



## Department of Energy

Portsmouth/Paducah Project Office  
1017 Majestic Drive, Suite 200  
Lexington, Kentucky 40513  
(859) 219-4000

NOV 26 2014

Ms. Robin Green  
Division of Waste Management  
Kentucky Department for Environmental Protection  
200 Fair Oaks Lane, 2<sup>nd</sup> Floor  
Frankfort, Kentucky 40601

PPPO-02-2642555-15B

Mr. Todd Hendricks  
Division of Waste Management  
Kentucky Department for Environmental Protection  
200 Fair Oaks Lane, 2<sup>nd</sup> Floor  
Frankfort, Kentucky 40601

Mr. Bill McDonough  
Division of Waste Management  
Kentucky Department for Environmental Protection  
625 Hospital Drive  
Madisonville, Kentucky 42431

Dear Ms. Green, Mr. Hendricks, and Mr. McDonough:

**C-746-U CONTAINED LANDFILL THIRD QUARTER CALENDAR YEAR 2014  
(JULY-SEPTEMBER) COMPLIANCE MONITORING REPORT, PADUCAH  
GASEOUS DIFFUSION PLANT, PADUCAH, KENTUCKY, PAD-ENM-0089/V3,  
PERMIT NUMBER 073-00045**

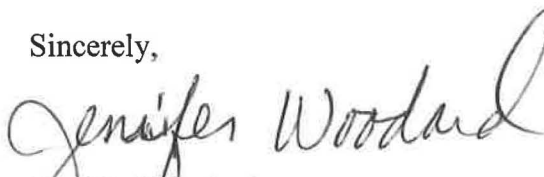
Enclosed is the subject report for the third quarter calendar year 2014. This report is required in accordance with Condition ACTV0006, Special Condition Number 3, of the C-746-U Contained Solid Waste Landfill Permit Number 073-00045. The report includes groundwater and surface water analytical data, validation summary, groundwater flow rate and direction determination, diagrams depicting well locations, and methane monitoring results.

The statistical analyses on the third quarter 2014 monitoring well data collected from the C-746-U Landfill were performed in accordance with Condition GSTR0001, Standard Requirement 3, using the U.S. Environmental Protection Agency guidance document, *EPA Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Final Guidance* (1989). The *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 was issued in June

2014, and approved during this quarter; therefore the new methodology for statistical analyses has been performed for this quarter's data. This report serves as the statistical increase notification for the third quarter calendar year 2014, in accordance with Condition GSTR0001, Standard Requirement 8, of the C-746-U Solid Waste Landfill Permit Number 073-00045.

If you have any questions or require additional information, please contact Lisa Santoro at (270) 441-6804.

Sincerely,



Jennifer Woodard  
Paducah Site Lead  
Portsmouth/Paducah Project Office

Enclosure:

*C-746-U Contained Landfill Third Quarter Calendar Year 2014 (July–September)  
Compliance Monitoring Report*

e-copy w/enclosure:

brian.begley@ky.gov, KDEP/Frankfort  
darla.bowen@lataky.com, LATA/Kevil  
gary.hines@lataky.com, LATA/Kevil  
jennifer.johnson@lataky.com, LATA/Kevil  
jennifer.woodard@lex.doe.gov, PPPO/PAD  
john.morgan@lataky.com, LATA/Kevil  
john.morgan@lataky.com, LATA/Kevil  
latacorrespondence@lataky.com, LATA/Kevil  
leo.williamson@ky.gov, KDEP/Frankfort  
lisa.santoro@lex.doe.gov, PPPO/PAD  
mark.duff@lataky.com, LATA/Kevil  
mike.guffey@ky.gov, KDEP/Frankfort  
myrna.redfield@lataky.com, LATA/Kevil  
pad.dmc@swiftstaley.com, SST/Kevil  
paula.spear@lataky.com, LATA/Kevil  
reinhard.knerr@lex.doe.gov, PPPO/PAD  
stephaniec.brock@ky.gov, KYRHB/Frankfort  
todd.mullins@ky.gov, KDEP/Frankfort

**C-746-U Contained Landfill  
Third Quarter Calendar Year 2014  
(July–September)  
Compliance Monitoring Report  
Paducah Gaseous Diffusion Plant,  
Paducah, Kentucky**

**CLEARED FOR PUBLIC RELEASE**



**C-746-U Contained Landfill  
Third Quarter Calendar Year 2014  
(July–September)  
Compliance Monitoring Report  
Paducah Gaseous Diffusion Plant,  
Paducah, Kentucky**

Date Issued—November 2014

Prepared for the  
U.S. DEPARTMENT OF ENERGY  
Office of Environmental Management

Prepared by  
LATA ENVIRONMENTAL SERVICES OF KENTUCKY, LLC  
managing the  
Environmental Remediation Activities at the  
Paducah Gaseous Diffusion Plant  
under contract DE-AC30-10CC40020

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## ACRONYMS

<i>CFR</i>	<i>Code of Federal Regulations</i>
EPA	U.S. Environmental Protection Agency
<i>KAR</i>	<i>Kentucky Administrative Regulations</i>
KDWM	Kentucky Division of Waste Management
<i>KRS</i>	<i>Kentucky Revised Statutes</i>
LEL	lower explosive limit
LRGA	Lower Regional Gravel Aquifer
MCL	maximum contaminant level
MW	monitoring well
RGA	Regional Gravel Aquifer
UCRS	Upper Continental Recharge System
URGA	Upper Regional Gravel Aquifer
UTL	upper tolerance limit

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# **1. INTRODUCTION**

This report, *C-746-U Contained Landfill Third Quarter Calendar Year 2014 (July–September) Compliance Monitoring Report, Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, is being submitted in accordance with Solid Waste Landfill Permit Number 073-00045. This report was written utilizing 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, KY*, (LATA Kentucky 2014).

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 reporting forms, which are presented in Appendix C. The statistical analyses and qualification statement are provided in Appendix D. The groundwater flow rate and direction determination are provided in Appendix E. Appendix F contains the notifications for parameters whose concentrations exceed the maximum contaminant level (MCL) listed in 401 KAR 47:030 § 6 for Kentucky solid waste facilities and for all 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 MCL exceedances and exceedances of the historical background UTL that have occurred, beginning in the fourth quarter calendar year 2002. Methane monitoring results are documented on the approved C-746-U Landfill Methane Monitoring Report form provided in Appendix H. The form includes pertinent remarks/observations as required by 401 KAR 48:090 § 4. Surface water was monitored, as specified in 401 KAR 48:300 § 2, and the approved surface water monitoring plan. The parameters identified in the Solid Waste Landfill Permit were analyzed for the three locations sampled for reporting only, pursuant to Permit Condition GMNP0003, Standard Requirement 1. Surface water results are provided in Appendix I.

## **1.1 BACKGROUND**

The C-746-U Landfill is an operating solid waste landfill located north of the Paducah Gaseous Diffusion Plant and north of the C-746-S&T Landfills. Construction and operation of the C-746-U Landfill was permitted in November 1996 under Solid Waste Landfill Permit Number 073-00045. The permitted C-746-U Landfill area covers about 60 acres and includes a liner and leachate collection system. C-746-U Landfill currently is operating in Phases 3, 4, and 5. Phases 1, 2, and most of Phase 3 have long-term cover. Phases 6 through 23 have not been constructed.

## **1.2 MONITORING PERIOD ACTIVITIES**

### **1.2.1 Groundwater Monitoring**

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

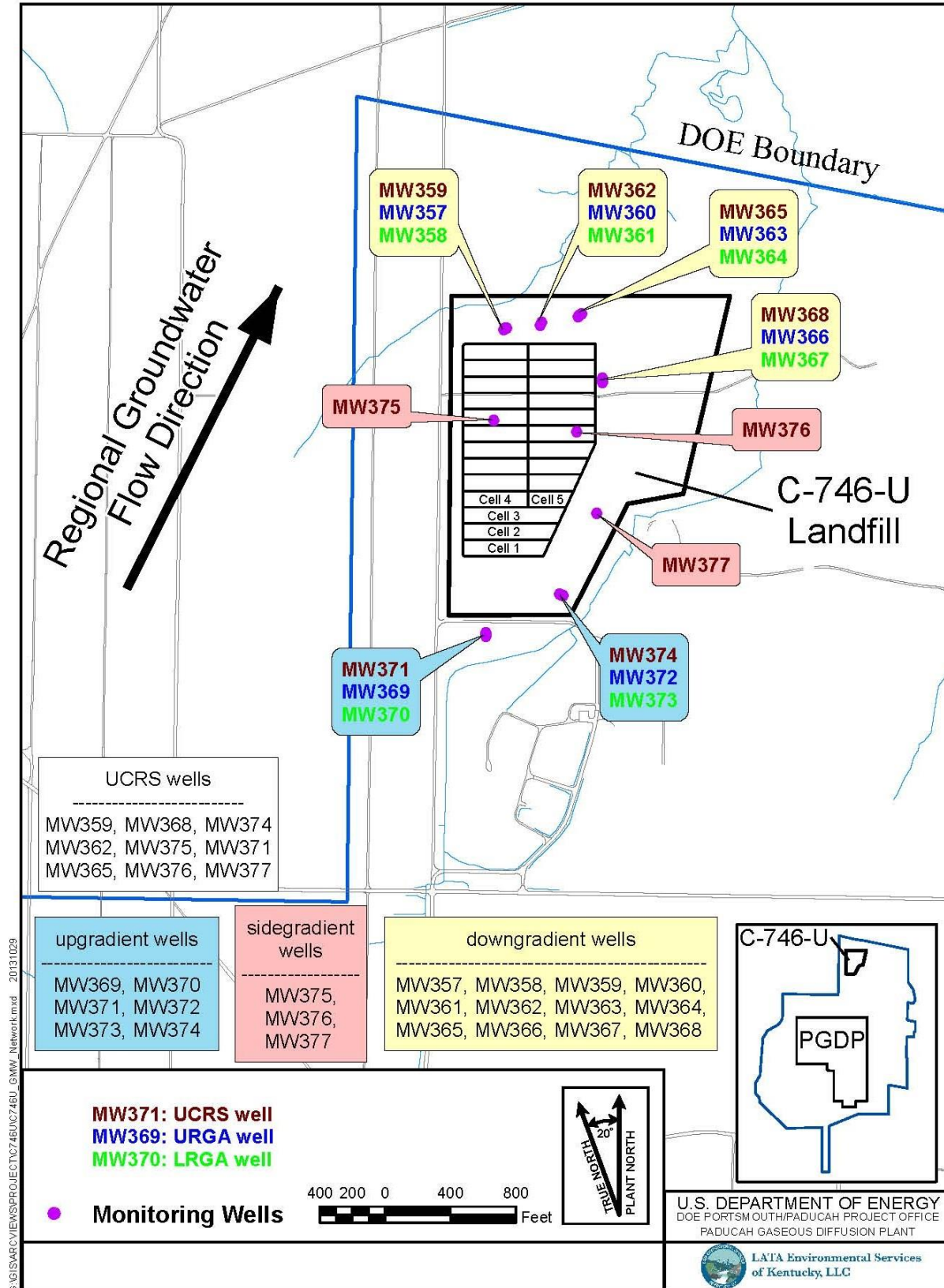


Figure 1. C-746-U Landfill Groundwater Monitoring Well Network

Consistent with the approved Groundwater Monitoring Plan (LATA Kentucky 2014) UCRS wells are included in the monitoring program. Groundwater flow is downward through the UCRS, but flow in the underlying RGA is lateral. Groundwater flow in the RGA is in a north-northeasterly direction in the vicinity of the C-746-U Landfill. The Ohio River and lower reaches of Little Bayou Creek are the discharge areas for the RGA flow system from the vicinity of the landfills. Consistent with the conceptual site model, the constituent concentrations in UCRS wells are considered to be representative only of the conditions local to the well or sourced from overlying soils; thus, no discussion of potential “upgradient” sources is relevant to the discussion for the UCRS. Nevertheless, a UTL for background also has been calculated for UCRS wells using concentrations from UCRS wells located in the same direction (relative to the landfill) as those RGA wells identified as upgradient. The results from these wells are considered to represent historical “background” for the UCRS water quality. Results from UCRS wells are compared to this UTL and exceedances of these values are reported in the quarterly report.

