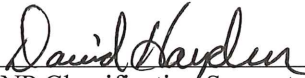


**C-746-S&T Landfills
Second Quarter Calendar Year 2019
(April–June)
Compliance Monitoring Report,
Paducah Gaseous Diffusion Plant,
Paducah, Kentucky**



This document is approved for public release per review by:


FRNP Classification Support

8-22-19
Date

**C-746-S&T Landfills
Second Quarter Calendar Year 2019
(April–June)
Compliance Monitoring Report,
Paducah Gaseous Diffusion Plant,
Paducah, Kentucky**

Date Issued—August 2019

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

THIS PAGE INTENTIONALLY LEFT BLANK

CONTENTS

FIGURES	v
TABLES	v
ACRONYMS	vii
1. INTRODUCTION	1
1.1 BACKGROUND	1
1.2 MONITORING PERIOD ACTIVITIES	1
1.2.1 Groundwater Monitoring	1
1.2.2 Methane Monitoring	3
1.2.3 Surface Water Monitoring	3
1.3 KEY RESULTS	5
2. DATA EVALUATION/STATISTICAL SYNOPSIS	9
2.1 STATISTICAL ANALYSIS OF GROUNDWATER DATA	10
2.1.1 Upper Continental Recharge System	10
2.1.2 Upper Regional Gravel Aquifer	10
2.1.3 Lower Regional Gravel Aquifer	11
2.2 DATA VERIFICATION AND VALIDATION	11
3. PROFESSIONAL GEOLOGIST AUTHORIZATION	13
4. REFERENCES	15
APPENDIX A: GROUNDWATER, SURFACE WATER, LEACHATE, AND METHANE MONITORING SAMPLE DATA REPORTING FORM	A-1
APPENDIX B: FACILITY INFORMATION SHEET	B-1
APPENDIX C: GROUNDWATER SAMPLE ANALYSES AND WRITTEN COMMENTS	C-1
APPENDIX D: STATISTICAL ANALYSES AND QUALIFICATION STATEMENT	D-1
APPENDIX E: GROUNDWATER FLOW RATE AND DIRECTION	E-1
APPENDIX F: NOTIFICATIONS	F-1
APPENDIX G: CHART OF MCL AND UTL EXCEEDANCES	G-1
APPENDIX H: METHANE MONITORING DATA	H-1
APPENDIX I: SURFACE WATER ANALYSES AND WRITTEN COMMENTS	I-1
APPENDIX J: ANALYTICAL LABORATORY CERTIFICATION	J-1

APPENDIX K:	LABORATORY ANALYTICAL METHODS	K-1
APPENDIX L:	MICRO-PURGING STABILITY PARAMETERS	L-1

FIGURES

1. C-746-S&T Landfills Groundwater Monitoring Well Network.....	2
2. C-746-S&T Landfills Surface Water Monitoring Locations.....	4

TABLES

1. Summary of MCL Exceedances.....	6
2. Exceedances of Statistically Derived Historical Background Concentrations	6
3. Exceedances of Current Background UTL in Downgradient Wells	7
4. C-746-S&T Landfills Downgradient Wells Trend Summary Utilizing the Previous Eight Quarters	7
5. Exceedances of Current Background UTL in Downgradient UCRS Wells	8
6. Monitoring Wells Included in Statistical Analysis.....	10

THIS PAGE INTENTIONALLY LEFT BLANK

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

THIS PAGE INTENTIONALLY LEFT BLANK

1. INTRODUCTION

This report, *C-746-S&T Landfills Second Quarter Calendar Year 2019 (April–June) Compliance Monitoring Report, Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, is being submitted in accordance with Solid Waste Landfill 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 exceedances of the MCL and historical UTL that have occurred since the fourth quarter calendar year (CY) 2002. Methane monitoring results are documented on the approved C-746-S&T Landfills Methane Monitoring Report form provided in Appendix H. The form includes pertinent remarks/observations as required by 401 KAR 48:090 § 5. Surface water results are provided in Appendix I. Analytical laboratory certification is provided in Appendix J. Laboratory analytical methods used to analyze the included data set are provided in Appendix K. Micro-purging stability parameter results are provided in Appendix L.

1.1 BACKGROUND

The C-746-S&T Landfills are closed, solid waste landfills located north of the Paducah Site and south of the C-746-U Landfill. Construction and operation of the C-746-S Residential Landfill were permitted in April 1981 under Solid Waste Landfill Permit Number 073-00014. The permitted C-746-S Landfill area covers about 16 acres and contains a clay liner with a final cover of compacted soil. The C-746-S Landfill was a sanitary landfill for the Paducah Gaseous Diffusion Plant operations. The C-746-S Landfill is closed and has been inactive since July 1995.

Construction and operation of the C-746-T Inert Landfill were permitted in February 1985 under Solid Waste Landfill Permit Number 073-00015. The permitted C-746-T Landfill area covers about 20 acres and contains a clay liner with a final cover of compacted soil. The C-746-T Landfill was used to dispose of construction debris (e.g., concrete, wood, and rock) and steam plant fly ash from the Paducah Gaseous Diffusion Plant operations. The C-746-T Landfill is closed and has been inactive since June 1992.

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 23 monitoring wells (MWs) under permit for the C-746-S&T Landfills: 5 UCRS wells, 11 URGA wells, and 7 LRGA wells. A map of the MW locations is presented in Figure 1. All MWs listed on the permit were

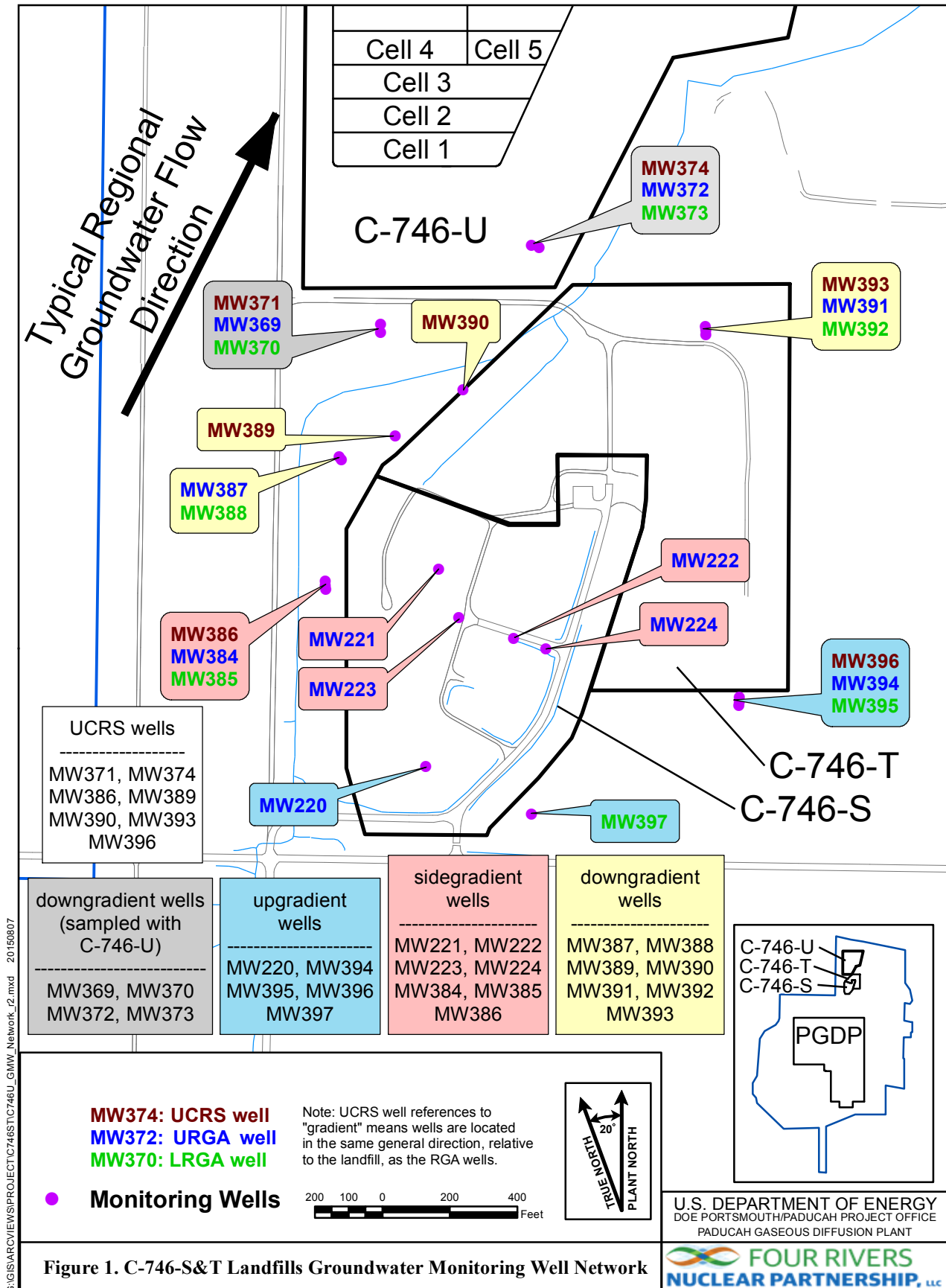


Figure 1. C-746-S&T Landfills Groundwater Monitoring Well Network

sampled this quarter except MW389 (screened in the UCRS), which had an insufficient amount of water to obtain a water level measurement or sample; therefore, there are no analytical results for this location.

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*, PAD-PROJ-0139, (Groundwater Monitoring Plan) (LATA Kentucky 2014), UCRS wells are included in the monitoring program. Groundwater flow gradients are downward through the UCRS, but the underlying Regional Gravel Aquifer (RGA) flows laterally. Groundwater flow in the RGA is typically in a north-northeasterly direction in the vicinity of the C-746-S&T Landfills. 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 second quarter 2019 in accordance with the Groundwater Monitoring Plan (LATA Kentucky 2014) using the Deactivation and Remediation Contractor, procedure CP4-ES-2101, *Groundwater Sampling*. Appropriate sample containers and preservatives were utilized. The laboratory also used U.S. Environmental Protection Agency-approved methods, as applicable. The parameters specified in Permit Condition GSTR0003, Special Condition 3, were analyzed for all locations sampled.

The groundwater flow rate and direction determination are provided in Appendix E. Depth-to-water was measured on April 23, 2019, in MWs of the C-746-S&T Landfills (see Table E.1); in MWs of the C-746-U Landfill; and in MWs of the surrounding region (shown on Figure E.3). 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 April, 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-S&T Landfills in April was 5.08×10^{-4} ft/ft, while the gradient beneath the C-746-S&T Landfills was 4.91×10^{-4} ft/ft. Calculated groundwater flow rates (average linear velocities) for the RGA at the C-746-S&T Landfills range from 0.835 to 1.42 ft/day (see Table E.3).

1.2.2 Methane Monitoring

Methane monitoring was conducted in accordance with 401 KAR 48:090 § 5 and the Solid Waste Landfill Permit. Landfill operations staff monitored for the occurrence of methane in one on-site building location, four locations along the landfill boundary, and 27 passive-gas vents located in Cells 1, 2, and 3 of the C-746-S Landfill on May 30, 2019. See Appendix H for a map (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-S&T Landfills Methane Log provided in Appendix H.

1.2.3 Surface Water Monitoring

Surface water sampling was performed at the three locations (see Figure 2) monitored for the C-746-S&T Landfills: (1) upstream location L135; (2) downstream location, L154; and (3) L136, a location capturing

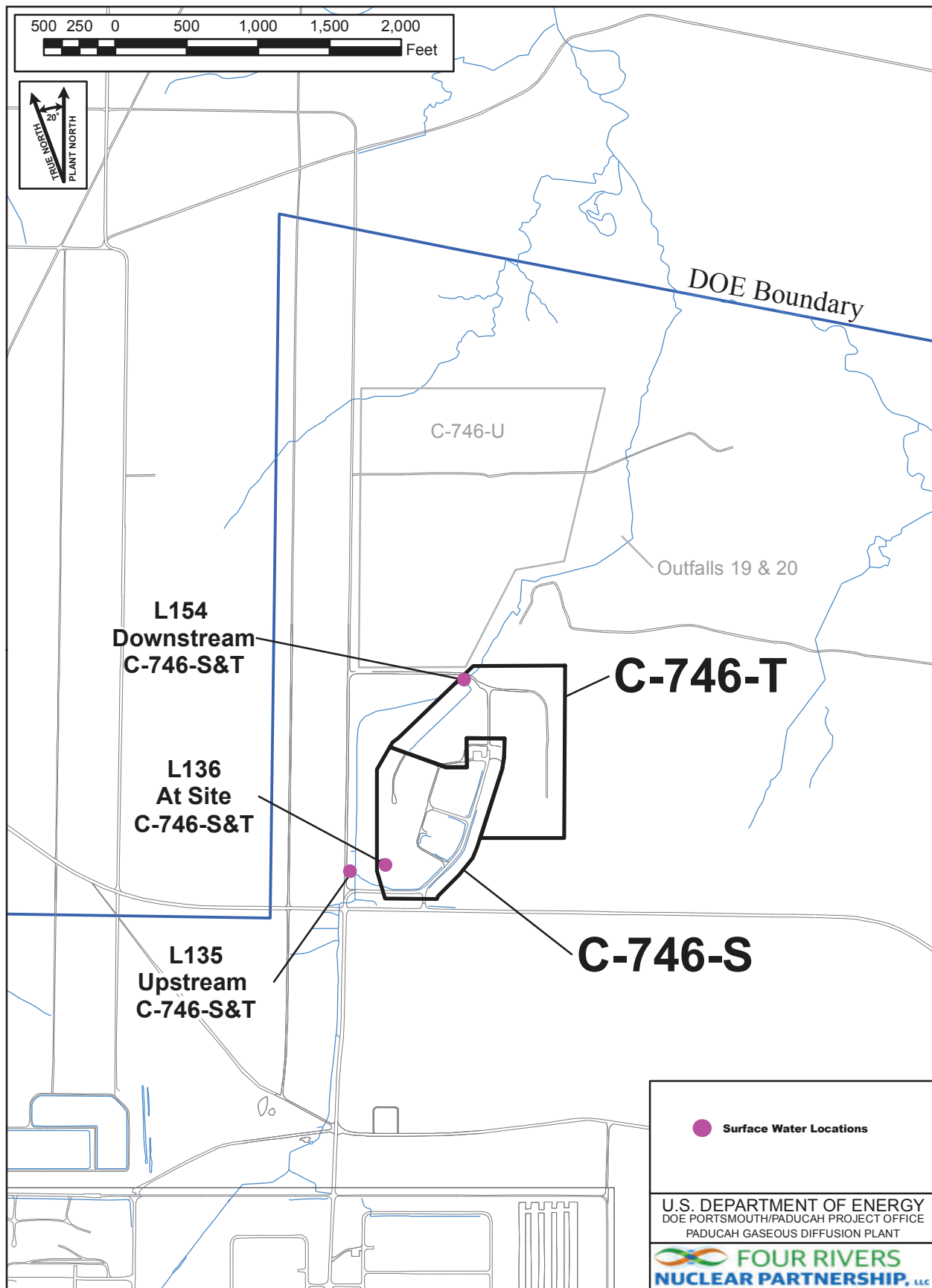


Figure 2. C-746-S&T Landfills Surface Water Monitoring Locations

runoff from 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-S and C-746-T Landfills Permit Numbers KY-073-00014 and 073-00015, Paducah Gaseous Diffusion Plant, Paducah, Kentucky* (PRS 2008), which is Technical Application Attachment 24 of the Solid Waste Landfill 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 Landfill Permit. Parameters that had concentrations that exceeded their respective MCL are listed in Table 1. Those constituents that exceeded their respective MCL were further evaluated against their historical background UTL. Table 2 identifies parameters (that do not have MCLs) with concentrations that exceeded the statistically derived historical background UTL¹ during the second quarter 2019, 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 upgradient (Table 3).

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

The constituents that exceeded their MCL 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 MW373, MW391, and MW392 (downgradient wells) do not exceed the historical background concentration and are considered to be a Type 1 exceedance—not attributable to the C-746-S&T Landfills.

The MCL exceedances for beta activity in MW369, MW370, MW387, and MW388 (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 parameter was subjected to the Mann-Kendall statistical test for trend using the most recent eight quarters of data. The results are summarized in Table 4. All of these wells had no increasing Mann-Kendall trend for beta activity and are considered to be a Type 1 exceedance—not attributable to the C-746-S&T Landfills.

This report serves as the notification of parameters that had statistically significant increased concentrations relative to historical background concentrations, as required by Permit Number SW07300014, SW07300015, SW07300045, Condition GSTR0003, Standard Requirement 5, and 401 KAR 48:300 § 7.

The constituents listed in Table 2 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, to identify if the current downgradient concentrations are consistent with current background values. Table 3 summarizes the evaluation against current background UTL for those constituents present in downgradient 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 landfill source; therefore, they are a Type 1 exceedance.

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

Table 1. Summary of MCL Exceedances

UCRS	URGA	LRGA
None	MW369: Beta activity	MW370: Beta activity
	MW384: Beta activity	MW373: Trichloroethene
	MW387: Beta activity	MW385: Beta activity
	MW391: Trichloroethene	MW388: Beta activity
		MW392: Trichloroethene

Table 2. Exceedances of Statistically Derived Historical Background Concentrations

UCRS*	URGA	LRGA
MW386: Oxidation-reduction potential	MW220: Oxidation-reduction potential, sulfate	MW370: Beta activity, oxidation-reduction potential, sulfate, technetium-99
MW390: Oxidation-reduction potential, technetium-99	MW221: Oxidation-reduction potential	MW373: Calcium, chemical oxygen demand (COD), conductivity, dissolved solids, magnesium, oxidation-reduction potential, sulfate
MW393: Oxidation-reduction potential	MW222: Oxidation-reduction potential	MW385: Beta activity, oxidation-reduction potential, sulfate, technetium-99
MW396: Chemical oxygen demand (COD), oxidation-reduction potential	MW223: Oxidation-reduction potential, sulfate	MW388: Beta activity, oxidation-reduction potential, sulfate, technetium-99
	MW224: Oxidation-reduction potential	MW392: Chloride, oxidation-reduction potential
	MW369: Beta activity, technetium-99	MW395: Oxidation-reduction potential
	MW372: Calcium, chemical oxygen demand (COD), dissolved solids, magnesium, oxidation-reduction potential, sulfate, technetium-99	MW397: Oxidation-reduction potential
	MW384: Beta activity, oxidation-reduction potential, sulfate, technetium-99	
	MW387: Beta activity, oxidation-reduction potential, sodium, sulfate, technetium-99	
	MW391: Chemical oxygen demand (COD), oxidation-reduction potential, sulfate	
	MW394: Oxidation-reduction potential	

*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: MW221, MW222, MW223, MW224, MW384, MW385, MW386

Downgradient wells: MW369, MW370, MW372, MW373, MW387, MW388, MW389, MW390, MW391, MW392, MW393

Upgradient wells: MW220, MW394, MW395, MW396, MW397

Table 3. Exceedances of Current Background UTL in Downgradient Wells

URGA	LRGA
MW369: Beta activity, technetium-99	MW370: Beta activity, sulfate, technetium-99
MW372: Calcium, chemical oxygen demand (COD), magnesium, sulfate, technetium-99	MW373: Calcium, conductivity, dissolved solids, magnesium, sulfate
MW387: Beta activity, sodium, technetium-99	MW388: Beta activity, sulfate, technetium-99
MW391: Chemical oxygen demand (COD), oxidation-reduction potential, sulfate	MW392: Chloride

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

Location	Well ID	Parameter	Sample Size	Alpha ¹	p-Value ²	S ³	Decision ⁴
C-746-S&T Landfill	MW369	Beta activity	8	0.05	0.451	-2	No Trend
		Technetium-99	8	0.05	0.309	5	No Trend
	MW370	Beta activity	8	0.05	0.355	-4	No Trend
		Sulfate	8	0.05	0.133	10	No Trend
		Technetium-99	8	0.05	0.451	-2	No Trend
	MW372	Calcium	8	0.05	0.159	9	No Trend
		Chemical oxygen demand (COD)	8	0.05	0.133	10	No Trend
		Magnesium	8	0.05	0.268	6	No Trend
		Sulfate	8	0.05	0.268	6	No Trend
		Technetium-99	8	0.05	0.355	4	No Trend
	MW373	Calcium	8	0.05	0.193	8	No Trend
		Conductivity	8	0.05	0.193	8	No Trend
		Dissolved Solids	8	0.05	0.309	5	No Trend
		Magnesium	8	0.05	0.193	8	No Trend
		Sulfate	8	0.05	0.193	8	No Trend
	MW387	Beta activity	8	0.05	0.451	-2	No Trend
		Sodium	8	0.05	0.0539	14	No Trend
		Technetium-99	8	0.05	0.451	2	No Trend
	MW388	Beta activity	8	0.05	0.355	-4	No Trend
		Sulfate	8	0.05	0.451	2	No Trend
		Technetium-99	8	0.05	0.548	0	No Trend
	MW391	Chemical oxygen demand (COD)	8	0.05	0.106	11	No Trend
		Oxidation-reduction potential	8	0.05	0.548	0	No Trend
		Sulfate	8	0.05	0.355	-4	No Trend

**Table 4. C-746-S&T Landfills Downgradient Wells Trend Summary
Utilizing the Previous Eight Quarters (Continued)**

Location	Well ID	Parameter	Sample Size	Alpha ¹	p-Value ²	S ³	Decision ⁴
C-746-S&T Landfill	MW392	Chloride	8	0.05	0.355	4	No Trend

Footnotes:

¹ An alpha of 0.05 represents a 95% confidence interval.

² The p-value represents the risk of acceptance the H_a hypothesis of a trend, in terms of a percentage.

³ The initial value of the Mann-Kendall statistic, S, is assumed to be 0 (e.g., no trend). If a data value from a later time period is higher than a data value from an earlier time period, S is incremented by 1. On the other hand, if the data value from a later time period is lower than a data value sampled earlier, S is decremented by 1. The net result of all such increments and decrements yields the final value of S. A very high positive value of S is an indicator of an increasing trend, and a very low negative value indicates a decreasing trend.

⁴ The Mann-Kendall decision operates on two hypotheses, the H₀ and H_a. H₀ assumes there is no trend in the data, whereas H_a assumes either a positive or negative trend.

Note: Statistics generated using ProUCL.

The constituents listed in Table 3 that exceed both the historical UTL and the current UTL do not have an identified source and are considered preliminarily to be a Type 2 exceedance, per the approved Groundwater Monitoring Plan. 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. All of these preliminary Type 2 exceedances in downgradient wells did not have an increasing trend and are considered to be a Type 1 exceedance—not attributable to the C-746-S&T Landfills.

In accordance with Permit Condition GSTR0003, Special Condition 2, of the Solid Waste Landfill Permit, the groundwater assessment and corrective action requirements of 401 KAR 48:300 § 8 shall not apply to the C-746-S Residential Landfill and the C-746-T Inert Landfill. This variance in the permit provides that groundwater assessment and corrective actions for these landfills will be conducted in accordance with the corrective action requirements of 401 KAR 34:060 § 12.

The statistical evaluation of current UCRS wells against the current UCRS background UTL identified oxidation-reduction potential and technetium-99 values in UCRS well MW390 and an oxidation-reduction potential value in UCRS well MW393 that exceed both the historical and current backgrounds (Table 5). Because these wells are not hydrogeologically downgradient of the C-746-S&T Landfills, these exceedances are not attributable to C-746-S&T sources and are considered to be a Type 1 exceedance.

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

UCRS
MW390: Oxidation-reduction potential, technetium-99
MW393: Oxidation-reduction potential

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

All MCL and UTL exceedances reported for this quarter were evaluated and considered to be Type 1 exceedances—not attributable to the C-746-S&T Landfills.

2. DATA EVALUATION/STATISTICAL SYNOPSIS

The statistical analyses conducted on the second quarter 2019 groundwater data collected from the C-746-S&T Landfills MWs were performed in accordance with the Groundwater Monitoring Plan (LATA Kentucky 2014). The statistical analyses for this report utilize data from the first eight quarters that were sampled for each parameter, beginning with the first two 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).

For those parameters that exceed the MCL for Kentucky solid waste facilities found in 401 KAR 47:030 § 6, these exceedances were documented and evaluated further as follows. 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 landfills. 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 upgradient) 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 further evaluated using the Mann-Kendall test for trend. If there was not a statistically significant increasing trend for a constituent in a downgradient well, the exceedance was reclassified as a Type 1 exceedance (not attributable to the landfills).

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 further evaluated using the Mann-Kendall test for trend. If there was not a statistically significant increasing trend for a constituent in a downgradient well, the exceedance was reclassified as a Type 1 exceedance (not attributable to the landfills).

To calculate the UTL, the data are divided into censored (nondetects) and uncensored (detected) observations. The one-sided tolerance interval statistical test is conducted only on parameters that have at least one uncensored observation. Results of the one-sided tolerance interval statistical test are used to determine whether the data show 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 is conducted. The test well results are compared to both the UTL and LTL to determine if statistically significant deviations in concentrations exist with respect to upgradient (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*

UCRS	URGA	LRGA
MW386	MW220 (upgradient)	MW370
MW389**	MW221	MW373
MW390	MW222	MW385
MW393	MW223	MW388
MW396***	MW224	MW392
	MW369	MW395 (upgradient)
	MW372	MW397 (upgradient)
	MW384	
	MW387	
	MW391	
	MW394 (upgradient)	

*A map showing the MW locations is shown on Figure 1.

**Well had insufficient water to permit a water sample for laboratory analysis.

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

2.1 STATISTICAL ANALYSIS OF GROUNDWATER DATA

Parameters requiring statistical analysis are summarized in Appendix D for each hydrological 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 exceedances 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. Table 3 summarizes the constituents present in downgradient wells with historical UTL exceedances that are above the current UTL. Those constituents that have exceeded both the historical and current background UTLs in downgradient wells were further evaluated for increasing trends and are listed in Table 4.

2.1.1 Upper Continental Recharge System

In this quarter, 27 parameters, including those with MCLs, required statistical analysis in the UCRS. During the second quarter, chemical oxygen demand (COD), oxidation-reduction potential and technetium-99 displayed concentrations that exceeded their respective historical UTLs and are listed in Table 2. Oxidation-reduction potential and technetium-99 exceeded the current background UTL and is included in Table 5.

2.1.2 Upper Regional Gravel Aquifer

In this quarter, 32 parameters, including those with MCLs, required statistical analysis in the URGA. During the second quarter, beta activity, calcium, chemical oxygen demand (COD), dissolved solids, magnesium, oxidation-reduction potential, sodium, sulfate, and technetium-99 displayed concentrations that exceeded their respective historical UTLs and are listed in Table 2. Beta activity, calcium, chemical oxygen demand (COD), magnesium, oxidation-reduction potential, sodium, sulfate, and technetium-99 exceeded the current background UTL in downgradient wells and are included in Table 3.

2.1.3 Lower Regional Gravel Aquifer

In this quarter, 31 parameters, including those with MCLs, required statistical analysis in the LRGA. During the second quarter, beta activity, calcium, chemical oxygen demand (COD), chloride, conductivity, dissolved solids, magnesium, oxidation-reduction potential, sulfate, and technetium-99 displayed concentrations that exceeded their respective historical UTL and are listed in Table 2. Beta activity, calcium, chloride, conductivity, dissolved solids, magnesium, sulfate, and technetium-99 exceeded the current background UTL in downgradient wells and are included in Table 3.

2.2 DATA VERIFICATION AND VALIDATION

Data verification is the process of comparing a data set against 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 for 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.

THIS PAGE INTENTIONALLY LEFT BLANK

3. PROFESSIONAL GEOLOGIST AUTHORIZATION

DOCUMENT IDENTIFICATION: *C-746-S&T Landfills
Second Quarter Calendar Year 2019 (April-June)
Compliance Monitoring Report,
Paducah Gaseous Diffusion Plant,
Paducah, Kentucky (FRNP-RPT-0088/V2)*

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



PG 113927
K Davis
8-19-19

Kenneth R. Davis
Kenneth R. Davis

PG113927

August 19, 2019
Date

THIS PAGE INTENTIONALLY LEFT BLANK

4. REFERENCES

- 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-S and C-746-T Landfills Permit Numbers KY-073-00014 and 073-00015, 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.

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX A

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

THIS PAGE INTENTIONALLY LEFT BLANK

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

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

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

Activity: C-746-S&T Landfills

Permit No: SW07300014,
SW07300015,
SW07300045

Finds/Unit No: _____

Quarter & Year 2nd Qtr. CY 2019

Please check the following as applicable:

 Characterization X Quarterly Semiannual Annual Assessment

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

 Leachate X Methane Monitoring

This form is to be utilized by those sites required by regulation (Kentucky Waste Management Regulations-401 KAR 48:300 and 45:160) or by statute (Kentucky Revised 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 B. Redfield, Deputy Program Manager
Four Rivers Nuclear Partnership, LLC

8/29/19

Date



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

8/29/19

Date

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX B
FACILITY INFORMATION SHEET

THIS PAGE INTENTIONALLY LEFT BLANK

FACILITY INFORMATION SHEET

Groundwater: April/May 2019
Surface water: May 2019
Sampling Date: Methane: May 2019 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' 37.70" Longitude: W 88° 47' 55.41"

OWNER INFORMATION

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

Contact Person: David Hutchison Phone No: (270) 441-5929

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, LLC

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
Street City/State Zip

LABORATORY RECORD #3

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

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

Mailing Address: N/A
Street City/State Zip

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX C

**GROUNDWATER SAMPLE ANALYSES
AND WRITTEN COMMENTS**

THIS PAGE INTENTIONALLY LEFT BLANK

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

RESIDENTIAL/INERT-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 ¹ , Facility Well/Spring Number					8000-5201	8000-5202	8000-5242	8000-5243					
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					220	221	222	223					
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)					4/16/2019 12:45	4/16/2019 08:56	4/16/2019 10:23	4/16/2019 09:47					
Duplicate ("Y" or "N") ²					N	N	N	N					
Split ("Y" or "N") ³					N	N	N	N					
Facility Sample ID Number (if applicable)					MW220SG3-19	MW221SG3-19	MW222SG3-19	MW223SG3-19					
Laboratory Sample ID Number (if applicable)					476611003	476611007	476611009	476611011					
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis					4/23/2019	4/22/2019	4/22/2019	4/22/2019					
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)					UP	SIDE	SIDE	SIDE					
CAS RN ⁴		CONSTITUENT	T D S ⁵	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S ⁷	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S		
24959-67-9		Bromide	T	mg/L	9056	0.211		0.433		0.424		0.384	
16887-00-6		Chloride(s)	T	mg/L	9056	18.7	*	32.6	*	31.4	*	27.6	*
16984-48-8		Fluoride	T	mg/L	9056	0.284		0.269		0.349		0.294	
S0595- -		Nitrate & Nitrite	T	mg/L	9056	1.18		1.02		0.843		0.841	
14808-79-8		Sulfate	T	mg/L	9056	24.1	*	15.4	*	14.4	*	20.5	*
NS1894		Barometric Pressure Reading	T	Inches/Hg	Field	30.1		30.1		30.1		30.1	
S0145- -		Specific Conductance	T	µMH0/cm	Field	435		427		334		425	

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

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

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

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

⁵"T" = Total; "D" = Dissolved

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

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

STANDARD FLAGS:

* = See Comments

J = Estimated Value

B = Analyte found in blank

A = Average value

N = Presumptive ID

D = Concentration from analysis
of a secondary dilution

RESIDENTIAL/INERT-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 ¹ , Facility Well/Spring Number					8000-5201		8000-5202		8000-5242		8000-5243		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)					220		221		222		223		
CAS RN ⁴		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
S0906 - -		Static Water Level Elevation	T	Ft. MSL	Field	332.01		331.88		332.2		332.13	
N238		Dissolved Oxygen	T	mg/L	Field	3.69		2.91		2.99		2.39	
S0266- -		Total Dissolved Solids	T	mg/L	160.1	273		239		234		233	
S0296- -		pH	T	Units	Field	6.31		6.21		6.21		6.18	
NS215		Eh	T	mV	Field	471		469		463		460	
S0907 - -		Temperature	T	°C	Field	17.94		16.11		16.94		16.67	
7429-90-5		Aluminum	T	mg/L	6020	<0.05		<0.05		<0.05		<0.05	
7440-36-0		Antimony	T	mg/L	6020	0.0013	J	0.00123	J	0.00123	J	0.00134	J
7440-38-2		Arsenic	T	mg/L	6020	0.00232	J	0.00247	J	0.00286	J	0.0045	J
7440-39-3		Barium	T	mg/L	6020	0.232		0.201		0.274		0.227	
7440-41-7		Beryllium	T	mg/L	6020	<0.0005		<0.0005		<0.0005		<0.0005	
7440-42-8		Boron	T	mg/L	6020	0.00652	J	0.0131	J	0.00887	J	0.00832	J
7440-43-9		Cadmium	T	mg/L	6020	<0.001		<0.001		<0.001		<0.001	
7440-70-2		Calcium	T	mg/L	6020	35.8		21.4		19		22.7	
7440-47-3		Chromium	T	mg/L	6020	0.00518	J	0.0114		<0.01		0.0136	
7440-48-4		Cobalt	T	mg/L	6020	<0.001		0.000745	J	0.000401	J	0.000498	J
7440-50-8		Copper	T	mg/L	6020	0.000823	J	0.00101	J	0.000335	J	0.000459	J
7439-89-6		Iron	T	mg/L	6020	0.0374	J	<0.1		<0.1		0.0474	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	10.3		9.25		8.59		9.65	
7439-96-5		Manganese	T	mg/L	6020	0.00188	J	<0.005		0.00829		0.00962	
7439-97-6		Mercury	T	mg/L	7470	<0.0002		<0.0002		<0.0002		<0.0002	

C4

RESIDENTIAL/INERT-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 ¹ , Facility Well/Spring Number					8000-5201		8000-5202		8000-5242		8000-5243		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					220		221		222		223		
CAS RN ⁴		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
7439-98-7		Molybdenum	T	mg/L	6020	0.00105		0.0104		<0.001		0.00644	
7440-02-0		Nickel	T	mg/L	6020	0.0237		0.0715		0.0639		0.178	
7440-09-7		Potassium	T	mg/L	6020	1.87		2.17		1.56		2.97	
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	47.4		45.6		46.7		43.7	
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	<0.0002		<0.0002		<0.0002		<0.0002	
7440-62-2		Vanadium	T	mg/L	6020	0.00369	BJ	0.00464	BJ	0.00668	BJ	0.00931	BJ
7440-66-6		Zinc	T	mg/L	6020	<0.02		<0.02		<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/INERT-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 ¹ , Facility Well/Spring Number					8000-5201		8000-5202		8000-5242		8000-5243	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					220		221		222		223	
CAS RN ⁴	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
75-27-4	Bromodichloromethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-25-2	Tribromomethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
74-83-9	Methyl bromide	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
78-93-3	Methyl ethyl ketone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
110-57-6	trans-1,4-Dichloro-2-butene	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
75-15-0	Carbon disulfide	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
75-00-3	Chloroethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
67-66-3	Chloroform	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
74-87-3	Methyl chloride	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
156-59-2	cis-1,2-Dichloroethene	T	mg/L	8260	0.00034	J	<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	0.00105		<0.001		<0.001		<0.001	

RESIDENTIAL/INERT-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 ¹ , Facility Well/Spring Number						8000-5201		8000-5202		8000-5242		8000-5243	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						220		221		222		223	
CAS RN ⁴		CONSTITUENT	T D ⁵	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
100-41-4		Ethylbenzene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
591-78-6		2-Hexanone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
74-88-4		Iodomethane	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
124-48-1		Methane, Dibromochloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
56-23-5		Carbon Tetrachloride	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-09-2		Dichloromethane	T	mg/L	8260	0.00224	BJ	0.00256	J	0.00244	J	0.00282	J
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	<0.0000196		<0.0000198		<0.0000197		<0.0000193	
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		*		*		*		*
12674-11-2		PCB-1016	T	ug/L	8082		*		*		*		*
11104-28-2		PCB-1221	T	ug/L	8082		*		*		*		*
11141-16-5		PCB-1232	T	ug/L	8082		*		*		*		*
53469-21-9		PCB-1242	T	ug/L	8082		*		*		*		*
12672-29-6		PCB-1248	T	ug/L	8082		*		*		*		*

C-7

RESIDENTIAL/INERT-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 ¹ , Facility Well/Spring Number					8000-5201		8000-5202		8000-5242		8000-5243	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					220		221		222		223	
CAS RN ⁴	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
11097-69-1	PCB-1254	T	ug/L	8082		*		*		*		*
11096-82-5	PCB-1260	T	ug/L	8082		*		*		*		*
11100-14-4	PCB-1268	T	ug/L	8082		*		*		*		*
12587-46-1	Gross Alpha	T	pCi/L	9310	1.15	*	4.47	*	-0.124	*	2.91	*
12587-47-2	Gross Beta	T	pCi/L	9310	8.19	*	9.35	*	7.11	*	24.4	*
10043-66-0	Iodine-131	T	pCi/L			*		*		*		*
13982-63-3	Radium-226	T	pCi/L	AN-1418	0.313	*	0.304	*	0.478	*	0.432	*
10098-97-2	Strontium-90	T	pCi/L	905.0	-1.98	*	-1.09	*	-0.853	*	-2.83	*
14133-76-7	Technetium-99	T	pCi/L	Tc-02-RC	17.1	*	14.4	*	2.01	*	9.75	*
14269-63-7	Thorium-230	T	pCi/L	Th-01-RC	0.356	*	-0.426	*	0.0883	*	-0.054	*
10028-17-8	Tritium	T	pCi/L	906.0	-26.6	*	15.4	*	20	*	31.2	*
S0130- -	Chemical Oxygen Demand	T	mg/L	410.4	16.4	J	<20		13.3	J	<20	
57-12-5	Cyanide	T	mg/L	9012	<0.2		<0.2		<0.2		<0.2	
20461-54-5	Iodide	T	mg/L	300.0	<0.5		<0.5		<0.5		<0.5	
S0268- -	Total Organic Carbon	T	mg/L	9060	1.09	J	0.931	J	0.886	J	1.03	J
S0586- -	Total Organic Halides	T	mg/L	9020		*		*		*		*

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

RESIDENTIAL/INERT-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 ¹ , Facility Well/Spring Number					8000-5244	8004-4820	8004-4818	8004-4808					
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					224	369	370	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)					4/16/2019 12:11	4/15/2019 07:37	4/15/2019 08:17	4/11/2019 09:04					
Duplicate ("Y" or "N") ²					N	N	N	N					
Split ("Y" or "N") ³					N	N	N	N					
Facility Sample ID Number (if applicable)					MW224SG3-19	MW369UG3-19	MW370UG3-19	MW372UG3-19					
Laboratory Sample ID Number (if applicable)					476611013	476577001	476577003	476239007					
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis					4/22/2019	4/20/2019	4/20/2019	4/17/2019					
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)					SIDE	DOWN	DOWN	DOWN					
CAS RN ⁴		CONSTITUENT	T D ⁵	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S ⁷	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S		
24959-67-9		Bromide	T	mg/L	9056	0.461		0.404		0.415		0.586	
16887-00-6		Chloride(s)	T	mg/L	9056	36.7	*	34.7	*	34.8	*	46.2	*
16984-48-8		Fluoride	T	mg/L	9056	0.33		0.184		0.157		0.198	
S0595- -		Nitrate & Nitrite	T	mg/L	9056	0.974		0.544		0.993		0.676	
14808-79-8		Sulfate	T	mg/L	9056	14.1		14.6		20.7		71.3	*
NS1894		Barometric Pressure Reading	T	Inches/Hg	Field	30.11		30.06		30.09		29.7	
S0145- -		Specific Conductance	T	µMH0/cm	Field	439		439		458		632	

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

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

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

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

⁵"T" = Total; "D" = Dissolved

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

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

STANDARD FLAGS:

* = See Comments

J = Estimated Value

B = Analyte found in blank

A = Average value

N = Presumptive ID

D = Concentration from analysis
of a secondary dilution

RESIDENTIAL/INERT-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 ¹ , Facility Well/Spring Number					8000-5244		8004-4820		8004-4818		8004-4808		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)					224		369		370		372		
CAS RN ⁴		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
S0906 - -		Static Water Level Elevation	T	Ft. MSL	Field	332.22		332.24		332.22		332.9	
N238		Dissolved Oxygen	T	mg/L	Field	2.97		0.71		2.99		0.95	
S0266- -		Total Dissolved Solids	T	mg/L	160.1	219		261	B	237	B	309	*
S0296- -		pH	T	Units	Field	6.23		6.21		6.18		6.25	
NS215		Eh	T	mV	Field	464		372		379		383	
S0907 - -		Temperature	T	°C	Field	17.17		15.11		15.72		17.5	
7429-90-5		Aluminum	T	mg/L	6020	<0.05		<0.05		<0.05		<0.05	
7440-36-0		Antimony	T	mg/L	6020	0.00124	J	<0.003		<0.003		0.00125	J
7440-38-2		Arsenic	T	mg/L	6020	0.00487	J	0.00215	J	0.00259	J	0.00347	J
7440-39-3		Barium	T	mg/L	6020	0.2		0.412		0.207		0.052	
7440-41-7		Beryllium	T	mg/L	6020	<0.0005		<0.0005		<0.0005		<0.0005	
7440-42-8		Boron	T	mg/L	6020	0.0213		0.0187		0.0319		0.86	
7440-43-9		Cadmium	T	mg/L	6020	<0.001		<0.001		<0.001		<0.001	
7440-70-2		Calcium	T	mg/L	6020	21.3		20		26.5		49.7	
7440-47-3		Chromium	T	mg/L	6020	<0.01		<0.01		<0.01		<0.01	
7440-48-4		Cobalt	T	mg/L	6020	0.00162		0.0033		0.000377	J	0.000571	J
7440-50-8		Copper	T	mg/L	6020	0.000439	J	0.00247		0.00192	J	0.00058	J
7439-89-6		Iron	T	mg/L	6020	0.0411	J	0.149		0.0351	J	0.236	
7439-92-1		Lead	T	mg/L	6020	<0.002		<0.002		<0.002		<0.002	
7439-95-4		Magnesium	T	mg/L	6020	9.54		9.06		12.1		18.2	
7439-96-5		Manganese	T	mg/L	6020	0.0174		0.0201		0.00749		0.0049	J
7439-97-6		Mercury	T	mg/L	7470	<0.0002		<0.0002		<0.0002		<0.0002	

C-10

RESIDENTIAL/INERT-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 ¹ , Facility Well/Spring Number					8000-5244		8004-4820		8004-4818		8004-4808		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					224		369		370		372		
CAS RN ⁴		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
7439-98-7		Molybdenum	T	mg/L	6020	<0.001		<0.001		<0.001		0.000389	J
7440-02-0		Nickel	T	mg/L	6020	0.106		0.00656		0.000761	J	0.00125	J
7440-09-7		Potassium	T	mg/L	6020	1.13		0.825		2.46		2.1	
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	48.6		51.1		45.1		47.4	
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	0.00964	BJ	0.0103	BJ	0.00499	BJ	0.00669	BJ
7440-66-6		Zinc	T	mg/L	6020	<0.02		<0.02		<0.02		0.00375	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		0.00455	J	<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/INERT-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 ¹ , Facility Well/Spring Number					8000-5244		8004-4820		8004-4818		8004-4808	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					224		369		370		372	
CAS RN ⁴	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
75-27-4	Bromodichloromethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-25-2	Tribromomethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
74-83-9	Methyl bromide	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
78-93-3	Methyl ethyl ketone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
110-57-6	trans-1,4-Dichloro-2-butene	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
75-15-0	Carbon disulfide	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	*
75-00-3	Chloroethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
67-66-3	Chloroform	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
74-87-3	Methyl chloride	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
156-59-2	cis-1,2-Dichloroethene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
74-95-3	Methylene bromide	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-34-3	1,1-Dichloroethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
107-06-2	1,2-Dichloroethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-35-4	1,1-Dichloroethylene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
106-93-4	Ethane, 1,2-dibromo	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
79-34-5	Ethane, 1,1,2,2-Tetrachloro	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
71-55-6	Ethane, 1,1,1-Trichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
79-00-5	Ethane, 1,1,2-Trichloro	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
630-20-6	Ethane, 1,1,1,2-Tetrachloro	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-01-4	Vinyl chloride	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
127-18-4	Ethene, Tetrachloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
79-01-6	Ethene, Trichloro-	T	mg/L	8260	<0.001		0.00052	J	0.00055	J	0.00478	

RESIDENTIAL/INERT-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 ¹ , Facility Well/Spring Number						8000-5244		8004-4820		8004-4818		8004-4808	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						224		369		370		372	
CAS RN ⁴		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
100-41-4		Ethylbenzene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
591-78-6		2-Hexanone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
74-88-4		Iodomethane	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	*
124-48-1		Methane, Dibromochloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
56-23-5		Carbon Tetrachloride	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-09-2		Dichloromethane	T	mg/L	8260	0.00238	J	<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	<0.0000193		<0.0000192		<0.0000192		<0.0000193	
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		<0.098		<0.0971	
12674-11-2		PCB-1016	T	ug/L	8082		*	<0.1		<0.098		<0.0971	
11104-28-2		PCB-1221	T	ug/L	8082		*	<0.1		<0.098		<0.0971	
11141-16-5		PCB-1232	T	ug/L	8082		*	<0.1		<0.098		<0.0971	
53469-21-9		PCB-1242	T	ug/L	8082		*	<0.1		<0.098		<0.0971	
12672-29-6		PCB-1248	T	ug/L	8082		*	<0.1		<0.098		<0.0971	

RESIDENTIAL/INERT-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 ¹ , Facility Well/Spring Number					8000-5244		8004-4820		8004-4818		8004-4808	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					224		369		370		372	
CAS RN ⁴	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
11097-69-1	PCB-1254	T	ug/L	8082		*	<0.1		<0.098		<0.0971	
11096-82-5	PCB-1260	T	ug/L	8082		*	<0.1		<0.098		<0.0971	
11100-14-4	PCB-1268	T	ug/L	8082		*	<0.1		<0.098		<0.0971	
12587-46-1	Gross Alpha	T	pCi/L	9310	0.843	*	5.69	*	0.212	*	3.12	*
12587-47-2	Gross Beta	T	pCi/L	9310	2.3	*	83.7	*	61	*	41	*
10043-66-0	Iodine-131	T	pCi/L			*		*		*		*
13982-63-3	Radium-226	T	pCi/L	AN-1418	0.449	*	0.366	*	0.21	*	0.316	*
10098-97-2	Strontium-90	T	pCi/L	905.0	2.29	*	0.59	*	-1.44	*	0.353	*
14133-76-7	Technetium-99	T	pCi/L	Tc-02-RC	5.63	*	70.8	*	111	*	59.4	*
14269-63-7	Thorium-230	T	pCi/L	Th-01-RC	-0.194	*	0.0643	*	-0.198	*	-0.358	*
10028-17-8	Tritium	T	pCi/L	906.0	44.3	*	-60.7	*	-17.3	*	17.1	*
S0130- -	Chemical Oxygen Demand	T	mg/L	410.4	10.1	J	17.4	J	<20		52.6	
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	0.863	J	1.19	J	0.964	J	1.1	J
S0586- -	Total Organic Halides	T	mg/L	9020		*		*		*		*

C-14

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

RESIDENTIAL/INERT-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 ¹ , Facility Well/Spring Number					8004-4792	8004-4809	8004-4810	8004-4804					
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					373	384	385	386					
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)					4/11/2019 09:47	4/17/2019 09:22	4/17/2019 11:26	4/17/2019 11:53					
Duplicate ("Y" or "N") ²					N	N	N	N					
Split ("Y" or "N") ³					N	N	N	N					
Facility Sample ID Number (if applicable)					MW373UG3-19	MW384SG3-19	MW385SG3-19	MW386SG3-19					
Laboratory Sample ID Number (if applicable)					476239009	476794003	476794005	476794007					
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis					4/17/2019	4/24/2019	4/24/2019	4/24/2019					
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)					DOWN	SIDE	SIDE	SIDE					
CAS RN ⁴		CONSTITUENT	T D ⁵	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S ⁷	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
24959-67-9		Bromide	T	mg/L	9056	0.572		0.33		0.365		0.169	J
16887-00-6		Chloride(s)	T	mg/L	9056	43.6	*	36.4	*	34.5	*	13.7	*
16984-48-8		Fluoride	T	mg/L	9056	0.262		0.227		0.155		0.637	
S0595- -		Nitrate & Nitrite	T	mg/L	9056	0.944		1.1		0.912		0.221	
14808-79-8		Sulfate	T	mg/L	9056	126	*	22.8	*	22.4	*	49.1	*
NS1894		Barometric Pressure Reading	T	Inches/Hg	Field	29.7		29.98		29.97		29.97	
S0145- -		Specific Conductance	T	µMH0/cm	Field	730		452		427		593	

STANDARD FLAGS:

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

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

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

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

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

⁵"T" = Total; "D" = Dissolved

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

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

RESIDENTIAL/INERT-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 ¹ , Facility Well/Spring Number					8004-4792		8004-4809		8004-4810		8004-4804		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)					373		384		385		386		
CAS RN ⁴		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
S0906 - -		Static Water Level Elevation	T	Ft. MSL	Field	332.89		332.05		332.02		345.75	
N238		Dissolved Oxygen	T	mg/L	Field	1.49		3.38		2.89		3.3	
S0266- -		Total Dissolved Solids	T	mg/L	160.1	401	*	269	B	253	B	349	B
S0296- -		pH	T	Units	Field	6.21		6.17		6.14		6.81	
NS215		Eh	T	mV	Field	387		391		398		375	
S0907 - -		Temperature	T	°C	Field	17.22		16.17		16.89		17.67	
7429-90-5		Aluminum	T	mg/L	6020	<0.05		<0.05		0.0338	J	0.0198	J
7440-36-0		Antimony	T	mg/L	6020	0.00125	J	0.00138	BJ	0.00132	BJ	0.00134	BJ
7440-38-2		Arsenic	T	mg/L	6020	0.00338	J	0.00425	J	0.00349	J	0.00484	J
7440-39-3		Barium	T	mg/L	6020	0.0368		0.143		0.203		0.131	
7440-41-7		Beryllium	T	mg/L	6020	<0.0005		<0.0005		<0.0005		<0.0005	
7440-42-8		Boron	T	mg/L	6020	1.32		0.0268		0.0226		0.00596	J
7440-43-9		Cadmium	T	mg/L	6020	<0.001		<0.001		<0.001		<0.001	
7440-70-2		Calcium	T	mg/L	6020	64		23.3		22.8		19.3	
7440-47-3		Chromium	T	mg/L	6020	<0.01		<0.01		<0.01		<0.01	
7440-48-4		Cobalt	T	mg/L	6020	0.000473	J	<0.001		<0.001		0.000739	J
7440-50-8		Copper	T	mg/L	6020	0.000479	J	0.000617	J	0.000637	J	0.00102	J
7439-89-6		Iron	T	mg/L	6020	0.178		0.357		0.0611	J	0.318	
7439-92-1		Lead	T	mg/L	6020	<0.002		<0.002		<0.002		<0.002	
7439-95-4		Magnesium	T	mg/L	6020	23.7		9.71		9.05		8.85	
7439-96-5		Manganese	T	mg/L	6020	0.0177		0.0128		0.00288	J	0.0812	
7439-97-6		Mercury	T	mg/L	7470	<0.0002		<0.0002		<0.0002		<0.0002	

RESIDENTIAL/INERT-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 ¹ , Facility Well/Spring Number					8004-4792		8004-4809		8004-4810		8004-4804		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					373		384		385		386		
CAS RN ⁴		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
7439-98-7		Molybdenum	T	mg/L	6020	<0.001		<0.001		<0.001		<0.001	
7440-02-0		Nickel	T	mg/L	6020	0.000916	J	0.000607	J	0.000912	J	0.000699	J
7440-09-7		Potassium	T	mg/L	6020	2.43		1.14		1.5		0.262	J
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	51.4		49.6		45.6		93.9	
7440-25-7		Tantalum	T	mg/L	6020	<0.005		<0.005	*	<0.005	*	<0.005	*
7440-28-0		Thallium	T	mg/L	6020	<0.002		<0.002		<0.002		<0.002	
7440-61-1		Uranium	T	mg/L	6020	<0.0002		<0.0002		<0.0002		<0.0002	
7440-62-2		Vanadium	T	mg/L	6020	0.00646	BJ	0.00679	J	0.00524	J	0.0101	J
7440-66-6		Zinc	T	mg/L	6020	<0.02		0.00385	J	0.00386	J	<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/INERT-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 ¹ , Facility Well/Spring Number					8004-4792		8004-4809		8004-4810		8004-4804	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					373		384		385		386	
CAS RN ⁴	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
75-27-4	Bromodichloromethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-25-2	Tribromomethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
74-83-9	Methyl bromide	T	mg/L	8260	<0.001	*	<0.001		<0.001		<0.001	
78-93-3	Methyl ethyl ketone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
110-57-6	trans-1,4-Dichloro-2-butene	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
75-15-0	Carbon disulfide	T	mg/L	8260	<0.005	*	<0.005		<0.005		<0.005	
75-00-3	Chloroethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
67-66-3	Chloroform	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
74-87-3	Methyl chloride	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
156-59-2	cis-1,2-Dichloroethene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
74-95-3	Methylene bromide	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-34-3	1,1-Dichloroethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
107-06-2	1,2-Dichloroethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-35-4	1,1-Dichloroethylene	T	mg/L	8260	<0.001	*	<0.001		<0.001		<0.001	
106-93-4	Ethane, 1,2-dibromo	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
79-34-5	Ethane, 1,1,2,2-Tetrachloro	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
71-55-6	Ethane, 1,1,1-Trichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
79-00-5	Ethane, 1,1,2-Trichloro	T	mg/L	8260	<0.001		<0.001	*	<0.001	*	<0.001	*
630-20-6	Ethane, 1,1,1,2-Tetrachloro	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-01-4	Vinyl chloride	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
127-18-4	Ethene, Tetrachloro-	T	mg/L	8260	<0.001		<0.001	*	<0.001	*	<0.001	*
79-01-6	Ethene, Trichloro-	T	mg/L	8260	0.0052		0.00036	J	0.00041	J	<0.001	

RESIDENTIAL/INERT-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 ¹ , Facility Well/Spring Number					8004-4792		8004-4809		8004-4810		8004-4804		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					373		384		385		386		
CAS RN ⁴		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
100-41-4		Ethylbenzene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
591-78-6		2-Hexanone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
74-88-4		Iodomethane	T	mg/L	8260	<0.005	*	<0.005		<0.005		<0.005	
124-48-1		Methane, Dibromochloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
56-23-5		Carbon Tetrachloride	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-09-2		Dichloromethane	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
108-10-1		Methyl isobutyl ketone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
96-12-8		Propane, 1,2-Dibromo-3-chloro	T	mg/L	8011	<0.0000193		<0.0000195		<0.0000195		<0.0000193	
78-87-5		Propane, 1,2-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
10061-02-6		trans-1,3-Dichloro-1-propene	T	mg/L	8260	<0.001		<0.001	*	<0.001	*	<0.001	*
10061-01-5		cis-1,3-Dichloro-1-propene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
156-60-5		trans-1,2-Dichloroethene	T	mg/L	8260	<0.001	*	<0.001		<0.001		<0.001	
75-69-4		Trichlorofluoromethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
96-18-4		1,2,3-Trichloropropane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
95-50-1		Benzene, 1,2-Dichloro-	T	mg/L	8260	<0.001		<0.001	*	<0.001	*	<0.001	*
106-46-7		Benzene, 1,4-Dichloro-	T	mg/L	8260	<0.001		<0.001	*	<0.001	*	<0.001	*
1336-36-3		PCB, Total	T	ug/L	8082	<0.099			*		*		*
12674-11-2		PCB-1016	T	ug/L	8082	<0.099			*		*		*
11104-28-2		PCB-1221	T	ug/L	8082	<0.099			*		*		*
11141-16-5		PCB-1232	T	ug/L	8082	<0.099			*		*		*
53469-21-9		PCB-1242	T	ug/L	8082	<0.099			*		*		*
12672-29-6		PCB-1248	T	ug/L	8082	<0.099			*		*		*

