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May 20, 2021

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PPPO-02-10010527-21B

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Dear Mr. Hendricks and Ms. Nielsen:

**C-746-U CONTAINED LANDFILL FIRST QUARTER CALENDAR YEAR 2021  
(JANUARY–MARCH) COMPLIANCE MONITORING REPORT, PADUCAH  
GASEOUS DIFFUSION PLANT, PADUCAH, KENTUCKY, FRNP-RPT-0192/V1,  
PERMIT NUMBER SW07300014, SW07300015, SW07300045, AGENCY INTEREST ID  
NO. 3059**

The subject report for the first 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.

The statistical analyses on the first 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 first 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,



Jennifer Woodard  
Paducah Site Lead  
Portsmouth/Paducah Project Office

Enclosure:

*C-746-U Contained Landfill First Quarter Calendar Year 2021 (January–March)  
Compliance Monitoring Report at the Paducah Gaseous Diffusion Plant, Paducah,  
Kentucky, FRNP-RPT-0192/V1*

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**C-746-U Contained Landfill  
First Quarter Calendar Year 2021  
(January-March)  
Compliance Monitoring Report,  
Paducah Gaseous Diffusion Plant,  
Paducah, Kentucky**



This document is approved for public release per review by:

David Hayden  
FRNP Classification Support

05/18/2021  
Date



**C-746-U Contained Landfill  
First Quarter Calendar Year 2021  
(January-March)  
Compliance Monitoring Report,  
Paducah Gaseous Diffusion Plant,  
Paducah, Kentucky**

Date Issued—May 2021

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 First Quarter Calendar Year 2021 (January–March) 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 fourth 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 Site 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. 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.

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

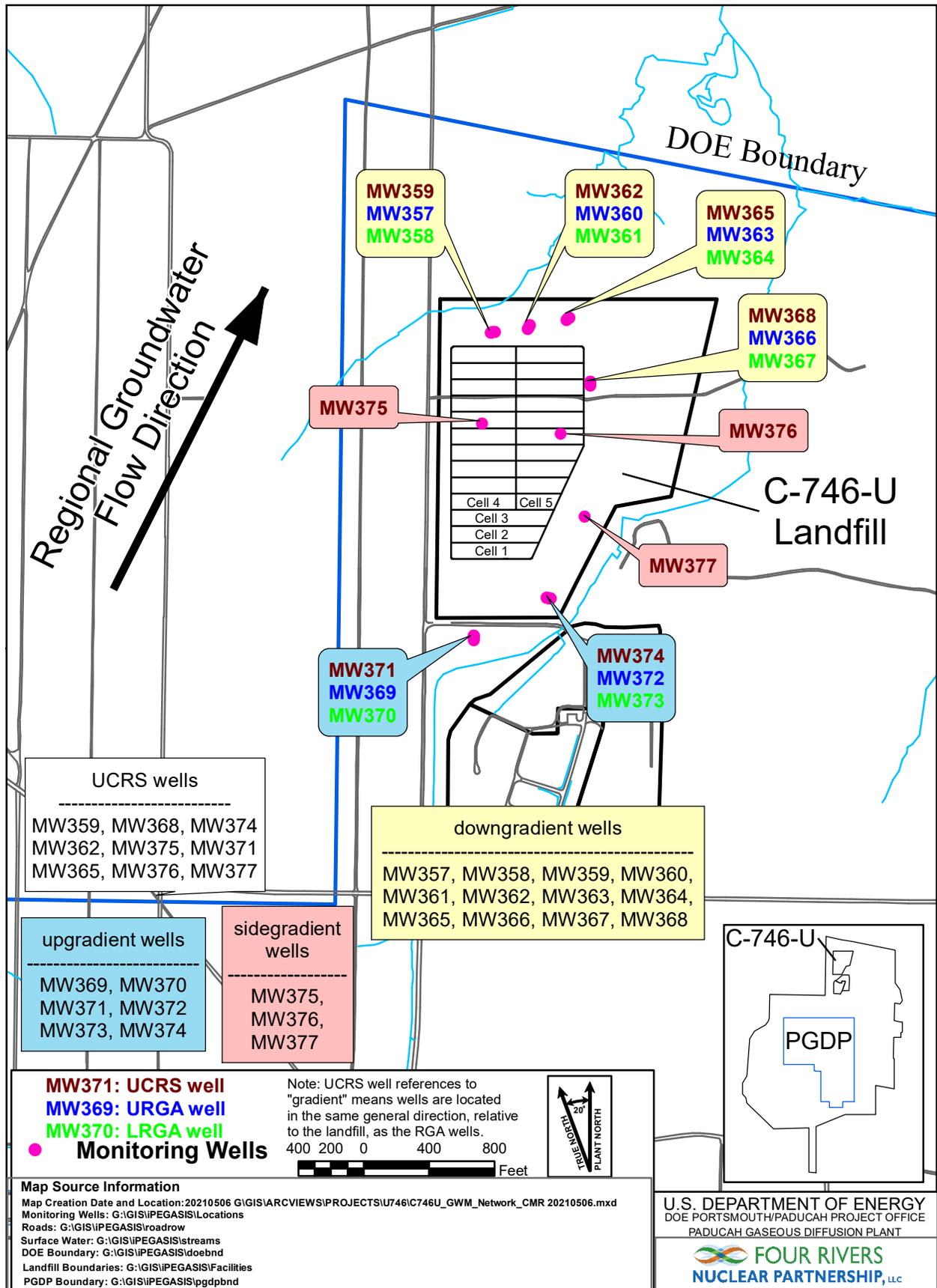


Figure 1. C-746-U Landfill Groundwater Monitoring Well Network

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 first 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 first quarter 2021 was conducted in January and March 2021. MW358 was resampled for nitrate in March due to a holding time issue attributable to the sample courier. 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 January 25, 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 39 vicinity wells define the potentiometric surface for the RGA. Typical regional flow in the RGA is northeastward, toward the Ohio River. During January, RGA groundwater flow in the area of the landfill was oriented northeastward. The hydraulic gradient for the RGA in the vicinity of the C-746-U Landfill in October was  $5.31 \times 10^{-4}$  ft/ft. The hydraulic gradients for the URGA and LRGA at the C-746-U Landfill were  $1.15 \times 10^{-3}$  ft/ft and  $1.13 \times 10^{-3}$  ft/ft, respectively. Calculated groundwater flow rates (average linear velocity) at the C-746-U Landfill range from 1.95 to 3.32 ft/day for the URGA and 1.93 to 3.29 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 March 22, 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 sampling was performed at three locations (see Figure 2) monitored for the C-746-U Landfill: (1) upstream location, L154; (2) downstream location, L351; and (3) location L150 capturing runoff from

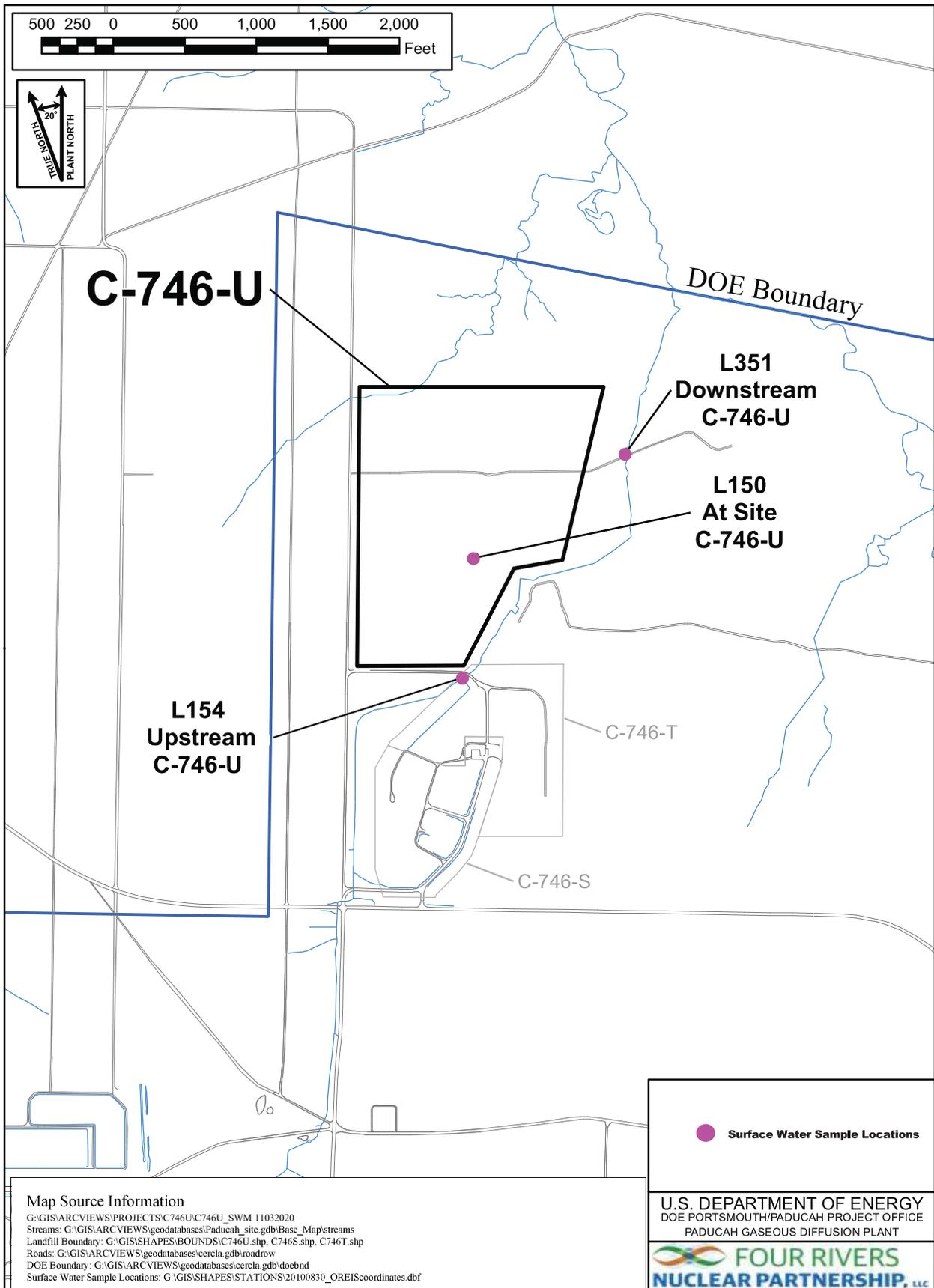


Figure 2. C-746-U Landfill Surface Water Monitoring Locations

the landfill surface. Surface water was monitored, as specified in 401 KAR 48:300 § 2, and the approved *Surface Water Monitoring Plan for C-746-U Contained Landfill Permit Number KY-073-00045, Paducah Gaseous Diffusion Plant, Paducah, Kentucky* (PRS 2008), which is Technical Application Attachment 24 of the Solid Waste Permit. Surface water results are provided in Appendix I.

### 1.3 KEY RESULTS

Groundwater data were evaluated in accordance with the approved Groundwater Monitoring Plan (LATA Kentucky 2014), which is Technical Application Attachment 25, of the Solid Waste Permit. Parameters that had concentrations that exceeded their respective MCL are listed in Table 1. Those constituents that exceeded their respective MCL were evaluated further against their historical background UTL. Table 2 identifies parameters (that do not have MCLs) with concentrations that exceeded the statistically derived historical background UTL<sup>1</sup> during the first 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	None	MW361: Trichloroethene
		MW364: Trichloroethene

**Table 2. Exceedances of Statistically Derived Historical Background Concentrations**

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

<sup>1</sup> 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.

**Table 2. Exceedance of Statistically Derived historical Background Concentrations (Continued)**

\*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

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

URGA	LRGA
MW366: Oxidation-reduction potential	MW364: pH
	MW367: pH

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 MW364, MW366, and MW367, 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.

The pH readings for MW364 and MW367, and oxidation-reduction potential in MW366 (all downgradient wells), were shown to exceed both the historical background UTL and the current background UTL; therefore, preliminarily they were considered to be Type 2 exceedances. To evaluate these preliminary Type 2 exceedances further, the parameters were subjected to the Mann-Kendall statistical test for trend using the most recent eight quarters of data. The results are summarized in Table 4. None of the wells evaluated showed an increasing Mann-Kendall trend and are considered to be a Type 1 exceedance—not attributable to the C-746-U Landfill.

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

Location	Well ID	Parameter	Sample Size	Alpha <sup>1</sup>	p-Value <sup>2</sup>	S <sup>3</sup>	Decision <sup>4</sup>
C-746-U Landfill	MW364	pH	8	0.05	-8	0.119	No Trend
	MW366	Oxidation-reduction Potential	8	0.05	6	0.274	No Trend
	MW367	pH	8	0.05	-7	0.274	No Trend

<sup>1</sup>An alpha of 0.05 represents a 95% confidence interval.

<sup>2</sup>The p-value represents the risk of acceptance the H<sub>a</sub> hypothesis of a trend, in terms of a percentage.

<sup>3</sup>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.

<sup>4</sup>The Mann-Kendall decision operates on two hypotheses; the H<sub>0</sub> and H<sub>a</sub>. H<sub>0</sub> assumes there is no trend in the data, whereas H<sub>a</sub> 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\***

<b>UCRS</b>
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 first 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 6.

**Table 6. Monitoring Wells Included in Statistical Analysis<sup>a</sup>**

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

<sup>a</sup> Map showing the monitoring well locations is shown on Figure 1.

<sup>b</sup> In the same direction (relative to the landfill) as RGA wells considered to be upgradient.

<sup>c</sup> 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, 28 parameters, including those with MCLs, required statistical analysis in the UCRS. During the first quarter, dissolved oxygen, oxidation-reduction potential, and sulfate displayed concentrations that exceeded their respective historical UTL and are listed in Table 2. The sulfate concentration in MW368 exceeded the current background UTL in downgradient wells and is listed in Table 5.

### **2.1.2 Upper Regional Gravel Aquifer**

In this quarter, 26 parameters, including those with MCLs, required statistical analysis in the URGA. During the first quarter, calcium, conductivity, dissolved solids, magnesium, oxidation-reduction potential, and sulfate displayed concentrations that exceeded their respective historical UTL and are listed in Table 2. MW366 (downgradient) exceeded the current background UTL for oxidation-reduction potential and is included in Table 3.

### **2.1.3 Lower Regional Gravel Aquifer**

In this quarter, 28 parameters, including those with MCLs, required statistical analysis in the LRGA. During the first quarter, dissolved oxygen, oxidation-reduction potential, pH, and technetium-99 displayed concentrations that exceeded their respective historical UTL and are listed in Table 2. MW364 and MW367 (downgradient) exceeded the current background UTL for pH and are included in Table 3.

## **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 were considered usable.

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### 3. PROFESSIONAL GEOLOGIST AUTHORIZATION

**DOCUMENT IDENTIFICATION:** C-746-U Contained Landfill  
First Quarter Calendar Year 2021 (January–March)  
Compliance Monitoring Report,  
Paducah Gaseous Diffusion Plant,  
Paducah, Kentucky (FRNP-RPT-0192/V1)

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



PG 113927  
K. Davis  
05-18-2021

Kenneth R. Davis  
Kenneth R. Davis

PG113927

May 18, 2021  
Date

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## 4. REFERENCES

- 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.
- PRS (Paducah Remediation Services, LLC) 2008. *Surface Water Monitoring Plan for C-746-U Contained Landfill Permit Number KY-073-00045, Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, Solid Waste Landfill Permit, Number SW07300014, SW07300015, SW07300045, Technical Application Attachment 24, Paducah Remediation Services, 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 1st Qtr. CY 2021  
SW07300015,  
SW07300045

*Please check the following as applicable:*

       Characterization   X   Quarterly        Semiannual        Annual        Assessment

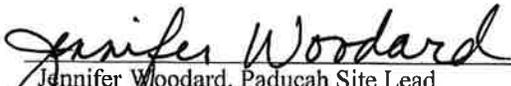
*Please check applicable submittal(s):*   X   Groundwater        Surface Water  
       Leachate        Methane Monitoring

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

5/20/21  
\_\_\_\_\_  
Date

  
\_\_\_\_\_  
Jennifer Woodard, Paducah Site Lead  
U.S. Department of Energy

5/20/21  
\_\_\_\_\_  
Date

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**APPENDIX B**  
**FACILITY INFORMATION SHEET**

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# FACILITY INFORMATION SHEET

Groundwater: January and March 2021  
Surface water: January 2021  
Methane: March 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 Kevil, Kentucky 42053  
Street City/State Zip

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

## OWNER INFORMATION

Facility Owner: U.S. DOE, Robert E. Edwards III, Manager Phone No: (859) 227-5020

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 Kevil, Kentucky 42053  
Street City/State 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 Kevil, Kentucky 42053  
Street City/State 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 Charleston, South Carolina 29407  
Street City/State Zip

## LABORATORY RECORD #2

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

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

Mailing Address: N/A N/A N/A  
Street City/State Zip

## LABORATORY RECORD #3

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

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

Mailing Address: N/A N/A N/A  
Street City/State 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  
 For Official Use Only

## GROUNDWATER SAMPLE ANALYSIS (S)

AKGWA NUMBER <sup>1</sup> , 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 (B)quipment	NA	NA	NA	NA						
Sample Date and Time (Month/Day/Year hour: minutes)	1/14/2021 09:03	1/14/2021 09:46	1/14/2021 10:22	1/14/2021 06:33						
Duplicate ("Y" or "N") <sup>2</sup>	N	N	N	N						
Split ("Y" or "N") <sup>3</sup>	N	N	N	N						
Facility Sample ID Number (if applicable)	MW357UG2-21	MW358UG2-21	MW359UG2-21	MW360UG2-21						
Laboratory Sample ID Number (if applicable)	532312001	532312003	532312005	532312009						
Date of Analysis (Month/Day/Year) For <u>Volatile Organics Analysis</u>	1/20/2021	1/21/2021	1/20/2021	1/20/2021						
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)	DOWN	DOWN	DOWN	DOWN						
CAS RN <sup>4</sup>	CONSTITUENT	T D S	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S <sup>7</sup>	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S		
24959-67-9	Bromide	T	mg/L	9056	0.368		0.227	<0.2	0.175	J
16887-00-6	Chloride(s)	T	mg/L	9056	31.6		17.4	1.18	9.01	
16984-48-8	Fluoride	T	mg/L	9056	0.174		0.212	0.15	0.226	
S0595- -	Nitrate & Nitrite	T	mg/L	9056	1.28	*		0.459	0.69	*
14808-79-8	Sulfate	T	mg/L	9056	39.2		29.3	42.9	12.5	
NS1894	Barometric Pressure Reading	T	Inches/Hg	Field	30.34		30.34	30.35	30.3	
S0145- -	Specific Conductance	T	µMHO/cm	Field	425		572	212	400	

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

<sup>1</sup>AKGWA # is 0000-0000 for any type of blank.  
<sup>2</sup>Respond "Y" if the sample was a duplicate of another sample in this report.  
<sup>3</sup>Respond "Y" if the sample was split and analyzed by separate laboratories.  
<sup>4</sup>Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.  
<sup>5</sup>m = Total; "D" = Dissolved  
<sup>6</sup>"<" indicates a non-detect; do not use "ND" or "BDL". Value shown is Practical Quantification Limit.  
<sup>7</sup>Flags 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**

**Permit Number: SW07300014, SW07300015, SW07300045**

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

LAB ID: None

For Official Use Only

**GROUNDWATER SAMPLE ANALYSIS - (Cont.)**

CAS RN <sup>4</sup>	CONSTITUENT	T D S	Unit OF MEASURE	METHOD	8004-4798		8004-4799		8004-0981		8004-4800	
					DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
S0906 - -	Static Water Level Elevation	T	Ft. MSL	Field	324.16		324.18		335.47		324.2	
N238	Dissolved Oxygen	T	mg/L	Field	4.17		0.86		5.12		1.44	
S0266- -	Total Dissolved Solids	T	mg/L	160.1	220	*	270	*	151	*	201	*
S0296- -	pH	T	Units	Field	6.01		6.22		5.87		6.1	
NS215	Eh	T	mV	Field	447		130		288		421	
S0907 - -	Temperature	T	°C	Field	13.89		14.28		15.39		12.06	
7429-90-5	Aluminum	T	mg/L	6020	<0.05		0.0899		0.0258	J	0.0459	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		0.0128		<0.005		<0.005	
7440-39-3	Barium	T	mg/L	6020	0.0676		0.0805		0.0211		0.175	
7440-41-7	Beryllium	T	mg/L	6020	<0.0005		<0.0005		<0.0005		<0.0005	
7440-42-8	Boron	T	mg/L	6020	0.334		0.164		0.0122	J	0.0358	
7440-43-9	Cadmium	T	mg/L	6020	<0.001		<0.001		<0.001		<0.001	
7440-70-2	Calcium	T	mg/L	6020	23.9		34.7		4.93		17.5	
7440-47-3	Chromium	T	mg/L	6020	<0.01		0.00463	J	<0.01		<0.01	
7440-48-4	Cobalt	T	mg/L	6020	<0.001		0.0462		<0.001		0.0017	
7440-50-8	Copper	T	mg/L	6020	0.000682	J	0.00068	J	0.000477	J	0.00177	J
7439-89-6	Iron	T	mg/L	6020	<0.1		22.9		<0.1		0.119	
7439-92-1	Lead	T	mg/L	6020	<0.002		<0.002		<0.002		<0.002	
7439-95-4	Magnesium	T	mg/L	6020	10.4		17.9		2.94		7.55	
7439-96-5	Manganese	T	mg/L	6020	0.00441	J	2.38		<0.005		0.0206	
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

For Official Use Only

**GROUNDWATER SAMPLE ANALYSIS - (Cont.)**

AKGWA NUMBER <sup>1</sup> , 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 <sup>4</sup>	CONSTITUENT	T D S	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S		
7439-98-7	Molybdenum	T	mg/L	6020	<0.001		0.000858	J	<0.001		<0.001	
7440-02-0	Nickel	T	mg/L	6020	0.000893	J	0.0767		0.00119	J	0.00153	J
7440-09-7	Potassium	T	mg/L	6020	1.58		3.17		<0.3		0.669	
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	39.7		33.3		32.7		54.4	
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		<0.0002		<0.0002	
7440-62-2	Vanadium	T	mg/L	6020	<0.02		0.00717	J	0.00527	J	<0.02	
7440-66-6	Zinc	T	mg/L	6020	<0.02		0.0191	J	<0.02		<0.02	
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

For Official Use Only

**GROUNDWATER SAMPLE ANALYSIS - (Cont.)**

AKGWA NUMBER <sup>1</sup> , 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 <sup>4</sup>	CONSTITUENT	T D S	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	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	0.00266		0.00446		<0.001	J

**RESIDENTIAL/CONTAINED-QUARTERLY**

**Facility: USDOE - Paducah Gaseous Diffusion Plant**

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

**Permit Number: SW07300014, SW07300015, SW07300045**

LAB ID: None

For Official Use Only

**GROUNDWATER SAMPLE ANALYSIS - (Cont.)**

ARGWA NUMBER <sup>1</sup> , 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 <sup>4</sup>	CONSTITUENT	T D S	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	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	<0.0000191		<0.0000188		<0.0000188	
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	<0.0956		<0.0963		<0.0974	
12674-11-2	PCB-1016	T	ug/L	8082	<0.0956		<0.0963		<0.0974	
11104-28-2	PCB-1221	T	ug/L	8082	<0.0956		<0.0963		<0.0974	
11141-16-5	PCB-1232	T	ug/L	8082	<0.0956		<0.0963		<0.0974	
53469-21-9	PCB-1242	T	ug/L	8082	<0.0956		<0.0963		<0.0974	
12672-29-6	PCB-1248	T	ug/L	8082	<0.0956		<0.0963		<0.0974	



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  
 For Official Use Only

## GROUNDWATER SAMPLE ANALYSIS (S)

AKGWA NUMBER <sup>1</sup> , 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 (B)quipment								
Sample Date and Time (Month/Day/Year hour: minutes)	1/14/2021 07:31	1/14/2021 08:23	1/19/2021 07:09	1/19/2021 08:09				
Duplicate ("Y" or "N") <sup>2</sup>								
Split ("Y" or "N") <sup>3</sup>								
Facility Sample ID Number (if applicable)	MW361UG2-21	MW362UG2-21	MW363UG2-21	MW364UG2-21				
Laboratory Sample ID Number (if applicable)	532312011	532312013	532475001	532475003				
Date of Analysis (Month/Day/Year) For <u>Volatile Organics Analysis</u>								
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)								
CAS RN <sup>4</sup>	CONSTITUENT	T D S	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S <sup>7</sup>	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
24959-67-9	Bromide	T	mg/L	9056	0.469		<0.2	J
16887-00-6	Chloride(s)	T	mg/L	9056	35.3		3.91	*
16984-48-8	Fluoride	T	mg/L	9056	0.182		0.36	
S0595- -	Nitrate & Nitrite	T	mg/L	9056	0.986	*	0.513	*
14808-79-8	Sulfate	T	mg/L	9056	82.2		30.3	
NS1894	Barometric Pressure Reading	T	Inches/Hg	Field	30.32		30.32	
S0145- -	Specific Conductance	T	µMHO/cm	Field	525		727	
							0.449	
							34.2	*
							0.213	
							8.21	
							26.6	
							30.22	
							450	
								470

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

<sup>1</sup>AKGWA # is 0000-0000 for any type of blank.  
<sup>2</sup>Respond "Y" if the sample was a duplicate of another sample in this report.  
<sup>3</sup>Respond "Y" if the sample was split and analyzed by separate laboratories.  
<sup>4</sup>Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.  
<sup>5</sup>m = Total; "D" = Dissolved  
<sup>6</sup>"<" indicates a non-detect; do not use "ND" or "BDL". Value shown is Practical Quantification Limit.  
<sup>7</sup>Flags 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**

**Permit Number: SW07300014, SW07300015, SW07300045**

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

LAB ID: None

For Official Use Only

**GROUNDWATER SAMPLE ANALYSIS - (Cont.)**

AKGWA NUMBER <sup>1</sup> , 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 <sup>4</sup>	CONSTITUENT	T D S	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S		
S0906 - -	Static Water Level Elevation	T	Ft. MSL	Field	323.9		339.35		323.54		322.78	
N238	Dissolved Oxygen	T	mg/L	Field	3.38		2.16		0.84		3.24	
S0266- -	Total Dissolved Solids	T	mg/L	160.1	284	*	386	*	259		287	
S0296- -	pH	T	Units	Field	5.9		6.8		5.94		5.79	
NS215	Eh	T	mV	Field	466		436		425		461	
S0907 - -	Temperature	T	°C	Field	13.44		13.89		12.56		13.72	
7429-90-5	Aluminum	T	mg/L	6020	<0.05		0.0387	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	0.0504		0.0979		0.143		0.0584	
7440-41-7	Beryllium	T	mg/L	6020	<0.0005		<0.0005		<0.0005		<0.0005	
7440-42-8	Boron	T	mg/L	6020	0.102		0.0195		0.0194		0.049	
7440-43-9	Cadmium	T	mg/L	6020	<0.001		<0.001		<0.001		<0.001	
7440-70-2	Calcium	T	mg/L	6020	31.7		20.1		29.5		33.5	
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		<0.001		0.00122		<0.001	
7440-50-8	Copper	T	mg/L	6020	0.000768	J	0.000974	J	0.00345	B	0.00207	B
7439-89-6	Iron	T	mg/L	6020	<0.1		<0.1		0.0388	J	<0.1	
7439-92-1	Lead	T	mg/L	6020	<0.002		<0.002		<0.002		<0.002	
7439-95-4	Magnesium	T	mg/L	6020	14.4		9.18		12.3		14.5	
7439-96-5	Manganese	T	mg/L	6020	0.00123	J	0.00203	J	0.2		0.00332	J
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**

**Permit Number: SW07300014, SW07300015, SW07300045**

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

LAB ID: None

For Official Use Only

**GROUNDWATER SAMPLE ANALYSIS - (Cont.)**

CAS RN <sup>4</sup>	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	8004-4795		8004-4796		8004-4797	
					DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
	Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)				361	362	363	364		
7439-98-7	Molybdenum	T	mg/L	6020	<0.001	0.000508	0.000219	0.000282	BJ	BJ
7440-02-0	Nickel	T	mg/L	6020	0.000772	0.000908	0.0209	0.00277		
7440-09-7	Potassium	T	mg/L	6020	2.37	0.305	2.01	2.04		
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	43.8	127	41.8	42.3		
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	0.00332	<0.0002	<0.0002		
7440-62-2	Vanadium	T	mg/L	6020	<0.02	<0.02	0.00521	<0.02	BJ	BJ
7440-66-6	Zinc	T	mg/L	6020	<0.02	<0.02	0.00604	0.0118	J	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

For Official Use Only

**GROUNDWATER SAMPLE ANALYSIS - (Cont.)**

AKGWA NUMBER <sup>1</sup> , 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 <sup>4</sup>	CONSTITUENT	T D S	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	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	0.00788		<0.001		0.00079	J
									0.00715	

**RESIDENTIAL/CONTAINED-QUARTERLY**

**Facility: USDOE - Paducah Gaseous Diffusion Plant**

**Permit Number: SW07300014, SW07300015, SW07300045**

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

LAB ID: None

For Official Use Only

**GROUNDWATER SAMPLE ANALYSIS - (Cont.)**

ARGWA NUMBER <sup>1</sup> , 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 <sup>4</sup>	CONSTITUENT	T D S	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	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	<0.0000192		<0.0000188		<0.0000206	
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	<0.1		<0.0974		<0.1	
12674-11-2	PCB-1016	T	ug/L	8082	<0.1		<0.0974		<0.0973	
11104-28-2	PCB-1221	T	ug/L	8082	<0.1		<0.0974		<0.0973	
11141-16-5	PCB-1232	T	ug/L	8082	<0.1		<0.0974		<0.0973	
53469-21-9	PCB-1242	T	ug/L	8082	<0.1		<0.0974		<0.0973	
12672-29-6	PCB-1248	T	ug/L	8082	<0.1		<0.0974		<0.0973	



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  
 For Official Use Only

## GROUNDWATER SAMPLE ANALYSIS (S)

CAS RN <sup>4</sup>	CONSTITUENT	T D S	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S <sup>7</sup>	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
24959-67-9	Bromide	T	mg/L	9056	<0.2		0.151	J	<0.2	
16887-00-6	Chloride (s)	T	mg/L	9056	2.64	*	10.6	*	4.41	*
16984-48-8	Fluoride	T	mg/L	9056	0.341		0.12		0.245	
S0595- -	Nitrate & Nitrite	T	mg/L	9056	0.877		<0.1		<0.1	
14808-79-8	Sulfate	T	mg/L	9056	60.6		24.3		126	
NS1894	Barometric Pressure Reading	T	Inches/Hg	Field	30.25		30.31		30.31	
S0145- -	Specific Conductance	T	µMHO/cm	Field	383		245		642	
AKGWA NUMBER <sup>1</sup> , 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 (B)equipment										
Sample Date and Time (Month/Day/Year hour: minutes)					1/19/2021 08:48	1/19/2021 09:28	1/19/2021 10:09	1/19/2021 10:47		
Duplicate ("Y" or "N") <sup>2</sup>										
Split ("Y" or "N") <sup>3</sup>										
Facility Sample ID Number (if applicable)					MW365UG2-21	MW366UG2-21	MW367UG2-21	MW368UG2-21		
Laboratory Sample ID Number (if applicable)					532475005	532475007	532475009	532475011		
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis										
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)										
					DOWN	DOWN	DOWN	DOWN		

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
- <sup>1</sup>AKGWA # is 0000-0000 for any type of blank.  
<sup>2</sup>Respond "Y" if the sample was a duplicate of another sample in this report.  
<sup>3</sup>Respond "Y" if the sample was split and analyzed by separate laboratories.  
<sup>4</sup>Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.  
<sup>5</sup>m = Total; "D" = Dissolved  
<sup>6</sup>"<" indicates a non-detect; do not use "ND" or "BDL". Value shown is Practical Quantification Limit.  
<sup>7</sup>Flags 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**

**Permit Number: SW07300014, SW07300015, SW07300045**

FINDS/UNIT: KY8-890-008-982 / 1  
LAB ID: None  
For Official Use Only

**GROUNDWATER SAMPLE ANALYSIS - (Cont.)**

CAS RN <sup>4</sup>	CONSTITUENT	T D S	Unit OF MEASURE	METHOD	8004-0984		8004-0982		8004-4793		8004-0983	
					DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
	Facility Well/Spring Number				365		366		367		368	
	Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)											
S0906 - -	Static Water Level Elevation	T	Ft. MSL	Field	332.07		323.39		323.63		344.76	
N238	Dissolved Oxygen	T	mg/L	Field	6.08		3.08		0.8		1.32	
S0266- -	Total Dissolved Solids	T	mg/L	160.1	243		223		130		414	
S0296- -	pH	T	Units	Field	6.12		5.96		5.73		6.18	
NS215	Eh	T	mV	Field	451		477		278		291	
S0907 - -	Temperature	T	°C	Field	13.56		14.61		14.72		14.72	
7429-90-5	Aluminum	T	mg/L	6020	0.023	J	<0.05		<0.05		0.103	
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		0.00244	J	0.00361	J
7440-39-3	Barium	T	mg/L	6020	0.0814		0.101		0.131		0.0481	
7440-41-7	Beryllium	T	mg/L	6020	<0.0005		<0.0005		<0.0005		<0.0005	
7440-42-8	Boron	T	mg/L	6020	<0.015		0.0786		0.0195		<0.015	
7440-43-9	Cadmium	T	mg/L	6020	<0.001		<0.001		<0.001		<0.001	
7440-70-2	Calcium	T	mg/L	6020	19.7		26.9		13.9		59.3	
7440-47-3	Chromium	T	mg/L	6020	<0.01		<0.01		<0.01		<0.01	
7440-48-4	Cobalt	T	mg/L	6020	0.00135		<0.001		0.00739		<0.001	
7440-50-8	Copper	T	mg/L	6020	0.00487	B	0.00119	BJ	0.00119	BJ	0.000877	BJ
7439-89-6	Iron	T	mg/L	6020	<0.1		<0.1		5.15		0.0734	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	9.72		12		7.82		13.9	
7439-96-5	Manganese	T	mg/L	6020	0.00419	J	0.00265	J	1.54		0.00737	
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

For Official Use Only

**GROUNDWATER SAMPLE ANALYSIS - (Cont.)**

CAS RN <sup>4</sup>	CONSTITUENT	T D S	Unit OF MEASURE	METHOD	8004-0984		8004-0982		8004-4793		8004-0983	
					DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
	Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)				365	366	367	368				
7439-98-7	Molybdenum	T	mg/L	6020	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.000676	BJ
7440-02-0	Nickel	T	mg/L	6020	0.00671	0.00178	0.00439	0.00213				
7440-09-7	Potassium	T	mg/L	6020	0.243	1.82	2.81	0.567				
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	0.00309	<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	58.3	43.1	18.7	75.7				
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	0.00021	<0.0002	<0.0002	0.000226				
7440-62-2	Vanadium	T	mg/L	6020	0.0052	0.00428	0.00409	0.0035	BJ			BJ
7440-66-6	Zinc	T	mg/L	6020	0.00757	<0.02	0.0154	0.00661	J			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

For Official Use Only

**GROUNDWATER SAMPLE ANALYSIS - (Cont.)**

AKGWA NUMBER <sup>1</sup> , 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 <sup>4</sup>	CONSTITUENT	T D S	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	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		0.00313		0.00077	J

**RESIDENTIAL/CONTAINED-QUARTERLY**

**Facility: USDOE - Paducah Gaseous Diffusion Plant**

**Permit Number: SW07300014, SW07300015, SW07300045**

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

LAB ID: None

For Official Use Only

**GROUNDWATER SAMPLE ANALYSIS - (Cont.)**

AKGWA NUMBER <sup>1</sup> , 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 <sup>4</sup>	CONSTITUENT	T D S	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	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	<0.0000206		<0.0000205		<0.0000202	
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	0.051	J	<0.101		<0.0987	
12674-11-2	PCB-1016	T	ug/L	8082	<0.0985		<0.101		<0.0987	
11104-28-2	PCB-1221	T	ug/L	8082	<0.0985		<0.101		<0.0987	
11141-16-5	PCB-1232	T	ug/L	8082	<0.0985		<0.101		<0.0987	
53469-21-9	PCB-1242	T	ug/L	8082	0.051	J	<0.101		<0.0987	
12672-29-6	PCB-1248	T	ug/L	8082	<0.0985		<0.101		<0.0987	



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  
 For Official Use Only

**GROUNDWATER SAMPLE ANALYSIS (S)**

AKGWA NUMBER <sup>1</sup> , 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 (B)quipment												
Sample Date and Time (Month/Day/Year hour: minutes)	1/20/2021 07:19	1/20/2021 08:17	1/20/2021 08:54	1/20/2021 09:37								
Duplicate ("Y" or "N") <sup>2</sup>	N	N	N	N								
Split ("Y" or "N") <sup>3</sup>	N	N	N	N								
Facility Sample ID Number (if applicable)	MW369UG2-21	MW370UG2-21	MW371UG2-21	MW372UG2-21								
Laboratory Sample ID Number (if applicable)	532565001	532565003	532565005	532565007								
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis	1/26/2021	1/26/2021	1/26/2021	1/26/2021								
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)												
CAS RN <sup>4</sup>	CONSTITUENT	T D S	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S <sup>7</sup>	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S				
24959-67-9	Bromide	T	mg/L	9056	0.343		0.464		<0.2		0.51	
16887-00-6	Chloride (s)	T	mg/L	9056	29.8	*	36.7	*	3.4	*	38.4	*
16984-48-8	Fluoride	T	mg/L	9056	0.232		0.219		0.229		0.194	
S0595- -	Nitrate & Nitrite	T	mg/L	9056	0.838		1.12		0.116	J	1.19	
14808-79-8	Sulfate	T	mg/L	9056	5.86		20.9		29.2		156	
NS1894	Barometric Pressure Reading	T	Inches/Hg	Field	30.37		30.38		30.39		30.39	
S0145- -	Specific Conductance	T	µMHO/cm	Field	373		464		641		822	

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

<sup>1</sup>AKGWA # is 0000-0000 for any type of blank.  
<sup>2</sup>Respond "Y" if the sample was a duplicate of another sample in this report.  
<sup>3</sup>Respond "Y" if the sample was split and analyzed by separate laboratories.  
<sup>4</sup>Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.  
<sup>5</sup>m = Total; "D" = Dissolved  
<sup>6</sup>"<" indicates a non-detect; do not use "ND" or "BDL". Value shown is Practical Quantification Limit.  
<sup>7</sup>Flags 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

For Official Use Only

**GROUNDWATER SAMPLE ANALYSIS - (Cont.)**

CAS RN <sup>4</sup>	CONSTITUENT	T D S	Unit OF MEASURE	METHOD	8004-4820		8004-4818		8004-4819		8004-4808	
					DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
	Facility Well/Spring Number				369	370	371	372				
	Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)											
S0906 - -	Static Water Level Elevation	T	Ft. MSL	Field	324.58	324.81	342.42	324.68				
N238	Dissolved Oxygen	T	mg/L	Field	1.88	4.3	1.6	2.13				
S0266- -	Total Dissolved Solids	T	mg/L	160.1	191	210	347	447	*	*	*	*
S0296- -	pH	T	Units	Field	5.98	5.79	6.39	6.04				
NS215	Eh	T	mV	Field	350	395	296	362				
S0907 - -	Temperature	T	°C	Field	13.72	14.5	14.67	14.89				
7429-90-5	Aluminum	T	mg/L	6020	0.0351	<0.05	24.9	<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	0.00606	<0.005				
7440-39-3	Barium	T	mg/L	6020	0.354	0.241	0.174	0.0638				
7440-41-7	Beryllium	T	mg/L	6020	<0.0005	<0.0005	0.00103	<0.0005				
7440-42-8	Boron	T	mg/L	6020	0.0147	0.27	0.0106	1.39				
7440-43-9	Cadmium	T	mg/L	6020	<0.001	<0.001	<0.001	<0.001				
7440-70-2	Calcium	T	mg/L	6020	15.4	28.3	62.8	67.5				
7440-47-3	Chromium	T	mg/L	6020	<0.01	<0.01	0.028	<0.01				
7440-48-4	Cobalt	T	mg/L	6020	0.00382	<0.001	0.00408	<0.001				
7440-50-8	Copper	T	mg/L	6020	0.00341	0.00128	0.0117	0.00142				
7439-89-6	Iron	T	mg/L	6020	0.167	<0.1	14.2	<0.1				
7439-92-1	Lead	T	mg/L	6020	<0.002	<0.002	0.0106	<0.002				
7439-95-4	Magnesium	T	mg/L	6020	6.85	12.9	16	24.1				
7439-96-5	Manganese	T	mg/L	6020	0.0167	0.00196	0.3	<0.005				
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

For Official Use Only

**GROUNDWATER SAMPLE ANALYSIS - (Cont.)**

CAS RN <sup>4</sup>	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	8004-4820		8004-4818		8004-4819		8004-4808	
					DETECTED VALUE OR PQL <sup>6</sup>	F L A G S						
	Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)				369		370		371		372	
7439-98-7	Molybdenum	T	mg/L	6020	0.000208	J	<0.001		0.00105		<0.001	
7440-02-0	Nickel	T	mg/L	6020	0.00505		0.00254		0.0204		0.00145	J
7440-09-7	Potassium	T	mg/L	6020	0.505		2.69		1.57		2.21	
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		0.00151		<0.001	
7440-23-5	Sodium	T	mg/L	6020	53.9		43.1		60.8		64	
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		0.00228		<0.0002	
7440-62-2	Vanadium	T	mg/L	6020	0.00332	J	<0.02		0.0432		<0.02	
7440-66-6	Zinc	T	mg/L	6020	0.00591	J	<0.02		0.0432		<0.02	
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

For Official Use Only

**GROUNDWATER SAMPLE ANALYSIS - (Cont.)**

ARGWA NUMBER <sup>1</sup> , 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 <sup>4</sup>	CONSTITUENT	T D S	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	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	0.00147		0.00086	J	<0.001	0.00341

**RESIDENTIAL/CONTAINED-QUARTERLY**

**Facility: USDOE - Paducah Gaseous Diffusion Plant**

**Permit Number: SW07300014, SW07300015, SW07300045**

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

LAB ID: None

For Official Use Only

**GROUNDWATER SAMPLE ANALYSIS - (Cont.)**

ARGWA NUMBER <sup>1</sup> , 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 <sup>4</sup>	CONSTITUENT	T D S	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	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	<0.0000204		<0.0000205		<0.0000203	
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	<0.1		<0.0982		<0.0981	
12674-11-2	PCB-1016	T	ug/L	8082	<0.1		<0.0982		<0.0981	
11104-28-2	PCB-1221	T	ug/L	8082	<0.1		<0.0982		<0.0981	
11141-16-5	PCB-1232	T	ug/L	8082	<0.1		<0.0982		<0.0981	
53469-21-9	PCB-1242	T	ug/L	8082	<0.1		<0.0982		<0.0981	
12672-29-6	PCB-1248	T	ug/L	8082	<0.1		<0.0982		<0.0981	



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  
 For Official Use Only

## GROUNDWATER SAMPLE ANALYSIS (S)

CAS RN <sup>4</sup>	CONSTITUENT	T D S	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S <sup>7</sup>	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
8004-4792	8004-4990	8004-0985	8004-0988							
	AGWA NUMBER <sup>1</sup> , Facility Well/Spring Number									
	Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)									
	Sample Sequence #									
	If sample is a Blank, specify Type: (F)ield, (T)rip, (M)ethod, or (B)equipment									
	Sample Date and Time (Month/Day/Year hour: minutes)									
	Duplicate ("Y" or "N") <sup>2</sup>									
	Split ("Y" or "N") <sup>3</sup>									
	Facility Sample ID Number (if applicable)									
	Laboratory Sample ID Number (if applicable)									
	Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis									
	Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)									
24959-67-9	Bromide	T	mg/L	9056	0.565		0.647		<0.2	*
16887-00-6	Chloride (s)	T	mg/L	9056	39	*	57.4	*	3.56	*
16984-48-8	Fluoride	T	mg/L	9056	0.196		0.264		0.317	*
S0595- -	Nitrate & Nitrite	T	mg/L	9056	1.12		<0.1		1.1	*
14808-79-8	Sulfate	T	mg/L	9056	170		10.7		24	*
NS1894	Barometric Pressure Reading	T	Inches/Hg	Field	30.4		30.37		30.37	*
S0145- -	Specific Conductance	T	µMHO/cm	Field	854		713		344	*

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

<sup>1</sup>AKGWA # is 0000-0000 for any type of blank.  
<sup>2</sup>Respond "Y" if the sample was a duplicate of another sample in this report.  
<sup>3</sup>Respond "Y" if the sample was split and analyzed by separate laboratories.  
<sup>4</sup>Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.  
<sup>5</sup>m = Total; "D" = Dissolved  
<sup>6</sup>"<" indicates a non-detect; do not use "ND" or "BDL". Value shown is Practical Quantification Limit.  
<sup>7</sup>Flags 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**

**Permit Number: SW07300014, SW07300015, SW07300045**

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

LAB ID: None

For Official Use Only

**GROUNDWATER SAMPLE ANALYSIS - (Cont.)**

AKGWA NUMBER <sup>1</sup> , 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 <sup>4</sup>	CONSTITUENT	T D S	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
S0906 - -	Static Water Level Elevation	T	Ft. MSL	Field	324.65		339.15		337.72	
N238	Dissolved Oxygen	T	mg/L	Field	1.8		0.92		0.95	
S0266- -	Total Dissolved Solids	T	mg/L	160.1	484	*	341	*	169	*
S0296- -	pH	T	Units	Field	6.05		6.69		6.3	
NS215	Eh	T	mV	Field	372		145		297	
S0907 - -	Temperature	T	°C	Field	15.28		15.67		15.22	
7429-90-5	Aluminum	T	mg/L	6020	0.0399	J	<0.05		0.0356	J
7440-36-0	Antimony	T	mg/L	6020	<0.003		<0.003		<0.003	
7440-38-2	Arsenic	T	mg/L	6020	<0.005		0.00349	J	<0.005	
7440-39-3	Barium	T	mg/L	6020	0.0308		0.143		0.165	
7440-41-7	Beryllium	T	mg/L	6020	<0.0005		<0.0005		<0.0005	
7440-42-8	Boron	T	mg/L	6020	2.1		0.03		0.0148	J
7440-43-9	Cadmium	T	mg/L	6020	<0.001		<0.001		<0.001	
7440-70-2	Calcium	T	mg/L	6020	71		22.8		12.9	
7440-47-3	Chromium	T	mg/L	6020	<0.01		<0.01		<0.01	
7440-48-4	Cobalt	T	mg/L	6020	0.000536	J	0.000838	J	<0.001	
7440-50-8	Copper	T	mg/L	6020	0.00115	J	0.000649	J	0.000692	J
7439-89-6	Iron	T	mg/L	6020	0.0362	J	1.31		0.0479	J
7439-92-1	Lead	T	mg/L	6020	<0.002		<0.002		<0.002	
7439-95-4	Magnesium	T	mg/L	6020	27.2		5.83		5.5	
7439-96-5	Manganese	T	mg/L	6020	0.0185		0.193		0.00285	J
7439-97-6	Mercury	T	mg/L	7470	<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

For Official Use Only

**GROUNDWATER SAMPLE ANALYSIS - (Cont.)**

CAS RN <sup>4</sup>	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	8004-4792		8004-0990		8004-0985		8004-0988	
					DETECTED VALUE OR PQL <sup>6</sup>	F L A G S						
	Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)				373		374		375		376	
7439-98-7	Molybdenum	T	mg/L	6020	0.000584	J	0.000434	J	<0.001			*
7440-02-0	Nickel	T	mg/L	6020	0.0027		0.00149	J	0.00133	J		*
7440-09-7	Potassium	T	mg/L	6020	2.78		0.554	J	0.283	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		0.00203	J		*
7440-22-4	Silver	T	mg/L	6020	<0.001		<0.001		<0.001			*
7440-23-5	Sodium	T	mg/L	6020	64		131		55.5			*
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	0.000068	J	0.000192	J	<0.0002			*
7440-62-2	Vanadium	T	mg/L	6020	<0.02		<0.02		<0.02			*
7440-66-6	Zinc	T	mg/L	6020	<0.02		<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

For Official Use Only

**GROUNDWATER SAMPLE ANALYSIS - (Cont.)**

AKGWA NUMBER <sup>1</sup> , 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 <sup>4</sup>	CONSTITUENT	T D S	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	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	0.00454		<0.001		<0.001	*

**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

For Official Use Only

**GROUNDWATER SAMPLE ANALYSIS - (Cont.)**

ARGWA NUMBER <sup>1</sup> , 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 <sup>4</sup>	CONSTITUENT	T D S	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	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	<0.0000201		<0.0000202		<0.0000211		*
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	<0.1		<0.1		<0.0999		*
12674-11-2	PCB-1016	T	ug/L	8082	<0.1		<0.1		<0.0999		*
11104-28-2	PCB-1221	T	ug/L	8082	<0.1		<0.1		<0.0999		*
11141-16-5	PCB-1232	T	ug/L	8082	<0.1		<0.1		<0.0999		*
53469-21-9	PCB-1242	T	ug/L	8082	<0.1		<0.1		<0.0999		*
12672-29-6	PCB-1248	T	ug/L	8082	<0.1		<0.1		<0.0999		*



