyl isobutyl ketone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
96-12-8		Propane, 1,2-Dibromo-3-chloro	T	mg/L	8011	<0.0000191		<0.0000188		<0.0000187		<0.0000192	
78-87-5		Propane, 1,2-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
10061-02-6		trans-1,3-Dichloro-1-propene	T	mg/L	8260	<0.001	*	<0.001	*	<0.001		<0.001	
10061-01-5		cis-1,3-Dichloro-1-propene	T	mg/L	8260	<0.001	*	<0.001	*	<0.001		<0.001	
156-60-5		trans-1,2-Dichloroethene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-69-4		Trichlorofluoromethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
96-18-4		1,2,3-Trichloropropane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
95-50-1		Benzene, 1,2-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
106-46-7		Benzene, 1,4-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
1336-36-3		PCB, Total	T	ug/L	8082	<0.099		<0.0987		<0.0959		<0.107	
12674-11-2		PCB-1016	T	ug/L	8082	<0.099		<0.0987		<0.0959		<0.107	
11104-28-2		PCB-1221	T	ug/L	8082	<0.099		<0.0987		<0.0959		<0.107	
11141-16-5		PCB-1232	T	ug/L	8082	<0.099		<0.0987		<0.0959		<0.107	
53469-21-9		PCB-1242	T	ug/L	8082	<0.099		<0.0987		<0.0959		<0.107	
12672-29-6		PCB-1248	T	ug/L	8082	<0.099		<0.0987		<0.0959		<0.107	

RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045

LAB ID: None

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number					8004-0984		8004-0982		8004-4793		8004-0983		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					365		366		367		368		
CAS RN ⁴		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
11097-69-1		PCB-1254	T	ug/L	8082	<0.099		<0.0987		<0.0959		<0.107	
11096-82-5		PCB-1260	T	ug/L	8082	<0.099		<0.0987		<0.0959		<0.107	
11100-14-4		PCB-1268	T	ug/L	8082	<0.099		<0.0987		<0.0959		<0.107	
12587-46-1		Gross Alpha	T	pCi/L	9310	1.49	*	5.6	*	-1.27	*	0.151	*
12587-47-2		Gross Beta	T	pCi/L	9310	-2.34	*	43	*	3.57	*	6.61	*
10043-66-0		Iodine-131	T	pCi/L			*		*		*		*
13982-63-3		Radium-226	T	pCi/L	AN-1418	-0.157	*	0.144	*	0.831	*	0.672	*
10098-97-2		Strontium-90	T	pCi/L	905.0	4.45	*	4.68	*	3.5	*	1.71	*
14133-76-7		Technetium-99	T	pCi/L	Tc-02-RC	-0.0713	*	64.1	*	-3.45	*	-8.9	*
14269-63-7		Thorium-230	T	pCi/L	Th-01-RC	-0.117	*	0.354	*	0.113	*	0.109	*
10028-17-8		Tritium	T	pCi/L	906.0	-14.9	*	97.6	*	-0.742	*	60.2	*
S0130- -		Chemical Oxygen Demand	T	mg/L	410.4	22.9	B	20.3	B	22.9	B	25.5	B
57-12-5		Cyanide	T	mg/L	9012	<0.2		<0.2		<0.2		<0.2	
20461-54-5		Iodide	T	mg/L	300.0	<0.5		<0.5		<0.5		<0.5	
S0268- -		Total Organic Carbon	T	mg/L	9060	1.48	J	1.12	J	0.708	J	1.78	J
S0586- -		Total Organic Halides	T	mg/L	9020	0.0102		0.00452	J	<0.01		<0.01	

Division of Waste Management
Solid Waste Branch
14 Reilly Road
Frankfort, KY 40601 (502)564-6716

RESIDENTIAL/CONTAINED-QUARTERLY
Facility: US DOE - Paducah Gaseous Diffusion Plant
Permit Number: SW07300014, SW07300015, SW07300045

FINDS/UNIT: KY8-890-008-982 / 1
LAB ID: None

GROUNDWATER SAMPLE ANALYSIS(S)

AKGWA NUMBER ¹ , Facility Well/Spring Number					8004-4820		8004-4818		8004-4819		8004-4808		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					369		370		371		372		
Sample Sequence #					1		1		1		1		
If sample is a Blank, specify Type: (F)ield, (T)rip, (M)ethod, or (E)quipment					NA		NA		NA		NA		
Sample Date and Time (Month/Day/Year hour: minutes)					10/12/2021 11:07		10/12/2021 11:50		10/12/2021 12:30		10/13/2021 06:21		
Duplicate ("Y" or "N") ²					N		N		N		N		
Split ("Y" or "N") ³					N		N		N		N		
Facility Sample ID Number (if applicable)					MW369UG1-22		MW370UG1-22		MW371UG1-22		MW372UG1-22		
Laboratory Sample ID Number (if applicable)					558733015		558733017		558733019		558836001		
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis					10/19/2021		10/19/2021		10/19/2021		10/21/2021		
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)					UP		UP		UP		UP		
CAS RN ⁴		CONSTITUENT	T D S	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S ⁷	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
24959-67-9		Bromide	T	mg/L	9056	0.327		0.48		0.0705	J	0.678	*
16887-00-6		Chloride(s)	T	mg/L	9056	29.3	J	37.9	J	5.3	J	39.8	J
16984-48-8		Fluoride	T	mg/L	9056	0.208	J	0.204	J	0.245	J	0.207	J
S0595- -		Nitrate & Nitrite	T	mg/L	9056	0.956	J	1	J	0.186	J	0.934	J
14808-79-8		Sulfate	T	mg/L	9056	8.82		21		11.9		147	
NS1894		Barometric Pressure Reading	T	Inches/Hg	Field	30.04		30.04		30.03		29.96	
S0145- -		Specific Conductance	T	µMH0/cm	Field	305		391		628		484	

STANDARD FLAGS:

* = See Comments
J = Estimated Value
B = Analyte found in blank
A = Average value
N = Presumptive ID
D = Concentration from analysis of a secondary dilution

¹AKGWA # is 0000-0000 for any type of blank.

²Respond "Y" if the sample was a duplicate of another sample in this report.

³Respond "Y" if the sample was split and analyzed by separate laboratories.

⁴Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.

⁵"T" = Total; "D" = Dissolved

⁶"<" indicates a non-detect; do not use "ND" or "BDL". Value shown is Practical Quantification Limit.

⁷Flags are as designated, do not use any other type. Use "*", then describe on "Written Comments Page."

RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045

LAB ID: None

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number					8004-4820		8004-4818		8004-4819		8004-4808		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)					369		370		371		372		
CAS RN ⁴		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
S0906 - -		Static Water Level Elevation	T	Ft. MSL	Field	325.04		325.03		342.53		325.19	
N238		Dissolved Oxygen	T	mg/L	Field	2.82		4.6		3.36		2.28	
S0266- -		Total Dissolved Solids	T	mg/L	160.1	179	B	229	B	417	B	461	*
S0296- -		pH	T	Units	Field	6		5.9		6.32		5.8	
NS215		Eh	T	mV	Field	343		359		344		390	
S0907 - -		Temperature	T	°C	Field	16.5		16.39		16.5		16	
7429-90-5		Aluminum	T	mg/L	6020	0.022	J	<0.05		0.399		<0.05	
7440-36-0		Antimony	T	mg/L	6020	<0.003		<0.003		<0.003		<0.003	
7440-38-2		Arsenic	T	mg/L	6020	<0.005		<0.005		<0.005		<0.005	
7440-39-3		Barium	T	mg/L	6020	0.379		0.242		0.164		0.0622	
7440-41-7		Beryllium	T	mg/L	6020	<0.0005		<0.0005		<0.0005		<0.0005	
7440-42-8		Boron	T	mg/L	6020	0.0171		0.332		0.00734	J	1.23	
7440-43-9		Cadmium	T	mg/L	6020	<0.001		<0.001		<0.001		<0.001	
7440-70-2		Calcium	T	mg/L	6020	15.1		26.1		54		64.8	
7440-47-3		Chromium	T	mg/L	6020	<0.01		<0.01		<0.01		<0.01	
7440-48-4		Cobalt	T	mg/L	6020	0.00429		<0.001		<0.001		<0.001	
7440-50-8		Copper	T	mg/L	6020	0.00113	J	0.000486	J	0.00139	J	0.000755	J
7439-89-6		Iron	T	mg/L	6020	0.0624	J	<0.1		0.255		0.036	J
7439-92-1		Lead	T	mg/L	6020	<0.002		<0.002		<0.002		<0.002	
7439-95-4		Magnesium	T	mg/L	6020	6.77		11		15.8		22.8	
7439-96-5		Manganese	T	mg/L	6020	0.00774		0.00119	J	0.00966		<0.005	
7439-97-6		Mercury	T	mg/L	7470	0.000172	BJ	0.000173	BJ	0.000187	BJ	0.000518	B

RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045

LAB ID: None

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number						8004-4820		8004-4818		8004-4819		8004-4808	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						369		370		371		372	
CAS RN ⁴		CONSTITUENT	T D ⁵	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
7439-98-7		Molybdenum	T	mg/L	6020	0.000511	J	<0.001		0.000365	J	0.00187	*
7440-02-0		Nickel	T	mg/L	6020	0.00279		<0.002		0.0021		<0.002	
7440-09-7		Potassium	T	mg/L	6020	0.67		2.9		0.501		2.29	
7440-16-6		Rhodium	T	mg/L	6020	<0.005		<0.005		<0.005		<0.005	
7782-49-2		Selenium	T	mg/L	6020	0.00278	J	<0.005		<0.005		0.00214	J
7440-22-4		Silver	T	mg/L	6020	<0.001		<0.001		<0.001		<0.001	
7440-23-5		Sodium	T	mg/L	6020	48.4		42		97.2		62.5	
7440-25-7		Tantalum	T	mg/L	6020	<0.005		<0.005		<0.005		<0.005	
7440-28-0		Thallium	T	mg/L	6020	<0.002		<0.002		<0.002		<0.002	
7440-61-1		Uranium	T	mg/L	6020	<0.0002		<0.0002		0.00229		<0.0002	
7440-62-2		Vanadium	T	mg/L	6020	<0.02		<0.02		0.00558	J	0.00498	BJ
7440-66-6		Zinc	T	mg/L	6020	0.0034	J	<0.02		0.0057	J	0.00601	BJ
108-05-4		Vinyl acetate	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	*
67-64-1		Acetone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	*
107-02-8		Acrolein	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	*
107-13-1		Acrylonitrile	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	*
71-43-2		Benzene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
108-90-7		Chlorobenzene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
1330-20-7		Xylenes	T	mg/L	8260	<0.003		<0.003		<0.003		<0.003	*
100-42-5		Styrene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
108-88-3		Toluene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
74-97-5		Chlorobromomethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*

RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045 LAB ID: None

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number					8004-4820		8004-4818		8004-4819		8004-4808	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					369		370		371		372	
CAS RN ⁴	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
75-27-4	Bromodichloromethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
75-25-2	Tribromomethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
74-83-9	Methyl bromide	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
78-93-3	Methyl ethyl ketone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	*
110-57-6	trans-1,4-Dichloro-2-butene	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	*
75-15-0	Carbon disulfide	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	*
75-00-3	Chloroethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
67-66-3	Chloroform	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
74-87-3	Methyl chloride	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
156-59-2	cis-1,2-Dichloroethene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
74-95-3	Methylene bromide	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
75-34-3	1,1-Dichloroethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
107-06-2	1,2-Dichloroethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
75-35-4	1,1-Dichloroethylene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
106-93-4	Ethane, 1,2-dibromo	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
79-34-5	Ethane, 1,1,2,2-Tetrachloro	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
71-55-6	Ethane, 1,1,1-Trichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
79-00-5	Ethane, 1,1,2-Trichloro	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
630-20-6	Ethane, 1,1,1,2-Tetrachloro	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
75-01-4	Vinyl chloride	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
127-18-4	Ethene, Tetrachloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
79-01-6	Ethene, Trichloro-	T	mg/L	8260	0.00123		0.00084	J	<0.001		0.004	*

RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045

LAB ID: None

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number						8004-4820		8004-4818		8004-4819		8004-4808		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						369		370		371		372		
CAS	RN ⁴		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
100-41-4			Ethylbenzene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
591-78-6			2-Hexanone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	*
74-88-4			Iodomethane	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	*
124-48-1			Methane, Dibromochloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
56-23-5			Carbon Tetrachloride	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
75-09-2			Dichloromethane	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	*
108-10-1			Methyl isobutyl ketone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	*
96-12-8			Propane, 1,2-Dibromo-3-chloro	T	mg/L	8011	<0.0000189		<0.0000187		<0.000019		<0.0000188	
78-87-5			Propane, 1,2-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
10061-02-6			trans-1,3-Dichloro-1-propene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
10061-01-5			cis-1,3-Dichloro-1-propene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
156-60-5			trans-1,2-Dichloroethene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
75-69-4			Trichlorofluoromethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
96-18-4			1,2,3-Trichloropropane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
95-50-1			Benzene, 1,2-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
106-46-7			Benzene, 1,4-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
1336-36-3			PCB, Total	T	ug/L	8082	<0.0972		<0.0991		<0.0989		<0.102	
12674-11-2			PCB-1016	T	ug/L	8082	<0.0972		<0.0991		<0.0989		<0.102	
11104-28-2			PCB-1221	T	ug/L	8082	<0.0972		<0.0991		<0.0989		<0.102	
11141-16-5			PCB-1232	T	ug/L	8082	<0.0972		<0.0991		<0.0989		<0.102	
53469-21-9			PCB-1242	T	ug/L	8082	<0.0972		<0.0991		<0.0989		<0.102	
12672-29-6			PCB-1248	T	ug/L	8082	<0.0972		<0.0991		<0.0989		<0.102	

RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045 LAB ID: None

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number					8004-4820		8004-4818		8004-4819		8004-4808		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					369		370		371		372		
CAS RN ⁴		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
11097-69-1		PCB-1254	T	ug/L	8082	<0.0972		<0.0991		<0.0989		<0.102	
11096-82-5		PCB-1260	T	ug/L	8082	<0.0972		<0.0991		<0.0989		<0.102	
11100-14-4		PCB-1268	T	ug/L	8082	<0.0972		<0.0991		<0.0989		<0.102	
12587-46-1		Gross Alpha	T	pCi/L	9310	1.47	*	3.13	*	7.13	*	-0.244	*
12587-47-2		Gross Beta	T	pCi/L	9310	41.8	*	40.6	*	15.2	*	35.6	*
10043-66-0		Iodine-131	T	pCi/L			*		*		*		*
13982-63-3		Radium-226	T	pCi/L	AN-1418	0.332	*	0.937	*	0.6	*	0.446	*
10098-97-2		Strontium-90	T	pCi/L	905.0	-0.314	*	3.66	*	0.6	*	5.09	*
14133-76-7		Technetium-99	T	pCi/L	Tc-02-RC	59.8	*	39.2	*	1.98	*	55.9	*
14269-63-7		Thorium-230	T	pCi/L	Th-01-RC	-0.38	*	0.122	*	0.983	*	0.491	*
10028-17-8		Tritium	T	pCi/L	906.0	13.8	*	19.3	*	-43.5	*	-8.74	*
S0130- -		Chemical Oxygen Demand	T	mg/L	410.4	12.6	BJ	30.6	B	22.9	B	16.2	J
57-12-5		Cyanide	T	mg/L	9012	<0.2		<0.2		<0.2		<0.2	
20461-54-5		Iodide	T	mg/L	300.0	<0.5		<0.5		<0.5		<0.5	
S0268- -		Total Organic Carbon	T	mg/L	9060	1.28	J	1.19	J	2.3		1.24	J
S0586- -		Total Organic Halides	T	mg/L	9020	0.0111		0.0063	J	0.00588	J	0.0084	J

Division of Waste Management
Solid Waste Branch
14 Reilly Road
Frankfort, KY 40601 (502)564-6716

RESIDENTIAL/CONTAINED-QUARTERLY
Facility: US DOE - Paducah Gaseous Diffusion Plant
Permit Number: SW07300014, SW07300015, SW07300045

FINDS/UNIT: KY8-890-008-982 / 1
LAB ID: None

GROUNDWATER SAMPLE ANALYSIS(S)

AKGWA NUMBER ¹ , Facility Well/Spring Number					8004-4792		8004-0990		8004-0985		8004-0988		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					373		374		375		376		
Sample Sequence #					1		1		1		1		
If sample is a Blank, specify Type: (F)ield, (T)rip, (M)ethod, or (E)quipment					NA		NA		NA		NA		
Sample Date and Time (Month/Day/Year hour: minutes)					10/13/2021 07:18		10/13/2021 07:58		10/13/2021 08:42		NA		
Duplicate ("Y" or "N") ²					N		N		N		N		
Split ("Y" or "N") ³					N		N		N		N		
Facility Sample ID Number (if applicable)					MW373UG1-22		MW374UG1-22		MW375UG1-22		NA		
Laboratory Sample ID Number (if applicable)					558836003		558836005		558836007		NA		
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis					10/20/2021		10/20/2021		10/20/2021		NA		
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)					UP		UP		SIDE		SIDE		
CAS RN ⁴		CONSTITUENT	T D ⁵	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S ⁷	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
24959-67-9		Bromide	T	mg/L	9056	0.699	*	0.823	*	<0.2	*		*
16887-00-6		Chloride(s)	T	mg/L	9056	35.2	J	46.8	J	3.21	J		*
16984-48-8		Fluoride	T	mg/L	9056	0.184	J	0.244	J	0.294	J		*
S0595- -		Nitrate & Nitrite	T	mg/L	9056	0.86	J	<10		0.929	J		*
14808-79-8		Sulfate	T	mg/L	9056	155		12.7		23.2			*
NS1894		Barometric Pressure Reading	T	Inches/Hg	Field	29.95		29.95		29.95			*
S0145- -		Specific Conductance	T	µMH0/cm	Field	560		241		630			*

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²Respond "Y" if the sample was a duplicate of another sample in this report.

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⁴Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.

⁵"T" = Total; "D" = Dissolved

⁶"<" indicates a non-detect; do not use "ND" or "BDL". Value shown is Practical Quantification Limit.

⁷Flags are as designated, do not use any other type. Use "*", " then describe on "Written Comments Page."

RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045

LAB ID: None

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number					8004-4792		8004-0990		8004-0985		8004-0988		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)					373		374		375		376		
CAS RN ⁴		CONSTITUENT	T D ⁵	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
S0906 - -		Static Water Level Elevation	T	Ft. MSL	Field	325.18		338.26		335.5			*
N238		Dissolved Oxygen	T	mg/L	Field	2		0.44		1.8			*
S0266- -		Total Dissolved Solids	T	mg/L	160.1	491	*	370	*	167	*		*
S0296- -		pH	T	Units	Field	5.77		6.44		6.19			*
NS215		Eh	T	mV	Field	372		202		327			*
S0907 - -		Temperature	T	°C	Field	16		16.28		16.28			*
7429-90-5		Aluminum	T	mg/L	6020	<0.05		<0.05		<0.05			*
7440-36-0		Antimony	T	mg/L	6020	<0.003		<0.003		<0.003			*
7440-38-2		Arsenic	T	mg/L	6020	<0.005		0.00324	J	<0.005			*
7440-39-3		Barium	T	mg/L	6020	0.0318		0.169		0.18			*
7440-41-7		Beryllium	T	mg/L	6020	<0.0005		<0.0005		<0.0005			*
7440-42-8		Boron	T	mg/L	6020	1.96		0.0308		0.0153			*
7440-43-9		Cadmium	T	mg/L	6020	<0.001		<0.001		<0.001			*
7440-70-2		Calcium	T	mg/L	6020	67.8		25		12.8			*
7440-47-3		Chromium	T	mg/L	6020	<0.01		<0.01		<0.01			*
7440-48-4		Cobalt	T	mg/L	6020	<0.001		0.000826	J	<0.001			*
7440-50-8		Copper	T	mg/L	6020	0.000675	J	0.000324	J	0.00044	J		*
7439-89-6		Iron	T	mg/L	6020	0.0481	J	0.725		0.0476	J		*
7439-92-1		Lead	T	mg/L	6020	<0.002		<0.002		<0.002			*
7439-95-4		Magnesium	T	mg/L	6020	26.1		6.15		5.43			*
7439-96-5		Manganese	T	mg/L	6020	0.0108		0.219		0.00239	J		*
7439-97-6		Mercury	T	mg/L	7470	<0.0002		0.000082	BJ	0.000111	BJ		*

RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045

LAB ID: None

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number						8004-4792		8004-0990		8004-0985		8004-0988		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						373		374		375		376		
CAS	RN ⁴		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
7439-98-7			Molybdenum	T	mg/L	6020	0.000288	J*	0.000544	J*	<0.001	*		*
7440-02-0			Nickel	T	mg/L	6020	0.000959	J	<0.002		0.000764	J		*
7440-09-7			Potassium	T	mg/L	6020	2.92		0.564		0.272	J		*
7440-16-6			Rhodium	T	mg/L	6020	<0.005		<0.005		<0.005			*
7782-49-2			Selenium	T	mg/L	6020	<0.005		<0.005		0.00246	J		*
7440-22-4			Silver	T	mg/L	6020	<0.001		<0.001		<0.001			*
7440-23-5			Sodium	T	mg/L	6020	62.8		127		52.4			*
7440-25-7			Tantalum	T	mg/L	6020	<0.005		<0.005		<0.005			*
7440-28-0			Thallium	T	mg/L	6020	<0.002		<0.002		<0.002			*
7440-61-1			Uranium	T	mg/L	6020	0.000073	J	0.000333		<0.0002			*
7440-62-2			Vanadium	T	mg/L	6020	0.0055	BJ	0.00495	BJ	0.00502	BJ		*
7440-66-6			Zinc	T	mg/L	6020	0.00596	BJ	<0.02		<0.02			*
108-05-4			Vinyl acetate	T	mg/L	8260	<0.005		<0.005		<0.005			*
67-64-1			Acetone	T	mg/L	8260	<0.005		<0.005		<0.005			*
107-02-8			Acrolein	T	mg/L	8260	<0.005		<0.005		<0.005			*
107-13-1			Acrylonitrile	T	mg/L	8260	<0.005		<0.005		<0.005			*
71-43-2			Benzene	T	mg/L	8260	<0.001		<0.001		<0.001			*
108-90-7			Chlorobenzene	T	mg/L	8260	<0.001		<0.001		<0.001			*
1330-20-7			Xylenes	T	mg/L	8260	<0.003		<0.003		<0.003			*
100-42-5			Styrene	T	mg/L	8260	<0.001		<0.001		<0.001			*
108-88-3			Toluene	T	mg/L	8260	<0.001		<0.001		<0.001			*
74-97-5			Chlorobromomethane	T	mg/L	8260	<0.001		<0.001		<0.001			*

RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045

LAB ID: None

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number					8004-4792		8004-0990		8004-0985		8004-0988	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					373		374		375		376	
CAS RN ⁴	CONSTITUENT	T D ⁵	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
75-27-4	Bromodichloromethane	T	mg/L	8260	<0.001		<0.001		<0.001			*
75-25-2	Tribromomethane	T	mg/L	8260	<0.001		<0.001		<0.001			*
74-83-9	Methyl bromide	T	mg/L	8260	<0.001		<0.001		<0.001			*
78-93-3	Methyl ethyl ketone	T	mg/L	8260	<0.005		<0.005		<0.005			*
110-57-6	trans-1,4-Dichloro-2-butene	T	mg/L	8260	<0.005		<0.005		<0.005			*
75-15-0	Carbon disulfide	T	mg/L	8260	<0.005		<0.005		<0.005			*
75-00-3	Chloroethane	T	mg/L	8260	<0.001		<0.001		<0.001			*
67-66-3	Chloroform	T	mg/L	8260	<0.001		<0.001		<0.001			*
74-87-3	Methyl chloride	T	mg/L	8260	<0.001		<0.001		<0.001			*
156-59-2	cis-1,2-Dichloroethene	T	mg/L	8260	<0.001		<0.001		<0.001			*
74-95-3	Methylene bromide	T	mg/L	8260	<0.001		<0.001		<0.001			*
75-34-3	1,1-Dichloroethane	T	mg/L	8260	<0.001		<0.001		<0.001			*
107-06-2	1,2-Dichloroethane	T	mg/L	8260	<0.001		<0.001		<0.001			*
75-35-4	1,1-Dichloroethylene	T	mg/L	8260	<0.001		<0.001		<0.001			*
106-93-4	Ethane, 1,2-dibromo	T	mg/L	8260	<0.001		<0.001		<0.001			*
79-34-5	Ethane, 1,1,2,2-Tetrachloro	T	mg/L	8260	<0.001		<0.001		<0.001			*
71-55-6	Ethane, 1,1,1-Trichloro-	T	mg/L	8260	<0.001		<0.001		<0.001			*
79-00-5	Ethane, 1,1,2-Trichloro	T	mg/L	8260	<0.001		<0.001		<0.001			*
630-20-6	Ethane, 1,1,1,2-Tetrachloro	T	mg/L	8260	<0.001		<0.001		<0.001			*
75-01-4	Vinyl chloride	T	mg/L	8260	<0.001		<0.001		<0.001			*
127-18-4	Ethene, Tetrachloro-	T	mg/L	8260	<0.001		<0.001		<0.001			*
79-01-6	Ethene, Trichloro-	T	mg/L	8260	0.00591		<0.001		<0.001			*

RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045

LAB ID: None

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number						8004-4792		8004-0990		8004-0985		8004-0988	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						373		374		375		376	
CAS RN ⁴		CONSTITUENT	T D ⁵	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
100-41-4		Ethylbenzene	T	mg/L	8260	<0.001		<0.001		<0.001			*
591-78-6		2-Hexanone	T	mg/L	8260	<0.005		<0.005		<0.005			*
74-88-4		Iodomethane	T	mg/L	8260	<0.005		<0.005		<0.005			*
124-48-1		Methane, Dibromochloro-	T	mg/L	8260	<0.001		<0.001		<0.001			*
56-23-5		Carbon Tetrachloride	T	mg/L	8260	<0.001		<0.001		<0.001			*
75-09-2		Dichloromethane	T	mg/L	8260	<0.005		<0.005		<0.005			*
108-10-1		Methyl isobutyl ketone	T	mg/L	8260	<0.005		<0.005		<0.005			*
96-12-8		Propane, 1,2-Dibromo-3-chloro	T	mg/L	8011	<0.0000189		<0.0000186		<0.0000187			*
78-87-5		Propane, 1,2-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001			*
10061-02-6		trans-1,3-Dichloro-1-propene	T	mg/L	8260	<0.001		<0.001		<0.001			*
10061-01-5		cis-1,3-Dichloro-1-propene	T	mg/L	8260	<0.001		<0.001		<0.001			*
156-60-5		trans-1,2-Dichloroethene	T	mg/L	8260	<0.001		<0.001		<0.001			*
75-69-4		Trichlorofluoromethane	T	mg/L	8260	<0.001		<0.001		<0.001			*
96-18-4		1,2,3-Trichloropropane	T	mg/L	8260	<0.001		<0.001		<0.001			*
95-50-1		Benzene, 1,2-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001			*
106-46-7		Benzene, 1,4-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001			*
1336-36-3		PCB, Total	T	ug/L	8082	<0.0993		<0.0997		<0.0967			*
12674-11-2		PCB-1016	T	ug/L	8082	<0.0993		<0.0997		<0.0967			*
11104-28-2		PCB-1221	T	ug/L	8082	<0.0993		<0.0997		<0.0967			*
11141-16-5		PCB-1232	T	ug/L	8082	<0.0993		<0.0997		<0.0967			*
53469-21-9		PCB-1242	T	ug/L	8082	<0.0993		<0.0997		<0.0967			*
12672-29-6		PCB-1248	T	ug/L	8082	<0.0993		<0.0997		<0.0967			*

RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045

LAB ID: None

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number					8004-4792		8004-0990		8004-0985		8004-0988		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					373		374		375		376		
CAS RN ⁴		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
11097-69-1		PCB-1254	T	ug/L	8082	<0.0993		<0.0997		<0.0967			*
11096-82-5		PCB-1260	T	ug/L	8082	<0.0993		<0.0997		<0.0967			*
11100-14-4		PCB-1268	T	ug/L	8082	<0.0993		<0.0997		<0.0967			*
12587-46-1		Gross Alpha	T	pCi/L	9310	-6.66	*	-3.21	*	7.12	*		*
12587-47-2		Gross Beta	T	pCi/L	9310	-1.1	*	0.767	*	-2.54	*		*
10043-66-0		Iodine-131	T	pCi/L			*		*		*		*
13982-63-3		Radium-226	T	pCi/L	AN-1418	0.438	*	0.627	*	-0.00436	*		*
10098-97-2		Strontium-90	T	pCi/L	905.0	4.38	*	3.76	*	2.47	*		*
14133-76-7		Technetium-99	T	pCi/L	Tc-02-RC	8.12	*	-2.62	*	-3.76	*		*
14269-63-7		Thorium-230	T	pCi/L	Th-01-RC	0.51	*	1.39	*	0.51	*		*
10028-17-8		Tritium	T	pCi/L	906.0	-29.1	*	39.4	*	-76.6	*		*
S0130- -		Chemical Oxygen Demand	T	mg/L	410.4	16.2	J	16.2	J	16.2	J		*
57-12-5		Cyanide	T	mg/L	9012	<0.2		<0.2		<0.2			*
20461-54-5		Iodide	T	mg/L	300.0	<0.5		<0.5		<0.5			*
S0268- -		Total Organic Carbon	T	mg/L	9060	1.36	J	2.78		0.644	J		*
S0586- -		Total Organic Halides	T	mg/L	9020	0.00774	J	0.0191		0.00828	J		*

Division of Waste Management
Solid Waste Branch
14 Reilly Road
Frankfort, KY 40601 (502)564-6716

RESIDENTIAL/CONTAINED-QUARTERLY
Facility: US DOE - Paducah Gaseous Diffusion Plant
Permit Number: SW07300014, SW07300015, SW07300045

FINDS/UNIT: KY8-890-008-982 / 1
LAB ID: None

GROUNDWATER SAMPLE ANALYSIS(S)

AKGWA NUMBER ¹ , Facility Well/Spring Number					8004-0989	0000-0000	0000-0000	0000-0000			
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					377	E. BLANK	F. BLANK	T. BLANK 1			
Sample Sequence #					1	1	1	1			
If sample is a Blank, specify Type: (F)ield, (T)rip, (M)ethod, or (E)quipment					NA	E	F	T			
Sample Date and Time (Month/Day/Year hour:minutes)					NA	10/12/2021 05:15	10/12/2021 09:20	10/11/2021 06:45			
06:50Duplicate ("Y" or "N") ²					N	N	N	N			
Split ("Y" or "N") ³					N	N	N	N			
Facility Sample ID Number (if applicable)					NA	RI1UG1-22	FB1UG1-22	TB1UG1-22			
Laboratory Sample ID Number (if applicable)					NA	558733022	558733021	558545013			
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis					NA	10/19/2021	10/19/2021	10/16/2021			
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)					SIDE	NA	NA	NA			
CAS RN ⁴		CONSTITUENT	T D S ⁵	Unit OF MEASURE	METHO D	DETECTED VALUE OR PQL ⁶	F L A G S ⁷	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
24959-67-9		Bromide	T	mg/L	9056		*		*		*
16887-00-6		Chloride(s)	T	mg/L	9056		*		*		*
16984-48-8		Fluoride	T	mg/L	9056		*		*		*
S0595- -		Nitrate & Nitrite	T	mg/L	9056		*		*		*
14808-79-8		Sulfate	T	mg/L	9056		*		*		*
NS1894		Barometric Pressure Reading	T	Inches/Hg	Field		*		*		*
S0145- -		Specific Conductance	T	µMH0/cm	Field		*		*		*

STANDARD FLAGS:

* = See Comments
J = Estimated Value
B = Analyte found in blank
A = Average value
N = Presumptive ID
D = Concentration from analysis
of a secondary dilution

¹AKGWA # is 0000-0000 for any type of blank.

²Respond "Y" if the sample was a duplicate of another sample in this report.

³Respond "Y" if the sample was split and analyzed by separate laboratories.

⁴Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.

⁵"T" = Total; "D" = Dissolved

⁶"<" indicates a non-detect; do not use "ND" or "BDL". Value shown is Practical Quantification Limit.

⁷Flags are as designated, do not use any other type. Use "*", then describe on "Written Comments Page."

RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045

LAB ID: None

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number					8004-0989		0000-0000		0000-0000		0000-0000		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)					377		E. BLANK		F. BLANK		T. BLANK 1		
CAS RN ⁴		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
S0906 - -		Static Water Level Elevation	T	Ft. MSL	Field		*		*		*		*
N238		Dissolved Oxygen	T	mg/L	Field		*		*		*		*
S0266- -		Total Dissolved Solids	T	mg/L	160.1		*		*		*		*
S0296- -		pH	T	Units	Field		*		*		*		*
NS215		Eh	T	mV	Field		*		*		*		*
S0907 - -		Temperature	T	°C	Field		*		*		*		*
7429-90-5		Aluminum	T	mg/L	6020		*	<0.05		<0.05			*
7440-36-0		Antimony	T	mg/L	6020		*	<0.003		<0.003			*
7440-38-2		Arsenic	T	mg/L	6020		*	<0.005		<0.005			*
7440-39-3		Barium	T	mg/L	6020		*	<0.004		<0.004			*
7440-41-7		Beryllium	T	mg/L	6020		*	<0.0005		<0.0005			*
7440-42-8		Boron	T	mg/L	6020		*	<0.015		<0.015			*
7440-43-9		Cadmium	T	mg/L	6020		*	<0.001		<0.001			*
7440-70-2		Calcium	T	mg/L	6020		*	<0.2		<0.2			*
7440-47-3		Chromium	T	mg/L	6020		*	<0.01		<0.01			*
7440-48-4		Cobalt	T	mg/L	6020		*	<0.001		<0.001			*
7440-50-8		Copper	T	mg/L	6020		*	0.000563	J	<0.002			*
7439-89-6		Iron	T	mg/L	6020		*	<0.1		<0.1			*
7439-92-1		Lead	T	mg/L	6020		*	<0.002		<0.002			*
7439-95-4		Magnesium	T	mg/L	6020		*	<0.03		<0.03			*
7439-96-5		Manganese	T	mg/L	6020		*	<0.005		<0.005			*
7439-97-6		Mercury	T	mg/L	7470		*	0.000203	B	0.000082	BJ		*

RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045

LAB ID: None

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number						8004-0989		0000-0000		0000-0000		0000-0000	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						377		E. BLANK		F. BLANK		T. BLANK 1	
CAS RN ⁴		CONSTITUENT	T D ⁵	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
7439-98-7		Molybdenum	T	mg/L	6020		*	0.000292	J	<0.001			*
7440-02-0		Nickel	T	mg/L	6020		*	<0.002		<0.002			*
7440-09-7		Potassium	T	mg/L	6020		*	<0.3		<0.3			*
7440-16-6		Rhodium	T	mg/L	6020		*	<0.005		<0.005			*
7782-49-2		Selenium	T	mg/L	6020		*	<0.005		<0.005			*
7440-22-4		Silver	T	mg/L	6020		*	<0.001		<0.001			*
7440-23-5		Sodium	T	mg/L	6020		*	<0.25		<0.25			*
7440-25-7		Tantalum	T	mg/L	6020		*	<0.005		<0.005			*
7440-28-0		Thallium	T	mg/L	6020		*	<0.002		<0.002			*
7440-61-1		Uranium	T	mg/L	6020		*	<0.0002		<0.0002			*
7440-62-2		Vanadium	T	mg/L	6020		*	<0.02		<0.02			*
7440-66-6		Zinc	T	mg/L	6020		*	<0.02		<0.02			*
108-05-4		Vinyl acetate	T	mg/L	8260		*	<0.005		<0.005		<0.005	
67-64-1		Acetone	T	mg/L	8260		*	0.00664	B	0.00676	B	0.00183	J
107-02-8		Acrolein	T	mg/L	8260		*	<0.005		<0.005		<0.005	
107-13-1		Acrylonitrile	T	mg/L	8260		*	<0.005		<0.005		<0.005	
71-43-2		Benzene	T	mg/L	8260		*	<0.001		<0.001		<0.001	
108-90-7		Chlorobenzene	T	mg/L	8260		*	<0.001		<0.001		<0.001	
1330-20-7		Xylenes	T	mg/L	8260		*	<0.003		<0.003		<0.003	
100-42-5		Styrene	T	mg/L	8260		*	<0.001		<0.001		<0.001	
108-88-3		Toluene	T	mg/L	8260		*	<0.001		<0.001		<0.001	
74-97-5		Chlorobromomethane	T	mg/L	8260		*	<0.001		<0.001		<0.001	

RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045 LAB ID: None

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number					8004-0989		0000-0000		0000-0000		0000-0000	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					377		E. BLANK		F. BLANK		T. BLANK 1	
CAS RN ⁴	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
75-27-4	Bromodichloromethane	T	mg/L	8260		*	<0.001		<0.001		<0.001	
75-25-2	Tribromomethane	T	mg/L	8260		*	<0.001		<0.001		<0.001	
74-83-9	Methyl bromide	T	mg/L	8260		*	<0.001		<0.001		<0.001	*
78-93-3	Methyl ethyl ketone	T	mg/L	8260		*	<0.005		<0.005		<0.005	
110-57-6	trans-1,4-Dichloro-2-butene	T	mg/L	8260		*	<0.005		<0.005		<0.005	
75-15-0	Carbon disulfide	T	mg/L	8260		*	<0.005		<0.005		<0.005	
75-00-3	Chloroethane	T	mg/L	8260		*	<0.001		<0.001		<0.001	
67-66-3	Chloroform	T	mg/L	8260		*	<0.001		<0.001		<0.001	
74-87-3	Methyl chloride	T	mg/L	8260		*	<0.001		<0.001		<0.001	
156-59-2	cis-1,2-Dichloroethene	T	mg/L	8260		*	<0.001		<0.001		<0.001	
74-95-3	Methylene bromide	T	mg/L	8260		*	<0.001		<0.001		<0.001	
75-34-3	1,1-Dichloroethane	T	mg/L	8260		*	<0.001		<0.001		<0.001	
107-06-2	1,2-Dichloroethane	T	mg/L	8260		*	<0.001		<0.001		<0.001	
75-35-4	1,1-Dichloroethylene	T	mg/L	8260		*	<0.001		<0.001		<0.001	
106-93-4	Ethane, 1,2-dibromo	T	mg/L	8260		*	<0.001		<0.001		<0.001	
79-34-5	Ethane, 1,1,2,2-Tetrachloro	T	mg/L	8260		*	<0.001		<0.001		<0.001	
71-55-6	Ethane, 1,1,1-Trichloro-	T	mg/L	8260		*	<0.001		<0.001		<0.001	
79-00-5	Ethane, 1,1,2-Trichloro	T	mg/L	8260		*	<0.001		<0.001		<0.001	
630-20-6	Ethane, 1,1,1,2-Tetrachloro	T	mg/L	8260		*	<0.001		<0.001		<0.001	
75-01-4	Vinyl chloride	T	mg/L	8260		*	<0.001		<0.001		<0.001	
127-18-4	Ethene, Tetrachloro-	T	mg/L	8260		*	<0.001		<0.001		<0.001	
79-01-6	Ethene, Trichloro-	T	mg/L	8260		*	<0.001		<0.001		<0.001	

RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045

LAB ID: None

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number						8004-0989		0000-0000		0000-0000		0000-0000	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						377		E. BLANK		F. BLANK		T. BLANK 1	
CAS RN ⁴		CONSTITUENT	T D ⁵	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
100-41-4		Ethylbenzene	T	mg/L	8260		*	<0.001		<0.001		<0.001	
591-78-6		2-Hexanone	T	mg/L	8260		*	<0.005		<0.005		<0.005	
74-88-4		Iodomethane	T	mg/L	8260		*	<0.005		<0.005		<0.005	*
124-48-1		Methane, Dibromochloro-	T	mg/L	8260		*	<0.001		<0.001		<0.001	
56-23-5		Carbon Tetrachloride	T	mg/L	8260		*	<0.001		<0.001		<0.001	
75-09-2		Dichloromethane	T	mg/L	8260		*	<0.005		<0.005		<0.005	
108-10-1		Methyl isobutyl ketone	T	mg/L	8260		*	<0.005		<0.005		<0.005	
96-12-8		Propane, 1,2-Dibromo-3-chloro	T	mg/L	8011		*	<0.0000185		<0.0000187		<0.0000185	
78-87-5		Propane, 1,2-Dichloro-	T	mg/L	8260		*	<0.001		<0.001		<0.001	
10061-02-6		trans-1,3-Dichloro-1-propene	T	mg/L	8260		*	<0.001		<0.001		<0.001	*
10061-01-5		cis-1,3-Dichloro-1-propene	T	mg/L	8260		*	<0.001		<0.001		<0.001	*
156-60-5		trans-1,2-Dichloroethene	T	mg/L	8260		*	<0.001		<0.001		<0.001	
75-69-4		Trichlorofluoromethane	T	mg/L	8260		*	<0.001		<0.001		<0.001	
96-18-4		1,2,3-Trichloropropane	T	mg/L	8260		*	<0.001		<0.001		<0.001	
95-50-1		Benzene, 1,2-Dichloro-	T	mg/L	8260		*	<0.001		<0.001		<0.001	
106-46-7		Benzene, 1,4-Dichloro-	T	mg/L	8260		*	<0.001		<0.001		<0.001	
1336-36-3		PCB, Total	T	ug/L	8082		*	<0.0963		<0.0985			*
12674-11-2		PCB-1016	T	ug/L	8082		*	<0.0963		<0.0985			*
11104-28-2		PCB-1221	T	ug/L	8082		*	<0.0963		<0.0985			*
11141-16-5		PCB-1232	T	ug/L	8082		*	<0.0963		<0.0985			*
53469-21-9		PCB-1242	T	ug/L	8082		*	<0.0963		<0.0985			*
12672-29-6		PCB-1248	T	ug/L	8082		*	<0.0963		<0.0985			*

RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045 LAB ID: None

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number					8004-0989		0000-0000		0000-0000		0000-0000		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					377		E. BLANK		F. BLANK		T. BLANK 1		
CAS RN ⁴		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
11097-69-1		PCB-1254	T	ug/L	8082		*	<0.0963		<0.0985			*
11096-82-5		PCB-1260	T	ug/L	8082		*	<0.0963		<0.0985			*
11100-14-4		PCB-1268	T	ug/L	8082		*	<0.0963		<0.0985			*
12587-46-1		Gross Alpha	T	pCi/L	9310		*	-0.588	*	2.39	*		*
12587-47-2		Gross Beta	T	pCi/L	9310		*	4.33	*	-0.687	*		*
10043-66-0		Iodine-131	T	pCi/L			*		*		*		*
13982-63-3		Radium-226	T	pCi/L	AN-1418		*	0.176	*	0.0673	*		*
10098-97-2		Strontium-90	T	pCi/L	905.0		*	-2.22	*	-0.365	*		*
14133-76-7		Technetium-99	T	pCi/L	Tc-02-RC		*	-2.56	*	-6.9	*		*
14269-63-7		Thorium-230	T	pCi/L	Th-01-RC		*	-0.121	*	-0.143	*		*
10028-17-8		Tritium	T	pCi/L	906.0		*	62.9	*	98	*		*
S0130- -		Chemical Oxygen Demand	T	mg/L	410.4		*		*		*		*
57-12-5		Cyanide	T	mg/L	9012		*		*		*		*
20461-54-5		Iodide	T	mg/L	300.0		*	<0.5		<0.5			*
S0268- -		Total Organic Carbon	T	mg/L	9060		*		*		*		*
S0586- -		Total Organic Halides	T	mg/L	9020		*		*		*		*

Division of Waste Management
Solid Waste Branch
14 Reilly Road
Frankfort, KY 40601 (502)564-6716

RESIDENTIAL/CONTAINED-QUARTERLY
Facility: US DOE - Paducah Gaseous Diffusion Plant
Permit Number: SW07300014, SW07300015, SW07300045

FINDS/UNIT: KY8-890-008-982 / 1
LAB ID: None

GROUNDWATER SAMPLE ANALYSIS_(S)

AKGWA NUMBER ¹ , Facility Well/Spring Number					0000-0000	0000-0000	8004-4793						
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					T. BLANK 2	T. BLANK 3	367						
Sample Sequence #					1	1	2						
If sample is a Blank, specify Type: (F)ield, (T)rip, (M)ethod, or (E)quipment					T	T	NA						
Sample Date and Time (Month/Day/Year hour: minutes)					10/12/2021 05:10	10/13/2021 05:30	10/12/2021 09:17						
Duplicate ("Y" or "N") ²					N	N	Y						
Split ("Y" or "N") ³					N	N	N						
Facility Sample ID Number (if applicable)					TB2UG1-22	TB3UG1-22	MW367DUG1-22						
Laboratory Sample ID Number (if applicable)					558733023	558836009	558733009						
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis					10/19/2021	10/20/2021	10/19/2021						
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)					NA	NA	DOWN						
CAS RN ⁴		CONSTITUENT	T D S	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S ⁷	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
24959-67-9		Bromide	T	mg/L	9056		*		*	0.112	J		
16887-00-6		Chloride(s)	T	mg/L	9056		*		*	7.72	J		
16984-48-8		Fluoride	T	mg/L	9056		*		*	0.142	J		
S0595- -		Nitrate & Nitrite	T	mg/L	9056		*		*	<10			
14808-79-8		Sulfate	T	mg/L	9056		*		*	21.9			
NS1894		Barometric Pressure Reading	T	Inches/Hg	Field		*		*		*		
S0145- -		Specific Conductance	T	µMH0/cm	Field		*		*		*		

STANDARD FLAGS:

* = See Comments
J = Estimated Value
B = Analyte found in blank
A = Average value
N = Presumptive ID
D = Concentration from analysis of a secondary dilution

¹AKGWA # is 0000-0000 for any type of blank.

²Respond "Y" if the sample was a duplicate of another sample in this report.

³Respond "Y" if the sample was split and analyzed by separate laboratories.

⁴Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.

⁵"T" = Total; "D" = Dissolved

⁶"<" indicates a non-detect; do not use "ND" or "BDL". Value shown is Practical Quantification Limit.

⁷Flags are as designated, do not use any other type. Use "*", then describe on "Written Comments Page."

RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045

LAB ID: None

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number					0000-0000		0000-0000		8004-4793				
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)					T. BLANK 2		T. BLANK 3		367				
CAS RN ⁴		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
S0906 - -		Static Water Level Elevation	T	Ft. MSL	Field		*		*		*		
N238		Dissolved Oxygen	T	mg/L	Field		*		*		*		
S0266- -		Total Dissolved Solids	T	mg/L	160.1		*		*	114	B		
S0296- -		pH	T	Units	Field		*		*		*		
NS215		Eh	T	mV	Field		*		*		*		
S0907 - -		Temperature	T	°C	Field		*		*		*		
7429-90-5		Aluminum	T	mg/L	6020		*		*	<0.05			
7440-36-0		Antimony	T	mg/L	6020		*		*	<0.003			
7440-38-2		Arsenic	T	mg/L	6020		*		*	0.00216	J		
7440-39-3		Barium	T	mg/L	6020		*		*	0.131			
7440-41-7		Beryllium	T	mg/L	6020		*		*	<0.0005			
7440-42-8		Boron	T	mg/L	6020		*		*	0.0187			
7440-43-9		Cadmium	T	mg/L	6020		*		*	<0.001			
7440-70-2		Calcium	T	mg/L	6020		*		*	12.2			
7440-47-3		Chromium	T	mg/L	6020		*		*	<0.01			
7440-48-4		Cobalt	T	mg/L	6020		*		*	0.00589			
7440-50-8		Copper	T	mg/L	6020		*		*	0.000721	J		
7439-89-6		Iron	T	mg/L	6020		*		*	6.24			
7439-92-1		Lead	T	mg/L	6020		*		*	<0.002			
7439-95-4		Magnesium	T	mg/L	6020		*		*	7.04			
7439-96-5		Manganese	T	mg/L	6020		*		*	1.29			
7439-97-6		Mercury	T	mg/L	7470		*		*	0.000187	BJ		

C-40

RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045

LAB ID: None

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number					0000-0000		0000-0000		8004-4793				
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					T. BLANK 2		T. BLANK 3		367				
CAS RN ⁴		CONSTITUENT	T D ⁵	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
7439-98-7		Molybdenum	T	mg/L	6020		*		*	0.000434	J		
7440-02-0		Nickel	T	mg/L	6020		*		*	0.00266			
7440-09-7		Potassium	T	mg/L	6020		*		*	3.08			
7440-16-6		Rhodium	T	mg/L	6020		*		*	<0.005			
7782-49-2		Selenium	T	mg/L	6020		*		*	<0.005			
7440-22-4		Silver	T	mg/L	6020		*		*	<0.001			
7440-23-5		Sodium	T	mg/L	6020		*		*	15.8			
7440-25-7		Tantalum	T	mg/L	6020		*		*	<0.005			
7440-28-0		Thallium	T	mg/L	6020		*		*	<0.002			
7440-61-1		Uranium	T	mg/L	6020		*		*	<0.0002			
7440-62-2		Vanadium	T	mg/L	6020		*		*	<0.02			
7440-66-6		Zinc	T	mg/L	6020		*		*	0.0113	J		
108-05-4		Vinyl acetate	T	mg/L	8260	<0.005		<0.005		<0.005			
67-64-1		Acetone	T	mg/L	8260	0.00685	B	0.00575		<0.005			
107-02-8		Acrolein	T	mg/L	8260	<0.005		<0.005		<0.005			
107-13-1		Acrylonitrile	T	mg/L	8260	<0.005		<0.005		<0.005			
71-43-2		Benzene	T	mg/L	8260	<0.001		<0.001		<0.001			
108-90-7		Chlorobenzene	T	mg/L	8260	<0.001		<0.001		<0.001			
1330-20-7		Xylenes	T	mg/L	8260	<0.003		<0.003		<0.003			
100-42-5		Styrene	T	mg/L	8260	<0.001		<0.001		<0.001			
108-88-3		Toluene	T	mg/L	8260	<0.001		<0.001		<0.001			
74-97-5		Chlorobromomethane	T	mg/L	8260	<0.001		<0.001		<0.001			

RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045

LAB ID: None

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number					0000-0000		0000-0000		8004-4793				
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					T. BLANK 2		T. BLANK 3		367				
CAS RN ⁴		CONSTITUENT	T D ⁵	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
75-27-4		Bromodichloromethane	T	mg/L	8260	<0.001		<0.001		<0.001			
75-25-2		Tribromomethane	T	mg/L	8260	<0.001		<0.001		<0.001			
74-83-9		Methyl bromide	T	mg/L	8260	<0.001		<0.001		<0.001			
78-93-3		Methyl ethyl ketone	T	mg/L	8260	<0.005		<0.005		<0.005			
110-57-6		trans-1,4-Dichloro-2-butene	T	mg/L	8260	<0.005		<0.005		<0.005			
75-15-0		Carbon disulfide	T	mg/L	8260	<0.005		<0.005		<0.005			
75-00-3		Chloroethane	T	mg/L	8260	<0.001		<0.001		<0.001			
67-66-3		Chloroform	T	mg/L	8260	<0.001		<0.001		<0.001			
74-87-3		Methyl chloride	T	mg/L	8260	<0.001		<0.001		<0.001			
156-59-2		cis-1,2-Dichloroethene	T	mg/L	8260	<0.001		<0.001		<0.001			
74-95-3		Methylene bromide	T	mg/L	8260	<0.001		<0.001		<0.001			
75-34-3		1,1-Dichloroethane	T	mg/L	8260	<0.001		<0.001		<0.001			
107-06-2		1,2-Dichloroethane	T	mg/L	8260	<0.001		<0.001		<0.001			
75-35-4		1,1-Dichloroethylene	T	mg/L	8260	<0.001		<0.001		<0.001			
106-93-4		Ethane, 1,2-dibromo	T	mg/L	8260	<0.001		<0.001		<0.001			
79-34-5		Ethane, 1,1,2,2-Tetrachloro	T	mg/L	8260	<0.001		<0.001		<0.001			
71-55-6		Ethane, 1,1,1-Trichloro-	T	mg/L	8260	<0.001		<0.001		<0.001			
79-00-5		Ethane, 1,1,2-Trichloro	T	mg/L	8260	<0.001		<0.001		<0.001			
630-20-6		Ethane, 1,1,1,2-Tetrachloro	T	mg/L	8260	<0.001		<0.001		<0.001			
75-01-4		Vinyl chloride	T	mg/L	8260	<0.001		<0.001		<0.001	*		
127-18-4		Ethene, Tetrachloro-	T	mg/L	8260	<0.001		<0.001		<0.001			
79-01-6		Ethene, Trichloro-	T	mg/L	8260	<0.001		<0.001		<0.001			

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RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045

LAB ID: None

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number						0000-0000		0000-0000		8004-4793			
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						T. BLANK 2		T. BLANK 3		367			
CAS RN ⁴		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
100-41-4		Ethylbenzene	T	mg/L	8260	<0.001		<0.001		<0.001			
591-78-6		2-Hexanone	T	mg/L	8260	<0.005		<0.005		<0.005			
74-88-4		Iodomethane	T	mg/L	8260	<0.005		<0.005		<0.005	*		
124-48-1		Methane, Dibromochloro-	T	mg/L	8260	<0.001		<0.001		<0.001			
56-23-5		Carbon Tetrachloride	T	mg/L	8260	<0.001		<0.001		<0.001			
75-09-2		Dichloromethane	T	mg/L	8260	<0.005		<0.005		<0.005			
108-10-1		Methyl isobutyl ketone	T	mg/L	8260	<0.005		<0.005		<0.005			
96-12-8		Propane, 1,2-Dibromo-3-chloro	T	mg/L	8011	<0.0000188		<0.0000191		<0.0000184			
78-87-5		Propane, 1,2-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001			
10061-02-6		trans-1,3-Dichloro-1-propene	T	mg/L	8260	<0.001		<0.001		<0.001	*		
10061-01-5		cis-1,3-Dichloro-1-propene	T	mg/L	8260	<0.001		<0.001		<0.001	*		
156-60-5		trans-1,2-Dichloroethene	T	mg/L	8260	<0.001		<0.001		<0.001			
75-69-4		Trichlorofluoromethane	T	mg/L	8260	<0.001		<0.001		<0.001			
96-18-4		1,2,3-Trichloropropane	T	mg/L	8260	<0.001		<0.001		<0.001			
95-50-1		Benzene, 1,2-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001			
106-46-7		Benzene, 1,4-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001			
1336-36-3		PCB, Total	T	ug/L	8082		*		*	<0.0986			
12674-11-2		PCB-1016	T	ug/L	8082		*		*	<0.0986			
11104-28-2		PCB-1221	T	ug/L	8082		*		*	<0.0986			
11141-16-5		PCB-1232	T	ug/L	8082		*		*	<0.0986			
53469-21-9		PCB-1242	T	ug/L	8082		*		*	<0.0986			
12672-29-6		PCB-1248	T	ug/L	8082		*		*	<0.0986			

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RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045

LAB ID: None

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number					0000-0000		0000-0000		8004-4793				
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					T. BLANK 2		T. BLANK 3		367				
CAS RN ⁴		CONSTITUENT	T D ⁵	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
11097-69-1		PCB-1254	T	ug/L	8082		*		*	<0.0986			
11096-82-5		PCB-1260	T	ug/L	8082		*		*	<0.0986			
11100-14-4		PCB-1268	T	ug/L	8082		*		*	<0.0986			
12587-46-1		Gross Alpha	T	pCi/L	9310		*		*	1.23	*		
12587-47-2		Gross Beta	T	pCi/L	9310		*		*	2.32	*		
10043-66-0		Iodine-131	T	pCi/L			*		*		*		
13982-63-3		Radium-226	T	pCi/L	AN-1418		*		*	0.432	*		
10098-97-2		Strontium-90	T	pCi/L	905.0		*		*	6.23	*		
14133-76-7		Technetium-99	T	pCi/L	Tc-02-RC		*		*	-8.77	*		
14269-63-7		Thorium-230	T	pCi/L	Th-01-RC		*		*	-0.617	*		
10028-17-8		Tritium	T	pCi/L	906.0		*		*	-43.4	*		
S0130- -		Chemical Oxygen Demand	T	mg/L	410.4		*		*	20.3	B		
57-12-5		Cyanide	T	mg/L	9012		*		*	<0.2			
20461-54-5		Iodide	T	mg/L	300.0		*		*	<0.5			
S0268- -		Total Organic Carbon	T	mg/L	9060		*		*	0.651	J		
S0586- -		Total Organic Halides	T	mg/L	9020		*		*	0.00398	J		

RESIDENTIAL/CONTAINED – QUARTERLY
 Facility: US DOE - Paducah Gaseous Diffusion Plant
 Permit Number: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-890-008-982 / 1
 LAB ID: None

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4798 MW357	MW357UG1-22	Total Dissolved Solids	*	Duplicate analysis not within control limits.
		Copper	*	Duplicate analysis not within control limits.
		Methyl bromide	Y1	MS/MSD recovery outside acceptance criteria
		Iodomethane	Y1	MS/MSD recovery outside acceptance criteria
		trans-1,3-Dichloropropene	Y1	MS/MSD recovery outside acceptance criteria
		cis-1,3-Dichloropropene		See resample.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.11. Rad error is 3.1.
		Gross beta		TPU is 9.43. Rad error is 9.01.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.526. Rad error is 0.526.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.98. Rad error is 3.98.
		Technetium-99		TPU is 11.5. Rad error is 10.9.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.82. Rad error is 0.818.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 151. Rad error is 150.
8004-4799 MW358	MW358UG1-22	Total Dissolved Solids	*	Duplicate analysis not within control limits.
		Copper	*	Duplicate analysis not within control limits.
		Methyl bromide	Y1	MS/MSD recovery outside acceptance criteria
		Iodomethane	Y1	MS/MSD recovery outside acceptance criteria
		trans-1,3-Dichloropropene	Y1	MS/MSD recovery outside acceptance criteria
		cis-1,3-Dichloropropene	Y1Y2	MS/MSD recovery outside acceptance criteria and MS/MSD RPD outside acceptance criteria
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.14. Rad error is 2.13.
		Gross beta		TPU is 9.79. Rad error is 9.4.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.637. Rad error is 0.637.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.86. Rad error is 3.86.
		Technetium-99		TPU is 11.8. Rad error is 11.2.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.07. Rad error is 1.07.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 146. Rad error is 146.

RESIDENTIAL/CONTAINED – QUARTERLY
 Facility: US DOE - Paducah Gaseous Diffusion Plant
 Permit Number: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-890-008-982 / 1
 LAB ID: None

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-0981 MW359	MW359UG1-22	Total Dissolved Solids	*	Duplicate analysis not within control limits.
		Copper	*	Duplicate analysis not within control limits.
		Methyl bromide	Y1	MS/MSD recovery outside acceptance criteria
		Iodomethane	Y1	MS/MSD recovery outside acceptance criteria
		trans-1,3-Dichloropropene	Y1	MS/MSD recovery outside acceptance criteria
		cis-1,3-Dichloropropene	Y1Y2	MS/MSD recovery outside acceptance criteria and MS/MSD RPD outside acceptance criteria
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.81. Rad error is 3.8.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 8.19. Rad error is 8.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.582. Rad error is 0.581.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.94. Rad error is 1.92.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 11.3. Rad error is 11.2.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.33. Rad error is 1.33.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 149. Rad error is 147.
8004-4800 MW360	MW360UG1-22	Total Dissolved Solids	*	Duplicate analysis not within control limits.
		Copper	*	Duplicate analysis not within control limits.
		Methyl bromide	Y1	MS/MSD recovery outside acceptance criteria
		Iodomethane	Y1	MS/MSD recovery outside acceptance criteria
		trans-1,3-Dichloropropene	Y1	MS/MSD recovery outside acceptance criteria
		cis-1,3-Dichloropropene	Y1Y2	MS/MSD recovery outside acceptance criteria and MS/MSD RPD outside acceptance criteria
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.42. Rad error is 4.37.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.51. Rad error is 6.43.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.515. Rad error is 0.515.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.93. Rad error is 4.8.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 10.5. Rad error is 10.4.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1. Rad error is 0.999.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 148. Rad error is 148.

RESIDENTIAL/CONTAINED – QUARTERLY
 Facility: US DOE - Paducah Gaseous Diffusion Plant
 Permit Number: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-890-008-982 / 1
 LAB ID: None

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4795 MW361	MW361UG1-22	Total Dissolved Solids	*	Duplicate analysis not within control limits.
		Copper	*	Duplicate analysis not within control limits.
		Methyl bromide	Y1	MS/MSD recovery outside acceptance criteria
		Iodomethane	Y1	MS/MSD recovery outside acceptance criteria
		trans-1,3-Dichloropropene	Y1	MS/MSD recovery outside acceptance criteria
		cis-1,3-Dichloropropene	Y1Y2	MS/MSD recovery outside acceptance criteria and MS/MSD RPD outside acceptance criteria
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.53. Rad error is 6.53.
		Gross beta		TPU is 10.1. Rad error is 8.17.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.483. Rad error is 0.483.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.97. Rad error is 1.92.
		Technetium-99		TPU is 13.3. Rad error is 11.8.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.03. Rad error is 1.02.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 145. Rad error is 145.
8004-0986 MW362	MW362UG1-22	Total Dissolved Solids	*	Duplicate analysis not within control limits.
		Copper	*	Duplicate analysis not within control limits.
		Methyl bromide	Y1	MS/MSD recovery outside acceptance criteria
		Iodomethane	Y1	MS/MSD recovery outside acceptance criteria
		trans-1,3-Dichloropropene	Y1	MS/MSD recovery outside acceptance criteria
		cis-1,3-Dichloropropene	Y1Y2	MS/MSD recovery outside acceptance criteria and MS/MSD RPD outside acceptance criteria
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5. Rad error is 4.99.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.55. Rad error is 6.51.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.702. Rad error is 0.701.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.59. Rad error is 4.55.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 10.8. Rad error is 10.8.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.826. Rad error is 0.826.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 149. Rad error is 149.

RESIDENTIAL/CONTAINED – QUARTERLY
 Facility: US DOE - Paducah Gaseous Diffusion Plant
 Permit Number: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-890-008-982 / 1
 LAB ID: None

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4796 MW363	MW363UG1-22	Vinyl chloride	L	LCS or LCSD recovery outside of control limits.
		Iodomethane	Y1	MS/MSD recovery outside acceptance criteria
		trans-1,3-Dichloropropene	Y1	MS/MSD recovery outside acceptance criteria
		cis-1,3-Dichloropropene	Y1	MS/MSD recovery outside acceptance criteria
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.04. Rad error is 4.99.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 8.57. Rad error is 8.52.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.488. Rad error is 0.488.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.16. Rad error is 4.14.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 11.5. Rad error is 11.5.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.897. Rad error is 0.896.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 111. Rad error is 111.
8004-4797 MW364	MW364UG1-22	Vinyl chloride	L	LCS or LCSD recovery outside of control limits.
		Iodomethane	Y1	MS/MSD recovery outside acceptance criteria
		trans-1,3-Dichloropropene	Y1	MS/MSD recovery outside acceptance criteria
		cis-1,3-Dichloropropene	Y1	MS/MSD recovery outside acceptance criteria
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.67. Rad error is 6.52.
		Gross beta		TPU is 11.4. Rad error is 9.88.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.538. Rad error is 0.538.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.97. Rad error is 3.97.
		Technetium-99		TPU is 15.2. Rad error is 13.9.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.36. Rad error is 1.36.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 125. Rad error is 123.

RESIDENTIAL/CONTAINED – QUARTERLY
 Facility: US DOE - Paducah Gaseous Diffusion Plant
 Permit Number: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-890-008-982 / 1
 LAB ID: None

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-0984 MW365	MW365UG1-22	Vinyl chloride	L	LCS or LCSD recovery outside of control limits.
		Iodomethane	Y1	MS/MSD recovery outside acceptance criteria
		trans-1,3-Dichloropropene	Y1	MS/MSD recovery outside acceptance criteria
		cis-1,3-Dichloropropene	Y1	MS/MSD recovery outside acceptance criteria
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.21. Rad error is 5.21.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 7.15. Rad error is 7.14.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.364. Rad error is 0.364.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.2. Rad error is 3.12.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 11.6. Rad error is 11.6.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.914. Rad error is 0.914.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 110. Rad error is 110.
8004-0982 MW366	MW366UG1-22	Vinyl chloride	L	LCS or LCSD recovery outside of control limits.
		Iodomethane	Y1	MS/MSD recovery outside acceptance criteria
		trans-1,3-Dichloropropene	Y1	MS/MSD recovery outside acceptance criteria
		cis-1,3-Dichloropropene	Y1	MS/MSD recovery outside acceptance criteria
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.61. Rad error is 5.53.
		Gross beta		TPU is 12.6. Rad error is 10.5.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.483. Rad error is 0.483.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.72. Rad error is 4.66.
		Technetium-99		TPU is 16. Rad error is 14.3.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.24. Rad error is 1.24.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 125. Rad error is 124.
8004-4793 MW367	MW367UG1-22	Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.73. Rad error is 2.73.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.2. Rad error is 6.17.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.725. Rad error is 0.724.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.28. Rad error is 4.24.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 11.7. Rad error is 11.7.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.89. Rad error is 0.888.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 111. Rad error is 111.

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 Facility: US DOE - Paducah Gaseous Diffusion Plant
 Permit Number: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-890-008-982 / 1
 LAB ID: None

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-0983 MW368	MW368UG1-22	Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.29. Rad error is 4.29.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.32. Rad error is 6.21.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.718. Rad error is 0.717.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.77. Rad error is 3.76.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 12.1. Rad error is 12.1.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.873. Rad error is 0.871.
8004-4820 MW369	MW369UG1-22	Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 119. Rad error is 119.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.86. Rad error is 3.85.
		Gross beta		TPU is 11.2. Rad error is 8.88.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.466. Rad error is 0.466.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.17. Rad error is 3.17.
		Technetium-99		TPU is 15.5. Rad error is 14.
8004-4818 MW370	MW370UG1-22	Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.659. Rad error is 0.658.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 114. Rad error is 114.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.77. Rad error is 4.74.
		Gross beta		TPU is 12. Rad error is 9.97.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.28. Rad error is 1.28.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.99. Rad error is 3.95.
8004-4819 MW371	MW371UG1-22	Technetium-99		TPU is 14.1. Rad error is 13.4.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.09. Rad error is 1.09.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 113. Rad error is 113.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.54. Rad error is 6.44.
		Gross beta		TPU is 7.7. Rad error is 7.28.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.592. Rad error is 0.592.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.01. Rad error is 3.01.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 12.2. Rad error is 12.2.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.15. Rad error is 1.13.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 108. Rad error is 108.

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 LAB ID: None

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4808 MW372	MW372UG1-22	Bromide	W	Post-digestion spike recovery out of control limits.
		Total Dissolved Solids	*	Duplicate analysis not within control limits.
		Molybdenum	*	Duplicate analysis not within control limits.
		Vinyl acetate	H	Analysis performed outside holding time requirement
		Acetone	H	Analysis performed outside holding time requirement
		Acrolein	H	Analysis performed outside holding time requirement
		Acrylonitrile	H	Analysis performed outside holding time requirement
		Benzene	H	Analysis performed outside holding time requirement
		Chlorobenzene	H	Analysis performed outside holding time requirement
		Xylenes	H	Analysis performed outside holding time requirement
		Styrene	H	Analysis performed outside holding time requirement
		Toluene	H	Analysis performed outside holding time requirement
		Chlorobromomethane	H	Analysis performed outside holding time requirement
		Bromodichloromethane	H	Analysis performed outside holding time requirement
		Tribromomethane	H	Analysis performed outside holding time requirement
		Methyl bromide	H	Analysis performed outside holding time requirement
		Methyl Ethyl Ketone	H	Analysis performed outside holding time requirement
		trans-1,4-Dichloro-2-butene	H	Analysis performed outside holding time requirement
		Carbon disulfide	H	Analysis performed outside holding time requirement
		Chloroethane	H	Analysis performed outside holding time requirement
		Chloroform	H	Analysis performed outside holding time requirement
		Methyl chloride	H	Analysis performed outside holding time requirement
		cis-1,2-Dichloroethene	H	Analysis performed outside holding time requirement
		Methylene bromide	H	Analysis performed outside holding time requirement
		1,1-Dichloroethane	H	Analysis performed outside holding time requirement
		1,2-Dichloroethane	H	Analysis performed outside holding time requirement
		1,1-Dichloroethylene	H	Analysis performed outside holding time requirement
		1,2-Dibromoethane	H	Analysis performed outside holding time requirement
		1,1,2,2-Tetrachloroethane	H	Analysis performed outside holding time requirement
		1,1,1-Trichloroethane	H	Analysis performed outside holding time requirement
		1,1,2-Trichloroethane	H	Analysis performed outside holding time requirement
		1,1,1,2-Tetrachloroethane	H	Analysis performed outside holding time requirement
		Vinyl chloride	H	Analysis performed outside holding time requirement
		Tetrachloroethene	H	Analysis performed outside holding time requirement
		Trichloroethene	H	Analysis performed outside holding time requirement
		Ethylbenzene	H	Analysis performed outside holding time requirement
		2-Hexanone	H	Analysis performed outside holding time requirement
		Iodomethane	H	Analysis performed outside holding time requirement
		Dibromochloromethane	H	Analysis performed outside holding time requirement
		Carbon tetrachloride	H	Analysis performed outside holding time requirement

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 LAB ID: None

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4808 MW372	MW372UG1-22	Dichloromethane	H	Analysis performed outside holding time requirement
		Methyl Isobutyl Ketone	H	Analysis performed outside holding time requirement
		1,2-Dichloropropane	H	Analysis performed outside holding time requirement
		trans-1,3-Dichloropropene	H	Analysis performed outside holding time requirement
		cis-1,3-Dichloropropene	H	Analysis performed outside holding time requirement
		trans-1,2-Dichloroethene	H	Analysis performed outside holding time requirement
		Trichlorofluoromethane	H	Analysis performed outside holding time requirement
		1,2,3-Trichloropropane	H	Analysis performed outside holding time requirement
		1,2-Dichlorobenzene	H	Analysis performed outside holding time requirement
		1,4-Dichlorobenzene	H	Analysis performed outside holding time requirement
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.74. Rad error is 5.73.
		Gross beta		TPU is 12.3. Rad error is 10.8.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.577. Rad error is 0.577.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.9. Rad error is 4.83.
		Technetium-99		TPU is 15. Rad error is 13.7.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.478. Rad error is 0.471.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 111. Rad error is 111.
8004-4792 MW373	MW373UG1-22	Bromide	W	Post-digestion spike recovery out of control limits.
		Total Dissolved Solids	*	Duplicate analysis not within control limits.
		Molybdenum	*	Duplicate analysis not within control limits.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.62. Rad error is 4.62.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.08. Rad error is 5.08.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.6. Rad error is 0.599.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.08. Rad error is 4.03.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 12.4. Rad error is 12.4.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.912. Rad error is 0.906.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 111. Rad error is 111.