RESIDENTIAL/INERT-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 ¹ , Facility Well/Spring Number					8004-4792		8004-4809		8004-4810		8004-4804	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					373		384		385		386	
CAS RN ⁴	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
11097-69-1	PCB-1254	T	ug/L	8082	<0.099			*		*		*
11096-82-5	PCB-1260	T	ug/L	8082	<0.099			*		*		*
11100-14-4	PCB-1268	T	ug/L	8082	<0.099			*		*		*
12587-46-1	Gross Alpha	T	pCi/L	9310	-0.109	*	0.122	*	2.56	*	1.4	*
12587-47-2	Gross Beta	T	pCi/L	9310	13.7	*	97	*	138	*	-2.72	*
10043-66-0	Iodine-131	T	pCi/L			*		*		*		*
13982-63-3	Radium-226	T	pCi/L	AN-1418	0.213	*	0.192	*	0.443	*	0.0899	*
10098-97-2	Strontium-90	T	pCi/L	905.0	0.966	*	0.592	*	-2.28	*	0.653	*
14133-76-7	Technetium-99	T	pCi/L	Tc-02-RC	22.7	*	155	*	164	*	-2.67	*
14269-63-7	Thorium-230	T	pCi/L	Th-01-RC	-0.561	*	0.561	*	-0.41	*	-0.356	*
10028-17-8	Tritium	T	pCi/L	906.0	46.7	*	-45.4	*	3	*	-47	*
S0130- -	Chemical Oxygen Demand	T	mg/L	410.4	43.8		<20		<20		<20	
57-12-5	Cyanide	T	mg/L	9012	<0.2		<0.2		<0.2		<0.2	
20461-54-5	Iodide	T	mg/L	300.0	<0.5		<0.5		<0.5		<0.5	
S0268- -	Total Organic Carbon	T	mg/L	9060	1.28	J	1.06	J	1.07	J	4.24	
S0586- -	Total Organic Halides	T	mg/L	9020		*		*		*		*

C-20

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 ¹ , Facility Well/Spring Number					8004-4815		8004-4816		8004-4812		8004-4811		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					387		388		389		390		
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)					4/17/2019 08:09		4/17/2019 08:46		NA		4/17/2019 07:32		
Duplicate ("Y" or "N") ²					N		N		N		N		
Split ("Y" or "N") ³					N		N		N		N		
Facility Sample ID Number (if applicable)					MW387SG3-19		MW388SG3-19		NA		MW390SG3-19		
Laboratory Sample ID Number (if applicable)					476794009		476794011		NA		476794001		
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis					4/24/2019		4/24/2019		NA		4/24/2019		
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)					DOWN		DOWN		DOWN		DOWN		
CAS RN ⁴		CONSTITUENT	T D S ⁵	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S ⁷	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
24959-67-9		Bromide	T	mg/L	9056	0.591		0.431			*	0.692	
16887-00-6		Chloride(s)	T	mg/L	9056	43.7	*	33.5	*		*	37.7	*
16984-48-8		Fluoride	T	mg/L	9056	0.49		0.239			*	0.298	
S0595- -		Nitrate & Nitrite	T	mg/L	9056	1.39		1.01			*	2.3	
14808-79-8		Sulfate	T	mg/L	9056	20.8	*	23.7	*		*	43.5	*
NS1894		Barometric Pressure Reading	T	Inches/Hg	Field	29.99		29.99			*	29.99	
S0145- -		Specific Conductance	T	µMH0/cm	Field	524		441			*	639	

STANDARD FLAGS:

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

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

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

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

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

⁵"T" = Total; "D" = Dissolved

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

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

RESIDENTIAL/INERT-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 ¹ , Facility Well/Spring Number					8004-4815		8004-4816		8004-4812		8004-4811		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)					387		388		389		390		
CAS RN ⁴		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
S0906 - -		Static Water Level Elevation	T	Ft. MSL	Field	332.08		332.03			*	332.23	
N238		Dissolved Oxygen	T	mg/L	Field	2.62		3.19			*	4.55	
S0266- -		Total Dissolved Solids	T	mg/L	160.1	276	B	253	B		*	407	B
S0296- -		pH	T	Units	Field	6.26		6.13			*	6.3	
NS215		Eh	T	mV	Field	436		364			*	425	
S0907 - -		Temperature	T	°C	Field	16.67		16.39			*	15.83	
7429-90-5		Aluminum	T	mg/L	6020	0.0206	J	0.0233	J		*	0.0818	
7440-36-0		Antimony	T	mg/L	6020	0.0013	BJ	0.00128	BJ		*	<0.003	
7440-38-2		Arsenic	T	mg/L	6020	0.00402	J	0.00417	J		*	0.00226	J
7440-39-3		Barium	T	mg/L	6020	0.157		0.174			*	0.232	
7440-41-7		Beryllium	T	mg/L	6020	<0.0005		<0.0005			*	<0.0005	
7440-42-8		Boron	T	mg/L	6020	0.0224		0.0222			*	0.0265	
7440-43-9		Cadmium	T	mg/L	6020	<0.001		<0.001			*	<0.001	
7440-70-2		Calcium	T	mg/L	6020	29.8		23.7			*	28.7	
7440-47-3		Chromium	T	mg/L	6020	0.00362	J	<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	0.000446	J	0.00043	J		*	0.00251	
7439-89-6		Iron	T	mg/L	6020	0.171		0.0964	J		*	0.0878	J
7439-92-1		Lead	T	mg/L	6020	<0.002		<0.002			*	<0.002	
7439-95-4		Magnesium	T	mg/L	6020	12.4		10.9			*	12.3	
7439-96-5		Manganese	T	mg/L	6020	0.0933		0.00156	J		*	<0.005	
7439-97-6		Mercury	T	mg/L	7470	<0.0002		<0.0002			*	<0.0002	

C-22

RESIDENTIAL/INERT-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 ¹ , Facility Well/Spring Number					8004-4815		8004-4816		8004-4812		8004-4811		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					387		388		389		390		
CAS RN ⁴		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
7439-98-7		Molybdenum	T	mg/L	6020	<0.001		<0.001			*	0.000498	J
7440-02-0		Nickel	T	mg/L	6020	0.000689	J	0.0011	J		*	0.0015	J
7440-09-7		Potassium	T	mg/L	6020	1.17		1.79			*	0.315	
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			*	<0.005	
7440-22-4		Silver	T	mg/L	6020	<0.001		<0.001			*	<0.001	
7440-23-5		Sodium	T	mg/L	6020	58.6		45.5			*	100	
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	<0.0002		<0.0002			*	0.000213	
7440-62-2		Vanadium	T	mg/L	6020	0.00514	J	0.00567	J		*	<0.02	
7440-66-6		Zinc	T	mg/L	6020	<0.02		<0.02			*	0.00393	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		<0.005			*	<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/INERT-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 ¹ , Facility Well/Spring Number					8004-4815		8004-4816		8004-4812		8004-4811	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					387		388		389		390	
CAS RN ⁴	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
75-27-4	Bromodichloromethane	T	mg/L	8260	<0.001		<0.001			*	<0.001	
75-25-2	Tribromomethane	T	mg/L	8260	<0.001		<0.001			*	<0.001	
74-83-9	Methyl bromide	T	mg/L	8260	<0.001		<0.001			*	<0.001	
78-93-3	Methyl ethyl ketone	T	mg/L	8260	<0.005		<0.005			*	<0.005	
110-57-6	trans-1,4-Dichloro-2-butene	T	mg/L	8260	<0.005		<0.005			*	<0.005	
75-15-0	Carbon disulfide	T	mg/L	8260	<0.005		<0.005			*	<0.005	
75-00-3	Chloroethane	T	mg/L	8260	<0.001		<0.001			*	<0.001	
67-66-3	Chloroform	T	mg/L	8260	<0.001		<0.001			*	<0.001	
74-87-3	Methyl chloride	T	mg/L	8260	<0.001		<0.001			*	<0.001	
156-59-2	cis-1,2-Dichloroethene	T	mg/L	8260	<0.001		<0.001			*	<0.001	
74-95-3	Methylene bromide	T	mg/L	8260	<0.001		<0.001			*	<0.001	
75-34-3	1,1-Dichloroethane	T	mg/L	8260	<0.001		<0.001			*	<0.001	
107-06-2	1,2-Dichloroethane	T	mg/L	8260	<0.001		<0.001			*	<0.001	
75-35-4	1,1-Dichloroethylene	T	mg/L	8260	<0.001		<0.001			*	<0.001	
106-93-4	Ethane, 1,2-dibromo	T	mg/L	8260	<0.001		<0.001			*	<0.001	
79-34-5	Ethane, 1,1,2,2-Tetrachloro	T	mg/L	8260	<0.001		<0.001			*	<0.001	
71-55-6	Ethane, 1,1,1-Trichloro-	T	mg/L	8260	<0.001		<0.001			*	<0.001	
79-00-5	Ethane, 1,1,2-Trichloro	T	mg/L	8260	<0.001	*	<0.001	*		*	<0.001	*
630-20-6	Ethane, 1,1,1,2-Tetrachloro	T	mg/L	8260	<0.001		<0.001			*	<0.001	
75-01-4	Vinyl chloride	T	mg/L	8260	<0.001		<0.001			*	<0.001	
127-18-4	Ethene, Tetrachloro-	T	mg/L	8260	<0.001	*	<0.001	*		*	<0.001	*
79-01-6	Ethene, Trichloro-	T	mg/L	8260	0.00062	J	0.00047	J		*	<0.001	

RESIDENTIAL/INERT-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 ¹ , Facility Well/Spring Number					8004-4815		8004-4816		8004-4812		8004-4811		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					387		388		389		390		
CAS RN ⁴		CONSTITUENT	T D ⁵	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
100-41-4		Ethylbenzene	T	mg/L	8260	<0.001		<0.001			*	<0.001	
591-78-6		2-Hexanone	T	mg/L	8260	<0.005		<0.005			*	<0.005	
74-88-4		Iodomethane	T	mg/L	8260	<0.005		<0.005			*	<0.005	
124-48-1		Methane, Dibromochloro-	T	mg/L	8260	<0.001		<0.001			*	<0.001	
56-23-5		Carbon Tetrachloride	T	mg/L	8260	<0.001		<0.001			*	<0.001	
75-09-2		Dichloromethane	T	mg/L	8260	<0.005		<0.005			*	<0.005	
108-10-1		Methyl isobutyl ketone	T	mg/L	8260	<0.005		<0.005			*	<0.005	
96-12-8		Propane, 1,2-Dibromo-3-chloro	T	mg/L	8011	<0.0000197		<0.0000193			*	<0.0000194	
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		*		*		*		*
12674-11-2		PCB-1016	T	ug/L	8082		*		*		*		*
11104-28-2		PCB-1221	T	ug/L	8082		*		*		*		*
11141-16-5		PCB-1232	T	ug/L	8082		*		*		*		*
53469-21-9		PCB-1242	T	ug/L	8082		*		*		*		*
12672-29-6		PCB-1248	T	ug/L	8082		*		*		*		*

RESIDENTIAL/INERT-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 ¹ , Facility Well/Spring Number					8004-4815		8004-4816		8004-4812		8004-4811	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					387		388		389		390	
CAS RN ⁴	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
11097-69-1	PCB-1254	T	ug/L	8082		*		*		*		*
11096-82-5	PCB-1260	T	ug/L	8082		*		*		*		*
11100-14-4	PCB-1268	T	ug/L	8082		*		*		*		*
12587-46-1	Gross Alpha	T	pCi/L	9310	3.6	*	4.95	*		*	1.82	*
12587-47-2	Gross Beta	T	pCi/L	9310	135	*	76.7	*		*	47.6	*
10043-66-0	Iodine-131	T	pCi/L			*		*		*		*
13982-63-3	Radium-226	T	pCi/L	AN-1418	0.575	*	0.669	*		*	-0.0845	*
10098-97-2	Strontium-90	T	pCi/L	905.0	0.545	*	1.43	*		*	0.508	*
14133-76-7	Technetium-99	T	pCi/L	Tc-02-RC	229	*	139	*		*	63.1	*
14269-63-7	Thorium-230	T	pCi/L	Th-01-RC	0.287	*	0.395	*		*	0.357	*
10028-17-8	Tritium	T	pCi/L	906.0	30.1	*	11	*		*	-15	*
S0130- -	Chemical Oxygen Demand	T	mg/L	410.4	<20		<20			*	35.1	
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	1.19	J	1.14	J		*	2.46	
S0586- -	Total Organic Halides	T	mg/L	9020		*		*		*		*

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

RESIDENTIAL/INERT-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 ¹ , Facility Well/Spring Number					8004-4805	8004-4806	8004-4807	8004-4802					
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					391	392	393	394					
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)					4/16/2019 07:36	4/16/2019 08:16	4/15/2019 10:33	4/22/2019 07:52					
Duplicate ("Y" or "N") ²					N	N	N	N					
Split ("Y" or "N") ³					N	N	N	N					
Facility Sample ID Number (if applicable)					MW391SG3-19	MW392SG3-19	MW393SG3-19	MW394SG3-19					
Laboratory Sample ID Number (if applicable)					476611001	476611015	476561001	477227001					
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis					4/23/2019	4/22/2019	4/20/2019	4/29/2019					
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)					DOWN	DOWN	DOWN	UP					
CAS RN ⁴		CONSTITUENT	T D ⁵	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S ⁷	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S		
24959-67-9		Bromide	T	mg/L	9056	0.492		0.597		0.151	J	0.565	
16887-00-6		Chloride(s)	T	mg/L	9056	39.3	*	103	*	12.5	*	44.3	
16984-48-8		Fluoride	T	mg/L	9056	0.197		0.258		0.176		0.107	
S0595- -		Nitrate & Nitrite	T	mg/L	9056	1.02		0.48		0.22		1.41	
14808-79-8		Sulfate	T	mg/L	9056	57.5	*	14.5	*	21.1		10.7	
NS1894		Barometric Pressure Reading	T	Inches/Hg	Field	30.09		30.1		30.13		30.12	
S0145- -		Specific Conductance	T	µMH0/cm	Field	439		446		473		376	

STANDARD FLAGS:

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

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

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

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

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

⁵"T" = Total; "D" = Dissolved

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

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

RESIDENTIAL/INERT-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 ¹ , Facility Well/Spring Number					8004-4805		8004-4806		8004-4807		8004-4802		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)					391		392		393		394		
CAS RN ⁴		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
S0906 - -		Static Water Level Elevation	T	Ft. MSL	Field	332.04		331.9		341.06		332.2	
N238		Dissolved Oxygen	T	mg/L	Field	4.58		2.41		2.76		4.03	
S0266- -		Total Dissolved Solids	T	mg/L	160.1	289		239		281	B	216	*
S0296- -		pH	T	Units	Field	6.16		6.24		6.02		6.14	
NS215		Eh	T	mV	Field	469		461		305		446	
S0907 - -		Temperature	T	°C	Field	15.28		15.67		14.61		15.17	
7429-90-5		Aluminum	T	mg/L	6020	<0.05		0.0538		<0.05		<0.05	
7440-36-0		Antimony	T	mg/L	6020	0.0014	J	0.00123	J	0.00167	J	0.00126	J
7440-38-2		Arsenic	T	mg/L	6020	0.00253	J	0.00648		0.00369	J	<0.005	
7440-39-3		Barium	T	mg/L	6020	0.102		0.199		0.103		0.242	
7440-41-7		Beryllium	T	mg/L	6020	<0.0005		<0.0005		<0.0005		<0.0005	
7440-42-8		Boron	T	mg/L	6020	0.231		0.0305		0.0238		0.0245	
7440-43-9		Cadmium	T	mg/L	6020	<0.001		<0.001		<0.001		<0.001	
7440-70-2		Calcium	T	mg/L	6020	32		28.4		13.9		24.7	
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		0.000361	J	<0.001		<0.001	
7440-50-8		Copper	T	mg/L	6020	0.000335	J	0.00138	J	0.000919	J	0.000541	J
7439-89-6		Iron	T	mg/L	6020	0.0526	J	0.67		0.479		0.107	
7439-92-1		Lead	T	mg/L	6020	<0.002		<0.002		<0.002		<0.002	
7439-95-4		Magnesium	T	mg/L	6020	13.9		11		4.17		11	*
7439-96-5		Manganese	T	mg/L	6020	0.00198	J	0.135		0.00768		0.00474	J
7439-97-6		Mercury	T	mg/L	7470	<0.0002		<0.0002		<0.0002		<0.0002	

C-28

RESIDENTIAL/INERT-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 ¹ , Facility Well/Spring Number					8004-4805		8004-4806		8004-4807		8004-4802		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					391		392		393		394		
CAS RN ⁴		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
7439-98-7		Molybdenum	T	mg/L	6020	<0.001		<0.001		<0.001		<0.001	
7440-02-0		Nickel	T	mg/L	6020	<0.002		0.00161	J	<0.002		0.00424	
7440-09-7		Potassium	T	mg/L	6020	1.61		1.77		0.476		1.34	
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		42.3		83.1		30.8	*
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		0.000084	J	<0.0002	
7440-62-2		Vanadium	T	mg/L	6020	0.00407	BJ	0.0139	BJ	0.0152	BJ	<0.02	
7440-66-6		Zinc	T	mg/L	6020	<0.02		0.00352	J	<0.02		0.00354	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/INERT-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 ¹ , Facility Well/Spring Number					8004-4805		8004-4806		8004-4807		8004-4802	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					391		392		393		394	
CAS RN ⁴	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
75-27-4	Bromodichloromethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-25-2	Tribromomethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
74-83-9	Methyl bromide	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
78-93-3	Methyl ethyl ketone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
110-57-6	trans-1,4-Dichloro-2-butene	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
75-15-0	Carbon disulfide	T	mg/L	8260	0.00285	J	<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		0.00131		<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	0.00688		0.0112		<0.001		0.00381	

RESIDENTIAL/INERT-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 ¹ , Facility Well/Spring Number					8004-4805		8004-4806		8004-4807		8004-4802		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					391		392		393		394		
CAS RN ⁴		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
100-41-4		Ethylbenzene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
591-78-6		2-Hexanone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
74-88-4		Iodomethane	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
124-48-1		Methane, Dibromochloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
56-23-5		Carbon Tetrachloride	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-09-2		Dichloromethane	T	mg/L	8260	0.00233	BJ	0.00262	J	<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	<0.0000195		<0.0000193		<0.0000196		<0.0000196	
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		*		*		*		*
12674-11-2		PCB-1016	T	ug/L	8082		*		*		*		*
11104-28-2		PCB-1221	T	ug/L	8082		*		*		*		*
11141-16-5		PCB-1232	T	ug/L	8082		*		*		*		*
53469-21-9		PCB-1242	T	ug/L	8082		*		*		*		*
12672-29-6		PCB-1248	T	ug/L	8082		*		*		*		*

C-31

RESIDENTIAL/INERT-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 ¹ , Facility Well/Spring Number					8004-4805		8004-4806		8004-4807		8004-4802	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					391		392		393		394	
CAS RN ⁴	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
11097-69-1	PCB-1254	T	ug/L	8082		*		*		*		*
11096-82-5	PCB-1260	T	ug/L	8082		*		*		*		*
11100-14-4	PCB-1268	T	ug/L	8082		*		*		*		*
12587-46-1	Gross Alpha	T	pCi/L	9310	-3.42	*	-4.36	*	2.25	*	-0.227	*
12587-47-2	Gross Beta	T	pCi/L	9310	15.3	*	-4.1	*	1.83	*	2.82	*
10043-66-0	Iodine-131	T	pCi/L			*		*		*		*
13982-63-3	Radium-226	T	pCi/L	AN-1418	0.268	*	0.081	*	0.329	*	0.347	*
10098-97-2	Strontium-90	T	pCi/L	905.0	1.82	*	-1.26	*	-1.26	*	1.51	*
14133-76-7	Technetium-99	T	pCi/L	Tc-02-RC	12.5	*	2.84	*	4.03	*	2.55	*
14269-63-7	Thorium-230	T	pCi/L	Th-01-RC	0.125	*	-0.453	*	-0.175	*	-0.0679	*
10028-17-8	Tritium	T	pCi/L	906.0	-25.4	*	30.7	*	-57.8	*	-48.7	*
S0130- -	Chemical Oxygen Demand	T	mg/L	410.4	44.5		<20		<20		20.3	
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	0.888	J	1.15	J	2.51		0.935	J
S0586- -	Total Organic Halides	T	mg/L	9020		*		*		*		*

C-32

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 ¹ , Facility Well/Spring Number					8004-4801	8004-4803	8004-4817	0000-0000					
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					395	396	397	E. BLANK					
Sample Sequence #					1	1	1	1					
If sample is a Blank, specify Type: (F)ield, (T)rip, (M)ethod, or (E)quipment					NA	NA	NA	E					
Sample Date and Time (Month/Day/Year hour: minutes)					4/22/2019 08:31	4/22/2019 09:09	4/16/2019 13:23	4/15/2019 09:50					
Duplicate ("Y" or "N") ²					N	N	N	N					
Split ("Y" or "N") ³					N	N	N	N					
Facility Sample ID Number (if applicable)					MW395SG3-19	MW396SG3-19	MW397SG3-19	R11SG3-19					
Laboratory Sample ID Number (if applicable)					477227003	477227005	476611017	476561003					
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis					4/29/2019	4/29/2019	4/22/2019	4/20/2019					
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)					UP	UP	UP	NA					
CAS RN ⁴		CONSTITUENT	T D ⁵	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S ⁷	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
24959-67-9		Bromide	T	mg/L	9056	0.533		0.901		0.397			*
16887-00-6		Chloride(s)	T	mg/L	9056	43.5		54.7		34.5	*		*
16984-48-8		Fluoride	T	mg/L	9056	0.102		0.602		0.188			*
S0595- -		Nitrate & Nitrite	T	mg/L	9056	1.44		0.109		1.26			*
14808-79-8		Sulfate	T	mg/L	9056	10.5		25.5		10	*		*
NS1894		Barometric Pressure Reading	T	Inches/Hg	Field	30.13		30.14		30.08			*
S0145- -		Specific Conductance	T	µMH0/cm	Field	355		710		325			*

STANDARD FLAGS:

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

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

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

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

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

⁵"T" = Total; "D" = Dissolved

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

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

RESIDENTIAL/INERT-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 ¹ , Facility Well/Spring Number					8004-4801		8004-4803		8004-4817		0000-0000		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)					395		396		397		E. BLANK		
CAS RN ⁴		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
S0906 - -		Static Water Level Elevation	T	Ft. MSL	Field	332.57		374.11		332.21			*
N238		Dissolved Oxygen	T	mg/L	Field	4.41		3.52		5.28			*
S0266- -		Total Dissolved Solids	T	mg/L	160.1	173	*	393	*	229			*
S0296- -		pH	T	Units	Field	6.16		6.6		6.19			*
NS215		Eh	T	mV	Field	464		431		505			*
S0907 - -		Temperature	T	°C	Field	15.72		15.5		17.56			*
7429-90-5		Aluminum	T	mg/L	6020	0.0296	J	0.0486	J	0.143		<0.05	
7440-36-0		Antimony	T	mg/L	6020	0.0013	J	0.00126	J	0.00123	J	0.00144	J
7440-38-2		Arsenic	T	mg/L	6020	<0.005		<0.005		0.00579		<0.005	
7440-39-3		Barium	T	mg/L	6020	0.239		0.359		0.134		<0.004	
7440-41-7		Beryllium	T	mg/L	6020	<0.0005		<0.0005		<0.0005		<0.0005	
7440-42-8		Boron	T	mg/L	6020	0.0245		0.00738	J	0.00975	J	<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	25.4		31.8		16.9		<0.2	
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		0.000348	J	<0.001		<0.001	
7440-50-8		Copper	T	mg/L	6020	0.000551	J	0.00168	J	0.000691	J	<0.002	
7439-89-6		Iron	T	mg/L	6020	0.108		0.326		0.448		<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	11.1	*	14.7	*	7.65		<0.03	
7439-96-5		Manganese	T	mg/L	6020	0.00283	J	0.0305		0.0078		<0.005	
7439-97-6		Mercury	T	mg/L	7470	<0.0002		<0.0002		<0.0002		<0.0002	

C-34

RESIDENTIAL/INERT-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 ¹ , Facility Well/Spring Number					8004-4801		8004-4803		8004-4817		0000-0000		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					395		396		397		E. BLANK		
CAS RN ⁴		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
7439-98-7		Molybdenum	T	mg/L	6020	<0.001		0.000266	J	<0.001		<0.001	
7440-02-0		Nickel	T	mg/L	6020	0.000866	J	0.000641	J	0.00102	J	<0.002	
7440-09-7		Potassium	T	mg/L	6020	1.53		0.857		1.57		<0.3	
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	30.6	*	98.1	*	36.2		<0.25	
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		0.000069	J	<0.0002		<0.0002	
7440-62-2		Vanadium	T	mg/L	6020	<0.02		<0.02		0.0135	BJ	0.0192	BJ
7440-66-6		Zinc	T	mg/L	6020	0.00334	J	0.00438	J	0.00386	J	<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/INERT-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 ¹ , Facility Well/Spring Number					8004-4801		8004-4803		8004-4817		0000-0000	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					395		396		397		E. BLANK	
CAS RN ⁴	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
75-27-4	Bromodichloromethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-25-2	Tribromomethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
74-83-9	Methyl bromide	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
78-93-3	Methyl ethyl ketone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
110-57-6	trans-1,4-Dichloro-2-butene	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
75-15-0	Carbon disulfide	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
75-00-3	Chloroethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
67-66-3	Chloroform	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
74-87-3	Methyl chloride	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
156-59-2	cis-1,2-Dichloroethene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
74-95-3	Methylene bromide	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-34-3	1,1-Dichloroethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
107-06-2	1,2-Dichloroethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-35-4	1,1-Dichloroethylene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
106-93-4	Ethane, 1,2-dibromo	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
79-34-5	Ethane, 1,1,2,2-Tetrachloro	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
71-55-6	Ethane, 1,1,1-Trichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
79-00-5	Ethane, 1,1,2-Trichloro	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
630-20-6	Ethane, 1,1,1,2-Tetrachloro	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-01-4	Vinyl chloride	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
127-18-4	Ethene, Tetrachloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
79-01-6	Ethene, Trichloro-	T	mg/L	8260	0.00298		<0.001		<0.001		<0.001	

RESIDENTIAL/INERT-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 ¹ , Facility Well/Spring Number						8004-4801		8004-4803		8004-4817		0000-0000	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						395		396		397		E. BLANK	
CAS RN ⁴		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
100-41-4		Ethylbenzene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
591-78-6		2-Hexanone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
74-88-4		Iodomethane	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
124-48-1		Methane, Dibromochloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
56-23-5		Carbon Tetrachloride	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-09-2		Dichloromethane	T	mg/L	8260	<0.005		<0.005		0.00232	J	<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	<0.0000198		<0.0000194		<0.0000196		<0.0000194	
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		*		*		*		*
12674-11-2		PCB-1016	T	ug/L	8082		*		*		*		*
11104-28-2		PCB-1221	T	ug/L	8082		*		*		*		*
11141-16-5		PCB-1232	T	ug/L	8082		*		*		*		*
53469-21-9		PCB-1242	T	ug/L	8082		*		*		*		*
12672-29-6		PCB-1248	T	ug/L	8082		*		*		*		*

C-37

RESIDENTIAL/INERT-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 ¹ , Facility Well/Spring Number					8004-4801		8004-4803		8004-4817		0000-0000	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					395		396		397		E. BLANK	
CAS RN ⁴	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
11097-69-1	PCB-1254	T	ug/L	8082		*		*		*		*
11096-82-5	PCB-1260	T	ug/L	8082		*		*		*		*
11100-14-4	PCB-1268	T	ug/L	8082		*		*		*		*
12587-46-1	Gross Alpha	T	pCi/L	9310	3.71	*	10.6	*	5.93	*	3.09	*
12587-47-2	Gross Beta	T	pCi/L	9310	3.8	*	-3.26	*	7.45	*	6.56	*
10043-66-0	Iodine-131	T	pCi/L			*		*		*		*
13982-63-3	Radium-226	T	pCi/L	AN-1418	0.449	*	0.162	*	0.457	*	0.145	*
10098-97-2	Strontium-90	T	pCi/L	905.0	0.0257	*	-0.695	*	1.34	*	-0.871	*
14133-76-7	Technetium-99	T	pCi/L	Tc-02-RC	11.2	*	5.89	*	32.1	*	-1.33	*
14269-63-7	Thorium-230	T	pCi/L	Th-01-RC	-0.876	*	0.849	*	-0.0319	*	-0.00618	*
10028-17-8	Tritium	T	pCi/L	906.0	-92.2	*	17.9	*	39.1	*	53.2	*
S0130- -	Chemical Oxygen Demand	T	mg/L	410.4	26.2		43.8		<20			*
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		<0.5	
S0268- -	Total Organic Carbon	T	mg/L	9060	0.904	J	4.53		0.784	J		*
S0586- -	Total Organic Halides	T	mg/L	9020		*		*		*		*

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

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

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

GROUNDWATER SAMPLE ANALYSIS (S)

AKGWA NUMBER ¹ , Facility Well/Spring Number					0000-0000	0000-0000	0000-0000	0000-0000
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					F. BLANK	T. BLANK 1	T. BLANK 2	T. BLANK 3
Sample Sequence #					1	1	1	1
If sample is a Blank, specify Type: (F)ield, (T)rip, (M)ethod, or (E)quipment					F	T	T	T
Sample Date and Time (Month/Day/Year hour: minutes)					4/16/2019 07:40	4/15/2019 09:45	4/16/2019 05:30	4/17/2019 05:40
Duplicate ("Y" or "N") ²					N	N	N	N
Split ("Y" or "N") ³					N	N	N	N
Facility Sample ID Number (if applicable)					FB1SG3-19	TB1SG3-19	TB2SG3-19	TB3SG3-19
Laboratory Sample ID Number (if applicable)					476611019	476561004	476611020	476794013
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis					4/22/2019	4/20/2019	4/22/2019	4/24/2019
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)					NA	NA	NA	NA

CAS RN ⁴	CONSTITUENT	T D ⁵	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S ⁷	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
24959-67-9	Bromide	T	mg/L	9056		*		*		*		*
16887-00-6	Chloride(s)	T	mg/L	9056		*		*		*		*
16984-48-8	Fluoride	T	mg/L	9056		*		*		*		*
S0595- -	Nitrate & Nitrite	T	mg/L	9056		*		*		*		*
14808-79-8	Sulfate	T	mg/L	9056		*		*		*		*
NS1894	Barometric Pressure Reading	T	Inches/Hg	Field		*		*		*		*
S0145- -	Specific Conductance	T	µMH0/cm	Field		*		*		*		*

STANDARD FLAGS:

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

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

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

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

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

⁵"T" = Total; "D" = Dissolved

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

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

RESIDENTIAL/INERT-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 ¹ , Facility Well/Spring Number					0000-0000		0000-0000		0000-0000		0000-0000		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)					F. BLANK		T. BLANK 1		T. BLANK 2		T. BLANK 3		
CAS RN ⁴		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
S0906 - -		Static Water Level Elevation	T	Ft. MSL	Field		*		*		*		*
N238		Dissolved Oxygen	T	mg/L	Field		*		*		*		*
S0266- -		Total Dissolved Solids	T	mg/L	160.1		*		*		*		*
S0296- -		pH	T	Units	Field		*		*		*		*
NS215		Eh	T	mV	Field		*		*		*		*
S0907 - -		Temperature	T	°C	Field		*		*		*		*
7429-90-5		Aluminum	T	mg/L	6020	<0.05			*		*		*
7440-36-0		Antimony	T	mg/L	6020	0.00116	J		*		*		*
7440-38-2		Arsenic	T	mg/L	6020	0.00486	J		*		*		*
7440-39-3		Barium	T	mg/L	6020	<0.004			*		*		*
7440-41-7		Beryllium	T	mg/L	6020	<0.0005			*		*		*
7440-42-8		Boron	T	mg/L	6020	<0.015			*		*		*
7440-43-9		Cadmium	T	mg/L	6020	<0.001			*		*		*
7440-70-2		Calcium	T	mg/L	6020	<0.2			*		*		*
7440-47-3		Chromium	T	mg/L	6020	<0.01			*		*		*
7440-48-4		Cobalt	T	mg/L	6020	<0.001			*		*		*
7440-50-8		Copper	T	mg/L	6020	<0.002			*		*		*
7439-89-6		Iron	T	mg/L	6020	<0.1			*		*		*
7439-92-1		Lead	T	mg/L	6020	<0.002			*		*		*
7439-95-4		Magnesium	T	mg/L	6020	<0.03			*		*		*
7439-96-5		Manganese	T	mg/L	6020	<0.005			*		*		*
7439-97-6		Mercury	T	mg/L	7470	<0.0002			*		*		*

C-40

RESIDENTIAL/INERT-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 ¹ , Facility Well/Spring Number					0000-0000		0000-0000		0000-0000		0000-0000		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					F. BLANK		T. BLANK 1		T. BLANK 2		T. BLANK 3		
CAS RN ⁴		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
7439-98-7		Molybdenum	T	mg/L	6020	<0.001			*		*		*
7440-02-0		Nickel	T	mg/L	6020	<0.002			*		*		*
7440-09-7		Potassium	T	mg/L	6020	<0.3			*		*		*
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	<0.25			*		*		*
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	0.013	BJ		*		*		*
7440-66-6		Zinc	T	mg/L	6020	<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/INERT-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 ¹ , Facility Well/Spring Number					0000-0000		0000-0000		0000-0000		0000-0000	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					F. BLANK		T. BLANK 1		T. BLANK 2		T. BLANK 3	
CAS RN ⁴	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
75-27-4	Bromodichloromethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-25-2	Tribromomethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
74-83-9	Methyl bromide	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
78-93-3	Methyl ethyl ketone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
110-57-6	trans-1,4-Dichloro-2-butene	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
75-15-0	Carbon disulfide	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
75-00-3	Chloroethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
67-66-3	Chloroform	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
74-87-3	Methyl chloride	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
156-59-2	cis-1,2-Dichloroethene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
74-95-3	Methylene bromide	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-34-3	1,1-Dichloroethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
107-06-2	1,2-Dichloroethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-35-4	1,1-Dichloroethylene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
106-93-4	Ethane, 1,2-dibromo	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
79-34-5	Ethane, 1,1,2,2-Tetrachloro	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
71-55-6	Ethane, 1,1,1-Trichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
79-00-5	Ethane, 1,1,2-Trichloro	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
630-20-6	Ethane, 1,1,1,2-Tetrachloro	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-01-4	Vinyl chloride	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
127-18-4	Ethene, Tetrachloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	*
79-01-6	Ethene, Trichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	

RESIDENTIAL/INERT-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 ¹ , Facility Well/Spring Number						0000-0000		0000-0000		0000-0000		0000-0000	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						F. BLANK		T. BLANK 1		T. BLANK 2		T. BLANK 3	
CAS RN ⁴		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
100-41-4		Ethylbenzene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
591-78-6		2-Hexanone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
74-88-4		Iodomethane	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
124-48-1		Methane, Dibromochloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
56-23-5		Carbon Tetrachloride	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-09-2		Dichloromethane	T	mg/L	8260	0.00251	J	<0.005		0.00259	J	<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	<0.0000195		<0.0000193		<0.0000197		<0.0000197	
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		*		*		*		*
12674-11-2		PCB-1016	T	ug/L	8082		*		*		*		*
11104-28-2		PCB-1221	T	ug/L	8082		*		*		*		*
11141-16-5		PCB-1232	T	ug/L	8082		*		*		*		*
53469-21-9		PCB-1242	T	ug/L	8082		*		*		*		*
12672-29-6		PCB-1248	T	ug/L	8082		*		*		*		*

C-43

RESIDENTIAL/INERT-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 ¹ , Facility Well/Spring Number					0000-0000		0000-0000		0000-0000		0000-0000	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					F. BLANK		T. BLANK 1		T. BLANK 2		T. BLANK 3	
CAS RN ⁴	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
11097-69-1	PCB-1254	T	ug/L	8082		*		*		*		*
11096-82-5	PCB-1260	T	ug/L	8082		*		*		*		*
11100-14-4	PCB-1268	T	ug/L	8082		*		*		*		*
12587-46-1	Gross Alpha	T	pCi/L	9310	-0.213	*		*		*		*
12587-47-2	Gross Beta	T	pCi/L	9310	-0.00207	*		*		*		*
10043-66-0	Iodine-131	T	pCi/L			*		*		*		*
13982-63-3	Radium-226	T	pCi/L	AN-1418	0.161	*		*		*		*
10098-97-2	Strontium-90	T	pCi/L	905.0	2.16	*		*		*		*
14133-76-7	Technetium-99	T	pCi/L	Tc-02-RC	5.01	*		*		*		*
14269-63-7	Thorium-230	T	pCi/L	Th-01-RC	0.27	*		*		*		*
10028-17-8	Tritium	T	pCi/L	906.0	-11.2	*		*		*		*
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			*		*		*
S0268- -	Total Organic Carbon	T	mg/L	9060		*		*		*		*
S0586- -	Total Organic Halides	T	mg/L	9020		*		*		*		*

C-44

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

RESIDENTIAL/INERT-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 ¹ , Facility Well/Spring Number					0000-0000	8000-5202								
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					T. BLANK 4	221								
Sample Sequence #					1	2								
If sample is a Blank, specify Type: (F)ield, (T)rip, (M)ethod, or (E)quipment					T	NA								
Sample Date and Time (Month/Day/Year hour: minutes)					4/22/2019 06:00	4/16/2019 08:56								
Duplicate ("Y" or "N") ²					N	Y								
Split ("Y" or "N") ³					N	N								
Facility Sample ID Number (if applicable)					TB4SG3-19	MW221DSG3-19								
Laboratory Sample ID Number (if applicable)					477227007	476611005								
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis					4/29/2019	4/23/2019								
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)					NA	SIDE								
CAS RN ⁴		CONSTITUENT	T D ⁵	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S ⁷	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	
24959-67-9		Bromide	T	mg/L	9056		*	0.427						
16887-00-6		Chloride(s)	T	mg/L	9056		*	32.1	*					
16984-48-8		Fluoride	T	mg/L	9056		*	0.241						
S0595- -		Nitrate & Nitrite	T	mg/L	9056		*	1.02						
14808-79-8		Sulfate	T	mg/L	9056		*	15.5	*					
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

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

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

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

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

⁵"T" = Total; "D" = Dissolved

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

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

RESIDENTIAL/INERT-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 ¹ , Facility Well/Spring Number					0000-0000		8000-5202						
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)					T. BLANK 4		221						
CAS RN ⁴		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
S0906 - -		Static Water Level Elevation	T	Ft. MSL	Field		*		*				
N238		Dissolved Oxygen	T	mg/L	Field		*		*				
S0266- -		Total Dissolved Solids	T	mg/L	160.1		*	266					
S0296- -		pH	T	Units	Field		*		*				
NS215		Eh	T	mV	Field		*		*				
S0907 - -		Temperature	T	°C	Field		*		*				
7429-90-5		Aluminum	T	mg/L	6020		*	<0.05					
7440-36-0		Antimony	T	mg/L	6020		*	0.00126	J				
7440-38-2		Arsenic	T	mg/L	6020		*	0.00249	J				
7440-39-3		Barium	T	mg/L	6020		*	0.198					
7440-41-7		Beryllium	T	mg/L	6020		*	<0.0005					
7440-42-8		Boron	T	mg/L	6020		*	0.0134	J				
7440-43-9		Cadmium	T	mg/L	6020		*	<0.001					
7440-70-2		Calcium	T	mg/L	6020		*	21.1					
7440-47-3		Chromium	T	mg/L	6020		*	0.00763	J				
7440-48-4		Cobalt	T	mg/L	6020		*	0.00141					
7440-50-8		Copper	T	mg/L	6020		*	0.00101	J				
7439-89-6		Iron	T	mg/L	6020		*	<0.1					
7439-92-1		Lead	T	mg/L	6020		*	<0.002					
7439-95-4		Magnesium	T	mg/L	6020		*	9.42					
7439-96-5		Manganese	T	mg/L	6020		*	0.00284	J				
7439-97-6		Mercury	T	mg/L	7470		*	<0.0002					

C-46

RESIDENTIAL/INERT-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 ¹ , Facility Well/Spring Number						0000-0000		8000-5202					
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						T. BLANK 4		221					
CAS RN ⁴		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
7439-98-7		Molybdenum	T	mg/L	6020		*	0.00844					
7440-02-0		Nickel	T	mg/L	6020		*	0.124					
7440-09-7		Potassium	T	mg/L	6020		*	1.82					
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		*	49.2					
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		*	0.0045	BJ				
7440-66-6		Zinc	T	mg/L	6020		*	<0.02					
108-05-4		Vinyl acetate	T	mg/L	8260	<0.005		<0.005					
67-64-1		Acetone	T	mg/L	8260	0.00665		<0.005					
107-02-8		Acrolein	T	mg/L	8260	<0.005		<0.005					
107-13-1		Acrylonitrile	T	mg/L	8260	<0.005		<0.005					
71-43-2		Benzene	T	mg/L	8260	<0.001		<0.001					
108-90-7		Chlorobenzene	T	mg/L	8260	<0.001		<0.001					
1330-20-7		Xylenes	T	mg/L	8260	<0.003		<0.003					
100-42-5		Styrene	T	mg/L	8260	<0.001		<0.001					
108-88-3		Toluene	T	mg/L	8260	<0.001		<0.001					
74-97-5		Chlorobromomethane	T	mg/L	8260	<0.001		<0.001					

RESIDENTIAL/INERT-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 ¹ , Facility Well/Spring Number					0000-0000		8000-5202						
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					T. BLANK 4		221						
CAS RN ⁴		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
75-27-4		Bromodichloromethane	T	mg/L	8260	<0.001		<0.001					
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/INERT-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 ¹ , Facility Well/Spring Number						0000-0000		8000-5202					
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						T. BLANK 4		221					
CAS RN ⁴		CONSTITUENT	T D ⁵	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
100-41-4		Ethylbenzene	T	mg/L	8260	<0.001		<0.001					
591-78-6		2-Hexanone	T	mg/L	8260	<0.005		<0.005					
74-88-4		Iodomethane	T	mg/L	8260	<0.005		<0.005					
124-48-1		Methane, Dibromochloro-	T	mg/L	8260	<0.001		<0.001					
56-23-5		Carbon Tetrachloride	T	mg/L	8260	<0.001		<0.001					
75-09-2		Dichloromethane	T	mg/L	8260	<0.005		0.00279	BJ				
108-10-1		Methyl isobutyl ketone	T	mg/L	8260	<0.005		<0.005					
96-12-8		Propane, 1,2-Dibromo-3-chloro	T	mg/L	8011	<0.0000197		<0.0000196					
78-87-5		Propane, 1,2-Dichloro-	T	mg/L	8260	<0.001		<0.001					
10061-02-6		trans-1,3-Dichloro-1-propene	T	mg/L	8260	<0.001		<0.001					
10061-01-5		cis-1,3-Dichloro-1-propene	T	mg/L	8260	<0.001		<0.001					
156-60-5		trans-1,2-Dichloroethene	T	mg/L	8260	<0.001		<0.001					
75-69-4		Trichlorofluoromethane	T	mg/L	8260	<0.001		<0.001					
96-18-4		1,2,3-Trichloropropane	T	mg/L	8260	<0.001		<0.001					
95-50-1		Benzene, 1,2-Dichloro-	T	mg/L	8260	<0.001		<0.001					
106-46-7		Benzene, 1,4-Dichloro-	T	mg/L	8260	<0.001	*	<0.001					
1336-36-3		PCB, Total	T	ug/L	8082		*		*				
12674-11-2		PCB-1016	T	ug/L	8082		*		*				
11104-28-2		PCB-1221	T	ug/L	8082		*		*				
11141-16-5		PCB-1232	T	ug/L	8082		*		*				
53469-21-9		PCB-1242	T	ug/L	8082		*		*				
12672-29-6		PCB-1248	T	ug/L	8082		*		*				

C-49

RESIDENTIAL/INERT-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 ¹ , Facility Well/Spring Number					0000-0000		8000-5202						
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					T. BLANK 4		221						
CAS RN ⁴		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
11097-69-1		PCB-1254	T	ug/L	8082		*		*				
11096-82-5		PCB-1260	T	ug/L	8082		*		*				
11100-14-4		PCB-1268	T	ug/L	8082		*		*				
12587-46-1		Gross Alpha	T	pCi/L	9310		*	3.32	*				
12587-47-2		Gross Beta	T	pCi/L	9310		*	3.2	*				
10043-66-0		Iodine-131	T	pCi/L			*		*				
13982-63-3		Radium-226	T	pCi/L	AN-1418		*	0.407	*				
10098-97-2		Strontium-90	T	pCi/L	905.0		*	-4.17	*				
14133-76-7		Technetium-99	T	pCi/L	Tc-02-RC		*	12.4	*				
14269-63-7		Thorium-230	T	pCi/L	Th-01-RC		*	-0.762	*				
10028-17-8		Tritium	T	pCi/L	906.0		*	66.7	*				
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		*	0.996	J				
S0586- -		Total Organic Halides	T	mg/L	9020		*		*				

C-50

RESIDENTIAL/INERT – QUARTERLY

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

Facility: US DOE - Paducah Gaseous Diffusion Plant

LAB ID: None

Permit Number: SW07300014, SW07300015, SW07300045

For Official Use Only

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8000-5201 MW220	MW220SG3-19	Chloride	W	Post-digestion spike recovery out of control limits.
		Sulfate	W	Post-digestion spike recovery out of control limits.
		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	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.38. Rad error is 6.37.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.68. Rad error is 5.51.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.413. Rad error is 0.412.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.15. Rad error is 3.15.
		Technetium-99		TPU is 8.66. Rad error is 8.45.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.839. Rad error is 0.834.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 133. Rad error is 133.
		Total Organic Halides		See resample.

RESIDENTIAL/INERT – QUARTERLY

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

Facility: US DOE - Paducah Gaseous Diffusion Plant

LAB ID: None

Permit Number: SW07300014, SW07300015, SW07300045

For Official Use Only

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8000-5202 MW221	MW221SG3-19	Chloride	W	Post-digestion spike recovery out of control limits.
		Sulfate	W	Post-digestion spike recovery out of control limits.
		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	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.4. Rad error is 6.35.
		Gross beta		TPU is 5.85. Rad error is 5.64.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.402. Rad error is 0.4.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.52. Rad error is 2.52.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 12.3. Rad error is 12.2.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.724. Rad error is 0.722.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 135. Rad error is 135.
		Total Organic Halides		See resample.

RESIDENTIAL/INERT – QUARTERLY

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

Facility: US DOE - Paducah Gaseous Diffusion Plant

LAB ID: None

Permit Number: SW07300014, SW07300015, SW07300045

For Official Use Only

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8000-5242 MW222	MW222SG3-19	Chloride	W	Post-digestion spike recovery out of control limits.
		Sulfate	W	Post-digestion spike recovery out of control limits.
		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	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.17. Rad error is 4.17.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 7.7. Rad error is 7.61.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.508. Rad error is 0.501.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.62. Rad error is 1.62.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 13. Rad error is 13.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.854. Rad error is 0.853.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 134. Rad error is 134.
		Total Organic Halides		See resample.

RESIDENTIAL/INERT – QUARTERLY

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

Facility: US DOE - Paducah Gaseous Diffusion Plant

LAB ID: None

Permit Number: SW07300014, SW07300015, SW07300045

For Official Use Only

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8000-5243 MW223	MW223SG3-19	Chloride	W	Post-digestion spike recovery out of control limits.
		Sulfate	W	Post-digestion spike recovery out of control limits.
		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	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.8. Rad error is 5.77.
		Gross beta		TPU is 11.1. Rad error is 10.3.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.43. Rad error is 0.422.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.69. Rad error is 2.69.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 8.51. Rad error is 8.44.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.557. Rad error is 0.557.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 135. Rad error is 134.
		Total Organic Halides		See resample.

RESIDENTIAL/INERT – QUARTERLY

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

Facility: US DOE - Paducah Gaseous Diffusion Plant

LAB ID: None

Permit Number: SW07300014, SW07300015, SW07300045

For Official Use Only

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8000-5244 MW224	MW224SG3-19	Chloride	W	Post-digestion spike recovery out of control limits.
		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	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.55. Rad error is 5.54.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 9.14. Rad error is 9.13.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.45. Rad error is 0.438.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.57. Rad error is 2.54.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 7.89. Rad error is 7.87.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.802. Rad error is 0.801.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 136. Rad error is 135.
		Total Organic Halides		See resample.
8004-4820 MW369	MW369UG3-19	Chloride	W	Post-digestion spike recovery out of control limits.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.1. Rad error is 5.97.
		Gross beta		TPU is 18. Rad error is 11.9.
		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 0.482.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.48. Rad error is 2.48.
		Technetium-99		TPU is 13.4. Rad error is 10.9.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.01. Rad error is 1.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 132. Rad error is 132.
		Total Organic Halides		See resample.

RESIDENTIAL/INERT – QUARTERLY

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

Facility: US DOE - Paducah Gaseous Diffusion Plant

LAB ID: None

Permit Number: SW07300014, SW07300015, SW07300045

For Official Use Only

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4818 MW370	MW370UG3-19	Chloride	W	Post-digestion spike recovery out of control limits.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.6. Rad error is 6.59.
		Gross beta		TPU is 15. Rad error is 11.3.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.641. Rad error is 0.64.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.39. Rad error is 2.39.
		Technetium-99		TPU is 17.5. Rad error is 12.4.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.572. Rad error is 0.571.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 134. Rad error is 134.
		Total Organic Halides		See resample.
8004-4808 MW372	MW372UG3-19	Chloride	W	Post-digestion spike recovery out of control limits.
		Sulfate	W	Post-digestion spike recovery out of control limits.
		Total Dissolved Solids	*	Duplicate analysis not within control limits.
		Chlorobromomethane	L	LCS or LCSD recovery outside of control limits
		Methyl bromide	L	LCS or LCSD recovery outside of control limits
		Carbon disulfide	Y1	MS/MSD recovery outside acceptance criteria
		1,1-Dichloroethylene	Y1	MS/MSD recovery outside acceptance criteria
		Iodomethane	LY1	LCS or LCSD recovery outside of control limits AND MS/MSD recovery outside acceptance criteria
		trans-1,2-Dichloroethene	Y1	MS/MSD recovery outside acceptance criteria
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.74. Rad error is 6.72.
		Gross beta		TPU is 11.5. Rad error is 9.3.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.476. Rad error is 0.474.
		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 11.7. Rad error is 9.68.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.538. Rad error is 0.537.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 134. Rad error is 134.
		Total Organic Halides		See resample.

RESIDENTIAL/INERT – QUARTERLY

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

Facility: US DOE - Paducah Gaseous Diffusion Plant

LAB ID: None

Permit Number: SW07300014, SW07300015, SW07300045

For Official Use Only

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4792 MW373	MW373UG3-19	Chloride	W	Post-digestion spike recovery out of control limits.
		Sulfate	W	Post-digestion spike recovery out of control limits.
		Total Dissolved Solids	*	Duplicate analysis not within control limits.
		Chlorobromomethane	L	LCS or LCSD recovery outside of control limits
		Methyl bromide	L	LCS or LCSD recovery outside of control limits
		Carbon disulfide	Y1	MS/MSD recovery outside acceptance criteria
		1,1-Dichloroethylene	Y1	MS/MSD recovery outside acceptance criteria
		Iodomethane	LY1	LCS or LCSD recovery outside of control limits AND MS/MSD recovery outside acceptance criteria
		trans-1,2-Dichloroethene	Y1	MS/MSD recovery outside acceptance criteria
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.76. Rad error is 4.76.
		Gross beta		TPU is 7.69. Rad error is 7.36.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.415. Rad error is 0.414.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.03. Rad error is 3.03.
		Technetium-99		TPU is 9.14. Rad error is 8.8.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.788. Rad error is 0.786.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 139. Rad error is 138.
		Total Organic Halides		See resample.

RESIDENTIAL/INERT – QUARTERLY

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

Facility: US DOE - Paducah Gaseous Diffusion Plant

LAB ID: None

Permit Number: SW07300014, SW07300015, SW07300045

For Official Use Only

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4809 MW384	MW384SG3-19	Chloride	W	Post-digestion spike recovery out of control limits.
		Sulfate	W	Post-digestion spike recovery out of control limits.
		Tantalum	N	Sample spike (MS/MSD) recovery not within control limits
		Benzene	Y2	MS/MSD RPD outside acceptance criteria
		Styrene	L	LCS or LCSD recovery outside of control limits
		Toluene	Y2	MS/MSD RPD outside acceptance criteria
		Chlorobromomethane	Y1	MS/MSD recovery outside acceptance criteria
		1,1,2-Trichloroethane	Y1Y2	MS/MSD recovery outside acceptance criteria and MS/MSD RPD outside acceptance criteria
		Tetrachloroethene	Y2	MS/MSD RPD outside acceptance criteria
		trans-1,3-Dichloropropene	Y1Y2	MS/MSD recovery outside acceptance criteria and MS/MSD RPD outside acceptance criteria
		1,2-Dichlorobenzene	Y2	MS/MSD RPD outside acceptance criteria
		1,4-Dichlorobenzene	Y2	MS/MSD RPD outside acceptance criteria
		PCB, Total		Analysis of constituent not required and not performed.
		PCB-1016		Analysis of constituent not required and not performed.
		PCB-1221		Analysis of constituent not required and not performed.
		PCB-1232		Analysis of constituent not required and not performed.
		PCB-1242		Analysis of constituent not required and not performed.
		PCB-1248		Analysis of constituent not required and not performed.
		PCB-1254		Analysis of constituent not required and not performed.
		PCB-1260		Analysis of constituent not required and not performed.
		PCB-1268		Analysis of constituent not required and not performed.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.38. Rad error is 6.38.
		Gross beta		TPU is 20.7. Rad error is 13.4.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.373. Rad error is 0.373.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.02. Rad error is 2.02.
		Technetium-99		TPU is 24.1. Rad error is 16.9.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.09. Rad error is 1.08.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 126. Rad error is 126.
		Total Organic Halides		See resample.

RESIDENTIAL/INERT – QUARTERLY

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

Facility: US DOE - Paducah Gaseous Diffusion Plant

LAB ID: None

Permit Number: SW07300014, SW07300015, SW07300045

For Official Use Only

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4810 MW385	MW385SG3-19	Chloride	W	Post-digestion spike recovery out of control limits.
		Sulfate	W	Post-digestion spike recovery out of control limits.
		Tantalum	N	Sample spike (MS/MSD) recovery not within control limits
		Benzene	Y2	MS/MSD RPD outside acceptance criteria
		Styrene	L	LCS or LCSD recovery outside of control limits
		Toluene	Y2	MS/MSD RPD outside acceptance criteria
		Chlorobromomethane	Y1	MS/MSD recovery outside acceptance criteria
		1,1,2-Trichloroethane	Y1Y2	MS/MSD recovery outside acceptance criteria and MS/MSD RPD outside acceptance criteria
		Tetrachloroethene	Y2	MS/MSD RPD outside acceptance criteria
		trans-1,3-Dichloropropene	Y1Y2	MS/MSD recovery outside acceptance criteria and MS/MSD RPD outside acceptance criteria
		1,2-Dichlorobenzene	Y2	MS/MSD RPD outside acceptance criteria
		1,4-Dichlorobenzene	Y2	MS/MSD RPD outside acceptance criteria
		PCB, Total		Analysis of constituent not required and not performed.
		PCB-1016		Analysis of constituent not required and not performed.
		PCB-1221		Analysis of constituent not required and not performed.
		PCB-1232		Analysis of constituent not required and not performed.
		PCB-1242		Analysis of constituent not required and not performed.
		PCB-1248		Analysis of constituent not required and not performed.
		PCB-1254		Analysis of constituent not required and not performed.
		PCB-1260		Analysis of constituent not required and not performed.
		PCB-1268		Analysis of constituent not required and not performed.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.16. Rad error is 6.13.
		Gross beta		TPU is 27.6. Rad error is 15.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.51. Rad error is 0.508.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.82. Rad error is 1.82.
		Technetium-99		TPU is 23.3. Rad error is 14.7.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.475. Rad error is 0.473.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 129. Rad error is 129.
		Total Organic Halides		See resample.