Division of Waste Management  
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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  
 For Official Use Only

## GROUNDWATER SAMPLE ANALYSIS (S)

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number	8004-0989	0000-0000	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	1/14/2021 05:55	1/14/2021 06:36	1/14/2021 05:50				
Duplicate ("Y" or "N") <sup>2</sup>	N	N	N	N				
Split ("Y" or "N") <sup>3</sup>	N	N	N	N				
Facility Sample ID Number (if applicable)	NA	R1UG2-21	FB1UG2-21	TB1UG2-21				
Laboratory Sample ID Number (if applicable)	NA	532312016	532312015	532312017				
Date of Analysis (Month/Day/Year) For <u>Volatile Organics Analysis</u>	NA	1/21/2021	1/21/2021	1/21/2021				
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)	SIDE							
CAS RN <sup>4</sup>	CONSTITUENT	TID <sup>5</sup>	Unit OF MEASURE	METHO D	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S <sup>7</sup>	DETECTED VALUE OR PQL <sup>6</sup>	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	µMHO/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

<sup>1</sup>AKGWA # is 0000-0000 for any type of blank.  
<sup>2</sup>Respond "Y" if the sample was a duplicate of another sample in this report.  
<sup>3</sup>Respond "Y" if the sample was split and analyzed by separate laboratories.  
<sup>4</sup>Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.  
<sup>5</sup>"m" = Total; "D" = Dissolved  
<sup>6</sup>"z" indicates a non-detect; do not use "ND" or "BDL". Value shown is Practical Quantification Limit.  
<sup>7</sup>Flags 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

For Official Use Only

**GROUNDWATER SAMPLE ANALYSIS - (Cont.)**

AKGWA NUMBER <sup>1</sup> , 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 <sup>4</sup>	CONSTITUENT	T D S	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>
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	*	<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	*	<0.005	*	<0.005
7440-39-3	Barium	T	mg/L	6020	<0.004	*	<0.004	*	<0.004
7440-41-7	Beryllium	T	mg/L	6020	<0.0005	*	<0.0005	*	<0.0005
7440-42-8	Boron	T	mg/L	6020	<0.015	*	<0.015	*	<0.015
7440-43-9	Cadmium	T	mg/L	6020	<0.001	*	<0.001	*	<0.001
7440-70-2	Calcium	T	mg/L	6020	<0.2	*	<0.2	*	<0.2
7440-47-3	Chromium	T	mg/L	6020	<0.01	*	<0.01	*	<0.01
7440-48-4	Cobalt	T	mg/L	6020	<0.001	*	<0.001	*	<0.001
7440-50-8	Copper	T	mg/L	6020	<0.002	*	<0.002	*	<0.002
7439-89-6	Iron	T	mg/L	6020	<0.1	*	<0.1	*	<0.1
7439-92-1	Lead	T	mg/L	6020	<0.002	*	<0.002	*	<0.002
7439-95-4	Magnesium	T	mg/L	6020	<0.03	*	<0.03	*	<0.03
7439-96-5	Manganese	T	mg/L	6020	<0.005	*	<0.005	*	<0.005
7439-97-6	Mercury	T	mg/L	7470	<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

For Official Use Only

**GROUNDWATER SAMPLE ANALYSIS - (Cont.)**

CAS RN <sup>4</sup>	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	8004-0989		0000-0000		0000-0000		0000-0000	
					DETECTED VALUE OR PQL <sup>6</sup>	F L A G S						
	Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)				377		E. BLANK		F. BLANK		T. BLANK 1	
7439-98-7	Molybdenum	T	mg/L	6020		*	<0.001		<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		*	<0.005		<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

For Official Use Only

**GROUNDWATER SAMPLE ANALYSIS - (Cont.)**

AKGWA NUMBER <sup>1</sup> , 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 <sup>4</sup>	CONSTITUENT	T D S	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>
75-27-4	Bromodichloromethane	T	mg/L	8260		*	<0.001		<0.001
75-25-2	Tribromomethane	T	mg/L	8260		*	<0.001		<0.001
74-83-9	Methyl bromide	T	mg/L	8260		*	<0.001		<0.001
78-93-3	Methyl ethyl ketone	T	mg/L	8260		*	<0.005		<0.005
110-57-6	trans-1,4-Dichloro-2-butene	T	mg/L	8260		*	<0.005		<0.005
75-15-0	Carbon disulfide	T	mg/L	8260		*	<0.005		<0.005
75-00-3	Chloroethane	T	mg/L	8260		*	<0.001		<0.001
67-66-3	Chloroform	T	mg/L	8260		*	<0.001		<0.001
74-87-3	Methyl chloride	T	mg/L	8260		*	<0.001		<0.001
156-59-2	cis-1,2-Dichloroethene	T	mg/L	8260		*	<0.001		<0.001
74-95-3	Methylene bromide	T	mg/L	8260		*	<0.001		<0.001
75-34-3	1,1-Dichloroethane	T	mg/L	8260		*	<0.001		<0.001
107-06-2	1,2-Dichloroethane	T	mg/L	8260		*	<0.001		<0.001
75-35-4	1,1-Dichloroethylene	T	mg/L	8260		*	<0.001		<0.001
106-93-4	Ethane, 1,2-dibromo	T	mg/L	8260		*	<0.001		<0.001
79-34-5	Ethane, 1,1,2,2-Tetrachloro	T	mg/L	8260		*	<0.001		<0.001
71-55-6	Ethane, 1,1,1-Trichloro-	T	mg/L	8260		*	<0.001		<0.001
79-00-5	Ethane, 1,1,2-Trichloro	T	mg/L	8260		*	<0.001		<0.001
630-20-6	Ethane, 1,1,1,2-Tetrachloro	T	mg/L	8260		*	<0.001		<0.001
75-01-4	Vinyl chloride	T	mg/L	8260		*	<0.001		<0.001
127-18-4	Ethene, Tetrachloro-	T	mg/L	8260		*	<0.001		<0.001
79-01-6	Ethene, Trichloro-	T	mg/L	8260		*	<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

For Official Use Only

**GROUNDWATER SAMPLE ANALYSIS - (Cont.)**

ARGWA NUMBER <sup>1</sup> , Facility Well/Spring Number	8004-0989	0000-0000	0000-0000	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	F. BLANK	T. BLANK 1						
CAS RN <sup>4</sup>	CONSTITUENT	T ID <sup>5</sup>	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	FLA G S	DETECTED VALUE OR PQL <sup>6</sup>	FLA G S	DETECTED VALUE OR PQL <sup>6</sup>	FLA 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		*	<0.0000187		<0.0000191		<0.000019	
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		*	<0.0979		<0.0944		<0.0944	*
12674-11-2	PCB-1016	T	ug/L	8082		*	<0.0979		<0.0944		<0.0944	*
11104-28-2	PCB-1221	T	ug/L	8082		*	<0.0979		<0.0944		<0.0944	*
11141-16-5	PCB-1232	T	ug/L	8082		*	<0.0979		<0.0944		<0.0944	*
53469-21-9	PCB-1242	T	ug/L	8082		*	<0.0979		<0.0944		<0.0944	*
12672-29-6	PCB-1248	T	ug/L	8082		*	<0.0979		<0.0944		<0.0944	*



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  
 For Official Use Only

**GROUNDWATER SAMPLE ANALYSIS (S)**

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number	0000-0000	0000-0000	8004-4800				
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)	T. BLANK 2	T. BLANK 3	360				
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)	1/19/2021 06:30	1/20/2021 06:25	1/14/2021 06:33				
Duplicate ("Y" or "N") <sup>2</sup>	N	N	Y				
Split ("Y" or "N") <sup>3</sup>	N	N	N				
Facility Sample ID Number (if applicable)	TB2UG2-21	TB3UG2-21	MW360DUG2-21				
Laboratory Sample ID Number (if applicable)	532475013	532565015	532312007				
Date of Analysis (Month/Day/Year) For Volatile Organics Analysis	1/21/2021	1/26/2021	1/20/2021				
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)	NA	NA	DOWN				
CAS RN <sup>4</sup>	CONSTITUENT	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S <sup>7</sup>	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
24959-67-9	Bromide	mg/L	9056	*	*	0.177	J
16887-00-6	Chloride(s)	mg/L	9056	*	*	9.96	
16984-48-8	Fluoride	mg/L	9056	*	*	0.222	
S0595-	Nitrate & Nitrite	mg/L	9056	*	*	0.681	*
14808-79-8	Sulfate	mg/L	9056	*	*	12.5	
NS1894	Barometric Pressure Reading	Inches/Hg	Field	*	*		*
S0145-	Specific Conductance	µMHO/cm	Field	*	*		*

<sup>1</sup>AKGWA # is 0000-0000 for any type of blank.  
<sup>2</sup>Respond "Y" if the sample was a duplicate of another sample in this report.  
<sup>3</sup>Respond "Y" if the sample was split and analyzed by separate laboratories.  
<sup>4</sup>Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.  
<sup>5</sup>m = Total; "D" = Dissolved  
<sup>6</sup>"z" indicates a non-detect; do not use "ND" or "BDL". Value shown is Practical Quantification Limit.  
<sup>7</sup>Flags 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

For Official Use Only

**GROUNDWATER SAMPLE ANALYSIS - (Cont.)**

CAS RN <sup>4</sup>	CONSTITUENT	T D S	Unit OF MEASURE	METHOD	0000-0000		0000-0000		8004-4800		DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	F L A G S
					DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	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	*	*	*	*	*	187			
S0296- -	pH	T	Units	Field	*	*	*	*	*	*			
NS215	Eh	T	mV	Field	*	*	*	*	*	*			
S0907 - -	Temperature	T	°C	Field	*	*	*	*	*	*			
7429-90-5	Aluminum	T	mg/L	6020	*	*	*	*	*	0.0359		J	
7440-36-0	Antimony	T	mg/L	6020	*	*	*	*	*	<0.003			
7440-38-2	Arsenic	T	mg/L	6020	*	*	*	*	*	<0.005			
7440-39-3	Barium	T	mg/L	6020	*	*	*	*	*	0.175			
7440-41-7	Beryllium	T	mg/L	6020	*	*	*	*	*	<0.0005			
7440-42-8	Boron	T	mg/L	6020	*	*	*	*	*	0.0352			
7440-43-9	Cadmium	T	mg/L	6020	*	*	*	*	*	<0.001			
7440-70-2	Calcium	T	mg/L	6020	*	*	*	*	*	17.4			
7440-47-3	Chromium	T	mg/L	6020	*	*	*	*	*	<0.01			
7440-48-4	Cobalt	T	mg/L	6020	*	*	*	*	*	0.00163			
7440-50-8	Copper	T	mg/L	6020	*	*	*	*	*	0.00182		J	
7439-89-6	Iron	T	mg/L	6020	*	*	*	*	*	0.11			
7439-92-1	Lead	T	mg/L	6020	*	*	*	*	*	<0.002			
7439-95-4	Magnesium	T	mg/L	6020	*	*	*	*	*	7.63			
7439-96-5	Manganese	T	mg/L	6020	*	*	*	*	*	0.0187			
7439-97-6	Mercury	T	mg/L	7470	*	*	*	*	*	<0.0002			

**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  
 For Official Use Only

**GROUNDWATER SAMPLE ANALYSIS - (Cont.)**

CAS RN <sup>4</sup>	CONSTITUENT	T D S	Unit OF MEASURE	METHOD	0000-0000		0000-0000		8004-4800	
					DETECTED VALUE OR PQL <sup>6</sup>	FLA G S	DETECTED VALUE OR PQL <sup>6</sup>	FLA G S	DETECTED VALUE OR PQL <sup>6</sup>	FLA G S
	Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)				T. BLANK 2		T. BLANK 3		360	
7439-98-7	Molybdenum	T	mg/L	6020	* <0.001	* <0.001	* <0.001	* <0.001	* <0.001	* <0.001
7440-02-0	Nickel	T	mg/L	6020	* 0.0015	* 0.0015	* 0.0015	* 0.0015	* 0.0015	* 0.0015
7440-09-7	Potassium	T	mg/L	6020	* 0.67	* 0.67	* 0.67	* 0.67	* 0.67	* 0.67
7440-16-6	Rhodium	T	mg/L	6020	* <0.005	* <0.005	* <0.005	* <0.005	* <0.005	* <0.005
7782-49-2	Selenium	T	mg/L	6020	* <0.005	* <0.005	* <0.005	* <0.005	* <0.005	* <0.005
7440-22-4	Silver	T	mg/L	6020	* <0.001	* <0.001	* <0.001	* <0.001	* <0.001	* <0.001
7440-23-5	Sodium	T	mg/L	6020	* 53.7	* 53.7	* 53.7	* 53.7	* 53.7	* 53.7
7440-25-7	Tantalum	T	mg/L	6020	* <0.005	* <0.005	* <0.005	* <0.005	* <0.005	* <0.005
7440-28-0	Thallium	T	mg/L	6020	* <0.002	* <0.002	* <0.002	* <0.002	* <0.002	* <0.002
7440-61-1	Uranium	T	mg/L	6020	* <0.0002	* <0.0002	* <0.0002	* <0.0002	* <0.0002	* <0.0002
7440-62-2	Vanadium	T	mg/L	6020	* <0.02	* <0.02	* <0.02	* <0.02	* <0.02	* <0.02
7440-66-6	Zinc	T	mg/L	6020	* 0.0036	* 0.0036	* 0.0036	* 0.0036	* 0.0036	* 0.0036
108-05-4	Vinyl acetate	T	mg/L	8260	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
67-64-1	Acetone	T	mg/L	8260	<0.005	0.00368	0.00368	<0.005	<0.005	<0.005
107-02-8	Acrolein	T	mg/L	8260	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
107-13-1	Acrylonitrile	T	mg/L	8260	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
71-43-2	Benzene	T	mg/L	8260	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
108-90-7	Chlorobenzene	T	mg/L	8260	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
1330-20-7	Xylenes	T	mg/L	8260	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
100-42-5	Styrene	T	mg/L	8260	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
108-88-3	Toluene	T	mg/L	8260	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
74-97-5	Chlorobromomethane	T	mg/L	8260	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

**RESIDENTIAL/CONTAINED-QUARTERLY**

**Facility: USDOE - Paducah Gaseous Diffusion Plant** FINDS/UNIT: KY8-890-008-982 / 1  
**Permit Number: SW07300014, SW07300015, SW07300045** LAB ID: None  
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**GROUNDWATER SAMPLE ANALYSIS - (Cont.)**

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number		0000-0000	0000-0000	0000-0000	8004-4800					
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)		T. BLANK 2	T. BLANK 3	360						
CAS RN <sup>4</sup>	CONSTITUENT	T D S	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	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		0.00038	J

**RESIDENTIAL/CONTAINED-QUARTERLY**

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**Permit Number: SW07300014, SW07300015, SW07300045**

LAB ID: None

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**GROUNDWATER SAMPLE ANALYSIS - (Cont.)**

ARGWA NUMBER <sup>1</sup> , Facility Well/Spring Number	0000-0000	0000-0000	0000-0000	0000-0000	0000-0000	8004-4800					
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)	T. BLANK 2	T. BLANK 3	T. BLANK 3	T. BLANK 3	T. BLANK 3	360					
CAS RN <sup>4</sup>	CONSTITUENT	T ID <sup>5</sup>	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	DETECTED VALUE OR PQL <sup>6</sup>	DETECTED VALUE OR PQL <sup>6</sup>	FLA G S	FLA G S	DETECTED VALUE OR PQL <sup>6</sup>	FLA 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	<0.0000206	<0.0000209	<0.0000191			<0.0000191	
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	*	*	<0.0966	*	*	<0.0966	*
12674-11-2	PCB-1016	T	ug/L	8082	*	*	<0.0966	*	*	<0.0966	*
11104-28-2	PCB-1221	T	ug/L	8082	*	*	<0.0966	*	*	<0.0966	*
11141-16-5	PCB-1232	T	ug/L	8082	*	*	<0.0966	*	*	<0.0966	*
53469-21-9	PCB-1242	T	ug/L	8082	*	*	<0.0966	*	*	<0.0966	*
12672-29-6	PCB-1248	T	ug/L	8082	*	*	<0.0966	*	*	<0.0966	*



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 LAB ID: None  
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## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4798 MW357	MW357UG2-21	Nitrate & Nitrite	H	Analysis performed outside holding time requirement
		Total Dissolved Solids	*	Duplicate analysis not within control limits.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.26. Rad error is 3.26.
		Gross beta		TPU is 9.04. Rad error is 8.31.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.544. Rad error is 0.544.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3. Rad error is 3.
		Technetium-99		TPU is 13.5. Rad error is 13.2.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.26. Rad error is 1.24.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 121. Rad error is 121.
		Chemical Oxygen Demand	N	Sample spike (MS/MSD) recovery not within control limits
8004-4799 MW358	MW358UG2-21	Nitrate & Nitrite		Analysis of constituent not required and not performed.
		Total Dissolved Solids	*	Duplicate analysis not within control limits.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.45. Rad error is 3.44.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.5. Rad error is 6.5.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.503. Rad error is 0.503.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.82. Rad error is 3.8.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 11.1. Rad error is 11.1.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.874. Rad error is 0.865.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 126. Rad error is 124.
		Chemical Oxygen Demand	N	Sample spike (MS/MSD) recovery not within control limits

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Finds/Unit: KY8-890-008-982 / 1  
 LAB ID: None  
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## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-0981 MW359	MW359UG2-21	Nitrate & Nitrite	H	Analysis performed outside holding time requirement
		Total Dissolved Solids	*	Duplicate analysis not within control limits.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.46. Rad error is 2.45.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 7.91. Rad error is 7.72.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.33. Rad error is 0.33.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.01. Rad error is 3.98.
		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 0.848. Rad error is 0.842.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 121. Rad error is 121.
		Chemical Oxygen Demand	N	Sample spike (MS/MSD) recovery not within control limits
8004-4800 MW360	MW360UG2-21	Nitrate & Nitrite	H	Analysis performed outside holding time requirement
		Total Dissolved Solids	*	Duplicate analysis not within control limits.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.27. Rad error is 3.27.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 7.07. Rad error is 7.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.37. Rad error is 0.369.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.82. Rad error is 2.82.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 11.9. Rad error is 11.9.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.796. Rad error is 0.795.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 119. Rad error is 119.
		Chemical Oxygen Demand	N	Sample spike (MS/MSD) recovery not within control limits

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Finds/Unit: KY8-890-008-982 / 1  
 LAB ID: None  
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## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4795 MW361	MW361UG2-21	Nitrate & Nitrite	H	Analysis performed outside holding time requirement
		Total Dissolved Solids	*	Duplicate analysis not within control limits.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.75. Rad error is 3.74.
		Gross beta		TPU is 10.8. Rad error is 9.18.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.365. Rad error is 0.365.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.51. Rad error is 3.49.
		Technetium-99		TPU is 13.8. Rad error is 12.9.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.618. Rad error is 0.618.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 122. Rad error is 121.
8004-0986 MW362	MW362UG2-21	Chemical Oxygen Demand	N	Sample spike (MS/MSD) recovery not within control limits
		Nitrate & Nitrite	H	Analysis performed outside holding time requirement
		Total Dissolved Solids	*	Duplicate analysis not within control limits.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.18. Rad error is 6.07.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 7.09. Rad error is 7.05.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.626. Rad error is 0.626.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.07. Rad error is 4.07.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 11.3. Rad error is 11.3.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.12. Rad error is 1.11.
8004-4796 MW363	MW363UG2-21	Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 121. Rad error is 121.
		Chemical Oxygen Demand	N	Sample spike (MS/MSD) recovery not within control limits
		Chloride	W	Post-digestion spike recovery out of control limits.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.45. Rad error is 3.44.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 8.14. Rad error is 8.13.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.32. Rad error is 1.32.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.1. Rad error is 3.1.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 11.9. Rad error is 11.9.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.236. Rad error is 0.236.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 123. Rad error is 123.
		Iodide	W	Post-digestion spike recovery out of control limits.

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 LAB ID: None  
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## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4797 MW364	MW364UG2-21	Chloride	W	Post-digestion spike recovery out of control limits.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.74. Rad error is 3.72.
		Gross beta		TPU is 10.8. Rad error is 9.2.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.561. Rad error is 0.561.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.64. Rad error is 3.57.
		Technetium-99		TPU is 13.6. Rad error is 13.1.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.225. Rad error is 0.225.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 133. Rad error is 128.
		Iodide	W	Post-digestion spike recovery out of control limits.
8004-0984 MW365	MW365UG2-21	Chloride	W	Post-digestion spike recovery out of control limits.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.88. Rad error is 1.87.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.38. Rad error is 6.38.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.351. Rad error is 0.351.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.66. Rad error is 2.66.
		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 0.369. Rad error is 0.366.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 124. Rad error is 123.
		Iodide	W	Post-digestion spike recovery out of control limits.
8004-0982 MW366	MW366UG2-21	Chloride	W	Post-digestion spike recovery out of control limits.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.32. Rad error is 2.31.
		Gross beta		TPU is 11.5. Rad error is 9.6.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.336. Rad error is 0.336.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.57. Rad error is 3.51.
		Technetium-99		TPU is 14.1. Rad error is 13.2.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.26. Rad error is 0.26.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 129. Rad error is 129.
		Iodide	W	Post-digestion spike recovery out of control limits.

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 LAB ID: None  
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## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4793 MW367	MW367UG2-21	Chloride	W	Post-digestion spike recovery out of control limits.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.52. Rad error is 5.42.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.15. 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 0.789. Rad error is 0.789.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.5. Rad error is 4.48.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 11.9. Rad error is 11.9.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.357. Rad error is 0.355.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 123. Rad error is 122.
		Iodide	W	Post-digestion spike recovery out of control limits.
8004-0983 MW368	MW368UG2-21	Chloride	W	Post-digestion spike recovery out of control limits.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 7.24. Rad error is 7.19.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.43. 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 0.47. Rad error is 0.469.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.73. Rad error is 2.73.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 11.8. Rad error is 11.8.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.233. Rad error is 0.233.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 121. Rad error is 121.
		Iodide	W	Post-digestion spike recovery out of control limits.
8004-4820 MW369	MW369UG2-21	Chloride	W	Post-digestion spike recovery out of control limits.
		Total Dissolved Solids	*	Duplicate analysis not within control limits.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.04. Rad error is 4.02.
		Gross beta		TPU is 9.29. Rad error is 8.45.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.324. Rad error is 0.324.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.82. Rad error is 2.78.
		Technetium-99		TPU is 14. Rad error is 12.9.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.682. Rad error is 0.68.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 126. Rad error is 125.
		Iodide	W	Post-digestion spike recovery out of control limits.

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 LAB ID: None  
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## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4818 MW370	MW370UG2-21	Chloride	W	Post-digestion spike recovery out of control limits.
		Total Dissolved Solids	*	Duplicate analysis not within control limits.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.91. Rad error is 1.91.
		Gross beta		TPU is 11.2. Rad error is 9.57.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.541. Rad error is 0.541.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.03. Rad error is 2.03.
		Technetium-99		TPU is 14.9. Rad error is 13.4.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.776. Rad error is 0.776.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 124. Rad error is 123.
8004-4819 MW371	MW371UG2-21	Iodide	W	Post-digestion spike recovery out of control limits.
		Chloride	W	Post-digestion spike recovery out of control limits.
		Total Dissolved Solids	*	Duplicate analysis not within control limits.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.63. Rad error is 6.59.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.16. Rad error is 4.16.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.856. Rad error is 0.856.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.22. Rad error is 3.22.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 11. Rad error is 11.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.988. Rad error is 0.982.
8004-4808 MW372	MW372UG2-21	Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 125. Rad error is 124.
		Iodide	W	Post-digestion spike recovery out of control limits.
		Chloride	W	Post-digestion spike recovery out of control limits.
		Total Dissolved Solids	*	Duplicate analysis not within control limits.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.09. Rad error is 4.08.
		Gross beta		TPU is 9.69. Rad error is 8.51.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.496. Rad error is 0.496.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.62. Rad error is 2.62.
		Technetium-99		TPU is 13.2. Rad error is 12.2.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.745. Rad error is 0.742.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 123. Rad error is 121.
		Iodide	W	Post-digestion spike recovery out of control limits.

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Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4792 MW373	MW373UG2-21	Chloride	W	Post-digestion spike recovery out of control limits.
		Total Dissolved Solids	*	Duplicate analysis not within control limits.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.5. Rad error is 4.5.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.61. Rad error is 5.61.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.344. Rad error is 0.343.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3. Rad error is 2.96.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 11. Rad error is 11.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.594. Rad error is 0.593.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 127. Rad error is 126.
		Iodide	W	Post-digestion spike recovery out of control limits.
8004-0990 MW374	MW374UG2-21	Chloride	W	Post-digestion spike recovery out of control limits.
		Total Dissolved Solids	*	Duplicate analysis not within control limits.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.4. Rad error is 4.39.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.2. Rad error is 6.2.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.484. Rad error is 0.483.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.4. Rad error is 3.32.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 10.4. Rad error is 10.4.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.921. Rad error is 0.914.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 119. Rad error is 119.
		Iodide	W	Post-digestion spike recovery out of control limits.

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Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-0985 MW375	MW375UG2-21	Chloride	W	Post-digestion spike recovery out of control limits.
		Total Dissolved Solids	*	Duplicate analysis not within control limits.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.12. Rad error is 3.12.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 7.24. Rad error is 7.17.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.544. Rad error is 0.543.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.3. Rad error is 2.3.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 10.1. Rad error is 10.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.744. Rad error is 0.744.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 123. Rad error is 122.

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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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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.

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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  
 For Official Use Only

## 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  
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Finds/Unit: KY8-890-008-982 / 1  
 LAB ID: None  
 For Official Use Only

## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	RI1UG2-21	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 3.38. Rad error is 3.36.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.27. Rad error is 6.19.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.227. Rad error is 0.227.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.13. Rad error is 3.13.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 11.1. Rad error is 11.1.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.958. Rad error is 0.948.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 131. Rad error is 126.
		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  
 Facility: US DOE - Paducah Gaseous Diffusion Plant  
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Finds/Unit: KY8-890-008-982 / 1  
 LAB ID: None  
 For Official Use Only

## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	FB1UG2-21	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 5.53. Rad error is 5.53.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.85. Rad error is 6.77.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.48. Rad error is 0.48.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.85. Rad error is 2.85.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 11.1. Rad error is 11.1.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.826. Rad error is 0.82.
Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 117. 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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Finds/Unit: KY8-890-008-982 / 1  
 LAB ID: None  
 For Official Use Only

## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB1UG2-21	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.		

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

## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB1UG2-21	Vanadium		Analysis of constituent not required and not performed.
		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.

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Finds/Unit: KY8-890-008-982 / 1  
 LAB ID: None  
 For Official Use Only

## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB2UG2-21	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.		

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 Facility: US DOE - Paducah Gaseous Diffusion Plant  
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Finds/Unit: KY8-890-008-982 / 1  
 LAB ID: None  
 For Official Use Only

## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB2UG2-21	Vanadium		Analysis of constituent not required and not performed.
		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.

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 Facility: US DOE - Paducah Gaseous Diffusion Plant  
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Finds/Unit: KY8-890-008-982 / 1  
 LAB ID: None  
 For Official Use Only

## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB3UG2-21	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.		

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 Facility: US DOE - Paducah Gaseous Diffusion Plant  
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Finds/Unit: KY8-890-008-982 / 1  
 LAB ID: None  
 For Official Use Only

## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB3UG2-21	Vanadium		Analysis of constituent not required and not performed.
		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  
 For Official Use Only

## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4800 MW360	MW360DUG2-21	Nitrate & Nitrite	H	Analysis performed outside holding time requirement
		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	*	Duplicate analysis not within control limits.
		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 3.84. Rad error is 3.83.
		Gross beta		TPU is 7.3. Rad error is 7.02.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.416. Rad error is 0.415.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.39. Rad error is 2.39.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 11.4. Rad error is 11.4.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.07. Rad error is 1.05.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 124. Rad error is 124.
		Chemical Oxygen Demand	N	Sample spike (MS/MSD) recovery not within control limits



**RESIDENTIAL/CONTAINED-QUARTERLY**

Facility: US DOE - Paducah Gaseous Diffusion Plant  
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 LAB ID: None  
 For Official Use Only

**GROUNDWATER SAMPLE ANALYSIS - (Cont.)**

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number		8004-4799							
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)		358							
CAS RN <sup>4</sup>	CONSTITUENT	T D S	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>
S0906 - -	Static Water Level Elevation	T	Ft. MSL	Field	325.15				
N238	Dissolved Oxygen	T	mg/L	Field	1				
S0266- -	Total Dissolved Solids	T	mg/L	160.1		*			
S0296- -	pH	T	Units	Field	6.25				
NS215	Eh	T	mV	Field	126				
S0907 - -	Temperature	T	°C	Field	15.5				
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  
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 Permit Number: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-890-008-982 / 1  
 LAB ID: None  
 For Official Use Only

## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4799 MW358	MW358UG2-21R	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.
		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.

**APPENDIX D**  
**STATISTICAL ANALYSES AND**  
**QUALIFICATION STATEMENT**

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# GROUNDWATER STATISTICAL COMMENTS

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## Introduction

The statistical analyses conducted on the first 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 first quarter 2021 data used to conduct the statistical analyses were collected in January and March 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**

<b>Station</b>	<b>Type</b>	<b>Groundwater Unit</b>
MW357	TW	URGA
MW358	TW	LRGA
MW359 <sup>a</sup>	TW	UCRS
MW360	TW	URGA
MW361	TW	LRGA
MW362 <sup>a</sup>	TW	UCRS
MW363	TW	URGA
MW364	TW	LRGA
MW365 <sup>a</sup>	TW	UCRS
MW366	TW	URGA
MW367	TW	LRGA
MW368 <sup>a</sup>	TW	UCRS
MW369	BG	URGA
MW370	BG	LRGA
MW371 <sup>a</sup>	BG	UCRS
MW372	BG	URGA
MW373	BG	LRGA
MW374 <sup>a</sup>	BG	UCRS
MW375 <sup>a</sup>	SG	UCRS
MW376 <sup>a,b</sup>	SG	UCRS
MW377 <sup>a,b</sup>	SG	UCRS

<sup>a</sup> 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.

<sup>b</sup> 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.<sup>1</sup>

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 URGA, and the LRGA, respectively. Those parameters displayed with bold-face type indicate the one-sided tolerance interval statistical test was performed. The data presented in Exhibits D.3, D.4, and D.5 were collected during the current quarter, first 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.

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<sup>1</sup> 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**

<b>Parameters</b>
Aluminum
Beryllium
Boron
Bromide
Calcium
Chemical Oxygen Demand (COD)
Chloride
Cobalt
Conductivity
Copper
Dissolved Oxygen
Dissolved Solids
Iodide
Iron
Magnesium
Manganese
Molybdenum
Nickel
Oxidation-Reduction Potential
PCB, Total
PCB-1242
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
<b>Aluminum</b>	<b>7</b>	<b>1</b>	<b>6</b>	<b>Yes</b>
Antimony	7	7	0	No
<b>Beryllium</b>	<b>7</b>	<b>6</b>	<b>1</b>	<b>Yes</b>
<b>Boron</b>	<b>7</b>	<b>2</b>	<b>5</b>	<b>Yes</b>
<b>Bromide</b>	<b>7</b>	<b>6</b>	<b>1</b>	<b>Yes</b>
Bromochloromethane	7	7	0	No
Bromodichloromethane	7	7	0	No
Bromoform	7	7	0	No
Bromomethane	7	7	0	No
<b>Calcium</b>	<b>7</b>	<b>0</b>	<b>7</b>	<b>Yes</b>
Carbon disulfide	7	7	0	No
<b>Chemical Oxygen Demand (COD)</b>	<b>7</b>	<b>3</b>	<b>4</b>	<b>Yes</b>
<b>Chloride</b>	<b>7</b>	<b>0</b>	<b>7</b>	<b>Yes</b>
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
<b>Cobalt</b>	<b>7</b>	<b>5</b>	<b>2</b>	<b>Yes</b>
<b>Conductivity</b>	<b>7</b>	<b>0</b>	<b>7</b>	<b>Yes</b>
<b>Copper</b>	<b>7</b>	<b>1</b>	<b>6</b>	<b>Yes</b>
Cyanide	7	7	0	No
Dibromochloromethane	7	7	0	No
Dibromomethane	7	7	0	No
Dimethylbenzene, Total	7	7	0	No
<b>Dissolved Oxygen</b>	<b>7</b>	<b>0</b>	<b>7</b>	<b>Yes</b>
<b>Dissolved Solids</b>	<b>7</b>	<b>0</b>	<b>7</b>	<b>Yes</b>
Ethylbenzene	7	7	0	No
Iodide	7	7	0	No
Iodomethane	7	7	0	No
<b>Iron</b>	<b>7</b>	<b>3</b>	<b>4</b>	<b>Yes</b>
<b>Magnesium</b>	<b>7</b>	<b>0</b>	<b>7</b>	<b>Yes</b>
<b>Manganese</b>	<b>7</b>	<b>4</b>	<b>3</b>	<b>Yes</b>
Methylene chloride	7	7	0	No
<b>Molybdenum</b>	<b>7</b>	<b>4</b>	<b>3</b>	<b>Yes</b>

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

<b>Parameters</b>	<b>Observations</b>	<b>Censored Observation</b>	<b>Uncensored Observation</b>	<b>Statistical Analysis?</b>
<b>Nickel</b>	<b>7</b>	<b>0</b>	<b>7</b>	<b>Yes</b>
<b>Oxidation-Reduction Potential</b>	<b>7</b>	<b>0</b>	<b>7</b>	<b>Yes</b>
<b>PCB, Total</b>	<b>7</b>	<b>6</b>	<b>1</b>	<b>Yes</b>
PCB-1016	7	7	0	No
PCB-1221	7	7	0	No
PCB-1232	7	7	0	No
<b>PCB-1242</b>	<b>7</b>	<b>6</b>	<b>1</b>	<b>Yes</b>
PCB-1248	7	7	0	No
PCB-1254	7	7	0	No
PCB-1260	7	7	0	No
PCB-1268	7	7	0	No
<b>pH</b>	<b>7</b>	<b>0</b>	<b>7</b>	<b>Yes</b>
<b>Potassium</b>	<b>7</b>	<b>1</b>	<b>6</b>	<b>Yes</b>
Radium-226	7	7	0	No
Rhodium	7	7	0	No
<b>Sodium</b>	<b>7</b>	<b>0</b>	<b>7</b>	<b>Yes</b>
Styrene	7	7	0	No
<b>Sulfate</b>	<b>7</b>	<b>0</b>	<b>7</b>	<b>Yes</b>
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
<b>Total Organic Carbon (TOC)</b>	<b>7</b>	<b>0</b>	<b>7</b>	<b>Yes</b>
<b>Total Organic Halides (TOX)</b>	<b>7</b>	<b>0</b>	<b>7</b>	<b>Yes</b>
<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
<b>Vanadium</b>	<b>7</b>	<b>5</b>	<b>2</b>	<b>Yes</b>
Vinyl Acetate	7	7	0	No
<b>Zinc</b>	<b>7</b>	<b>4</b>	<b>3</b>	<b>Yes</b>

**Bold** denotes parameters with at least one uncensored observation.

**Exhibit D.4. Summary of Censored, and Uncensored Data—URGA**

<b>Parameters</b>	<b>Observations</b>	<b>Censored Observation</b>	<b>Uncensored Observation</b>	<b>Statistical Analysis?</b>
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
<b>Aluminum</b>	<b>6</b>	<b>4</b>	<b>2</b>	<b>Yes</b>
Antimony	6	6	0	No
Beryllium	6	6	0	No
<b>Boron</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
<b>Bromide</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
Bromochloromethane	6	6	0	No
Bromodichloromethane	6	6	0	No
Bromoform	6	6	0	No
Bromomethane	6	6	0	No
<b>Calcium</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
Carbon disulfide	6	6	0	No
<b>Chemical Oxygen Demand (COD)</b>	<b>6</b>	<b>2</b>	<b>4</b>	<b>Yes</b>
<b>Chloride</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
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
<b>Cobalt</b>	<b>6</b>	<b>3</b>	<b>3</b>	<b>Yes</b>
<b>Conductivity</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
<b>Copper</b>	<b>6</b>	<b>1</b>	<b>5</b>	<b>Yes</b>
Cyanide	6	6	0	No
Dibromochloromethane	6	6	0	No
Dibromomethane	6	6	0	No
Dimethylbenzene, Total	6	6	0	No
<b>Dissolved Oxygen</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
<b>Dissolved Solids</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
Ethylbenzene	6	6	0	No
Iodide	6	6	0	No
Iodomethane	6	6	0	No
<b>Iron</b>	<b>6</b>	<b>3</b>	<b>3</b>	<b>Yes</b>
<b>Magnesium</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
<b>Manganese</b>	<b>6</b>	<b>3</b>	<b>3</b>	<b>Yes</b>
Methylene chloride	6	6	0	No
<b>Molybdenum</b>	<b>6</b>	<b>5</b>	<b>1</b>	<b>Yes</b>

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

<b>Parameters</b>	<b>Observations</b>	<b>Censored Observation</b>	<b>Uncensored Observation</b>	<b>Statistical Analysis?</b>
<b>Nickel</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
<b>Oxidation-Reduction Potential</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
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
<b>pH</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
<b>Potassium</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
Radium-226	6	6	0	No
Rhodium	6	6	0	No
<b>Sodium</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
Styrene	6	6	0	No
<b>Sulfate</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
Tantalum	6	6	0	No
<b>Technetium-99</b>	<b>6</b>	<b>2</b>	<b>4</b>	<b>Yes</b>
Tetrachloroethene	6	6	0	No
Thallium	6	6	0	No
Thorium-230	6	6	0	No
Toluene	6	6	0	No
<b>Total Organic Carbon (TOC)</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
<b>Total Organic Halides (TOX)</b>	<b>6</b>	<b>1</b>	<b>5</b>	<b>Yes</b>
<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
<b>Vanadium</b>	<b>6</b>	<b>5</b>	<b>1</b>	<b>Yes</b>
Vinyl Acetate	6	6	0	No
<b>Zinc</b>	<b>6</b>	<b>3</b>	<b>3</b>	<b>Yes</b>

**Bold** denotes parameters with at least one uncensored observation.

**Exhibit D.5. Summary of Censored, and Uncensored Data—LRGA**

<b>Parameters</b>	<b>Observations</b>	<b>Censored Observation</b>	<b>Uncensored Observation</b>	<b>Statistical Analysis?</b>
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
<b>Aluminum</b>	<b>6</b>	<b>4</b>	<b>2</b>	<b>Yes</b>
Antimony	6	6	0	No
Beryllium	6	6	0	No
<b>Boron</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
<b>Bromide</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
Bromochloromethane	6	6	0	No
Bromodichloromethane	6	6	0	No
Bromoform	6	6	0	No
Bromomethane	6	6	0	No
<b>Calcium</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
Carbon disulfide	6	6	0	No
<b>Chemical Oxygen Demand (COD)</b>	<b>6</b>	<b>1</b>	<b>5</b>	<b>Yes</b>
<b>Chloride</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
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
<b>Cobalt</b>	<b>6</b>	<b>4</b>	<b>2</b>	<b>Yes</b>
<b>Conductivity</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
<b>Copper</b>	<b>6</b>	<b>1</b>	<b>5</b>	<b>Yes</b>
Cyanide	6	6	0	No
Dibromochloromethane	6	6	0	No
Dibromomethane	6	6	0	No
Dimethylbenzene, Total	6	6	0	No
<b>Dissolved Oxygen</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
<b>Dissolved Solids</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
Ethylbenzene	6	6	0	No
<b>Iodide</b>	<b>6</b>	<b>5</b>	<b>1</b>	<b>Yes</b>
Iodomethane	6	6	0	No
<b>Iron</b>	<b>6</b>	<b>3</b>	<b>3</b>	<b>Yes</b>
<b>Magnesium</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
<b>Manganese</b>	<b>6</b>	<b>3</b>	<b>3</b>	<b>Yes</b>
Methylene chloride	6	6	0	No
<b>Molybdenum</b>	<b>6</b>	<b>4</b>	<b>2</b>	<b>Yes</b>

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

<b>Parameters</b>	<b>Observations</b>	<b>Censored Observation</b>	<b>Uncensored Observation</b>	<b>Statistical Analysis?</b>
<b>Nickel</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
<b>Oxidation-Reduction Potential</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
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
<b>pH</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
<b>Potassium</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
Radium-226	6	6	0	No
Rhodium	6	6	0	No
<b>Sodium</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
Styrene	6	6	0	No
<b>Sulfate</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
Tantalum	6	6	0	No
<b>Technetium-99</b>	<b>6</b>	<b>3</b>	<b>3</b>	<b>Yes</b>
Tetrachloroethene	6	6	0	No
Thallium	6	6	0	No
Thorium-230	6	6	0	No
Toluene	6	6	0	No
<b>Total Organic Carbon (TOC)</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
<b>Total Organic Halides (TOX)</b>	<b>6</b>	<b>2</b>	<b>4</b>	<b>Yes</b>
<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
<b>Trichloroethene</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
Trichlorofluoromethane	6	6	0	No
<b>Vanadium</b>	<b>6</b>	<b>5</b>	<b>1</b>	<b>Yes</b>
Vinyl Acetate	6	6	0	No
<b>Zinc</b>	<b>6</b>	<b>3</b>	<b>3</b>	<b>Yes</b>

**Bold** denotes parameters with at least one uncensored observation.

## **Discussion of Results from Historical Background Comparison**

For the UCRS, URGA, and LRGA, the concentrations of this quarter were compared to the results of the one-sided tolerance interval test calculated using historical background and are presented in Attachment D1. The statistician qualification statement is presented in Attachment D3. For the UCRS, URGA, and LRGA, the test was applied to 28, 26, and 28 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, conductivity, dissolved solids, magnesium, oxidation-reduction potential, and sulfate.

### **LRGA**

This quarter's results identified historical background exceedances for dissolved oxygen, oxidation-reduction potential, pH, and technetium-99.

## **Statistical Summary**

Summaries of the results of the statistical tests conducted on data obtained from wells in the UCRS, the URGA, and in the LRGA in comparison to historical data are presented in Exhibit D.7, Exhibit D.8, and Exhibit D.9, respectively.

**Exhibit D.6. Summary of Exceedances of Statistically Derived Historical Background Concentrations**

UCRS	URGA	LRGA
<b>MW359:</b> Dissolved Oxygen, Oxidation-Reduction Potential, Sulfate	<b>MW357:</b> Oxidation-Reduction Potential	<b>MW361:</b> Oxidation-Reduction Potential
<b>MW362:</b> Oxidation-Reduction Potential, Sulfate	<b>MW360:</b> Oxidation-Reduction Potential	<b>MW364:</b> Oxidation-Reduction Potential, pH
<b>MW365:</b> Dissolved Oxygen, Oxidation-Reduction Potential, Sulfate	<b>MW363:</b> Oxidation-Reduction Potential	<b>MW367:</b> Oxidation-Reduction Potential, pH
<b>MW368:</b> Oxidation-Reduction Potential, Sulfate	<b>MW366:</b> Oxidation-Reduction Potential	<b>MW370:</b> Dissolved Oxygen, Oxidation-Reduction Potential, pH, Technetium-99
<b>MW371:</b> Oxidation-Reduction Potential, Sulfate	<b>MW369:</b> Oxidation-Reduction Potential	<b>MW373:</b> Oxidation-Reduction Potential
<b>MW375:</b> Oxidation-Reduction Potential, Sulfate	<b>MW372:</b> Calcium, Conductivity, Dissolved Solids, Magnesium, Oxidation-Reduction Potential, Sulfate	

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

<b>Parameter</b>	<b>Performed Test</b>	<b>CV Normality Test*</b>	<b>Results of Tolerance Interval Test Conducted</b>
Aluminum	Tolerance Interval	2.08	No exceedance of statistically derived historical background concentration.
Beryllium	Tolerance Interval	1.12	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 and MW365.
Dissolved Solids	Tolerance Interval	0.42	No exceedance of statistically derived historical background concentration.
Iron	Tolerance Interval	0.98	No exceedance of statistically derived historical background concentration.
Magnesium	Tolerance Interval	0.27	No exceedance of statistically derived historical background concentration.
Manganese	Tolerance Interval	0.89	No exceedance of statistically derived historical background concentration.
Molybdenum	Tolerance Interval	1.65	No exceedance of statistically derived historical background concentration.

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

<b>Parameter</b>	<b>Performed Test</b>	<b>CV Normality Test*</b>	<b>Results of Tolerance Interval Test Conducted</b>
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, and MW375.
PCB (total)	Tolerance Interval	0.92	No exceedance of statistically derived historical background concentration.
PCB-1242	Tolerance Interval	1.41	No exceedance of statistically derived historical background concentration.
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, MW371, 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**

<b>Parameter</b>	<b>Performed Test</b>	<b>CV Normality Test*</b>	<b>Results of Tolerance Interval Test Conducted</b>
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	Current results exceed statistically derived historical background concentration in MW372.
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.
Molybdenum	Tolerance Interval	1.20	No exceedance of statistically derived historical background concentration.
Nickel	Tolerance Interval	0.91	No exceedance of statistically derived historical background concentration.

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

<b>Parameter</b>	<b>Performed Test</b>	<b>CV Normality Test*</b>	<b>Results of Tolerance Interval Test Conducted</b>
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.
Vanadium	Tolerance Interval	0.26	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**

<b>Parameter</b>	<b>Performed Test</b>	<b>CV Normality Test*</b>	<b>Results of Tolerance Interval Test Conducted</b>
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.
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.
Iodide	Tolerance Interval	0.00	No exceedance of statistically derived historical background concentration.
Iron	Tolerance Interval	0.96	No exceedance of statistically derived historical background concentration.
Magnesium	Tolerance Interval	0.34	No exceedance of statistically derived historical background concentration.
Manganese	Tolerance Interval	0.62	No exceedance of statistically derived historical background concentration.
Molybdenum	Tolerance Interval	1.20	No exceedance of statistically derived historical background concentration.
Nickel	Tolerance Interval	0.90	No exceedance of statistically derived historical background concentration.

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

<b>Parameter</b>	<b>Performed Test</b>	<b>CV Normality Test*</b>	<b>Results of Tolerance Interval Test Conducted</b>
Oxidation-Reduction Potential	Tolerance Interval	1.31	Current results exceed statistically derived historical background concentration in MW361, MW364, MW367, MW370, and MW373.
pH	Tolerance Interval	0.03	Current results exceed statistically derived historical background concentration in MW364, MW367, and MW370.
Potassium	Tolerance Interval	0.18	No exceedance of statistically derived historical background concentration.
Sodium	Tolerance Interval	0.30	No exceedance of statistically derived historical background concentration.
Sulfate	Tolerance Interval	1.59	No exceedance of statistically derived historical background concentration.
Technetium-99	Tolerance Interval	1.73	Current results exceed statistically derived historical background concentration in MW370.
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 <sup>1</sup>	Tolerance Interval	0.57	No exceedance of statistically derived historical background concentration.
Vanadium	Tolerance Interval	0.32	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.

<sup>1</sup> A tolerance interval was calculated based on an MCL exceedance.

## **Discussion of Results from Current Background Comparison**

For concentrations in wells in the UCRS, URGA, and LRGA that exceeded the TL test using historical background, the concentrations were compared to the results of the one-sided tolerance interval test compared to current background, and are presented in Attachment D2. The statistician qualification statement is presented in Attachment D3. For the UCRS, URGA, and LRGA, the test was applied to 3, 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 one UCRS well (i.e., MW368) exceeded the current TL this quarter.

### **URGA**

This quarter's results identified current background exceedances in one downgradient well (i.e., MW366) for oxidation-reduction potential.

### **LRGA**

This quarter's results identified current background exceedances in downgradient wells (i.e., MW364 and MW367) for pH.

## **Statistical Summary**

Summaries of the statistical tests conducted on data obtained from wells in the UCRS, the URGA, and the LRGA are presented in Exhibit D.10, Exhibit D.11, and Exhibit D.12, respectively.