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Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-0990 MW374	MW374UG1-22	Bromide	W	Post-digestion spike recovery out of control limits.
		Total Dissolved Solids	*	Duplicate analysis not within control limits.
		Molybdenum	*	Duplicate analysis not within control limits.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.12. Rad error is 5.11.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.21. Rad error is 5.2.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.621. Rad error is 0.62.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.3. Rad error is 4.25.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 12.1. Rad error is 12.1.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.09. Rad error is 1.07.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 116. Rad error is 116.
8004-0985 MW375	MW375UG1-22	Bromide	W	Post-digestion spike recovery out of control limits.
		Total Dissolved Solids	*	Duplicate analysis not within control limits.
		Molybdenum	*	Duplicate analysis not within control limits.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 7.6. Rad error is 7.5.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.54. Rad error is 5.54.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.386. Rad error is 0.386.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.18. Rad error is 4.17.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 11.7. Rad error is 11.7.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.839. Rad error is 0.833.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 101. Rad error is 101.

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 LAB ID: None

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Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-0988 MW376		Bromide		During sampling, the well went dry; therefore, no sample was collected.
		Chloride		During sampling, the well went dry; therefore, no sample was collected.
		Fluoride		During sampling, the well went dry; therefore, no sample was collected.
		Nitrate & Nitrite		During sampling, the well went dry; therefore, no sample was collected.
		Sulfate		During sampling, the well went dry; therefore, no sample was collected.
		Barometric Pressure Reading		During sampling, the well went dry; therefore, no sample was collected.
		Specific Conductance		During sampling, the well went dry; therefore, no sample was collected.
		Static Water Level Elevation		During sampling, the well went dry; therefore, no sample was collected.
		Dissolved Oxygen		During sampling, the well went dry; therefore, no sample was collected.
		Total Dissolved Solids		During sampling, the well went dry; therefore, no sample was collected.
		pH		During sampling, the well went dry; therefore, no sample was collected.
		Eh		During sampling, the well went dry; therefore, no sample was collected.
		Temperature		During sampling, the well went dry; therefore, no sample was collected.
		Aluminum		During sampling, the well went dry; therefore, no sample was collected.
		Antimony		During sampling, the well went dry; therefore, no sample was collected.
		Arsenic		During sampling, the well went dry; therefore, no sample was collected.
		Barium		During sampling, the well went dry; therefore, no sample was collected.
		Beryllium		During sampling, the well went dry; therefore, no sample was collected.
		Boron		During sampling, the well went dry; therefore, no sample was collected.
		Cadmium		During sampling, the well went dry; therefore, no sample was collected.
		Calcium		During sampling, the well went dry; therefore, no sample was collected.
		Chromium		During sampling, the well went dry; therefore, no sample was collected.
		Cobalt		During sampling, the well went dry; therefore, no sample was collected.
		Copper		During sampling, the well went dry; therefore, no sample was collected.
		Iron		During sampling, the well went dry; therefore, no sample was collected.
		Lead		During sampling, the well went dry; therefore, no sample was collected.
		Magnesium		During sampling, the well went dry; therefore, no sample was collected.
		Manganese		During sampling, the well went dry; therefore, no sample was collected.
		Mercury		During sampling, the well went dry; therefore, no sample was collected.

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Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-0988 MW376		Molybdenum		During sampling, the well went dry; therefore, no sample was collected.
		Nickel		During sampling, the well went dry; therefore, no sample was collected.
		Potassium		During sampling, the well went dry; therefore, no sample was collected.
		Rhodium		During sampling, the well went dry; therefore, no sample was collected.
		Selenium		During sampling, the well went dry; therefore, no sample was collected.
		Silver		During sampling, the well went dry; therefore, no sample was collected.
		Sodium		During sampling, the well went dry; therefore, no sample was collected.
		Tantalum		During sampling, the well went dry; therefore, no sample was collected.
		Thallium		During sampling, the well went dry; therefore, no sample was collected.
		Uranium		During sampling, the well went dry; therefore, no sample was collected.
		Vanadium		During sampling, the well went dry; therefore, no sample was collected.
		Zinc		During sampling, the well went dry; therefore, no sample was collected.
		Vinyl acetate		During sampling, the well went dry; therefore, no sample was collected.
		Acetone		During sampling, the well went dry; therefore, no sample was collected.
		Acrolein		During sampling, the well went dry; therefore, no sample was collected.
		Acrylonitrile		During sampling, the well went dry; therefore, no sample was collected.
		Benzene		During sampling, the well went dry; therefore, no sample was collected.
		Chlorobenzene		During sampling, the well went dry; therefore, no sample was collected.
		Xylenes		During sampling, the well went dry; therefore, no sample was collected.
		Styrene		During sampling, the well went dry; therefore, no sample was collected.
		Toluene		During sampling, the well went dry; therefore, no sample was collected.
		Chlorobromomethane		During sampling, the well went dry; therefore, no sample was collected.
		Bromodichloromethane		During sampling, the well went dry; therefore, no sample was collected.
		Tribromomethane		During sampling, the well went dry; therefore, no sample was collected.
		Methyl bromide		During sampling, the well went dry; therefore, no sample was collected.
		Methyl Ethyl Ketone		During sampling, the well went dry; therefore, no sample was collected.
		trans-1,4-Dichloro-2-butene		During sampling, the well went dry; therefore, no sample was collected.
		Carbon disulfide		During sampling, the well went dry; therefore, no sample was collected.
		Chloroethane		During sampling, the well went dry; therefore, no sample was collected.

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Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-0988 MW376		Chloroform		During sampling, the well went dry; therefore, no sample was collected.
		Methyl chloride		During sampling, the well went dry; therefore, no sample was collected.
		cis-1,2-Dichloroethene		During sampling, the well went dry; therefore, no sample was collected.
		Methylene bromide		During sampling, the well went dry; therefore, no sample was collected.
		1,1-Dichloroethane		During sampling, the well went dry; therefore, no sample was collected.
		1,2-Dichloroethane		During sampling, the well went dry; therefore, no sample was collected.
		1,1-Dichloroethylene		During sampling, the well went dry; therefore, no sample was collected.
		1,2-Dibromoethane		During sampling, the well went dry; therefore, no sample was collected.
		1,1,2,2-Tetrachloroethane		During sampling, the well went dry; therefore, no sample was collected.
		1,1,1-Trichloroethane		During sampling, the well went dry; therefore, no sample was collected.
		1,1,2-Trichloroethane		During sampling, the well went dry; therefore, no sample was collected.
		1,1,1,2-Tetrachloroethane		During sampling, the well went dry; therefore, no sample was collected.
		Vinyl chloride		During sampling, the well went dry; therefore, no sample was collected.
		Tetrachloroethene		During sampling, the well went dry; therefore, no sample was collected.
		Trichloroethene		During sampling, the well went dry; therefore, no sample was collected.
		Ethylbenzene		During sampling, the well went dry; therefore, no sample was collected.
		2-Hexanone		During sampling, the well went dry; therefore, no sample was collected.
		Iodomethane		During sampling, the well went dry; therefore, no sample was collected.
		Dibromochloromethane		During sampling, the well went dry; therefore, no sample was collected.
		Carbon tetrachloride		During sampling, the well went dry; therefore, no sample was collected.
		Dichloromethane		During sampling, the well went dry; therefore, no sample was collected.
		Methyl Isobutyl Ketone		During sampling, the well went dry; therefore, no sample was collected.
		1,2-Dibromo-3-chloropropane		During sampling, the well went dry; therefore, no sample was collected.
		1,2-Dichloropropane		During sampling, the well went dry; therefore, no sample was collected.
		trans-1,3-Dichloropropene		During sampling, the well went dry; therefore, no sample was collected.
		cis-1,3-Dichloropropene		During sampling, the well went dry; therefore, no sample was collected.
		trans-1,2-Dichloroethene		During sampling, the well went dry; therefore, no sample was collected.
		Trichlorofluoromethane		During sampling, the well went dry; therefore, no sample was collected.
		1,2,3-Trichloropropane		During sampling, the well went dry; therefore, no sample was collected.

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Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-0988 MW376		1,2-Dichlorobenzene		During sampling, the well went dry; therefore, no sample was collected.
		1,4-Dichlorobenzene		During sampling, the well went dry; therefore, no sample was collected.
		PCB, Total		During sampling, the well went dry; therefore, no sample was collected.
		PCB-1016		During sampling, the well went dry; therefore, no sample was collected.
		PCB-1221		During sampling, the well went dry; therefore, no sample was collected.
		PCB-1232		During sampling, the well went dry; therefore, no sample was collected.
		PCB-1242		During sampling, the well went dry; therefore, no sample was collected.
		PCB-1248		During sampling, the well went dry; therefore, no sample was collected.
		PCB-1254		During sampling, the well went dry; therefore, no sample was collected.
		PCB-1260		During sampling, the well went dry; therefore, no sample was collected.
		PCB-1268		During sampling, the well went dry; therefore, no sample was collected.
		Gross alpha		During sampling, the well went dry; therefore, no sample was collected.
		Gross beta		During sampling, the well went dry; therefore, no sample was collected.
		Iodine-131		During sampling, the well went dry; therefore, no sample was collected.
		Radium-226		During sampling, the well went dry; therefore, no sample was collected.
		Strontium-90		During sampling, the well went dry; therefore, no sample was collected.
		Technetium-99		During sampling, the well went dry; therefore, no sample was collected.
		Thorium-230		During sampling, the well went dry; therefore, no sample was collected.
		Tritium		During sampling, the well went dry; therefore, no sample was collected.
		Chemical Oxygen Demand		During sampling, the well went dry; therefore, no sample was collected.
		Cyanide		During sampling, the well went dry; therefore, no sample was collected.
		Iodide		During sampling, the well went dry; therefore, no sample was collected.
		Total Organic Carbon		During sampling, the well went dry; therefore, no sample was collected.
		Total Organic Halides		During sampling, the well went dry; therefore, no sample was collected.

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Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-0989 MW377		Bromide		During sampling, the well went dry; therefore, no sample was collected.
		Chloride		During sampling, the well went dry; therefore, no sample was collected.
		Fluoride		During sampling, the well went dry; therefore, no sample was collected.
		Nitrate & Nitrite		During sampling, the well went dry; therefore, no sample was collected.
		Sulfate		During sampling, the well went dry; therefore, no sample was collected.
		Barometric Pressure Reading		During sampling, the well went dry; therefore, no sample was collected.
		Specific Conductance		During sampling, the well went dry; therefore, no sample was collected.
		Static Water Level Elevation		During sampling, the well went dry; therefore, no sample was collected.
		Dissolved Oxygen		During sampling, the well went dry; therefore, no sample was collected.
		Total Dissolved Solids		During sampling, the well went dry; therefore, no sample was collected.
		pH		During sampling, the well went dry; therefore, no sample was collected.
		Eh		During sampling, the well went dry; therefore, no sample was collected.
		Temperature		During sampling, the well went dry; therefore, no sample was collected.
		Aluminum		During sampling, the well went dry; therefore, no sample was collected.
		Antimony		During sampling, the well went dry; therefore, no sample was collected.
		Arsenic		During sampling, the well went dry; therefore, no sample was collected.
		Barium		During sampling, the well went dry; therefore, no sample was collected.
		Beryllium		During sampling, the well went dry; therefore, no sample was collected.
		Boron		During sampling, the well went dry; therefore, no sample was collected.
		Cadmium		During sampling, the well went dry; therefore, no sample was collected.
		Calcium		During sampling, the well went dry; therefore, no sample was collected.
		Chromium		During sampling, the well went dry; therefore, no sample was collected.
		Cobalt		During sampling, the well went dry; therefore, no sample was collected.
		Copper		During sampling, the well went dry; therefore, no sample was collected.
		Iron		During sampling, the well went dry; therefore, no sample was collected.
		Lead		During sampling, the well went dry; therefore, no sample was collected.
		Magnesium		During sampling, the well went dry; therefore, no sample was collected.
		Manganese		During sampling, the well went dry; therefore, no sample was collected.
		Mercury		During sampling, the well went dry; therefore, no sample was collected.

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Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-0989 MW377		Molybdenum		During sampling, the well went dry; therefore, no sample was collected.
		Nickel		During sampling, the well went dry; therefore, no sample was collected.
		Potassium		During sampling, the well went dry; therefore, no sample was collected.
		Rhodium		During sampling, the well went dry; therefore, no sample was collected.
		Selenium		During sampling, the well went dry; therefore, no sample was collected.
		Silver		During sampling, the well went dry; therefore, no sample was collected.
		Sodium		During sampling, the well went dry; therefore, no sample was collected.
		Tantalum		During sampling, the well went dry; therefore, no sample was collected.
		Thallium		During sampling, the well went dry; therefore, no sample was collected.
		Uranium		During sampling, the well went dry; therefore, no sample was collected.
		Vanadium		During sampling, the well went dry; therefore, no sample was collected.
		Zinc		During sampling, the well went dry; therefore, no sample was collected.
		Vinyl acetate		During sampling, the well went dry; therefore, no sample was collected.
		Acetone		During sampling, the well went dry; therefore, no sample was collected.
		Acrolein		During sampling, the well went dry; therefore, no sample was collected.
		Acrylonitrile		During sampling, the well went dry; therefore, no sample was collected.
		Benzene		During sampling, the well went dry; therefore, no sample was collected.
		Chlorobenzene		During sampling, the well went dry; therefore, no sample was collected.
		Xylenes		During sampling, the well went dry; therefore, no sample was collected.
		Styrene		During sampling, the well went dry; therefore, no sample was collected.
		Toluene		During sampling, the well went dry; therefore, no sample was collected.
		Chlorobromomethane		During sampling, the well went dry; therefore, no sample was collected.
		Bromodichloromethane		During sampling, the well went dry; therefore, no sample was collected.
		Tribromomethane		During sampling, the well went dry; therefore, no sample was collected.
		Methyl bromide		During sampling, the well went dry; therefore, no sample was collected.
		Methyl Ethyl Ketone		During sampling, the well went dry; therefore, no sample was collected.
		trans-1,4-Dichloro-2-butene		During sampling, the well went dry; therefore, no sample was collected.
		Carbon disulfide		During sampling, the well went dry; therefore, no sample was collected.
		Chloroethane		During sampling, the well went dry; therefore, no sample was collected.

RESIDENTIAL/CONTAINED – QUARTERLY
 Facility: US DOE - Paducah Gaseous Diffusion Plant
 Permit Number: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-890-008-982 / 1
 LAB ID: None

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-0989 MW377		Chloroform		During sampling, the well went dry; therefore, no sample was collected.
		Methyl chloride		During sampling, the well went dry; therefore, no sample was collected.
		cis-1,2-Dichloroethene		During sampling, the well went dry; therefore, no sample was collected.
		Methylene bromide		During sampling, the well went dry; therefore, no sample was collected.
		1,1-Dichloroethane		During sampling, the well went dry; therefore, no sample was collected.
		1,2-Dichloroethane		During sampling, the well went dry; therefore, no sample was collected.
		1,1-Dichloroethylene		During sampling, the well went dry; therefore, no sample was collected.
		1,2-Dibromoethane		During sampling, the well went dry; therefore, no sample was collected.
		1,1,2,2-Tetrachloroethane		During sampling, the well went dry; therefore, no sample was collected.
		1,1,1-Trichloroethane		During sampling, the well went dry; therefore, no sample was collected.
		1,1,2-Trichloroethane		During sampling, the well went dry; therefore, no sample was collected.
		1,1,1,2-Tetrachloroethane		During sampling, the well went dry; therefore, no sample was collected.
		Vinyl chloride		During sampling, the well went dry; therefore, no sample was collected.
		Tetrachloroethene		During sampling, the well went dry; therefore, no sample was collected.
		Trichloroethene		During sampling, the well went dry; therefore, no sample was collected.
		Ethylbenzene		During sampling, the well went dry; therefore, no sample was collected.
		2-Hexanone		During sampling, the well went dry; therefore, no sample was collected.
		Iodomethane		During sampling, the well went dry; therefore, no sample was collected.
		Dibromochloromethane		During sampling, the well went dry; therefore, no sample was collected.
		Carbon tetrachloride		During sampling, the well went dry; therefore, no sample was collected.
		Dichloromethane		During sampling, the well went dry; therefore, no sample was collected.
		Methyl Isobutyl Ketone		During sampling, the well went dry; therefore, no sample was collected.
		1,2-Dibromo-3-chloropropane		During sampling, the well went dry; therefore, no sample was collected.
		1,2-Dichloropropane		During sampling, the well went dry; therefore, no sample was collected.
		trans-1,3-Dichloropropene		During sampling, the well went dry; therefore, no sample was collected.
		cis-1,3-Dichloropropene		During sampling, the well went dry; therefore, no sample was collected.
		trans-1,2-Dichloroethene		During sampling, the well went dry; therefore, no sample was collected.
		Trichlorofluoromethane		During sampling, the well went dry; therefore, no sample was collected.
		1,2,3-Trichloropropane		During sampling, the well went dry; therefore, no sample was collected.

RESIDENTIAL/CONTAINED – QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Number: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-890-008-982 / 1

LAB ID: None

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-0989 MW377		1,2-Dichlorobenzene		During sampling, the well went dry; therefore, no sample was collected.
		1,4-Dichlorobenzene		During sampling, the well went dry; therefore, no sample was collected.
		PCB, Total		During sampling, the well went dry; therefore, no sample was collected.
		PCB-1016		During sampling, the well went dry; therefore, no sample was collected.
		PCB-1221		During sampling, the well went dry; therefore, no sample was collected.
		PCB-1232		During sampling, the well went dry; therefore, no sample was collected.
		PCB-1242		During sampling, the well went dry; therefore, no sample was collected.
		PCB-1248		During sampling, the well went dry; therefore, no sample was collected.
		PCB-1254		During sampling, the well went dry; therefore, no sample was collected.
		PCB-1260		During sampling, the well went dry; therefore, no sample was collected.
		PCB-1268		During sampling, the well went dry; therefore, no sample was collected.
		Gross alpha		During sampling, the well went dry; therefore, no sample was collected.
		Gross beta		During sampling, the well went dry; therefore, no sample was collected.
		Iodine-131		During sampling, the well went dry; therefore, no sample was collected.
		Radium-226		During sampling, the well went dry; therefore, no sample was collected.
		Strontium-90		During sampling, the well went dry; therefore, no sample was collected.
		Technetium-99		During sampling, the well went dry; therefore, no sample was collected.
		Thorium-230		During sampling, the well went dry; therefore, no sample was collected.
		Tritium		During sampling, the well went dry; therefore, no sample was collected.
		Chemical Oxygen Demand		During sampling, the well went dry; therefore, no sample was collected.
		Cyanide		During sampling, the well went dry; therefore, no sample was collected.
		Iodide		During sampling, the well went dry; therefore, no sample was collected.
		Total Organic Carbon		During sampling, the well went dry; therefore, no sample was collected.
		Total Organic Halides		During sampling, the well went dry; therefore, no sample was collected.

RESIDENTIAL/CONTAINED – QUARTERLY
 Facility: US DOE - Paducah Gaseous Diffusion Plant
 Permit Number: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-890-008-982 / 1
 LAB ID: None

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	RI1UG1-22	Bromide		Analysis of constituent not required and not performed.
		Chloride		Analysis of constituent not required and not performed.
		Fluoride		Analysis of constituent not required and not performed.
		Nitrate & Nitrite		Analysis of constituent not required and not performed.
		Sulfate		Analysis of constituent not required and not performed.
		Barometric Pressure Reading		Analysis of constituent not required and not performed.
		Specific Conductance		Analysis of constituent not required and not performed.
		Static Water Level Elevation		Analysis of constituent not required and not performed.
		Dissolved Oxygen		Analysis of constituent not required and not performed.
		Total Dissolved Solids		Analysis of constituent not required and not performed.
		pH		Analysis of constituent not required and not performed.
		Eh		Analysis of constituent not required and not performed.
		Temperature		Analysis of constituent not required and not performed.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.55. Rad error is 2.54.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.81. Rad error is 5.77.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.453. Rad error is 0.453.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.81. Rad error is 3.81.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 12.1. Rad error is 12.1.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.12. Rad error is 1.12.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 118. Rad error is 117.
		Chemical Oxygen Demand		Analysis of constituent not required and not performed.
		Cyanide		Analysis of constituent not required and not performed.
		Total Organic Carbon		Analysis of constituent not required and not performed.
		Total Organic Halides		Analysis of constituent not required and not performed.

RESIDENTIAL/CONTAINED – QUARTERLY
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 Permit Number: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-890-008-982 / 1
 LAB ID: None

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	FB1UG1-22	Bromide		Analysis of constituent not required and not performed.
		Chloride		Analysis of constituent not required and not performed.
		Fluoride		Analysis of constituent not required and not performed.
		Nitrate & Nitrite		Analysis of constituent not required and not performed.
		Sulfate		Analysis of constituent not required and not performed.
		Barometric Pressure Reading		Analysis of constituent not required and not performed.
		Specific Conductance		Analysis of constituent not required and not performed.
		Static Water Level Elevation		Analysis of constituent not required and not performed.
		Dissolved Oxygen		Analysis of constituent not required and not performed.
		Total Dissolved Solids		Analysis of constituent not required and not performed.
		pH		Analysis of constituent not required and not performed.
		Eh		Analysis of constituent not required and not performed.
		Temperature		Analysis of constituent not required and not performed.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.51. Rad error is 3.49.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.76. Rad error is 3.76.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.346. Rad error is 0.345.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.74. Rad error is 3.74.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 11.7. Rad error is 11.7.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.891. Rad error is 0.891.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 124. Rad error is 122.
		Chemical Oxygen Demand		Analysis of constituent not required and not performed.
		Cyanide		Analysis of constituent not required and not performed.
		Total Organic Carbon		Analysis of constituent not required and not performed.
		Total Organic Halides		Analysis of constituent not required and not performed.

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 Permit Number: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-890-008-982 / 1
 LAB ID: None

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB1UG1-22	Bromide		Analysis of constituent not required and not performed.
		Chloride		Analysis of constituent not required and not performed.
		Fluoride		Analysis of constituent not required and not performed.
		Nitrate & Nitrite		Analysis of constituent not required and not performed.
		Sulfate		Analysis of constituent not required and not performed.
		Barometric Pressure Reading		Analysis of constituent not required and not performed.
		Specific Conductance		Analysis of constituent not required and not performed.
		Static Water Level Elevation		Analysis of constituent not required and not performed.
		Dissolved Oxygen		Analysis of constituent not required and not performed.
		Total Dissolved Solids		Analysis of constituent not required and not performed.
		pH		Analysis of constituent not required and not performed.
		Eh		Analysis of constituent not required and not performed.
		Temperature		Analysis of constituent not required and not performed.
		Aluminum		Analysis of constituent not required and not performed.
		Antimony		Analysis of constituent not required and not performed.
		Arsenic		Analysis of constituent not required and not performed.
		Barium		Analysis of constituent not required and not performed.
		Beryllium		Analysis of constituent not required and not performed.
		Boron		Analysis of constituent not required and not performed.
		Cadmium		Analysis of constituent not required and not performed.
		Calcium		Analysis of constituent not required and not performed.
		Chromium		Analysis of constituent not required and not performed.
		Cobalt		Analysis of constituent not required and not performed.
		Copper		Analysis of constituent not required and not performed.
		Iron		Analysis of constituent not required and not performed.
		Lead		Analysis of constituent not required and not performed.
		Magnesium		Analysis of constituent not required and not performed.
		Manganese		Analysis of constituent not required and not performed.
		Mercury		Analysis of constituent not required and not performed.
		Molybdenum		Analysis of constituent not required and not performed.
		Nickel		Analysis of constituent not required and not performed.
		Potassium		Analysis of constituent not required and not performed.
		Rhodium		Analysis of constituent not required and not performed.
		Selenium		Analysis of constituent not required and not performed.
		Silver		Analysis of constituent not required and not performed.
		Sodium		Analysis of constituent not required and not performed.
		Tantalum		Analysis of constituent not required and not performed.
		Thallium		Analysis of constituent not required and not performed.
		Uranium		Analysis of constituent not required and not performed.
		Vanadium		Analysis of constituent not required and not performed.

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 Facility: US DOE - Paducah Gaseous Diffusion Plant
 Permit Number: SW07300014, SW07300015, SW07300045

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 LAB ID: None

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB1UG1-22	Zinc		Analysis of constituent not required and not performed.
		Methyl bromide	Y1	MS/MSD recovery outside acceptance criteria
		Iodomethane	Y1	MS/MSD recovery outside acceptance criteria
		trans-1,3-Dichloropropene	Y1	MS/MSD recovery outside acceptance criteria
		cis-1,3-Dichloropropene	Y1Y2	MS/MSD recovery outside acceptance criteria and MS/MSD RPD outside acceptance criteria
		PCB, Total		Analysis of constituent not required and not performed.
		PCB-1016		Analysis of constituent not required and not performed.
		PCB-1221		Analysis of constituent not required and not performed.
		PCB-1232		Analysis of constituent not required and not performed.
		PCB-1242		Analysis of constituent not required and not performed.
		PCB-1248		Analysis of constituent not required and not performed.
		PCB-1254		Analysis of constituent not required and not performed.
		PCB-1260		Analysis of constituent not required and not performed.
		PCB-1268		Analysis of constituent not required and not performed.
		Gross alpha		Analysis of constituent not required and not performed.
		Gross beta		Analysis of constituent not required and not performed.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226		Analysis of constituent not required and not performed.
		Strontium-90		Analysis of constituent not required and not performed.
		Technetium-99		Analysis of constituent not required and not performed.
		Thorium-230		Analysis of constituent not required and not performed.
		Tritium		Analysis of constituent not required and not performed.
		Chemical Oxygen Demand		Analysis of constituent not required and not performed.
		Cyanide		Analysis of constituent not required and not performed.
		Iodide		Analysis of constituent not required and not performed.
		Total Organic Carbon		Analysis of constituent not required and not performed.
		Total Organic Halides		Analysis of constituent not required and not performed.

RESIDENTIAL/CONTAINED – QUARTERLY
 Facility: US DOE - Paducah Gaseous Diffusion Plant
 Permit Number: SW07300014, SW07300015, SW07300045

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 LAB ID: None

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB2UG1-22	Bromide		Analysis of constituent not required and not performed.
		Chloride		Analysis of constituent not required and not performed.
		Fluoride		Analysis of constituent not required and not performed.
		Nitrate & Nitrite		Analysis of constituent not required and not performed.
		Sulfate		Analysis of constituent not required and not performed.
		Barometric Pressure Reading		Analysis of constituent not required and not performed.
		Specific Conductance		Analysis of constituent not required and not performed.
		Static Water Level Elevation		Analysis of constituent not required and not performed.
		Dissolved Oxygen		Analysis of constituent not required and not performed.
		Total Dissolved Solids		Analysis of constituent not required and not performed.
		pH		Analysis of constituent not required and not performed.
		Eh		Analysis of constituent not required and not performed.
		Temperature		Analysis of constituent not required and not performed.
		Aluminum		Analysis of constituent not required and not performed.
		Antimony		Analysis of constituent not required and not performed.
		Arsenic		Analysis of constituent not required and not performed.
		Barium		Analysis of constituent not required and not performed.
		Beryllium		Analysis of constituent not required and not performed.
		Boron		Analysis of constituent not required and not performed.
		Cadmium		Analysis of constituent not required and not performed.
		Calcium		Analysis of constituent not required and not performed.
		Chromium		Analysis of constituent not required and not performed.
		Cobalt		Analysis of constituent not required and not performed.
		Copper		Analysis of constituent not required and not performed.
		Iron		Analysis of constituent not required and not performed.
		Lead		Analysis of constituent not required and not performed.
		Magnesium		Analysis of constituent not required and not performed.
		Manganese		Analysis of constituent not required and not performed.
		Mercury		Analysis of constituent not required and not performed.
		Molybdenum		Analysis of constituent not required and not performed.
		Nickel		Analysis of constituent not required and not performed.
		Potassium		Analysis of constituent not required and not performed.
		Rhodium		Analysis of constituent not required and not performed.
		Selenium		Analysis of constituent not required and not performed.
		Silver		Analysis of constituent not required and not performed.
		Sodium		Analysis of constituent not required and not performed.
		Tantalum		Analysis of constituent not required and not performed.
		Thallium		Analysis of constituent not required and not performed.
		Uranium		Analysis of constituent not required and not performed.
		Vanadium		Analysis of constituent not required and not performed.

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LAB ID: None

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB2UG1-22	Zinc		Analysis of constituent not required and not performed.
		PCB, Total		Analysis of constituent not required and not performed.
		PCB-1016		Analysis of constituent not required and not performed.
		PCB-1221		Analysis of constituent not required and not performed.
		PCB-1232		Analysis of constituent not required and not performed.
		PCB-1242		Analysis of constituent not required and not performed.
		PCB-1248		Analysis of constituent not required and not performed.
		PCB-1254		Analysis of constituent not required and not performed.
		PCB-1260		Analysis of constituent not required and not performed.
		PCB-1268		Analysis of constituent not required and not performed.
		Gross alpha		Analysis of constituent not required and not performed.
		Gross beta		Analysis of constituent not required and not performed.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226		Analysis of constituent not required and not performed.
		Strontium-90		Analysis of constituent not required and not performed.
		Technetium-99		Analysis of constituent not required and not performed.
		Thorium-230		Analysis of constituent not required and not performed.
		Tritium		Analysis of constituent not required and not performed.
		Chemical Oxygen Demand		Analysis of constituent not required and not performed.
		Cyanide		Analysis of constituent not required and not performed.
		Iodide		Analysis of constituent not required and not performed.
		Total Organic Carbon		Analysis of constituent not required and not performed.
		Total Organic Halides		Analysis of constituent not required and not performed.

RESIDENTIAL/CONTAINED – QUARTERLY
Facility: US DOE - Paducah Gaseous Diffusion Plant
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Finds/Unit: KY8-890-008-982 / 1
LAB ID: None

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB3UG1-22	Bromide		Analysis of constituent not required and not performed.
		Chloride		Analysis of constituent not required and not performed.
		Fluoride		Analysis of constituent not required and not performed.
		Nitrate & Nitrite		Analysis of constituent not required and not performed.
		Sulfate		Analysis of constituent not required and not performed.
		Barometric Pressure Reading		Analysis of constituent not required and not performed.
		Specific Conductance		Analysis of constituent not required and not performed.
		Static Water Level Elevation		Analysis of constituent not required and not performed.
		Dissolved Oxygen		Analysis of constituent not required and not performed.
		Total Dissolved Solids		Analysis of constituent not required and not performed.
		pH		Analysis of constituent not required and not performed.
		Eh		Analysis of constituent not required and not performed.
		Temperature		Analysis of constituent not required and not performed.
		Aluminum		Analysis of constituent not required and not performed.
		Antimony		Analysis of constituent not required and not performed.
		Arsenic		Analysis of constituent not required and not performed.
		Barium		Analysis of constituent not required and not performed.
		Beryllium		Analysis of constituent not required and not performed.
		Boron		Analysis of constituent not required and not performed.
		Cadmium		Analysis of constituent not required and not performed.
		Calcium		Analysis of constituent not required and not performed.
		Chromium		Analysis of constituent not required and not performed.
		Cobalt		Analysis of constituent not required and not performed.
		Copper		Analysis of constituent not required and not performed.
		Iron		Analysis of constituent not required and not performed.
		Lead		Analysis of constituent not required and not performed.
		Magnesium		Analysis of constituent not required and not performed.
		Manganese		Analysis of constituent not required and not performed.
		Mercury		Analysis of constituent not required and not performed.
		Molybdenum		Analysis of constituent not required and not performed.
		Nickel		Analysis of constituent not required and not performed.
		Potassium		Analysis of constituent not required and not performed.
		Rhodium		Analysis of constituent not required and not performed.
		Selenium		Analysis of constituent not required and not performed.
		Silver		Analysis of constituent not required and not performed.
		Sodium		Analysis of constituent not required and not performed.
		Tantalum		Analysis of constituent not required and not performed.
		Thallium		Analysis of constituent not required and not performed.
		Uranium		Analysis of constituent not required and not performed.
		Vanadium		Analysis of constituent not required and not performed.

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 Permit Number: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-890-008-982 / 1
 LAB ID: None

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB3UG1-22	Zinc		Analysis of constituent not required and not performed.
		PCB, Total		Analysis of constituent not required and not performed.
		PCB-1016		Analysis of constituent not required and not performed.
		PCB-1221		Analysis of constituent not required and not performed.
		PCB-1232		Analysis of constituent not required and not performed.
		PCB-1242		Analysis of constituent not required and not performed.
		PCB-1248		Analysis of constituent not required and not performed.
		PCB-1254		Analysis of constituent not required and not performed.
		PCB-1260		Analysis of constituent not required and not performed.
		PCB-1268		Analysis of constituent not required and not performed.
		Gross alpha		Analysis of constituent not required and not performed.
		Gross beta		Analysis of constituent not required and not performed.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226		Analysis of constituent not required and not performed.
		Strontium-90		Analysis of constituent not required and not performed.
		Technetium-99		Analysis of constituent not required and not performed.
		Thorium-230		Analysis of constituent not required and not performed.
		Tritium		Analysis of constituent not required and not performed.
		Chemical Oxygen Demand		Analysis of constituent not required and not performed.
		Cyanide		Analysis of constituent not required and not performed.
		Iodide		Analysis of constituent not required and not performed.
		Total Organic Carbon		Analysis of constituent not required and not performed.
		Total Organic Halides		Analysis of constituent not required and not performed.

RESIDENTIAL/CONTAINED – QUARTERLY
 Facility: US DOE - Paducah Gaseous Diffusion Plant
 Permit Number: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-890-008-982 / 1
 LAB ID: None

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4793 MW367	MW367DUG1-22	Barometric Pressure Reading		Analysis of constituent not required and not performed.
		Specific Conductance		Analysis of constituent not required and not performed.
		Static Water Level Elevation		Analysis of constituent not required and not performed.
		Dissolved Oxygen		Analysis of constituent not required and not performed.
		pH		Analysis of constituent not required and not performed.
		Eh		Analysis of constituent not required and not performed.
		Temperature		Analysis of constituent not required and not performed.
		Vinyl chloride	L	LCS or LCSD recovery outside of control limits.
		Iodomethane	Y1	MS/MSD recovery outside acceptance criteria
		trans-1,3-Dichloropropene	Y1	MS/MSD recovery outside acceptance criteria
		cis-1,3-Dichloropropene	Y1	MS/MSD recovery outside acceptance criteria
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.88. Rad error is 3.88.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.86. Rad error is 5.85.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.658. Rad error is 0.658.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.71. Rad error is 4.61.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 12. Rad error is 12.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.973. Rad error is 0.973.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 108. Rad error is 108.