RESIDENTIAL/INERT – QUARTERLY

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

Facility: US DOE - Paducah Gaseous Diffusion Plant

LAB ID: None

Permit Number: SW07300014, SW07300015, SW07300045

For Official Use Only

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4804 MW386	MW386SG3-19	Chloride	W	Post-digestion spike recovery out of control limits.
		Sulfate	W	Post-digestion spike recovery out of control limits.
		Tantalum	N	Sample spike (MS/MSD) recovery not within control limits
		Benzene	Y2	MS/MSD RPD outside acceptance criteria
		Styrene	L	LCS or LCSD recovery outside of control limits
		Toluene	Y2	MS/MSD RPD outside acceptance criteria
		Chlorobromomethane	Y1	MS/MSD recovery outside acceptance criteria
		1,1,2-Trichloroethane	Y1Y2	MS/MSD recovery outside acceptance criteria and MS/MSD RPD outside acceptance criteria
		Tetrachloroethene	Y2	MS/MSD RPD outside acceptance criteria
		trans-1,3-Dichloropropene	Y1Y2	MS/MSD recovery outside acceptance criteria and MS/MSD RPD outside acceptance criteria
		1,2-Dichlorobenzene	Y2	MS/MSD RPD outside acceptance criteria
		1,4-Dichlorobenzene	Y2	MS/MSD RPD outside acceptance criteria
		PCB, Total		Analysis of constituent not required and not performed.
		PCB-1016		Analysis of constituent not required and not performed.
		PCB-1221		Analysis of constituent not required and not performed.
		PCB-1232		Analysis of constituent not required and not performed.
		PCB-1242		Analysis of constituent not required and not performed.
		PCB-1248		Analysis of constituent not required and not performed.
		PCB-1254		Analysis of constituent not required and not performed.
		PCB-1260		Analysis of constituent not required and not performed.
		PCB-1268		Analysis of constituent not required and not performed.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.37. Rad error is 6.37.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.64. Rad error is 6.64.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.378. Rad error is 0.377.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.13. Rad error is 2.13.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 10.6. Rad error is 10.6.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.671. Rad error is 0.671.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 127. Rad error is 127.
		Total Organic Halides		See resample.

RESIDENTIAL/INERT – QUARTERLY

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

Facility: US DOE - Paducah Gaseous Diffusion Plant

LAB ID: None

Permit Number: SW07300014, SW07300015, SW07300045

For Official Use Only

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4815 MW387	MW387SG3-19	Chloride	W	Post-digestion spike recovery out of control limits.
		Sulfate	W	Post-digestion spike recovery out of control limits.
		Tantalum	N	Sample spike (MS/MSD) recovery not within control limits
		Benzene	Y2	MS/MSD RPD outside acceptance criteria
		Styrene	L	LCS or LCSD recovery outside of control limits
		Toluene	Y2	MS/MSD RPD outside acceptance criteria
		Chlorobromomethane	Y1	MS/MSD recovery outside acceptance criteria
		1,1,2-Trichloroethane	Y1Y2	MS/MSD recovery outside acceptance criteria and MS/MSD RPD outside acceptance criteria
		Tetrachloroethene	Y2	MS/MSD RPD outside acceptance criteria
		trans-1,3-Dichloropropene	Y1Y2	MS/MSD recovery outside acceptance criteria and MS/MSD RPD outside acceptance criteria
		1,2-Dichlorobenzene	Y2	MS/MSD RPD outside acceptance criteria
		1,4-Dichlorobenzene	Y2	MS/MSD RPD outside acceptance criteria
		PCB, Total		Analysis of constituent not required and not performed.
		PCB-1016		Analysis of constituent not required and not performed.
		PCB-1221		Analysis of constituent not required and not performed.
		PCB-1232		Analysis of constituent not required and not performed.
		PCB-1242		Analysis of constituent not required and not performed.
		PCB-1248		Analysis of constituent not required and not performed.
		PCB-1254		Analysis of constituent not required and not performed.
		PCB-1260		Analysis of constituent not required and not performed.
		PCB-1268		Analysis of constituent not required and not performed.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 7.86. Rad error is 7.84.
		Gross beta		TPU is 27. Rad error is 15.2.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.556. Rad error is 0.548.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.23. Rad error is 3.22.
		Technetium-99		TPU is 30.7. Rad error is 17.3.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.648. Rad error is 0.644.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 134. Rad error is 134.
		Total Organic Halides		See resample.

RESIDENTIAL/INERT – QUARTERLY

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

Facility: US DOE - Paducah Gaseous Diffusion Plant

LAB ID: None

Permit Number: SW07300014, SW07300015, SW07300045

For Official Use Only

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4816 MW388	MW388SG3-19	Chloride	W	Post-digestion spike recovery out of control limits.
		Sulfate	W	Post-digestion spike recovery out of control limits.
		Tantalum	N	Sample spike (MS/MSD) recovery not within control limits
		Benzene	Y2	MS/MSD RPD outside acceptance criteria
		Styrene	L	LCS or LCSD recovery outside of control limits
		Toluene	Y2	MS/MSD RPD outside acceptance criteria
		Chlorobromomethane	Y1	MS/MSD recovery outside acceptance criteria
		1,1,2-Trichloroethane	Y1Y2	MS/MSD recovery outside acceptance criteria and MS/MSD RPD outside acceptance criteria
		Tetrachloroethene	Y2	MS/MSD RPD outside acceptance criteria
		trans-1,3-Dichloropropene	Y1Y2	MS/MSD recovery outside acceptance criteria and MS/MSD RPD outside acceptance criteria
		1,2-Dichlorobenzene	Y2	MS/MSD RPD outside acceptance criteria
		1,4-Dichlorobenzene	Y2	MS/MSD RPD outside acceptance criteria
		PCB, Total		Analysis of constituent not required and not performed.
		PCB-1016		Analysis of constituent not required and not performed.
		PCB-1221		Analysis of constituent not required and not performed.
		PCB-1232		Analysis of constituent not required and not performed.
		PCB-1242		Analysis of constituent not required and not performed.
		PCB-1248		Analysis of constituent not required and not performed.
		PCB-1254		Analysis of constituent not required and not performed.
		PCB-1260		Analysis of constituent not required and not performed.
		PCB-1268		Analysis of constituent not required and not performed.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 7.34. Rad error is 7.28.
		Gross beta		TPU is 17. Rad error is 11.6.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.548. Rad error is 0.533.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.53. Rad error is 2.52.
		Technetium-99		TPU is 20.9. Rad error is 14.2.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.904. Rad error is 0.898.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 133. Rad error is 133.
		Total Organic Halides		See resample.

RESIDENTIAL/INERT – QUARTERLY

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

Facility: US DOE - Paducah Gaseous Diffusion Plant

LAB ID: None

Permit Number: SW07300014, SW07300015, SW07300045

For Official Use Only

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4812 MW389		Bromide		During sampling, the well was dry; therefore, no sample was collected.
		Chloride		During sampling, the well was dry; therefore, no sample was collected.
		Fluoride		During sampling, the well was dry; therefore, no sample was collected.
		Nitrate & Nitrite		During sampling, the well was dry; therefore, no sample was collected.
		Sulfate		During sampling, the well was dry; therefore, no sample was collected.
		Barometric Pressure Reading		During sampling, the well was dry; therefore, no sample was collected.
		Specific Conductance		During sampling, the well was dry; therefore, no sample was collected.
		Static Water Level Elevation		During sampling, the well was dry; therefore, no sample was collected.
		Dissolved Oxygen		During sampling, the well was dry; therefore, no sample was collected.
		Total Dissolved Solids		During sampling, the well was dry; therefore, no sample was collected.
		pH		During sampling, the well was dry; therefore, no sample was collected.
		Eh		During sampling, the well was dry; therefore, no sample was collected.
		Temperature		During sampling, the well was dry; therefore, no sample was collected.
		Aluminum		During sampling, the well was dry; therefore, no sample was collected.
		Antimony		During sampling, the well was dry; therefore, no sample was collected.
		Arsenic		During sampling, the well was dry; therefore, no sample was collected.
		Barium		During sampling, the well was dry; therefore, no sample was collected.
		Beryllium		During sampling, the well was dry; therefore, no sample was collected.
		Boron		During sampling, the well was dry; therefore, no sample was collected.
		Cadmium		During sampling, the well was dry; therefore, no sample was collected.
		Calcium		During sampling, the well was dry; therefore, no sample was collected.
		Chromium		During sampling, the well was dry; therefore, no sample was collected.
		Cobalt		During sampling, the well was dry; therefore, no sample was collected.
		Copper		During sampling, the well was dry; therefore, no sample was collected.
		Iron		During sampling, the well was dry; therefore, no sample was collected.
		Lead		During sampling, the well was dry; therefore, no sample was collected.
		Magnesium		During sampling, the well was dry; therefore, no sample was collected.
		Manganese		During sampling, the well was dry; therefore, no sample was collected.
		Mercury		During sampling, the well was dry; therefore, no sample was collected.

RESIDENTIAL/INERT – QUARTERLY

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

Facility: US DOE - Paducah Gaseous Diffusion Plant

LAB ID: None

Permit Number: SW07300014, SW07300015, SW07300045

For Official Use Only

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4812 MW389		Molybdenum		During sampling, the well was dry; therefore, no sample was collected.
		Nickel		During sampling, the well was dry; therefore, no sample was collected.
		Potassium		During sampling, the well was dry; therefore, no sample was collected.
		Rhodium		During sampling, the well was dry; therefore, no sample was collected.
		Selenium		During sampling, the well was dry; therefore, no sample was collected.
		Silver		During sampling, the well was dry; therefore, no sample was collected.
		Sodium		During sampling, the well was dry; therefore, no sample was collected.
		Tantalum		During sampling, the well was dry; therefore, no sample was collected.
		Thallium		During sampling, the well was dry; therefore, no sample was collected.
		Uranium		During sampling, the well was dry; therefore, no sample was collected.
		Vanadium		During sampling, the well was dry; therefore, no sample was collected.
		Zinc		During sampling, the well was dry; therefore, no sample was collected.
		Vinyl acetate		During sampling, the well was dry; therefore, no sample was collected.
		Acetone		During sampling, the well was dry; therefore, no sample was collected.
		Acrolein		During sampling, the well was dry; therefore, no sample was collected.
		Acrylonitrile		During sampling, the well was dry; therefore, no sample was collected.
		Benzene		During sampling, the well was dry; therefore, no sample was collected.
		Chlorobenzene		During sampling, the well was dry; therefore, no sample was collected.
		Xylenes		During sampling, the well was dry; therefore, no sample was collected.
		Styrene		During sampling, the well was dry; therefore, no sample was collected.
		Toluene		During sampling, the well was dry; therefore, no sample was collected.
		Chlorobromomethane		During sampling, the well was dry; therefore, no sample was collected.
		Bromodichloromethane		During sampling, the well was dry; therefore, no sample was collected.
		Tribromomethane		During sampling, the well was dry; therefore, no sample was collected.
		Methyl bromide		During sampling, the well was dry; therefore, no sample was collected.
		Methyl Ethyl Ketone		During sampling, the well was dry; therefore, no sample was collected.
		trans-1,4-Dichloro-2-butene		During sampling, the well was dry; therefore, no sample was collected.
		Carbon disulfide		During sampling, the well was dry; therefore, no sample was collected.
		Chloroethane		During sampling, the well was dry; therefore, no sample was collected.

RESIDENTIAL/INERT – QUARTERLY

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

Facility: US DOE - Paducah Gaseous Diffusion Plant

LAB ID: None

Permit Number: SW07300014, SW07300015, SW07300045

For Official Use Only

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4812 MW389		Chloroform		During sampling, the well was dry; therefore, no sample was collected.
		Methyl chloride		During sampling, the well was dry; therefore, no sample was collected.
		cis-1,2-Dichloroethene		During sampling, the well was dry; therefore, no sample was collected.
		Methylene bromide		During sampling, the well was dry; therefore, no sample was collected.
		1,1-Dichloroethane		During sampling, the well was dry; therefore, no sample was collected.
		1,2-Dichloroethane		During sampling, the well was dry; therefore, no sample was collected.
		1,1-Dichloroethylene		During sampling, the well was dry; therefore, no sample was collected.
		1,2-Dibromoethane		During sampling, the well was dry; therefore, no sample was collected.
		1,1,2,2-Tetrachloroethane		During sampling, the well was dry; therefore, no sample was collected.
		1,1,1-Trichloroethane		During sampling, the well was dry; therefore, no sample was collected.
		1,1,2-Trichloroethane		During sampling, the well was dry; therefore, no sample was collected.
		1,1,1,2-Tetrachloroethane		During sampling, the well was dry; therefore, no sample was collected.
		Vinyl chloride		During sampling, the well was dry; therefore, no sample was collected.
		Tetrachloroethene		During sampling, the well was dry; therefore, no sample was collected.
		Trichloroethene		During sampling, the well was dry; therefore, no sample was collected.
		Ethylbenzene		During sampling, the well was dry; therefore, no sample was collected.
		2-Hexanone		During sampling, the well was dry; therefore, no sample was collected.
		Iodomethane		During sampling, the well was dry; therefore, no sample was collected.
		Dibromochloromethane		During sampling, the well was dry; therefore, no sample was collected.
		Carbon tetrachloride		During sampling, the well was dry; therefore, no sample was collected.
		Dichloromethane		During sampling, the well was dry; therefore, no sample was collected.
		Methyl Isobutyl Ketone		During sampling, the well was dry; therefore, no sample was collected.
		1,2-Dibromo-3-chloropropane		During sampling, the well was dry; therefore, no sample was collected.
		1,2-Dichloropropane		During sampling, the well was dry; therefore, no sample was collected.
		trans-1,3-Dichloropropene		During sampling, the well was dry; therefore, no sample was collected.
		cis-1,3-Dichloropropene		During sampling, the well was dry; therefore, no sample was collected.
		trans-1,2-Dichloroethene		During sampling, the well was dry; therefore, no sample was collected.
		Trichlorofluoromethane		During sampling, the well was dry; therefore, no sample was collected.
		1,2,3-Trichloropropane		During sampling, the well was dry; therefore, no sample was collected.

RESIDENTIAL/INERT – QUARTERLY

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

Facility: US DOE - Paducah Gaseous Diffusion Plant

LAB ID: None

Permit Number: SW07300014, SW07300015, SW07300045

For Official Use Only

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4812 MW389		1,2-Dichlorobenzene		During sampling, the well was dry; therefore, no sample was collected.
		1,4-Dichlorobenzene		During sampling, the well was dry; therefore, no sample was collected.
		PCB, Total		During sampling, the well was dry; therefore, no sample was collected.
		PCB-1016		During sampling, the well was dry; therefore, no sample was collected.
		PCB-1221		During sampling, the well was dry; therefore, no sample was collected.
		PCB-1232		During sampling, the well was dry; therefore, no sample was collected.
		PCB-1242		During sampling, the well was dry; therefore, no sample was collected.
		PCB-1248		During sampling, the well was dry; therefore, no sample was collected.
		PCB-1254		During sampling, the well was dry; therefore, no sample was collected.
		PCB-1260		During sampling, the well was dry; therefore, no sample was collected.
		PCB-1268		During sampling, the well was dry; therefore, no sample was collected.
		Gross alpha		During sampling, the well was dry; therefore, no sample was collected.
		Gross beta		During sampling, the well was dry; therefore, no sample was collected.
		Iodine-131		During sampling, the well was dry; therefore, no sample was collected.
		Radium-226		During sampling, the well was dry; therefore, no sample was collected.
		Strontium-90		During sampling, the well was dry; therefore, no sample was collected.
		Technetium-99		During sampling, the well was dry; therefore, no sample was collected.
		Thorium-230		During sampling, the well was dry; therefore, no sample was collected.
		Tritium		During sampling, the well was dry; therefore, no sample was collected.
		Chemical Oxygen Demand		During sampling, the well was dry; therefore, no sample was collected.
		Cyanide		During sampling, the well was dry; therefore, no sample was collected.
		Iodide		During sampling, the well was dry; therefore, no sample was collected.
		Total Organic Carbon		During sampling, the well was dry; therefore, no sample was collected.
		Total Organic Halides		During sampling, the well was dry; therefore, no sample was collected.

RESIDENTIAL/INERT – QUARTERLY

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

Facility: US DOE - Paducah Gaseous Diffusion Plant

LAB ID: None

Permit Number: SW07300014, SW07300015, SW07300045

For Official Use Only

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4811 MW390	MW390SG3-19	Chloride	W	Post-digestion spike recovery out of control limits.
		Sulfate	W	Post-digestion spike recovery out of control limits.
		Tantalum	N	Sample spike (MS/MSD) recovery not within control limits
		Benzene	Y2	MS/MSD RPD outside acceptance criteria
		Styrene	L	LCS or LCSD recovery outside of control limits
		Toluene	Y2	MS/MSD RPD outside acceptance criteria
		Chlorobromomethane	Y1	MS/MSD recovery outside acceptance criteria
		1,1,2-Trichloroethane	Y1Y2	MS/MSD recovery outside acceptance criteria and MS/MSD RPD outside acceptance criteria
		Tetrachloroethene	Y2	MS/MSD RPD outside acceptance criteria
		trans-1,3-Dichloropropene	Y1Y2	MS/MSD recovery outside acceptance criteria and MS/MSD RPD outside acceptance criteria
		1,2-Dichlorobenzene	Y2	MS/MSD RPD outside acceptance criteria
		1,4-Dichlorobenzene	Y2	MS/MSD RPD outside acceptance criteria
		PCB, Total		Analysis of constituent not required and not performed.
		PCB-1016		Analysis of constituent not required and not performed.
		PCB-1221		Analysis of constituent not required and not performed.
		PCB-1232		Analysis of constituent not required and not performed.
		PCB-1242		Analysis of constituent not required and not performed.
		PCB-1248		Analysis of constituent not required and not performed.
		PCB-1254		Analysis of constituent not required and not performed.
		PCB-1260		Analysis of constituent not required and not performed.
		PCB-1268		Analysis of constituent not required and not performed.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 7.84. Rad error is 7.81.
		Gross beta		TPU is 13.2. Rad error is 10.6.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.229. Rad error is 0.229.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.79. Rad error is 2.79.
		Technetium-99		TPU is 13. Rad error is 10.9.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.842. Rad error is 0.837.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 127. Rad error is 127.
		Total Organic Halides		See resample.

RESIDENTIAL/INERT – QUARTERLY

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

Facility: US DOE - Paducah Gaseous Diffusion Plant

LAB ID: None

Permit Number: SW07300014, SW07300015, SW07300045

For Official Use Only

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4805 MW391	MW391SG3-19	Chloride	W	Post-digestion spike recovery out of control limits.
		Sulfate	W	Post-digestion spike recovery out of control limits.
		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	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.76. Rad error is 5.76.
		Gross beta		TPU is 8.42. Rad error is 8.03.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.376. Rad error is 0.376.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.14. Rad error is 3.13.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 10.9. Rad error is 10.8.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.786. Rad error is 0.784.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 131. Rad error is 131.
		Total Organic Halides		See resample.

RESIDENTIAL/INERT – QUARTERLY

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

Facility: US DOE - Paducah Gaseous Diffusion Plant

LAB ID: None

Permit Number: SW07300014, SW07300015, SW07300045

For Official Use Only

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4806 MW392	MW392SG3-19	Chloride	W	Post-digestion spike recovery out of control limits.
		Sulfate	W	Post-digestion spike recovery out of control limits.
		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	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.76. Rad error is 3.75.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 7.3. Rad error is 7.3.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.341. Rad error is 0.34.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.02. Rad error is 2.02.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 8.39. Rad error is 8.38.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.801. Rad error is 0.801.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 135. Rad error is 135.
		Total Organic Halides		See resample.

RESIDENTIAL/INERT – QUARTERLY

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

Facility: US DOE - Paducah Gaseous Diffusion Plant

LAB ID: None

Permit Number: SW07300014, SW07300015, SW07300045

For Official Use Only

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4807 MW393	MW393SG3-19	Chloride	W	Post-digestion spike recovery out of control limits.
		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	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.32. Rad error is 6.3.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.28. Rad error is 6.27.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.463. Rad error is 0.462.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.83. Rad error is 2.83.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 7.97. Rad error is 7.95.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.06. Rad error is 2.06.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 131. Rad error is 131.
		Total Organic Halides		See resample.

RESIDENTIAL/INERT – QUARTERLY

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

Facility: US DOE - Paducah Gaseous Diffusion Plant

LAB ID: None

Permit Number: SW07300014, SW07300015, SW07300045

For Official Use Only

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4802 MW394	MW394SG3-19	Total Dissolved Solids	*	Duplicate analysis not within control limits.
		Magnesium	E	Result estimated due to matrix interferences.
		Sodium	E	Result estimated due to matrix interferences.
		1,4-Dichlorobenzene	Y2	MS/MSD RPD outside acceptance criteria
		PCB, Total		Analysis of constituent not required and not performed.
		PCB-1016		Analysis of constituent not required and not performed.
		PCB-1221		Analysis of constituent not required and not performed.
		PCB-1232		Analysis of constituent not required and not performed.
		PCB-1242		Analysis of constituent not required and not performed.
		PCB-1248		Analysis of constituent not required and not performed.
		PCB-1254		Analysis of constituent not required and not performed.
		PCB-1260		Analysis of constituent not required and not performed.
		PCB-1268		Analysis of constituent not required and not performed.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.89. Rad error is 4.89.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.08. Rad error is 6.06.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.487. Rad error is 0.487.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.78. Rad error is 3.77.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 10.3. Rad error is 10.3.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.09. Rad error is 1.09.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 128. Rad error is 128.
		Total Organic Halides		See resample.

RESIDENTIAL/INERT – QUARTERLY

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

Facility: US DOE - Paducah Gaseous Diffusion Plant

LAB ID: None

Permit Number: SW07300014, SW07300015, SW07300045

For Official Use Only

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4801	MW395 MW395SG3-19	Total Dissolved Solids	*	Duplicate analysis not within control limits.
		Magnesium	E	Result estimated due to matrix interferences.
		Sodium	E	Result estimated due to matrix interferences.
		1,4-Dichlorobenzene	Y2	MS/MSD RPD outside acceptance criteria
		PCB, Total		Analysis of constituent not required and not performed.
		PCB-1016		Analysis of constituent not required and not performed.
		PCB-1221		Analysis of constituent not required and not performed.
		PCB-1232		Analysis of constituent not required and not performed.
		PCB-1242		Analysis of constituent not required and not performed.
		PCB-1248		Analysis of constituent not required and not performed.
		PCB-1254		Analysis of constituent not required and not performed.
		PCB-1260		Analysis of constituent not required and not performed.
		PCB-1268		Analysis of constituent not required and not performed.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.45. Rad error is 4.41.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.87. Rad error is 5.83.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.54. Rad error is 0.539.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.7. Rad error is 3.7.
		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 1.68. Rad error is 1.68.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 126. Rad error is 126.
		Total Organic Halides		See resample.

RESIDENTIAL/INERT – QUARTERLY

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

Facility: US DOE - Paducah Gaseous Diffusion Plant

LAB ID: None

Permit Number: SW07300014, SW07300015, SW07300045

For Official Use Only

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4803 MW396	MW396SG3-19	Total Dissolved Solids	*	Duplicate analysis not within control limits.
		Magnesium	E	Result estimated due to matrix interferences.
		Sodium	E	Result estimated due to matrix interferences.
		1,4-Dichlorobenzene	Y2	MS/MSD RPD outside acceptance criteria
		PCB, Total		Analysis of constituent not required and not performed.
		PCB-1016		Analysis of constituent not required and not performed.
		PCB-1221		Analysis of constituent not required and not performed.
		PCB-1232		Analysis of constituent not required and not performed.
		PCB-1242		Analysis of constituent not required and not performed.
		PCB-1248		Analysis of constituent not required and not performed.
		PCB-1254		Analysis of constituent not required and not performed.
		PCB-1260		Analysis of constituent not required and not performed.
		PCB-1268		Analysis of constituent not required and not performed.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 9.03. Rad error is 8.86.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.4. Rad error is 5.4.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.407. Rad error is 0.406.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.23. Rad error is 3.23.
		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 1.02. Rad error is 1.01.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 132. Rad error is 132.
		Total Organic Halides		See resample.

RESIDENTIAL/INERT – QUARTERLY

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

Facility: US DOE - Paducah Gaseous Diffusion Plant

LAB ID: None

Permit Number: SW07300014, SW07300015, SW07300045

For Official Use Only

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4817 MW397	MW397SG3-19	Chloride	W	Post-digestion spike recovery out of control limits.
		Sulfate	W	Post-digestion spike recovery out of control limits.
		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	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 7.39. Rad error is 7.32.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 8.18. Rad error is 8.09.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.492. Rad error is 0.474.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.35. Rad error is 2.34.
		Technetium-99		TPU is 11.2. Rad error is 10.6.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.752. Rad error is 0.752.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 137. Rad error is 137.
		Total Organic Halides		See resample.

RESIDENTIAL/INERT – QUARTERLY

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

Facility: US DOE - Paducah Gaseous Diffusion Plant

LAB ID: None

Permit Number: SW07300014, SW07300015, SW07300045

For Official Use Only

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	RI1SG3-19	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.
		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	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.75. Rad error is 5.73.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 7.27. Rad error is 7.19.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.365. Rad error is 0.365.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.39. Rad error is 3.39.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 10.9. Rad error is 10.9.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.689. Rad error is 0.689.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 136. Rad error is 136.
		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/INERT – QUARTERLY

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

Facility: US DOE - Paducah Gaseous Diffusion Plant

LAB ID: None

Permit Number: SW07300014, SW07300015, SW07300045

For Official Use Only

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	FB1SG3-19	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.
		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	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.27. Rad error is 3.26.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.95. Rad error is 5.95.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.407. Rad error is 0.404.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.22. Rad error is 2.2.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 8.49. Rad error is 8.47.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.629. Rad error is 0.626.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 133. Rad error is 133.
		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/INERT – QUARTERLY

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

Facility: US DOE - Paducah Gaseous Diffusion Plant

LAB ID: None

Permit Number: SW07300014, SW07300015, SW07300045

For Official Use Only

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB1SG3-19	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/INERT – QUARTERLY

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

Facility: US DOE - Paducah Gaseous Diffusion Plant

LAB ID: None

Permit Number: SW07300014, SW07300015, SW07300045

For Official Use Only

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB1SG3-19	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/INERT – QUARTERLY

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

Facility: US DOE - Paducah Gaseous Diffusion Plant

LAB ID: None

Permit Number: SW07300014, SW07300015, SW07300045

For Official Use Only

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB2SG3-19	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/INERT – QUARTERLY

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

Facility: US DOE - Paducah Gaseous Diffusion Plant

LAB ID: None

Permit Number: SW07300014, SW07300015, SW07300045

For Official Use Only

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB2SG3-19	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/INERT – QUARTERLY

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

Facility: US DOE - Paducah Gaseous Diffusion Plant

LAB ID: None

Permit Number: SW07300014, SW07300015, SW07300045

For Official Use Only

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB3SG3-19	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/INERT – QUARTERLY

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

Facility: US DOE - Paducah Gaseous Diffusion Plant

LAB ID: None

Permit Number: SW07300014, SW07300015, SW07300045

For Official Use Only

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB3SG3-19	Vanadium		Analysis of constituent not required and not performed.
		Zinc		Analysis of constituent not required and not performed.
		Benzene	Y2	MS/MSD RPD outside acceptance criteria
		Styrene	L	LCS or LCSD recovery outside of control limits
		Toluene	Y2	MS/MSD RPD outside acceptance criteria
		Chlorobromomethane	Y1	MS/MSD recovery outside acceptance criteria
		1,1,2-Trichloroethane	Y1Y2	MS/MSD recovery outside acceptance criteria and MS/MSD RPD outside acceptance criteria
		Tetrachloroethene	Y2	MS/MSD RPD outside acceptance criteria
		trans-1,3-Dichloropropene	Y1Y2	MS/MSD recovery outside acceptance criteria and MS/MSD RPD outside acceptance criteria
		1,2-Dichlorobenzene	Y2	MS/MSD RPD outside acceptance criteria
		1,4-Dichlorobenzene	Y2	MS/MSD RPD outside acceptance criteria
		PCB, Total		Analysis of constituent not required and not performed.
		PCB-1016		Analysis of constituent not required and not performed.
		PCB-1221		Analysis of constituent not required and not performed.
		PCB-1232		Analysis of constituent not required and not performed.
		PCB-1242		Analysis of constituent not required and not performed.
		PCB-1248		Analysis of constituent not required and not performed.
		PCB-1254		Analysis of constituent not required and not performed.
		PCB-1260		Analysis of constituent not required and not performed.
		PCB-1268		Analysis of constituent not required and not performed.
		Gross alpha		Analysis of constituent not required and not performed.
		Gross beta		Analysis of constituent not required and not performed.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226		Analysis of constituent not required and not performed.
		Strontium-90		Analysis of constituent not required and not performed.
		Technetium-99		Analysis of constituent not required and not performed.
		Thorium-230		Analysis of constituent not required and not performed.
		Tritium		Analysis of constituent not required and not performed.
		Chemical Oxygen Demand		Analysis of constituent not required and not performed.
		Cyanide		Analysis of constituent not required and not performed.
		Iodide		Analysis of constituent not required and not performed.
		Total Organic Carbon		Analysis of constituent not required and not performed.
		Total Organic Halides		Analysis of constituent not required and not performed.

RESIDENTIAL/INERT – QUARTERLY

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

Facility: US DOE - Paducah Gaseous Diffusion Plant

LAB ID: None

Permit Number: SW07300014, SW07300015, SW07300045

For Official Use Only

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB4SG3-19	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/INERT – QUARTERLY

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

Facility: US DOE - Paducah Gaseous Diffusion Plant

LAB ID: None

Permit Number: SW07300014, SW07300015, SW07300045

For Official Use Only

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB4SG3-19	Vanadium	Y2	Analysis of constituent not required and not performed.
		Zinc		Analysis of constituent not required and not performed.
		1,4-Dichlorobenzene		MS/MSD RPD outside acceptance criteria
		PCB, Total		Analysis of constituent not required and not performed.
		PCB-1016		Analysis of constituent not required and not performed.
		PCB-1221		Analysis of constituent not required and not performed.
		PCB-1232		Analysis of constituent not required and not performed.
		PCB-1242		Analysis of constituent not required and not performed.
		PCB-1248		Analysis of constituent not required and not performed.
		PCB-1254		Analysis of constituent not required and not performed.
		PCB-1260		Analysis of constituent not required and not performed.
		PCB-1268		Analysis of constituent not required and not performed.
		Gross alpha		Analysis of constituent not required and not performed.
		Gross beta		Analysis of constituent not required and not performed.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226		Analysis of constituent not required and not performed.
		Strontium-90		Analysis of constituent not required and not performed.
		Technetium-99		Analysis of constituent not required and not performed.
		Thorium-230		Analysis of constituent not required and not performed.
		Tritium		Analysis of constituent not required and not performed.
		Chemical Oxygen Demand		Analysis of constituent not required and not performed.
		Cyanide		Analysis of constituent not required and not performed.
		Iodide		Analysis of constituent not required and not performed.
		Total Organic Carbon		Analysis of constituent not required and not performed.
		Total Organic Halides		Analysis of constituent not required and not performed.

RESIDENTIAL/INERT – QUARTERLY

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

Facility: US DOE - Paducah Gaseous Diffusion Plant

LAB ID: None

Permit Number: SW07300014, SW07300015, SW07300045

For Official Use Only

GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8000-5202 MW221	MW221DSG3-19	Chloride	W	Post-digestion spike recovery out of control limits.
		Sulfate	W	Post-digestion spike recovery out of control limits.
		Barometric Pressure Reading		Analysis of constituent not required and not performed.
		Specific Conductance		Analysis of constituent not required and not performed.
		Static Water Level Elevation		Analysis of constituent not required and not performed.
		Dissolved Oxygen		Analysis of constituent not required and not performed.
		pH		Analysis of constituent not required and not performed.
		Eh		Analysis of constituent not required and not performed.
		Temperature		Analysis of constituent not required and not performed.
		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	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.1. Rad error is 5.07.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.84. Rad error is 4.81.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.399. Rad error is 0.397.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.23. Rad error is 3.23.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 8.79. Rad error is 8.69.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.688. Rad error is 0.685.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 134. Rad error is 133.
		Total Organic Halides		See resample.

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

RESIDENTIAL/INERT-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 ¹ , Facility Well/Spring Number					8000-5201	8000-5202	8000-5242	8000-5243					
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					220	221	222	223					
Sample Sequence #					3	3	3	3					
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)					5/30/2019 09:38	5/30/2019 07:58	5/30/2019 08:47	5/30/2019 08:29					
Duplicate ("Y" or "N") ²					N	N	N	N					
Split ("Y" or "N") ³					N	N	N	N					
Facility Sample ID Number (if applicable)					MW220SG3-19R	MW221SG3-19R	MW222SG3-19R	MW223SG3-19R					
Laboratory Sample ID Number (if applicable)					480527001	480527003	480527004	480527005					
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis					6/7/2019	6/7/2019	6/7/2019	6/7/2019					
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)					UP	SIDE	SIDE	SIDE					
CAS RN ⁴		CONSTITUENT	T D ⁵	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S ⁷	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
24959-67-9		Bromide	T	mg/L	9056		*		*		*		*
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	29.84		29.85		29.85		29.85	
S0145- -		Specific Conductance	T	µMH0/cm	Field	424		396		375		407	

STANDARD FLAGS:

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

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

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

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

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

⁵"T" = Total; "D" = Dissolved

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

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

RESIDENTIAL/INERT-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 ¹ , Facility Well/Spring Number					8000-5201		8000-5202		8000-5242		8000-5243		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)					220		221		222		223		
CAS RN ⁴		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
S0906 - -		Static Water Level Elevation	T	Ft. MSL	Field	332.39		332.34		332.47		332.5	
N238		Dissolved Oxygen	T	mg/L	Field	4.02		3.6		3.29		2.8	
S0266- -		Total Dissolved Solids	T	mg/L	160.1		*		*		*		*
S0296- -		pH	T	Units	Field	6.31		6.2		6.26		6.23	
NS215		Eh	T	mV	Field	523		539		519		520	
S0907 - -		Temperature	T	°C	Field	17.22		16.83		17.33		17.61	
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		*		*		*		*

C-87

RESIDENTIAL/INERT-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 ¹ , Facility Well/Spring Number					8000-5201		8000-5202		8000-5242		8000-5243		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					220		221		222		223		
CAS RN ⁴		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
11097-69-1		PCB-1254	T	ug/L	8082		*		*		*		*
11096-82-5		PCB-1260	T	ug/L	8082		*		*		*		*
11100-14-4		PCB-1268	T	ug/L	8082		*		*		*		*
12587-46-1		Gross Alpha	T	pCi/L	9310		*		*		*		*
12587-47-2		Gross Beta	T	pCi/L	9310		*		*		*		*
10043-66-0		Iodine-131	T	pCi/L			*		*		*		*
13982-63-3		Radium-226	T	pCi/L	AN-1418		*		*		*		*
10098-97-2		Strontium-90	T	pCi/L	905.0		*		*		*		*
14133-76-7		Technetium-99	T	pCi/L	Tc-02-RC		*		*		*		*
14269-63-7		Thorium-230	T	pCi/L	Th-01-RC		*		*		*		*
10028-17-8		Tritium	T	pCi/L	906.0		*		*		*		*
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		*		*		*		*
S0268- -		Total Organic Carbon	T	mg/L	9060		*		*		*		*
S0586- -		Total Organic Halides	T	mg/L	9020	0.00822	J	0.00588	J	0.00434	J	0.00582	J

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

RESIDENTIAL/INERT-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 ¹ , Facility Well/Spring Number					8000-5244	8004-4820	8004-4818	8004-4808					
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					224	369	370	372					
Sample Sequence #					3	3	3	3					
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)					5/30/2019 09:13	5/28/2019 13:31	5/28/2019 14:07	5/28/2019 14:29					
Duplicate ("Y" or "N") ²					N	N	N	N					
Split ("Y" or "N") ³					N	N	N	N					
Facility Sample ID Number (if applicable)					MW224SG3-19R	MW369UG3-19R	MW370UG3-19R	MW372UG3-19R					
Laboratory Sample ID Number (if applicable)					480527006	480404014	480404015	480404017					
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis					6/8/2019	5/30/2019	6/7/2019	5/31/2019					
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)					SIDE	DOWN	DOWN	DOWN					
CAS RN ⁴		CONSTITUENT	T D ⁵	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S ⁷	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
24959-67-9		Bromide	T	mg/L	9056		*		*		*		*
16887-00-6		Chloride(s)	T	mg/L	9056		*		*		*		*
16984-48-8		Fluoride	T	mg/L	9056		*		*		*		*
S0595- -		Nitrate & Nitrite	T	mg/L	9056		*		*		*		*
14808-79-8		Sulfate	T	mg/L	9056		*		*		*		*
NS1894		Barometric Pressure Reading	T	Inches/Hg	Field	29.84		29.84		29.81		29.81	
S0145- -		Specific Conductance	T	µMH0/cm	Field	432		387		436		628	

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

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

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

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

⁵"T" = Total; "D" = Dissolved

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

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

STANDARD FLAGS:

* = See Comments

J = Estimated Value

B = Analyte found in blank

A = Average value

N = Presumptive ID

D = Concentration from analysis
of a secondary dilution

RESIDENTIAL/INERT-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 ¹ , Facility Well/Spring Number					8000-5244		8004-4820		8004-4818		8004-4808		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)					224		369		370		372		
CAS RN ⁴		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
S0906 - -		Static Water Level Elevation	T	Ft. MSL	Field	332.63		332.7		332.67		332.76	
N238		Dissolved Oxygen	T	mg/L	Field	2.95		3.59		3.46		2.13	
S0266- -		Total Dissolved Solids	T	mg/L	160.1		*		*		*		*
S0296- -		pH	T	Units	Field	6.29		6.4		6.11		6.22	
NS215		Eh	T	mV	Field	516		309		400		400	
S0907 - -		Temperature	T	°C	Field	17.67		18.89		20.11		20.44	
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		*		*		*		*

C-90

RESIDENTIAL/INERT-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 ¹ , Facility Well/Spring Number					8000-5244		8004-4820		8004-4818		8004-4808		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					224		369		370		372		
CAS RN ⁴		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
11097-69-1		PCB-1254	T	ug/L	8082		*		*		*		*
11096-82-5		PCB-1260	T	ug/L	8082		*		*		*		*
11100-14-4		PCB-1268	T	ug/L	8082		*		*		*		*
12587-46-1		Gross Alpha	T	pCi/L	9310		*		*		*		*
12587-47-2		Gross Beta	T	pCi/L	9310		*		*		*		*
10043-66-0		Iodine-131	T	pCi/L			*		*		*		*
13982-63-3		Radium-226	T	pCi/L	AN-1418		*		*		*		*
10098-97-2		Strontium-90	T	pCi/L	905.0		*		*		*		*
14133-76-7		Technetium-99	T	pCi/L	Tc-02-RC		*		*		*		*
14269-63-7		Thorium-230	T	pCi/L	Th-01-RC		*		*		*		*
10028-17-8		Tritium	T	pCi/L	906.0		*		*		*		*
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		*		*		*		*
S0268- -		Total Organic Carbon	T	mg/L	9060		*		*		*		*
S0586- -		Total Organic Halides	T	mg/L	9020	0.0135		0.0143		0.00514	BJ	0.0075	J

C-91

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

RESIDENTIAL/INERT-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 ¹ , Facility Well/Spring Number					8004-4792	8004-4809	8004-8410	8004-4804				
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					373	384	385	386				
Sample Sequence #					3	3	3	3				
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)					5/28/2019 15:09	5/29/2019 13:23	5/29/2019 14:01	5/292019 13:40				
Duplicate ("Y" or "N") ²					N	N	N	N				
Split ("Y" or "N") ³					N	N	N	N				
Facility Sample ID Number (if applicable)					MW373UG3-19R	MW384SG3-19R	MW385SG3-19R	MW386SG3-19R				
Laboratory Sample ID Number (if applicable)					480404018	480527007	480527008	480527009				
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis					6/7/2019	6/8/2019	6/9/2019	6/9/2019				
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)					DOWN	SIDE	SIDE	SIDE				
CAS RN ⁴		CONSTITUENT	T D ⁵	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S ⁷	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	
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	29.8		29.81		29.8		29.81
S0145- -		Specific Conductance	T	µMH0/cm	Field	767		425		418		576

STANDARD FLAGS:

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

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

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

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

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

⁵"T" = Total; "D" = Dissolved

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

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

RESIDENTIAL/INERT-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 ¹ , Facility Well/Spring Number					8004-4792		8004-4809		8004-4810		8004-4804		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)					373		384		385		386		
CAS RN ⁴		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
S0906 - -		Static Water Level Elevation	T	Ft. MSL	Field	332.76		332.29		332.33		345.62	
N238		Dissolved Oxygen	T	mg/L	Field	1.28		4.72		2.6		3.51	
S0266- -		Total Dissolved Solids	T	mg/L	160.1		*		*		*		*
S0296- -		pH	T	Units	Field	6.21		6.14		6.14		6.92	
NS215		Eh	T	mV	Field	374		423		444		429	
S0907 - -		Temperature	T	°C	Field	18.72		18.61		18.72		18.28	
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		*		*		*		*

C-93

RESIDENTIAL/INERT-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 ¹ , Facility Well/Spring Number					8004-4792		8004-4809		8004-4810		8004-4804		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					373		384		385		386		
CAS RN ⁴		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
11097-69-1		PCB-1254	T	ug/L	8082		*		*		*		*
11096-82-5		PCB-1260	T	ug/L	8082		*		*		*		*
11100-14-4		PCB-1268	T	ug/L	8082		*		*		*		*
12587-46-1		Gross Alpha	T	pCi/L	9310		*		*		*		*
12587-47-2		Gross Beta	T	pCi/L	9310		*		*		*		*
10043-66-0		Iodine-131	T	pCi/L			*		*		*		*
13982-63-3		Radium-226	T	pCi/L	AN-1418		*		*		*		*
10098-97-2		Strontium-90	T	pCi/L	905.0		*		*		*		*
14133-76-7		Technetium-99	T	pCi/L	Tc-02-RC		*		*		*		*
14269-63-7		Thorium-230	T	pCi/L	Th-01-RC		*		*		*		*
10028-17-8		Tritium	T	pCi/L	906.0		*		*		*		*
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		*		*		*		*
S0268- -		Total Organic Carbon	T	mg/L	9060		*		*		*		*
S0586- -		Total Organic Halides	T	mg/L	9020	0.0105	B	0.008	J	0.0114	B	0.108	B

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

RESIDENTIAL/INERT-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 ¹ , Facility Well/Spring Number					8004-4815	8004-4816	8004-4811	8004-4805					
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					387	388	390	391					
Sample Sequence #					3	3	3	3					
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)					5/29/2019 12:38	5/29/2019 12:58	5/29/2019 12:15	5/29/2019 08:15					
Duplicate ("Y" or "N") ²					N	N	N	N					
Split ("Y" or "N") ³					N	N	N	N					
Facility Sample ID Number (if applicable)					MW387SG3-19R	MW388SG3-19R	MW390SG3-19R	MW391SG3-19R					
Laboratory Sample ID Number (if applicable)					480527010	480527011	480527012	480527013					
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis					6/9/2019	6/9/2019	6/9/2019	6/9/2019					
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)					DOWN	DOWN	DOWN	DOWN					
CAS RN ⁴		CONSTITUENT	T D ⁵	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S ⁷	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
24959-67-9		Bromide	T	mg/L	9056		*		*		*		*
16887-00-6		Chloride(s)	T	mg/L	9056		*		*		*		*
16984-48-8		Fluoride	T	mg/L	9056		*		*		*		*
S0595- -		Nitrate & Nitrite	T	mg/L	9056		*		*		*		*
14808-79-8		Sulfate	T	mg/L	9056		*		*		*		*
NS1894		Barometric Pressure Reading	T	Inches/Hg	Field	29.82		29.81		29.82		29.8	
S0145- -		Specific Conductance	T	µMH0/cm	Field	526		469		676		494	

STANDARD FLAGS:

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

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

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

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

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

⁵"T" = Total; "D" = Dissolved

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

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

RESIDENTIAL/INERT-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 ¹ , Facility Well/Spring Number					8004-4815		8004-4816		8004-4811		8004-4805		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)					387		388		390		391		
CAS RN ⁴		CONSTITUENT	T D ⁵	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
S0906 - -		Static Water Level Elevation	T	Ft. MSL	Field	332.34		332.34		332.5		332.44	
N238		Dissolved Oxygen	T	mg/L	Field	3.49		2.9		4.62		2.92	
S0266- -		Total Dissolved Solids	T	mg/L	160.1		*		*		*		*
S0296- -		pH	T	Units	Field	6.25		6.14		6.41		6.1	
NS215		Eh	T	mV	Field	436		405		464		462	
S0907 - -		Temperature	T	°C	Field	18.11		18.61		18.06		18.67	
7429-90-5		Aluminum	T	mg/L	6020		*		*		*		*
7440-36-0		Antimony	T	mg/L	6020		*		*		*		*
7440-38-2		Arsenic	T	mg/L	6020		*		*		*		*
7440-39-3		Barium	T	mg/L	6020		*		*		*		*
7440-41-7		Beryllium	T	mg/L	6020		*		*		*		*
7440-42-8		Boron	T	mg/L	6020		*		*		*		*
7440-43-9		Cadmium	T	mg/L	6020		*		*		*		*
7440-70-2		Calcium	T	mg/L	6020		*		*		*		*
7440-47-3		Chromium	T	mg/L	6020		*		*		*		*
7440-48-4		Cobalt	T	mg/L	6020		*		*		*		*
7440-50-8		Copper	T	mg/L	6020		*		*		*		*
7439-89-6		Iron	T	mg/L	6020		*		*		*		*
7439-92-1		Lead	T	mg/L	6020		*		*		*		*
7439-95-4		Magnesium	T	mg/L	6020		*		*		*		*
7439-96-5		Manganese	T	mg/L	6020		*		*		*		*
7439-97-6		Mercury	T	mg/L	7470		*		*		*		*

C-96

RESIDENTIAL/INERT-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 ¹ , Facility Well/Spring Number					8004-4815		8004-4816		8004-4811		8004-4805		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					387		388		390		391		
CAS RN ⁴		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
11097-69-1		PCB-1254	T	ug/L	8082		*		*		*		*
11096-82-5		PCB-1260	T	ug/L	8082		*		*		*		*
11100-14-4		PCB-1268	T	ug/L	8082		*		*		*		*
12587-46-1		Gross Alpha	T	pCi/L	9310		*		*		*		*
12587-47-2		Gross Beta	T	pCi/L	9310		*		*		*		*
10043-66-0		Iodine-131	T	pCi/L			*		*		*		*
13982-63-3		Radium-226	T	pCi/L	AN-1418		*		*		*		*
10098-97-2		Strontium-90	T	pCi/L	905.0		*		*		*		*
14133-76-7		Technetium-99	T	pCi/L	Tc-02-RC		*		*		*		*
14269-63-7		Thorium-230	T	pCi/L	Th-01-RC		*		*		*		*
10028-17-8		Tritium	T	pCi/L	906.0		*		*		*		*
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		*		*		*		*
S0268- -		Total Organic Carbon	T	mg/L	9060		*		*		*		*
S0586- -		Total Organic Halides	T	mg/L	9020	0.00682	BJ	0.0129	B	0.0113	B	0.00728	J

C-97

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

RESIDENTIAL/INERT-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 ¹ , Facility Well/Spring Number					8004-4806	8004-4807	8004-4802	8004-4801					
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					392	393	394	395					
Sample Sequence #					3	3	3	3					
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)					5/29/2019 07:37	5/29/2019 07:56	5/29/2019 09:18	5/29/2019 08:40					
Duplicate ("Y" or "N") ²					N	N	N	N					
Split ("Y" or "N") ³					N	N	N	N					
Facility Sample ID Number (if applicable)					MW392SG3-19R	MW393SG3-19R	MW394SG3-19R	MW395SG3-19R					
Laboratory Sample ID Number (if applicable)					480527014	480527015	480527016	480527017					
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis					6/9/2019	6/9/2019	6/9/2019	6/9/2019					
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)					DOWN	DOWN	UP	UP					
CAS RN ⁴		CONSTITUENT	T D ⁵	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S ⁷	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
24959-67-9		Bromide	T	mg/L	9056		*		*		*		*
16887-00-6		Chloride(s)	T	mg/L	9056		*		*		*		*
16984-48-8		Fluoride	T	mg/L	9056		*		*		*		*
S0595- -		Nitrate & Nitrite	T	mg/L	9056		*		*		*		*
14808-79-8		Sulfate	T	mg/L	9056		*		*		*		*
NS1894		Barometric Pressure Reading	T	Inches/Hg	Field	29.78		29.8		29.81		29.8	
S0145- -		Specific Conductance	T	µMH0/cm	Field	441		448		383		367	

STANDARD FLAGS:

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

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

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

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

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

⁵"T" = Total; "D" = Dissolved

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

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

RESIDENTIAL/INERT-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 ¹ , Facility Well/Spring Number					8004-4806		8004-4807		8004-4802		8004-4801		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)					392		393		394		395		
CAS RN ⁴		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
S0906 - -		Static Water Level Elevation	T	Ft. MSL	Field	332.39		342.05		332.75		333.11	
N238		Dissolved Oxygen	T	mg/L	Field	0.81		2.38		3.93		4.57	
S0266- -		Total Dissolved Solids	T	mg/L	160.1		*		*		*		*
S0296- -		pH	T	Units	Field	6.2		6.3		6.11		6.08	
NS215		Eh	T	mV	Field	429		454		463		477	
S0907 - -		Temperature	T	°C	Field	17.89		18.5		17.5		17.28	
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		*		*		*		*

C-99

RESIDENTIAL/INERT-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 ¹ , Facility Well/Spring Number					8004-4806		8004-4807		8004-4802		8004-4801		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					392		393		394		395		
CAS RN ⁴		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
11097-69-1		PCB-1254	T	ug/L	8082		*		*		*		*
11096-82-5		PCB-1260	T	ug/L	8082		*		*		*		*
11100-14-4		PCB-1268	T	ug/L	8082		*		*		*		*
12587-46-1		Gross Alpha	T	pCi/L	9310		*		*		*		*
12587-47-2		Gross Beta	T	pCi/L	9310		*		*		*		*
10043-66-0		Iodine-131	T	pCi/L			*		*		*		*
13982-63-3		Radium-226	T	pCi/L	AN-1418		*		*		*		*
10098-97-2		Strontium-90	T	pCi/L	905.0		*		*		*		*
14133-76-7		Technetium-99	T	pCi/L	Tc-02-RC		*		*		*		*
14269-63-7		Thorium-230	T	pCi/L	Th-01-RC		*		*		*		*
10028-17-8		Tritium	T	pCi/L	906.0		*		*		*		*
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		*		*		*		*
S0268- -		Total Organic Carbon	T	mg/L	9060		*		*		*		*
S0586- -		Total Organic Halides	T	mg/L	9020	0.0227		0.0171		0.00508	J	0.00434	J

C-100

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

RESIDENTIAL/INERT-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 ¹ , Facility Well/Spring Number	8004-4803	8004-4817	8000-5202									
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)	396	397	221									
Sample Sequence #	3	3	4									
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)	5/29/2019 08:58	5/29/2019 11:53	5/30/2019 07:58									
Duplicate ("Y" or "N") ²	N	N	Y									
Split ("Y" or "N") ³	N	N	N									
Facility Sample ID Number (if applicable)	MW396SG3-19R	MW397SG3-19R	MW221DSG3-19R									
Laboratory Sample ID Number (if applicable)	480527018	480527019	480527002									
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis	6/9/2019	6/9/2019	6/7/2019									
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)	UP	UP	SIDE									
CAS RN ⁴	CONSTITUENT	T D ⁵	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S ⁷	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
24959-67-9	Bromide	T	mg/L	9056		*		*		*		
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	29.81		29.82			*		
S0145- -	Specific Conductance	T	µMH0/cm	Field	722		318			*		

STANDARD FLAGS:

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

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

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

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

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

⁵"T" = Total; "D" = Dissolved

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

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

RESIDENTIAL/INERT-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 ¹ , Facility Well/Spring Number					8004-4803		8004-4817		8000-5202				
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)					396		397		221				
CAS RN ⁴		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
S0906 - -		Static Water Level Elevation	T	Ft. MSL	Field	372.99		332.68			*		
N238		Dissolved Oxygen	T	mg/L	Field	1.47		5.24			*		
S0266- -		Total Dissolved Solids	T	mg/L	160.1		*		*		*		
S0296- -		pH	T	Units	Field	6.71		6.11			*		
NS215		Eh	T	mV	Field	424		488			*		
S0907 - -		Temperature	T	°C	Field	17.61		18.11			*		
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		*		*		*		

C-102

RESIDENTIAL/INERT-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 ¹ , Facility Well/Spring Number					8004-4803		8004-4817		8000-5202				
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					396		397		221				
CAS RN ⁴		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S	DETECTED VALUE OR PQL ⁶	F L A G S
11097-69-1		PCB-1254	T	ug/L	8082		*		*		*		
11096-82-5		PCB-1260	T	ug/L	8082		*		*		*		
11100-14-4		PCB-1268	T	ug/L	8082		*		*		*		
12587-46-1		Gross Alpha	T	pCi/L	9310		*		*		*		
12587-47-2		Gross Beta	T	pCi/L	9310		*		*		*		
10043-66-0		Iodine-131	T	pCi/L			*		*		*		
13982-63-3		Radium-226	T	pCi/L	AN-1418		*		*		*		
10098-97-2		Strontium-90	T	pCi/L	905.0		*		*		*		
14133-76-7		Technetium-99	T	pCi/L	Tc-02-RC		*		*		*		
14269-63-7		Thorium-230	T	pCi/L	Th-01-RC		*		*		*		
10028-17-8		Tritium	T	pCi/L	906.0		*		*		*		
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		*		*		*		
S0268- -		Total Organic Carbon	T	mg/L	9060		*		*		*		
S0586- -		Total Organic Halides	T	mg/L	9020	0.031		0.0088	J	0.0167			

C-103

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
8000-5201 MW220	MW220SG3-19R	Bromide		Analysis of constituent not required and not performed.
		Chloride		Analysis of constituent not required and not performed.
		Fluoride		Analysis of constituent not required and not performed.
		Nitrate & Nitrite		Analysis of constituent not required and not performed.
		Sulfate		Analysis of constituent not required and not performed.
		Total Dissolved Solids		Analysis of constituent not required and not performed.
		Aluminum		Analysis of constituent not required and not performed.
		Antimony		Analysis of constituent not required and not performed.
		Arsenic		Analysis of constituent not required and not performed.
		Barium		Analysis of constituent not required and not performed.
		Beryllium		Analysis of constituent not required and not performed.
		Boron		Analysis of constituent not required and not performed.
		Cadmium		Analysis of constituent not required and not performed.
		Calcium		Analysis of constituent not required and not performed.
		Chromium		Analysis of constituent not required and not performed.
		Cobalt		Analysis of constituent not required and not performed.
		Copper		Analysis of constituent not required and not performed.
		Iron		Analysis of constituent not required and not performed.
		Lead		Analysis of constituent not required and not performed.
		Magnesium		Analysis of constituent not required and not performed.
		Manganese		Analysis of constituent not required and not performed.
		Mercury		Analysis of constituent not required and not performed.
		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.

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
8000-5202 MW221	MW221SG3-19R	Bromide		Analysis of constituent not required and not performed.
		Chloride		Analysis of constituent not required and not performed.
		Fluoride		Analysis of constituent not required and not performed.
		Nitrate & Nitrite		Analysis of constituent not required and not performed.
		Sulfate		Analysis of constituent not required and not performed.
		Total Dissolved Solids		Analysis of constituent not required and not performed.
		Aluminum		Analysis of constituent not required and not performed.
		Antimony		Analysis of constituent not required and not performed.
		Arsenic		Analysis of constituent not required and not performed.
		Barium		Analysis of constituent not required and not performed.
		Beryllium		Analysis of constituent not required and not performed.
		Boron		Analysis of constituent not required and not performed.
		Cadmium		Analysis of constituent not required and not performed.
		Calcium		Analysis of constituent not required and not performed.
		Chromium		Analysis of constituent not required and not performed.
		Cobalt		Analysis of constituent not required and not performed.
		Copper		Analysis of constituent not required and not performed.
		Iron		Analysis of constituent not required and not performed.
		Lead		Analysis of constituent not required and not performed.
		Magnesium		Analysis of constituent not required and not performed.
		Manganese		Analysis of constituent not required and not performed.
		Mercury		Analysis of constituent not required and not performed.
		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.