**Exhibit D.10. Test Summaries for Qualified Parameters for Current Background—UCRS**

<b>Parameter</b>	<b>Performed Test</b>	<b>CV Normality Test</b>	<b>Results of Tolerance Interval Test Conducted</b>
Dissolved Oxygen	Tolerance Interval	0.80	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	0.19	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	0.91	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**

<b>Parameter</b>	<b>Performed Test</b>	<b>CV Normality Test</b>	<b>Results of Tolerance Interval Test Conducted</b>
Calcium	Tolerance Interval	0.55	None of the test wells exceeded the upper TL, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically significant level.
Conductivity	Tolerance Interval	0.30	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	0.49	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	0.01	MW366 exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to current background data.
Sulfate	Tolerance Interval	0.93	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**

<b>Parameter</b>	<b>Performed Test</b>	<b>CV Normality Test</b>	<b>Results of Tolerance Interval Test Conducted</b>
Dissolved Oxygen	Tolerance Interval	0.40	None of the test wells exceeded the upper TL, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically significant level.
Oxidation-Reduction Potential	Tolerance Interval	0.09	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.
pH	Tolerance Interval	0.01	MW364, MW367, and MW370 were below the Lower Tolerance Limit, which is evidence of a statistically different concentration with respect to current background data.
Technetium-99	Tolerance Interval	0.69	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 First 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	0.0258	N/A	-3.657	NO
MW362	Downgradient	Yes	0.0387	N/A	-3.252	NO
MW365	Downgradient	Yes	0.023	N/A	-3.772	NO
MW368	Downgradient	Yes	0.103	N/A	-2.273	NO
MW371	Upgradient	Yes	24.9	N/A	3.215	NO
MW374	Upgradient	No	0.05	N/A	-2.996	N/A
MW375	Sidegradient	Yes	0.0356	N/A	-3.335	NO

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First Quarter 2021 Statistical Analysis      Historical Background Comparison**  
**Beryllium      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= 0.002    S= 0.003    CV(1)= 1.125    K factor\*\*= 2.523    TL(1)= 0.009    LL(1)=N/A

**Statistics-Transformed Background Data**      X= -6.462    S= 0.812    CV(2)=-0.126    K factor\*\*= 2.523    TL(2)= -4.413    LL(2)=N/A

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

Well Number: MW371

Date Collected	Result	LN(Result)
3/18/2002	0.005	-5.298
4/22/2002	0.005	-5.298
7/15/2002	0.005	-5.298
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	0.001	-6.908
4/2/2003	0.001	-6.908
7/9/2003	0.001	-6.908
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	No	0.0005	N/A	-7.601	N/A
MW362	Downgradient	No	0.0005	N/A	-7.601	N/A
MW365	Downgradient	No	0.0005	N/A	-7.601	N/A
MW368	Downgradient	No	0.0005	N/A	-7.601	N/A
MW371	Upgradient	Yes	0.00103	N/A	-6.878	NO
MW374	Upgradient	No	0.0005	N/A	-7.601	N/A
MW375	Sidegradient	No	0.0005	N/A	-7.601	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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 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 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	0.0122	N/A	-4.406	NO
MW362	Downgradient	Yes	0.0195	N/A	-3.937	NO
MW365	Downgradient	No	0.015	N/A	-4.200	N/A
MW368	Downgradient	No	0.015	N/A	-4.200	N/A
MW371	Upgradient	Yes	0.0106	N/A	-4.547	NO
MW374	Upgradient	Yes	0.03	N/A	-3.507	NO
MW375	Sidegradient	Yes	0.0148	N/A	-4.213	NO

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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	No	0.2	N/A	-1.609	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	No	0.2	N/A	-1.609	N/A
MW374	Upgradient	Yes	0.647	NO	-0.435	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 = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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	4.93	NO	1.595	N/A
MW362	Downgradient	Yes	20.1	NO	3.001	N/A
MW365	Downgradient	Yes	19.7	NO	2.981	N/A
MW368	Downgradient	Yes	59.3	NO	4.083	N/A
MW371	Upgradient	Yes	62.8	NO	4.140	N/A
MW374	Upgradient	Yes	22.8	NO	3.127	N/A
MW375	Sidegradient	Yes	12.9	NO	2.557	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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	Yes	63.7	NO	4.154	N/A
MW368	Downgradient	Yes	13.7	NO	2.617	N/A
MW371	Upgradient	No	20	N/A	2.996	N/A
MW374	Upgradient	Yes	22.7	NO	3.122	N/A
MW375	Sidegradient	Yes	15.3	NO	2.728	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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	1.18	NO	0.166	N/A
MW362	Downgradient	Yes	3.91	NO	1.364	N/A
MW365	Downgradient	Yes	2.64	NO	0.971	N/A
MW368	Downgradient	Yes	4.41	NO	1.484	N/A
MW371	Upgradient	Yes	3.4	NO	1.224	N/A
MW374	Upgradient	Yes	57.4	NO	4.050	N/A
MW375	Sidegradient	Yes	3.56	NO	1.270	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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	No	0.001	N/A	-6.908	N/A
MW362	Downgradient	No	0.001	N/A	-6.908	N/A
MW365	Downgradient	Yes	0.00135	N/A	-6.608	NO
MW368	Downgradient	No	0.001	N/A	-6.908	N/A
MW371	Upgradient	Yes	0.00408	N/A	-5.502	NO
MW374	Upgradient	No	0.000838	N/A	-7.084	N/A
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 = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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	212	NO	5.357	N/A
MW362	Downgradient	Yes	727	NO	6.589	N/A
MW365	Downgradient	Yes	383	NO	5.948	N/A
MW368	Downgradient	Yes	642	NO	6.465	N/A
MW371	Upgradient	Yes	641	NO	6.463	N/A
MW374	Upgradient	Yes	713	NO	6.569	N/A
MW375	Sidegradient	Yes	344	NO	5.841	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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	0.000477	N/A	-7.648	NO
MW362	Downgradient	Yes	0.000974	N/A	-6.934	NO
MW365	Downgradient	Yes	0.00487	N/A	-5.325	NO
MW368	Downgradient	No	0.000877	N/A	-7.039	N/A
MW371	Upgradient	Yes	0.0117	N/A	-4.448	NO
MW374	Upgradient	Yes	0.000649	N/A	-7.340	NO
MW375	Sidegradient	Yes	0.000692	N/A	-7.276	NO

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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	5.12	YES	1.633	N/A
MW362	Downgradient	Yes	2.16	NO	0.770	N/A
MW365	Downgradient	Yes	6.08	YES	1.805	N/A
MW368	Downgradient	Yes	1.32	NO	0.278	N/A
MW371	Upgradient	Yes	1.6	NO	0.470	N/A
MW374	Upgradient	Yes	0.92	NO	-0.083	N/A
MW375	Sidegradient	Yes	0.95	NO	-0.051	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

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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**

**Dry/Partially Dry Wells**

**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)
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 No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	Yes	151	NO	5.017	N/A
MW362	Downgradient	Yes	386	NO	5.956	N/A
MW365	Downgradient	Yes	243	NO	5.493	N/A
MW368	Downgradient	Yes	414	NO	6.026	N/A
MW371	Upgradient	Yes	347	NO	5.849	N/A
MW374	Upgradient	Yes	341	NO	5.832	N/A
MW375	Sidegradient	Yes	169	NO	5.130	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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	No	0.1	N/A	-2.303	N/A
MW362	Downgradient	No	0.1	N/A	-2.303	N/A
MW365	Downgradient	No	0.1	N/A	-2.303	N/A
MW368	Downgradient	Yes	0.0734	NO	-2.612	N/A
MW371	Upgradient	Yes	14.2	NO	2.653	N/A
MW374	Upgradient	Yes	1.31	NO	0.270	N/A
MW375	Sidegradient	Yes	0.0479	NO	-3.039	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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	2.94	NO	1.078	N/A
MW362	Downgradient	Yes	9.18	NO	2.217	N/A
MW365	Downgradient	Yes	9.72	NO	2.274	N/A
MW368	Downgradient	Yes	13.9	NO	2.632	N/A
MW371	Upgradient	Yes	16	NO	2.773	N/A
MW374	Upgradient	Yes	5.83	NO	1.763	N/A
MW375	Sidegradient	Yes	5.5	NO	1.705	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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	No	0.005	N/A	-5.298	N/A
MW362	Downgradient	No	0.00203	N/A	-6.200	N/A
MW365	Downgradient	No	0.00419	N/A	-5.475	N/A
MW368	Downgradient	Yes	0.00737	NO	-4.910	N/A
MW371	Upgradient	Yes	0.3	NO	-1.204	N/A
MW374	Upgradient	Yes	0.193	NO	-1.645	N/A
MW375	Sidegradient	No	0.00285	N/A	-5.860	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First Quarter 2021 Statistical Analysis      Historical Background Comparison**

**Molybdenum**

**UNITS: mg/L**

**UCRS**

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

**Statistics-Background Data**      X= 0.006    S= 0.010    CV(1)= 1.650    K factor\*\*= 2.523    TL(1)= 0.030    LL(1)=N/A

**Statistics-Transformed Background Data**      X= -6.108    S= 1.239    CV(2)=-0.203    K factor\*\*= 2.523    TL(2)= -2.983    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	0.00121	-6.717
4/3/2003	0.001	-6.908
7/9/2003	0.00111	-6.803
10/6/2003	0.001	-6.908

Well Number: MW374

Date Collected	Result	LN(Result)
10/8/2002	0.00222	-6.110
1/7/2003	0.00201	-6.210
4/2/2003	0.00159	-6.444
7/9/2003	0.00242	-6.024
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	No	0.001	N/A	-6.908	N/A
MW362	Downgradient	Yes	0.000508	N/A	-7.585	NO
MW365	Downgradient	No	0.001	N/A	-6.908	N/A
MW368	Downgradient	No	0.000676	N/A	-7.299	N/A
MW371	Upgradient	Yes	0.00105	N/A	-6.859	NO
MW374	Upgradient	Yes	0.000434	N/A	-7.742	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 = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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	0.00119	NO	-6.734	N/A
MW362	Downgradient	Yes	0.000908	NO	-7.004	N/A
MW365	Downgradient	Yes	0.00671	NO	-5.004	N/A
MW368	Downgradient	Yes	0.00213	NO	-6.152	N/A
MW371	Upgradient	Yes	0.0204	NO	-3.892	N/A
MW374	Upgradient	Yes	0.00149	NO	-6.509	N/A
MW375	Sidegradient	Yes	0.00133	NO	-6.623	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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	288	N/A	5.663	YES
MW362	Downgradient	Yes	436	N/A	6.078	YES
MW365	Downgradient	Yes	451	N/A	6.111	YES
MW368	Downgradient	Yes	291	N/A	5.673	YES
MW371	Upgradient	Yes	296	N/A	5.690	YES
MW374	Upgradient	Yes	145	N/A	4.977	NO
MW375	Sidegradient	Yes	297	N/A	5.694	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
- MW375

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First Quarter 2021 Statistical Analysis      Historical Background Comparison**

**PCB, Total**

**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= 0.224    S= 0.207    CV(1)=0.922    **K factor\*\*= 2.523**    TL(1)= 0.746    LL(1)=N/A

**Statistics-Transformed Background Data**      X= -1.647    S= 0.440    CV(2)=-0.267    **K factor\*\*= 2.523**    TL(2)= -0.537    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	0.17	-1.772
7/15/2002	0.17	-1.772
7/9/2003	0.17	-1.772
10/6/2003	0.17	-1.772
7/13/2004	0.18	-1.715
7/25/2005	0.17	-1.772
4/5/2006	0.18	-1.715

Well Number: MW374

Date Collected	Result	LN(Result)
7/9/2003	0.17	-1.772
10/7/2003	0.17	-1.772
7/14/2004	0.18	-1.715
7/26/2005	0.17	-1.772
4/6/2006	0.18	-1.715
7/10/2006	0.17	-1.772
10/12/2006	0.17	-1.772
1/8/2007	0.17	-1.772

**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	0.108	N/A	-2.226	N/A
MW362	Downgradient	No	0.0974	N/A	-2.329	N/A
MW365	Downgradient	Yes	0.051	NO	-2.976	N/A
MW368	Downgradient	No	0.0995	N/A	-2.308	N/A
MW371	Upgradient	No	0.0998	N/A	-2.305	N/A
MW374	Upgradient	No	0.1	N/A	-2.303	N/A
MW375	Sidegradient	No	0.0999	N/A	-2.304	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First Quarter 2021 Statistical Analysis      Historical Background Comparison**  
**PCB-1242      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.

<b>Statistics-Background Data</b>	X= 0.159	S= 0.224	CV(1)= 1.409	K factor**= 2.523	TL(1)= 0.726	LL(1)=N/A
<b>Statistics-Transformed Background Data</b>	X= -2.134	S= 0.579	CV(2)= -0.272	K factor**= 2.523	TL(2)= -0.672	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	0.11	-2.207
7/15/2002	0.11	-2.207
7/9/2003	0.13	-2.040
10/6/2003	0.09	-2.408
7/13/2004	0.1	-2.303
7/25/2005	0.09	-2.408
4/5/2006	0.1	-2.303
Well Number:	MW374	
Date Collected	Result	LN(Result)
7/9/2003	0.13	-2.040
10/7/2003	0.09	-2.408
7/14/2004	0.1	-2.303
7/26/2005	0.1	-2.303
4/6/2006	0.1	-2.303
7/10/2006	0.1	-2.303
10/12/2006	0.1	-2.303
1/8/2007	0.1	-2.303

**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	0.108	N/A	-2.226	N/A
MW362	Downgradient	No	0.0974	N/A	-2.329	N/A
MW365	Downgradient	Yes	0.051	N/A	-2.976	NO
MW368	Downgradient	No	0.0995	N/A	-2.308	N/A
MW371	Upgradient	No	0.0998	N/A	-2.305	N/A
MW374	Upgradient	No	0.1	N/A	-2.303	N/A
MW375	Sidegradient	No	0.0999	N/A	-2.304	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

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**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	5.87	NO	1.770	N/A
MW362	Downgradient	Yes	6.8	NO	1.917	N/A
MW365	Downgradient	Yes	6.12	NO	1.812	N/A
MW368	Downgradient	Yes	6.18	NO	1.821	N/A
MW371	Upgradient	Yes	6.39	NO	1.855	N/A
MW374	Upgradient	Yes	6.69	NO	1.901	N/A
MW375	Sidegradient	Yes	6.3	NO	1.841	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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	No	0.3	N/A	-1.204	N/A
MW362	Downgradient	Yes	0.305	NO	-1.187	N/A
MW365	Downgradient	Yes	0.243	NO	-1.415	N/A
MW368	Downgradient	Yes	0.567	NO	-0.567	N/A
MW371	Upgradient	Yes	1.57	NO	0.451	N/A
MW374	Upgradient	Yes	0.554	NO	-0.591	N/A
MW375	Sidegradient	Yes	0.283	NO	-1.262	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 = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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	32.7	NO	3.487	N/A
MW362	Downgradient	Yes	127	NO	4.844	N/A
MW365	Downgradient	Yes	58.3	NO	4.066	N/A
MW368	Downgradient	Yes	75.7	NO	4.327	N/A
MW371	Upgradient	Yes	60.8	NO	4.108	N/A
MW374	Upgradient	Yes	131	NO	4.875	N/A
MW375	Sidegradient	Yes	55.5	NO	4.016	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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	42.9	YES	3.759	N/A
MW362	Downgradient	Yes	30.3	YES	3.411	N/A
MW365	Downgradient	Yes	60.6	YES	4.104	N/A
MW368	Downgradient	Yes	126	YES	4.836	N/A
MW371	Upgradient	Yes	29.2	YES	3.374	N/A
MW374	Upgradient	Yes	10.7	NO	2.370	N/A
MW375	Sidegradient	Yes	24	YES	3.178	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
- MW371
- MW375

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

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**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	0.559	N/A	-0.582	NO
MW362	Downgradient	Yes	1.95	N/A	0.668	NO
MW365	Downgradient	Yes	1.54	N/A	0.432	NO
MW368	Downgradient	Yes	1.52	N/A	0.419	NO
MW371	Upgradient	Yes	1.89	N/A	0.637	NO
MW374	Upgradient	Yes	2.62	N/A	0.963	NO
MW375	Sidegradient	Yes	1.02	N/A	0.020	NO

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

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**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	5.76	N/A	1.751	NO
MW362	Downgradient	Yes	15.3	N/A	2.728	NO
MW365	Downgradient	Yes	16.3	N/A	2.791	NO
MW368	Downgradient	Yes	6.66	N/A	1.896	NO
MW371	Upgradient	Yes	6.14	N/A	1.815	NO
MW374	Upgradient	Yes	14.3	N/A	2.660	NO
MW375	Sidegradient	Yes	9	N/A	2.197	NO

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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	Yes	0.00527	N/A	-5.246	NO
MW362	Downgradient	No	0.02	N/A	-3.912	N/A
MW365	Downgradient	No	0.0052	N/A	-5.259	N/A
MW368	Downgradient	No	0.0035	N/A	-5.655	N/A
MW371	Upgradient	Yes	0.0432	N/A	-3.142	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 = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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	No	0.02	N/A	-3.912	N/A
MW362	Downgradient	No	0.02	N/A	-3.912	N/A
MW365	Downgradient	Yes	0.00757	N/A	-4.884	NO
MW368	Downgradient	Yes	0.00661	N/A	-5.019	NO
MW371	Upgradient	Yes	0.0432	N/A	-3.142	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 = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**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	0.0459	N/A	-3.081	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	0.0351	N/A	-3.350	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	0.334	NO	-1.097	N/A
MW360	Downgradient	Yes	0.0358	NO	-3.330	N/A
MW363	Downgradient	Yes	0.0194	NO	-3.942	N/A
MW366	Downgradient	Yes	0.0786	NO	-2.543	N/A
MW369	Upgradient	Yes	0.0147	NO	-4.220	N/A
MW372	Upgradient	Yes	1.39	NO	0.329	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	0.368	NO	-1.000	N/A
MW360	Downgradient	Yes	0.177	NO	-1.732	N/A
MW363	Downgradient	Yes	0.132	NO	-2.025	N/A
MW366	Downgradient	Yes	0.391	NO	-0.939	N/A
MW369	Upgradient	Yes	0.343	NO	-1.070	N/A
MW372	Upgradient	Yes	0.51	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	23.9	NO	3.174	N/A
MW360	Downgradient	Yes	17.5	NO	2.862	N/A
MW363	Downgradient	Yes	29.5	NO	3.384	N/A
MW366	Downgradient	Yes	26.9	NO	3.292	N/A
MW369	Upgradient	Yes	15.4	NO	2.734	N/A
MW372	Upgradient	Yes	67.5	YES	4.212	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**The test well(s) listed exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to historical background data.**

**Wells with Exceedances**

MW372

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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.

<b>Statistics-Background Data</b>	X= 35.938	S= 3.750	CV(1)=0.104	K factor**= 2.523	TL(1)= 45.399	LL(1)=N/A
<b>Statistics-Transformed Background Data</b>	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

**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	Yes	18.9	NO	2.939	N/A
MW363	Downgradient	Yes	37.4	NO	3.622	N/A
MW366	Downgradient	Yes	13.7	NO	2.617	N/A
MW369	Upgradient	No	20	N/A	2.996	N/A
MW372	Upgradient	Yes	39.7	NO	3.681	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	31.6	NO	3.453	N/A
MW360	Downgradient	Yes	9.96	NO	2.299	N/A
MW363	Downgradient	Yes	34.2	NO	3.532	N/A
MW366	Downgradient	Yes	34.5	NO	3.541	N/A
MW369	Upgradient	Yes	29.8	NO	3.395	N/A
MW372	Upgradient	Yes	38.4	NO	3.648	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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	0.0017	NO	-6.377	N/A
MW363	Downgradient	Yes	0.00122	NO	-6.709	N/A
MW366	Downgradient	No	0.001	N/A	-6.908	N/A
MW369	Upgradient	Yes	0.00382	NO	-5.568	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**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	425	NO	6.052	N/A
MW360	Downgradient	Yes	400	NO	5.991	N/A
MW363	Downgradient	Yes	450	NO	6.109	N/A
MW366	Downgradient	Yes	429	NO	6.061	N/A
MW369	Upgradient	Yes	373	NO	5.922	N/A
MW372	Upgradient	Yes	822	YES	6.712	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**The test well(s) listed exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to historical background data.**

**Wells with Exceedances**

MW372

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	0.000682	NO	-7.290	N/A
MW360	Downgradient	Yes	0.00182	NO	-6.309	N/A
MW363	Downgradient	Yes	0.00345	NO	-5.669	N/A
MW366	Downgradient	No	0.00119	N/A	-6.734	N/A
MW369	Upgradient	Yes	0.00341	NO	-5.681	N/A
MW372	Upgradient	Yes	0.00142	NO	-6.557	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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.

<b>Statistics-Background Data</b>	X= 1.781	S= 1.351	CV(1)=0.759	K factor**= 2.523	TL(1)= 5.190	LL(1)=N/A
<b>Statistics-Transformed Background Data</b>	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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	4.17	NO	1.428	N/A
MW360	Downgradient	Yes	1.44	NO	0.365	N/A
MW363	Downgradient	Yes	0.84	NO	-0.174	N/A
MW366	Downgradient	Yes	3.08	NO	1.125	N/A
MW369	Upgradient	Yes	1.88	NO	0.631	N/A
MW372	Upgradient	Yes	2.13	NO	0.756	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	220	NO	5.394	N/A
MW360	Downgradient	Yes	201	NO	5.303	N/A
MW363	Downgradient	Yes	259	NO	5.557	N/A
MW366	Downgradient	Yes	223	NO	5.407	N/A
MW369	Upgradient	Yes	191	NO	5.252	N/A
MW372	Upgradient	Yes	447	YES	6.103	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**The test well(s) listed exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to historical background data.**

**Wells with Exceedances**

MW372

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	No	0.1	N/A	-2.303	N/A
MW360	Downgradient	Yes	0.119	NO	-2.129	N/A
MW363	Downgradient	Yes	0.0388	NO	-3.249	N/A
MW366	Downgradient	No	0.1	N/A	-2.303	N/A
MW369	Upgradient	Yes	0.167	NO	-1.790	N/A
MW372	Upgradient	No	0.1	N/A	-2.303	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	10.4	NO	2.342	N/A
MW360	Downgradient	Yes	7.63	NO	2.032	N/A
MW363	Downgradient	Yes	12.3	NO	2.510	N/A
MW366	Downgradient	Yes	12	NO	2.485	N/A
MW369	Upgradient	Yes	6.85	NO	1.924	N/A
MW372	Upgradient	Yes	24.1	YES	3.182	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**The test well(s) listed exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to historical background data.**

**Wells with Exceedances**

MW372

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	No	0.00441	N/A	-5.424	N/A
MW360	Downgradient	Yes	0.0206	NO	-3.882	N/A
MW363	Downgradient	Yes	0.2	NO	-1.609	N/A
MW366	Downgradient	No	0.00265	N/A	-5.933	N/A
MW369	Upgradient	Yes	0.0167	NO	-4.092	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First Quarter 2021 Statistical Analysis      Historical Background Comparison**

**Molybdenum**

**UNITS: mg/L**

**URGA**

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

**Statistics-Background Data**      X= 0.010    S= 0.012    CV(1)= 1.199    K factor\*\*= 2.523    TL(1)= 0.040    LL(1)=N/A

**Statistics-Transformed Background Data**      X= -5.698    S= 1.607    CV(2)=-0.282    K factor\*\*= 2.523    TL(2)= -1.643    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	0.025	-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
7/8/2003	0.001	-6.908
10/6/2003	0.001	-6.908

**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	No	0.001	N/A	-6.908	N/A
MW363	Downgradient	No	0.000219	N/A	-8.426	N/A
MW366	Downgradient	No	0.001	N/A	-6.908	N/A
MW369	Upgradient	Yes	0.000208	N/A	-8.478	NO
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.

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	0.001	-6.908
1/7/2003	0.001	-6.908
4/2/2003	0.001	-6.908
7/9/2003	0.00105	-6.859
10/7/2003	0.001	-6.908

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	0.000893	NO	-7.021	N/A
MW360	Downgradient	Yes	0.00153	NO	-6.482	N/A
MW363	Downgradient	Yes	0.0209	NO	-3.868	N/A
MW366	Downgradient	Yes	0.00178	NO	-6.331	N/A
MW369	Upgradient	Yes	0.00505	NO	-5.288	N/A
MW372	Upgradient	Yes	0.00145	NO	-6.536	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

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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	447	N/A	6.103	YES
MW360	Downgradient	Yes	421	N/A	6.043	YES
MW363	Downgradient	Yes	425	N/A	6.052	YES
MW366	Downgradient	Yes	477	N/A	6.168	YES
MW369	Upgradient	Yes	350	N/A	5.858	YES
MW372	Upgradient	Yes	362	N/A	5.892	YES

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

**Conclusion of Statistical Analysis on Historical Data**

**The test well(s) listed exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to historical background data.**

**Wells with Exceedances**

- MW357
- MW360
- MW363
- MW366
- MW369
- MW372

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First Quarter 2021 Statistical Analysis      Historical Background Comparison**

**pH**

**UNITS: Std Unit**

**URGA**

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

**Statistics-Background Data**      X= 6.274    S= 0.194    CV(1)=0.031    K factor\*\*= 2.904    TL(1)= 6.837    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

**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	6.01	NO	1.793	N/A
MW360	Downgradient	Yes	6.1	NO	1.808	N/A
MW363	Downgradient	Yes	5.94	NO	1.782	N/A
MW366	Downgradient	Yes	5.96	NO	1.785	N/A
MW369	Upgradient	Yes	5.98	NO	1.788	N/A
MW372	Upgradient	Yes	6.04	NO	1.798	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	1.58	NO	0.457	N/A
MW360	Downgradient	Yes	0.67	NO	-0.400	N/A
MW363	Downgradient	Yes	2.01	NO	0.698	N/A
MW366	Downgradient	Yes	1.82	NO	0.599	N/A
MW369	Upgradient	Yes	0.505	NO	-0.683	N/A
MW372	Upgradient	Yes	2.21	NO	0.793	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

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**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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	39.7	NO	3.681	N/A
MW360	Downgradient	Yes	54.4	NO	3.996	N/A
MW363	Downgradient	Yes	41.8	NO	3.733	N/A
MW366	Downgradient	Yes	43.1	NO	3.764	N/A
MW369	Upgradient	Yes	53.9	NO	3.987	N/A
MW372	Upgradient	Yes	64	NO	4.159	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	39.2	NO	3.669	N/A
MW360	Downgradient	Yes	12.5	NO	2.526	N/A
MW363	Downgradient	Yes	26.6	NO	3.281	N/A
MW366	Downgradient	Yes	38.4	NO	3.648	N/A
MW369	Upgradient	Yes	5.86	NO	1.768	N/A
MW372	Upgradient	Yes	156	YES	5.050	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**The test well(s) listed exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to historical background data.**

**Wells with Exceedances**

MW372

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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	24.4	NO	3.195	N/A
MW360	Downgradient	No	4.3	N/A	1.459	N/A
MW363	Downgradient	No	2.69	N/A	0.990	N/A
MW366	Downgradient	Yes	43.9	NO	3.782	N/A
MW369	Upgradient	Yes	47.7	NO	3.865	N/A
MW372	Upgradient	Yes	43.5	NO	3.773	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	0.591	N/A	-0.526	NO
MW360	Downgradient	Yes	1.01	N/A	0.010	NO
MW363	Downgradient	Yes	1.32	N/A	0.278	NO
MW366	Downgradient	Yes	0.91	N/A	-0.094	NO
MW369	Upgradient	Yes	1.32	N/A	0.278	NO
MW372	Upgradient	Yes	1.29	N/A	0.255	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	6.62	NO	1.890	N/A
MW360	Downgradient	Yes	7.88	NO	2.064	N/A
MW363	Downgradient	No	10	N/A	2.303	N/A
MW366	Downgradient	Yes	6.16	NO	1.818	N/A
MW369	Upgradient	Yes	24.6	NO	3.203	N/A
MW372	Upgradient	Yes	14	NO	2.639	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First Quarter 2021 Statistical Analysis      Historical Background Comparison**

**Vanadium**

**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= 0.006    CV(1)=0.259    K factor\*\*= 2.523    TL(1)= 0.039    LL(1)=N/A

**Statistics-Transformed Background Data**      X= -3.771    S= 0.223    CV(2)=-0.059    K factor\*\*= 2.523    TL(2)= -3.208    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	0.027	-3.612
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
7/8/2003	0.02	-3.912
10/6/2003	0.02	-3.912

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	No	0.02	N/A	-3.912	N/A
MW360	Downgradient	No	0.02	N/A	-3.912	N/A
MW363	Downgradient	No	0.00521	N/A	-5.257	N/A
MW366	Downgradient	No	0.00428	N/A	-5.454	N/A
MW369	Upgradient	Yes	0.00332	NO	-5.708	N/A
MW372	Upgradient	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.

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	0.039	-3.244
4/23/2002	0.037	-3.297
7/16/2002	0.025	-3.689
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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	No	0.02	N/A	-3.912	N/A
MW360	Downgradient	Yes	0.0036	N/A	-5.627	NO
MW363	Downgradient	Yes	0.00604	N/A	-5.109	NO
MW366	Downgradient	No	0.02	N/A	-3.912	N/A
MW369	Upgradient	Yes	0.00591	N/A	-5.131	NO
MW372	Upgradient	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	0.0899	N/A	-2.409	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	Yes	0.0399	N/A	-3.221	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	0.164	NO	-1.808	N/A
MW361	Downgradient	Yes	0.102	NO	-2.283	N/A
MW364	Downgradient	Yes	0.049	NO	-3.016	N/A
MW367	Downgradient	Yes	0.0195	NO	-3.937	N/A
MW370	Upgradient	Yes	0.27	NO	-1.309	N/A
MW373	Upgradient	Yes	2.1	NO	0.742	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	0.227	NO	-1.483	N/A
MW361	Downgradient	Yes	0.469	NO	-0.757	N/A
MW364	Downgradient	Yes	0.449	NO	-0.801	N/A
MW367	Downgradient	Yes	0.151	NO	-1.890	N/A
MW370	Upgradient	Yes	0.464	NO	-0.768	N/A
MW373	Upgradient	Yes	0.565	NO	-0.571	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	34.7	NO	3.547	N/A
MW361	Downgradient	Yes	31.7	NO	3.456	N/A
MW364	Downgradient	Yes	33.5	NO	3.512	N/A
MW367	Downgradient	Yes	13.9	NO	2.632	N/A
MW370	Upgradient	Yes	28.3	NO	3.343	N/A
MW373	Upgradient	Yes	71	NO	4.263	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	24.2	NO	3.186	N/A
MW361	Downgradient	Yes	76.8	NO	4.341	N/A
MW364	Downgradient	Yes	13.7	NO	2.617	N/A
MW367	Downgradient	Yes	24.2	NO	3.186	N/A
MW370	Upgradient	Yes	17.8	NO	2.879	N/A
MW373	Upgradient	No	20	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	17.4	NO	2.856	N/A
MW361	Downgradient	Yes	35.3	NO	3.564	N/A
MW364	Downgradient	Yes	36.2	NO	3.589	N/A
MW367	Downgradient	Yes	10.6	NO	2.361	N/A
MW370	Upgradient	Yes	36.7	NO	3.603	N/A
MW373	Upgradient	Yes	39	NO	3.664	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	0.0462	N/A	-3.075	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	0.00739	N/A	-4.908	NO
MW370	Upgradient	No	0.001	N/A	-6.908	N/A
MW373	Upgradient	No	0.000536	N/A	-7.531	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	525	NO	6.263	N/A
MW361	Downgradient	Yes	525	NO	6.263	N/A
MW364	Downgradient	Yes	470	NO	6.153	N/A
MW367	Downgradient	Yes	245	NO	5.501	N/A
MW370	Upgradient	Yes	464	NO	6.140	N/A
MW373	Upgradient	Yes	854	NO	6.750	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	0.00068	NO	-7.293	N/A
MW361	Downgradient	Yes	0.000768	NO	-7.172	N/A
MW364	Downgradient	Yes	0.00207	NO	-6.180	N/A
MW367	Downgradient	No	0.00119	N/A	-6.734	N/A
MW370	Upgradient	Yes	0.00128	NO	-6.661	N/A
MW373	Upgradient	Yes	0.00115	NO	-6.768	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	1	NO	0.000	N/A
MW361	Downgradient	Yes	3.38	NO	1.218	N/A
MW364	Downgradient	Yes	3.24	NO	1.176	N/A
MW367	Downgradient	Yes	0.8	NO	-0.223	N/A
MW370	Upgradient	Yes	4.3	YES	1.459	N/A
MW373	Upgradient	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.

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

**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 = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	270	NO	5.598	N/A
MW361	Downgradient	Yes	284	NO	5.649	N/A
MW364	Downgradient	Yes	287	NO	5.659	N/A
MW367	Downgradient	Yes	130	NO	4.868	N/A
MW370	Upgradient	Yes	210	NO	5.347	N/A
MW373	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First Quarter 2021 Statistical Analysis      Historical Background Comparison**

**Iodide**

**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= 2.000    S= 0.000    CV(1)=0.000    K factor\*\*= 2.523    TL(1)= 2.000    LL(1)=N/A

**Statistics-Transformed Background Data**      X= 0.693    S= 0.000    CV(2)=0.000    K factor\*\*= 2.523    TL(2)= 0.693    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	2	0.693
1/8/2003	2	0.693
4/3/2003	2	0.693
7/9/2003	2	0.693
10/6/2003	2	0.693

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	0.196	NO	-1.630	N/A
MW361	Downgradient	No	0.5	N/A	-0.693	N/A
MW364	Downgradient	No	0.5	N/A	-0.693	N/A
MW367	Downgradient	No	0.5	N/A	-0.693	N/A
MW370	Upgradient	No	0.5	N/A	-0.693	N/A
MW373	Upgradient	No	0.5	N/A	-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.

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	2	0.693
1/7/2003	2	0.693
4/2/2003	2	0.693
7/9/2003	2	0.693
10/7/2003	2	0.693

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	22.9	NO	3.131	N/A
MW361	Downgradient	No	0.1	N/A	-2.303	N/A
MW364	Downgradient	No	0.1	N/A	-2.303	N/A
MW367	Downgradient	Yes	5.15	NO	1.639	N/A
MW370	Upgradient	No	0.1	N/A	-2.303	N/A
MW373	Upgradient	Yes	0.0362	NO	-3.319	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	17.9	NO	2.885	N/A
MW361	Downgradient	Yes	14.4	NO	2.667	N/A
MW364	Downgradient	Yes	14.5	NO	2.674	N/A
MW367	Downgradient	Yes	7.82	NO	2.057	N/A
MW370	Upgradient	Yes	12.9	NO	2.557	N/A
MW373	Upgradient	Yes	27.2	NO	3.303	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	2.38	NO	0.867	N/A
MW361	Downgradient	No	0.00123	N/A	-6.701	N/A
MW364	Downgradient	No	0.00332	N/A	-5.708	N/A
MW367	Downgradient	Yes	1.54	NO	0.432	N/A
MW370	Upgradient	No	0.00196	N/A	-6.235	N/A
MW373	Upgradient	Yes	0.0185	NO	-3.990	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First Quarter 2021 Statistical Analysis      Historical Background Comparison**

**Molybdenum**

**UNITS: mg/L**

**LRGA**

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

**Statistics-Background Data**      X= 0.010    S= 0.012    CV(1)= 1.198    K factor\*\*= 2.523    TL(1)= 0.040    LL(1)=N/A

**Statistics-Transformed Background Data**      X= -5.693    S= 1.604    CV(2)=-0.282    K factor\*\*= 2.523    TL(2)= -1.647    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	0.00113	-6.786
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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	0.000858	N/A	-7.061	NO
MW361	Downgradient	No	0.001	N/A	-6.908	N/A
MW364	Downgradient	No	0.000282	N/A	-8.174	N/A
MW367	Downgradient	No	0.001	N/A	-6.908	N/A
MW370	Upgradient	No	0.001	N/A	-6.908	N/A
MW373	Upgradient	Yes	0.000584	N/A	-7.446	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.

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	0.025	-3.689
4/23/2002	0.025	-3.689
7/16/2002	0.025	-3.689
10/8/2002	0.001	-6.908
1/7/2003	0.001	-6.908
4/2/2003	0.001	-6.908
7/9/2003	0.001	-6.908
10/7/2003	0.001	-6.908

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	0.0767	NO	-2.568	N/A
MW361	Downgradient	Yes	0.000772	NO	-7.167	N/A
MW364	Downgradient	Yes	0.00277	NO	-5.889	N/A
MW367	Downgradient	Yes	0.00439	NO	-5.428	N/A
MW370	Upgradient	Yes	0.00254	NO	-5.976	N/A
MW373	Upgradient	Yes	0.0027	NO	-5.915	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

# C-746-U First 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	126	N/A	4.836	NO
MW361	Downgradient	Yes	466	N/A	6.144	YES
MW364	Downgradient	Yes	461	N/A	6.133	YES
MW367	Downgradient	Yes	278	N/A	5.628	YES
MW370	Upgradient	Yes	395	N/A	5.979	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

MW361  
MW364  
MW367  
MW370  
MW373

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV    Coefficient-of-Variation, CV = S/X    If CV is less than or equal to 1 assume normal distribution.

S    Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X    Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989*, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**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	6.25	NO	1.833	N/A
MW361	Downgradient	Yes	5.9	NO	1.775	N/A
MW364	Downgradient	Yes	5.79	YES	1.756	N/A
MW367	Downgradient	Yes	5.73	YES	1.746	N/A
MW370	Upgradient	Yes	5.79	YES	1.756	N/A
MW373	Upgradient	Yes	6.05	NO	1.800	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.

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

**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**

MW364  
MW367  
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 = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	3.17	NO	1.154	N/A
MW361	Downgradient	Yes	2.37	NO	0.863	N/A
MW364	Downgradient	Yes	2.04	NO	0.713	N/A
MW367	Downgradient	Yes	2.81	NO	1.033	N/A
MW370	Upgradient	Yes	2.69	NO	0.990	N/A
MW373	Upgradient	Yes	2.78	NO	1.022	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

# C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	33.3	NO	3.506	N/A
MW361	Downgradient	Yes	43.8	NO	3.780	N/A
MW364	Downgradient	Yes	42.3	NO	3.745	N/A
MW367	Downgradient	Yes	18.7	NO	2.929	N/A
MW370	Upgradient	Yes	43.1	NO	3.764	N/A
MW373	Upgradient	Yes	64	NO	4.159	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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	29.3	N/A	3.378	NO
MW361	Downgradient	Yes	82.2	N/A	4.409	NO
MW364	Downgradient	Yes	72.9	N/A	4.289	NO
MW367	Downgradient	Yes	24.3	N/A	3.190	NO
MW370	Upgradient	Yes	20.9	N/A	3.040	NO
MW373	Upgradient	Yes	170	N/A	5.136	NO

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

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**Technetium-99**

**UNITS: pCi/L**

**LRGA**

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

**Statistics-Background Data**      X= 7.655    S= 13.274    CV(1)=1.734    **K factor\*\*= 2.523**    TL(1)= 41.146    LL(1)=N/A

**Statistics-Transformed Background Data**      X= 1.946    S= 0.939    CV(2)=0.483    **K factor\*\*= 2.523**    TL(2)= 3.833    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	No	0.722	N/A	-0.326	N/A
MW361	Downgradient	Yes	43.7	N/A	3.777	NO
MW364	Downgradient	Yes	33.9	N/A	3.523	NO
MW367	Downgradient	No	-1.74	N/A	#Error	N/A
MW370	Upgradient	Yes	58.8	N/A	4.074	YES
MW373	Upgradient	No	9.89	N/A	2.292	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 = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	7.07	N/A	1.956	NO
MW361	Downgradient	Yes	0.459	N/A	-0.779	NO
MW364	Downgradient	Yes	0.936	N/A	-0.066	NO
MW367	Downgradient	Yes	0.681	N/A	-0.384	NO
MW370	Upgradient	Yes	1.13	N/A	0.122	NO
MW373	Upgradient	Yes	1.3	N/A	0.262	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	7.06	NO	1.954	N/A
MW361	Downgradient	No	10	N/A	2.303	N/A
MW364	Downgradient	No	10	N/A	2.303	N/A
MW367	Downgradient	Yes	4.98	NO	1.605	N/A
MW370	Upgradient	Yes	7.02	NO	1.949	N/A
MW373	Upgradient	Yes	9.52	NO	2.253	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	4.46	N/A	1.495	N/A
MW361	Downgradient	Yes	7.88	NO	2.064	N/A
MW364	Downgradient	Yes	7.15	NO	1.967	N/A
MW367	Downgradient	Yes	0.77	N/A	-0.261	N/A
MW370	Upgradient	Yes	0.86	N/A	-0.151	N/A
MW373	Upgradient	Yes	4.54	N/A	1.513	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First Quarter 2021 Statistical Analysis      Historical Background Comparison**

**Vanadium**

**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= 0.008    CV(1)=0.324    K factor\*\*= 2.523    TL(1)= 0.044    LL(1)=N/A

**Statistics-Transformed Background Data**      X= -3.749    S= 0.265    CV(2)=-0.071    K factor\*\*= 2.523    TL(2)= -3.080    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: MW370

Date Collected	Result	LN(Result)
3/17/2002	0.035	-3.352
4/23/2002	0.033	-3.411
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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	0.00717	NO	-4.938	N/A
MW361	Downgradient	No	0.02	N/A	-3.912	N/A
MW364	Downgradient	No	0.02	N/A	-3.912	N/A
MW367	Downgradient	No	0.00409	N/A	-5.499	N/A
MW370	Upgradient	No	0.02	N/A	-3.912	N/A
MW373	Upgradient	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.

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	0.048	-3.037
4/23/2002	0.025	-3.689
7/16/2002	0.025	-3.689
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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	0.0191	NO	-3.958	N/A
MW361	Downgradient	No	0.02	N/A	-3.912	N/A
MW364	Downgradient	Yes	0.0118	NO	-4.440	N/A
MW367	Downgradient	Yes	0.0154	NO	-4.173	N/A
MW370	Upgradient	No	0.02	N/A	-3.912	N/A
MW373	Upgradient	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**ATTACHMENT D2**

**COMPARISON OF CURRENT DATA TO  
ONE-SIDED UPPER TOLERANCE INTERVAL TEST  
CALCULATED USING  
CURRENT BACKGROUND DATA**

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**C-746-U First 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= 2.719    S= 2.162    CV(1)=0.795    **K factor\*\*= 2.523**    TL(1)= 8.174    LL(1)=N/A

**Statistics-Transformed Background Data**      X= 0.688    S= 0.845    CV(2)=1.228    **K factor\*\*= 2.523**    TL(2)= 2.820    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)
1/16/2019	8.02	2.082
5/28/2019	5.2	1.649
7/15/2019	4.6	1.526
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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	Yes	5.12	NO	1.633	N/A
MW365	Downgradient	Yes	6.08	NO	1.805	N/A

Well Number: MW374

Date Collected	Result	LN(Result)
1/17/2019	0.67	-0.400
5/28/2019	1.49	0.399
7/11/2019	2.23	0.802
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

**Conclusion of Statistical Analysis on Current Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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= 338.500   S= 62.637   CV(1)=0.185      **K factor\*\*= 2.523**      TL(1)= 496.532      LL(1)=N/A

**Statistics-Transformed Background Data**      X= 5.806      S= 0.205      CV(2)=0.035      **K factor\*\*= 2.523**      TL(2)= 6.323      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)
1/16/2019	396	5.981
5/28/2019	363	5.894
7/15/2019	423	6.047
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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	Yes	288	NO	5.663	N/A
MW362	Downgradient	Yes	436	NO	6.078	N/A
MW365	Downgradient	Yes	451	NO	6.111	N/A
MW368	Downgradient	Yes	291	NO	5.673	N/A
MW371	Upgradient	Yes	296	NO	5.690	N/A
MW375	Sidegradient	Yes	297	NO	5.694	N/A

Well Number: MW374

Date Collected	Result	LN(Result)
1/17/2019	254	5.537
5/28/2019	355	5.872
7/11/2019	354	5.869
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

**Conclusion of Statistical Analysis on Current Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

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**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= 25.310   S= 23.108   CV(1)=0.913      **K factor\*\*= 2.523**    TL(1)= 83.612    LL(1)=N/A

**Statistics-Transformed Background Data**      X= 2.840   S= 0.905   CV(2)=0.319      **K factor\*\*= 2.523**    TL(2)= 5.123    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)
1/16/2019	10.1	2.313
4/15/2019	59.1	4.079
7/15/2019	55.4	4.015
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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	Yes	42.9	NO	3.759	N/A
MW362	Downgradient	Yes	30.3	NO	3.411	N/A
MW365	Downgradient	Yes	60.6	NO	4.104	N/A
MW368	Downgradient	Yes	126	YES	4.836	N/A
MW371	Upgradient	Yes	29.2	NO	3.374	N/A
MW375	Sidegradient	Yes	24	NO	3.178	N/A

Well Number: MW374

Date Collected	Result	LN(Result)
1/17/2019	6.8	1.917
4/11/2019	8.28	2.114
7/11/2019	8.06	2.087
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

**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 = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

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**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= 36.950    S= 20.475    CV(1)=0.554      K factor\*\*= 2.523    TL(1)= 88.608    LL(1)=N/A

**Statistics-Transformed Background Data**      X= 3.445    S= 0.608    CV(2)=0.177      K factor\*\*= 2.523    TL(2)= 4.979    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)
1/16/2019	16.3	2.791
4/15/2019	20	2.996
7/15/2019	17.7	2.874
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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW372	Upgradient	Yes	67.5	NO	4.212	N/A

Well Number: MW372

Date Collected	Result	LN(Result)
1/17/2019	46.8	3.846
4/11/2019	49.7	3.906
7/11/2019	49.7	3.906
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

**Conclusion of Statistical Analysis on Current Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

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# Current Background Comparison

## Conductivity

UNITS: umho/cm

URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is statistically significant evidence of elevated concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

**Statistics-Background Data**      X= 540.500   S= 164.056   CV(1)=0.304      **K factor\*\*= 2.523**      TL(1)= 954.414      LL(1)=N/A

**Statistics-Transformed Background Data**      X= 6.248      S= 0.308      CV(2)=0.049      **K factor\*\*= 2.523**      TL(2)= 7.024      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)
1/16/2019	386	5.956
5/28/2019	387	5.958
7/15/2019	373	5.922
10/16/2019	367	5.905
3/17/2020	440	6.087
4/6/2020	407	6.009
7/23/2020	372	5.919
10/12/2020	373	5.922

### Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW372	Upgradient	Yes	822	NO	6.712	N/A

Well Number: MW372

Date Collected	Result	LN(Result)
1/17/2019	613	6.418
5/28/2019	628	6.443
7/11/2019	640	6.461
10/16/2019	697	6.547
1/22/2020	730	6.593
4/6/2020	687	6.532
7/23/2020	770	6.646
10/12/2020	778	6.657

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

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= 329.188 S= 129.828 CV(1)=0.394      K factor\*\*= 2.523      TL(1)= 656.744      LL(1)=N/A

**Statistics-Transformed Background Data**      X= 5.726      S= 0.385      CV(2)=0.067      K factor\*\*= 2.523      TL(2)= 6.698      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)
1/16/2019	224	5.412
4/15/2019	261	5.565
7/15/2019	194	5.268
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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW372	Upgradient	Yes	447	NO	6.103	N/A

Well Number: MW372

Date Collected	Result	LN(Result)
1/17/2019	394	5.976
4/11/2019	309	5.733
7/11/2019	616	6.423
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

**Conclusion of Statistical Analysis on Current Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

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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= 14.196   S= 7.011   CV(1)=0.494   **K factor\*\*= 2.523**   TL(1)= 31.884   LL(1)=N/A

**Statistics-Transformed Background Data**      X= 2.525   S= 0.534   CV(2)=0.212   **K factor\*\*= 2.523**   TL(2)= 3.872   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)
1/16/2019	7.17	1.970
4/15/2019	9.06	2.204
7/15/2019	7.51	2.016
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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW372	Upgradient	Yes	24.1	NO	3.182	N/A

Well Number: MW372

Date Collected	Result	LN(Result)
1/17/2019	18.9	2.939
4/11/2019	18.2	2.901
7/11/2019	19.2	2.955
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

**Conclusion of Statistical Analysis on Current Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

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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= 368.125   S= 36.495   CV(1)=0.099      **K factor\*\*= 2.523**      TL(1)= 460.201      LL(1)=N/A

**Statistics-Transformed Background Data**      X= 5.904      S= 0.101      CV(2)=0.017      **K factor\*\*= 2.523**      TL(2)= 6.159      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)
1/16/2019	432	6.068
5/28/2019	309	5.733
7/15/2019	410	6.016
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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	447	NO	6.103	N/A
MW360	Downgradient	Yes	421	NO	6.043	N/A
MW363	Downgradient	Yes	425	NO	6.052	N/A
MW366	Downgradient	Yes	477	YES	6.168	N/A
MW369	Upgradient	Yes	350	NO	5.858	N/A
MW372	Upgradient	Yes	362	NO	5.892	N/A

Well Number: MW372

Date Collected	Result	LN(Result)
1/17/2019	393	5.974
5/28/2019	400	5.991
7/11/2019	390	5.966
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

**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**

MW366

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

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**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= 51.501    S= 48.146    CV(1)=0.935      **K factor\*\*= 2.523**    TL(1)= 172.974    LL(1)=N/A

**Statistics-Transformed Background Data**      X= 3.247    S= 1.361    CV(2)=0.419      **K factor\*\*= 2.523**    TL(2)= 6.682    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)
1/16/2019	6.59	1.886
4/15/2019	14.6	2.681
7/15/2019	8.91	2.187
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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW372	Upgradient	Yes	156	NO	5.050	N/A

Well Number: MW372

Date Collected	Result	LN(Result)
1/17/2019	71.7	4.272
4/11/2019	71.3	4.267
7/11/2019	70.5	4.256
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

**Conclusion of Statistical Analysis on Current Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

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**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.

