NOV 2 9 2016

Ms. Robin Green
Division of Waste Management
Kentucky Department for Environmental Protection
300 Sower Blvd., 2nd Floor
Frankfort, Kentucky 40601

PPPO-02-3866241-17B

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

Mr. Allan Shingleton
Division of Waste Management
Kentucky Department for Environmental Protection
625 Hospital Drive
Madisonville, Kentucky 42431
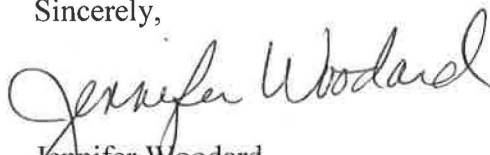
Dear Ms. Green, Mr. Hendricks, and Mr. Shingleton:

C-746-S&T LANDFILLS THIRD QUARTER CALENDAR YEAR 2016 (JULY–SEPTEMBER) COMPLIANCE MONITORING REPORT, PADUCAH GASEOUS DIFFUSION PLANT, PADUCAH, KENTUCKY, FPDP-RPT-0026/V3, PERMIT NUMBER SW07300014, SW07300015, SW07300045

Enclosed is the subject report for third quarter calendar year 2016. This report is required in accordance with Condition ACTV0006, Special Condition Number 3, of C-746-S&T Solid Waste Landfill Permit Number SW07300014, SW07300015, SW07300045. The report includes groundwater and surface water analytical data, validation summary, groundwater flow rate and direction determination, figures depicting well locations, and methane monitoring results.

The statistical analyses on the third quarter 2016 monitoring well data collected from the C-746-S&T Landfills were performed in accordance with Condition GSTR0001, Standard Requirement 3, using the U.S. Environmental Protection Agency guidance document, *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Final Guidance* (1989). This report also serves as the statistical increase notification for the third quarter calendar year 2016, in accordance with Condition GSTR0003, Standard Requirement 8, of the C-746-S&T Solid Waste Landfill Permit Number SW07300014, SW07300015, SW07300045.

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

Sincerely,

Jennifer Woodard
Paducah Site Lead
Portsmouth/Paducah Project Office

Enclosure:
C-746-S&T Landfills 3rd Qtr CY 2016 Compliance Monitoring Report

e-copy w/enclosure:
april.webb@ky.gov, KDEP/Frankfort
brian.begley@ky.gov, KDEP/Frankfort
dave.dollins@lex.doe.gov, PPPO/PAD
ffscorrespondence@ffspaducah.com, FFS/Kevil
gaye.brewer@ky.gov, KDEP/PAD
jennifer.blewett@ffspaducah.com, FFS/Kevil
jennifer.watson@ffspaducah.com, FFS/Kevil
jennifer.woodard@lex.doe.gov, PPPO/PAD
joseph.towarnicky@ffspaducah.com, FFS/Kevil
karen.walker@ffspaducah.com, FFS/Kevil
ken.davis@ffspaducah.com, FFS/Kevil
kim.knerr@lex.doe.gov, PPPO/PAD
leo.williamson@ky.gov, KDEP/Frankfort
lisa.crabtree@ffspaducah.com, FFS/Kevil
mike.guffey@ky.gov, KDEP/Frankfort
myrna.redfield@ffspaducah.com, FFS/Kevil
pad.rmc@swiftstaley.com, SSI/Kevil
stephaniec.brock@ky.gov, KYRHB/Frankfort
tracey.duncan@lex.doe.gov, PPPO/PAD

C-746-S&T Landfills
Third Quarter Calendar Year 2016
(July–September)
Compliance Monitoring Report,
Paducah Gaseous Diffusion Plant,
Paducah, Kentucky

FLUOR®

This document is approved for public release per
review by:

James Sheppard   11-21-16

FPDP Classification Support   Date

C-746-S&T Landfills
Third Quarter Calendar Year 2016
(July–September)
Compliance Monitoring Report,
Paducah Gaseous Diffusion Plant,
Paducah, Kentucky

Date Issued—November 2016

U.S. DEPARTMENT OF ENERGY
Office of Environmental Management

Prepared by
FLUOR FEDERAL SERVICES, INC.,
Paducah Deactivation Project
managing the
Deactivation Project at the
Paducah Gaseous Diffusion Plant
under Task Order DE-DT0007774

CLEARED FOR PUBLIC RELEASE

THIS PAGE INTENTIONALLY LEFT BLANK

CONTENTS

THIS PAGE INTENTIONALLY LEFT BLANK

FIGURES

TABLES

THIS PAGE INTENTIONALLY LEFT BLANK

ACRONYMS

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

1. INTRODUCTION

This report, *C-746-S&T Landfills Third Quarter Calendar Year 2016 (July–September) 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), 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 § 4. Surface water results are provided in Appendix I.

1.1 BACKGROUND

The C-746-S&T Landfills are closed, solid waste landfills located north of the Paducah Gaseous Diffusion Plant (PGDP) 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 cover of compacted soil. The C-746-S Landfill was a sanitary landfill for PGDP. 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 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 PGDP. 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 sampled this quarter except MW389 (screened in the UCRS), which had an insufficient amount of water to obtain samples; therefore, there are no analytical results for this location.

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

Regional Groundwater Flow Direction

Cell 4 | Cell 5
Cell 3
Cell 2
Cell 1

C-746-U

MW374
MW372
MW373

MW393
MW391
MW392

MW371
MW369
MW370

MW390

MW389

MW387
MW388

MW222

MW224

MW386
MW384
MW385

MW221

MW223

MW396
MW394
MW395

C-746-T
C-746-S

MW220

MW397

UCRS wells

MW371, MW374
MW386, MW389
MW390, MW393
MW396

downgradient wells (sampled with C-746-U)

MW369, MW370
MW372, MW373

upgradient wells

MW220, MW394
MW395, MW396
MW397

sidegradient wells

MW221, MW222
MW223, MW224
MW384, MW385
MW386

downgradient wells

MW387, MW388
MW389, MW390
MW391, MW392
MW393

C-746-U
C-746-T
C-746-S

PGDP

MW374: UCRS well
MW372: URGA well
MW370: LRGA well

Note: UCRS well references to "gradient" means wells are located in the same general direction, relative to the landfill, as the RGA wells.

● Monitoring Wells

200 100 0 200 400 Feet

TRUE NORTH PLANT NORTH 20°

U.S. DEPARTMENT OF ENERGY
DOE PORTSMOUTH/PADUCAH PROJECT OFFICE
PADUCAH GASEOUS DIFFUSION PLANT

G:\GIS\ARCVIEWS\PROJECT\C746S\TC746U_GMW_Network_r2.mxd 20150807

FLUOR

Consistent with the approved 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 the UCRS water quality. Similarly, other gradient references for UCRS wells are identified using the RGA wells located in the same direction (relative to the landfill) as nearby UCRS wells. Results from UCRS wells are compared to this UTL, and exceedances of these values are reported in the quarterly report.

Groundwater sampling was conducted within the third quarter 2016 in accordance with the Groundwater Monitoring Plan (LATA Kentucky 2014) using Fluor Federal Services, Inc., 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 July 26 and 27, 2016, 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. Normal regional flow in the RGA is northeastward, toward the Ohio River. The hydraulic gradient for the RGA in the vicinity of the C-746-S&T Landfills in July was 3.88×10^{-4} ft/ft, while the gradient beneath the C-746-S&T Landfills was 2.61×10^{-4} ft/ft. Calculated groundwater flow rates (average linear velocities) for the RGA at the C-746-S&T Landfills range from 0.44 to 1.12 ft/day (see Table E.3).

1.2.2 Methane Monitoring

Methane monitoring was conducted in accordance with 401 *KAR* 48:090 § 4 and the approved Explosive Gas Monitoring Program (KEEC 2011), which is Technical Application, Attachment 12, of the Solid Waste Landfill Permit. Landfill operations staff monitored for the occurrence of methane in 1 on-site building location, 4 locations along the landfill boundary, and 27 gas-passive vents located in Cells 1, 2, and 3 of the C-746-S Landfill on September 20, 2016. See Appendix H for a map (Figure H.1) of the monitoring locations. Monitoring identified 0% of the lower explosive limit (LEL) of methane at all locations, which is compliant with the regulatory requirement of < 100% LEL at boundary locations and < 25% LEL at all other locations. The results are documented on the approved C-746-S&T Landfills Methane Log provided in Appendix H.

1.2.3 Surface Water Monitoring

Surface water was monitored, as specified in 401 *KAR* 48:300 § 2, and the approved *Surface Water Monitoring Plan for C-746-S and C-746-T Landfills Permit Numbers KY-073-00014 and KY-073-00015, Paducah Gaseous Diffusion Plant, Paducah, Kentucky* (PRS 2008), which is Technical Application Attachment 24, of the Solid Waste Landfill Permit. Sampling was performed at the three locations (see Figure 2) that are monitored for the C-746-S&T Landfills. The landfills have an upstream location, L135;
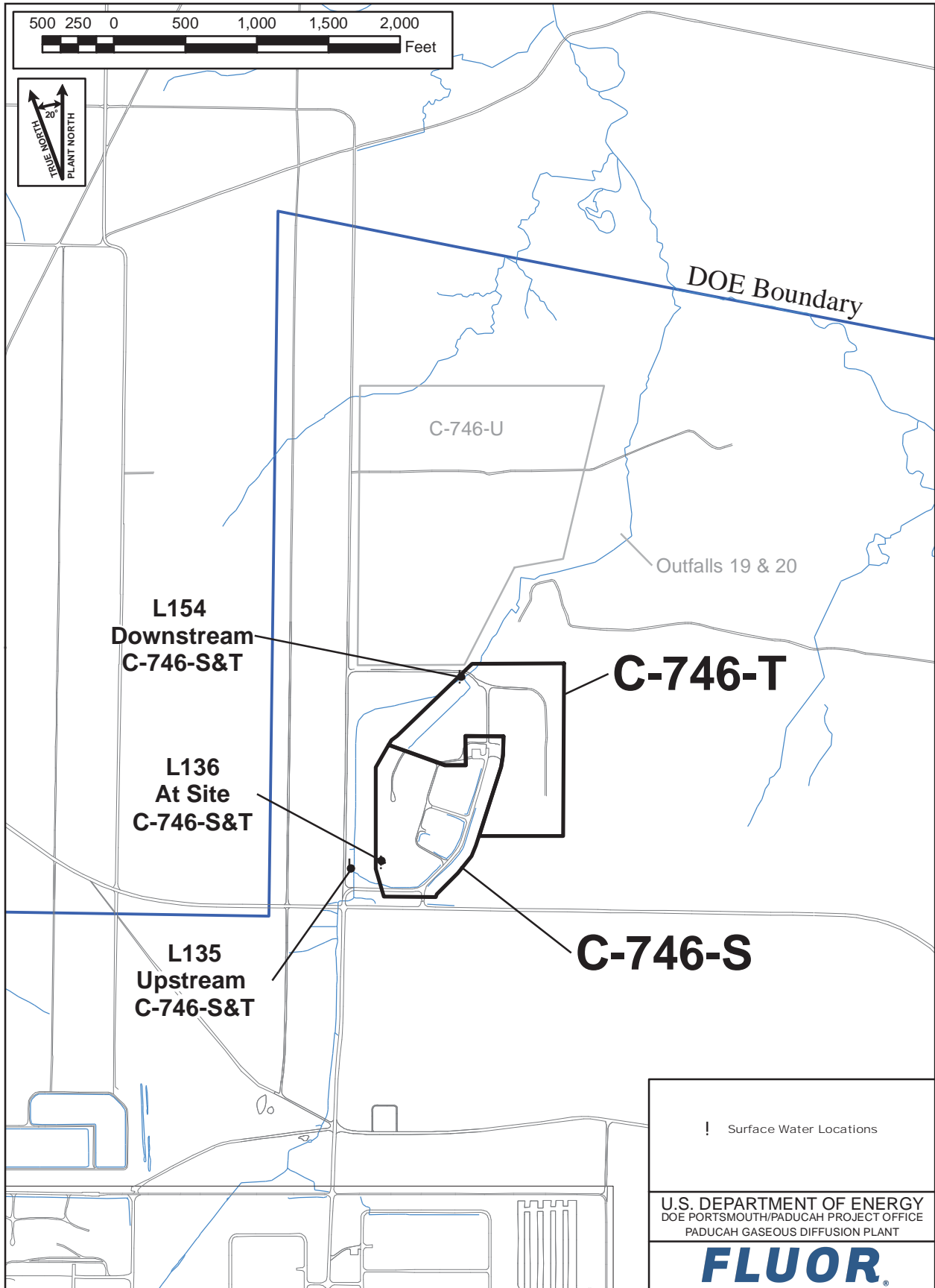
Figure 2. C-746-S&T Landfills Surface Water Monitoring Locations

a downstream location, L154; and a location capturing runoff from the landfill surface, L136. The parameters identified in the Solid Waste Landfill Permit were analyzed for the three locations sampled for report only format, pursuant to Permit Condition GMNP0003, Standard Requirement 1. Surface water results are provided in Appendix I.

1.3 KEY RESULTS

Groundwater data were evaluated in accordance 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*, (LATA Kentucky 2014) which is Technical Application, Attachment 25, of the Solid Waste Landfill permit. Parameters that had concentrations that exceeded the 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 (without MCLs) with concentrations that exceeded the statistically derived historical background UTL during the third quarter 2016, 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).

Table 1. Summary of MCL Exceedances

UCRS	URGA	LRGA
None	MW372: Trichloroethene	MW370: Beta activity
	MW384: Beta activity	MW373:Trichloroethene
	MW387: Beta activity	MW385: Beta activity
	MW391: Trichloroethene	MW388: Beta activity
	MW394: Trichloroethene	MW392: Trichloroethene

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 MW372, 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 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 because the source(s) of these exceedances is not determined. 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. MW387 had no increasing Mann-Kendall trend, and is considered to be Type 1 exceedances (not attributable to the landfill). MW370 and MW388 had increasing trends that are discussed in detail later in this section.

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 8, and 401 *KAR* 48:300 § 7.

Table 2. Exceedances of Statistically Derived Historical Background Concentrations

UCRS*	URGA	LRGA
MW386: Oxidation-reduction potential	**MW220:** Oxidation-reduction potential, sulfate	**MW370:** Beta activity,[a] oxidation-reduction potential, radium-226, sulfate, technetium-99
MW390: Chemical oxygen demand, oxidation-reduction potential, technetium-99	**MW221:** Oxidation-reduction potential	**MW373:** Calcium, conductivity, dissolved solids, magnesium, oxidation-reduction potential, sulfate total organic carbon
MW393: Oxidation-reduction potential	**MW222:** Oxidation-reduction potential	**MW385:** Beta activity,[a] oxidation-reduction potential, sulfate, technetium-99
MW396: Oxidation-reduction potential	**MW223:** Oxidation-reduction potential, sulfate	**MW388:** Beta activity,[a] oxidation-reduction potential, sulfate, technetium-99
	MW224: Oxidation-reduction potential	**MW392:** Oxidation-reduction potential
	MW369: Chemical oxygen demand, sodium	**MW395:** Oxidation-reduction potential
	MW372: Calcium, conductivity, dissolved solids, magnesium, sulfate, technetium-99	**MW397:** Oxidation-reduction potential, sodium
	MW384: Beta activity,[a] oxidation-reduction potential, sulfate, technetium-99	
	MW387: Beta activity,[a] oxidation-reduction potential, sulfate, technetium-99	
	MW391: Oxidation-reduction potential, sulfate	

*Gradients in the UCRS are downward. UCRS gradient designations refer to locations of wells in the same direction, relative to the landfill as the 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,[b] MW397

[a] Beta activity has an MCL; the exceedances of the MCL were subjected to a comparison against the statistically derived historical background.

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

Table 3. Exceedances of Current Background UTL in Downgradient Wells

URGA	LRGA
MW369: Sodium	**MW370:** Beta activity, sulfate, technetium-99
MW372: Calcium, conductivity, magnesium, sulfate	**MW373:** Calcium, conductivity, dissolved solids, magnesium, sulfate, total organic carbon
MW387: Beta activity, sulfate, technetium-99	**MW388:** Beta activity, sulfate, technetium-99
MW391: Sulfate	

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

Location	Well ID	Parameter	Sample Size	Alpha[1]	p-Value[2]	S[3]	Var(S)[4]	Sen's Slope[5]	Kendall Correlation[6]	Decision[7]
C-746-S and T Landfills Downgradient Wells	MW369	Sodium	8	0.05	0.089	12.00	0.000	1.275	0.429	No Trend
	MW370	Beta Activity	8	0.05	0.006	21.00	64.333	6.367	0.764	**Positive Trend**
		Sulfate	8	0.05	0.500	-1.000	64.33	-0.008	-0.036	No Trend
		Technetium-99	8	0.05	0.016	18.00	0.000	11.075	0.643	**Positive Trend**
	MW372	Calcium	8	0.05	0.452	-2.000	0.000	-0.508	-0.071	No Trend
		Conductivity	8	0.05	0.016	-18.00	0.000	-12.00	-0.643	**Negative Trend**
		Magnesium	8	0.05	0.274	-6.000	0.000	-0.450	-0.214	No Trend
		Sulfate	8	0.05	0.067	-13.00	64.33	-2.643	-0.473	No Trend
	MW373	Calcium	8	0.05	0.007	-20.00	0.000	-1.767	-0.714	**Negative Trend**
		Conductivity	8	0.05	0.003	-22.00	0.000	-34.50	-0.786	**Negative Trend**
		Dissolved Solids	8	0.05	0.089	-12.00	0.000	-18.119	-0.429	No Trend
		Magnesium	8	0.05	0.007	-20.00	0.000	-0.943	-0.714	**Negative Trend**
		Sulfate	8	0.05	0.001	-24.00	0.000	-10.733	-0.857	**Negative Trend**
		Total Organic Carbon	8	0.05	0.199	8.000	0.000	0.097	0.286	No Trend
	MW387	Beta Activity	8	0.05	0.452	-2.000	0.000	-1.417	-0.071	No Trend
		Sulfate	8	0.05	0.138	-10.00	0.000	-1.247	-0.357	No Trend
		Technetium-99	8	0.05	0.452	-2.000	0.000	-3.514	-0.071	No Trend
	MW388	Beta Activity	8	0.05	0.031	16.00	0.000	8.033	0.571	**Positive Trend**
		Sulfate	8	0.05	0.159	-9.000	64.33	-0.238	-0.327	No Trend
		Technetium-99	8	0.05	0.003	22.00	0.000	17.214	0.786	**Positive Trend**
	MW391	Sulfate	8	0.05	0.016	18.00	0.000	6.908	0.643	**Positive 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] VAR(S) represents the varience of S in the sample set and takes into account statistical ties.

[5] The magnitude of trend is predicted by the Sen's Slope. Here, the slope is described as the median of all $(x_j-x_k)/(j-k)$, where x is a data point and j and k are values of time.

[6] Kendall's correlation is described as the difference of concordant pairs and discordant pairs, also taking sample size and statistical ties into account. When the Kendall's correlation is postive, it indicates an increasing trend and when it is negative, it indicates a decreasing trend.

[7] The Mann-Kendall decision operates on two hypothesis, the H_0 and H_a. H_0 assumes there is no trend in the data, whereas H_a assumes either a positve or negative trend. Two different tests were ran to test for positive or negative trends. This table reports the test with the lowest p-value.

Note: Statistics generated using XLSTAT Version 2016

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, 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.

Those constituents listed in Table 3 that exceed both the historical UTL and the current UTL do not have an identified source and preliminarily are considered 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 but five of these preliminary Type 2 exceedances in downgradient wells did not have an increasing trend and are considered to be Type 1 exceedances (not attributable to the landfill).

The Mann-Kendall statistical test indicates that there is an increasing trend of beta activity and technetium-99 in MW370 and MW388 over the past eight quarters. In accordance with the Groundwater Monitoring Plan, this is considered a Type 2 exceedance (source unknown). The source of the trend is believed to be unrelated to the C-746-S&T Landfills for the following reasons:

- There is a known upgradient regional source of beta activity and technetium-99 associated with the technetium-99 Northwest Plume (refer to Figure 10 in the Groundwater Monitoring Plan that shows portions of the 2009 technetium-99 Plume map);

- Although the deeper (LRGA) MW370 shows increasing trends, the shallower, collocated (URGA) well, MW369, does not exceed statistically derived historical background concentrations for beta activity and technetium-99;

- Although the deeper (LRGA) MW388 shows increasing trends, the shallower, collocated (URGA) well, MW387, does not show the increasing Mann-Kendall trends for beta activity and technetium-99 (refer to Table 4);

- The recent beta activity in MW370 and MW388 is within the range of historical levels (7.19–184 pCi/L) of beta activity since 2002; and

- The recent technetium-99 in MW370 and MW388 is within the range of historical levels (0.493–228 pCi/L) of technetium-99 since 2002.

The Mann-Kendall statistical test indicates that there is an increasing trend of sulfate in MW391 over the past eight quarters. In accordance with the Groundwater Monitoring Plan, this is considered a Type 2 exceedance (source unknown). The source of the trend is believed to be unrelated to the C-746-S&T Landfills because the adjacent URGA well, MW372, does not show the increasing Mann-Kendall trends (refer to Table 4). In addition, the source of sulfate in this well may be associated with non-landfill alternative sources (e.g., in-well biofouling) that simultaneously could increase sulfate, dissolved solids, specific conductivity, calcium, and magnesium—all of which have similar concentration fluctuations over the past eight quarters.

In accordance with Permit Condition GSTR0003, Variance 2, of the Solid Waste 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 downgradient wells against the current UCRS background UTL identified a UCRS well with chemical oxygen demand and technetium-99 values that exceed both the historical and current backgrounds. Because this well is 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 Type 1 exceedances (Table 5).

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

UCRS
MW390: Chemical oxygen demand, technetium-99

All MCL and UTL exceedances, except for the listed parameters—beta activity in MW370 and MW388; technetium-99 in MW370 and MW388; and sulfate in MW391, reported for this quarter were evaluated and considered to be Type 1 exceedances—not attributable to the C-746-S&T Landfills. The increasing trends for these listed parameters do not appear to be landfill-related, given the data collected to date. The listed parameters will continue to be evaluated in the context of these observations.

THIS PAGE INTENTIONALLY LEFT BLANK

2. DATA EVALUATION/STATISTICAL SYNOPSIS

The statistical analyses conducted on the third quarter 2016 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 respective Kentucky solid waste facility MCL 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.

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 was conducted. The test well results were compared to both the upper and lower tolerance limit 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.
**In the same direction (relative to the landfill) as RGA wells considered to be upgradient.
***MW389 had insufficient water to permit a water sample for laboratory analysis.

2.1 STATISTICAL ANALYSIS OF GROUNDWATER DATA

Parameters requiring statistical analysis are summarized in Appendix D for each 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, 26 parameters, including those with MCLs, required statistical analysis in the UCRS. During the third quarter, chemical oxygen demand, oxidation-reduction potential, and technetium-99 displayed concentrations that exceeded their respective historical UTLs and are listed in Table 2. Chemical oxygen demand and technetium-99 exceeded the current background UTL and are included in Table 5.

2.1.2 Upper Regional Gravel Aquifer

In this quarter, 29 parameters, including those with MCLs, required statistical analysis in the URGA. During the third quarter, beta activity, calcium, chemical oxygen demand, conductivity, 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, conductivity, magnesium, 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, 28 parameters, including those with MCLs, required statistical analysis in the LRGA. During the third quarter, beta activity, calcium, conductivity, dissolved solids, magnesium, oxidation-reduction potential, radium-226, sodium, sulfate, technetium-99, and total organic carbon displayed concentrations that exceeded their respective historical UTL and are listed in Table 2. Beta activity, calcium, conductivity, dissolved solids, magnesium, sulfate, technetium-99, and total organic carbon 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. A result has been considered a nondetect, if it has a "U" validation code.

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 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*
Third Quarter Calendar Year 2016 (July–September)
Compliance Monitoring Report,
Paducah Gaseous Diffusion Plant,
Paducah, Kentucky (FPDP-RPT-0026/V3)

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

PG113927
K.R. Davis
11-21-16

_____   _____   _____
Kenneth R. Davis   PG113927   Date

THIS PAGE INTENTIONALLY LEFT BLANK

4. REFERENCES

KEEC (Kentucky Energy and Environment Cabinet) 2011. Solid Waste Landfill Permit, Number SW07300014, SW07300015, SW07300045, Division of Waste Management, Solid Waste Branch, Technical Application Attachment 12, "Explosive Gas Monitoring Program," January 21.

LATA Kentucky (LATA Environmental Services of Kentucky, LLC) 2014. *Groundwater Monitoring Plan for the Solid Waste Permitted Landfills (C-746-S Residential Landfill, C-746-T Inert Landfill, and C-746-U Contained Landfill) at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, PAD-PROJ-0139, 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 KY-073-00015, Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, 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**

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

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

Facility Name: U.S. DOE–Paducah Gaseous Diffusion Plant   Activity: C-746-S&T Landfills

(As officially shown on DWM Permit Face)

Permit No: SW07300014,   Finds/Unit No: Quarter & Year   3rd Qtr. CY 2016
SW07300015,
SW07300045
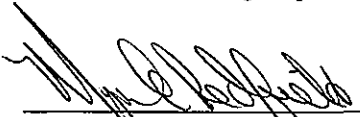
Please check the following as applicable:

_____ Characterization   __X__ Quarterly   _____ Semiannual   _____ Annual   _____ Assessment

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

_____ Leachate   __X__ Methane Monitoring

This form is to be utilized by those sites required by regulation (Kentucky Waste Management Regulations-401 *KAR* 48:300 and 45:160) or by statute (Kentucky Revised Statues Chapter 224) to conduct groundwater and surface water monitoring under the jurisdiction of the Division of Waste Management. **You must report any indication of contamination within forty-eight (48) hours of making the determination using statistical analyses, direct comparison, or other similar techniques. Submitting the lab report is NOT considered notification.** Instructions for completing the form are attached. Do not submit the instruction pages.
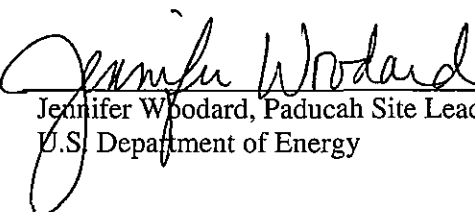
I certify under penalty of law that the document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for such violations.

_____   _____
Myrna E. Redfield, Director   Date
Environmental Management
Fluor Federal Services, Inc.

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

A-3

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX B

FACILITY INFORMATION SHEET

THIS PAGE INTENTIONALLY LEFT BLANK

FACILITY INFORMATION SHEET

Sampling Date:	Groundwater: July 2016 Surface Water: July/August 2016 Methane: September 2016	County: McCracken	Permit Nos.	SW07300014, SW07300015, SW07300045

Facility Name: U.S. DOE—Paducah Gaseous Diffusion Plant

<div align="center">(As officially shown on DWM Permit Face)</div>

Site Address: 5501 Hobbs Road   Kevil, Kentucky   42053

<div align="center">Street   City/State   Zip</div>

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: Myrna E. Redfield   Phone No: (270) 441-5113

Contact Person Title: Director, Environmental Management, Fluor Federal Services, Inc.