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
8000-5242 MW222	MW222SG3-19R	Bromide		Analysis of constituent not required and not performed.
		Chloride		Analysis of constituent not required and not performed.
		Fluoride		Analysis of constituent not required and not performed.
		Nitrate & Nitrite		Analysis of constituent not required and not performed.
		Sulfate		Analysis of constituent not required and not performed.
		Total Dissolved Solids		Analysis of constituent not required and not performed.
		Aluminum		Analysis of constituent not required and not performed.
		Antimony		Analysis of constituent not required and not performed.
		Arsenic		Analysis of constituent not required and not performed.
		Barium		Analysis of constituent not required and not performed.
		Beryllium		Analysis of constituent not required and not performed.
		Boron		Analysis of constituent not required and not performed.
		Cadmium		Analysis of constituent not required and not performed.
		Calcium		Analysis of constituent not required and not performed.
		Chromium		Analysis of constituent not required and not performed.
		Cobalt		Analysis of constituent not required and not performed.
		Copper		Analysis of constituent not required and not performed.
		Iron		Analysis of constituent not required and not performed.
		Lead		Analysis of constituent not required and not performed.
		Magnesium		Analysis of constituent not required and not performed.
		Manganese		Analysis of constituent not required and not performed.
		Mercury		Analysis of constituent not required and not performed.
		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.

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
8000-5243 MW223	MW223SG3-19R	Bromide		Analysis of constituent not required and not performed.
		Chloride		Analysis of constituent not required and not performed.
		Fluoride		Analysis of constituent not required and not performed.
		Nitrate & Nitrite		Analysis of constituent not required and not performed.
		Sulfate		Analysis of constituent not required and not performed.
		Total Dissolved Solids		Analysis of constituent not required and not performed.
		Aluminum		Analysis of constituent not required and not performed.
		Antimony		Analysis of constituent not required and not performed.
		Arsenic		Analysis of constituent not required and not performed.
		Barium		Analysis of constituent not required and not performed.
		Beryllium		Analysis of constituent not required and not performed.
		Boron		Analysis of constituent not required and not performed.
		Cadmium		Analysis of constituent not required and not performed.
		Calcium		Analysis of constituent not required and not performed.
		Chromium		Analysis of constituent not required and not performed.
		Cobalt		Analysis of constituent not required and not performed.
		Copper		Analysis of constituent not required and not performed.
		Iron		Analysis of constituent not required and not performed.
		Lead		Analysis of constituent not required and not performed.
		Magnesium		Analysis of constituent not required and not performed.
		Manganese		Analysis of constituent not required and not performed.
		Mercury		Analysis of constituent not required and not performed.
		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.

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
8000-5244 MW224	MW224SG3-19R	Bromide		Analysis of constituent not required and not performed.
		Chloride		Analysis of constituent not required and not performed.
		Fluoride		Analysis of constituent not required and not performed.
		Nitrate & Nitrite		Analysis of constituent not required and not performed.
		Sulfate		Analysis of constituent not required and not performed.
		Total Dissolved Solids		Analysis of constituent not required and not performed.
		Aluminum		Analysis of constituent not required and not performed.
		Antimony		Analysis of constituent not required and not performed.
		Arsenic		Analysis of constituent not required and not performed.
		Barium		Analysis of constituent not required and not performed.
		Beryllium		Analysis of constituent not required and not performed.
		Boron		Analysis of constituent not required and not performed.
		Cadmium		Analysis of constituent not required and not performed.
		Calcium		Analysis of constituent not required and not performed.
		Chromium		Analysis of constituent not required and not performed.
		Cobalt		Analysis of constituent not required and not performed.
		Copper		Analysis of constituent not required and not performed.
		Iron		Analysis of constituent not required and not performed.
		Lead		Analysis of constituent not required and not performed.
		Magnesium		Analysis of constituent not required and not performed.
		Manganese		Analysis of constituent not required and not performed.
		Mercury		Analysis of constituent not required and not performed.
		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.

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
8004-4820 MW369	MW369UG3-19R	Bromide		Analysis of constituent not required and not performed.
		Chloride		Analysis of constituent not required and not performed.
		Fluoride		Analysis of constituent not required and not performed.
		Nitrate & Nitrite		Analysis of constituent not required and not performed.
		Sulfate		Analysis of constituent not required and not performed.
		Total Dissolved Solids		Analysis of constituent not required and not performed.
		Aluminum		Analysis of constituent not required and not performed.
		Antimony		Analysis of constituent not required and not performed.
		Arsenic		Analysis of constituent not required and not performed.
		Barium		Analysis of constituent not required and not performed.
		Beryllium		Analysis of constituent not required and not performed.
		Boron		Analysis of constituent not required and not performed.
		Cadmium		Analysis of constituent not required and not performed.
		Calcium		Analysis of constituent not required and not performed.
		Chromium		Analysis of constituent not required and not performed.
		Cobalt		Analysis of constituent not required and not performed.
		Copper		Analysis of constituent not required and not performed.
		Iron		Analysis of constituent not required and not performed.
		Lead		Analysis of constituent not required and not performed.
		Magnesium		Analysis of constituent not required and not performed.
		Manganese		Analysis of constituent not required and not performed.
		Mercury		Analysis of constituent not required and not performed.
		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.

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
8004-4818 MW370	MW370UG3-19R	Bromide		Analysis of constituent not required and not performed.
		Chloride		Analysis of constituent not required and not performed.
		Fluoride		Analysis of constituent not required and not performed.
		Nitrate & Nitrite		Analysis of constituent not required and not performed.
		Sulfate		Analysis of constituent not required and not performed.
		Total Dissolved Solids		Analysis of constituent not required and not performed.
		Aluminum		Analysis of constituent not required and not performed.
		Antimony		Analysis of constituent not required and not performed.
		Arsenic		Analysis of constituent not required and not performed.
		Barium		Analysis of constituent not required and not performed.
		Beryllium		Analysis of constituent not required and not performed.
		Boron		Analysis of constituent not required and not performed.
		Cadmium		Analysis of constituent not required and not performed.
		Calcium		Analysis of constituent not required and not performed.
		Chromium		Analysis of constituent not required and not performed.
		Cobalt		Analysis of constituent not required and not performed.
		Copper		Analysis of constituent not required and not performed.
		Iron		Analysis of constituent not required and not performed.
		Lead		Analysis of constituent not required and not performed.
		Magnesium		Analysis of constituent not required and not performed.
		Manganese		Analysis of constituent not required and not performed.
		Mercury		Analysis of constituent not required and not performed.
		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.

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
8004-4808 MW372	MW372UG3-19R	Bromide		Analysis of constituent not required and not performed.
		Chloride		Analysis of constituent not required and not performed.
		Fluoride		Analysis of constituent not required and not performed.
		Nitrate & Nitrite		Analysis of constituent not required and not performed.
		Sulfate		Analysis of constituent not required and not performed.
		Total Dissolved Solids		Analysis of constituent not required and not performed.
		Aluminum		Analysis of constituent not required and not performed.
		Antimony		Analysis of constituent not required and not performed.
		Arsenic		Analysis of constituent not required and not performed.
		Barium		Analysis of constituent not required and not performed.
		Beryllium		Analysis of constituent not required and not performed.
		Boron		Analysis of constituent not required and not performed.
		Cadmium		Analysis of constituent not required and not performed.
		Calcium		Analysis of constituent not required and not performed.
		Chromium		Analysis of constituent not required and not performed.
		Cobalt		Analysis of constituent not required and not performed.
		Copper		Analysis of constituent not required and not performed.
		Iron		Analysis of constituent not required and not performed.
		Lead		Analysis of constituent not required and not performed.
		Magnesium		Analysis of constituent not required and not performed.
		Manganese		Analysis of constituent not required and not performed.
		Mercury		Analysis of constituent not required and not performed.
		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.

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
8004-4792 MW373	MW373UG3-19R	Bromide		Analysis of constituent not required and not performed.
		Chloride		Analysis of constituent not required and not performed.
		Fluoride		Analysis of constituent not required and not performed.
		Nitrate & Nitrite		Analysis of constituent not required and not performed.
		Sulfate		Analysis of constituent not required and not performed.
		Total Dissolved Solids		Analysis of constituent not required and not performed.
		Aluminum		Analysis of constituent not required and not performed.
		Antimony		Analysis of constituent not required and not performed.
		Arsenic		Analysis of constituent not required and not performed.
		Barium		Analysis of constituent not required and not performed.
		Beryllium		Analysis of constituent not required and not performed.
		Boron		Analysis of constituent not required and not performed.
		Cadmium		Analysis of constituent not required and not performed.
		Calcium		Analysis of constituent not required and not performed.
		Chromium		Analysis of constituent not required and not performed.
		Cobalt		Analysis of constituent not required and not performed.
		Copper		Analysis of constituent not required and not performed.
		Iron		Analysis of constituent not required and not performed.
		Lead		Analysis of constituent not required and not performed.
		Magnesium		Analysis of constituent not required and not performed.
		Manganese		Analysis of constituent not required and not performed.
		Mercury		Analysis of constituent not required and not performed.
		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.

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
8004-4809 MW384	MW384SG3-19R	Bromide		Analysis of constituent not required and not performed.
		Chloride		Analysis of constituent not required and not performed.
		Fluoride		Analysis of constituent not required and not performed.
		Nitrate & Nitrite		Analysis of constituent not required and not performed.
		Sulfate		Analysis of constituent not required and not performed.
		Total Dissolved Solids		Analysis of constituent not required and not performed.
		Aluminum		Analysis of constituent not required and not performed.
		Antimony		Analysis of constituent not required and not performed.
		Arsenic		Analysis of constituent not required and not performed.
		Barium		Analysis of constituent not required and not performed.
		Beryllium		Analysis of constituent not required and not performed.
		Boron		Analysis of constituent not required and not performed.
		Cadmium		Analysis of constituent not required and not performed.
		Calcium		Analysis of constituent not required and not performed.
		Chromium		Analysis of constituent not required and not performed.
		Cobalt		Analysis of constituent not required and not performed.
		Copper		Analysis of constituent not required and not performed.
		Iron		Analysis of constituent not required and not performed.
		Lead		Analysis of constituent not required and not performed.
		Magnesium		Analysis of constituent not required and not performed.
		Manganese		Analysis of constituent not required and not performed.
		Mercury		Analysis of constituent not required and not performed.
		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.

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
8004-4810 MW385	MW385SG3-19R	Bromide		Analysis of constituent not required and not performed.
		Chloride		Analysis of constituent not required and not performed.
		Fluoride		Analysis of constituent not required and not performed.
		Nitrate & Nitrite		Analysis of constituent not required and not performed.
		Sulfate		Analysis of constituent not required and not performed.
		Total Dissolved Solids		Analysis of constituent not required and not performed.
		Aluminum		Analysis of constituent not required and not performed.
		Antimony		Analysis of constituent not required and not performed.
		Arsenic		Analysis of constituent not required and not performed.
		Barium		Analysis of constituent not required and not performed.
		Beryllium		Analysis of constituent not required and not performed.
		Boron		Analysis of constituent not required and not performed.
		Cadmium		Analysis of constituent not required and not performed.
		Calcium		Analysis of constituent not required and not performed.
		Chromium		Analysis of constituent not required and not performed.
		Cobalt		Analysis of constituent not required and not performed.
		Copper		Analysis of constituent not required and not performed.
		Iron		Analysis of constituent not required and not performed.
		Lead		Analysis of constituent not required and not performed.
		Magnesium		Analysis of constituent not required and not performed.
		Manganese		Analysis of constituent not required and not performed.
		Mercury		Analysis of constituent not required and not performed.
		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.

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
8004-4804 MW386	MW386SG3-19R	Bromide		Analysis of constituent not required and not performed.
		Chloride		Analysis of constituent not required and not performed.
		Fluoride		Analysis of constituent not required and not performed.
		Nitrate & Nitrite		Analysis of constituent not required and not performed.
		Sulfate		Analysis of constituent not required and not performed.
		Total Dissolved Solids		Analysis of constituent not required and not performed.
		Aluminum		Analysis of constituent not required and not performed.
		Antimony		Analysis of constituent not required and not performed.
		Arsenic		Analysis of constituent not required and not performed.
		Barium		Analysis of constituent not required and not performed.
		Beryllium		Analysis of constituent not required and not performed.
		Boron		Analysis of constituent not required and not performed.
		Cadmium		Analysis of constituent not required and not performed.
		Calcium		Analysis of constituent not required and not performed.
		Chromium		Analysis of constituent not required and not performed.
		Cobalt		Analysis of constituent not required and not performed.
		Copper		Analysis of constituent not required and not performed.
		Iron		Analysis of constituent not required and not performed.
		Lead		Analysis of constituent not required and not performed.
		Magnesium		Analysis of constituent not required and not performed.
		Manganese		Analysis of constituent not required and not performed.
		Mercury		Analysis of constituent not required and not performed.
		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.

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
8004-4815 MW387	MW387SG3-19R	Bromide		Analysis of constituent not required and not performed.
		Chloride		Analysis of constituent not required and not performed.
		Fluoride		Analysis of constituent not required and not performed.
		Nitrate & Nitrite		Analysis of constituent not required and not performed.
		Sulfate		Analysis of constituent not required and not performed.
		Total Dissolved Solids		Analysis of constituent not required and not performed.
		Aluminum		Analysis of constituent not required and not performed.
		Antimony		Analysis of constituent not required and not performed.
		Arsenic		Analysis of constituent not required and not performed.
		Barium		Analysis of constituent not required and not performed.
		Beryllium		Analysis of constituent not required and not performed.
		Boron		Analysis of constituent not required and not performed.
		Cadmium		Analysis of constituent not required and not performed.
		Calcium		Analysis of constituent not required and not performed.
		Chromium		Analysis of constituent not required and not performed.
		Cobalt		Analysis of constituent not required and not performed.
		Copper		Analysis of constituent not required and not performed.
		Iron		Analysis of constituent not required and not performed.
		Lead		Analysis of constituent not required and not performed.
		Magnesium		Analysis of constituent not required and not performed.
		Manganese		Analysis of constituent not required and not performed.
		Mercury		Analysis of constituent not required and not performed.
		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.

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
8004-4816 MW388	MW388SG3-19R	Bromide		Analysis of constituent not required and not performed.
		Chloride		Analysis of constituent not required and not performed.
		Fluoride		Analysis of constituent not required and not performed.
		Nitrate & Nitrite		Analysis of constituent not required and not performed.
		Sulfate		Analysis of constituent not required and not performed.
		Total Dissolved Solids		Analysis of constituent not required and not performed.
		Aluminum		Analysis of constituent not required and not performed.
		Antimony		Analysis of constituent not required and not performed.
		Arsenic		Analysis of constituent not required and not performed.
		Barium		Analysis of constituent not required and not performed.
		Beryllium		Analysis of constituent not required and not performed.
		Boron		Analysis of constituent not required and not performed.
		Cadmium		Analysis of constituent not required and not performed.
		Calcium		Analysis of constituent not required and not performed.
		Chromium		Analysis of constituent not required and not performed.
		Cobalt		Analysis of constituent not required and not performed.
		Copper		Analysis of constituent not required and not performed.
		Iron		Analysis of constituent not required and not performed.
		Lead		Analysis of constituent not required and not performed.
		Magnesium		Analysis of constituent not required and not performed.
		Manganese		Analysis of constituent not required and not performed.
		Mercury		Analysis of constituent not required and not performed.
		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.

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
8004-4811 MW390	MW390SG3-19R	Bromide		Analysis of constituent not required and not performed.
		Chloride		Analysis of constituent not required and not performed.
		Fluoride		Analysis of constituent not required and not performed.
		Nitrate & Nitrite		Analysis of constituent not required and not performed.
		Sulfate		Analysis of constituent not required and not performed.
		Total Dissolved Solids		Analysis of constituent not required and not performed.
		Aluminum		Analysis of constituent not required and not performed.
		Antimony		Analysis of constituent not required and not performed.
		Arsenic		Analysis of constituent not required and not performed.
		Barium		Analysis of constituent not required and not performed.
		Beryllium		Analysis of constituent not required and not performed.
		Boron		Analysis of constituent not required and not performed.
		Cadmium		Analysis of constituent not required and not performed.
		Calcium		Analysis of constituent not required and not performed.
		Chromium		Analysis of constituent not required and not performed.
		Cobalt		Analysis of constituent not required and not performed.
		Copper		Analysis of constituent not required and not performed.
		Iron		Analysis of constituent not required and not performed.
		Lead		Analysis of constituent not required and not performed.
		Magnesium		Analysis of constituent not required and not performed.
		Manganese		Analysis of constituent not required and not performed.
		Mercury		Analysis of constituent not required and not performed.
		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.

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
8004-4805 MW391	MW391SG3-19R	Bromide		Analysis of constituent not required and not performed.
		Chloride		Analysis of constituent not required and not performed.
		Fluoride		Analysis of constituent not required and not performed.
		Nitrate & Nitrite		Analysis of constituent not required and not performed.
		Sulfate		Analysis of constituent not required and not performed.
		Total Dissolved Solids		Analysis of constituent not required and not performed.
		Aluminum		Analysis of constituent not required and not performed.
		Antimony		Analysis of constituent not required and not performed.
		Arsenic		Analysis of constituent not required and not performed.
		Barium		Analysis of constituent not required and not performed.
		Beryllium		Analysis of constituent not required and not performed.
		Boron		Analysis of constituent not required and not performed.
		Cadmium		Analysis of constituent not required and not performed.
		Calcium		Analysis of constituent not required and not performed.
		Chromium		Analysis of constituent not required and not performed.
		Cobalt		Analysis of constituent not required and not performed.
		Copper		Analysis of constituent not required and not performed.
		Iron		Analysis of constituent not required and not performed.
		Lead		Analysis of constituent not required and not performed.
		Magnesium		Analysis of constituent not required and not performed.
		Manganese		Analysis of constituent not required and not performed.
		Mercury		Analysis of constituent not required and not performed.
		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.

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
8004-4806 MW392	MW392SG3-19R	Bromide		Analysis of constituent not required and not performed.
		Chloride		Analysis of constituent not required and not performed.
		Fluoride		Analysis of constituent not required and not performed.
		Nitrate & Nitrite		Analysis of constituent not required and not performed.
		Sulfate		Analysis of constituent not required and not performed.
		Total Dissolved Solids		Analysis of constituent not required and not performed.
		Aluminum		Analysis of constituent not required and not performed.
		Antimony		Analysis of constituent not required and not performed.
		Arsenic		Analysis of constituent not required and not performed.
		Barium		Analysis of constituent not required and not performed.
		Beryllium		Analysis of constituent not required and not performed.
		Boron		Analysis of constituent not required and not performed.
		Cadmium		Analysis of constituent not required and not performed.
		Calcium		Analysis of constituent not required and not performed.
		Chromium		Analysis of constituent not required and not performed.
		Cobalt		Analysis of constituent not required and not performed.
		Copper		Analysis of constituent not required and not performed.
		Iron		Analysis of constituent not required and not performed.
		Lead		Analysis of constituent not required and not performed.
		Magnesium		Analysis of constituent not required and not performed.
		Manganese		Analysis of constituent not required and not performed.
		Mercury		Analysis of constituent not required and not performed.
		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.

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
8004-4807 MW393	MW393SG3-19R	Bromide		Analysis of constituent not required and not performed.
		Chloride		Analysis of constituent not required and not performed.
		Fluoride		Analysis of constituent not required and not performed.
		Nitrate & Nitrite		Analysis of constituent not required and not performed.
		Sulfate		Analysis of constituent not required and not performed.
		Total Dissolved Solids		Analysis of constituent not required and not performed.
		Aluminum		Analysis of constituent not required and not performed.
		Antimony		Analysis of constituent not required and not performed.
		Arsenic		Analysis of constituent not required and not performed.
		Barium		Analysis of constituent not required and not performed.
		Beryllium		Analysis of constituent not required and not performed.
		Boron		Analysis of constituent not required and not performed.
		Cadmium		Analysis of constituent not required and not performed.
		Calcium		Analysis of constituent not required and not performed.
		Chromium		Analysis of constituent not required and not performed.
		Cobalt		Analysis of constituent not required and not performed.
		Copper		Analysis of constituent not required and not performed.
		Iron		Analysis of constituent not required and not performed.
		Lead		Analysis of constituent not required and not performed.
		Magnesium		Analysis of constituent not required and not performed.
		Manganese		Analysis of constituent not required and not performed.
		Mercury		Analysis of constituent not required and not performed.
		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.

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
8004-4802 MW394	MW394SG3-19R	Bromide		Analysis of constituent not required and not performed.
		Chloride		Analysis of constituent not required and not performed.
		Fluoride		Analysis of constituent not required and not performed.
		Nitrate & Nitrite		Analysis of constituent not required and not performed.
		Sulfate		Analysis of constituent not required and not performed.
		Total Dissolved Solids		Analysis of constituent not required and not performed.
		Aluminum		Analysis of constituent not required and not performed.
		Antimony		Analysis of constituent not required and not performed.
		Arsenic		Analysis of constituent not required and not performed.
		Barium		Analysis of constituent not required and not performed.
		Beryllium		Analysis of constituent not required and not performed.
		Boron		Analysis of constituent not required and not performed.
		Cadmium		Analysis of constituent not required and not performed.
		Calcium		Analysis of constituent not required and not performed.
		Chromium		Analysis of constituent not required and not performed.
		Cobalt		Analysis of constituent not required and not performed.
		Copper		Analysis of constituent not required and not performed.
		Iron		Analysis of constituent not required and not performed.
		Lead		Analysis of constituent not required and not performed.
		Magnesium		Analysis of constituent not required and not performed.
		Manganese		Analysis of constituent not required and not performed.
		Mercury		Analysis of constituent not required and not performed.
		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.

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
8004-4801 MW395	MW395SG3-19R	Bromide		Analysis of constituent not required and not performed.
		Chloride		Analysis of constituent not required and not performed.
		Fluoride		Analysis of constituent not required and not performed.
		Nitrate & Nitrite		Analysis of constituent not required and not performed.
		Sulfate		Analysis of constituent not required and not performed.
		Total Dissolved Solids		Analysis of constituent not required and not performed.
		Aluminum		Analysis of constituent not required and not performed.
		Antimony		Analysis of constituent not required and not performed.
		Arsenic		Analysis of constituent not required and not performed.
		Barium		Analysis of constituent not required and not performed.
		Beryllium		Analysis of constituent not required and not performed.
		Boron		Analysis of constituent not required and not performed.
		Cadmium		Analysis of constituent not required and not performed.
		Calcium		Analysis of constituent not required and not performed.
		Chromium		Analysis of constituent not required and not performed.
		Cobalt		Analysis of constituent not required and not performed.
		Copper		Analysis of constituent not required and not performed.
		Iron		Analysis of constituent not required and not performed.
		Lead		Analysis of constituent not required and not performed.
		Magnesium		Analysis of constituent not required and not performed.
		Manganese		Analysis of constituent not required and not performed.
		Mercury		Analysis of constituent not required and not performed.
		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.

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
8004-4803 MW396	MW396SG3-19R	Bromide		Analysis of constituent not required and not performed.
		Chloride		Analysis of constituent not required and not performed.
		Fluoride		Analysis of constituent not required and not performed.
		Nitrate & Nitrite		Analysis of constituent not required and not performed.
		Sulfate		Analysis of constituent not required and not performed.
		Total Dissolved Solids		Analysis of constituent not required and not performed.
		Aluminum		Analysis of constituent not required and not performed.
		Antimony		Analysis of constituent not required and not performed.
		Arsenic		Analysis of constituent not required and not performed.
		Barium		Analysis of constituent not required and not performed.
		Beryllium		Analysis of constituent not required and not performed.
		Boron		Analysis of constituent not required and not performed.
		Cadmium		Analysis of constituent not required and not performed.
		Calcium		Analysis of constituent not required and not performed.
		Chromium		Analysis of constituent not required and not performed.
		Cobalt		Analysis of constituent not required and not performed.
		Copper		Analysis of constituent not required and not performed.
		Iron		Analysis of constituent not required and not performed.
		Lead		Analysis of constituent not required and not performed.
		Magnesium		Analysis of constituent not required and not performed.
		Manganese		Analysis of constituent not required and not performed.
		Mercury		Analysis of constituent not required and not performed.
		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.

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
8004-4817 MW397	MW397SG3-19R	Bromide		Analysis of constituent not required and not performed.
		Chloride		Analysis of constituent not required and not performed.
		Fluoride		Analysis of constituent not required and not performed.
		Nitrate & Nitrite		Analysis of constituent not required and not performed.
		Sulfate		Analysis of constituent not required and not performed.
		Total Dissolved Solids		Analysis of constituent not required and not performed.
		Aluminum		Analysis of constituent not required and not performed.
		Antimony		Analysis of constituent not required and not performed.
		Arsenic		Analysis of constituent not required and not performed.
		Barium		Analysis of constituent not required and not performed.
		Beryllium		Analysis of constituent not required and not performed.
		Boron		Analysis of constituent not required and not performed.
		Cadmium		Analysis of constituent not required and not performed.
		Calcium		Analysis of constituent not required and not performed.
		Chromium		Analysis of constituent not required and not performed.
		Cobalt		Analysis of constituent not required and not performed.
		Copper		Analysis of constituent not required and not performed.
		Iron		Analysis of constituent not required and not performed.
		Lead		Analysis of constituent not required and not performed.
		Magnesium		Analysis of constituent not required and not performed.
		Manganese		Analysis of constituent not required and not performed.
		Mercury		Analysis of constituent not required and not performed.
		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.

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
8000-5202 MW221	MW221DSG3-19R	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 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.
		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.
		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.

APPENDIX D

**STATISTICAL ANALYSES AND
QUALIFICATION STATEMENT**

THIS PAGE INTENTIONALLY LEFT BLANK

GROUNDWATER STATISTICAL COMMENTS

Introduction

The statistical analyses conducted on the second quarter 2019 groundwater data collected from the C-746-S&T Landfills monitoring wells (MWs) were performed in accordance with Permit GSTR0003, 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).

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 second quarter 2019 data used to conduct the statistical analyses were collected in April and May 2019. 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 was run on analytes that had at least one downgradient well that exceeded the historical background, using the last eight quarters. 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 for 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 for pH. The test well results are compared to both an upper and lower tolerance limit (TL) to determine if statistically significant deviations in concentrations exist with respect to upgradient (background) well data from the first eight quarters. The tolerance interval statistical analysis is conducted separately for each parameter in each well (no pooling of downgradient data).

Statistical analyses are performed on the first eight quarters of historical background data, not on the data for the current quarter. Once a statistical result is obtained using the background data, the result for the current quarter is compared to that value. If the value is exceeded, the well is considered to have an exceedance of the statistically derived historical background concentration.

**Exhibit D.1. Station Identification for Monitoring
Wells Analyzed**

Station	Type	Groundwater Unit
MW220	BG	URGA
MW221	SG	URGA
MW222	SG	URGA
MW223	SG	URGA
MW224	SG	URGA
MW369	TW	URGA
MW370	TW	LRGA
MW372	TW	URGA
MW373	TW	LRGA
MW384	SG	URGA
MW385	SG	LRGA
MW386 ¹	SG	UCRS
MW387	TW	URGA
MW388	TW	LRGA
MW389 ^{1*}	TW	UCRS
MW390 ¹	TW	UCRS
MW391	TW	URGA
MW392	TW	LRGA
MW393 ¹	TW	UCRS
MW394	BG	URGA
MW395	BG	LRGA
MW396 ¹	BG	UCRS
MW397	BG	LRGA

¹**NOTE:** The gradients in UCRS wells are downward. The UCRS wells identified as up-, side- or downgradient are those wells located in the same general direction as the RGA wells considered to be up-, side-, or downgradient.

BG: upgradient or background wells

TW: downgradient or test wells

SG: sidegradient wells

*Well was dry this quarter and a groundwater sample could not be collected.

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. The tolerance interval statistical analysis is conducted separately for each parameter in each well (no pooling of downgradient data).

For the statistical analysis of pH, a two-sided tolerance interval statistical test is conducted, 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. 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 a statistically significant difference in concentration compared to the current background concentration.

A stepwise list of the one-sided tolerance interval statistical procedure applied to the data is summarized below.¹

1. The TL is calculated for the background data (first using the first eight quarters, then using the last eight quarters).
 - 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-S&T Residential and Inert Landfills. Exhibit D.2 presents the parameters from the available data set for which a statistical test was performed using the one-sided tolerance interval.

Exhibits D.3, D.4, and D.5 list the number of analyses (observations), nondetects (censored observations), and detects (uncensored observations) by parameter in the UCRS, the URGAs, and the LRGA, respectively. Those parameters displayed with bold-face type indicate the one-sided tolerance interval statistical test was performed. The data presented in Exhibits D.3, D.4, and D.5 were collected during the current quarter, second quarter 2019. The observations are representative of the current quarter data. Historical background data are presented in Attachment D1. The sampling dates associated with background data are listed next to the result in Attachment D1. 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, this result is not used, and the next available data point is used for the background or current quarter data. A result has been considered a nondetect if it has a “U” validation code.

¹ For pH, two-sided TLs (upper and lower) were calculated with an adjusted K factor using the following equations:

$$\text{upper TL} = X + (K \times S)$$

$$\text{lower TL} = X - (K \times S)$$

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

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

*For pH, the test well results were compared to both an upper and lower TL to determine if the current result differs to a statistically significant degree from the historical background values.

Exhibit D.3. Summary of Censored and Uncensored Data—UCRS

Parameters	Observations	Censored Observation	Uncensored Observation	Statistical Analysis?
1,1,1,2-Tetrachloroethane	4	4	0	No
1,1,2,2-Tetrachloroethane	4	4	0	No
1,1,2-Trichloroethane	4	4	0	No
1,1-Dichloroethane	4	4	0	No
1,2,3-Trichloropropane	4	4	0	No
1,2-Dibromo-3-chloropropane	4	4	0	No
1,2-Dibromoethane	4	4	0	No
1,2-Dichlorobenzene	4	4	0	No
1,2-Dichloropropane	4	4	0	No
2-Butanone	4	4	0	No
2-Hexanone	4	4	0	No
4-Methyl-2-pentanone	4	4	0	No
Acetone	4	4	0	No
Acrolein	4	4	0	No
Acrylonitrile	4	4	0	No
Aluminum	4	1	3	Yes
Antimony	4	2	2	Yes
Beryllium	4	4	0	No
Boron	4	0	4	Yes
Bromide	4	0	4	Yes
Bromochloromethane	4	4	0	No
Bromodichloromethane	4	4	0	No
Bromoform	4	4	0	No
Bromomethane	4	4	0	No
Calcium	4	0	4	Yes
Carbon disulfide	4	4	0	No
Chemical Oxygen Demand (COD)	4	2	2	Yes
Chloride	4	0	4	Yes
Chlorobenzene	4	4	0	No
Chloroethane	4	4	0	No
Chloroform	4	4	0	No
Chloromethane	4	4	0	No
<i>cis</i> -1,2-Dichloroethene	4	4	0	No
<i>cis</i> -1,3-Dichloropropene	4	4	0	No
Cobalt	4	2	2	Yes
Conductivity	4	0	4	Yes
Copper	4	0	4	Yes
Cyanide	4	4	0	No
Dibromochloromethane	4	4	0	No
Dibromomethane	4	4	0	No
Dimethylbenzene, Total	4	4	0	No
Dissolved Oxygen	4	0	4	Yes
Dissolved Solids	4	0	4	Yes
Ethylbenzene	4	4	0	No
Iodide	4	4	0	No

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

Parameters	Observations	Censored Observation	Uncensored Observation	Statistical Analysis?
Iodomethane	4	4	0	No
Iron	4	0	4	Yes
Magnesium	4	0	4	Yes
Manganese	4	1	3	Yes
Methylene chloride	4	4	0	No
Molybdenum	4	2	2	Yes
Nickel	4	1	3	Yes
Oxidation-Reduction Potential	4	0	4	Yes
pH	4	0	4	Yes
Potassium	4	0	4	Yes
Radium-226	4	4	0	No
Rhodium	4	4	0	No
Sodium	4	0	4	Yes
Styrene	4	4	0	No
Sulfate	4	0	4	Yes
Tantalum	4	4	0	No
Technetium-99	4	3	1	Yes
Tetrachloroethene	4	4	0	No
Thallium	4	4	0	No
Thorium-230	4	4	0	No
Toluene	4	4	0	No
Total Organic Carbon (TOC)	4	0	4	Yes
Total Organic Halides (TOX)	4	0	4	Yes
<i>trans</i> -1,2-Dichloroethene	4	4	0	No
<i>trans</i> -1,3-Dichloropropene	4	4	0	No
<i>trans</i> -1,4-Dichloro-2-Butene	4	4	0	No
Trichlorofluoromethane	4	4	0	No
Vanadium	4	3	1	Yes
Vinyl Acetate	4	4	0	No
Zinc	4	2	2	Yes

Bold denotes parameters with at least one uncensored observation.

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

Parameters	Observations	Censored Observation	Uncensored Observation	Statistical Analysis?
1,1,1,2-Tetrachloroethane	11	11	0	No
1,1,2,2-Tetrachloroethane	11	11	0	No
1,1,2-Trichloroethane	11	11	0	No
1,1-Dichloroethane	11	11	0	No
1,2,3-Trichloropropane	11	11	0	No
1,2-Dibromo-3-chloropropane	11	11	0	No
1,2-Dibromoethane	11	11	0	No
1,2-Dichlorobenzene	11	11	0	No
1,2-Dichloropropane	11	11	0	No
2-Butanone	11	11	0	No
2-Hexanone	11	11	0	No
4-Methyl-2-pentanone	11	11	0	No
Acetone	11	11	0	No
Acrolein	11	11	0	No
Acrylonitrile	11	11	0	No
Aluminum	11	10	1	Yes
Antimony	11	3	8	Yes
Beryllium	11	11	0	No
Beta activity	11	4	7	Yes
Boron	11	0	11	Yes
Bromide	11	0	11	Yes
Bromochloromethane	11	11	0	No
Bromodichloromethane	11	11	0	No
Bromoform	11	11	0	No
Bromomethane	11	11	0	No
Calcium	11	0	11	Yes
Carbon disulfide	11	10	1	Yes
Chemical Oxygen Demand (COD)	11	4	7	Yes
Chloride	11	0	11	Yes
Chlorobenzene	11	11	0	No
Chloroethane	11	11	0	No
Chloroform	11	11	0	No
Chloromethane	11	11	0	No
cis-1,2-Dichloroethene	11	10	1	Yes
cis-1,3-Dichloropropene	11	11	0	No
Cobalt	11	5	6	Yes
Conductivity	11	0	11	Yes
Copper	11	0	11	Yes
Cyanide	11	11	0	No
Dibromochloromethane	11	11	0	No
Dibromomethane	11	11	0	No
Dimethylbenzene, Total	11	11	0	No
Dissolved Oxygen	11	0	11	Yes
Dissolved Solids	11	0	11	Yes
Ethylbenzene	11	11	0	No

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

Parameters	Observations	Censored Observation	Uncensored Observation	Statistical Analysis?
Iodide	11	11	0	No
Iodomethane	11	11	0	No
Iron	11	2	9	Yes
Magnesium	11	0	11	Yes
Manganese	11	5	6	Yes
Methylene chloride	11	7	4	Yes
Molybdenum	11	7	4	Yes
Nickel	11	1	10	Yes
Oxidation-Reduction Potential	11	0	11	Yes
pH	11	0	11	Yes
Potassium	11	0	11	Yes
Radium-226	11	11	0	No
Rhodium	11	11	0	No
Sodium	11	0	11	Yes
Styrene	11	11	0	No
Sulfate	11	0	11	Yes
Tantalum	11	11	0	No
Technetium-99	11	6	5	Yes
Tetrachloroethene	11	11	0	No
Thallium	11	11	0	No
Thorium-230	11	11	0	No
Toluene	11	11	0	No
Total Organic Carbon (TOC)	11	0	11	Yes
Total Organic Halides (TOX)	11	1	10	Yes
<i>trans</i> -1,2-Dichloroethene	11	11	0	No
<i>trans</i> -1,3-Dichloropropene	11	11	0	No
<i>trans</i> -1,4-Dichloro-2-Butene	11	11	0	No
Trichloroethene	11	4	7	Yes
Trichlorofluoromethane	11	11	0	No
Vanadium	11	9	2	Yes
Vinyl Acetate	11	11	0	No
Zinc	11	8	3	Yes

Bold denotes parameters with at least one uncensored observation.

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

Parameters	Observations	Censored Observation	Uncensored Observation	Statistical Analysis?
1,1,1,2-Tetrachloroethane	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	6	1	Yes
Acrolein	7	7	0	No
Acrylonitrile	7	7	0	No
Aluminum	7	2	5	Yes
Antimony	7	3	4	Yes
Beryllium	7	7	0	No
Beta activity	7	3	4	Yes
Boron	7	0	7	Yes
Bromide	7	0	7	Yes
Bromochloromethane	7	7	0	No
Bromodichloromethane	7	7	0	No
Bromoform	7	7	0	No
Bromomethane	7	7	0	No
Calcium	7	0	7	Yes
Carbon disulfide	7	7	0	No
Chemical Oxygen Demand (COD)	7	5	2	Yes
Chloride	7	0	7	Yes
Chlorobenzene	7	7	0	No
Chloroethane	7	7	0	No
Chloroform	7	7	0	No
Chloromethane	7	7	0	No
cis-1,2-Dichloroethene	7	6	1	Yes
cis-1,3-Dichloropropene	7	7	0	No
Cobalt	7	4	3	Yes
Conductivity	7	0	7	Yes
Copper	7	0	7	Yes
Cyanide	7	7	0	No
Dibromochloromethane	7	7	0	No
Dibromomethane	7	7	0	No
Dimethylbenzene, Total	7	7	0	No
Dissolved Oxygen	7	0	7	Yes
Dissolved Solids	7	0	7	Yes
Ethylbenzene	7	7	0	No
Iodide	7	7	0	No
Iodomethane	7	7	0	No
Iron	7	0	7	Yes

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

Parameters	Observations	Censored Observation	Uncensored Observation	Statistical Analysis?
Magnesium	7	0	7	Yes
Manganese	7	3	4	Yes
Methylene chloride	7	5	2	Yes
Molybdenum	7	7	0	No
Nickel	7	0	7	Yes
Oxidation-Reduction Potential	7	0	7	Yes
pH	7	0	7	Yes
Potassium	7	0	7	Yes
Radium-226	7	7	0	No
Rhodium	7	7	0	No
Sodium	7	0	7	Yes
Styrene	7	7	0	No
Sulfate	7	0	7	Yes
Tantalum	7	7	0	No
Technetium-99	7	2	5	Yes
Tetrachloroethene	7	7	0	No
Thallium	7	7	0	No
Thorium-230	7	7	0	No
Toluene	7	7	0	No
Total Organic Carbon (TOC)	7	0	7	Yes
Total Organic Halides (TOX)	7	1	6	Yes
<i>trans</i> -1,2-Dichloroethene	7	7	0	No
<i>trans</i> -1,3-Dichloropropene	7	7	0	No
<i>trans</i> -1,4-Dichloro-2-Butene	7	7	0	No
Trichloroethene	7	1	6	Yes
Trichlorofluoromethane	7	7	0	No
Vanadium	7	5	2	Yes
Vinyl Acetate	7	7	0	No
Zinc	7	3	4	Yes

Bold denotes parameters with at least one uncensored observation.

Discussion of Results from Historical Background Comparison

For the UCRS, URGA, and LRGA, the concentrations of this quarter were compared to the results of the one-sided tolerance interval tests that were calculated using historical background and presented in Attachment D1. The statistician qualification statement is presented in Attachment D3. For the UCRS, URGA, and LRGA, the test was applied to 27, 32, and 31 parameters, respectively, including those listed in bold print in Exhibits D.3, D.4, and D.5, which includes those constituents (beta activity and 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 exceedances of historical background UTL for chemical oxygen demand (COD), oxidation-reduction potential, and technetium-99.

URGA

This quarter's results identified exceedances of historical background UTL for beta activity, calcium, chemical oxygen demand (COD), dissolved solids, magnesium, oxidation-reduction potential, sodium, sulfate, and technetium-99.

LRGA

This quarter's results identified exceedances of historical background UTL for beta activity, calcium, chemical oxygen demand (COD), chloride, conductivity, dissolved solids, magnesium, oxidation-reduction potential, sulfate, 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 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
MW386: Oxidation-reduction potential	MW220: Oxidation-reduction potential, sulfate	MW370: Beta activity, oxidation-reduction potential, sulfate, technetium-99
MW390: Oxidation-reduction potential, technetium-99	MW221: Oxidation-reduction potential	MW373: Calcium, chemical oxygen demand (COD), conductivity, dissolved solids, magnesium, oxidation-reduction potential, sulfate
MW393: Oxidation-reduction potential	MW222: Oxidation-reduction potential	MW385: Beta activity, oxidation-reduction potential, sulfate, technetium-99
MW396: Chemical Oxygen Demand (COD), oxidation-reduction potential	MW223: Oxidation-reduction potential, sulfate	MW388: Beta activity, oxidation-reduction potential, sulfate, technetium-99
	MW224: Oxidation-reduction potential	MW392: Chloride, oxidation-reduction potential
	MW369: Beta activity, technetium-99	MW395: Oxidation-reduction potential
	MW372: Calcium, chemical oxygen demand (COD), dissolved solids, magnesium, oxidation-reduction potential, sulfate, technetium-99	MW397: Oxidation-reduction potential
	MW384: Beta activity, oxidation-reduction potential, sulfate, technetium-99	
	MW387: Beta activity, oxidation-reduction potential, sodium, sulfate, technetium-99	
	MW391: Chemical oxygen demand (COD), oxidation-reduction potential, sulfate	
	MW394: Oxidation-reduction potential	

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

Parameter	Performed Test	CV Normality Test*	Results of Tolerance Interval Test Conducted
Aluminum	Tolerance Interval	0.57	No exceedance of statistically derived historical background concentration.
Antimony	Tolerance Interval	1.68	No exceedance of statistically derived historical background concentration.
Boron	Tolerance Interval	1.28	No exceedance of statistically derived historical background concentration.
Bromide	Tolerance Interval	0.24	No exceedance of statistically derived historical background concentration.
Calcium	Tolerance Interval	0.20	No exceedance of statistically derived historical background concentration.
Chemical Oxygen Demand (COD)	Tolerance Interval	0.02	Current results exceed statistically derived historical background concentration in MW396.
Chloride	Tolerance Interval	0.05	No exceedance of statistically derived historical background concentration.
Cobalt	Tolerance Interval	1.34	No exceedance of statistically derived historical background concentration.
Conductivity	Tolerance Interval	0.12	No exceedance of statistically derived historical background concentration.
Copper	Tolerance Interval	0.48	No exceedance of statistically derived historical background concentration.
Dissolved Oxygen	Tolerance Interval	1.20	No exceedance of statistically derived historical background concentration.
Dissolved Solids	Tolerance Interval	0.19	No exceedance of statistically derived historical background concentration.
Iron	Tolerance Interval	0.48	No exceedance of statistically derived historical background concentration.
Magnesium	Tolerance Interval	0.20	No exceedance of statistically derived historical background concentration.

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

Parameter	Performed Test	CV Normality Test*	Results of Tolerance Interval Test Conducted
Manganese	Tolerance Interval	0.46	No exceedance of statistically derived historical background concentration.
Molybdenum	Tolerance Interval	1.51	No exceedance of statistically derived historical background concentration.
Nickel	Tolerance Interval	1.27	No exceedance of statistically derived historical background concentration.
Oxidation-Reduction Potential	Tolerance Interval	4.77	Current results exceed statistically derived historical background concentration in MW386, MW390, MW393, and MW396.
pH	Tolerance Interval	0.05	No exceedance of statistically derived historical background concentration.
Potassium	Tolerance Interval	0.28	No exceedance of statistically derived historical background concentration.
Sodium	Tolerance Interval	0.30	No exceedance of statistically derived historical background concentration.
Sulfate	Tolerance Interval	0.40	No exceedance of statistically derived historical background concentration.
Technetium-99	Tolerance Interval	0.86	Current results exceed statistically derived historical background concentration in MW390.
Total Organic Carbon (TOC)	Tolerance Interval	0.47	No exceedance of statistically derived historical background concentration.
Total Organic Halides (TOX)	Tolerance Interval	0.38	No exceedance of statistically derived historical background concentration.
Vanadium	Tolerance Interval	0.11	No exceedance of statistically derived historical background concentration.
Zinc	Tolerance Interval	0.79	No exceedance of statistically derived historical background concentration.

CV: coefficient of variation

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

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

Parameter	Performed Test	CV Normality Test*	Results of Tolerance Interval Test Conducted
Aluminum	Tolerance Interval	0.28	No exceedance of statistically derived historical background concentration.
Antimony	Tolerance Interval	2.27	No exceedance of statistically derived historical background concentration.
Beta Activity ¹	Tolerance Interval	0.97	Current results exceed statistically derived historical background concentrations in MW369, MW384, and MW387.
Boron	Tolerance Interval	1.45	No exceedance of statistically derived historical background concentration.
Bromide	Tolerance Interval	0.00	No exceedance of statistically derived historical background concentration.
Calcium	Tolerance Interval	0.17	Current results exceed statistically derived historical background concentrations in MW372.
Carbon Disulfide	Tolerance Interval	0.00	No exceedance of statistically derived historical background concentration.
Chemical Oxygen Demand (COD)	Tolerance Interval	0.00	Current results exceed statistically derived historical background concentrations in MW372 and MW391.
Chloride	Tolerance Interval	0.23	No exceedance of statistically derived historical background concentration.
<i>cis</i> -1,2-Dichloroethene	Tolerance Interval	0.00	No exceedance of statistically derived historical background concentration.
Cobalt	Tolerance Interval	2.44	No exceedance of statistically derived historical background concentration.
Conductivity	Tolerance Interval	0.28	No exceedance of statistically derived historical background concentration.
Copper	Tolerance Interval	0.43	No exceedance of statistically derived historical background concentration.
Dissolved Oxygen	Tolerance Interval	0.50	No exceedance of statistically derived historical background concentration.
Dissolved Solids	Tolerance Interval	0.12	Current results exceed statistically derived historical background concentration in MW372.
Iron	Tolerance Interval	1.17	No exceedance of statistically derived historical background concentration.
Magnesium	Tolerance Interval	0.16	Current results exceed statistically derived historical background concentration in MW372.

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

Parameter	Performed Test	CV Normality Test*	Results of Tolerance Interval Test Conducted
Manganese	Tolerance Interval	2.16	No exceedance of statistically derived historical background concentration.
Methylene Chloride	Tolerance Interval	0.16	No exceedance of statistically derived historical background concentration.
Molybdenum	Tolerance Interval	1.26	No exceedance of statistically derived historical background concentration.
Nickel	Tolerance Interval	1.79	No exceedance of statistically derived historical background concentration.
Oxidation-Reduction Potential	Tolerance Interval	0.48	Current results exceed statistically derived historical background concentration in MW220, MW221, MW222, MW223, MW224, MW372, MW384, MW387, MW391, and MW394.
pH	Tolerance Interval	0.05	No exceedance of statistically derived historical background concentration.
Potassium	Tolerance Interval	1.40	No exceedance of statistically derived historical background concentration.
Sodium	Tolerance Interval	0.24	Current results exceed statistically derived historical background concentration in MW387.
Sulfate	Tolerance Interval	0.25	Current results exceed statistically derived historical background concentration in MW220, MW223, MW372, MW384, MW387, and MW391.
Technetium-99	Tolerance Interval	0.99	Current results exceed statistically derived historical background concentration in MW369, MW372, MW384, and MW387.
Total Organic Carbon (TOC)	Tolerance Interval	0.49	No exceedance of statistically derived historical background concentration.
Total Organic Halides (TOX)	Tolerance Interval	2.57	No exceedance of statistically derived historical background concentration.
Trichloroethene ¹	Tolerance Interval	0.95	No exceedance of statistically derived historical background concentration.
Vanadium	Tolerance Interval	0.08	No exceedance of statistically derived historical background concentration.
Zinc	Tolerance Interval	0.72	No exceedance of statistically derived historical background concentration.

CV: coefficient of variation

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

¹ Tolerance interval was calculated based on an MCL exceedance.

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

Parameter	Performed Test	CV Normality Test*	Results of Tolerance Interval Test Conducted
Acetone	Tolerance Interval	0.03	No exceedance of statistically derived historical background concentration.
Aluminum	Tolerance Interval	0.86	No exceedance of statistically derived historical background concentration.
Antimony	Tolerance Interval	1.62	No exceedance of statistically derived historical background concentration.
Beta Activity ¹	Tolerance Interval	0.36	Current results exceed statistically derived historical background concentration in MW370, MW385, and MW388.
Boron	Tolerance Interval	1.24	No exceedance of statistically derived historical background concentration.
Bromide	Tolerance Interval	0.00	No exceedance of statistically derived historical background concentration.
Calcium	Tolerance Interval	0.50	Current results exceed statistically derived historical background concentration in MW373.
Chemical Oxygen Demand (COD)	Tolerance Interval	0.04	Current results exceed statistically derived historical background concentration in MW373.
Chloride	Tolerance Interval	0.22	Current results exceed statistically derived historical background concentration in MW392.
<i>cis</i> -1,2-Dichloroethene	Tolerance Interval	0.00	No exceedance of statistically derived historical background concentration.
Cobalt	Tolerance Interval	1.51	No exceedance of statistically derived historical background concentration.
Conductivity	Tolerance Interval	0.14	Current results exceed statistically derived historical background concentration in MW373.
Copper	Tolerance Interval	0.47	No exceedance of statistically derived historical background concentration.
Dissolved Oxygen	Tolerance Interval	0.52	No exceedance of statistically derived historical background concentration.
Dissolved Solids	Tolerance Interval	0.16	Current results exceed statistically derived historical background concentration in MW373.
Iron	Tolerance Interval	1.29	No exceedance of statistically derived historical background concentration.

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

Parameter	Performed Test	CV Normality Test*	Results of Tolerance Interval Test Conducted
Magnesium	Tolerance Interval	0.51	Current results exceed statistically derived historical background concentration in MW373.
Manganese	Tolerance Interval	1.49	No exceedance of statistically derived historical background concentration.
Methylene Chloride	Tolerance Interval	0.55	No exceedance of statistically derived historical background concentration.
Nickel	Tolerance Interval	1.09	No exceedance of statistically derived historical background concentration.
Oxidation-Reduction Potential	Tolerance Interval	0.33	Current results exceed statistically derived historical background concentration in MW370, MW373, MW385, MW388, MW392, MW395, and MW397.
pH	Tolerance Interval	0.04	No exceedance of statistically derived historical background concentration.
Potassium	Tolerance Interval	0.40	No exceedance of statistically derived historical background concentration.
Sodium	Tolerance Interval	0.47	No exceedance of statistically derived historical background concentration.
Sulfate	Tolerance Interval	0.20	Current results exceed statistically derived historical background concentration in MW370, MW373, MW385, and MW388.
Technetium-99	Tolerance Interval	0.80	Current results exceed statistically derived historical background concentration in MW370, MW385, and MW388.
Total Organic Carbon (TOC)	Tolerance Interval	0.55	No exceedance of statistically derived historical background concentration.
Total Organic Halides (TOX)	Tolerance Interval	0.59	No exceedance of statistically derived historical background concentration.
Trichloroethene ¹	Tolerance Interval	0.78	No exceedance of statistically derived historical background concentration.
Vanadium	Tolerance Interval	0.11	No exceedance of statistically derived historical background concentration.
Zinc	Tolerance Interval	0.76	No exceedance of statistically derived historical background concentration.

CV: coefficient of variation

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

¹ Tolerance interval was calculated based on an MCL exceedance.

Discussion of Results from Current Background Comparison

For concentrations in wells in the UCRS, URGAs, and LRGA that exceeded the TL test using historical background, the concentrations were compared to the one-sided TL calculated using the most recent eight quarters of data and are presented in Attachment D2. The statistician qualification statement is presented in Attachment D3. For the UCRS, URGAs, and LRGA, the test was applied to 3, 9, and 10 parameters, respectively, because these parameter concentrations exceeded the historical background TL.

For downgradient wells only, a summary of instances where concentrations exceeded the TL calculated using current background data is shown in Exhibit D.10.

Exhibit D.10. Summary of Exceedances (Downgradient Wells) of the TL Calculated Using Current Background Concentrations

URGA	LRGA
MW369: Beta activity, technetium-99	MW370: Beta activity, sulfate, technetium-99
MW372: Calcium, chemical oxygen demand (COD), magnesium, sulfate, technetium-99	MW373: Calcium, conductivity, dissolved solids, magnesium, sulfate
MW387: Beta activity, sodium, technetium-99	MW388: Beta activity, sulfate, technetium-99
MW391: Chemical oxygen demand (COD), oxidation-reduction potential, sulfate	MW392: Chloride

UCRS

Because gradients in the UCRS are downward (vertical), there are no hydrogeologically downgradient UCRS wells. It should be noted; however, that the oxidation-reduction potential concentrations in two UCRS wells (i.e., MW390 and MW393) and technetium-99 concentration in one UCRS well (i.e., MW390) exceeded the current TL this quarter.

URGA

This quarter's results identified current background exceedances in downgradient wells for beta activity, calcium, chemical oxygen demand (COD), magnesium, oxidation-reduction potential, sodium, sulfate, and technetium-99.

LRGA

This quarter's results identified current background exceedances in downgradient wells for beta activity, calcium, chloride, conductivity, dissolved solids, magnesium, sulfate, and technetium-99.

Statistical Summary

Summaries of the statistical tests conducted on data obtained from wells in the UCRS, the URGAs, and the LRGA are presented in Exhibit D.11, Exhibit D.12, and Exhibit D.13, respectively.

Exhibit D.11. Test Summaries for Qualified Parameters for Current Background—UCRS

Parameter	Performed Test	CV Normality Test*	Results of Tolerance Interval Test Conducted
Chemical Oxygen Demand (COD)	Tolerance Interval	0.34	None of the test wells exceeded the upper TL, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically significant level.
Oxidation-Reduction Potential	Tolerance Interval	0.24	Because gradients in UCRS wells are downward, there are no UCRS wells that are hydrogeologically downgradient of the landfill; however, MW390, MW393, and MW396 exceeded the upper TL, which is evidence of elevated concentration with respect to current background data.
Technetium-99	Tolerance Interval	-3.16	Because gradients in UCRS wells are downward, there are no UCRS wells that are hydrogeologically downgradient of the landfill; however, MW390 exceeded the upper TL, which is evidence of elevated concentration with respect to current background data.

CV: coefficient of variation

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

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

Parameter	Performed Test	CV Normality Test*	Results of Tolerance Interval Test Conducted
Beta Activity	Tolerance Interval	0.74	MW369, MW384, and MW387 exceeded the upper TL, which is evidence of elevated concentration with respect to current background data.
Calcium	Tolerance Interval	0.12	MW372 exceeded the upper TL, which is evidence of elevated concentration with respect to current background data.
Chemical Oxygen Demand (COD)	Tolerance Interval	0.41	MW372 and MW391 exceeded the upper TL, which is evidence of elevated concentration with respect to current background data.
Dissolved Solids	Tolerance Interval	0.32	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	0.12	MW372 exceeded the upper TL, which is evidence of elevated concentration with respect to current background data.
Oxidation-Reduction Potential	Tolerance Interval	0.14	MW220, MW221, MW222, MW223, MW224, and MW391 exceeded the upper TL, which is evidence of elevated concentration with respect to current background data.
Sodium	Tolerance Interval	0.17	MW387 exceeded the upper TL, which is evidence of elevated concentration with respect to current background data.
Sulfate	Tolerance Interval	0.35	MW372 and MW391 exceeded the upper TL, which is evidence of elevated concentration with respect to current background data.
Technetium-99	Tolerance Interval	0.55	MW369, MW372, MW384, and MW387 exceeded the upper TL, which is evidence of elevated concentration with respect to current background data.

CV: coefficient of variation

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

Exhibit D.13. Test Summaries for Qualified Parameters for Current Background—LRGA

Parameter	Performed Test	CV Normality Test*	Results of Tolerance Interval Test Conducted
Beta Activity	Tolerance Interval	0.38	MW370, MW385, and MW388 exceeded the upper TL, which is evidence of elevated concentration with respect to current background data.
Calcium	Tolerance Interval	0.19	MW373 exceeded the upper TL, which is evidence of elevated concentration with respect to current background data.
Chemical Oxygen Demand (COD)	Tolerance Interval	0.63	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.
Chloride	Tolerance Interval	0.15	MW392 exceeded the upper TL, which is evidence of elevated concentration with respect to current background data.
Conductivity	Tolerance Interval	0.09	MW373 exceeded the upper TL, which is evidence of elevated concentration with respect to current background data.
Dissolved Solids	Tolerance Interval	0.21	MW373 exceeded the upper TL, which is evidence of elevated concentration with respect to current background data.
Magnesium	Tolerance Interval	0.19	MW373 exceeded the upper TL, which is evidence of elevated concentration with respect to current background data.
Oxidation-Reduction Potential	Tolerance Interval	0.22	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	0.05	MW370, MW373, MW385, and MW388 exceeded the upper TL, which is evidence of elevated concentration with respect to current background data.
Technetium-99	Tolerance Interval	0.45	MW370, MW385, and MW388 exceeded the upper TL, which is evidence of elevated concentration with respect to current background data.