<b>Statistics-Background Data</b>	<b>X</b> = 2.482	<b>S</b> = 0.982	<b>CV(1)</b> =0.396	<b>K factor**</b> = 2.523	<b>TL(1)</b> = 4.959	<b>LL(1)</b> =N/A
<b>Statistics-Transformed Background Data</b>	<b>X</b> = 0.827	<b>S</b> = 0.432	<b>CV(2)</b> =0.523	<b>K factor**</b> = 2.523	<b>TL(2)</b> = 1.918	<b>LL(2)</b> =N/A

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

Well Number: MW370

Date Collected	Result	LN(Result)
1/16/2019	3.52	1.258
5/28/2019	3.46	1.241
7/15/2019	4.09	1.409
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

Well Number: MW373

Date Collected	Result	LN(Result)
1/17/2019	1.07	0.068
4/11/2019	1.49	0.399
7/11/2019	2.36	0.859
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

**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)
MW370	Upgradient	Yes	4.3	NO	1.459	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,  $S = \sqrt{[\text{Sum} ((\text{background result}-X)^2)/(\text{count of background results} - 1)]^{0.5}}$

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.

**C-746-U First 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= 388.438   S= 36.507   CV(1)=0.094      **K factor\*\*= 2.523**      TL(1)= 480.546   LL(1)=N/A

**Statistics-Transformed Background Data**      X= 5.958   S= 0.094   CV(2)=0.016      **K factor\*\*= 2.523**      TL(2)= 6.195      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)
1/16/2019	440	6.087
5/28/2019	400	5.991
7/15/2019	421	6.043
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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW361	Downgradient	Yes	466	NO	6.144	N/A
MW364	Downgradient	Yes	461	NO	6.133	N/A
MW367	Downgradient	Yes	278	NO	5.628	N/A
MW370	Upgradient	Yes	395	NO	5.979	N/A
MW373	Upgradient	Yes	372	NO	5.919	N/A

Well Number: MW373

Date Collected	Result	LN(Result)
1/17/2019	336	5.817
5/28/2019	374	5.924
7/11/2019	417	6.033
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

**Conclusion of Statistical Analysis on Current Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

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.

<b>Statistics-Background Data</b>	<b>X</b> = 6.129	<b>S</b> = 0.053	<b>CV(1)</b> =0.009	<b>K factor**</b> = 2.904	<b>TL(1)</b> = 6.283	<b>LL(1)</b> =5.9740
<b>Statistics-Transformed Background Data</b>	<b>X</b> = 1.813	<b>S</b> = 0.009	<b>CV(2)</b> =0.005	<b>K factor**</b> = 2.904	<b>TL(2)</b> = 1.838	<b>LL(2)</b> =1.7876

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

Well Number: MW370

Date Collected	Result	LN(Result)
1/16/2019	6.17	1.820
4/15/2019	6.18	1.821
7/15/2019	6.15	1.816
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

Well Number: MW373

Date Collected	Result	LN(Result)
1/17/2019	6.16	1.818
4/11/2019	6.21	1.826
7/11/2019	6.03	1.797
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

**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)?
MW364	Downgradient	Yes	5.79	YES	1.756	N/A
MW367	Downgradient	Yes	5.73	YES	1.746	N/A
MW370	Upgradient	Yes	5.79	YES	1.756	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**

- MW364
- MW367
- 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 = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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= 56.275   S= 38.643   CV(1)=0.687      **K factor\*\*= 2.523**      TL(1)= 153.772      LL(1)=N/A

**Statistics-Transformed Background Data**      X= 3.764   S= 0.791   CV(2)=0.210      **K factor\*\*= 2.523**      TL(2)= 5.759      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)
1/16/2019	94.3	4.546
4/15/2019	111	4.710
7/15/2019	107	4.673
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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW370	Upgradient	Yes	58.8	NO	4.074	N/A

Well Number: MW373

Date Collected	Result	LN(Result)
1/17/2019	28.4	3.346
4/11/2019	22.7	3.122
7/11/2019	28.3	3.343
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

**Conclusion of Statistical Analysis on Current Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

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**ATTACHMENT D3**

**STATISTICIAN QUALIFICATION STATEMENT**

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April 29, 2021

Mr. Dennis Greene  
Four Rivers Nuclear Partnership, LLC  
5511 Hobbs Road  
Kevil, KY 42053

Dear Mr. Greene:

As an Environmental Scientist, with a bachelor's degree in Earth Sciences/Geology, I have over 30 years of experience in reviewing and assessing laboratory analytical results associated with environmental sampling and investigation activities. For the generation of these statistical analyses, my work was reviewed by a qualified independent technical reviewer with Four Rivers Nuclear Partnership, LLC.

For this project, the statistical analyses conducted on the first 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

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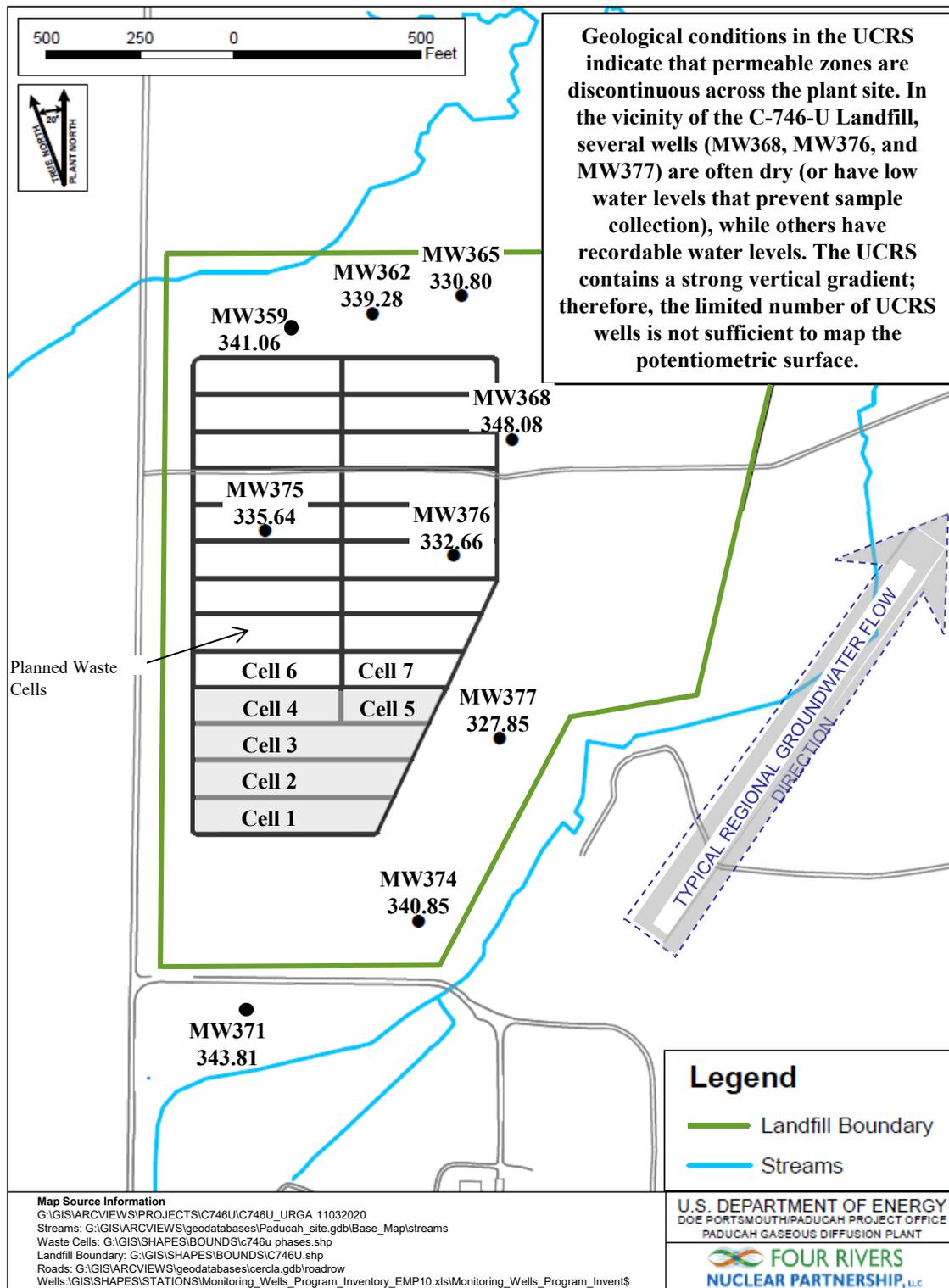
Determination of groundwater flow rate and direction of flow in the uppermost aquifer whenever the monitoring wells (MWs) are sampled is a requirement of 401 KAR 48.300, Section 11. The uppermost aquifer below the C-746-U Landfill is the Regional Gravel Aquifer (RGA). Water level measurements currently 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 first quarter 2021 and determine groundwater flow rate and direction.

Water levels during this reporting period were measured on January 25, 2021. As shown on Figure E.1, all Upper Continental Recharge System (UCRS) wells had sufficient water to permit water level measurement during this reporting period. UCRS wells MW376 and MW377 had insufficient water to permit sampling for laboratory analysis.

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  $1.15 \times 10^{-3}$  ft/ft and  $1.13 \times 10^{-3}$  ft/ft, respectively. Water level measurements in wells at the C-746-U Landfill and in wells of the surrounding region (MW98, MW100, MW125, MW139, MW165A, MW173, MW193, MW197, and MW200), along with the C-746-S&T Landfill wells, were used to contour the general RGA potentiometric surface (Figure E.4). The hydraulic gradient for the RGA, as a whole, in the vicinity of the C-746-U Landfill was  $5.31 \times 10^{-4}$  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.

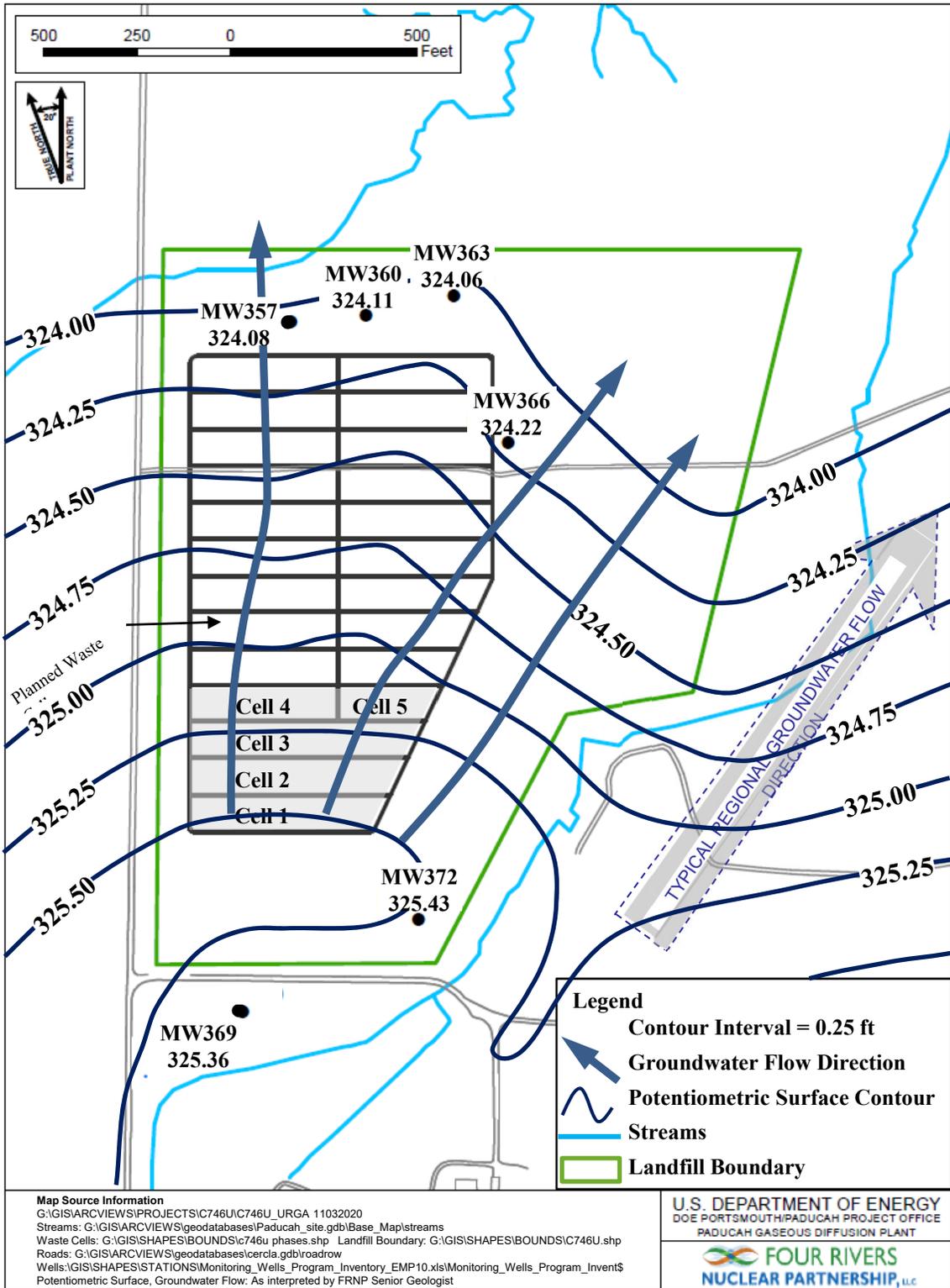
Groundwater flow beneath the C-746-U Landfill typically trends northeastward toward the Ohio River. As demonstrated on the potentiometric maps for January 2021, the groundwater flow direction in the immediate area of the landfill was to the northeast.



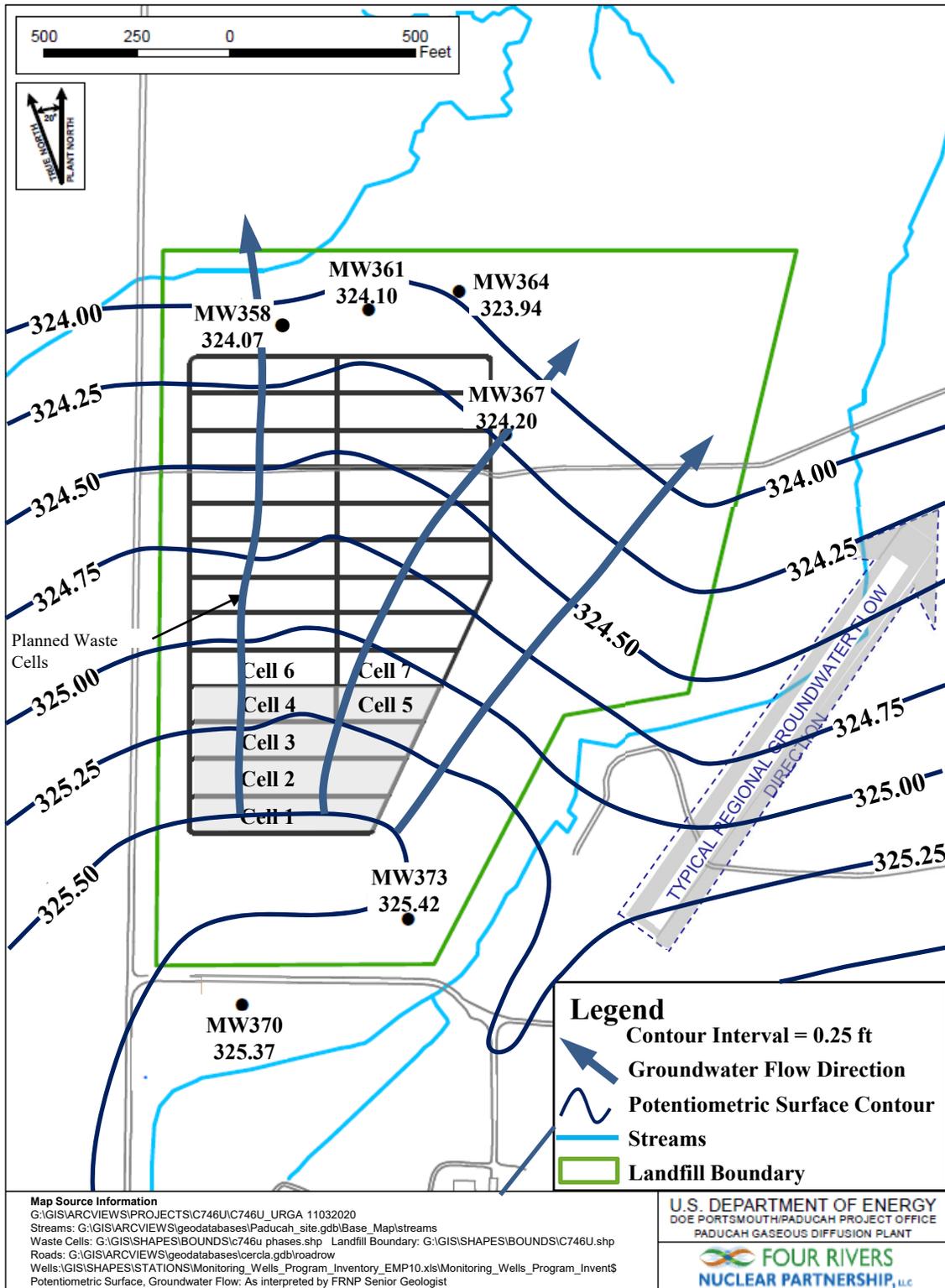
**Figure E.1. Potentiometric Measurements of the Upper Continental Recharge System at the C-746-U Landfill, January 25, 2021**

Table E.1. C-746-U Landfill First Quarter 2021 (January) Water Levels

C-746-U Landfill (January 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)
1/25/2021	13:33	MW357	URGA	368.77	29.63	0.00	44.69	324.08	44.69	324.08
1/25/2021	13:34	MW358	LRGA	368.92	29.63	0.00	44.85	324.07	44.85	324.07
1/25/2021	13:35	MW359	UCRS	368.91	29.63	0.00	27.85	341.06	27.85	341.06
1/25/2021	13:36	MW360	URGA	362.07	29.63	0.00	37.96	324.11	37.96	324.11
1/25/2021	13:37	MW361	LRGA	361.32	29.63	0.00	37.22	324.10	37.22	324.10
1/25/2021	13:38	MW362	UCRS	361.85	29.63	0.00	22.57	339.28	22.57	339.28
1/25/2021	13:21	MW363	URGA	368.56	29.63	0.00	44.50	324.06	44.50	324.06
1/25/2021	13:22	MW364	LRGA	368.17	29.63	0.00	44.23	323.94	44.23	323.94
1/25/2021	13:23	MW365	UCRS	368.14	29.63	0.00	37.34	330.80	37.34	330.80
1/25/2021	13:25	MW366	URGA	368.95	29.63	0.00	44.73	324.22	44.73	324.22
1/25/2021	13:26	MW367	LRGA	369.37	29.63	0.00	45.17	324.20	45.17	324.20
1/25/2021	13:27	MW368	UCRS	368.98	29.63	0.00	20.90	348.08	20.90	348.08
1/25/2021	14:46	MW369	URGA	364.23	29.63	0.00	38.87	325.36	38.87	325.36
1/25/2021	14:47	MW370	LRGA	365.12	29.63	0.00	39.75	325.37	39.75	325.37
1/25/2021	14:48	MW371	UCRS	364.64	29.63	0.00	20.83	343.81	20.83	343.81
1/25/2021	14:43	MW372	URGA	359.42	29.63	0.00	33.99	325.43	33.99	325.43
1/25/2021	14:44	MW373	LRGA	359.73	29.63	0.00	34.31	325.42	34.31	325.42
1/25/2021	14:45	MW374	UCRS	359.44	29.63	0.00	18.59	340.85	18.59	340.85
1/25/2021	14:39	MW375	UCRS	370.36	29.63	0.00	34.72	335.64	34.72	335.64
1/25/2021	14:37	MW376	UCRS	370.39	29.63	0.00	37.73	332.66	37.73	332.66
1/25/2021	14:35	MW377	UCRS	365.74	29.63	0.00	37.89	327.85	37.89	327.85
Reference Barometric Pressure			<b>29.63</b>							
Elev = elevation										
amsl = above mean sea level										
BP = barometric pressure										
DTW = depth to water in feet below datum										
URGA = Upper Regional Gravel Aquifer										
LRGA = Lower Regional Gravel Aquifer										
UCRS = Upper Continental Recharge System										
*Assumes a barometric efficiency of 1.0										



**Figure E.2. Potentiometric Surface of the Upper Regional Gravel Aquifer at the C-746-U Landfill, January 25, 2021**



**Figure E.3. Potentiometric Surface of the Lower Regional Gravel Aquifer at the C-746-U Landfill, January 25, 2021**

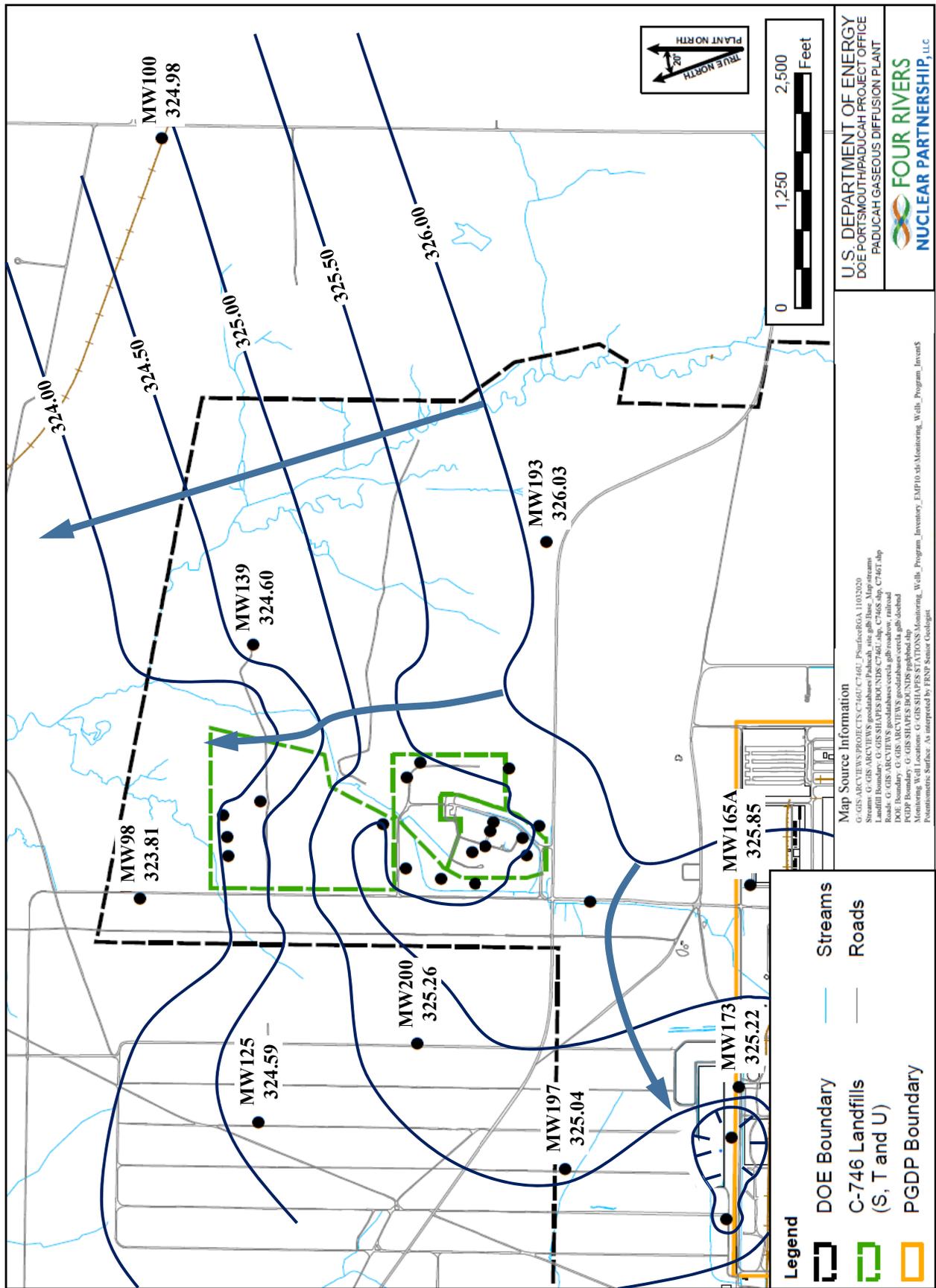


Figure E.4. Vicinity Potentiometric Surface of the Regional Gravel Aquifer, January 25, 2021

**Table E.2. C-746-U Landfill Hydraulic Gradients**

	ft/ft
Beneath Landfill—Upper RGA	$1.15 \times 10^{-3}$
Beneath Landfill—Lower RGA	$1.13 \times 10^{-3}$
Vicinity	$5.31 \times 10^{-4}$

**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	0.830	$2.93 \times 10^{-4}$	3.32	$1.17 \times 10^{-3}$
425	0.150	0.487	$1.72 \times 10^{-4}$	1.95	$6.87 \times 10^{-4}$
Lower RGA					
725	0.256	0.822	$2.90 \times 10^{-4}$	3.29	$1.16 \times 10^{-3}$
425	0.150	0.482	$1.70 \times 10^{-4}$	1.93	$6.81 \times 10^{-4}$

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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 first 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>
<b>Upper Continental Recharge System</b>	None	
<b>Upper Regional Gravel Aquifer</b>	None	
<b>Lower Regional Gravel Aquifer</b>	Technetium-99	MW370

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.

3/1/2021

**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**

<b>AKGWA</b>	<b>Station</b>	<b>Analysis</b>	<b>Method</b>	<b>Results</b>	<b>Units</b>	<b>MCL</b>
8004-4795	MW361	Trichloroethene	8260B	7.88	ug/L	5
8004-4797	MW364	Trichloroethene	8260B	7.15	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	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	
<b>ACETONE</b>																						
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							*															
<b>ALPHA ACTIVITY</b>																						
Quarter 1, 2004																					■	
Quarter 2, 2004							■														■	
Quarter 3, 2009							■															
<b>ALUMINUM</b>																						
Quarter 3, 2003											*											
<b>BETA ACTIVITY</b>																						
Quarter 1, 2004															■							
Quarter 2, 2004															■						■	
Quarter 3, 2004															■							
Quarter 4, 2004															■							
Quarter 4, 2005															■							
Quarter 1, 2006															■						■	
Quarter 2, 2006															■						■	
Quarter 3, 2006															■						■	
Quarter 4, 2006															■						■	
Quarter 1, 2007										■					■						■	
Quarter 2, 2007										■					■						■	
Quarter 3, 2007										■					■						■	
Quarter 4, 2007										■					■						■	
Quarter 1, 2008										■					■							
Quarter 2, 2008														■	■							
Quarter 3, 2008										■					■					■		
Quarter 4, 2008										■					■					■		
Quarter 1, 2009										■					■					■		
Quarter 2, 2009										■					■		■	■				
Quarter 3, 2009										■					■							
Quarter 4, 2009										■					■							
Quarter 1, 2010										■					■							
Quarter 2, 2010										■					■							
Quarter 3, 2010										■					■							
Quarter 4, 2010										■					■							
Quarter 2, 2011										■					■							
Quarter 4, 2011										■					■							
Quarter 1, 2012										■					■							
Quarter 2, 2012										■					■							
Quarter 3, 2012										■					■							
Quarter 4, 2012										■					■						■	
Quarter 1, 2013										■					■						■	
Quarter 3, 2013										■					■						■	
Quarter 4, 2013										■					■							
Quarter 1, 2014										■					■							
Quarter 4, 2014										■					■							
Quarter 1, 2015										■					■							
Quarter 2, 2015										■					■							
Quarter 4, 2015										■					■					■		
Quarter 3, 2016										■					■						■	
Quarter 4, 2016										■					■							
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										■					■						■	
<b>BROMIDE</b>																						
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	U	D	D	D	D	U	U	D	D	D	D	U
Monitoring Well	368	375	376	377	359	362	365	371	374	366	360	363	357	369	372	367	361	364	358	370	373
<b>CALCIUM</b>																					
Quarter 3, 2003										*											
Quarter 2, 2005																					*
Quarter 3, 2006																					
Quarter 2, 2008															*						
Quarter 3, 2009															*						
Quarter 4, 2009															*						
Quarter 1, 2010															*						
Quarter 2, 2010															*						
Quarter 3, 2010															*						
Quarter 1, 2011															*						
Quarter 2, 2011															*						
Quarter 3, 2011																					*
Quarter 4, 2011															*						*
Quarter 1, 2012															*						*
Quarter 2, 2012															*						*
Quarter 3, 2012															*						*
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 2, 2017	*																				
Quarter 1, 2018	*																				
Quarter 3, 2018	*																				
Quarter 3, 2019	*							*													
Quarter 4, 2019															*						
Quarter 1, 2020								*							*						
Quarter 2, 2020								*							*						
Quarter 3, 2020	*							*							*						
Quarter 4, 2020															*						
Quarter 1, 2021															*						
<b>CARBON DISULFIDE</b>																					
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															*						
<b>CHEMICAL OXYGEN DEMAND</b>																					
Quarter 3, 2002										*	*	*	*	*	*						
Quarter 4, 2002										*	*										
Quarter 1, 2003										*	*										
Quarter 2, 2003										*	*	*									
Quarter 3, 2003	*									*	*	*				*					
Quarter 4, 2003						*				*	*										
Quarter 3, 2004										*					*	*					*
Quarter 3, 2005						*				*					*	*					*
Quarter 4, 2005						*											*	*			*
Quarter 1, 2006																	*	*			*
Quarter 4, 2016																	*				
Quarter 1, 2017										*											
Quarter 2, 2019											*				*						
Quarter 3, 2019															*						*
Quarter 4, 2019															*						
<b>CHLORIDE</b>																					
Quarter 1, 2006																					*
Quarter 2, 2014															*						
<b>COBALT</b>																					
Quarter 3, 2003	*						*			*	*		*	*	*	*	*	*	*	*	*
Quarter 1, 2004															*						*
Quarter 2, 2016															*						
<b>CONDUCTIVITY</b>																					
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	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
<b>CONDUCTIVITY</b>																						
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															*							
Quarter 2, 2015															*							
Quarter 3, 2015															*							
Quarter 4, 2015															*							
Quarter 1, 2016															*							
Quarter 2, 2016															*							
Quarter 3, 2016															*							
Quarter 2, 2019															*							
Quarter 3, 2019															*							
Quarter 4, 2019															*							
Quarter 1, 2020															*							
Quarter 2, 2020															*							
Quarter 3, 2020															*							
Quarter 4, 2020															*							
Quarter 1, 2021															*							
<b>DISSOLVED OXYGEN</b>																						
Quarter 1, 2003					*	*					*											
Quarter 3, 2003					*						*											
Quarter 4, 2003					*																	
Quarter 1, 2004					*																	
Quarter 2, 2004								*								*						
Quarter 1, 2005					*																	
Quarter 2, 2005								*														
Quarter 1, 2006					*																	
Quarter 2, 2006					*																	
Quarter 3, 2006					*			*														
Quarter 4, 2006					*				*													
Quarter 2, 2007					*			*														
Quarter 3, 2007					*			*	*													
Quarter 1, 2008					*																*	
Quarter 2, 2008								*	*													
Quarter 3, 2008								*														
Quarter 1, 2009							*															
Quarter 2, 2009					*			*	*													
Quarter 3, 2009					*			*	*													
Quarter 1, 2010					*		*		*													
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					
	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	
<b>DISSOLVED OXYGEN</b>																						
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					*	*	*	*	*												*	
<b>DISSOLVED SOLIDS</b>																						
Quarter 4, 2002										*												
Quarter 1, 2003										*												
Quarter 2, 2003										*												
Quarter 3, 2003							*			*	*											
Quarter 4, 2003							*			*	*											
Quarter 3, 2005						*																
Quarter 4, 2006															*							
Quarter 1, 2007															*							
Quarter 2, 2007															*							
Quarter 4, 2008															*							
Quarter 1, 2009															*							
Quarter 2, 2009															*							
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 4, 2014															*							
Quarter 2, 2015															*							
Quarter 3, 2015															*							
Quarter 4, 2015															*							
Quarter 1, 2016															*							
Quarter 3, 2019															*							
Quarter 4, 2019															*							
Quarter 1, 2020															*							
Quarter 2, 2020															*							

**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	U	D	D	D	D	U	U	D	D	D	D	U
Gradient	368	375	376	377	359	362	365	371	374	366	360	363	357	369	372	367	361	364	358	370	373
<b>DISSOLVED SOLIDS</b>																					
Quarter 3, 2020															*						
Quarter 4, 2020															*						
Quarter 1, 2021															*						
<b>IODIDE</b>																					
Quarter 2, 2003																*					
Quarter 3, 2003	*									*											
Quarter 4, 2003							*	*						*				*			
Quarter 3, 2010														*				*			
<b>IODINE-131</b>																					
Quarter 3, 2010																		■			
<b>IODOMETHANE</b>																					
Quarter 4, 2003							*														
<b>IRON</b>																					
Quarter 4, 2002							*														
Quarter 3, 2003																					*
Quarter 4, 2003														*							*
Quarter 1, 2004														*							*
Quarter 2, 2004														*							
Quarter 3, 2004														*							
Quarter 3, 2005																					*
<b>MAGNESIUM</b>																					
Quarter 2, 2005															*						*
Quarter 3, 2005							*														*
Quarter 2, 2006															*						*
Quarter 3, 2006															*						
Quarter 1, 2007															*						
Quarter 2, 2008															*						
Quarter 2, 2009															*						
Quarter 3, 2009															*						
Quarter 4, 2009															*						
Quarter 1, 2010															*						
Quarter 2, 2010															*						
Quarter 3, 2010															*						
Quarter 1, 2011															*						
Quarter 2, 2011															*						
Quarter 3, 2011															*						
Quarter 4, 2011															*						
Quarter 1, 2012															*						
Quarter 2, 2012															*						
Quarter 3, 2012															*						
Quarter 4, 2012															*						
Quarter 1, 2013															*						
Quarter 2, 2013															*						
Quarter 3, 2013															*						
Quarter 4, 2013															*						
Quarter 2, 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 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															*						
<b>MANGANESE</b>																					
Quarter 3, 2002										*		*									
Quarter 4, 2002		*				*	*			*		*		*							
Quarter 2, 2003										*		*									
Quarter 3, 2003										*		*	*			*	*	*	*		
Quarter 4, 2003										*	*	*	*			*	*	*	*		
Quarter 1, 2004										*	*	*	*			*	*	*	*		
Quarter 2, 2004							*			*	*	*	*			*	*	*	*		
Quarter 3, 2004							*			*	*	*	*			*	*	*	*		
Quarter 4, 2004										*	*	*	*			*	*	*	*		
Quarter 1, 2005										*	*	*	*			*	*	*	*		
Quarter 2, 2005										*	*	*	*			*	*	*	*		
Quarter 3, 2005										*	*	*	*			*	*	*	*		
Quarter 4, 2005										*	*	*	*			*	*	*	*		
Quarter 1, 2006										*	*	*	*			*	*	*	*		
Quarter 2, 2006							*			*	*	*	*			*	*	*	*		
Quarter 3, 2006										*	*	*	*			*	*	*	*		
Quarter 4, 2006										*	*	*	*			*	*	*	*		
Quarter 1, 2007										*	*	*	*			*	*	*	*		

**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	U	U	D	D	D	U	U	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	
<b>MANGANESE</b>							*			*												
Quarter 2, 2007							*			*												
Quarter 3, 2007							*															
Quarter 3, 2008							*															
Quarter 4, 2008							*															
Quarter 3, 2009							*															
Quarter 3, 2011							*															
Quarter 2, 2016														*								
Quarter 3, 2016									*													
<b>NICKEL</b>																						
Quarter 3, 2003										*												
<b>OXIDATION-REDUCTION POTENTIAL</b>																						
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					
	D	S	S	S	D	D	U	U	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	
<b>OXIDATION-REDUCTION POTENTIAL</b>																						
Quarter 2, 2019	*	*			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Quarter 3, 2019	*	*			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Quarter 4, 2019	*	*			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Quarter 1, 2020	*	*			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Quarter 2, 2020	*	*			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Quarter 3, 2020	*	*			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Quarter 4, 2020	*	*			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Quarter 1, 2021	*	*			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
<b>PCB, TOTAL</b>																						
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							*															
<b>PCB-1016</b>																						
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							*															
<b>PCB-1242</b>																						
Quarter 3, 2006							*				*											
Quarter 4, 2006										*		*										
Quarter 1, 2008							*															
Quarter 2, 2012							*															
<b>PCB-1248</b>																						
Quarter 2, 2008							*															
<b>PCB-1260</b>																						
Quarter 2, 2006							*															
<b>pH</b>																						
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															*	*	*	*		*		
<b>POTASSIUM</b>																						
Quarter 1, 2014															*							
<b>RADIUM-228</b>																						
Quarter 2, 2005																						
Quarter 4, 2005							■					■					■					
<b>SELENIUM</b>																						
Quarter 4, 2003										■												

**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	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
<b>SODIUM</b>																					
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											*										
<b>STRONTIUM-90</b>																					
Quarter 4, 2008									■												
<b>SULFATE</b>																					
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					
	D	S	S	S	D	D	D	U	U		D	D	D	D	U	U	D	D	D	D	U	U
Gradient	368	375	376	377	359	362	365	371	374	366	360	363	357	369	372	367	361	364	358	370	373	
<b>SULFATE</b>																						
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	*	*			*	*	*	*							*							
<b>TECHNETIUM-99</b>																						
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	U	U	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
<b>TECHNETIUM-99</b>																					
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														*		*	*	*	*		
<b>THORIUM-230</b>																					
Quarter 4, 2015																*					
Quarter 2, 2016										*											
Quarter 4, 2016	*											*				*			*		
Quarter 4, 2017												*									
Quarter 2, 2018										*		*									
<b>TOLUENE</b>																					
Quarter 2, 2014										*			*								
<b>TOTAL ORGANIC CARBON</b>																					
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																			*	*	
<b>TOTAL ORGANIC HALIDES</b>																					
Quarter 4, 2002										*											
Quarter 1, 2003										*											
Quarter 2, 2003										*											
Quarter 1, 2004															*						
<b>TRICHLOROETHENE</b>																					
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					
	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
<b>TRICHLOROETHENE</b>																						
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																			■	■		
<b>TURBIDITY</b>																						
Quarter 1, 2003											*											
<b>URANIUM</b>																						
Quarter 4, 2002		*			*	*	*				*	*	*	*	*	*	*	*	*	*	*	*
Quarter 4, 2006																						*
<b>ZINC</b>																						
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**

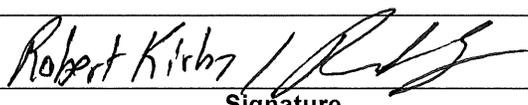
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**CP3-WM-0017-F04 - C-746-U LANDFILL METHANE MONITORING REPORT**

PADUCAH GASEOUS DIFFUSION PLANT

Permit #: 073-00045

McCracken County, Kentucky

<b>Date:</b>	<b>3/22/2021</b>	<b>Time:</b>	<b>1300</b>	<b>Monitor:</b>	<b>Robert Kirby</b>
<b>Weather Conditions:</b> Sunny, Slight Wind, 65F					
<b>Monitoring Equipment:</b> RAE Systems, Multi-RAE, Serial #4494					
<b>Monitoring Location</b>					<b>Reading (% LEL)</b>
<b>C-746-U1</b>	Checked at floor level				0
<b>C-746-U2</b>	Checked at floor level				0
<b>C-746-U-T-14</b>	Checked at floor level				0
<b>C-746-U15</b>	Checked at floor level				0
<b>MG1</b>	Checked 1" from opening				0
<b>MG2</b>	Checked 1" from opening				0
<b>MG3</b>	Checked 1" from opening				0
<b>MG4</b>	Checked 1" from opening				0
<b>Suspect or Problem Areas</b>	No problems noted				
<b>Remarks:</b>	N/A				
<b>Performed by:</b>				<b>03/26/2021</b>	
	<b>Signature</b>			<b>Date</b>	

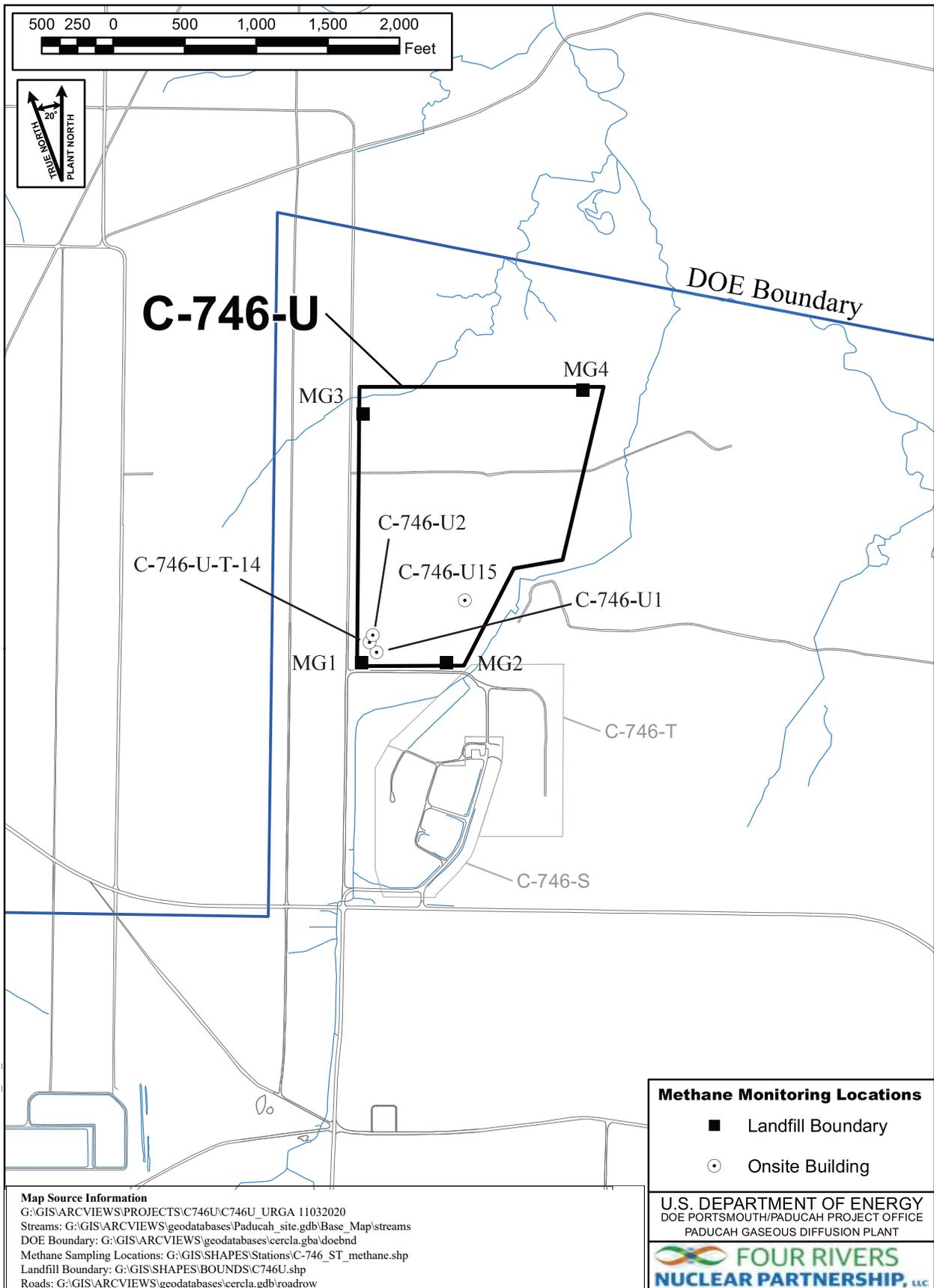


Figure H.1. C-746-U Methane Monitoring Locations

**APPENDIX I**

**SURFACE WATER ANALYSES AND WRITTEN COMMENTS**

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Division of Waste Management      **RESIDENTIAL/CONTAINED-QUARTERLY**  
Solid Waste Branch      **Facility: US DOE - Paducah Gaseous Diffusion Plant**  
14 Reilly Road      **Permit Number: SW07300014, SW07300015, SW07300045**  
Frankfort, KY 40601 (502)564-6716

FINDS/UNIT: KY8-890-008-982 / 1  
LAB ID: None  
For Official Use Only

## SURFACE WATER SAMPLE ANALYSIS (S)

Monitoring Point (KPDES Discharge Number, or "UPSTREAM", or "DOWNSTREAM")		L150 AT SITE	L154 UPSTREAM	L351 DOWNSTREAM						
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)	1/25/2021 08:58	1/25/2021 09:11	1/25/2021 08:47							
Duplicate ("Y" or "N") <sup>1</sup>	N	N	N							
Split ('Y' or 'N') <sup>2</sup>	N	N	N							
Facility Sample ID Number (if applicable)	L150US2-21	L154US2-21	L351US2-21							
Laboratory Sample ID Number (if applicable)	532967001	532967002	532967003							
Date of Analysis (Month/Day/Year)	2/8/2021	2/8/2021	2/8/2021							
CAS RN <sup>3</sup>	CONSTITUENT	T D 4	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>5</sup>	F L A G S <sup>7</sup>	DETECTED VALUE OR PQL <sup>5</sup>	F L A G S <sup>7</sup>	DETECTED VALUE OR PQL <sup>5</sup>	F L A G S <sup>7</sup>
A200-00-0	0 Flow	T	MGD	Field		*		*		
16887-00-6	2 Chloride (s)	T	mg/L	300.0	1.97		1.01		1.19	
14808-79-8	0 Sulfate	T	mg/L	300.0	15.8		3.26		3.34	
7439-89-6	0 Iron	T	mg/L	200.8	8.62	*	1.76	*	2.89	*
7440-23-5	0 Sodium	T	mg/L	200.8	3.47		1.16		1.11	
S0268 - -	0 Organic Carbon <sup>6</sup>	T	mg/L	9060	4.68		10.4		9.98	
S0097 - -	0 BOD <sup>6</sup>	T	mg/L	not applicable		*		*		*
S0130 - -	0 Chemical Oxygen Demand	T	mg/L	410.4	17.8	J	37.3		27.5	

**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

<sup>1</sup>Respond "Y" if the sample was a duplicate of another sample in this report  
<sup>2</sup>Respond "Y" if the sample was split and analyzed by separate laboratories.  
<sup>3</sup>Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.  
<sup>4</sup>"T" = Total; "D" = Dissolved  
<sup>5</sup>"<" indicates a non-detect; do not use "ND" or "BDL". Value then shown is Practical Quantification Limit  
<sup>6</sup>Facility has either/or option on Organic Carbon and (BOD) Biochemical Oxygen Demand - both are not required  
<sup>7</sup>Flags 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**  
**Permit Number: SW07300014, SW07300015, SW07300045**

**Finds/Unit: KY8-890-008-982 / 1**  
**LAB ID: None**  
**For Official Use Only**

## SURFACE WATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
L150	L150US2-21	Flow Rate		Analysis of constituent not required and not performed.
		Iron	*	Duplicate analysis not within control limits.
		Biochemical Oxygen Demand (BOD)		Analysis of constituent not required and not performed.
		Dissolved Solids	*	Duplicate analysis not within control limits.
		Total Solids	*	Duplicate analysis not within control limits.
		Alpha activity	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.77. Rad error is 3.74.
L154	L154US2-21	Beta activity	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.22. Rad error is 6.16.
		Flow Rate		Analysis of constituent not required and not performed.
		Iron	*	Duplicate analysis not within control limits.
		Biochemical Oxygen Demand (BOD)		Analysis of constituent not required and not performed.
		Dissolved Solids	*	Duplicate analysis not within control limits.
		Total Solids	*	Duplicate analysis not within control limits.
L351	L351US2-21	Alpha activity		TPU is 5.91. Rad error is 5.75.
		Beta activity	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.72. Rad error is 5.66.
		Flow Rate		Analysis of constituent not required and not performed.
		Iron	*	Duplicate analysis not within control limits.
		Biochemical Oxygen Demand (BOD)		Analysis of constituent not required and not performed.
		Dissolved Solids	*	Duplicate analysis not within control limits.
		Total Solids	*	Duplicate analysis not within control limits.
		Alpha activity	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.11. Rad error is 3.1.
		Beta activity	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.73. Rad error is 3.72.

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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 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 15<sup>th</sup> day of July 2019.