Division of Waste Management
Solid Waste Branch
14 Reilly Road
Frankfort, KY 40601 (502)564-6716

RESIDENTIAL/CONTAINED-QUARTERLY
Facility: US DOE - Paducah Gaseous Diffusion Plant
Permit Number: SW07300014, SW07300015, SW07300045

FINDS/UNIT: KY8-890-008-982 / 1
LAB ID: None

GROUNDWATER SAMPLE ANALYSIS(S)

AKGWA NUMBER ¹ , Facility Well/Spring Number					8004-4798	0000-0000						
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					MW357	T. BLANK 4						
Sample Sequence #					3	3						
If sample is a Blank, specify Type: (F)ield, (T)rip, (M)ethod, or (E)quipment					NA	T						
Sample Date and Time (Month/Day/Year hour: minutes)					12/16/2021 13:56	12/16/2021 11:15						
Duplicate ("Y" or "N") ²					N	N						
Split ("Y" or "N") ³					N	N						
Facility Sample ID Number (if applicable)					MW357UG1-22R	TB7UG1-22						
Laboratory Sample ID Number (if applicable)					565304001	565304002						
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis					12/20/2021	12/20/2021						
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)					DOWN	NA						
CAS RN ⁴	CONSTITUENT	T D ⁵	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S ⁷	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
24959-67-9	Bromide	T	mg/L	9056		*		*				
16887-00-6	Chloride(s)	T	mg/L	9056		*		*				
16984-48-8	Fluoride	T	mg/L	9056		*		*				
S0595- -	Nitrate & Nitrite	T	mg/L	9056		*		*				
14808-79-8	Sulfate	T	mg/L	9056		*		*				
NS1894	Barometric Pressure Reading	T	Inches/Hg	Field	30.03			*				
S0145- -	Specific Conductance	T	µMH0/cm	Field	413			*				

STANDARD FLAGS:

* = See Comments
J = Estimated Value
B = Analyte found in blank
A = Average value
N = Presumptive ID
D = Concentration from analysis
of a secondary dilution

¹AKGWA # is 0000-0000 for any type of blank.

²Respond "Y" if the sample was a duplicate of another sample in this report.

³Respond "Y" if the sample was split and analyzed by separate laboratories.

⁴Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.

⁵"T" = Total; "D" = Dissolved

⁶"<" indicates a non-detect; do not use "ND" or "BDL". Value shown is Practical Quantification Limit.

⁷Flags are as designated, do not use any other type. Use "*", then describe on "Written Comments Page."

RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045

LAB ID: None

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number						8004-4798		0000-0000					
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)						357		T. BLANK 4					
CAS RN ⁴		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
S0906 - -		Static Water Level Elevation	T	Ft. MSL	Field	322.38			*				
N238		Dissolved Oxygen	T	mg/L	Field	5.12			*				
S0266- -		Total Dissolved Solids	T	mg/L	160.1		*		*				
S0296- -		pH	T	Units	Field	6.02			*				
NS215		Eh	T	mV	Field	393			*				
S0907 - -		Temperature	T	°C	Field	14.67			*				
7429-90-5		Aluminum	T	mg/L	6020		*		*				
7440-36-0		Antimony	T	mg/L	6020		*		*				
7440-38-2		Arsenic	T	mg/L	6020		*		*				
7440-39-3		Barium	T	mg/L	6020		*		*				
7440-41-7		Beryllium	T	mg/L	6020		*		*				
7440-42-8		Boron	T	mg/L	6020		*		*				
7440-43-9		Cadmium	T	mg/L	6020		*		*				
7440-70-2		Calcium	T	mg/L	6020		*		*				
7440-47-3		Chromium	T	mg/L	6020		*		*				
7440-48-4		Cobalt	T	mg/L	6020		*		*				
7440-50-8		Copper	T	mg/L	6020		*		*				
7439-89-6		Iron	T	mg/L	6020		*		*				
7439-92-1		Lead	T	mg/L	6020		*		*				
7439-95-4		Magnesium	T	mg/L	6020		*		*				
7439-96-5		Manganese	T	mg/L	6020		*		*				
7439-97-6		Mercury	T	mg/L	7470		*		*				

RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

FINDS/UNIT: KY8-890-008-982 / 1

Permit Number: SW07300014, SW07300015, SW07300045

LAB ID: None

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER ¹ , Facility Well/Spring Number						8004-4798		0000-0000					
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						357		T. BLANK 4					
CAS RN ⁴		CONSTITUENT	T D ⁵	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
100-41-4		Ethylbenzene	T	mg/L	8260		*		*				
591-78-6		2-Hexanone	T	mg/L	8260		*		*				
74-88-4		Iodomethane	T	mg/L	8260		*		*				
124-48-1		Methane, Dibromochloro-	T	mg/L	8260		*		*				
56-23-5		Carbon Tetrachloride	T	mg/L	8260		*		*				
75-09-2		Dichloromethane	T	mg/L	8260		*		*				
108-10-1		Methyl isobutyl ketone	T	mg/L	8260		*		*				
96-12-8		Propane, 1,2-Dibromo-3-chloro	T	mg/L	8011		*		*				
78-87-5		Propane, 1,2-Dichloro-	T	mg/L	8260		*		*				
10061-02-6		trans-1,3-Dichloro-1-propene	T	mg/L	8260		*		*				
10061-01-5		cis-1,3-Dichloro-1-propene	T	mg/L	8260	<0.001		<0.001					
156-60-5		trans-1,2-Dichloroethene	T	mg/L	8260		*		*				
75-69-4		Trichlorofluoromethane	T	mg/L	8260		*		*				
96-18-4		1,2,3-Trichloropropane	T	mg/L	8260		*		*				
95-50-1		Benzene, 1,2-Dichloro-	T	mg/L	8260		*		*				
106-46-7		Benzene, 1,4-Dichloro-	T	mg/L	8260		*		*				
1336-36-3		PCB, Total	T	ug/L	8082		*		*				
12674-11-2		PCB-1016	T	ug/L	8082		*		*				
11104-28-2		PCB-1221	T	ug/L	8082		*		*				
11141-16-5		PCB-1232	T	ug/L	8082		*		*				
53469-21-9		PCB-1242	T	ug/L	8082		*		*				
12672-29-6		PCB-1248	T	ug/L	8082		*		*				

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RESIDENTIAL/CONTAINED – QUARTERLY
Facility: US DOE - Paducah Gaseous Diffusion Plant
Permit Number: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-890-008-982 / 1
LAB ID: None

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4798 MW357	MW357UG1-22R	Bromide		Analysis of constituent not required and not performed.
		Chloride		Analysis of constituent not required and not performed.
		Fluoride		Analysis of constituent not required and not performed.
		Nitrate & Nitrite		Analysis of constituent not required and not performed.
		Sulfate		Analysis of constituent not required and not performed.
		Total Dissolved Solids		Analysis of constituent not required and not performed.
		Aluminum		Analysis of constituent not required and not performed.
		Antimony		Analysis of constituent not required and not performed.
		Arsenic		Analysis of constituent not required and not performed.
		Barium		Analysis of constituent not required and not performed.
		Beryllium		Analysis of constituent not required and not performed.
		Boron		Analysis of constituent not required and not performed.
		Cadmium		Analysis of constituent not required and not performed.
		Calcium		Analysis of constituent not required and not performed.
		Chromium		Analysis of constituent not required and not performed.
		Cobalt		Analysis of constituent not required and not performed.
		Copper		Analysis of constituent not required and not performed.
		Iron		Analysis of constituent not required and not performed.
		Lead		Analysis of constituent not required and not performed.
		Magnesium		Analysis of constituent not required and not performed.
		Manganese		Analysis of constituent not required and not performed.
		Mercury		Analysis of constituent not required and not performed.

RESIDENTIAL/CONTAINED – QUARTERLY
Facility: US DOE - Paducah Gaseous Diffusion Plant
Permit Number: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-890-008-982 / 1
LAB ID: None

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4798 MW357	MW357UG1-22R	Ethylbenzene		Analysis of constituent not required and not performed.
		2-Hexanone		Analysis of constituent not required and not performed.
		Iodomethane		Analysis of constituent not required and not performed.
		Dibromochloromethane		Analysis of constituent not required and not performed.
		Carbon tetrachloride		Analysis of constituent not required and not performed.
		Dichloromethane		Analysis of constituent not required and not performed.
		Methyl Isobutyl Ketone		Analysis of constituent not required and not performed.
		1,2-Dibromo-3-chloropropane		Analysis of constituent not required and not performed.
		1,2-Dichloropropane		Analysis of constituent not required and not performed.
		trans-1,3-Dichloropropene		Analysis of constituent not required and not performed.
		trans-1,2-Dichloroethene		Analysis of constituent not required and not performed.
		Trichlorofluoromethane 1,2,3-		Analysis of constituent not required and not performed.
		Trichloropropane		Analysis of constituent not required and not performed.
		1,2-Dichlorobenzene		Analysis of constituent not required and not performed.
		1,4-Dichlorobenzene		Analysis of constituent not required and not performed.
		PCB, Total		Analysis of constituent not required and not performed.
		PCB-1016		Analysis of constituent not required and not performed.
		PCB-1221		Analysis of constituent not required and not performed.
		PCB-1232		Analysis of constituent not required and not performed.
		PCB-1242		Analysis of constituent not required and not performed.
		PCB-1248		Analysis of constituent not required and not performed.
		PCB-1254		Analysis of constituent not required and not performed.
		PCB-1260		Analysis of constituent not required and not performed.
		PCB-1268		Analysis of constituent not required and not performed.

RESIDENTIAL/CONTAINED – QUARTERLY
Facility: US DOE - Paducah Gaseous Diffusion Plant
Permit Number: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-890-008-982 / 1
LAB ID: None

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB7UG1-22	Bromide		Analysis of constituent not required and not performed.
		Chloride		Analysis of constituent not required and not performed.
		Fluoride		Analysis of constituent not required and not performed.
		Nitrate & Nitrite		Analysis of constituent not required and not performed.
		Sulfate		Analysis of constituent not required and not performed.
		Barometric Pressure Reading		Analysis of constituent not required and not performed.
		Specific Conductance		Analysis of constituent not required and not performed.
		Static Water Level Elevation		Analysis of constituent not required and not performed.
		Dissolved Oxygen		Analysis of constituent not required and not performed.
		Total Dissolved Solids		Analysis of constituent not required and not performed.
		pH		Analysis of constituent not required and not performed.
		Eh		Analysis of constituent not required and not performed.
		Temperature		Analysis of constituent not required and not performed.
		Aluminum		Analysis of constituent not required and not performed.
		Antimony		Analysis of constituent not required and not performed.
		Arsenic		Analysis of constituent not required and not performed.
		Barium		Analysis of constituent not required and not performed.
		Beryllium		Analysis of constituent not required and not performed.
		Boron		Analysis of constituent not required and not performed.
		Cadmium		Analysis of constituent not required and not performed.
		Calcium		Analysis of constituent not required and not performed.
		Chromium		Analysis of constituent not required and not performed.
		Cobalt		Analysis of constituent not required and not performed.
		Copper		Analysis of constituent not required and not performed.
		Iron		Analysis of constituent not required and not performed.
		Lead		Analysis of constituent not required and not performed.
		Magnesium		Analysis of constituent not required and not performed.
		Manganese		Analysis of constituent not required and not performed.
		Mercury		Analysis of constituent not required and not performed.
		Molybdenum		Analysis of constituent not required and not performed.
		Nickel		Analysis of constituent not required and not performed.
		Potassium		Analysis of constituent not required and not performed.
		Rhodium		Analysis of constituent not required and not performed.
		Selenium		Analysis of constituent not required and not performed.
		Silver		Analysis of constituent not required and not performed.
		Sodium		Analysis of constituent not required and not performed.
		Tantalum		Analysis of constituent not required and not performed.
		Thallium		Analysis of constituent not required and not performed.
		Uranium		Analysis of constituent not required and not performed.
		Vanadium		Analysis of constituent not required and not performed.

RESIDENTIAL/CONTAINED – QUARTERLY
 Facility: US DOE - Paducah Gaseous Diffusion Plant
 Permit Number: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-890-008-982 / 1
 LAB ID: None

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB7UG1-22	Zinc		Analysis of constituent not required and not performed.
		Vinyl acetate		Analysis of constituent not required and not performed.
		Acetone		Analysis of constituent not required and not performed.
		Acrolein		Analysis of constituent not required and not performed.
		Acrylonitrile		Analysis of constituent not required and not performed.
		Benzene		Analysis of constituent not required and not performed.
		Chlorobenzene		Analysis of constituent not required and not performed.
		Xylenes		Analysis of constituent not required and not performed.
		Styrene		Analysis of constituent not required and not performed.
		Toluene		Analysis of constituent not required and not performed.
		Chlorobromomethane		Analysis of constituent not required and not performed.
		Bromodichloromethane		Analysis of constituent not required and not performed.
		Tribromomethane		Analysis of constituent not required and not performed.
		Methyl bromide		Analysis of constituent not required and not performed.
		Methyl Ethyl Ketone		Analysis of constituent not required and not performed.
		trans-1,4-Dichloro-2-butene		Analysis of constituent not required and not performed.
		Carbon disulfide		Analysis of constituent not required and not performed.
		Chloroethane		Analysis of constituent not required and not performed.
		Chloroform		Analysis of constituent not required and not performed.
		Methyl chloride		Analysis of constituent not required and not performed.
		cis-1,2-Dichloroethene		Analysis of constituent not required and not performed.
		Methylene bromide		Analysis of constituent not required and not performed.
		1,1-Dichloroethane		Analysis of constituent not required and not performed.
		1,2-Dichloroethane		Analysis of constituent not required and not performed.
		1,1-Dichloroethylene		Analysis of constituent not required and not performed.
		1,2-Dibromoethane		Analysis of constituent not required and not performed.
		1,1,2,2-Tetrachloroethane		Analysis of constituent not required and not performed.
		1,1,1-Trichloroethane		Analysis of constituent not required and not performed.
		1,1,2-Trichloroethane		Analysis of constituent not required and not performed.
		1,1,1,2-Tetrachloroethane		Analysis of constituent not required and not performed.
		Vinyl chloride		Analysis of constituent not required and not performed.
		Tetrachloroethene		Analysis of constituent not required and not performed.
		Trichloroethene		Analysis of constituent not required and not performed.
		Ethylbenzene		Analysis of constituent not required and not performed.
		2-Hexanone		Analysis of constituent not required and not performed.
		Iodomethane		Analysis of constituent not required and not performed.
		Dibromochloromethane		Analysis of constituent not required and not performed.
		Carbon tetrachloride		Analysis of constituent not required and not performed.
		Dichloromethane		Analysis of constituent not required and not performed.
		Methyl Isobutyl Ketone		Analysis of constituent not required and not performed.

RESIDENTIAL/CONTAINED – QUARTERLY
Facility: US DOE - Paducah Gaseous Diffusion Plant
Permit Number: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-890-008-982 / 1
LAB ID: None

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB7UG1-22	1,2-Dibromo-3-chloropropane		Analysis of constituent not required and not performed.
		1,2-Dichloropropane		Analysis of constituent not required and not performed.
		trans-1,3-Dichloropropene		Analysis of constituent not required and not performed.
		trans-1,2-Dichloroethene		Analysis of constituent not required and not performed.
		Trichlorofluoromethane		Analysis of constituent not required and not performed.
		1,2,3-Trichloropropane		Analysis of constituent not required and not performed.
		1,2-Dichlorobenzene		Analysis of constituent not required and not performed.
		1,4-Dichlorobenzene		Analysis of constituent not required and not performed.
		PCB, Total		Analysis of constituent not required and not performed.
		PCB-1016		Analysis of constituent not required and not performed.
		PCB-1221		Analysis of constituent not required and not performed.
		PCB-1232		Analysis of constituent not required and not performed.
		PCB-1242		Analysis of constituent not required and not performed.
		PCB-1248		Analysis of constituent not required and not performed.

APPENDIX D

**STATISTICAL ANALYSES AND
QUALIFICATION STATEMENT**

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RESIDENTIAL/CONTAINED—QUARTERLY, 4th CY 2021
Facility: U.S. DOE—Paducah Gaseous Diffusion Plant
Permit Number: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-980-008-982/1
LAB ID: None
For Official Use Only

GROUNDWATER STATISTICAL COMMENTS

Introduction

The statistical analyses conducted on the fourth quarter 2021 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 fourth quarter 2021 data used to conduct the statistical analyses were collected in October and December 2021. 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.

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. 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 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	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	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 $CV \leq 1.0$, 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 URGAs, 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, fourth quarter 2021. 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:

$$\begin{aligned}\text{upper TL} &= X + (K \times S) \\ \text{lower TL} &= X - (K \times S)\end{aligned}$$

**Exhibit D.2. List of Parameters Tested Using the One-Sided Upper Tolerance Level
Test with Historical Background**

Parameters
Aluminum
Boron
Bromide
Calcium
Chemical Oxygen Demand (COD)
Chloride
<i>cis</i> -1,2-Dichloroethene
Cobalt
Conductivity
Copper
Dissolved Oxygen
Dissolved Solids
Iron
Magnesium
Manganese
Nickel
Nitrate as Nitrogen
Oxidation-Reduction Potential
pH*
Potassium
Sodium
Sulfate
Technetium-99
Total Organic Carbon (TOC)
Total Organic Halides (TOX)
Trichloroethene
Vanadium
Zinc

*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	7	7	0	No
1,1,2,2-Tetrachloroethane	7	7	0	No
1,1,2-Trichloroethane	7	7	0	No
1,1-Dichloroethane	7	7	0	No
1,2,3-Trichloropropane	7	7	0	No
1,2-Dibromo-3-chloropropane	7	7	0	No
1,2-Dibromoethane	7	7	0	No
1,2-Dichlorobenzene	7	7	0	No
1,2-Dichloropropane	7	7	0	No
2-Butanone	7	7	0	No
2-Hexanone	7	7	0	No
4-Methyl-2-pentanone	7	7	0	No
Acetone	7	7	0	No
Acrolein	7	7	0	No
Acrylonitrile	7	7	0	No
Aluminum	7	3	4	Yes
Antimony	7	7	0	No
Beryllium	7	7	0	No
Boron	7	2	5	Yes
Bromide	7	4	3	Yes
Bromochloromethane	7	7	0	No
Bromodichloromethane	7	7	0	No
Bromoform	7	7	0	No
Bromomethane	7	7	0	No
Calcium	7	0	7	Yes
Carbon disulfide	7	7	0	No
Chemical Oxygen Demand (COD)	7	5	2	Yes
Chloride	7	0	7	Yes
Chlorobenzene	7	7	0	No
Chloroethane	7	7	0	No
Chloroform	7	7	0	No
Chloromethane	7	7	0	No
<i>cis</i> -1,2-Dichloroethene	7	7	0	No
<i>cis</i> -1,3-Dichloropropene	7	7	0	No
Cobalt	7	3	4	Yes
Conductivity	7	0	7	Yes
Copper	7	0	7	Yes
Cyanide	7	7	0	No
Dibromochloromethane	7	7	0	No
Dibromomethane	7	7	0	No
Dimethylbenzene, Total	7	7	0	No
Dissolved Oxygen	7	0	7	Yes
Dissolved Solids	7	0	7	Yes
Ethylbenzene	7	7	0	No
Iodide	7	7	0	No
Iodomethane	7	7	0	No
Iron	7	1	6	Yes
Magnesium	7	0	7	Yes
Manganese	7	0	7	Yes
Methylene chloride	7	7	0	No
Molybdenum	7	7	0	No

Exhibit D.3. Summary of Censored, and Uncensored Data—UCRS (Continued)

Parameters	Observations	Censored Observation	Uncensored Observation	Statistical Analysis?
Nickel	7	1	6	Yes
Oxidation-Reduction Potential	7	0	7	Yes
PCB, Total	7	7	0	No
PCB-1016	7	7	0	No
PCB-1221	7	7	0	No
PCB-1232	7	7	0	No
PCB-1242	7	7	0	No
PCB-1248	7	7	0	No
PCB-1254	7	7	0	No
PCB-1260	7	7	0	No
PCB-1268	7	7	0	No
pH	7	0	7	Yes
Potassium	7	0	7	Yes
Radium-226	7	7	0	No
Rhodium	7	7	0	No
Sodium	7	0	7	Yes
Styrene	7	7	0	No
Sulfate	7	0	7	Yes
Tantalum	7	7	0	No
Technetium-99	7	7	0	No
Tetrachloroethene	7	7	0	No
Thallium	7	7	0	No
Thorium-230	7	7	0	No
Toluene	7	7	0	No
Total Organic Carbon (TOC)	7	0	7	Yes
Total Organic Halides (TOX)	7	1	6	Yes
<i>trans</i> -1,2-Dichloroethene	7	7	0	No
<i>trans</i> -1,3-Dichloropropene	7	7	0	No
<i>trans</i> -1,4-Dichloro-2-Butene	7	7	0	No
Trichlorofluoromethane	7	7	0	No
Vanadium	7	5	2	Yes
Vinyl Acetate	7	7	0	No
Zinc	7	2	5	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	4	2	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	5	1	Yes
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
<i>cis</i> -1,2-Dichloroethene	6	6	0	No
<i>cis</i> -1,3-Dichloropropene	6	6	0	No
Cobalt	6	3	3	Yes
Conductivity	6	0	6	Yes
Copper	6	0	6	Yes
Cyanide	6	6	0	No
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	1	5	Yes
Methylene chloride	6	6	0	No
Molybdenum	6	6	0	No

Exhibit D.4. Summary of Censored, and Uncensored Data—URGA (Continued)

Parameters	Observations	Censored Observation	Uncensored Observation	Statistical Analysis?
Nickel	6	1	5	Yes
Nitrate as Nitrogen	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	2	4	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	0	6	Yes
Total Organic Halides (TOX)	6	0	6	Yes
<i>trans</i> -1,2-Dichloroethene	6	6	0	No
<i>trans</i> -1,3-Dichloropropene	6	6	0	No
<i>trans</i> -1,4-Dichloro-2-Butene	6	6	0	No
Trichlorofluoromethane	6	6	0	No
Vanadium	6	6	0	No
Vinyl Acetate	6	6	0	No
Zinc	6	3	3	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	6	0	No
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	4	2	Yes
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	5	1	Yes
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	6	0	No
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	2	4	Yes
Magnesium	6	0	6	Yes
Manganese	6	0	6	Yes
Methylene chloride	6	6	0	No
Molybdenum	6	6	0	No

Exhibit D.5. Summary of Censored, and Uncensored Data—LRGA (Continued)

Parameters	Observations	Censored Observation	Uncensored Observation	Statistical Analysis?
Nickel	6	1	5	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	2	4	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	0	6	Yes
Total Organic Halides (TOX)	6	2	4	Yes
<i>trans</i> -1,2-Dichloroethene	6	6	0	No
<i>trans</i> -1,3-Dichloropropene	6	6	0	No
<i>trans</i> -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	2	4	Yes

Bold denotes parameters with at least one uncensored observation.

Discussion of Results from Historical Background Comparison

For the UCRS, URGAs, 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, URGAs, and LRGA, the test was applied to 24, 25, and 26 parameters, respectively, including those listed in bold print in Exhibits D.3, D.4, and D.5, which includes those constituents (trichloroethene) 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, dissolved solids, magnesium, nitrate as nitrogen, oxidation-reduction potential, and sulfate.

LRGA

This quarter's results identified historical background exceedances for dissolved oxygen, pH, 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 URGAs, 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
MW359: Dissolved Oxygen, Oxidation-Reduction Potential, Sulfate	MW357: Oxidation-Reduction Potential	MW358: Oxidation-Reduction Potential
MW362: Oxidation-Reduction Potential, Sulfate	MW360: Oxidation-Reduction Potential	MW361: Oxidation-Reduction Potential, Technetium-99
MW365: Dissolved Oxygen, Oxidation-Reduction Potential, Sulfate	MW363: Nitrate as Nitrogen, Oxidation-Reduction Potential	MW364: Oxidation-Reduction Potential, Technetium-99
MW368: Oxidation-Reduction Potential, Sulfate	MW366: Oxidation-Reduction Potential	MW367: pH, Oxidation-Reduction Potential
MW371: Dissolved Oxygen, Oxidation-Reduction Potential	MW369: Oxidation-Reduction Potential	MW370: Dissolved Oxygen, Oxidation-Reduction Potential
MW374: Oxidation-Reduction Potential	MW372: Calcium, Dissolved Solids, Magnesium, Oxidation-Reduction Potential, Sulfate	MW373: pH, Oxidation-Reduction Potential
MW375: Oxidation-Reduction Potential, Sulfate		

Exhibit D.7. Test Summaries for Qualified Parameters for Historical Background—UCRS

Parameter	Performed Test	CV Normality Test*	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.
Chemical Oxygen Demand (COD)	Tolerance Interval	0.97	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.
Dissolved Oxygen	Tolerance Interval	0.55	Current results exceed statistically derived historical background concentration in MW359, 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.

Exhibit D.7. Test Summaries for Qualified Parameters for Historical Background—UCRS (Continued)

Parameter	Performed Test	CV Normality Test*	Results of Tolerance Interval Test Conducted
Nickel	Tolerance Interval	0.98	No exceedance of statistically derived historical background concentration.
Oxidation-Reduction Potential	Tolerance Interval	3.54	Current results exceed statistically derived historical background concentration in MW359, MW362, MW365, MW368, 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 MW359, MW362, MW365, MW368, and MW375.
Total Organic Carbon (TOC)	Tolerance Interval	1.38	No exceedance of statistically derived historical background concentration.
Total Organic Halides (TOX)	Tolerance Interval	1.08	No exceedance of statistically derived historical background concentration.
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

*If CV > 1.0, used log-transformed data.

Exhibit D.8. Test Summaries for Qualified Parameters for Historical Background—URGA

Parameter	Performed Test	CV Normality Test*	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.
Chemical Oxygen Demand (COD)	Tolerance Interval	0.10	No exceedance of statistically derived historical background concentration.
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	No exceedance of statistically derived historical background concentration.
Copper	Tolerance Interval	0.40	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	Current results exceed statistically derived historical background concentration in MW372.
Manganese	Tolerance Interval	0.66	No exceedance of statistically derived historical background concentration.
Nickel	Tolerance Interval	0.91	No exceedance of statistically derived historical background concentration.

Exhibit D.8. Test Summaries for Qualified Parameters for Historical Background—URGA (Continued)

Parameter	Performed Test	CV Normality Test*	Results of Tolerance Interval Test Conducted
Nitrate as Nitrogen	Tolerance Interval	0.00	Current results exceed statistically derived historical background concentration in MW363.
Oxidation-Reduction Potential	Tolerance Interval	1.26	Current results exceed statistically derived historical background concentration in MW357, MW360, MW363, MW366, MW369, and MW372.
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.
Total Organic Carbon (TOC)	Tolerance Interval	1.23	No exceedance of statistically derived historical background concentration.
Total Organic Halides (TOX)	Tolerance Interval	0.95	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

*If CV > 1.0, used log-transformed data.

Exhibit D.9. Test Summaries for Qualified Parameters for Historical Background—LRGA

Parameter	Performed Test	CV Normality Test*	Results of Tolerance Interval Test Conducted
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	No exceedance of statistically derived historical background concentration.
Chemical Oxygen Demand (COD)	Tolerance Interval	0.59	No exceedance of statistically derived historical background concentration.
Chloride	Tolerance Interval	0.16	No exceedance of statistically derived historical background concentration.
<i>cis</i> -1,2-Dichloroethene	Tolerance Interval	0.80	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.
Dissolved Oxygen	Tolerance Interval	0.83	Current results exceed statistically derived historical background concentration in MW370.
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.
Nickel	Tolerance Interval	0.90	No exceedance of statistically derived historical background concentration.

Exhibit D.9. Test Summaries for Qualified Parameters for Historical Background—LRGA (Continued)

Parameter	Performed Test	CV Normality Test*	Results of Tolerance Interval Test Conducted
Oxidation-Reduction Potential	Tolerance Interval	1.31	Current results exceed statistically derived historical background concentration in MW358, MW361, MW364, MW367, MW370, and MW373.
pH	Tolerance Interval	0.03	Current results exceed statistically derived historical background concentration in MW367 and MW373.
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 MW361 and MW364.
Total Organic Carbon (TOC)	Tolerance Interval	1.96	No exceedance of statistically derived historical background concentration.
Total Organic Halides (TOX)	Tolerance Interval	0.98	No exceedance of statistically derived historical background concentration.
Trichloroethene ¹	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

*If CV > 1.0, used log-transformed data.

¹ A tolerance interval was calculated based on an MCL exceedance.

Discussion of Results from Current Background Comparison

For concentrations in wells in the UCRS, URGAs, 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, URGAs, and LRGA, the test was applied to 3, 6, and 4 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 the sulfate concentration in MW368 exceeded its respective current TL this quarter.

URGA

This quarter's results showed a statistically significant exceedance of current background TL for nitrate as nitrogen in downgradient URGAs well MW363.

LRGA

This quarter's results showed no statistically significant exceedances in LRGA wells located downgradient of the landfill.

Statistical Summary

Summaries of the statistical tests conducted on data obtained from wells in the UCRS, the URGAs, 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	0.76	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	0.23	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	0.90	Because gradients in UCRS wells are downward, there are no UCRS wells that are hydrogeologically downgradient of the landfill; however, MW368 exceeded the upper TL, which is evidence of elevated concentration with respect to current background data.

CV: coefficient of variation

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	0.60	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	0.39	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.
Magnesium	Tolerance Interval	0.54	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.
Nitrate as Nitrogen	Tolerance Interval	0.26	MW363 exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to current background data.
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	0.97	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

Exhibit D.12. Test Summaries for Qualified Parameters for Current Background—LRGA

Parameter	Performed Test	CV Normality Test	Results of Tolerance Interval Test Conducted
Dissolved Oxygen	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	0.08	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.
pH	Tolerance Interval	0.02	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	0.75	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

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 Fourth Quarter 2021 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)**= 20.604 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= -0.371 **S**= 1.678 **CV(2)**= -4.521 **K factor****= 2.523 **TL(2)**= 3.863 **LL(2)**=N/A

**Historical Background Data from
Upgradient Wells with Transformed Result**

Well Number: MW371

Date Collected	Result	LN(Result)
3/18/2002	2.24	0.806
4/22/2002	0.2	-1.609
7/15/2002	0.2	-1.609
10/8/2002	0.2	-1.609
1/8/2003	0.2	-1.609
4/3/2003	0.2	-1.609
7/9/2003	0.2	-1.609
10/6/2003	0.2	-1.609

Well Number: MW374

Date Collected	Result	LN(Result)
10/8/2002	21.3	3.059
1/7/2003	20	2.996
4/2/2003	4.11	1.413
7/9/2003	1.41	0.344
10/7/2003	1.09	0.086
1/6/2004	0.854	-0.158
4/7/2004	0.2	-1.609
7/14/2004	0.2	-1.609

Dry/Partially Dry Wells

Well No. Gradient

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)
MW359	Downgradient	Yes	0.101	N/A	-2.293	NO
MW362	Downgradient	Yes	0.0293	N/A	-3.530	NO
MW365	Downgradient	No	0.05	N/A	-2.996	N/A
MW368	Downgradient	Yes	0.0613	N/A	-2.792	NO
MW371	Upgradient	Yes	0.399	N/A	-0.919	NO
MW374	Upgradient	No	0.05	N/A	-2.996	N/A
MW375	Sidegradient	No	0.05	N/A	-2.996	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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 $X = 0.650$ $S = 0.805$ $CV(1) = 1.238$ $K \text{ factor}^{**} = 2.523$ $TL(1) = 2.681$ $LL(1) = N/A$

Statistics-Transformed Background Data $X = -1.034$ $S = 1.030$ $CV(2) = -0.996$ $K \text{ factor}^{**} = 2.523$ $TL(2) = 1.564$ $LL(2) = N/A$

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW371

Date Collected	Result	LN(Result)
3/18/2002	2	0.693
4/22/2002	2	0.693
7/15/2002	2	0.693
10/8/2002	0.2	-1.609
1/8/2003	0.2	-1.609
4/3/2003	0.2	-1.609
7/9/2003	0.2	-1.609
10/6/2003	0.2	-1.609

Well Number: MW374

Date Collected	Result	LN(Result)
10/8/2002	2	0.693
1/7/2003	0.2	-1.609
4/2/2003	0.2	-1.609
7/9/2003	0.2	-1.609
10/7/2003	0.2	-1.609
1/6/2004	0.2	-1.609
4/7/2004	0.2	-1.609
7/14/2004	0.2	-1.609

Dry/Partially Dry Wells

Well No. Gradient

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)
MW359	Downgradient	Yes	0.00956	N/A	-4.650	NO
MW362	Downgradient	Yes	0.018	N/A	-4.017	NO
MW365	Downgradient	Yes	0.00699	N/A	-4.963	NO
MW368	Downgradient	Yes	0.00653	N/A	-5.031	NO
MW371	Upgradient	Yes	0.00734	N/A	-4.914	NO
MW374	Upgradient	No	0.0308	N/A	-3.480	N/A
MW375	Sidegradient	No	0.0153	N/A	-4.180	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, $S = [\text{Sum}([(background \text{ result} - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

**** 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 Fourth Quarter 2021 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)**= 2.590 **LL(1)**=N/A

Statistics-Transformed Background Data **X**=0.279 **S**= 0.332 **CV(2)**=1.190 **K factor****= 2.523 **TL(2)**= 1.118 **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	0.000
4/22/2002	1	0.000
7/15/2002	1	0.000
10/8/2002	1	0.000
1/8/2003	1	0.000
4/3/2003	1	0.000
7/9/2003	1	0.000
10/6/2003	1	0.000

Well Number: MW374

Date Collected	Result	LN(Result)
10/8/2002	2.1	0.742
1/7/2003	2.1	0.742
4/2/2003	1.9	0.642
7/9/2003	1	0.000
10/7/2003	1.9	0.642
1/6/2004	1.9	0.642
4/7/2004	1.8	0.588
7/14/2004	1.6	0.470

Dry/Partially Dry Wells

Well No. Gradient

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)
MW359	Downgradient	No	0.2	N/A	-1.609	N/A
MW362	Downgradient	Yes	0.112	NO	-2.189	N/A
MW365	Downgradient	No	0.2	N/A	-1.609	N/A
MW368	Downgradient	No	0.2	N/A	-1.609	N/A
MW371	Upgradient	Yes	0.0705	NO	-2.652	N/A
MW374	Upgradient	Yes	0.823	NO	-0.195	N/A
MW375	Sidegradient	No	0.2	N/A	-1.609	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)**= 68.505 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= 3.466 **S**= 0.356 **CV(2)**=0.103 **K factor****= 2.523 **TL(2)**= 4.364 **LL(2)**=N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW371

Date Collected	Result	LN(Result)
3/18/2002	17.2	2.845
4/22/2002	22.4	3.109
7/15/2002	25.5	3.239
10/8/2002	26.4	3.273
1/8/2003	27.2	3.303
4/3/2003	30.3	3.411
7/9/2003	25.9	3.254
10/6/2003	27	3.296

Well Number: MW374

Date Collected	Result	LN(Result)
10/8/2002	67.3	4.209
1/7/2003	60.6	4.104
4/2/2003	47.2	3.854
7/9/2003	34.7	3.547
10/7/2003	37.1	3.614
1/6/2004	37.7	3.630
4/7/2004	32.2	3.472
7/14/2004	26.9	3.292

Dry/Partially Dry Wells

Well No. Gradient

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)
MW359	Downgradient	Yes	5.82	NO	1.761	N/A
MW362	Downgradient	Yes	20.5	NO	3.020	N/A
MW365	Downgradient	Yes	16	NO	2.773	N/A
MW368	Downgradient	Yes	58.4	NO	4.067	N/A
MW371	Upgradient	Yes	54	NO	3.989	N/A
MW374	Upgradient	Yes	25	NO	3.219	N/A
MW375	Sidegradient	Yes	12.8	NO	2.549	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 Statistical Analysis Historical Background Comparison

Chemical Oxygen Demand (COD) 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 $X = 72.938$ $S = 70.749$ $CV(1) = 0.970$ **K factor**** = 2.523 **TL(1)** = 251.437 **LL(1)** = N/A

Statistics-Transformed Background Data $X = 4.000$ $S = 0.702$ $CV(2) = 0.175$ **K factor**** = 2.523 **TL(2)** = 5.770 **LL(2)** = N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW371