CV: coefficient of variation

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

ATTACHMENT D1

**COMPARISON OF CURRENT DATA TO
ONE-SIDED UPPER TOLERANCE INTERVAL TEST
CALCULATED USING
HISTORICAL BACKGROUND DATA**

THIS PAGE INTENTIONALLY LEFT BLANK

C-746-S/T Second Quarter 2019 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**= 0.320 **S**= 0.182 **CV(1)**=0.567 **K factor****= 3.188 **TL(1)**= 0.900 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= -1.259 **S**= 0.503 **CV(2)**=-0.400 **K factor****= 3.188 **TL(2)**= 0.345 **LL(2)**=N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW396

Date Collected	Result	LN(Result)
8/13/2002	0.393	-0.934
9/16/2002	0.2	-1.609
10/16/2002	0.2	-1.609
1/13/2003	0.501	-0.691
4/8/2003	0.2	-1.609
7/16/2003	0.2	-1.609
10/14/2003	0.2	-1.609
1/14/2004	0.668	-0.403

Dry/Partially Dry Wells

Well No.	Gradient
MW389	Downgradient

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)
MW386	Sidegradient	Yes	0.0198	NO	-3.922	N/A
MW390	Downgradient	Yes	0.0818	NO	-2.503	N/A
MW393	Downgradient	No	0.05	N/A	-2.996	N/A
MW396	Upgradient	Yes	0.0486	NO	-3.024	N/A

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

Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

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

C-746-S/T Second Quarter 2019 Statistical Analysis
Historical Background Comparison

Antimony
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= 0.054	S= 0.090	CV(1)= 1.679	K factor**= 3.188	TL(1)= 0.342	LL(1)=N/A
Statistics-Transformed Background Data	X= -4.376	S= 1.708	CV(2)= -0.390	K factor**= 3.188	TL(2)= 1.068	LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW396		
Date Collected	Result	LN(Result)
8/13/2002	0.2	-1.609
9/16/2002	0.2	-1.609
10/16/2002	0.005	-5.298
1/13/2003	0.005	-5.298
4/8/2003	0.005	-5.298
7/16/2003	0.005	-5.298
10/14/2003	0.005	-5.298
1/14/2004	0.005	-5.298

Dry/Partially Dry Wells

Well No.	Gradient
MW389	Downgradient

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)
MW386	Sidegradient	No	0.00134	N/A	-6.615	N/A
MW390	Downgradient	No	0.003	N/A	-5.809	N/A
MW393	Downgradient	Yes	0.00167	N/A	-6.395	NO
MW396	Upgradient	Yes	0.00126	N/A	-6.677	NO

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

Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

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

D1-4

C-746-S/T Second Quarter 2019 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**= 0.833 **CV(1)**= 1.282 **K factor****= 3.188 **TL(1)**= 3.306 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= -1.034 **S**= 1.066 **CV(2)**= -1.031 **K factor****= 3.188 **TL(2)**= 2.364 **LL(2)**=N/A

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

Well Number: MW396

Date Collected	Result	LN(Result)
8/13/2002	2	0.693
9/16/2002	2	0.693
10/16/2002	0.2	-1.609
1/13/2003	0.2	-1.609
4/8/2003	0.2	-1.609
7/16/2003	0.2	-1.609
10/14/2003	0.2	-1.609
1/14/2004	0.2	-1.609

Dry/Partially Dry Wells

Well No.	Gradient
MW389	Downgradient

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)
MW386	Sidegradient	Yes	0.00596	N/A	-5.123	NO
MW390	Downgradient	Yes	0.0265	N/A	-3.631	NO
MW393	Downgradient	Yes	0.0238	N/A	-3.738	NO
MW396	Upgradient	Yes	0.00738	N/A	-4.909	NO

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

Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

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

C-746-S/T Second Quarter 2019 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**= 1.388 **S**= 0.327 **CV(1)**=0.236 **K factor****= 3.188 **TL(1)**= 2.430 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= 0.301 **S**= 0.252 **CV(2)**=0.838 **K factor****= 3.188 **TL(2)**= 1.105 **LL(2)**=N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW396	
Date Collected	Result	LN(Result)
8/13/2002	1.5	0.405
9/16/2002	1.6	0.470
10/16/2002	1.6	0.470
1/13/2003	1	0.000
4/8/2003	1	0.000
7/16/2003	1	0.000
10/14/2003	1.7	0.531
1/14/2004	1.7	0.531

Dry/Partially Dry Wells

Well No.	Gradient
MW389	Downgradient

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)
MW386	Sidegradient	Yes	0.169	NO	-1.778	N/A
MW390	Downgradient	Yes	0.692	NO	-0.368	N/A
MW393	Downgradient	Yes	0.151	NO	-1.890	N/A
MW396	Upgradient	Yes	0.901	NO	-0.104	N/A

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

Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

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

C-746-S/T Second Quarter 2019 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= 41.825	S= 8.445	CV(1)=0.202	K factor**= 3.188	TL(1)= 68.748	LL(1)=N/A
Statistics-Transformed Background Data	X= 3.711	S= 0.241	CV(2)=0.065	K factor**= 3.188	TL(2)= 4.479	LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW396	
Date Collected	Result	LN(Result)
8/13/2002	38.4	3.648
9/16/2002	42.9	3.759
10/16/2002	40.2	3.694
1/13/2003	46.7	3.844
4/8/2003	49.8	3.908
7/16/2003	43.3	3.768
10/14/2003	49.7	3.906
1/14/2004	23.6	3.161

Dry/Partially Dry Wells

Well No.	Gradient
MW389	Downgradient

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)
MW386	Sidegradient	Yes	19.3	NO	2.960	N/A
MW390	Downgradient	Yes	28.7	NO	3.357	N/A
MW393	Downgradient	Yes	13.9	NO	2.632	N/A
MW396	Upgradient	Yes	31.8	NO	3.459	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters 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.

D1-7

C-746-S/T Second Quarter 2019 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= 35.375	S= 0.744	CV(1)=0.021	K factor**= 3.188	TL(1)= 37.747	LL(1)=N/A
Statistics-Transformed Background Data	X= 3.566	S= 0.021	CV(2)=0.006	K factor**= 3.188	TL(2)= 3.632	LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW396		
Date Collected	Result	LN(Result)
8/13/2002	36	3.584
9/16/2002	35	3.555
10/16/2002	37	3.611
1/13/2003	35	3.555
4/8/2003	35	3.555
7/16/2003	35	3.555
10/14/2003	35	3.555
1/14/2004	35	3.555

Dry/Partially Dry Wells

Well No.	Gradient
MW389	Downgradient

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)
MW386	Sidegradient	No	20	N/A	2.996	N/A
MW390	Downgradient	Yes	35.1	NO	3.558	N/A
MW393	Downgradient	No	20	N/A	2.996	N/A
MW396	Upgradient	Yes	43.8	YES	3.780	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters 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

MW396

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

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

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

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

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

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

D1-8

C-746-S/T Second Quarter 2019 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= 101.725	S= 5.245	CV(1)=0.052	K factor**= 3.188	TL(1)= 118.447	LL(1)=N/A
Statistics-Transformed Background Data	X= 4.621	S= 0.053	CV(2)=0.011	K factor**= 3.188	TL(2)= 4.789	LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW396		
Date Collected	Result	LN(Result)
8/13/2002	91.6	4.517
9/16/2002	98.3	4.588
10/16/2002	101.4	4.619
1/13/2003	108.3	4.685
4/8/2003	100.5	4.610
7/16/2003	102.5	4.630
10/14/2003	106.8	4.671
1/14/2004	104.4	4.648

Dry/Partially Dry Wells

Well No.	Gradient
MW389	Downgradient

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)
MW386	Sidegradient	Yes	13.7	NO	2.617	N/A
MW390	Downgradient	Yes	37.7	NO	3.630	N/A
MW393	Downgradient	Yes	12.5	NO	2.526	N/A
MW396	Upgradient	Yes	54.7	NO	4.002	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters 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.

D1-9

C-746-S/T Second Quarter 2019 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**= 0.008 **S**= 0.011 **CV(1)**= 1.340 **K factor****= 3.188 **TL(1)**= 0.042 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= -5.645 **S**= 1.339 **CV(2)**= -0.237 **K factor****= 3.188 **TL(2)**= -1.377 **LL(2)**=N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW396	
Date Collected	Result	LN(Result)
8/13/2002	0.025	-3.689
9/16/2002	0.025	-3.689
10/16/2002	0.001	-6.908
1/13/2003	0.00324	-5.732
4/8/2003	0.00436	-5.435
7/16/2003	0.00276	-5.893
10/14/2003	0.001	-6.908
1/14/2004	0.001	-6.908

Dry/Partially Dry Wells

Well No.	Gradient
MW389	Downgradient

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)
MW386	Sidegradient	Yes	0.000739	N/A	-7.210	NO
MW390	Downgradient	No	0.001	N/A	-6.908	N/A
MW393	Downgradient	No	0.001	N/A	-6.908	N/A
MW396	Upgradient	Yes	0.000348	N/A	-7.963	NO

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

Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

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

C-746-S/T Second Quarter 2019 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= 922.500	S= 107.616	CV(1)=0.117	K factor**= 3.188	TL(1)= 1265.579	LL(1)=N/A
Statistics-Transformed Background Data	X= 6.822	S= 0.111	CV(2)=0.016	K factor**= 3.188	TL(2)= 7.175	LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW396	
Date Collected	Result	LN(Result)
8/13/2002	784	6.664
9/30/2002	871	6.770
10/16/2002	868	6.766
1/13/2003	912	6.816
4/8/2003	942	6.848
7/16/2003	910	6.813
10/14/2003	935	6.841
1/14/2004	1158	7.054

Dry/Partially Dry Wells

Well No.	Gradient
MW389	Downgradient

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)
MW386	Sidegradient	Yes	593	NO	6.385	N/A
MW390	Downgradient	Yes	676	NO	6.516	N/A
MW393	Downgradient	Yes	473	NO	6.159	N/A
MW396	Upgradient	Yes	722	NO	6.582	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters 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.
D1-11

C-746-S/T Second Quarter 2019 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**= 0.028 **S**= 0.014 **CV(1)**=0.481 **K factor****= 3.188 **TL(1)**= 0.072 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= -3.650 **S**= 0.414 **CV(2)**=-0.113 **K factor****= 3.188 **TL(2)**= -2.331 **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:	MW396	
Date Collected	Result	LN(Result)
8/13/2002	0.05	-2.996
9/16/2002	0.05	-2.996
10/16/2002	0.026	-3.650
1/13/2003	0.02	-3.912
4/8/2003	0.02	-3.912
7/16/2003	0.02	-3.912
10/14/2003	0.02	-3.912
1/14/2004	0.02	-3.912

Well No.	Gradient
MW389	Downgradient

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW386	Sidegradient	Yes	0.00102	NO	-6.888	N/A
MW390	Downgradient	Yes	0.00251	NO	-5.987	N/A
MW393	Downgradient	Yes	0.000919	NO	-6.992	N/A
MW396	Upgradient	Yes	0.00168	NO	-6.389	N/A

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

Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

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

C-746-S/T Second Quarter 2019 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= 1.395	S= 1.677	CV(1)= 1.202	K factor**= 3.188	TL(1)= 6.743	LL(1)=N/A
Statistics-Transformed Background Data	X= -0.043	S= 0.814	CV(2)= -18.867	K factor**= 3.188	TL(2)= 2.553	LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW396		
Date Collected	Result	LN(Result)
8/13/2002	5.45	1.696
9/16/2002	0.4	-0.916
10/16/2002	0.54	-0.616
1/13/2003	0.72	-0.329
4/8/2003	0.69	-0.371
7/16/2003	1.1	0.095
10/14/2003	0.71	-0.342
1/14/2004	1.55	0.438

Dry/Partially Dry Wells

Well No.	Gradient
MW389	Downgradient

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)
MW386	Sidegradient	Yes	3.51	N/A	1.256	NO
MW390	Downgradient	Yes	4.62	N/A	1.530	NO
MW393	Downgradient	Yes	2.76	N/A	1.015	NO
MW396	Upgradient	Yes	3.52	N/A	1.258	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.
D1-13

C-746-S/T Second Quarter 2019 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= 550.375	S= 104.330	CV(1)=0.190	K factor**= 3.188	TL(1)= 882.980	LL(1)=N/A
Statistics-Transformed Background Data	X= 6.298	S= 0.162	CV(2)=0.026	K factor**= 3.188	TL(2)= 6.815	LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW396	
Date Collected	Result	LN(Result)
8/13/2002	502	6.219
9/16/2002	506	6.227
10/16/2002	543	6.297
1/13/2003	521	6.256
4/8/2003	504	6.223
7/16/2003	532	6.277
10/14/2003	490	6.194
1/14/2004	805	6.691

Dry/Partially Dry Wells

Well No.	Gradient
MW389	Downgradient

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)
MW386	Sidegradient	Yes	349	NO	5.855	N/A
MW390	Downgradient	Yes	407	NO	6.009	N/A
MW393	Downgradient	Yes	281	NO	5.638	N/A
MW396	Upgradient	Yes	393	NO	5.974	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters 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.

D1-14

C-746-S/T Second Quarter 2019 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= 7.796	S= 3.723	CV(1)=0.478	K factor**= 3.188	TL(1)= 19.666	LL(1)=N/A
Statistics-Transformed Background Data	X= 1.880	S= 0.723	CV(2)=0.384	K factor**= 3.188	TL(2)= 4.184	LL(2)=N/A

Historical Background Data from
Upgradient Wells with Transformed Result

Well Number:	MW396	
Date Collected	Result	LN(Result)
8/13/2002	1.8	0.588
9/16/2002	9.53	2.254
10/16/2002	7.43	2.006
1/13/2003	9.93	2.296
4/8/2003	10.2	2.322
7/16/2003	9.16	2.215
10/14/2003	11.9	2.477
1/14/2004	2.42	0.884

Dry/Partially Dry Wells

Well No.	Gradient
MW389	Downgradient

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)
MW386	Sidegradient	Yes	0.318	NO	-1.146	N/A
MW390	Downgradient	Yes	0.0878	NO	-2.433	N/A
MW393	Downgradient	Yes	0.479	NO	-0.736	N/A
MW396	Upgradient	Yes	0.326	NO	-1.121	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters 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.

D1-15

C-746-S/T Second Quarter 2019 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= 16.876	S= 3.313	CV(1)=0.196	K factor**= 3.188	TL(1)= 27.438	LL(1)=N/A
Statistics-Transformed Background Data	X= 2.804	S= 0.240	CV(2)=0.086	K factor**= 3.188	TL(2)= 3.569	LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW396		
Date Collected	Result	LN(Result)
8/13/2002	15.5	2.741
9/16/2002	17.3	2.851
10/16/2002	17.8	2.879
1/13/2003	19.2	2.955
4/8/2003	17.8	2.879
7/16/2003	17.8	2.879
10/14/2003	20.2	3.006
1/14/2004	9.41	2.242

Dry/Partially Dry Wells

Well No.	Gradient
MW389	Downgradient

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)
MW386	Sidegradient	Yes	8.85	NO	2.180	N/A
MW390	Downgradient	Yes	12.3	NO	2.510	N/A
MW393	Downgradient	Yes	4.17	NO	1.428	N/A
MW396	Upgradient	Yes	14.7	NO	2.688	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters 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.
D1-16

C-746-S/T Second Quarter 2019 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= 0.774	S= 0.353	CV(1)=0.456	K factor**= 3.188	TL(1)= 1.900	LL(1)=N/A
Statistics-Transformed Background Data	X= -0.566	S= 1.192	CV(2)=-2.105	K factor**= 3.188	TL(2)= 3.235	LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW396	
Date Collected	Result	LN(Result)
8/13/2002	0.57	-0.562
9/16/2002	0.647	-0.435
10/16/2002	0.88	-0.128
1/13/2003	1.132	0.124
4/8/2003	0.965	-0.036
7/16/2003	0.983	-0.017
10/14/2003	0.984	-0.016
1/14/2004	0.0314	-3.461

Dry/Partially Dry Wells

Well No.	Gradient
MW389	Downgradient

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)
MW386	Sidegradient	Yes	0.0812	NO	-2.511	N/A
MW390	Downgradient	No	0.005	N/A	-5.298	N/A
MW393	Downgradient	Yes	0.00768	NO	-4.869	N/A
MW396	Upgradient	Yes	0.0305	NO	-3.490	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters 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.

D1-17

C-746-S/T Second Quarter 2019 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= 0.007	S= 0.011	CV(1)= 1.507	K factor**= 3.188	TL(1)= 0.042	LL(1)=N/A
Statistics-Transformed Background Data	X= -5.928	S= 1.420	CV(2)= -0.240	K factor**= 3.188	TL(2)= -1.400	LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW396	
Date Collected	Result	LN(Result)
8/13/2002	0.025	-3.689
9/16/2002	0.025	-3.689
10/16/2002	0.001	-6.908
1/13/2003	0.00128	-6.661
4/8/2003	0.00271	-5.911
7/16/2003	0.00117	-6.751
10/14/2003	0.001	-6.908
1/14/2004	0.001	-6.908

Dry/Partially Dry Wells

Well No.	Gradient
MW389	Downgradient

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)
MW386	Sidegradient	No	0.001	N/A	-6.908	N/A
MW390	Downgradient	Yes	0.000498	N/A	-7.605	NO
MW393	Downgradient	No	0.001	N/A	-6.908	N/A
MW396	Upgradient	Yes	0.000266	N/A	-8.232	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.

D1-18

C-746-S/T Second Quarter 2019 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**= 0.016 **S**= 0.021 **CV(1)**= 1.272 **K factor****= 3.188 **TL(1)**= 0.083 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= -4.706 **S**= 1.057 **CV(2)**= -0.225 **K factor****= 3.188 **TL(2)**= -1.338 **LL(2)**=N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW396
Date Collected	Result LN(Result)
8/13/2002	0.05 -2.996
9/16/2002	0.05 -2.996
10/16/2002	0.005 -5.298
1/13/2003	0.005 -5.298
4/8/2003	0.00571 -5.166
7/16/2003	0.005 -5.298
10/14/2003	0.005 -5.298
1/14/2004	0.005 -5.298

Dry/Partially Dry Wells

Well No.	Gradient
MW389	Downgradient

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)
MW386	Sidegradient	Yes	0.000699	N/A	-7.266	NO
MW390	Downgradient	Yes	0.0015	N/A	-6.502	NO
MW393	Downgradient	No	0.002	N/A	-6.215	N/A
MW396	Upgradient	Yes	0.000641	N/A	-7.352	NO

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

Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

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

C-746-S/T Second Quarter 2019 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= 13.000 S= 61.952 CV(1)=4.766 K factor**= 3.188 TL(1)= 210.502 LL(1)=N/A

Statistics-Transformed Background Data X= 4.364 S= 0.333 CV(2)=0.076 K factor**= 3.188 TL(2)= 4.736 LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW396	
Date Collected	Result	LN(Result)
8/13/2002	60	4.094
4/8/2003	71	4.263
7/16/2003	-56	#Func!
10/14/2003	-54	#Func!
1/14/2004	-22	#Func!
4/12/2004	-6	#Func!
7/20/2004	-3	#Func!
10/12/2004	114	4.736

Dry/Partially Dry Wells

Well No.	Gradient
MW389	Downgradient

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)
MW386	Sidegradient	Yes	429	N/A	6.061	YES
MW390	Downgradient	Yes	464	N/A	6.140	YES
MW393	Downgradient	Yes	454	N/A	6.118	YES
MW396	Upgradient	Yes	431	N/A	6.066	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

MW386
MW390
MW393
MW396

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

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

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

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

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

** Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009. D1-20

C-746-S/T Second Quarter 2019 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= 6.460	S= 0.350	CV(1)=0.054	K factor**= 3.736	TL(1)= 7.766	LL(1)=5.1541
Statistics-Transformed Background Data	X= 1.864	S= 0.054	CV(2)=0.029	K factor**= 3.736	TL(2)= 2.067	LL(2)=1.6621

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW396		
Date Collected	Result	LN(Result)
8/13/2002	6.17	1.820
9/16/2002	6.4	1.856
10/16/2002	5.9	1.775
1/13/2003	6.4	1.856
4/8/2003	6.65	1.895
7/16/2003	6.4	1.856
10/14/2003	6.71	1.904
1/14/2004	7.05	1.953

Dry/Partially Dry Wells

Well No.	Gradient
MW389	Downgradient

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)?
MW386	Sidegradient	Yes	6.92	NO	1.934	N/A
MW390	Downgradient	Yes	6.41	NO	1.858	N/A
MW393	Downgradient	Yes	6.3	NO	1.841	N/A
MW396	Upgradient	Yes	6.71	NO	1.904	N/A

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

Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

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

D1-21

C-746-S/T Second Quarter 2019 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**= 1.411 **S**= 0.399 **CV(1)**=0.282 **K factor****= 3.188 **TL(1)**= 2.682 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= 0.311 **S**= 0.271 **CV(2)**=0.870 **K factor****= 3.188 **TL(2)**= 1.175 **LL(2)**=N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW396

Date Collected	Result	LN(Result)
8/13/2002	2	0.693
9/16/2002	2	0.693
10/16/2002	0.978	-0.022
1/13/2003	1.08	0.077
4/8/2003	1.12	0.113
7/16/2003	1.38	0.322
10/14/2003	1.24	0.215
1/14/2004	1.49	0.399

Dry/Partially Dry Wells

Well No.	Gradient
MW389	Downgradient

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)
MW386	Sidegradient	Yes	0.262	NO	-1.339	N/A
MW390	Downgradient	Yes	0.315	NO	-1.155	N/A
MW393	Downgradient	Yes	0.476	NO	-0.742	N/A
MW396	Upgradient	Yes	0.857	NO	-0.154	N/A

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

Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

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

C-746-S/T Second Quarter 2019 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= 106.825	S= 32.041	CV(1)=0.300	K factor**= 3.188	TL(1)= 208.973	LL(1)=N/A
Statistics-Transformed Background Data	X= 4.595	S= 0.492	CV(2)=0.107	K factor**= 3.188	TL(2)= 6.163	LL(2)=N/A

Historical Background Data from
Upgradient Wells with Transformed Result

Well Number:	MW396	
Date Collected	Result	LN(Result)
8/13/2002	115	4.745
9/16/2002	116	4.754
10/16/2002	117	4.762
1/13/2003	122	4.804
4/8/2003	106	4.663
7/16/2003	117	4.762
10/14/2003	132	4.883
1/14/2004	29.6	3.388

Dry/Partially Dry Wells

Well No.	Gradient
MW389	Downgradient

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)
MW386	Sidegradient	Yes	93.9	NO	4.542	N/A
MW390	Downgradient	Yes	100	NO	4.605	N/A
MW393	Downgradient	Yes	83.1	NO	4.420	N/A
MW396	Upgradient	Yes	98.1	NO	4.586	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters 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.

D1-23

C-746-S/T Second Quarter 2019 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**= 22.463 **S**= 8.876 **CV(1)**=0.395 **K factor****= 3.188 **TL(1)**= 50.759 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= 3.054 **S**= 0.351 **CV(2)**=0.115 **K factor****= 3.188 **TL(2)**= 4.173 **LL(2)**=N/A

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

Well Number: MW396		
Date Collected	Result	LN(Result)
8/13/2002	41.9	3.735
9/16/2002	26.3	3.270
10/16/2002	20.6	3.025
1/13/2003	16.6	2.809
4/8/2003	23.9	3.174
7/16/2003	18.8	2.934
10/14/2003	12.9	2.557
1/14/2004	18.7	2.929

Dry/Partially Dry Wells

Well No.	Gradient
MW389	Downgradient

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)
MW386	Sidegradient	Yes	49.1	NO	3.894	N/A
MW390	Downgradient	Yes	43.5	NO	3.773	N/A
MW393	Downgradient	Yes	21.1	NO	3.049	N/A
MW396	Upgradient	Yes	25.5	NO	3.239	N/A

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

Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

** Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009. D1-24

C-746-S/T Second Quarter 2019 Statistical Analysis
Historical Background Comparison

Technetium-99
UNITS: pCi/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 = 7.624	S = 6.558	CV(1) =0.860	K factor** = 3.188	TL(1) = 28.531	LL(1) =N/A
Statistics-Transformed Background Data	X = 1.498	S = 1.321	CV(2) =0.882	K factor** = 3.188	TL(2) = 5.710	LL(2) =N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW396	
Date Collected	Result	LN(Result)
8/13/2002	16.7	2.815
9/16/2002	6.39	1.855
10/16/2002	4.55	1.515
1/13/2003	16.5	2.803
4/8/2003	3.04	1.112
7/16/2003	0.354	-1.038
10/14/2003	11.9	2.477
1/14/2004	1.56	0.445

Dry/Partially Dry Wells

Well No.	Gradient
MW389	Downgradient

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)
MW386	Sidegradient	No	-2.67	N/A	#Error	N/A
MW390	Downgradient	Yes	63.1	YES	4.145	N/A
MW393	Downgradient	No	4.03	N/A	1.394	N/A
MW396	Upgradient	No	5.89	N/A	1.773	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

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

MW390

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

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

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

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

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

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

D1-25

C-746-S/T Second Quarter 2019 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= 9.988	S= 4.696	CV(1)=0.470	K factor**= 3.188	TL(1)= 24.959	LL(1)=N/A
Statistics-Transformed Background Data	X= 2.210	S= 0.454	CV(2)=0.205	K factor**= 3.188	TL(2)= 3.657	LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW396	
Date Collected	Result	LN(Result)
8/13/2002	19	2.944
9/16/2002	14.6	2.681
10/16/2002	10.4	2.342
1/13/2003	4.4	1.482
4/8/2003	7	1.946
7/16/2003	7.3	1.988
10/14/2003	9.1	2.208
1/14/2004	8.1	2.092

Dry/Partially Dry Wells

Well No.	Gradient
MW389	Downgradient

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)
MW386	Sidegradient	Yes	4.24	NO	1.445	N/A
MW390	Downgradient	Yes	2.46	NO	0.900	N/A
MW393	Downgradient	Yes	2.51	NO	0.920	N/A
MW396	Upgradient	Yes	4.53	NO	1.511	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters 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.

D1-26

C-746-S/T Second Quarter 2019 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= 142.650	S= 53.533	CV(1)=0.375	K factor**= 3.188	TL(1)= 313.314	LL(1)=N/A
Statistics-Transformed Background Data	X= 4.896	S= 0.390	CV(2)=0.080	K factor**= 3.188	TL(2)= 6.138	LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW396	
Date Collected	Result	LN(Result)
8/13/2002	193	5.263
9/16/2002	190	5.247
10/16/2002	221	5.398
1/13/2003	106	4.663
4/8/2003	77.8	4.354
7/16/2003	122	4.804
10/14/2003	86.4	4.459
1/14/2004	145	4.977

Dry/Partially Dry Wells

Well No.	Gradient
MW389	Downgradient

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)
MW386	Sidegradient	Yes	108	NO	4.682	N/A
MW390	Downgradient	Yes	11.3	NO	2.425	N/A
MW393	Downgradient	Yes	17.1	NO	2.839	N/A
MW396	Upgradient	Yes	31	NO	3.434	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters 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.

D1-27

C-746-S/T Second Quarter 2019 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= 0.021	S= 0.002	CV(1)=0.109	K factor**= 3.188	TL(1)= 0.029	LL(1)=N/A
Statistics-Transformed Background Data	X= -3.856	S= 0.103	CV(2)=-0.027	K factor**= 3.188	TL(2)= -3.527	LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW396	
Date Collected	Result	LN(Result)
8/13/2002	0.025	-3.689
9/16/2002	0.025	-3.689
10/16/2002	0.02	-3.912
1/13/2003	0.02	-3.912
4/8/2003	0.02	-3.912
7/16/2003	0.02	-3.912
10/14/2003	0.02	-3.912
1/14/2004	0.02	-3.912

Dry/Partially Dry Wells

Well No.	Gradient
MW389	Downgradient

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)
MW386	Sidegradient	Yes	0.0101	NO	-4.595	N/A
MW390	Downgradient	No	0.02	N/A	-3.912	N/A
MW393	Downgradient	No	0.0152	N/A	-4.186	N/A
MW396	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.

Conclusion of Statistical Analysis on Historical Data

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

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.
CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.
S Standard Deviation, S = [Sum (((background result-X)^2)/[count of background results -1])]^0.5
TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)
X Mean, X = (sum of background results)/(count of background results)
** Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>,2009.

D1-28

C-746-S/T Second Quarter 2019 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= 0.044	S= 0.035	CV(1)=0.786	K factor**= 3.188	TL(1)= 0.156	LL(1)=N/A
Statistics-Transformed Background Data	X= -3.342	S= 0.682	CV(2)=-0.204	K factor**= 3.188	TL(2)= -1.168	LL(2)=N/A

Historical Background Data from
Upgradient Wells with Transformed Result

Well Number:	MW396	
Date Collected	Result	LN(Result)
8/13/2002	0.1	-2.303
9/16/2002	0.1	-2.303
10/16/2002	0.025	-3.689
1/13/2003	0.035	-3.352
4/8/2003	0.035	-3.352
7/16/2003	0.02	-3.912
10/14/2003	0.02	-3.912
1/14/2004	0.02	-3.912

Dry/Partially Dry Wells

Well No.	Gradient
MW389	Downgradient

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)
MW386	Sidegradient	No	0.02	N/A	-3.912	N/A
MW390	Downgradient	Yes	0.00393	NO	-5.539	N/A
MW393	Downgradient	No	0.02	N/A	-3.912	N/A
MW396	Upgradient	Yes	0.00438	NO	-5.431	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters 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.

D1-29

C-746-S/T Second Quarter 2019 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= 0.221	S= 0.061	CV(1)=0.277	K factor**= 2.523	TL(1)= 0.376	LL(1)=N/A
Statistics-Transformed Background Data	X= -1.534	S= 0.212	CV(2)=-0.138	K factor**= 2.523	TL(2)= -0.999	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: MW220

Date Collected	Result	LN(Result)
10/14/2002	0.2	-1.609
1/15/2003	0.2	-1.609
4/10/2003	0.2	-1.609
7/14/2003	0.2	-1.609
10/13/2003	0.427	-0.851
1/13/2004	0.309	-1.174
4/13/2004	0.2	-1.609
7/21/2004	0.202	-1.599

Well Number: MW394

Date Collected	Result	LN(Result)
8/13/2002	0.2	-1.609
9/16/2002	0.2	-1.609
10/16/2002	0.2	-1.609
1/13/2003	0.2	-1.609
4/10/2003	0.2	-1.609
7/16/2003	0.2	-1.609
10/14/2003	0.2	-1.609
1/13/2004	0.2	-1.609

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW220	Upgradient	No	0.05	N/A	-2.996	N/A
MW221	Sidegradient	No	0.05	N/A	-2.996	N/A
MW222	Sidegradient	No	0.05	N/A	-2.996	N/A
MW223	Sidegradient	No	0.05	N/A	-2.996	N/A
MW224	Sidegradient	No	0.05	N/A	-2.996	N/A
MW369	Downgradient	No	0.05	N/A	-2.996	N/A
MW372	Downgradient	No	0.05	N/A	-2.996	N/A
MW384	Sidegradient	No	0.05	N/A	-2.996	N/A
MW387	Downgradient	Yes	0.0206	NO	-3.882	N/A
MW391	Downgradient	No	0.05	N/A	-2.996	N/A
MW394	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.

C-746-S/T Second Quarter 2019 Statistical Analysis
Historical Background Comparison

Antimony
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= 0.029	S= 0.067	CV(1)=2.267	K factor**= 2.523	TL(1)= 0.197	LL(1)=N/A
Statistics-Transformed Background Data	X= -4.837	S= 1.260	CV(2)=-0.260	K factor**= 2.523	TL(2)= -1.658	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: MW220

Date Collected	Result	LN(Result)
10/14/2002	0.005	-5.298
1/15/2003	0.005	-5.298
4/10/2003	0.005	-5.298
7/14/2003	0.005	-5.298
10/13/2003	0.005	-5.298
1/13/2004	0.005	-5.298
4/13/2004	0.005	-5.298
7/21/2004	0.005	-5.298

Well Number: MW394

Date Collected	Result	LN(Result)
8/13/2002	0.2	-1.609
9/16/2002	0.2	-1.609
10/16/2002	0.005	-5.298
1/13/2003	0.005	-5.298
4/10/2003	0.005	-5.298
7/16/2003	0.005	-5.298
10/14/2003	0.005	-5.298
1/13/2004	0.005	-5.298

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW220	Upgradient	Yes	0.0013	N/A	-6.645	NO
MW221	Sidegradient	Yes	0.00126	N/A	-6.677	NO
MW222	Sidegradient	Yes	0.00123	N/A	-6.701	NO
MW223	Sidegradient	Yes	0.00134	N/A	-6.615	NO
MW224	Sidegradient	Yes	0.00124	N/A	-6.693	NO
MW369	Downgradient	No	0.003	N/A	-5.809	N/A
MW372	Downgradient	Yes	0.00125	N/A	-6.685	NO
MW384	Sidegradient	No	0.00138	N/A	-6.586	N/A
MW387	Downgradient	No	0.0013	N/A	-6.645	N/A
MW391	Downgradient	Yes	0.0014	N/A	-6.571	NO
MW394	Upgradient	Yes	0.00126	N/A	-6.677	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.

D1-31

C-746-S/T Second Quarter 2019 Statistical Analysis Historical Background Comparison

Beta activity

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=** 14.273 **S=** 13.883 **CV(1)=**0.973 **K factor**=** 2.523 **TL(1)=** 49.300 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** 2.213 **S=** 1.033 **CV(2)=**0.467 **K factor**=** 2.523 **TL(2)=** 4.819 **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: MW220

Date Collected	Result	LN(Result)
10/14/2002	15.2	2.721
1/15/2003	42.5	3.750
4/10/2003	45.4	3.816
7/14/2003	8.53	2.144
10/13/2003	11.7	2.460
1/13/2004	13.5	2.603
4/13/2004	33.5	3.512
7/21/2004	13.7	2.617

Well Number: MW394

Date Collected	Result	LN(Result)
8/13/2002	5.03	1.615
9/16/2002	5.57	1.717
10/16/2002	12.8	2.549
1/13/2003	4.3	1.459
4/10/2003	9.52	2.253
7/16/2003	3.92	1.366
10/14/2003	1.06	0.058
1/13/2004	2.14	0.761

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW220	Upgradient	No	8.19	N/A	2.103	N/A
MW221	Sidegradient	Yes	9.35	N/A	2.235	N/A
MW222	Sidegradient	No	7.11	N/A	1.962	N/A
MW223	Sidegradient	Yes	24.4	N/A	3.195	N/A
MW224	Sidegradient	No	2.3	N/A	0.833	N/A
MW369	Downgradient	Yes	83.7	YES	4.427	N/A
MW372	Downgradient	Yes	41	N/A	3.714	N/A
MW384	Sidegradient	Yes	97	YES	4.575	N/A
MW387	Downgradient	Yes	135	YES	4.905	N/A
MW391	Downgradient	Yes	15.3	N/A	2.728	N/A
MW394	Upgradient	No	2.82	N/A	1.037	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters 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

MW369
MW384
MW387

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

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

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

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

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

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

C-746-S/T Second Quarter 2019 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**= 0.425 **S**= 0.615 **CV(1)**= 1.447 **K factor****= 2.523 **TL(1)**= 1.976 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= -1.322 **S**= 0.786 **CV(2)**= -0.595 **K factor****= 2.523 **TL(2)**= 0.663 **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: MW220

Date Collected	Result	LN(Result)
10/14/2002	0.2	-1.609
1/15/2003	0.2	-1.609
4/10/2003	0.2	-1.609
7/14/2003	0.2	-1.609
10/13/2003	0.2	-1.609
1/13/2004	0.2	-1.609
4/13/2004	0.2	-1.609
7/21/2004	0.2	-1.609

Well Number: MW394

Date Collected	Result	LN(Result)
8/13/2002	2	0.693
9/16/2002	2	0.693
10/16/2002	0.2	-1.609
1/13/2003	0.2	-1.609
4/10/2003	0.2	-1.609
7/16/2003	0.2	-1.609
10/14/2003	0.2	-1.609
1/13/2004	0.2	-1.609

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result > TL(1)?	LN(Result)	LN(Result) > TL(2)
MW220	Upgradient	Yes	0.00652	N/A	-5.033	NO
MW221	Sidegradient	Yes	0.0134	N/A	-4.313	NO
MW222	Sidegradient	Yes	0.00887	N/A	-4.725	NO
MW223	Sidegradient	Yes	0.00832	N/A	-4.789	NO
MW224	Sidegradient	Yes	0.0213	N/A	-3.849	NO
MW369	Downgradient	Yes	0.0187	N/A	-3.979	NO
MW372	Downgradient	Yes	0.86	N/A	-0.151	NO
MW384	Sidegradient	Yes	0.0268	N/A	-3.619	NO
MW387	Downgradient	Yes	0.0224	N/A	-3.799	NO
MW391	Downgradient	Yes	0.231	N/A	-1.465	NO
MW394	Upgradient	Yes	0.0245	N/A	-3.709	NO

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

Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

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

C-746-S/T Second Quarter 2019 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: MW220

Date Collected	Result	LN(Result)
10/14/2002	1	0.000
1/15/2003	1	0.000
4/10/2003	1	0.000
7/14/2003	1	0.000
10/13/2003	1	0.000
1/13/2004	1	0.000
4/13/2004	1	0.000
7/21/2004	1	0.000

Well Number: MW394

Date Collected	Result	LN(Result)
8/13/2002	1	0.000
9/16/2002	1	0.000
10/16/2002	1	0.000
1/13/2003	1	0.000
4/10/2003	1	0.000
7/16/2003	1	0.000
10/14/2003	1	0.000
1/13/2004	1	0.000

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW220	Upgradient	Yes	0.211	NO	-1.556	N/A
MW221	Sidegradient	Yes	0.433	NO	-0.837	N/A
MW222	Sidegradient	Yes	0.424	NO	-0.858	N/A
MW223	Sidegradient	Yes	0.384	NO	-0.957	N/A
MW224	Sidegradient	Yes	0.461	NO	-0.774	N/A
MW369	Downgradient	Yes	0.404	NO	-0.906	N/A
MW372	Downgradient	Yes	0.586	NO	-0.534	N/A
MW384	Sidegradient	Yes	0.33	NO	-1.109	N/A
MW387	Downgradient	Yes	0.591	NO	-0.526	N/A
MW391	Downgradient	Yes	0.492	NO	-0.709	N/A
MW394	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.

Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

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

C-746-S/T Second Quarter 2019 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= 27.638	S= 4.743	CV(1)=0.172	K factor**= 2.523	TL(1)= 39.604	LL(1)=N/A
Statistics-Transformed Background Data	X= 3.304	S= 0.183	CV(2)=0.055	K factor**= 2.523	TL(2)= 3.765	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: MW220

Date Collected	Result	LN(Result)
10/14/2002	23.6	3.161
1/15/2003	25.9	3.254
4/10/2003	30.4	3.414
7/14/2003	33.9	3.523
10/13/2003	21.3	3.059
1/13/2004	20.3	3.011
4/13/2004	23.8	3.170
7/21/2004	19	2.944

Well Number: MW394

Date Collected	Result	LN(Result)
8/13/2002	29.5	3.384
9/16/2002	29.9	3.398
10/16/2002	31.2	3.440
1/13/2003	30.7	3.424
4/10/2003	34.4	3.538
7/16/2003	29.6	3.388
10/14/2003	30.3	3.411
1/13/2004	28.4	3.346

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW220	Upgradient	Yes	35.8	NO	3.578	N/A
MW221	Sidegradient	Yes	21.4	NO	3.063	N/A
MW222	Sidegradient	Yes	19	NO	2.944	N/A
MW223	Sidegradient	Yes	22.7	NO	3.122	N/A
MW224	Sidegradient	Yes	21.3	NO	3.059	N/A
MW369	Downgradient	Yes	20	NO	2.996	N/A
MW372	Downgradient	Yes	49.7	YES	3.906	N/A
MW384	Sidegradient	Yes	23.3	NO	3.148	N/A
MW387	Downgradient	Yes	29.8	NO	3.395	N/A
MW391	Downgradient	Yes	32	NO	3.466	N/A
MW394	Upgradient	Yes	24.7	NO	3.207	N/A

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

Conclusion of Statistical Analysis on Historical Data

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.

D1-35

C-746-S/T Second Quarter 2019 Statistical Analysis Historical Background Comparison

Carbon disulfide

UNITS: ug/L

URGA

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

Statistics-Background Data **X= 5.000** **S= 0.000** **CV(1)=0.000** **K factor**= 2.523** **TL(1)= 5.000** **LL(1)=N/A**

Statistics-Transformed Background Data **X= 1.609** **S= 0.000** **CV(2)=0.000** **K factor**= 2.523** **TL(2)= 1.609** **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: MW220

Date Collected	Result	LN(Result)
10/14/2002	5	1.609
1/15/2003	5	1.609
4/10/2003	5	1.609
7/14/2003	5	1.609
10/13/2003	5	1.609
1/13/2004	5	1.609
4/13/2004	5	1.609
7/21/2004	5	1.609

Well Number: MW394

Date Collected	Result	LN(Result)
8/13/2002	5	1.609
9/30/2002	5	1.609
10/16/2002	5	1.609
1/13/2003	5	1.609
4/10/2003	5	1.609
7/16/2003	5	1.609
10/14/2003	5	1.609
1/13/2004	5	1.609

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW220	Upgradient	No	5	N/A	1.609	N/A
MW221	Sidegradient	No	5	N/A	1.609	N/A
MW222	Sidegradient	No	5	N/A	1.609	N/A
MW223	Sidegradient	No	5	N/A	1.609	N/A
MW224	Sidegradient	No	5	N/A	1.609	N/A
MW369	Downgradient	No	5	N/A	1.609	N/A
MW372	Downgradient	No	5	N/A	1.609	N/A
MW384	Sidegradient	No	5	N/A	1.609	N/A
MW387	Downgradient	No	5	N/A	1.609	N/A
MW391	Downgradient	Yes	2.85	NO	1.047	N/A
MW394	Upgradient	No	5	N/A	1.609	N/A

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

Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

** Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009. D1-36

C-746-S/T Second Quarter 2019 Statistical Analysis Historical Background Comparison

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

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

Statistics-Background Data	X= 35.000	S= 0.000	CV(1)=0.000	K factor**= 2.523	TL(1)= 35.000	LL(1)=N/A
Statistics-Transformed Background Data	X= 3.555	S= 0.000	CV(2)=0.000	K factor**= 2.523	TL(2)= 3.555	LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW220

Date Collected	Result	LN(Result)
10/14/2002	35	3.555
1/15/2003	35	3.555
4/10/2003	35	3.555
7/14/2003	35	3.555
10/13/2003	35	3.555
1/13/2004	35	3.555
4/13/2004	35	3.555
7/21/2004	35	3.555

Well Number: MW394

Date Collected	Result	LN(Result)
8/13/2002	35	3.555
9/16/2002	35	3.555
10/16/2002	35	3.555
1/13/2003	35	3.555
4/10/2003	35	3.555
7/16/2003	35	3.555
10/14/2003	35	3.555
1/13/2004	35	3.555

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW220	Upgradient	Yes	16.4	NO	2.797	N/A
MW221	Sidegradient	No	20	N/A	2.996	N/A
MW222	Sidegradient	Yes	13.3	NO	2.588	N/A
MW223	Sidegradient	No	20	N/A	2.996	N/A
MW224	Sidegradient	Yes	10.1	NO	2.313	N/A
MW369	Downgradient	Yes	17.4	NO	2.856	N/A
MW372	Downgradient	Yes	52.6	YES	3.963	N/A
MW384	Sidegradient	No	20	N/A	2.996	N/A
MW387	Downgradient	No	20	N/A	2.996	N/A
MW391	Downgradient	Yes	44.5	YES	3.795	N/A
MW394	Upgradient	Yes	20.3	NO	3.011	N/A

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

Conclusion of Statistical Analysis on Historical Data

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

Wells with Exceedances

MW372
MW391

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

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

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

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

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

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

D1-37

C-746-S/T Second Quarter 2019 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= 49.044	S= 11.278	CV(1)=0.230	K factor**= 2.523	TL(1)= 77.499	LL(1)=N/A
Statistics-Transformed Background Data	X= 3.866	S= 0.244	CV(2)=0.063	K factor**= 2.523	TL(2)= 4.482	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: MW220

Date Collected	Result	LN(Result)
10/14/2002	44.6	3.798
1/15/2003	43.2	3.766
4/10/2003	31.5	3.450
7/14/2003	30.8	3.428
10/13/2003	40.9	3.711
1/13/2004	40.8	3.709
4/13/2004	37.5	3.624
7/21/2004	40.8	3.709

Well Number: MW394

Date Collected	Result	LN(Result)
8/13/2002	60.4	4.101
9/16/2002	60.3	4.099
10/16/2002	58	4.060
1/13/2003	60.7	4.106
4/10/2003	62.9	4.142
7/16/2003	58.1	4.062
10/14/2003	58.2	4.064
1/13/2004	56	4.025

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW220	Upgradient	Yes	18.7	NO	2.929	N/A
MW221	Sidegradient	Yes	32.6	NO	3.484	N/A
MW222	Sidegradient	Yes	31.4	NO	3.447	N/A
MW223	Sidegradient	Yes	27.6	NO	3.318	N/A
MW224	Sidegradient	Yes	36.7	NO	3.603	N/A
MW369	Downgradient	Yes	34.7	NO	3.547	N/A
MW372	Downgradient	Yes	46.2	NO	3.833	N/A
MW384	Sidegradient	Yes	36.4	NO	3.595	N/A
MW387	Downgradient	Yes	43.7	NO	3.777	N/A
MW391	Downgradient	Yes	39.3	NO	3.671	N/A
MW394	Upgradient	Yes	44.3	NO	3.791	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters 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.

D1-38

C-746-S/T Second Quarter 2019 Statistical Analysis
Historical Background Comparison

cis-1,2-Dichloroethene
UNITS: ug/L
URGA

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

Statistics-Background Data	X= 5.000	S= 0.000	CV(1)=0.000	K factor**= 2.523	TL(1)= 5.000	LL(1)=N/A
Statistics-Transformed Background Data	X= 1.609	S= 0.000	CV(2)=0.000	K factor**= 2.523	TL(2)= 1.609	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: MW220

Date Collected	Result	LN(Result)
10/14/2002	5	1.609
1/15/2003	5	1.609
4/10/2003	5	1.609
7/14/2003	5	1.609
10/13/2003	5	1.609
1/13/2004	5	1.609
4/13/2004	5	1.609
7/21/2004	5	1.609

Well Number: MW394

Date Collected	Result	LN(Result)
8/13/2002	5	1.609
9/30/2002	5	1.609
10/16/2002	5	1.609
1/13/2003	5	1.609
4/10/2003	5	1.609
7/16/2003	5	1.609
10/14/2003	5	1.609
1/13/2004	5	1.609

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW220	Upgradient	Yes	0.34	NO	-1.079	N/A
MW221	Sidegradient	No	1	N/A	0.000	N/A
MW222	Sidegradient	No	1	N/A	0.000	N/A
MW223	Sidegradient	No	1	N/A	0.000	N/A
MW224	Sidegradient	No	1	N/A	0.000	N/A
MW369	Downgradient	No	1	N/A	0.000	N/A
MW372	Downgradient	No	1	N/A	0.000	N/A
MW384	Sidegradient	No	1	N/A	0.000	N/A
MW387	Downgradient	No	1	N/A	0.000	N/A
MW391	Downgradient	No	1	N/A	0.000	N/A
MW394	Upgradient	No	1	N/A	0.000	N/A

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

Conclusion of Statistical Analysis on Historical Data

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

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.
CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.
S Standard Deviation, S = [Sum (((background result-X)^2)/[count of background results -1])]^0.5
TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)
X Mean, X = (sum of background results)/(count of background results)
** Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>,2009.

D1-39

C-746-S/T Second Quarter 2019 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**= 0.016 **S**= 0.040 **CV(1)**=2.440 **K factor****= 2.523 **TL(1)**= 0.116 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= -5.582 **S**= 1.573 **CV(2)**=-0.282 **K factor****= 2.523 **TL(2)**= -1.613 **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: MW220

Date Collected	Result	LN(Result)
10/14/2002	0.0041	-5.497
1/15/2003	0.00496	-5.306
4/10/2003	0.00289	-5.846
7/14/2003	0.161	-1.826
10/13/2003	0.0226	-3.790
1/13/2004	0.00464	-5.373
4/13/2004	0.001	-6.908
7/21/2004	0.00264	-5.937

Well Number: MW394

Date Collected	Result	LN(Result)
8/13/2002	0.025	-3.689
9/16/2002	0.025	-3.689
10/16/2002	0.001	-6.908
1/13/2003	0.001	-6.908
4/10/2003	0.001	-6.908
7/16/2003	0.001	-6.908
10/14/2003	0.001	-6.908
1/13/2004	0.001	-6.908

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW220	Upgradient	No	0.001	N/A	-6.908	N/A
MW221	Sidegradient	Yes	0.00141	N/A	-6.564	NO
MW222	Sidegradient	Yes	0.000401	N/A	-7.822	NO
MW223	Sidegradient	Yes	0.000498	N/A	-7.605	NO
MW224	Sidegradient	Yes	0.00162	N/A	-6.425	NO
MW369	Downgradient	Yes	0.0033	N/A	-5.714	NO
MW372	Downgradient	Yes	0.000571	N/A	-7.468	NO
MW384	Sidegradient	No	0.001	N/A	-6.908	N/A
MW387	Downgradient	No	0.001	N/A	-6.908	N/A
MW391	Downgradient	No	0.001	N/A	-6.908	N/A
MW394	Upgradient	No	0.001	N/A	-6.908	N/A

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

Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

** Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009. D1-40

C-746-S/T Second Quarter 2019 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= 382.132	S= 107.134	CV(1)=0.280	K factor**= 2.523	TL(1)= 652.432	LL(1)=N/A
Statistics-Transformed Background Data	X= 5.716	S= 1.164	CV(2)=0.204	K factor**= 2.523	TL(2)= 8.652	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: MW220

Date Collected	Result	LN(Result)
10/14/2002	368	5.908
1/15/2003	433.2	6.071
4/10/2003	489	6.192
7/14/2003	430	6.064
10/13/2003	346	5.846
1/13/2004	365	5.900
4/13/2004	416	6.031
7/21/2004	353	5.866

Well Number: MW394

Date Collected	Result	LN(Result)
8/13/2002	406	6.006
9/16/2002	418	6.035
10/16/2002	411	6.019
1/13/2003	422	6.045
4/10/2003	420	6.040
7/16/2003	438	6.082
10/14/2003	3.91	1.364
1/13/2004	395	5.979

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW220	Upgradient	Yes	435	NO	6.075	N/A
MW221	Sidegradient	Yes	427	NO	6.057	N/A
MW222	Sidegradient	Yes	375	NO	5.927	N/A
MW223	Sidegradient	Yes	425	NO	6.052	N/A
MW224	Sidegradient	Yes	439	NO	6.084	N/A
MW369	Downgradient	Yes	439	NO	6.084	N/A
MW372	Downgradient	Yes	632	NO	6.449	N/A
MW384	Sidegradient	Yes	452	NO	6.114	N/A
MW387	Downgradient	Yes	526	NO	6.265	N/A
MW391	Downgradient	Yes	494	NO	6.203	N/A
MW394	Upgradient	Yes	383	NO	5.948	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters 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-S/T Second Quarter 2019 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**= 0.024 **S**= 0.010 **CV(1)**=0.429 **K factor****= 2.523 **TL(1)**= 0.050 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= -3.794 **S**= 0.312 **CV(2)**=-0.082 **K factor****= 2.523 **TL(2)**= -3.007 **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: MW220

Date Collected	Result	LN(Result)
10/14/2002	0.0211	-3.858
1/15/2003	0.02	-3.912
4/10/2003	0.02	-3.912
7/14/2003	0.02	-3.912
10/13/2003	0.02	-3.912
1/13/2004	0.02	-3.912
4/13/2004	0.02	-3.912
7/21/2004	0.02	-3.912

Well Number: MW394

Date Collected	Result	LN(Result)
8/13/2002	0.05	-2.996
9/16/2002	0.05	-2.996
10/16/2002	0.02	-3.912
1/13/2003	0.02	-3.912
4/10/2003	0.02	-3.912
7/16/2003	0.02	-3.912
10/14/2003	0.02	-3.912
1/13/2004	0.02	-3.912

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW220	Upgradient	Yes	0.000823	NO	-7.103	N/A
MW221	Sidegradient	Yes	0.00101	NO	-6.898	N/A
MW222	Sidegradient	Yes	0.000335	NO	-8.001	N/A
MW223	Sidegradient	Yes	0.000459	NO	-7.686	N/A
MW224	Sidegradient	Yes	0.000439	NO	-7.731	N/A
MW369	Downgradient	Yes	0.00247	NO	-6.004	N/A
MW372	Downgradient	Yes	0.00058	NO	-7.452	N/A
MW384	Sidegradient	Yes	0.000617	NO	-7.391	N/A
MW387	Downgradient	Yes	0.000446	NO	-7.715	N/A
MW391	Downgradient	Yes	0.000335	NO	-8.001	N/A
MW394	Upgradient	Yes	0.000541	NO	-7.522	N/A

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

Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

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

C-746-S/T Second Quarter 2019 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**= 3.784 **S**= 1.887 **CV(1)**=0.499 **K factor****= 2.523 **TL(1)**= 8.545 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= 1.182 **S**= 0.612 **CV(2)**=0.518 **K factor****= 2.523 **TL(2)**= 2.727 **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: MW220

Date Collected	Result	LN(Result)
10/14/2002	6.79	1.915
1/15/2003	7.25	1.981
4/10/2003	3.6	1.281
7/14/2003	0.94	-0.062
10/13/2003	1.65	0.501
1/13/2004	3.48	1.247
4/13/2004	1.05	0.049
7/21/2004	4.46	1.495

Well Number: MW394

Date Collected	Result	LN(Result)
8/13/2002	6.09	1.807
9/16/2002	3.85	1.348
10/16/2002	5.11	1.631
1/13/2003	3.83	1.343
4/10/2003	4.15	1.423
7/16/2003	1.83	0.604
10/14/2003	3.33	1.203
1/13/2004	3.14	1.144

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW220	Upgradient	Yes	4.02	NO	1.391	N/A
MW221	Sidegradient	Yes	3.6	NO	1.281	N/A
MW222	Sidegradient	Yes	3.29	NO	1.191	N/A
MW223	Sidegradient	Yes	2.8	NO	1.030	N/A
MW224	Sidegradient	Yes	2.97	NO	1.089	N/A
MW369	Downgradient	Yes	3.59	NO	1.278	N/A
MW372	Downgradient	Yes	2.13	NO	0.756	N/A
MW384	Sidegradient	Yes	4.72	NO	1.552	N/A
MW387	Downgradient	Yes	3.49	NO	1.250	N/A
MW391	Downgradient	Yes	4.58	NO	1.522	N/A
MW394	Upgradient	Yes	4.03	NO	1.394	N/A

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

Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

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

C-746-S/T Second Quarter 2019 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**= 232.688 **S**= 27.490 **CV(1)**=0.118 **K factor****= 2.523 **TL(1)**= 302.045 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= 5.443 **S**= 0.118 **CV(2)**=0.022 **K factor****= 2.523 **TL(2)**= 5.740 **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: MW220

Date Collected	Result	LN(Result)
10/14/2002	208	5.338
1/15/2003	257	5.549
4/10/2003	288	5.663
7/14/2003	262	5.568
10/13/2003	197	5.283
1/13/2004	198	5.288
4/13/2004	245	5.501
7/21/2004	204	5.318

Well Number: MW394

Date Collected	Result	LN(Result)
8/13/2002	247	5.509
9/16/2002	259	5.557
10/16/2002	201	5.303
1/13/2003	228	5.429
4/10/2003	249	5.517
7/16/2003	240	5.481
10/14/2003	230	5.438
1/13/2004	210	5.347

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW220	Upgradient	Yes	273	NO	5.609	N/A
MW221	Sidegradient	Yes	266	NO	5.583	N/A
MW222	Sidegradient	Yes	234	NO	5.455	N/A
MW223	Sidegradient	Yes	233	NO	5.451	N/A
MW224	Sidegradient	Yes	219	NO	5.389	N/A
MW369	Downgradient	Yes	261	NO	5.565	N/A
MW372	Downgradient	Yes	309	YES	5.733	N/A
MW384	Sidegradient	Yes	269	NO	5.595	N/A
MW387	Downgradient	Yes	276	NO	5.620	N/A
MW391	Downgradient	Yes	289	NO	5.666	N/A
MW394	Upgradient	Yes	216	NO	5.375	N/A

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

Conclusion of Statistical Analysis on Historical Data

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

Wells with Exceedances

MW372

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

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

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

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

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

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

C-746-S/T Second Quarter 2019 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= 0.897	S= 1.050	CV(1)= 1.170	K factor**= 2.523	TL(1)= 3.545	LL(1)=N/A
Statistics-Transformed Background Data	X= -0.565	S= 0.951	CV(2)= -1.683	K factor**= 2.523	TL(2)= 1.834	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: MW220		
Date Collected	Result	LN(Result)
10/14/2002	0.2	-1.609
1/15/2003	0.2	-1.609
4/10/2003	0.429	-0.846
7/14/2003	4.33	1.466
10/13/2003	1.81	0.593
1/13/2004	0.793	-0.232
4/13/2004	0.13	-2.040
7/21/2004	0.382	-0.962
Well Number: MW394		
Date Collected	Result	LN(Result)
8/13/2002	1.34	0.293
9/16/2002	0.328	-1.115
10/16/2002	1.38	0.322
1/13/2003	1.3	0.262
4/10/2003	0.494	-0.705
7/16/2003	0.62	-0.478
10/14/2003	0.37	-0.994
1/13/2004	0.251	-1.382

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW220	Upgradient	Yes	0.0374	N/A	-3.286	NO
MW221	Sidegradient	No	0.1	N/A	-2.303	N/A
MW222	Sidegradient	No	0.1	N/A	-2.303	N/A
MW223	Sidegradient	Yes	0.0474	N/A	-3.049	NO
MW224	Sidegradient	Yes	0.0411	N/A	-3.192	NO
MW369	Downgradient	Yes	0.149	N/A	-1.904	NO
MW372	Downgradient	Yes	0.236	N/A	-1.444	NO
MW384	Sidegradient	Yes	0.357	N/A	-1.030	NO
MW387	Downgradient	Yes	0.171	N/A	-1.766	NO
MW391	Downgradient	Yes	0.0526	N/A	-2.945	NO
MW394	Upgradient	Yes	0.107	N/A	-2.235	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.