Mailing Address: 5511 Hobbs Road   Kevil, Kentucky   42053

<div align="center">Street   City/State   Zip</div>

SAMPLING PERSONNEL
(IF OTHER THAN LANDFILL OR LABORATORY)

Company: GEO Consultants, LLC

Contact Person: Sam Martin   Phone No: (270) 441-6755

Mailing Address: 199 Kentucky Avenue   Kevil, Kentucky   42053

<div align="center">Street   City/State   Zip</div>

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

<div align="center">Street   City/State   Zip</div>

LABORATORY RECORD #2

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

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

Mailing Address: N/A

<div align="center">Street   City/State   Zip</div>

LABORATORY RECORD #3

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

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

Mailing Address: N/A

<div align="center">Street   City/State   Zip</div>

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: 073-00014 & 073-00015 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)					7/19/2016 12:35		7/20/2016 07:44		7/20/2016 09:22		7/20/2016 08:38	
Duplicate ("Y" or "N")[2]					N		N		N		N	
Split ("Y" or "N")[3]					N		N		N		N	
Facility Sample ID Number (if applicable)					MW220SG4-16		MW221SG4-16		MW222SG4-16		MW223SG4-16	
Laboratory Sample ID Number (if applicable)					401986003		402053001		402053005		402053007	
Date of Analysis (Month/Day/Year) For Volatile Organics Analysis					7/25/2016		7/26/2016		7/26/2016		7/26/2016	
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]	FLAGS[7]	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
24959-67-9	Bromide	T	mg/L	9056	0.229		0.453		0.442		0.418	
16887-00-6	Chloride(s)	T	mg/L	9056	21.7		32.9		32.9		31.2	
16984-48-8	Fluoride	T	mg/L	9056	0.25		0.164		0.195		0.171	
S0595- -	Nitrate & Nitrite	T	mg/L	9056	1.02		1.03		0.934		0.989	
14808-79-8	Sulfate	T	mg/L	9056	17.9		14		11.9		18	
NS1894	Barometric Pressure Reading	T	Inches/Hg	Field	30.22		30.2		30.21		30.2	
S0145- -	Specific Conductance	T	μMHO/cm	Field	346		394		365		396	

[1]AKGWA # is 0000-0000 for any type of blank.
[2]Respond "Y" if the sample was a duplicate of another sample in this report.
[3]Respond "Y" if the sample was split and analyzed by separate laboratories.
[4]Chemical 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.
[7]Flags are as designated, do not use any other type. Use "*," then describe on "Written Comments Page."

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

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

Permit Number: 073-00014 & 073-00015   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	327.6		327.44		327.46		327.41	
N238		Dissolved Oxygen	T	mg/L	Field	6.33		4.68		3.79		4.09	
S0266- -		Total Dissolved Solids	T	mg/L	160.1	200		187		200		199	
S0296- -		pH	T	Units	Field	6.68		6.5		6.41		6.3	
NS215		Eh	T	mV	Field	425		410		426		428	
S0907 - -		Temperature	T	°C	Field	19.78		18.89		18.39		18.39	
7429-90-5		Aluminum	T	mg/L	6020	<0.05		<0.05		0.023	J	<0.05	
7440-36-0		Antimony	T	mg/L	6020	<0.003		<0.003		<0.003		<0.003	
7440-38-2		Arsenic	T	mg/L	6020	<0.005		0.00228	BJ	0.0019	BJ	0.00196	BJ
7440-39-3		Barium	T	mg/L	6020	0.195		0.21		0.29		0.246	
7440-41-7		Beryllium	T	mg/L	6020	<0.0005		<0.0005		<0.0005		<0.0005	
7440-42-8		Boron	T	mg/L	6020	0.00961	BJ	0.0122	J	0.00911	J	0.00834	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	19.5		22.3	B	20.1	B	21.7	B
7440-47-3		Chromium	T	mg/L	6020	0.00413	J	0.00324	J	0.00432	J	0.0514	
7440-48-4		Cobalt	T	mg/L	6020	0.000118	J	0.00025	J	0.000427	J	0.000448	J
7440-50-8		Copper	T	mg/L	6020	0.000732	J	0.000855	J	0.000801	J	0.0011	
7439-89-6		Iron	T	mg/L	6020	<0.1		0.0539	J	0.0771	J	0.0471	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	7.99		8.68		8.13		8.77	
7439-96-5		Manganese	T	mg/L	6020	<0.005		<0.005		0.00842		0.00252	J
7439-97-6		Mercury	T	mg/L	7470	<0.0002		<0.0002		<0.0002		<0.0002	

C-4

Facility: US DOE – Paducah Gaseous Diffusion Plant   FINDS/UNIT: KY8-890-008-982 / 1
Permit Number: 073-00014 & 073-00015   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	0.000981	B	0.00244		0.000254	J	0.0094	
7440-02-0	Nickel	T	mg/L	6020	0.0316		0.0141		0.0731		0.275	
7440-09-7	Potassium	T	mg/L	6020	2.69		1.18		0.881		2.99	
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	39.8		43.2		41.4		43.9	
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	<0.01		<0.01		<0.01		<0.01	
7440-66-6	Zinc	T	mg/L	6020	<0.01		<0.01		<0.01		<0.01	
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	

Facility: US DOE - Paducah Gaseous Diffusion Plant   FINDS/UNIT: _KY8-890-008-982_ / _1_

Permit Number: 073-00014 & 073-00015

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	<0.001		<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	0.00078	J	<0.001		<0.001		<0.001	

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

Permit Number: 073-00014 & 073-00015 LAB ID: None

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

C-7

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	<0.005		<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	<0.0000201		<0.0000201		<0.00002		<0.0000198	
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		*		*		*		*

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

Permit Number: 073-00014 & 073-00015 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]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
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	0.795	*	0.675	*	1.61	*	-1.61	*
12587-47-2	Gross Beta	T	pCi/L	9310	6.61	*	7.55	*	4.52	*	3.72	*
10043-66-0	Iodine-131	T	pCi/L			*		*		*		*
13982-63-3	Radium-226	T	pCi/L	HASL 300	0.375	*	0.246	*	0.297	*	0.433	*
10098-97-2	Strontium-90	T	pCi/L	905.0	2.72	*	-3.82	*	1.03	*	-1.21	*
14133-76-7	Technetium-99	T	pCi/L	Tc-02-RC	28.9	*	14.3	*	5.82	*	5.76	*
14269-63-7	Thorium-230	T	pCi/L	Th-01-RC	0.174	*	-0.0168	*	0.0915	*	0.315	*
10028-17-8	Tritium	T	pCi/L	906.0	79.8	*	-183	*	-71.8	*	-180	*
S0130- -	Chemical Oxygen Demand	T	mg/L	410.4	33.1	B	18.1	BJ	33.1	B	25.6	B
57-12-5	Cyanide	T	mg/L	9012	<0.2		<0.2		<0.2		<0.2	
20461-54-5	Iodide	T	mg/L	300.0	<0.5	*	<0.5		<0.5		<0.5	
S0268- -	Total Organic Carbon	T	mg/L	9060	0.9	J	0.746	J	0.759	J	0.851	J
S0586- -	Total Organic Halides	T	mg/L	9020	0.0041	J	0.00442	J	0.00362	J	0.00824	J

C-8

Division of Waste Management **RESIDENTIAL/INERT-QUARTERLY**

Solid Waste Branch **Facility: US DOE - Paducah Gaseous Diffusion Plant**

14 Reilly Road **Permit Number:** 073-00014 & 073-00015 FINDS/UNIT: <u>KY8-890-008-982</u> / <u>1</u>

Frankfort, KY 40601 (502)564-6716 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)					7/20/2016 10:09		7/14/2016 10:06		7/18/2016 12:42		7/18/2016 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)					MW224SG4-16		MW369UG4-16		MW370UG4-16		MW372UG4-16	
Laboratory Sample ID Number (if applicable)					402053011		401712019		401905003		401905007	
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis					7/26/2016		7/19/2016		7/21/2016		7/21/2016	
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]	FLAGS[7]	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
24959-67-9	Bromide	T	mg/L	9056	0.49		0.406		0.4		0.623	
16887-00-6	Chloride(s)	T	mg/L	9056	36.1		35.4		36		46.5	
16984-48-8	Fluoride	T	mg/L	9056	0.202		0.168		0.131		0.141	
S0595- -	Nitrate & Nitrite	T	mg/L	9056	0.952		0.318		1.1		0.0776	J
14808-79-8	Sulfate	T	mg/L	9056	15		5.64		19.9		102	
NS1894	Barometric Pressure Reading	T	Inches/Hg	Field	30.21		29.97		30.21		30.2	
S0145- -	Specific Conductance	T	μMHO/cm	Field	443		391		423		694	

[1]AKGWA # is 0000-0000 for any type of blank.
[2]Respond "Y" if the sample was a duplicate of another sample in this report.
[3]Respond "Y" if the sample was split and analyzed by separate laboratories.
[4]Chemical 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.
[7]Flags are as designated, <u>do not</u> 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

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

Permit Number: 073-00014 & 073-00015   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	327.46		327.22		326.9		326.9	
N238		Dissolved Oxygen	T	mg/L	Field	3.61		2.4		3.48		1.13	
S0266- -		Total Dissolved Solids	T	mg/L	160.1	234		213		217	B	381	B
S0296- -		pH	T	Units	Field	6.38		6.42		5.8		6.64	
NS215		Eh	T	mV	Field	427		323		483		248	
S0907 - -		Temperature	T	°C	Field	18.78		19.94		22.83		21.61	
7429-90-5		Aluminum	T	mg/L	6020	<0.05		0.054		<0.05		0.112	
7440-36-0		Antimony	T	mg/L	6020	<0.003		<0.003		<0.003		<0.003	
7440-38-2		Arsenic	T	mg/L	6020	0.00181	BJ	<0.005		0.00218	BJ	0.00238	BJ
7440-39-3		Barium	T	mg/L	6020	0.215		0.386		0.213		0.0498	
7440-41-7		Beryllium	T	mg/L	6020	<0.0005		<0.0005		<0.0005		<0.0005	
7440-42-8		Boron	T	mg/L	6020	0.0182		0.115		0.0311		1.08	
7440-43-9		Cadmium	T	mg/L	6020	<0.001		<0.001		<0.001		<0.001	
7440-70-2		Calcium	T	mg/L	6020	24	B	16.9		26.7		51.6	
7440-47-3		Chromium	T	mg/L	6020	<0.01		<0.01		<0.01		0.00261	J
7440-48-4		Cobalt	T	mg/L	6020	0.000288	J	0.0064		0.000578	J	0.000515	J
7440-50-8		Copper	T	mg/L	6020	0.000592	J	0.00178		0.000438	J	<0.001	
7439-89-6		Iron	T	mg/L	6020	0.0621	J	0.213		0.0808	J	2.14	
7439-92-1		Lead	T	mg/L	6020	<0.002		<0.002		<0.002		<0.002	
7439-95-4		Magnesium	T	mg/L	6020	9.79		7.18		11.8		20.9	
7439-96-5		Manganese	T	mg/L	6020	0.00606		0.0321		0.00668		0.0287	
7439-97-6		Mercury	T	mg/L	7470	<0.0002		<0.0002		<0.0002		<0.0002	

C-10

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

Permit Number: 073-00014 & 073-00015 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	0.000622		0.000168	BJ	<0.0005		0.000373	J
7440-02-0		Nickel	T	mg/L	6020	0.0044		0.00887		0.000765	J	0.00124	J
7440-09-7		Potassium	T	mg/L	6020	0.927		0.468		2.39		2.38	
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	51.9		58.9		41.8		48.5	
7440-25-7		Tantalum	T	mg/L	6020	<0.005		<0.005		<0.005	*	<0.005	*
7440-28-0		Thallium	T	mg/L	6020	<0.002		<0.002		<0.002	*	<0.002	*
7440-61-1		Uranium	T	mg/L	6020	<0.0002		<0.0002		<0.0002		<0.0002	
7440-62-2		Vanadium	T	mg/L	6020	<0.01		<0.01		<0.01		<0.01	
7440-66-6		Zinc	T	mg/L	6020	<0.01		0.00377	J	<0.01		0.00589	J
108-05-4		Vinyl acetate	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
67-64-1		Acetone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
107-02-8		Acrolein	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
107-13-1		Acrylonitrile	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
71-43-2		Benzene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
108-90-7		Chlorobenzene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
1330-20-7		Xylenes	T	mg/L	8260	<0.003		<0.003		<0.003		<0.003	
100-42-5		Styrene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
108-88-3		Toluene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
74-97-5		Chlorobromomethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	

C-11

Facility: US DOE – Paducah Gaseous Diffusion Plant   FINDS/UNIT: _KY8-890-008-982_ / _1_

Permit Number: 073-00014 & 073-00015   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]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
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		0.00041	J	0.00251		0.0108	

C-12

RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Number: 073-00014 & 073-00015

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, etc.)					224		369		370		372	
CAS RN[4]		CONSTITUENT	T D [5]	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
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	<0.0000198		<0.0000189		<0.0000199		<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		*	0.0579	J	<0.0952		<0.0952	
12674-11-2		PCB-1016	T	ug/L	8082		*	<0.0952		<0.0952		<0.0952	
11104-28-2		PCB-1221	T	ug/L	8082		*	<0.0952		<0.0952		<0.0952	
11141-16-5		PCB-1232	T	ug/L	8082		*	<0.0952		<0.0952		<0.0952	
53469-21-9		PCB-1242	T	ug/L	8082		*	0.0579	J	<0.0952		<0.0952	
12672-29-6		PCB-1248	T	ug/L	8082		*	<0.0952		<0.0952		<0.0952	

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

Permit Number: 073-00014 & 073-00015   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]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
11097-69-1	PCB-1254	T	ug/L	8082		*	<0.0952		<0.0952		<0.0952	
11096-82-5	PCB-1260	T	ug/L	8082		*	<0.0952		<0.0952		<0.0952	
11100-14-4	PCB-1268	T	ug/L	8082		*	<0.0952		<0.0952		<0.0952	
12587-46-1	Gross Alpha	T	pCi/L	9310	-0.244	*	-0.441	*	-0.661	*	0.179	*
12587-47-2	Gross Beta	T	pCi/L	9310	1.17	*	22.3	*	58	*	21.5	*
10043-66-0	Iodine-131	T	pCi/L			*		*		*		*
13982-63-3	Radium-226	T	pCi/L	HASL 300	0.632	*	0.499	*	0.887	*	0.108	*
10098-97-2	Strontium-90	T	pCi/L	905.0	-2.49	*	-1.25	*	2.26	*	0.184	*
14133-76-7	Technetium-99	T	pCi/L	Tc-02-RC	9.05	*	10.7	*	93.2	*	35.4	*
14269-63-7	Thorium-230	T	pCi/L	Th-01-RC	0.434	*	0.151	*	-0.124	*	-0.025	*
10028-17-8	Tritium	T	pCi/L	906.0	1.9	*	-37.9	*	18.7	*	70	*
S0130- -	Chemical Oxygen Demand	T	mg/L	410.4	<20		37.1		50.9	B	75.9	B
57-12-5	Cyanide	T	mg/L	9012	<0.2		<0.2		<0.2		<0.2	
20461-54-5	Iodide	T	mg/L	300.0	<0.5		<0.5	*	<0.5	*	<0.5	*
S0268- -	Total Organic Carbon	T	mg/L	9060	0.846	J	1.47	J	1.16	J	3.13	
S0586- -	Total Organic Halides	T	mg/L	9020	0.00484	J	0.0301		0.00612	J	0.0114	

C-14

Division of Waste Management **RESIDENTIAL/INERT-QUARTERLY**
Solid Waste Branch **Facility: US DOE - Paducah Gaseous Diffusion Plant**
14 Reilly Road **Permit Number:** 073-00014 & 073-00015   FINDS/UNIT: <u>KY8-890-008-982</u> / <u>1</u>
Frankfort, KY 40601 (502)564-6716   LAB ID: None
For Official Use Only

GROUNDWATER SAMPLE ANALYSIS(s)

C-15

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)					7/18/2016 09:57		7/19/2016 09:39		7/19/2016 11:47		7/19/2016 10:15	
Duplicate ("Y" or "N")[2]					N		N		N		N	
Split ("Y" or "N")[3]					N		N		N		N	
Facility Sample ID Number (if applicable)					MW373UG4-16		MW384SG4-16		MW385SG4-16		MW386SG4-16	
Laboratory Sample ID Number (if applicable)					401905009		401986005		401986007		401986009	
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis					7/21/2016		7/25/2016		7/25/2016		7/25/2016	
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]	FLAGS[7]	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
24959-67-9	Bromide	T	mg/L	9056	0.607		0.358		0.259		0.173	J
16887-00-6	Chloride(s)	T	mg/L	9056	48.5		37.4		30.6		16.4	
16984-48-8	Fluoride	T	mg/L	9056	0.157		0.328		0.163		0.583	
S0595- -	Nitrate & Nitrite	T	mg/L	9056	1.13		1.21		1		0.0561	J
14808-79-8	Sulfate	T	mg/L	9056	113		21.3		21.4		45.5	
NS1894	Barometric Pressure Reading	T	Inches/Hg	Field	30.21		30.23		30.22		30.24	
S0145- -	Specific Conductance	T	μMHO/cm	Field	703		457		439		606	

[1]AKGWA # is 0000-0000 for any type of blank.
[2]Respond "Y" if the sample was a duplicate of another sample in this report.
[3]Respond "Y" if the sample was split and analyzed by separate laboratories.
[4]Chemical 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.
[7]Flags are as designated, <u>do not</u> 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

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

Permit Number: 073-00014 & 073-00015   LAB ID: <u>None</u>

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	326.91		327.02		327		345.26	
N238		Dissolved Oxygen	T	mg/L	Field	2.39		5.17		2.21		1.66	
S0266– –		Total Dissolved Solids	T	mg/L	160.1	399	B	259		239		373	
S0296– –		pH	T	Units	Field	6.5		6.32		6.41		6.78	
NS215		Eh	T	mV	Field	337		436		382		366	
S0907 – –		Temperature	T	°C	Field	20.5		18.72		21		20	
7429-90-5		Aluminum	T	mg/L	6020	<0.05		0.143		<0.05		<0.05	
7440-36-0		Antimony	T	mg/L	6020	<0.003		<0.003		<0.003		<0.003	
7440-38-2		Arsenic	T	mg/L	6020	<0.005		<0.005		<0.005		0.00171	BJ
7440-39-3		Barium	T	mg/L	6020	0.0307		0.121		0.236		0.154	
7440-41-7		Beryllium	T	mg/L	6020	<0.0005		<0.0005		<0.0005		<0.0005	
7440-42-8		Boron	T	mg/L	6020	1.34		0.0133	BJ	0.0163	B	0.00607	BJ
7440-43-9		Cadmium	T	mg/L	6020	<0.001		<0.001		<0.001		<0.001	
7440-70-2		Calcium	T	mg/L	6020	57.2		25.4		29.5		21.4	
7440-47-3		Chromium	T	mg/L	6020	<0.01		0.00344	J	<0.01		<0.01	
7440-48-4		Cobalt	T	mg/L	6020	<0.001		<0.001		<0.001		0.000182	J
7440-50-8		Copper	T	mg/L	6020	<0.001		0.00221		0.000522	J	0.00083	J
7439-89-6		Iron	T	mg/L	6020	<0.1		<0.1		<0.1		0.0437	J
7439-92-1		Lead	T	mg/L	6020	<0.002		0.000523	J	<0.002		<0.002	
7439-95-4		Magnesium	T	mg/L	6020	21.2		9.92		10.9		9.1	
7439-96-5		Manganese	T	mg/L	6020	<0.005		0.00694		0.00175	J	0.0289	
7439-97-6		Mercury	T	mg/L	7470	<0.0002		<0.0002		<0.0002		<0.0002	

Facility: US DOE – Paducah Gaseous Diffusion Plant FINDS/UNIT: _KY8-890-008-982_ / _1_
Permit Number: 073-00014 & 073-00015 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	<0.0005		<0.0005		0.000371	BJ	0.000586	B
7440-02-0	Nickel	T	mg/L	6020	0.00057	J	<0.002		0.000842	J	0.00075	J
7440-09-7	Potassium	T	mg/L	6020	2.52		1.05		1.78		0.326	
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		0.00274	J	<0.005		<0.005	
7440-22-4	Silver	T	mg/L	6020	<0.001		<0.001		<0.001		<0.001	
7440-23-5	Sodium	T	mg/L	6020	49.4		56.3		39.7		97.1	
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	<0.01		<0.01		<0.01		<0.01	
7440-66-6	Zinc	T	mg/L	6020	<0.01		<0.01		0.00356	J	<0.01	
108-05-4	Vinyl acetate	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
67-64-1	Acetone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
107-02-8	Acrolein	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
107-13-1	Acrylonitrile	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
71-43-2	Benzene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
108-90-7	Chlorobenzene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
1330-20-7	Xylenes	T	mg/L	8260	<0.003		<0.003		<0.003		<0.003	
100-42-5	Styrene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
108-88-3	Toluene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
74-97-5	Chlorobromomethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	

C-17

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

Permit Number: 073-00014 & 073-00015   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]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
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	0.00787		0.00033	J	0.00053	J	<0.001	

C-18

Facility: US DOE - Paducah Gaseous Diffusion Plant FINDS/UNIT: KY8-890-008-982 / 1
Permit Number: 073-00014 & 073-00015

LAB ID: None
For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

C-19

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]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
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	<0.0000199		<0.0000198		<0.0000195		<0.0000195	
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	<0.0962			*		*		*
12674-11-2		PCB-1016	T	ug/L	8082	<0.0962			*		*		*
11104-28-2		PCB-1221	T	ug/L	8082	<0.0962			*		*		*
11141-16-5		PCB-1232	T	ug/L	8082	<0.0962			*		*		*
53469-21-9		PCB-1242	T	ug/L	8082	<0.0962			*		*		*
12672-29-6		PCB-1248	T	ug/L	8082	<0.0962			*		*		*

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

Permit Number: 073-00014 & 073-00015

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]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
11097-69-1	PCB-1254	T	ug/L	8082	<0.0962			*		*		*
11096-82-5	PCB-1260	T	ug/L	8082	<0.0962			*		*		*
11100-14-4	PCB-1268	T	ug/L	8082	<0.0962			*		*		*
12587-46-1	Gross Alpha	T	pCi/L	9310	-0.899	*	-3.11	*	-0.703	*	-0.883	*
12587-47-2	Gross Beta	T	pCi/L	9310	18.1	*	99.2	*	108	*	-0.639	*
10043-66-0	Iodine-131	T	pCi/L			*		*		*		*
13982-63-3	Radium-226	T	pCi/L	HASL 300	0.564	*	0.0501	*	0.474	*	0.301	*
10098-97-2	Strontium-90	T	pCi/L	905.0	0.335	*	-1.86	*	-1.23	*	-0.305	*
14133-76-7	Technetium-99	T	pCi/L	Tc-02-RC	23.7	*	192	*	211	*	-4.05	*
14269-63-7	Thorium-230	T	pCi/L	Th-01-RC	0.0659	*	0.196	*	0.15	*	-0.0747	*
10028-17-8	Tritium	T	pCi/L	906.0	68.9	*	1.16	*	-68.7	*	46.2	*
S0130- -	Chemical Oxygen Demand	T	mg/L	410.4	49.1	B	27.7	B	63.4	B	34.9	B
57-12-5	Cyanide	T	mg/L	9012	<0.2		<0.2		<0.2		<0.2	
20461-54-5	Iodide	T	mg/L	300.0	<0.5	*	<0.5	*	<0.5	*	<0.5	*
S0268- -	Total Organic Carbon	T	mg/L	9060	4.88		1.19	J	1.03	J	4.73	
S0586- -	Total Organic Halides	T	mg/L	9020	0.0134		0.00452	J	<0.01		0.13	

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:073-00014 & 073-00015 FINDS/UNIT: KY8-890-008-982 / 1
LAB ID: None
For Official Use Only

C-21

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)					7/19/2016 08:18		7/19/2016 09:01		NA		7/19/2016 07:39	
Duplicate ("Y" or "N")[2]					N		N		N		N	
Split ("Y" or "N")[3]					N		N		N		N	
Facility Sample ID Number (if applicable)					MW387SG4-16		MW388SG4-16		NA		MW390SG4-16	
Laboratory Sample ID Number (if applicable)					401986011		401986013		NA		402053003	
Date of Analysis (Month/Day/Year) For Volatile Organics Analysis					7/25/2016		7/25/2016		NA		7/26/2016	
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]	FLAGS[7]	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
24959-67-9	Bromide	T	mg/L	9056	0.317		0.305			*	0.661	
16887-00-6	Chloride(s)	T	mg/L	9056	34.5		31.7			*	66.3	
16984-48-8	Fluoride	T	mg/L	9056	0.47		0.245			*	0.235	
S0595- -	Nitrate & Nitrite	T	mg/L	9056	1.11		1.2			*	2.93	*
14808-79-8	Sulfate	T	mg/L	9056	25.7		21.2			*	45.5	
NS1894	Barometric Pressure Reading	T	Inches/Hg	Field	30.23		30.22			*	30.21	
S0145- -	Specific Conductance	T	μMHO/cm	Field	465		390			*	725	

[1]AKGWA # is 0000-0000 for any type of blank.
[2]Respond "Y" if the sample was a duplicate of another sample in this report.
[3]Respond "Y" if the sample was split and analyzed by separate laboratories.
[4]Chemical 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.
[7]Flags are as designated, do not use any other type. Use "*," then describe on "Written Comments Page."