Date Collected	Result	LN(Result)
3/18/2002	35	3.555
4/22/2002	35	3.555
7/15/2002	35	3.555
10/8/2002	35	3.555
1/8/2003	35	3.555
4/3/2003	35	3.555
7/9/2003	35	3.555
10/6/2003	35	3.555

Well Number: MW374

Date Collected	Result	LN(Result)
10/8/2002	260	5.561
1/7/2003	214	5.366
4/2/2003	147	4.990
7/9/2003	72	4.277
10/7/2003	56	4.025
1/6/2004	68	4.220
4/7/2004	35	3.555
7/14/2004	35	3.555

Dry/Partially Dry Wells

Well No. Gradient

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)
MW359	Downgradient	No	20	N/A	2.996	N/A
MW362	Downgradient	No	20	N/A	2.996	N/A
MW365	Downgradient	No	22.9	N/A	3.131	N/A
MW368	Downgradient	No	25.5	N/A	3.239	N/A
MW371	Upgradient	No	22.9	N/A	3.131	N/A
MW374	Upgradient	Yes	16.2	NO	2.785	N/A
MW375	Sidegradient	Yes	16.2	NO	2.785	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)**= 310.697 **LL(1)**=N/A

Statistics-Transformed Background Data **X**=3.620 **S**= 1.590 **CV(2)**=0.439 **K factor****= 2.523 **TL(2)**= 7.631 **LL(2)**=N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW371

Date Collected	Result	LN(Result)
7/15/2002	8.3	2.116
10/8/2002	7.6	2.028
1/8/2003	7.7	2.041
4/3/2003	8.8	2.175
7/9/2003	8.1	2.092
10/6/2003	8.6	2.152
1/7/2004	7.6	2.028
4/6/2004	7.6	2.028

Well Number: MW374

Date Collected	Result	LN(Result)
10/8/2002	199.2	5.294
1/7/2003	199.7	5.297
4/2/2003	171.8	5.146
7/9/2003	178.7	5.186
10/7/2003	175.6	5.168
1/6/2004	170.4	5.138
4/7/2004	156.4	5.052
7/14/2004	144.7	4.975

Dry/Partially Dry Wells

Well No. Gradient

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)
MW359	Downgradient	Yes	1.1	NO	0.095	N/A
MW362	Downgradient	Yes	3.02	NO	1.105	N/A
MW365	Downgradient	Yes	2.23	NO	0.802	N/A
MW368	Downgradient	Yes	2.82	NO	1.037	N/A
MW371	Upgradient	Yes	5.3	NO	1.668	N/A
MW374	Upgradient	Yes	46.8	NO	3.846	N/A
MW375	Sidegradient	Yes	3.21	NO	1.166	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)**= 0.031 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= -5.843 **S**= 1.392 **CV(2)**= -0.238 **K factor****= 2.523 **TL(2)**= -2.331 **LL(2)**=N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW371

Date Collected	Result	LN(Result)
3/18/2002	0.025	-3.689
4/22/2002	0.025	-3.689
7/15/2002	0.025	-3.689
10/8/2002	0.001	-6.908
1/8/2003	0.001	-6.908
4/3/2003	0.001	-6.908
7/9/2003	0.001	-6.908
10/6/2003	0.001	-6.908

Well Number: MW374

Date Collected	Result	LN(Result)
10/8/2002	0.01	-4.605
1/7/2003	0.01	-4.605
4/2/2003	0.01	-4.605
7/9/2003	0.00161	-6.432
10/7/2003	0.001	-6.908
1/6/2004	0.001	-6.908
4/7/2004	0.001	-6.908
7/14/2004	0.001	-6.908

Dry/Partially Dry Wells

Well No. Gradient

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)
MW359	Downgradient	Yes	0.000407	N/A	-7.807	NO
MW362	Downgradient	Yes	0.000868	N/A	-7.049	NO
MW365	Downgradient	Yes	0.00111	N/A	-6.803	NO
MW368	Downgradient	No	0.001	N/A	-6.908	N/A
MW371	Upgradient	No	0.001	N/A	-6.908	N/A
MW374	Upgradient	Yes	0.000826	N/A	-7.099	NO
MW375	Sidegradient	No	0.001	N/A	-6.908	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)**= 1971.483 **LL(1)**=N/A

Statistics-Transformed Background Data **X**=6.705 **S**= 0.550 **CV(2)**=0.082 **K factor****= 2.523 **TL(2)**= 8.092 **LL(2)**=N/A

**Historical Background Data from
Upgradient Wells with Transformed Result**

Well Number: MW371

Date Collected	Result	LN(Result)
3/18/2002	541	6.293
4/22/2002	643	6.466
7/15/2002	632	6.449
10/8/2002	631	6.447
1/8/2003	680	6.522
4/3/2003	749	6.619
7/9/2003	734	6.599
10/6/2003	753	6.624

Well Number: MW374

Date Collected	Result	LN(Result)
3/18/2002	1007	6.915
10/8/2002	1680	7.427
1/7/2003	1715.9	7.448
4/2/2003	172	5.147
7/9/2003	1231	7.116
10/7/2003	1214	7.102
1/6/2004	1172	7.066
4/7/2004	1145	7.043

Dry/Partially Dry Wells

Well No. Gradient

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)
MW359	Downgradient	Yes	180	NO	5.193	N/A
MW362	Downgradient	Yes	468	NO	6.148	N/A
MW365	Downgradient	Yes	300	NO	5.704	N/A
MW368	Downgradient	Yes	501	NO	6.217	N/A
MW371	Upgradient	Yes	628	NO	6.443	N/A
MW374	Upgradient	Yes	241	NO	5.485	N/A
MW375	Sidegradient	Yes	630	NO	6.446	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)**= 0.237 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= -3.395 **S**= 0.915 **CV(2)**= -0.270 **K factor****= 2.523 **TL(2)**= -1.086 **LL(2)**=N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW371

Date Collected	Result	LN(Result)
3/18/2002	0.025	-3.689
4/22/2002	0.025	-3.689
7/15/2002	0.05	-2.996
10/8/2002	0.02	-3.912
1/8/2003	0.02	-3.912
4/3/2003	0.02	-3.912
7/9/2003	0.02	-3.912
10/6/2003	0.02	-3.912

Well Number: MW374

Date Collected	Result	LN(Result)
10/8/2002	0.2	-1.609
1/7/2003	0.2	-1.609
4/2/2003	0.2	-1.609
7/9/2003	0.02	-3.912
10/7/2003	0.02	-3.912
1/6/2004	0.02	-3.912
4/7/2004	0.02	-3.912
7/14/2004	0.02	-3.912

Dry/Partially Dry Wells

Well No. Gradient

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)
MW359	Downgradient	Yes	0.00199	N/A	-6.220	NO
MW362	Downgradient	Yes	0.00139	N/A	-6.578	NO
MW365	Downgradient	Yes	0.00187	N/A	-6.282	NO
MW368	Downgradient	Yes	0.000967	N/A	-6.941	NO
MW371	Upgradient	Yes	0.00139	N/A	-6.578	NO
MW374	Upgradient	Yes	0.000324	N/A	-8.035	NO
MW375	Sidegradient	Yes	0.00044	N/A	-7.729	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)= 2.704 LL(1)=N/A

Statistics-Transformed Background Data X= -0.013 S= 0.577 CV(2)=-43.069 K factor**= 2.523 TL(2)= 1.441 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW371

Date Collected	Result	LN(Result)
3/18/2002	2.26	0.815
4/22/2002	1.15	0.140
7/15/2002	0.94	-0.062
10/8/2002	0.74	-0.301
1/8/2003	2.62	0.963
4/3/2003	1.5	0.405
7/9/2003	1.66	0.507
10/6/2003	1.28	0.247

Well Number: MW374

Date Collected	Result	LN(Result)
3/18/2002	0.6	-0.511
10/8/2002	0.67	-0.400
1/7/2003	0.23	-1.470
4/2/2003	0.65	-0.431
7/9/2003	0.92	-0.083
10/7/2003	0.99	-0.010
1/6/2004	1.11	0.104
4/7/2004	0.88	-0.128

Dry/Partially Dry Wells

Well No.	Gradient
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)
MW359	Downgradient	Yes	6.05	YES	1.800	N/A
MW362	Downgradient	Yes	2.59	NO	0.952	N/A
MW365	Downgradient	Yes	3.66	YES	1.297	N/A
MW368	Downgradient	Yes	2.4	NO	0.875	N/A
MW371	Upgradient	Yes	3.36	YES	1.212	N/A
MW374	Upgradient	Yes	0.44	NO	-0.821	N/A
MW375	Sidegradient	Yes	1.8	NO	0.588	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

MW359
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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)**= 1215.876 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= 6.308 **S**= 0.383 **CV(2)**=0.061 **K factor****= 2.523 **TL(2)**= 7.274 **LL(2)**=N/A

**Historical Background Data from
Upgradient Wells with Transformed Result**

Well Number: MW371

Date Collected	Result	LN(Result)
3/18/2002	274	5.613
4/22/2002	409	6.014
7/15/2002	418	6.035
10/8/2002	424	6.050
1/8/2003	431	6.066
4/3/2003	444	6.096
7/9/2003	445	6.098
10/6/2003	438	6.082

Well Number: MW374

Date Collected	Result	LN(Result)
10/8/2002	1136	7.035
1/7/2003	1101	7.004
4/2/2003	863	6.760
7/9/2003	682	6.525
10/7/2003	589	6.378
1/6/2004	603	6.402
4/7/2004	601	6.399
7/14/2004	582	6.366

Dry/Partially Dry Wells

Well No. Gradient

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)
MW359	Downgradient	Yes	149	NO	5.004	N/A
MW362	Downgradient	Yes	406	NO	6.006	N/A
MW365	Downgradient	Yes	206	NO	5.328	N/A
MW368	Downgradient	Yes	334	NO	5.811	N/A
MW371	Upgradient	Yes	417	NO	6.033	N/A
MW374	Upgradient	Yes	370	NO	5.914	N/A
MW375	Sidegradient	Yes	167	NO	5.118	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)**= 22.979 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= 1.363 **S**= 1.147 **CV(2)**=0.841 **K factor****= 2.523 **TL(2)**= 4.256 **LL(2)**=N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW371

Date Collected	Result	LN(Result)
3/18/2002	1.31	0.270
4/22/2002	0.913	-0.091
7/15/2002	0.881	-0.127
10/8/2002	3.86	1.351
1/8/2003	1.88	0.631
4/3/2003	3.18	1.157
7/9/2003	0.484	-0.726
10/6/2003	2.72	1.001

Well Number: MW374

Date Collected	Result	LN(Result)
10/8/2002	23	3.135
1/7/2003	13.9	2.632
4/2/2003	14	2.639
7/9/2003	14.2	2.653
10/7/2003	7.92	2.069
1/6/2004	7.86	2.062
4/7/2004	4.82	1.573
7/14/2004	4.87	1.583

Dry/Partially Dry Wells

Well No. Gradient

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)
MW359	Downgradient	Yes	0.206	NO	-1.580	N/A
MW362	Downgradient	Yes	0.206	NO	-1.580	N/A
MW365	Downgradient	No	0.1	N/A	-2.303	N/A
MW368	Downgradient	Yes	0.0609	NO	-2.799	N/A
MW371	Upgradient	Yes	0.255	NO	-1.366	N/A
MW374	Upgradient	Yes	0.725	NO	-0.322	N/A
MW375	Sidegradient	Yes	0.0476	NO	-3.045	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)= 18.963 LL(1)=N/A

Statistics-Transformed Background Data X= 2.401 S= 0.237 CV(2)=0.099 K factor**= 2.523 TL(2)= 2.999 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW371

Date Collected	Result	LN(Result)
3/18/2002	7.1	1.960
4/22/2002	9.77	2.279
7/15/2002	10.4	2.342
10/8/2002	10.2	2.322
1/8/2003	10.7	2.370
4/3/2003	11.9	2.477
7/9/2003	10.8	2.380
10/6/2003	10.9	2.389

Well Number: MW374

Date Collected	Result	LN(Result)
10/8/2002	20	2.996
1/7/2003	16.1	2.779
4/2/2003	13.1	2.573
7/9/2003	10.3	2.332
10/7/2003	11.1	2.407
1/6/2004	11	2.398
4/7/2004	9.69	2.271
7/14/2004	8.49	2.139

Dry/Partially Dry Wells

Well No. Gradient

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)
MW359	Downgradient	Yes	3.34	NO	1.206	N/A
MW362	Downgradient	Yes	9.29	NO	2.229	N/A
MW365	Downgradient	Yes	8.17	NO	2.100	N/A
MW368	Downgradient	Yes	12.9	NO	2.557	N/A
MW371	Upgradient	Yes	15.8	NO	2.760	N/A
MW374	Upgradient	Yes	6.15	NO	1.816	N/A
MW375	Sidegradient	Yes	5.43	NO	1.692	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)**= 0.809 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= -1.873 **S**= 1.068 **CV(2)**=-0.570 **K factor****= 2.523 **TL(2)**= 0.821 **LL(2)**=N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW371

Date Collected	Result	LN(Result)
3/18/2002	0.063	-2.765
4/22/2002	0.067	-2.703
7/15/2002	0.074	-2.604
10/8/2002	0.0521	-2.955
1/8/2003	0.0385	-3.257
4/3/2003	0.0551	-2.899
7/9/2003	0.0546	-2.908
10/6/2003	0.0543	-2.913

Well Number: MW374

Date Collected	Result	LN(Result)
10/8/2002	0.596	-0.518
1/7/2003	0.565	-0.571
4/2/2003	0.675	-0.393
7/9/2003	0.397	-0.924
10/7/2003	0.312	-1.165
1/6/2004	0.299	-1.207
4/7/2004	0.329	-1.112
7/14/2004	0.342	-1.073

Dry/Partially Dry Wells

Well No. Gradient

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)
MW359	Downgradient	Yes	0.00494	NO	-5.310	N/A
MW362	Downgradient	Yes	0.0406	NO	-3.204	N/A
MW365	Downgradient	Yes	0.00371	NO	-5.597	N/A
MW368	Downgradient	Yes	0.00877	NO	-4.736	N/A
MW371	Upgradient	Yes	0.00966	NO	-4.640	N/A
MW374	Upgradient	Yes	0.219	NO	-1.519	N/A
MW375	Sidegradient	Yes	0.00239	NO	-6.036	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)**= 0.078 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= -4.349 **S**= 1.109 **CV(2)**=-0.255 **K factor****= 2.523 **TL(2)**= -1.552 **LL(2)**=N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW371

Date Collected	Result	LN(Result)
3/18/2002	0.05	-2.996
4/22/2002	0.05	-2.996
7/15/2002	0.05	-2.996
10/8/2002	0.0124	-4.390
1/8/2003	0.005	-5.298
4/3/2003	0.005	-5.298
7/9/2003	0.005	-5.298
10/6/2003	0.005	-5.298

Well Number: MW374

Date Collected	Result	LN(Result)
10/8/2002	0.05	-2.996
1/7/2003	0.05	-2.996
4/2/2003	0.05	-2.996
7/9/2003	0.00794	-4.836
10/7/2003	0.005	-5.298
1/6/2004	0.005	-5.298
4/7/2004	0.005	-5.298
7/14/2004	0.005	-5.298

Dry/Partially Dry Wells

Well No. Gradient

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)
MW359	Downgradient	Yes	0.00193	NO	-6.250	N/A
MW362	Downgradient	Yes	0.00127	NO	-6.669	N/A
MW365	Downgradient	Yes	0.00458	NO	-5.386	N/A
MW368	Downgradient	Yes	0.00128	NO	-6.661	N/A
MW371	Upgradient	Yes	0.0021	NO	-6.166	N/A
MW374	Upgradient	No	0.002	N/A	-6.215	N/A
MW375	Sidegradient	Yes	0.000764	NO	-7.177	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)= 221.319 LL(1)=N/A

Statistics-Transformed Background Data X= 3.642 S= 1.729 CV(2)=0.475 K factor**= 2.523 TL(2)= 5.106 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW371

Date Collected	Result	LN(Result)
3/18/2002	75	4.317
4/22/2002	165	5.106
7/15/2002	65	4.174
4/3/2003	-19	#Func!
7/9/2003	114	4.736
10/6/2003	-22	#Func!
1/7/2004	20.5	3.020
4/6/2004	113	4.727

Well Number: MW374

Date Collected	Result	LN(Result)
3/18/2002	135	4.905
4/2/2003	-56	#Func!
7/9/2003	-68	#Func!
10/7/2003	-50	#Func!
1/6/2004	-85	#Func!
4/7/2004	6	1.792
7/14/2004	-38	#Func!
10/7/2004	1	0.000

Dry/Partially Dry Wells

Well No. Gradient

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)
MW359	Downgradient	Yes	264.2	N/A	5.577	YES
MW362	Downgradient	Yes	220.4	N/A	5.395	YES
MW365	Downgradient	Yes	336	N/A	5.817	YES
MW368	Downgradient	Yes	242	N/A	5.489	YES
MW371	Upgradient	Yes	344	N/A	5.841	YES
MW374	Upgradient	Yes	202	N/A	5.308	YES
MW375	Sidegradient	Yes	327	N/A	5.790	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

MW359
MW362
MW365
MW368
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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)**= 7.475 **LL(1)**=5.7635

Statistics-Transformed Background Data **X**= 1.889 **S**= 0.046 **CV(2)**=0.024 **K factor****= 2.904 **TL(2)**= 2.023 **LL(2)**=1.7548

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW371

Date Collected	Result	LN(Result)
3/18/2002	6.3	1.841
4/22/2002	6.5	1.872
7/15/2002	6.5	1.872
10/8/2002	6.6	1.887
1/8/2003	6.6	1.887
4/3/2003	6.9	1.932
7/9/2003	6.7	1.902
10/6/2003	7	1.946

Well Number: MW374

Date Collected	Result	LN(Result)
3/18/2002	5.75	1.749
10/8/2002	6.6	1.887
1/7/2003	6.82	1.920
4/2/2003	6.86	1.926
7/9/2003	6.7	1.902
10/7/2003	6.6	1.887
1/6/2004	6.9	1.932
4/7/2004	6.58	1.884

Dry/Partially Dry Wells

Well No. Gradient

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)?
MW359	Downgradient	Yes	6.2	NO	1.825	N/A
MW362	Downgradient	Yes	6.69	NO	1.901	N/A
MW365	Downgradient	Yes	6.03	NO	1.797	N/A
MW368	Downgradient	Yes	6.21	NO	1.826	N/A
MW371	Upgradient	Yes	6.32	NO	1.844	N/A
MW374	Upgradient	Yes	6.44	NO	1.863	N/A
MW375	Sidegradient	Yes	6.19	NO	1.823	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)**= 3.549 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= -0.023 **S**= 0.752 **CV(2)**=-32.218 **K factor****= 2.523 **TL(2)**= 1.874 **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	0.693
4/22/2002	2	0.693
7/15/2002	2	0.693
10/8/2002	0.408	-0.896
1/8/2003	0.384	-0.957
4/3/2003	0.368	-1.000
7/9/2003	0.587	-0.533
10/6/2003	0.382	-0.962

Well Number: MW374

Date Collected	Result	LN(Result)
10/8/2002	3.04	1.112
1/7/2003	2.83	1.040
4/2/2003	2	0.693
7/9/2003	1.09	0.086
10/7/2003	0.802	-0.221
1/6/2004	0.897	-0.109
4/7/2004	0.689	-0.373
7/14/2004	0.716	-0.334

Dry/Partially Dry Wells

Well No. Gradient

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)
MW359	Downgradient	Yes	0.144	NO	-1.938	N/A
MW362	Downgradient	Yes	0.375	NO	-0.981	N/A
MW365	Downgradient	Yes	0.255	NO	-1.366	N/A
MW368	Downgradient	Yes	0.52	NO	-0.654	N/A
MW371	Upgradient	Yes	0.501	NO	-0.691	N/A
MW374	Upgradient	Yes	0.564	NO	-0.573	N/A
MW375	Sidegradient	Yes	0.272	NO	-1.302	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)**= 367.800 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= 5.146 **S**= 0.356 **CV(2)**=0.069 **K factor****= 2.523 **TL(2)**= 6.044 **LL(2)**=N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW371

Date Collected	Result	LN(Result)
3/18/2002	129	4.860
4/22/2002	131	4.875
7/15/2002	127	4.844
10/8/2002	123	4.812
1/8/2003	128	4.852
4/3/2003	144	4.970
7/9/2003	126	4.836
10/6/2003	120	4.787

Well Number: MW374

Date Collected	Result	LN(Result)
10/8/2002	336	5.817
1/7/2003	329	5.796
4/2/2003	287	5.659
7/9/2003	181	5.198
10/7/2003	182	5.204
1/6/2004	206	5.328
4/7/2004	182	5.204
7/14/2004	198	5.288

Dry/Partially Dry Wells

Well No. Gradient

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)
MW359	Downgradient	Yes	32.8	NO	3.490	N/A
MW362	Downgradient	Yes	134	NO	4.898	N/A
MW365	Downgradient	Yes	42.7	NO	3.754	N/A
MW368	Downgradient	Yes	46.7	NO	3.844	N/A
MW371	Upgradient	Yes	97.2	NO	4.577	N/A
MW374	Upgradient	Yes	127	NO	4.844	N/A
MW375	Sidegradient	Yes	52.4	NO	3.959	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)= 14.423 LL(1)=N/A

Statistics-Transformed Background Data X= 1.794 S= 0.357 CV(2)=0.199 K factor**= 2.523 TL(2)= 2.694 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW371

Date Collected	Result	LN(Result)
3/18/2002	16.3	2.791
4/22/2002	8.6	2.152
7/15/2002	6.7	1.902
10/8/2002	5	1.609
1/8/2003	5	1.609
4/3/2003	5	1.609
7/9/2003	5	1.609
10/6/2003	5	1.609

Well Number: MW374

Date Collected	Result	LN(Result)
10/8/2002	5	1.609
1/7/2003	5	1.609
4/2/2003	5	1.609
7/9/2003	5.6	1.723
10/7/2003	5	1.609
1/6/2004	5	1.609
4/7/2004	11.3	2.425
7/14/2004	5	1.609

Dry/Partially Dry Wells

Well No. Gradient

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)
MW359	Downgradient	Yes	38.5	YES	3.651	N/A
MW362	Downgradient	Yes	28.4	YES	3.346	N/A
MW365	Downgradient	Yes	59.3	YES	4.083	N/A
MW368	Downgradient	Yes	101	YES	4.615	N/A
MW371	Upgradient	Yes	11.9	NO	2.477	N/A
MW374	Upgradient	Yes	12.7	NO	2.542	N/A
MW375	Sidegradient	Yes	23.2	YES	3.144	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

MW359
MW362
MW365
MW368
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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)=** 78.977 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** 2.318 **S=** 0.979 **CV(2)=** 0.422 **K factor**=** 2.523 **TL(2)=** 4.788 **LL(2)=**N/A
Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW371

Date Collected	Result	LN(Result)
3/18/2002	11.1	2.407
4/22/2002	7	1.946
7/15/2002	4.1	1.411
10/8/2002	6	1.792
1/8/2003	5.3	1.668
4/3/2003	5.3	1.668
7/9/2003	2.9	1.065
10/6/2003	3.2	1.163

Well Number: MW374

Date Collected	Result	LN(Result)
10/8/2002	90	4.500
1/7/2003	64	4.159
4/2/2003	25	3.219
7/9/2003	16	2.773
10/7/2003	13	2.565
1/6/2004	10	2.303
4/7/2004	7.2	1.974
7/14/2004	12	2.485

Dry/Partially Dry Wells

Well No. Gradient

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)
MW359	Downgradient	Yes	1.39	N/A	0.329	NO
MW362	Downgradient	Yes	2.36	N/A	0.859	NO
MW365	Downgradient	Yes	1.48	N/A	0.392	NO
MW368	Downgradient	Yes	1.78	N/A	0.577	NO
MW371	Upgradient	Yes	2.3	N/A	0.833	NO
MW374	Upgradient	Yes	2.78	N/A	1.022	NO
MW375	Sidegradient	Yes	0.644	N/A	-0.440	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)**= 797.131 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= 4.867 **S**= 1.065 **CV(2)**= 0.219 **K factor****= 2.523 **TL(2)**= 7.554 **LL(2)**=N/A
Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW371

Date Collected	Result	LN(Result)
3/18/2002	50	3.912
4/22/2002	105	4.654
7/15/2002	70	4.248
10/8/2002	52	3.951
1/8/2003	20.2	3.006
4/3/2003	104	4.644
7/9/2003	34.2	3.532
10/6/2003	46.1	3.831

Well Number: MW374

Date Collected	Result	LN(Result)
10/8/2002	903	6.806
1/7/2003	539	6.290
4/2/2003	295	5.687
7/9/2003	272	5.606
10/7/2003	197	5.283
1/6/2004	330	5.799
4/7/2004	183	5.209
7/14/2004	225	5.416

Dry/Partially Dry Wells

Well No. Gradient

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)
MW359	Downgradient	Yes	4.12	N/A	1.416	NO
MW362	Downgradient	Yes	16.8	N/A	2.821	NO
MW365	Downgradient	Yes	10.2	N/A	2.322	NO
MW368	Downgradient	No	10	N/A	2.303	N/A
MW371	Upgradient	Yes	5.88	N/A	1.772	NO
MW374	Upgradient	Yes	19.1	N/A	2.950	NO
MW375	Sidegradient	Yes	8.28	N/A	2.114	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)**= 0.237 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= -3.438 **S**= 0.912 **CV(2)**= -0.265 **K factor****= 2.523 **TL(2)**= -1.138 **LL(2)**=N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW371

Date Collected	Result	LN(Result)
3/18/2002	0.025	-3.689
4/22/2002	0.025	-3.689
7/15/2002	0.025	-3.689
10/8/2002	0.02	-3.912
1/8/2003	0.02	-3.912
4/3/2003	0.02	-3.912
7/9/2003	0.02	-3.912
10/6/2003	0.02	-3.912

Well Number: MW374

Date Collected	Result	LN(Result)
10/8/2002	0.2	-1.609
1/7/2003	0.2	-1.609
4/2/2003	0.2	-1.609
7/9/2003	0.02	-3.912
10/7/2003	0.02	-3.912
1/6/2004	0.02	-3.912
4/7/2004	0.02	-3.912
7/14/2004	0.02	-3.912

Dry/Partially Dry Wells

Well No. Gradient

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)
MW359	Downgradient	No	0.00632	N/A	-5.064	N/A
MW362	Downgradient	No	0.00558	N/A	-5.189	N/A
MW365	Downgradient	No	0.02	N/A	-3.912	N/A
MW368	Downgradient	Yes	0.00441	N/A	-5.424	NO
MW371	Upgradient	Yes	0.00558	N/A	-5.189	NO
MW374	Upgradient	No	0.00495	N/A	-5.308	N/A
MW375	Sidegradient	No	0.00502	N/A	-5.294	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)**= 0.270 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= -3.259 **S**= 0.840 **CV(2)**=-0.258 **K factor****= 2.523 **TL(2)**= -1.140 **LL(2)**=N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW371

Date Collected	Result	LN(Result)
3/18/2002	0.1	-2.303
4/22/2002	0.1	-2.303
7/15/2002	0.1	-2.303
10/8/2002	0.025	-3.689
1/8/2003	0.035	-3.352
4/3/2003	0.035	-3.352
7/9/2003	0.0376	-3.281
10/6/2003	0.02	-3.912

Well Number: MW374

Date Collected	Result	LN(Result)
10/8/2002	0.025	-3.689
1/7/2003	0.35	-1.050
4/2/2003	0.035	-3.352
7/9/2003	0.02	-3.912
10/7/2003	0.02	-3.912
1/6/2004	0.02	-3.912
4/7/2004	0.02	-3.912
7/14/2004	0.02	-3.912

Dry/Partially Dry Wells

Well No. Gradient

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)
MW359	Downgradient	Yes	0.00615	N/A	-5.091	NO
MW362	Downgradient	Yes	0.00687	N/A	-4.981	NO
MW365	Downgradient	Yes	0.0038	N/A	-5.573	NO
MW368	Downgradient	Yes	0.00413	N/A	-5.489	NO
MW371	Upgradient	Yes	0.0057	N/A	-5.167	NO
MW374	Upgradient	No	0.02	N/A	-3.912	N/A
MW375	Sidegradient	No	0.02	N/A	-3.912	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)**= 2.578 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= -0.973 **S**= 0.935 **CV(2)**= -0.961 **K factor****= 2.523 **TL(2)**= 1.386 **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	0.255	-1.366
4/22/2002	0.2	-1.609
7/15/2002	0.322	-1.133
10/8/2002	0.2	-1.609
1/8/2003	0.2	-1.609
4/3/2003	0.2	-1.609
7/8/2003	0.2	-1.609
10/6/2003	0.689	-0.373

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	2.61	0.959
4/23/2002	0.2	-1.609
7/16/2002	1.14	0.131
10/8/2002	0.862	-0.149
1/7/2003	2.32	0.842
4/2/2003	0.2	-1.609
7/9/2003	0.2	-1.609
10/7/2003	0.2	-1.609

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	No	0.05	N/A	-2.996	N/A
MW360	Downgradient	Yes	0.023	N/A	-3.772	NO
MW363	Downgradient	No	0.05	N/A	-2.996	N/A
MW366	Downgradient	No	0.05	N/A	-2.996	N/A
MW369	Upgradient	Yes	0.022	N/A	-3.817	NO
MW372	Upgradient	No	0.05	N/A	-2.996	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)**= 3.067 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= -0.430 **S**= 0.990 **CV(2)**=-2.302 **K factor****= 2.523 **TL(2)**= 2.068 **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	0.693
4/22/2002	2	0.693
7/15/2002	2	0.693
10/8/2002	0.2	-1.609
1/8/2003	0.2	-1.609
4/3/2003	0.2	-1.609
7/8/2003	0.2	-1.609
10/6/2003	0.2	-1.609

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	2	0.693
4/23/2002	2	0.693
7/16/2002	2	0.693
10/8/2002	0.492	-0.709
1/7/2003	0.492	-0.709
4/2/2003	0.6	-0.511
7/9/2003	0.57	-0.562
10/7/2003	0.604	-0.504

Current Quarter Data						
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Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	0.392	NO	-0.936	N/A
MW360	Downgradient	Yes	0.0416	NO	-3.180	N/A
MW363	Downgradient	Yes	0.0205	NO	-3.887	N/A
MW366	Downgradient	Yes	0.057	NO	-2.865	N/A
MW369	Upgradient	Yes	0.0171	NO	-4.069	N/A
MW372	Upgradient	Yes	1.23	NO	0.207	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
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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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)= 1.000 LL(1)=N/A

Statistics-Transformed Background Data X= 0.000 S= 0.000 CV(2)=#Num! K factor**= 2.523 TL(2)= 0.000 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	1	0.000
4/22/2002	1	0.000
7/15/2002	1	0.000
10/8/2002	1	0.000
1/8/2003	1	0.000
4/3/2003	1	0.000
7/8/2003	1	0.000
10/6/2003	1	0.000

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	1	0.000
4/23/2002	1	0.000
7/16/2002	1	0.000
10/8/2002	1	0.000
1/7/2003	1	0.000
4/2/2003	1	0.000
7/9/2003	1	0.000
10/7/2003	1	0.000

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	0.363	NO	-1.013	N/A
MW360	Downgradient	Yes	0.192	NO	-1.650	N/A
MW363	Downgradient	Yes	0.17	NO	-1.772	N/A
MW366	Downgradient	Yes	0.428	NO	-0.849	N/A
MW369	Upgradient	Yes	0.327	NO	-1.118	N/A
MW372	Upgradient	Yes	0.678	NO	-0.389	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)**= 56.456 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= 3.449 **S**= 0.299 **CV(2)**=0.087 **K factor****= 2.523 **TL(2)**= 4.202 **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	29.5	3.384
4/22/2002	29.8	3.395
7/15/2002	25.3	3.231
10/8/2002	21.9	3.086
1/8/2003	20.9	3.040
4/3/2003	22.2	3.100
7/8/2003	22.9	3.131
10/6/2003	21.7	3.077

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	41.5	3.726
4/23/2002	43.6	3.775
7/16/2002	40.4	3.699
10/8/2002	38.8	3.658
1/7/2003	41.1	3.716
4/2/2003	42.9	3.759
7/9/2003	35.1	3.558
10/7/2003	46.6	3.842

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	25.4	NO	3.235	N/A
MW360	Downgradient	Yes	18.5	NO	2.918	N/A
MW363	Downgradient	Yes	30.1	NO	3.405	N/A
MW366	Downgradient	Yes	26.5	NO	3.277	N/A
MW369	Upgradient	Yes	15.1	NO	2.715	N/A
MW372	Upgradient	Yes	64.8	YES	4.171	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 Statistical Analysis Historical Background Comparison

Chemical Oxygen Demand (COD) UNITS: mg/L URG

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= 35.938 S= 3.750 CV(1)=0.104 K factor**= 2.523 TL(1)= 45.399 LL(1)=N/A

Statistics-Transformed Background Data X= 3.578 S= 0.089 CV(2)=0.025 K factor**= 2.523 TL(2)= 3.803 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	35	3.555
4/22/2002	35	3.555
7/15/2002	35	3.555
10/8/2002	50	3.912
1/8/2003	35	3.555
4/3/2003	35	3.555
7/8/2003	35	3.555
10/6/2003	35	3.555

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	35	3.555
4/23/2002	35	3.555
7/16/2002	35	3.555
10/8/2002	35	3.555
1/7/2003	35	3.555
4/2/2003	35	3.555
7/9/2003	35	3.555
10/7/2003	35	3.555

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	No	20	N/A	2.996	N/A
MW360	Downgradient	No	20	N/A	2.996	N/A
MW363	Downgradient	No	20.3	N/A	3.011	N/A
MW366	Downgradient	No	20.3	N/A	3.011	N/A
MW369	Upgradient	No	12.6	N/A	2.534	N/A
MW372	Upgradient	Yes	16.2	NO	2.785	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)**= 55.607 **LL(1)**=N/A

Statistics-Transformed Background Data **X**=3.782 **S**= 0.099 **CV(2)**=0.026 **K factor****= 2.523 **TL(2)**= 4.033 **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)
7/15/2002	48.3	3.877
10/8/2002	47.7	3.865
1/8/2003	45.7	3.822
4/3/2003	47.4	3.859
7/8/2003	55.9	4.024
10/6/2003	47.4	3.859
1/7/2004	45.5	3.818
4/7/2004	43.4	3.770

Well Number: MW372

Date Collected	Result	LN(Result)
7/16/2002	39.8	3.684
10/8/2002	41	3.714
1/7/2003	39.4	3.674
4/2/2003	39.2	3.669
7/9/2003	39.8	3.684
10/7/2003	40	3.689
1/5/2004	43.4	3.770
4/5/2004	42	3.738

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	30	NO	3.401	N/A
MW360	Downgradient	Yes	9.12	NO	2.210	N/A
MW363	Downgradient	Yes	40.2	NO	3.694	N/A
MW366	Downgradient	Yes	37	NO	3.611	N/A
MW369	Upgradient	Yes	29.3	NO	3.378	N/A
MW372	Upgradient	Yes	39.8	NO	3.684	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)**= 0.077 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= -4.090 **S**= 1.006 **CV(2)**=-0.246 **K factor****= 2.523 **TL(2)**= -1.553 **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	0.025	-3.689
4/22/2002	0.025	-3.689
7/15/2002	0.025	-3.689
10/8/2002	0.00938	-4.669
1/8/2003	0.00548	-5.207
4/3/2003	0.00587	-5.138
7/8/2003	0.0541	-2.917
10/6/2003	0.0689	-2.675