Vice President, Accreditation Services  
For the Accreditation Council  
Certificate Number 2567.01  
Valid to June 30, 2021

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**

<b>Analytical Method</b>	<b>Preparation Method</b>	<b>Product</b>
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 The 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 (°C)	Conductivity (umho/cm)	pH (Std Unit)	Dissolved oxygen (mg/L)	Turbidity (NTU)		Temperature (°C)	Conductivity (umho/cm)	pH (Std Unit)	Dissolved oxygen (mg/L)	Turbidity (NTU)
<b>MW357</b>						<b>MW358</b>					
Date Collected: 01/14/2021						Date Collected: 01/14/2021					
0856	57.6	428	6.04	4.63	19.2	0939	58.6	566	6.23	1.96	3.8
0859	57.2	426	6.01	4.23	23.0	0942	57.9	573	6.23	0.84	6.6
0902	57.0	425	6.01	4.17	23.9	0945	57.7	572	6.22	0.86	7.1
<b>MW359</b>						<b>MW360</b>					
Date Collected: 01/14/2021						Date Collected: 01/14/2021					
1015	59.7	218	5.89	5.01	20.4	0626	55.6	405	6.12	1.88	6.41
1018	59.8	216	5.87	5.13	21.6	0629	54.2	401	6.10	1.52	7.36
1021	59.7	212	5.87	5.12	22.3	0632	53.7	400	6.10	1.44	7.57
<b>MW361</b>						<b>MW362</b>					
Date Collected: 01/14/2021						Date Collected: 01/14/2021					
0724	57.3	525	5.90	3.87	13.5	0816	57.9	726	6.81	3.22	20.5
0727	56.4	526	5.89	3.44	17.3	0819	57.7	727	6.80	2.21	20.8
0730	56.2	525	5.90	3.38	19.8	0822	57.0	727	6.80	2.16	20.7
<b>MW363</b>						<b>MW364</b>					
Date Collected: 01/19/2021						Date Collected: 01/19/2021					
0702	56.3	487	5.98	1.72	3.0	0803	57.3	471	5.84	4.37	2.0
0705	55.0	452	5.94	0.86	8.4	0805	56.7	471	5.81	3.26	2.5
0708	54.6	450	5.94	0.84	8.6	0808	56.7	470	5.79	3.24	3.1
<b>MW365</b>						<b>MW366</b>					
Date Collected: 01/19/2021						Date Collected: 01/19/2021					
0841	57.3	386	6.13	6.63	2.18	0921	59.2	429	5.96	3.93	1.8
0844	56.6	386	6.12	6.12	2.20	0924	58.3	429	5.95	3.10	1.7
0847	56.4	383	6.12	6.08	2.22	0927	58.3	429	5.96	3.08	1.8
<b>MW367</b>						<b>MW368</b>					
Date Collected: 01/19/2021						Date Collected: 01/19/2021					
1002	59.0	246	5.86	2.08	4.46	1040	58.8	632	6.19	2.41	4.81
1005	58.8	245	5.73	0.87	3.90	1043	58.6	644	6.18	1.35	3.70
1008	58.5	245	5.73	0.80	3.88	1046	58.5	642	6.18	1.32	3.55
<b>MW369</b>						<b>MW370</b>					
Date Collected: 01/20/2021						Date Collected: 01/20/2021					
0712	57.1	378	6.48	4.45	3.82	0810	56.4	450	5.93	6.50	1.10
0715	56.9	373	6.02	1.95	4.06	0813	58.2	464	5.80	4.39	1.75
0718	56.7	373	5.98	1.88	4.10	0816	58.1	464	5.79	4.30	2.05
<b>MW371</b>						<b>MW372</b>					
Date Collected: 01/20/2021						Date Collected: 01/20/2021					
0847	59.4	646	6.37	1.97	510	0930	59.1	819	6.10	3.38	12.4
0850	58.4	642	6.38	1.64	520	0933	59.1	822	6.04	2.22	14.9
0853	58.4	641	6.39	1.60	514	0936	58.8	822	6.04	2.13	15.2
<b>MW373</b>						<b>MW374</b>					
Date Collected: 01/20/2021						Date Collected: 01/20/2021					
1010	59.9	855	6.06	3.33	1.49	1049	60.5	717	6.72	1.40	14.9
1013	59.5	855	6.04	1.86	1.50	1052	60.2	714	6.71	0.95	18.3
1016	59.5	854	6.05	1.80	1.58	1055	60.2	713	6.69	0.92	19.1
<b>MW375</b>						<b>MW358 (Resample)</b>					
Date Collected: 01/20/2021						Date Collected: 03/08/2021					
1132	59.6	349	6.40	1.90	4.93	1201	59.6	523	6.33	1.78	3.1
1135	59.4	344	6.32	1.02	2.10	1204	59.8	524	6.26	1.04	2.7
1138	59.4	344	6.30	0.95	2.28	1207	59.9	525	6.25	1.00	2.7

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**C-746-U Contained Landfill  
First Quarter Calendar Year 2021  
(January-March)  
Compliance Monitoring Report,  
Paducah Gaseous Diffusion Plant,  
Paducah, Kentucky**



This document is approved for public release per review by:

David Hayden  
FRNP Classification Support

05/18/2021  
Date



**C-746-U Contained Landfill  
First Quarter Calendar Year 2021  
(January-March)  
Compliance Monitoring Report,  
Paducah Gaseous Diffusion Plant,  
Paducah, Kentucky**

Date Issued—May 2021

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 First Quarter Calendar Year 2021 (January–March) 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 fourth 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 Site 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. 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.

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

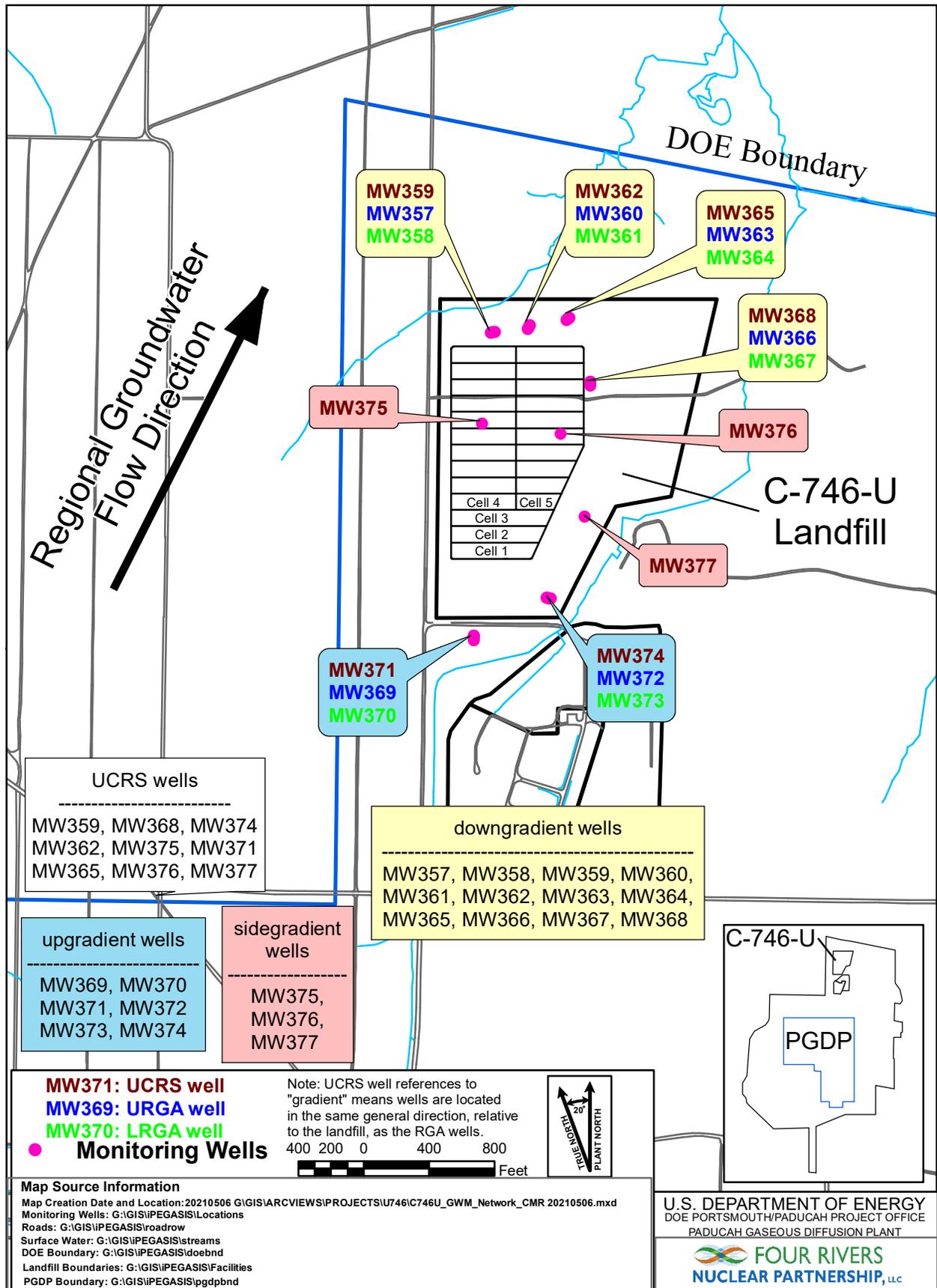


Figure 1. C-746-U Landfill Groundwater Monitoring Well Network

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 first 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 first quarter 2021 was conducted in January and March 2021. MW358 was resampled for nitrate in March due to a holding time issue attributable to the sample courier. 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 January 25, 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 39 vicinity wells define the potentiometric surface for the RGA. Typical regional flow in the RGA is northeastward, toward the Ohio River. During January, RGA groundwater flow in the area of the landfill was oriented northeastward. The hydraulic gradient for the RGA in the vicinity of the C-746-U Landfill in October was  $5.31 \times 10^{-4}$  ft/ft. The hydraulic gradients for the URGA and LRGA at the C-746-U Landfill were  $1.15 \times 10^{-3}$  ft/ft and  $1.13 \times 10^{-3}$  ft/ft, respectively. Calculated groundwater flow rates (average linear velocity) at the C-746-U Landfill range from 1.95 to 3.32 ft/day for the URGA and 1.93 to 3.29 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 March 22, 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 sampling was performed at three locations (see Figure 2) monitored for the C-746-U Landfill: (1) upstream location, L154; (2) downstream location, L351; and (3) location L150 capturing runoff from

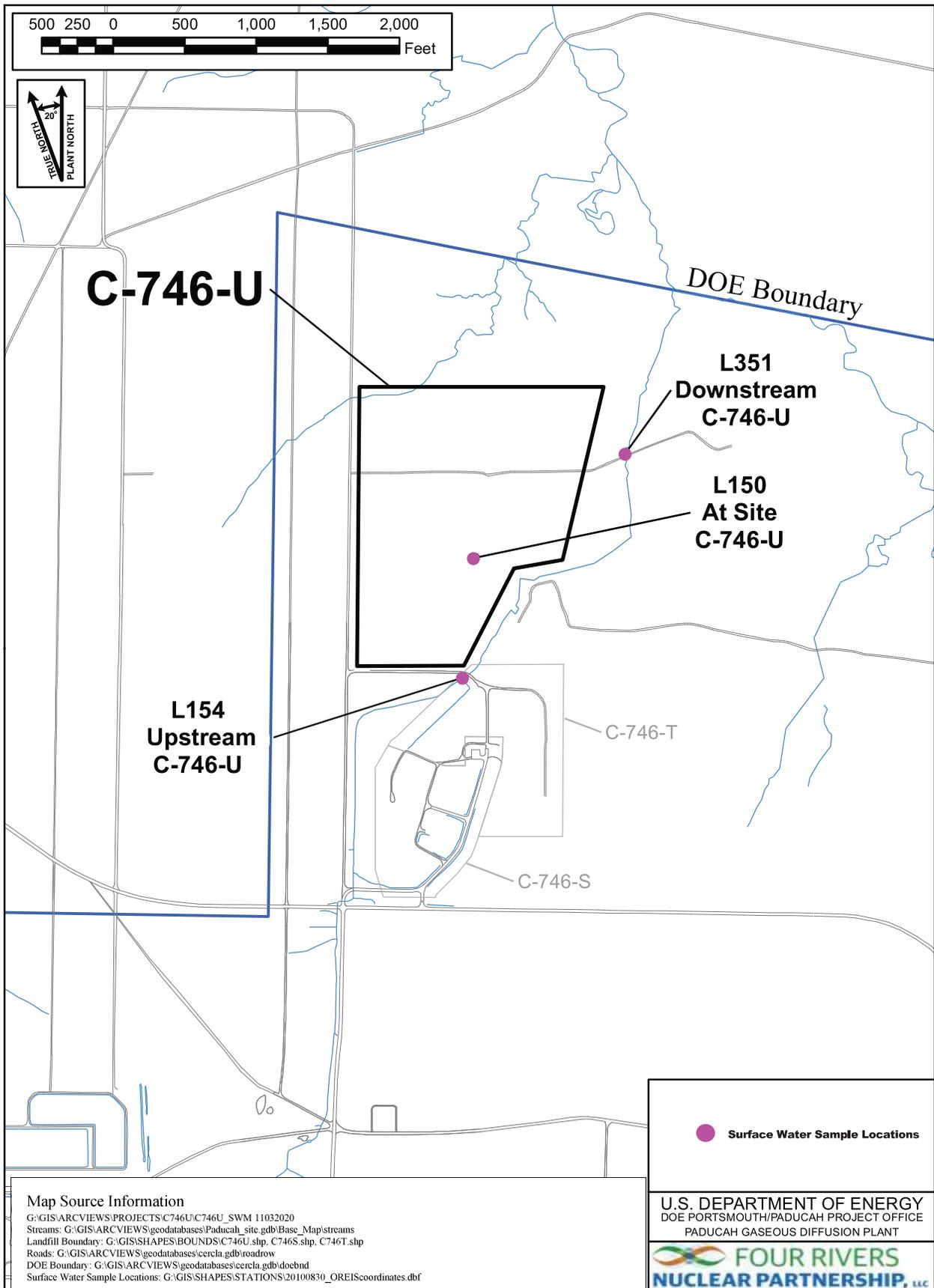


Figure 2. C-746-U Landfill Surface Water Monitoring Locations

the landfill surface. Surface water was monitored, as specified in 401 KAR 48:300 § 2, and the approved *Surface Water Monitoring Plan for C-746-U Contained Landfill Permit Number KY-073-00045, Paducah Gaseous Diffusion Plant, Paducah, Kentucky* (PRS 2008), which is Technical Application Attachment 24 of the Solid Waste Permit. Surface water results are provided in Appendix I.

### 1.3 KEY RESULTS

Groundwater data were evaluated in accordance with the approved Groundwater Monitoring Plan (LATA Kentucky 2014), which is Technical Application Attachment 25, of the Solid Waste Permit. Parameters that had concentrations that exceeded their respective MCL are listed in Table 1. Those constituents that exceeded their respective MCL were evaluated further against their historical background UTL. Table 2 identifies parameters (that do not have MCLs) with concentrations that exceeded the statistically derived historical background UTL<sup>1</sup> during the first 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	None	MW361: Trichloroethene
		MW364: Trichloroethene

**Table 2. Exceedances of Statistically Derived Historical Background Concentrations**

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

<sup>1</sup> 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.

**Table 2. Exceedance of Statistically Derived historical Background Concentrations (Continued)**

\*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

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

URGA	LRGA
MW366: Oxidation-reduction potential	MW364: pH
	MW367: pH

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 MW364, MW366, and MW367, 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.

The pH readings for MW364 and MW367, and oxidation-reduction potential in MW366 (all downgradient wells), were shown to exceed both the historical background UTL and the current background UTL; therefore, preliminarily they were considered to be Type 2 exceedances. To evaluate these preliminary Type 2 exceedances further, the parameters were subjected to the Mann-Kendall statistical test for trend using the most recent eight quarters of data. The results are summarized in Table 4. None of the wells evaluated showed an increasing Mann-Kendall trend and are considered to be a Type 1 exceedance—not attributable to the C-746-U Landfill.

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

Location	Well ID	Parameter	Sample Size	Alpha <sup>1</sup>	p-Value <sup>2</sup>	S <sup>3</sup>	Decision <sup>4</sup>
C-746-U Landfill	MW364	pH	8	0.05	-8	0.119	No Trend
	MW366	Oxidation-reduction Potential	8	0.05	6	0.274	No Trend
	MW367	pH	8	0.05	-7	0.274	No Trend

<sup>1</sup>An alpha of 0.05 represents a 95% confidence interval.

<sup>2</sup>The p-value represents the risk of acceptance the H<sub>a</sub> hypothesis of a trend, in terms of a percentage.

<sup>3</sup>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.

<sup>4</sup>The Mann-Kendall decision operates on two hypotheses; the H<sub>0</sub> and H<sub>a</sub>. H<sub>0</sub> assumes there is no trend in the data, whereas H<sub>a</sub> 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\***

<b>UCRS</b>
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 first 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 6.

**Table 6. Monitoring Wells Included in Statistical Analysis<sup>a</sup>**

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

<sup>a</sup> Map showing the monitoring well locations is shown on Figure 1.

<sup>b</sup> In the same direction (relative to the landfill) as RGA wells considered to be upgradient.

<sup>c</sup> 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, 28 parameters, including those with MCLs, required statistical analysis in the UCRS. During the first quarter, dissolved oxygen, oxidation-reduction potential, and sulfate displayed concentrations that exceeded their respective historical UTL and are listed in Table 2. The sulfate concentration in MW368 exceeded the current background UTL in downgradient wells and is listed in Table 5.

### **2.1.2 Upper Regional Gravel Aquifer**

In this quarter, 26 parameters, including those with MCLs, required statistical analysis in the URGA. During the first quarter, calcium, conductivity, dissolved solids, magnesium, oxidation-reduction potential, and sulfate displayed concentrations that exceeded their respective historical UTL and are listed in Table 2. MW366 (downgradient) exceeded the current background UTL for oxidation-reduction potential and is included in Table 3.

### **2.1.3 Lower Regional Gravel Aquifer**

In this quarter, 28 parameters, including those with MCLs, required statistical analysis in the LRGA. During the first quarter, dissolved oxygen, oxidation-reduction potential, pH, and technetium-99 displayed concentrations that exceeded their respective historical UTL and are listed in Table 2. MW364 and MW367 (downgradient) exceeded the current background UTL for pH and are included in Table 3.

## **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 were considered usable.

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### 3. PROFESSIONAL GEOLOGIST AUTHORIZATION

**DOCUMENT IDENTIFICATION:** C-746-U Contained Landfill  
First Quarter Calendar Year 2021 (January–March)  
Compliance Monitoring Report,  
Paducah Gaseous Diffusion Plant,  
Paducah, Kentucky (FRNP-RPT-0192/V1)

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



PG 113927  
K. Davis  
05-18-2021

Kenneth R. Davis  
Kenneth R. Davis

PG113927

May 18, 2021  
Date

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## 4. REFERENCES

- 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.
- PRS (Paducah Remediation Services, LLC) 2008. *Surface Water Monitoring Plan for C-746-U Contained Landfill Permit Number KY-073-00045, Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, Solid Waste Landfill Permit, Number SW07300014, SW07300015, SW07300045, Technical Application Attachment 24, Paducah Remediation Services, 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 1st 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 Statues Chapter 224) to conduct groundwater and surface water monitoring under the jurisdiction of the Division of Waste Management. **You must report any indication of contamination within forty-eight (48) hours of making the determination using statistical analyses, direct comparison, or other similar techniques. Submitting the lab report is NOT considered notification.** Instructions for completing the form are attached. Do not submit the instruction pages.

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

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

\_\_\_\_\_  
Date

\_\_\_\_\_  
Jennifer Woodard, Paducah Site Lead  
U.S. Department of Energy

\_\_\_\_\_  
Date

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**APPENDIX B**  
**FACILITY INFORMATION SHEET**

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# FACILITY INFORMATION SHEET

Groundwater: January and March 2021  
Surface water: January 2021  
Methane: March 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 Kevil, Kentucky 42053  
Street City/State Zip

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

## OWNER INFORMATION

Facility Owner: U.S. DOE, Robert E. Edwards III, Manager Phone No: (859) 227-5020

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 Kevil, Kentucky 42053  
Street City/State 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 Kevil, Kentucky 42053  
Street City/State 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 Charleston, South Carolina 29407  
Street City/State Zip

## LABORATORY RECORD #2

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

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

Mailing Address: N/A N/A N/A  
Street City/State Zip

## LABORATORY RECORD #3

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

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

Mailing Address: N/A N/A N/A  
Street City/State 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  
 For Official Use Only

## GROUNDWATER SAMPLE ANALYSIS(S)

AKGWA NUMBER <sup>1</sup> , 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)	1/14/2021 09:03	1/14/2021 09:46	1/14/2021 10:22	1/14/2021 06:33								
Duplicate ("Y" or "N") <sup>2</sup>	N	N	N	N								
Split ("Y" or "N") <sup>3</sup>	N	N	N	N								
Facility Sample ID Number (if applicable)	MW357UG2-21	MW358UG2-21	MW359UG2-21	MW360UG2-21								
Laboratory Sample ID Number (if applicable)	532312001	532312003	532312005	532312009								
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis	1/20/2021	1/21/2021	1/20/2021	1/20/2021								
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)	DOWN	DOWN	DOWN	DOWN								
CAS RN <sup>4</sup>	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S <sup>7</sup>	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
24959-67-9	Bromide	T	mg/L	9056	0.368		0.227		<0.2		0.175	J
16887-00-6	Chloride(s)	T	mg/L	9056	31.6		17.4		1.18		9.01	
16984-48-8	Fluoride	T	mg/L	9056	0.174		0.212		0.15		0.226	
S0595- -	Nitrate & Nitrite	T	mg/L	9056	1.28	*		*	0.459	*	0.69	*
14808-79-8	Sulfate	T	mg/L	9056	39.2		29.3		42.9		12.5	
NS1894	Barometric Pressure Reading	T	Inches/Hg	Field	30.34		30.34		30.35		30.3	
S0145- -	Specific Conductance	T	µMHO/cm	Field	425		572		212		400	

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

<sup>1</sup>AKGWA # is 0000-0000 for any type of blank.

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

<sup>3</sup>Respond "Y" if the sample was split and analyzed by separate laboratories.

<sup>4</sup>Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.

<sup>5</sup>"T" = Total; "D" = Dissolved

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

<sup>7</sup>Flags 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

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , 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 <sup>4</sup>	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S						
S0906 - -	Static Water Level Elevation	T	Ft. MSL	Field	324.16		324.18		335.47		324.2	
N238	Dissolved Oxygen	T	mg/L	Field	4.17		0.86		5.12		1.44	
S0266- -	Total Dissolved Solids	T	mg/L	160.1	220	*	270	*	151	*	201	*
S0296- -	pH	T	Units	Field	6.01		6.22		5.87		6.1	
NS215	Eh	T	mV	Field	447		130		288		421	
S0907 - -	Temperature	T	°C	Field	13.89		14.28		15.39		12.06	
7429-90-5	Aluminum	T	mg/L	6020	<0.05		0.0899		0.0258	J	0.0459	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		0.0128		<0.005		<0.005	
7440-39-3	Barium	T	mg/L	6020	0.0676		0.0805		0.0211		0.175	
7440-41-7	Beryllium	T	mg/L	6020	<0.0005		<0.0005		<0.0005		<0.0005	
7440-42-8	Boron	T	mg/L	6020	0.334		0.164		0.0122	J	0.0358	
7440-43-9	Cadmium	T	mg/L	6020	<0.001		<0.001		<0.001		<0.001	
7440-70-2	Calcium	T	mg/L	6020	23.9		34.7		4.93		17.5	
7440-47-3	Chromium	T	mg/L	6020	<0.01		0.00463	J	<0.01		<0.01	
7440-48-4	Cobalt	T	mg/L	6020	<0.001		0.0462		<0.001		0.0017	
7440-50-8	Copper	T	mg/L	6020	0.000682	J	0.00068	J	0.000477	J	0.00177	J
7439-89-6	Iron	T	mg/L	6020	<0.1		22.9		<0.1		0.119	
7439-92-1	Lead	T	mg/L	6020	<0.002		<0.002		<0.002		<0.002	
7439-95-4	Magnesium	T	mg/L	6020	10.4		17.9		2.94		7.55	
7439-96-5	Manganese	T	mg/L	6020	0.00441	J	2.38		<0.005		0.0206	
7439-97-6	Mercury	T	mg/L	7470	<0.0002		<0.0002		<0.0002		<0.0002	

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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

For Official Use Only

**GROUNDWATER SAMPLE ANALYSIS - (Cont.)**

AKGWA NUMBER <sup>1</sup> , 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 <sup>4</sup>	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S						
7439-98-7	Molybdenum	T	mg/L	6020	<0.001		0.000858	J	<0.001		<0.001	
7440-02-0	Nickel	T	mg/L	6020	0.000893	J	0.0767		0.00119	J	0.00153	J
7440-09-7	Potassium	T	mg/L	6020	1.58		3.17		<0.3		0.669	
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	39.7		33.3		32.7		54.4	
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		<0.0002		<0.0002	
7440-62-2	Vanadium	T	mg/L	6020	<0.02		0.00717	J	0.00527	J	<0.02	
7440-66-6	Zinc	T	mg/L	6020	<0.02		0.0191	J	<0.02		<0.02	
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	

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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

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , 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 <sup>4</sup>	CONSTITUENT	T D <sup>5</sup>	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	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	0.00266		0.00446		<0.001		0.00042	J

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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

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , 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 <sup>4</sup>	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	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		<0.0000191		<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	<0.0956		<0.0963		<0.108		<0.0974	
12674-11-2	PCB-1016	T	ug/L	8082	<0.0956		<0.0963		<0.108		<0.0974	
11104-28-2	PCB-1221	T	ug/L	8082	<0.0956		<0.0963		<0.108		<0.0974	
11141-16-5	PCB-1232	T	ug/L	8082	<0.0956		<0.0963		<0.108		<0.0974	
53469-21-9	PCB-1242	T	ug/L	8082	<0.0956		<0.0963		<0.108		<0.0974	
12672-29-6	PCB-1248	T	ug/L	8082	<0.0956		<0.0963		<0.108		<0.0974	

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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

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , 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 <sup>4</sup>	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S						
11097-69-1	PCB-1254	T	ug/L	8082	<0.0956		<0.0963		<0.108		<0.0974	
11096-82-5	PCB-1260	T	ug/L	8082	<0.0956		<0.0963		<0.108		<0.0974	
11100-14-4	PCB-1268	T	ug/L	8082	<0.0956		<0.0963		<0.108		<0.0974	
12587-46-1	Gross Alpha	T	pCi/L	9310	0.547	*	1.15	*	-0.333	*	0.601	*
12587-47-2	Gross Beta	T	pCi/L	9310	21.4	*	0.927	*	10.6	*	5.6	*
10043-66-0	Iodine-131	T	pCi/L			*		*		*		*
13982-63-3	Radium-226	T	pCi/L	AN-1418	0.241	*	0.438	*	0.166	*	0.363	*
10098-97-2	Strontium-90	T	pCi/L	905.0	-2.25	*	2.46	*	2.75	*	-0.148	*
14133-76-7	Technetium-99	T	pCi/L	Tc-02-RC	24.4	*	0.722	*	-6.98	*	4.3	*
14269-63-7	Thorium-230	T	pCi/L	Th-01-RC	0.975	*	0.651	*	0.509	*	-0.0261	*
10028-17-8	Tritium	T	pCi/L	906.0	25.6	*	117	*	33.4	*	33.8	*
S0130- -	Chemical Oxygen Demand	T	mg/L	410.4	<20	*	24.2	*	<20	*	18.9	*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		0.196	J	<0.5		<0.5	
S0268- -	Total Organic Carbon	T	mg/L	9060	0.591	J	7.07		0.559	J	0.989	J
S0586- -	Total Organic Halides	T	mg/L	9020	0.00662	J	0.00706	J	0.00576	J	0.0063	J

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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  
For Official Use Only

## GROUNDWATER SAMPLE ANALYSIS(S)

AKGWA NUMBER <sup>1</sup> , 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)	1/14/2021 07:31	1/14/2021 08:23	1/19/2021 07:09	1/19/2021 08:09								
Duplicate ("Y" or "N") <sup>2</sup>	N	N	N	N								
Split ("Y" or "N") <sup>3</sup>	N	N	N	N								
Facility Sample ID Number (if applicable)	MW361UG2-21	MW362UG2-21	MW363UG2-21	MW364UG2-21								
Laboratory Sample ID Number (if applicable)	532312011	532312013	532475001	532475003								
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis	1/21/2021	1/21/2021	1/21/2021	1/21/2021								
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)	DOWN	DOWN	DOWN	DOWN								
CAS RN <sup>4</sup>	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S <sup>7</sup>	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
24959-67-9	Bromide	T	mg/L	9056	0.469		<0.2		0.132	J	0.449	
16887-00-6	Chloride(s)	T	mg/L	9056	35.3		3.91		34.2	*	36.2	*
16984-48-8	Fluoride	T	mg/L	9056	0.182		0.36		0.213		0.168	
S0595- -	Nitrate & Nitrite	T	mg/L	9056	0.986	*	0.513	*	8.21		1.23	
14808-79-8	Sulfate	T	mg/L	9056	82.2		30.3		26.6		72.9	
NS1894	Barometric Pressure Reading	T	Inches/Hg	Field	30.32		30.32		30.22		30.25	
S0145- -	Specific Conductance	T	µMHO/cm	Field	525		727		450		470	

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

<sup>1</sup>AKGWA # is 0000-0000 for any type of blank.

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

<sup>3</sup>Respond "Y" if the sample was split and analyzed by separate laboratories.

<sup>4</sup>Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.

<sup>5</sup>"T" = Total; "D" = Dissolved

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

<sup>7</sup>Flags 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**

**Permit Number: SW07300014, SW07300015, SW07300045**

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

LAB ID: None

For Official Use Only

**GROUNDWATER SAMPLE ANALYSIS - (Cont.)**

AKGWA NUMBER <sup>1</sup> , 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 <sup>4</sup>	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S						
S0906 - -	Static Water Level Elevation	T	Ft. MSL	Field	323.9		339.35		323.54		322.78	
N238	Dissolved Oxygen	T	mg/L	Field	3.38		2.16		0.84		3.24	
S0266- -	Total Dissolved Solids	T	mg/L	160.1	284	*	386	*	259		287	
S0296- -	pH	T	Units	Field	5.9		6.8		5.94		5.79	
NS215	Eh	T	mV	Field	466		436		425		461	
S0907 - -	Temperature	T	°C	Field	13.44		13.89		12.56		13.72	
7429-90-5	Aluminum	T	mg/L	6020	<0.05		0.0387	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	0.0504		0.0979		0.143		0.0584	
7440-41-7	Beryllium	T	mg/L	6020	<0.0005		<0.0005		<0.0005		<0.0005	
7440-42-8	Boron	T	mg/L	6020	0.102		0.0195		0.0194		0.049	
7440-43-9	Cadmium	T	mg/L	6020	<0.001		<0.001		<0.001		<0.001	
7440-70-2	Calcium	T	mg/L	6020	31.7		20.1		29.5		33.5	
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		<0.001		0.00122		<0.001	
7440-50-8	Copper	T	mg/L	6020	0.000768	J	0.000974	J	0.00345	B	0.00207	B
7439-89-6	Iron	T	mg/L	6020	<0.1		<0.1		0.0388	J	<0.1	
7439-92-1	Lead	T	mg/L	6020	<0.002		<0.002		<0.002		<0.002	
7439-95-4	Magnesium	T	mg/L	6020	14.4		9.18		12.3		14.5	
7439-96-5	Manganese	T	mg/L	6020	0.00123	J	0.00203	J	0.2		0.00332	J
7439-97-6	Mercury	T	mg/L	7470	<0.0002		<0.0002		<0.0002		<0.0002	

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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

For Official Use Only

**GROUNDWATER SAMPLE ANALYSIS - (Cont.)**

AKGWA NUMBER <sup>1</sup> , 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 <sup>4</sup>	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S						
7439-98-7	Molybdenum	T	mg/L	6020	<0.001		0.000508	J	0.000219	BJ	0.000282	BJ
7440-02-0	Nickel	T	mg/L	6020	0.000772	J	0.000908	J	0.0209		0.00277	
7440-09-7	Potassium	T	mg/L	6020	2.37		0.305		2.01		2.04	
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	43.8		127		41.8		42.3	
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		0.00332		<0.0002		<0.0002	
7440-62-2	Vanadium	T	mg/L	6020	<0.02		<0.02		0.00521	BJ	<0.02	
7440-66-6	Zinc	T	mg/L	6020	<0.02		<0.02		0.00604	J	0.0118	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	

C-11

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

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , 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 <sup>4</sup>	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	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	0.00788		<0.001		0.00079	J	0.00715	

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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

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , 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 <sup>4</sup>	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	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	<0.0000192		<0.0000188		<0.0000206		<0.0000204	
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	<0.1		<0.0974		<0.1		<0.0973	
12674-11-2	PCB-1016	T	ug/L	8082	<0.1		<0.0974		<0.1		<0.0973	
11104-28-2	PCB-1221	T	ug/L	8082	<0.1		<0.0974		<0.1		<0.0973	
11141-16-5	PCB-1232	T	ug/L	8082	<0.1		<0.0974		<0.1		<0.0973	
53469-21-9	PCB-1242	T	ug/L	8082	<0.1		<0.0974		<0.1		<0.0973	
12672-29-6	PCB-1248	T	ug/L	8082	<0.1		<0.0974		<0.1		<0.0973	

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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

For Official Use Only

**GROUNDWATER SAMPLE ANALYSIS - (Cont.)**

AKGWA NUMBER <sup>1</sup> , 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 <sup>4</sup>	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S						
11097-69-1	PCB-1254	T	ug/L	8082	<0.1		<0.0974		<0.1		<0.0973	
11096-82-5	PCB-1260	T	ug/L	8082	<0.1		<0.0974		<0.1		<0.0973	
11100-14-4	PCB-1268	T	ug/L	8082	<0.1		<0.0974		<0.1		<0.0973	
12587-46-1	Gross Alpha	T	pCi/L	9310	0.575	*	7.34	*	1.98	*	2.44	*
12587-47-2	Gross Beta	T	pCi/L	9310	34.1	*	4.52	*	2.57	*	34.5	*
10043-66-0	Iodine-131	T	pCi/L			*		*		*		*
13982-63-3	Radium-226	T	pCi/L	AN-1418	0.246	*	0.379	*	1.08	*	0.268	*
10098-97-2	Strontium-90	T	pCi/L	905.0	2.16	*	0.443	*	-0.35	*	4.23	*
14133-76-7	Technetium-99	T	pCi/L	Tc-02-RC	43.7	*	-2.23	*	2.69	*	33.9	*
14269-63-7	Thorium-230	T	pCi/L	Th-01-RC	-0.256	*	0.833	*	-0.0422	*	-0.0443	*
10028-17-8	Tritium	T	pCi/L	906.0	34.3	*	48.7	*	38.8	*	179	*
S0130- -	Chemical Oxygen Demand	T	mg/L	410.4	76.8	*	<20	*	37.4		13.7	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	0.459	J	1.95	J	1.32	J	0.936	J
S0586- -	Total Organic Halides	T	mg/L	9020	<0.01		0.0153		<0.01		<0.01	

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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  
For Official Use Only

## GROUNDWATER SAMPLE ANALYSIS(S)

AKGWA NUMBER <sup>1</sup> , 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)	1/19/2021 08:48	1/19/2021 09:28	1/19/2021 10:09	1/19/2021 10:47								
Duplicate ("Y" or "N") <sup>2</sup>	N	N	N	N								
Split ("Y" or "N") <sup>3</sup>	N	N	N	N								
Facility Sample ID Number (if applicable)	MW365UG2-21	MW366UG2-21	MW367UG2-21	MW368UG2-21								
Laboratory Sample ID Number (if applicable)	532475005	532475007	532475009	532475011								
Date of Analysis (Month/Day/Year) For <u>Volatiles Organics</u> Analysis	1/21/2021	1/21/2021	1/21/2021	1/21/2021								
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)	DOWN	DOWN	DOWN	DOWN								
CAS RN <sup>4</sup>	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S <sup>7</sup>	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
24959-67-9	Bromide	T	mg/L	9056	<0.2		0.391		0.151	J	<0.2	
16887-00-6	Chloride(s)	T	mg/L	9056	2.64	*	34.5	*	10.6	*	4.41	*
16984-48-8	Fluoride	T	mg/L	9056	0.341		0.197		0.12		0.245	
S0595- -	Nitrate & Nitrite	T	mg/L	9056	0.877		0.928		<0.1		<0.1	
14808-79-8	Sulfate	T	mg/L	9056	60.6		38.4		24.3		126	
NS1894	Barometric Pressure Reading	T	Inches/Hg	Field	30.25		30.28		30.31		30.31	
S0145- -	Specific Conductance	T	µMHO/cm	Field	383		429		245		642	

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

<sup>1</sup>AKGWA # is 0000-0000 for any type of blank.

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

<sup>3</sup>Respond "Y" if the sample was split and analyzed by separate laboratories.

<sup>4</sup>Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.

<sup>5</sup>"T" = Total; "D" = Dissolved

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

<sup>7</sup>Flags 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

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , 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 <sup>4</sup>	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S						
S0906 - -	Static Water Level Elevation	T	Ft. MSL	Field	332.07		323.39		323.63		344.76	
N238	Dissolved Oxygen	T	mg/L	Field	6.08		3.08		0.8		1.32	
S0266- -	Total Dissolved Solids	T	mg/L	160.1	243		223		130		414	
S0296- -	pH	T	Units	Field	6.12		5.96		5.73		6.18	
NS215	Eh	T	mV	Field	451		477		278		291	
S0907 - -	Temperature	T	°C	Field	13.56		14.61		14.72		14.72	
7429-90-5	Aluminum	T	mg/L	6020	0.023	J	<0.05		<0.05		0.103	
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		0.00244	J	0.00361	J
7440-39-3	Barium	T	mg/L	6020	0.0814		0.101		0.131		0.0481	
7440-41-7	Beryllium	T	mg/L	6020	<0.0005		<0.0005		<0.0005		<0.0005	
7440-42-8	Boron	T	mg/L	6020	<0.015		0.0786		0.0195		<0.015	
7440-43-9	Cadmium	T	mg/L	6020	<0.001		<0.001		<0.001		<0.001	
7440-70-2	Calcium	T	mg/L	6020	19.7		26.9		13.9		59.3	
7440-47-3	Chromium	T	mg/L	6020	<0.01		<0.01		<0.01		<0.01	
7440-48-4	Cobalt	T	mg/L	6020	0.00135		<0.001		0.00739		<0.001	
7440-50-8	Copper	T	mg/L	6020	0.00487	B	0.00119	BJ	0.00119	BJ	0.000877	BJ
7439-89-6	Iron	T	mg/L	6020	<0.1		<0.1		5.15		0.0734	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	9.72		12		7.82		13.9	
7439-96-5	Manganese	T	mg/L	6020	0.00419	J	0.00265	J	1.54		0.00737	
7439-97-6	Mercury	T	mg/L	7470	<0.0002		<0.0002		<0.0002		<0.0002	

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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

For Official Use Only

**GROUNDWATER SAMPLE ANALYSIS - (Cont.)**

AKGWA NUMBER <sup>1</sup> , 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 <sup>4</sup>	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S						
7439-98-7	Molybdenum	T	mg/L	6020	<0.001		<0.001		<0.001		0.000676	BJ
7440-02-0	Nickel	T	mg/L	6020	0.00671		0.00178	J	0.00439		0.00213	
7440-09-7	Potassium	T	mg/L	6020	0.243	J	1.82		2.81		0.567	
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		0.00309	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	58.3		43.1		18.7		75.7	
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	0.00021		<0.0002		<0.0002		0.000226	
7440-62-2	Vanadium	T	mg/L	6020	0.0052	BJ	0.00428	BJ	0.00409	BJ	0.0035	BJ
7440-66-6	Zinc	T	mg/L	6020	0.00757	J	<0.02		0.0154	J	0.00661	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	

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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

For Official Use Only

**GROUNDWATER SAMPLE ANALYSIS - (Cont.)**

AKGWA NUMBER <sup>1</sup> , 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 <sup>4</sup>	CONSTITUENT	T D <sup>5</sup>	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	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		0.00313		0.00077	J	<0.001	

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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

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , 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 <sup>4</sup>	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	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	<0.0000206		<0.0000205		<0.0000203		<0.0000202	
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	0.051	J	<0.101		<0.0987		<0.0995	
12674-11-2	PCB-1016	T	ug/L	8082	<0.0985		<0.101		<0.0987		<0.0995	
11104-28-2	PCB-1221	T	ug/L	8082	<0.0985		<0.101		<0.0987		<0.0995	
11141-16-5	PCB-1232	T	ug/L	8082	<0.0985		<0.101		<0.0987		<0.0995	
53469-21-9	PCB-1242	T	ug/L	8082	0.051	J	<0.101		<0.0987		<0.0995	
12672-29-6	PCB-1248	T	ug/L	8082	<0.0985		<0.101		<0.0987		<0.0995	

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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

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , 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 <sup>4</sup>	CONSTITUENT	T D <sup>5</sup>	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
11097-69-1	PCB-1254	T	ug/L	8082	<0.0985		<0.101		<0.0987		<0.0995	
11096-82-5	PCB-1260	T	ug/L	8082	<0.0985		<0.101		<0.0987		<0.0995	
11100-14-4	PCB-1268	T	ug/L	8082	<0.0985		<0.101		<0.0987		<0.0995	
12587-46-1	Gross Alpha	T	pCi/L	9310	0.0296	*	0.154	*	6.56	*	5.43	*
12587-47-2	Gross Beta	T	pCi/L	9310	-7.14	*	39.6	*	4.8	*	-0.183	*
10043-66-0	Iodine-131	T	pCi/L			*		*		*		*
13982-63-3	Radium-226	T	pCi/L	AN-1418	0.217	*	0.19	*	0.516	*	0.0663	*
10098-97-2	Strontium-90	T	pCi/L	905.0	-0.0427	*	3.95	*	2.62	*	-2.99	*
14133-76-7	Technetium-99	T	pCi/L	Tc-02-RC	-9.21	*	43.9	*	-1.74	*	1.85	*
14269-63-7	Thorium-230	T	pCi/L	Th-01-RC	0.232	*	-0.0501	*	0.184	*	-0.0235	*
10028-17-8	Tritium	T	pCi/L	906.0	81.4	*	26.9	*	81.3	*	78	*
S0130- -	Chemical Oxygen Demand	T	mg/L	410.4	63.7		13.7	J	24.2		13.7	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	1.54	J	0.91	J	0.681	J	1.52	J
S0586- -	Total Organic Halides	T	mg/L	9020	0.0163		0.00616	J	0.00498	J	0.00666	J

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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  
For Official Use Only

## GROUNDWATER SAMPLE ANALYSIS(S)

AKGWA NUMBER <sup>1</sup> , 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)	1/20/2021 07:19	1/20/2021 08:17	1/20/2021 08:54	1/20/2021 09:37								
Duplicate ("Y" or "N") <sup>2</sup>	N	N	N	N								
Split ("Y" or "N") <sup>3</sup>	N	N	N	N								
Facility Sample ID Number (if applicable)	MW369UG2-21	MW370UG2-21	MW371UG2-21	MW372UG2-21								
Laboratory Sample ID Number (if applicable)	532565001	532565003	532565005	532565007								
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis	1/26/2021	1/26/2021	1/26/2021	1/26/2021								
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)	UP	UP	UP	UP								
CAS RN <sup>4</sup>	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S <sup>7</sup>	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
24959-67-9	Bromide	T	mg/L	9056	0.343		0.464		<0.2		0.51	
16887-00-6	Chloride(s)	T	mg/L	9056	29.8	*	36.7	*	3.4	*	38.4	*
16984-48-8	Fluoride	T	mg/L	9056	0.232		0.219		0.229		0.194	
S0595- -	Nitrate & Nitrite	T	mg/L	9056	0.838		1.12		0.116	J	1.19	
14808-79-8	Sulfate	T	mg/L	9056	5.86		20.9		29.2		156	
NS1894	Barometric Pressure Reading	T	Inches/Hg	Field	30.37		30.38		30.39		30.39	
S0145- -	Specific Conductance	T	µMHO/cm	Field	373		464		641		822	

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

<sup>1</sup>AKGWA # is 0000-0000 for any type of blank.

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

<sup>3</sup>Respond "Y" if the sample was split and analyzed by separate laboratories.

<sup>4</sup>Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.

<sup>5</sup>"T" = Total; "D" = Dissolved

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

<sup>7</sup>Flags 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

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , 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 <sup>4</sup>	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S						
S0906 - -	Static Water Level Elevation	T	Ft. MSL	Field	324.58		324.81		342.42		324.68	
N238	Dissolved Oxygen	T	mg/L	Field	1.88		4.3		1.6		2.13	
S0266- -	Total Dissolved Solids	T	mg/L	160.1	191	*	210	*	347	*	447	*
S0296- -	pH	T	Units	Field	5.98		5.79		6.39		6.04	
NS215	Eh	T	mV	Field	350		395		296		362	
S0907 - -	Temperature	T	°C	Field	13.72		14.5		14.67		14.89	
7429-90-5	Aluminum	T	mg/L	6020	0.0351	J	<0.05		24.9		<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		0.00606		<0.005	
7440-39-3	Barium	T	mg/L	6020	0.354		0.241		0.174		0.0638	
7440-41-7	Beryllium	T	mg/L	6020	<0.0005		<0.0005		0.00103		<0.0005	
7440-42-8	Boron	T	mg/L	6020	0.0147	J	0.27		0.0106	J	1.39	
7440-43-9	Cadmium	T	mg/L	6020	<0.001		<0.001		<0.001		<0.001	
7440-70-2	Calcium	T	mg/L	6020	15.4		28.3		62.8		67.5	
7440-47-3	Chromium	T	mg/L	6020	<0.01		<0.01		0.028		<0.01	
7440-48-4	Cobalt	T	mg/L	6020	0.00382		<0.001		0.00408		<0.001	
7440-50-8	Copper	T	mg/L	6020	0.00341		0.00128	J	0.0117		0.00142	J
7439-89-6	Iron	T	mg/L	6020	0.167		<0.1		14.2		<0.1	
7439-92-1	Lead	T	mg/L	6020	<0.002		<0.002		0.0106		<0.002	
7439-95-4	Magnesium	T	mg/L	6020	6.85		12.9		16		24.1	
7439-96-5	Manganese	T	mg/L	6020	0.0167		0.00196	J	0.3		<0.005	
7439-97-6	Mercury	T	mg/L	7470	<0.0002		<0.0002		<0.0002		<0.0002	

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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

For Official Use Only

**GROUNDWATER SAMPLE ANALYSIS - (Cont.)**

AKGWA NUMBER <sup>1</sup> , 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 <sup>4</sup>	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S						
7439-98-7	Molybdenum	T	mg/L	6020	0.000208	J	<0.001		0.00105		<0.001	
7440-02-0	Nickel	T	mg/L	6020	0.00505		0.00254		0.0204		0.00145	J
7440-09-7	Potassium	T	mg/L	6020	0.505		2.69		1.57		2.21	
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		0.00151		<0.001	
7440-23-5	Sodium	T	mg/L	6020	53.9		43.1		60.8		64	
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		0.00228		<0.0002	
7440-62-2	Vanadium	T	mg/L	6020	0.00332	J	<0.02		0.0432		<0.02	
7440-66-6	Zinc	T	mg/L	6020	0.00591	J	<0.02		0.0432		<0.02	
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	

C-23

**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

For Official Use Only

**GROUNDWATER SAMPLE ANALYSIS - (Cont.)**

AKGWA NUMBER <sup>1</sup> , 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 <sup>4</sup>	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	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	0.00147		0.00086	J	<0.001		0.00341	

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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

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , 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 <sup>4</sup>	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	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	<0.0000204		<0.0000205		<0.0000205		<0.0000203	
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	<0.1		<0.0982		<0.0998		<0.0981	
12674-11-2	PCB-1016	T	ug/L	8082	<0.1		<0.0982		<0.0998		<0.0981	
11104-28-2	PCB-1221	T	ug/L	8082	<0.1		<0.0982		<0.0998		<0.0981	
11141-16-5	PCB-1232	T	ug/L	8082	<0.1		<0.0982		<0.0998		<0.0981	
53469-21-9	PCB-1242	T	ug/L	8082	<0.1		<0.0982		<0.0998		<0.0981	
12672-29-6	PCB-1248	T	ug/L	8082	<0.1		<0.0982		<0.0998		<0.0981	

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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

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , 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 <sup>4</sup>	CONSTITUENT	T D <sup>5</sup>	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
11097-69-1	PCB-1254	T	ug/L	8082	<0.1		<0.0982		<0.0998		<0.0981	
11096-82-5	PCB-1260	T	ug/L	8082	<0.1		<0.0982		<0.0998		<0.0981	
11100-14-4	PCB-1268	T	ug/L	8082	<0.1		<0.0982		<0.0998		<0.0981	
12587-46-1	Gross Alpha	T	pCi/L	9310	2.32	*	-1.4	*	4.23	*	1.68	*
12587-47-2	Gross Beta	T	pCi/L	9310	23.2	*	35	*	-1.18	*	27.6	*
10043-66-0	Iodine-131	T	pCi/L			*		*		*		*
13982-63-3	Radium-226	T	pCi/L	AN-1418	0.151	*	0.447	*	0.159	*	0.114	*
10098-97-2	Strontium-90	T	pCi/L	905.0	2.91	*	-2.04	*	-3.17	*	0.0329	*
14133-76-7	Technetium-99	T	pCi/L	Tc-02-RC	47.7	*	58.8	*	7.38	*	43.5	*
14269-63-7	Thorium-230	T	pCi/L	Th-01-RC	-0.0188	*	-0.142	*	0.513	*	0.2	*
10028-17-8	Tritium	T	pCi/L	906.0	86.3	*	91.9	*	71.9	*	100	*
S0130- -	Chemical Oxygen Demand	T	mg/L	410.4	<20		17.8	J	<20		39.7	
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	1.32	J	1.13	J	1.89	J	1.29	J
S0586- -	Total Organic Halides	T	mg/L	9020	0.0246		0.00702	J	0.00614	J	0.014	

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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  
For Official Use Only

## GROUNDWATER SAMPLE ANALYSIS(S)

AKGWA NUMBER <sup>1</sup> , 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)	1/20/2021 10:17	1/20/2021 10:56	1/20/2021 11:39	NA								
Duplicate ("Y" or "N") <sup>2</sup>	N	N	N	N								
Split ("Y" or "N") <sup>3</sup>	N	N	N	N								
Facility Sample ID Number (if applicable)	MW373UG2-21	MW374UG2-21	MW375UG2-21	NA								
Laboratory Sample ID Number (if applicable)	532565009	532565011	532565013	NA								
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis	1/26/2021	1/26/2021	1/26/2021	NA								
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)	UP	UP	SIDE	SIDE								
CAS RN <sup>4</sup>	CONSTITUENT	T D S <sup>5</sup>	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S <sup>7</sup>	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
24959-67-9	Bromide	T	mg/L	9056	0.565		0.647		<0.2			*
16887-00-6	Chloride(s)	T	mg/L	9056	39	*	57.4	*	3.56	*		*
16984-48-8	Fluoride	T	mg/L	9056	0.196		0.264		0.317			*
S0595- -	Nitrate & Nitrite	T	mg/L	9056	1.12		<0.1		1.1			*
14808-79-8	Sulfate	T	mg/L	9056	170		10.7		24			*
NS1894	Barometric Pressure Reading	T	Inches/Hg	Field	30.4		30.37		30.37			*
S0145- -	Specific Conductance	T	µMH0/cm	Field	854		713		344			*

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

<sup>1</sup>AKGWA # is 0000-0000 for any type of blank.