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

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

Permit Number: 073-00014 & 073-00015   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	327.09		327.1			*	327.02	
N238		Dissolved Oxygen	T	mg/L	Field	5.08		5.37			*	7.02	
S0266- -		Total Dissolved Solids	T	mg/L	160.1	259		227			*	391	
S0296- -		pH	T	Units	Field	6.33		6.15			*	6.48	
NS215		Eh	T	mV	Field	421		426			*	419	
S0907 - -		Temperature	T	°C	Field	21.56		19.72			*	18.67	
7429-90-5		Aluminum	T	mg/L	6020	<0.05		0.0287	J		*	0.0416	J
7440-36-0		Antimony	T	mg/L	6020	<0.003		<0.003			*	<0.003	
7440-38-2		Arsenic	T	mg/L	6020	0.00187	BJ	<0.005			*	0.00216	BJ
7440-39-3		Barium	T	mg/L	6020	0.106		0.172			*	0.226	
7440-41-7		Beryllium	T	mg/L	6020	<0.0005		<0.0005			*	<0.0005	
7440-42-8		Boron	T	mg/L	6020	0.0322	B	0.0177	B		*	0.00912	J
7440-43-9		Cadmium	T	mg/L	6020	<0.001		<0.001			*	<0.001	
7440-70-2		Calcium	T	mg/L	6020	26		21.8			*	33.8	B
7440-47-3		Chromium	T	mg/L	6020	0.00252	J	<0.01			*	<0.01	
7440-48-4		Cobalt	T	mg/L	6020	<0.001		<0.001			*	0.000248	J
7440-50-8		Copper	T	mg/L	6020	0.000517	J	0.000772	J		*	0.00127	
7439-89-6		Iron	T	mg/L	6020	0.0374	J	0.0701	J		*	0.104	
7439-92-1		Lead	T	mg/L	6020	<0.002		<0.002			*	<0.002	
7439-95-4		Magnesium	T	mg/L	6020	11.2		9.5			*	13.3	
7439-96-5		Manganese	T	mg/L	6020	0.00205	J	0.00125	J		*	<0.005	
7439-97-6		Mercury	T	mg/L	7470	<0.0002		<0.0002			*	<0.0002	

Facility: US DOE – Paducah Gaseous Diffusion Plant

Permit Number: 073-00014 & 073-00015

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		T D [5]	Unit OF MEASURE	METHOD	8004-4815 DETECTED VALUE OR PQL[6]	FLAGS	8004-4816 DETECTED VALUE OR PQL[6]	FLAGS	8004-4812 DETECTED VALUE OR PQL[6]	FLAGS	8004-4811 DETECTED VALUE OR PQL[6]	FLAGS
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					387		388		389		390	
CAS RN[4]	CONSTITUENT											
7439-98-7	Molybdenum	T	mg/L	6020	<0.0005		<0.0005			*	0.000657	
7440-02-0	Nickel	T	mg/L	6020	<0.002		0.000652	J		*	0.00202	
7440-09-7	Potassium	T	mg/L	6020	1.61		1.88			*	0.369	
7440-16-6	Rhodium	T	mg/L	6020	<0.005		<0.005			*	<0.005	
7782-49-2	Selenium	T	mg/L	6020	<0.005		0.00172	J		*	<0.005	
7440-22-4	Silver	T	mg/L	6020	<0.001		<0.001			*	<0.001	
7440-23-5	Sodium	T	mg/L	6020	48		42.9			*	96.9	
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			*	0.000148	J
7440-62-2	Vanadium	T	mg/L	6020	<0.01		<0.01			*	<0.01	
7440-66-6	Zinc	T	mg/L	6020	<0.01		0.00375	J		*	0.00385	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	

C-23

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

Permit Number: 073-00014 & 073-00015   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	TD[5]	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
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	0.0006	J	0.00057	J		*	<0.001	

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

Permit Number: 073-00014 & 073-00015   LAB ID: None
For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

C-25

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	TD[5]	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
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	<0.0000196		<0.0000199			*	<0.00002	
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		*		*		*		*

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

Permit Number: 073-00014 & 073-00015

LAB ID: <u>None</u>
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]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
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	-1.96	*	-0.209	*		*	1.75	*
12587-47-2	Gross Beta	T	pCi/L	9310	103	*	97.1	*		*	38.8	*
10043-66-0	Iodine-131	T	pCi/L			*		*		*		*
13982-63-3	Radium-226	T	pCi/L	HASL 300	0.685	*	0.386	*		*	0.595	*
10098-97-2	Strontium-90	T	pCi/L	905.0	3.18	*	-0.37	*		*	0.572	*
14133-76-7	Technetium-99	T	pCi/L	Tc-02-RC	214	*	201	*		*	58.4	*
14269-63-7	Thorium-230	T	pCi/L	Th-01-RC	0.18	*	0.402	*		*	0.0205	*
10028-17-8	Tritium	T	pCi/L	906.0	44.8	*	-15.3	*		*	-48.4	*
S0130- -	Chemical Oxygen Demand	T	mg/L	410.4	36.6	B	33.1	B		*	55.6	B
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	1.07	J	1.05	J		*	2.46	
S0586- -	Total Organic Halides	T	mg/L	9020	0.00612	J	<0.01			*	0.0273	

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:073-00014 & 073-00015 FINDS/UNIT: <u>KY8-890-008-982</u> / <u>1</u>

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)					7/19/2016 09:37		7/19/2016 08:07		7/19/2016 08:58		7/19/2016 12:05	
Duplicate ("Y" or "N")[2]					N		N		N		N	
Split ("Y" or "N")[3]					N		N		N		N	
Facility Sample ID Number (if applicable)					MW391SG4-16		MW392SG4-16		MW393SG4-16		MW394SG4-16	
Laboratory Sample ID Number (if applicable)					401986015		401986001		401986017		401986019	
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis					7/25/2016		7/25/2016		7/25/2016		7/26/2016	
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]	FLAGS[7]	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
24959-67-9	Bromide	T	mg/L	9056	0.566		0.684		0.174	J	0.642	
16887-00-6	Chloride(s)	T	mg/L	9056	43.5		46.9		14.1		49.5	
16984-48-8	Fluoride	T	mg/L	9056	0.169		0.228		0.118		0.0918	J
S0595- -	Nitrate & Nitrite	T	mg/L	9056	0.918		0.18		0.155		1.55	
14808-79-8	Sulfate	T	mg/L	9056	54.3		6.19		15.8		10.5	
NS1894	Barometric Pressure Reading	T	Inches/Hg	Field	30.22		30.22		30.22		30.22	
S0145- -	Specific Conductance	T	μMHO/cm	Field	493		435		416		393	

[1]AKGWA # is 0000-0000 for any type of blank.
[2]Respond "Y" if the sample was a duplicate of another sample in this report.
[3]Respond "Y" if the sample was split and analyzed by separate laboratories.
[4]Chemical 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.
[7]Flags are as designated, <u>do not</u> 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

Facility: US DOE – Paducah Gaseous Diffusion Plant

Permit Number: 073-00014 & 073-00015

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	326.97		326.75		340.55		327.21	
N238		Dissolved Oxygen	T	mg/L	Field	3.7		1.14		1.25		4.91	
S0266- -		Total Dissolved Solids	T	mg/L	160.1	273		229		264		231	
S0296- -		pH	T	Units	Field	6.29		6.43		6.45		6.26	
NS215		Eh	T	mV	Field	430		409		420		348	
S0907 - -		Temperature	T	°C	Field	18.78		20.5		20.17		21.61	
7429-90-5		Aluminum	T	mg/L	6020	0.0267	J	0.0159	J	0.0308	J	<0.05	
7440-36-0		Antimony	T	mg/L	6020	<0.003		<0.003		<0.003		<0.003	
7440-38-2		Arsenic	T	mg/L	6020	<0.005		<0.005		0.00282	BJ	<0.005	
7440-39-3		Barium	T	mg/L	6020	0.21		0.193		0.0884		0.288	
7440-41-7		Beryllium	T	mg/L	6020	<0.0005		<0.0005		<0.0005		<0.0005	
7440-42-8		Boron	T	mg/L	6020	0.19		0.0326	B	0.0426		0.0388	
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		27.2		12.4		28.8	
7440-47-3		Chromium	T	mg/L	6020	<0.01		<0.01		<0.01		<0.01	
7440-48-4		Cobalt	T	mg/L	6020	<0.001		0.000252	J	<0.001		<0.001	
7440-50-8		Copper	T	mg/L	6020	<0.001		<0.001		0.00047	J	0.000376	J
7439-89-6		Iron	T	mg/L	6020	0.156		0.23		0.821		0.037	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	15		9.39		3.4		11.7	
7439-96-5		Manganese	T	mg/L	6020	0.00281	J	0.149		0.0188		0.0015	J
7439-97-6		Mercury	T	mg/L	7470	<0.0002		<0.0002		<0.0002		<0.0002	

Facility: US DOE – Paducah Gaseous Diffusion Plant   FINDS/UNIT: _KY8-890-008-982_ / _1_

Permit Number: 073-00014 & 073-00015   LAB ID: _None_

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

C-29

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	<0.0005		0.000394	BJ	<0.0005		<0.0005	
7440-02-0	Nickel	T	mg/L	6020	0.000629	J	0.0012	J	<0.002		0.00232	
7440-09-7	Potassium	T	mg/L	6020	1.72		1.85		0.437		1.49	
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	38.8		40.4		77		31.4	
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	<0.01		<0.01		<0.01		<0.01	
7440-66-6	Zinc	T	mg/L	6020	<0.01		<0.01		<0.01		<0.01	
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	

Facility: US DOE - Paducah Gaseous Diffusion Plant FINDS/UNIT: _KY8-890-008-982_ / _1_

Permit Number: 073-00014 & 073-00015 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	<0.005		<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	0.00059	J	0.00077	J	<0.001		<0.001	
74-95-3	Methylene bromide	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-34-3	1,1-Dichloroethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
107-06-2	1,2-Dichloroethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-35-4	1,1-Dichloroethylene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
106-93-4	Ethane, 1,2-dibromo	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
79-34-5	Ethane, 1,1,2,2-Tetrachloro	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
71-55-6	Ethane, 1,1,1-Trichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
79-00-5	Ethane, 1,1,2-Trichloro	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
630-20-6	Ethane, 1,1,1,2-Tetrachloro	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-01-4	Vinyl chloride	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
127-18-4	Ethene, Tetrachloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
79-01-6	Ethene, Trichloro-	T	mg/L	8260	0.0114		0.0173		0.00032	J	0.00627	

C-30

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

Permit Number: 073-00014 & 073-00015 LAB ID: None
For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

C-31

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	<0.005		<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	<0.0000198		<0.0000201		<0.00002		<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		*		*		*		*

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

Permit Number: 073-00014 & 073-00015

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]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
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	-1.19	*	-1.12	*	0.389	*	-2.51	*
12587-47-2	Gross Beta	T	pCi/L	9310	1.91	*	0.454	*	-0.375	*	4.04	*
10043-66-0	Iodine-131	T	pCi/L			*		*		*		*
13982-63-3	Radium-226	T	pCi/L	HASL 300	0.536	*	0.201	*	0.249	*	0.405	*
10098-97-2	Strontium-90	T	pCi/L	905.0	-0.963	*	-0.114	*	1.72	*	-2.13	*
14133-76-7	Technetium-99	T	pCi/L	Tc-02-RC	13.7	*	7.9	*	6.59	*	5.87	*
14269-63-7	Thorium-230	T	pCi/L	Th-01-RC	0.307	*	0.228	*	-0.0995	*	0.172	*
10028-17-8	Tritium	T	pCi/L	906.0	56.6	*	66.8	*	12.1	*	-15	*
S0130- -	Chemical Oxygen Demand	T	mg/L	410.4	40.2	B	47.4	B	25.9	B	34.9	B
57-12-5	Cyanide	T	mg/L	9012	<0.2		<0.2		<0.2		<0.2	
20461-54-5	Iodide	T	mg/L	300.0	<0.5	*	<0.5	*	<0.5	*	<0.5	*
S0268- -	Total Organic Carbon	T	mg/L	9060	0.951	J	1.41	J	2.44		0.861	J
S0586- -	Total Organic Halides	T	mg/L	9020	0.0105		0.0399		0.0154		0.0078	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: 073-00014 & 073-00015 FINDS/UNIT: KY8-890-008-982 / 1
LAB ID: None
For Official Use Only

GROUNDWATER SAMPLE ANALYSIS(s)

	8004-4801	8004-4803	8004-4817	0000-0000
AKGWA NUMBER[1], Facility Well/Spring Number				
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)	7/19/2016 10:23	7/19/2016 12:44	7/19/2016 13:17	7/20/2016 07:00
Duplicate ("Y" or "N")[2]	N	N	N	N
Split ("Y" or "N")[3]	N	N	N	N
Facility Sample ID Number (if applicable)	MW395SG4-16	MW396SG4-16	MW397SG4-16	RI1SG4-16
Laboratory Sample ID Number (if applicable)	401986021	401986023	401986025	402053013
Date of Analysis (Month/Day/Year) For Volatile Organics Analysis	7/26/2016	7/26/2016	7/26/2016	7/26/2016
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]	FLAGS[7]	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
24959-67-9	Bromide	T	mg/L	9056	0.618		1.15		0.485			*
16887-00-6	Chloride(s)	T	mg/L	9056	48.8		73.1		38.9			*
16984-48-8	Fluoride	T	mg/L	9056	0.0833	J	0.561		0.102			*
S0595- -	Nitrate & Nitrite	T	mg/L	9056	1.59		0.112		1.5			*
14808-79-8	Sulfate	T	mg/L	9056	9.9		23.8		11			*
NS1894	Barometric Pressure Reading	T	Inches/Hg	Field	30.22		30.21		30.21			*
S0145- -	Specific Conductance	T	μMHO/cm	Field	394		736		333			*

[1]AKGWA # is 0000-0000 for any type of blank.
[2]Respond "Y" if the sample was a duplicate of another sample in this report.
[3]Respond "Y" if the sample was split and analyzed by separate laboratories.
[4]Chemical 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.
[7]Flags are as designated, do not use any other type. Use "*," then describe on "Written Comments Page."

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

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

Permit Number: 073-00014 & 073-00015   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	327.59		369.35		327.19			*
N238		Dissolved Oxygen	T	mg/L	Field	4.65		2.82		5.55			*
S0266- -		Total Dissolved Solids	T	mg/L	160.1	219		420		169			*
S0296- -		pH	T	Units	Field	6.26		6.63		6.11			*
NS215		Eh	T	mV	Field	428		339		420			*
S0907 - -		Temperature	T	°C	Field	19.72		20.61		20.56			*
7429-90-5		Aluminum	T	mg/L	6020	<0.05		0.0487	J	0.0897		<0.05	
7440-36-0		Antimony	T	mg/L	6020	<0.003		<0.003		<0.003		<0.003	
7440-38-2		Arsenic	T	mg/L	6020	<0.005		<0.005		<0.005		<0.005	
7440-39-3		Barium	T	mg/L	6020	0.272		0.163		0.418		<0.002	
7440-41-7		Beryllium	T	mg/L	6020	<0.0005		<0.0005		<0.0005		<0.0005	
7440-42-8		Boron	T	mg/L	6020	0.0325		0.016		0.0132	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	26.3		18.8		35.1		0.117	BJ
7440-47-3		Chromium	T	mg/L	6020	<0.01		<0.01		<0.01		<0.01	
7440-48-4		Cobalt	T	mg/L	6020	<0.001		<0.001		0.000731	J	<0.001	
7440-50-8		Copper	T	mg/L	6020	<0.001		0.000464	J	0.00122		<0.001	
7439-89-6		Iron	T	mg/L	6020	<0.1		0.116		0.544		<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		8.01		15.2		<0.03	
7439-96-5		Manganese	T	mg/L	6020	<0.005		0.00289	J	0.138		<0.005	
7439-97-6		Mercury	T	mg/L	7470	<0.0002		<0.0002		<0.0002		<0.0002	

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

Permit Number: 073-00014 & 073-00015 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	<0.0005		<0.0005		0.00043	J	<0.0005	
7440-02-0	Nickel	T	mg/L	6020	0.000622	J	0.000793	J	0.00116	J	<0.002	
7440-09-7	Potassium	T	mg/L	6020	1.53		1.78		0.901		<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	29.3		31.7		105		<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		<0.0002		<0.0002		<0.0002	
7440-62-2	Vanadium	T	mg/L	6020	<0.01		<0.01		<0.01		<0.01	
7440-66-6	Zinc	T	mg/L	6020	<0.01		0.00489	J	0.00559	J	<0.01	
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	

Facility: US DOE – Paducah Gaseous Diffusion Plant FINDS/UNIT: _KY8-890-008-982_ / _1_

Permit Number: 073-00014 & 073-00015   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]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
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		0.00236	
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	0.00439		0.00203		<0.001		<0.001	

C-36

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

Permit Number: 073-00014 & 073-00015

LAB ID: <u>None</u>
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		<0.005		<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	<0.00002		<0.00002		<0.0000197		<0.0000199	
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		*		*		*		*

Facility: US DOE - Paducah Gaseous Diffusion Plant FINDS/UNIT: KY8-890-008-982 / 1
Permit Number: 073-00014 & 073-00015 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]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
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	0.0266	*	2.2	*	-0.787	*	-0.665	*
12587-47-2	Gross Beta	T	pCi/L	9310	-1.87	*	-2.66	*	7.53	*	-1.27	*
10043-66-0	Iodine-131	T	pCi/L			*		*		*		*
13982-63-3	Radium-226	T	pCi/L	HASL 300	0.654	*	0.376	*	0.464	*	0.402	*
10098-97-2	Strontium-90	T	pCi/L	905.0	-3.35	*	0.197	*	2.18	*	-1.37	*
14133-76-7	Technetium-99	T	pCi/L	Tc-02-RC	13.2	*	3.89	*	14.9	*	-6.62	*
14269-63-7	Thorium-230	T	pCi/L	Th-01-RC	0.0725	*	0.456	*	0.354	*	0.327	*
10028-17-8	Tritium	T	pCi/L	906.0	-30.8	*	15.4	*	35	*	-91.6	*
S0130- -	Chemical Oxygen Demand	T	mg/L	410.4	74.1	B	63.4	B	49.1	B		*
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	0.864	J	4.98		0.798	J		*
S0586- -	Total Organic Halides	T	mg/L	9020	0.00688	J	0.0657		<0.01			*

Division of Waste Management **RESIDENTIAL/INERT-QUARTERLY**
Solid Waste Branch **Facility: US DOE - Paducah Gaseous Diffusion Plant**
14 Reilly Road **Permit Number:** 073-00014 & 073-00015 FINDS/UNIT: <u>KY8-890-008-982</u> / <u>1</u>
Frankfort, KY 40601 (502)564-6716 LAB ID: <u>None</u>
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)				7/20/2016 10:15	7/19/2016 07:30	7/19/2016 07:15	7/20/2016 06:55
Duplicate ("Y" or "N")[2]				N	N	N	N
Split ("Y" or "N")[3]				N	N	N	N
Facility Sample ID Number (if applicable)				FB1SG4-16	TB1SG4-16	TB2SG4-16	TB3SG4-16
Laboratory Sample ID Number (if applicable)				402053014	401986027	402053015	402053016
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis				7/26/2016	7/25/2016	7/26/2016	7/26/2016
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)				NA	NA	NA	NA

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

[1]AKGWA # is 0000-0000 for any type of blank.
[2]Respond "Y" if the sample was a duplicate of another sample in this report.
[3]Respond "Y" if the sample was split and analyzed by separate laboratories.
[4]Chemical 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.
[7]Flags are as designated, <u>do not</u> 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

C-39

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

Permit Number: 073-00014 & 073-00015

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	<0.003			*		*		*
7440-38-2		Arsenic	T	mg/L	6020	<0.005			*		*		*
7440-39-3		Barium	T	mg/L	6020	<0.002			*		*		*
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	0.0837	BJ		*		*		*
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	0.000502	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	<0.03			*		*		*
7439-96-5		Manganese	T	mg/L	6020	<0.005			*		*		*
7439-97-6		Mercury	T	mg/L	7470	<0.0002			*		*		*

C-40

Facility: US DOE – Paducah Gaseous Diffusion Plant   FINDS/UNIT: _KY8-890-008-982_ / _1_

Permit Number: 073-00014 & 073-00015   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	<0.0005			*		*		*
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	<0.01			*		*		*
7440-66-6	Zinc	T	mg/L	6020	<0.01			*		*		*
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	

Facility: US DOE – Paducah Gaseous Diffusion Plant FINDS/UNIT: _KY8-890-008-982_ / _1_

Permit Number: 073-00014 & 073-00015

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	TD[5]	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
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	0.00224		0.00288		0.00256		0.0025	
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	

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

Permit Number: 073-00014 & 073-00015   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	<0.005		<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	<0.00002		<0.00002		<0.0000196		<0.00002	
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

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

Permit Number: 073-00014 & 073-00015   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]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
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	-0.000564	*		*		*		*
12587-47-2		Gross Beta	T	pCi/L	9310	-1.81	*		*		*		*
10043-66-0		Iodine-131	T	pCi/L			*		*		*		*
13982-63-3		Radium-226	T	pCi/L	HASL 300	0.314	*		*		*		*
10098-97-2		Strontium-90	T	pCi/L	905.0	-2.04	*		*		*		*
14133-76-7		Technetium-99	T	pCi/L	Tc-02-RC	-9.02	*		*		*		*
14269-63-7		Thorium-230	T	pCi/L	Th-01-RC	0.348	*		*		*		*
10028-17-8		Tritium	T	pCi/L	906.0	-105	*		*		*		*
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		*		*		*		*

Division of Waste Management **RESIDENTIAL/INERT-QUARTERLY**
Solid Waste Branch **Facility: US DOE - Paducah Gaseous Diffusion Plant**
14 Reilly Road **Permit Number:073-00014 & 073-00015** FINDS/UNIT: <u>KY8-890-008-982</u> / <u>1</u>
Frankfort, KY 40601 (502)564-6716 LAB ID: None
For Official Use Only

GROUNDWATER SAMPLE ANALYSIS(S)

AKGWA NUMBER[1], Facility Well/Spring Number	8000-5244			
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)	224			
Sample Sequence #	2			
If sample is a Blank, specify Type: (F)ield, (T)rip, (M)ethod, or (E)quipment	NA			
Sample Date and Time (Month/Day/Year hour: minutes)	7/20/2016 10:09			
Duplicate ("Y" or "N")[2]	Y			
Split ("Y" or "N")[3]	N			
Facility Sample ID Number (if applicable)	MW224DSG4-16			
Laboratory Sample ID Number (if applicable)	402053009			
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis	7/26/2016			
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)	SIDE			

CAS RN[4]	CONSTITUENT	T D [5]	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL[6]	FLAGS[7]	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
24959-67-9	Bromide	T	mg/L	9056	0.449							
16887-00-6	Chloride(s)	T	mg/L	9056	35.9							
16984-48-8	Fluoride	T	mg/L	9056	0.21							
S0595- -	Nitrate & Nitrite	T	mg/L	9056	0.946							
14808-79-8	Sulfate	T	mg/L	9056	15.2							
NS1894	Barometric Pressure Reading	T	Inches/Hg	Field	30.21							
S0145- -	Specific Conductance	T	μMHO/cm	Field	443							

[1]AKGWA # is 0000-0000 for any type of blank.
[2]Respond "Y" if the sample was a duplicate of another sample in this report.
[3]Respond "Y" if the sample was split and analyzed by separate laboratories.
[4]Chemical 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.
[7]Flags are as designated, <u>do not</u> 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

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

Permit Number: 073-00014 & 073-00015   LAB ID: <u>None</u>

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER[1], Facility Well/Spring Number					8000-5244							
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)					224							
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	327.46							
N238	Dissolved Oxygen	T	mg/L	Field	3.61							
S0266- -	Total Dissolved Solids	T	mg/L	160.1	194							
S0296- -	pH	T	Units	Field	6.38							
NS215	Eh	T	mV	Field	427							
S0907 - -	Temperature	T	°C	Field	18.78							
7429-90-5	Aluminum	T	mg/L	6020	<0.05							
7440-36-0	Antimony	T	mg/L	6020	<0.003							
7440-38-2	Arsenic	T	mg/L	6020	0.00191	BJ						
7440-39-3	Barium	T	mg/L	6020	0.203							
7440-41-7	Beryllium	T	mg/L	6020	<0.0005							
7440-42-8	Boron	T	mg/L	6020	0.0171							
7440-43-9	Cadmium	T	mg/L	6020	<0.001							
7440-70-2	Calcium	T	mg/L	6020	24.7	B						
7440-47-3	Chromium	T	mg/L	6020	0.00237	J						
7440-48-4	Cobalt	T	mg/L	6020	0.000324	J						
7440-50-8	Copper	T	mg/L	6020	0.000844	J						
7439-89-6	Iron	T	mg/L	6020	0.0669	J						
7439-92-1	Lead	T	mg/L	6020	<0.002							
7439-95-4	Magnesium	T	mg/L	6020	9.74							
7439-96-5	Manganese	T	mg/L	6020	0.00618							
7439-97-6	Mercury	T	mg/L	7470	<0.0002							

C-46

Facility: US DOE – Paducah Gaseous Diffusion Plant   FINDS/UNIT: _KY8-890-008-982_ / _1_

Permit Number: 073-00014 & 073-00015   LAB ID: _None_

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER[1], Facility Well/Spring Number					8000-5244							
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					224							
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	0.000608							
7440-02-0	Nickel	T	mg/L	6020	0.00459							
7440-09-7	Potassium	T	mg/L	6020	0.913							
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	54.2							
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	<0.01							
7440-66-6	Zinc	T	mg/L	6020	<0.01							
108-05-4	Vinyl acetate	T	mg/L	8260	<0.005							
67-64-1	Acetone	T	mg/L	8260	<0.005							
107-02-8	Acrolein	T	mg/L	8260	<0.005							
107-13-1	Acrylonitrile	T	mg/L	8260	<0.005							
71-43-2	Benzene	T	mg/L	8260	<0.001							
108-90-7	Chlorobenzene	T	mg/L	8260	<0.001							
1330-20-7	Xylenes	T	mg/L	8260	<0.003							
100-42-5	Styrene	T	mg/L	8260	<0.001							
108-88-3	Toluene	T	mg/L	8260	<0.001							
74-97-5	Chlorobromomethane	T	mg/L	8260	<0.001							

Facility: US DOE - Paducah Gaseous Diffusion Plant FINDS/UNIT: _KY8-890-008-982_ / _1_

Permit Number: 073-00014 & 073-00015 LAB ID: None

For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER[1], Facility Well/Spring Number					8000-5244								
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					224								
CAS RN[4]	CONSTITUENT	T D[5]	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
---	---	---	---	---	---	---	---	---	---	---	---	---
75-27-4	Bromodichloromethane	T	mg/L	8260	<0.001							
75-25-2	Tribromomethane	T	mg/L	8260	<0.001							
74-83-9	Methyl bromide	T	mg/L	8260	<0.001							
78-93-3	Methyl ethyl ketone	T	mg/L	8260	<0.005							
110-57-6	trans-1,4-Dichloro-2-butene	T	mg/L	8260	<0.005							
75-15-0	Carbon disulfide	T	mg/L	8260	<0.005							
75-00-3	Chloroethane	T	mg/L	8260	<0.001							
67-66-3	Chloroform	T	mg/L	8260	<0.001							
74-87-3	Methyl chloride	T	mg/L	8260	<0.001							
156-59-2	cis-1,2-Dichloroethene	T	mg/L	8260	<0.001							
74-95-3	Methylene bromide	T	mg/L	8260	<0.001							
75-34-3	1,1-Dichloroethane	T	mg/L	8260	<0.001							
107-06-2	1,2-Dichloroethane	T	mg/L	8260	<0.001							
75-35-4	1,1-Dichloroethylene	T	mg/L	8260	<0.001							
106-93-4	Ethane, 1,2-dibromo	T	mg/L	8260	<0.001							
79-34-5	Ethane, 1,1,2,2-Tetrachloro	T	mg/L	8260	<0.001							
71-55-6	Ethane, 1,1,1-Trichloro-	T	mg/L	8260	<0.001							
79-00-5	Ethane, 1,1,2-Trichloro	T	mg/L	8260	<0.001							
630-20-6	Ethane, 1,1,1,2-Tetrachloro	T	mg/L	8260	<0.001							
75-01-4	Vinyl chloride	T	mg/L	8260	<0.001							
127-18-4	Ethene, Tetrachloro-	T	mg/L	8260	<0.001							
79-01-6	Ethene, Trichloro-	T	mg/L	8260	<0.001							

Facility: US DOE - Paducah Gaseous Diffusion Plant   FINDS/UNIT: KY8-890-008-982 / 1
Permit Number: 073-00014 & 073-00015

LAB ID: None
For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER[1], Facility Well/Spring Number					8000-5244							
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					224							
CAS RN[4]	CONSTITUENT	TDS[5]	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
100-41-4	Ethylbenzene	T	mg/L	8260	<0.001							
591-78-6	2-Hexanone	T	mg/L	8260	<0.005							
74-88-4	Iodomethane	T	mg/L	8260	<0.005							
124-48-1	Methane, Dibromochloro-	T	mg/L	8260	<0.001							
56-23-5	Carbon Tetrachloride	T	mg/L	8260	<0.001							
75-09-2	Dichloromethane	T	mg/L	8260	<0.005							
108-10-1	Methyl isobutyl ketone	T	mg/L	8260	<0.005							
96-12-8	Propane, 1,2-Dibromo-3-chloro	T	mg/L	8011	<0.00002							
78-87-5	Propane, 1,2-Dichloro-	T	mg/L	8260	<0.001							
10061-02-6	trans-1,3-Dichloro-1-propene	T	mg/L	8260	<0.001							
10061-01-5	cis-1,3-Dichloro-1-propene	T	mg/L	8260	<0.001							
156-60-5	trans-1,2-Dichloroethene	T	mg/L	8260	<0.001							
75-69-4	Trichlorofluoromethane	T	mg/L	8260	<0.001							
96-18-4	1,2,3-Trichloropropane	T	mg/L	8260	<0.001							
95-50-1	Benzene, 1,2-Dichloro-	T	mg/L	8260	<0.001							
106-46-7	Benzene, 1,4-Dichloro-	T	mg/L	8260	<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

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

Permit Number: 073-00014 & 073-00015   LAB ID: None
For Official Use Only

GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER[1], Facility Well/Spring Number					8000-5244								
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					224								

CAS RN[4]	CONSTITUENT	T D[5]	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS	DETECTED VALUE OR PQL[6]	FLAGS
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	1.73	*						
12587-47-2	Gross Beta	T	pCi/L	9310	4.04	*						
10043-66-0	Iodine-131	T	pCi/L			*						
13982-63-3	Radium-226	T	pCi/L	HASL 300	0.361	*						
10098-97-2	Strontium-90	T	pCi/L	905.0	-1.71	*						
14133-76-7	Technetium-99	T	pCi/L	Tc-02-RC	9.75	*						
14269-63-7	Thorium-230	T	pCi/L	Th-01-RC	0.152	*						
10028-17-8	Tritium	T	pCi/L	906.0	-103	*						
S0130- -	Chemical Oxygen Demand	T	mg/L	410.4	<20							
57-12-5	Cyanide	T	mg/L	9012	<0.2							
20461-54-5	Iodide	T	mg/L	300.0	<0.5							
S0268- -	Total Organic Carbon	T	mg/L	9060	1.22	J						
S0586- -	Total Organic Halides	T	mg/L	9020	0.00492	J						

GROUNDWATER
WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8000-5201 MW220	MW220SG4-16	Tantalum	N	Sample spike recovery not within 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		TPU is 2.55. Rad error is 2.55.
		Gross beta		TPU is 2.76. Rad error is 2.49.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226		TPU is 0.494. Rad error is 0.494.
		Strontium-90		TPU is 2.3. Rad error is 2.26.
		Technetium-99		TPU is 11.6. Rad error is 11.1.
		Thorium-230		TPU is 0.366. Rad error is 0.361.
		Tritium		TPU is 147. Rad error is 146.
		Iodide	H	Analysis performed outside holding time requirement
8000-5202 MW221	MW221SG4-16	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		TPU is 2.54. Rad error is 2.54.
		Gross beta		TPU is 2.61. Rad error is 2.29.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226		TPU is 0.399. Rad error is 0.399.
		Strontium-90		TPU is 2.67. Rad error is 2.67.
		Technetium-99		TPU is 10.2. Rad error is 10.
		Thorium-230		TPU is 0.291. Rad error is 0.29.
		Tritium		TPU is 136. Rad error is 136.