Groundwater sampling was conducted in accordance with the Groundwater Monitoring Plan (LATA Kentucky 2014) within the third quarter 2014 using LATA Environmental Services of Kentucky, LLC, procedure PAD-ENM-2101, *Groundwater Sampling*. Appropriate sample containers and preservatives were used.

The parameters specified in Permit Condition GSTR0001, Special Condition 1, were analyzed for all locations sampled.

The groundwater flow rate and direction determination are provided in Appendix E. Depth-to-water was measured on July 30 and 31, 2014, in MWs of the C-746-U Landfill (see Table E.1), in MWs of the C-746-S&T Landfills, and in MWs of the surrounding region (shown on Figure E.4). Water level measurements in 38 vicinity wells define the potentiometric surface for the RGA.<sup>1</sup> Normal regional flow in the RGA is northeastward, toward the Ohio River. The hydraulic gradient in the vicinity of the C-746-U Landfill in July was  $3.51 \times 10^{-4}$  ft/ft. The hydraulic gradient for the URGA at the C-746-U Landfill was  $7.69 \times 10^{-4}$  ft/ft, and the hydraulic gradient for the LRGA was  $7.44 \times 10^{-4}$  ft/ft. Calculated groundwater flow rates (average linear velocity) at the C-746-U Landfill range from 1.27 to 2.23 ft/day for the URGA and LRGA (see Table E.3).

### **1.2.2 Methane Monitoring**

Landfill operations staff monitored for the occurrence of methane on September 25, 2014, in four on-site building locations and four locations along the landfill boundary. See Appendix H for a map 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 C-746-U Landfill Methane Log provided in Appendix H.

### **1.2.3 Surface Water Monitoring**

Surface water was sampled in accordance with 401 KAR 48:300 § 2 and the approved surface water monitoring plan. Sampling was performed at three locations at the C-746-U Landfill. The C-746-U Landfill has an upstream location, L154; a downstream location, L351; and a location capturing runoff from the landfill surface, L150. A map of the surface water monitoring locations is presented in Figure 2.

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<sup>1</sup> Although depth-to-water is measured in the UCRS wells, the UCRS has a strong vertical hydraulic gradient that varies locally. The UCRS wells are screened over different elevations; therefore, the UCRS well measurements are not sufficient for mapping the potentiometric surface.

The parameters identified in the Solid Waste Landfill Permit were analyzed for the three locations sampled in report only format, pursuant to Permit Condition GMNP0003, Standard Requirement 1. Surface water reports are provided in Appendix I.

### 1.3 KEY RESULTS

The following parameters had concentrations that either exceeded the respective MCL (Table 1) or were shown to exceed the statistically derived historical background UTL (Table 2) concentrations<sup>2</sup> during the third quarter 2014. Those constituents (present in downgradient wells) that exceed their historical UTL were further 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	MW357: Trichloroethene	MW358: Trichloroethene
	MW372: Trichloroethene	MW373: Trichloroethene

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

UCRS	URGA	LRGA
MW359: Dissolved oxygen, oxidation-reduction potential, sulfate	MW357: Oxidation-reduction potential	MW358: Oxidation-reduction potential, technetium-99
MW362: Dissolved oxygen, oxidation-reduction potential; sulfate	MW360: Sodium	MW361: Oxidation-reduction potential, technetium-99
MW365: Dissolved oxygen, oxidation-reduction potential, sulfate	MW363: Oxidation-reduction potential	MW364: Oxidation-reduction potential, technetium-99
MW368: Dissolved oxygen, oxidation-reduction potential, sulfate	MW366: Oxidation-reduction potential,	MW367: Oxidation-reduction potential
MW371: Oxidation-reduction potential, sulfate	MW369: Oxidation-reduction potential	MW370: Oxidation-reduction potential
MW374: Oxidation-reduction potential	MW372: Calcium, conductivity, sulfate	MW373: Calcium, oxidation-reduction potential
MW375: Oxidation-reduction potential, sulfate		

Sidegradient wells\*: MW375,\* MW376, MW377

Downgradient wells\*: MW357, MW358, MW359,\* MW360, MW361, MW362,\* MW363, MW364, MW365,\* MW366,\* MW367,\* MW368\*

Upgradient wells\*: MW369, MW370, MW371,\* MW372, MW373, MW374\*

\*In the same direction, relative to the landfill, as RGA wells.

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

None
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<sup>2</sup> The term “concentration” may refer to a field measurement result such as pH, oxidation-reduction potential, or an analytical parameter such as trichloroethene or polychlorinated biphenyls.



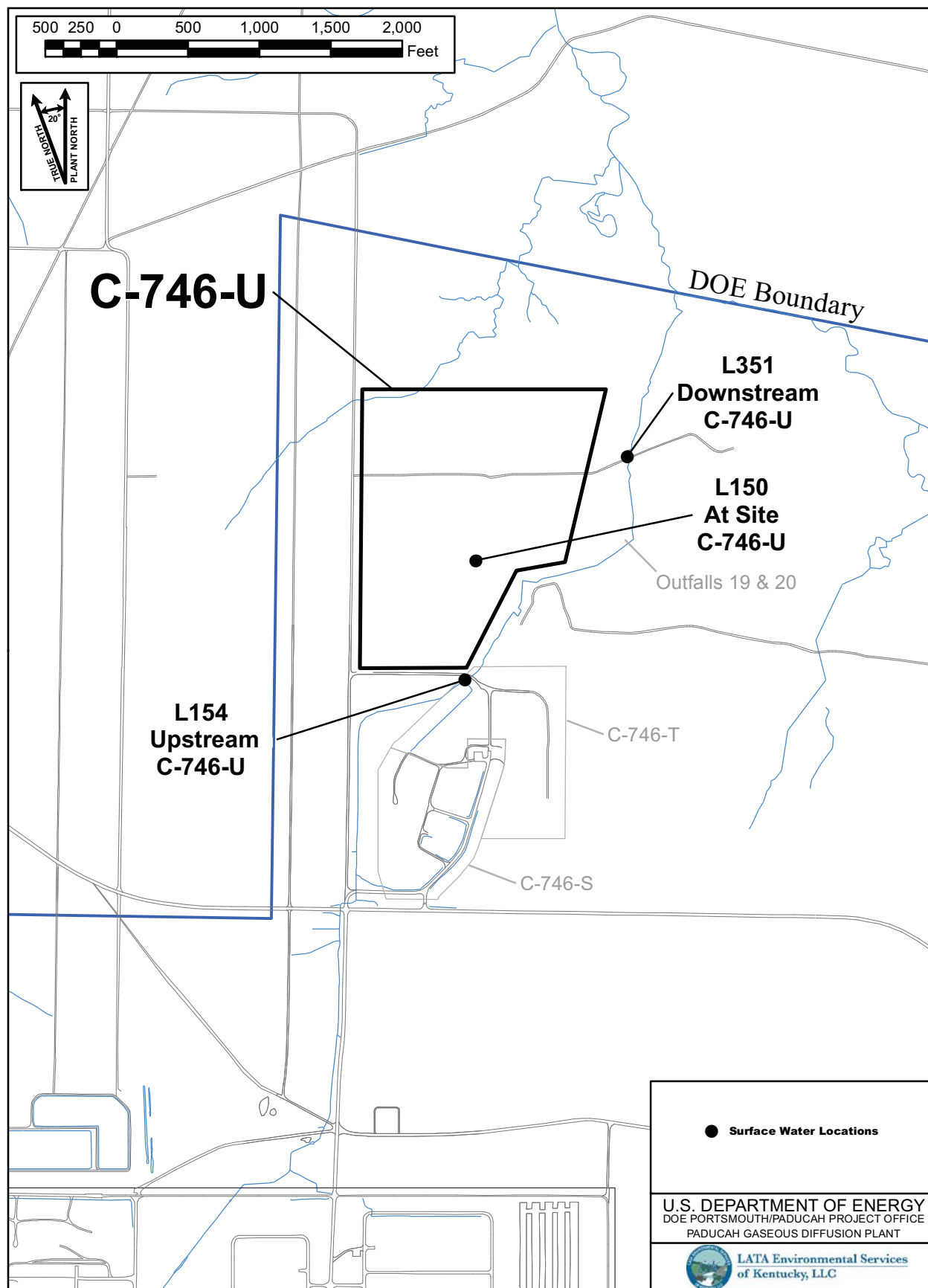


Figure 2. C-746-U Landfill Surface Water Monitoring Locations

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

There were no new MCL exceedances for this quarter. The constituents that exceeded their MCL were subjected to a comparison against the UTL concentrations calculated using historical concentrations from wells identified as background. None of the MCL exceedances also exceeded the statistically derived historical background concentration. In accordance with the approved groundwater monitoring plan, the MCL exceedances (trichloroethene in MW357, MW358, MW372, and MW373) do not exceed the historical background concentration and are considered to be Type I exceedances not attributable to a C-746-U Landfill

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 that the constituents present in downgradient wells with historical UTL exceedances are below the current UTL. In accordance with the approved groundwater monitoring plan, these are considered to be Type 1 exceedances and are considered to be not attributable to the C-746-U Landfill. NOTE: The gradients in UCRS wells are downward. Thus, none of the UCRS wells are properly considered to be downgradient of the landfill. However, the statistical evaluation of current UCRS wells against the current UCRS background UTL identified UCRS wells with sulfate values that exceed both the historical and current background. These exceedances are not attributable to C-746-U sources and are considered Type 1 exceedances (Table 4).