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	0.025	-3.689
4/23/2002	0.025	-3.689
7/16/2002	0.025	-3.689
10/8/2002	0.00158	-6.450
1/7/2003	0.0147	-4.220
4/2/2003	0.0116	-4.457
7/9/2003	0.0653	-2.729
10/7/2003	0.00788	-4.843

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	No	0.001	N/A	-6.908	N/A
MW360	Downgradient	Yes	0.00265	NO	-5.933	N/A
MW363	Downgradient	Yes	0.000777	NO	-7.160	N/A
MW366	Downgradient	No	0.001	N/A	-6.908	N/A
MW369	Upgradient	Yes	0.00429	NO	-5.451	N/A
MW372	Upgradient	No	0.001	N/A	-6.908	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
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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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)**= 628.189 **LL(1)**=N/A

Statistics-Transformed Background Data **X**=6.173 **S**= 0.123 **CV(2)**=0.020 **K factor****= 2.523 **TL(2)**= 6.484 **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	388	5.961
4/22/2002	404	6.001
7/15/2002	394	5.976
10/8/2002	403	5.999
1/8/2003	520	6.254
4/3/2003	487	6.188
7/8/2003	478	6.170
10/6/2003	476	6.165

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	508	6.230
4/23/2002	501	6.217
7/16/2002	507	6.229
10/8/2002	495	6.205
1/7/2003	508.7	6.232
4/2/2003	515	6.244
7/9/2003	576	6.356
10/7/2003	565	6.337

Current Quarter Data						
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Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	413	NO	6.023	N/A
MW360	Downgradient	Yes	272	NO	5.606	N/A
MW363	Downgradient	Yes	418	NO	6.035	N/A
MW366	Downgradient	Yes	390	NO	5.966	N/A
MW369	Upgradient	Yes	305	NO	5.720	N/A
MW372	Upgradient	Yes	484	NO	6.182	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
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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, $S = [\text{Sum}([(background\ result-X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)**= 0.050 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= -3.742 **S**= 0.307 **CV(2)**=-0.082 **K factor****= 2.523 **TL(2)**= -2.967 **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	0.025	-3.689
4/22/2002	0.025	-3.689
7/15/2002	0.05	-2.996
10/8/2002	0.02	-3.912
1/8/2003	0.02	-3.912
4/3/2003	0.02	-3.912
7/8/2003	0.02	-3.912
10/6/2003	0.02	-3.912

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	0.025	-3.689
4/23/2002	0.025	-3.689
7/16/2002	0.05	-2.996
10/8/2002	0.02	-3.912
1/7/2003	0.02	-3.912
4/2/2003	0.02	-3.912
7/9/2003	0.02	-3.912
10/7/2003	0.02	-3.912

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	0.00287	NO	-5.853	N/A
MW360	Downgradient	Yes	0.00354	NO	-5.644	N/A
MW363	Downgradient	Yes	0.000998	NO	-6.910	N/A
MW366	Downgradient	Yes	0.000798	NO	-7.133	N/A
MW369	Upgradient	Yes	0.00113	NO	-6.786	N/A
MW372	Upgradient	Yes	0.000755	NO	-7.189	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)= 5.190 LL(1)=N/A

Statistics-Transformed Background Data X= 0.228 S= 1.065 CV(2)=4.665 K factor**= 2.523 TL(2)= 2.915 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	5.41	1.688
4/22/2002	1.57	0.451
7/15/2002	0.8	-0.223
10/8/2002	1.09	0.086
1/8/2003	2.69	0.990
4/3/2003	2.04	0.713
7/8/2003	1.19	0.174
10/6/2003	1.78	0.577

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	3.89	1.358
4/23/2002	0.05	-2.996
7/16/2002	1.33	0.285
10/8/2002	2.66	0.978
1/7/2003	0.4	-0.916
4/2/2003	0.91	-0.094
7/9/2003	1.42	0.351
10/7/2003	1.26	0.231

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	5.12	NO	1.633	N/A
MW360	Downgradient	Yes	2.8	NO	1.030	N/A
MW363	Downgradient	Yes	0.86	NO	-0.151	N/A
MW366	Downgradient	Yes	3.88	NO	1.356	N/A
MW369	Upgradient	Yes	2.82	NO	1.037	N/A
MW372	Upgradient	Yes	2.28	NO	0.824	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)**= 398.489 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= 5.640 **S**= 0.175 **CV(2)**=0.031 **K factor****= 2.523 **TL(2)**= 6.080 **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	173	5.153
4/22/2002	246	5.505
7/15/2002	232	5.447
10/8/2002	275	5.617
1/8/2003	269	5.595
4/3/2003	250	5.521
7/8/2003	295	5.687
10/6/2003	276	5.620

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	295	5.687
4/23/2002	322	5.775
7/16/2002	329	5.796
10/8/2002	290	5.670
1/7/2003	316	5.756
4/2/2003	311	5.740
7/9/2003	347	5.849
10/7/2003	337	5.820

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	217	NO	5.380	N/A
MW360	Downgradient	Yes	221	NO	5.398	N/A
MW363	Downgradient	Yes	274	NO	5.613	N/A
MW366	Downgradient	Yes	223	NO	5.407	N/A
MW369	Upgradient	Yes	179	NO	5.187	N/A
MW372	Upgradient	Yes	461	YES	6.133	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)**= 25.024 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= 1.358 **S**= 1.323 **CV(2)**=0.974 **K factor****= 2.523 **TL(2)**= 4.697 **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	0.656	-0.422
4/22/2002	0.695	-0.364
7/15/2002	7.1	1.960
10/8/2002	21.5	3.068
1/8/2003	18.5	2.918
4/3/2003	14.9	2.701
7/8/2003	11.3	2.425
10/6/2003	14.9	2.701

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	5.95	1.783
4/23/2002	0.792	-0.233
7/16/2002	1.78	0.577
10/8/2002	0.776	-0.254
1/7/2003	3.55	1.267
4/2/2003	5.02	1.613
7/9/2003	10	2.303
10/7/2003	0.733	-0.311

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	0.039	NO	-3.244	N/A
MW360	Downgradient	Yes	0.453	NO	-0.792	N/A
MW363	Downgradient	Yes	0.058	NO	-2.847	N/A
MW366	Downgradient	No	0.1	N/A	-2.303	N/A
MW369	Upgradient	Yes	0.0624	NO	-2.774	N/A
MW372	Upgradient	Yes	0.036	NO	-3.324	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)**= 21.707 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= 2.517 **S**= 0.290 **CV(2)**=0.115 **K factor****= 2.523 **TL(2)**= 3.248 **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	11.4	2.434
4/22/2002	12	2.485
7/15/2002	10	2.303
10/8/2002	8.62	2.154
1/8/2003	7.89	2.066
4/3/2003	7.97	2.076
7/8/2003	10.3	2.332
10/6/2003	9.14	2.213

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	15.7	2.754
4/23/2002	16.6	2.809
7/16/2002	15.4	2.734
10/8/2002	15.8	2.760
1/7/2003	15.8	2.760
4/2/2003	16.4	2.797
7/9/2003	15.2	2.721
10/7/2003	17.6	2.868

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	11.4	NO	2.434	N/A
MW360	Downgradient	Yes	8.26	NO	2.111	N/A
MW363	Downgradient	Yes	11.9	NO	2.477	N/A
MW366	Downgradient	Yes	11	NO	2.398	N/A
MW369	Upgradient	Yes	6.77	NO	1.913	N/A
MW372	Upgradient	Yes	22.8	YES	3.127	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)= 1.105 LL(1)=N/A

Statistics-Transformed Background Data X= -1.226 S= 1.008 CV(2)=-0.822 K factor**= 2.523 TL(2)= 1.317 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	0.034	-3.381
4/22/2002	0.062	-2.781
7/15/2002	0.436	-0.830
10/8/2002	0.867	-0.143
1/8/2003	0.828	-0.189
4/3/2003	0.672	-0.397
7/8/2003	0.321	-1.136
10/6/2003	0.714	-0.337

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	0.205	-1.585
4/23/2002	0.345	-1.064
7/16/2002	0.21	-1.561
10/8/2002	0.0539	-2.921
1/7/2003	0.537	-0.622
4/2/2003	0.415	-0.879
7/9/2003	0.654	-0.425
10/7/2003	0.254	-1.370

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	0.00222	NO	-6.110	N/A
MW360	Downgradient	Yes	0.0337	NO	-3.390	N/A
MW363	Downgradient	Yes	0.089	NO	-2.419	N/A
MW366	Downgradient	Yes	0.00113	NO	-6.786	N/A
MW369	Upgradient	Yes	0.00774	NO	-4.861	N/A
MW372	Upgradient	No	0.005	N/A	-5.298	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)**= 0.078 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= -4.246 **S**= 1.075 **CV(2)**=-0.253 **K factor****= 2.523 **TL(2)**= -1.535 **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	0.05	-2.996
4/22/2002	0.05	-2.996
7/15/2002	0.05	-2.996
10/8/2002	0.005	-5.298
1/8/2003	0.005	-5.298
4/3/2003	0.005	-5.298
7/8/2003	0.013	-4.343
10/6/2003	0.0104	-4.566

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	0.05	-2.996
4/23/2002	0.05	-2.996
7/16/2002	0.05	-2.996
10/8/2002	0.005	-5.298
1/7/2003	0.005	-5.298
4/2/2003	0.005	-5.298
7/9/2003	0.019	-3.963
10/7/2003	0.005	-5.298

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	0.000928	NO	-6.982	N/A
MW360	Downgradient	Yes	0.00443	NO	-5.419	N/A
MW363	Downgradient	Yes	0.0437	NO	-3.130	N/A
MW366	Downgradient	Yes	0.000631	NO	-7.368	N/A
MW369	Upgradient	Yes	0.00279	NO	-5.882	N/A
MW372	Upgradient	No	0.002	N/A	-6.215	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 Statistical Analysis Historical Background Comparison**Nitrate as Nitrogen****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)**= 1.000 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= 0.000 **S**= 0.000 **CV(2)**=#Num! **K factor****= 2.523 **TL(2)**= 0.000 **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)
7/15/2002	1	0.000
10/8/2002	1	0.000
1/8/2003	1	0.000
4/3/2003	1	0.000
7/8/2003	1	0.000
10/6/2003	1	0.000
1/7/2004	1	0.000
4/7/2004	1	0.000

Well Number: MW372

Date Collected	Result	LN(Result)
7/16/2002	1	0.000
10/8/2002	1	0.000
1/7/2003	1	0.000
4/2/2003	1	0.000
7/9/2003	1	0.000
10/7/2003	1	0.000
1/5/2004	1	0.000
4/5/2004	1	0.000

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	1.04	N/A	0.039	N/A
MW360	Downgradient	Yes	0.675	N/A	-0.393	N/A
MW363	Downgradient	Yes	10.5	YES	2.351	N/A
MW366	Downgradient	Yes	0.832	N/A	-0.184	N/A
MW369	Upgradient	Yes	0.956	N/A	-0.045	N/A
MW372	Upgradient	Yes	0.934	N/A	-0.068	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

MW363

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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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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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)= 312.337 LL(1)=N/A

Statistics-Transformed Background Data X=4.554 S= 0.784 CV(2)=0.172 K factor**= 2.523 TL(2)= 5.371 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	215	5.371
4/22/2002	110	4.700
7/15/2002	20	2.996
1/8/2003	-5	#Func!
4/3/2003	-18	#Func!
7/8/2003	-67	#Func!
10/6/2003	-1	#Func!
1/7/2004	55	4.007

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	210	5.347
4/23/2002	65	4.174
7/16/2002	215	5.371
10/8/2002	185	5.220
1/7/2003	45	3.807
4/2/2003	65	4.174
7/9/2003	-39	#Func!
10/7/2003	138	4.927

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	393	N/A	5.974	YES
MW360	Downgradient	Yes	379.5	N/A	5.939	YES
MW363	Downgradient	Yes	272	N/A	5.606	YES
MW366	Downgradient	Yes	355	N/A	5.872	YES
MW369	Upgradient	Yes	343	N/A	5.838	YES
MW372	Upgradient	Yes	390	N/A	5.966	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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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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)= 6.837 LL(1)=5.7114

Statistics-Transformed Background Data X= 1.836 S= 0.031 CV(2)=0.017 K factor**= 2.904 TL(2)= 1.925 LL(2)=1.7467

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	6.1	1.808
4/22/2002	6.1	1.808
7/15/2002	6.1	1.808
10/8/2002	6.5	1.872
1/8/2003	6.5	1.872
4/3/2003	6.6	1.887
7/8/2003	6.5	1.872
10/6/2003	6.5	1.872

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	6.1	1.808
4/23/2002	6.12	1.812
7/16/2002	6.1	1.808
10/8/2002	6.06	1.802
1/7/2003	6.26	1.834
4/2/2003	6.15	1.816
7/9/2003	6.3	1.841
10/7/2003	6.4	1.856

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	6.02	NO	1.795	N/A
MW360	Downgradient	Yes	6.14	NO	1.815	N/A
MW363	Downgradient	Yes	6.36	NO	1.850	N/A
MW366	Downgradient	Yes	5.96	NO	1.785	N/A
MW369	Upgradient	Yes	6	NO	1.792	N/A
MW372	Upgradient	Yes	5.8	NO	1.758	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)**= 2.895 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= 0.456 **S**= 0.362 **CV(2)**=0.794 **K factor****= 2.523 **TL(2)**= 1.368 **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	0.693
4/22/2002	2.21	0.793
7/15/2002	2	0.693
10/8/2002	0.966	-0.035
1/8/2003	0.727	-0.319
4/3/2003	0.8	-0.223
7/8/2003	1.62	0.482
10/6/2003	1.14	0.131

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	2.04	0.713
4/23/2002	2.03	0.708
7/16/2002	2	0.693
10/8/2002	1.54	0.432
1/7/2003	1.88	0.631
4/2/2003	2.09	0.737
7/9/2003	1.78	0.577
10/7/2003	1.79	0.582

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	1.88	NO	0.631	N/A
MW360	Downgradient	Yes	0.785	NO	-0.242	N/A
MW363	Downgradient	Yes	2.87	NO	1.054	N/A
MW366	Downgradient	Yes	2.14	NO	0.761	N/A
MW369	Upgradient	Yes	0.67	NO	-0.400	N/A
MW372	Upgradient	Yes	2.29	NO	0.829	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)**= 75.061 **LL(1)**=N/A

Statistics-Transformed Background Data **X**=3.780 **S**= 0.242 **CV(2)**=0.064 **K factor****= 2.523 **TL(2)**= 4.390 **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	35.7	3.575
4/22/2002	37.6	3.627
7/15/2002	42.4	3.747
10/8/2002	66.9	4.203
1/8/2003	67.9	4.218
4/3/2003	61.8	4.124
7/8/2003	45.6	3.820
10/6/2003	59.1	4.079

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	37.2	3.616
4/23/2002	38.6	3.653
7/16/2002	35.6	3.572
10/8/2002	37.5	3.624
1/7/2003	34.1	3.529
4/2/2003	34.4	3.538
7/9/2003	44.1	3.786
10/7/2003	43.1	3.764

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	40.7	NO	3.706	N/A
MW360	Downgradient	Yes	58.9	NO	4.076	N/A
MW363	Downgradient	Yes	40.5	NO	3.701	N/A
MW366	Downgradient	Yes	42.5	NO	3.750	N/A
MW369	Upgradient	Yes	48.4	NO	3.879	N/A
MW372	Upgradient	Yes	62.5	NO	4.135	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
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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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)**= 130.609 **LL(1)**=N/A

Statistics-Transformed Background Data **X**=3.420 **S**= 0.981 **CV(2)**=0.287 **K factor****= 2.523 **TL(2)**= 5.894 **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	15.5	2.741
4/22/2002	15.8	2.760
7/15/2002	13.8	2.625
10/8/2002	6.9	1.932
1/8/2003	10.5	2.351
4/3/2003	10.5	2.351
7/8/2003	10.9	2.389
10/6/2003	16.3	2.791

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	71.7	4.272
4/23/2002	74.7	4.313
7/16/2002	74.1	4.305
10/8/2002	70.5	4.256
1/7/2003	75.8	4.328
4/2/2003	81.8	4.404
7/9/2003	83.6	4.426
10/7/2003	88.1	4.478

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	38.6	NO	3.653	N/A
MW360	Downgradient	Yes	12.4	NO	2.518	N/A
MW363	Downgradient	Yes	24.3	NO	3.190	N/A
MW366	Downgradient	Yes	41	NO	3.714	N/A
MW369	Upgradient	Yes	8.82	NO	2.177	N/A
MW372	Upgradient	Yes	147	YES	4.990	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)= 66.344 LL(1)=N/A

Statistics-Transformed Background Data X= 2.770 S= 1.150 CV(2)=0.415 K factor**= 2.523 TL(2)= 3.972 LL(2)=N/A

**Historical Background Data from
Upgradient Wells with Transformed Result**

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	41.7	3.731
4/22/2002	53.1	3.972
7/15/2002	18.1	2.896
10/8/2002	16.4	2.797
1/8/2003	3.49	1.250
4/3/2003	9.34	2.234
7/8/2003	17.5	2.862
10/6/2003	17	2.833

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	44.8	3.802
4/23/2002	0.802	-0.221
7/16/2002	19.8	2.986
10/8/2002	46.1	3.831
1/7/2003	-0.973	#Func!
4/2/2003	9.07	2.205
7/9/2003	0	#Func!
10/7/2003	36.9	3.608

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	32.7	NO	3.487	N/A
MW360	Downgradient	No	14.7	N/A	2.688	N/A
MW363	Downgradient	No	-1.73	N/A	#Error	N/A
MW366	Downgradient	Yes	64.1	NO	4.160	N/A
MW369	Upgradient	Yes	59.8	NO	4.091	N/A
MW372	Upgradient	Yes	55.9	NO	4.024	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)**= 14.378 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= 0.851 **S**= 0.828 **CV(2)**= 0.973 **K factor****= 2.523 **TL(2)**= 2.940 **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	1.7	0.531
4/22/2002	1.6	0.470
7/15/2002	3.1	1.131
10/8/2002	17.7	2.874
1/8/2003	9	2.197
4/3/2003	4	1.386
7/8/2003	4.9	1.589
10/6/2003	2.4	0.875

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	1	0.000
4/23/2002	1.2	0.182
7/16/2002	1	0.000
10/8/2002	1	0.000
1/7/2003	1.6	0.470
4/2/2003	1.5	0.405
7/9/2003	3	1.099
10/7/2003	1.5	0.405

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	1.03	N/A	0.030	NO
MW360	Downgradient	Yes	1.44	N/A	0.365	NO
MW363	Downgradient	Yes	0.896	N/A	-0.110	NO
MW366	Downgradient	Yes	1.12	N/A	0.113	NO
MW369	Upgradient	Yes	1.28	N/A	0.247	NO
MW372	Upgradient	Yes	1.24	N/A	0.215	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)**= 230.231 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= 3.772 **S**= 1.023 **CV(2)**=0.271 **K factor****= 2.523 **TL(2)**= 6.353 **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	50	3.912
4/22/2002	50	3.912
7/15/2002	81	4.394
10/8/2002	202	5.308
1/8/2003	177	5.176
4/3/2003	93.1	4.534
7/8/2003	17.5	2.862
10/6/2003	37.5	3.624

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	184	5.215
4/23/2002	50	3.912
7/16/2002	50	3.912
10/8/2002	50	3.912
1/7/2003	10	2.303
4/2/2003	12.7	2.542
7/9/2003	10	2.303
10/7/2003	12.6	2.534

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	9.04	NO	2.202	N/A
MW360	Downgradient	Yes	4.2	NO	1.435	N/A
MW363	Downgradient	Yes	3.44	NO	1.235	N/A
MW366	Downgradient	Yes	4.52	NO	1.509	N/A
MW369	Upgradient	Yes	11.1	NO	2.407	N/A
MW372	Upgradient	Yes	8.4	NO	2.128	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)**= 0.552 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= -2.729 **S**= 1.014 **CV(2)**=-0.371 **K factor****= 2.523 **TL(2)**= -0.172 **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	0.1	-2.303
4/22/2002	0.1	-2.303
7/15/2002	0.1	-2.303
10/8/2002	0.025	-3.689
1/8/2003	0.035	-3.352
4/3/2003	0.035	-3.352
7/8/2003	0.02	-3.912
10/6/2003	0.02	-3.912

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	0.725	-0.322
4/23/2002	0.1	-2.303
7/16/2002	0.1	-2.303
10/8/2002	0.025	-3.689
1/7/2003	0.035	-3.352
4/2/2003	0.035	-3.352
7/9/2003	0.2	-1.609
10/7/2003	0.2	-1.609

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	0.0041	N/A	-5.497	NO
MW360	Downgradient	Yes	0.016	N/A	-4.135	NO
MW363	Downgradient	No	0.02	N/A	-3.912	N/A
MW366	Downgradient	No	0.02	N/A	-3.912	N/A
MW369	Upgradient	Yes	0.0034	N/A	-5.684	NO
MW372	Upgradient	No	0.00601	N/A	-5.114	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)**= 16.219 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= -0.803 **S**= 1.380 **CV(2)**= -1.718 **K factor****= 2.523 **TL(2)**= 2.678 **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	4.66	1.539
4/23/2002	0.2	-1.609
7/15/2002	0.2	-1.609
10/8/2002	0.2	-1.609
1/8/2003	0.2	-1.609
4/3/2003	0.2	-1.609
7/9/2003	0.2	-1.609
10/6/2003	0.2	-1.609

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	22.7	3.122
4/23/2002	1.46	0.378
7/16/2002	0.253	-1.374
10/8/2002	0.482	-0.730
1/7/2003	0.608	-0.498
4/2/2003	0.446	-0.807
7/9/2003	0.2	-1.609
10/7/2003	0.2	-1.609

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	0.0194	N/A	-3.942	NO
MW361	Downgradient	No	0.05	N/A	-2.996	N/A
MW364	Downgradient	No	0.05	N/A	-2.996	N/A
MW367	Downgradient	No	0.05	N/A	-2.996	N/A
MW370	Upgradient	No	0.05	N/A	-2.996	N/A
MW373	Upgradient	No	0.05	N/A	-2.996	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)**= 3.108 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= -0.235 **S**= 1.006 **CV(2)**=-4.287 **K factor****= 2.523 **TL(2)**= 2.303 **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	2	0.693
4/23/2002	2	0.693
7/15/2002	2	0.693
10/8/2002	0.2	-1.609
1/8/2003	0.2	-1.609
4/3/2003	0.2	-1.609
7/9/2003	0.2	-1.609
10/6/2003	0.2	-1.609

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	2	0.693
4/23/2002	2	0.693
7/16/2002	2	0.693
10/8/2002	0.79	-0.236
1/7/2003	0.807	-0.214
4/2/2003	1.13	0.122
7/9/2003	1.28	0.247
10/7/2003	1.24	0.215

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	0.339	NO	-1.082	N/A
MW361	Downgradient	Yes	0.122	NO	-2.104	N/A
MW364	Downgradient	Yes	0.0796	NO	-2.531	N/A
MW367	Downgradient	Yes	0.0187	NO	-3.979	N/A
MW370	Upgradient	Yes	0.332	NO	-1.103	N/A
MW373	Upgradient	Yes	1.96	NO	0.673	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)= 1.000 LL(1)=N/A

Statistics-Transformed Background Data X= 0.000 S= 0.000 CV(2)=#Num! K factor**= 2.523 TL(2)= 0.000 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	0.000
4/23/2002	1	0.000
7/15/2002	1	0.000
10/8/2002	1	0.000
1/8/2003	1	0.000
4/3/2003	1	0.000
7/9/2003	1	0.000
10/6/2003	1	0.000

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	1	0.000
4/23/2002	1	0.000
7/16/2002	1	0.000
10/8/2002	1	0.000
1/7/2003	1	0.000
4/2/2003	1	0.000
7/9/2003	1	0.000
10/7/2003	1	0.000

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	0.417	NO	-0.875	N/A
MW361	Downgradient	Yes	0.472	NO	-0.751	N/A
MW364	Downgradient	Yes	0.587	NO	-0.533	N/A
MW367	Downgradient	Yes	0.112	NO	-2.189	N/A
MW370	Upgradient	Yes	0.48	NO	-0.734	N/A
MW373	Upgradient	Yes	0.699	NO	-0.358	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)**= 77.331 **LL(1)**=N/A

Statistics-Transformed Background Data **X**=3.723 **S**= 0.323 **CV(2)**=0.087 **K factor****= 2.523 **TL(2)**= 4.539 **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	34.8	3.550
4/23/2002	43.4	3.770
7/15/2002	33.2	3.503
10/8/2002	29.2	3.374
1/8/2003	31.3	3.444
4/3/2003	32.4	3.478
7/9/2003	22.9	3.131
10/6/2003	28	3.332

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	61.9	4.126
4/23/2002	59.2	4.081
7/16/2002	47.6	3.863
10/8/2002	46.1	3.831
1/7/2003	49.2	3.896
4/2/2003	57.8	4.057
7/9/2003	52.7	3.965
10/7/2003	64.9	4.173

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	31.6	NO	3.453	N/A
MW361	Downgradient	Yes	32.7	NO	3.487	N/A
MW364	Downgradient	Yes	29.9	NO	3.398	N/A
MW367	Downgradient	Yes	12.2	NO	2.501	N/A
MW370	Upgradient	Yes	26.1	NO	3.262	N/A
MW373	Upgradient	Yes	67.8	NO	4.217	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 Statistical Analysis Historical Background Comparison**Chemical Oxygen Demand (COD)****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**=41.938 **S**= 24.732 **CV(1)**=0.590 **K factor****= 2.523 **TL(1)**= 104.336 **LL(1)**=N/A

Statistics-Transformed Background Data **X**=3.658 **S**= 0.339 **CV(2)**=0.093 **K factor****= 2.523 **TL(2)**= 4.512 **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	35	3.555
4/23/2002	134	4.898
7/15/2002	35	3.555
10/8/2002	35	3.555
1/8/2003	35	3.555
4/3/2003	35	3.555
7/9/2003	35	3.555
10/6/2003	35	3.555

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	35	3.555
4/23/2002	47	3.850
7/16/2002	35	3.555
10/8/2002	35	3.555
1/7/2003	35	3.555
4/2/2003	35	3.555
7/9/2003	35	3.555
10/7/2003	35	3.555

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	11.3	NO	2.425	N/A
MW361	Downgradient	No	20	N/A	2.996	N/A
MW364	Downgradient	No	20.3	N/A	3.011	N/A
MW367	Downgradient	No	22.9	N/A	3.131	N/A
MW370	Upgradient	No	30.6	N/A	3.421	N/A
MW373	Upgradient	Yes	16.2	NO	2.785	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)**= 64.901 **LL(1)**=N/A

Statistics-Transformed Background Data **X**=3.814 **S**= 0.165 **CV(2)**=0.043 **K factor****= 2.523 **TL(2)**= 4.231 **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)
7/15/2002	55.5	4.016
10/8/2002	53.6	3.982
1/8/2003	52.9	3.968
4/3/2003	53.6	3.982
7/9/2003	51.9	3.949
10/6/2003	53	3.970
1/7/2004	53	3.970
4/7/2004	51.6	3.944

Well Number: MW373

Date Collected	Result	LN(Result)
7/16/2002	40.6	3.704
10/8/2002	38.8	3.658
1/7/2003	39	3.664
4/2/2003	38.4	3.648
7/9/2003	38.1	3.640
10/7/2003	38	3.638
1/6/2004	37.9	3.635
4/7/2004	38.8	3.658

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	27.3	NO	3.307	N/A
MW361	Downgradient	Yes	34.2	NO	3.532	N/A
MW364	Downgradient	Yes	36.6	NO	3.600	N/A
MW367	Downgradient	Yes	7.72	NO	2.044	N/A
MW370	Upgradient	Yes	37.9	NO	3.635	N/A
MW373	Upgradient	Yes	35.2	NO	3.561	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
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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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 Statistical Analysis Historical Background Comparison**cis-1,2-Dichloroethene****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**=6.250 **S**= 5.000 **CV(1)**=0.800 **K factor****= 2.523 **TL(1)**= 18.865 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= 1.710 **S**= 0.402 **CV(2)**=0.235 **K factor****= 2.523 **TL(2)**= 2.725 **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	1.609
4/23/2002	5	1.609
7/15/2002	5	1.609
10/8/2002	5	1.609
1/8/2003	5	1.609
4/3/2003	5	1.609
7/9/2003	5	1.609
10/6/2003	5	1.609

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	5	1.609
4/23/2002	25	3.219
7/16/2002	5	1.609
10/8/2002	5	1.609
1/7/2003	5	1.609
4/2/2003	5	1.609
7/9/2003	5	1.609
10/7/2003	5	1.609

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	0.38	NO	-0.968	N/A
MW361	Downgradient	No	1	N/A	0.000	N/A
MW364	Downgradient	No	1	N/A	0.000	N/A
MW367	Downgradient	No	1	N/A	0.000	N/A
MW370	Upgradient	No	1	N/A	0.000	N/A
MW373	Upgradient	No	1	N/A	0.000	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)**= 0.108 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= -4.058 **S**= 1.011 **CV(2)**= -0.249 **K factor****= 2.523 **TL(2)**= -1.507 **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	0.025	-3.689
4/23/2002	0.025	-3.689
7/15/2002	0.025	-3.689
10/8/2002	0.0174	-4.051
1/8/2003	0.0105	-4.556
4/3/2003	0.00931	-4.677
7/9/2003	0.137	-1.988
10/6/2003	0.0463	-3.073

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	0.025	-3.689
4/23/2002	0.034	-3.381
7/16/2002	0.025	-3.689
10/8/2002	0.00411	-5.494
1/7/2003	0.00344	-5.672
4/2/2003	0.00368	-5.605
7/9/2003	0.0405	-3.206
10/7/2003	0.00843	-4.776

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	0.0157	N/A	-4.154	NO
MW361	Downgradient	No	0.001	N/A	-6.908	N/A
MW364	Downgradient	No	0.001	N/A	-6.908	N/A
MW367	Downgradient	Yes	0.00596	N/A	-5.123	NO
MW370	Upgradient	No	0.001	N/A	-6.908	N/A
MW373	Upgradient	No	0.001	N/A	-6.908	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)**= 1002.702 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= 6.380 **S**= 0.260 **CV(2)**=0.041 **K factor****= 2.523 **TL(2)**= 7.036 **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	406	6.006
4/23/2002	543	6.297
7/15/2002	476	6.165
10/8/2002	441	6.089
1/8/2003	486	6.186
4/3/2003	466	6.144
7/9/2003	479	6.172
10/6/2003	435	6.075

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	661	6.494
4/23/2002	801	6.686
7/16/2002	774	6.652
10/8/2002	680	6.522
1/7/2003	686.5	6.532
4/2/2003	763	6.637
7/9/2003	828	6.719
10/7/2003	814	6.702

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	353	NO	5.866	N/A
MW361	Downgradient	Yes	355	NO	5.872	N/A
MW364	Downgradient	Yes	412	NO	6.021	N/A
MW367	Downgradient	Yes	200	NO	5.298	N/A
MW370	Upgradient	Yes	391	NO	5.969	N/A
MW373	Upgradient	Yes	560	NO	6.328	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
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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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

**** 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 Fourth Quarter 2021 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)**= 0.050 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= -3.739 **S**= 0.308 **CV(2)**=-0.082 **K factor****= 2.523 **TL(2)**= -2.963 **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	0.025	-3.689
4/23/2002	0.025	-3.689
7/15/2002	0.05	-2.996
10/8/2002	0.02	-3.912
1/8/2003	0.02	-3.912
4/3/2003	0.02	-3.912
7/9/2003	0.02	-3.912
10/6/2003	0.02	-3.912

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	0.026	-3.650
4/23/2002	0.025	-3.689
7/16/2002	0.05	-2.996
10/8/2002	0.02	-3.912
1/7/2003	0.02	-3.912
4/2/2003	0.02	-3.912
7/9/2003	0.02	-3.912
10/7/2003	0.02	-3.912

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	0.00108	NO	-6.831	N/A
MW361	Downgradient	Yes	0.00145	NO	-6.536	N/A
MW364	Downgradient	Yes	0.00101	NO	-6.898	N/A
MW367	Downgradient	Yes	0.000721	NO	-7.235	N/A
MW370	Upgradient	Yes	0.000486	NO	-7.629	N/A
MW373	Upgradient	Yes	0.000675	NO	-7.301	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)**= 4.295 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= -0.115 **S**= 1.207 **CV(2)**=-10.514 **K factor****= 2.523 **TL(2)**= 2.930 **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	4.32	1.463
4/23/2002	1.24	0.215
7/15/2002	0.75	-0.288
10/8/2002	0.94	-0.062
1/8/2003	3.08	1.125
4/3/2003	1.45	0.372
7/9/2003	1.22	0.199
10/6/2003	1.07	0.068

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	3.04	1.112
4/23/2002	0.03	-3.507
7/16/2002	0.23	-1.470
10/8/2002	0.86	-0.151
1/7/2003	0.21	-1.561
4/2/2003	1.19	0.174
7/9/2003	1.1	0.095
10/7/2003	1.46	0.378

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	1.13	NO	0.122	N/A
MW361	Downgradient	Yes	3.83	NO	1.343	N/A
MW364	Downgradient	Yes	3.2	NO	1.163	N/A
MW367	Downgradient	Yes	0.8	NO	-0.223	N/A
MW370	Upgradient	Yes	4.6	YES	1.526	N/A
MW373	Upgradient	Yes	2	NO	0.693	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

MW370

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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)**= 625.523 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= 5.831 **S**= 0.311 **CV(2)**=0.053 **K factor****= 2.523 **TL(2)**= 6.616 **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	236	5.464
4/23/2002	337	5.820
7/15/2002	266	5.583
10/8/2002	240	5.481
1/8/2003	282	5.642
4/3/2003	238	5.472
7/9/2003	248	5.513
10/6/2003	224	5.412

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	427	6.057
4/23/2002	507	6.229
7/16/2002	464	6.140
10/8/2002	408	6.011
1/7/2003	404	6.001
4/2/2003	450	6.109
7/9/2003	487	6.188
10/7/2003	481	6.176

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	267	NO	5.587	N/A
MW361	Downgradient	Yes	279	NO	5.631	N/A
MW364	Downgradient	Yes	254	NO	5.537	N/A
MW367	Downgradient	Yes	114	NO	4.736	N/A
MW370	Upgradient	Yes	229	NO	5.434	N/A
MW373	Upgradient	Yes	491	NO	6.196	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
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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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

**** 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 Fourth Quarter 2021 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)**= 31.535 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= 1.942 **S**= 0.713 **CV(2)**=0.367 **K factor****= 2.523 **TL(2)**= 3.740 **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	9.34	2.234
4/23/2002	4.33	1.466
7/15/2002	3.52	1.258
10/8/2002	7.45	2.008
1/8/2003	7.04	1.952
4/3/2003	4.64	1.535
7/9/2003	15.8	2.760
10/6/2003	6.49	1.870

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	37.6	3.627
4/23/2002	19	2.944
7/16/2002	10.7	2.370
10/8/2002	3.75	1.322
1/7/2003	3.87	1.353
4/2/2003	3.5	1.253
7/9/2003	7.72	2.044
10/7/2003	2.93	1.075