GROUNDWATER
WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8000-5242 MW222	MW222SG4-16	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		TPU is 2.73. Rad error is 2.72.
		Gross beta		TPU is 2.79. Rad error is 2.67.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226		TPU is 0.433. Rad error is 0.432.
		Strontium-90		TPU is 3.6. Rad error is 3.6.
		Technetium-99		TPU is 10.2. Rad error is 10.2.
		Thorium-230		TPU is 0.373. Rad error is 0.37.
		Tritium		TPU is 144. Rad error is 144.
8000-5243 MW223	MW223SG4-16	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		TPU is 1.91. Rad error is 1.91.
		Gross beta		TPU is 2.19. Rad error is 2.09.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226		TPU is 0.433. Rad error is 0.432.
		Strontium-90		TPU is 2.28. Rad error is 2.28.
		Technetium-99		TPU is 11.3. Rad error is 11.3.
		Thorium-230		TPU is 0.424. Rad error is 0.417.
		Tritium		TPU is 145. Rad error is 145.

RESIDENTIAL/INERT – QUARTERLY
Facility: US DOE - Paducah Gaseous Diffusion Plant
Permit Numbers: 073-00014 and 073-00015

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

GROUNDWATER
WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8000-5244 MW224	MW224SG4-16	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		TPU is 2.22. Rad error is 2.22.
		Gross beta		TPU is 1.82. Rad error is 1.81.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226		TPU is 0.489. Rad error is 0.489.
		Strontium-90		TPU is 1.69. Rad error is 1.69.
		Technetium-99		TPU is 10.3. Rad error is 10.2.
		Thorium-230		TPU is 0.409. Rad error is 0.399.
		Tritium		TPU is 150. Rad error is 150.
8004-4820 MW369	MW369UG4-16	Gross alpha		TPU is 2.45. Rad error is 2.45.
		Gross beta		TPU is 4.97. Rad error is 3.25.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226		TPU is 0.369. Rad error is 0.369.
		Strontium-90		TPU is 1.17. Rad error is 1.17.
		Technetium-99		TPU is 9.84. Rad error is 9.77.
		Thorium-230		TPU is 0.343. Rad error is 0.339.
		Tritium		TPU is 111. Rad error is 111.
		Iodide	H	Analysis performed outside holding time requirement
8004-4818 MW370	MW370UG4-16	Tantalum	N	Sample spike recovery not within control limits.
		Thallium	N	Sample spike recovery not within control limits.
		Gross alpha		TPU is 1.98. Rad error is 1.98.
		Gross beta		TPU is 10.9. Rad error is 5.5.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226		TPU is 0.519. Rad error is 0.518.
		Strontium-90		TPU is 2.01. Rad error is 1.98.
		Technetium-99		TPU is 16.5. Rad error is 12.9.
		Thorium-230		TPU is 0.151. Rad error is 0.15.
		Tritium		TPU is 135. Rad error is 135.
		Iodide	H	Analysis performed outside holding time requirement

RESIDENTIAL/INERT – QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Numbers: 073-00014 and 073-00015

Finds/Unit: <u>KY8-890-008-982 / 1</u>

LAB ID:<u>None</u>

For Official Use Only

GROUNDWATER
WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4808 MW372	MW372UG4-16	Tantalum	N	Sample spike recovery not within control limits.
		Thallium	N	Sample spike recovery not within control limits.
		Gross alpha		TPU is 2.53. Rad error is 2.53.
		Gross beta		TPU is 4.59. Rad error is 2.85.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226		TPU is 0.395. Rad error is 0.395.
		Strontium-90		TPU is 1.39. Rad error is 1.39.
		Technetium-99		TPU is 12.5. Rad error is 11.9.
		Thorium-230		TPU is 0.306. Rad error is 0.305.
		Tritium		TPU is 146. Rad error is 146.
		Iodide	H	Analysis performed outside holding time requirement
8004-4792 MW373	MW373UG4-16	Tantalum	N	Sample spike recovery not within control limits.
		Thallium	N	Sample spike recovery not within control limits.
		Gross alpha		TPU is 1.5. Rad error is 1.49.
		Gross beta		TPU is 4.16. Rad error is 2.95.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226		TPU is 0.489. Rad error is 0.489.
		Strontium-90		TPU is 3.08. Rad error is 3.08.
		Technetium-99		TPU is 11.4. Rad error is 11.1.
		Thorium-230		TPU is 0.415. Rad error is 0.414.
		Tritium		TPU is 146. Rad error is 145.
		Iodide	H	Analysis performed outside holding time requirement

RESIDENTIAL/INERT – QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Numbers: 073-00014 and 073-00015

Finds/Unit: <u>KY8-890-008-982 / 1</u>

LAB ID:<u>None</u>

For Official Use Only

GROUNDWATER
WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4809 MW384	MW384SG4-16	Tantalum	N	Sample spike recovery not within 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		TPU is 2.04. Rad error is 2.04.
		Gross beta		TPU is 17.8. Rad error is 5.86.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226		TPU is 0.352. Rad error is 0.352.
		Strontium-90		TPU is 3.24. Rad error is 3.24.
		Technetium-99		TPU is 25.7. Rad error is 14.4.
		Thorium-230		TPU is 0.386. Rad error is 0.382.
		Tritium		TPU is 135. Rad error is 135.
		Iodide	H	Analysis performed outside holding time requirement
8004-4810 MW385	MW385SG4-16	Tantalum	N	Sample spike recovery not within 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		TPU is 2.52. Rad error is 2.52.
		Gross beta		TPU is 18.5. Rad error is 5.63.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226		TPU is 0.412. Rad error is 0.411.
		Strontium-90		TPU is 3.07. Rad error is 3.07.
		Technetium-99		TPU is 27.8. Rad error is 15.
		Thorium-230		TPU is 0.418. Rad error is 0.414.
		Tritium		TPU is 122. Rad error is 122.
		Iodide	H	Analysis performed outside holding time requirement

GROUNDWATER
WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4804 MW386	MW386SG4-16	Tantalum	N	Sample spike recovery not within 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		TPU is 2.16. Rad error is 2.16.
		Gross beta		TPU is 1.3. Rad error is 1.3.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226		TPU is 0.355. Rad error is 0.355.
		Strontium-90		TPU is 3.75. Rad error is 3.75.
		Technetium-99		TPU is 11. Rad error is 11.
		Thorium-230		TPU is 0.273. Rad error is 0.272.
		Tritium		TPU is 141. Rad error is 141.
		Iodide	H	Analysis performed outside holding time requirement
8004-4815 MW387	MW387SG4-16	Tantalum	N	Sample spike recovery not within 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		TPU is 2.21. Rad error is 2.21.
		Gross beta		TPU is 17.6. Rad error is 5.89.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226		TPU is 0.53. Rad error is 0.529.
		Strontium-90		TPU is 2.49. Rad error is 2.44.
		Technetium-99		TPU is 28.7. Rad error is 16.2.
		Thorium-230		TPU is 0.28. Rad error is 0.275.
		Tritium		TPU is 137. Rad error is 137.
		Iodide	H	Analysis performed outside holding time requirement

RESIDENTIAL/INERT – QUARTERLY
Facility: US DOE - Paducah Gaseous Diffusion Plant
Permit Numbers: 073-00014 and 073-00015

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

GROUNDWATER
WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4816 MW388	MW388SG4-16	Tantalum	N	Sample spike recovery not within 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		TPU is 2.47. Rad error is 2.47.
		Gross beta		TPU is 16.7. Rad error is 5.68.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226		TPU is 0.405. Rad error is 0.405.
		Strontium-90		TPU is 2.59. Rad error is 2.58.
		Technetium-99		TPU is 27.2. Rad error is 15.5.
		Thorium-230		TPU is 0.46. Rad error is 0.451.
		Tritium		TPU is 130. Rad error is 129.
		Iodide	H	Analysis performed outside holding time requirement

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.

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.
		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.

GROUNDWATER
WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4812 MW389		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.
8004-4811 MW390	MW390SG4-16	Nitrate & Nitrite	H	Analysis performed outside holding time requirement
		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		TPU is 2.78. Rad error is 2.77.
		Gross beta		TPU is 8.21. Rad error is 5.26.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226		TPU is 0.533. Rad error is 0.533.
		Strontium-90		TPU is 2.87. Rad error is 2.86.
		Technetium-99		TPU is 13.3. Rad error is 11.7.
		Thorium-230		TPU is 0.305. Rad error is 0.303.
		Tritium		TPU is 151. Rad error is 151.

GROUNDWATER
WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4805 MW391	MW391SG4-16	Tantalum	N	Sample spike recovery not within 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		TPU is 2.11. Rad error is 2.11.
		Gross beta		TPU is 2.01. Rad error is 1.99.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226		TPU is 0.455. Rad error is 0.454.
		Strontium-90		TPU is 1.73. Rad error is 1.73.
		Technetium-99		TPU is 10.3. Rad error is 10.2.
		Thorium-230		TPU is 0.417. Rad error is 0.41.
		Tritium		TPU is 143. Rad error is 143.
		Iodide	H	Analysis performed outside holding time requirement
8004-4806 MW392	MW392SG4-16	Tantalum	N	Sample spike recovery not within 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		TPU is 2.38. Rad error is 2.38.
		Gross beta		TPU is 1.89. Rad error is 1.88.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226		TPU is 0.357. Rad error is 0.357.
		Strontium-90		TPU is 2.03. Rad error is 2.03.
		Technetium-99		TPU is 9.58. Rad error is 9.54.
		Thorium-230		TPU is 0.366. Rad error is 0.361.
		Tritium		TPU is 145. Rad error is 144.
		Iodide	H	Analysis performed outside holding time requirement

RESIDENTIAL/INERT – QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Numbers: 073-00014 and 073-00015

Finds/Unit: <u>KY8-890-008-982 / 1</u>

LAB ID:<u>None   </u>

For Official Use Only

GROUNDWATER
WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4807 MW393	MW393SG4-16	Tantalum	N	Sample spike recovery not within 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		TPU is 2.54. Rad error is 2.54.
		Gross beta		TPU is 2.04. Rad error is 2.04.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226		TPU is 0.374. Rad error is 0.374.
		Strontium-90		TPU is 2.73. Rad error is 2.72.
		Technetium-99		TPU is 10.5. Rad error is 10.5.
		Thorium-230		TPU is 0.257. Rad error is 0.257.
		Tritium		TPU is 135. Rad error is 135.
		Iodide	H	Analysis performed outside holding time requirement
8004-4802 MW394	MW394SG4-16	Tantalum	N	Sample spike recovery not within 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		TPU is 2.07. Rad error is 2.07.
		Gross beta		TPU is 2.73. Rad error is 2.64.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226		TPU is 0.414. Rad error is 0.414.
		Strontium-90		TPU is 1.79. Rad error is 1.79.
		Technetium-99		TPU is 10.3. Rad error is 10.3.
		Thorium-230		TPU is 0.348. Rad error is 0.344.
		Tritium		TPU is 130. Rad error is 130.
		Iodide	H	Analysis performed outside holding time requirement

RESIDENTIAL/INERT – QUARTERLY
Facility: US DOE - Paducah Gaseous Diffusion Plant
Permit Numbers: 073-00014 and 073-00015

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

GROUNDWATER
WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4801 MW395	MW395SG4-16	Tantalum	N	Sample spike recovery not within 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		TPU is 2.36. Rad error is 2.36.
		Gross beta		TPU is 2.45. Rad error is 2.45.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226		TPU is 0.481. Rad error is 0.48.
		Strontium-90		TPU is 2.53. Rad error is 2.53.
		Technetium-99		TPU is 10.5. Rad error is 10.4.
		Thorium-230		TPU is 0.34. Rad error is 0.338.
		Tritium		TPU is 126. Rad error is 126.
		Iodide	H	Analysis performed outside holding time requirement
8004-4803 MW396	MW396SG4-16	Tantalum	N	Sample spike recovery not within 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		TPU is 2.94. Rad error is 2.91.
		Gross beta		TPU is 2.29. Rad error is 2.29.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226		TPU is 0.555. Rad error is 0.555.
		Strontium-90		TPU is 2.66. Rad error is 2.66.
		Technetium-99		TPU is 10.2. Rad error is 10.2.
		Thorium-230		TPU is 0.423. Rad error is 0.413.
		Tritium		TPU is 137. Rad error is 137.
		Iodide	H	Analysis performed outside holding time requirement

RESIDENTIAL/INERT – QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Numbers: 073-00014 and 073-00015

Finds/Unit: <u>KY8-890-008-982 / 1</u>

LAB ID:<u>None</u>

For Official Use Only

GROUNDWATER
WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4817 MW397	MW397SG4-16	Tantalum	N	Sample spike recovery not within 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		TPU is 2.34. Rad error is 2.34.
		Gross beta		TPU is 3.05. Rad error is 2.78.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226		TPU is 0.454. Rad error is 0.453.
		Strontium-90		TPU is 3.76. Rad error is 3.74.
		Technetium-99		TPU is 10.7. Rad error is 10.5.
		Thorium-230		TPU is 0.423. Rad error is 0.415.
		Tritium		TPU is 140. Rad error is 140.
		Iodide	H	Analysis performed outside holding time requirement

RESIDENTIAL/INERT – QUARTERLY   Finds/Unit: <u>KY8-890-008-982 / 1</u>

Facility: US DOE - Paducah Gaseous Diffusion Plant   LAB ID:<u>None</u>

Permit Numbers: 073-00014 and 073-00015   For Official Use Only

GROUNDWATER
WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	RI1SG4-16	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		TPU is 1.8. Rad error is 1.8.
		Gross beta		TPU is 2.79. Rad error is 2.79.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226		TPU is 0.461. Rad error is 0.461.
		Strontium-90		TPU is 1.39. Rad error is 1.39.
		Technetium-99		TPU is 10.2. Rad error is 10.2.
		Thorium-230		TPU is 0.431. Rad error is 0.423.
		Tritium		TPU is 147. Rad error is 147.
		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.

GROUNDWATER
WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	FB1SG4-16	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		TPU is 1.96. Rad error is 1.96.
		Gross beta		TPU is 1.78. Rad error is 1.78.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226		TPU is 0.432. Rad error is 0.431.
		Strontium-90		TPU is 3.41. Rad error is 3.41.
		Technetium-99		TPU is 9.38. Rad error is 9.38.
		Thorium-230		TPU is 0.422. Rad error is 0.412.
		Tritium		TPU is 144. Rad error is 144.
		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.

GROUNDWATER
WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB1SG4-16	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

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Numbers: 073-00014 and 073-00015

Finds/Unit: <u>KY8-890-008-982 / 1</u>

LAB ID:<u>None</u>

For Official Use Only

GROUNDWATER
WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB1SG4-16	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.

GROUNDWATER
WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB2SG4-16	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.

GROUNDWATER
WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB2SG4-16	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

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Numbers: 073-00014 and 073-00015

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

LAB ID:None

For Official Use Only

GROUNDWATER
WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB3SG4-16	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.

GROUNDWATER
WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB3SG4-16	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.

GROUNDWATER
WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8000-5244 MW224	MW224DSG4-16	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		TPU is 2.72. Rad error is 2.7.
		Gross beta		TPU is 2.47. Rad error is 2.36.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226		TPU is 0.389. Rad error is 0.389.
		Strontium-90		TPU is 2.68. Rad error is 2.68.
		Technetium-99		TPU is 10.1. Rad error is 10.1.
		Thorium-230		TPU is 0.33. Rad error is 0.326.
		Tritium		TPU is 152. Rad error is 152.

APPENDIX D

**STATISTICAL ANALYSES AND
QUALIFICATION STATEMENT**

THIS PAGE INTENTIONALLY LEFT BLANK

GROUNDWATER
STATISTICAL COMMENTS

Introduction

The statistical analyses conducted on the third quarter 2016 groundwater data collected from the C-746-S&T Landfills monitoring wells (MWs) were performed in accordance with Permit GSTR0001, Standard Requirement 3, using the U.S. Environmental Protection Agency (EPA) guidance document, *EPA Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Interim Final Guidance* (1989).

The statistical evaluation was conducted separately for the three groundwater systems: the Upper Continental Recharge System (UCRS), the Upper Regional Gravel Aquifer (URGA), and the Lower Regional Gravel Aquifer (LRGA). For each groundwater system, data from wells considered to represent background conditions were compared with test wells (downgradient or sidegradient wells) (Exhibit D.1). The third quarter 2016 data used to conduct the statistical analyses were collected in July 2016. 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.

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 ≤ 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.

---

[1] For pH, two-sided TLs (upper and lower) were calculated with an adjusted K factor using the following equations:
   upper $TL = X + (K \times S)$
   lower $TL = X - (K \times S)$

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 URGA, and the LRGA, respectively. Those parameters displayed with bold-face type indicate the one-sided tolerance interval statistical test was performed. The data presented in Exhibits D.3, D.4, and D.5 were collected during the current quarter, third quarter 2016. The observations are representative of the current quarter data. 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.

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.

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

Parameters
Aluminum
Beta Activity
Boron
Bromide
Calcium
Chemical Oxygen Demand (COD)
Chloride
cis-1,2-Dichloroethene
Cobalt
Conductivity
Copper
Dissolved Oxygen
Dissolved Solids
Iron
Magnesium
Manganese
Molybdenum
Nickel
Oxidation-Reduction Potential
pH*
Potassium
Radium-226
Sodium
Sulfate
Technetium-99
Total Organic Carbon (TOC)
Total Organic Halides (TOX)
Trichloroethene
Uranium
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	4	0	No
Beryllium	4	4	0	No
Boron	**4**	**2**	**2**	**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**	**3**	**1**	**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
cis-1,2-Dichloroethene	4	4	0	No
cis-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**	**3**	**1**	**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**
trans-1,2-Dichloroethene	4	4	0	No
trans-1,3-Dichloropropene	4	4	0	No
trans-1,4-Dichloro-2-Butene	4	4	0	No
Trichlorofluoromethane	4	4	0	No
Uranium	**4**	**3**	**1**	**Yes**
Vanadium	4	4	0	No
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	12	12	0	No
1,1,2,2-Tetrachloroethane	12	12	0	No
1,1,2-Trichloroethane	12	12	0	No
1,1-Dichloroethane	12	12	0	No
1,2,3-Trichloropropane	12	12	0	No
1,2-Dibromo-3-chloropropane	12	12	0	No
1,2-Dibromoethane	12	12	0	No
1,2-Dichlorobenzene	12	12	0	No
1,2-Dichloropropane	12	12	0	No
2-Butanone	12	12	0	No
2-Hexanone	12	12	0	No
4-Methyl-2-pentanone	12	12	0	No
Acetone	12	12	0	No
Acrolein	12	12	0	No
Acrylonitrile	12	12	0	No
Aluminum	**12**	**7**	**5**	**Yes**
Antimony	12	12	0	No
Aroclor-1268	2	2	0	No
Beryllium	12	12	0	No
Beta activity	**12**	**3**	**9**	**Yes**
Boron	**12**	**3**	**9**	**Yes**
Bromide	**12**	**0**	**12**	**Yes**
Bromochloromethane	12	12	0	No
Bromodichloromethane	12	12	0	No
Bromoform	12	12	0	No
Bromomethane	12	12	0	No
Calcium	**12**	**0**	**12**	**Yes**
Carbon disulfide	12	12	0	No
Chemical Oxygen Demand (COD)	**12**	**11**	**1**	**Yes**
Chloride	**12**	**0**	**12**	**Yes**
Chlorobenzene	12	12	0	No
Chloroethane	12	12	0	No
Chloroform	12	12	0	No
Chloromethane	12	12	0	No
***cis*-1,2-Dichloroethene**	**12**	**11**	**1**	**Yes**
cis-1,3-Dichloropropene	12	12	0	No
Cobalt	**12**	**4**	**8**	**Yes**
Conductivity	**12**	**0**	**12**	**Yes**
Copper	**12**	**2**	**10**	**Yes**
Cyanide	12	12	0	No
Dibromochloromethane	12	12	0	No
Dibromomethane	12	12	0	No
Dimethylbenzene, Total	12	12	0	No
Dissolved Oxygen	**12**	**0**	**12**	**Yes**
Dissolved Solids	**12**	**0**	**12**	**Yes**

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

Parameters	Observations	Censored Observation	Uncensored Observation	Statistical Analysis?
Ethylbenzene	12	12	0	No
Iodide	12	12	0	No
Iodomethane	12	12	0	No
Iron	**12**	**2**	**10**	**Yes**
Magnesium	**12**	**0**	**12**	**Yes**
Manganese	**12**	**2**	**10**	**Yes**
Methylene chloride	12	12	0	No
Molybdenum	**12**	**6**	**6**	**Yes**
Nickel	**12**	**2**	**10**	**Yes**
Oxidation-Reduction Potential	**12**	**0**	**12**	**Yes**
pH	**12**	**0**	**12**	**Yes**
Potassium	**12**	**0**	**12**	**Yes**
Radium-226	**12**	**11**	**1**	**Yes**
Rhodium	12	12	0	No
Sodium	**12**	**0**	**12**	**Yes**
Styrene	12	12	0	No
Sulfate	**12**	**0**	**12**	**Yes**
Tantalum	12	12	0	No
Technetium-99	**12**	**8**	**4**	**Yes**
Tetrachloroethene	12	12	0	No
Thallium	12	12	0	No
Thorium-230	12	12	0	No
Toluene	12	12	0	No
Total Organic Carbon (TOC)	**12**	**0**	**12**	**Yes**
Total Organic Halides (TOX)	**12**	**0**	**12**	**Yes**
trans-1,2-Dichloroethene	12	12	0	No
trans-1,3-Dichloropropene	12	12	0	No
trans-1,4-Dichloro-2-Butene	12	12	0	No
Trichloroethene	**12**	**5**	**7**	**Yes**
Trichlorofluoromethane	12	12	0	No
Uranium	12	12	0	No
Vanadium	12	12	0	No
Vinyl Acetate	12	12	0	No
Zinc	**12**	**10**	**2**	**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	7	0	No
Acrolein	7	7	0	No
Acrylonitrile	7	7	0	No
Aluminum	**7**	**4**	**3**	**Yes**
Antimony	7	7	0	No
Aroclor-1268	2	2	0	No
Beryllium	7	7	0	No
Beta activity	**7**	**2**	**5**	**Yes**
Boron	**7**	**5**	**2**	**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	7	0	No
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**	**3**	**4**	**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

Parameters	Observations	Censored Observation	Uncensored Observation	Statistical Analysis?
Iron	**7**	**3**	**4**	**Yes**
Magnesium	**7**	**0**	**7**	**Yes**
Manganese	**7**	**2**	**5**	**Yes**
Methylene chloride	7	7	0	No
Molybdenum	**7**	**6**	**1**	**Yes**
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**	**5**	**2**	**Yes**
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**	**3**	**4**	**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**	**3**	**4**	**Yes**
trans-1,2-Dichloroethene	7	7	0	No
trans-1,3-Dichloropropene	7	7	0	No
trans-1,4-Dichloro-2-Butene	7	7	0	No
Trichloroethene	**7**	**1**	**6**	**Yes**
Trichlorofluoromethane	7	7	0	No
Uranium	7	7	0	No
Vanadium	7	7	0	No
Vinyl Acetate	7	7	0	No
Zinc	**7**	**4**	**3**	**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 upper 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 26, 29, and 28 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, oxidation-reduction potential, and technetium-99.

URGA

This quarter's results identified exceedances of historical background UTL for beta activity, calcium, chemical oxygen demand, conductivity, 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, conductivity, dissolved solids, magnesium, oxidation-reduction potential, radium-226, sodium, sulfate, technetium-99 and TOC.

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, radium-226, sulfate, technetium-99
MW390: Chemical oxygen demand, oxidation-reduction potential, technetium-99	**MW221:** Oxidation-reduction potential	**MW373:** Calcium, conductivity, dissolved solids, magnesium, oxidation-reduction potential, sulfate, total organic carbon
MW393: Oxidation-reduction potential	**MW222:** Oxidation-reduction potential	**MW385:** Beta activity, oxidation-reduction potential, sulfate, technetium-99
MW396: Oxidation-reduction potential	**MW223:** Oxidation-reduction potential, sulfate	**MW388:** Beta activity, oxidation-reduction potential, sulfate, technetium-99
	MW224: Oxidation-reduction potential	**MW392:** Oxidation-reduction potential
	MW369: Chemical oxygen demand, sodium	**MW395:** Oxidation-reduction potential
	MW372: Calcium, conductivity, dissolved solids, magnesium, sulfate, technetium-99	**MW397:** Oxidation-reduction potential, sodium
	MW384: Beta activity, oxidation-reduction potential, sulfate, technetium-99	
	MW387: Beta activity, oxidation-reduction potential, sulfate, technetium-99	
	MW391: Oxidation-reduction potential, sulfate	

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

Parameter	Performed Test	CV Normality Test*	Results of Tolerance Interval Test Conducted
Aluminum	Tolerance Interval	0.57	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 MW390.
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.
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.

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
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.
Uranium	Tolerance Interval	0.31	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.
Beta Activity[1]	Tolerance Interval	0.97	Current results exceed statistically derived historical background concentration in 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 concentration in MW372.
Chemical Oxygen Demand (COD)	Tolerance Interval	0.00	Current results exceed statistically derived historical background concentration in MW369.
Chloride	Tolerance Interval	0.23	No exceedance of statistically derived historical background concentration.
cis-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	Current results exceed statistically derived historical background concentration in MW372.
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.
Manganese	Tolerance Interval	2.16	No exceedance of statistically derived historical background concentration.

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

Parameter	Performed Test	CV Normality Test*	Results of Tolerance Interval Test Conducted
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, MW384, MW387, and MW391.
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.
Radium-226	Tolerance Interval	10.6	No exceedance of statistically derived historical background concentration.
Sodium	Tolerance Interval	0.24	Current results exceed statistically derived historical background concentration in MW369.
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 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.
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
Aluminum	Tolerance Interval	0.86	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.
Chloride	Tolerance Interval	0.23	No exceedance of statistically derived historical background concentration.
cis-1,2-Dichloroethene	Tolerance Interval	0.00	No exceedance of statistically derived historical background concentration.
Cobalt	Tolerance Interval	1.52	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.
Magnesium	Tolerance Interval	0.52	Current results exceed statistically derived historical background concentration in MW373.
Manganese	Tolerance Interval	1.49	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
Molybdenum	Tolerance Interval	1.45	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.
Radium-226	Tolerance Interval	10.7	Current results exceed statistically derived historical background concentration in MW370.
Sodium	Tolerance Interval	0.47	Current results exceed statistically derived historical background concentration in MW397.
Sulfate	Tolerance Interval	0.20	Current results exceed statistically derived historical background concentration in MW370, MW373, MW385, and MW388.
Technetium-99	Tolerance Interval	0.81	Current results exceed statistically derived historical background concentration in MW370, MW385, and MW388.
Total Organic Carbon (TOC)	Tolerance Interval	0.55	Current results exceed statistically derived historical background concentration in MW373.
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.
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 the UCRS, URGA, and LRGA, the concentrations from downgradient wells were compared to the one-sided TL calculated using the most recent eight quarters of data and are presented in Attachment D2 and the statistician qualification statement is presented in Attachment D3. For the UCRS, URGA, and LRGA, the test was applied to 3, 10, and 11 parameters, respectively, because these parameter concentrations exceeded the historical background TL. A summary of instances where downgradient well concentrations exceeded the TL calculated using current background data is shown in Exhibit D.10, presented by well number.