**Table 4. Exceedances of Current Background  
UTL in UCRS Wells**

<b>UCRS</b>
MW359: Sulfate
MW362: Sulfate
MW365: Sulfate
MW368: Sulfate
MW375: Sulfate

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

## 2. DATA EVALUATION/STATISTICAL SYNOPSIS

The statistical analyses conducted on the third quarter 2014 groundwater data collected from the C-746-U Contained Landfill MWs were performed in accordance with the *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 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, D2, and D3).

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 landfill. If there was an exceedance of the MCL in a downgradient well and this constituent also exceeded the historical background, the quarterly result was compared to the current background UTL (developed using the most recent eight quarters of data from wells identified as upgradient) to identify if this exceedance is properly 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 evaluated further to identify the source of the exceedance, if possible. If the source of the exceedance could not be identified, it was reported as a Type 2 exceedance—source undetermined.

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

**Table 5. Monitoring Wells Included Historically in Statistical Analysis\***

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

\*A map showing the monitoring well locations is shown on Figure 1.

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

\*\*\*MW376 and MW377 had sufficient water to permit a water level measurement, but insufficient water to provide water samples 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.

### **2.1.1 Upper Continental Recharge System**

In this quarter, 27 parameters without MCLs required statistical analysis in the UCRS. During the third quarter, dissolved oxygen, oxidation-reduction potential, and sulfate displayed concentrations that exceeded their respective historical UTL and are listed in Table 2.

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

In this quarter, 27 parameters without MCLs required statistical analysis in the URGA. During the third quarter, calcium, conductivity, oxidation-reduction potential, sodium and sulfate displayed concentrations that exceeded their respective historical UTL and are listed in Table 2.

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

In this quarter, 23 parameters without MCLs required statistical analysis in the LRGA. During the third quarter, calcium, oxidation-reduction potential, and technetium-99 displayed concentrations that exceeded their respective historical UTL and are listed in Table 2.

## **2.2 DATA VALIDATION**

Data verification is the process of comparing a data set against a set standard or contractual requirements. In accordance with the approved groundwater monitoring plan, data verification is performed for 100 percent of the data. Data is flagged as necessary.

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

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

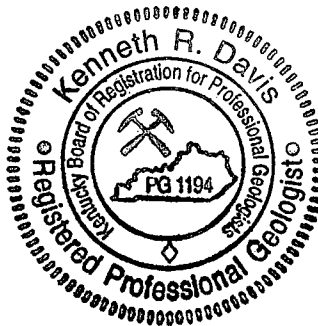
Due to laboratory error, acrolein and acrylonitrile were initially analyzed from preserved sample vials and the initial data was rejected. The following locations were resampled on September 22, 2014, and reanalyzed with the proper preservation and holding time: MW369, MW370, MW371, and MW375 and associated field blank, rinseate blank, and trip blank.

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### 3. PROFESSIONAL GEOLOGIST AUTHORIZATION

**DOCUMENT IDENTIFICATION:** *C-746-U Contained Landfill  
Third Quarter Calendar Year 2014 (July–September)  
Compliance Monitoring Report,  
Paducah Gaseous Diffusion Plant,  
Paducah, Kentucky (PAD-ENM-0089/V3)*

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



*Kenneth R. Davis*

Kenneth R. Davis

PG1194

*November 21, 2014*

Date

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## 4. REFERENCES

- EPA (U.S. Environmental Protection Agency) 1989. *EPA Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*, Interim Final Guidance, Office of Resource Conservation and Recovery, U.S. Environmental Protection Agency, Washington, DC.
- 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.

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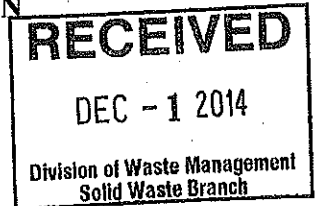
**APPENDIX A**

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

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

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



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

Permit No: 073-00045 Finds/Unit No: \_\_\_\_\_ Quarter & Year 3rd Qtr. CY 2014

*Please check the following as applicable:*

\_\_\_\_\_ Characterization X Quarterly \_\_\_\_\_ Semiannual \_\_\_\_\_ Annual \_\_\_\_\_ Assessment

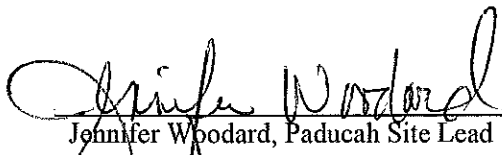
*Please check applicable submittal(s):* X Groundwater X Surface Water  
\_\_\_\_\_ Leachate X Methane Monitoring

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

I certify under penalty of law that 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.

  
\_\_\_\_\_  
Mark J. Duff, Paducah Project Manager  
LATA Environmental Services of Kentucky, LLC

11-26-14  
\_\_\_\_\_  
Date

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

11/26/14  
\_\_\_\_\_  
Date

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**APPENDIX B**

**FACILITY INFORMATION SHEET**

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## FACILITY INFORMATION SHEET

Groundwater: July 2014  
Surface Water: July 2014  
Sampling Date: Methane: September 2014 County: McCracken Permit Nos. 073-00045

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

Site Address: 5501 Hobbs Road Kevil, Kentucky 42053  
Street City/State Zip

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

### OWNER INFORMATION

Facility Owner: U.S. DOE – W. E. Murphie, Manager Phone No: (859) 219-4001

Contact Person: Mark J. Duff Phone No: (270) 441-5030

Contact Person Title: Project Manager, LATA Environmental Services of Kentucky, LLC

Mailing Address: 761 Veterans Avenue Kevil, Kentucky 42053  
Street City/State Zip

### SAMPLING PERSONNEL (IF OTHER THAN LANDFILL OR LABORATORY)

Company: LATA Environmental Services of Kentucky, LLC

Contact Person: Jeff Boulton Phone No: (270) 441-5444

Mailing Address: 761 Veterans Avenue Kevil, Kentucky 42053  
Street City/State Zip

### LABORATORY RECORD #1

Laboratory GEL Laboratories, LLC Lab ID No: KY90129

Contact Person: Joanne Harley Phone No: (843) 769-7387

Mailing Address: 2040 Savage Road Charleston, South Carolina 29047  
Street City/State Zip

### LABORATORY RECORD #2

Laboratory: . Lab ID No:

Contact Person:  Phone No:

Mailing Address:     
Street City/State Zip

### LABORATORY RECORD #3

Laboratory:  Lab ID No:

Contact Person:  Phone No:

Mailing Address:     
Street City/State Zip

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**APPENDIX C**

**GROUNDWATER SAMPLE ANALYSES  
AND WRITTEN COMMENTS**

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

RESIDENTIAL/CONTAINED-QUARTERLY  
Facility: US DOE - Paducah Gaseous Diffusion Plant  
Permit Number: 073-00045

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

LAB ID: None  
For Official Use Only

## GROUNDWATER SAMPLE ANALYSIS<sub>(S)</sub>

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number					8004-4798	8004-4799	8004-0981	8004-4800					
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					357	358	359	360					
Sample Sequence #					1	1	1	1					
If sample is a Blank, specify Type: (F)ield, (T)rip, (M)ethod, or (E)quipment					NA	NA	NA	NA					
Sample Date and Time (Month/Day/Year hour:minutes)					7/9/2014 08:14	7/9/2014 12:50	7/9/2014 09:01	7/10/2014 09:59					
Duplicate ("Y" or "N") <sup>2</sup>					N	N	N	N					
Split ("Y" or "N") <sup>3</sup>					N	N	N	N					
Facility Sample ID Number (if applicable)					MW357UG4-14	MW358UG4-14	MW359UG4-14	MW360UG4-14					
Laboratory Sample ID Number (if applicable)					352313001	352313006	352313002	352438001					
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis					7/15/2014	7/15/2014	7/15/2014	7/16/2014					
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)					DOWN	DOWN	DOWN	DOWN					
CAS RN <sup>4</sup>		CONSTITUENT	T D <sup>5</sup>	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S <sup>7</sup>	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
24959-67-9		Bromide	T	mg/L	9056	0.481		0.468		<0.2		<0.2	
16887-00-6		Chloride(s)	T	mg/L	9056	34.4		35.4		1.31		10.3	
16984-48-8		Fluoride	T	mg/L	9056	0.145		0.201		0.123		0.309	
S0595- -		Nitrate & Nitrite	T	mg/L	9056	1.21		0.653		1.82		0.0759	J
14808-79-8		Sulfate	T	mg/L	9056	54.7		83.2		48.5		41.2	
NS1894		Barometric Pressure Reading	T	Inches/Hg	Field	29.98		30.01		30.01		30.1	
S0145- -		Specific Conductance	T	µMH0/cm	Field	440		517		244		568	

<sup>1</sup>AKGWA # is 0000-0000 for any type of blank.

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

<sup>3</sup>Respond "Y" if the sample was split and analyzed by separate laboratories.

<sup>4</sup>Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.

<sup>5</sup>"T" = Total; "D" = Dissolved

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

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

### STANDARD FLAGS:

\* = See Comments

J = Estimated Value

B = Analyte found in blank

A = Average value

N = Presumptive ID

D = Concentration from analysis of a secondary dilution

## RESIDENTIAL/CONTAINED-QUARTERLY

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## GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number					8004-4798		8004-4799		8004-0981		8004-4800	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)					357		358		359		360	
CAS RN <sup>4</sup>	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
S0906 - -	Static Water Level Elevation	T	Ft. MSL	Field	326.01		325.99		331.9		325.76	
N238	Dissolved Oxygen	T	mg/L	Field	4.18		1.48		4.8		1.7	
S0266- -	Total Dissolved Solids	T	mg/L	160.1	216		243		144		334	
S0296- -	pH	T	Units	Field	6.18		6.15		5.94		6.41	
NS215	Eh	T	mV	Field	416		184		376		189	
S0907 - -	Temperature	T	°C	Field	18.56		21.33		19.39		19.61	
7429-90-5	Aluminum	T	mg/L	6020	0.0191	J	<0.05		0.0546		0.0261	J
7440-36-0	Antimony	T	mg/L	6020	<0.003		<0.003		<0.003		<0.003	
7440-38-2	Arsenic	T	mg/L	6020	<0.005		<0.005		<0.005		0.00301	J
7440-39-3	Barium	T	mg/L	6020	0.0582		0.0464		0.03		0.149	
7440-41-7	Beryllium	T	mg/L	6020	<0.0005		<0.0005		<0.0005		<0.0005	
7440-42-8	Boron	T	mg/L	6020	0.345		0.405		<0.015		0.0274	
7440-43-9	Cadmium	T	mg/L	6020	<0.001		<0.001		<0.001		<0.001	
7440-70-2	Calcium	T	mg/L	6020	27.3		33.6		6.39		26.7	
7440-47-3	Chromium	T	mg/L	6020	<0.01		<0.01		<0.01		<0.01	
7440-48-4	Cobalt	T	mg/L	6020	0.00022	J	0.0028		0.00017	J	0.0203	
7440-50-8	Copper	T	mg/L	6020	0.00068	J	0.00063	J	0.0135		0.00066	J
7439-89-6	Iron	T	mg/L	6020	0.121		0.505		0.0637	J	5.02	
7439-92-1	Lead	T	mg/L	6020	<0.002		<0.002		<0.002		<0.002	
7439-95-4	Magnesium	T	mg/L	6020	11.5		15		3.66		9.81	
7439-96-5	Manganese	T	mg/L	6020	0.032		0.153		0.00112	J	0.255	
7439-97-6	Mercury	T	mg/L	7470	<0.0002		<0.0002		<0.0002		<0.0002	