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	4.82	NO	1.573	N/A
MW361	Downgradient	No	0.1	N/A	-2.303	N/A
MW364	Downgradient	Yes	0.0612	NO	-2.794	N/A
MW367	Downgradient	Yes	6.31	NO	1.842	N/A
MW370	Upgradient	No	0.1	N/A	-2.303	N/A
MW373	Upgradient	Yes	0.0481	NO	-3.034	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)**= 32.458 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= 2.810 **S**= 0.343 **CV(2)**=0.122 **K factor****= 2.523 **TL(2)**= 3.676 **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	12.1	2.493
4/23/2002	15.1	2.715
7/15/2002	12.4	2.518
10/8/2002	12.2	2.501
1/8/2003	11.5	2.442
4/3/2003	12.3	2.510
7/9/2003	10	2.303
10/6/2003	12.1	2.493

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	24.8	3.211
4/23/2002	22.7	3.122
7/16/2002	18.8	2.934
10/8/2002	21.1	3.049
1/7/2003	19.9	2.991
4/2/2003	25.5	3.239
7/9/2003	23.3	3.148
10/7/2003	26.9	3.292

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	15	NO	2.708	N/A
MW361	Downgradient	Yes	14.6	NO	2.681	N/A
MW364	Downgradient	Yes	12.8	NO	2.549	N/A
MW367	Downgradient	Yes	7.04	NO	1.952	N/A
MW370	Upgradient	Yes	11	NO	2.398	N/A
MW373	Upgradient	Yes	26.1	NO	3.262	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)= 2.780 LL(1)=N/A

Statistics-Transformed Background Data X= -0.114 S= 0.658 CV(2)=-5.762 K factor**= 2.523 TL(2)= 1.547 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	0.244	-1.411
4/23/2002	1.82	0.599
7/15/2002	1.22	0.199
10/8/2002	0.988	-0.012
1/8/2003	0.729	-0.316
4/3/2003	0.637	-0.451
7/9/2003	2.51	0.920
10/6/2003	1.05	0.049

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	0.355	-1.036
4/23/2002	2.16	0.770
7/16/2002	1.39	0.329
10/8/2002	0.717	-0.333
1/7/2003	0.587	-0.533
4/2/2003	0.545	-0.607
7/9/2003	1.76	0.565
10/7/2003	0.57	-0.562

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	0.786	NO	-0.241	N/A
MW361	Downgradient	Yes	0.00551	NO	-5.201	N/A
MW364	Downgradient	Yes	0.00571	NO	-5.166	N/A
MW367	Downgradient	Yes	1.3	NO	0.262	N/A
MW370	Upgradient	Yes	0.00119	NO	-6.734	N/A
MW373	Upgradient	Yes	0.0108	NO	-4.528	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)**= 0.078 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= -4.239 **S**= 1.087 **CV(2)**=-0.256 **K factor****= 2.523 **TL(2)**= -1.497 **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	0.05	-2.996
4/23/2002	0.05	-2.996
7/15/2002	0.05	-2.996
10/8/2002	0.005	-5.298
1/8/2003	0.005	-5.298
4/3/2003	0.005	-5.298
7/9/2003	0.0264	-3.634
10/6/2003	0.00971	-4.635

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	0.05	-2.996
4/23/2002	0.05	-2.996
7/16/2002	0.05	-2.996
10/8/2002	0.005	-5.298
1/7/2003	0.005	-5.298
4/2/2003	0.005	-5.298
7/9/2003	0.0112	-4.492
10/7/2003	0.005	-5.298

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	0.0271	NO	-3.608	N/A
MW361	Downgradient	Yes	0.00149	NO	-6.509	N/A
MW364	Downgradient	Yes	0.00475	NO	-5.350	N/A
MW367	Downgradient	Yes	0.00273	NO	-5.903	N/A
MW370	Upgradient	No	0.002	N/A	-6.215	N/A
MW373	Upgradient	Yes	0.000959	NO	-6.950	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
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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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

**** 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 Fourth Quarter 2021 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)**= 200.555 **LL(1)**=N/A

Statistics-Transformed Background Data **X**=3.829 **S**= 1.151 **CV(2)**=0.301 **K factor****= 2.523 **TL(2)**= 4.942 **LL(2)**=N/A

**Historical Background Data from
Upgradient Wells with Transformed Result**

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	140	4.942
4/23/2002	-15	#Func!
7/15/2002	5	1.609
4/3/2003	49	3.892
7/9/2003	-35	#Func!
10/6/2003	40	3.689
1/7/2004	101	4.615
4/7/2004	105	4.654

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	140	4.942
4/23/2002	-20	#Func!
10/8/2002	10	2.303
1/7/2003	10	2.303
4/2/2003	67	4.205
7/9/2003	-29	#Func!
10/7/2003	127	4.844
1/6/2004	52	3.951

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	158.7	N/A	5.067	YES
MW361	Downgradient	Yes	370.4	N/A	5.915	YES
MW364	Downgradient	Yes	331	N/A	5.802	YES
MW367	Downgradient	Yes	217	N/A	5.380	YES
MW370	Upgradient	Yes	359	N/A	5.883	YES
MW373	Upgradient	Yes	372	N/A	5.919	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

MW358
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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)= 6.745 LL(1)=5.8202

Statistics-Transformed Background Data X= 1.837 S= 0.025 CV(2)=0.014 K factor**= 2.904 TL(2)= 1.911 LL(2)=1.7634

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	6.3	1.841
4/23/2002	6.4	1.856
7/15/2002	6.3	1.841
10/8/2002	6.3	1.841
1/8/2003	6.4	1.856
4/3/2003	6.5	1.872
7/9/2003	6.3	1.841
10/6/2003	6.5	1.872

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	6	1.792
4/23/2002	6.3	1.841
7/16/2002	6.45	1.864
10/8/2002	6.18	1.821
1/7/2003	6.35	1.848
4/2/2003	6.14	1.815
7/9/2003	6.1	1.808
10/7/2003	6	1.792

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	6.1	NO	1.808	N/A
MW361	Downgradient	Yes	6.03	NO	1.797	N/A
MW364	Downgradient	Yes	5.83	NO	1.763	N/A
MW367	Downgradient	Yes	5.7	YES	1.740	N/A
MW370	Upgradient	Yes	5.9	NO	1.775	N/A
MW373	Upgradient	Yes	5.77	YES	1.753	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

MW367
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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)**= 4.139 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= 1.024 **S**= 0.167 **CV(2)**=0.163 **K factor****= 2.523 **TL(2)**= 1.445 **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	3.22	1.169
4/23/2002	3.43	1.233
7/15/2002	2.98	1.092
10/8/2002	2.46	0.900
1/8/2003	2.41	0.880
4/3/2003	2.43	0.888
7/9/2003	2.44	0.892
10/6/2003	2.48	0.908

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	4.34	1.468
4/23/2002	3.04	1.112
7/16/2002	2.93	1.075
10/8/2002	2.3	0.833
1/7/2003	2.45	0.896
4/2/2003	2.7	0.993
7/9/2003	2.68	0.986
10/7/2003	2.88	1.058

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	2.86	NO	1.051	N/A
MW361	Downgradient	Yes	2.74	NO	1.008	N/A
MW364	Downgradient	Yes	2.31	NO	0.837	N/A
MW367	Downgradient	Yes	3.08	NO	1.125	N/A
MW370	Upgradient	Yes	2.9	NO	1.065	N/A
MW373	Upgradient	Yes	2.92	NO	1.072	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)**= 89.962 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= 3.906 **S**= 0.272 **CV(2)**=0.070 **K factor****= 2.523 **TL(2)**= 4.592 **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	31.8	3.459
4/23/2002	50	3.912
7/15/2002	44.7	3.800
10/8/2002	40	3.689
1/8/2003	44.6	3.798
4/3/2003	41.9	3.735
7/9/2003	40	3.689
10/6/2003	38.1	3.640

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	43.4	3.770
4/23/2002	79.8	4.380
7/16/2002	87.7	4.474
10/8/2002	61.6	4.121
1/7/2003	59.3	4.083
4/2/2003	62.1	4.129
7/9/2003	50.1	3.914
10/7/2003	49.6	3.904

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	37.1	NO	3.614	N/A
MW361	Downgradient	Yes	44.4	NO	3.793	N/A
MW364	Downgradient	Yes	41	NO	3.714	N/A
MW367	Downgradient	Yes	15.8	NO	2.760	N/A
MW370	Upgradient	Yes	42	NO	3.738	N/A
MW373	Upgradient	Yes	62.8	NO	4.140	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)**= 614.606 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= 3.985 **S**= 1.323 **CV(2)**=0.332 **K factor****= 2.523 **TL(2)**= 7.322 **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	17.4	2.856
4/23/2002	37.9	3.635
7/15/2002	15.7	2.754
10/8/2002	13.4	2.595
1/8/2003	14.4	2.667
4/3/2003	18.1	2.896
7/9/2003	9.6	2.262
10/6/2003	16.5	2.803

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	163.3	5.096
4/23/2002	809.6	6.697
7/16/2002	109.4	4.695
10/8/2002	110.6	4.706
1/7/2003	113.7	4.734
4/2/2003	133	4.890
7/9/2003	182.1	5.205
10/7/2003	193.4	5.265

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	53	N/A	3.970	NO
MW361	Downgradient	Yes	79.2	N/A	4.372	NO
MW364	Downgradient	Yes	74.4	N/A	4.309	NO
MW367	Downgradient	Yes	21.9	N/A	3.086	NO
MW370	Upgradient	Yes	21	N/A	3.045	NO
MW373	Upgradient	Yes	155	N/A	5.043	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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 $X = 7.655$ $S = 13.274$ $CV(1) = 1.734$ $K \text{ factor}^{**} = 2.523$ $TL(1) = 41.146$ $LL(1) = N/A$

Statistics-Transformed Background Data $X = 1.946$ $S = 0.939$ $CV(2) = 0.483$ $K \text{ factor}^{**} = 2.523$ $TL(2) = 3.833$ $LL(2) = N/A$

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	10.8	2.380
4/23/2002	8.53	2.144
7/15/2002	5.09	1.627
10/8/2002	4.78	1.564
1/8/2003	-5.12	#Func!
4/3/2003	5.11	1.631
7/9/2003	4.25	1.447
10/6/2003	6.54	1.878

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	16.5	2.803
4/23/2002	3.49	1.250
7/16/2002	1.42	0.351
10/8/2002	-6.06	#Func!
1/7/2003	-8.41	#Func!
4/2/2003	26.3	3.270
7/9/2003	3.06	1.118
10/7/2003	46.2	3.833

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	35.1	N/A	3.558	NO
MW361	Downgradient	Yes	55.5	N/A	4.016	YES
MW364	Downgradient	Yes	55.3	N/A	4.013	YES
MW367	Downgradient	No	-3.45	N/A	#Error	N/A
MW370	Upgradient	Yes	39.2	N/A	3.669	NO
MW373	Upgradient	No	8.12	N/A	2.094	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

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, $S = [\text{Sum}([(background \text{ result} - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)**= 36.626 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= 1.069 **S**= 1.014 **CV(2)**=0.948 **K factor****= 2.523 **TL(2)**= 3.626 **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	1.2	0.182
4/23/2002	4.3	1.459
7/15/2002	2.6	0.956
10/8/2002	2.3	0.833
1/8/2003	3	1.099
4/3/2003	1.2	0.182
7/9/2003	2.6	0.956
10/6/2003	1.7	0.531

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	1.1	0.095
4/23/2002	17.5	2.862
7/16/2002	49	3.892
10/8/2002	2.9	1.065
1/7/2003	3.9	1.361
4/2/2003	2.5	0.916
7/9/2003	1.7	0.531
10/7/2003	1.2	0.182

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	2.79	N/A	1.026	NO
MW361	Downgradient	Yes	0.967	N/A	-0.034	NO
MW364	Downgradient	Yes	1.07	N/A	0.068	NO
MW367	Downgradient	Yes	0.708	N/A	-0.345	NO
MW370	Upgradient	Yes	1.19	N/A	0.174	NO
MW373	Upgradient	Yes	1.36	N/A	0.307	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)**= 277.798 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= 3.971 **S**= 0.950 **CV(2)**=0.239 **K factor****= 2.523 **TL(2)**= 6.368 **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	50	3.912
4/23/2002	228	5.429
7/15/2002	88	4.477
10/8/2002	58	4.060
1/8/2003	72.4	4.282
4/3/2003	26.6	3.281
7/9/2003	16.4	2.797
10/6/2003	31.1	3.437

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	50	3.912
4/23/2002	276	5.620
7/16/2002	177	5.176
10/8/2002	76	4.331
1/7/2003	45.9	3.826
4/2/2003	57.8	4.057
7/9/2003	10	2.303
10/7/2003	13.9	2.632

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	No	10	N/A	2.303	N/A
MW361	Downgradient	Yes	5.68	NO	1.737	N/A
MW364	Downgradient	Yes	6.48	NO	1.869	N/A
MW367	Downgradient	Yes	3.98	NO	1.381	N/A
MW370	Upgradient	Yes	6.3	NO	1.841	N/A
MW373	Upgradient	Yes	7.74	NO	2.046	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)**= 29.721 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= 2.305 **S**= 0.687 **CV(2)**=0.298 **K factor****= 2.523 **TL(2)**= 4.039 **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	19	2.944
4/23/2002	17	2.833
7/15/2002	15	2.708
10/8/2002	18	2.890
1/8/2003	17	2.833
4/3/2003	18	2.890
7/9/2003	15	2.708
10/6/2003	16	2.773

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	5	1.609
4/23/2002	25	3.219
7/16/2002	3	1.099
10/8/2002	4	1.386
1/7/2003	6	1.792
4/2/2003	5	1.609
7/9/2003	6	1.792
10/7/2003	6	1.792

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	1.65	N/A	0.501	N/A
MW361	Downgradient	Yes	6.31	NO	1.842	N/A
MW364	Downgradient	Yes	6.07	NO	1.803	N/A
MW367	Downgradient	No	1	N/A	0.000	N/A
MW370	Upgradient	Yes	0.84	N/A	-0.174	N/A
MW373	Upgradient	Yes	5.91	NO	1.777	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 Fourth Quarter 2021 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)**= 0.147 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= -3.131 **S**= 0.691 **CV(2)**=-0.221 **K factor****= 2.523 **TL(2)**= -1.388 **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	0.1	-2.303
4/23/2002	0.1	-2.303
7/15/2002	0.1	-2.303
10/8/2002	0.025	-3.689
1/8/2003	0.035	-3.352
4/3/2003	0.035	-3.352
7/9/2003	0.02	-3.912
10/6/2003	0.02	-3.912

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	0.1	-2.303
4/23/2002	0.1	-2.303
7/16/2002	0.1	-2.303
10/8/2002	0.025	-3.689
1/7/2003	0.035	-3.352
4/2/2003	0.035	-3.352
7/9/2003	0.0234	-3.755
10/7/2003	0.02	-3.912

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	0.00697	NO	-4.966	N/A
MW361	Downgradient	Yes	0.00535	NO	-5.231	N/A
MW364	Downgradient	Yes	0.00928	NO	-4.680	N/A
MW367	Downgradient	Yes	0.0122	NO	-4.406	N/A
MW370	Upgradient	No	0.02	N/A	-3.912	N/A
MW373	Upgradient	No	0.00596	N/A	-5.123	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 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 2021 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= 2.450 S= 1.858 CV(1)=0.758 K factor**= 2.523 TL(1)= 7.137 LL(1)=N/A

Statistics-Transformed Background Data X= 0.617 S= 0.788 CV(2)=1.277 K factor**= 2.523 TL(2)= 2.604 LL(2)=N/A

Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW371

Date Collected	Result	LN(Result)
10/16/2019	1.27	0.239
3/17/2020	5.56	1.716
4/6/2020	3.39	1.221
7/23/2020	2.5	0.916
10/12/2020	1.34	0.293
1/20/2021	1.6	0.470
4/13/2021	6.07	1.803
7/20/2021	5.52	1.708

Well Number: MW374

Date Collected	Result	LN(Result)
10/16/2019	1.88	0.631
3/17/2020	3.36	1.212
4/6/2020	0.8	-0.223
7/23/2020	0.7	-0.357
10/12/2020	0.5	-0.693
1/20/2021	0.92	-0.083
4/13/2021	2.8	1.030
7/14/2021	0.99	-0.010

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)
MW359	Downgradient	Yes	6.05	NO	1.800	N/A
MW365	Downgradient	Yes	3.66	NO	1.297	N/A
MW371	Upgradient	Yes	3.36	NO	1.212	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 2021 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= 325.688 S= 74.720 CV(1)=0.229 K factor**= 2.523 TL(1)= 514.205 LL(1)=N/A

Statistics-Transformed Background Data X= 5.754 S= 0.280 CV(2)=0.049 K factor**= 2.523 TL(2)= 6.461 LL(2)=N/A

Current 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: MW371

Date Collected	Result	LN(Result)
10/16/2019	321	5.771
3/17/2020	335	5.814
4/6/2020	423	6.047
7/23/2020	361	5.889
10/12/2020	344	5.841
1/20/2021	296	5.690
4/13/2021	388	5.961
7/20/2021	401	5.994

Well Number: MW374

Date Collected	Result	LN(Result)
10/16/2019	233	5.451
3/17/2020	358	5.881
4/6/2020	385	5.953
7/23/2020	304	5.717
10/12/2020	207	5.333
1/20/2021	145	4.977
4/13/2021	361	5.889
7/14/2021	349	5.855

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	Yes	264.2	NO	5.577	N/A
MW362	Downgradient	Yes	220.4	NO	5.395	N/A
MW365	Downgradient	Yes	336	NO	5.817	N/A
MW368	Downgradient	Yes	242	NO	5.489	N/A
MW371	Upgradient	Yes	344	NO	5.841	N/A
MW374	Upgradient	Yes	202	NO	5.308	N/A
MW375	Sidegradient	Yes	327	NO	5.790	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 2021 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= 28.020 S= 25.244 CV(1)=0.901 K factor**= 2.523 TL(1)= 91.710 LL(1)=N/A

Statistics-Transformed Background Data X= 2.991 S= 0.843 CV(2)=0.282 K factor**= 2.523 TL(2)= 5.119 LL(2)=N/A

Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW371

Date Collected	Result	LN(Result)
10/16/2019	30	3.401
1/21/2020	27	3.296
4/6/2020	75.3	4.321
7/23/2020	53.6	3.982
10/12/2020	29.9	3.398
1/20/2021	29.2	3.374
4/13/2021	90.7	4.508
7/20/2021	34.1	3.529

Well Number: MW374

Date Collected	Result	LN(Result)
10/16/2019	6.43	1.861
1/22/2020	7.75	2.048
4/6/2020	8.41	2.129
7/23/2020	9.1	2.208
10/12/2020	9.73	2.275
1/20/2021	10.7	2.370
4/13/2021	13	2.565
7/14/2021	13.4	2.595

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)
MW359	Downgradient	Yes	38.5	NO	3.651	N/A
MW362	Downgradient	Yes	28.4	NO	3.346	N/A
MW365	Downgradient	Yes	59.3	NO	4.083	N/A
MW368	Downgradient	Yes	101	YES	4.615	N/A
MW375	Sidegradient	Yes	23.2	NO	3.144	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

MW368

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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 2021 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= 39.575	S= 23.633	CV(1)=0.597	K factor**= 2.523	TL(1)= 99.200	LL(1)=N/A
Statistics-Transformed Background Data	X= 3.474	S= 0.683	CV(2)=0.197	K factor**= 2.523	TL(2)= 5.198	LL(2)=N/A

Current 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)
10/16/2019	15.5	2.741
1/21/2020	19.1	2.950
4/6/2020	20.4	3.016
7/20/2020	16.5	2.803
10/12/2020	15.7	2.754
1/20/2021	15.4	2.734
4/13/2021	16.7	2.815
7/13/2021	15.3	2.728

Well Number: MW372

Date Collected	Result	LN(Result)
10/16/2019	59.4	4.084
1/22/2020	57	4.043
4/6/2020	62.7	4.138
7/23/2020	62.4	4.134
10/12/2020	62.3	4.132
1/20/2021	67.5	4.212
4/13/2021	62.3	4.132
7/14/2021	65	4.174

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW372	Upgradient	Yes	64.8	NO	4.171	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, $S = [\text{Sum} ([(\text{background result}-X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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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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= 329.625 S= 127.637 CV(1)=0.387 K factor**= 2.523 TL(1)= 651.654 LL(1)=N/A

Statistics-Transformed Background Data X= 5.723 S= 0.406 CV(2)=0.071 K factor**= 2.523 TL(2)= 6.747 LL(2)=N/A

Current 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)
10/16/2019	227	5.425
1/21/2020	224	5.412
4/6/2020	214	5.366
7/20/2020	186	5.226
10/12/2020	220	5.394
1/20/2021	191	5.252
4/13/2021	209	5.342
7/13/2021	194	5.268

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW372	Upgradient	Yes	461	NO	6.133	N/A

Well Number: MW372

Date Collected	Result	LN(Result)
10/16/2019	466	6.144
1/22/2020	423	6.047
4/6/2020	399	5.989
7/23/2020	436	6.078
10/12/2020	474	6.161
1/20/2021	447	6.103
4/13/2021	483	6.180
7/14/2021	481	6.176

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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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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Current 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 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=** 14.921 **S=** 8.121 **CV(1)=**0.544 **K factor**=** 2.523 **TL(1)=** 35.410 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** 2.540 **S=** 0.606 **CV(2)=**0.238 **K factor**=** 2.523 **TL(2)=** 4.068 **LL(2)=**N/A

Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW369

Date Collected	Result	LN(Result)
10/16/2019	7.28	1.985
1/21/2020	7.14	1.966
4/6/2020	8.43	2.132
7/20/2020	6.51	1.873
10/12/2020	7.24	1.980
1/20/2021	6.85	1.924
4/13/2021	6.97	1.942
7/13/2021	6.41	1.858

Well Number: MW372

Date Collected	Result	LN(Result)
10/16/2019	22	3.091
1/22/2020	21.3	3.059
4/6/2020	22.4	3.109
7/23/2020	21.4	3.063
10/12/2020	23.4	3.153
1/20/2021	24.1	3.182
4/13/2021	23.2	3.144
7/14/2021	24.1	3.182

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)
MW372	Upgradient	Yes	22.8	NO	3.127	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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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Current Background Comparison

Nitrate as Nitrogen

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= 0.850 S= 0.224 CV(1)=0.264 K factor**= 2.523 TL(1)= 1.416 LL(1)=N/A

Statistics-Transformed Background Data X= -0.193 S= 0.252 CV(2)=-1.305 K factor**= 2.523 TL(2)= 0.443 LL(2)=N/A

Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW369

Date Collected	Result	LN(Result)
10/16/2019	0.676	-0.392
1/21/2020	0.628	-0.465
4/6/2020	0.604	-0.504
7/20/2020	0.76	-0.274
10/12/2020	0.736	-0.307
1/20/2021	0.838	-0.177
4/13/2021	0.532	-0.631
7/13/2021	0.851	-0.161

Well Number: MW372

Date Collected	Result	LN(Result)
10/16/2019	1.38	0.322
1/22/2020	0.836	-0.179
4/6/2020	0.77	-0.261
7/23/2020	1.12	0.113
10/12/2020	0.959	-0.042
1/20/2021	1.19	0.174
4/13/2021	0.807	-0.214
7/14/2021	0.909	-0.095

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)
MW363	Downgradient	Yes	10.5	YES	2.351	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

MW363

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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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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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= 365.813 S= 33.435 CV(1)=0.091 K factor**= 2.523 TL(1)= 450.169 LL(1)=N/A

Statistics-Transformed Background Data X= 5.898 S= 0.090 CV(2)=0.015 K factor**= 2.523 TL(2)= 6.126 LL(2)=N/A

Current 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)
10/16/2019	347	5.849
3/17/2020	327	5.790
4/6/2020	390	5.966
7/23/2020	353	5.866
10/12/2020	362	5.892
1/20/2021	350	5.858
4/13/2021	444	6.096
7/13/2021	352	5.864

Well Number: MW372

Date Collected	Result	LN(Result)
10/16/2019	303	5.714
1/22/2020	375	5.927
4/6/2020	393	5.974
7/23/2020	365	5.900
10/12/2020	341	5.832
1/20/2021	362	5.892
4/13/2021	411	6.019
7/14/2021	378	5.935

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	393	NO	5.974	N/A
MW360	Downgradient	Yes	379.5	NO	5.939	N/A
MW363	Downgradient	Yes	272	NO	5.606	N/A
MW366	Downgradient	Yes	355	NO	5.872	N/A
MW369	Upgradient	Yes	343	NO	5.838	N/A
MW372	Upgradient	Yes	390	NO	5.966	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 2021 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= 66.408 S= 64.228 CV(1)=0.967 K factor**= 2.523 TL(1)= 228.455 LL(1)=N/A

Statistics-Transformed Background Data X= 3.341 S= 1.542 CV(2)=0.462 K factor**= 2.523 TL(2)= 7.232 LL(2)=N/A

Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW369

Date Collected	Result	LN(Result)
10/16/2019	5.09	1.627
1/21/2020	5.54	1.712
4/6/2020	9.41	2.242
7/20/2020	5.48	1.701
10/12/2020	5.29	1.666
1/20/2021	5.86	1.768
4/13/2021	7.59	2.027
7/13/2021	8.66	2.159

Well Number: MW372

Date Collected	Result	LN(Result)
10/16/2019	89.6	4.495
1/22/2020	105	4.654
4/6/2020	102	4.625
7/23/2020	124	4.820
10/12/2020	129	4.860
1/20/2021	156	5.050
4/13/2021	157	5.056
7/14/2021	147	4.990

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)
MW372	Upgradient	Yes	147	NO	4.990	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 2021 Statistical Analysis

Current 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 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= 2.593 S= 1.062 CV(1)=0.409 K factor**= 2.523 TL(1)= 5.272 LL(1)=N/A

Statistics-Transformed Background Data X= 0.871 S= 0.426 CV(2)=0.489 K factor**= 2.523 TL(2)= 1.944 LL(2)=N/A

Current 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)
10/16/2019	3.7	1.308
1/21/2020	2.86	1.051
4/6/2020	2.72	1.001
7/23/2020	2.86	1.051
10/12/2020	3.45	1.238
1/20/2021	4.3	1.459
4/13/2021	3.57	1.273
7/13/2021	4.47	1.497

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW370	Upgradient	Yes	4.6	NO	1.526	N/A

Well Number: MW373

Date Collected	Result	LN(Result)
10/16/2019	1.98	0.683
1/22/2020	1.79	0.582
4/6/2020	1.18	0.166
7/23/2020	1.41	0.344
10/12/2020	1.77	0.571
1/20/2021	1.8	0.588
4/13/2021	1.33	0.285
7/14/2021	2.3	0.833

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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 2021 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**= 386.250 **S**= 32.438 **CV(1)**=0.084 **K factor****= 2.523 **TL(1)**= 468.090 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= 5.953 **S**= 0.083 **CV(2)**=0.014 **K factor****= 2.523 **TL(2)**= 6.162 **LL(2)**=N/A

Current 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)
10/16/2019	405	6.004
1/21/2020	425	6.052
4/6/2020	448	6.105
7/23/2020	366	5.903
10/12/2020	350	5.858
1/20/2021	395	5.979
4/13/2021	435	6.075
7/13/2021	364	5.897

Well Number: MW373

Date Collected	Result	LN(Result)
10/16/2019	347	5.849
1/22/2020	350	5.858
4/6/2020	409	6.014
7/23/2020	377	5.932
10/12/2020	350	5.858
1/20/2021	372	5.919
4/13/2021	407	6.009
7/14/2021	380	5.940

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	158.7	NO	5.067	N/A
MW361	Downgradient	Yes	370.4	NO	5.915	N/A
MW364	Downgradient	Yes	331	NO	5.802	N/A
MW367	Downgradient	Yes	217	NO	5.380	N/A
MW370	Upgradient	Yes	359	NO	5.883	N/A
MW373	Upgradient	Yes	372	NO	5.919	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 2021 Statistical Analysis

Current 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 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= 6.039	S= 0.126	CV(1)=0.021	K factor**= 2.904	TL(1)= 6.406	LL(1)=5.6722
Statistics-Transformed Background Data	X= 1.798	S= 0.021	CV(2)=0.012	K factor**= 2.904	TL(2)= 1.860	LL(2)=1.7366

Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW370

Date Collected	Result	LN(Result)
10/16/2019	6.06	1.802
1/21/2020	6.17	1.820
4/6/2020	6.08	1.805
7/23/2020	6.07	1.803
10/12/2020	6.06	1.802
1/20/2021	5.79	1.756
4/13/2021	5.9	1.775
7/13/2021	5.96	1.785

Well Number: MW373

Date Collected	Result	LN(Result)
10/16/2019	6.16	1.818
1/22/2020	6.13	1.813
4/6/2020	6.15	1.816
7/23/2020	6.11	1.810
10/12/2020	6.17	1.820
1/20/2021	6.05	1.800
4/13/2021	6	1.792
7/14/2021	5.77	1.753

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)?
MW367	Downgradient	Yes	5.7	NO	1.740	N/A
MW373	Upgradient	Yes	5.77	NO	1.753	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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 2021 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**= 43.199 **S**= 32.536 **CV(1)**=0.753 **K factor****= 2.523 **TL(1)**= 125.287 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= 3.487 **S**= 0.791 **CV(2)**=0.227 **K factor****= 2.523 **TL(2)**= 5.483 **LL(2)**=N/A

Current 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)
10/16/2019	125	4.828
1/21/2020	82.8	4.416
4/6/2020	60.4	4.101
7/23/2020	67.3	4.209
10/12/2020	72.3	4.281
1/20/2021	58.8	4.074
4/13/2021	44.2	3.789
7/13/2021	37.9	3.635

Well Number: MW373

Date Collected	Result	LN(Result)
10/16/2019	36.5	3.597
1/22/2020	13	2.565
4/6/2020	13.8	2.625
7/23/2020	18.4	2.912
10/12/2020	19.2	2.955
1/20/2021	9.89	2.292
4/13/2021	17.5	2.862
7/14/2021	14.2	2.653

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW361	Downgradient	Yes	55.5	NO	4.016	N/A
MW364	Downgradient	Yes	55.3	NO	4.013	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, $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit, $TL = X + (K * S)$, LL Lower Tolerance Limit, $LL = X - (K * S)$

X Mean, $X = (\text{sum of background results})/(\text{count of background results})$

** 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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January 24, 2022

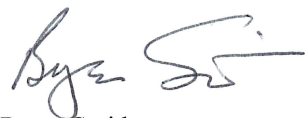
Mr. Dennis Greene
Four Rivers Nuclear Partnership, LLC
5511 Hobbs Road
Kevil, KY 42053

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 an independent technical reviewer with Four Rivers Nuclear Partnership, LLC.

For this project, the statistical analyses conducted on the fourth quarter 2021 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 fourth quarter 2021 and determine groundwater flow rate and direction.

Water levels during this reporting period were measured on October 26, 2021. As shown on Figure E.1, all Upper Continental Recharge System (UCRS) wells had sufficient water to permit water level measurement and sampling for laboratory analysis during this reporting period.

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 1.08×10^{-3} ft/ft and 1.12×10^{-3} ft/ft, respectively. Water level measurements in wells at the C-746-U Landfill and in wells of the surrounding region¹ (MW98, MW100, MW125, MW139, MW165A, MW173, 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 5.21×10^{-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 October 2021, the groundwater flow direction in the immediate area of the landfill was to the northeast.

¹ Water level could not be measured in MW193 this quarter.