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

URGA	LRGA
MW369: Sodium	**MW370:** Beta activity, sulfate, technetium-99
MW372: Calcium, conductivity, magnesium, sulfate	**MW373:** Calcium, conductivity, dissolved solids, magnesium, sulfate, TOC
MW387: Beta activity, sulfate, technetium-99	**MW388:** Beta activity, sulfate, technetium-99
MW391: Sulfate	

UCRS

Because gradients in the UCRS are downward (vertical), there are no hydrogeologically downgradient UCRS wells. It should be noted, however, that the chemical oxygen demand (COD) and technetium-99 concentrations in one UCRS well (i.e., MW390) were higher than the current TL this quarter.

URGA

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

LRGA

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

Statistical Summary

Summaries of the statistical tests conducted on data obtained from wells in the UCRS, the URGA, and in 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	0.54	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.
Oxidation-Reduction Potential	Tolerance Interval	0.43	None of the test wells exceeded the upper TL, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically significant level.
Technetium-99	Tolerance Interval	5.09	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	0.50	MW384 and MW387 exceeded the upper TL, which is evidence of elevated concentration with respect to current background data.
Calcium	Tolerance Interval	0.15	MW372 exceeded the upper TL, which is evidence of elevated concentration with respect to current background data.
Chemical Oxygen Demand	Tolerance Interval	1.02	None of the test wells exceeded the upper TL, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically significant level.
Conductivity	Tolerance Interval	0.10	MW372 exceeded the upper TL, which is evidence of elevated concentration with respect to current background data.
Dissolved Solids	Tolerance Interval	0.42	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	0.16	MW372 exceeded the upper TL, which is evidence of elevated concentration with respect to current background data.
Oxidation-Reduction Potential	Tolerance Interval	0.25	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.
Sodium	Tolerance Interval	0.15	MW369 exceeded the upper TL, which is evidence of elevated concentration with respect to current background data.
Sulfate	Tolerance Interval	0.29	MW372, MW387, and MW391 exceeded the upper TL, which is evidence of elevated concentration with respect to current background data.
Technetium-99	Tolerance Interval	0.64	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	0.64	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.
Conductivity	Tolerance Interval	0.08	MW373 exceeded the upper TL, which is evidence of elevated concentration with respect to current background data.
Dissolved Solids	Tolerance Interval	0.14	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	0.23	None of the test wells exceeded the upper TL, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically significant level.
Radium-226	Tolerance Interval	0.98	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.
Sodium	Tolerance Interval	0.10	MW397 exceeded the upper TL, which is evidence of elevated concentration with respect to current background data.
Sulfate	Tolerance Interval	0.08	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	0.37	MW370, MW385, and MW388 exceeded the upper TL, which is evidence of elevated concentration with respect to current background data.
Total Organic Carbon	Tolerance Interval	0.22	MW373 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 Third Quarter 2016 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	No	0.05	N/A	-2.996	N/A
MW390	Downgradient	Yes	0.0416	NO	-3.180	N/A
MW393	Downgradient	Yes	0.0308	NO	-3.480	N/A
MW396	Upgradient	Yes	0.0487	NO	-3.022	N/A

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

Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

** Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009. D1-3

C-746-S/T Third Quarter 2016 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	No	0.00607	N/A	-5.104	N/A
MW390	Downgradient	Yes	0.00912	N/A	-4.697	NO
MW393	Downgradient	Yes	0.0426	N/A	-3.156	NO
MW396	Upgradient	No	0.016	N/A	-4.135	N/A

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

Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

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

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the 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	0.173	NO	-1.754	N/A
MW390	Downgradient	Yes	0.661	NO	-0.414	N/A
MW393	Downgradient	Yes	0.174	NO	-1.749	N/A
MW396	Upgradient	Yes	1.15	NO	0.140	N/A

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

Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

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

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the 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	21.4	NO	3.063	N/A
MW390	Downgradient	Yes	33.8	NO	3.520	N/A
MW393	Downgradient	Yes	12.4	NO	2.518	N/A
MW396	Upgradient	Yes	18.8	NO	2.934	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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 Third Quarter 2016 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	34.9	N/A	3.552	N/A
MW390	Downgradient	Yes	55.6	YES	4.018	N/A
MW393	Downgradient	No	25.9	N/A	3.254	N/A
MW396	Upgradient	No	63.4	N/A	4.149	N/A

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

MW390

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

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

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

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

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

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

** Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-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 Third Quarter 2016 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	16.4	NO	2.797	N/A
MW390	Downgradient	Yes	66.3	NO	4.194	N/A
MW393	Downgradient	Yes	14.1	NO	2.646	N/A
MW396	Upgradient	Yes	73.1	NO	4.292	N/A

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

Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

** Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-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

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the 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	0.000182	N/A	-8.612	NO
MW390	Downgradient	Yes	0.000248	N/A	-8.302	NO
MW393	Downgradient	No	0.001	N/A	-6.908	N/A
MW396	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.

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the 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	606	NO	6.407	N/A
MW390	Downgradient	Yes	725	NO	6.586	N/A
MW393	Downgradient	Yes	416	NO	6.031	N/A
MW396	Upgradient	Yes	736	NO	6.601	N/A

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

Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

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

C-746-S/T Third Quarter 2016 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

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

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	0.00083	NO	-7.094	N/A
MW390	Downgradient	Yes	0.00127	NO	-6.669	N/A
MW393	Downgradient	Yes	0.00047	NO	-7.663	N/A
MW396	Upgradient	Yes	0.000464	NO	-7.676	N/A

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

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the 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	1.66	N/A	0.507	NO
MW390	Downgradient	Yes	7.02	N/A	1.949	NO
MW393	Downgradient	Yes	1.25	N/A	0.223	NO
MW396	Upgradient	Yes	2.82	N/A	1.037	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.   D1-12

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the 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	373	NO	5.922	N/A
MW390	Downgradient	Yes	391	NO	5.969	N/A
MW393	Downgradient	Yes	264	NO	5.576	N/A
MW396	Upgradient	Yes	420	NO	6.040	N/A

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

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the 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	0.0437	NO	-3.130	N/A
MW390	Downgradient	Yes	0.104	NO	-2.263	N/A
MW393	Downgradient	Yes	0.821	NO	-0.197	N/A
MW396	Upgradient	Yes	0.116	NO	-2.154	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 = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

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

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

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-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 Third Quarter 2016 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	9.1	NO	2.208	N/A
MW390	Downgradient	Yes	13.3	NO	2.588	N/A
MW393	Downgradient	Yes	3.4	NO	1.224	N/A
MW396	Upgradient	Yes	8.01	NO	2.081	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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 Third Quarter 2016 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	0.0289	NO	-3.544	N/A
MW390	Downgradient	No	0.005	N/A	-5.298	N/A
MW393	Downgradient	Yes	0.0188	NO	-3.974	N/A
MW396	Upgradient	Yes	0.00289	NO	-5.846	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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 Third Quarter 2016 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	0.000586	N/A	-7.442	N/A
MW390	Downgradient	Yes	0.000657	N/A	-7.328	NO
MW393	Downgradient	No	0.0005	N/A	-7.601	N/A
MW396	Upgradient	No	0.0005	N/A	-7.601	N/A

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

Conclusion of Statistical Analysis on Historical Data

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

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.
CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.
S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5
TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)
X Mean, X = (sum of background results)/(count of background results)
** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.* D1-17

C-746-S/T Third Quarter 2016 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	0.00075	N/A	-7.195	NO
MW390	Downgradient	Yes	0.00202	N/A	-6.205	NO
MW393	Downgradient	No	0.002	N/A	-6.215	N/A
MW396	Upgradient	Yes	0.000793	N/A	-7.140	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 Third Quarter 2016 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 possbile 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	366	N/A	5.903	YES
MW390	Downgradient	Yes	419	N/A	6.038	YES
MW393	Downgradient	Yes	420	N/A	6.040	YES
MW396	Upgradient	Yes	339	N/A	5.826	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 = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

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

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

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

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the 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	6.78	NO	1.914	N/A
MW390	Downgradient	Yes	6.48	NO	1.869	N/A
MW393	Downgradient	Yes	6.45	NO	1.864	N/A
MW396	Upgradient	Yes	6.63	NO	1.892	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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.*   D1-20

C-746-S/T Third Quarter 2016 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	0.326	NO	-1.121	N/A
MW390	Downgradient	Yes	0.369	NO	-0.997	N/A
MW393	Downgradient	Yes	0.437	NO	-0.828	N/A
MW396	Upgradient	Yes	1.78	NO	0.577	N/A

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

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the 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	97.1	NO	4.576	N/A
MW390	Downgradient	Yes	96.9	NO	4.574	N/A
MW393	Downgradient	Yes	77	NO	4.344	N/A
MW396	Upgradient	Yes	31.7	NO	3.456	N/A

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

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the 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	45.5	NO	3.818	N/A
MW390	Downgradient	Yes	45.5	NO	3.818	N/A
MW393	Downgradient	Yes	15.8	NO	2.760	N/A
MW396	Upgradient	Yes	23.8	NO	3.170	N/A

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

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the 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	-4.05	N/A	#Error	N/A
MW390	Downgradient	Yes	58.4	YES	4.067	N/A
MW393	Downgradient	No	6.59	N/A	1.886	N/A
MW396	Upgradient	No	3.89	N/A	1.358	N/A

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

Conclusion of Statistical Analysis on Historical Data

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

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

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

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-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

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the 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	4.73	NO	1.554	N/A
MW390	Downgradient	Yes	2.46	NO	0.900	N/A
MW393	Downgradient	Yes	2.44	NO	0.892	N/A
MW396	Upgradient	Yes	4.98	NO	1.605	N/A

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

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the 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	130	NO	4.868	N/A
MW390	Downgradient	Yes	27.3	NO	3.307	N/A
MW393	Downgradient	Yes	15.4	NO	2.734	N/A
MW396	Upgradient	Yes	65.7	NO	4.185	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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 Third Quarter 2016 Statistical Analysis	Historical Background Comparison
Uranium 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=** 0.001	**S=** 0.000	**CV(1)=** 0.314	**K factor**=** 3.188	**TL(1)=** 0.002	**LL(1)=** N/A
Statistics-Transformed Background Data	**X=** -6.821	**S=** 0.245	**CV(2)=** -0.036	**K factor**=** 3.188	**TL(2)=** -6.040	**LL(2)=** N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW396

Date Collected	Result	LN(Result)
8/13/2002	0.002	-6.215
9/16/2002	0.001	-6.908
10/16/2002	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
1/14/2004	0.001	-6.908

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	0.0002	N/A	-8.517	N/A
MW390	Downgradient	Yes	0.000148	NO	-8.818	N/A
MW393	Downgradient	No	0.0002	N/A	-8.517	N/A
MW396	Upgradient	No	0.0002	N/A	-8.517	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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 Third Quarter 2016 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	0.01	N/A	-4.605	N/A
MW390	Downgradient	Yes	0.00385	NO	-5.560	N/A
MW393	Downgradient	No	0.01	N/A	-4.605	N/A
MW396	Upgradient	Yes	0.00489	NO	-5.321	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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 Third Quarter 2016 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	Yes	0.023	NO	-3.772	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	Yes	0.054	NO	-2.919	N/A
MW372	Downgradient	Yes	0.112	NO	-2.189	N/A
MW384	Sidegradient	Yes	0.143	NO	-1.945	N/A
MW387	Downgradient	No	0.05	N/A	-2.996	N/A
MW391	Downgradient	Yes	0.0267	NO	-3.623	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. D1-29

C-746-S/T Third Quarter 2016 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	Yes	6.61	N/A	1.889	N/A
MW221	Sidegradient	Yes	7.55	N/A	2.022	N/A
MW222	Sidegradient	Yes	4.52	N/A	1.509	N/A
MW223	Sidegradient	Yes	3.72	N/A	1.314	N/A
MW224	Sidegradient	Yes	4.04	N/A	1.396	N/A
MW369	Downgradient	Yes	22.3	N/A	3.105	N/A
MW372	Downgradient	Yes	21.5	N/A	3.068	N/A
MW384	Sidegradient	Yes	99.2	YES	4.597	N/A
MW387	Downgradient	Yes	103	YES	4.635	N/A
MW391	Downgradient	No	1.91	N/A	0.647	N/A
MW394	Upgradient	No	4.04	N/A	1.396	N/A

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

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.   D1-30

C-746-S/T Third Quarter 2016 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	No	0.00961	N/A	-4.645	N/A
MW221	Sidegradient	Yes	0.0122	N/A	-4.406	NO
MW222	Sidegradient	Yes	0.00911	N/A	-4.698	NO
MW223	Sidegradient	Yes	0.00834	N/A	-4.787	NO
MW224	Sidegradient	Yes	0.0182	N/A	-4.006	NO
MW369	Downgradient	Yes	0.115	N/A	-2.163	NO
MW372	Downgradient	Yes	1.08	N/A	0.077	NO
MW384	Sidegradient	No	0.0133	N/A	-4.320	N/A
MW387	Downgradient	No	0.0322	N/A	-3.436	N/A
MW391	Downgradient	Yes	0.19	N/A	-1.661	NO
MW394	Upgradient	Yes	0.0388	N/A	-3.249	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

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

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Historical Background Data from Upgradient Wells with Transformed Result

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	0.229	NO	-1.474	N/A
MW221	Sidegradient	Yes	0.453	NO	-0.792	N/A
MW222	Sidegradient	Yes	0.442	NO	-0.816	N/A
MW223	Sidegradient	Yes	0.418	NO	-0.872	N/A
MW224	Sidegradient	Yes	0.49	NO	-0.713	N/A
MW369	Downgradient	Yes	0.406	NO	-0.901	N/A
MW372	Downgradient	Yes	0.623	NO	-0.473	N/A
MW384	Sidegradient	Yes	0.358	NO	-1.027	N/A
MW387	Downgradient	Yes	0.317	NO	-1.149	N/A
MW391	Downgradient	Yes	0.566	NO	-0.569	N/A
MW394	Upgradient	Yes	0.642	NO	-0.443	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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 Third Quarter 2016 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

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Historical Background Data from Upgradient Wells with Transformed Result

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	19.5	NO	2.970	N/A
MW221	Sidegradient	Yes	22.3	NO	3.105	N/A
MW222	Sidegradient	Yes	20.1	NO	3.001	N/A
MW223	Sidegradient	Yes	21.7	NO	3.077	N/A
MW224	Sidegradient	Yes	24.7	NO	3.207	N/A
MW369	Downgradient	Yes	16.9	NO	2.827	N/A
MW372	Downgradient	Yes	51.6	YES	3.944	N/A
MW384	Sidegradient	Yes	25.4	NO	3.235	N/A
MW387	Downgradient	Yes	26	NO	3.258	N/A
MW391	Downgradient	Yes	35.8	NO	3.578	N/A
MW394	Upgradient	Yes	28.8	NO	3.360	N/A

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

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

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	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	No	33.1	N/A	3.500	N/A
MW221	Sidegradient	No	18.1	N/A	2.896	N/A
MW222	Sidegradient	No	33.1	N/A	3.500	N/A
MW223	Sidegradient	No	25.6	N/A	3.243	N/A
MW224	Sidegradient	No	20	N/A	2.996	N/A
MW369	Downgradient	Yes	37.1	YES	3.614	N/A
MW372	Downgradient	No	75.9	N/A	4.329	N/A
MW384	Sidegradient	No	27.7	N/A	3.321	N/A
MW387	Downgradient	No	36.6	N/A	3.600	N/A
MW391	Downgradient	No	40.2	N/A	3.694	N/A
MW394	Upgradient	No	34.9	N/A	3.552	N/A

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

MW369

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

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

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

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

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

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

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*   D1-34

C-746-S/T Third Quarter 2016 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

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

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	21.7	NO	3.077	N/A
MW221	Sidegradient	Yes	32.9	NO	3.493	N/A
MW222	Sidegradient	Yes	32.9	NO	3.493	N/A
MW223	Sidegradient	Yes	31.2	NO	3.440	N/A
MW224	Sidegradient	Yes	36.1	NO	3.586	N/A
MW369	Downgradient	Yes	35.4	NO	3.567	N/A
MW372	Downgradient	Yes	46.5	NO	3.839	N/A
MW384	Sidegradient	Yes	37.4	NO	3.622	N/A
MW387	Downgradient	Yes	34.5	NO	3.541	N/A
MW391	Downgradient	Yes	43.5	NO	3.773	N/A
MW394	Upgradient	Yes	49.5	NO	3.902	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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. D1-35

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the 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	1	N/A	0.000	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	Yes	0.59	NO	-0.528	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.

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

Because CV(1) is greater than 1, the natural logarithm of background and test well results were calculated utilizing TL(2) for comparison.

Historical Background Data from Upgradient Wells with Transformed Result

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	Yes	0.000118	N/A	-9.045	NO
MW221	Sidegradient	Yes	0.00025	N/A	-8.294	NO
MW222	Sidegradient	Yes	0.000427	N/A	-7.759	NO
MW223	Sidegradient	Yes	0.000448	N/A	-7.711	NO
MW224	Sidegradient	Yes	0.000324	N/A	-8.035	NO
MW369	Downgradient	Yes	0.0064	N/A	-5.051	NO
MW372	Downgradient	Yes	0.000515	N/A	-7.571	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.*   D1-37

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the 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	346	NO	5.846	N/A
MW221	Sidegradient	Yes	394	NO	5.976	N/A
MW222	Sidegradient	Yes	365	NO	5.900	N/A
MW223	Sidegradient	Yes	396	NO	5.981	N/A
MW224	Sidegradient	Yes	443	NO	6.094	N/A
MW369	Downgradient	Yes	391	NO	5.969	N/A
MW372	Downgradient	Yes	694	YES	6.542	N/A
MW384	Sidegradient	Yes	457	NO	6.125	N/A
MW387	Downgradient	Yes	465	NO	6.142	N/A
MW391	Downgradient	Yes	493	NO	6.201	N/A
MW394	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

Wells with Exceedances

MW372

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

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

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

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

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

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

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for 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 Third Quarter 2016 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	0.000732	NO	-7.220	N/A
MW221	Sidegradient	Yes	0.000855	NO	-7.064	N/A
MW222	Sidegradient	Yes	0.000801	NO	-7.130	N/A
MW223	Sidegradient	Yes	0.0011	NO	-6.812	N/A
MW224	Sidegradient	Yes	0.000844	NO	-7.077	N/A
MW369	Downgradient	Yes	0.00178	NO	-6.331	N/A
MW372	Downgradient	No	0.001	N/A	-6.908	N/A
MW384	Sidegradient	Yes	0.00221	NO	-6.115	N/A
MW387	Downgradient	Yes	0.000517	NO	-7.567	N/A
MW391	Downgradient	No	0.001	N/A	-6.908	N/A
MW394	Upgradient	Yes	0.000376	NO	-7.886	N/A

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

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the 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	6.33	NO	1.845	N/A
MW221	Sidegradient	Yes	4.68	NO	1.543	N/A
MW222	Sidegradient	Yes	3.79	NO	1.332	N/A
MW223	Sidegradient	Yes	4.09	NO	1.409	N/A
MW224	Sidegradient	Yes	3.61	NO	1.284	N/A
MW369	Downgradient	Yes	2.4	NO	0.875	N/A
MW372	Downgradient	Yes	1.13	NO	0.122	N/A
MW384	Sidegradient	Yes	5.17	NO	1.643	N/A
MW387	Downgradient	Yes	5.08	NO	1.625	N/A
MW391	Downgradient	Yes	3.7	NO	1.308	N/A
MW394	Upgradient	Yes	4.91	NO	1.591	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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.* D1-40

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the 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	200	NO	5.298	N/A
MW221	Sidegradient	Yes	187	NO	5.231	N/A
MW222	Sidegradient	Yes	200	NO	5.298	N/A
MW223	Sidegradient	Yes	199	NO	5.293	N/A
MW224	Sidegradient	Yes	234	NO	5.455	N/A
MW369	Downgradient	Yes	213	NO	5.361	N/A
MW372	Downgradient	Yes	381	YES	5.943	N/A
MW384	Sidegradient	Yes	259	NO	5.557	N/A
MW387	Downgradient	Yes	259	NO	5.557	N/A
MW391	Downgradient	Yes	273	NO	5.609	N/A
MW394	Upgradient	Yes	231	NO	5.442	N/A

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

MW372

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

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

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

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

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

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

** Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.   D1-41

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the 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	No	0.1	N/A	-2.303	N/A
MW221	Sidegradient	Yes	0.0539	N/A	-2.921	NO
MW222	Sidegradient	Yes	0.0771	N/A	-2.563	NO
MW223	Sidegradient	Yes	0.0471	N/A	-3.055	NO
MW224	Sidegradient	Yes	0.0669	N/A	-2.705	NO
MW369	Downgradient	Yes	0.213	N/A	-1.546	NO
MW372	Downgradient	Yes	2.14	N/A	0.761	NO
MW384	Sidegradient	No	0.1	N/A	-2.303	N/A
MW387	Downgradient	Yes	0.0374	N/A	-3.286	NO
MW391	Downgradient	Yes	0.156	N/A	-1.858	NO
MW394	Upgradient	Yes	0.037	N/A	-3.297	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.   D1-42

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the 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	7.99	NO	2.078	N/A
MW221	Sidegradient	Yes	8.68	NO	2.161	N/A
MW222	Sidegradient	Yes	8.13	NO	2.096	N/A
MW223	Sidegradient	Yes	8.77	NO	2.171	N/A
MW224	Sidegradient	Yes	9.79	NO	2.281	N/A
MW369	Downgradient	Yes	7.18	NO	1.971	N/A
MW372	Downgradient	Yes	20.9	YES	3.040	N/A
MW384	Sidegradient	Yes	9.92	NO	2.295	N/A
MW387	Downgradient	Yes	11.2	NO	2.416	N/A
MW391	Downgradient	Yes	15	NO	2.708	N/A
MW394	Upgradient	Yes	11.7	NO	2.460	N/A

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

MW372

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

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

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

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

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

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

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

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

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	0.0306	-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

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW220	Upgradient	No	0.005	N/A	-5.298	N/A
MW221	Sidegradient	No	0.005	N/A	-5.298	N/A
MW222	Sidegradient	Yes	0.00842	N/A	-4.777	NO
MW223	Sidegradient	Yes	0.00252	N/A	-5.983	NO
MW224	Sidegradient	Yes	0.00618	N/A	-5.086	NO
MW369	Downgradient	Yes	0.0321	N/A	-3.439	NO
MW372	Downgradient	Yes	0.0287	N/A	-3.551	NO
MW384	Sidegradient	Yes	0.00694	N/A	-4.970	NO
MW387	Downgradient	Yes	0.00205	N/A	-6.190	NO
MW391	Downgradient	Yes	0.00281	N/A	-5.875	NO
MW394	Upgradient	Yes	0.0015	N/A	-6.502	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.*

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the 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	No	0.000981	N/A	-6.927	N/A
MW221	Sidegradient	Yes	0.00244	N/A	-6.016	NO
MW222	Sidegradient	Yes	0.000254	N/A	-8.278	NO
MW223	Sidegradient	Yes	0.0094	N/A	-4.667	NO
MW224	Sidegradient	Yes	0.000622	N/A	-7.383	NO
MW369	Downgradient	No	0.000168	N/A	-8.692	N/A
MW372	Downgradient	Yes	0.000373	N/A	-7.894	NO
MW384	Sidegradient	No	0.0005	N/A	-7.601	N/A
MW387	Downgradient	No	0.0005	N/A	-7.601	N/A
MW391	Downgradient	No	0.0005	N/A	-7.601	N/A
MW394	Upgradient	No	0.0005	N/A	-7.601	N/A

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

Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*   D1-45

C-746-S/T Third Quarter 2016 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

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

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	Yes	0.0316	N/A	-3.455	NO
MW221	Sidegradient	Yes	0.0141	N/A	-4.262	NO
MW222	Sidegradient	Yes	0.0731	N/A	-2.616	NO
MW223	Sidegradient	Yes	0.275	N/A	-1.291	NO
MW224	Sidegradient	Yes	0.00459	N/A	-5.384	NO
MW369	Downgradient	Yes	0.00887	N/A	-4.725	NO
MW372	Downgradient	Yes	0.00124	N/A	-6.693	NO
MW384	Sidegradient	No	0.002	N/A	-6.215	N/A
MW387	Downgradient	No	0.002	N/A	-6.215	N/A
MW391	Downgradient	Yes	0.000629	N/A	-7.371	NO
MW394	Upgradient	Yes	0.00232	N/A	-6.066	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.*   D1-46

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the 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	425	YES	6.052	N/A
MW221	Sidegradient	Yes	410	YES	6.016	N/A
MW222	Sidegradient	Yes	426	YES	6.054	N/A
MW223	Sidegradient	Yes	428	YES	6.059	N/A
MW224	Sidegradient	Yes	427	YES	6.057	N/A
MW369	Downgradient	Yes	323	NO	5.778	N/A
MW372	Downgradient	Yes	248	NO	5.513	N/A
MW384	Sidegradient	Yes	436	YES	6.078	N/A
MW387	Downgradient	Yes	421	YES	6.043	N/A
MW391	Downgradient	Yes	430	YES	6.064	N/A
MW394	Upgradient	Yes	348	NO	5.852	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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
MW221
MW222
MW223
MW224
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.*   D1-47

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the 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	6.68	NO	1.899	N/A
MW221	Sidegradient	Yes	6.5	NO	1.872	N/A
MW222	Sidegradient	Yes	6.41	NO	1.858	N/A
MW223	Sidegradient	Yes	6.3	NO	1.841	N/A
MW224	Sidegradient	Yes	6.38	NO	1.853	N/A
MW369	Downgradient	Yes	6.42	NO	1.859	N/A
MW372	Downgradient	Yes	6.64	NO	1.893	N/A
MW384	Sidegradient	Yes	6.32	NO	1.844	N/A
MW387	Downgradient	Yes	6.33	NO	1.845	N/A
MW391	Downgradient	Yes	6.29	NO	1.839	N/A
MW394	Upgradient	Yes	6.26	NO	1.834	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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.* D1-48

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the 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	2.69	N/A	0.990	NO
MW221	Sidegradient	Yes	1.18	N/A	0.166	NO
MW222	Sidegradient	Yes	0.881	N/A	-0.127	NO
MW223	Sidegradient	Yes	2.99	N/A	1.095	NO
MW224	Sidegradient	Yes	0.927	N/A	-0.076	NO
MW369	Downgradient	Yes	0.468	N/A	-0.759	NO
MW372	Downgradient	Yes	2.38	N/A	0.867	NO
MW384	Sidegradient	Yes	1.05	N/A	0.049	NO
MW387	Downgradient	Yes	1.61	N/A	0.476	NO
MW391	Downgradient	Yes	1.72	N/A	0.542	NO
MW394	Upgradient	Yes	1.49	N/A	0.399	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.*   D1-49

C-746-S/T Third Quarter 2016 Statistical Analysis   Historical Background Comparison

Radium-226   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=** 0.036	**S=** 0.382	**CV(1)=** 10.588	**K factor**=** 2.523	**TL(1)=** 1.001	**LL(1)=** N/A
Statistics-Transformed Background Data	**X=** -1.873	**S=** 1.110	**CV(2)=** -0.592	**K factor**=** 2.523	**TL(2)=** -0.538	**LL(2)=** N/A

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 possbile for all background values, the TL was considered equal to the maximum background value.