D1-45

C-746-S/T Second Quarter 2019 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= 10.796	S= 1.703	CV(1)=0.158	K factor**= 2.523	TL(1)= 15.092	LL(1)=N/A
Statistics-Transformed Background Data	X= 2.368	S= 0.158	CV(2)=0.067	K factor**= 2.523	TL(2)= 2.766	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: MW220		
Date Collected	Result	LN(Result)
10/14/2002	9.16	2.215
1/15/2003	10	2.303
4/10/2003	10.8	2.380
7/14/2003	14.7	2.688
10/13/2003	9.03	2.201
1/13/2004	8.49	2.139
4/13/2004	9.7	2.272
7/21/2004	8.06	2.087
Well Number: MW394		
Date Collected	Result	LN(Result)
8/13/2002	11.8	2.468
9/16/2002	12.1	2.493
10/16/2002	11.3	2.425
1/13/2003	10.3	2.332
4/10/2003	11.7	2.460
7/16/2003	12	2.485
10/14/2003	12.2	2.501
1/13/2004	11.4	2.434

Current Quarter Data						
Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW220	Upgradient	Yes	10.3	NO	2.332	N/A
MW221	Sidegradient	Yes	9.42	NO	2.243	N/A
MW222	Sidegradient	Yes	8.59	NO	2.151	N/A
MW223	Sidegradient	Yes	9.65	NO	2.267	N/A
MW224	Sidegradient	Yes	9.54	NO	2.255	N/A
MW369	Downgradient	Yes	9.06	NO	2.204	N/A
MW372	Downgradient	Yes	18.2	YES	2.901	N/A
MW384	Sidegradient	Yes	9.71	NO	2.273	N/A
MW387	Downgradient	Yes	12.4	NO	2.518	N/A
MW391	Downgradient	Yes	13.9	NO	2.632	N/A
MW394	Upgradient	Yes	11	NO	2.398	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters 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	Wells with Exceedances
<div> The test well(s) listed exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to historical background data. </div>	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, $S = \sqrt{[\text{Sum } ((\text{background result}-X)^2)/[\text{count of background results } -1]]}^{0.5}$

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.

D1-46

C-746-S/T Second Quarter 2019 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**= 0.287 **S**= 0.619 **CV(1)**=2.156 **K factor****= 2.523 **TL(1)**= 1.848 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= -2.455 **S**= 1.619 **CV(2)**=-0.659 **K factor****= 2.523 **TL(2)**= 1.630 **LL(2)**=N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW220

Date Collected	Result	LN(Result)
10/14/2002	0.0306	-3.487
1/15/2003	0.0291	-3.537
4/10/2003	0.0137	-4.290
7/14/2003	2.54	0.932
10/13/2003	0.378	-0.973
1/13/2004	0.159	-1.839
4/13/2004	0.00707	-4.952
7/21/2004	0.0841	-2.476

Well Number: MW394

Date Collected	Result	LN(Result)
8/13/2002	0.542	-0.612
9/16/2002	0.155	-1.864
10/16/2002	0.103	-2.273
1/13/2003	0.128	-2.056
4/10/2003	0.005	-5.298
7/16/2003	0.272	-1.302
10/14/2003	0.0795	-2.532
1/13/2004	0.0658	-2.721

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)
MW220	Upgradient	No	0.00188	N/A	-6.276	N/A
MW221	Sidegradient	No	0.005	N/A	-5.298	N/A
MW222	Sidegradient	Yes	0.00829	N/A	-4.793	NO
MW223	Sidegradient	Yes	0.00962	N/A	-4.644	NO
MW224	Sidegradient	Yes	0.0174	N/A	-4.051	NO
MW369	Downgradient	Yes	0.0201	N/A	-3.907	NO
MW372	Downgradient	No	0.0049	N/A	-5.319	N/A
MW384	Sidegradient	Yes	0.0128	N/A	-4.358	NO
MW387	Downgradient	Yes	0.0933	N/A	-2.372	NO
MW391	Downgradient	No	0.00198	N/A	-6.225	N/A
MW394	Upgradient	No	0.00474	N/A	-5.352	N/A

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

Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

** Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009. D1-47

C-746-S/T Second Quarter 2019 Statistical Analysis Historical Background Comparison

Methylene chloride

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**= 4.813 **S**= 0.750 **CV(1)**=0.156 **K factor****= 2.523 **TL(1)**= 6.705 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= 1.552 **S**= 0.229 **CV(2)**=0.148 **K factor****= 2.523 **TL(2)**= 2.130 **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: MW220

Date Collected	Result	LN(Result)
10/14/2002	5	1.609
1/15/2003	5	1.609
4/10/2003	5	1.609
7/14/2003	5	1.609
10/13/2003	5	1.609
1/13/2004	5	1.609
4/13/2004	5	1.609
7/21/2004	5	1.609

Well Number: MW394

Date Collected	Result	LN(Result)
8/13/2002	5	1.609
9/30/2002	2	0.693
10/16/2002	5	1.609
1/13/2003	5	1.609
4/10/2003	5	1.609
7/16/2003	5	1.609
10/14/2003	5	1.609
1/13/2004	5	1.609

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW220	Upgradient	No	2.24	N/A	0.806	N/A
MW221	Sidegradient	Yes	2.56	NO	0.940	N/A
MW222	Sidegradient	Yes	2.44	NO	0.892	N/A
MW223	Sidegradient	Yes	2.82	NO	1.037	N/A
MW224	Sidegradient	Yes	2.38	NO	0.867	N/A
MW369	Downgradient	No	5	N/A	1.609	N/A
MW372	Downgradient	No	5	N/A	1.609	N/A
MW384	Sidegradient	No	5	N/A	1.609	N/A
MW387	Downgradient	No	5	N/A	1.609	N/A
MW391	Downgradient	No	2.33	N/A	0.846	N/A
MW394	Upgradient	No	5	N/A	1.609	N/A

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

Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

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

C-746-S/T Second Quarter 2019 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= 0.006	S= 0.008	CV(1)= 1.261	K factor**= 2.523	TL(1)= 0.026	LL(1)=N/A
Statistics-Transformed Background Data	X= -5.747	S= 1.205	CV(2)= -0.210	K factor**= 2.523	TL(2)= -2.708	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: MW220

Date Collected	Result	LN(Result)
10/14/2002	0.00558	-5.189
1/15/2003	0.00983	-4.622
4/10/2003	0.0109	-4.519
7/14/2003	0.00245	-6.012
10/13/2003	0.00566	-5.174
1/13/2004	0.00572	-5.164
4/13/2004	0.001	-6.908
7/21/2004	0.00392	-5.542

Well Number: MW394

Date Collected	Result	LN(Result)
8/13/2002	0.025	-3.689
9/16/2002	0.025	-3.689
10/16/2002	0.001	-6.908
1/13/2003	0.001	-6.908
4/10/2003	0.001	-6.908
7/16/2003	0.001	-6.908
10/14/2003	0.001	-6.908
1/13/2004	0.001	-6.908

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW220	Upgradient	Yes	0.00105	N/A	-6.859	NO
MW221	Sidegradient	Yes	0.0104	N/A	-4.566	NO
MW222	Sidegradient	No	0.001	N/A	-6.908	N/A
MW223	Sidegradient	Yes	0.00644	N/A	-5.045	NO
MW224	Sidegradient	No	0.001	N/A	-6.908	N/A
MW369	Downgradient	No	0.001	N/A	-6.908	N/A
MW372	Downgradient	Yes	0.000389	N/A	-7.852	NO
MW384	Sidegradient	No	0.001	N/A	-6.908	N/A
MW387	Downgradient	No	0.001	N/A	-6.908	N/A
MW391	Downgradient	No	0.001	N/A	-6.908	N/A
MW394	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-S/T Second Quarter 2019 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**= 0.127 **S**= 0.228 **CV(1)**= 1.790 **K factor****= 2.523 **TL(1)**= 0.701 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= -3.617 **S**= 1.837 **CV(2)**= -0.508 **K factor****= 2.523 **TL(2)**= 1.019 **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: MW220

Date Collected	Result	LN(Result)
10/14/2002	0.418	-0.872
1/15/2003	0.738	-0.304
4/10/2003	0.544	-0.609
7/14/2003	0.106	-2.244
10/13/2003	0.0529	-2.939
1/13/2004	0.0209	-3.868
4/13/2004	0.005	-5.298
7/21/2004	0.0192	-3.953

Well Number: MW394

Date Collected	Result	LN(Result)
8/13/2002	0.05	-2.996
9/16/2002	0.05	-2.996
10/16/2002	0.005	-5.298
1/13/2003	0.005	-5.298
4/10/2003	0.005	-5.298
7/16/2003	0.005	-5.298
10/14/2003	0.005	-5.298
1/13/2004	0.005	-5.298

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result > TL(1)?	LN(Result)	LN(Result) > TL(2)
MW220	Upgradient	Yes	0.0237	N/A	-3.742	NO
MW221	Sidegradient	Yes	0.124	N/A	-2.087	NO
MW222	Sidegradient	Yes	0.0639	N/A	-2.750	NO
MW223	Sidegradient	Yes	0.178	N/A	-1.726	NO
MW224	Sidegradient	Yes	0.106	N/A	-2.244	NO
MW369	Downgradient	Yes	0.00656	N/A	-5.027	NO
MW372	Downgradient	Yes	0.00125	N/A	-6.685	NO
MW384	Sidegradient	Yes	0.000607	N/A	-7.407	NO
MW387	Downgradient	Yes	0.000689	N/A	-7.280	NO
MW391	Downgradient	No	0.002	N/A	-6.215	N/A
MW394	Upgradient	Yes	0.00424	N/A	-5.463	NO

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

Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

** Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009. D1-50

C-746-S/T Second Quarter 2019 Statistical Analysis Historical Background Comparison

Oxidation-Reduction Potential UNITS: mV URG

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

Statistics-Background Data	X= 179.872	S= 86.318	CV(1)=0.480	K factor**= 2.523	TL(1)= 397.652	LL(1)=N/A
Statistics-Transformed Background Data	X= 4.861	S= 1.252	CV(2)=0.258	K factor**= 2.523	TL(2)= 8.021	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: MW220		
Date Collected	Result	LN(Result)
10/14/2002	205	5.323
1/15/2003	1.95	0.668
4/10/2003	203	5.313
7/14/2003	30	3.401
10/13/2003	107	4.673
1/13/2004	295	5.687
4/13/2004	190	5.247
7/21/2004	319	5.765
Well Number: MW394		
Date Collected	Result	LN(Result)
8/13/2002	90	4.500
9/16/2002	240	5.481
10/16/2002	185	5.220
1/13/2003	220	5.394
4/10/2003	196	5.278
7/16/2003	172	5.147
10/14/2003	175	5.165
1/13/2004	249	5.517

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW220	Upgradient	Yes	523	YES	6.260	N/A
MW221	Sidegradient	Yes	539	YES	6.290	N/A
MW222	Sidegradient	Yes	519	YES	6.252	N/A
MW223	Sidegradient	Yes	520	YES	6.254	N/A
MW224	Sidegradient	Yes	516	YES	6.246	N/A
MW369	Downgradient	Yes	372	NO	5.919	N/A
MW372	Downgradient	Yes	400	YES	5.991	N/A
MW384	Sidegradient	Yes	423	YES	6.047	N/A
MW387	Downgradient	Yes	436	YES	6.078	N/A
MW391	Downgradient	Yes	469	YES	6.151	N/A
MW394	Upgradient	Yes	463	YES	6.138	N/A

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

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

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

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

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

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

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

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

MW220
MW221
MW222
MW223
MW224
MW372
MW384
MW387
MW391
MW394

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

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

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

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

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

** Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009. D1-52

C-746-S/T Second Quarter 2019 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= 6.138	S= 0.282	CV(1)=0.046	K factor**= 2.904	TL(1)= 6.957	LL(1)=5.3179
Statistics-Transformed Background Data	X= 1.813	S= 0.047	CV(2)=0.026	K factor**= 2.904	TL(2)= 1.950	LL(2)=1.6765

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: MW220

Date Collected	Result	LN(Result)
10/14/2002	6.04	1.798
1/15/2003	6.31	1.842
4/10/2003	6.5	1.872
7/14/2003	6.3	1.841
10/13/2003	6.34	1.847
1/13/2004	6.33	1.845
4/13/2004	6.3	1.841
7/21/2004	5.9	1.775

Well Number: MW394

Date Collected	Result	LN(Result)
8/13/2002	5.8	1.758
9/30/2002	5.93	1.780
10/16/2002	5.42	1.690
1/13/2003	6	1.792
4/10/2003	6.04	1.798
7/16/2003	6.2	1.825
10/14/2003	6.4	1.856
1/13/2004	6.39	1.855

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)? Result <LL(1)?	LN(Result)	LN(Result) >TL(2)? LN(Result) <LL(2)?
MW220	Upgradient	Yes	6.31	NO	1.842	N/A
MW221	Sidegradient	Yes	6.21	NO	1.826	N/A
MW222	Sidegradient	Yes	6.26	NO	1.834	N/A
MW223	Sidegradient	Yes	6.23	NO	1.829	N/A
MW224	Sidegradient	Yes	6.29	NO	1.839	N/A
MW369	Downgradient	Yes	6.4	NO	1.856	N/A
MW372	Downgradient	Yes	6.25	NO	1.833	N/A
MW384	Sidegradient	Yes	6.17	NO	1.820	N/A
MW387	Downgradient	Yes	6.26	NO	1.834	N/A
MW391	Downgradient	Yes	6.16	NO	1.818	N/A
MW394	Upgradient	Yes	6.14	NO	1.815	N/A

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

Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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.

D1-53

C-746-S/T Second Quarter 2019 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= 6.654	S= 9.310	CV(1)= 1.399	K factor**= 2.523	TL(1)= 30.144	LL(1)=N/A
Statistics-Transformed Background Data	X= 1.130	S= 1.208	CV(2)= 1.069	K factor**= 2.523	TL(2)= 4.178	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: MW220

Date Collected	Result	LN(Result)
10/14/2002	6.7	1.902
1/15/2003	29.7	3.391
4/10/2003	24.9	3.215
7/14/2003	1.13	0.122
10/13/2003	3.43	1.233
1/13/2004	6.71	1.904
4/13/2004	19.3	2.960
7/21/2004	3.97	1.379

Well Number: MW394

Date Collected	Result	LN(Result)
8/13/2002	2	0.693
9/16/2002	2	0.693
10/16/2002	1.03	0.030
1/13/2003	1.1	0.095
4/10/2003	1.24	0.215
7/16/2003	1.14	0.131
10/14/2003	1.05	0.049
1/13/2004	1.07	0.068

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW220	Upgradient	Yes	1.87	N/A	0.626	NO
MW221	Sidegradient	Yes	2.17	N/A	0.775	NO
MW222	Sidegradient	Yes	1.56	N/A	0.445	NO
MW223	Sidegradient	Yes	2.97	N/A	1.089	NO
MW224	Sidegradient	Yes	1.13	N/A	0.122	NO
MW369	Downgradient	Yes	0.825	N/A	-0.192	NO
MW372	Downgradient	Yes	2.1	N/A	0.742	NO
MW384	Sidegradient	Yes	1.14	N/A	0.131	NO
MW387	Downgradient	Yes	1.17	N/A	0.157	NO
MW391	Downgradient	Yes	1.61	N/A	0.476	NO
MW394	Upgradient	Yes	1.34	N/A	0.293	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.

D1-54

C-746-S/T Second Quarter 2019 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= 36.363	S= 8.666	CV(1)=0.238	K factor**= 2.523	TL(1)= 58.227	LL(1)=N/A
Statistics-Transformed Background Data	X= 3.570	S= 0.222	CV(2)=0.062	K factor**= 2.523	TL(2)= 4.129	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: MW220

Date Collected	Result	LN(Result)
10/14/2002	35.4	3.567
1/15/2003	40.6	3.704
4/10/2003	51	3.932
7/14/2003	58.2	4.064
10/13/2003	38.1	3.640
1/13/2004	37	3.611
4/13/2004	43.2	3.766
7/21/2004	33.8	3.520

Well Number: MW394

Date Collected	Result	LN(Result)
8/13/2002	32.9	3.493
9/16/2002	29.9	3.398
10/16/2002	29	3.367
1/13/2003	27.1	3.300
4/10/2003	24.8	3.211
7/16/2003	35.6	3.572
10/14/2003	33.9	3.523
1/13/2004	31.3	3.444

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW220	Upgradient	Yes	47.4	NO	3.859	N/A
MW221	Sidegradient	Yes	49.2	NO	3.896	N/A
MW222	Sidegradient	Yes	46.7	NO	3.844	N/A
MW223	Sidegradient	Yes	43.7	NO	3.777	N/A
MW224	Sidegradient	Yes	48.6	NO	3.884	N/A
MW369	Downgradient	Yes	51.1	NO	3.934	N/A
MW372	Downgradient	Yes	47.4	NO	3.859	N/A
MW384	Sidegradient	Yes	49.6	NO	3.904	N/A
MW387	Downgradient	Yes	58.6	YES	4.071	N/A
MW391	Downgradient	Yes	39.7	NO	3.681	N/A
MW394	Upgradient	Yes	30.8	NO	3.428	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters 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
MW387

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.
CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.
S Standard Deviation, S = [Sum (((background result-X)^2)/[count of background results -1])]^0.5
TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)
X Mean, X = (sum of background results)/(count of background results)
** Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>,2009.

D1-55

C-746-S/T Second Quarter 2019 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= 10.481	S= 2.648	CV(1)=0.253	K factor**= 2.523	TL(1)= 17.161	LL(1)=N/A
Statistics-Transformed Background Data	X= 2.322	S= 0.239	CV(2)=0.103	K factor**= 2.523	TL(2)= 2.925	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: MW220

Date Collected	Result	LN(Result)
10/14/2002	10.4	2.342
1/15/2003	9.8	2.282
4/10/2003	15.4	2.734
7/14/2003	14.9	2.701
10/13/2003	13.5	2.603
1/13/2004	10.3	2.332
4/13/2004	14.3	2.660
7/21/2004	10.5	2.351

Well Number: MW394

Date Collected	Result	LN(Result)
8/13/2002	11.2	2.416
9/16/2002	8.3	2.116
10/16/2002	8	2.079
1/13/2003	8.5	2.140
4/10/2003	7.9	2.067
7/16/2003	8.4	2.128
10/14/2003	8.2	2.104
1/13/2004	8.1	2.092

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW220	Upgradient	Yes	24.1	YES	3.182	N/A
MW221	Sidegradient	Yes	15.5	NO	2.741	N/A
MW222	Sidegradient	Yes	14.4	NO	2.667	N/A
MW223	Sidegradient	Yes	20.5	YES	3.020	N/A
MW224	Sidegradient	Yes	14.1	NO	2.646	N/A
MW369	Downgradient	Yes	14.6	NO	2.681	N/A
MW372	Downgradient	Yes	71.3	YES	4.267	N/A
MW384	Sidegradient	Yes	22.8	YES	3.127	N/A
MW387	Downgradient	Yes	20.8	YES	3.035	N/A
MW391	Downgradient	Yes	57.5	YES	4.052	N/A
MW394	Upgradient	Yes	10.7	NO	2.370	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters 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

MW220
MW223
MW372
MW384
MW387
MW391

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.
CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.
S Standard Deviation, S = [Sum (((background result-X)^2)/[count of background results -1])]^0.5
TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)
X Mean, X = (sum of background results)/(count of background results)
** Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>,2009.

D1-56

C-746-S/T Second Quarter 2019 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 = 9.354	S = 9.280	CV(1) =0.992	K factor **= 2.523	TL(1) = 32.768	LL(1) =N/A
Statistics-Transformed Background Data	X = 2.270	S = 0.849	CV(2) =0.374	K factor **= 2.523	TL(2) = 3.262	LL(2) =N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW220

Date Collected	Result	LN(Result)
10/14/2002	19.7	2.981
1/15/2003	26.1	3.262
4/10/2003	3.56	1.270
7/14/2003	0	#Func!
10/13/2003	21	3.045
1/13/2004	6.32	1.844
4/13/2004	3	1.099
7/21/2004	14.6	2.681

Well Number: MW394

Date Collected	Result	LN(Result)
8/13/2002	14	2.639
9/16/2002	5.45	1.696
10/16/2002	2.49	0.912
1/13/2003	18.3	2.907
4/10/2003	-1.45	#Func!
7/16/2003	-1.71	#Func!
10/14/2003	18.3	2.907
1/13/2004	0	#Func!

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW220	Upgradient	Yes	17.1	NO	2.839	N/A
MW221	Sidegradient	No	14.4	N/A	2.667	N/A
MW222	Sidegradient	No	2.01	N/A	0.698	N/A
MW223	Sidegradient	No	9.75	N/A	2.277	N/A
MW224	Sidegradient	No	5.63	N/A	1.728	N/A
MW369	Downgradient	Yes	70.8	YES	4.260	N/A
MW372	Downgradient	Yes	59.4	YES	4.084	N/A
MW384	Sidegradient	Yes	155	YES	5.043	N/A
MW387	Downgradient	Yes	229	YES	5.434	N/A
MW391	Downgradient	No	12.5	N/A	2.526	N/A
MW394	Upgradient	No	2.55	N/A	0.936	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters 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

MW369
MW372
MW384
MW387

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

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

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

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

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

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

C-746-S/T Second Quarter 2019 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**= 1.494 **S**= 0.737 **CV(1)**=0.493 **K factor****= 2.523 **TL(1)**= 3.353 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= 0.315 **S**= 0.402 **CV(2)**=1.279 **K factor****= 2.523 **TL(2)**= 1.330 **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: MW220

Date Collected	Result	LN(Result)
10/14/2002	1	0.000
1/15/2003	1.1	0.095
4/10/2003	1	0.000
7/14/2003	3.3	1.194
10/13/2003	1.8	0.588
1/13/2004	1	0.000
4/13/2004	2	0.693
7/21/2004	3.1	1.131

Well Number: MW394

Date Collected	Result	LN(Result)
8/13/2002	1.3	0.262
9/16/2002	1	0.000
10/16/2002	1	0.000
1/13/2003	1.6	0.470
4/10/2003	1	0.000
7/16/2003	1.4	0.336
10/14/2003	1.3	0.262
1/13/2004	1	0.000

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW220	Upgradient	Yes	1.09	NO	0.086	N/A
MW221	Sidegradient	Yes	0.996	NO	-0.004	N/A
MW222	Sidegradient	Yes	0.886	NO	-0.121	N/A
MW223	Sidegradient	Yes	1.03	NO	0.030	N/A
MW224	Sidegradient	Yes	0.863	NO	-0.147	N/A
MW369	Downgradient	Yes	1.19	NO	0.174	N/A
MW372	Downgradient	Yes	1.1	NO	0.095	N/A
MW384	Sidegradient	Yes	1.06	NO	0.058	N/A
MW387	Downgradient	Yes	1.19	NO	0.174	N/A
MW391	Downgradient	Yes	0.888	NO	-0.119	N/A
MW394	Upgradient	Yes	0.935	NO	-0.067	N/A

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

Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

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

C-746-S/T Second Quarter 2019 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**= 63.475 **S**= 163.135 **CV(1)**=2.570 **K factor****= 2.523 **TL(1)**= 475.063 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= 3.103 **S**= 1.145 **CV(2)**=0.369 **K factor****= 2.523 **TL(2)**= 5.992 **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: MW220

Date Collected	Result	LN(Result)
10/14/2002	50	3.912
1/15/2003	10	2.303
4/10/2003	10	2.303
7/14/2003	10	2.303
10/13/2003	10	2.303
1/13/2004	10	2.303
4/13/2004	10	2.303
7/21/2004	10	2.303

Well Number: MW394

Date Collected	Result	LN(Result)
8/13/2002	50	3.912
9/16/2002	672	6.510
10/16/2002	50	3.912
1/13/2003	36.1	3.586
4/10/2003	10	2.303
7/16/2003	42.7	3.754
10/14/2003	22	3.091
1/13/2004	12.8	2.549

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW220	Upgradient	Yes	8.22	N/A	2.107	NO
MW221	Sidegradient	Yes	16.7	N/A	2.815	NO
MW222	Sidegradient	Yes	4.34	N/A	1.468	NO
MW223	Sidegradient	Yes	5.82	N/A	1.761	NO
MW224	Sidegradient	Yes	13.5	N/A	2.603	NO
MW369	Downgradient	Yes	14.3	N/A	2.660	NO
MW372	Downgradient	Yes	7.5	N/A	2.015	NO
MW384	Sidegradient	Yes	8	N/A	2.079	NO
MW387	Downgradient	No	6.82	N/A	1.920	N/A
MW391	Downgradient	Yes	7.28	N/A	1.985	NO
MW394	Upgradient	Yes	5.08	N/A	1.625	NO

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

Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

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

C-746-S/T Second Quarter 2019 Statistical Analysis Historical Background Comparison

Trichloroethene

UNITS: ug/L

URGA

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

Statistics-Background Data **X**= 8.813 **S**= 8.376 **CV(1)**=0.951 **K factor****= 2.523 **TL(1)**= 29.946 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= 1.395 **S**= 1.449 **CV(2)**=1.039 **K factor****= 2.523 **TL(2)**= 5.052 **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: MW220

Date Collected	Result	LN(Result)
10/14/2002	1	0.000
1/15/2003	1	0.000
4/10/2003	1	0.000
7/14/2003	1	0.000
10/13/2003	1	0.000
1/13/2004	1	0.000
4/13/2004	1	0.000
7/21/2004	1	0.000

Well Number: MW394

Date Collected	Result	LN(Result)
8/13/2002	16	2.773
9/30/2002	20	2.996
10/16/2002	17	2.833
1/13/2003	15	2.708
4/10/2003	10	2.303
7/16/2003	19	2.944
10/14/2003	20	2.996
1/13/2004	16	2.773

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW220	Upgradient	Yes	1.05	N/A	0.049	N/A
MW221	Sidegradient	No	1	N/A	0.000	N/A
MW222	Sidegradient	No	1	N/A	0.000	N/A
MW223	Sidegradient	No	1	N/A	0.000	N/A
MW224	Sidegradient	No	1	N/A	0.000	N/A
MW369	Downgradient	Yes	0.52	N/A	-0.654	N/A
MW372	Downgradient	Yes	4.78	N/A	1.564	N/A
MW384	Sidegradient	Yes	0.36	N/A	-1.022	N/A
MW387	Downgradient	Yes	0.62	N/A	-0.478	N/A
MW391	Downgradient	Yes	6.88	NO	1.929	N/A
MW394	Upgradient	Yes	3.81	N/A	1.338	N/A

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

Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

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

C-746-S/T Second Quarter 2019 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= 0.021	S= 0.002	CV(1)=0.083	K factor**= 2.523	TL(1)= 0.025	LL(1)=N/A
Statistics-Transformed Background Data	X= -3.884	S= 0.076	CV(2)=-0.020	K factor**= 2.523	TL(2)= -3.692	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: MW220

Date Collected	Result	LN(Result)
10/14/2002	0.02	-3.912
1/15/2003	0.02	-3.912
4/10/2003	0.02	-3.912
7/14/2003	0.02	-3.912
10/13/2003	0.02	-3.912
1/13/2004	0.02	-3.912
4/13/2004	0.02	-3.912
7/21/2004	0.02	-3.912

Well Number: MW394

Date Collected	Result	LN(Result)
8/13/2002	0.025	-3.689
9/16/2002	0.025	-3.689
10/16/2002	0.02	-3.912
1/13/2003	0.02	-3.912
4/10/2003	0.02	-3.912
7/16/2003	0.02	-3.912
10/14/2003	0.02	-3.912
1/13/2004	0.02	-3.912

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW220	Upgradient	No	0.00369	N/A	-5.602	N/A
MW221	Sidegradient	No	0.00464	N/A	-5.373	N/A
MW222	Sidegradient	No	0.00668	N/A	-5.009	N/A
MW223	Sidegradient	No	0.00931	N/A	-4.677	N/A
MW224	Sidegradient	No	0.00964	N/A	-4.642	N/A
MW369	Downgradient	No	0.0103	N/A	-4.576	N/A
MW372	Downgradient	No	0.00669	N/A	-5.007	N/A
MW384	Sidegradient	Yes	0.00679	NO	-4.992	N/A
MW387	Downgradient	Yes	0.00514	NO	-5.271	N/A
MW391	Downgradient	No	0.00407	N/A	-5.504	N/A
MW394	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.

Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

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

C-746-S/T Second Quarter 2019 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= 0.036	S= 0.026	CV(1)=0.722	K factor**= 2.523	TL(1)= 0.101	LL(1)=N/A
Statistics-Transformed Background Data	X= -3.485	S= 0.525	CV(2)=-0.151	K factor**= 2.523	TL(2)= -2.162	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: MW220

Date Collected	Result	LN(Result)
10/14/2002	0.025	-3.689
1/15/2003	0.035	-3.352
4/10/2003	0.035	-3.352
7/14/2003	0.0389	-3.247
10/13/2003	0.026	-3.650
1/13/2004	0.02	-3.912
4/13/2004	0.02	-3.912
7/21/2004	0.02	-3.912

Well Number: MW394

Date Collected	Result	LN(Result)
8/13/2002	0.1	-2.303
9/16/2002	0.1	-2.303
10/16/2002	0.025	-3.689
1/13/2003	0.035	-3.352
4/10/2003	0.035	-3.352
7/16/2003	0.02	-3.912
10/14/2003	0.02	-3.912
1/13/2004	0.02	-3.912

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW220	Upgradient	No	0.02	N/A	-3.912	N/A
MW221	Sidegradient	No	0.02	N/A	-3.912	N/A
MW222	Sidegradient	No	0.02	N/A	-3.912	N/A
MW223	Sidegradient	No	0.02	N/A	-3.912	N/A
MW224	Sidegradient	No	0.02	N/A	-3.912	N/A
MW369	Downgradient	No	0.02	N/A	-3.912	N/A
MW372	Downgradient	Yes	0.00375	NO	-5.586	N/A
MW384	Sidegradient	Yes	0.00385	NO	-5.560	N/A
MW387	Downgradient	No	0.02	N/A	-3.912	N/A
MW391	Downgradient	No	0.02	N/A	-3.912	N/A
MW394	Upgradient	Yes	0.00354	NO	-5.644	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters 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-S/T Second Quarter 2019 Statistical Analysis Historical Background Comparison**Acetone****UNITS: ug/L****LRGA**

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

Statistics-Background Data **X**= 10.063 **S**= 0.250 **CV(1)**=0.025 **K factor****= 2.523 **TL(1)**= 10.693 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= 2.309 **S**= 0.024 **CV(2)**=0.010 **K factor****= 2.523 **TL(2)**= 2.369 **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: MW395

Date Collected	Result	LN(Result)
8/13/2002	11	2.398
9/30/2002	10	2.303
10/16/2002	10	2.303
1/13/2003	10	2.303
4/10/2003	10	2.303
7/16/2003	10	2.303
10/14/2003	10	2.303
4/12/2004	10	2.303

Well Number: MW397

Date Collected	Result	LN(Result)
8/13/2002	10	2.303
9/30/2002	10	2.303
10/17/2002	10	2.303
1/13/2003	10	2.303
4/8/2003	10	2.303
7/16/2003	10	2.303
10/14/2003	10	2.303
4/12/2004	10	2.303

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW370	Downgradient	Yes	4.55	NO	1.515	N/A
MW373	Downgradient	No	5	N/A	1.609	N/A
MW385	Sidegradient	No	5	N/A	1.609	N/A
MW388	Downgradient	No	5	N/A	1.609	N/A
MW392	Downgradient	No	5	N/A	1.609	N/A
MW395	Upgradient	No	5	N/A	1.609	N/A
MW397	Upgradient	No	5	N/A	1.609	N/A

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

Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

** Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/2009>. D1-63

C-746-S/T Second Quarter 2019 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= 0.258 S= 0.221 CV(1)=0.856 K factor**= 2.523 TL(1)= 0.815 LL(1)=N/A

Statistics-Transformed Background Data X= -2.266 S= 2.485 CV(2)=-1.097 K factor**= 2.523 TL(2)= 4.003 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: MW395

Date Collected	Result	LN(Result)
8/13/2002	0.2	-1.609
9/16/2002	0.2	-1.609
10/16/2002	0.0002	-8.517
1/13/2003	0.737	-0.305
4/10/2003	0.2	-1.609
7/16/2003	0.2	-1.609
10/14/2003	0.2	-1.609
1/13/2004	0.2	-1.609

Well Number: MW397

Date Collected	Result	LN(Result)
8/13/2002	0.824	-0.194
9/16/2002	0.2	-1.609
10/17/2002	0.0002	-8.517
1/13/2003	0.363	-1.013
4/8/2003	0.2	-1.609
7/16/2003	0.2	-1.609
10/14/2003	0.2	-1.609
1/13/2004	0.2	-1.609

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW370	Downgradient	No	0.05	N/A	-2.996	N/A
MW373	Downgradient	No	0.05	N/A	-2.996	N/A
MW385	Sidegradient	Yes	0.0338	NO	-3.387	N/A
MW388	Downgradient	Yes	0.0233	NO	-3.759	N/A
MW392	Downgradient	Yes	0.0538	NO	-2.922	N/A
MW395	Upgradient	Yes	0.0296	NO	-3.520	N/A
MW397	Upgradient	Yes	0.143	NO	-1.945	N/A

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

Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

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

C-746-S/T Second Quarter 2019 Statistical Analysis

Historical Background Comparison

Antimony

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= 0.054	S= 0.087	CV(1)= 1.622	K factor**= 2.523	TL(1)= 0.274	LL(1)=N/A
Statistics-Transformed Background Data	X= -4.376	S= 1.650	CV(2)= -0.377	K factor**= 2.523	TL(2)= -0.214	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: MW395

Date Collected	Result	LN(Result)
8/13/2002	0.2	-1.609
9/16/2002	0.2	-1.609
10/16/2002	0.005	-5.298
1/13/2003	0.005	-5.298
4/10/2003	0.005	-5.298
7/16/2003	0.005	-5.298
10/14/2003	0.005	-5.298
1/13/2004	0.005	-5.298

Well Number: MW397

Date Collected	Result	LN(Result)
8/13/2002	0.2	-1.609
9/16/2002	0.2	-1.609
10/17/2002	0.005	-5.298
1/13/2003	0.005	-5.298
4/8/2003	0.005	-5.298
7/16/2003	0.005	-5.298
10/14/2003	0.005	-5.298
1/13/2004	0.005	-5.298

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW370	Downgradient	No	0.003	N/A	-5.809	N/A
MW373	Downgradient	Yes	0.00125	N/A	-6.685	NO
MW385	Sidegradient	No	0.00132	N/A	-6.630	N/A
MW388	Downgradient	No	0.00128	N/A	-6.661	N/A
MW392	Downgradient	Yes	0.00123	N/A	-6.701	NO
MW395	Upgradient	Yes	0.0013	N/A	-6.645	NO
MW397	Upgradient	Yes	0.00123	N/A	-6.701	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.

D1-65

C-746-S/T Second Quarter 2019 Statistical Analysis

Historical Background Comparison

Beta activity

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= 7.183	S= 2.612	CV(1)=0.364	K factor**= 2.523	TL(1)= 13.773	LL(1)=N/A
Statistics-Transformed Background Data	X= 1.870	S= 0.552	CV(2)=0.295	K factor**= 2.523	TL(2)= 3.261	LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW395		
Date Collected	Result	LN(Result)
8/13/2002	1.09	0.086
9/16/2002	5.79	1.756
10/16/2002	6.82	1.920
1/13/2003	5.01	1.611
4/10/2003	6.1	1.808
7/16/2003	8.51	2.141
10/14/2003	4.99	1.607
1/13/2004	6.58	1.884
Well Number: MW397		
Date Collected	Result	LN(Result)
8/13/2002	9.57	2.259
9/16/2002	11	2.398
10/17/2002	9.3	2.230
1/13/2003	8.63	2.155
4/8/2003	10	2.303
7/16/2003	6.89	1.930
10/14/2003	10.1	2.313
1/13/2004	4.55	1.515

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	Downgradient	Yes	61	YES	4.111	N/A
MW373	Downgradient	Yes	13.7	N/A	2.617	N/A
MW385	Sidegradient	Yes	138	YES	4.927	N/A
MW388	Downgradient	Yes	76.7	YES	4.340	N/A
MW392	Downgradient	No	-4.1	N/A	#Error	N/A
MW395	Upgradient	No	3.8	N/A	1.335	N/A
MW397	Upgradient	No	7.45	N/A	2.008	N/A
N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters 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
MW385
MW388

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

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

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

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

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

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

D1-66

C-746-S/T Second Quarter 2019 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= 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

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: MW395

Date Collected	Result	LN(Result)
8/13/2002	2	0.693
9/16/2002	2	0.693
10/16/2002	0.2	-1.609
1/13/2003	0.2	-1.609
4/10/2003	0.2	-1.609
7/16/2003	0.2	-1.609
10/14/2003	0.2	-1.609
1/13/2004	0.2	-1.609

Well Number: MW397

Date Collected	Result	LN(Result)
8/13/2002	2	0.693
9/16/2002	2	0.693
10/17/2002	0.2	-1.609
1/13/2003	0.2	-1.609
4/8/2003	0.2	-1.609
7/16/2003	0.2	-1.609
10/14/2003	0.2	-1.609
1/13/2004	0.2	-1.609

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW370	Downgradient	Yes	0.0319	N/A	-3.445	NO
MW373	Downgradient	Yes	1.32	N/A	0.278	NO
MW385	Sidegradient	Yes	0.0226	N/A	-3.790	NO
MW388	Downgradient	Yes	0.0222	N/A	-3.808	NO
MW392	Downgradient	Yes	0.0305	N/A	-3.490	NO
MW395	Upgradient	Yes	0.0245	N/A	-3.709	NO
MW397	Upgradient	Yes	0.00975	N/A	-4.630	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.

D1-67

C-746-S/T Second Quarter 2019 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: MW395		
Date Collected	Result	LN(Result)
8/13/2002	1	0.000
9/16/2002	1	0.000
10/16/2002	1	0.000
1/13/2003	1	0.000
4/10/2003	1	0.000
7/16/2003	1	0.000
10/14/2003	1	0.000
1/13/2004	1	0.000
Well Number: MW397		
Date Collected	Result	LN(Result)
8/13/2002	1	0.000
9/16/2002	1	0.000
10/17/2002	1	0.000
1/13/2003	1	0.000
4/8/2003	1	0.000
7/16/2003	1	0.000
10/14/2003	1	0.000
1/13/2004	1	0.000

Current Quarter Data						
Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW370	Downgradient	Yes	0.415	NO	-0.879	N/A
MW373	Downgradient	Yes	0.572	NO	-0.559	N/A
MW385	Sidegradient	Yes	0.365	NO	-1.008	N/A
MW388	Downgradient	Yes	0.431	NO	-0.842	N/A
MW392	Downgradient	Yes	0.597	NO	-0.516	N/A
MW395	Upgradient	Yes	0.533	NO	-0.629	N/A
MW397	Upgradient	Yes	0.397	NO	-0.924	N/A
N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters 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-S/T Second Quarter 2019 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= 23.103	S= 11.538	CV(1)=0.499	K factor**= 2.523	TL(1)= 52.213	LL(1)=N/A
Statistics-Transformed Background Data	X= 2.357	S= 2.411	CV(2)=1.023	K factor**= 2.523	TL(2)= 8.439	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: MW395		
Date Collected	Result	LN(Result)
8/13/2002	32.2	3.472
9/16/2002	33	3.497
10/16/2002	0.0295	-3.523
1/13/2003	32.1	3.469
4/10/2003	40.2	3.694
7/16/2003	32.4	3.478
10/14/2003	33.9	3.523
1/13/2004	31.2	3.440
Well Number: MW397		
Date Collected	Result	LN(Result)
8/13/2002	19.4	2.965
9/16/2002	19	2.944
10/17/2002	0.0179	-4.023
1/13/2003	17.8	2.879
4/8/2003	20.3	3.011
7/16/2003	19.4	2.965
10/14/2003	19.9	2.991
1/13/2004	18.8	2.934

Current Quarter Data						
Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW370	Downgradient	Yes	26.5	NO	3.277	N/A
MW373	Downgradient	Yes	64	YES	4.159	N/A
MW385	Sidegradient	Yes	22.8	NO	3.127	N/A
MW388	Downgradient	Yes	23.7	NO	3.165	N/A
MW392	Downgradient	Yes	28.4	NO	3.346	N/A
MW395	Upgradient	Yes	25.4	NO	3.235	N/A
MW397	Upgradient	Yes	16.9	NO	2.827	N/A
N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.						

Conclusion of Statistical Analysis on Historical Data

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

Wells with Exceedances

MW373

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

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

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

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

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

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

D1-69

C-746-S/T Second Quarter 2019 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= 35.313	S= 1.250	CV(1)=0.035	K factor**= 2.523	TL(1)= 38.466	LL(1)=N/A
Statistics-Transformed Background Data	X= 3.564	S= 0.033	CV(2)=0.009	K factor**= 2.523	TL(2)= 3.648	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: MW395		
Date Collected	Result	LN(Result)
8/13/2002	35	3.555
9/16/2002	35	3.555
10/16/2002	35	3.555
1/13/2003	35	3.555
4/10/2003	35	3.555
7/16/2003	35	3.555
10/14/2003	35	3.555
1/13/2004	35	3.555
Well Number: MW397		
Date Collected	Result	LN(Result)
8/13/2002	40	3.689
9/16/2002	35	3.555
10/17/2002	35	3.555
1/13/2003	35	3.555
4/8/2003	35	3.555
7/16/2003	35	3.555
10/14/2003	35	3.555
1/13/2004	35	3.555

Current Quarter Data						
Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW370	Downgradient	No	20	N/A	2.996	N/A
MW373	Downgradient	Yes	43.8	YES	3.780	N/A
MW385	Sidegradient	No	20	N/A	2.996	N/A
MW388	Downgradient	No	20	N/A	2.996	N/A
MW392	Downgradient	No	20	N/A	2.996	N/A
MW395	Upgradient	Yes	26.2	NO	3.266	N/A
MW397	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.						

Conclusion of Statistical Analysis on Historical Data

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

Wells with Exceedances

MW373

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

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

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

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

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

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

D1-70

C-746-S/T Second Quarter 2019 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= 51.844	S= 11.652	CV(1)=0.225	K factor**= 2.523	TL(1)= 81.242	LL(1)=N/A
Statistics-Transformed Background Data	X= 3.924	S= 0.229	CV(2)=0.058	K factor**= 2.523	TL(2)= 4.501	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: MW395

Date Collected	Result	LN(Result)
8/13/2002	62.2	4.130
9/16/2002	64.7	4.170
10/16/2002	62.2	4.130
1/13/2003	63.5	4.151
4/10/2003	64.1	4.160
7/16/2003	64	4.159
10/14/2003	63.2	4.146
1/13/2004	60.6	4.104

Well Number: MW397

Date Collected	Result	LN(Result)
8/13/2002	38.9	3.661
9/16/2002	39.8	3.684
10/17/2002	39.3	3.671
1/13/2003	40.5	3.701
4/8/2003	42.1	3.740
7/16/2003	42	3.738
10/14/2003	40.8	3.709
1/13/2004	41.6	3.728

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW370	Downgradient	Yes	34.8	NO	3.550	N/A
MW373	Downgradient	Yes	43.6	NO	3.775	N/A
MW385	Sidegradient	Yes	34.5	NO	3.541	N/A
MW388	Downgradient	Yes	33.5	NO	3.512	N/A
MW392	Downgradient	Yes	103	YES	4.635	N/A
MW395	Upgradient	Yes	43.5	NO	3.773	N/A
MW397	Upgradient	Yes	34.5	NO	3.541	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters 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

MW392

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.
CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.
S Standard Deviation, S = [Sum (((background result-X)^2)/[count of background results -1])]^0.5
TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)
X Mean, X = (sum of background results)/(count of background results)
** Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>,2009.

D1-71

C-746-S/T Second Quarter 2019 Statistical Analysis Historical Background Comparison

cis-1,2-Dichloroethene UNITS: ug/L LRGA

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

Statistics-Background Data	X= 5.000	S= 0.000	CV(1)=0.000	K factor**= 2.523	TL(1)= 5.000	LL(1)=N/A
Statistics-Transformed Background Data	X= 1.609	S= 0.000	CV(2)=0.000	K factor**= 2.523	TL(2)= 1.609	LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW395

Date Collected	Result	LN(Result)
8/13/2002	5	1.609
9/30/2002	5	1.609
10/16/2002	5	1.609
1/13/2003	5	1.609
4/10/2003	5	1.609
7/16/2003	5	1.609
10/14/2003	5	1.609
1/13/2004	5	1.609

Well Number: MW397

Date Collected	Result	LN(Result)
8/13/2002	5	1.609
9/30/2002	5	1.609
10/17/2002	5	1.609
1/13/2003	5	1.609
4/8/2003	5	1.609
7/16/2003	5	1.609
10/14/2003	5	1.609
1/13/2004	5	1.609

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	Downgradient	No	1	N/A	0.000	N/A
MW373	Downgradient	No	1	N/A	0.000	N/A
MW385	Sidegradient	No	1	N/A	0.000	N/A
MW388	Downgradient	No	1	N/A	0.000	N/A
MW392	Downgradient	Yes	1.31	NO	0.270	N/A
MW395	Upgradient	No	1	N/A	0.000	N/A
MW397	Upgradient	No	1	N/A	0.000	N/A

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

Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

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

C-746-S/T Second Quarter 2019 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= 0.007	S= 0.011	CV(1)= 1.515	K factor**= 2.523	TL(1)= 0.034	LL(1)=N/A
Statistics-Transformed Background Data	X= -6.053	S= 1.416	CV(2)= -0.234	K factor**= 2.523	TL(2)= -2.480	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: MW395		
Date Collected	Result	LN(Result)
8/13/2002	0.025	-3.689
9/16/2002	0.025	-3.689
10/16/2002	0.001	-6.908
1/13/2003	0.00148	-6.516
4/10/2003	0.00151	-6.496
7/16/2003	0.001	-6.908
10/14/2003	0.001	-6.908
1/13/2004	0.001	-6.908
Well Number: MW397		
Date Collected	Result	LN(Result)
8/13/2002	0.025	-3.689
9/16/2002	0.025	-3.689
10/17/2002	0.001	-6.908
1/13/2003	0.001	-6.908
4/8/2003	0.001	-6.908
7/16/2003	0.001	-6.908
10/14/2003	0.001	-6.908
1/13/2004	0.001	-6.908

Current Quarter Data						
Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW370	Downgradient	Yes	0.000377	N/A	-7.883	NO
MW373	Downgradient	Yes	0.000473	N/A	-7.656	NO
MW385	Sidegradient	No	0.001	N/A	-6.908	N/A
MW388	Downgradient	No	0.001	N/A	-6.908	N/A
MW392	Downgradient	Yes	0.000361	N/A	-7.927	NO
MW395	Upgradient	No	0.001	N/A	-6.908	N/A
MW397	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.

D1-73

C-746-S/T Second Quarter 2019 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= 377.875	S= 52.101	CV(1)=0.138	K factor**= 2.523	TL(1)= 509.326	LL(1)=N/A
Statistics-Transformed Background Data	X= 5.926	S= 0.136	CV(2)=0.023	K factor**= 2.523	TL(2)= 6.270	LL(2)=N/A

Historical Background Data from
Upgradient Wells with Transformed Result

Well Number: MW395

Date Collected	Result	LN(Result)
8/13/2002	405	6.004
9/16/2002	401	5.994
10/16/2002	392	5.971
1/13/2003	404	6.001
4/10/2003	488	6.190
7/16/2003	450	6.109
10/14/2003	410	6.016
1/13/2004	413	6.023

Well Number: MW397

Date Collected	Result	LN(Result)
8/13/2002	322	5.775
9/16/2002	315	5.753
10/17/2002	317	5.759
1/13/2003	320	5.768
4/8/2003	390	5.966
7/16/2003	354	5.869
10/14/2003	331	5.802
1/13/2004	334	5.811

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW370	Downgradient	Yes	458	NO	6.127	N/A
MW373	Downgradient	Yes	767	YES	6.642	N/A
MW385	Sidegradient	Yes	427	NO	6.057	N/A
MW388	Downgradient	Yes	469	NO	6.151	N/A
MW392	Downgradient	Yes	446	NO	6.100	N/A
MW395	Upgradient	Yes	367	NO	5.905	N/A
MW397	Upgradient	Yes	325	NO	5.784	N/A

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

Conclusion of Statistical Analysis on Historical Data

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

Wells with Exceedances

MW373

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.
CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.
S Standard Deviation, S = [Sum (((background result-X)^2)/[count of background results -1])]^0.5
TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)
X Mean, X = (sum of background results)/(count of background results)
** Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>,2009.

D1-74

C-746-S/T Second Quarter 2019 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= 0.028	S= 0.013	CV(1)=0.474	K factor**= 2.523	TL(1)=0.061	LL(1)=N/A
Statistics-Transformed Background Data	X= -3.662	S= 0.406	CV(2)=-0.111	K factor**= 2.523	TL(2)= -2.638	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: MW395

Date Collected	Result	LN(Result)
8/13/2002	0.05	-2.996
9/16/2002	0.05	-2.996
10/16/2002	0.0281	-3.572
1/13/2003	0.02	-3.912
4/10/2003	0.02	-3.912
7/16/2003	0.02	-3.912
10/14/2003	0.02	-3.912
1/13/2004	0.02	-3.912

Well Number: MW397

Date Collected	Result	LN(Result)
8/13/2002	0.05	-2.996
9/16/2002	0.05	-2.996
10/17/2002	0.02	-3.912
1/13/2003	0.02	-3.912
4/8/2003	0.02	-3.912
7/16/2003	0.02	-3.912
10/14/2003	0.02	-3.912
1/13/2004	0.02	-3.912

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW370	Downgradient	Yes	0.00192	NO	-6.255	N/A
MW373	Downgradient	Yes	0.000479	NO	-7.644	N/A
MW385	Sidegradient	Yes	0.000637	NO	-7.359	N/A
MW388	Downgradient	Yes	0.00043	NO	-7.752	N/A
MW392	Downgradient	Yes	0.00138	NO	-6.586	N/A
MW395	Upgradient	Yes	0.000551	NO	-7.504	N/A
MW397	Upgradient	Yes	0.000691	NO	-7.277	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters 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.

D1-75

C-746-S/T Second Quarter 2019 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= 4.678	S= 2.431	CV(1)=0.520	K factor**= 2.523	TL(1)= 10.812	LL(1)=N/A
Statistics-Transformed Background Data	X= 1.414	S= 0.550	CV(2)=0.389	K factor**= 2.523	TL(2)= 2.802	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: MW395

Date Collected	Result	LN(Result)
8/13/2002	7.29	1.987
9/30/2002	4.03	1.394
10/16/2002	3.85	1.348
1/13/2003	2.36	0.859
4/10/2003	1.14	0.131
7/16/2003	1.76	0.565
10/14/2003	4.05	1.399
1/13/2004	4.26	1.449

Well Number: MW397

Date Collected	Result	LN(Result)
8/13/2002	11.56	2.448
9/16/2002	5.86	1.768
10/17/2002	5.94	1.782
1/13/2003	4.66	1.539
4/8/2003	3.77	1.327
7/16/2003	3.47	1.244
10/14/2003	5.34	1.675
1/13/2004	5.51	1.707

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW370	Downgradient	Yes	3.46	NO	1.241	N/A
MW373	Downgradient	Yes	1.49	NO	0.399	N/A
MW385	Sidegradient	Yes	2.89	NO	1.061	N/A
MW388	Downgradient	Yes	3.19	NO	1.160	N/A
MW392	Downgradient	Yes	2.41	NO	0.880	N/A
MW395	Upgradient	Yes	4.57	NO	1.520	N/A
MW397	Upgradient	Yes	5.28	NO	1.664	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.

Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

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

D1-76

C-746-S/T Second Quarter 2019 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= 219.250	S= 34.107	CV(1)=0.156	K factor**= 2.523	TL(1)= 305.301	LL(1)=N/A
Statistics-Transformed Background Data	X= 5.379	S= 0.152	CV(2)=0.028	K factor**= 2.523	TL(2)= 5.762	LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW395		
Date Collected	Result	LN(Result)
8/13/2002	249	5.517
9/16/2002	272	5.606
10/16/2002	255	5.541
1/13/2003	211	5.352
4/10/2003	289	5.666
7/16/2003	236	5.464
10/14/2003	224	5.412
1/13/2004	235	5.460
Well Number: MW397		
Date Collected	Result	LN(Result)
8/13/2002	187	5.231
9/16/2002	197	5.283
10/17/2002	183	5.209
1/13/2003	182	5.204
4/8/2003	217	5.380
7/16/2003	196	5.278
10/14/2003	198	5.288
1/13/2004	177	5.176

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	Downgradient	Yes	237	NO	5.468	N/A
MW373	Downgradient	Yes	401	YES	5.994	N/A
MW385	Sidegradient	Yes	253	NO	5.533	N/A
MW388	Downgradient	Yes	253	NO	5.533	N/A
MW392	Downgradient	Yes	239	NO	5.476	N/A
MW395	Upgradient	Yes	173	NO	5.153	N/A
MW397	Upgradient	Yes	229	NO	5.434	N/A
N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.						

Conclusion of Statistical Analysis on Historical Data

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

Wells with Exceedances
 MW373

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.
CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.
S Standard Deviation, S = [Sum (((background result-X)^2)/[count of background results -1])]^0.5
TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)
X Mean, X = (sum of background results)/(count of background results)
** Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>,2009.