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

<sup>3</sup>Respond "Y" if the sample was split and analyzed by separate laboratories.

<sup>4</sup>Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.

<sup>5</sup>"T" = Total; "D" = Dissolved

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

<sup>7</sup>Flags 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

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , 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 <sup>4</sup>	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S						
S0906 - -	Static Water Level Elevation	T	Ft. MSL	Field	324.65		339.15		337.72			*
N238	Dissolved Oxygen	T	mg/L	Field	1.8		0.92		0.95			*
S0266- -	Total Dissolved Solids	T	mg/L	160.1	484	*	341	*	169	*		*
S0296- -	pH	T	Units	Field	6.05		6.69		6.3			*
NS215	Eh	T	mV	Field	372		145		297			*
S0907 - -	Temperature	T	°C	Field	15.28		15.67		15.22			*
7429-90-5	Aluminum	T	mg/L	6020	0.0399	J	<0.05		0.0356	J		*
7440-36-0	Antimony	T	mg/L	6020	<0.003		<0.003		<0.003			*
7440-38-2	Arsenic	T	mg/L	6020	<0.005		0.00349	J	<0.005			*
7440-39-3	Barium	T	mg/L	6020	0.0308		0.143		0.165			*
7440-41-7	Beryllium	T	mg/L	6020	<0.0005		<0.0005		<0.0005			*
7440-42-8	Boron	T	mg/L	6020	2.1		0.03		0.0148	J		*
7440-43-9	Cadmium	T	mg/L	6020	<0.001		<0.001		<0.001			*
7440-70-2	Calcium	T	mg/L	6020	71		22.8		12.9			*
7440-47-3	Chromium	T	mg/L	6020	<0.01		<0.01		<0.01			*
7440-48-4	Cobalt	T	mg/L	6020	0.000536	J	0.000838	J	<0.001			*
7440-50-8	Copper	T	mg/L	6020	0.00115	J	0.000649	J	0.000692	J		*
7439-89-6	Iron	T	mg/L	6020	0.0362	J	1.31		0.0479	J		*
7439-92-1	Lead	T	mg/L	6020	<0.002		<0.002		<0.002			*
7439-95-4	Magnesium	T	mg/L	6020	27.2		5.83		5.5			*
7439-96-5	Manganese	T	mg/L	6020	0.0185		0.193		0.00285	J		*
7439-97-6	Mercury	T	mg/L	7470	<0.0002		<0.0002		<0.0002			*

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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

For Official Use Only

**GROUNDWATER SAMPLE ANALYSIS - (Cont.)**

AKGWA NUMBER <sup>1</sup> , 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 <sup>4</sup>	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S						
7439-98-7	Molybdenum	T	mg/L	6020	0.000584	J	0.000434	J	<0.001			*
7440-02-0	Nickel	T	mg/L	6020	0.0027		0.00149	J	0.00133	J		*
7440-09-7	Potassium	T	mg/L	6020	2.78		0.554		0.283	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		0.00203	J		*
7440-22-4	Silver	T	mg/L	6020	<0.001		<0.001		<0.001			*
7440-23-5	Sodium	T	mg/L	6020	64		131		55.5			*
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	0.000068	J	0.000192	J	<0.0002			*
7440-62-2	Vanadium	T	mg/L	6020	<0.02		<0.02		<0.02			*
7440-66-6	Zinc	T	mg/L	6020	<0.02		<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			*

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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

For Official Use Only

**GROUNDWATER SAMPLE ANALYSIS - (Cont.)**

AKGWA NUMBER <sup>1</sup> , 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 <sup>4</sup>	CONSTITUENT	T D <sup>5</sup>	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	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	0.00454		<0.001		<0.001			*

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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

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , 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 <sup>4</sup>	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	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	<0.0000201		<0.0000202		<0.0000211			*
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	<0.1		<0.1		<0.0999			*
12674-11-2	PCB-1016	T	ug/L	8082	<0.1		<0.1		<0.0999			*
11104-28-2	PCB-1221	T	ug/L	8082	<0.1		<0.1		<0.0999			*
11141-16-5	PCB-1232	T	ug/L	8082	<0.1		<0.1		<0.0999			*
53469-21-9	PCB-1242	T	ug/L	8082	<0.1		<0.1		<0.0999			*
12672-29-6	PCB-1248	T	ug/L	8082	<0.1		<0.1		<0.0999			*

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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

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , 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 <sup>4</sup>	CONSTITUENT	T D <sup>5</sup>	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
11097-69-1	PCB-1254	T	ug/L	8082	<0.1		<0.1		<0.0999			*
11096-82-5	PCB-1260	T	ug/L	8082	<0.1		<0.1		<0.0999			*
11100-14-4	PCB-1268	T	ug/L	8082	<0.1		<0.1		<0.0999			*
12587-46-1	Gross Alpha	T	pCi/L	9310	0.43	*	1.58	*	0.761	*		*
12587-47-2	Gross Beta	T	pCi/L	9310	0.285	*	1.38	*	6.37	*		*
10043-66-0	Iodine-131	T	pCi/L			*		*		*		*
13982-63-3	Radium-226	T	pCi/L	AN-1418	0.294	*	0.549	*	0.295	*		*
10098-97-2	Strontium-90	T	pCi/L	905.0	3.24	*	4.49	*	-0.828	*		*
14133-76-7	Technetium-99	T	pCi/L	Tc-02-RC	9.89	*	3.17	*	6.19	*		*
14269-63-7	Thorium-230	T	pCi/L	Th-01-RC	-0.208	*	0.514	*	-0.149	*		*
10028-17-8	Tritium	T	pCi/L	906.0	89.8	*	29.6	*	75.5	*		*
S0130- -	Chemical Oxygen Demand	T	mg/L	410.4	<20		22.7		15.3	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	1.3	J	2.62		1.02	J		*
S0586- -	Total Organic Halides	T	mg/L	9020	0.00952	J	0.0143		0.009	J		*

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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  
 For Official Use Only

## GROUNDWATER SAMPLE ANALYSIS(S)

AKGWA NUMBER <sup>1</sup> , 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	1/14/2021 05:55	1/14/2021 06:36	1/14/2021 05:50								
Duplicate ("Y" or "N") <sup>2</sup>	N	N	N	N								
Split ("Y" or "N") <sup>3</sup>	N	N	N	N								
Facility Sample ID Number (if applicable)	NA	RI1UG2-21	FB1UG2-21	TB1UG2-21								
Laboratory Sample ID Number (if applicable)	NA	532312016	532312015	532312017								
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis	NA	1/21/2021	1/21/2021	1/21/2021								
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)	SIDE	NA	NA	NA								
CAS RN <sup>4</sup>	CONSTITUENT	T D 5	Unit OF MEASURE	METHO D	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S <sup>7</sup>	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	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

<sup>1</sup>AKGWA # is 0000-0000 for any type of blank.

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

<sup>3</sup>Respond "Y" if the sample was split and analyzed by separate laboratories.

<sup>4</sup>Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.

<sup>5</sup>"T" = Total; "D" = Dissolved

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

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

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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

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , 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 <sup>4</sup>	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	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		*	<0.002		<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		*	<0.0002		<0.0002			*

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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

For Official Use Only

**GROUNDWATER SAMPLE ANALYSIS - (Cont.)**

AKGWA NUMBER <sup>1</sup> , 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 <sup>4</sup>	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S						
7439-98-7	Molybdenum	T	mg/L	6020		*	<0.001		<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		*	<0.005		<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	

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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

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , 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 <sup>4</sup>	CONSTITUENT	T D <sup>5</sup>	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	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

Permit Number: SW07300014, SW07300015, SW07300045

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

LAB ID: None

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , 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 <sup>4</sup>	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	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		*	<0.0000187		<0.0000191		<0.000019	
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		*	<0.0979		<0.0944			*
12674-11-2	PCB-1016	T	ug/L	8082		*	<0.0979		<0.0944			*
11104-28-2	PCB-1221	T	ug/L	8082		*	<0.0979		<0.0944			*
11141-16-5	PCB-1232	T	ug/L	8082		*	<0.0979		<0.0944			*
53469-21-9	PCB-1242	T	ug/L	8082		*	<0.0979		<0.0944			*
12672-29-6	PCB-1248	T	ug/L	8082		*	<0.0979		<0.0944			*

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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

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , 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 <sup>4</sup>	CONSTITUENT	T D <sup>5</sup>	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
11097-69-1	PCB-1254	T	ug/L	8082		*	<0.0979		<0.0944			*
11096-82-5	PCB-1260	T	ug/L	8082		*	<0.0979		<0.0944			*
11100-14-4	PCB-1268	T	ug/L	8082		*	<0.0979		<0.0944			*
12587-46-1	Gross Alpha	T	pCi/L	9310		*	1.93	*	-0.38	*		*
12587-47-2	Gross Beta	T	pCi/L	9310		*	6.4	*	6.52	*		*
10043-66-0	Iodine-131	T	pCi/L			*		*		*		*
13982-63-3	Radium-226	T	pCi/L	AN-1418		*	-0.0328	*	0.279	*		*
10098-97-2	Strontium-90	T	pCi/L	905.0		*	0.574	*	-0.449	*		*
14133-76-7	Technetium-99	T	pCi/L	Tc-02-RC		*	-6.72	*	-7.9	*		*
14269-63-7	Thorium-230	T	pCi/L	Th-01-RC		*	0.818	*	0.403	*		*
10028-17-8	Tritium	T	pCi/L	906.0		*	175	*	28.6	*		*
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		*		*		*		*

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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  
 For Official Use Only

## GROUNDWATER SAMPLE ANALYSIS(S)

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number	0000-0000	0000-0000	8004-4800									
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)	T. BLANK 2	T. BLANK 3	360									
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)	1/19/2021 06:30	1/20/2021 06:25	1/14/2021 06:33									
Duplicate ("Y" or "N") <sup>2</sup>	N	N	Y									
Split ("Y" or "N") <sup>3</sup>	N	N	N									
Facility Sample ID Number (if applicable)	TB2UG2-21	TB3UG2-21	MW360DUG2-21									
Laboratory Sample ID Number (if applicable)	532475013	532565015	532312007									
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis	1/21/2021	1/26/2021	1/20/2021									
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)	NA	NA	DOWN									
CAS RN <sup>4</sup>	CONSTITUENT	T D S <sup>5</sup>	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S <sup>7</sup>	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
24959-67-9	Bromide	T	mg/L	9056		*		*	0.177	J		
16887-00-6	Chloride(s)	T	mg/L	9056		*		*	9.96			
16984-48-8	Fluoride	T	mg/L	9056		*		*	0.222			
S0595- -	Nitrate & Nitrite	T	mg/L	9056		*		*	0.681	*		
14808-79-8	Sulfate	T	mg/L	9056		*		*	12.5			
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

<sup>1</sup>AKGWA # is 0000-0000 for any type of blank.

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

<sup>3</sup>Respond "Y" if the sample was split and analyzed by separate laboratories.

<sup>4</sup>Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.

<sup>5</sup>"T" = Total; "D" = Dissolved

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

<sup>7</sup>Flags 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

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number					0000-0000	0000-0000	8004-4800					
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)					T. BLANK 2	T. BLANK 3	360					
CAS RN <sup>4</sup>	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	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		*		*	187	*		
S0296- -	pH	T	Units	Field		*		*		*		
NS215	Eh	T	mV	Field		*		*		*		
S0907 - -	Temperature	T	°C	Field		*		*		*		
7429-90-5	Aluminum	T	mg/L	6020		*		*	0.0359	J		
7440-36-0	Antimony	T	mg/L	6020		*		*	<0.003			
7440-38-2	Arsenic	T	mg/L	6020		*		*	<0.005			
7440-39-3	Barium	T	mg/L	6020		*		*	0.175			
7440-41-7	Beryllium	T	mg/L	6020		*		*	<0.0005			
7440-42-8	Boron	T	mg/L	6020		*		*	0.0352			
7440-43-9	Cadmium	T	mg/L	6020		*		*	<0.001			
7440-70-2	Calcium	T	mg/L	6020		*		*	17.4			
7440-47-3	Chromium	T	mg/L	6020		*		*	<0.01			
7440-48-4	Cobalt	T	mg/L	6020		*		*	0.00163			
7440-50-8	Copper	T	mg/L	6020		*		*	0.00182	J		
7439-89-6	Iron	T	mg/L	6020		*		*	0.11			
7439-92-1	Lead	T	mg/L	6020		*		*	<0.002			
7439-95-4	Magnesium	T	mg/L	6020		*		*	7.63			
7439-96-5	Manganese	T	mg/L	6020		*		*	0.0187			
7439-97-6	Mercury	T	mg/L	7470		*		*	<0.0002			

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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

For Official Use Only

**GROUNDWATER SAMPLE ANALYSIS - (Cont.)**

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number					0000-0000	0000-0000	8004-4800					
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					T. BLANK 2	T. BLANK 3	360					
CAS RN <sup>4</sup>	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S						
7439-98-7	Molybdenum	T	mg/L	6020		*		*	<0.001			
7440-02-0	Nickel	T	mg/L	6020		*		*	0.0015	J		
7440-09-7	Potassium	T	mg/L	6020		*		*	0.67			
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		*		*	53.7			
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		*		*	0.0036	J		
108-05-4	Vinyl acetate	T	mg/L	8260	<0.005		<0.005		<0.005			
67-64-1	Acetone	T	mg/L	8260	<0.005		0.00368	J	<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			

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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

For Official Use Only

**GROUNDWATER SAMPLE ANALYSIS - (Cont.)**

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number					0000-0000	0000-0000	8004-4800					
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					T. BLANK 2	T. BLANK 3	360					
CAS RN <sup>4</sup>	CONSTITUENT	T D <sup>5</sup>	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	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		0.00038	J		

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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

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number					0000-0000	0000-0000	8004-4800					
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					T. BLANK 2	T. BLANK 3	360					
CAS RN <sup>4</sup>	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	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	<0.0000206		<0.0000209		<0.0000191			
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		*		*	<0.0966			
12674-11-2	PCB-1016	T	ug/L	8082		*		*	<0.0966			
11104-28-2	PCB-1221	T	ug/L	8082		*		*	<0.0966			
11141-16-5	PCB-1232	T	ug/L	8082		*		*	<0.0966			
53469-21-9	PCB-1242	T	ug/L	8082		*		*	<0.0966			
12672-29-6	PCB-1248	T	ug/L	8082		*		*	<0.0966			

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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

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number					0000-0000	0000-0000	8004-4800					
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					T. BLANK 2	T. BLANK 3	360					
CAS RN <sup>4</sup>	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S						
11097-69-1	PCB-1254	T	ug/L	8082		*		*	<0.0966			
11096-82-5	PCB-1260	T	ug/L	8082		*		*	<0.0966			
11100-14-4	PCB-1268	T	ug/L	8082		*		*	<0.0966			
12587-46-1	Gross Alpha	T	pCi/L	9310		*		*	1.58	*		
12587-47-2	Gross Beta	T	pCi/L	9310		*		*	11.8	*		
10043-66-0	Iodine-131	T	pCi/L			*		*		*		
13982-63-3	Radium-226	T	pCi/L	HASL 300		*		*	0.416	*		
10098-97-2	Strontium-90	T	pCi/L	905.0		*		*	-0.255	*		
14133-76-7	Technetium-99	T	pCi/L	Tc-02-RC		*		*	2.04	*		
14269-63-7	Thorium-230	T	pCi/L	Th-01-RC		*		*	0.927	*		
10028-17-8	Tritium	T	pCi/L	906.0		*		*	26	*		
S0130- -	Chemical Oxygen Demand	T	mg/L	410.4		*		*	<20	*		
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		*		*	1.01	J		
S0586- -	Total Organic Halides	T	mg/L	9020		*		*	0.00788	J		

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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  
 For Official Use Only

## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4798 MW357	MW357UG2-21	Nitrate & Nitrite	H	Analysis performed outside holding time requirement
		Total Dissolved Solids	*	Duplicate analysis not within control limits.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.26. Rad error is 3.26.
		Gross beta		TPU is 9.04. Rad error is 8.31.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.544. Rad error is 0.544.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3. Rad error is 3.
		Technetium-99		TPU is 13.5. Rad error is 13.2.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.26. Rad error is 1.24.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 121. Rad error is 121.
		Chemical Oxygen Demand	N	Sample spike (MS/MSD) recovery not within control limits
8004-4799 MW358	MW358UG2-21	Nitrate & Nitrite		Analysis of constituent not required and not performed.
		Total Dissolved Solids	*	Duplicate analysis not within control limits.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.45. Rad error is 3.44.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.5. Rad error is 6.5.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.503. Rad error is 0.503.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.82. Rad error is 3.8.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 11.1. Rad error is 11.1.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.874. Rad error is 0.865.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 126. Rad error is 124.
		Chemical Oxygen Demand	N	Sample spike (MS/MSD) recovery not within control limits

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  
 For Official Use Only

## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-0981 MW359	MW359UG2-21	Nitrate & Nitrite	H	Analysis performed outside holding time requirement
		Total Dissolved Solids	*	Duplicate analysis not within control limits.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.46. Rad error is 2.45.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 7.91. Rad error is 7.72.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.33. Rad error is 0.33.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.01. Rad error is 3.98.
		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 0.848. Rad error is 0.842.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 121. Rad error is 121.
		Chemical Oxygen Demand	N	Sample spike (MS/MSD) recovery not within control limits
8004-4800 MW360	MW360UG2-21	Nitrate & Nitrite	H	Analysis performed outside holding time requirement
		Total Dissolved Solids	*	Duplicate analysis not within control limits.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.27. Rad error is 3.27.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 7.07. Rad error is 7.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.37. Rad error is 0.369.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.82. Rad error is 2.82.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 11.9. Rad error is 11.9.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.796. Rad error is 0.795.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 119. Rad error is 119.
		Chemical Oxygen Demand	N	Sample spike (MS/MSD) recovery not within control limits

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Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4795 MW361	MW361UG2-21	Nitrate & Nitrite	H	Analysis performed outside holding time requirement
		Total Dissolved Solids	*	Duplicate analysis not within control limits.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.75. Rad error is 3.74.
		Gross beta		TPU is 10.8. Rad error is 9.18.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.365. Rad error is 0.365.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.51. Rad error is 3.49.
		Technetium-99		TPU is 13.8. Rad error is 12.9.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.618. Rad error is 0.618.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 122. Rad error is 121.
8004-0986 MW362	MW362UG2-21	Chemical Oxygen Demand	N	Sample spike (MS/MSD) recovery not within control limits
		Nitrate & Nitrite	H	Analysis performed outside holding time requirement
		Total Dissolved Solids	*	Duplicate analysis not within control limits.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.18. Rad error is 6.07.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 7.09. Rad error is 7.05.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.626. Rad error is 0.626.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.07. Rad error is 4.07.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 11.3. Rad error is 11.3.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.12. Rad error is 1.11.
8004-4796 MW363	MW363UG2-21	Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 121. Rad error is 121.
		Chemical Oxygen Demand	N	Sample spike (MS/MSD) recovery not within control limits
		Chloride	W	Post-digestion spike recovery out of control limits.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.45. Rad error is 3.44.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 8.14. Rad error is 8.13.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.32. Rad error is 1.32.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.1. Rad error is 3.1.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 11.9. Rad error is 11.9.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.236. Rad error is 0.236.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 123. Rad error is 123.
		Iodide	W	Post-digestion spike recovery out of control limits.

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Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4797 MW364	MW364UG2-21	Chloride	W	Post-digestion spike recovery out of control limits.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.74. Rad error is 3.72.
		Gross beta		TPU is 10.8. Rad error is 9.2.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.561. Rad error is 0.561.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.64. Rad error is 3.57.
		Technetium-99		TPU is 13.6. Rad error is 13.1.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.225. Rad error is 0.225.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 133. Rad error is 128.
		Iodide	W	Post-digestion spike recovery out of control limits.
8004-0984 MW365	MW365UG2-21	Chloride	W	Post-digestion spike recovery out of control limits.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.88. Rad error is 1.87.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.38. Rad error is 6.38.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.351. Rad error is 0.351.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.66. Rad error is 2.66.
		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 0.369. Rad error is 0.366.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 124. Rad error is 123.
		Iodide	W	Post-digestion spike recovery out of control limits.
8004-0982 MW366	MW366UG2-21	Chloride	W	Post-digestion spike recovery out of control limits.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.32. Rad error is 2.31.
		Gross beta		TPU is 11.5. Rad error is 9.6.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.336. Rad error is 0.336.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.57. Rad error is 3.51.
		Technetium-99		TPU is 14.1. Rad error is 13.2.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.26. Rad error is 0.26.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 129. Rad error is 129.
		Iodide	W	Post-digestion spike recovery out of control limits.

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8004-4793 MW367	MW367UG2-21	Chloride	W	Post-digestion spike recovery out of control limits.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.52. Rad error is 5.42.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.15. 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 0.789. Rad error is 0.789.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.5. Rad error is 4.48.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 11.9. Rad error is 11.9.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.357. Rad error is 0.355.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 123. Rad error is 122.
		Iodide	W	Post-digestion spike recovery out of control limits.
8004-0983 MW368	MW368UG2-21	Chloride	W	Post-digestion spike recovery out of control limits.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 7.24. Rad error is 7.19.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.43. 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 0.47. Rad error is 0.469.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.73. Rad error is 2.73.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 11.8. Rad error is 11.8.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.233. Rad error is 0.233.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 121. Rad error is 121.
		Iodide	W	Post-digestion spike recovery out of control limits.
8004-4820 MW369	MW369UG2-21	Chloride	W	Post-digestion spike recovery out of control limits.
		Total Dissolved Solids	*	Duplicate analysis not within control limits.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.04. Rad error is 4.02.
		Gross beta		TPU is 9.29. Rad error is 8.45.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.324. Rad error is 0.324.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.82. Rad error is 2.78.
		Technetium-99		TPU is 14. Rad error is 12.9.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.682. Rad error is 0.68.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 126. Rad error is 125.
		Iodide	W	Post-digestion spike recovery out of control limits.

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Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4818 MW370	MW370UG2-21	Chloride	W	Post-digestion spike recovery out of control limits.
		Total Dissolved Solids	*	Duplicate analysis not within control limits.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.91. Rad error is 1.91.
		Gross beta		TPU is 11.2. Rad error is 9.57.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.541. Rad error is 0.541.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.03. Rad error is 2.03.
		Technetium-99		TPU is 14.9. Rad error is 13.4.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.776. Rad error is 0.776.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 124. Rad error is 123.
8004-4819 MW371	MW371UG2-21	Iodide	W	Post-digestion spike recovery out of control limits.
		Chloride	W	Post-digestion spike recovery out of control limits.
		Total Dissolved Solids	*	Duplicate analysis not within control limits.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.63. Rad error is 6.59.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.16. Rad error is 4.16.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.856. Rad error is 0.856.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.22. Rad error is 3.22.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 11. Rad error is 11.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.988. Rad error is 0.982.
8004-4808 MW372	MW372UG2-21	Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 125. Rad error is 124.
		Iodide	W	Post-digestion spike recovery out of control limits.
		Chloride	W	Post-digestion spike recovery out of control limits.
		Total Dissolved Solids	*	Duplicate analysis not within control limits.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.09. Rad error is 4.08.
		Gross beta		TPU is 9.69. Rad error is 8.51.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.496. Rad error is 0.496.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.62. Rad error is 2.62.
		Technetium-99		TPU is 13.2. Rad error is 12.2.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.745. Rad error is 0.742.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 123. Rad error is 121.
		Iodide	W	Post-digestion spike recovery out of control limits.

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Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4792 MW373	MW373UG2-21	Chloride	W	Post-digestion spike recovery out of control limits.
		Total Dissolved Solids	*	Duplicate analysis not within control limits.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.5. Rad error is 4.5.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.61. Rad error is 5.61.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.344. Rad error is 0.343.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3. Rad error is 2.96.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 11. Rad error is 11.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.594. Rad error is 0.593.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 127. Rad error is 126.
		Iodide	W	Post-digestion spike recovery out of control limits.
8004-0990 MW374	MW374UG2-21	Chloride	W	Post-digestion spike recovery out of control limits.
		Total Dissolved Solids	*	Duplicate analysis not within control limits.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.4. Rad error is 4.39.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.2. Rad error is 6.2.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.484. Rad error is 0.483.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.4. Rad error is 3.32.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 10.4. Rad error is 10.4.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.921. Rad error is 0.914.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 119. Rad error is 119.
		Iodide	W	Post-digestion spike recovery out of control limits.

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Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-0985 MW375	MW375UG2-21	Chloride	W	Post-digestion spike recovery out of control limits.
		Total Dissolved Solids	*	Duplicate analysis not within control limits.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.12. Rad error is 3.12.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 7.24. Rad error is 7.17.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.544. Rad error is 0.543.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.3. Rad error is 2.3.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 10.1. Rad error is 10.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.744. Rad error is 0.744.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 123. Rad error is 122.

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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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 Permit Number: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-890-008-982 / 1  
 LAB ID: None  
 For Official Use Only

## GROUNDWATER WRITTEN COMMENTS

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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 Permit Number: SW07300014, SW07300015, SW07300045

Finds/Unit: KY8-890-008-982 / 1  
 LAB ID: None  
 For Official Use Only

## GROUNDWATER WRITTEN COMMENTS

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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 LAB ID: None  
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## GROUNDWATER WRITTEN COMMENTS

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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## GROUNDWATER WRITTEN COMMENTS

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.		

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## 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.

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## 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.	

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 LAB ID: None  
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## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	RI1UG2-21	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 3.38. Rad error is 3.36.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.27. Rad error is 6.19.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.227. Rad error is 0.227.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.13. Rad error is 3.13.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 11.1. Rad error is 11.1.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.958. Rad error is 0.948.
Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 131. Rad error is 126.		
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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 LAB ID: None  
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## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	FB1UG2-21	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 5.53. Rad error is 5.53.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.85. Rad error is 6.77.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.48. Rad error is 0.48.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.85. Rad error is 2.85.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 11.1. Rad error is 11.1.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.826. Rad error is 0.82.
Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 117. 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.		

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## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB1UG2-21	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.		

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## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB1UG2-21	Vanadium		Analysis of constituent not required and not performed.
		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.

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 LAB ID: None  
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## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB2UG2-21	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.		

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  
 For Official Use Only

## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB2UG2-21	Vanadium		Analysis of constituent not required and not performed.
		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  
 For Official Use Only

## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB3UG2-21	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.		

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  
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## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB3UG2-21	Vanadium		Analysis of constituent not required and not performed.
		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  
 For Official Use Only

## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4800 MW360	MW360DUG2-21	Nitrate & Nitrite	H	Analysis performed outside holding time requirement
		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	*	Duplicate analysis not within control limits.
		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 3.84. Rad error is 3.83.
		Gross beta		TPU is 7.3. Rad error is 7.02.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.416. Rad error is 0.415.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.39. Rad error is 2.39.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 11.4. Rad error is 11.4.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.07. Rad error is 1.05.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 124. Rad error is 124.
		Chemical Oxygen Demand	N	Sample spike (MS/MSD) recovery not within control limits

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  
 For Official Use Only

## GROUNDWATER SAMPLE ANALYSIS(S)

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number		8004-4799											
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)		358											
Sample Sequence #		3											
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)		3/8/2021 12:08											
Duplicate ("Y" or "N") <sup>2</sup>		N											
Split ("Y" or "N") <sup>3</sup>		N											
Facility Sample ID Number (if applicable)		MW358UG2-21R											
Laboratory Sample ID Number (if applicable)		537095001											
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis		NA											
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)		DOWN											
CAS RN <sup>4</sup>	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S <sup>7</sup>	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	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	<0.1								
14808-79-8	Sulfate	T	mg/L	9056		*							
NS1894	Barometric Pressure Reading	T	Inches/Hg	Field	30.47								
S0145- -	Specific Conductance	T	µMHO/cm	Field	525								

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<sup>1</sup>AKGWA # is 0000-0000 for any type of blank.

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

<sup>3</sup>Respond "Y" if the sample was split and analyzed by separate laboratories.

<sup>4</sup>Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.

<sup>5</sup>"T" = Total; "D" = Dissolved

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

<sup>7</sup>Flags 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

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GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number					8004-4799								
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)					358								
CAS RN <sup>4</sup>	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S							
S0906 - -	Static Water Level Elevation	T	Ft. MSL	Field	325.15								
N238	Dissolved Oxygen	T	mg/L	Field	1								
S0266- -	Total Dissolved Solids	T	mg/L	160.1		*							
S0296- -	pH	T	Units	Field	6.25								
NS215	Eh	T	mV	Field	126								
S0907 - -	Temperature	T	°C	Field	15.5								
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		*							

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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  
 For Official Use Only

## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4799 MW358	MW358UG2-21R	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.
		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.

**APPENDIX D**  
**STATISTICAL ANALYSES AND**  
**QUALIFICATION STATEMENT**

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# GROUNDWATER STATISTICAL COMMENTS

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## Introduction

The statistical analyses conducted on the first 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 first quarter 2021 data used to conduct the statistical analyses were collected in January and March 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**

<b>Station</b>	<b>Type</b>	<b>Groundwater Unit</b>
MW357	TW	URGA
MW358	TW	LRGA
MW359 <sup>a</sup>	TW	UCRS
MW360	TW	URGA
MW361	TW	LRGA
MW362 <sup>a</sup>	TW	UCRS
MW363	TW	URGA
MW364	TW	LRGA
MW365 <sup>a</sup>	TW	UCRS
MW366	TW	URGA
MW367	TW	LRGA
MW368 <sup>a</sup>	TW	UCRS
MW369	BG	URGA
MW370	BG	LRGA
MW371 <sup>a</sup>	BG	UCRS
MW372	BG	URGA
MW373	BG	LRGA
MW374 <sup>a</sup>	BG	UCRS
MW375 <sup>a</sup>	SG	UCRS
MW376 <sup>a,b</sup>	SG	UCRS
MW377 <sup>a,b</sup>	SG	UCRS

<sup>a</sup> 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.

<sup>b</sup> 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.<sup>1</sup>

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 URGA, and the LRGA, respectively. Those parameters displayed with bold-face type indicate the one-sided tolerance interval statistical test was performed. The data presented in Exhibits D.3, D.4, and D.5 were collected during the current quarter, first 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.

---

<sup>1</sup> 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**

---

<b>Parameters</b>
Aluminum
Beryllium
Boron
Bromide
Calcium
Chemical Oxygen Demand (COD)
Chloride
Cobalt
Conductivity
Copper
Dissolved Oxygen
Dissolved Solids
Iodide
Iron
Magnesium
Manganese
Molybdenum
Nickel
Oxidation-Reduction Potential
PCB, Total
PCB-1242
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
<b>Aluminum</b>	<b>7</b>	<b>1</b>	<b>6</b>	<b>Yes</b>
Antimony	7	7	0	No
<b>Beryllium</b>	<b>7</b>	<b>6</b>	<b>1</b>	<b>Yes</b>
<b>Boron</b>	<b>7</b>	<b>2</b>	<b>5</b>	<b>Yes</b>
<b>Bromide</b>	<b>7</b>	<b>6</b>	<b>1</b>	<b>Yes</b>
Bromochloromethane	7	7	0	No
Bromodichloromethane	7	7	0	No
Bromoform	7	7	0	No
Bromomethane	7	7	0	No
<b>Calcium</b>	<b>7</b>	<b>0</b>	<b>7</b>	<b>Yes</b>
Carbon disulfide	7	7	0	No
<b>Chemical Oxygen Demand (COD)</b>	<b>7</b>	<b>3</b>	<b>4</b>	<b>Yes</b>
<b>Chloride</b>	<b>7</b>	<b>0</b>	<b>7</b>	<b>Yes</b>
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
<b>Cobalt</b>	<b>7</b>	<b>5</b>	<b>2</b>	<b>Yes</b>
<b>Conductivity</b>	<b>7</b>	<b>0</b>	<b>7</b>	<b>Yes</b>
<b>Copper</b>	<b>7</b>	<b>1</b>	<b>6</b>	<b>Yes</b>
Cyanide	7	7	0	No
Dibromochloromethane	7	7	0	No
Dibromomethane	7	7	0	No
Dimethylbenzene, Total	7	7	0	No
<b>Dissolved Oxygen</b>	<b>7</b>	<b>0</b>	<b>7</b>	<b>Yes</b>
<b>Dissolved Solids</b>	<b>7</b>	<b>0</b>	<b>7</b>	<b>Yes</b>
Ethylbenzene	7	7	0	No
Iodide	7	7	0	No
Iodomethane	7	7	0	No
<b>Iron</b>	<b>7</b>	<b>3</b>	<b>4</b>	<b>Yes</b>
<b>Magnesium</b>	<b>7</b>	<b>0</b>	<b>7</b>	<b>Yes</b>
<b>Manganese</b>	<b>7</b>	<b>4</b>	<b>3</b>	<b>Yes</b>
Methylene chloride	7	7	0	No
<b>Molybdenum</b>	<b>7</b>	<b>4</b>	<b>3</b>	<b>Yes</b>

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

<b>Parameters</b>	<b>Observations</b>	<b>Censored Observation</b>	<b>Uncensored Observation</b>	<b>Statistical Analysis?</b>
<b>Nickel</b>	<b>7</b>	<b>0</b>	<b>7</b>	<b>Yes</b>
<b>Oxidation-Reduction Potential</b>	<b>7</b>	<b>0</b>	<b>7</b>	<b>Yes</b>
<b>PCB, Total</b>	<b>7</b>	<b>6</b>	<b>1</b>	<b>Yes</b>
PCB-1016	7	7	0	No
PCB-1221	7	7	0	No
PCB-1232	7	7	0	No
<b>PCB-1242</b>	<b>7</b>	<b>6</b>	<b>1</b>	<b>Yes</b>
PCB-1248	7	7	0	No
PCB-1254	7	7	0	No
PCB-1260	7	7	0	No
PCB-1268	7	7	0	No
<b>pH</b>	<b>7</b>	<b>0</b>	<b>7</b>	<b>Yes</b>
<b>Potassium</b>	<b>7</b>	<b>1</b>	<b>6</b>	<b>Yes</b>
Radium-226	7	7	0	No
Rhodium	7	7	0	No
<b>Sodium</b>	<b>7</b>	<b>0</b>	<b>7</b>	<b>Yes</b>
Styrene	7	7	0	No
<b>Sulfate</b>	<b>7</b>	<b>0</b>	<b>7</b>	<b>Yes</b>
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
<b>Total Organic Carbon (TOC)</b>	<b>7</b>	<b>0</b>	<b>7</b>	<b>Yes</b>
<b>Total Organic Halides (TOX)</b>	<b>7</b>	<b>0</b>	<b>7</b>	<b>Yes</b>
<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
<b>Vanadium</b>	<b>7</b>	<b>5</b>	<b>2</b>	<b>Yes</b>
Vinyl Acetate	7	7	0	No
<b>Zinc</b>	<b>7</b>	<b>4</b>	<b>3</b>	<b>Yes</b>

**Bold** denotes parameters with at least one uncensored observation.

**Exhibit D.4. Summary of Censored, and Uncensored Data—URGA**

<b>Parameters</b>	<b>Observations</b>	<b>Censored Observation</b>	<b>Uncensored Observation</b>	<b>Statistical Analysis?</b>
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
<b>Aluminum</b>	<b>6</b>	<b>4</b>	<b>2</b>	<b>Yes</b>
Antimony	6	6	0	No
Beryllium	6	6	0	No
<b>Boron</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
<b>Bromide</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
Bromochloromethane	6	6	0	No
Bromodichloromethane	6	6	0	No
Bromoform	6	6	0	No
Bromomethane	6	6	0	No
<b>Calcium</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
Carbon disulfide	6	6	0	No
<b>Chemical Oxygen Demand (COD)</b>	<b>6</b>	<b>2</b>	<b>4</b>	<b>Yes</b>
<b>Chloride</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
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
<b>Cobalt</b>	<b>6</b>	<b>3</b>	<b>3</b>	<b>Yes</b>
<b>Conductivity</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
<b>Copper</b>	<b>6</b>	<b>1</b>	<b>5</b>	<b>Yes</b>
Cyanide	6	6	0	No
Dibromochloromethane	6	6	0	No
Dibromomethane	6	6	0	No
Dimethylbenzene, Total	6	6	0	No
<b>Dissolved Oxygen</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
<b>Dissolved Solids</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
Ethylbenzene	6	6	0	No
Iodide	6	6	0	No
Iodomethane	6	6	0	No
<b>Iron</b>	<b>6</b>	<b>3</b>	<b>3</b>	<b>Yes</b>
<b>Magnesium</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
<b>Manganese</b>	<b>6</b>	<b>3</b>	<b>3</b>	<b>Yes</b>
Methylene chloride	6	6	0	No
<b>Molybdenum</b>	<b>6</b>	<b>5</b>	<b>1</b>	<b>Yes</b>

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

<b>Parameters</b>	<b>Observations</b>	<b>Censored Observation</b>	<b>Uncensored Observation</b>	<b>Statistical Analysis?</b>
<b>Nickel</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
<b>Oxidation-Reduction Potential</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
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
<b>pH</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
<b>Potassium</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
Radium-226	6	6	0	No
Rhodium	6	6	0	No
<b>Sodium</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
Styrene	6	6	0	No
<b>Sulfate</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
Tantalum	6	6	0	No
<b>Technetium-99</b>	<b>6</b>	<b>2</b>	<b>4</b>	<b>Yes</b>
Tetrachloroethene	6	6	0	No
Thallium	6	6	0	No
Thorium-230	6	6	0	No
Toluene	6	6	0	No
<b>Total Organic Carbon (TOC)</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
<b>Total Organic Halides (TOX)</b>	<b>6</b>	<b>1</b>	<b>5</b>	<b>Yes</b>
<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
<b>Vanadium</b>	<b>6</b>	<b>5</b>	<b>1</b>	<b>Yes</b>
Vinyl Acetate	6	6	0	No
<b>Zinc</b>	<b>6</b>	<b>3</b>	<b>3</b>	<b>Yes</b>

**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
<b>Aluminum</b>	<b>6</b>	<b>4</b>	<b>2</b>	<b>Yes</b>
Antimony	6	6	0	No
Beryllium	6	6	0	No
<b>Boron</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
<b>Bromide</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
Bromochloromethane	6	6	0	No
Bromodichloromethane	6	6	0	No
Bromoform	6	6	0	No
Bromomethane	6	6	0	No
<b>Calcium</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
Carbon disulfide	6	6	0	No
<b>Chemical Oxygen Demand (COD)</b>	<b>6</b>	<b>1</b>	<b>5</b>	<b>Yes</b>
<b>Chloride</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
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
<b>Cobalt</b>	<b>6</b>	<b>4</b>	<b>2</b>	<b>Yes</b>
<b>Conductivity</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
<b>Copper</b>	<b>6</b>	<b>1</b>	<b>5</b>	<b>Yes</b>
Cyanide	6	6	0	No
Dibromochloromethane	6	6	0	No
Dibromomethane	6	6	0	No
Dimethylbenzene, Total	6	6	0	No
<b>Dissolved Oxygen</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
<b>Dissolved Solids</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
Ethylbenzene	6	6	0	No
<b>Iodide</b>	<b>6</b>	<b>5</b>	<b>1</b>	<b>Yes</b>
Iodomethane	6	6	0	No
<b>Iron</b>	<b>6</b>	<b>3</b>	<b>3</b>	<b>Yes</b>
<b>Magnesium</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
<b>Manganese</b>	<b>6</b>	<b>3</b>	<b>3</b>	<b>Yes</b>
Methylene chloride	6	6	0	No
<b>Molybdenum</b>	<b>6</b>	<b>4</b>	<b>2</b>	<b>Yes</b>

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

<b>Parameters</b>	<b>Observations</b>	<b>Censored Observation</b>	<b>Uncensored Observation</b>	<b>Statistical Analysis?</b>
<b>Nickel</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
<b>Oxidation-Reduction Potential</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
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
<b>pH</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
<b>Potassium</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
Radium-226	6	6	0	No
Rhodium	6	6	0	No
<b>Sodium</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
Styrene	6	6	0	No
<b>Sulfate</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
Tantalum	6	6	0	No
<b>Technetium-99</b>	<b>6</b>	<b>3</b>	<b>3</b>	<b>Yes</b>
Tetrachloroethene	6	6	0	No
Thallium	6	6	0	No
Thorium-230	6	6	0	No
Toluene	6	6	0	No
<b>Total Organic Carbon (TOC)</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
<b>Total Organic Halides (TOX)</b>	<b>6</b>	<b>2</b>	<b>4</b>	<b>Yes</b>
<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
<b>Trichloroethene</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>Yes</b>
Trichlorofluoromethane	6	6	0	No
<b>Vanadium</b>	<b>6</b>	<b>5</b>	<b>1</b>	<b>Yes</b>
Vinyl Acetate	6	6	0	No
<b>Zinc</b>	<b>6</b>	<b>3</b>	<b>3</b>	<b>Yes</b>

**Bold** denotes parameters with at least one uncensored observation.

## **Discussion of Results from Historical Background Comparison**

For the UCRS, URGA, and LRGA, the concentrations of this quarter were compared to the results of the one-sided tolerance interval test calculated using historical background and are presented in Attachment D1. The statistician qualification statement is presented in Attachment D3. For the UCRS, URGA, and LRGA, the test was applied to 28, 26, and 28 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, conductivity, dissolved solids, magnesium, oxidation-reduction potential, and sulfate.

### **LRGA**

This quarter's results identified historical background exceedances for dissolved oxygen, oxidation-reduction potential, pH, and technetium-99.

## **Statistical Summary**

Summaries of the results of the statistical tests conducted on data obtained from wells in the UCRS, the URGA, and in the LRGA in comparison to historical data are presented in Exhibit D.7, Exhibit D.8, and Exhibit D.9, respectively.

**Exhibit D.6. Summary of Exceedances of Statistically Derived Historical Background Concentrations**

UCRS	URGA	LRGA
<b>MW359:</b> Dissolved Oxygen, Oxidation-Reduction Potential, Sulfate	<b>MW357:</b> Oxidation-Reduction Potential	<b>MW361:</b> Oxidation-Reduction Potential
<b>MW362:</b> Oxidation-Reduction Potential, Sulfate	<b>MW360:</b> Oxidation-Reduction Potential	<b>MW364:</b> Oxidation-Reduction Potential, pH
<b>MW365:</b> Dissolved Oxygen, Oxidation-Reduction Potential, Sulfate	<b>MW363:</b> Oxidation-Reduction Potential	<b>MW367:</b> Oxidation-Reduction Potential, pH
<b>MW368:</b> Oxidation-Reduction Potential, Sulfate	<b>MW366:</b> Oxidation-Reduction Potential	<b>MW370:</b> Dissolved Oxygen, Oxidation-Reduction Potential, pH, Technetium-99
<b>MW371:</b> Oxidation-Reduction Potential, Sulfate	<b>MW369:</b> Oxidation-Reduction Potential	<b>MW373:</b> Oxidation-Reduction Potential
<b>MW375:</b> Oxidation-Reduction Potential, Sulfate	<b>MW372:</b> Calcium, Conductivity, Dissolved Solids, Magnesium, Oxidation-Reduction Potential, Sulfate	

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

<b>Parameter</b>	<b>Performed Test</b>	<b>CV Normality Test*</b>	<b>Results of Tolerance Interval Test Conducted</b>
Aluminum	Tolerance Interval	2.08	No exceedance of statistically derived historical background concentration.
Beryllium	Tolerance Interval	1.12	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 and MW365.
Dissolved Solids	Tolerance Interval	0.42	No exceedance of statistically derived historical background concentration.
Iron	Tolerance Interval	0.98	No exceedance of statistically derived historical background concentration.
Magnesium	Tolerance Interval	0.27	No exceedance of statistically derived historical background concentration.
Manganese	Tolerance Interval	0.89	No exceedance of statistically derived historical background concentration.
Molybdenum	Tolerance Interval	1.65	No exceedance of statistically derived historical background concentration.

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

<b>Parameter</b>	<b>Performed Test</b>	<b>CV Normality Test*</b>	<b>Results of Tolerance Interval Test Conducted</b>
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, and MW375.
PCB (total)	Tolerance Interval	0.92	No exceedance of statistically derived historical background concentration.
PCB-1242	Tolerance Interval	1.41	No exceedance of statistically derived historical background concentration.
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, MW371, 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**

<b>Parameter</b>	<b>Performed Test</b>	<b>CV Normality Test*</b>	<b>Results of Tolerance Interval Test Conducted</b>
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	Current results exceed statistically derived historical background concentration in MW372.
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.
Molybdenum	Tolerance Interval	1.20	No exceedance of statistically derived historical background concentration.
Nickel	Tolerance Interval	0.91	No exceedance of statistically derived historical background concentration.

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

<b>Parameter</b>	<b>Performed Test</b>	<b>CV Normality Test*</b>	<b>Results of Tolerance Interval Test Conducted</b>
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.
Vanadium	Tolerance Interval	0.26	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**

<b>Parameter</b>	<b>Performed Test</b>	<b>CV Normality Test*</b>	<b>Results of Tolerance Interval Test Conducted</b>
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.
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.
Iodide	Tolerance Interval	0.00	No exceedance of statistically derived historical background concentration.
Iron	Tolerance Interval	0.96	No exceedance of statistically derived historical background concentration.
Magnesium	Tolerance Interval	0.34	No exceedance of statistically derived historical background concentration.
Manganese	Tolerance Interval	0.62	No exceedance of statistically derived historical background concentration.
Molybdenum	Tolerance Interval	1.20	No exceedance of statistically derived historical background concentration.
Nickel	Tolerance Interval	0.90	No exceedance of statistically derived historical background concentration.

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

<b>Parameter</b>	<b>Performed Test</b>	<b>CV Normality Test*</b>	<b>Results of Tolerance Interval Test Conducted</b>
Oxidation-Reduction Potential	Tolerance Interval	1.31	Current results exceed statistically derived historical background concentration in MW361, MW364, MW367, MW370, and MW373.
pH	Tolerance Interval	0.03	Current results exceed statistically derived historical background concentration in MW364, MW367, and MW370.
Potassium	Tolerance Interval	0.18	No exceedance of statistically derived historical background concentration.
Sodium	Tolerance Interval	0.30	No exceedance of statistically derived historical background concentration.
Sulfate	Tolerance Interval	1.59	No exceedance of statistically derived historical background concentration.
Technetium-99	Tolerance Interval	1.73	Current results exceed statistically derived historical background concentration in MW370.
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 <sup>1</sup>	Tolerance Interval	0.57	No exceedance of statistically derived historical background concentration.
Vanadium	Tolerance Interval	0.32	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.

<sup>1</sup> A tolerance interval was calculated based on an MCL exceedance.

## **Discussion of Results from Current Background Comparison**

For concentrations in wells in the UCRS, URGA, and LRGA that exceeded the TL test using historical background, the concentrations were compared to the results of the one-sided tolerance interval test compared to current background, and are presented in Attachment D2. The statistician qualification statement is presented in Attachment D3. For the UCRS, URGA, and LRGA, the test was applied to 3, 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 one UCRS well (i.e., MW368) exceeded the current TL this quarter.

### **URGA**

This quarter's results identified current background exceedances in one downgradient well (i.e., MW366) for oxidation-reduction potential.

### **LRGA**

This quarter's results identified current background exceedances in downgradient wells (i.e., MW364 and MW367) for pH.

## **Statistical Summary**

Summaries of the statistical tests conducted on data obtained from wells in the UCRS, the URGA, and the LRGA are presented in Exhibit D.10, Exhibit D.11, and Exhibit D.12, respectively.