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW220

Date Collected	Result	LN(Result)
10/14/2002	-0.804	#Func!
1/15/2003	0	#Func!
10/13/2003	0.389	-0.944
1/13/2004	-0.12	#Func!
4/13/2004	0.159	-1.839
7/21/2004	0.382	-0.962
10/11/2004	0.211	-1.556
1/20/2005	0.229	-1.474

Well Number: MW394

Date Collected	Result	LN(Result)
10/16/2002	0.584	-0.538
1/13/2003	-0.839	#Func!
10/14/2003	0.0325	-3.427
1/13/2004	-0.00402	#Func!
4/12/2004	-0.000337	#Func!
7/20/2004	0.29	-1.238
10/12/2004	0.0366	-3.308
1/18/2005	0.0319	-3.445

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW220	Upgradient	No	0.375	N/A	-0.981	N/A
MW221	Sidegradient	No	0.246	N/A	-1.402	N/A
MW222	Sidegradient	No	0.297	N/A	-1.214	N/A
MW223	Sidegradient	No	0.433	N/A	-0.837	N/A
MW224	Sidegradient	No	0.632	N/A	-0.459	N/A
MW369	Downgradient	Yes	0.499	N/A	-0.695	NO
MW372	Downgradient	No	0.108	N/A	-2.226	N/A
MW384	Sidegradient	No	0.0501	N/A	-2.994	N/A
MW387	Downgradient	No	0.685	N/A	-0.378	N/A
MW391	Downgradient	No	0.536	N/A	-0.624	N/A
MW394	Upgradient	No	0.405	N/A	-0.904	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 = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

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

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

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

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the 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	39.8	NO	3.684	N/A
MW221	Sidegradient	Yes	43.2	NO	3.766	N/A
MW222	Sidegradient	Yes	41.4	NO	3.723	N/A
MW223	Sidegradient	Yes	43.9	NO	3.782	N/A
MW224	Sidegradient	Yes	54.2	NO	3.993	N/A
MW369	Downgradient	Yes	58.9	YES	4.076	N/A
MW372	Downgradient	Yes	48.5	NO	3.882	N/A
MW384	Sidegradient	Yes	56.3	NO	4.031	N/A
MW387	Downgradient	Yes	48	NO	3.871	N/A
MW391	Downgradient	Yes	38.8	NO	3.658	N/A
MW394	Upgradient	Yes	31.4	NO	3.447	N/A

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

MW369

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

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

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

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

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

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

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

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

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Historical Background Data from Upgradient Wells with Transformed Result

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	17.9	YES	2.885	N/A
MW221	Sidegradient	Yes	14	NO	2.639	N/A
MW222	Sidegradient	Yes	11.9	NO	2.477	N/A
MW223	Sidegradient	Yes	18	YES	2.890	N/A
MW224	Sidegradient	Yes	15.2	NO	2.721	N/A
MW369	Downgradient	Yes	5.64	NO	1.730	N/A
MW372	Downgradient	Yes	102	YES	4.625	N/A
MW384	Sidegradient	Yes	21.3	YES	3.059	N/A
MW387	Downgradient	Yes	25.7	YES	3.246	N/A
MW391	Downgradient	Yes	54.3	YES	3.995	N/A
MW394	Upgradient	Yes	10.5	NO	2.351	N/A

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

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

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 possbile 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)
MW220	Upgradient	Yes	28.9	NO	3.364	N/A
MW221	Sidegradient	No	14.3	N/A	2.660	N/A
MW222	Sidegradient	No	5.82	N/A	1.761	N/A
MW223	Sidegradient	No	5.76	N/A	1.751	N/A
MW224	Sidegradient	No	9.75	N/A	2.277	N/A
MW369	Downgradient	No	10.7	N/A	2.370	N/A
MW372	Downgradient	Yes	35.4	YES	3.567	N/A
MW384	Sidegradient	Yes	192	YES	5.257	N/A
MW387	Downgradient	Yes	214	YES	5.366	N/A
MW391	Downgradient	No	13.7	N/A	2.617	N/A
MW394	Upgradient	No	5.87	N/A	1.770	N/A

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

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.*   D1-53

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

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Historical Background Data from Upgradient Wells with Transformed Result

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	0.9	NO	-0.105	N/A
MW221	Sidegradient	Yes	0.746	NO	-0.293	N/A
MW222	Sidegradient	Yes	0.759	NO	-0.276	N/A
MW223	Sidegradient	Yes	0.851	NO	-0.161	N/A
MW224	Sidegradient	Yes	1.22	NO	0.199	N/A
MW369	Downgradient	Yes	1.47	NO	0.385	N/A
MW372	Downgradient	Yes	3.13	NO	1.141	N/A
MW384	Sidegradient	Yes	1.19	NO	0.174	N/A
MW387	Downgradient	Yes	1.07	NO	0.068	N/A
MW391	Downgradient	Yes	0.951	NO	-0.050	N/A
MW394	Upgradient	Yes	0.861	NO	-0.150	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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 Third Quarter 2016 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	4.1	N/A	1.411	NO
MW221	Sidegradient	Yes	4.42	N/A	1.486	NO
MW222	Sidegradient	Yes	3.62	N/A	1.286	NO
MW223	Sidegradient	Yes	8.24	N/A	2.109	NO
MW224	Sidegradient	Yes	4.92	N/A	1.593	NO
MW369	Downgradient	Yes	30.1	N/A	3.405	NO
MW372	Downgradient	Yes	11.4	N/A	2.434	NO
MW384	Sidegradient	Yes	4.52	N/A	1.509	NO
MW387	Downgradient	Yes	6.12	N/A	1.812	NO
MW391	Downgradient	Yes	10.5	N/A	2.351	NO
MW394	Upgradient	Yes	7.8	N/A	2.054	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.*   D1-55

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the 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	0.78	N/A	-0.248	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	0.41	N/A	-0.892	N/A
MW372	Downgradient	Yes	10.8	NO	2.380	N/A
MW384	Sidegradient	Yes	0.33	N/A	-1.109	N/A
MW387	Downgradient	Yes	0.6	N/A	-0.511	N/A
MW391	Downgradient	Yes	11.4	NO	2.434	N/A
MW394	Upgradient	Yes	6.27	NO	1.836	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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.*   D1-56

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the 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	0.01	N/A	-4.605	N/A
MW221	Sidegradient	No	0.01	N/A	-4.605	N/A
MW222	Sidegradient	No	0.01	N/A	-4.605	N/A
MW223	Sidegradient	No	0.01	N/A	-4.605	N/A
MW224	Sidegradient	No	0.01	N/A	-4.605	N/A
MW369	Downgradient	Yes	0.00377	NO	-5.581	N/A
MW372	Downgradient	Yes	0.00589	NO	-5.134	N/A
MW384	Sidegradient	No	0.01	N/A	-4.605	N/A
MW387	Downgradient	No	0.01	N/A	-4.605	N/A
MW391	Downgradient	No	0.01	N/A	-4.605	N/A
MW394	Upgradient	No	0.01	N/A	-4.605	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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.   D1-57

C-746-S/T Third Quarter 2016 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	No	0.05	N/A	-2.996	N/A
MW388	Downgradient	Yes	0.0287	NO	-3.551	N/A
MW392	Downgradient	Yes	0.0159	NO	-4.141	N/A
MW395	Upgradient	No	0.05	N/A	-2.996	N/A
MW397	Upgradient	Yes	0.0897	NO	-2.411	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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.* D1-58

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

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	1.09	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

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW370	Downgradient	Yes	58	YES	4.060	N/A
MW373	Downgradient	Yes	18.1	N/A	2.896	N/A
MW385	Sidegradient	Yes	108	YES	4.682	N/A
MW388	Downgradient	Yes	97.1	YES	4.576	N/A
MW392	Downgradient	No	0.454	N/A	-0.790	N/A
MW395	Upgradient	No	-1.87	N/A	#Error	N/A
MW397	Upgradient	Yes	7.53	N/A	2.019	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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.*   D1-59

C-746-S/T Third Quarter 2016 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

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

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)
MW370	Downgradient	Yes	0.0311	N/A	-3.471	NO
MW373	Downgradient	Yes	1.34	N/A	0.293	NO
MW385	Sidegradient	No	0.0163	N/A	-4.117	N/A
MW388	Downgradient	No	0.0177	N/A	-4.034	N/A
MW392	Downgradient	No	0.0326	N/A	-3.423	N/A
MW395	Upgradient	No	0.0325	N/A	-3.427	N/A
MW397	Upgradient	No	0.0132	N/A	-4.328	N/A

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

Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

** Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.   D1-60

C-746-S/T Third Quarter 2016 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

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Historical Background Data from Upgradient Wells with Transformed Result

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	0.4	NO	-0.916	N/A
MW373	Downgradient	Yes	0.607	NO	-0.499	N/A
MW385	Sidegradient	Yes	0.259	NO	-1.351	N/A
MW388	Downgradient	Yes	0.305	NO	-1.187	N/A
MW392	Downgradient	Yes	0.684	NO	-0.380	N/A
MW395	Upgradient	Yes	0.618	NO	-0.481	N/A
MW397	Upgradient	Yes	0.485	NO	-0.724	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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.   D1-61

C-746-S/T Third Quarter 2016 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	26.7	NO	3.285	N/A
MW373	Downgradient	Yes	57.2	YES	4.047	N/A
MW385	Sidegradient	Yes	29.5	NO	3.384	N/A
MW388	Downgradient	Yes	21.8	NO	3.082	N/A
MW392	Downgradient	Yes	27.2	NO	3.303	N/A
MW395	Upgradient	Yes	26.3	NO	3.270	N/A
MW397	Upgradient	Yes	35.1	NO	3.558	N/A

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

MW373

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

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

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

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

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

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

** Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.   D1-62

C-746-S/T Third Quarter 2016 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

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Historical Background Data from Upgradient Wells with Transformed Result

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	36	NO	3.584	N/A
MW373	Downgradient	Yes	48.5	NO	3.882	N/A
MW385	Sidegradient	Yes	30.6	NO	3.421	N/A
MW388	Downgradient	Yes	31.7	NO	3.456	N/A
MW392	Downgradient	Yes	46.9	NO	3.848	N/A
MW395	Upgradient	Yes	48.8	NO	3.888	N/A
MW397	Upgradient	Yes	38.9	NO	3.661	N/A

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

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

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

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

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	0.77	NO	-0.261	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 = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

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

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

** Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.   D1-64

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

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

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)
MW370	Downgradient	Yes	0.000578	N/A	-7.456	NO
MW373	Downgradient	No	0.001	N/A	-6.908	N/A
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	0.000252	N/A	-8.286	NO
MW395	Upgradient	No	0.001	N/A	-6.908	N/A
MW397	Upgradient	Yes	0.000731	N/A	-7.221	NO

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

Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

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

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

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	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	423	NO	6.047	N/A
MW373	Downgradient	Yes	703	YES	6.555	N/A
MW385	Sidegradient	Yes	439	NO	6.084	N/A
MW388	Downgradient	Yes	390	NO	5.966	N/A
MW392	Downgradient	Yes	435	NO	6.075	N/A
MW395	Upgradient	Yes	394	NO	5.976	N/A
MW397	Upgradient	Yes	333	NO	5.808	N/A

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

MW373

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

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

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

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

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

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

** Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-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 Third Quarter 2016 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

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Historical Background Data from Upgradient Wells with Transformed Result

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	0.000438	NO	-7.733	N/A
MW373	Downgradient	No	0.001	N/A	-6.908	N/A
MW385	Sidegradient	Yes	0.000522	NO	-7.558	N/A
MW388	Downgradient	Yes	0.000772	NO	-7.167	N/A
MW392	Downgradient	No	0.001	N/A	-6.908	N/A
MW395	Upgradient	No	0.001	N/A	-6.908	N/A
MW397	Upgradient	Yes	0.00122	NO	-6.709	N/A

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

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

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Historical Background Data from Upgradient Wells with Transformed Result

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	3.48	NO	1.247	N/A
MW373	Downgradient	Yes	2.39	NO	0.871	N/A
MW385	Sidegradient	Yes	2.21	NO	0.793	N/A
MW388	Downgradient	Yes	5.37	NO	1.681	N/A
MW392	Downgradient	Yes	1.14	NO	0.131	N/A
MW395	Upgradient	Yes	4.65	NO	1.537	N/A
MW397	Upgradient	Yes	5.55	NO	1.714	N/A

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

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

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	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

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW370	Downgradient	Yes	217	NO	5.380	N/A
MW373	Downgradient	Yes	399	YES	5.989	N/A
MW385	Sidegradient	Yes	239	NO	5.476	N/A
MW388	Downgradient	Yes	227	NO	5.425	N/A
MW392	Downgradient	Yes	229	NO	5.434	N/A
MW395	Upgradient	Yes	219	NO	5.389	N/A
MW397	Upgradient	Yes	169	NO	5.130	N/A

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

Conclusion of Statistical Analysis on Historical Data

Wells with Exceedances

MW373

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

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

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

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

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

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

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

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the 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	0.0808	N/A	-2.516	NO
MW373	Downgradient	No	0.1	N/A	-2.303	N/A
MW385	Sidegradient	No	0.1	N/A	-2.303	N/A
MW388	Downgradient	Yes	0.0701	N/A	-2.658	NO
MW392	Downgradient	Yes	0.23	N/A	-1.470	NO
MW395	Upgradient	No	0.1	N/A	-2.303	N/A
MW397	Upgradient	Yes	0.544	N/A	-0.609	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.*

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

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	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

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW370	Downgradient	Yes	11.8	NO	2.468	N/A
MW373	Downgradient	Yes	21.2	YES	3.054	N/A
MW385	Sidegradient	Yes	10.9	NO	2.389	N/A
MW388	Downgradient	Yes	9.5	NO	2.251	N/A
MW392	Downgradient	Yes	9.39	NO	2.240	N/A
MW395	Upgradient	Yes	11.1	NO	2.407	N/A
MW397	Upgradient	Yes	15.2	NO	2.721	N/A

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

MW373

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

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

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

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

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

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

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

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

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

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)
MW370	Downgradient	Yes	0.00668	N/A	-5.009	NO
MW373	Downgradient	No	0.005	N/A	-5.298	N/A
MW385	Sidegradient	Yes	0.00175	N/A	-6.348	NO
MW388	Downgradient	Yes	0.00125	N/A	-6.685	NO
MW392	Downgradient	Yes	0.149	N/A	-1.904	NO
MW395	Upgradient	No	0.005	N/A	-5.298	N/A
MW397	Upgradient	Yes	0.138	N/A	-1.981	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.*

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the 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)**=1.451	**K factor****= 2.523	**TL(1)**= 0.034	**LL(1)**=N/A
Statistics-Transformed Background Data	**X**= -5.990	**S**= 1.443	**CV(2)**= -0.241	**K factor****= 2.523	**TL(2)**= -2.349	**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	0.00609	-5.101
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

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	No	0.0005	N/A	-7.601	N/A
MW373	Downgradient	No	0.0005	N/A	-7.601	N/A
MW385	Sidegradient	No	0.000371	N/A	-7.899	N/A
MW388	Downgradient	No	0.0005	N/A	-7.601	N/A
MW392	Downgradient	No	0.000394	N/A	-7.839	N/A
MW395	Upgradient	No	0.0005	N/A	-7.601	N/A
MW397	Upgradient	Yes	0.00043	N/A	-7.752	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 Third Quarter 2016 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	0.000765	N/A	-7.176	NO
MW373	Downgradient	Yes	0.00057	N/A	-7.470	NO
MW385	Sidegradient	Yes	0.000842	N/A	-7.080	NO
MW388	Downgradient	Yes	0.000652	N/A	-7.335	NO
MW392	Downgradient	Yes	0.0012	N/A	-6.725	NO
MW395	Upgradient	Yes	0.000622	N/A	-7.383	NO
MW397	Upgradient	Yes	0.00116	N/A	-6.759	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.*   D1-74

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

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Historical Background Data from Upgradient Wells with Transformed Result

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	483	YES	6.180	N/A
MW373	Downgradient	Yes	337	YES	5.820	N/A
MW385	Sidegradient	Yes	382	YES	5.945	N/A
MW388	Downgradient	Yes	426	YES	6.054	N/A
MW392	Downgradient	Yes	409	YES	6.014	N/A
MW395	Upgradient	Yes	428	YES	6.059	N/A
MW397	Upgradient	Yes	420	YES	6.040	N/A

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

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the 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	5.8	NO	1.758	N/A
MW373	Downgradient	Yes	6.5	NO	1.872	N/A
MW385	Sidegradient	Yes	6.41	NO	1.858	N/A
MW388	Downgradient	Yes	6.15	NO	1.816	N/A
MW392	Downgradient	Yes	6.43	NO	1.861	N/A
MW395	Upgradient	Yes	6.26	NO	1.834	N/A
MW397	Upgradient	Yes	6.11	NO	1.810	N/A

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

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the 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	2.39	NO	0.871	N/A
MW373	Downgradient	Yes	2.52	NO	0.924	N/A
MW385	Sidegradient	Yes	1.78	NO	0.577	N/A
MW388	Downgradient	Yes	1.88	NO	0.631	N/A
MW392	Downgradient	Yes	1.85	NO	0.615	N/A
MW395	Upgradient	Yes	1.53	NO	0.425	N/A
MW397	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 = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

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

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

** Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-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

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

Statistics-Background Data	**X=** 0.039	**S=** 0.419	**CV(1)=** 10.740	**K factor**=** 2.523	**TL(1)=** 1.096	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -1.695	**S=** 1.043	**CV(2)=** -0.615	**K factor**=** 2.523	**TL(2)=** -0.414	**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.

#Because the natural log was not possbile for all background values, the TL was considered equal to the maximum background value.

Well Number: MW395

Date Collected	Result	LN(Result)
10/16/2002	0.661	-0.414
1/13/2003	-0.839	#Func!
10/14/2003	0.0266	-3.627
1/13/2004	-0.0777	#Func!
4/12/2004	-0.115	#Func!
7/20/2004	0.105	-2.254
10/12/2004	0.408	-0.896
1/18/2005	0.0564	-2.875

Well Number: MW397

Date Collected	Result	LN(Result)
10/17/2002	0.576	-0.552
1/13/2003	-0.841	#Func!
10/14/2003	-0.179	#Func!
1/13/2004	-0.0564	#Func!
4/12/2004	0.174	-1.749
7/21/2004	0.227	-1.483
10/12/2004	0.379	-0.970
1/20/2005	0.119	-2.129

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW370	Downgradient	Yes	0.887	N/A	-0.120	YES
MW373	Downgradient	Yes	0.564	N/A	-0.573	NO
MW385	Sidegradient	No	0.474	N/A	-0.747	N/A
MW388	Downgradient	No	0.386	N/A	-0.952	N/A
MW392	Downgradient	No	0.201	N/A	-1.604	N/A
MW395	Upgradient	No	0.654	N/A	-0.425	N/A
MW397	Upgradient	No	0.464	N/A	-0.768	N/A

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

Conclusion of Statistical Analysis on Historical Data

Wells with Exceedances

MW370

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

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

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

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

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

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

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*   D1-78

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

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Historical Background Data from Upgradient Wells with Transformed Result

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	41.8	NO	3.733	N/A
MW373	Downgradient	Yes	49.4	NO	3.900	N/A
MW385	Sidegradient	Yes	39.7	NO	3.681	N/A
MW388	Downgradient	Yes	42.9	NO	3.759	N/A
MW392	Downgradient	Yes	40.4	NO	3.699	N/A
MW395	Upgradient	Yes	29.3	NO	3.378	N/A
MW397	Upgradient	Yes	105	YES	4.654	N/A

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

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.*   D1-79

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the 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	19.9	YES	2.991	N/A
MW373	Downgradient	Yes	113	YES	4.727	N/A
MW385	Sidegradient	Yes	21.4	YES	3.063	N/A
MW388	Downgradient	Yes	21.2	YES	3.054	N/A
MW392	Downgradient	Yes	6.19	NO	1.823	N/A
MW395	Upgradient	Yes	9.9	NO	2.293	N/A
MW397	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

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.*   D1-80

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the 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 possbile 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	93.2	YES	4.535	N/A
MW373	Downgradient	Yes	23.7	NO	3.165	N/A
MW385	Sidegradient	Yes	211	YES	5.352	N/A
MW388	Downgradient	Yes	201	YES	5.303	N/A
MW392	Downgradient	No	7.9	N/A	2.067	N/A
MW395	Upgradient	No	13.2	N/A	2.580	N/A
MW397	Upgradient	No	14.9	N/A	2.701	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for 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.*   D1-81

C-746-S/T Third Quarter 2016 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

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Historical Background Data from Upgradient Wells with Transformed Result

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	1.16	NO	0.148	N/A
MW373	Downgradient	Yes	4.88	YES	1.585	N/A
MW385	Sidegradient	Yes	1.03	NO	0.030	N/A
MW388	Downgradient	Yes	1.05	NO	0.049	N/A
MW392	Downgradient	Yes	1.41	NO	0.344	N/A
MW395	Upgradient	Yes	0.864	NO	-0.146	N/A
MW397	Upgradient	Yes	0.798	NO	-0.226	N/A

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

Conclusion of Statistical Analysis on Historical Data

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

Wells with Exceedances
MW373

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

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

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

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

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

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

C-746-S/T Third Quarter 2016 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	Yes	6.12	NO	1.812	N/A
MW373	Downgradient	Yes	13.4	NO	2.595	N/A
MW385	Sidegradient	No	10	N/A	2.303	N/A
MW388	Downgradient	No	10	N/A	2.303	N/A
MW392	Downgradient	Yes	39.9	NO	3.686	N/A
MW395	Upgradient	Yes	6.88	NO	1.929	N/A
MW397	Upgradient	No	10	N/A	2.303	N/A

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

Conclusion of Statistical Analysis on Historical Data

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

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

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

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	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

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW370	Downgradient	Yes	2.51	N/A	0.920	N/A
MW373	Downgradient	Yes	7.87	NO	2.063	N/A
MW385	Sidegradient	Yes	0.53	N/A	-0.635	N/A
MW388	Downgradient	Yes	0.57	N/A	-0.562	N/A
MW392	Downgradient	Yes	17.3	NO	2.851	N/A
MW395	Upgradient	Yes	4.39	N/A	1.479	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 = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

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

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

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

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

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Historical Background Data from Upgradient Wells with Transformed Result

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	0.01	N/A	-4.605	N/A
MW373	Downgradient	No	0.01	N/A	-4.605	N/A
MW385	Sidegradient	Yes	0.00356	NO	-5.638	N/A
MW388	Downgradient	Yes	0.00375	NO	-5.586	N/A
MW392	Downgradient	No	0.01	N/A	-4.605	N/A
MW395	Upgradient	No	0.01	N/A	-4.605	N/A
MW397	Upgradient	Yes	0.00559	NO	-5.187	N/A

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

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

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test 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= 18.746	S= 10.103	**CV(1)**=0.539	**K factor****= 3.188	**TL(1)**= 50.954	**LL(1)**=N/A
Statistics-Transformed Background Data	X= 2.804	S= 0.547	**CV(2)**=0.195	**K factor****= 3.188	**TL(2)**= 4.546	**LL(2)**=N/A

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW396

Date Collected	Result	LN(Result)
7/17/2014	37.6	3.627
10/27/2014	13	2.565
1/8/2015	20	2.996
4/22/2015	6.77	1.913
7/16/2015	20	2.996
10/22/2015	12.9	2.557
1/5/2016	11.4	2.434
4/18/2016	28.3	3.343

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW390	Downgradient	Yes	55.6	YES	4.018	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 = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

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

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

** Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for 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 Third Quarter 2016 Statistical Analysis   Current Background Comparison
Oxidation-Reduction Potential   UNITS: mV   UCRS

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

Statistics-Background Data $X=$ 270.500 **S=** 115.462 **CV(1)=**0.427 **K factor**=** 3.188 **TL(1)=** 638.592 **LL(1)=**N/A

Statistics-Transformed Background Data $X=$ 5.521 **S=** 0.426 **CV(2)=**0.077 **K factor**=** 3.188 **TL(2)=** 6.881 **LL(2)=**N/A

Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW396

Date Collected	Result	LN(Result)
7/17/2014	265	5.580
10/27/2014	141	4.949
1/8/2015	193	5.263
4/22/2015	469	6.151
7/16/2015	330	5.799
10/22/2015	159	5.069
1/5/2016	223	5.407
4/18/2016	384	5.951

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	366	NO	5.903	N/A
MW390	Downgradient	Yes	419	NO	6.038	N/A
MW393	Downgradient	Yes	420	NO	6.040	N/A
MW396	Upgradient	Yes	339	NO	5.826	N/A

Conclusion of Statistical Analysis on Current Data

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

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

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

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

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

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

*** Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*   D2-4

C-746-S/T Third Quarter 2016 Statistical Analysis — Current 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 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= 1.245   S= 6.341   **CV(1)**=5.092   **K factor****= 3.188   **TL(1)**= 21.460   **LL(1)**=N/A

Statistics-Transformed Background Data   X= 0.790   S= 1.487   **CV(2)**=1.882   **K factor****= 3.188   **TL(2)**= 2.416   **LL(2)**=N/A

Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW396

Date Collected	Result	LN(Result)
7/17/2014	1.03	0.030
10/27/2014	3.28	1.188
1/8/2015	11.2	2.416
4/22/2015	2.84	1.044
7/16/2015	0.171	-1.766
10/22/2015	-7.28	#Func!
1/5/2016	6.24	1.831
4/18/2016	-7.52	#Func!

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 possbile 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	58.4	N/A	4.067	YES

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

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

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

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

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

Statistics-Background Data	X= 11.152 S= 5.594	CV(1)=0.502	K factor**= 2.523	TL(1)= 25.266	LL(1)=N/A
Statistics-Transformed Background Data	X= 2.291 S= 0.513	CV(2)=0.224	K factor**= 2.523	TL(2)= 3.585	LL(2)=N/A

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW220

Date Collected	Result	LN(Result)
7/17/2014	20.3	3.011
10/21/2014	9.99	2.302
1/5/2015	21.8	3.082
4/14/2015	11.4	2.434
7/15/2015	9.31	2.231
10/15/2015	17	2.833
1/5/2016	18.1	2.896
4/12/2016	14.2	2.653

Well Number: MW394

Date Collected	Result	LN(Result)
7/17/2014	6.9	1.932
10/27/2014	3.99	1.384
1/8/2015	5.07	1.623
4/22/2015	9.13	2.212
7/17/2015	5.97	1.787
10/22/2015	11.6	2.451
1/5/2016	6.13	1.813
4/18/2016	7.54	2.020

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW384	Sidegradient	Yes	99.2	YES	4.597	N/A
MW387	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

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 Third Quarter 2016 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= 24.106	S= 3.672	CV(1)=0.152	K factor**= 2.523	TL(1)= 33.370	LL(1)=N/A
Statistics-Transformed Background Data	X= 3.171	S= 0.159	CV(2)=0.050	K factor**= 2.523	TL(2)= 3.571	LL(2)=N/A

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW220

Date Collected	Result	LN(Result)
7/17/2014	21.6	3.073
10/21/2014	18.4	2.912
1/5/2015	20	2.996
4/14/2015	23	3.135
7/15/2015	21.8	3.082
10/15/2015	18.5	2.918
1/5/2016	19.3	2.960
4/12/2016	25.7	3.246

Well Number: MW394

Date Collected	Result	LN(Result)
7/17/2014	26.3	3.270
10/27/2014	26.5	3.277
1/8/2015	27.2	3.303
4/22/2015	26.5	3.277
7/17/2015	26.8	3.288
10/22/2015	26.9	3.292
1/5/2016	27.7	3.321
4/18/2016	29.5	3.384

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW372	Downgradient	Yes	51.6	YES	3.944	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 = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

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

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

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*   D2-7

C-746-S/T Third Quarter 2016 Statistical Analysis — Current Background Comparison
Chemical Oxygen Demand (COD) — 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= 25.675	S= 26.048	CV(1)= 1.015	K factor**= 2.523	TL(1)= 91.393	LL(1)=N/A
Statistics-Transformed Background Data	X= 3.032	S= 0.560	CV(2)= 0.185	K factor**= 2.523	TL(2)= 4.446	LL(2)=N/A

Because CV(1) is greater than 1, the natural logarithm of background and test well results were calculated utilizing TL(2) for comparison.

Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW220

Date Collected	Result	LN(Result)
7/17/2014	20	2.996
10/21/2014	10.2	2.322
1/5/2015	20	2.996
4/14/2015	20	2.996
7/15/2015	120	4.787
10/15/2015	20	2.996
1/5/2016	20	2.996
4/12/2016	15.8	2.760

Well Number: MW394

Date Collected	Result	LN(Result)
7/17/2014	18.8	2.934
10/27/2014	20	2.996
1/8/2015	11.7	2.460
4/22/2015	41.4	3.723
7/17/2015	20	2.996
10/22/2015	12.9	2.557
1/5/2016	20	2.996
4/18/2016	20	2.996

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW369	Downgradient	Yes	37.1	N/A	3.614	NO

Conclusion of Statistical Analysis on Current Data

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

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

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

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

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

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

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

C-746-S/T Third Quarter 2016 Statistical Analysis   Current Background Comparison

Conductivity   UNITS: umho/cm   URGA

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

Statistics-Background Data	X= 383.000	S= 39.088	CV(1)=0.102	K factor**= 2.523	TL(1)= 481.619	LL(1)=N/A
Statistics-Transformed Background Data	X= 5.943	S= 0.105	CV(2)=0.018	K factor**= 2.523	TL(2)= 6.208	LL(2)=N/A

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW220

Date Collected	Result	LN(Result)
7/17/2014	407	6.009
10/21/2014	316	5.756
1/5/2015	330	5.799
4/14/2015	422	6.045
9/3/2015	343	5.838
10/15/2015	330	5.799
1/5/2016	439	6.084
4/12/2016	422	6.045

Well Number: MW394

Date Collected	Result	LN(Result)
7/17/2014	391	5.969
10/27/2014	397	5.984
1/8/2015	397	5.984
4/22/2015	335	5.814
7/17/2015	395	5.979
10/22/2015	383	5.948
1/5/2016	415	6.028
4/18/2016	406	6.006

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW372	Downgradient	Yes	694	YES	6.542	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 = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

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

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

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

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

Statistics-Background Data	X= 222.500	S= 94.406	CV(1)=0.424	K factor**= 2.523	TL(1)= 460.687	LL(1)=N/A
Statistics-Transformed Background Data	X= 5.352	S= 0.304	CV(2)=0.057	K factor**= 2.523	TL(2)= 6.119	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)
7/17/2014	556	6.321
10/21/2014	159	5.069
1/5/2015	140	4.942
4/14/2015	197	5.283
7/15/2015	224	5.412
10/15/2015	236	5.464
1/5/2016	209	5.342
4/12/2016	273	5.609

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW372	Downgradient	Yes	381	NO	5.943	N/A

Well Number: MW394

Date Collected	Result	LN(Result)
7/17/2014	196	5.278
10/27/2014	187	5.231
1/8/2015	166	5.112
4/22/2015	181	5.198
7/17/2015	201	5.303
10/22/2015	210	5.347
1/5/2016	226	5.421
4/18/2016	199	5.293

Conclusion of Statistical Analysis on Current Data

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

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

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

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

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

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

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

C-746-S/T Third Quarter 2016 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= 10.179	S= 1.622	CV(1)=0.159	K factor**= 2.523	TL(1)= 14.271	LL(1)=N/A
Statistics-Transformed Background Data	X= 2.308	S= 0.167	CV(2)=0.072	K factor**= 2.523	TL(2)= 2.729	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)
7/17/2014	8.95	2.192
10/21/2014	7.41	2.003
1/5/2015	8.05	2.086
4/14/2015	10.2	2.322
7/15/2015	9.16	2.215
10/15/2015	7.86	2.062
1/5/2016	8.44	2.133
4/12/2016	10.5	2.351

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW372	Downgradient	Yes	20.9	YES	3.040	N/A

Well Number: MW394

Date Collected	Result	LN(Result)
7/17/2014	11.1	2.407
10/27/2014	11	2.398
1/8/2015	11.3	2.425
4/22/2015	11.1	2.407
7/17/2015	11.9	2.477
10/22/2015	12.1	2.493
1/5/2016	11.9	2.477
4/18/2016	11.9	2.477

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

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

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

*** Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*   D2-11

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test 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= 492.563	S= 124.125	CV(1)=0.252	K factor**= 2.523	TL(1)= 805.729	LL(1)=N/A
Statistics-Transformed Background Data	X= 6.173	S= 0.235	CV(2)=0.038	K factor**= 2.523	TL(2)= 6.764	LL(2)=N/A

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW220

Date Collected	Result	LN(Result)
7/17/2014	395	5.979
10/21/2014	401	5.994
1/5/2015	733	6.597
4/14/2015	488	6.190
9/3/2015	672	6.510
10/15/2015	728	6.590
1/5/2016	449	6.107
4/12/2016	438	6.082

Well Number: MW394

Date Collected	Result	LN(Result)
7/17/2014	356	5.875
10/27/2014	453	6.116
1/8/2015	453	6.116
4/22/2015	461	6.133
7/17/2015	608	6.410
10/22/2015	411	6.019
1/5/2016	351	5.861
4/18/2016	484	6.182

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW220	Upgradient	Yes	425	NO	6.052	N/A
MW221	Sidegradient	Yes	410	NO	6.016	N/A
MW222	Sidegradient	Yes	426	NO	6.054	N/A
MW223	Sidegradient	Yes	428	NO	6.059	N/A
MW224	Sidegradient	Yes	427	NO	6.057	N/A
MW384	Sidegradient	Yes	436	NO	6.078	N/A
MW387	Downgradient	Yes	421	NO	6.043	N/A
MW391	Downgradient	Yes	430	NO	6.064	N/A

Conclusion of Statistical Analysis on Current Data

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

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

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

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

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

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

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

C-746-S/T Third Quarter 2016 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= 35.950 S= 5.424	CV(1)=0.151	K factor**= 2.523	TL(1)= 49.634	LL(1)=N/A
Statistics-Transformed Background Data	X= 3.572 S= 0.143	CV(2)=0.040	K factor**= 2.523	TL(2)= 3.932	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)
7/17/2014	39.1	3.666
10/21/2014	36	3.584
1/5/2015	38.1	3.640
4/14/2015	44.9	3.804
7/15/2015	38.3	3.645
10/15/2015	33.5	3.512
1/5/2016	40.1	3.691
4/12/2016	49.2	3.896

Well Number: MW394

Date Collected	Result	LN(Result)
7/17/2014	29.6	3.388
10/27/2014	33.9	3.523
1/8/2015	33.8	3.520
4/22/2015	30.3	3.411
7/17/2015	31.2	3.440
10/22/2015	33.1	3.500
1/5/2016	32.3	3.475
4/18/2016	31.8	3.459

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW369	Downgradient	Yes	58.9	YES	4.076	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

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

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

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

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

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

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

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

Statistics-Background Data	X= 13.728 S= 3.971	**CV(1)=**0.289	**K factor**=** 2.523	**TL(1)=** 23.747	**LL(1)=**N/A
Statistics-Transformed Background Data	X= 2.583 S= 0.276	**CV(2)=**0.107	**K factor**=** 2.523	**TL(2)=** 3.278	**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)
7/17/2014	19.4	2.965
10/21/2014	13.5	2.603
1/5/2015	14	2.639
4/14/2015	17.9	2.885
7/15/2015	18.6	2.923
10/15/2015	14.7	2.688
1/5/2016	16.5	2.803
4/12/2016	21.8	3.082

Well Number: MW394

Date Collected	Result	LN(Result)
7/17/2014	10.3	2.332
10/27/2014	11.1	2.407
1/8/2015	10.5	2.351
4/22/2015	10.3	2.332
7/17/2015	10.4	2.342
10/22/2015	10.7	2.370
1/5/2016	10.1	2.313
4/18/2016	9.84	2.286

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW220	Upgradient	Yes	17.9	NO	2.885	N/A
MW223	Sidegradient	Yes	18	NO	2.890	N/A
MW372	Downgradient	Yes	102	YES	4.625	N/A
MW384	Sidegradient	Yes	21.3	NO	3.059	N/A
MW387	Downgradient	Yes	25.7	YES	3.246	N/A
MW391	Downgradient	Yes	54.3	YES	3.995	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

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. D2-14

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test 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	$X=$ 14.283	$S=$ 9.134	$CV(1)=$0.640	K factor**= 2.523	$TL(1)=$ 37.328	$LL(1)=$N/A
Statistics-Transformed Background Data	$X=$ 2.378	$S=$ 0.941	$CV(2)=$0.396	K factor**= 2.523	$TL(2)=$ 4.751	$LL(2)=$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)
7/17/2014	12.1	2.493
10/21/2014	35	3.555
1/5/2015	32.5	3.481
4/14/2015	12.2	2.501
7/15/2015	14.8	2.695
10/15/2015	11.6	2.451
1/5/2016	18.4	2.912
4/12/2016	13	2.565

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW372	Downgradient	Yes	35.4	NO	3.567	N/A
MW384	Sidegradient	Yes	192	YES	5.257	N/A
MW387	Downgradient	Yes	214	YES	5.366	N/A

Well Number: MW394

Date Collected	Result	LN(Result)
7/17/2014	10.1	2.313
10/27/2014	17.2	2.845
1/8/2015	17.2	2.845
4/22/2015	11.5	2.442
7/17/2015	3.11	1.135
10/22/2015	0.742	-0.298
1/5/2016	4.07	1.404
4/18/2016	15	2.708

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

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.*   D2-15

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test 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= 9.291	S= 5.958	CV(1)=0.641	K factor**= 2.523	TL(1)= 24.324	LL(1)=N/A
Statistics-Transformed Background Data	X= 2.099	S= 0.757	CV(2)=0.361	K factor**= 2.523	TL(2)= 2.950	LL(2)=N/A

Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW395

Date Collected	Result	LN(Result)
7/17/2014	11.5	2.442
10/27/2014	19.1	2.950
1/6/2015	5.98	1.788
4/22/2015	1.03	0.030
7/17/2015	3.79	1.332
10/22/2015	10.7	2.370
1/5/2016	17.2	2.845
4/18/2016	6.43	1.861

Well Number: MW397

Date Collected	Result	LN(Result)
7/16/2014	5.18	1.645
10/21/2014	10.4	2.342
1/7/2015	16.3	2.791
4/22/2015	5.37	1.681
7/15/2015	17	2.833
10/22/2015	-1.02	#Func!
1/5/2016	9.49	2.250
4/14/2016	10.2	2.322

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 possbile 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	58	YES	4.060	N/A
MW385	Sidegradient	Yes	108	YES	4.682	N/A
MW388	Downgradient	Yes	97.1	YES	4.576	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 = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

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

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

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.* D2-16

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test 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= 22.681　S= 4.226	CV(1)=0.186	K factor**= 2.523	TL(1)= 33.343	LL(1)=N/A
Statistics-Transformed Background Data	X= 3.105　S= 0.189	CV(2)=0.061	K factor**= 2.523	TL(2)= 3.582	LL(2)=N/A

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Background Data from Upgradient Wells with Transformed Result

Well Number:　MW395

Date Collected	Result	LN(Result)
7/17/2014	26.5	3.277
10/27/2014	26.6	3.281
1/6/2015	25.8	3.250
4/22/2015	26.4	3.273
7/17/2015	26.5	3.277
10/22/2015	27	3.296
1/5/2016	27.4	3.311
4/18/2016	27.6	3.318

Well Number:　MW397

Date Collected	Result	LN(Result)
7/16/2014	17.8	2.879
10/21/2014	19.8	2.986
1/7/2015	18.6	2.923
4/22/2015	18.7	2.929
7/15/2015	17.7	2.874
10/22/2015	19.2	2.955
1/5/2016	19.2	2.955
4/14/2016	18.1	2.896

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW373	Downgradient	Yes	57.2	YES	4.047	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 = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

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

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

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for 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 Third Quarter 2016 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= 359.750 | S= 30.383 | CV(1)=0.084 | K factor**= 2.523 | TL(1)= 436.407 | LL(1)=N/A |
| **Statistics-Transformed Background Data** | X= 5.882 | S= 0.084 | CV(2)=0.014 | K factor**= 2.523 | TL(2)= 6.094 | LL(2)=N/A |

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW395

Date Collected	Result	LN(Result)
7/17/2014	401	5.994
10/27/2014	387	5.958
1/6/2015	376	5.930
4/22/2015	338	5.823
7/17/2015	390	5.966
10/22/2015	372	5.919
1/5/2016	408	6.011
4/18/2016	399	5.989

Well Number: MW397

Date Collected	Result	LN(Result)
7/16/2014	336	5.817
10/21/2014	337	5.820
1/7/2015	354	5.869
4/22/2015	325	5.784
7/15/2015	334	5.811
10/22/2015	323	5.778
1/5/2016	353	5.866
4/14/2016	323	5.778

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW373	Downgradient	Yes	703	YES	6.555	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 = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

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

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

*** Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.* D2-18

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test 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= 179.688 S= 25.638	**CV(1)**=0.143	**K factor****= 2.523	**TL(1)**= 244.372 **LL(1)**=N/A
Statistics-Transformed Background Data	X= 5.182 S= 0.140	**CV(2)**=0.027	**K factor****= 2.523	**TL(2)**= 5.534 **LL(2)**=N/A

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW395

Date Collected	Result	LN(Result)
7/17/2014	166	5.112
10/27/2014	181	5.198
1/6/2015	147	4.990
4/22/2015	179	5.187
7/17/2015	203	5.313
10/22/2015	194	5.268
1/5/2016	229	5.434
4/18/2016	224	5.412

Well Number: MW397

Date Collected	Result	LN(Result)
7/16/2014	167	5.118
10/21/2014	161	5.081
1/7/2015	159	5.069
4/22/2015	144	4.970
7/15/2015	190	5.247
10/22/2015	160	5.075
1/5/2016	204	5.318
4/14/2016	167	5.118

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW373	Downgradient	Yes	399	YES	5.989	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 = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

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

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

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*   D2-19*

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test 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**= 9.646	**S**= 1.862	**CV(1)**=0.193	**K factor****= 2.523	**TL(1)**= 14.344 **LL(1)**=N/A
Statistics-Transformed Background Data	**X**= 2.249	**S**= 0.194	**CV(2)**=0.086	**K factor****= 2.523	**TL(2)**= 2.739 **LL(2)**=N/A

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW395

Date Collected	Result	LN(Result)
7/17/2014	11	2.398
10/27/2014	11.3	2.425
1/6/2015	9.96	2.299
4/22/2015	11.3	2.425
7/17/2015	11.8	2.468
10/22/2015	12.3	2.510
1/5/2016	11.8	2.468
4/18/2016	11.5	2.442

Well Number: MW397

Date Collected	Result	LN(Result)
7/16/2014	7.49	2.014
10/21/2014	8.07	2.088
1/7/2015	7.64	2.033
4/22/2015	8.09	2.091
7/15/2015	7.55	2.022
10/22/2015	8.64	2.156
1/5/2016	8.18	2.102
4/14/2016	7.72	2.044

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW373	Downgradient	Yes	21.2	YES	3.054	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 = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL   Upper Tolerance Limit, TL = X + (K * S),   LL   Lower Tolerance Limit, LL = X - (K * S)
 X   Mean, X = (sum of background results)/(count of background results)
** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for 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 Third Quarter 2016 Statistical Analysis   Current Background Comparison
Oxidation-Reduction Potential   UNITS: mV   LRGA

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

Statistics-Background Data	X= 457.063	S= 106.876	CV(1)=0.234	K factor**= 2.523	TL(1)= 726.710	LL(1)=N/A
Statistics-Transformed Background Data	X= 6.100	S= 0.229	CV(2)=0.038	K factor**= 2.523	TL(2)= 6.678	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: MW395

Date Collected	Result	LN(Result)
7/17/2014	381	5.943
10/27/2014	307	5.727
1/6/2015	586	6.373
4/22/2015	474	6.161
7/17/2015	468	6.148
10/22/2015	378	5.935
1/5/2016	380	5.940
4/18/2016	325	5.784

Well Number: MW397

Date Collected	Result	LN(Result)
7/16/2014	382	5.945
10/21/2014	380	5.940
1/7/2015	675	6.515
4/22/2015	471	6.155
7/15/2015	599	6.395
10/22/2015	448	6.105
1/5/2016	473	6.159
4/14/2016	586	6.373

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW370	Downgradient	Yes	483	NO	6.180	N/A
MW373	Downgradient	Yes	337	NO	5.820	N/A
MW385	Sidegradient	Yes	382	NO	5.945	N/A
MW388	Downgradient	Yes	426	NO	6.054	N/A
MW392	Downgradient	Yes	409	NO	6.014	N/A
MW395	Upgradient	Yes	428	NO	6.059	N/A
MW397	Upgradient	Yes	420	NO	6.040	N/A

Conclusion of Statistical Analysis on Current Data

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

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

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

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

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

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

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*   D2-21

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

Statistics-Background Data	X= 0.872	S= 0.852	CV(1)=0.978	K factor**= 2.523	TL(1)= 3.023	LL(1)=N/A

Statistics-Transformed Background Data	X= -0.354	S= 0.766	CV(2)=-2.167	K factor**= 2.523	TL(2)= 1.218	LL(2)=N/A

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

#Because the natural log was not possbile for all background values, the TL was considered equal to the maximum background value.

Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW395

Date Collected	Result	LN(Result)
7/17/2014	2.32	0.842
10/27/2014	0.537	-0.622
1/6/2015	0.566	-0.569
4/22/2015	0.892	-0.114
7/17/2015	1.2	0.182
10/22/2015	1.01	0.010
1/5/2016	0.707	-0.347
4/18/2016	0.13	-2.040

Well Number: MW397

Date Collected	Result	LN(Result)
7/16/2014	3.38	1.218
10/21/2014	0.492	-0.709
1/7/2015	0.45	-0.799
4/22/2015	0.69	-0.371
7/15/2015	0.516	-0.662
10/22/2015	0.356	-1.033
1/5/2016	0.748	-0.290
4/14/2016	-0.0439	#Func!

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW370	Downgradient	Yes	0.887	NO	-0.120	N/A

Conclusion of Statistical Analysis on Current Data

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

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

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

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

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

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

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

C-746-S/T Third Quarter 2016 Statistical Analysis   Current 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 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= 32.063 S= 3.093	CV(1)=0.096	K factor**= 2.523	TL(1)= 39.866	LL(1)=N/A
Statistics-Transformed Background Data	X= 3.463 S= 0.097	CV(2)=0.028	K factor**= 2.523	TL(2)= 3.708	LL(2)=N/A

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW395

Date Collected	Result	LN(Result)
7/17/2014	28.7	3.357
10/27/2014	30.4	3.414
1/6/2015	25.8	3.250
4/22/2015	29.9	3.398
7/17/2015	31.7	3.456
10/22/2015	32.5	3.481
1/5/2016	31.2	3.440
4/18/2016	30.7	3.424

Well Number: MW397

Date Collected	Result	LN(Result)
7/16/2014	33.1	3.500
10/21/2014	35.6	3.572
1/7/2015	30.3	3.411
4/22/2015	35.4	3.567
7/15/2015	30.3	3.411
10/22/2015	36	3.584
1/5/2016	33.5	3.512
4/14/2016	37.9	3.635

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW397	Upgradient	Yes	105	YES	4.654	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
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.   D2-23

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test 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= 10.711	S= 0.891	CV(1)=0.083	K factor**= 2.523	TL(1)= 12.958	LL(1)=N/A
Statistics-Transformed Background Data	X= 2.368	S= 0.082	CV(2)=0.034	K factor**= 2.523	TL(2)= 2.574	LL(2)=N/A

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW395

Date Collected	Result	LN(Result)
7/17/2014	10.1	2.313
10/27/2014	10.6	2.361
1/6/2015	10.1	2.313
4/22/2015	10.1	2.313
7/17/2015	10.2	2.322
10/22/2015	10	2.303
1/5/2016	9.84	2.286
4/18/2016	9.73	2.275

Well Number: MW397

Date Collected	Result	LN(Result)
7/16/2014	11.7	2.460
10/21/2014	12.6	2.534
1/7/2015	11.7	2.460
4/22/2015	10.9	2.389
7/15/2015	11.4	2.434
10/22/2015	11.6	2.451
1/5/2016	11.2	2.416
4/14/2016	9.61	2.263

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW370	Downgradient	Yes	19.9	YES	2.991	N/A
MW373	Downgradient	Yes	113	YES	4.727	N/A
MW385	Sidegradient	Yes	21.4	YES	3.063	N/A
MW388	Downgradient	Yes	21.2	YES	3.054	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 = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

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

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

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-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

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test 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= 10.744 S= 3.987	**CV(1)**=0.371	**K factor****= 2.523	**TL(1)**= 20.804	**LL(1)**=N/A
Statistics-Transformed Background Data	X= 2.306 S= 0.392	**CV(2)**=0.170	**K factor****= 2.523	**TL(2)**= 3.295	**LL(2)**=N/A

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW395

Date Collected	Result	LN(Result)
7/17/2014	8.05	2.086
10/27/2014	14.4	2.667
1/6/2015	17	2.833
4/22/2015	7.25	1.981
7/17/2015	14.7	2.688
10/22/2015	9.39	2.240
1/5/2016	5.69	1.739
4/18/2016	8.36	2.123

Well Number: MW397

Date Collected	Result	LN(Result)
7/16/2014	10.6	2.361
10/21/2014	14.7	2.688
1/7/2015	4.58	1.522
4/22/2015	9.32	2.232
7/15/2015	13.2	2.580
10/22/2015	9.83	2.285
1/5/2016	17.4	2.856
4/14/2016	7.44	2.007

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW370	Downgradient	Yes	93.2	YES	4.535	N/A
MW385	Sidegradient	Yes	211	YES	5.352	N/A
MW388	Downgradient	Yes	201	YES	5.303	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 = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

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

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

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for 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 Third Quarter 2016 Statistical Analysis   Current 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 statistically significant evidence of elevated concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	X= 0.904 S= 0.197	CV(1)=0.218	K factor**= 2.523	TL(1)= 1.401	LL(1)=N/A
Statistics-Transformed Background Data	X= -0.124 S= 0.224	CV(2)=-1.800	K factor**= 2.523	TL(2)= 0.440	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: MW395

Date Collected	Result	LN(Result)
7/17/2014	0.92	-0.083
10/27/2014	1.08	0.077
1/6/2015	1.21	0.191
4/22/2015	1	0.000
7/17/2015	0.565	-0.571
10/22/2015	0.755	-0.281
1/5/2016	0.766	-0.267
4/18/2016	1.02	0.020

Well Number: MW397

Date Collected	Result	LN(Result)
7/16/2014	0.751	-0.286
10/21/2014	1.05	0.049
1/7/2015	1.25	0.223
4/22/2015	1	0.000
7/15/2015	0.688	-0.374
10/22/2015	0.699	-0.358
1/5/2016	0.773	-0.257
4/14/2016	0.931	-0.071

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW373	Downgradient	Yes	4.88	YES	1.585	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 = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

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

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

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

ATTACHMENT D3

STATISTICIAN QUALIFICATION STATEMENT

THIS PAGE INTENTIONALLY LEFT BLANK

FLUOR®

October 25, 2016

Mr. John Morgan
Fluor Federal Services, Inc.
5511 Hobbs Road
Kevil, KY 42053

Dear Mr. Morgan:

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 a Chemist, with a Bachelor of Science degree in chemistry and a minor in biology, 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 Fluor Federal Services, Inc.

For this project, the statistical analyses conducted on the third quarter 2016 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. Blewett

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX E

GROUNDWATER FLOW RATE AND DIRECTION

THIS PAGE INTENTIONALLY LEFT BLANK

RESIDENTIAL/INERT—QUARTERLY, 3rd CY 2016   Finds/Unit: <u>KY8-890-008-982/1</u>
Facility: U.S. DOE—Paducah Gaseous Diffusion Plant   LAB ID: <u> None   </u>
Permit Numbers: SW07300014, SW07300015, SW07300045   For Official Use Only

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 third quarter 2016 and to determine the groundwater flow rate and direction.

Water levels during this reporting period were measured on July 26 and 27, 2016. 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 is 2.61×10^{-4} ft/ft. Additional water level measurements in July (Figure E.3) document the vicinity groundwater hydraulic gradient for the RGA to be 3.88×10^{-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 July 2016, the groundwater flow direction in the immediate area of the landfill was oriented northeastward.

---

[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.

Geological conditions in the UCRS indicate that permeable zones are discontinuous across the plant site. In the vicinity of the C-746-S&T Landfills, one of the wells is usually dry (MW389) or has a low water level which prevents sample collection, while others have recordable water levels. The UCRS contains a strong vertical gradient; therefore, the limited number of UCRS wells is not sufficient to map the potentiometric surface.

MW393
340.88

MW371
343.46

MW390
327.09

MW389
DRY

MW386
344.92

C-746-T Landfill

MW396
369.35

C-746-S Landfill

North-South Diversion Ditch
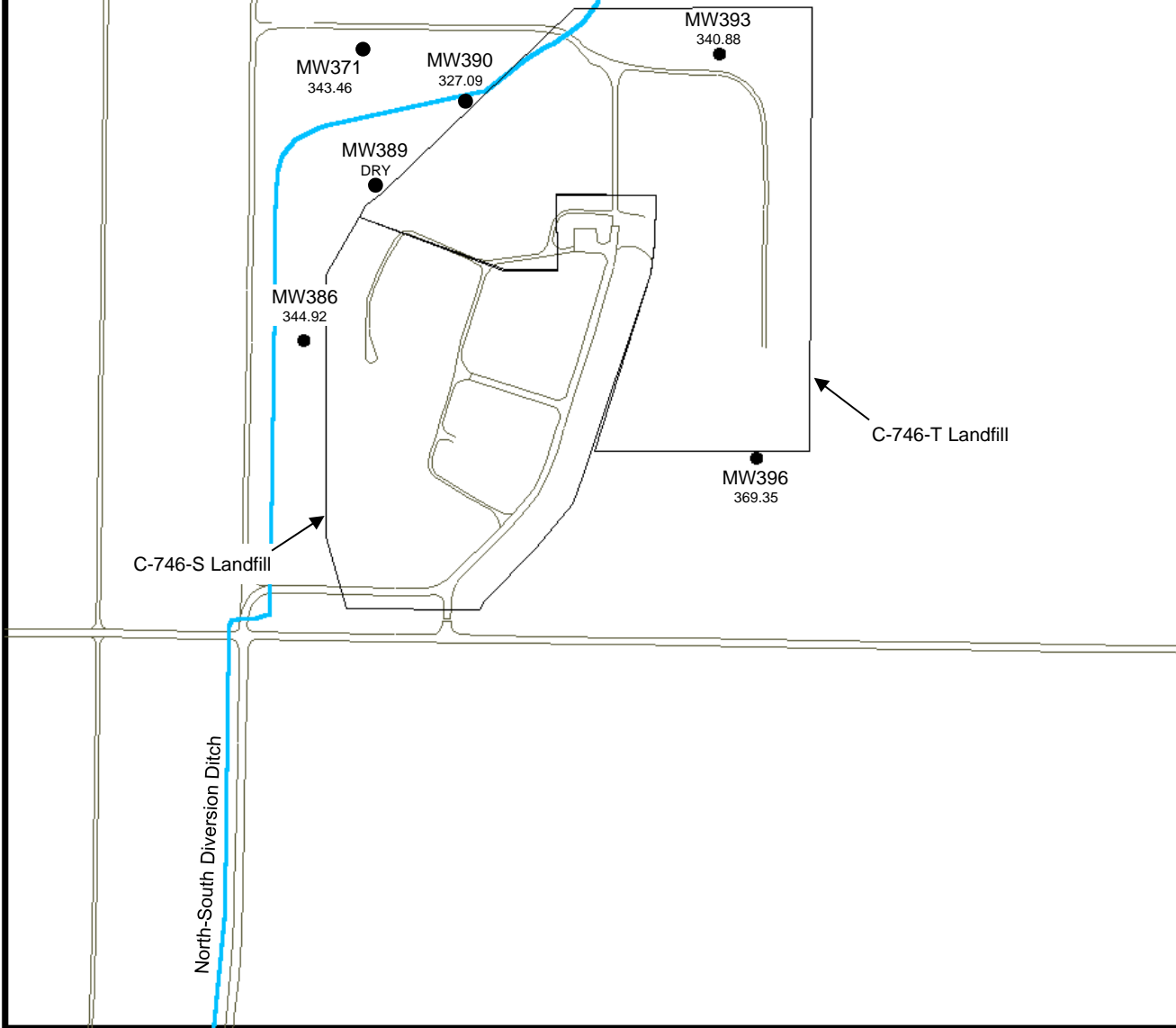
500   0   500 Feet

Contour Interval = N/A
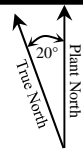
20°
Plant North
True North

U.S. DEPARTMENT OF ENERGY
DOE PORTSMOUTH-PADUCAH PROJECT OFFICE
PADUCAH GASEOUS DIFFUSION PLANT

Figure E.1. Potentiometric Surface of the Upper Continental Recharge System at the C-746 S&T Landfills Permit Numbers 073-00014 & 073-00015 July 26, 2016