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## GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number					8004-4798		8004-4799		8004-0981		8004-4800		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					357		358		359		360		
CAS RN <sup>4</sup>		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
7439-98-7		Molybdenum	T	mg/L	6020	<0.0005		<0.0005		<0.0005		0.00042	J
7440-02-0		Nickel	T	mg/L	6020	0.00066	J	0.00206		0.00114	J	0.00212	
7440-09-7		Potassium	T	mg/L	6020	1.69		2.23		0.161	J	0.711	
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	41.4		41		36.2		85.5	
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		0.00028	
7440-62-2		Vanadium	T	mg/L	6010	<0.005		<0.005		<0.005		<0.005	
7440-66-6		Zinc	T	mg/L	6020	0.00627	J	0.0052	J	0.0064	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	

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## GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number					8004-4798		8004-4799		8004-0981		8004-4800	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					357		358		359		360	
CAS RN <sup>4</sup>	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
75-27-4	Bromodichloromethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-25-2	Tribromomethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
74-83-9	Methyl bromide	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
78-93-3	Methyl ethyl ketone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
110-57-6	trans-1,4-Dichloro-2-butene	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
75-15-0	Carbon disulfide	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
75-00-3	Chloroethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
67-66-3	Chloroform	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
74-87-3	Methyl chloride	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
156-59-2	cis-1,2-Dichloroethene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
74-95-3	Methylene bromide	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-34-3	1,1-Dichloroethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
107-06-2	1,2-Dichloroethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-35-4	1,1-Dichloroethylene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
106-93-4	Ethane, 1,2-dibromo	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
79-34-5	Ethane, 1,1,2,2-Tetrachloro	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
71-55-6	Ethane, 1,1,1-Trichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
79-00-5	Ethane, 1,1,2-Trichloro	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
630-20-6	Ethane, 1,1,1,2-Tetrachloro	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-01-4	Vinyl chloride	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
127-18-4	Ethene, Tetrachloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
79-01-6	Ethene, Trichloro-	T	mg/L	8260	0.00642		0.00558		<0.001		<0.001	



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Permit Number: 073-00045

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

LAB ID: None

For Official Use Only

## GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number					8004-4798		8004-4799		8004-0981		8004-4800		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					357		358		359		360		
CAS RN <sup>4</sup>		CONSTITUENT	T D <sup>5</sup>	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
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		<0.0000196		<0.0000198		<0.0000202	
78-87-5		Propane, 1,2-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
10061-02-6		trans-1,3-Dichloro-1-propene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
10061-01-5		cis-1,3-Dichloro-1-propene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
156-60-5		trans-1,2-Dichloroethene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-69-4		Trichlorofluoromethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
96-18-4		1,2,3-Trichloropropane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
95-50-1		Benzene, 1,2-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
106-46-7		Benzene, 1,4-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
1336-36-3		PCB, Total	T	ug/L	8082	<0.098		<0.102		<0.106		0.0803	J
12674-11-2		PCB-1016	T	ug/L	8082	<0.098		<0.102		<0.106		<0.0952	
11104-28-2		PCB-1221	T	ug/L	8082	<0.098		<0.102		<0.106		<0.0952	
11141-16-5		PCB-1232	T	ug/L	8082	<0.098		<0.102		<0.106		<0.0952	
53469-21-9		PCB-1242	T	ug/L	8082	<0.098		<0.102		<0.106		0.0803	J
12672-29-6		PCB-1248	T	ug/L	8082	<0.098		<0.102		<0.106		<0.0952	

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Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					357		358		359		360		
CAS RN <sup>4</sup>		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
11097-69-1		PCB-1254	T	ug/L	8082	<0.098		<0.102		<0.106		<0.0952	
11096-82-5		PCB-1260	T	ug/L	8082	<0.098		<0.102		<0.106		<0.0952	
11100-14-4		PCB-1268	T	ug/L	8082	<0.098		<0.102		<0.106		<0.0952	
12587-46-1		Gross Alpha	T	pCi/L	9310	5.39	*	-0.791	*	0.664	*	-1.62	*
12587-47-2		Gross Beta	T	pCi/L	9310	33.4	*	10	*	1.6	*	2.8	*
10043-66-0		Iodine-131	T	pCi/L			*		*		*		*
13982-63-3		Radium-226	T	pCi/L	AlphaSpec	0.245	*	0.22	*	0.344	*	0.297	*
10098-97-2		Strontium-90	T	pCi/L	905.0	4.18	*	0.182	*	-1.08	*	-1.11	*
14133-76-7		Technetium-99	T	pCi/L	Tc-02-RC	31.7	*	60.6	*	7.89	*	0.0254	*
14269-63-7		Thorium-230	T	pCi/L	Th-01-RC	0.729	*	-0.287	*	0.917	*	4.72	*
10028-17-8		Tritium	T	pCi/L	906.0	-73.7	*	-3.42	*	26.9	*	-91.6	*
S0130- -		Chemical Oxygen Demand	T	mg/L	410.4	9.33	J	20.4		20.4		17.8	J
57-12-5		Cyanide	T	mg/L	9012	<0.2		<0.2		<0.2		<0.2	
20461-54-5		Iodide	T	mg/L	300.0	<0.5		<0.5		<0.5		<0.5	
S0268- -		Total Organic Carbon	T	mg/L	9060	0.905	J	1	J	1.15	J	3.27	
S0586- -		Total Organic Halides	T	mg/L	9020	0.00672	J	0.00692	J	0.00352	J	0.0218	

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RESIDENTIAL/CONTAINED-QUARTERLY  
Facility: US DOE - Paducah Gaseous Diffusion Plant  
Permit Number: 073-00045

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

LAB ID: None  
For Official Use Only

## GROUNDWATER SAMPLE ANALYSIS<sub>(S)</sub>

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number					8004-4795	8004-0986	8004-4796	8004-4797					
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					361	362	363	364					
Sample Sequence #					1	1	1	1					
If sample is a Blank, specify Type: (F)ield, (T)rip, (M)ethod, or (E)quipment					NA	NA	NA	NA					
Sample Date and Time (Month/Day/Year hour:minutes)					7/10/2014 08:32	7/10/2014 09:14	7/10/2014 13:00	7/10/2014 14:06					
Duplicate ("Y" or "N") <sup>2</sup>					N	N	N	N					
Split ("Y" or "N") <sup>3</sup>					N	N	N	N					
Facility Sample ID Number (if applicable)					MW361UG4-14	MW362UG4-14	MW363UG4-14	MW364UG4-14					
Laboratory Sample ID Number (if applicable)					352438002	352438003	352438004	352438005					
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis					7/16/2014	7/16/2014	7/16/2014	7/16/2014					
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)					DOWN	DOWN	DOWN	DOWN					
CAS RN <sup>4</sup>		CONSTITUENT	T D <sup>5</sup>	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S <sup>7</sup>	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
24959-67-9		Bromide	T	mg/L	9056	0.412		0.145	J	0.142	J	0.438	
16887-00-6		Chloride(s)	T	mg/L	9056	32		9.93		27.5		30.4	
16984-48-8		Fluoride	T	mg/L	9056	0.175		0.402		0.266		0.181	
S0595- -		Nitrate & Nitrite	T	mg/L	9056	1.01		0.608		4.1		0.854	
14808-79-8		Sulfate	T	mg/L	9056	78.9		34.6		31.1		65.7	
NS1894		Barometric Pressure Reading	T	Inches/Hg	Field	30.09		30.1		30.12		30.11	
S0145- -		Specific Conductance	T	µMH0/cm	Field	484		729		402		476	

<sup>1</sup>AKGWA # is 0000-0000 for any type of blank.

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

<sup>3</sup>Respond "Y" if the sample was split and analyzed by separate laboratories.

<sup>4</sup>Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.

<sup>5</sup>"T" = Total; "D" = Dissolved

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

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

### STANDARD FLAGS:

\* = See Comments

J = Estimated Value

B = Analyte found in blank

A = Average value

N = Presumptive ID

D = Concentration from analysis of a secondary dilution

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## GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number						8004-4795		8004-0986		8004-4796		8004-4797	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)						361		362		363		364	
CAS RN <sup>4</sup>		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
S0906 - -		Static Water Level Elevation	T	Ft. MSL	Field	325.85		337.61		325.72		325.69	
N238		Dissolved Oxygen	T	mg/L	Field	3.12		5.36		1.36		2.87	
S0266- -		Total Dissolved Solids	T	mg/L	160.1	263		437		219		277	
S0296- -		pH	T	Units	Field	6.13		7.09		6.25		6.19	
NS215		Eh	T	mV	Field	429		215		354		204	
S0907 - -		Temperature	T	°C	Field	16.5		18.39		18.28		19.06	
7429-90-5		Aluminum	T	mg/L	6020	<0.05		2.79		<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		0.00303	J
7440-39-3		Barium	T	mg/L	6020	0.0546		0.107		0.167		0.0846	
7440-41-7		Beryllium	T	mg/L	6020	<0.0005		<0.0005		<0.0005		<0.0005	
7440-42-8		Boron	T	mg/L	6020	0.247		0.0177		0.0211		0.0106	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	31.6		21.9		27.7		28.6	
7440-47-3		Chromium	T	mg/L	6020	<0.01		0.00277	J	<0.01		<0.01	
7440-48-4		Cobalt	T	mg/L	6020	0.00015	J	0.00118		0.00141		0.00077	J
7440-50-8		Copper	T	mg/L	6020	0.00075	J	0.0035		0.00057	J	0.00119	
7439-89-6		Iron	T	mg/L	6020	0.103		1.74		0.125		4.2	
7439-92-1		Lead	T	mg/L	6020	<0.002		0.00136	J	<0.002		<0.002	
7439-95-4		Magnesium	T	mg/L	6020	13.5		9.38		10.7		12.4	
7439-96-5		Manganese	T	mg/L	6020	0.0164		0.0107		0.265		0.412	
7439-97-6		Mercury	T	mg/L	7470	<0.0002		<0.0002		<0.0002		<0.0002	