**Exhibit D.10. Test Summaries for Qualified Parameters for Current Background—UCRS**

<b>Parameter</b>	<b>Performed Test</b>	<b>CV Normality Test</b>	<b>Results of Tolerance Interval Test Conducted</b>
Dissolved Oxygen	Tolerance Interval	0.80	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	0.19	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	0.91	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**

<b>Parameter</b>	<b>Performed Test</b>	<b>CV Normality Test</b>	<b>Results of Tolerance Interval Test Conducted</b>
Calcium	Tolerance Interval	0.55	None of the test wells exceeded the upper TL, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically significant level.
Conductivity	Tolerance Interval	0.30	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	0.49	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	0.01	MW366 exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to current background data.
Sulfate	Tolerance Interval	0.93	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**

<b>Parameter</b>	<b>Performed Test</b>	<b>CV Normality Test</b>	<b>Results of Tolerance Interval Test Conducted</b>
Dissolved Oxygen	Tolerance Interval	0.40	None of the test wells exceeded the upper TL, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically significant level.
Oxidation-Reduction Potential	Tolerance Interval	0.09	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.
pH	Tolerance Interval	0.01	MW364, MW367, and MW370 were below the Lower Tolerance Limit, which is evidence of a statistically different concentration with respect to current background data.
Technetium-99	Tolerance Interval	0.69	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 First 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	0.0258	N/A	-3.657	NO
MW362	Downgradient	Yes	0.0387	N/A	-3.252	NO
MW365	Downgradient	Yes	0.023	N/A	-3.772	NO
MW368	Downgradient	Yes	0.103	N/A	-2.273	NO
MW371	Upgradient	Yes	24.9	N/A	3.215	NO
MW374	Upgradient	No	0.05	N/A	-2.996	N/A
MW375	Sidegradient	Yes	0.0356	N/A	-3.335	NO

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.



**C-746-U First 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 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 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	0.0122	N/A	-4.406	NO
MW362	Downgradient	Yes	0.0195	N/A	-3.937	NO
MW365	Downgradient	No	0.015	N/A	-4.200	N/A
MW368	Downgradient	No	0.015	N/A	-4.200	N/A
MW371	Upgradient	Yes	0.0106	N/A	-4.547	NO
MW374	Upgradient	Yes	0.03	N/A	-3.507	NO
MW375	Sidegradient	Yes	0.0148	N/A	-4.213	NO

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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	No	0.2	N/A	-1.609	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	No	0.2	N/A	-1.609	N/A
MW374	Upgradient	Yes	0.647	NO	-0.435	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 = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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	4.93	NO	1.595	N/A
MW362	Downgradient	Yes	20.1	NO	3.001	N/A
MW365	Downgradient	Yes	19.7	NO	2.981	N/A
MW368	Downgradient	Yes	59.3	NO	4.083	N/A
MW371	Upgradient	Yes	62.8	NO	4.140	N/A
MW374	Upgradient	Yes	22.8	NO	3.127	N/A
MW375	Sidegradient	Yes	12.9	NO	2.557	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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	Yes	63.7	NO	4.154	N/A
MW368	Downgradient	Yes	13.7	NO	2.617	N/A
MW371	Upgradient	No	20	N/A	2.996	N/A
MW374	Upgradient	Yes	22.7	NO	3.122	N/A
MW375	Sidegradient	Yes	15.3	NO	2.728	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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	1.18	NO	0.166	N/A
MW362	Downgradient	Yes	3.91	NO	1.364	N/A
MW365	Downgradient	Yes	2.64	NO	0.971	N/A
MW368	Downgradient	Yes	4.41	NO	1.484	N/A
MW371	Upgradient	Yes	3.4	NO	1.224	N/A
MW374	Upgradient	Yes	57.4	NO	4.050	N/A
MW375	Sidegradient	Yes	3.56	NO	1.270	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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	No	0.001	N/A	-6.908	N/A
MW362	Downgradient	No	0.001	N/A	-6.908	N/A
MW365	Downgradient	Yes	0.00135	N/A	-6.608	NO
MW368	Downgradient	No	0.001	N/A	-6.908	N/A
MW371	Upgradient	Yes	0.00408	N/A	-5.502	NO
MW374	Upgradient	No	0.000838	N/A	-7.084	N/A
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 = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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	212	NO	5.357	N/A
MW362	Downgradient	Yes	727	NO	6.589	N/A
MW365	Downgradient	Yes	383	NO	5.948	N/A
MW368	Downgradient	Yes	642	NO	6.465	N/A
MW371	Upgradient	Yes	641	NO	6.463	N/A
MW374	Upgradient	Yes	713	NO	6.569	N/A
MW375	Sidegradient	Yes	344	NO	5.841	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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	0.000477	N/A	-7.648	NO
MW362	Downgradient	Yes	0.000974	N/A	-6.934	NO
MW365	Downgradient	Yes	0.00487	N/A	-5.325	NO
MW368	Downgradient	No	0.000877	N/A	-7.039	N/A
MW371	Upgradient	Yes	0.0117	N/A	-4.448	NO
MW374	Upgradient	Yes	0.000649	N/A	-7.340	NO
MW375	Sidegradient	Yes	0.000692	N/A	-7.276	NO

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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	5.12	YES	1.633	N/A
MW362	Downgradient	Yes	2.16	NO	0.770	N/A
MW365	Downgradient	Yes	6.08	YES	1.805	N/A
MW368	Downgradient	Yes	1.32	NO	0.278	N/A
MW371	Upgradient	Yes	1.6	NO	0.470	N/A
MW374	Upgradient	Yes	0.92	NO	-0.083	N/A
MW375	Sidegradient	Yes	0.95	NO	-0.051	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

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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	151	NO	5.017	N/A
MW362	Downgradient	Yes	386	NO	5.956	N/A
MW365	Downgradient	Yes	243	NO	5.493	N/A
MW368	Downgradient	Yes	414	NO	6.026	N/A
MW371	Upgradient	Yes	347	NO	5.849	N/A
MW374	Upgradient	Yes	341	NO	5.832	N/A
MW375	Sidegradient	Yes	169	NO	5.130	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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	No	0.1	N/A	-2.303	N/A
MW362	Downgradient	No	0.1	N/A	-2.303	N/A
MW365	Downgradient	No	0.1	N/A	-2.303	N/A
MW368	Downgradient	Yes	0.0734	NO	-2.612	N/A
MW371	Upgradient	Yes	14.2	NO	2.653	N/A
MW374	Upgradient	Yes	1.31	NO	0.270	N/A
MW375	Sidegradient	Yes	0.0479	NO	-3.039	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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	2.94	NO	1.078	N/A
MW362	Downgradient	Yes	9.18	NO	2.217	N/A
MW365	Downgradient	Yes	9.72	NO	2.274	N/A
MW368	Downgradient	Yes	13.9	NO	2.632	N/A
MW371	Upgradient	Yes	16	NO	2.773	N/A
MW374	Upgradient	Yes	5.83	NO	1.763	N/A
MW375	Sidegradient	Yes	5.5	NO	1.705	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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	No	0.005	N/A	-5.298	N/A
MW362	Downgradient	No	0.00203	N/A	-6.200	N/A
MW365	Downgradient	No	0.00419	N/A	-5.475	N/A
MW368	Downgradient	Yes	0.00737	NO	-4.910	N/A
MW371	Upgradient	Yes	0.3	NO	-1.204	N/A
MW374	Upgradient	Yes	0.193	NO	-1.645	N/A
MW375	Sidegradient	No	0.00285	N/A	-5.860	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First Quarter 2021 Statistical Analysis      Historical Background Comparison**

**Molybdenum**

**UNITS: mg/L**

**UCRS**

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

**Statistics-Background Data**      X= 0.006    S= 0.010    CV(1)= 1.650    K factor\*\*= 2.523    TL(1)= 0.030    LL(1)=N/A

**Statistics-Transformed Background Data**      X= -6.108    S= 1.239    CV(2)=-0.203    K factor\*\*= 2.523    TL(2)= -2.983    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	0.00121	-6.717
4/3/2003	0.001	-6.908
7/9/2003	0.00111	-6.803
10/6/2003	0.001	-6.908

Well Number: MW374

Date Collected	Result	LN(Result)
10/8/2002	0.00222	-6.110
1/7/2003	0.00201	-6.210
4/2/2003	0.00159	-6.444
7/9/2003	0.00242	-6.024
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	No	0.001	N/A	-6.908	N/A
MW362	Downgradient	Yes	0.000508	N/A	-7.585	NO
MW365	Downgradient	No	0.001	N/A	-6.908	N/A
MW368	Downgradient	No	0.000676	N/A	-7.299	N/A
MW371	Upgradient	Yes	0.00105	N/A	-6.859	NO
MW374	Upgradient	Yes	0.000434	N/A	-7.742	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 = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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	0.00119	NO	-6.734	N/A
MW362	Downgradient	Yes	0.000908	NO	-7.004	N/A
MW365	Downgradient	Yes	0.00671	NO	-5.004	N/A
MW368	Downgradient	Yes	0.00213	NO	-6.152	N/A
MW371	Upgradient	Yes	0.0204	NO	-3.892	N/A
MW374	Upgradient	Yes	0.00149	NO	-6.509	N/A
MW375	Sidegradient	Yes	0.00133	NO	-6.623	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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	288	N/A	5.663	YES
MW362	Downgradient	Yes	436	N/A	6.078	YES
MW365	Downgradient	Yes	451	N/A	6.111	YES
MW368	Downgradient	Yes	291	N/A	5.673	YES
MW371	Upgradient	Yes	296	N/A	5.690	YES
MW374	Upgradient	Yes	145	N/A	4.977	NO
MW375	Sidegradient	Yes	297	N/A	5.694	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
- MW375

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First Quarter 2021 Statistical Analysis      Historical Background Comparison**

**PCB, Total**

**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= 0.224    S= 0.207    CV(1)=0.922    **K factor\*\*= 2.523**    TL(1)= 0.746    LL(1)=N/A

**Statistics-Transformed Background Data**      X= -1.647    S= 0.440    CV(2)=-0.267    **K factor\*\*= 2.523**    TL(2)= -0.537    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	0.17	-1.772
7/15/2002	0.17	-1.772
7/9/2003	0.17	-1.772
10/6/2003	0.17	-1.772
7/13/2004	0.18	-1.715
7/25/2005	0.17	-1.772
4/5/2006	0.18	-1.715

Well Number: MW374

Date Collected	Result	LN(Result)
7/9/2003	0.17	-1.772
10/7/2003	0.17	-1.772
7/14/2004	0.18	-1.715
7/26/2005	0.17	-1.772
4/6/2006	0.18	-1.715
7/10/2006	0.17	-1.772
10/12/2006	0.17	-1.772
1/8/2007	0.17	-1.772

**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	0.108	N/A	-2.226	N/A
MW362	Downgradient	No	0.0974	N/A	-2.329	N/A
MW365	Downgradient	Yes	0.051	NO	-2.976	N/A
MW368	Downgradient	No	0.0995	N/A	-2.308	N/A
MW371	Upgradient	No	0.0998	N/A	-2.305	N/A
MW374	Upgradient	No	0.1	N/A	-2.303	N/A
MW375	Sidegradient	No	0.0999	N/A	-2.304	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First Quarter 2021 Statistical Analysis      Historical Background Comparison**  
**PCB-1242      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= 0.159    S= 0.224    CV(1)= 1.409    **K factor\*\*= 2.523**    TL(1)= 0.726    LL(1)=N/A

**Statistics-Transformed Background Data**      X= -2.134    S= 0.579    CV(2)=-0.272    **K factor\*\*= 2.523**    TL(2)= -0.672    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	0.11	-2.207
7/15/2002	0.11	-2.207
7/9/2003	0.13	-2.040
10/6/2003	0.09	-2.408
7/13/2004	0.1	-2.303
7/25/2005	0.09	-2.408
4/5/2006	0.1	-2.303

Well Number: MW374

Date Collected	Result	LN(Result)
7/9/2003	0.13	-2.040
10/7/2003	0.09	-2.408
7/14/2004	0.1	-2.303
7/26/2005	0.1	-2.303
4/6/2006	0.1	-2.303
7/10/2006	0.1	-2.303
10/12/2006	0.1	-2.303
1/8/2007	0.1	-2.303

**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	0.108	N/A	-2.226	N/A
MW362	Downgradient	No	0.0974	N/A	-2.329	N/A
MW365	Downgradient	Yes	0.051	N/A	-2.976	NO
MW368	Downgradient	No	0.0995	N/A	-2.308	N/A
MW371	Upgradient	No	0.0998	N/A	-2.305	N/A
MW374	Upgradient	No	0.1	N/A	-2.303	N/A
MW375	Sidegradient	No	0.0999	N/A	-2.304	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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	5.87	NO	1.770	N/A
MW362	Downgradient	Yes	6.8	NO	1.917	N/A
MW365	Downgradient	Yes	6.12	NO	1.812	N/A
MW368	Downgradient	Yes	6.18	NO	1.821	N/A
MW371	Upgradient	Yes	6.39	NO	1.855	N/A
MW374	Upgradient	Yes	6.69	NO	1.901	N/A
MW375	Sidegradient	Yes	6.3	NO	1.841	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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	No	0.3	N/A	-1.204	N/A
MW362	Downgradient	Yes	0.305	NO	-1.187	N/A
MW365	Downgradient	Yes	0.243	NO	-1.415	N/A
MW368	Downgradient	Yes	0.567	NO	-0.567	N/A
MW371	Upgradient	Yes	1.57	NO	0.451	N/A
MW374	Upgradient	Yes	0.554	NO	-0.591	N/A
MW375	Sidegradient	Yes	0.283	NO	-1.262	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 = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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	32.7	NO	3.487	N/A
MW362	Downgradient	Yes	127	NO	4.844	N/A
MW365	Downgradient	Yes	58.3	NO	4.066	N/A
MW368	Downgradient	Yes	75.7	NO	4.327	N/A
MW371	Upgradient	Yes	60.8	NO	4.108	N/A
MW374	Upgradient	Yes	131	NO	4.875	N/A
MW375	Sidegradient	Yes	55.5	NO	4.016	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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	42.9	YES	3.759	N/A
MW362	Downgradient	Yes	30.3	YES	3.411	N/A
MW365	Downgradient	Yes	60.6	YES	4.104	N/A
MW368	Downgradient	Yes	126	YES	4.836	N/A
MW371	Upgradient	Yes	29.2	YES	3.374	N/A
MW374	Upgradient	Yes	10.7	NO	2.370	N/A
MW375	Sidegradient	Yes	24	YES	3.178	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
- MW371
- MW375

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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	0.559	N/A	-0.582	NO
MW362	Downgradient	Yes	1.95	N/A	0.668	NO
MW365	Downgradient	Yes	1.54	N/A	0.432	NO
MW368	Downgradient	Yes	1.52	N/A	0.419	NO
MW371	Upgradient	Yes	1.89	N/A	0.637	NO
MW374	Upgradient	Yes	2.62	N/A	0.963	NO
MW375	Sidegradient	Yes	1.02	N/A	0.020	NO

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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	5.76	N/A	1.751	NO
MW362	Downgradient	Yes	15.3	N/A	2.728	NO
MW365	Downgradient	Yes	16.3	N/A	2.791	NO
MW368	Downgradient	Yes	6.66	N/A	1.896	NO
MW371	Upgradient	Yes	6.14	N/A	1.815	NO
MW374	Upgradient	Yes	14.3	N/A	2.660	NO
MW375	Sidegradient	Yes	9	N/A	2.197	NO

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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	Yes	0.00527	N/A	-5.246	NO
MW362	Downgradient	No	0.02	N/A	-3.912	N/A
MW365	Downgradient	No	0.0052	N/A	-5.259	N/A
MW368	Downgradient	No	0.0035	N/A	-5.655	N/A
MW371	Upgradient	Yes	0.0432	N/A	-3.142	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 = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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	No	0.02	N/A	-3.912	N/A
MW362	Downgradient	No	0.02	N/A	-3.912	N/A
MW365	Downgradient	Yes	0.00757	N/A	-4.884	NO
MW368	Downgradient	Yes	0.00661	N/A	-5.019	NO
MW371	Upgradient	Yes	0.0432	N/A	-3.142	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 = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

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**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	0.0459	N/A	-3.081	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	0.0351	N/A	-3.350	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 = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X    Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

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**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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	0.334	NO	-1.097	N/A
MW360	Downgradient	Yes	0.0358	NO	-3.330	N/A
MW363	Downgradient	Yes	0.0194	NO	-3.942	N/A
MW366	Downgradient	Yes	0.0786	NO	-2.543	N/A
MW369	Upgradient	Yes	0.0147	NO	-4.220	N/A
MW372	Upgradient	Yes	1.39	NO	0.329	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

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**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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	0.368	NO	-1.000	N/A
MW360	Downgradient	Yes	0.177	NO	-1.732	N/A
MW363	Downgradient	Yes	0.132	NO	-2.025	N/A
MW366	Downgradient	Yes	0.391	NO	-0.939	N/A
MW369	Upgradient	Yes	0.343	NO	-1.070	N/A
MW372	Upgradient	Yes	0.51	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	23.9	NO	3.174	N/A
MW360	Downgradient	Yes	17.5	NO	2.862	N/A
MW363	Downgradient	Yes	29.5	NO	3.384	N/A
MW366	Downgradient	Yes	26.9	NO	3.292	N/A
MW369	Upgradient	Yes	15.4	NO	2.734	N/A
MW372	Upgradient	Yes	67.5	YES	4.212	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**The test well(s) listed exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to historical background data.**

**Wells with Exceedances**

MW372

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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.

<b>Statistics-Background Data</b>	X= 35.938	S= 3.750	CV(1)=0.104	K factor**= 2.523	TL(1)= 45.399	LL(1)=N/A
<b>Statistics-Transformed Background Data</b>	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

**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	Yes	18.9	NO	2.939	N/A
MW363	Downgradient	Yes	37.4	NO	3.622	N/A
MW366	Downgradient	Yes	13.7	NO	2.617	N/A
MW369	Upgradient	No	20	N/A	2.996	N/A
MW372	Upgradient	Yes	39.7	NO	3.681	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	31.6	NO	3.453	N/A
MW360	Downgradient	Yes	9.96	NO	2.299	N/A
MW363	Downgradient	Yes	34.2	NO	3.532	N/A
MW366	Downgradient	Yes	34.5	NO	3.541	N/A
MW369	Upgradient	Yes	29.8	NO	3.395	N/A
MW372	Upgradient	Yes	38.4	NO	3.648	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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	0.0017	NO	-6.377	N/A
MW363	Downgradient	Yes	0.00122	NO	-6.709	N/A
MW366	Downgradient	No	0.001	N/A	-6.908	N/A
MW369	Upgradient	Yes	0.00382	NO	-5.568	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**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	425	NO	6.052	N/A
MW360	Downgradient	Yes	400	NO	5.991	N/A
MW363	Downgradient	Yes	450	NO	6.109	N/A
MW366	Downgradient	Yes	429	NO	6.061	N/A
MW369	Upgradient	Yes	373	NO	5.922	N/A
MW372	Upgradient	Yes	822	YES	6.712	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**The test well(s) listed exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to historical background data.**

**Wells with Exceedances**

MW372

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	0.000682	NO	-7.290	N/A
MW360	Downgradient	Yes	0.00182	NO	-6.309	N/A
MW363	Downgradient	Yes	0.00345	NO	-5.669	N/A
MW366	Downgradient	No	0.00119	N/A	-6.734	N/A
MW369	Upgradient	Yes	0.00341	NO	-5.681	N/A
MW372	Upgradient	Yes	0.00142	NO	-6.557	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	4.17	NO	1.428	N/A
MW360	Downgradient	Yes	1.44	NO	0.365	N/A
MW363	Downgradient	Yes	0.84	NO	-0.174	N/A
MW366	Downgradient	Yes	3.08	NO	1.125	N/A
MW369	Upgradient	Yes	1.88	NO	0.631	N/A
MW372	Upgradient	Yes	2.13	NO	0.756	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	220	NO	5.394	N/A
MW360	Downgradient	Yes	201	NO	5.303	N/A
MW363	Downgradient	Yes	259	NO	5.557	N/A
MW366	Downgradient	Yes	223	NO	5.407	N/A
MW369	Upgradient	Yes	191	NO	5.252	N/A
MW372	Upgradient	Yes	447	YES	6.103	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**The test well(s) listed exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to historical background data.**

**Wells with Exceedances**

MW372

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	No	0.1	N/A	-2.303	N/A
MW360	Downgradient	Yes	0.119	NO	-2.129	N/A
MW363	Downgradient	Yes	0.0388	NO	-3.249	N/A
MW366	Downgradient	No	0.1	N/A	-2.303	N/A
MW369	Upgradient	Yes	0.167	NO	-1.790	N/A
MW372	Upgradient	No	0.1	N/A	-2.303	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	10.4	NO	2.342	N/A
MW360	Downgradient	Yes	7.63	NO	2.032	N/A
MW363	Downgradient	Yes	12.3	NO	2.510	N/A
MW366	Downgradient	Yes	12	NO	2.485	N/A
MW369	Upgradient	Yes	6.85	NO	1.924	N/A
MW372	Upgradient	Yes	24.1	YES	3.182	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**The test well(s) listed exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to historical background data.**

**Wells with Exceedances**

MW372

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	No	0.00441	N/A	-5.424	N/A
MW360	Downgradient	Yes	0.0206	NO	-3.882	N/A
MW363	Downgradient	Yes	0.2	NO	-1.609	N/A
MW366	Downgradient	No	0.00265	N/A	-5.933	N/A
MW369	Upgradient	Yes	0.0167	NO	-4.092	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First Quarter 2021 Statistical Analysis      Historical Background Comparison**

**Molybdenum**

**UNITS: mg/L**

**URGA**

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

**Statistics-Background Data**      X= 0.010    S= 0.012    CV(1)= 1.199    K factor\*\*= 2.523    TL(1)= 0.040    LL(1)=N/A

**Statistics-Transformed Background Data**      X= -5.698    S= 1.607    CV(2)=-0.282    K factor\*\*= 2.523    TL(2)= -1.643    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	0.025	-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
7/8/2003	0.001	-6.908
10/6/2003	0.001	-6.908

**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	No	0.001	N/A	-6.908	N/A
MW363	Downgradient	No	0.000219	N/A	-8.426	N/A
MW366	Downgradient	No	0.001	N/A	-6.908	N/A
MW369	Upgradient	Yes	0.000208	N/A	-8.478	NO
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.

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	0.001	-6.908
1/7/2003	0.001	-6.908
4/2/2003	0.001	-6.908
7/9/2003	0.00105	-6.859
10/7/2003	0.001	-6.908

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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	0.000893	NO	-7.021	N/A
MW360	Downgradient	Yes	0.00153	NO	-6.482	N/A
MW363	Downgradient	Yes	0.0209	NO	-3.868	N/A
MW366	Downgradient	Yes	0.00178	NO	-6.331	N/A
MW369	Upgradient	Yes	0.00505	NO	-5.288	N/A
MW372	Upgradient	Yes	0.00145	NO	-6.536	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First Quarter 2021 Statistical Analysis      Historical Background Comparison**

**Oxidation-Reduction Potential**

**UNITS: mV**

**URGA**

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

**Statistics-Background Data**      X= 74.563    S= 94.243    CV(1)=1.264      **K factor\*\*= 2.523**    TL(1)= 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	447	N/A	6.103	YES
MW360	Downgradient	Yes	421	N/A	6.043	YES
MW363	Downgradient	Yes	425	N/A	6.052	YES
MW366	Downgradient	Yes	477	N/A	6.168	YES
MW369	Upgradient	Yes	350	N/A	5.858	YES
MW372	Upgradient	Yes	362	N/A	5.892	YES

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

**Conclusion of Statistical Analysis on Historical Data**

**The test well(s) listed exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to historical background data.**

**Wells with Exceedances**

- MW357
- MW360
- MW363
- MW366
- MW369
- MW372

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First Quarter 2021 Statistical Analysis      Historical Background Comparison**

**pH**

**UNITS: Std Unit**

**URGA**

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

**Statistics-Background Data**      X= 6.274    S= 0.194    CV(1)=0.031    K factor\*\*= 2.904    TL(1)= 6.837    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

**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	6.01	NO	1.793	N/A
MW360	Downgradient	Yes	6.1	NO	1.808	N/A
MW363	Downgradient	Yes	5.94	NO	1.782	N/A
MW366	Downgradient	Yes	5.96	NO	1.785	N/A
MW369	Upgradient	Yes	5.98	NO	1.788	N/A
MW372	Upgradient	Yes	6.04	NO	1.798	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	1.58	NO	0.457	N/A
MW360	Downgradient	Yes	0.67	NO	-0.400	N/A
MW363	Downgradient	Yes	2.01	NO	0.698	N/A
MW366	Downgradient	Yes	1.82	NO	0.599	N/A
MW369	Upgradient	Yes	0.505	NO	-0.683	N/A
MW372	Upgradient	Yes	2.21	NO	0.793	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	39.7	NO	3.681	N/A
MW360	Downgradient	Yes	54.4	NO	3.996	N/A
MW363	Downgradient	Yes	41.8	NO	3.733	N/A
MW366	Downgradient	Yes	43.1	NO	3.764	N/A
MW369	Upgradient	Yes	53.9	NO	3.987	N/A
MW372	Upgradient	Yes	64	NO	4.159	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	39.2	NO	3.669	N/A
MW360	Downgradient	Yes	12.5	NO	2.526	N/A
MW363	Downgradient	Yes	26.6	NO	3.281	N/A
MW366	Downgradient	Yes	38.4	NO	3.648	N/A
MW369	Upgradient	Yes	5.86	NO	1.768	N/A
MW372	Upgradient	Yes	156	YES	5.050	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**The test well(s) listed exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to historical background data.**

**Wells with Exceedances**

MW372

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

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**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	24.4	NO	3.195	N/A
MW360	Downgradient	No	4.3	N/A	1.459	N/A
MW363	Downgradient	No	2.69	N/A	0.990	N/A
MW366	Downgradient	Yes	43.9	NO	3.782	N/A
MW369	Upgradient	Yes	47.7	NO	3.865	N/A
MW372	Upgradient	Yes	43.5	NO	3.773	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	0.591	N/A	-0.526	NO
MW360	Downgradient	Yes	1.01	N/A	0.010	NO
MW363	Downgradient	Yes	1.32	N/A	0.278	NO
MW366	Downgradient	Yes	0.91	N/A	-0.094	NO
MW369	Upgradient	Yes	1.32	N/A	0.278	NO
MW372	Upgradient	Yes	1.29	N/A	0.255	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	6.62	NO	1.890	N/A
MW360	Downgradient	Yes	7.88	NO	2.064	N/A
MW363	Downgradient	No	10	N/A	2.303	N/A
MW366	Downgradient	Yes	6.16	NO	1.818	N/A
MW369	Upgradient	Yes	24.6	NO	3.203	N/A
MW372	Upgradient	Yes	14	NO	2.639	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First Quarter 2021 Statistical Analysis      Historical Background Comparison**

**Vanadium**

**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= 0.006    CV(1)=0.259    K factor\*\*= 2.523    TL(1)= 0.039    LL(1)=N/A

**Statistics-Transformed Background Data**      X= -3.771    S= 0.223    CV(2)=-0.059    K factor\*\*= 2.523    TL(2)= -3.208    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	0.027	-3.612
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
7/8/2003	0.02	-3.912
10/6/2003	0.02	-3.912

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	No	0.02	N/A	-3.912	N/A
MW360	Downgradient	No	0.02	N/A	-3.912	N/A
MW363	Downgradient	No	0.00521	N/A	-5.257	N/A
MW366	Downgradient	No	0.00428	N/A	-5.454	N/A
MW369	Upgradient	Yes	0.00332	NO	-5.708	N/A
MW372	Upgradient	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.

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	0.039	-3.244
4/23/2002	0.037	-3.297
7/16/2002	0.025	-3.689
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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	No	0.02	N/A	-3.912	N/A
MW360	Downgradient	Yes	0.0036	N/A	-5.627	NO
MW363	Downgradient	Yes	0.00604	N/A	-5.109	NO
MW366	Downgradient	No	0.02	N/A	-3.912	N/A
MW369	Upgradient	Yes	0.00591	N/A	-5.131	NO
MW372	Upgradient	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

# C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	0.0899	N/A	-2.409	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	Yes	0.0399	N/A	-3.221	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV    Coefficient-of-Variation, CV = S/X    If CV is less than or equal to 1 assume normal distribution.

S    Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X    Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

# C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	0.164	NO	-1.808	N/A
MW361	Downgradient	Yes	0.102	NO	-2.283	N/A
MW364	Downgradient	Yes	0.049	NO	-3.016	N/A
MW367	Downgradient	Yes	0.0195	NO	-3.937	N/A
MW370	Upgradient	Yes	0.27	NO	-1.309	N/A
MW373	Upgradient	Yes	2.1	NO	0.742	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV    Coefficient-of-Variation, CV = S/X    If CV is less than or equal to 1 assume normal distribution.

S    Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X    Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	0.227	NO	-1.483	N/A
MW361	Downgradient	Yes	0.469	NO	-0.757	N/A
MW364	Downgradient	Yes	0.449	NO	-0.801	N/A
MW367	Downgradient	Yes	0.151	NO	-1.890	N/A
MW370	Upgradient	Yes	0.464	NO	-0.768	N/A
MW373	Upgradient	Yes	0.565	NO	-0.571	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	34.7	NO	3.547	N/A
MW361	Downgradient	Yes	31.7	NO	3.456	N/A
MW364	Downgradient	Yes	33.5	NO	3.512	N/A
MW367	Downgradient	Yes	13.9	NO	2.632	N/A
MW370	Upgradient	Yes	28.3	NO	3.343	N/A
MW373	Upgradient	Yes	71	NO	4.263	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	24.2	NO	3.186	N/A
MW361	Downgradient	Yes	76.8	NO	4.341	N/A
MW364	Downgradient	Yes	13.7	NO	2.617	N/A
MW367	Downgradient	Yes	24.2	NO	3.186	N/A
MW370	Upgradient	Yes	17.8	NO	2.879	N/A
MW373	Upgradient	No	20	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	17.4	NO	2.856	N/A
MW361	Downgradient	Yes	35.3	NO	3.564	N/A
MW364	Downgradient	Yes	36.2	NO	3.589	N/A
MW367	Downgradient	Yes	10.6	NO	2.361	N/A
MW370	Upgradient	Yes	36.7	NO	3.603	N/A
MW373	Upgradient	Yes	39	NO	3.664	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	0.0462	N/A	-3.075	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	0.00739	N/A	-4.908	NO
MW370	Upgradient	No	0.001	N/A	-6.908	N/A
MW373	Upgradient	No	0.000536	N/A	-7.531	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	525	NO	6.263	N/A
MW361	Downgradient	Yes	525	NO	6.263	N/A
MW364	Downgradient	Yes	470	NO	6.153	N/A
MW367	Downgradient	Yes	245	NO	5.501	N/A
MW370	Upgradient	Yes	464	NO	6.140	N/A
MW373	Upgradient	Yes	854	NO	6.750	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	0.00068	NO	-7.293	N/A
MW361	Downgradient	Yes	0.000768	NO	-7.172	N/A
MW364	Downgradient	Yes	0.00207	NO	-6.180	N/A
MW367	Downgradient	No	0.00119	N/A	-6.734	N/A
MW370	Upgradient	Yes	0.00128	NO	-6.661	N/A
MW373	Upgradient	Yes	0.00115	NO	-6.768	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	1	NO	0.000	N/A
MW361	Downgradient	Yes	3.38	NO	1.218	N/A
MW364	Downgradient	Yes	3.24	NO	1.176	N/A
MW367	Downgradient	Yes	0.8	NO	-0.223	N/A
MW370	Upgradient	Yes	4.3	YES	1.459	N/A
MW373	Upgradient	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.

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

**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 = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	270	NO	5.598	N/A
MW361	Downgradient	Yes	284	NO	5.649	N/A
MW364	Downgradient	Yes	287	NO	5.659	N/A
MW367	Downgradient	Yes	130	NO	4.868	N/A
MW370	Upgradient	Yes	210	NO	5.347	N/A
MW373	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First Quarter 2021 Statistical Analysis      Historical Background Comparison**

**Iodide**

**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= 2.000    S= 0.000    CV(1)=0.000    K factor\*\*= 2.523    TL(1)= 2.000    LL(1)=N/A

**Statistics-Transformed Background Data**      X= 0.693    S= 0.000    CV(2)=0.000    K factor\*\*= 2.523    TL(2)= 0.693    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	2	0.693
1/8/2003	2	0.693
4/3/2003	2	0.693
7/9/2003	2	0.693
10/6/2003	2	0.693

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	0.196	NO	-1.630	N/A
MW361	Downgradient	No	0.5	N/A	-0.693	N/A
MW364	Downgradient	No	0.5	N/A	-0.693	N/A
MW367	Downgradient	No	0.5	N/A	-0.693	N/A
MW370	Upgradient	No	0.5	N/A	-0.693	N/A
MW373	Upgradient	No	0.5	N/A	-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.

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	2	0.693
1/7/2003	2	0.693
4/2/2003	2	0.693
7/9/2003	2	0.693
10/7/2003	2	0.693

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	22.9	NO	3.131	N/A
MW361	Downgradient	No	0.1	N/A	-2.303	N/A
MW364	Downgradient	No	0.1	N/A	-2.303	N/A
MW367	Downgradient	Yes	5.15	NO	1.639	N/A
MW370	Upgradient	No	0.1	N/A	-2.303	N/A
MW373	Upgradient	Yes	0.0362	NO	-3.319	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	17.9	NO	2.885	N/A
MW361	Downgradient	Yes	14.4	NO	2.667	N/A
MW364	Downgradient	Yes	14.5	NO	2.674	N/A
MW367	Downgradient	Yes	7.82	NO	2.057	N/A
MW370	Upgradient	Yes	12.9	NO	2.557	N/A
MW373	Upgradient	Yes	27.2	NO	3.303	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	2.38	NO	0.867	N/A
MW361	Downgradient	No	0.00123	N/A	-6.701	N/A
MW364	Downgradient	No	0.00332	N/A	-5.708	N/A
MW367	Downgradient	Yes	1.54	NO	0.432	N/A
MW370	Upgradient	No	0.00196	N/A	-6.235	N/A
MW373	Upgradient	Yes	0.0185	NO	-3.990	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First Quarter 2021 Statistical Analysis      Historical Background Comparison**

**Molybdenum**

**UNITS: mg/L**

**LRGA**

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

**Statistics-Background Data**      X= 0.010    S= 0.012    CV(1)= 1.198    K factor\*\*= 2.523    TL(1)= 0.040    LL(1)=N/A

**Statistics-Transformed Background Data**      X= -5.693    S= 1.604    CV(2)=-0.282    K factor\*\*= 2.523    TL(2)= -1.647    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	0.00113	-6.786
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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	0.000858	N/A	-7.061	NO
MW361	Downgradient	No	0.001	N/A	-6.908	N/A
MW364	Downgradient	No	0.000282	N/A	-8.174	N/A
MW367	Downgradient	No	0.001	N/A	-6.908	N/A
MW370	Upgradient	No	0.001	N/A	-6.908	N/A
MW373	Upgradient	Yes	0.000584	N/A	-7.446	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.

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	0.025	-3.689
4/23/2002	0.025	-3.689
7/16/2002	0.025	-3.689
10/8/2002	0.001	-6.908
1/7/2003	0.001	-6.908
4/2/2003	0.001	-6.908
7/9/2003	0.001	-6.908
10/7/2003	0.001	-6.908

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	0.0767	NO	-2.568	N/A
MW361	Downgradient	Yes	0.000772	NO	-7.167	N/A
MW364	Downgradient	Yes	0.00277	NO	-5.889	N/A
MW367	Downgradient	Yes	0.00439	NO	-5.428	N/A
MW370	Upgradient	Yes	0.00254	NO	-5.976	N/A
MW373	Upgradient	Yes	0.0027	NO	-5.915	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

# C-746-U First 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	126	N/A	4.836	NO
MW361	Downgradient	Yes	466	N/A	6.144	YES
MW364	Downgradient	Yes	461	N/A	6.133	YES
MW367	Downgradient	Yes	278	N/A	5.628	YES
MW370	Upgradient	Yes	395	N/A	5.979	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**

- MW361
- MW364
- MW367
- MW370
- MW373

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**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	6.25	NO	1.833	N/A
MW361	Downgradient	Yes	5.9	NO	1.775	N/A
MW364	Downgradient	Yes	5.79	YES	1.756	N/A
MW367	Downgradient	Yes	5.73	YES	1.746	N/A
MW370	Upgradient	Yes	5.79	YES	1.756	N/A
MW373	Upgradient	Yes	6.05	NO	1.800	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.

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

**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**

MW364  
MW367  
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 = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	3.17	NO	1.154	N/A
MW361	Downgradient	Yes	2.37	NO	0.863	N/A
MW364	Downgradient	Yes	2.04	NO	0.713	N/A
MW367	Downgradient	Yes	2.81	NO	1.033	N/A
MW370	Upgradient	Yes	2.69	NO	0.990	N/A
MW373	Upgradient	Yes	2.78	NO	1.022	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

# C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	33.3	NO	3.506	N/A
MW361	Downgradient	Yes	43.8	NO	3.780	N/A
MW364	Downgradient	Yes	42.3	NO	3.745	N/A
MW367	Downgradient	Yes	18.7	NO	2.929	N/A
MW370	Upgradient	Yes	43.1	NO	3.764	N/A
MW373	Upgradient	Yes	64	NO	4.159	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV    Coefficient-of-Variation, CV = S/X    If CV is less than or equal to 1 assume normal distribution.

S    Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X    Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

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**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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	29.3	N/A	3.378	NO
MW361	Downgradient	Yes	82.2	N/A	4.409	NO
MW364	Downgradient	Yes	72.9	N/A	4.289	NO
MW367	Downgradient	Yes	24.3	N/A	3.190	NO
MW370	Upgradient	Yes	20.9	N/A	3.040	NO
MW373	Upgradient	Yes	170	N/A	5.136	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

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**Technetium-99**

**UNITS: pCi/L**

**LRGA**

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

**Statistics-Background Data**      X= 7.655    S= 13.274    CV(1)=1.734    **K factor\*\*= 2.523**    TL(1)= 41.146    LL(1)=N/A

**Statistics-Transformed Background Data**      X= 1.946    S= 0.939    CV(2)=0.483    **K factor\*\*= 2.523**    TL(2)= 3.833    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	No	0.722	N/A	-0.326	N/A
MW361	Downgradient	Yes	43.7	N/A	3.777	NO
MW364	Downgradient	Yes	33.9	N/A	3.523	NO
MW367	Downgradient	No	-1.74	N/A	#Error	N/A
MW370	Upgradient	Yes	58.8	N/A	4.074	YES
MW373	Upgradient	No	9.89	N/A	2.292	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 = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

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**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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	7.07	N/A	1.956	NO
MW361	Downgradient	Yes	0.459	N/A	-0.779	NO
MW364	Downgradient	Yes	0.936	N/A	-0.066	NO
MW367	Downgradient	Yes	0.681	N/A	-0.384	NO
MW370	Upgradient	Yes	1.13	N/A	0.122	NO
MW373	Upgradient	Yes	1.3	N/A	0.262	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

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**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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	7.06	NO	1.954	N/A
MW361	Downgradient	No	10	N/A	2.303	N/A
MW364	Downgradient	No	10	N/A	2.303	N/A
MW367	Downgradient	Yes	4.98	NO	1.605	N/A
MW370	Upgradient	Yes	7.02	NO	1.949	N/A
MW373	Upgradient	Yes	9.52	NO	2.253	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

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**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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	4.46	N/A	1.495	N/A
MW361	Downgradient	Yes	7.88	NO	2.064	N/A
MW364	Downgradient	Yes	7.15	NO	1.967	N/A
MW367	Downgradient	Yes	0.77	N/A	-0.261	N/A
MW370	Upgradient	Yes	0.86	N/A	-0.151	N/A
MW373	Upgradient	Yes	4.54	N/A	1.513	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

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**Vanadium**

**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= 0.008    CV(1)=0.324    K factor\*\*= 2.523    TL(1)= 0.044    LL(1)=N/A

**Statistics-Transformed Background Data**    X= -3.749    S= 0.265    CV(2)=-0.071    K factor\*\*= 2.523    TL(2)= -3.080    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: MW370

Date Collected	Result	LN(Result)
3/17/2002	0.035	-3.352
4/23/2002	0.033	-3.411
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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	0.00717	NO	-4.938	N/A
MW361	Downgradient	No	0.02	N/A	-3.912	N/A
MW364	Downgradient	No	0.02	N/A	-3.912	N/A
MW367	Downgradient	No	0.00409	N/A	-5.499	N/A
MW370	Upgradient	No	0.02	N/A	-3.912	N/A
MW373	Upgradient	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.

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	0.048	-3.037
4/23/2002	0.025	-3.689
7/16/2002	0.025	-3.689
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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum([(background result-X)^2]/[count of background results -1])]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	0.0191	NO	-3.958	N/A
MW361	Downgradient	No	0.02	N/A	-3.912	N/A
MW364	Downgradient	Yes	0.0118	NO	-4.440	N/A
MW367	Downgradient	Yes	0.0154	NO	-4.173	N/A
MW370	Upgradient	No	0.02	N/A	-3.912	N/A
MW373	Upgradient	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.

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

**Conclusion of Statistical Analysis on Historical Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**ATTACHMENT D2**

**COMPARISON OF CURRENT DATA TO  
ONE-SIDED UPPER TOLERANCE INTERVAL TEST  
CALCULATED USING  
CURRENT BACKGROUND DATA**

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**C-746-U First 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= 2.719    S= 2.162    CV(1)=0.795    **K factor\*\*= 2.523**    TL(1)= 8.174    LL(1)=N/A

**Statistics-Transformed Background Data**      X= 0.688    S= 0.845    CV(2)=1.228    **K factor\*\*= 2.523**    TL(2)= 2.820    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)
1/16/2019	8.02	2.082
5/28/2019	5.2	1.649
7/15/2019	4.6	1.526
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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	Yes	5.12	NO	1.633	N/A
MW365	Downgradient	Yes	6.08	NO	1.805	N/A

Well Number: MW374

Date Collected	Result	LN(Result)
1/17/2019	0.67	-0.400
5/28/2019	1.49	0.399
7/11/2019	2.23	0.802
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

**Conclusion of Statistical Analysis on Current Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

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**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= 338.500   S= 62.637   CV(1)=0.185      **K factor\*\*= 2.523**      TL(1)= 496.532      LL(1)=N/A

**Statistics-Transformed Background Data**      X= 5.806      S= 0.205      CV(2)=0.035      **K factor\*\*= 2.523**      TL(2)= 6.323      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)
1/16/2019	396	5.981
5/28/2019	363	5.894
7/15/2019	423	6.047
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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	Yes	288	NO	5.663	N/A
MW362	Downgradient	Yes	436	NO	6.078	N/A
MW365	Downgradient	Yes	451	NO	6.111	N/A
MW368	Downgradient	Yes	291	NO	5.673	N/A
MW371	Upgradient	Yes	296	NO	5.690	N/A
MW375	Sidegradient	Yes	297	NO	5.694	N/A

Well Number: MW374

Date Collected	Result	LN(Result)
1/17/2019	254	5.537
5/28/2019	355	5.872
7/11/2019	354	5.869
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

**Conclusion of Statistical Analysis on Current Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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= 25.310   S= 23.108   CV(1)=0.913      **K factor\*\*= 2.523**      TL(1)= 83.612      LL(1)=N/A

**Statistics-Transformed Background Data**      X= 2.840   S= 0.905   CV(2)=0.319      **K factor\*\*= 2.523**      TL(2)= 5.123      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)
1/16/2019	10.1	2.313
4/15/2019	59.1	4.079
7/15/2019	55.4	4.015
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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW359	Downgradient	Yes	42.9	NO	3.759	N/A
MW362	Downgradient	Yes	30.3	NO	3.411	N/A
MW365	Downgradient	Yes	60.6	NO	4.104	N/A
MW368	Downgradient	Yes	126	YES	4.836	N/A
MW371	Upgradient	Yes	29.2	NO	3.374	N/A
MW375	Sidegradient	Yes	24	NO	3.178	N/A

Well Number: MW374

Date Collected	Result	LN(Result)
1/17/2019	6.8	1.917
4/11/2019	8.28	2.114
7/11/2019	8.06	2.087
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

**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 = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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= 36.950   S= 20.475   CV(1)=0.554      **K factor\*\*= 2.523**      TL(1)= 88.608      LL(1)=N/A

**Statistics-Transformed Background Data**      X= 3.445   S= 0.608   CV(2)=0.177      **K factor\*\*= 2.523**      TL(2)= 4.979      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)
1/16/2019	16.3	2.791
4/15/2019	20	2.996
7/15/2019	17.7	2.874
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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW372	Upgradient	Yes	67.5	NO	4.212	N/A

Well Number: MW372

Date Collected	Result	LN(Result)
1/17/2019	46.8	3.846
4/11/2019	49.7	3.906
7/11/2019	49.7	3.906
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

**Conclusion of Statistical Analysis on Current Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

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**Current Background Comparison**

**Conductivity**

**UNITS: umho/cm**

**URGA**

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is statistically significant evidence of elevated concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

**Statistics-Background Data**      X= 540.500   S= 164.056   CV(1)=0.304      **K factor\*\*= 2.523**      TL(1)= 954.414   LL(1)=N/A

**Statistics-Transformed Background Data**      X= 6.248   S= 0.308   CV(2)=0.049      **K factor\*\*= 2.523**      TL(2)= 7.024      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)
1/16/2019	386	5.956
5/28/2019	387	5.958
7/15/2019	373	5.922
10/16/2019	367	5.905
3/17/2020	440	6.087
4/6/2020	407	6.009
7/23/2020	372	5.919
10/12/2020	373	5.922

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW372	Upgradient	Yes	822	NO	6.712	N/A

Well Number: MW372

Date Collected	Result	LN(Result)
1/17/2019	613	6.418
5/28/2019	628	6.443
7/11/2019	640	6.461
10/16/2019	697	6.547
1/22/2020	730	6.593
4/6/2020	687	6.532
7/23/2020	770	6.646
10/12/2020	778	6.657

**Conclusion of Statistical Analysis on Current Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

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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= 329.188 S= 129.828 CV(1)=0.394      K factor\*\*= 2.523      TL(1)= 656.744      LL(1)=N/A

**Statistics-Transformed Background Data**      X= 5.726      S= 0.385      CV(2)=0.067      K factor\*\*= 2.523      TL(2)= 6.698      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)
1/16/2019	224	5.412
4/15/2019	261	5.565
7/15/2019	194	5.268
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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW372	Upgradient	Yes	447	NO	6.103	N/A

Well Number: MW372

Date Collected	Result	LN(Result)
1/17/2019	394	5.976
4/11/2019	309	5.733
7/11/2019	616	6.423
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

**Conclusion of Statistical Analysis on Current Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

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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= 14.196   S= 7.011   CV(1)=0.494   **K factor\*\*= 2.523**   TL(1)= 31.884   LL(1)=N/A

**Statistics-Transformed Background Data**      X= 2.525   S= 0.534   CV(2)=0.212   **K factor\*\*= 2.523**   TL(2)= 3.872   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)
1/16/2019	7.17	1.970
4/15/2019	9.06	2.204
7/15/2019	7.51	2.016
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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW372	Upgradient	Yes	24.1	NO	3.182	N/A

Well Number: MW372

Date Collected	Result	LN(Result)
1/17/2019	18.9	2.939
4/11/2019	18.2	2.901
7/11/2019	19.2	2.955
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

**Conclusion of Statistical Analysis on Current Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First Quarter 2021 Statistical Analysis**

**Current Background Comparison**

**Oxidation-Reduction Potential**

**UNITS: mV**

**URGA**

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is statistically significant evidence of elevated concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

**Statistics-Background Data**      X= 368.125   S= 36.495   CV(1)=0.099      **K factor\*\*= 2.523**      TL(1)= 460.201      LL(1)=N/A

**Statistics-Transformed Background Data**      X= 5.904      S= 0.101      CV(2)=0.017      **K factor\*\*= 2.523**      TL(2)= 6.159      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)
1/16/2019	432	6.068
5/28/2019	309	5.733
7/15/2019	410	6.016
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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	447	NO	6.103	N/A
MW360	Downgradient	Yes	421	NO	6.043	N/A
MW363	Downgradient	Yes	425	NO	6.052	N/A
MW366	Downgradient	Yes	477	YES	6.168	N/A
MW369	Upgradient	Yes	350	NO	5.858	N/A
MW372	Upgradient	Yes	362	NO	5.892	N/A

Well Number: MW372

Date Collected	Result	LN(Result)
1/17/2019	393	5.974
5/28/2019	400	5.991
7/11/2019	390	5.966
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

**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**

MW366

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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= 51.501    S= 48.146    CV(1)=0.935      K factor\*\*= 2.523    TL(1)= 172.974    LL(1)=N/A

**Statistics-Transformed Background Data**      X= 3.247    S= 1.361    CV(2)=0.419      K factor\*\*= 2.523    TL(2)= 6.682    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)
1/16/2019	6.59	1.886
4/15/2019	14.6	2.681
7/15/2019	8.91	2.187
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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW372	Upgradient	Yes	156	NO	5.050	N/A

Well Number: MW372

Date Collected	Result	LN(Result)
1/17/2019	71.7	4.272
4/11/2019	71.3	4.267
7/11/2019	70.5	4.256
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

**Conclusion of Statistical Analysis on Current Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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.