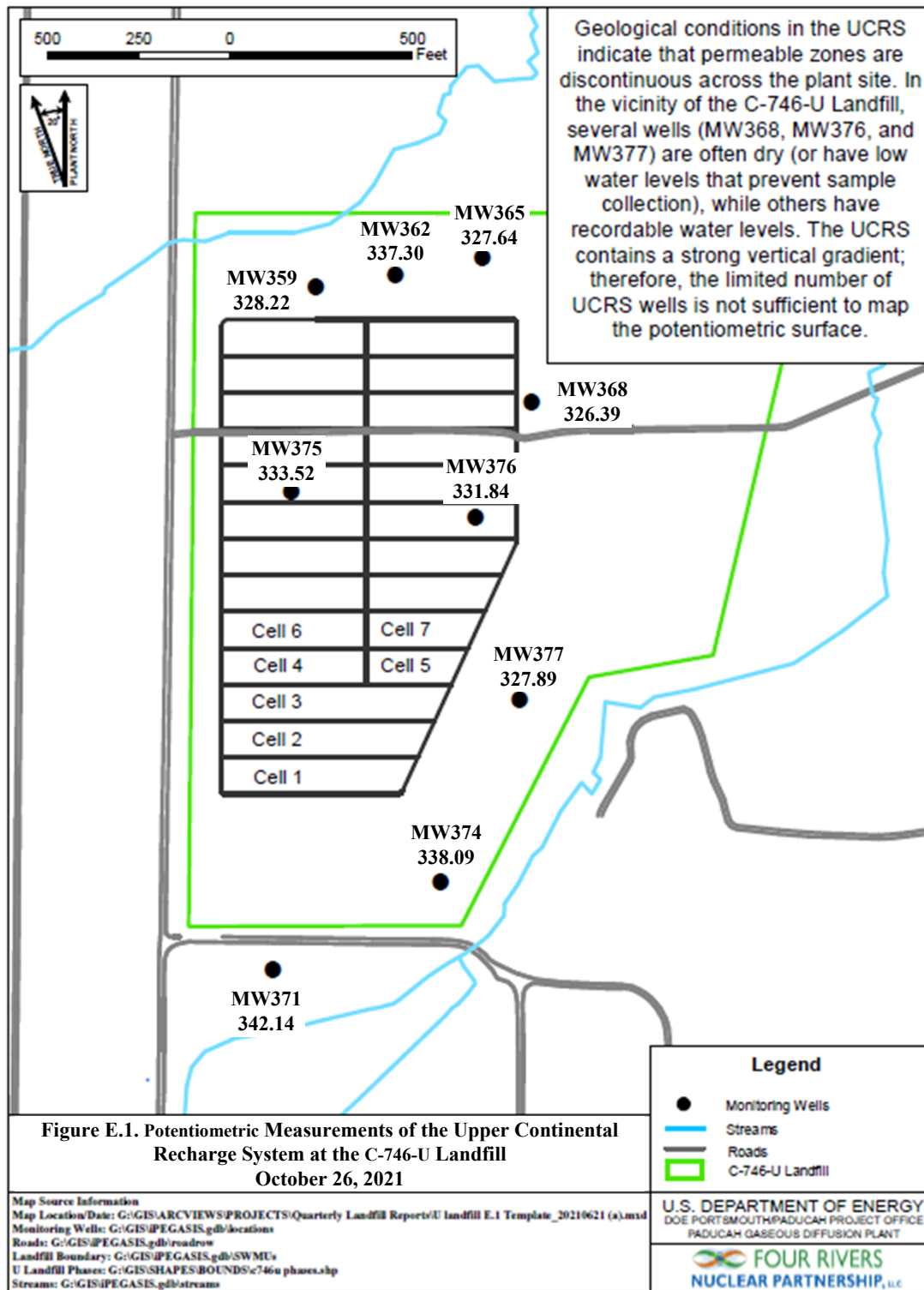
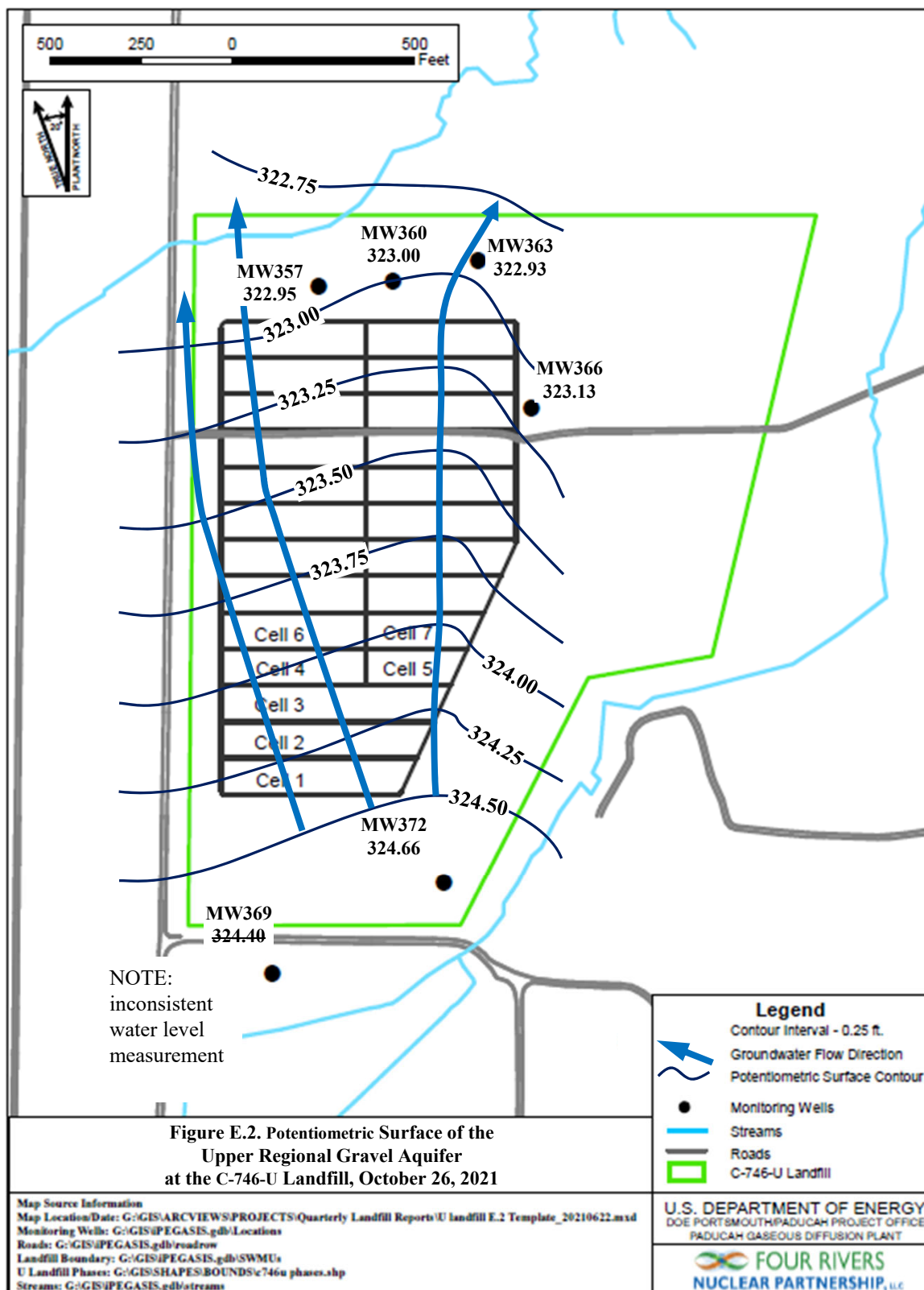
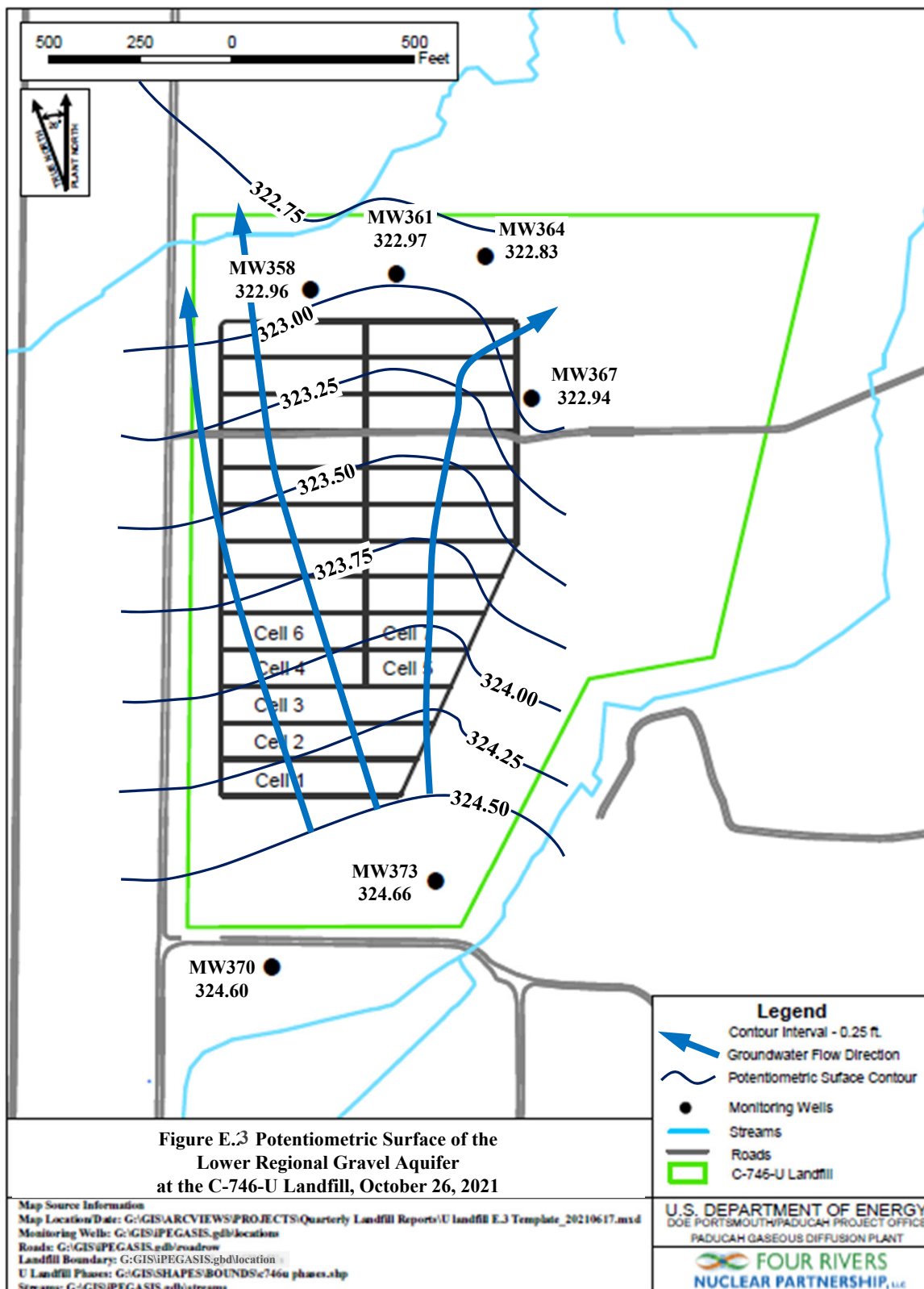


Table E.1. C-746-U Landfill Fourth Quarter 2021 (October) Water Levels

C-746-U Landfill (October 2021) Water Levels										
Date	Time	Well	Aquifer	Datum Elev (ft amsl)	BP (in Hg)	Delta BP (ft H2O)	Raw Data		*Corrected Data	
							DTW (ft)	Elev (ft amsl)	DTW (ft)	Elev (ft amsl)
10/26/2021	8:50	MW357	URGA	368.77	30.10	0.01	45.81	322.96	45.82	322.95
10/26/2021	8:53	MW358	LRGA	368.92	30.11	0.00	45.96	322.96	45.96	322.96
10/26/2021	8:52	MW359	UCRS	368.91	30.10	0.01	40.68	328.23	40.69	328.22
10/26/2021	8:55	MW360	URGA	362.07	30.11	0.00	39.07	323.00	39.07	323.00
10/26/2021	8:57	MW361	LRGA	361.32	30.11	0.00	38.35	322.97	38.35	322.97
10/26/2021	8:56	MW362	UCRS	361.85	30.11	0.00	24.55	337.30	24.55	337.30
10/26/2021	9:04	MW363	URGA	368.56	30.11	0.00	45.63	322.93	45.63	322.93
10/26/2021	9:06	MW364	LRGA	368.17	30.11	0.00	45.34	322.83	45.34	322.83
10/26/2021	9:05	MW365	UCRS	368.14	30.11	0.00	40.50	327.64	40.50	327.64
10/26/2021	9:00	MW366	URGA	368.95	30.11	0.00	45.82	323.13	45.82	323.13
10/26/2021	9:02	MW367	LRGA	369.37	30.11	0.00	46.43	322.94	46.43	322.94
10/26/2021	9:01	MW368	UCRS	368.98	30.11	0.00	42.59	326.39	42.59	326.39
10/26/2021	9:36	MW369	URGA	364.23	30.11	0.00	39.83	324.40	39.83	324.40
10/26/2021	9:38	MW370	LRGA	365.12	30.11	0.00	40.52	324.60	40.52	324.60
10/26/2021	9:37	MW371	UCRS	364.64	30.11	0.00	22.50	342.14	22.50	342.14
10/26/2021	9:31	MW372	URGA	359.42	30.11	0.00	34.76	324.66	34.76	324.66
10/26/2021	9:33	MW373	LRGA	359.73	30.11	0.00	35.07	324.66	35.07	324.66
10/26/2021	9:32	MW374	UCRS	359.44	30.11	0.00	21.35	338.09	21.35	338.09
10/26/2021	9:23	MW375	UCRS	370.36	30.11	0.00	36.84	333.52	36.84	333.52
10/26/2021	9:25	MW376	UCRS	370.39	30.11	0.00	38.55	331.84	38.55	331.84
10/26/2021	9:28	MW377	UCRS	365.74	30.11	0.00	37.85	327.89	37.85	327.89
Reference Barometric Pressure					30.11					
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										





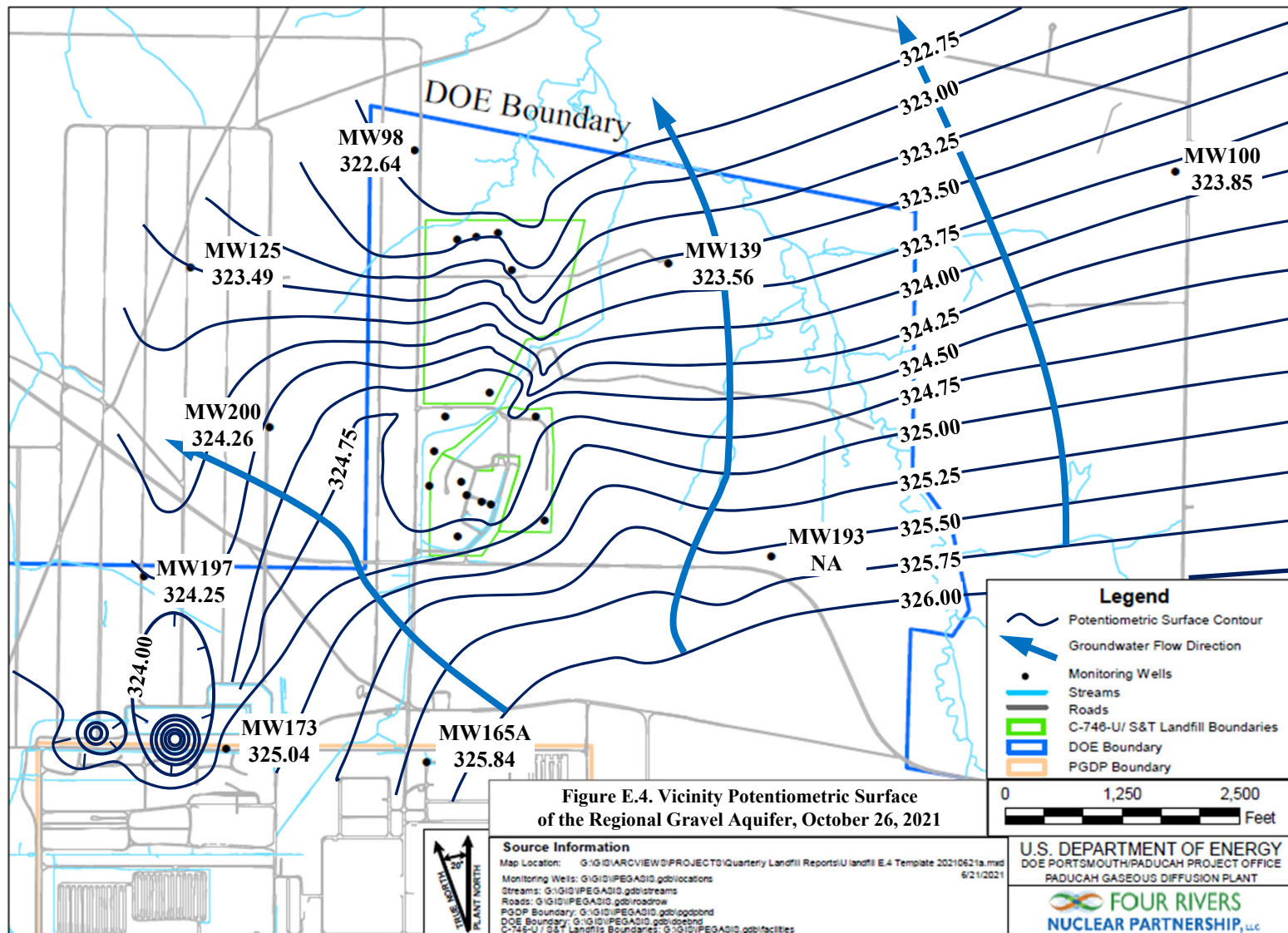


Table E.2. C-746-U Landfill Hydraulic Gradients

	ft/ft
Beneath Landfill—Upper RGA	1.08×10^{-3}
Beneath Landfill—Lower RGA	1.12×10^{-3}
Vicinity	5.21×10^{-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	0.784	2.77×10^{-4}	3.14	1.11×10^{-3}
425	0.150	0.460	1.62×10^{-4}	1.84	6.49×10^{-4}
Lower RGA					
725	0.256	0.814	2.88×10^{-4}	3.26	1.15×10^{-3}
425	0.150	0.477	1.68×10^{-4}	1.91	6.74×10^{-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 fourth quarter 2021 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.

	<u>Parameter</u>	<u>Monitoring Well</u>
Upper Continental Recharge System	None	
Upper Regional Gravel Aquifer	None	
Lower Regional Gravel Aquifer	Technetium-99	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.

11/16/2021

**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
8004-4795	MW361	Trichloroethene	8260D	6.31	ug/L	5
8004-4796	MW363	Nitrate as Nitrogen	9056A	10.5	mg/L	10
8004-4797	MW364	Trichloroethene	8260D	6.07	ug/L	5
8004-4792	MW373	Trichloroethene	8260D	5.91	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					
	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																■						
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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					
	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																*						
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Quarter 4, 2021																*						
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						*					*				*	*			*			
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Quarter 1, 2006																		*	*			
Quarter 4, 2016																		*				
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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																*						
CONDUCTIVITY																						
Quarter 4, 2002											*											
Quarter 1, 2003											*											
Quarter 2, 2003											*	*										
Quarter 4, 2003											*											
Quarter 1, 2004											*											
Quarter 2, 2004											*											

**Chart of MCL and Historical UTL Exceedances
for the C-746-U Contained Landfill (Continued)**

Groundwater Flow System	UCRS										URGA						LRGA					
	D	S	S	S	D	D	D	U	U		D	D	D	U	U		D	D	D	D	U	U
Gradient 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 3, 2004											*											
Quarter 1, 2005																*						
Quarter 2, 2005																*						
Quarter 3, 2005						*													*			
Quarter 4, 2005																*			*			
Quarter 1, 2006																*						
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Quarter 1, 2016															*	*						
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Quarter 2, 2019															*	*						
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Quarter 1, 2020															*	*						
Quarter 2, 2020															*	*						
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Quarter 1, 2021															*	*						
Quarter 2, 2021															*	*						
Quarter 3, 2021															*	*						
DISSOLVED OXYGEN																						
Quarter 1, 2003					*	*					*											
Quarter 3, 2003					*						*											
Quarter 4, 2003					*																	
Quarter 1, 2004					*																	
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Quarter 2, 2010					*	*		*	*											*	*	
Quarter 3, 2010					*	*																

**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 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					*	*	*	*	*												*	
DISSOLVED SOLIDS																						
Quarter 4, 2002											*											
Quarter 1, 2003											*											
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Quarter 3, 2003							*				*	*										
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Quarter 2, 2020																*						

**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 3, 2020																*						
Quarter 4, 2020																*						
Quarter 1, 2021																*						
Quarter 2, 2021																*						
Quarter 3, 2021																*						
Quarter 4, 2021																*						
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																*						*
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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																*						
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											*		*				*		*			

**Chart of MCL and Historical UTL Exceedances
for the C-746-U Contained Landfill (Continued)**

Groundwater Flow System	UCRS										URGA						LRGA					
	D	S	S	S	D	D	D	U	U		D	D	D	D	U	U	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 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									*													
NICKEL																						
Quarter 3, 2003											*											
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	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
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	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

**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 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	*	*				*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
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																			*			
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																						

**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
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	*	*			*	*	*	*	*							*						
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					
	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																	*	*	*	*	*	
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																■					■	■
Quarter 3, 2012																■					■	■
Quarter 4, 2012																■					■	■
Quarter 1, 2013																■					■	■
Quarter 2, 2013																■					■	■
Quarter 3, 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
TRICHLOROETHENE																						
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																		■	■			■
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

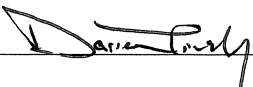
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CP3-WM-0017-F04 - C-746-U LANDFILL METHANE MONITORING REPORT

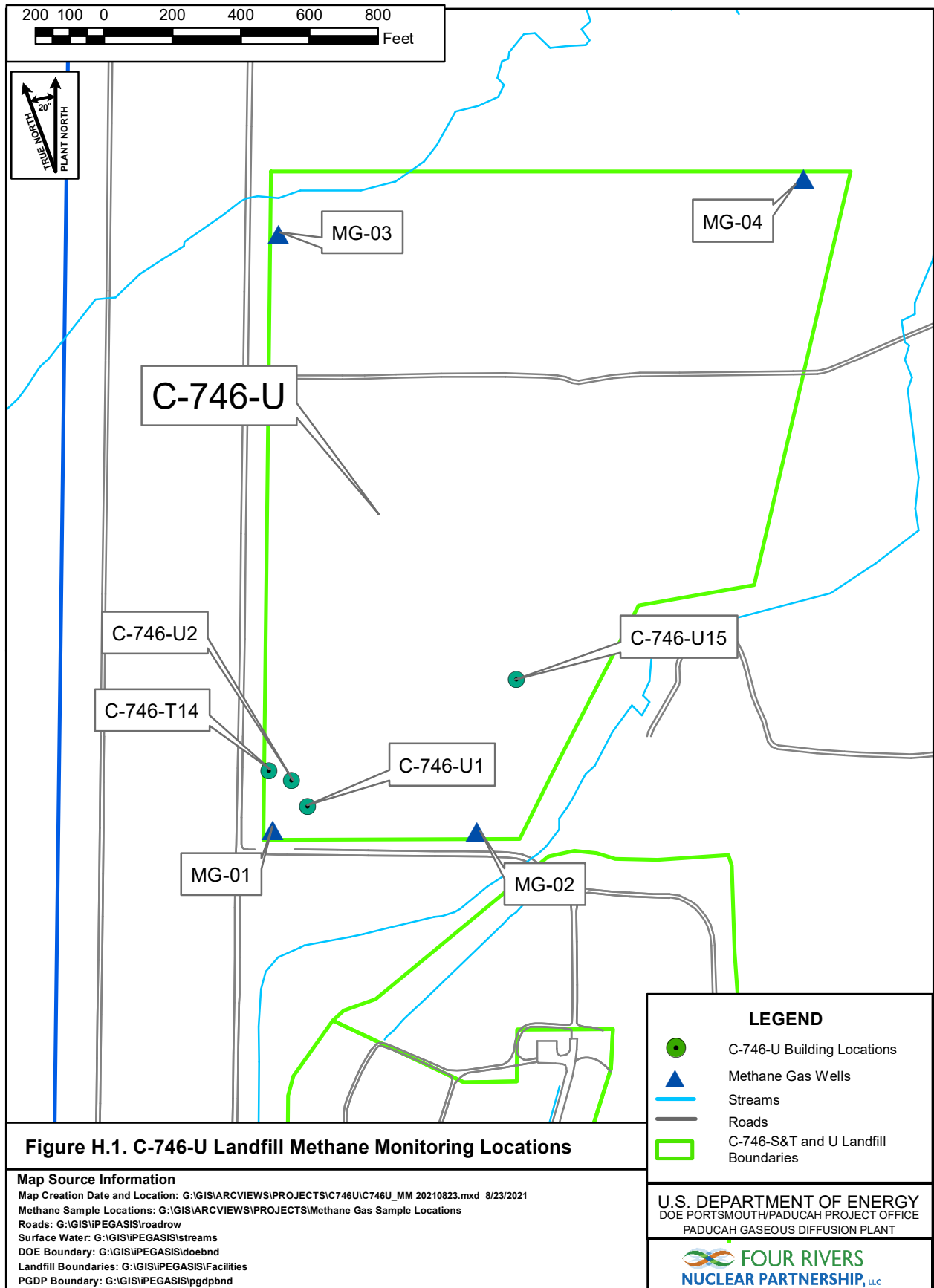
PADUCAH GASEOUS DIFFUSION PLANT

Permit #: 073-00045

McCracken County, Kentucky

Date:	December 2, 2021	Time:	0935	Monitor:	Robert Kirby
Weather Conditions: Sunny, 56 degrees, slight wind, humidity: 37%					
Monitoring Equipment::Multi RAE – Serial # 11880					
Monitoring Location					Reading (% LEL)
C-746-U1	Checked at floor level				0
C-746-U2	Checked at floor level				0
C-746-U-T-14	Checked at floor level				0
C-746-U15	Checked at floor level				0
MG1	Checked 1" from opening				0
MG2	Checked 1" from opening				0
MG3	Checked 1" from opening				0
MG4	Checked 1" from opening				0
Suspect or Problem Areas	No problems noted				
Remarks: N/A					
Performed by: <i>no Sampling performed by Robert Kirby, Data reviewed + accurate.</i> Signature  Date <i>12/14/2021</i>					

-Robert Kirby is out of office.



APPENDIX I

SURFACE WATER ANALYSES AND WRITTEN COMMENTS

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Division of Waste Management
Solid Waste Branch
14 Reilly Road
Frankfort, KY 40601 (502)564-6716

RESIDENTIAL/CONTAINED-QUARTERLY
Facility: US DOE - Paducah Gaseous Diffusion Plant
Permit Number: SW07300014, SW07300015, SW07300045

FINDS/UNIT: KY8-890-008-982
LAB ID: None

SURFACE WATER SAMPLE ANALYSIS (S)

Monitoring Point (KPDES Discharge Number, or "UPSTREAM", or "DOWNSTREAM")						L150 INSTREAM		L154 INSTREAM		L351 DOWNSTREAM		F. BLANK	
Sample Sequence #						1		1		1		1	
If sample is a Blank, specify Type: (F)ield, (T)rip, (M)ethod, or (E)quipment						NA		NA		NA		F	
Sample Date and Time (Month/Day/Year hour: minutes)						10/11/2021 16:12		12/6/2021 07:47		12/6/2021 07:30		10/11/2021 16:13	
Duplicate ("Y" or "N") ¹						N		N		N		N	
Split ('Y' or "N") ²						N		N		N		N	
Facility Sample ID Number (if applicable)						L150US1-22		L154US1-22		L351US1-22		FB1US1-22	
Laboratory Sample ID Number (if applicable)						558724002		564079001		564079002		558724003	
Date of Analysis (Month/Day/Year)						11/2/2021		12/30/2021		12/30/2021		10/13/2021	
CAS RN ³		CONSTITUENT	T D 4	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁵	F L A G S ⁷	DETECTED VALUE OR PQL ⁵	F L A G S ⁷	DETECTED VALUE OR PQL ⁵	F L A G S ⁷	DETECTED VALUE OR PQL ⁵	F L A G S ⁷
A200-00-0	0	Flow	T	MGD	Field		*		*		*		*
16887-00-6	2	Chloride(s)	T	mg/L	300.0	15.2		2.77		2.97		<0.2	
14808-79-8	0	Sulfate	T	mg/L	300.0	51.7		4.73		4.89		<0.4	
7439-89-6	0	Iron	T	mg/L	200.8	2.18		1.4		1.37		<0.1	
7440-23-5	0	Sodium	T	mg/L	200.8	8.11		2.51		2.57		<0.25	
S0268- -	0	Organic Carbon ⁶	T	mg/L	9060	7.07		17.8		22.9			*
S0097- -	0	BOD ⁶	T	mg/L	not applicable		*		*		*		*
S0130- -	0	Chemical Oxygen Demand	T	mg/L	410.4	28		65.9		65.9			*

¹Respond "Y" if the sample was a duplicate of another sample in this report

²Respond "Y" if the sample was split and analyzed by separate laboratories.

³Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.

⁴"T" = Total; "D" = Dissolved

⁵"<" indicates a non-detect; do not use "ND" or "BDL". Value then shown is Practical Quantification Limit

⁶Facility has either/or option on Organic Carbon and (BOD) Biochemical Oxygen Demand - both are not required

⁷Flags are as designated, do not use any other type. Use "*", " then describe on "Written Comments" page.

STANDARD FLAGS:

* = See Comments

J = Estimated Value

B = Analyte found in blank

A = Average value

N = Presumptive ID

D = Concentration from analysis of
a secondary dilution factor

I-4

Division of Waste Management
Solid Waste Branch
14 Reilly Road
Frankfort, KY 40601 (502)564-6716

RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Number: SW07300014, SW07300015, SW07300045

FINDS/UNIT: KY8-890-008-982 / 1
LAB ID: None

SURFACE WATER SAMPLE ANALYSIS (S)

Monitoring Point (KPDES Discharge Number, or "UPSTREAM", or "DOWNSTREAM")		L150 INSTREAM											
Sample Sequence #		2											
If sample is a Blank, specify Type: (F)ield, (T)rip, (M)ethod, or (E)quipment		NA											
Sample Date and Time (Month/Day/Year hour: minutes)		10/11/2021 16:12											
Duplicate ("Y" or "N") ¹		N											
Split ('Y' or "N") ²		N											
Facility Sample ID Number (if applicable)		L150DUS1-22											
Laboratory Sample ID Number (if applicable)		558724001											
Date of Analysis (Month/Day/Year)		11/2/2021											
CAS RN ³		CONSTITUENT	T D ⁴	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁵	F L A G S ⁷	DETECTED VALUE OR PQL ⁵	F L A G S ⁷	DETECTED VALUE OR PQL ⁵	F L A G S ⁷	DETECTED VALUE OR PQL ⁵	F L A G S ⁷
A200-00-0	0	Flow	T	MGD	Field		*						
16887-00-6	2	Chloride(s)	T	mg/L	300.0	15.1							
14808-79-8	0	Sulfate	T	mg/L	300.0	50.9							
7439-89-6	0	Iron	T	mg/L	200.8	2.04							
7440-23-5	0	Sodium	T	mg/L	200.8	8.24							
S0268- -	0	Organic Carbon ⁶	T	mg/L	9060	6.66							
S0097- -	0	BOD ⁶	T	mg/L	not applicable		*						
S0130- -	0	Chemical Oxygen Demand	T	mg/L	410.4	23.8							

¹Respond "Y" if the sample was a duplicate of another sample in this report²Respond "Y" if the sample was split and analyzed by separate laboratories.³Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.⁴"T" = Total; "D" = Dissolved⁵"<" indicates a non-detect; do not use "ND" or "BDL". Value then shown is Practical Quantification Limit⁶Facility has either/or option on Organic Carbon and (BOD) Biochemical Oxygen Demand - both are not required⁷Flags are as designated, do not use any other type. Use "*", then describe on "Written Comments" page.

STANDARD FLAGS:

* = See Comments

J = Estimated Value

B = Analyte found in blank

A = Average value

N = Presumptive ID

D = Concentration from analysis of
a secondary dilution factor

9-I

RESIDENTIAL/CONTAINED – QUARTERLY**Facility: US DOE - Paducah Gaseous Diffusion Plant****Permit Number: SW07300014, SW07300015, SW07300045****Finds/Unit: KY8-890-008-982 / 1****LAB ID: None**

SURFACE WATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
L150	L150US1-22	Flow Rate		Analysis of constituent not required and not performed.
		Biochemical Oxygen Demand (BOD)		Analysis of constituent not required and not performed.
		Suspended Solids	*	Duplicate analysis not within control limits.
		Dissolved Solids	*	Duplicate analysis not within control limits.
		Alpha activity	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.54. Rad error is 4.53.
		Beta activity		TPU is 7.74. Rad error is 7.49.
L154	L154US1-22	Flow Rate		Analysis of constituent not required and not performed.
		Biochemical Oxygen Demand (BOD)		Analysis of constituent not required and not performed.
		Alpha activity	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.02. Rad error is 3.96.
		Beta activity		TPU is 7.74. Rad error is 7.13.
L351	L351US1-22	Flow Rate		Analysis of constituent not required and not performed.
		Biochemical Oxygen Demand (BOD)		Analysis of constituent not required and not performed.
		Alpha activity	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.79. Rad error is 4.75.
		Beta activity		TPU is 8.1. Rad error is 7.72.
QC	FB1US1-22	Flow Rate		Analysis of constituent not required and not performed.
		Total Organic Carbon (TOC)		Analysis of constituent not required and not performed.
		Biochemical Oxygen Demand (BOD)		Analysis of constituent not required and not performed.
		Chemical Oxygen Demand (COD)		Analysis of constituent not required and not performed.
		Conductivity		Analysis of constituent not required and not performed.
		Suspended Solids		Analysis of constituent not required and not performed.
		Dissolved Solids		Analysis of constituent not required and not performed.
		Total Solids		Analysis of constituent not required and not performed.
		pH		Analysis of constituent not required and not performed.
		Alpha activity	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.23. Rad error is 3.23.
		Beta activity	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.22. Rad error is 5.22.
L150	L150DUS1-22	Flow Rate		Analysis of constituent not required and not performed.
		Biochemical Oxygen Demand (BOD)		Analysis of constituent not required and not performed.
		Conductivity		Analysis of constituent not required and not performed.
		Suspended Solids	*	Duplicate analysis not within control limits.
		Dissolved Solids	*	Duplicate analysis not within control limits.
		pH		Analysis of constituent not required and not performed.
		Alpha activity	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.15. Rad error is 4.14.
		Beta activity	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.84. Rad error is 5.83.

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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 5.3 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 16th day of June 2021.

A blue ink signature of the Vice President of Accreditation Services.

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 2567.01
Valid to June 30, 2023

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
SW846 8260B		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 3535A/8082	SW846 3535A	Analysis of Polychlorinated Biphenyls by GC/ECD by ECD
SW846 6020	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 9056		Ion Chromatography
EPA 160.1		Solids, Total Dissolved
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/SW846 9320 Modified		904.0Mod, Ra228, Liquid
EPA 900.0/SW846 9310		9310, Alpha/Beta Activity, liquid
EPA 905.0 Modified/DOE RP501 Rev. 1 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

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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)		Temperature (°F)		Conductivity (umho/cm)		pH (Std Unit)	Dissolved oxygen (mg/L)	Turbidity (NTU)
MW357								MW358							
Date Collected:10/11/2021								Date Collected:10/11/2021							
0953	63.1	287	6.27	5.19	2.00			1104	62.3	352	6.18	1.20	2.28		
0956	62.3	281	6.20	5.14	2.02			1107	62.0	355	6.13	1.15	2.30		
0959	62.0	283	6.22	5.16	2.07			1110	61.9	353	6.10	1.13	2.35		
MW359								MW360							
Date Collected: 10/11/2021								Date Collected:10/11/2021							
1150	65.6	182	6.28	6.08	5.20			0735	62.2	277	7.05	2.76	10.40		
1153	65.2	179	6.18	6.02	5.40			0738	61.1	275	6.45	2.70	9.08		
1156	65.5	180	6.20	6.05	4.95			0741	60.7	272	6.14	2.80	9.60		
MW361								MW362							
Date Collected: 10/11/2021								Date Collected:10/11/2021							
0900	61.3	360	6.40	4.26	2.14			0816	62.4	450	6.67	2.75	4.57		
0903	60.9	354	6.05	4.20	2.05			0819	61.4	460	6.66	2.66	4.66		
0906	61.3	359	6.02	3.80	2.13			0822	60.9	468	6.69	2.59	4.99		
0909	61.2	355	6.03	3.83	2.16										
MW363								MW364							
Date Collected: 10/12/2021								Date Collected:10/12/2021							
0557	58.4	415	6.50	1.36	3.17			0701	59.0	409	5.96	3.50	7.10		
0600	58.5	417	6.40	0.89	3.20			0704	59.1	411	5.83	3.23	7.44		
0603	58.5	418	6.36	0.86	3.21			0707	59.2	412	5.83	3.20	7.47		
MW365								MW366							
Date Collected:10/12/2021								Date Collected: 10/12/2021							
0742	59.5	303	6.10	3.91	2.55			0825	60.9	388	6.08	4.10	2.17		
0745	58.9	300	6.05	3.70	2.50			0828	60.7	388	5.96	3.89	2.13		
0748	59.0	300	6.03	3.66	2.47			0831	60.7	390	5.96	3.88	2.09		
MW367								MW368							
Date Collected:10/12/2021								Date Collected: 10/12/2021							
0910	60.6	210	5.96	1.11	3.93			1015	60.5	497	6.25	2.68	3.02		
0913	60.7	202	5.71	0.85	4.01			1018	60.6	500	6.20	2.45	3.11		
0916	60.7	200	5.70	0.80	4.09			1021	60.6	501	6.21	2.40	3.30		
MW369								MW370							
Date Collected: 10/12/2021								Date Collected: 10/12/2021							
1100	62.5	304	6.20	3.26	5.18			1143	63.0	391	6.03	4.82	2.21		
1103	62.1	305	6.07	2.91	4.90			1146	61.7	390	5.94	4.65	2.30		
1106	61.7	305	6.00	2.82	4.85			1149	61.5	391	5.90	4.60	2.26		
MW371								MW372							
Date Collected:10/12/2021								Date Collected:10/13/2021							
1223	62.0	628	6.40	4.00	17.37			0614	60.6	479	5.93	2.58	2.2		
1226	61.6	627	6.33	3.38	17.30			0617	60.8	482	5.81	2.30	2.46		
1229	61.7	628	6.32	3.36	17.60			0620	60.8	484	5.80	2.28	2.32		
MW373								MW374							
Date Collected: 10/13/2021								Date Collected: 10/13/2021							
0711	61.2	561	5.90	2.34	2.01			0751	61.5	245	6.40	1.11	5.78		
0714	61.0	559	5.79	2.04	1.98			0754	61.2	242	6.44	0.49	6.32		
0717	60.8	560	5.77	2.00	2.11			0757	61.3	241	6.44	0.44	6.20		
MW375								MW357 Resample							
Date Collected:10/13/2021								Date Collected:12/16/2021							
0835	61.2	640	6.33	1.99	2.68			1349	58.4	413	6.09	5.33	0.0		
0838	61.3	633	6.20	1.85	2.56			1352	58.5	413	6.01	5.11	0.0		
0841	61.3	630	6.19	1.80	2.01			1355	58.4	413	6.02	5.12	0.0		

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