D1-77

C-746-S/T Second Quarter 2019 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= 0.400	S= 0.514	CV(1)= 1.286	K factor**= 2.523	TL(1)= 1.698	LL(1)=N/A
Statistics-Transformed Background Data	X= -2.197	S= 2.634	CV(2)=-1.199	K factor**= 2.523	TL(2)= 4.449	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: MW395		
Date Collected	Result	LN(Result)
8/13/2002	0.294	-1.224
9/16/2002	0.2	-1.609
10/16/2002	0.0002	-8.517
1/13/2003	1.33	0.285
4/10/2003	1.31	0.270
7/16/2003	0.2	-1.609
10/14/2003	0.1	-2.303
1/13/2004	0.1	-2.303
Well Number: MW397		
Date Collected	Result	LN(Result)
8/13/2002	1.58	0.457
9/16/2002	0.232	-1.461
10/17/2002	0.0002	-8.517
1/13/2003	0.453	-0.792
4/8/2003	0.2	-1.609
7/16/2003	0.2	-1.609
10/14/2003	0.1	-2.303
1/13/2004	0.1	-2.303

Current Quarter Data						
Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW370	Downgradient	Yes	0.0351	N/A	-3.350	NO
MW373	Downgradient	Yes	0.178	N/A	-1.726	NO
MW385	Sidegradient	Yes	0.0611	N/A	-2.795	NO
MW388	Downgradient	Yes	0.0964	N/A	-2.339	NO
MW392	Downgradient	Yes	0.67	N/A	-0.400	NO
MW395	Upgradient	Yes	0.108	N/A	-2.226	NO
MW397	Upgradient	Yes	0.448	N/A	-0.803	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-S/T Second Quarter 2019 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**= 9.102 **S**= 4.685 **CV(1)**=0.515 **K factor****= 2.523 **TL(1)**= 20.922 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= 1.423 **S**= 2.408 **CV(2)**=1.692 **K factor****= 2.523 **TL(2)**= 7.500 **LL(2)**=N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW395

Date Collected	Result	LN(Result)
8/13/2002	12.5	2.526
9/16/2002	13	2.565
10/16/2002	0.0127	-4.366
1/13/2003	11.2	2.416
4/10/2003	17.5	2.862
7/16/2003	12.9	2.557
10/14/2003	13.4	2.595
1/13/2004	12.4	2.518

Well Number: MW397

Date Collected	Result	LN(Result)
8/13/2002	7.83	2.058
9/16/2002	7.64	2.033
10/17/2002	0.00658	-5.024
1/13/2003	6.69	1.901
4/8/2003	7.28	1.985
7/16/2003	7.82	2.057
10/14/2003	7.94	2.072
1/13/2004	7.51	2.016

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	Downgradient	Yes	12.1	NO	2.493	N/A
MW373	Downgradient	Yes	23.7	YES	3.165	N/A
MW385	Sidegradient	Yes	9.05	NO	2.203	N/A
MW388	Downgradient	Yes	10.9	NO	2.389	N/A
MW392	Downgradient	Yes	11	NO	2.398	N/A
MW395	Upgradient	Yes	11.1	NO	2.407	N/A
MW397	Upgradient	Yes	7.65	NO	2.035	N/A

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

Conclusion of Statistical Analysis on Historical Data

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

Wells with Exceedances

MW373

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

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

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

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

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

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

C-746-S/T Second Quarter 2019 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= 0.131	S= 0.195	CV(1)= 1.487	K factor**= 2.523	TL(1)= 0.624	LL(1)=N/A
Statistics-Transformed Background Data	X= -3.104	S= 1.529	CV(2)= -0.493	K factor**= 2.523	TL(2)= 0.755	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: MW395		
Date Collected	Result	LN(Result)
8/13/2002	0.361	-1.019
9/16/2002	0.028	-3.576
10/16/2002	0.026	-3.650
1/13/2003	0.0713	-2.641
4/10/2003	0.629	-0.464
7/16/2003	0.297	-1.214
10/14/2003	0.0198	-3.922
1/13/2004	0.0126	-4.374
Well Number: MW397		
Date Collected	Result	LN(Result)
8/13/2002	0.466	-0.764
9/16/2002	0.077	-2.564
10/17/2002	0.028	-3.576
1/13/2003	0.0164	-4.110
4/8/2003	0.0407	-3.202
7/16/2003	0.0167	-4.092
10/14/2003	0.00555	-5.194
1/13/2004	0.005	-5.298

Current Quarter Data						
Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW370	Downgradient	Yes	0.00749	N/A	-4.894	NO
MW373	Downgradient	Yes	0.0177	N/A	-4.034	NO
MW385	Sidegradient	No	0.00288	N/A	-5.850	N/A
MW388	Downgradient	No	0.00156	N/A	-6.463	N/A
MW392	Downgradient	Yes	0.135	N/A	-2.002	NO
MW395	Upgradient	No	0.00283	N/A	-5.867	N/A
MW397	Upgradient	Yes	0.0078	N/A	-4.854	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.

D1-80

C-746-S/T Second Quarter 2019 Statistical Analysis Historical Background Comparison

Methylene chloride

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=** 5.625 **S=** 3.074 **CV(1)=**0.547 **K factor**=** 2.523 **TL(1)=** 13.381 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** 1.614 **S=** 0.483 **CV(2)=**0.300 **K factor**=** 2.523 **TL(2)=** 2.834 **LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW395

Date Collected	Result	LN(Result)
8/13/2002	14	2.639
9/30/2002	2	0.693
10/16/2002	5	1.609
1/13/2003	5	1.609
4/10/2003	5	1.609
7/16/2003	5	1.609
10/14/2003	5	1.609
1/13/2004	5	1.609

Well Number: MW397

Date Collected	Result	LN(Result)
8/13/2002	12	2.485
9/30/2002	2	0.693
10/17/2002	5	1.609
1/13/2003	5	1.609
4/8/2003	5	1.609
7/16/2003	5	1.609
10/14/2003	5	1.609
1/13/2004	5	1.609

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	Downgradient	No	5	N/A	1.609	N/A
MW373	Downgradient	No	5	N/A	1.609	N/A
MW385	Sidegradient	No	5	N/A	1.609	N/A
MW388	Downgradient	No	5	N/A	1.609	N/A
MW392	Downgradient	Yes	2.62	NO	0.963	N/A
MW395	Upgradient	No	5	N/A	1.609	N/A
MW397	Upgradient	Yes	2.32	NO	0.842	N/A

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

Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

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

C-746-S/T Second Quarter 2019 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= 0.018	S= 0.020	CV(1)= 1.089	K factor**= 2.523	TL(1)= 0.068	LL(1)=N/A
Statistics-Transformed Background Data	X= -4.540	S= 1.020	CV(2)= -0.225	K factor**= 2.523	TL(2)= -1.965	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: MW395		
Date Collected	Result	LN(Result)
8/13/2002	0.05	-2.996
9/16/2002	0.05	-2.996
10/16/2002	0.00702	-4.959
1/13/2003	0.029	-3.540
4/10/2003	0.0091	-4.699
7/16/2003	0.00627	-5.072
10/14/2003	0.005	-5.298
1/13/2004	0.005	-5.298
Well Number: MW397		
Date Collected	Result	LN(Result)
8/13/2002	0.05	-2.996
9/16/2002	0.05	-2.996
10/17/2002	0.005	-5.298
1/13/2003	0.00502	-5.294
4/8/2003	0.005	-5.298
7/16/2003	0.005	-5.298
10/14/2003	0.005	-5.298
1/13/2004	0.005	-5.298

Current Quarter Data						
Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW370	Downgradient	Yes	0.000761	N/A	-7.181	NO
MW373	Downgradient	Yes	0.000916	N/A	-6.995	NO
MW385	Sidegradient	Yes	0.000912	N/A	-7.000	NO
MW388	Downgradient	Yes	0.0011	N/A	-6.812	NO
MW392	Downgradient	Yes	0.00161	N/A	-6.432	NO
MW395	Upgradient	Yes	0.000866	N/A	-7.052	NO
MW397	Upgradient	Yes	0.00102	N/A	-6.888	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.

D1-82

C-746-S/T Second Quarter 2019 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= 157.250	S= 52.376	CV(1)=0.333	K factor**= 2.523	TL(1)= 289.395	LL(1)=N/A
Statistics-Transformed Background Data	X= 5.003	S= 0.348	CV(2)=0.069	K factor**= 2.523	TL(2)= 5.880	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: MW395		
Date Collected	Result	LN(Result)
8/13/2002	80	4.382
9/16/2002	145	4.977
10/16/2002	125	4.828
1/13/2003	85	4.443
4/10/2003	159	5.069
7/16/2003	98	4.585
10/14/2003	138	4.927
1/13/2004	233	5.451
Well Number: MW397		
Date Collected	Result	LN(Result)
8/13/2002	115	4.745
9/30/2002	140	4.942
10/17/2002	185	5.220
1/13/2003	230	5.438
4/8/2003	155	5.043
7/16/2003	188	5.236
10/14/2003	187	5.231
1/13/2004	253	5.533

Current Quarter Data						
Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW370	Downgradient	Yes	400	YES	5.991	N/A
MW373	Downgradient	Yes	387	YES	5.958	N/A
MW385	Sidegradient	Yes	444	YES	6.096	N/A
MW388	Downgradient	Yes	405	YES	6.004	N/A
MW392	Downgradient	Yes	461	YES	6.133	N/A
MW395	Upgradient	Yes	477	YES	6.168	N/A
MW397	Upgradient	Yes	505	YES	6.225	N/A
N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters 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
 - MW373
 - MW385
 - MW388
 - MW392
 - MW395
 - MW397

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

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

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

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

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

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

D1-83

C-746-S/T Second Quarter 2019 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= 6.048	S= 0.248	CV(1)=0.041	K factor**= 2.904	TL(1)= 6.767	LL(1)=5.3289
Statistics-Transformed Background Data	X= 1.799	S= 0.042	CV(2)=0.023	K factor**= 2.904	TL(2)= 1.920	LL(2)=1.6782

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: MW395		
Date Collected	Result	LN(Result)
8/13/2002	5.8	1.758
9/16/2002	6	1.792
10/16/2002	5.47	1.699
1/13/2003	6	1.792
4/10/2003	6.18	1.821
7/16/2003	6	1.792
10/14/2003	6.31	1.842
1/13/2004	6.24	1.831
Well Number: MW397		
Date Collected	Result	LN(Result)
8/13/2002	5.84	1.765
9/30/2002	6	1.792
10/17/2002	5.75	1.749
1/13/2003	6	1.792
4/8/2003	6.3	1.841
7/16/2003	6.2	1.825
10/14/2003	6.36	1.850
1/13/2004	6.32	1.844

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)? Result <LL(1)?	LN(Result)	LN(Result) >TL(2)? LN(Result) <LL(2)?
MW370	Downgradient	Yes	6.18	NO	1.821	N/A
MW373	Downgradient	Yes	6.21	NO	1.826	N/A
MW385	Sidegradient	Yes	6.14	NO	1.815	N/A
MW388	Downgradient	Yes	6.14	NO	1.815	N/A
MW392	Downgradient	Yes	6.24	NO	1.831	N/A
MW395	Upgradient	Yes	6.16	NO	1.818	N/A
MW397	Upgradient	Yes	6.19	NO	1.823	N/A

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

Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

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

D1-84

C-746-S/T Second Quarter 2019 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= 1.590	S= 0.642	CV(1)=0.404	K factor**= 2.523	TL(1)= 3.208	LL(1)=N/A
Statistics-Transformed Background Data	X= -0.306	S= 2.457	CV(2)=-8.028	K factor**= 2.523	TL(2)= 5.892	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: MW395		
Date Collected	Result	LN(Result)
8/13/2002	2	0.693
9/16/2002	2	0.693
10/16/2002	0.00129	-6.653
1/13/2003	1.51	0.412
4/10/2003	1.67	0.513
7/16/2003	1.73	0.548
10/14/2003	1.7	0.531
1/13/2004	1.58	0.457
Well Number: MW397		
Date Collected	Result	LN(Result)
8/13/2002	2.03	0.708
9/16/2002	2	0.693
10/17/2002	0.00145	-6.536
1/13/2003	1.69	0.525
4/8/2003	1.73	0.548
7/16/2003	2	0.693
10/14/2003	1.92	0.652
1/13/2004	1.87	0.626

Current Quarter Data						
Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW370	Downgradient	Yes	2.46	NO	0.900	N/A
MW373	Downgradient	Yes	2.43	NO	0.888	N/A
MW385	Sidegradient	Yes	1.5	NO	0.405	N/A
MW388	Downgradient	Yes	1.79	NO	0.582	N/A
MW392	Downgradient	Yes	1.77	NO	0.571	N/A
MW395	Upgradient	Yes	1.53	NO	0.425	N/A
MW397	Upgradient	Yes	1.57	NO	0.451	N/A
N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters 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.

D1-85

C-746-S/T Second Quarter 2019 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= 29.560	S= 13.894	CV(1)=0.470	K factor**= 2.523	TL(1)= 64.616	LL(1)=N/A
Statistics-Transformed Background Data	X= 2.615	S= 2.411	CV(2)=0.922	K factor**= 2.523	TL(2)= 8.699	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: MW395		
Date Collected	Result	LN(Result)
8/13/2002	27	3.296
9/16/2002	27.2	3.303
10/16/2002	0.0253	-3.677
1/13/2003	22.6	3.118
4/10/2003	53.9	3.987
7/16/2003	30	3.401
10/14/2003	29.1	3.371
1/13/2004	26.4	3.273
Well Number: MW397		
Date Collected	Result	LN(Result)
8/13/2002	35.2	3.561
9/16/2002	34.3	3.535
10/17/2002	0.0336	-3.393
1/13/2003	31.3	3.444
4/8/2003	46.1	3.831
7/16/2003	38.4	3.648
10/14/2003	37.1	3.614
1/13/2004	34.3	3.535

Current Quarter Data						
Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW370	Downgradient	Yes	45.1	NO	3.809	N/A
MW373	Downgradient	Yes	51.4	NO	3.940	N/A
MW385	Sidegradient	Yes	45.6	NO	3.820	N/A
MW388	Downgradient	Yes	45.5	NO	3.818	N/A
MW392	Downgradient	Yes	42.3	NO	3.745	N/A
MW395	Upgradient	Yes	30.6	NO	3.421	N/A
MW397	Upgradient	Yes	36.2	NO	3.589	N/A
N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters 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.

D1-86

C-746-S/T Second Quarter 2019 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= 10.756	S= 2.147	CV(1)=0.200	K factor**= 2.523	TL(1)= 16.173	LL(1)=N/A
Statistics-Transformed Background Data	X= 2.356	S= 0.203	CV(2)=0.086	K factor**= 2.523	TL(2)= 2.869	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: MW395		
Date Collected	Result	LN(Result)
8/13/2002	10.3	2.332
9/16/2002	9.1	2.208
10/16/2002	8.8	2.175
1/13/2003	9	2.197
4/10/2003	8.3	2.116
7/16/2003	8.2	2.104
10/14/2003	8.3	2.116
1/13/2004	8.2	2.104
Well Number: MW397		
Date Collected	Result	LN(Result)
8/13/2002	14	2.639
9/16/2002	12.8	2.549
10/17/2002	12.3	2.510
1/13/2003	12.7	2.542
4/8/2003	12.8	2.549
7/16/2003	13.1	2.573
10/14/2003	12.1	2.493
1/13/2004	12.1	2.493

Current Quarter Data						
Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW370	Downgradient	Yes	20.7	YES	3.030	N/A
MW373	Downgradient	Yes	126	YES	4.836	N/A
MW385	Sidegradient	Yes	22.4	YES	3.109	N/A
MW388	Downgradient	Yes	23.7	YES	3.165	N/A
MW392	Downgradient	Yes	14.5	NO	2.674	N/A
MW395	Upgradient	Yes	10.5	NO	2.351	N/A
MW397	Upgradient	Yes	10	NO	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.

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
MW373
MW385
MW388

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.
CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.
S Standard Deviation, S = [Sum (((background result-X)^2)/[count of background results -1])]^0.5
TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)
X Mean, X = (sum of background results)/(count of background results)
** Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>,2009.

D1-87

C-746-S/T Second Quarter 2019 Statistical Analysis Historical Background Comparison

Technetium-99 UNITS: pCi/L LRGA

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

Statistics-Background Data **X**= 11.359 **S**= 9.138 **CV(1)**=0.805 **K factor****= 2.523 **TL(1)**= 34.414 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= 2.398 **S**= 0.859 **CV(2)**=0.358 **K factor****= 2.523 **TL(2)**= 3.246 **LL(2)**=N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW395

Date Collected	Result	LN(Result)
8/13/2002	20.8	3.035
9/16/2002	16.2	2.785
10/16/2002	8.28	2.114
1/13/2003	13	2.565
4/10/2003	-9.37	#Func!
7/16/2003	0.826	-0.191
10/14/2003	14.1	2.646
1/13/2004	0	#Func!

Well Number: MW397

Date Collected	Result	LN(Result)
8/13/2002	6.06	1.802
9/16/2002	17.3	2.851
10/17/2002	25.7	3.246
1/13/2003	20.9	3.040
4/8/2003	20.1	3.001
7/16/2003	9.2	2.219
10/14/2003	10.1	2.313
1/13/2004	8.54	2.145

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)
MW370	Downgradient	Yes	111	YES	4.710	N/A
MW373	Downgradient	Yes	22.7	NO	3.122	N/A
MW385	Sidegradient	Yes	164	YES	5.100	N/A
MW388	Downgradient	Yes	139	YES	4.934	N/A
MW392	Downgradient	No	2.84	N/A	1.044	N/A
MW395	Upgradient	No	11.2	N/A	2.416	N/A
MW397	Upgradient	Yes	32.1	NO	3.469	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters 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
MW385
MW388

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

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

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

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

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

** Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009. D1-88

C-746-S/T Second Quarter 2019 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**= 1.544 **S**= 0.856 **CV(1)**=0.554 **K factor****= 2.523 **TL(1)**= 3.702 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= 0.325 **S**= 0.452 **CV(2)**=1.393 **K factor****= 2.523 **TL(2)**= 1.465 **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: MW395

Date Collected	Result	LN(Result)
8/13/2002	1.6	0.470
9/16/2002	1.1	0.095
10/16/2002	1	0.000
1/13/2003	2	0.693
4/10/2003	3.4	1.224
7/16/2003	2	0.693
10/14/2003	1	0.000
1/13/2004	1	0.000

Well Number: MW397

Date Collected	Result	LN(Result)
8/13/2002	1	0.000
9/16/2002	1	0.000
10/17/2002	1	0.000
1/13/2003	3.6	1.281
4/8/2003	1.9	0.642
7/16/2003	1.1	0.095
10/14/2003	1	0.000
1/13/2004	1	0.000

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW370	Downgradient	Yes	0.964	NO	-0.037	N/A
MW373	Downgradient	Yes	1.28	NO	0.247	N/A
MW385	Sidegradient	Yes	1.07	NO	0.068	N/A
MW388	Downgradient	Yes	1.14	NO	0.131	N/A
MW392	Downgradient	Yes	1.15	NO	0.140	N/A
MW395	Upgradient	Yes	0.904	NO	-0.101	N/A
MW397	Upgradient	Yes	0.784	NO	-0.243	N/A

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

Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

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

C-746-S/T Second Quarter 2019 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= 31.513	S= 18.609	CV(1)=0.591	K factor**= 2.523	TL(1)= 78.462	LL(1)=N/A
Statistics-Transformed Background Data	X= 3.240	S= 0.707	CV(2)=0.218	K factor**= 2.523	TL(2)= 5.024	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: MW395

Date Collected	Result	LN(Result)
8/13/2002	50	3.912
9/16/2002	50	3.912
10/16/2002	50	3.912
1/13/2003	18.3	2.907
4/10/2003	51.2	3.936
7/16/2003	42.6	3.752
10/14/2003	12.3	2.510
1/13/2004	10	2.303

Well Number: MW397

Date Collected	Result	LN(Result)
8/13/2002	50	3.912
9/16/2002	50	3.912
10/17/2002	50	3.912
1/13/2003	12	2.485
4/8/2003	19.9	2.991
7/16/2003	17.9	2.885
10/14/2003	10	2.303
1/13/2004	10	2.303

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW370	Downgradient	No	5.14	N/A	1.637	N/A
MW373	Downgradient	Yes	10.5	NO	2.351	N/A
MW385	Sidegradient	Yes	11.4	NO	2.434	N/A
MW388	Downgradient	Yes	12.9	NO	2.557	N/A
MW392	Downgradient	Yes	22.7	NO	3.122	N/A
MW395	Upgradient	Yes	4.34	NO	1.468	N/A
MW397	Upgradient	Yes	8.8	NO	2.175	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters 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.

D1-90

C-746-S/T Second Quarter 2019 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=** 7.313 **S=** 5.701 **CV(1)=**0.780 **K factor**=** 2.523 **TL(1)=** 21.695 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** 1.467 **S=** 1.213 **CV(2)=**0.827 **K factor**=** 2.523 **TL(2)=** 4.528 **LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW395

Date Collected	Result	LN(Result)
8/13/2002	11	2.398
9/30/2002	14	2.639
10/16/2002	12	2.485
1/13/2003	14	2.639
4/10/2003	14	2.639
7/16/2003	13	2.565
10/14/2003	12	2.485
1/13/2004	11	2.398

Well Number: MW397

Date Collected	Result	LN(Result)
8/13/2002	5	1.609
9/30/2002	5	1.609
10/17/2002	1	0.000
1/13/2003	1	0.000
4/8/2003	1	0.000
7/16/2003	1	0.000
10/14/2003	1	0.000
1/13/2004	1	0.000

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	Downgradient	Yes	0.55	N/A	-0.598	N/A
MW373	Downgradient	Yes	5.2	NO	1.649	N/A
MW385	Sidegradient	Yes	0.41	N/A	-0.892	N/A
MW388	Downgradient	Yes	0.47	N/A	-0.755	N/A
MW392	Downgradient	Yes	11.2	NO	2.416	N/A
MW395	Upgradient	Yes	2.98	N/A	1.092	N/A
MW397	Upgradient	No	1	N/A	0.000	N/A

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

Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

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

C-746-S/T Second Quarter 2019 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= 0.021	S= 0.002	CV(1)=0.105	K factor**= 2.523	TL(1)= 0.027	LL(1)=N/A
Statistics-Transformed Background Data	X= -3.856	S= 0.100	CV(2)=-0.026	K factor**= 2.523	TL(2)= -3.604	LL(2)=N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW395

Date Collected	Result	LN(Result)
8/13/2002	0.025	-3.689
9/16/2002	0.025	-3.689
10/16/2002	0.02	-3.912
1/13/2003	0.02	-3.912
7/16/2003	0.02	-3.912
10/14/2003	0.02	-3.912
1/13/2004	0.02	-3.912
4/12/2004	0.02	-3.912

Well Number: MW397

Date Collected	Result	LN(Result)
8/13/2002	0.025	-3.689
9/16/2002	0.025	-3.689
10/17/2002	0.02	-3.912
1/13/2003	0.02	-3.912
4/8/2003	0.02	-3.912
7/16/2003	0.02	-3.912
10/14/2003	0.02	-3.912
1/13/2004	0.02	-3.912

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW370	Downgradient	No	0.00499	N/A	-5.300	N/A
MW373	Downgradient	No	0.00646	N/A	-5.042	N/A
MW385	Sidegradient	Yes	0.00524	NO	-5.251	N/A
MW388	Downgradient	Yes	0.00567	NO	-5.173	N/A
MW392	Downgradient	No	0.0139	N/A	-4.276	N/A
MW395	Upgradient	No	0.02	N/A	-3.912	N/A
MW397	Upgradient	No	0.0135	N/A	-4.305	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters 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-S/T Second Quarter 2019 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= 0.044	S= 0.034	CV(1)=0.760	K factor**= 2.523	TL(1)= 0.129	LL(1)=N/A
Statistics-Transformed Background Data	X= -3.342	S= 0.659	CV(2)=-0.197	K factor**= 2.523	TL(2)= -1.679	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: MW395		
Date Collected	Result	LN(Result)
8/13/2002	0.1	-2.303
9/16/2002	0.1	-2.303
10/16/2002	0.025	-3.689
1/13/2003	0.035	-3.352
4/10/2003	0.035	-3.352
7/16/2003	0.02	-3.912
10/14/2003	0.02	-3.912
1/13/2004	0.02	-3.912
Well Number: MW397		
Date Collected	Result	LN(Result)
8/13/2002	0.1	-2.303
9/16/2002	0.1	-2.303
10/17/2002	0.025	-3.689
1/13/2003	0.035	-3.352
4/8/2003	0.035	-3.352
7/16/2003	0.02	-3.912
10/14/2003	0.02	-3.912
1/13/2004	0.02	-3.912

Current Quarter Data						
Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW370	Downgradient	No	0.02	N/A	-3.912	N/A
MW373	Downgradient	No	0.02	N/A	-3.912	N/A
MW385	Sidegradient	Yes	0.00386	NO	-5.557	N/A
MW388	Downgradient	No	0.02	N/A	-3.912	N/A
MW392	Downgradient	Yes	0.00352	NO	-5.649	N/A
MW395	Upgradient	Yes	0.00334	NO	-5.702	N/A
MW397	Upgradient	Yes	0.00386	NO	-5.557	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.

D1-93

THIS PAGE INTENTIONALLY LEFT BLANK

ATTACHMENT D2

**COMPARISON OF CURRENT DATA TO
ONE-SIDED UPPER TOLERANCE INTERVAL TEST
CALCULATED USING
CURRENT BACKGROUND DATA**

THIS PAGE INTENTIONALLY LEFT BLANK

C-746-S/T Second Quarter 2019 Statistical Analysis	Current 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 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= 26.338	S= 8.924	CV(1)=0.339	K factor**= 3.188	TL(1)= 54.787	LL(1)=N/A
Statistics-Transformed Background Data	X= 3.212	S= 0.384	CV(2)=0.119	K factor**= 3.188	TL(2)= 4.435	LL(2)=N/A

Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW396

Date Collected	Result	LN(Result)
4/20/2017	36.8	3.605
7/19/2017	21.8	3.082
10/9/2017	27.1	3.300
1/23/2018	37.6	3.627
4/19/2018	23.1	3.140
7/19/2018	32.5	3.481
10/22/2018	11.8	2.468
1/23/2019	20	2.996

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)
MW396	Upgradient	Yes	43.8	NO	3.780	N/A

Conclusion of Statistical Analysis on Current Data

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

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

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

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

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

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

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

C-746-S/T Second Quarter 2019 Statistical Analysis Oxidation-Reduction Potential	Current Background Comparison 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= 244.000	S= 58.517	CV(1)=0.240	K factor**= 3.188	TL(1)= 430.553	LL(1)=N/A
Statistics-Transformed Background Data	X= 5.473	S= 0.231	CV(2)=0.042	K factor**= 3.188	TL(2)= 6.209	LL(2)=N/A

Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW396

Date Collected	Result	LN(Result)
4/20/2017	172	5.147
7/19/2017	291	5.673
10/9/2017	217	5.380
1/23/2018	203	5.313
4/19/2018	275	5.617
7/19/2018	353	5.866
10/22/2018	210	5.347
1/23/2019	231	5.442

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)
MW386	Sidegradient	Yes	429	NO	6.061	N/A
MW390	Downgradient	Yes	464	YES	6.140	N/A
MW393	Downgradient	Yes	454	YES	6.118	N/A
MW396	Upgradient	Yes	431	YES	6.066	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

MW390
MW393
MW396

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the 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-S/T Second Quarter 2019 Statistical Analysis Technetium-99	Current Background Comparison UNITS: pCi/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= -2.208	S= 6.987	CV(1)=-3.165	K factor**= 3.188	TL(1)= 20.066	LL(1)=N/A
Statistics-Transformed Background Data	X= 1.094	S= 0.831	CV(2)=0.759	K factor**= 3.188	TL(2)= 1.828	LL(2)=N/A

Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW396

Date Collected	Result	LN(Result)
4/20/2017	-7.44	#Func!
7/19/2017	1.19	0.174
10/9/2017	-11.3	#Func!
1/23/2018	5.85	1.766
4/19/2018	-10.3	#Func!
7/19/2018	1.84	0.610
10/22/2018	-3.72	#Func!
1/23/2019	6.22	1.828

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)
MW390	Downgradient	Yes	63.1	YES	4.145	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

MW390

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

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

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

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

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

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

C-746-S/T Second Quarter 2019 Statistical Analysis Current Background Comparison

Beta activity

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 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= 10.292 S= 7.571 CV(1)=0.736 K factor**= 2.523 TL(1)= 29.394 LL(1)=N/A

Statistics-Transformed Background Data X= 2.341 S= 0.598 CV(2)=0.255 K factor**= 2.523 TL(2)= 3.135 LL(2)=N/A

Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW220

Date Collected	Result	LN(Result)
4/19/2017	20.1	3.001
7/19/2017	22.5	3.114
10/9/2017	13.1	2.573
1/23/2018	12.8	2.549
4/17/2018	14.4	2.667
7/19/2018	8.64	2.156
10/15/2018	12.2	2.501
1/22/2019	23	3.135

Well Number: MW394

Date Collected	Result	LN(Result)
4/20/2017	9.09	2.207
7/19/2017	6.29	1.839
10/9/2017	-0.603	#Func!
1/23/2018	-3.27	#Func!
4/19/2018	8.1	2.092
7/19/2018	2.94	1.078
10/22/2018	11.1	2.407
1/23/2019	4.28	1.454

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)
MW369	Downgradient	Yes	83.7	YES	4.427	N/A
MW384	Sidegradient	Yes	97	YES	4.575	N/A
MW387	Downgradient	Yes	135	YES	4.905	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

MW369
MW384
MW387

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

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

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

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

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

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

C-746-S/T Second Quarter 2019 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= 24.325 S= 2.997 CV(1)=0.123 K factor**= 2.523 TL(1)= 31.886 LL(1)=N/A

Statistics-Transformed Background Data X= 3.184 S= 0.128 CV(2)=0.040 K factor**= 2.523 TL(2)= 3.508 LL(2)=N/A

Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW220

Date Collected	Result	LN(Result)
4/19/2017	20.8	3.035
7/19/2017	22.7	3.122
10/9/2017	19.9	2.991
1/23/2018	18.8	2.934
4/17/2018	22.6	3.118
7/19/2018	25.5	3.239
10/15/2018	20.6	3.025
1/22/2019	26	3.258

Well Number: MW394

Date Collected	Result	LN(Result)
4/20/2017	27.9	3.329
7/19/2017	26.1	3.262
10/9/2017	25.7	3.246
1/23/2018	26	3.258
4/19/2018	25.4	3.235
7/19/2018	27.9	3.329
10/22/2018	25.4	3.235
1/23/2019	27.9	3.329

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW372	Downgradient	Yes	49.7	YES	3.906	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

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

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-S/T Second Quarter 2019 Statistical Analysis Chemical Oxygen Demand (COD)	Current Background Comparison URGA
UNITS: mg/L	

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test 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= 21.156	S= 8.670	CV(1)=0.410	K factor**= 2.523	TL(1)= 43.032	LL(1)=N/A
Statistics-Transformed Background Data	X= 2.986	S= 0.362	CV(2)=0.121	K factor**= 2.523	TL(2)= 3.900	LL(2)=N/A

Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW220

Date Collected	Result	LN(Result)
4/19/2017	24	3.178
7/19/2017	46.8	3.846
10/9/2017	14.2	2.653
1/23/2018	18.9	2.939
4/17/2018	26.3	3.270
7/19/2018	29.3	3.378
10/15/2018	20	2.996
1/22/2019	20	2.996

Well Number: MW394

Date Collected	Result	LN(Result)
4/20/2017	16.1	2.779
7/19/2017	20	2.996
10/9/2017	12.5	2.526
1/23/2018	12.6	2.534
4/19/2018	18.4	2.912
7/19/2018	27.6	3.318
10/22/2018	11.8	2.468
1/23/2019	20	2.996

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW372	Downgradient	Yes	52.6	YES	3.963	N/A
MW391	Downgradient	Yes	44.5	YES	3.795	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

MW372
MW391

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the 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-S/T Second Quarter 2019 Statistical Analysis Current Background Comparison

Dissolved Solids

UNITS: mg/L

URGA

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

Statistics-Background Data X= 213.750 S= 69.035 CV(1)=0.323 K factor**= 2.523 TL(1)= 387.925 LL(1)=N/A

Statistics-Transformed Background Data X= 5.331 S= 0.249 CV(2)=0.047 K factor**= 2.523 TL(2)= 5.960 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: MW220

Date Collected	Result	LN(Result)
4/19/2017	193	5.263
7/19/2017	451	6.111
10/9/2017	147	4.990
1/23/2018	163	5.094
4/17/2018	183	5.209
7/19/2018	207	5.333
10/15/2018	226	5.421
1/22/2019	209	5.342

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW372	Downgradient	Yes	309	NO	5.733	N/A

Well Number: MW394

Date Collected	Result	LN(Result)
4/20/2017	203	5.313
7/19/2017	203	5.313
10/9/2017	170	5.136
1/23/2018	187	5.231
4/19/2018	271	5.602
7/19/2018	204	5.318
10/22/2018	206	5.328
1/23/2019	197	5.283

Conclusion of Statistical Analysis on Current Data

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

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

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

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

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

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

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

C-746-S/T Second Quarter 2019 Statistical Analysis 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= 10.488 S= 1.309 CV(1)=0.125 K factor**= 2.523 TL(1)= 13.790 LL(1)=N/A

Statistics-Transformed Background Data X= 2.342 S= 0.131 CV(2)=0.056 K factor**= 2.523 TL(2)= 2.672 LL(2)=N/A

Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW220

Date Collected	Result	LN(Result)
4/19/2017	9.11	2.209
7/19/2017	9.36	2.236
10/9/2017	8.67	2.160
1/23/2018	8.04	2.084
4/17/2018	9.63	2.265
7/19/2018	11.1	2.407
10/15/2018	8.8	2.175
1/22/2019	10.8	2.380

Well Number: MW394

Date Collected	Result	LN(Result)
4/20/2017	11.6	2.451
7/19/2017	11.4	2.434
10/9/2017	11.4	2.434
1/23/2018	11.5	2.442
4/19/2018	11.7	2.460
7/19/2018	12	2.485
10/22/2018	11.3	2.425
1/23/2019	11.4	2.434

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW372	Downgradient	Yes	18.2	YES	2.901	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

MW372

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

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

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

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

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

** Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009. D2-10

C-746-S/T Second Quarter 2019 Statistical Analysis Oxidation-Reduction Potential	Current Background Comparison URGA
UNITS: mV	

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test 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= 345.625	S= 47.539	CV(1)=0.138	K factor**= 2.523	TL(1)= 465.567	LL(1)=N/A
Statistics-Transformed Background Data	X= 5.836	S= 0.138	CV(2)=0.024	K factor**= 2.523	TL(2)= 6.186	LL(2)=N/A

Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW220

Date Collected	Result	LN(Result)
4/19/2017	283	5.645
7/19/2017	350	5.858
10/9/2017	436	6.078
1/23/2018	362	5.892
4/17/2018	305	5.720
7/19/2018	390	5.966
10/15/2018	413	6.023
1/22/2019	361	5.889

Well Number: MW394

Date Collected	Result	LN(Result)
4/20/2017	306	5.724
7/19/2017	338	5.823
10/9/2017	337	5.820
1/23/2018	264	5.576
4/19/2018	310	5.737
7/19/2018	375	5.927
10/22/2018	386	5.956
1/23/2019	314	5.749

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)
MW220	Upgradient	Yes	523	YES	6.260	N/A
MW221	Sidegradient	Yes	539	YES	6.290	N/A
MW222	Sidegradient	Yes	519	YES	6.252	N/A
MW223	Sidegradient	Yes	520	YES	6.254	N/A
MW224	Sidegradient	Yes	516	YES	6.246	N/A
MW372	Downgradient	Yes	400	NO	5.991	N/A
MW384	Sidegradient	Yes	423	NO	6.047	N/A
MW387	Downgradient	Yes	436	NO	6.078	N/A
MW391	Downgradient	Yes	469	YES	6.151	N/A
MW394	Upgradient	Yes	463	NO	6.138	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

MW220
MW221
MW222
MW223
MW224
MW391

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

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

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

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-S/T Second Quarter 2019 Statistical Analysis Current 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 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= 37.163 S= 6.336 CV(1)=0.170 K factor**= 2.523 TL(1)= 53.148 LL(1)=N/A

Statistics-Transformed Background Data X= 3.602 S= 0.169 CV(2)=0.047 K factor**= 2.523 TL(2)= 4.027 LL(2)=N/A

Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW220

Date Collected	Result	LN(Result)
4/19/2017	41.4	3.723
7/19/2017	42	3.738
10/9/2017	40.9	3.711
1/23/2018	38.8	3.658
4/17/2018	44.6	3.798
7/19/2018	49.6	3.904
10/15/2018	39	3.664
1/22/2019	45.1	3.809

Well Number: MW394

Date Collected	Result	LN(Result)
4/20/2017	30.7	3.424
7/19/2017	28.7	3.357
10/9/2017	33.6	3.515
1/23/2018	33.5	3.512
4/19/2018	30.4	3.414
7/19/2018	30.2	3.408
10/22/2018	33.4	3.509
1/23/2019	32.7	3.487

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)
MW387	Downgradient	Yes	58.6	YES	4.071	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

MW387

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

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

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

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-S/T Second Quarter 2019 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= 15.300 S= 5.341 CV(1)=0.349 K factor**= 2.523 TL(1)= 28.776 LL(1)=N/A

Statistics-Transformed Background Data X= 2.671 S= 0.345 CV(2)=0.129 K factor**= 2.523 TL(2)= 3.542 LL(2)=N/A

Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW220

Date Collected	Result	LN(Result)
4/19/2017	19.9	2.991
7/19/2017	22.7	3.122
10/9/2017	17.6	2.868
1/23/2018	16.4	2.797
4/17/2018	21.1	3.049
7/19/2018	24.7	3.207
10/15/2018	16.9	2.827
1/22/2019	21.4	3.063

Well Number: MW394

Date Collected	Result	LN(Result)
4/20/2017	10.5	2.351
7/19/2017	10.2	2.322
10/9/2017	10.5	2.351
1/23/2018	10.4	2.342
4/19/2018	10.4	2.342
7/19/2018	10.5	2.351
10/22/2018	10.6	2.361
1/23/2019	11	2.398

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)
MW220	Upgradient	Yes	24.1	NO	3.182	N/A
MW223	Sidegradient	Yes	20.5	NO	3.020	N/A
MW372	Downgradient	Yes	71.3	YES	4.267	N/A
MW384	Sidegradient	Yes	22.8	NO	3.127	N/A
MW387	Downgradient	Yes	20.8	NO	3.035	N/A
MW391	Downgradient	Yes	57.5	YES	4.052	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

MW372
MW391

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the 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-S/T Second Quarter 2019 Statistical Analysis Technetium-99	Current Background Comparison 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 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= 14.120	S= 7.706	CV(1)=0.546	K factor**= 2.523	TL(1)= 33.563	LL(1)=N/A
Statistics-Transformed Background Data	X= 2.283	S= 1.274	CV(2)=0.558	K factor**= 2.523	TL(2)= 5.498	LL(2)=N/A

Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW220

Date Collected	Result	LN(Result)
4/19/2017	20.7	3.030
7/19/2017	22.7	3.122
10/9/2017	18.3	2.907
1/23/2018	27.4	3.311
4/17/2018	19.9	2.991
7/19/2018	14	2.639
10/15/2018	20.8	3.035
1/22/2019	19.4	2.965

Well Number: MW394

Date Collected	Result	LN(Result)
4/20/2017	7.82	2.057
7/19/2017	11.1	2.407
10/9/2017	1.99	0.688
1/23/2018	6.15	1.816
4/19/2018	0.158	-1.845
7/19/2018	10.6	2.361
10/22/2018	13.4	2.595
1/23/2019	11.5	2.442

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)
MW369	Downgradient	Yes	70.8	YES	4.260	N/A
MW372	Downgradient	Yes	59.4	YES	4.084	N/A
MW384	Sidegradient	Yes	155	YES	5.043	N/A
MW387	Downgradient	Yes	229	YES	5.434	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

MW369
MW372
MW384
MW387

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

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

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

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-S/T Second Quarter 2019 Statistical Analysis Current Background Comparison

Beta activity

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= 7.833 S= 2.999 CV(1)=0.383 K factor**= 2.523 TL(1)= 15.399 LL(1)=N/A

Statistics-Transformed Background Data X= 1.983 S= 0.417 CV(2)=0.210 K factor**= 2.523 TL(2)= 3.034 LL(2)=N/A

Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW395

Date Collected	Result	LN(Result)
4/20/2017	7.61	2.029
7/19/2017	5.16	1.641
10/9/2017	8.17	2.100
1/23/2018	7.59	2.027
4/19/2018	5.4	1.686
7/19/2018	7.89	2.066
10/22/2018	9.41	2.242
1/23/2019	5.24	1.656

Well Number: MW397

Date Collected	Result	LN(Result)
4/20/2017	12.1	2.493
7/19/2017	9.5	2.251
10/9/2017	11.9	2.477
1/23/2018	2.66	0.978
4/17/2018	5.57	1.717
7/19/2018	13.8	2.625
10/15/2018	5.14	1.637
1/23/2019	8.19	2.103

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	Downgradient	Yes	61	YES	4.111	N/A
MW385	Sidegradient	Yes	138	YES	4.927	N/A
MW388	Downgradient	Yes	76.7	YES	4.340	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

MW370
MW385
MW388

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

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

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

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

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

** Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009. D2-15

C-746-S/T Second Quarter 2019 Statistical Analysis Current Background Comparison

Calcium

UNITS: mg/L

LRGA

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

Statistics-Background Data X= 22.063 S= 4.193 CV(1)=0.190 K factor**= 2.523 TL(1)= 32.642 LL(1)=N/A

Statistics-Transformed Background Data X= 3.077 S= 0.192 CV(2)=0.062 K factor**= 2.523 TL(2)= 3.561 LL(2)=N/A

Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW395

Date Collected	Result	LN(Result)
4/20/2017	28.2	3.339
7/19/2017	26.2	3.266
10/9/2017	25.3	3.231
1/23/2018	24.5	3.199
4/19/2018	24.5	3.199
7/19/2018	27.1	3.300
10/22/2018	24.4	3.195
1/23/2019	27.3	3.307

Well Number: MW397

Date Collected	Result	LN(Result)
4/20/2017	18.2	2.901
7/19/2017	17.2	2.845
10/9/2017	18.7	2.929
1/23/2018	19.4	2.965
4/17/2018	16.8	2.821
7/19/2018	16.9	2.827
10/15/2018	19.3	2.960
1/23/2019	19	2.944

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)
MW373	Downgradient	Yes	64	YES	4.159	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

MW373

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

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

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

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-S/T Second Quarter 2019 Statistical Analysis Chemical Oxygen Demand (COD)	Current Background Comparison LRGA
UNITS: mg/L	

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test 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= 21.859	S= 13.787	CV(1)=0.631	K factor**= 2.523	TL(1)= 56.644	LL(1)=N/A
Statistics-Transformed Background Data	X= 2.943	S= 0.520	CV(2)=0.177	K factor**= 2.523	TL(2)= 4.254	LL(2)=N/A

Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW395

Date Collected	Result	LN(Result)
4/20/2017	12.6	2.534
7/19/2017	12.7	2.542
10/9/2017	14.2	2.653
1/23/2018	18.9	2.939
4/19/2018	42.2	3.742
7/19/2018	24.3	3.190
10/22/2018	9.87	2.289
1/23/2019	20	2.996

Well Number: MW397

Date Collected	Result	LN(Result)
4/20/2017	9.17	2.216
7/19/2017	20	2.996
10/9/2017	14.2	2.653
1/23/2018	18.9	2.939
4/17/2018	37.4	3.622
7/19/2018	14.5	2.674
10/15/2018	60.8	4.108
1/23/2019	20	2.996

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)
MW373	Downgradient	Yes	43.8	NO	3.780	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, $S = \sqrt{[\text{Sum } ((\text{background result} - X)^2) / (\text{count of background results} - 1)]}$

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-S/T Second Quarter 2019 Statistical Analysis	Current 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 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= 40.006	S= 6.032	CV(1)=0.151	K factor**= 2.523	TL(1)= 55.225	LL(1)=N/A
Statistics-Transformed Background Data	X= 3.679	S= 0.149	CV(2)=0.041	K factor**= 2.523	TL(2)= 4.055	LL(2)=N/A

Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW395

Date Collected	Result	LN(Result)
4/20/2017	51.6	3.944
7/19/2017	48.1	3.873
10/9/2017	43	3.761
1/23/2018	40.6	3.704
4/19/2018	46.5	3.839
7/19/2018	47.5	3.861
10/22/2018	39.9	3.686
1/23/2019	41.7	3.731

Well Number: MW397

Date Collected	Result	LN(Result)
4/20/2017	35.5	3.570
7/19/2017	34	3.526
10/9/2017	37.6	3.627
1/23/2018	39.1	3.666
4/17/2018	30.7	3.424
7/19/2018	33.5	3.512
10/15/2018	36.1	3.586
1/23/2019	34.7	3.547

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)
MW392	Downgradient	Yes	103	YES	4.635	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

MW392

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

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

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

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-S/T Second Quarter 2019 Statistical Analysis	Current 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 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= 350.750	S= 32.840	CV(1)=0.094	K factor**= 2.523	TL(1)= 433.605	LL(1)=N/A
-----------------------------------	------------	-----------	-------------	-------------------	----------------	-----------

Statistics-Transformed Background Data	X= 5.856	S= 0.094	CV(2)=0.016	K factor**= 2.523	TL(2)= 6.092	LL(2)=N/A
---	----------	----------	-------------	-------------------	--------------	-----------

Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW395

Date Collected	Result	LN(Result)
4/20/2017	392	5.971
7/19/2017	392	5.971
10/9/2017	378	5.935
1/23/2018	384	5.951
4/19/2018	372	5.919
7/19/2018	396	5.981
10/22/2018	375	5.927
1/23/2019	359	5.883

Well Number: MW397

Date Collected	Result	LN(Result)
4/20/2017	320	5.768
7/19/2017	315	5.753
10/9/2017	333	5.808
1/23/2018	326	5.787
4/17/2018	307	5.727
8/21/2018	326	5.787
10/15/2018	321	5.771
1/23/2019	316	5.756

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)
MW373	Downgradient	Yes	767	YES	6.642	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

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

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-S/T Second Quarter 2019 Statistical Analysis Current 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 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= 186.688 S= 39.128 CV(1)=0.210 K factor**= 2.523 TL(1)= 285.408 LL(1)=N/A

Statistics-Transformed Background Data X= 5.211 S= 0.197 CV(2)=0.038 K factor**= 2.523 TL(2)= 5.709 LL(2)=N/A

Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW395

Date Collected	Result	LN(Result)
4/20/2017	204	5.318
7/19/2017	210	5.347
10/9/2017	163	5.094
1/23/2018	176	5.170
4/19/2018	257	5.549
7/19/2018	203	5.313
10/22/2018	176	5.170
1/23/2019	284	5.649

Well Number: MW397

Date Collected	Result	LN(Result)
4/20/2017	180	5.193
7/19/2017	171	5.142
10/9/2017	156	5.050
1/23/2018	179	5.187
4/17/2018	124	4.820
7/19/2018	160	5.075
10/15/2018	184	5.215
1/23/2019	160	5.075

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)
MW373	Downgradient	Yes	401	YES	5.994	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

MW373

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

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

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

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

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

** Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009. D2-20

C-746-S/T Second Quarter 2019 Statistical Analysis Current 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 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**= 9.532 **S**= 1.804 **CV(1)**=0.189 **K factor****= 2.523 **TL(1)**= 14.085 **LL(1)**=N/A

Statistics-Transformed Background Data **X**= 2.237 **S**= 0.194 **CV(2)**=0.087 **K factor****= 2.523 **TL(2)**= 2.727 **LL(2)**=N/A

Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW395

Date Collected	Result	LN(Result)
4/20/2017	11.6	2.451
7/19/2017	10.9	2.389
10/9/2017	11.4	2.434
1/23/2018	10.8	2.380
4/19/2018	11.4	2.434
7/19/2018	11.7	2.460
10/22/2018	10.7	2.370
1/23/2019	11.2	2.416

Well Number: MW397

Date Collected	Result	LN(Result)
4/20/2017	7.83	2.058
7/19/2017	7.37	1.997
10/9/2017	8.41	2.129
1/23/2018	8.61	2.153
4/17/2018	6.89	1.930
7/19/2018	7.38	1.999
10/15/2018	8.48	2.138
1/23/2019	7.84	2.059

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)
MW373	Downgradient	Yes	23.7	YES	3.165	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

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

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. D2-21

C-746-S/T Second Quarter 2019 Statistical Analysis Oxidation-Reduction Potential	Current Background Comparison LRGA
UNITS: mV	

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test 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= 75.098	CV(1)=0.222	K factor**= 2.523	TL(1)= 527.973	LL(1)=N/A
Statistics-Transformed Background Data	X= 5.796	S= 0.257	CV(2)=0.044	K factor**= 2.523	TL(2)= 6.446	LL(2)=N/A

Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW395

Date Collected	Result	LN(Result)
4/20/2017	190	5.247
7/19/2017	392	5.971
10/9/2017	385	5.953
1/23/2018	195	5.273
4/19/2018	367	5.905
7/19/2018	336	5.817
10/22/2018	237	5.468
1/23/2019	433	6.071

Well Number: MW397

Date Collected	Result	LN(Result)
4/20/2017	282	5.642
7/19/2017	352	5.864
10/9/2017	362	5.892
1/23/2018	361	5.889
4/17/2018	319	5.765
8/21/2018	404	6.001
10/15/2018	407	6.009
1/23/2019	394	5.976

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	Downgradient	Yes	400	NO	5.991	N/A
MW373	Downgradient	Yes	387	NO	5.958	N/A
MW385	Sidegradient	Yes	444	NO	6.096	N/A
MW388	Downgradient	Yes	405	NO	6.004	N/A
MW392	Downgradient	Yes	461	NO	6.133	N/A
MW395	Upgradient	Yes	477	NO	6.168	N/A
MW397	Upgradient	Yes	505	NO	6.225	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-S/T Second Quarter 2019 Statistical Analysis Current 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 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= 10.284 S= 0.511 CV(1)=0.050 K factor**= 2.523 TL(1)= 11.573 LL(1)=N/A

Statistics-Transformed Background Data X= 2.329 S= 0.050 CV(2)=0.021 K factor**= 2.523 TL(2)= 2.455 LL(2)=N/A

Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW395

Date Collected	Result	LN(Result)
4/20/2017	10.4	2.342
7/19/2017	10	2.303
10/9/2017	10.1	2.313
1/23/2018	10.4	2.342
4/19/2018	10.5	2.351
7/19/2018	10.4	2.342
10/22/2018	10.2	2.322
1/23/2019	10.6	2.361

Well Number: MW397

Date Collected	Result	LN(Result)
4/20/2017	9.7	2.272
7/19/2017	10.1	2.313
10/9/2017	11.1	2.407
1/23/2018	11.4	2.434
4/17/2018	9.21	2.220
7/19/2018	9.94	2.297
10/15/2018	10.4	2.342
1/23/2019	10.1	2.313

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	Downgradient	Yes	20.7	YES	3.030	N/A
MW373	Downgradient	Yes	126	YES	4.836	N/A
MW385	Sidegradient	Yes	22.4	YES	3.109	N/A
MW388	Downgradient	Yes	23.7	YES	3.165	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

MW370
MW373
MW385
MW388

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the 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. D2-23

C-746-S/T Second Quarter 2019 Statistical Analysis Technetium-99	Current Background Comparison 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= 14.251	S= 6.391	CV(1)=0.448	K factor**= 2.523	TL(1)= 30.375	LL(1)=N/A
Statistics-Transformed Background Data	X= 2.553	S= 0.498	CV(2)=0.195	K factor**= 2.523	TL(2)= 3.809	LL(2)=N/A

Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW395

Date Collected	Result	LN(Result)
4/20/2017	9.95	2.298
7/19/2017	19.2	2.955
10/9/2017	3.67	1.300
1/23/2018	15.7	2.754
4/19/2018	9.83	2.285
7/19/2018	9.05	2.203
10/22/2018	13.2	2.580
1/23/2019	10.3	2.332

Well Number: MW397

Date Collected	Result	LN(Result)
4/20/2017	14.9	2.701
7/19/2017	29.8	3.395
10/9/2017	13	2.565
1/23/2018	13.2	2.580
4/17/2018	18.9	2.939
7/19/2018	21.9	3.086
10/15/2018	18.3	2.907
1/23/2019	7.12	1.963

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	Downgradient	Yes	111	YES	4.710	N/A
MW385	Sidegradient	Yes	164	YES	5.100	N/A
MW388	Downgradient	Yes	139	YES	4.934	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

MW370
MW385
MW388

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the 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. D2-24

ATTACHMENT D3

STATISTICIAN QUALIFICATION STATEMENT

THIS PAGE INTENTIONALLY LEFT BLANK

July 2, 2019

Ms. Kelly Layne
Four Rivers Nuclear Partnership, LLC
5511 Hobbs Road
Kevil, KY 42053

Dear Ms. Layne:

This statement is submitted in response to your request that it be included with the completed statistical analysis that I have performed on the groundwater data for the C-746-S&T and C-746-U Landfills at the Paducah Gaseous Diffusion Plant.

As an Environmental Scientist, with a bachelor's degree in science, I have over 20 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 observed and reviewed by a senior chemist and geologist with Four Rivers Nuclear Partnership, LLC.

For this project, the statistical analyses conducted on the second quarter 2019 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,



Jennifer R. Watson

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX E

GROUNDWATER FLOW RATE AND DIRECTION

THIS PAGE INTENTIONALLY LEFT BLANK

GROUNDWATER FLOW RATE AND DIRECTION

Whenever monitoring wells (MWs) are sampled, 401 KAR 48:300, Section 11, requires determination of groundwater flow rate and direction of flow in the uppermost aquifer. The uppermost aquifer below the C-746-S&T Landfills 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 second quarter 2019 and to determine the groundwater flow rate and direction.

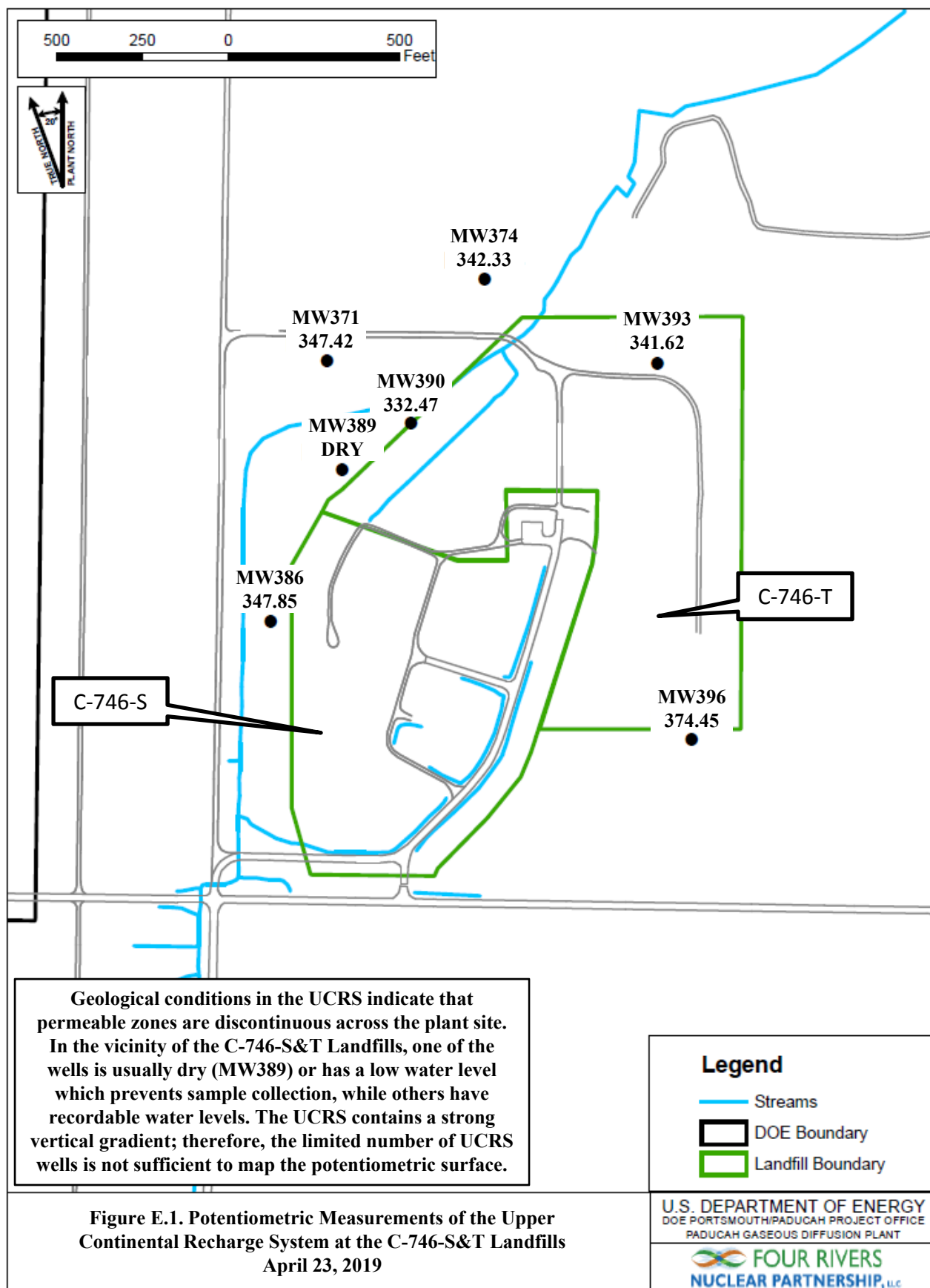
Water levels during this reporting period were measured on April 23, 2019. As shown on Figure E.1, MW389, screened in the Upper Continental Recharge System (UCRS), is usually dry, while other UCRS wells have recordable water levels. During this reporting period, MW389 had insufficient water for both measurement of the water level and for sampling.