<b>Statistics-Background Data</b>	X= 2.482	S= 0.982	CV(1)=0.396	K factor**= 2.523	TL(1)= 4.959	LL(1)=N/A
<b>Statistics-Transformed Background Data</b>	X= 0.827	S= 0.432	CV(2)=0.523	K factor**= 2.523	TL(2)= 1.918	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)
1/16/2019	3.52	1.258
5/28/2019	3.46	1.241
7/15/2019	4.09	1.409
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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW370	Upgradient	Yes	4.3	NO	1.459	N/A

Well Number: MW373

Date Collected	Result	LN(Result)
1/17/2019	1.07	0.068
4/11/2019	1.49	0.399
7/11/2019	2.36	0.859
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

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

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.

**C-746-U First 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= 388.438   S= 36.507   CV(1)=0.094      **K factor\*\*= 2.523**      TL(1)= 480.546   LL(1)=N/A

**Statistics-Transformed Background Data**      X= 5.958   S= 0.094   CV(2)=0.016      **K factor\*\*= 2.523**      TL(2)= 6.195      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)
1/16/2019	440	6.087
5/28/2019	400	5.991
7/15/2019	421	6.043
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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW361	Downgradient	Yes	466	NO	6.144	N/A
MW364	Downgradient	Yes	461	NO	6.133	N/A
MW367	Downgradient	Yes	278	NO	5.628	N/A
MW370	Upgradient	Yes	395	NO	5.979	N/A
MW373	Upgradient	Yes	372	NO	5.919	N/A

Well Number: MW373

Date Collected	Result	LN(Result)
1/17/2019	336	5.817
5/28/2019	374	5.924
7/11/2019	417	6.033
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

**Conclusion of Statistical Analysis on Current Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**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.

<b>Statistics-Background Data</b>	<b>X</b> = 6.129	<b>S</b> = 0.053	<b>CV(1)</b> =0.009	<b>K factor</b> **= 2.904	<b>TL(1)</b> = 6.283	<b>LL(1)</b> =5.9740
<b>Statistics-Transformed Background Data</b>	<b>X</b> = 1.813	<b>S</b> = 0.009	<b>CV(2)</b> =0.005	<b>K factor</b> **= 2.904	<b>TL(2)</b> = 1.838	<b>LL(2)</b> =1.7876

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

Well Number: MW370

Date Collected	Result	LN(Result)
1/16/2019	6.17	1.820
4/15/2019	6.18	1.821
7/15/2019	6.15	1.816
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

Well Number: MW373

Date Collected	Result	LN(Result)
1/17/2019	6.16	1.818
4/11/2019	6.21	1.826
7/11/2019	6.03	1.797
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

**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)?
MW364	Downgradient	Yes	5.79	YES	1.756	N/A
MW367	Downgradient	Yes	5.73	YES	1.746	N/A
MW370	Upgradient	Yes	5.79	YES	1.756	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**

- MW364
- MW367
- 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 = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

**C-746-U First 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= 56.275    S= 38.643    CV(1)=0.687      **K factor\*\*= 2.523**    TL(1)= 153.772    LL(1)=N/A

**Statistics-Transformed Background Data**      X= 3.764    S= 0.791    CV(2)=0.210      **K factor\*\*= 2.523**    TL(2)= 5.759    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)
1/16/2019	94.3	4.546
4/15/2019	111	4.710
7/15/2019	107	4.673
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

**Current Quarter Data**

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW370	Upgradient	Yes	58.8	NO	4.074	N/A

Well Number: MW373

Date Collected	Result	LN(Result)
1/17/2019	28.4	3.346
4/11/2019	22.7	3.122
7/11/2019	28.3	3.343
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

**Conclusion of Statistical Analysis on Current Data**

**None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically-significant level.**

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ((background result-X)^2)/[count of background results -1]]^0.5

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

X Mean, X = (sum of background results)/(count of background results)

\*\* Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

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**ATTACHMENT D3**

**STATISTICIAN QUALIFICATION STATEMENT**

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April 29, 2021

Mr. Dennis Greene  
Four Rivers Nuclear Partnership, LLC  
5511 Hobbs Road  
Kevil, KY 42053

Dear Mr. Greene:

As an Environmental Scientist, with a bachelor's degree in Earth Sciences/Geology, I have over 30 years of experience in reviewing and assessing laboratory analytical results associated with environmental sampling and investigation activities. For the generation of these statistical analyses, my work was reviewed by a qualified independent technical reviewer with Four Rivers Nuclear Partnership, LLC.

For this project, the statistical analyses conducted on the first 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**

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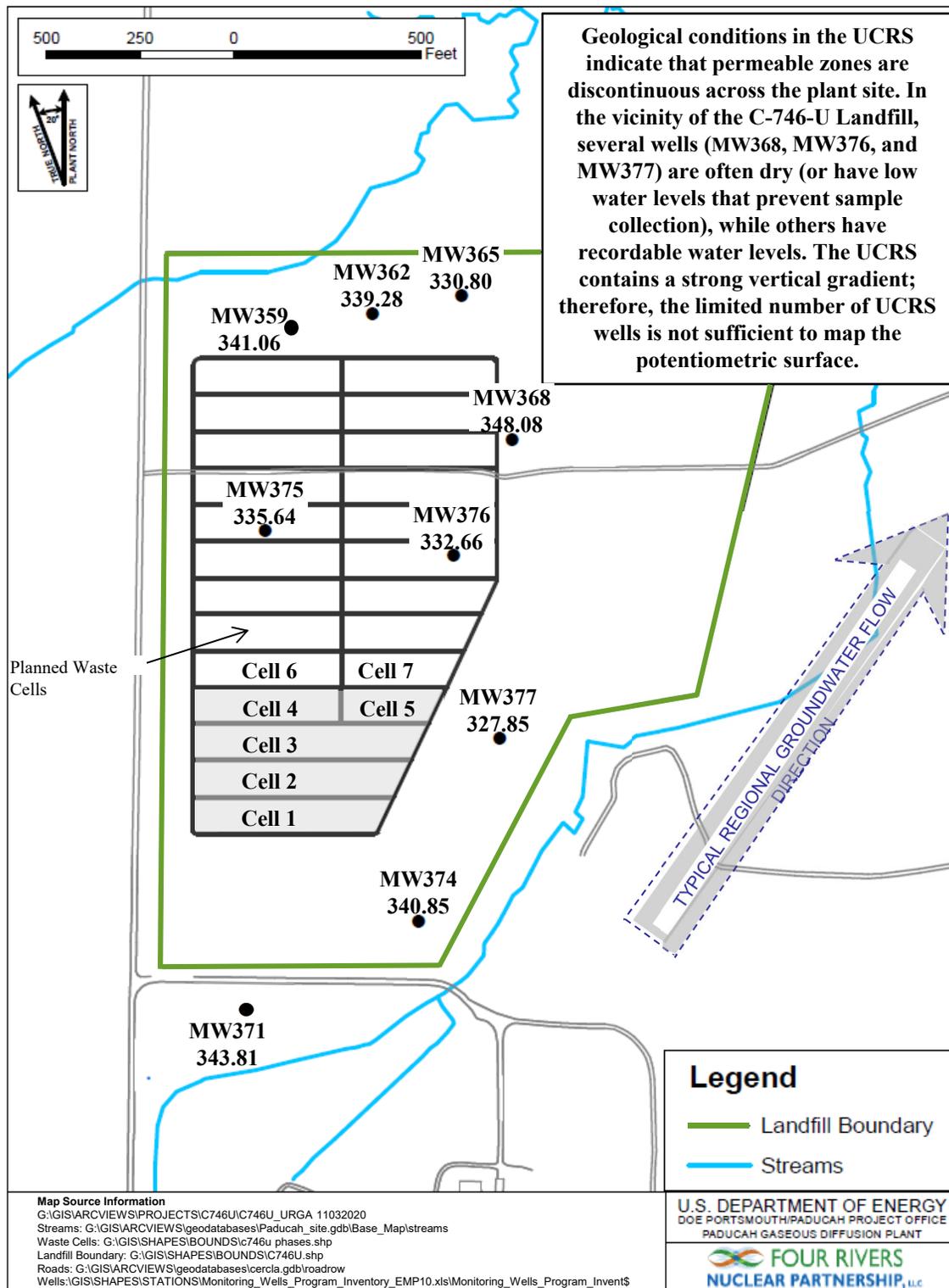
Determination of groundwater flow rate and direction of flow in the uppermost aquifer whenever the monitoring wells (MWs) are sampled is a requirement of 401 KAR 48.300, Section 11. The uppermost aquifer below the C-746-U Landfill is the Regional Gravel Aquifer (RGA). Water level measurements currently 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 first quarter 2021 and determine groundwater flow rate and direction.

Water levels during this reporting period were measured on January 25, 2021. As shown on Figure E.1, all Upper Continental Recharge System (UCRS) wells had sufficient water to permit water level measurement during this reporting period. UCRS wells MW376 and MW377 had insufficient water to permit sampling for laboratory analysis.

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  $1.15 \times 10^{-3}$  ft/ft and  $1.13 \times 10^{-3}$  ft/ft, respectively. Water level measurements in wells at the C-746-U Landfill and in wells of the surrounding region (MW98, MW100, MW125, MW139, MW165A, MW173, MW193, MW197, and MW200), along with the C-746-S&T Landfill wells, were used to contour the general RGA potentiometric surface (Figure E.4). The hydraulic gradient for the RGA, as a whole, in the vicinity of the C-746-U Landfill was  $5.31 \times 10^{-4}$  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.

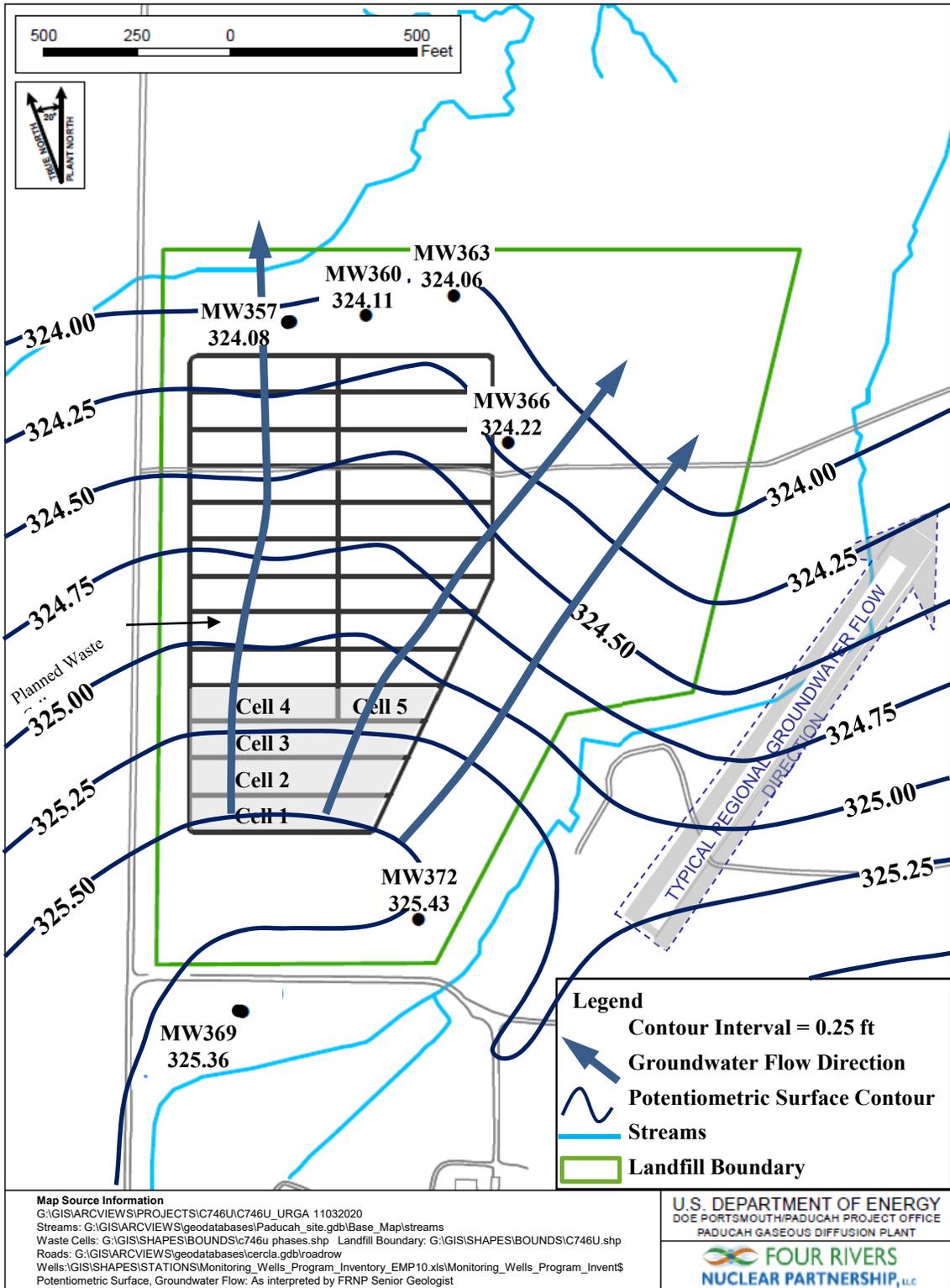
Groundwater flow beneath the C-746-U Landfill typically trends northeastward toward the Ohio River. As demonstrated on the potentiometric maps for January 2021, the groundwater flow direction in the immediate area of the landfill was to the northeast.



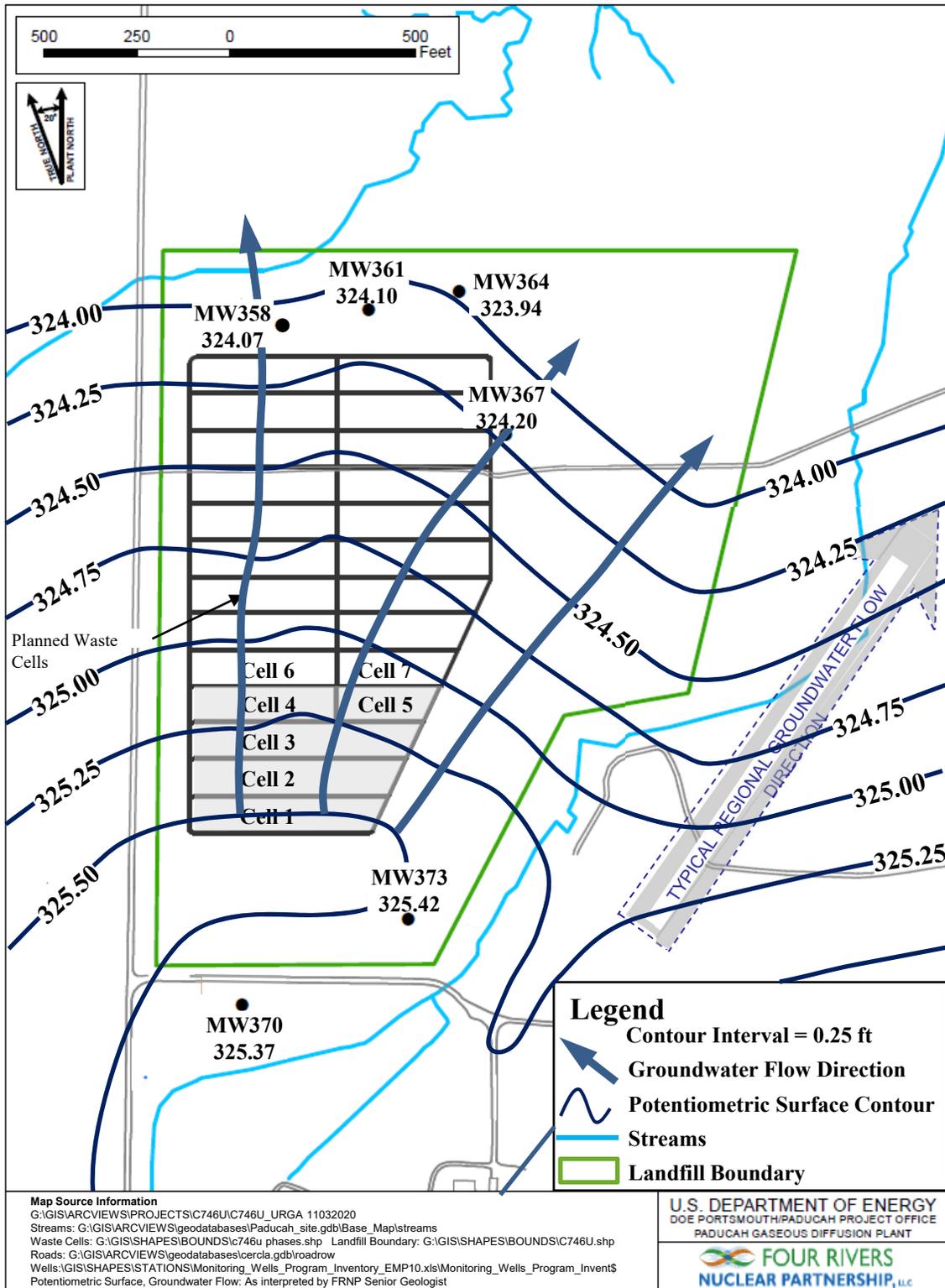
**Figure E.1. Potentiometric Measurements of the Upper Continental Recharge System at the C-746-U Landfill, January 25, 2021**

Table E.1. C-746-U Landfill First Quarter 2021 (January) Water Levels

C-746-U Landfill (January 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)
1/25/2021	13:33	MW357	URGA	368.77	29.63	0.00	44.69	324.08	44.69	324.08
1/25/2021	13:34	MW358	LRGA	368.92	29.63	0.00	44.85	324.07	44.85	324.07
1/25/2021	13:35	MW359	UCRS	368.91	29.63	0.00	27.85	341.06	27.85	341.06
1/25/2021	13:36	MW360	URGA	362.07	29.63	0.00	37.96	324.11	37.96	324.11
1/25/2021	13:37	MW361	LRGA	361.32	29.63	0.00	37.22	324.10	37.22	324.10
1/25/2021	13:38	MW362	UCRS	361.85	29.63	0.00	22.57	339.28	22.57	339.28
1/25/2021	13:21	MW363	URGA	368.56	29.63	0.00	44.50	324.06	44.50	324.06
1/25/2021	13:22	MW364	LRGA	368.17	29.63	0.00	44.23	323.94	44.23	323.94
1/25/2021	13:23	MW365	UCRS	368.14	29.63	0.00	37.34	330.80	37.34	330.80
1/25/2021	13:25	MW366	URGA	368.95	29.63	0.00	44.73	324.22	44.73	324.22
1/25/2021	13:26	MW367	LRGA	369.37	29.63	0.00	45.17	324.20	45.17	324.20
1/25/2021	13:27	MW368	UCRS	368.98	29.63	0.00	20.90	348.08	20.90	348.08
1/25/2021	14:46	MW369	URGA	364.23	29.63	0.00	38.87	325.36	38.87	325.36
1/25/2021	14:47	MW370	LRGA	365.12	29.63	0.00	39.75	325.37	39.75	325.37
1/25/2021	14:48	MW371	UCRS	364.64	29.63	0.00	20.83	343.81	20.83	343.81
1/25/2021	14:43	MW372	URGA	359.42	29.63	0.00	33.99	325.43	33.99	325.43
1/25/2021	14:44	MW373	LRGA	359.73	29.63	0.00	34.31	325.42	34.31	325.42
1/25/2021	14:45	MW374	UCRS	359.44	29.63	0.00	18.59	340.85	18.59	340.85
1/25/2021	14:39	MW375	UCRS	370.36	29.63	0.00	34.72	335.64	34.72	335.64
1/25/2021	14:37	MW376	UCRS	370.39	29.63	0.00	37.73	332.66	37.73	332.66
1/25/2021	14:35	MW377	UCRS	365.74	29.63	0.00	37.89	327.85	37.89	327.85
Reference Barometric Pressure			<b>29.63</b>							
Elev = elevation										
amsl = above mean sea level										
BP = barometric pressure										
DTW = depth to water in feet below datum										
URGA = Upper Regional Gravel Aquifer										
LRGA = Lower Regional Gravel Aquifer										
UCRS = Upper Continental Recharge System										
*Assumes a barometric efficiency of 1.0										



**Figure E.2. Potentiometric Surface of the Upper Regional Gravel Aquifer at the C-746-U Landfill, January 25, 2021**



**Figure E.3. Potentiometric Surface of the Lower Regional Gravel Aquifer at the C-746-U Landfill, January 25, 2021**

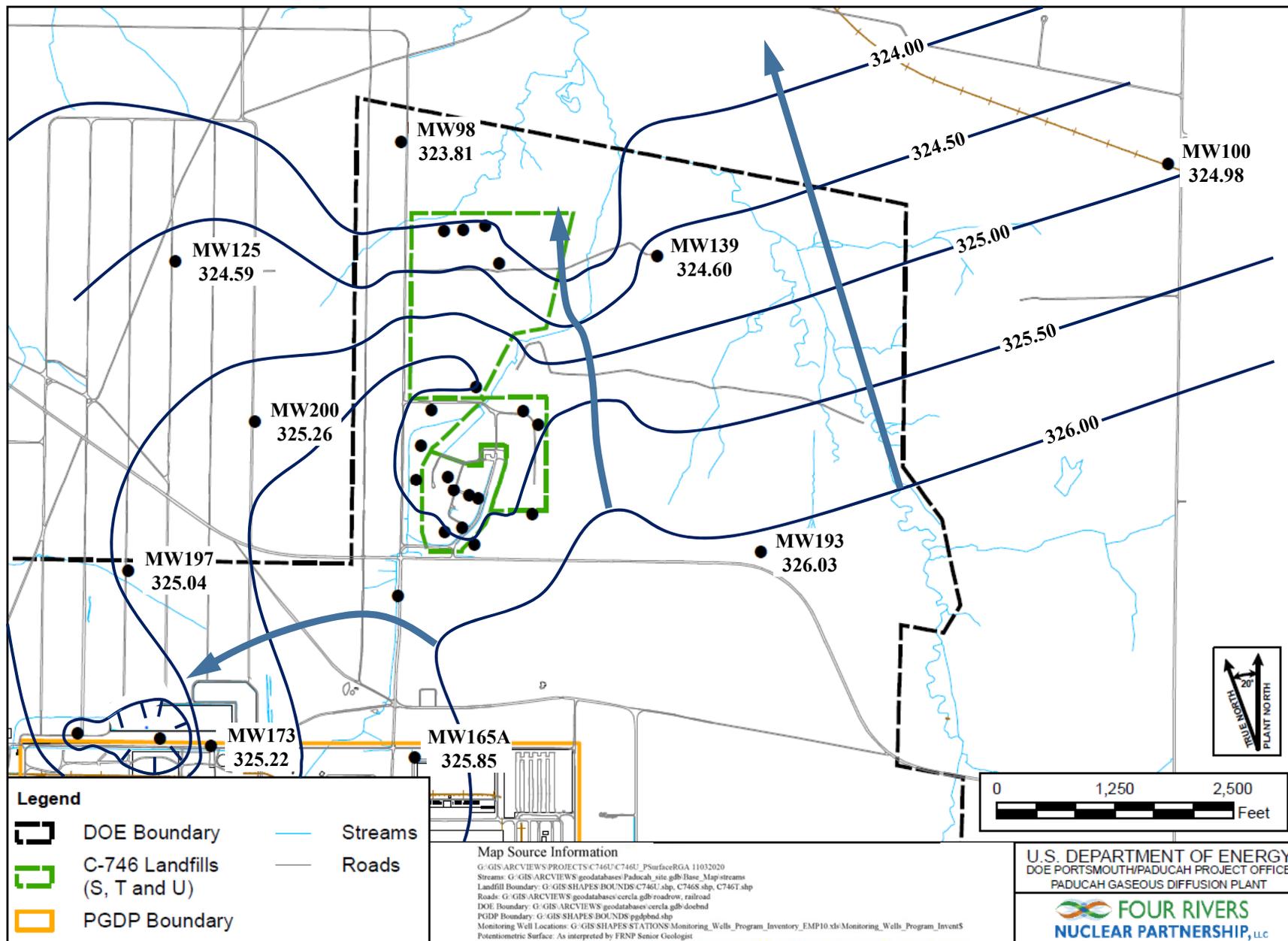


Figure E.4. Vicinity Potentiometric Surface of the Regional Gravel Aquifer, January 25, 2021

**Table E.2. C-746-U Landfill Hydraulic Gradients**

	ft/ft
Beneath Landfill—Upper RGA	$1.15 \times 10^{-3}$
Beneath Landfill—Lower RGA	$1.13 \times 10^{-3}$
Vicinity	$5.31 \times 10^{-4}$

**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
<b>Upper RGA</b>					
725	0.256	0.830	$2.93 \times 10^{-4}$	3.32	$1.17 \times 10^{-3}$
425	0.150	0.487	$1.72 \times 10^{-4}$	1.95	$6.87 \times 10^{-4}$
<b>Lower RGA</b>					
725	0.256	0.822	$2.90 \times 10^{-4}$	3.29	$1.16 \times 10^{-3}$
425	0.150	0.482	$1.70 \times 10^{-4}$	1.93	$6.81 \times 10^{-4}$

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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 first 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>
<b>Upper Continental Recharge System</b>	None	
<b>Upper Regional Gravel Aquifer</b>	None	
<b>Lower Regional Gravel Aquifer</b>	Technetium-99	MW370

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.

3/1/2021

**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**

<b>AKGWA</b>	<b>Station</b>	<b>Analysis</b>	<b>Method</b>	<b>Results</b>	<b>Units</b>	<b>MCL</b>
8004-4795	MW361	Trichloroethene	8260B	7.88	ug/L	5
8004-4797	MW364	Trichloroethene	8260B	7.15	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	
<b>ACETONE</b>																						
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						*																
<b>ALPHA ACTIVITY</b>																						
Quarter 1, 2004																					■	
Quarter 2, 2004							■															
Quarter 3, 2009							■															
<b>ALUMINUM</b>																						
Quarter 3, 2003											*											
<b>BETA ACTIVITY</b>																						
Quarter 1, 2004															■							
Quarter 2, 2004															■						■	
Quarter 3, 2004															■							
Quarter 4, 2004															■							
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Quarter 4, 2019											■				■					■		
Quarter 1, 2020										■					■					■		
Quarter 2, 2020															■					■		
Quarter 3, 2020															■					■		
Quarter 4, 2020															■					■		
<b>BROMIDE</b>																						
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	U	D	D	D	D	U	U	D	D	D	D	U
Monitoring Well	368	375	376	377	359	362	365	371	374	366	360	363	357	369	372	367	361	364	358	370	373
<b>CALCIUM</b>																					
Quarter 3, 2003										*											
Quarter 2, 2005																					*
Quarter 3, 2006																					
Quarter 2, 2008															*						
Quarter 3, 2009															*						
Quarter 4, 2009															*						
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Quarter 4, 2020															*						
Quarter 1, 2021															*						
<b>CARBON DISULFIDE</b>																					
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															*						
<b>CHEMICAL OXYGEN DEMAND</b>																					
Quarter 3, 2002										*	*	*	*	*	*						
Quarter 4, 2002										*	*										
Quarter 1, 2003										*	*										
Quarter 2, 2003										*	*	*									
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Quarter 4, 2003						*				*	*										
Quarter 3, 2004										*					*	*					*
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Quarter 4, 2005						*											*	*			*
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Quarter 4, 2019															*						
<b>CHLORIDE</b>																					
Quarter 1, 2006																					*
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<b>COBALT</b>																					
Quarter 3, 2003	*						*			*	*		*	*	*	*	*	*	*	*	*
Quarter 1, 2004															*						*
Quarter 2, 2016															*						
<b>CONDUCTIVITY</b>																					
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	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
<b>CONDUCTIVITY</b>																						
Quarter 3, 2004											*											
Quarter 1, 2005															*							
Quarter 2, 2005															*							
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<b>DISSOLVED OXYGEN</b>																						
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Quarter 3, 2003					*						*											
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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					
	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	
<b>DISSOLVED OXYGEN</b>																						
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					*	*	*	*	*												*	
<b>DISSOLVED SOLIDS</b>																						
Quarter 4, 2002										*												
Quarter 1, 2003										*												
Quarter 2, 2003										*												
Quarter 3, 2003							*			*	*											
Quarter 4, 2003							*			*	*											
Quarter 3, 2005						*																
Quarter 4, 2006															*							
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Quarter 1, 2016														*	*							
Quarter 3, 2019														*	*							
Quarter 4, 2019														*	*							
Quarter 1, 2020														*	*							
Quarter 2, 2020														*	*							

**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	U	D	D	D	D	U	U	D	D	D	D	U
Gradient	368	375	376	377	359	362	365	371	374	366	360	363	357	369	372	367	361	364	358	370	373
<b>DISSOLVED SOLIDS</b>																					
Quarter 3, 2020															*						
Quarter 4, 2020															*						
Quarter 1, 2021															*						
<b>IODIDE</b>																					
Quarter 2, 2003																*					
Quarter 3, 2003	*									*											
Quarter 4, 2003							*	*						*				*			
Quarter 3, 2010														*				*			
<b>IODINE-131</b>																					
Quarter 3, 2010																		■			
<b>IODOMETHANE</b>																					
Quarter 4, 2003							*														
<b>IRON</b>																					
Quarter 4, 2002							*														
Quarter 3, 2003																					*
Quarter 4, 2003																					*
Quarter 1, 2004																					*
Quarter 2, 2004																					*
Quarter 3, 2004														*							*
Quarter 3, 2005																					*
<b>MAGNESIUM</b>																					
Quarter 2, 2005															*						*
Quarter 3, 2005							*														*
Quarter 2, 2006															*						*
Quarter 3, 2006															*						*
Quarter 1, 2007															*						*
Quarter 2, 2008															*						*
Quarter 2, 2009															*						*
Quarter 3, 2009															*						*
Quarter 4, 2009															*						*
Quarter 1, 2010															*						*
Quarter 2, 2010															*						*
Quarter 3, 2010															*						*
Quarter 1, 2011															*						*
Quarter 2, 2011															*						*
Quarter 3, 2011															*						*
Quarter 4, 2011															*						*
Quarter 1, 2012															*						*
Quarter 2, 2012															*						*
Quarter 3, 2012															*						*
Quarter 4, 2012															*						*
Quarter 1, 2013															*						*
Quarter 2, 2013															*						*
Quarter 3, 2013															*						*
Quarter 4, 2013															*						*
Quarter 2, 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 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															*						*
<b>MANGANESE</b>																					
Quarter 3, 2002										*		*									
Quarter 4, 2002		*				*	*			*		*		*							
Quarter 2, 2003										*		*									
Quarter 3, 2003										*		*	*			*	*	*	*		
Quarter 4, 2003										*	*	*	*			*	*	*	*		
Quarter 1, 2004										*	*	*	*			*	*	*	*		
Quarter 2, 2004							*			*	*	*	*			*	*	*	*		
Quarter 3, 2004							*			*	*	*	*			*	*	*	*		
Quarter 4, 2004										*	*	*	*			*	*	*	*		
Quarter 1, 2005										*	*	*	*			*	*	*	*		
Quarter 2, 2005										*	*	*	*			*	*	*	*		
Quarter 3, 2005										*	*	*	*			*	*	*	*		
Quarter 4, 2005										*	*	*	*			*	*	*	*		
Quarter 1, 2006										*	*	*	*			*	*	*	*		
Quarter 2, 2006							*			*	*	*	*			*	*	*	*		
Quarter 3, 2006										*	*	*	*			*	*	*	*		
Quarter 4, 2006										*	*	*	*			*	*	*	*		
Quarter 1, 2007										*	*	*	*			*	*	*	*		

**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	U	U	D	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	
<b>MANGANESE</b>																						
Quarter 2, 2007							*			*												
Quarter 3, 2007							*															
Quarter 3, 2008							*															
Quarter 4, 2008							*															
Quarter 3, 2009							*															
Quarter 3, 2011							*															
Quarter 2, 2016														*								
Quarter 3, 2016									*													
<b>NICKEL</b>																						
Quarter 3, 2003										*												
<b>OXIDATION-REDUCTION POTENTIAL</b>																						
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					
	D	S	S	S	D	D	U	U	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	
<b>OXIDATION-REDUCTION POTENTIAL</b>																						
Quarter 2, 2019	*	*			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Quarter 3, 2019	*	*			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Quarter 4, 2019	*	*			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Quarter 1, 2020	*	*			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Quarter 2, 2020	*	*			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Quarter 3, 2020	*	*			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Quarter 4, 2020	*	*			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Quarter 1, 2021	*	*			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
<b>PCB, TOTAL</b>																						
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								*														
<b>PCB-1016</b>																						
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								*														
<b>PCB-1242</b>																						
Quarter 3, 2006								*			*											
Quarter 4, 2006								*		*												
Quarter 1, 2008								*														
Quarter 2, 2012								*														
<b>PCB-1248</b>																						
Quarter 2, 2008								*														
<b>PCB-1260</b>																						
Quarter 2, 2006								*														
<b>pH</b>																						
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															*	*	*	*	*			
<b>POTASSIUM</b>																						
Quarter 1, 2014															*							
<b>RADIUM-228</b>																						
Quarter 2, 2005																						
Quarter 4, 2005							■					■					■					
<b>SELENIUM</b>																						
Quarter 4, 2003									■													

**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	U	U	D	D	D	U	U	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
<b>SODIUM</b>																					
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												*									
<b>STRONTIUM-90</b>																					
Quarter 4, 2008									■												
<b>SULFATE</b>																					
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										
	D	S	S	S	D	D	U	U	D	D	D	U	U	D	D	D	U	U	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						
<b>SULFATE</b>																											
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	*	*			*	*	*	*							*												
<b>TECHNETIUM-99</b>																											
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	U	U	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
<b>TECHNETIUM-99</b>																					
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																				*	
<b>THORIUM-230</b>																					
Quarter 4, 2015																*					
Quarter 2, 2016										*											
Quarter 4, 2016	*											*				*				*	
Quarter 4, 2017												*									
Quarter 2, 2018										*		*									
<b>TOLUENE</b>																					
Quarter 2, 2014										*				*							
<b>TOTAL ORGANIC CARBON</b>																					
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																			*	*	
<b>TOTAL ORGANIC HALIDES</b>																					
Quarter 4, 2002										*											
Quarter 1, 2003										*											
Quarter 2, 2003										*											
Quarter 1, 2004															*						
<b>TRICHLOROETHENE</b>																					
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					
	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	
<b>TRICHLOROETHENE</b>																						
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													■		■			■	■	■	■	
<b>TURBIDITY</b>																						
Quarter 1, 2003										*												
<b>URANIUM</b>																						
Quarter 4, 2002		*			*	*	*			*	*	*	*	*	*	*	*	*	*	*	*	
Quarter 4, 2006																					*	
<b>ZINC</b>																						
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**

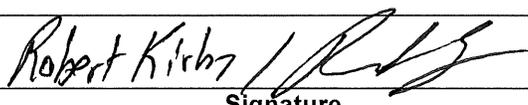
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**CP3-WM-0017-F04 - C-746-U LANDFILL METHANE MONITORING REPORT**

PADUCAH GASEOUS DIFFUSION PLANT

Permit #: 073-00045

McCracken County, Kentucky

<b>Date:</b>	<b>3/22/2021</b>	<b>Time:</b>	<b>1300</b>	<b>Monitor:</b>	<b>Robert Kirby</b>
<b>Weather Conditions:</b> Sunny, Slight Wind, 65F					
<b>Monitoring Equipment:</b> RAE Systems, Multi-RAE, Serial #4494					
<b>Monitoring Location</b>					<b>Reading (% LEL)</b>
<b>C-746-U1</b>	Checked at floor level				0
<b>C-746-U2</b>	Checked at floor level				0
<b>C-746-U-T-14</b>	Checked at floor level				0
<b>C-746-U15</b>	Checked at floor level				0
<b>MG1</b>	Checked 1" from opening				0
<b>MG2</b>	Checked 1" from opening				0
<b>MG3</b>	Checked 1" from opening				0
<b>MG4</b>	Checked 1" from opening				0
<b>Suspect or Problem Areas</b>	No problems noted				
<b>Remarks:</b>	N/A				
<b>Performed by:</b>				<b>03/26/2021</b>	
	<b>Signature</b>			<b>Date</b>	

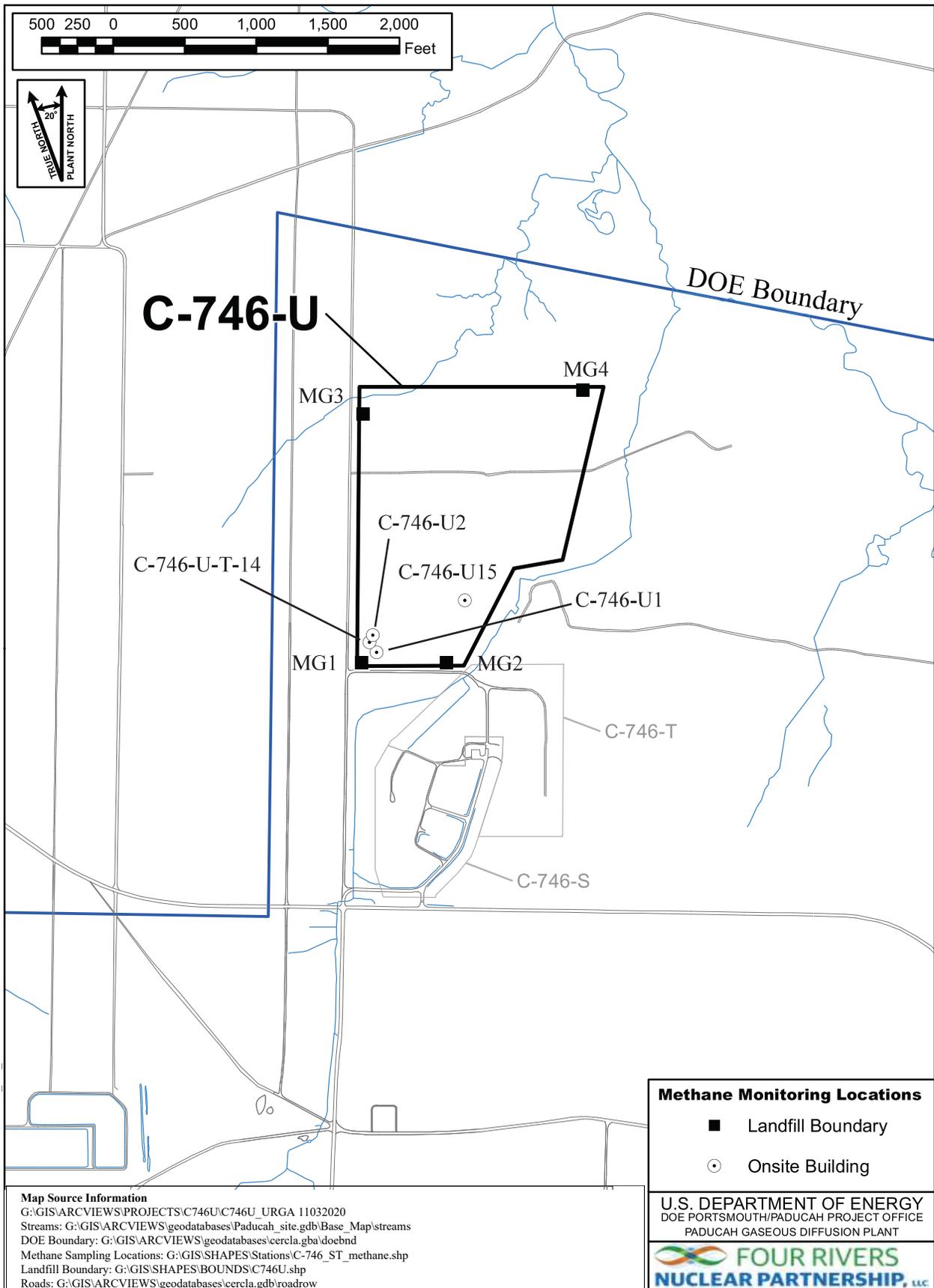


Figure H.1. C-746-U Methane Monitoring Locations

**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 / 1  
 LAB ID: None  
 For Official Use Only

# SURFACE WATER SAMPLE ANALYSIS (S)

S-1

Monitoring Point (KPDES Discharge Number, or "UPSTREAM", or "DOWNSTREAM")				L150 AT SITE	L154 UPSTREAM	L351 DOWNSTREAM							
Sample Sequence #				1	1	1							
If sample is a Blank, specify Type: (F)ield, (T)rip, (M)ethod, or (E)quipment				NA	NA	NA							
Sample Date and Time (Month/Day/Year hour: minutes)				1/25/2021 08:58	1/25/2021 09:11	1/25/2021 08:47							
Duplicate ("Y" or "N") <sup>1</sup>				N	N	N							
Split ('Y' or "N") <sup>2</sup>				N	N	N							
Facility Sample ID Number (if applicable)				L150US2-21	L154US2-21	L351US2-21							
Laboratory Sample ID Number (if applicable)				532967001	532967002	532967003							
Date of Analysis (Month/Day/Year)				2/8/2021	2/8/2021	2/8/2021							
CAS RN <sup>3</sup>		CONSTITUENT	T D 4	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>5</sup>	F L A G S <sup>7</sup>						
A200-00-0	0	Flow	T	MGD	Field		*		*		*		
16887-00-6	2	Chloride(s)	T	mg/L	300.0	1.97		1.01		1.19			
14808-79-8	0	Sulfate	T	mg/L	300.0	15.8		3.26		3.34			
7439-89-6	0	Iron	T	mg/L	200.8	8.62	*	1.76	*	2.89	*		
7440-23-5	0	Sodium	T	mg/L	200.8	3.47		1.16		1.11			
S0268- -	0	Organic Carbon <sup>6</sup>	T	mg/L	9060	4.68		10.4		9.98			
S0097- -	0	BOD <sup>6</sup>	T	mg/L	not applicable		*		*		*		
S0130- -	0	Chemical Oxygen Demand	T	mg/L	410.4	17.8	J	37.3		27.5			

<sup>1</sup>Respond "Y" if the sample was a duplicate of another sample in this report

<sup>2</sup>Respond "Y" if the sample was split and analyzed by separate laboratories.

<sup>3</sup>Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.

<sup>4</sup>"T" = Total; "D" = Dissolved

<sup>5</sup>"<" indicates a non-detect; do not use "ND" or "BDL". Value then shown is Practical Quantification Limit

<sup>6</sup>Facility has either/or option on Organic Carbon and (BOD) Biochemical Oxygen Demand - both are not required

<sup>7</sup>Flags 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



**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**  
**For Official Use Only**

## SURFACE WATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
L150	L150US2-21	Flow Rate		Analysis of constituent not required and not performed.
		Iron	*	Duplicate analysis not within control limits.
		Biochemical Oxygen Demand (BOD)		Analysis of constituent not required and not performed.
		Dissolved Solids	*	Duplicate analysis not within control limits.
		Total Solids	*	Duplicate analysis not within control limits.
		Alpha activity	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.77. Rad error is 3.74.
L154	L154US2-21	Beta activity	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.22. Rad error is 6.16.
		Flow Rate		Analysis of constituent not required and not performed.
		Iron	*	Duplicate analysis not within control limits.
		Biochemical Oxygen Demand (BOD)		Analysis of constituent not required and not performed.
		Dissolved Solids	*	Duplicate analysis not within control limits.
		Total Solids	*	Duplicate analysis not within control limits.
L351	L351US2-21	Alpha activity		TPU is 5.91. Rad error is 5.75.
		Beta activity	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.72. Rad error is 5.66.
		Flow Rate		Analysis of constituent not required and not performed.
		Iron	*	Duplicate analysis not within control limits.
		Biochemical Oxygen Demand (BOD)		Analysis of constituent not required and not performed.
		Dissolved Solids	*	Duplicate analysis not within control limits.
		Total Solids	*	Duplicate analysis not within control limits.
		Alpha activity	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.11. Rad error is 3.1.
		Beta activity	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.73. Rad error is 3.72.

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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 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 15<sup>th</sup> day of July 2019.

A blue ink signature of a person, likely the Vice President of Accreditation Services, written over a horizontal line.

Vice President, Accreditation Services  
For the Accreditation Council  
Certificate Number 2567.01  
Valid to June 30, 2021

*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**

<b>Analytical Method</b>	<b>Preparation Method</b>	<b>Product</b>
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 The 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 (°C)	Conductivity (umho/cm)	pH (Std Unit)	Dissolved oxygen (mg/L)	Turbidity (NTU)		Temperature (°C)	Conductivity (umho/cm)	pH (Std Unit)	Dissolved oxygen (mg/L)	Turbidity (NTU)
<b>MW357</b>						<b>MW358</b>					
Date Collected: 01/14/2021						Date Collected: 01/14/2021					
0856	57.6	428	6.04	4.63	19.2	0939	58.6	566	6.23	1.96	3.8
0859	57.2	426	6.01	4.23	23.0	0942	57.9	573	6.23	0.84	6.6
0902	57.0	425	6.01	4.17	23.9	0945	57.7	572	6.22	0.86	7.1
<b>MW359</b>						<b>MW360</b>					
Date Collected: 01/14/2021						Date Collected: 01/14/2021					
1015	59.7	218	5.89	5.01	20.4	0626	55.6	405	6.12	1.88	6.41
1018	59.8	216	5.87	5.13	21.6	0629	54.2	401	6.10	1.52	7.36
1021	59.7	212	5.87	5.12	22.3	0632	53.7	400	6.10	1.44	7.57
<b>MW361</b>						<b>MW362</b>					
Date Collected: 01/14/2021						Date Collected: 01/14/2021					
0724	57.3	525	5.90	3.87	13.5	0816	57.9	726	6.81	3.22	20.5
0727	56.4	526	5.89	3.44	17.3	0819	57.7	727	6.80	2.21	20.8
0730	56.2	525	5.90	3.38	19.8	0822	57.0	727	6.80	2.16	20.7
<b>MW363</b>						<b>MW364</b>					
Date Collected: 01/19/2021						Date Collected: 01/19/2021					
0702	56.3	487	5.98	1.72	3.0	0803	57.3	471	5.84	4.37	2.0
0705	55.0	452	5.94	0.86	8.4	0805	56.7	471	5.81	3.26	2.5
0708	54.6	450	5.94	0.84	8.6	0808	56.7	470	5.79	3.24	3.1
<b>MW365</b>						<b>MW366</b>					
Date Collected: 01/19/2021						Date Collected: 01/19/2021					
0841	57.3	386	6.13	6.63	2.18	0921	59.2	429	5.96	3.93	1.8
0844	56.6	386	6.12	6.12	2.20	0924	58.3	429	5.95	3.10	1.7
0847	56.4	383	6.12	6.08	2.22	0927	58.3	429	5.96	3.08	1.8
<b>MW367</b>						<b>MW368</b>					
Date Collected: 01/19/2021						Date Collected: 01/19/2021					
1002	59.0	246	5.86	2.08	4.46	1040	58.8	632	6.19	2.41	4.81
1005	58.8	245	5.73	0.87	3.90	1043	58.6	644	6.18	1.35	3.70
1008	58.5	245	5.73	0.80	3.88	1046	58.5	642	6.18	1.32	3.55
<b>MW369</b>						<b>MW370</b>					
Date Collected: 01/20/2021						Date Collected: 01/20/2021					
0712	57.1	378	6.48	4.45	3.82	0810	56.4	450	5.93	6.50	1.10
0715	56.9	373	6.02	1.95	4.06	0813	58.2	464	5.80	4.39	1.75
0718	56.7	373	5.98	1.88	4.10	0816	58.1	464	5.79	4.30	2.05
<b>MW371</b>						<b>MW372</b>					
Date Collected: 01/20/2021						Date Collected: 01/20/2021					
0847	59.4	646	6.37	1.97	510	0930	59.1	819	6.10	3.38	12.4
0850	58.4	642	6.38	1.64	520	0933	59.1	822	6.04	2.22	14.9
0853	58.4	641	6.39	1.60	514	0936	58.8	822	6.04	2.13	15.2
<b>MW373</b>						<b>MW374</b>					
Date Collected: 01/20/2021						Date Collected: 01/20/2021					
1010	59.9	855	6.06	3.33	1.49	1049	60.5	717	6.72	1.40	14.9
1013	59.5	855	6.04	1.86	1.50	1052	60.2	714	6.71	0.95	18.3
1016	59.5	854	6.05	1.80	1.58	1055	60.2	713	6.69	0.92	19.1
<b>MW375</b>						<b>MW358 (Resample)</b>					
Date Collected: 01/20/2021						Date Collected: 03/08/2021					
1132	59.6	349	6.40	1.90	4.93	1201	59.6	523	6.33	1.78	3.1
1135	59.4	344	6.32	1.02	2.10	1204	59.8	524	6.26	1.04	2.7
1138	59.4	344	6.30	0.95	2.28	1207	59.9	525	6.25	1.00	2.7

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