FLUOR®

Table E.1. C-746-S&T Landfills Third Quarter 2016 (July) Water Levels

							Raw Data		*Corrected Data	
Date	**Time**	**Well**	**Formation**	**Datum Elev (ft amsl)**	**BP (in Hg)**	**Delta BP (ft H20)**	**DTW (ft)**	**Elev (ft amsl)**	**DTW (ft)**	**Elev (ft amsl)**
7/26/2016	9:22	MW220	URGA	381.44	30.02	0.00	54.08	327.36	54.08	327.36
7/26/2016	9:09	MW221	URGA	390.83	30.02	0.00	63.68	327.15	63.68	327.15
7/26/2016	9:14	MW222	URGA	394.87	30.02	0.00	67.71	327.16	67.71	327.16
7/26/2016	9:12	MW223	URGA	394.03	30.02	0.00	66.88	327.15	66.88	327.15
7/26/2016	9:16	MW224	URGA	395.41	30.02	0.00	68.20	327.21	68.20	327.21
7/26/2016	9:18	MW225	URGA	385.55	30.02	0.00	58.16	327.39	58.16	327.39
7/26/2016	10:03	MW353	LRGA	374.86	30.01	0.01	47.24	327.62	47.25	327.61
7/26/2016	9:28	MW384	URGA	365.06	30.02	0.00	37.93	327.13	37.93	327.13
7/26/2016	9:26	MW385	LRGA	365.54	30.02	0.00	38.41	327.13	38.41	327.13
7/26/2016	9:27	MW386	UCRS	365.21	30.02	0.00	20.29	344.92	20.29	344.92
7/26/2016	9:30	MW387	URGA	363.27	30.02	0.00	36.14	327.13	36.14	327.13
7/26/2016	9:31	MW388	LRGA	363.25	30.02	0.00	36.12	327.13	36.12	327.13
7/26/2016	--	MW389	UCRS	363.82	--	--	DRY	--	DRY	--
7/26/2016	9:34	MW390	UCRS	360.36	30.02	0.00	33.27	327.09	33.27	327.09
7/26/2016	9:50	MW391	URGA	366.54	30.02	0.00	39.47	327.07	39.47	327.07
7/26/2016	9:48	MW392	LRGA	365.67	30.02	0.00	38.62	327.05	38.62	327.05
7/26/2016	9:49	MW393	UCRS	366.59	30.02	0.00	25.71	340.88	25.71	340.88
7/26/2016	9:40	MW394	URGA	378.32	30.02	0.00	51.00	327.32	51.00	327.32
7/26/2016	9:42	MW395	LRGA	379.01	30.02	0.00	51.63	327.38	51.63	327.38
7/26/2016	9:41	MW396	UCRS	378.64	30.02	0.00	9.29	369.35	9.29	369.35
7/26/2016	9:55	MW397	LRGA	386.90	30.01	0.01	59.59	327.31	59.60	327.30
7/27/2016	9:34	MW418	URGA	366.78	29.97	0.06	39.64	327.14	39.70	327.08
7/26/2016	9:47	MW419	LRGA	366.68	30.02	0.00	39.60	327.08	39.60	327.08

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

Figure E.2. Composite Potentiometric Surface of the Regional Gravel Aquifer at the C-746-S&T Landfills Permit Numbers 073-00014 & 073-00015 July 26 and 27, 2016

U.S. DEPARTMENT OF ENERGY
DOE PORTSMOUTH-PADUCAH PROJECT OFFICE
PADUCAH GASEOUS DIFFUSION PLANT

FLUOR

Figure E.3. Vicinity Potentiometric Surface of the Regional Gravel Aquifer, July 26, 2016
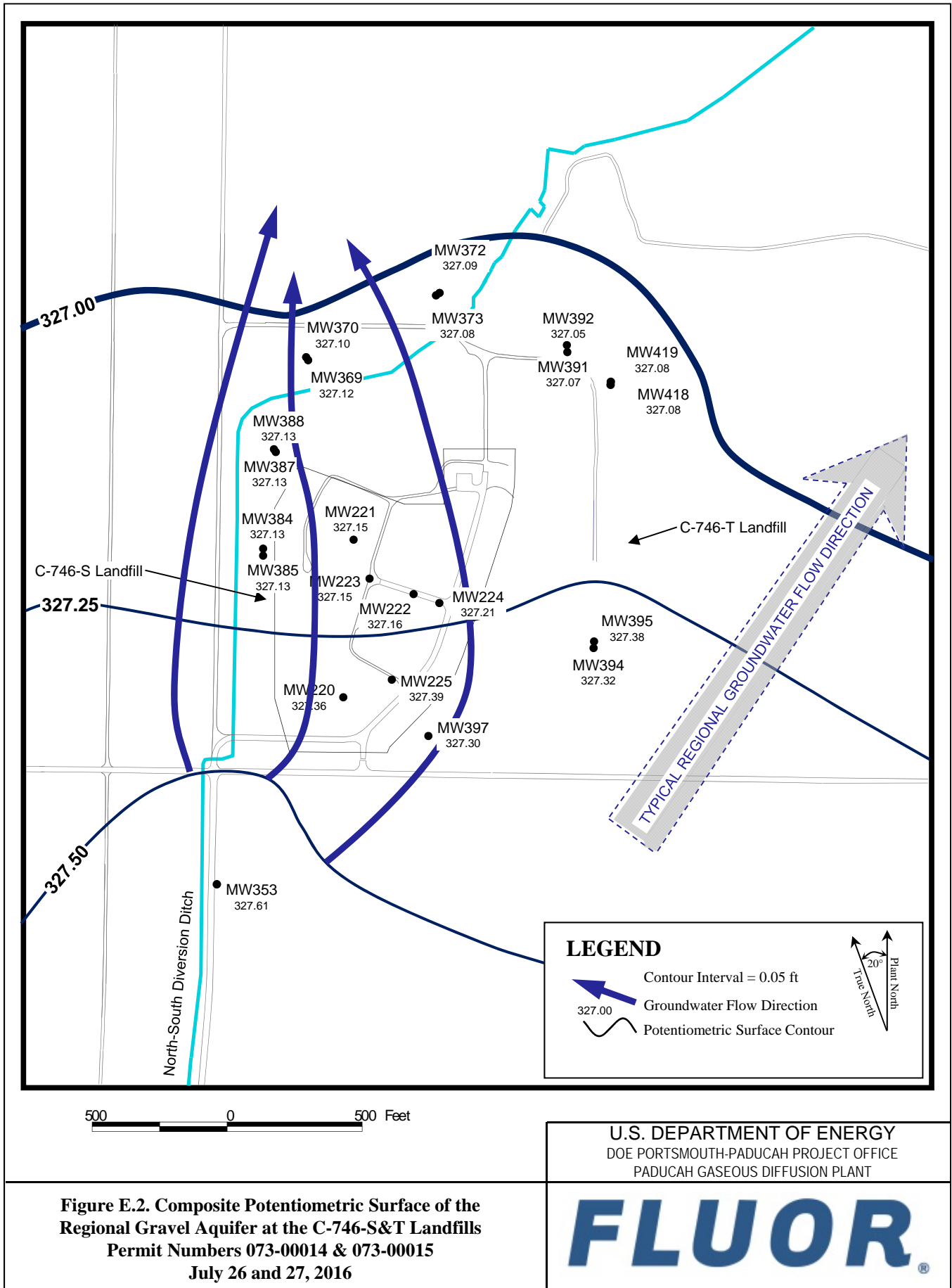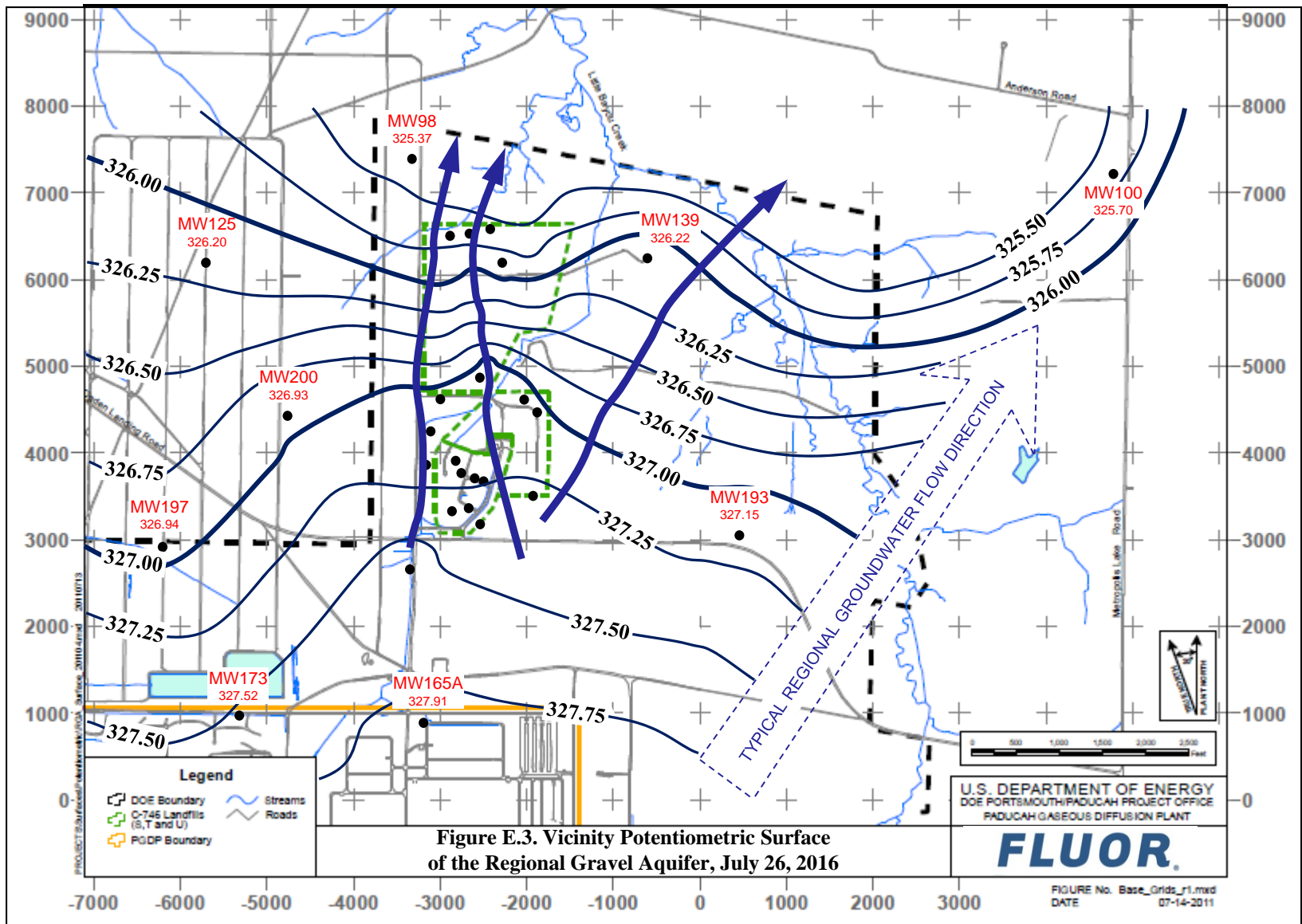
Table E.2. C-746-S&T Landfills Hydraulic Gradients

	ft/ft
Beneath Landfill Mound	2.61×10^{-4}
Vicinity	3.88×10^{-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
Beneath Landfill Mound					
725	0.256	0.19	6.69×10^{-5}	0.76	2.68×10^{-4}
425	0.150	0.11	3.92×10^{-5}	0.44	1.57×10^{-4}
Vicinity					
725	0.256	0.28	9.92×10^{-5}	1.12	3.97×10^{-4}
425	0.150	0.16	5.82×10^{-5}	0.66	2.33×10^{-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 third quarter 2016 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.

	Parameter	**Monitoring Well**
Upper Continental Recharge System	Technetium-99	MW390
Upper Regional Gravel Aquifer	Sodium	MW369
	Technetium-99	MW372, MW384, MW387
Lower Regional Gravel Aquifer	Sodium	MW397
	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.

Fluor Federal Services
PROJECT ENVIRONMENTAL MEASUREMENTS SYSTEM
C-746-S and -T LANDFILLS
PERMIT NUMBERS 073-00014 and 073-00015
MAXIMUM CONTAMINANT LIMIT (MCL) EXCEEDANCE REPORT
Quarterly Groundwater Sampling

AKGWA	Station	Analysis	Method	Results	Units	MCL
8004-4818	MW370	Beta activity	9310	58	pCi/L	50
8004-4808	MW372	Trichloroethene	8260B	10.8	ug/L	5
8004-4792	MW373	Trichloroethene	8260B	7.87	ug/L	5
8004-4809	MW384	Beta activity	9310	99.2	pCi/L	50
8004-4810	MW385	Beta activity	9310	108	pCi/L	50
8004-4815	MW387	Beta activity	9310	103	pCi/L	50
8004-4816	MW388	Beta activity	9310	97.1	pCi/L	50
8004-4805	MW391	Trichloroethene	8260B	11.4	ug/L	5
8004-4806	MW392	Trichloroethene	8260B	17.3	ug/L	5
8004-4802	MW394	Trichloroethene	8260B	6.27	ug/L	5

NOTE 1: These limits are defined in 401 KAR 47:030.

NOTE 2: MW370, MW372, and MW373 are down-gradient wells for the C-746-S and C-746-T Landfills and upgradient for the 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 and 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														*									
BARIUM																							
Quarter 3, 2003							■	■															
Quarter 4, 2003							■	■															
BETA ACTIVITY																							
Quarter 4, 2002													■										
Quarter 1, 2003													■				■						
Quarter 2, 2003			■	■													■			■			
Quarter 3, 2003			■										■				■						

G-3

Chart of MCL and Historical UTL Exceedances for the C-746-S and 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, 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										■			■				■	■		■			
BROMIDE																							
Quarter 1, 2003			✳																				
Quarter 4, 2003			✳																				
Quarter 1, 2004			✳																				

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
BROMIDE																							
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												✱							✱				
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												✱	✱						✱				

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 2, 2015												✳							✳				
Quarter 3, 2015												✳							✳				
Quarter 4, 2015												✳							✳				
Quarter 1, 2016												✳							✳				
Quarter 2, 2016												✳		✳					✳				
Quarter 3, 2016												✳							✳				
CARBON DISULFIDE																							
Quarter 4, 2010											✳												
Quarter 1, 2011												✳									✳		
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	✳																						
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			✳							✳													
CHLORIDE																							
Quarter 1, 2003			✳																				
Quarter 2, 2003			✳																				
Quarter 3, 2003			✳																				
Quarter 4, 2003			✳																				
Quarter 1, 2004			✳																				

Chart of MCL and Historical UTL Exceedances for the C-746-S and 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, 2004			✳																				
Quarter 3, 2004			✳																				
Quarter 4, 2004			✳																				
Quarter 1, 2005			✳																				
Quarter 2, 2005			✳																				
Quarter 3, 2005			✳																				
Quarter 4, 2005			✳																				
Quarter 1, 2006																		✳					
Quarter 2, 2006			✳																				
Quarter 3, 2006			✳																				
Quarter 4, 2006			✳																				
Quarter 1, 2007			✳																				
Quarter 2, 2007			✳																				
Quarter 3, 2007			✳																				
Quarter 4, 2007			✳																				
Quarter 1, 2008			✳																				
Quarter 2, 2008			✳																				
Quarter 3, 2008			✳																				
Quarter 4, 2008			✳																				
Quarter 1, 2009			✳																				
Quarter 2, 2009			✳																				
Quarter 3, 2009			✳																				
Quarter 4, 2009			✳																				
Quarter 1, 2010			✳																				
Quarter 2, 2010			✳																				
Quarter 3, 2010			✳																				
Quarter 4, 2010			✳																				
Quarter 2, 2011			✳																				
Quarter 3, 2011			✳																				
Quarter 4, 2011			✳																				
Quarter 3, 2012			✳																				
Quarter 3, 2013			✳																				
Quarter 4, 2013			✳																				
Quarter 4, 2014			✳																				
CHROMIUM																							
Quarter 4, 2002								■															
Quarter 1, 2003								■														■	
Quarter 2, 2003							■	■															
Quarter 3, 2009						■																	
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												✳							✳				

Chart of MCL and Historical UTL Exceedances for the C-746-S and 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 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												✱							✱				
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										✱		✱							✱				

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 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												∗							∗				
IODIDE																							
Quarter 4, 2002																						∗	
Quarter 2, 2003						∗																	
Quarter 3, 2003												∗											
Quarter 1, 2004			∗																				
Quarter 3, 2010																						∗	
Quarter 2, 2013										∗													

Chart of MCL and Historical UTL Exceedances for the C-746-S and 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, 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 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												*	*						*				

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 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												✳							✳				
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	✳		✳	✳		✳											✳	✳	✳	✳			
Quarter 4, 2010			✳					✳		✳				✳			✳	✳	✳	✳			
Quarter 1, 2011	✳			✳		✳	✳	✳	✳		✳		✳	✳			✳	✳		✳	✳		
Quarter 2, 2011	✳		✳	✳		✳	✳	✳	✳	✳	✳		✳	✳			✳	✳	✳	✳	✳		
Quarter 3, 2011	✳		✳	✳		✳		✳			✳		✳				✳	✳	✳	✳			

Chart of MCL and Historical UTL Exceedances for the C-746-S and 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, 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	*		*	*	*	*	*	*	*	*			*	*	*		*	*	*	*	*	*	*
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											*												
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																	*						

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
pH																							
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			✱																				
Quarter 4, 2015					✱	✱									✱		✱					✱	✱
Quarter 2, 2016			✱						✱		✱	✱	✱	✱	✱	✱		✱					
Quarter 3, 2016																		✱					
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			■																				

G-13

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 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																			*				
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										*													*
STRONTIUM-90																							
Quarter 2, 2003										■													
Quarter 1, 2004										■													

Chart of MCL and Historical UTL Exceedances for the C-746-S and 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 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	*									*		*	*				*	*	*	*			
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									*	*		*	*	*		*	*	*	*	*			

G-15

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 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			✶							✶		✶	✶				✶						
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			✶							✶		✶	✶				✶	✶		✶			

Chart of MCL and Historical UTL Exceedances for the C-746-S and 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
THORIUM-230																							
Quarter 1, 2012	*								*					*									
Quarter 4, 2014	*		*																				
Quarter 3, 2015	*								*	*			*			*							
THORIUM-234																							
Quarter 2, 2003						*			*					*									
Quarter 4, 2007									*														
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	*																						

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
TOTAL ORGANIC HALIDES																							
Quarter 4, 2010	✱																						
Quarter 1, 2011	✱																						
Quarter 3, 2013																					✱		
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												■		■		■			■		■		

Chart of MCL and Historical UTL Exceedances for the C-746-S and 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
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

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

C-746-S & T LANDFILL METHANE MONITORING REPORT

Date:	9/20/16		Time:	13:24		Monitor:	Tammy Smith

Weather Conditions:
Sunny @ 87*

Monitoring Equipment:
RAE System, Multi Rae 4495-5

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	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Cell 2 Gas Vent (3)	1	2	3	0
	0	0	0	

Cell 3 Gas Vent (7)	1	2	3	4	5	6	7	0
	0	0	0	0	0	0	0	

Landfill Office	Checked at floor level	0
Suspect or Problem Areas	No areas noted	*TS 9-20-16*

Remarks:

ALL VENTS CHECKED 1" FROM THE MOUTH OF THE VENT

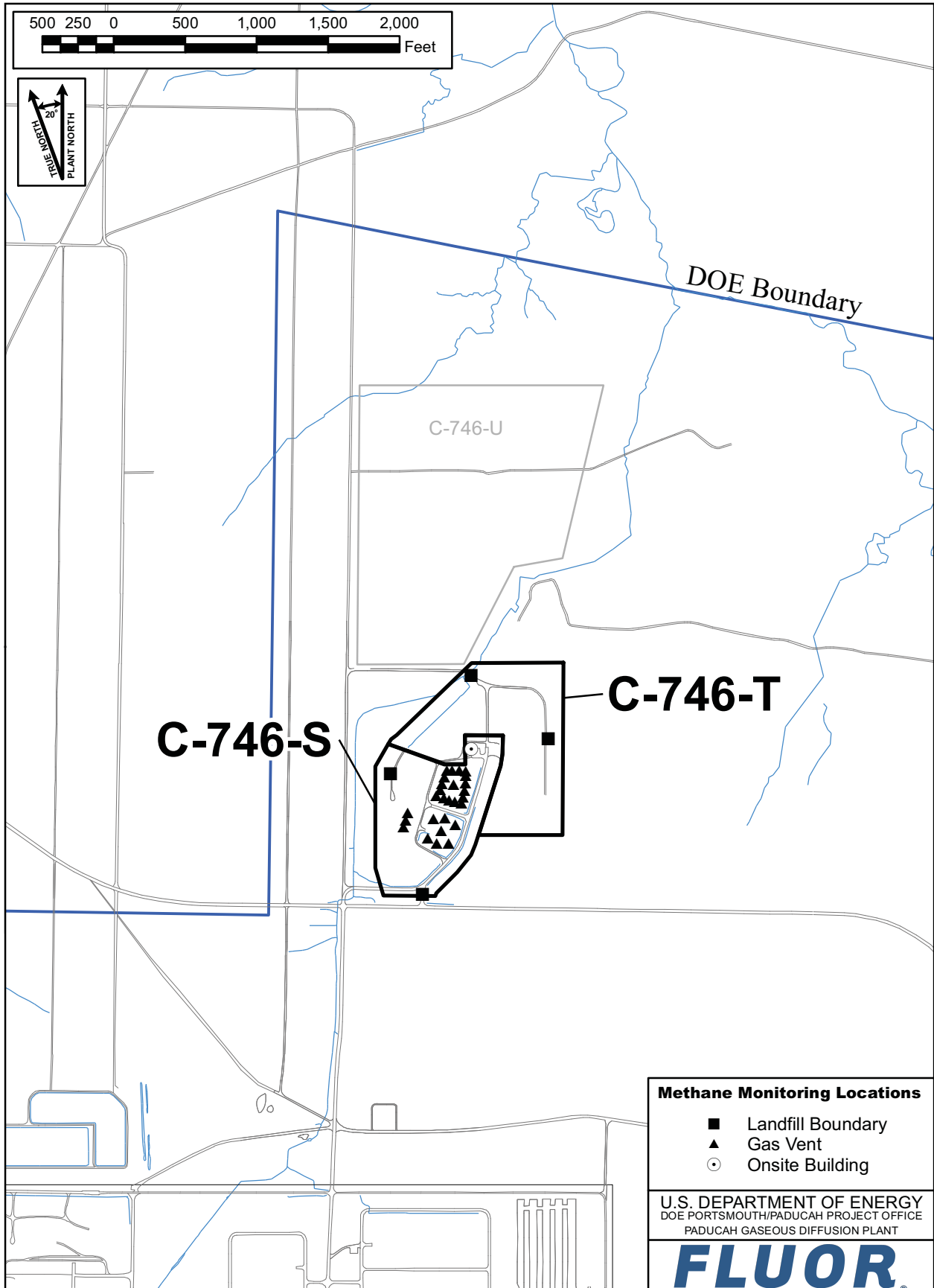| Performed by:		
Tammy Smith		9/20/2016
Signature		Date

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　　**RESIDENTIAL/INERT-QUARTERLY**

Solid Waste Branch　　**Facility: US DOE - Paducah Gaseous Diffusion Plant**

14 Reilly Road　　**Permit Number:** 073-00014 & 073-00015　FINDS/UNIT: <u>KY8-890-008-982</u> / <u>1</u>

Frankfort, KY 40601 (502)564-6716　　LAB ID: <u>None</u>

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)					7/7/2016 08:48		7/7/2016 08:32		8/1/2016 14:40			
Duplicate ("Y" or "N")[1]					N		N		N			
Split ('Y' or "N")[2]					N		N		N			
Facility Sample ID Number (if applicable)					L135SS4-16		L154US4-16		L136SS4-16			
Laboratory Sample ID Number (if applicable)					401151001		401153002		402879001			
Date of Analysis (Month/Day/Year)					7/28/2016		7/28/2016		8/25/2016			
CAS RN[3]	TD[4]	CONSTITUENT	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL[5]	FLAGS[7]	DETECTED VALUE OR PQL[5]	FLAGS[7]	DETECTED VALUE OR PQL[5]	FLAGS[7]	DETECTED VALUE OR PQL[5]	FLAGS[7]
A200-00-0	0 T	Flow	MGD	Field	1.54		2.04		0.61			
16887-00-6	2 T	Chloride(s)	MG/L	300.0	1.04		0.878		2.05			
14808-79-8	0 T	Sulfate	MG/L	300.0	2.78		2.33		4.61			
7439-89-6	0 T	Iron	MG/L	200.8	0.913		1.04		0.188			
7440-23-5	0 T	Sodium	MG/L	200.8	1.45		1.24		0.646			
S0268- -	0 T	Organic Carbon[6]	MG/L	9060	13.6		13.6		17.2			
S0097- -	0 T	BOD[6]	MG/L	not applicable		*		*		*		
S0130- -	0 T	Chemical Oxygen Demand	MG/L	410.4	67.7	B	120	B	97.5	B		

[1]Respond "Y" if the sample was a duplicate of another sample in this report
[2]Respond "Y" if the sample was split and analyzed by <u>separate</u> laboratories.
[3]Chemical 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
[6]Facility has either/or option on Organic Carbon and (BOD) Biochemical Oxygen Demand - both are <u>not</u> required
[7]Flags are as designated, <u>do not</u> 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

SURFACE WATER - QUARTERLY

Facility: **US DOE – Paducah Gaseous Diffusion Plant**

Permit Number: **073-00014 & 073-00015**   FINDS/UNIT: KY8-890-008-982 / 1

LAB ID: None

For Official Use Only

SURFACE WATER SAMPLE ANALYSIS – (Cont.)

CAS RN[3]		CONSTITUENT	T D [4]	Unit OF MEASURE	METHOD	L135 UPSTREAM DETECTED VALUE OR PQL[5]	FLAGS[7]	L154 DOWNSTREAM DETECTED VALUE OR PQL[5]	FLAGS[7]	L136 AT SITE DETECTED VALUE OR PQL[5]	FLAGS[7]	DETECTED VALUE OR PQL[5]	FLAGS[7]
S0145- -	1	Specific Conductance	T	μHMS/CM	Field	87		70		99			
S0270- -	0	Total Suspended Solids	T	MG/L	160.2	8.7		11.7		12.6			
S0266- -	0	Total Dissolved Solids	T	MG/L	160.1	78.6		52.9		97.1			
S0269- -	0	Total Solids	T	MG/L	SM-2540 B 17	104		98		105			
S0296- -	0	pH	T	Units	Field	6.97		7.1		7.13			
7440-61-1		Uranium	T	MG/L	200.8	0.00126		0.000694		0.000138	J		
12587-46-1		Gross Alpha (α)	T	pCi/L	9310	-4.96	*	-0.936	*	3.95	*		
12587-47-2		Gross Beta (β)	T	pCi/L	9310	2.25	*	3.26	*	3.51	*		

I-4

RESIDENTIAL/INERT – QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Numbers: 073-00014 & 073-00015

Finds/Unit: <u>KY8-890-008-982 / 1</u>

LAB ID:<u>   None   </u>

For Official Use Only

SURFACE WATER
WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
L135	L135SS4-16	Biochemical Oxygen Demand (BOD		Analysis of constituent not required and not performed.
		Alpha activity		TPU is 4.13. Rad error is 4.13.
		Beta activity		TPU is 4.75. Rad error is 4.74.
L154	L154US4-16	Biochemical Oxygen Demand (BOD		Analysis of constituent not required and not performed.
		Alpha activity		TPU is 4.42. Rad error is 4.42.
		Beta activity		TPU is 5.82. Rad error is 5.78.
L136	L136SS4-16	Biochemical Oxygen Demand (BOD		Analysis of constituent not required and not performed.
		Alpha activity		TPU is 5.49. Rad error is 5.45.
		Beta activity		TPU is 8.1. Rad error is 8.07.

THIS PAGE INTENTIONALLY LEFT BLANK