The UCRS has a strong vertical hydraulic gradient; therefore, the limited number of available UCRS wells, screened over different elevations, is not sufficient for mapping the potentiometric surface. Figure E.1 shows the location of UCRS MWs. The Upper Regional Gravel Aquifer (URGA) and Lower Regional Gravel Aquifer (LRGA) data were corrected for barometric pressure, if necessary, and converted to elevations to plot the potentiometric surface of the RGA, as a whole, as shown on Table E.1. Figure E.2 is a composite or average map of the URGA and LRGA elevations where well clusters exist. The contour lines are placed based on the average water level elevations of the clusters.¹ Based on the site potentiometric map (Figure E.2), the hydraulic gradient beneath the landfill, as measured along the defined groundwater flow directions, is 4.91×10^{-4} ft/ft. Additional water level measurements in April (Figure E.3) document the vicinity groundwater hydraulic gradient for the RGA to be 5.08×10^{-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. 073-00045NWC1 and range from 425 to 725 ft/day (0.150 to 0.256 cm/s). RGA effective porosity is assumed to be 25%. Vicinity and site flow velocities were calculated using the low and high values for hydraulic conductivity, as shown in Table E.3.

Regional groundwater flow near the C-746-S&T Landfills typically trends northeastward toward the Ohio River. As demonstrated on the potentiometric map for April 2019, the groundwater flow direction in the immediate area of the landfill was oriented to the northeast.

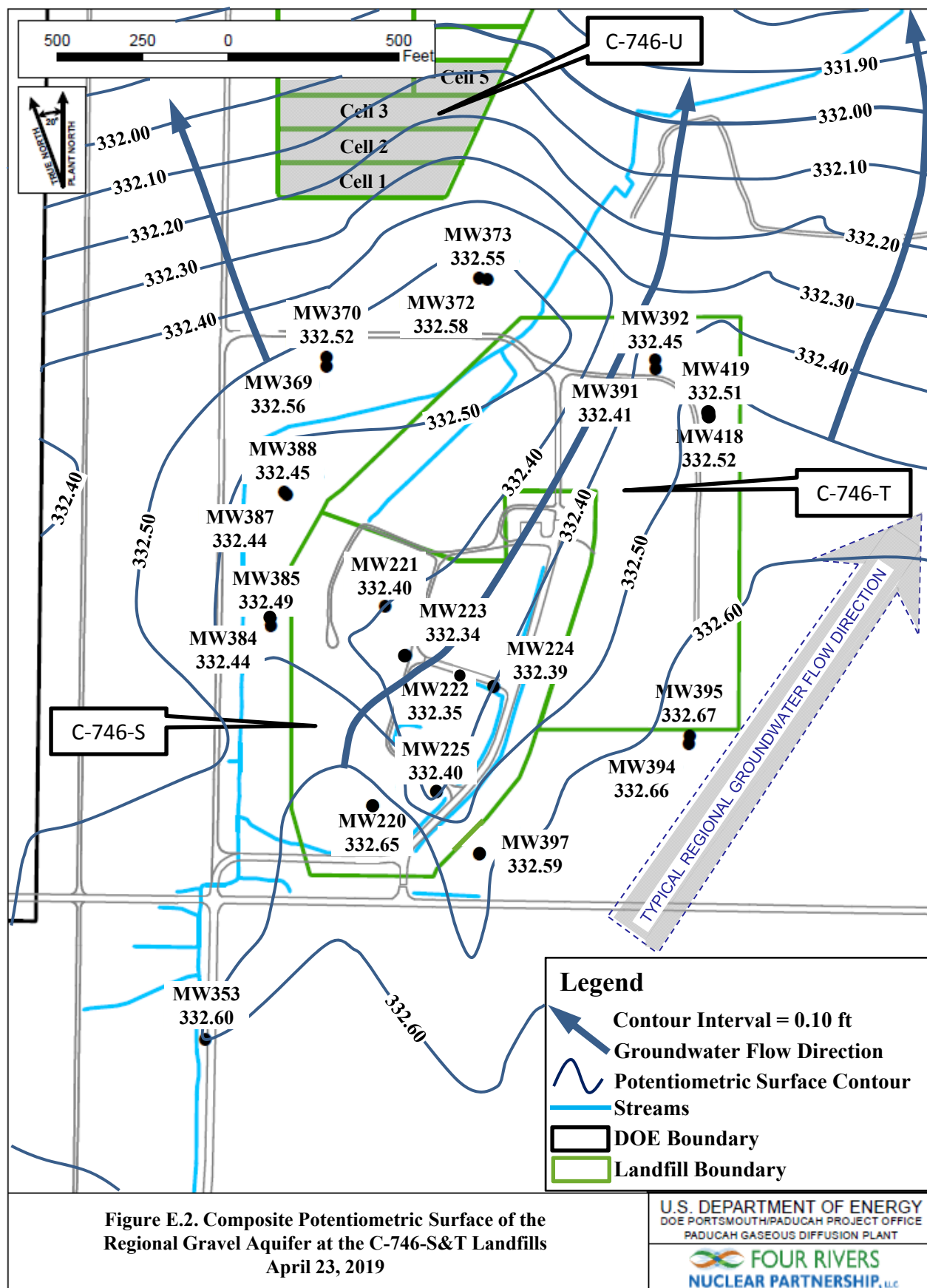
¹ Additional water level measurements, in wells at the C-746-U Landfill and in wells of the surrounding region (MW98, MW100, MW125, MW139, MW165A, MW173, MW193, MW197, and MW200), were used to contour the RGA potentiometric surface.



G:\GIS\ARCVIEW\PROJECTS\Quarterly Landfill Reports\Basemap Template.mxd 11/29/2018

Table E.1. C-746-S&T Landfills Second Quarter 2019 (April) Water Levels

C-746-S&T Landfills (April 2019) Water Levels										
Date	Time	Well	Formation	Datum Elev (ft amsl)	BP (in Hg)	Delta BP (ft H ₂ O)	Raw Data		*Corrected Data	
							DTW (ft)	Elev (ft amsl)	DTW (ft)	Elev (ft amsl)
4/23/2019	14:15	MW220	URGA	382.27	30.01	0.01	49.61	332.66	49.62	332.65
4/23/2019	14:22	MW221	URGA	391.51	30.01	0.01	59.10	332.41	59.11	332.40
4/23/2019	14:20	MW222	URGA	395.39	30.01	0.01	63.03	332.36	63.04	332.35
4/23/2019	14:21	MW223	URGA	394.49	30.01	0.01	62.14	332.35	62.15	332.34
4/23/2019	14:19	MW224	URGA	395.82	30.01	0.01	63.42	332.40	63.43	332.39
4/23/2019	14:17	MW225	URGA	385.88	30.01	0.01	53.47	332.41	53.48	332.40
4/23/2019	12:54	MW353	LRGA	375.12	30.02	0.00	42.52	332.60	42.52	332.60
4/23/2019	14:11	MW384	URGA	365.42	30.01	0.01	32.97	332.45	32.98	332.44
4/23/2019	14:12	MW385	LRGA	365.86	30.01	0.01	33.36	332.50	33.37	332.49
4/23/2019	14:13	MW386	UCRS	365.47	30.01	0.01	17.61	347.86	17.62	347.85
4/23/2019	14:09	MW387	URGA	363.65	30.01	0.01	31.20	332.45	31.21	332.44
4/23/2019	14:10	MW388	LRGA	363.64	30.01	0.01	31.18	332.46	31.19	332.45
4/23/2019	14:08	MW389	UCRS	364.26	--	--	DRY	--	DRY	--
4/23/2019	14:07	MW390	UCRS	360.60	30.01	0.01	28.12	332.48	28.13	332.47
4/23/2019	13:54	MW391	URGA	366.83	30.01	0.01	34.41	332.42	34.42	332.41
4/23/2019	13:55	MW392	LRGA	366.07	30.01	0.01	33.61	332.46	33.62	332.45
4/23/2019	13:56	MW393	UCRS	366.81	30.01	0.01	25.18	341.63	25.19	341.62
4/23/2019	14:00	MW394	URGA	378.64	30.01	0.01	45.97	332.67	45.98	332.66
4/23/2019	14:01	MW395	LRGA	379.34	30.01	0.01	46.66	332.68	46.67	332.67
4/23/2019	14:02	MW396	UCRS	378.84	30.01	0.01	4.38	374.46	4.39	374.45
4/23/2019	14:03	MW397	LRGA	387.12	30.01	0.01	54.52	332.60	54.53	332.59
4/23/2019	13:57	MW418	URGA	367.37	30.01	0.01	34.84	332.53	34.85	332.52
4/23/2019	13:58	MW419	LRGA	367.22	30.01	0.01	34.70	332.52	34.71	332.51
Initial Barometric Pressure			30.02							
Elev = elevation										
amsl = above mean sea level										
BP = barometric pressure										
DTW = depth to water in feet below datum										
URGA = Upper Regional Gravel Aquifer										
LRGA = Lower Regional Gravel Aquifer										
UCRS = Upper Continental Recharge System										
*Assumes a barometric efficiency of 1.0										



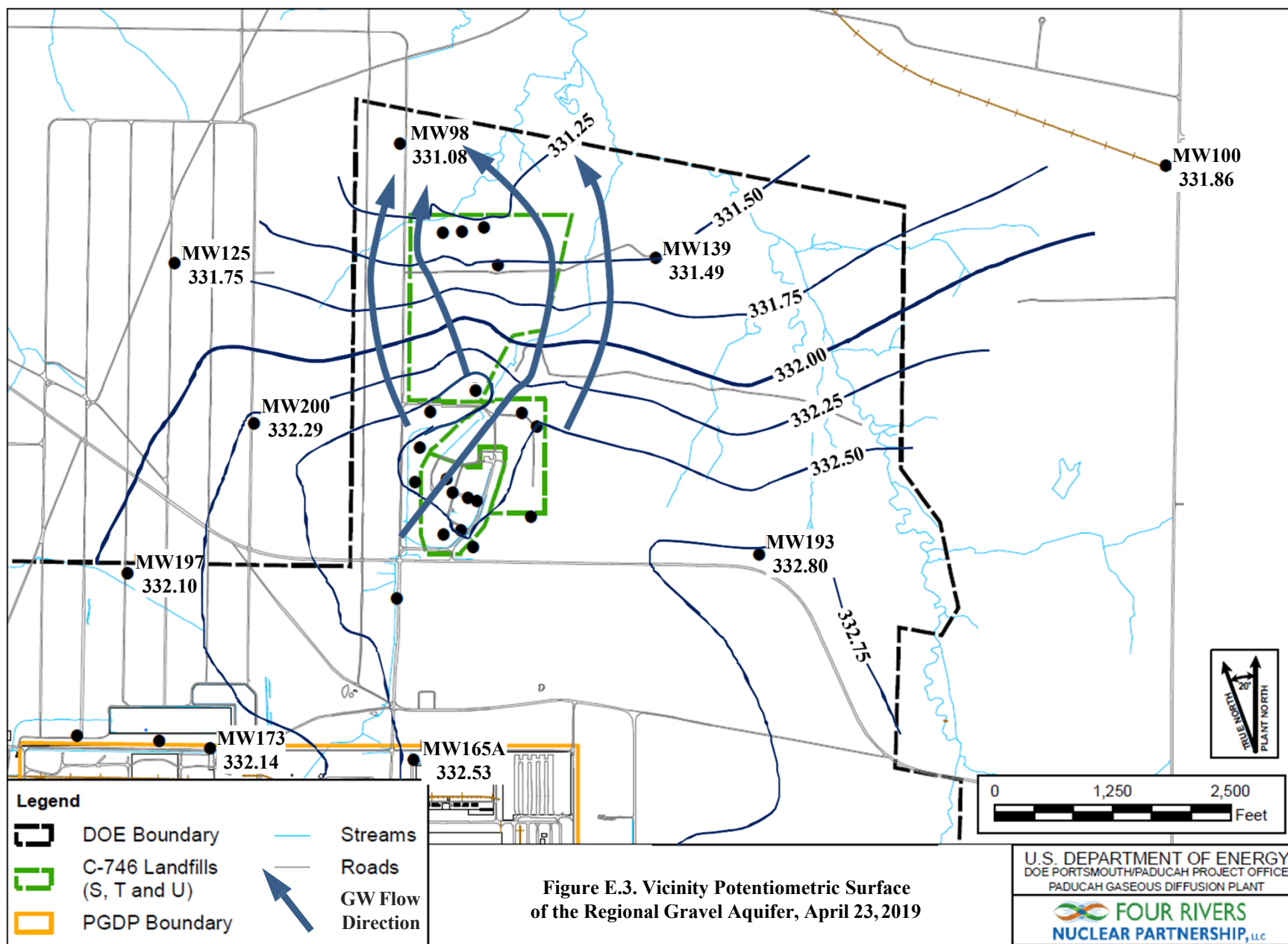


Table E.2. C-746-S&T Landfills Hydraulic Gradients

	ft/ft
Beneath Landfill Mound	4.91×10^{-4}
Vicinity	5.08×10^{-4}

Table E.3. C-746-S&T Landfills 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
<u>Beneath Landfill Mound</u>					
725	0.256	0.356	1.26×10^{-4}	1.42	5.03×10^{-4}
425	0.150	0.209	7.37×10^{-5}	0.835	2.95×10^{-4}
<u>Vicinity</u>					
725	0.256	0.369	1.30×10^{-4}	1.47	5.21×10^{-4}
425	0.150	0.216	7.63×10^{-5}	0.864	3.05×10^{-4}

APPENDIX F
NOTIFICATIONS

THIS PAGE INTENTIONALLY LEFT BLANK

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 are listed on the 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 second quarter 2019 groundwater data collected from the C-746-S&T Landfills monitoring wells were performed in accordance with *Groundwater Monitoring Plan for the Solid Waste Permitted Landfills (C-746-S Residential Landfill, C-746-T Inert Landfill, and C-746-U Contained Landfill) at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky* (LATA Kentucky 2014).

The following are the permit required parameters in 40 CFR § 302.4, Appendix A, which had statistically significant increased concentrations relative to historical background concentrations.

	<u>Parameter</u>	<u>Monitoring Well</u>
Upper Continental Recharge System	Technetium-99	MW390
Upper Regional Gravel Aquifer	Sodium Technetium-99	MW387 MW369, MW372, MW384, MW387
Lower Regional Gravel Aquifer	Technetium-99	MW370, MW385, MW388

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.

6/11/2019

**Four Rivers Nuclear Partnership, LLC
PROJECT ENVIRONMENTAL MEASUREMENTS SYSTEM
C-746-S&T LANDFILLS
SOLID WASTE PERMIT NUMBER SW07300014, SW07300015, SW07300045
MAXIMUM CONTAMINANT LEVEL (MCL) EXCEEDANCE REPORT
Quarterly Groundwater Sampling**

AKGWA	Station	Analysis	Method	Results	Units	MCL
8004-4820	MW369	Beta activity	9310	83.7	pCi/L	50
8004-4818	MW370	Beta activity	9310	61	pCi/L	50
8004-4792	MW373	Trichloroethene	8260B	5.2	ug/L	5
8004-4809	MW384	Beta activity	9310	97	pCi/L	50
8004-4810	MW385	Beta activity	9310	138	pCi/L	50
8004-4815	MW387	Beta activity	9310	135	pCi/L	50
8004-4816	MW388	Beta activity	9310	76.7	pCi/L	50
8004-4805	MW391	Trichloroethene	8260B	6.88	ug/L	5
8004-4806	MW392	Trichloroethene	8260B	11.2	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

THIS PAGE INTENTIONALLY LEFT BLANK

Chart of MCL and Historical UTL Exceedances for the C-746-S&T Landfills

Groundwater Flow System	UCRS					URGA										LRGA							
Gradient	S	D	D	D	U	S	S	S	S	S	D	D	D	D	U	U	S	D	D	D	D	U	U
Monitoring Well	386	389	390	393	396	221	222	223	224	384	369	372	387	391	220	394	385	370	373	388	392	395	397
ACETONE																							
Quarter 3, 2003							*					*											
Quarter 4, 2003											*								*				
Quarter 1, 2005									*														
ALPHA ACTIVITY																							
Quarter 4, 2002				■	■								■										
Quarter 4, 2008										■													
Quarter 4, 2010										■													
ALUMINUM																							
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 4, 2008							*																
Quarter 1, 2009			*				*				*												
Quarter 1, 2010			*				*				*												
Quarter 2, 2010			*								*												
Quarter 3, 2010			*								*			*			*		*				
Quarter 1, 2011							*				*												
Quarter 2, 2011			*								*												
Quarter 2, 2012			*																				
Quarter 3, 2012							*																
Quarter 1, 2013							*				*												
Quarter 3, 2013			*																				
Quarter 1, 2014							*																
Quarter 2, 2014											*												
Quarter 4, 2014			*																				
Quarter 1, 2016							*																
Quarter 2, 2016														*									
Quarter 1, 2017							*																
Quarter 4, 2017																						*	
Quarter 1, 2018							*																
BARIUM																							
Quarter 3, 2003							■	■															
Quarter 4, 2003							■	■															
BETA ACTIVITY																							
Quarter 4, 2002													■										
Quarter 1, 2003													■				■						

Chart of MCL and Historical UTL Exceedances for the C-746-S&T Landfills (Continued)

Groundwater Flow System	UCRS					URGA											LRGA						
Gradient	S	D	D	D	U	S	S	S	S	S	D	D	D	D	U	U	S	D	D	D	D	U	U
Monitoring Well	386	389	390	393	396	221	222	223	224	384	369	372	387	391	220	394	385	370	373	388	392	395	397
BETA ACTIVITY																							
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 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										■			■				■	■		■			

Chart of MCL and Historical UTL Exceedances for the C-746-S&T Landfills (Continued)

Groundwater Flow System	UCRS					URGA										LRGA							
Gradient	S	D	D	D	U	S	S	S	S	S	D	D	D	D	U	U	S	D	D	D	D	U	U
Monitoring Well	386	389	390	393	396	221	222	223	224	384	369	372	387	391	220	394	385	370	373	388	392	395	397
BETA ACTIVITY																							
Quarter 4, 2017																							
Quarter 1, 2018																							
Quarter 2, 2018																							
Quarter 3, 2018																							
Quarter 4, 2018																							
Quarter 1, 2019																							
Quarter 2, 2019																							
BROMIDE																							
Quarter 1, 2003																							
Quarter 4, 2003																							
Quarter 1, 2004																							
Quarter 2, 2004																							
Quarter 3, 2004																							
Quarter 4, 2004																							
Quarter 1, 2005																							
Quarter 3, 2006																							
CALCIUM																							
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 1, 2011																							
Quarter 2, 2011																							
Quarter 3, 2011																							
Quarter 4, 2011																							
Quarter 1, 2012																							
Quarter 2, 2012																							
Quarter 3, 2012																							

Chart of MCL and Historical UTL Exceedances for the C-746-S&T Landfills (Continued)

Groundwater Flow System	UCRS					URGA										LRGA							
Gradient	S	D	D	D	U	S	S	S	S	S	D	D	D	D	U	U	S	D	D	D	D	U	U
Monitoring Well	386	389	390	393	396	221	222	223	224	384	369	372	387	391	220	394	385	370	373	388	392	395	397
CALCIUM																							
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 4, 2018												*							*				
Quarter 1, 2019												*							*				
Quarter 2, 2019												*							*				
CARBON DISULFIDE																							
Quarter 4, 2010											*												
Quarter 1, 2011												*									*		
Quarter 2, 2017													*										
CHEMICAL OXYGEN DEMAND																							
Quarter 1, 2003				*																			
Quarter 2, 2003				*																			
Quarter 3, 2003				*			*			*													
Quarter 4, 2003				*																			
Quarter 1, 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	*																						

Chart of MCL and Historical UTL Exceedances for the C-746-S&T Landfills (Continued)

Groundwater Flow System	UCRS					URGA										LRGA							
Gradient	S	D	D	D	U	S	S	S	S	S	D	D	D	D	U	U	S	D	D	D	D	U	U
Monitoring Well	386	389	390	393	396	221	222	223	224	384	369	372	387	391	220	394	385	370	373	388	392	395	397
CHEMICAL OXYGEN DEMAND																							
Quarter 4, 2009	*																						
Quarter 1, 2010	*																						
Quarter 2, 2010	*																						
Quarter 3, 2010	*																						
Quarter 4, 2010	*																						
Quarter 3, 2011	*																						
Quarter 4, 2011	*																						
Quarter 1, 2012	*																						
Quarter 1, 2013	*																						
Quarter 3, 2013	*																						
Quarter 3, 2014	*								*				*					*					
Quarter 4, 2014							*																
Quarter 2, 2015																*							
Quarter 3, 2015															*								
Quarter 3, 2016			*								*												
Quarter 4, 2016																	*						
Quarter 2, 2017							*																
Quarter 3, 2017	*														*								
Quarter 4, 2017						*																	
Quarter 2, 2018													*									*	
Quarter 3, 2018												*											
Quarter 4, 2018														*									*
Quarter 2, 2019				*							*		*					*					
CHLORIDE																							
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			*																				

Chart of MCL and Historical UTL Exceedances for the C-746-S&T Landfills (Continued)

Groundwater Flow System	UCRS					URGA										LRGA							
Gradient	S	D	D	D	U	S	S	S	S	S	D	D	D	D	U	U	S	D	D	D	D	U	U
Monitoring Well	386	389	390	393	396	221	222	223	224	384	369	372	387	391	220	394	385	370	373	388	392	395	397
CHLORIDE																							
Quarter 2, 2011			*																				
Quarter 3, 2011			*																				
Quarter 4, 2011			*																				
Quarter 3, 2012			*																				
Quarter 3, 2013			*																				
Quarter 4, 2013			*																				
Quarter 4, 2014			*																				
Quarter 2, 2019																					*		
CHROMIUM																							
Quarter 4, 2002									■														
Quarter 1, 2003									■													■	
Quarter 2, 2003								■	■														
Quarter 3, 2009						■																	
Quarter 1, 2019						■																	
COBALT																							
Quarter 3, 2003							*																
CONDUCTIVITY																							
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 1, 2011										*		*							*				
Quarter 2, 2011												*							*				
Quarter 3, 2011												*							*				
Quarter 4, 2011												*							*				
Quarter 1, 2012											*	*							*				
Quarter 2, 2012												*							*				
Quarter 3, 2012												*							*				

Chart of MCL and Historical UTL Exceedances for the C-746-S&T Landfills (Continued)

Groundwater Flow System	UCRS					URGA										LRGA							
Gradient	S	D	D	D	U	S	S	S	S	S	D	D	D	D	U	U	S	D	D	D	D	U	U
Monitoring Well	386	389	390	393	396	221	222	223	224	384	369	372	387	391	220	394	385	370	373	388	392	395	397
CONDUCTIVITY																							
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																			*				
Quarter 2, 2019																			*				
DISSOLVED OXYGEN																							
Quarter 3, 2006			*					*															
DISSOLVED SOLIDS																							
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												*	*						*				

Chart of MCL and Historical UTL Exceedances for the C-746-S&T Landfills (Continued)

Groundwater Flow System	UCRS					URGA										LRGA							
Gradient	S	D	D	D	U	S	S	S	S	S	D	D	D	D	U	U	S	D	D	D	D	U	U
Monitoring Well	386	389	390	393	396	221	222	223	224	384	369	372	387	391	220	394	385	370	373	388	392	395	397
DISSOLVED SOLIDS																							
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												*							*				
Quarter 2, 2019												*							*				
IODIDE																							
Quarter 4, 2002																					*		
Quarter 2, 2003						*																	
Quarter 3, 2003													*										
Quarter 1, 2004				*																			
Quarter 3, 2010																					*		
Quarter 2, 2013										*													
IRON																							
Quarter 1, 2003						*				*	*			*									
Quarter 2, 2003										*	*	*	*										
Quarter 3, 2003						*	*	*		*	*	*											
Quarter 4, 2003										*													
Quarter 1, 2004										*													
Quarter 2, 2004										*	*												
Quarter 3, 2004										*													
Quarter 4, 2004										*													

Chart of MCL and Historical UTL Exceedances for the C-746-S&T Landfills (Continued)

Groundwater Flow System	UCRS					URGA										LRGA							
Gradient	S	D	D	D	U	S	S	S	S	S	D	D	D	D	U	U	S	D	D	D	D	U	U
Monitoring Well	386	389	390	393	396	221	222	223	224	384	369	372	387	391	220	394	385	370	373	388	392	395	397
IRON																							
Quarter 1, 2005												*											
Quarter 2, 2005											*	*											
Quarter 1, 2006							*																
Quarter 2, 2006												*											
Quarter 3, 2006											*												
Quarter 1, 2007											*	*											
Quarter 2, 2007											*												
Quarter 2, 2008												*											
Quarter 3, 2008												*											
MAGNESIUM																							
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 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																		*	*				

Chart of MCL and Historical UTL Exceedances for the C-746-S&T Landfills (Continued)

Groundwater Flow System	UCRS					URGA										LRGA							
Gradient	S	D	D	D	U	S	S	S	S	S	D	D	D	D	U	U	S	D	D	D	D	U	U
Monitoring Well	386	389	390	393	396	221	222	223	224	384	369	372	387	391	220	394	385	370	373	388	392	395	397
MAGNESIUM																							
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												*							*				
MANGANESE																							
Quarter 4, 2002																					*		
Quarter 3, 2003								*	*														
Quarter 4, 2003								*	*														
Quarter 1, 2004								*															
Quarter 2, 2004								*															
Quarter 4, 2004								*	*														
Quarter 1, 2005								*															
Quarter 3, 2005																					*		
Quarter 3, 2009	*																						
OXIDATION-REDUCTION POTENTIAL																							
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 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 3, 2009			*	*		*												*	*	*	*		
Quarter 4, 2009			*			*			*									*		*			
Quarter 1, 2010	*		*										*					*	*		*		
Quarter 2, 2010	*		*	*				*					*					*	*	*	*		
Quarter 3, 2010	*		*	*		*												*	*	*	*		

Chart of MCL and Historical UTL Exceedances for the C-746-S&T Landfills (Continued)

Groundwater Flow System	UCRS					URGA										LRGA							
Gradient	S	D	D	D	U	S	S	S	S	S	D	D	D	D	U	U	S	D	D	D	D	U	U
Monitoring Well	386	389	390	393	396	221	222	223	224	384	369	372	387	391	220	394	385	370	373	388	392	395	397
OXIDATION-REDUCTION POTENTIAL																							
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	*		*	*	*	*	*	*	*		*						*	*	*	*	*	*	*
Quarter 2, 2019	*		*	*	*	*	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*
PCB-1016																							
Quarter 4, 2003							*	*	*		*							*					
Quarter 3, 2004											*												
Quarter 3, 2005							*				*												
Quarter 1, 2006											*												
Quarter 2, 2006											*												
Quarter 4, 2006											*												
Quarter 1, 2007											*	*											
Quarter 2, 2007												*											
Quarter 3, 2007											*												
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											*												

Chart of MCL and Historical UTL Exceedances for the C-746-S&T Landfills (Continued)

Groundwater Flow System	UCRS					URGA												LRGA						
Gradient	S	D	D	D	U	S	S	S	S	S	D	D	D	D	U	U		S	D	D	D	D	U	U
Monitoring Well	386	389	390	393	396	221	222	223	224	384	369	372	387	391	220	394		385	370	373	388	392	395	397
PCB-1232																								
Quarter 1, 2011											*													
PCB-1248																								
Quarter 2, 2008												*												
PCB-1260																								
Quarter 2, 2006																			*					
pH																								
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 4, 2005											*								*					
Quarter 1, 2006																			*					
Quarter 2, 2006																			*					
Quarter 3, 2006																			*					
Quarter 3, 2007																			*					
Quarter 4, 2007																			*					
Quarter 4, 2008																			*					
Quarter 1, 2009																			*					
Quarter 1, 2011																			*					
Quarter 2, 2011											*													
Quarter 3, 2011											*													
Quarter 1, 2012														*										
Quarter 1, 2013										*			*		*				*					
Quarter 4, 2014																						*		
Quarter 2, 2016																			*	*				
POTASSIUM																								
Quarter 4, 2002																			*	*				
Quarter 3, 2004																				*				
Quarter 2, 2005																				*				
Quarter 3, 2005																				*				
Quarter 4, 2005																				*				
Quarter 2, 2006																				*				
Quarter 3, 2006																				*				
Quarter 4, 2006																				*				
Quarter 4, 2008																				*				
Quarter 3, 2012																				*				
Quarter 1, 2013																				*				
Quarter 2, 2013																				*				
Quarter 3, 2013																				*				
RADIUM-226																								
Quarter 4, 2002			*										*	*								*		
Quarter 2, 2004																				*				
Quarter 2, 2005									*															
Quarter 1, 2009											*													
Quarter 3, 2014									*			*												
Quarter 4, 2014			*								*								*					
Quarter 1, 2015			*				*			*		*							*					
Quarter 2, 2015			*				*			*		*							*					
Quarter 3, 2015			*																*					

Chart of MCL and Historical UTL Exceedances for the C-746-S&T Landfills (Continued)

Groundwater Flow System	UCRS					URGA										LRGA							
Gradient	S	D	D	D	U	S	S	S	S	S	D	D	D	D	U	U	S	D	D	D	D	U	U
Monitoring Well	386	389	390	393	396	221	222	223	224	384	369	372	387	391	220	394	385	370	373	388	392	395	397
RADIUM-226																							
Quarter 4, 2015					*	*									*		*				*	*	
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 4, 2018													*				*			*			
RADIUM-228																							
Quarter 2, 2005							■				■												
Quarter 3, 2005			■																				
Quarter 4, 2005							■		■														
Quarter 1, 2006					■																		
SELENIUM																							
Quarter 4, 2002			■		■																		
Quarter 1, 2003					■																	■	
Quarter 2, 2003			■																				
Quarter 3, 2003			■		■																		
Quarter 4, 2003			■																				
SODIUM																							
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 3, 2008											*												
Quarter 4, 2008									*	*													
Quarter 1, 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 4, 2011																			*				

Chart of MCL and Historical UTL Exceedances for the C-746-S&T Landfills (Continued)

Groundwater Flow System	UCRS					URGA										LRGA							
Gradient	S	D	D	D	U	S	S	S	S	S	D	D	D	D	U	U	S	D	D	D	D	U	U
Monitoring Well	386	389	390	393	396	221	222	223	224	384	369	372	387	391	220	394	385	370	373	388	392	395	397
SODIUM																							
Quarter 1, 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 2, 2016											*												
Quarter 3, 2016											*												*
Quarter 1, 2017										*	*		*					*					
Quarter 2, 2017									*	*	*												
Quarter 2, 2018													*										
Quarter 3, 2018														*									
Quarter 1, 2019													*										
Quarter 2, 2019													*										
STRONTIUM-90																							
Quarter 2, 2003										■													
Quarter 1, 2004										■													
SULFATE																							
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	*								*	*		*	*				*		*				

Chart of MCL and Historical UTL Exceedances for the C-746-S&T Landfills (Continued)

Groundwater Flow System	UCRS					URGA												LRGA							
Gradient	S	D	D	D	U	S	S	S	S	S	D	D	D	D	U	U	S	D	D	D	D	U	U		
Monitoring Well	386	389	390	393	396	221	222	223	224	384	369	372	387	391	220	394	385	370	373	388	392	395	397		
SULFATE																									
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								*		*		*	*	*	*	*	*	*	*	*					
Quarter 2, 2019								*		*		*	*	*	*	*	*	*	*	*					
TECHNETIUM-99																									
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			*							*		*	*				*		*	*					

Chart of MCL and Historical UTL Exceedances for the C-746-S&T Landfills (Continued)

Groundwater Flow System	UCRS					URGA												LRGA						
Gradient	S	D	D	D	U	S	S	S	S	S	D	D	D	D	U	U		S	D	D	D	D	U	U
Monitoring Well	386	389	390	393	396	221	222	223	224	384	369	372	387	391	220	394		385	370	373	388	392	395	397
TECHNETIUM-99																								
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			*							*	*	*	*					*	*		*			
Quarter 2, 2019			*							*	*	*	*					*	*		*			
THORIUM-230																								
Quarter 1, 2012	*									*				*										
Quarter 4, 2014	*		*							*														
Quarter 3, 2015	*									*	*		*		*									
Quarter 1, 2017			*							*								*						
THORIUM-234																								
Quarter 2, 2003						*				*				*										
Quarter 4, 2007										*														

Chart of MCL and Historical UTL Exceedances for the C-746-S&T Landfills (Continued)

Groundwater Flow System	UCRS					URGA										LRGA							
Gradient	S	D	D	D	U	S	S	S	S	S	D	D	D	D	U	U	S	D	D	D	D	U	U
Monitoring Well	386	389	390	393	396	221	222	223	224	384	369	372	387	391	220	394	385	370	373	388	392	395	397
TOLUENE																							
Quarter 2, 2014										*	*		*										
TOTAL ORGANIC CARBON																							
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 4, 2006																	*						
Quarter 1, 2007	*									*													
Quarter 3, 2007	*					*	*	*	*	*			*	*			*						
Quarter 2, 2011											*												
Quarter 3, 2012	*																						
Quarter 3, 2016																			*				
TOTAL ORGANIC HALIDES																							
Quarter 4, 2002																		*	*		*		
Quarter 1, 2003				*														*			*		
Quarter 3, 2003				*																	*		
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 4, 2006																	*						
Quarter 1, 2007	*																						
Quarter 2, 2007	*																						
Quarter 3, 2007	*																						
Quarter 4, 2007	*																				*		
Quarter 1, 2008	*																						
Quarter 4, 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 3, 2013																					*		

Chart of MCL and Historical UTL Exceedances for the C-746-S&T Landfills (Continued)

Groundwater Flow System	UCRS					URGA										LRGA							
Gradient	S	D	D	D	U	S	S	S	S	S	D	D	D	D	U	U	S	D	D	D	D	U	U
Monitoring Well	386	389	390	393	396	221	222	223	224	384	369	372	387	391	220	394	385	370	373	388	392	395	397
TRICHLOROETHENE																							
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 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																							

Chart of MCL and Historical UTL Exceedances for the C-746-S&T Landfills (Continued)

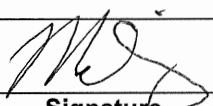
Groundwater Flow System	UCRS					URGA										LRGA							
Gradient	S	D	D	D	U	S	S	S	S	S	D	D	D	D	U	U	S	D	D	D	D	U	U
Monitoring Well	386	389	390	393	396	221	222	223	224	384	369	372	387	391	220	394	385	370	373	388	392	395	397
TRICHLOROETHENE																							
Quarter 1, 2018												■		■		■			■		■		
Quarter 2, 2018												■	■	■					■		■		
Quarter 3, 2018												■		■					■		■		
Quarter 4, 2018												■		■					■		■		
Quarter 1, 2019												■		■							■		
Quarter 2, 2019														■					■		■		
TURBIDITY																							
Quarter 4, 2002																					*		
Quarter 1, 2003							*					*		*									
URANIUM																							
Quarter 4, 2002																		*	*				
Quarter 1, 2003																			*				
Quarter 4, 2003							*													*			
Quarter 1, 2004							*	*	*					*				*					
Quarter 4, 2004																		*					
Quarter 4, 2006																			*		*		
ZINC																							
Quarter 3, 2003												*											
Quarter 4, 2003							*		*			*											
Quarter 4, 2004							*																
Quarter 4, 2007							*	*	*														
* Statistical test results indicate an elevated concentration (i.e., a statistically significant increase).																							
■ 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																							
S = Sidegradient; D = Downgradient; U = Upgradient																							

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX H
METHANE MONITORING DATA

THIS PAGE INTENTIONALLY LEFT BLANK

CP3-WM-0017-F03 - C-746-S & T LANDFILL METHANE MONITORING REPORT

Date:	5/30/2019		Time:	0830-0945		Monitor:	Michael Hideg											
Weather Conditions: Cloudy, Slight Wind and 70 Degrees																		
Monitoring Equipment:: RAE Systems, Multi-RAE Serial # 4495																		
Monitoring Location							Reading (% LEL)											
Ogden Landing Road Entrance	Checked at ground level							0										
North Landfill Gate	Checked at ground level							0										
West Side of Landfill: North 37° 07.652' West 88° 48.029'	Checked at ground level							0										
East Side of Landfill: North 37° 07.628' West 88° 47.798'	Checked at ground level							0										
Cell 1 Gas Vent (17)	1 0	2 0	3 0	4 0	5 0	6 0	7 0	8 0	9 0	10 0	11 0	12 0	13 0	14 0	15 0	16 0	17 0	0
Cell 2 Gas Vent (3)	1 0	2 0	3 0															0
Cell 3 Gas Vent (7)	1 0	2 0	3 0	4 0	5 0	6 0	7 0										0	
Landfill Office	Checked at floor level							0										
Suspect or Problem Areas	No areas noted							NA										
Remarks: <p align="center">ALL VENTS CHECKED 1" FROM THE MOUTH OF VENT .</p>																		
Performed by: Michael Hideg <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">  Signature </div> <div style="text-align: center;"> 5/30/19 Date </div> </div>																		

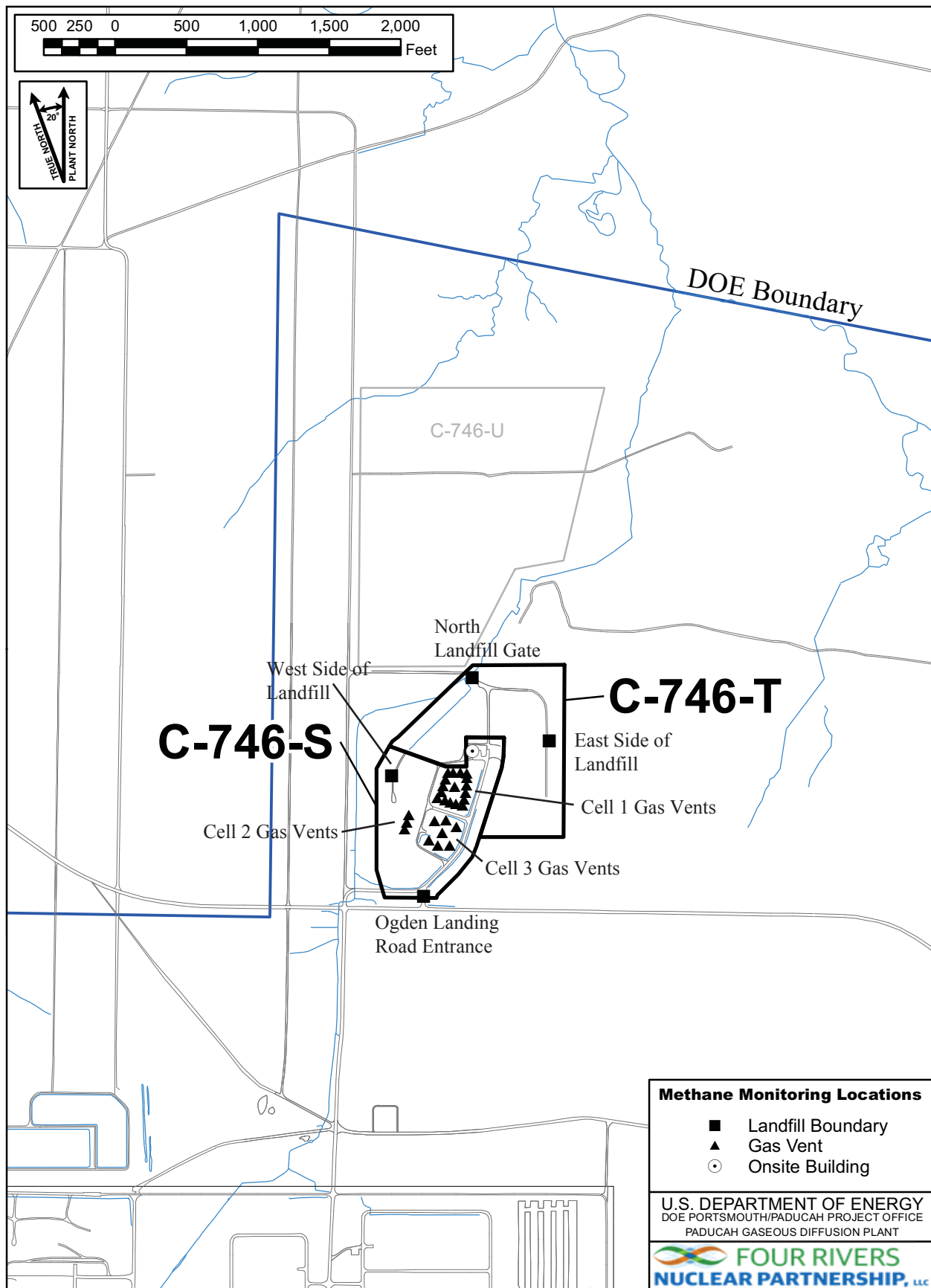


Figure H.1. C-746-S&T Methane Monitoring Locations

APPENDIX I

SURFACE WATER ANALYSES AND WRITTEN COMMENTS

THIS PAGE INTENTIONALLY LEFT BLANK

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)

Monitoring Point (KPDES Discharge Number, or "UPSTREAM", or "DOWNSTREAM")						L135 UPSTREAM		L154 DOWNSTREAM		L136 AT SITE			
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)						5/2/2019 15:01		5/2/2019 14:36		5/2/2019 14:50			
Duplicate ("Y" or "N") ¹						N		N		N			
Split ('Y' or "N") ²						N		N		N			
Facility Sample ID Number (if applicable)						L135SS3-19		L154US3-19		L136SS3-19			
Laboratory Sample ID Number (if applicable)						478099001		478102002		478099002			
Date of Analysis (Month/Day/Year)						5/25/2019		5/26/2019		5/25/2019			
CAS RN ³		CONSTITUENT	T D 4	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL ⁵	F L A G S ⁷	DETECTED VALUE OR PQL ⁵	F L A G S ⁷	DETECTED VALUE OR PQL ⁵	F L A G S ⁷	DETECTED VALUE OR PQL ⁵	F L A G S ⁷
A200-00-0	0	Flow	T	MGD	Field		*		*		*		
16887-00-6	2	Chloride(s)	T	MG/L	300.0	0.635		0.597		0.322			
14808-79-8	0	Sulfate	T	MG/L	300.0	1.68		1.81		5.42			
7439-89-6	0	Iron	T	MG/L	200.8	0.748		1.41		0.592			
7440-23-5	0	Sodium	T	MG/L	200.8	0.885		0.899		0.945			
S0268- -	0	Organic Carbon ⁶	T	MG/L	9060	14.3		14		11.9			
S0097- -	0	BOD ⁶	T	MG/L	not applicable		*		*		*		
S0130- -	0	Chemical Oxygen Demand	T	MG/L	410.4	81.1	B	34.9	B	63.1	B		

3-1

¹Respond "Y" if the sample was a duplicate of another sample in this report

²Respond "Y" if the sample was split and analyzed by separate laboratories.

³Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.

⁴"T" = Total; "D" = Dissolved

⁵"<" indicates a non-detect; do not use "ND" or "BDL". Value then shown is Practical Quantification Limit

⁶Facility has either/or option on Organic Carbon and (BOD) Biochemical Oxygen Demand - both are not required

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

STANDARD FLAGS:

* = See Comments

J = Estimated Value

B = Analyte found in blank

A = Average value

N = Presumptive ID

D = Concentration from analysis of
a secondary dilution factor

I-4

RESIDENTIAL/INERT – 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
L135	L135SS3-19	Flow Rate		Analysis of constituent not required and not performed.
		Biochemical Oxygen Demand (BOD		Analysis of constituent not required and not performed.
		Suspended Solids	*	Duplicate analysis not within control limits.
		Dissolved Solids	*	Duplicate analysis not within control limits.
		Alpha activity	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.49. Rad error is 6.41.
		Beta activity	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.92. Rad error is 4.89.
L154	L154US3-19	Flow Rate		Analysis of constituent not required and not performed.
		Biochemical Oxygen Demand (BOD		Analysis of constituent not required and not performed.
		Suspended Solids	*	Duplicate analysis not within control limits.
		Dissolved Solids	*	Duplicate analysis not within control limits.
		Alpha activity	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.01. Rad error is 3.
		Beta activity	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.39. Rad error is 4.39.
L136	L136SS3-19	Flow Rate		Analysis of constituent not required and not performed.
		Biochemical Oxygen Demand (BOD		Analysis of constituent not required and not performed.
		Suspended Solids	*	Duplicate analysis not within control limits.
		Dissolved Solids	*	Duplicate analysis not within control limits.
		Alpha activity	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.98. Rad error is 3.98.
		Beta activity	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.29. Rad error is 6.29.

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX J

ANALYTICAL LABORATORY CERTIFICATION

THIS PAGE INTENTIONALLY LEFT BLANK

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 17025:2005, 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 5.1.1 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 8 January 2009).



Presented this 30th day of August 2017.

A handwritten signature in black ink, appearing to read "L. L. L.", written over a horizontal line.

President and CEO
For the Accreditation Council
Certificate Number 2567.01
Valid to June 30, 2019
Revised July 30, 2018

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX K

LABORATORY ANALYTICAL METHODS

THIS PAGE INTENTIONALLY LEFT BLANK

LABORATORY ANALYTICAL METHODS

Analytical Method	Preparation Method	Product
SW846 8260B		Volatile Organic Compounds (VOC) by Gas Chromatograph/Mass Spectrometer
SW846 8011	SW846 8011 PREP	Analysis of 1,2-Dibromoethane (EDB), 1,2-Dibromo-3-Chloropropane (DBCP) and 1,2,3-Trichloropropane in Water by GC/ECD Using Methods 504.1 or 8011
SW846 3535A/8082	SW846 3535A	Analysis of 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

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX L

MICRO-PURGING STABILITY PARAMETERS

THIS PAGE INTENTIONALLY LEFT BLANK

**Micro-Purge Stability Parameters
for the C-746-S&T Landfills**

	Temperature	Conductivity	pH	Dissolved oxygen	Turbidity		Temperature	Conductivity	pH	Dissolved oxygen	Turbidity
MW220						MW221					
Date Collected: 4/16/2019						Date Collected: 4/16/2019					
1238	63.3	436	6.32	3.79	0.0	0849	60.4	426	6.22	3.28	0.0
1241	64.0	436	6.29	3.71	0.0	0852	60.8	426	6.21	2.95	0.0
1244	64.3	435	6.31	3.69	0.0	0855	61.0	427	6.21	2.91	0.0
MW222						MW223					
Date Collected: 4/16/2019						Date Collected: 4/16/2019					
1016	61.6	335	6.23	3.11	0.0	0940	61.2	425	6.18	2.54	0.0
1019	62.3	334	6.22	3.01	0.0	0943	61.9	425	6.19	2.40	0.0
1022	62.5	334	6.21	2.99	0.0	0946	62.0	425	6.18	2.39	0.0
MW224						MW369					
Date Collected: 4/16/2019						Date Collected: 4/15/2019					
1204	62.1	439	6.21	3.21	0.0	0730	59.4	439	6.20	0.70	1.3
1207	62.8	439	6.24	3.01	0.0	0733	59.3	439	6.20	0.70	0.9
1210	62.9	439	6.23	2.97	0.0	0736	59.2	439	6.21	0.71	0.5
MW370¹						MW372					
Date Collected: 4/15/2019						Date Collected: 4/11/2019					
0812	60.1	458	6.17	3.19	0.0	0857	62.8	633	6.26	1.08	3.1
0814	60.3	457	6.16	3.04	0.0	0900	63.2	632	6.25	0.97	3.3
0816	60.3	458	6.18	2.99	0.0	0903	63.5	632	6.25	0.95	3.3
MW373						MW384					
Date Collected: 4/11/2019						Date Collected: 4/17/2019					
0940	62.2	731	6.23	1.57	5.3	0915	60.9	453	6.17	3.34	0.1
0943	62.6	730	6.22	1.51	4.8	0918	61.0	452	6.16	3.35	0.0
0946	63.0	730	6.21	1.49	4.6	0921	61.1	452	6.17	3.38	0.0
MW385						MW386					
Date Collected: 4/17/2019						Date Collected: 4/17/2019					
1119	61.3	428	6.17	2.90	0.0	1146	62.6	592	6.73	3.46	0.0
1122	62.0	428	6.13	2.86	0.0	1149	63.2	593	6.84	3.32	0.0
1125	62.4	427	6.14	2.89	0.0	1152	63.8	593	6.81	3.30	0.0
MW387						MW388					
Date Collected: 4/17/2019						Date Collected: 4/17/2019					
0802	61.9	525	6.27	2.87	0.0	0839	61.4	441	6.16	3.24	0.0
0805	61.9	524	6.26	2.66	0.0	0842	61.4	441	6.14	3.17	0.0
0808	62.0	524	6.26	2.62	0.0	0845	61.5	441	6.13	3.19	0.0
MW390						MW391					
Date Collected: 4/17/2019						Date Collected: 4/16/2019					
0725	60.4	638	6.29	4.71	0.0	0729	59.4	438	6.17	5.17	0.0
0728	60.5	639	6.29	4.59	0.0	0732	59.5	439	6.16	4.62	0.0
0731	60.5	639	6.30	4.55	0.0	0735	59.5	439	6.16	4.58	0.0
MW392						MW393					
Date Collected: 4/16/2019						Date Collected: 4/15/2019					
0809	60.1	446	6.25	2.92	10.0	1026	57.8	474	5.96	3.35	5.7
0812	60.1	446	6.23	2.48	10.8	1029	58.1	474	6.04	2.80	4.7
0815	60.2	446	6.24	2.41	10.4	1032	58.3	473	6.02	2.76	4.1
MW394						MW395					
Date Collected: 4/22/2019						Date Collected: 4/22/2019					
0745	59.0	375	6.13	4.17	0.0	0824	59.6	354	6.17	4.51	0.0
0748	59.2	376	6.14	4.06	0.0	0827	60.2	355	6.15	4.40	0.0
0751	59.3	376	6.14	4.03	0.0	0830	60.3	355	6.16	4.41	0.0
MW396						MW397					
Date Collected: 4/22/2019						Date Collected: 4/16/2019					
0902	59.8	709	6.58	3.51	0.0	1316	62.8	326	6.20	5.86	1.4
0905	59.8	710	6.61	3.53	0.0	1319	63.3	325	6.18	5.29	2.2
0908	59.9	710	6.60	3.52	0.0	1322	63.6	325	6.19	5.28	1.9

¹ Readings were collected at a frequency not consistent with procedure. Data was considered useable based on consistent stability of parameters.

**Micro-Purge Stability Parameters
for the C-746-S&T Landfills (Continued)**

	Temperature Conductivity pH Dissolved oxygen Turbidity						Temperature Conductivity pH Dissolved oxygen Turbidity				
MW220						MW221					
Date Collected: 5/30/2019						Date Collected: 5/30/2019					
0931	61.6	426	6.33	4.52	0.2	0751	61.1	398	6.19	3.57	0.1
0934	63.1	423	6.32	4.04	2.1	0754	62.2	396	6.18	3.52	0.3
0937	63.0	424	6.31	4.02	2.9	0757	62.3	396	6.20	3.60	0.1
MW222						MW223					
Date Collected: 5/30/2019						Date Collected: 5/30/2019					
0840	62.6	373	6.28	3.90	0.0	0822	61.9	409	6.25	3.25	0.0
0843	63.1	372	6.25	3.31	0.1	0825	63.4	408	6.21	2.73	0.2
0846	63.2	375	6.26	3.29	0.0	0828	63.7	407	6.23	2.80	0.4
MW224						MW369					
Date Collected: 5/30/2019						Date Collected: 5/28/2019					
0906	62.4	433	6.31	3.99	0.0	1324	66.0	382	6.45	2.99	4.9
0909	63.7	432	6.27	2.98	0.5	1327	65.9	387	6.44	3.53	0.8
0912	63.8	432	6.29	2.95	0.0	1330	66.0	387	6.40	3.59	0.8
MW370						MW372					
Date Collected: 5/28/2019						Date Collected: 5/28/2019					
1400	66.2	444	6.23	5.04	5.3	1422	67.2	608	6.19	3.04	0.0
1403	68.0	437	6.12	3.54	0.0	1425	68.6	625	6.20	2.18	0.5
1406	68.2	436	6.11	3.46	0.0	1428	68.8	628	6.22	2.13	0.4
MW373						MW384					
Date Collected: 5/28/2019						Date Collected: 5/29/2019					
1502	68.1	772	6.23	1.35	1.4	1313	67.9	433	6.19	4.60	1.4
1505	65.8	768	6.20	1.28	0.2	1316	68.4	425	6.70	4.45	1.9
1508	65.7	767	6.21	1.28	1.1	1319	65.0	422	6.11	4.76	0.0
MW385						1322	65.5	425	6.14	4.72	0.0
Date Collected: 5/29/2019						MW386					
1354	65.1	418	6.17	3.02	1.4	Date Collected: 5/29/2019					
1357	65.6	419	6.19	2.57	0.3	1333	64.0	581	6.90	4.04	0.0
1400	65.7	418	6.14	2.60	1.0	1336	64.8	581	6.92	3.59	0.3
MW387						1339	64.9	576	6.92	3.51	0.0
Date Collected: 5/29/2019						MW388					
1231	63.8	525	6.27	4.02	0.1	Date Collected: 5/29/2019					
1234	64.5	524	6.24	3.57	0.7	1251	64.9	470	6.13	3.12	5.7
1237	64.6	526	6.25	3.49	0.5	1254	65.2	470	6.13	2.83	5.2
MW390						1257	65.5	469	6.14	2.90	5.1
Date Collected: 5/29/2019						MW391					
1208	63.0	676	6.47	5.12	1.3	Date Collected: 5/29/2019					
1211	64.4	676	6.42	4.68	3.2	0808	63.8	495	6.15	3.42	0.2
1214	64.5	676	6.41	4.62	3.0	0811	65.3	495	6.13	3.01	0.7
MW392						0814	65.6	494	6.10	2.92	0.6
Date Collected: 5/29/2019						MW393					
0730	62.9	443	6.22	1.46	2.0	Date Collected: 5/29/2019					
0733	64.1	442	6.25	0.89	3.0	0749	62.8	444	6.35	3.08	11.1
0736	64.2	441	6.20	0.81	2.3	0752	65.0	448	6.34	2.41	10.2
MW394						0755	65.3	448	6.30	2.38	8.4
Date Collected: 5/29/2019						MW395					
0911	61.4	383	6.13	4.57	1.8	Date Collected: 5/29/2019					
0914	63.5	384	6.11	3.98	3.5	0833	64.1	366	6.09	4.79	0.2
0917	63.5	383	6.11	3.93	4.0	0836	63.4	366	6.09	4.62	0.0
MW396						0839	63.1	367	6.08	4.57	0.2
Date Collected: 5/29/2019						MW397					
0851	61.6	723	6.71	1.91	0.9	Date Collected: 5/29/2019					
0854	63.5	722	6.68	1.50	1.3	1146	64.4	316	6.09	5.66	2.4
0857	63.7	722	6.71	1.47	1.4	1149	64.6	315	6.06	5.27	2.7
						1152	64.6	318	6.11	5.24	2.3