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## GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number					8004-4795		8004-0986		8004-4796		8004-4797		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					361		362		363		364		
CAS RN <sup>4</sup>		CONSTITUENT	T D <sup>5</sup>	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
7439-98-7		Molybdenum	T	mg/L	6020	<0.0005		0.00105		<0.0005		<0.0005	
7440-02-0		Nickel	T	mg/L	6020	0.00053	J	0.00289		0.00102	J	0.00177	J
7440-09-7		Potassium	T	mg/L	6020	1.93		0.498		1.3		2.01	
7440-16-6		Rhodium	T	mg/L	6020	<0.005		<0.005		<0.005		<0.005	
7782-49-2		Selenium	T	mg/L	6020	0.00157	J	<0.005		<0.005		0.00171	J
7440-22-4		Silver	T	mg/L	6020	<0.001		<0.001		<0.001		<0.001	
7440-23-5		Sodium	T	mg/L	6020	42.6		139		37.6		42.3	
7440-25-7		Tantalum	T	mg/L	6020	<0.005		<0.005		<0.005		<0.005	
7440-28-0		Thallium	T	mg/L	6020	<0.002		<0.002		<0.002		<0.002	
7440-61-1		Uranium	T	mg/L	6020	<0.0002		0.00696		<0.0002		<0.0002	
7440-62-2		Vanadium	T	mg/L	6010	<0.005		0.0042	J	<0.005		<0.005	
7440-66-6		Zinc	T	mg/L	6020	0.00721	J	0.00642	J	<0.01		0.0371	
108-05-4		Vinyl acetate	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
67-64-1		Acetone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
107-02-8		Acrolein	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
107-13-1		Acrylonitrile	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
71-43-2		Benzene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
108-90-7		Chlorobenzene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
1330-20-7		Xylenes	T	mg/L	8260	<0.003		<0.003		<0.003		<0.003	
100-42-5		Styrene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
108-88-3		Toluene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
74-97-5		Chlorobromomethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	

**RESIDENTIAL/CONTAINED-QUARTERLY**

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

LAB ID: None

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## GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number					8004-4795		8004-0986		8004-4796		8004-4797	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					361		362		363		364	
CAS RN <sup>4</sup>	CONSTITUENT	T D <sup>5</sup>	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
75-27-4	Bromodichloromethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-25-2	Tribromomethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
74-83-9	Methyl bromide	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
78-93-3	Methyl ethyl ketone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
110-57-6	trans-1,4-Dichloro-2-butene	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
75-15-0	Carbon disulfide	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
75-00-3	Chloroethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
67-66-3	Chloroform	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
74-87-3	Methyl chloride	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
156-59-2	cis-1,2-Dichloroethene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
74-95-3	Methylene bromide	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-34-3	1,1-Dichloroethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
107-06-2	1,2-Dichloroethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-35-4	1,1-Dichloroethylene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
106-93-4	Ethane, 1,2-dibromo	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
79-34-5	Ethane, 1,1,2,2-Tetrachloro	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
71-55-6	Ethane, 1,1,1-Trichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
79-00-5	Ethane, 1,1,2-Trichloro	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
630-20-6	Ethane, 1,1,1,2-Tetrachloro	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-01-4	Vinyl chloride	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
127-18-4	Ethene, Tetrachloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
79-01-6	Ethene, Trichloro-	T	mg/L	8260	0.0047		<0.001		0.00051	J	0.00348	

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## GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number						8004-4795		8004-0986		8004-4796		8004-4797	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						361		362		363		364	
CAS RN <sup>4</sup>		CONSTITUENT	T D <sup>5</sup>	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
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		<0.0000197	
78-87-5		Propane, 1,2-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
10061-02-6		trans-1,3-Dichloro-1-propene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
10061-01-5		cis-1,3-Dichloro-1-propene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
156-60-5		trans-1,2-Dichloroethene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-69-4		Trichlorofluoromethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
96-18-4		1,2,3-Trichloropropane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
95-50-1		Benzene, 1,2-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
106-46-7		Benzene, 1,4-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
1336-36-3		PCB, Total	T	ug/L	8082	<0.0962		<0.099		0.0896	J	<0.0952	
12674-11-2		PCB-1016	T	ug/L	8082	<0.0962		<0.099		<0.0943		<0.0952	
11104-28-2		PCB-1221	T	ug/L	8082	<0.0962		<0.099		<0.0943		<0.0952	
11141-16-5		PCB-1232	T	ug/L	8082	<0.0962		<0.099		<0.0943		<0.0952	
53469-21-9		PCB-1242	T	ug/L	8082	<0.0962		<0.099		0.0896	J	<0.0952	
12672-29-6		PCB-1248	T	ug/L	8082	<0.0962		<0.099		<0.0943		<0.0952	

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## GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number					8004-4795		8004-0986		8004-4796		8004-4797		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					361		362		363		364		
CAS RN <sup>4</sup>		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
11097-69-1		PCB-1254	T	ug/L	8082	<0.0962		<0.099		<0.0943		<0.0952	
11096-82-5		PCB-1260	T	ug/L	8082	<0.0962		<0.099		<0.0943		<0.0952	
11100-14-4		PCB-1268	T	ug/L	8082	<0.0962		<0.099		<0.0943		<0.0952	
12587-46-1		Gross Alpha	T	pCi/L	9310	0.437	*	6.6	*	-4.07	*	-1.47	*
12587-47-2		Gross Beta	T	pCi/L	9310	18	*	-3.28	*	6.77	*	35.4	*
10043-66-0		Iodine-131	T	pCi/L			*		*		*		*
13982-63-3		Radium-226	T	pCi/L	AlphaSpec	0.154	*	0.315	*	0.209	*	0.792	*
10098-97-2		Strontium-90	T	pCi/L	905.0	-3.86	*	0.0601	*	0.41	*	-0.338	*
14133-76-7		Technetium-99	T	pCi/L	Tc-02-RC	58.9	*	-6.47	*	18.8	*	59.7	*
14269-63-7		Thorium-230	T	pCi/L	Th-01-RC	2.64	*	1.23	*	3.34	*	2.91	*
10028-17-8		Tritium	T	pCi/L	906.0	-64.2	*	-136	*	-17.8	*	-1	*
S0130- -		Chemical Oxygen Demand	T	mg/L	410.4	17.8	J	21.5		6.69	J	12.2	J
57-12-5		Cyanide	T	mg/L	9012	<0.2		<0.2		<0.2		<0.2	
20461-54-5		Iodide	T	mg/L	300.0	<0.5		<0.5		<0.5		<0.5	
S0268- -		Total Organic Carbon	T	mg/L	9060	0.814	J	3.18		1.11	J	0.989	J
S0586- -		Total Organic Halides	T	mg/L	9020	0.0066	J	0.0273		0.00972	J	0.00798	J



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

RESIDENTIAL/CONTAINED-QUARTERLY  
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Permit Number: 073-00045

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

LAB ID: None  
For Official Use Only

## GROUNDWATER SAMPLE ANALYSIS<sub>(S)</sub>

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number					8004-0984	8004-0982	8004-4793	8004-0983					
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					365	366	367	368					
Sample Sequence #					1	1	1	1					
If sample is a Blank, specify Type: (F)ield, (T)rip, (M)ethod, or (E)quipment					NA	NA	NA	NA					
Sample Date and Time (Month/Day/Year hour: minutes)					7/9/2014 10:02	7/9/2014 07:52	7/9/2014 09:19	7/9/2014 08:29					
Duplicate ("Y" or "N") <sup>2</sup>					N	N	N	N					
Split ("Y" or "N") <sup>3</sup>					N	N	N	N					
Facility Sample ID Number (if applicable)					MW365UG4-14	MW366UG4-14	MW367UG4-14	MW368UG4-14					
Laboratory Sample ID Number (if applicable)					352313008	352313009	352313003	352313004					
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis					7/15/2014	7/15/2014	7/15/2014	7/15/2014					
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)					DOWN	SIDE	SIDE	SIDE					
CAS RN <sup>4</sup>		CONSTITUENT	T D <sup>5</sup>	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S <sup>7</sup>	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
24959-67-9		Bromide	T	mg/L	9056	<0.2		0.671		0.268		<0.2	
16887-00-6		Chloride(s)	T	mg/L	9056	5.87		37.7		18.4		1.96	
16984-48-8		Fluoride	T	mg/L	9056	0.254		0.173		0.132		0.583	
S0595- -		Nitrate & Nitrite	T	mg/L	9056	0.279		0.772		<0.1		<0.1	
14808-79-8		Sulfate	T	mg/L	9056	59.9		47.9		29.8		43.2	
NS1894		Barometric Pressure Reading	T	Inches/Hg	Field	30.01		30		30		30	
S0145- -		Specific Conductance	T	µMH0/cm	Field	446		459		335		655	

<sup>1</sup>AKGWA # is 0000-0000 for any type of blank.

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

<sup>3</sup>Respond "Y" if the sample was split and analyzed by separate laboratories.

<sup>4</sup>Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.

<sup>5</sup>"T" = Total; "D" = Dissolved

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

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

### STANDARD FLAGS:

\* = See Comments

J = Estimated Value

B = Analyte found in blank

A = Average value

N = Presumptive ID

D = Concentration from analysis of a secondary dilution

**RESIDENTIAL/CONTAINED-QUARTERLY**

**Facility: US DOE - Paducah Gaseous Diffusion Plant**

**Permit Number: 073-00045**

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

LAB ID: None

For Official Use Only

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

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number					8004-0984		8004-0982		8004-4793		8004-0983		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)					365		366		367		368		
CAS RN <sup>4</sup>		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
S0906 - -		Static Water Level Elevation	T	Ft. MSL	Field	331.49		325.97		325.27		332.79	
N238		Dissolved Oxygen	T	mg/L	Field	5.03		2.86		2.8		5.69	
S0266- -		Total Dissolved Solids	T	mg/L	160.1	231		219		140		416	
S0296- -		pH	T	Units	Field	6.39		6.16		6.1		6.79	
NS215		Eh	T	mV	Field	234		377		159		345	
S0907 - -		Temperature	T	°C	Field	21.78		20.17		20.5		21.56	
7429-90-5		Aluminum	T	mg/L	6020	0.0201	J	<0.05		<0.05		1.09	
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		0.00185	J	0.00225	J	0.0126	
7440-39-3		Barium	T	mg/L	6020	0.0946		0.153		0.173		0.0102	
7440-41-7		Beryllium	T	mg/L	6020	<0.0005		<0.0005		<0.0005		<0.0005	
7440-42-8		Boron	T	mg/L	6020	0.0115	J	0.103		0.014	J	0.0156	
7440-43-9		Cadmium	T	mg/L	6020	<0.001		<0.001		<0.001		<0.001	
7440-70-2		Calcium	T	mg/L	6020	23.7		28.2		19.4		19.6	
7440-47-3		Chromium	T	mg/L	6020	<0.01		<0.01		<0.01		<0.01	
7440-48-4		Cobalt	T	mg/L	6020	0.003		0.00013	J	0.00376		0.00082	J
7440-50-8		Copper	T	mg/L	6020	0.00157		0.00045	J	0.00039	J	0.00142	
7439-89-6		Iron	T	mg/L	6020	0.111		0.0711	J	9.07		0.581	
7439-92-1		Lead	T	mg/L	6020	<0.002		<0.002		<0.002		0.00066	J
7439-95-4		Magnesium	T	mg/L	6020	11		12		9.18		5.96	
7439-96-5		Manganese	T	mg/L	6020	0.0429		0.00304	J	1.32		0.008	
7439-97-6		Mercury	T	mg/L	7470	<0.0002		<0.0002		<0.0002		<0.0002	

## RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Number: 073-00045

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

LAB ID: None

For Official Use Only

## GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number					8004-0984		8004-0982		8004-4793		8004-0983		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					365		366		367		368		
CAS RN <sup>4</sup>		CONSTITUENT	T D <sup>5</sup>	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
7439-98-7		Molybdenum	T	mg/L	6020	0.00025	J	<0.0005		<0.0005		0.00395	
7440-02-0		Nickel	T	mg/L	6020	0.00724		0.00148	J	0.00215		0.0038	
7440-09-7		Potassium	T	mg/L	6020	0.269	J	1.81		2.71		0.967	
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		0.00186	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	57.5		42.2		23.6		133	
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	0.00026		<0.0002		<0.0002		0.00067	
7440-62-2		Vanadium	T	mg/L	6010	<0.005		<0.005		<0.005		0.00328	J
7440-66-6		Zinc	T	mg/L	6020	0.00418	J	<0.01		0.00394	J	0.00426	J
108-05-4		Vinyl acetate	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
67-64-1		Acetone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
107-02-8		Acrolein	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
107-13-1		Acrylonitrile	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
71-43-2		Benzene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
108-90-7		Chlorobenzene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
1330-20-7		Xylenes	T	mg/L	8260	<0.003		<0.003		<0.003		<0.003	
100-42-5		Styrene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
108-88-3		Toluene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
74-97-5		Chlorobromomethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	

## RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Number: 073-00045

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

LAB ID: None

For Official Use Only

## GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number					8004-0984		8004-0982		8004-4793		8004-0983	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					365		366		367		368	
CAS RN <sup>4</sup>	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
75-27-4	Bromodichloromethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-25-2	Tribromomethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
74-83-9	Methyl bromide	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
78-93-3	Methyl ethyl ketone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
110-57-6	trans-1,4-Dichloro-2-butene	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
75-15-0	Carbon disulfide	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
75-00-3	Chloroethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
67-66-3	Chloroform	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
74-87-3	Methyl chloride	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
156-59-2	cis-1,2-Dichloroethene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
74-95-3	Methylene bromide	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-34-3	1,1-Dichloroethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
107-06-2	1,2-Dichloroethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-35-4	1,1-Dichloroethylene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
106-93-4	Ethane, 1,2-dibromo	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
79-34-5	Ethane, 1,1,2,2-Tetrachloro	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
71-55-6	Ethane, 1,1,1-Trichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
79-00-5	Ethane, 1,1,2-Trichloro	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
630-20-6	Ethane, 1,1,1,2-Tetrachloro	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-01-4	Vinyl chloride	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
127-18-4	Ethene, Tetrachloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
79-01-6	Ethene, Trichloro-	T	mg/L	8260	<0.001		0.00386		0.00113		<0.001	

## RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Number: 073-00045

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

LAB ID: None

For Official Use Only

## GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number					8004-0984		8004-0982		8004-4793		8004-0983		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					365		366		367		368		
CAS RN <sup>4</sup>		CONSTITUENT	T D <sup>5</sup>	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
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	<0.0000197		<0.0000199		<0.00002		<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	0.245		<0.102		<0.098		0.251	
12674-11-2		PCB-1016	T	ug/L	8082	<0.1		<0.102		<0.098		<0.0962	
11104-28-2		PCB-1221	T	ug/L	8082	<0.1		<0.102		<0.098		<0.0962	
11141-16-5		PCB-1232	T	ug/L	8082	<0.1		<0.102		<0.098		<0.0962	
53469-21-9		PCB-1242	T	ug/L	8082	0.245		<0.102		<0.098		0.251	
12672-29-6		PCB-1248	T	ug/L	8082	<0.1		<0.102		<0.098		<0.0962	

## RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Number: 073-00045

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

LAB ID: None

For Official Use Only

## GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number					8004-0984		8004-0982		8004-4793		8004-0983		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					365		366		367		368		
CAS RN <sup>4</sup>		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
11097-69-1		PCB-1254	T	ug/L	8082	<0.1		<0.102		<0.098		<0.0962	
11096-82-5		PCB-1260	T	ug/L	8082	<0.1		<0.102		<0.098		<0.0962	
11100-14-4		PCB-1268	T	ug/L	8082	<0.1		<0.102		<0.098		<0.0962	
12587-46-1		Gross Alpha	T	pCi/L	9310	-4.55	*	-2.43	*	0.417	*	-0.0336	*
12587-47-2		Gross Beta	T	pCi/L	9310	-2.01	*	32	*	9.67	*	1.11	*
10043-66-0		Iodine-131	T	pCi/L			*		*		*		*
13982-63-3		Radium-226	T	pCi/L	AlphaSpec	0.241	*	0.221	*	0.909	*	0.0707	*
10098-97-2		Strontium-90	T	pCi/L	905.0	2.39	*	-0.93	*	0.461	*	-0.156	*
14133-76-7		Technetium-99	T	pCi/L	Tc-02-RC	10.3	*	54.3	*	8.96	*	-2.95	*
14269-63-7		Thorium-230	T	pCi/L	Th-01-RC	0.529	*	-0.282	*	0.0588	*	2.18	*
10028-17-8		Tritium	T	pCi/L	906.0	71.5	*	-62.2	*	22.9	*	-51.4	*
S0130- -		Chemical Oxygen Demand	T	mg/L	410.4	7.11	J	<20		<20		<20	
57-12-5		Cyanide	T	mg/L	9012	<0.2		<0.2		<0.2		<0.2	
20461-54-5		Iodide	T	mg/L	300.0	<0.5		<0.5		<0.5		<0.5	
S0268- -		Total Organic Carbon	T	mg/L	9060	2.44		0.982	J	0.969	J	2.12	
S0586- -		Total Organic Halides	T	mg/L	9020	0.0224		0.00676	J	<0.01		0.00672	J

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

RESIDENTIAL/CONTAINED-QUARTERLY  
Facility: US DOE - Paducah Gaseous Diffusion Plant  
Permit Number: 073-00045

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

LAB ID: None  
For Official Use Only

## GROUNDWATER SAMPLE ANALYSIS<sub>(S)</sub>

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number					8004-4820	8004-4818		8004-4819		8004-4808			
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					369	370		371		372			
Sample Sequence #					1	1		1		1			
If sample is a Blank, specify Type: (F)ield, (T)rip, (M)ethod, or (E)quipment					NA	NA		NA		NA			
Sample Date and Time (Month/Day/Year hour: minutes)					7/8/2014 08:02	7/8/2014 09:41		7/8/2014 08:46		7/7/2014 09:55			
Duplicate ("Y" or "N") <sup>2</sup>					N	N		N		N			
Split ("Y" or "N") <sup>3</sup>					N	N		N		N			
Facility Sample ID Number (if applicable)					MW369UG4-14	MW370UG4-14		MW371UG4-14		MW372UG4-14			
Laboratory Sample ID Number (if applicable)					352220001	352220002		352220003		352130001			
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis					7/12/2014	7/12/2014		7/12/2014		7/11/2014			
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)					UP	UP		UP		UP			
CAS RN <sup>4</sup>		CONSTITUENT	T D <sup>5</sup>	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S <sup>7</sup>	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
24959-67-9		Bromide	T	mg/L	9056	0.364		0.529		0.134	J	0.61	
16887-00-6		Chloride(s)	T	mg/L	9056	28.7		39.5		7.22		44.5	
16984-48-8		Fluoride	T	mg/L	9056	0.157		0.138		0.24		0.15	
S0595- -		Nitrate & Nitrite	T	mg/L	9056	0.279		1.31		1.52		0.034	J
14808-79-8		Sulfate	T	mg/L	9056	8.17		19		18.6		170	
NS1894		Barometric Pressure Reading	T	Inches/Hg	Field	29.85		29.89		29.87		29.94	
S0145- -		Specific Conductance	T	µMH0/cm	Field	364		430		675		839	

<sup>1</sup>AKGWA # is 0000-0000 for any type of blank.

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

<sup>3</sup>Respond "Y" if the sample was split and analyzed by separate laboratories.

<sup>4</sup>Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.

<sup>5</sup>"T" = Total; "D" = Dissolved

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

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

### STANDARD FLAGS:

\* = See Comments

J = Estimated Value

B = Analyte found in blank

A = Average value

N = Presumptive ID

D = Concentration from analysis of a secondary dilution

**RESIDENTIAL/CONTAINED-QUARTERLY**

**Facility: US DOE - Paducah Gaseous Diffusion Plant**

**Permit Number: 073-00045**

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

LAB ID: None

For Official Use Only

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

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number					8004-4820		8004-4818		8004-4819		8004-4808		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)					369		370		371		372		
CAS RN <sup>4</sup>		CONSTITUENT	T D <sup>5</sup>	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
S0906 - -		Static Water Level Elevation	T	Ft. MSL	Field	327.33		327.24		342.94		327.25	
N238		Dissolved Oxygen	T	mg/L	Field	3.07		3.3		2.64		1.26	
S0266- -		Total Dissolved Solids	T	mg/L	160.1	150		119		351		314	
S0296- -		pH	T	Units	Field	6.26		6.12		6.68		6.16	
NS215		Eh	T	mV	Field	409		363		335		126	
S0907 - -		Temperature	T	°C	Field	18.56		21.11		18.33		22.33	
7429-90-5		Aluminum	T	mg/L	6020	0.14		<0.05		0.137		0.0155	J
7440-36-0		Antimony	T	mg/L	6020	<0.003		<0.003		<0.003		<0.003	
7440-38-2		Arsenic	T	mg/L	6020	<0.005		<0.005		<0.005		0.0022	J
7440-39-3		Barium	T	mg/L	6020	0.313		0.184		0.133		0.0606	
7440-41-7		Beryllium	T	mg/L	6020	<0.0005		<0.0005		<0.0005		<0.0005	
7440-42-8		Boron	T	mg/L	6020	0.00703	J	0.0288		<0.015		1.04	
7440-43-9		Cadmium	T	mg/L	6020	<0.001		<0.001		<0.001		<0.001	
7440-70-2		Calcium	T	mg/L	6020	15.5		26.1		24.4		59.1	
7440-47-3		Chromium	T	mg/L	6020	<0.01		<0.01		<0.01		<0.01	
7440-48-4		Cobalt	T	mg/L	6020	0.00723		0.00052	J	<0.001		0.0003	J
7440-50-8		Copper	T	mg/L	6020	0.0014		0.00074	J	0.00102		0.00059	J
7439-89-6		Iron	T	mg/L	6020	0.483		0.0662	J	0.165		0.52	
7439-92-1		Lead	T	mg/L	6020	<0.002		<0.002		<0.002		<0.002	
7439-95-4		Magnesium	T	mg/L	6020	5.66		11		9.84		21.6	
7439-96-5		Manganese	T	mg/L	6020	0.0331		0.00219	J	0.00333	J	0.0166	
7439-97-6		Mercury	T	mg/L	7470	<0.0002		<0.0002		<0.0002		<0.0002	



## RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Number: 073-00045

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

LAB ID: None

For Official Use Only

## GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number					8004-4820		8004-4818		8004-4819		8004-4808		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					369		370		371		372		
CAS RN <sup>4</sup>		CONSTITUENT	T D <sup>5</sup>	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
7439-98-7		Molybdenum	T	mg/L	6020	0.00028	J	<0.0005		0.00026	J	0.00047	J
7440-02-0		Nickel	T	mg/L	6020	0.0113		0.00108	J	0.00095	J	0.00156	J
7440-09-7		Potassium	T	mg/L	6020	0.511		2.28		0.285	J	2.26	
7440-16-6		Rhodium	T	mg/L	6020	<0.005		<0.005		<0.005		<0.005	
7782-49-2		Selenium	T	mg/L	6020	<0.005		<0.005		<0.005		<0.005	
7440-22-4		Silver	T	mg/L	6020	<0.001		<0.001		<0.001		<0.001	
7440-23-5		Sodium	T	mg/L	6020	48.8		36.9		120		60.7	
7440-25-7		Tantalum	T	mg/L	6020	<0.005		<0.005		<0.005		<0.005	
7440-28-0		Thallium	T	mg/L	6020	<0.002		<0.002		<0.002		<0.002	
7440-61-1		Uranium	T	mg/L	6020	<0.0002		<0.0002		0.00131		<0.0002	
7440-62-2		Vanadium	T	mg/L	6010	<0.005		<0.005		<0.005		<0.005	
7440-66-6		Zinc	T	mg/L	6020	0.00373	J	<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	
107-13-1		Acrylonitrile	T	mg/L	8260		*		*		*	<0.005	
71-43-2		Benzene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
108-90-7		Chlorobenzene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
1330-20-7		Xylenes	T	mg/L	8260	<0.003		<0.003		<0.003		<0.003	
100-42-5		Styrene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
108-88-3		Toluene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
74-97-5		Chlorobromomethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	

## RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Number: 073-00045

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

LAB ID: None

For Official Use Only

## GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number					8004-4820		8004-4818		8004-4819		8004-4808	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					369		370		371		372	
CAS RN <sup>4</sup>	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
75-27-4	Bromodichloromethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-25-2	Tribromomethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
74-83-9	Methyl bromide	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
78-93-3	Methyl ethyl ketone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
110-57-6	trans-1,4-Dichloro-2-butene	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
75-15-0	Carbon disulfide	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
75-00-3	Chloroethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
67-66-3	Chloroform	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
74-87-3	Methyl chloride	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
156-59-2	cis-1,2-Dichloroethene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
74-95-3	Methylene bromide	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-34-3	1,1-Dichloroethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
107-06-2	1,2-Dichloroethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-35-4	1,1-Dichloroethylene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
106-93-4	Ethane, 1,2-dibromo	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
79-34-5	Ethane, 1,1,2,2-Tetrachloro	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
71-55-6	Ethane, 1,1,1-Trichloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
79-00-5	Ethane, 1,1,2-Trichloro	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
630-20-6	Ethane, 1,1,1,2-Tetrachloro	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-01-4	Vinyl chloride	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
127-18-4	Ethene, Tetrachloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
79-01-6	Ethene, Trichloro-	T	mg/L	8260	0.00048	J	0.00135		<0.001		0.00982	

## RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Number: 073-00045

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

LAB ID: None

For Official Use Only

## GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number						8004-4820		8004-4818		8004-4819		8004-4808		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						369		370		371		372		
CAS	RN <sup>4</sup>		CONSTITUENT	T D S	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
100-41-4			Ethylbenzene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
591-78-6			2-Hexanone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
74-88-4			Iodomethane	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
124-48-1			Methane, Dibromochloro-	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
56-23-5			Carbon Tetrachloride	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
75-09-2			Dichloromethane	T	mg/L	8260	<0.005		<0.005		<0.005		0.0011	J
108-10-1			Methyl isobutyl ketone	T	mg/L	8260	<0.005		<0.005		<0.005		<0.005	
96-12-8			Propane, 1,2-Dibromo-3-chloro	T	mg/L	8011	<0.0000199		<0.0000203		<0.0000196		<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	0.118		<0.102		<0.098		0.087	J
12674-11-2			PCB-1016	T	ug/L	8082	<0.104		<0.102		<0.098		<0.1	
11104-28-2			PCB-1221	T	ug/L	8082	<0.104		<0.102		<0.098		<0.1	
11141-16-5			PCB-1232	T	ug/L	8082	<0.104		<0.102		<0.098		<0.1	
53469-21-9			PCB-1242	T	ug/L	8082	0.118		<0.102		<0.098		0.087	J
12672-29-6			PCB-1248	T	ug/L	8082	<0.104		<0.102		<0.098		<0.1	

## RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Number: 073-00045

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

LAB ID: None

For Official Use Only

## GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number					8004-4820		8004-4818		8004-4819		8004-4808		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					369		370		371		372		
CAS RN <sup>4</sup>		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
11097-69-1		PCB-1254	T	ug/L	8082	<0.104		<0.102		<0.098		<0.1	
11096-82-5		PCB-1260	T	ug/L	8082	<0.104		<0.102		<0.098		<0.1	
11100-14-4		PCB-1268	T	ug/L	8082	<0.104		<0.102		<0.098		<0.1	
12587-46-1		Gross Alpha	T	pCi/L	9310	-2.16	*	-1.34	*	1.3	*	0.415	*
12587-47-2		Gross Beta	T	pCi/L	9310	5.76	*	19.2	*	5.06	*	30.3	*
10043-66-0		Iodine-131	T	pCi/L			*		*		*		*
13982-63-3		Radium-226	T	pCi/L	AlphaSpec	0.502	*	0.635	*	0.457	*	0.597	*
10098-97-2		Strontium-90	T	pCi/L	905.0	3.65	*	0.571	*	-0.753	*	0.869	*
14133-76-7		Technetium-99	T	pCi/L	Tc-02-RC	15.8	*	30.8	*	-0.93	*	26.6	*
14269-63-7		Thorium-230	T	pCi/L	Th-01-RC	0.0554	*	0.0902	*	1.84	*	0.431	*
10028-17-8		Tritium	T	pCi/L	906.0	-105	*	-76.4	*	41.8	*	-19	*
S0130- -		Chemical Oxygen Demand	T	mg/L	410.4	18.2	J	51.6		16	J	7.11	J
57-12-5		Cyanide	T	mg/L	9012	<0.2		<0.2		<0.2		<0.2	
20461-54-5		Iodide	T	mg/L	300.0	<0.5		<0.5		<0.5		<0.5	
S0268- -		Total Organic Carbon	T	mg/L	9060	1.26	J	0.852	J	1.94	J	1.38	J
S0586- -		Total Organic Halides	T	mg/L	9020	0.0206		0.00752	J	0.00552	J	0.0111	

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

RESIDENTIAL/CONTAINED-QUARTERLY  
Facility: US DOE - Paducah Gaseous Diffusion Plant  
Permit Number: 073-00045

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

LAB ID: None  
For Official Use Only

## GROUNDWATER SAMPLE ANALYSIS<sub>(S)</sub>

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number					8004-4792	8004-0990	8004-0985	8004-0988					
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					373	374	375	376					
Sample Sequence #					1	1	1	1					
If sample is a Blank, specify Type: (F)ield, (T)rip, (M)ethod, or (E)quipment					NA	NA	NA	NA					
Sample Date and Time (Month/Day/Year hour:minutes)					7/7/2014 12:50	7/7/2014 09:04	7/8/2014 12:52	NA					
Duplicate ("Y" or "N") <sup>2</sup>					N	N	N	N					
Split ("Y" or "N") <sup>3</sup>					N	N	N	N					
Facility Sample ID Number (if applicable)					MW373UG4-14	MW374UG4-14	MW375UG4-14	NA					
Laboratory Sample ID Number (if applicable)					352130002	352130003	352220004	NA					
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis					7/11/2014	7/11/2014	7/12/2014	NA					
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)					UP	UP	SIDE	SIDE					
CAS RN <sup>4</sup>		CONSTITUENT	T D <sup>5</sup>	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S <sup>7</sup>	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
24959-67-9		Bromide	T	mg/L	9056	0.608		0.927		<0.2			*
16887-00-6		Chloride(s)	T	mg/L	9056	44.2		76.4		5.13			*
16984-48-8		Fluoride	T	mg/L	9056	0.151		0.174		0.243			*
S0595- -		Nitrate & Nitrite	T	mg/L	9056	0.96		0.189		1.22			*
14808-79-8		Sulfate	T	mg/L	9056	203		5.64		30.5			*
NS1894		Barometric Pressure Reading	T	Inches/Hg	Field	29.91		29.94		29.95			*
S0145- -		Specific Conductance	T	µMH0/cm	Field	904		707		436			*

<sup>1</sup>AKGWA # is 0000-0000 for any type of blank.

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

<sup>3</sup>Respond "Y" if the sample was split and analyzed by separate laboratories.

<sup>4</sup>Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.

<sup>5</sup>"T" = Total; "D" = Dissolved

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

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

### STANDARD FLAGS:

\* = See Comments

J = Estimated Value

B = Analyte found in blank

A = Average value

N = Presumptive ID

D = Concentration from analysis of a secondary dilution

## RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Number: 073-00045

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

LAB ID: None

For Official Use Only

## GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number						8004-4792		8004-0990		8004-0985		8004-0988	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)						373		374		375		376	
CAS RN <sup>4</sup>		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
S0906 - -		Static Water Level Elevation	T	Ft. MSL	Field	327.26		337.85		334.46			*
N238		Dissolved Oxygen	T	mg/L	Field	2.4		1.76		2.39			*
S0266- -		Total Dissolved Solids	T	mg/L	160.1	540		366		210			*
S0296- -		pH	T	Units	Field	6.08		6.59		6.51			*
NS215		Eh	T	mV	Field	374		259		233			*
S0907 - -		Temperature	T	°C	Field	25.06		22.56		22.11			*
7429-90-5		Aluminum	T	mg/L	6020	<0.05		0.279		0.0388	J		*
7440-36-0		Antimony	T	mg/L	6020	<0.003		<0.003		<0.003			*
7440-38-2		Arsenic	T	mg/L	6020	<0.005		<0.005		0.00202	J		*
7440-39-3		Barium	T	mg/L	6020	0.0252		0.136		0.161			*
7440-41-7		Beryllium	T	mg/L	6020	<0.0005		<0.0005		<0.0005			*
7440-42-8		Boron	T	mg/L	6020	1.67		0.00917	J	0.00535	J		*
7440-43-9		Cadmium	T	mg/L	6020	<0.001		<0.001		<0.001			*
7440-70-2		Calcium	T	mg/L	6020	78.4		21.1		14.9			*
7440-47-3		Chromium	T	mg/L	6020	<0.01		<0.01		<0.01			*
7440-48-4		Cobalt	T	mg/L	6020	0.00015	J	0.00054	J	0.00018	J		*
7440-50-8		Copper	T	mg/L	6020	0.00076	J	0.00126		0.00077	J		*
7439-89-6		Iron	T	mg/L	6020	0.146		0.511		0.201			*
7439-92-1		Lead	T	mg/L	6020	<0.002		0.00056	J	<0.002			*
7439-95-4		Magnesium	T	mg/L	6020	27.5		5.64		5.57			*
7439-96-5		Manganese	T	mg/L	6020	0.00317	J	0.188		0.00546			*
7439-97-6		Mercury	T	mg/L	7470	<0.0002		<0.0002		<0.0002			*

## RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Number: 073-00045

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

LAB ID: None

For Official Use Only

## GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number					8004-4792		8004-0990		8004-0985		8004-0988	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					373		374		375		376	
CAS RN <sup>4</sup>	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
7439-98-7	Molybdenum	T	mg/L	6020	<0.0005		0.00027	J	<0.0005			*
7440-02-0	Nickel	T	mg/L	6020	0.00124	J	0.00205		0.00104	J		*
7440-09-7	Potassium	T	mg/L	6020	2.71		0.445		0.277	J		*
7440-16-6	Rhodium	T	mg/L	6020	<0.005		<0.005		<0.005			*
7782-49-2	Selenium	T	mg/L	6020	<0.005		0.00673		0.00196	J		*
7440-22-4	Silver	T	mg/L	6020	<0.001		<0.001		0.00047	J		*
7440-23-5	Sodium	T	mg/L	6020	66		132		68.4			*
7440-25-7	Tantalum	T	mg/L	6020	<0.005		<0.005		<0.005			*
7440-28-0	Thallium	T	mg/L	6020	<0.002		<0.002		<0.002			*
7440-61-1	Uranium	T	mg/L	6020	<0.0002		0.00072		0.0001	J		*
7440-62-2	Vanadium	T	mg/L	6010	<0.005		<0.005		<0.005			*
7440-66-6	Zinc	T	mg/L	6020	<0.01		0.00387	J	<0.01			*
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			*		*
107-13-1	Acrylonitrile	T	mg/L	8260	<0.005		<0.005			*		*
71-43-2	Benzene	T	mg/L	8260	<0.001		<0.001		<0.001			*
108-90-7	Chlorobenzene	T	mg/L	8260	<0.001		<0.001		<0.001			*
1330-20-7	Xylenes	T	mg/L	8260	<0.003		<0.003		<0.003			*
100-42-5	Styrene	T	mg/L	8260	<0.001		<0.001		<0.001			*
108-88-3	Toluene	T	mg/L	8260	<0.001		<0.001		<0.001			*
74-97-5	Chlorobromomethane	T	mg/L	8260	<0.001		<0.001		<0.001			*

## RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Number: 073-00045

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

LAB ID: None

For Official Use Only

## GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number					8004-4792		8004-0990		8004-0985		8004-0988	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					373		374		375		376	
CAS RN <sup>4</sup>	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
75-27-4	Bromodichloromethane	T	mg/L	8260	<0.001		<0.001		<0.001			*
75-25-2	Tribromomethane	T	mg/L	8260	<0.001		<0.001		<0.001			*
74-83-9	Methyl bromide	T	mg/L	8260	<0.001		<0.001		<0.001			*
78-93-3	Methyl ethyl ketone	T	mg/L	8260	<0.005		<0.005		<0.005			*
110-57-6	trans-1,4-Dichloro-2-butene	T	mg/L	8260	<0.005		<0.005		<0.005			*
75-15-0	Carbon disulfide	T	mg/L	8260	<0.005		<0.005		<0.005			*
75-00-3	Chloroethane	T	mg/L	8260	<0.001		<0.001		<0.001			*
67-66-3	Chloroform	T	mg/L	8260	<0.001		<0.001		<0.001			*
74-87-3	Methyl chloride	T	mg/L	8260	<0.001		<0.001		<0.001			*
156-59-2	cis-1,2-Dichloroethene	T	mg/L	8260	0.00032	J	<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	0.00964		<0.001		<0.001			*



## RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Number: 073-00045

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

LAB ID: None

For Official Use Only

## GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number						8004-4792		8004-0990		8004-0985		8004-0988	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						373		374		375		376	
CAS RN <sup>4</sup>		CONSTITUENT	T D <sup>5</sup>	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
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	0.00117	J	0.00116	J	<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	<0.00002		<0.0000198		<0.0000202			*
78-87-5		Propane, 1,2-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001			*
10061-02-6		trans-1,3-Dichloro-1-propene	T	mg/L	8260	<0.001		<0.001		<0.001			*
10061-01-5		cis-1,3-Dichloro-1-propene	T	mg/L	8260	<0.001		<0.001		<0.001			*
156-60-5		trans-1,2-Dichloroethene	T	mg/L	8260	<0.001		<0.001		<0.001			*
75-69-4		Trichlorofluoromethane	T	mg/L	8260	<0.001		<0.001		<0.001			*
96-18-4		1,2,3-Trichloropropane	T	mg/L	8260	<0.001		<0.001		<0.001			*
95-50-1		Benzene, 1,2-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001			*
106-46-7		Benzene, 1,4-Dichloro-	T	mg/L	8260	<0.001		<0.001		<0.001			*
1336-36-3		PCB, Total	T	ug/L	8082	<0.098		<0.098		<0.0962			*
12674-11-2		PCB-1016	T	ug/L	8082	<0.098		<0.098		<0.0962			*
11104-28-2		PCB-1221	T	ug/L	8082	<0.098		<0.098		<0.0962			*
11141-16-5		PCB-1232	T	ug/L	8082	<0.098		<0.098		<0.0962			*
53469-21-9		PCB-1242	T	ug/L	8082	<0.098		<0.098		<0.0962			*
12672-29-6		PCB-1248	T	ug/L	8082	<0.098		<0.098		<0.0962			*

## RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Number: 073-00045

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

LAB ID: None

For Official Use Only

## GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number					8004-4792		8004-0990		8004-0985		8004-0988		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					373		374		375		376		
CAS RN <sup>4</sup>		CONSTITUENT	T D <sup>5</sup>	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
11097-69-1		PCB-1254	T	ug/L	8082	<0.098		<0.098		<0.0962			*
11096-82-5		PCB-1260	T	ug/L	8082	<0.098		<0.098		<0.0962			*
11100-14-4		PCB-1268	T	ug/L	8082	<0.098		<0.098		<0.0962			*
12587-46-1		Gross Alpha	T	pCi/L	9310	-1.58	*	-3.97	*	6.12	*		*
12587-47-2		Gross Beta	T	pCi/L	9310	16.7	*	0.486	*	1.25	*		*
10043-66-0		Iodine-131	T	pCi/L			*		*		*		*
13982-63-3		Radium-226	T	pCi/L	AlphaSpec	0.425	*	0.435	*	0.253	*		*
10098-97-2		Strontium-90	T	pCi/L	905.0	0.254	*	-0.104	*	1.46	*		*
14133-76-7		Technetium-99	T	pCi/L	Tc-02-RC	20.1	*	1.74	*	0.174	*		*
14269-63-7		Thorium-230	T	pCi/L	Th-01-RC	0.688	*	-0.389	*	0.0558	*		*
10028-17-8		Tritium	T	pCi/L	906.0	-87	*	-36.7	*	-40.5	*		*
S0130- -		Chemical Oxygen Demand	T	mg/L	410.4	11.6	J	20.4		27.1			*
57-12-5		Cyanide	T	mg/L	9012	<0.2		<0.2		<0.2			*
20461-54-5		Iodide	T	mg/L	300.0	<0.5		<0.5		<0.5			*
S0268- -		Total Organic Carbon	T	mg/L	9060	1.2	J	2.16		1.37	J		*
S0586- -		Total Organic Halides	T	mg/L	9020	0.0118		0.013		0.0172			*

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

RESIDENTIAL/CONTAINED-QUARTERLY  
Facility: US DOE - Paducah Gaseous Diffusion Plant  
Permit Number: 073-00045

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

LAB ID: None  
For Official Use Only

## GROUNDWATER SAMPLE ANALYSIS<sub>(S)</sub>

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number					8004-0989	0000-0000		0000-0000		0000-0000			
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					377	E. BLANK		F. BLANK		T. BLANK 1			
Sample Sequence #					1	1		1		1			
If sample is a Blank, specify Type: (F)ield, (T)rip, (M)ethod, or (E)quipment					NA	E		F		T			
Sample Date and Time (Month/Day/Year hour:minutes)					NA	7/8/2014 13:55		7/8/2014 08:05		7/7/2014 08:00			
Duplicate ("Y" or "N") <sup>2</sup>					N	N		N		N			
Split ("Y" or "N") <sup>3</sup>					N	N		N		N			
Facility Sample ID Number (if applicable)					NA	RI1UG4-14		FB1UG4-14		TB1UG4-14			
Laboratory Sample ID Number (if applicable)					NA	352132008		352132009		352130004			
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis					NA	7/12/2014		7/12/2014		7/11/2014			
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)					SIDE	NA		NA		NA			
CAS RN <sup>4</sup>		CONSTITUENT	T D <sup>5</sup>	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S <sup>7</sup>	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
24959-67-9		Bromide	T	mg/L	9056		*		*		*		*
16887-00-6		Chloride(s)	T	mg/L	9056		*		*		*		*
16984-48-8		Fluoride	T	mg/L	9056		*		*		*		*
S0595- -		Nitrate & Nitrite	T	mg/L	9056		*		*		*		*
14808-79-8		Sulfate	T	mg/L	9056		*		*		*		*
NS1894		Barometric Pressure Reading	T	Inches/Hg	Field		*		*		*		*
S0145- -		Specific Conductance	T	µMH0/cm	Field		*		*		*		*

<sup>1</sup>AKGWA # is 0000-0000 for any type of blank.

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

<sup>3</sup>Respond "Y" if the sample was split and analyzed by separate laboratories.

<sup>4</sup>Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.

<sup>5</sup>"T" = Total; "D" = Dissolved

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

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

### STANDARD FLAGS:

\* = See Comments

J = Estimated Value

B = Analyte found in blank

A = Average value

N = Presumptive ID

D = Concentration from analysis of a secondary dilution

## RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Number: 073-00045

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

LAB ID: None

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## GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number					8004-0989		0000-0000		0000-0000		0000-0000		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)					377		E. BLANK		F. BLANK		T. BLANK 1		
CAS RN <sup>4</sup>		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
S0906 - -		Static Water Level Elevation	T	Ft. MSL	Field		*		*		*		*
N238		Dissolved Oxygen	T	mg/L	Field		*		*		*		*
S0266- -		Total Dissolved Solids	T	mg/L	160.1		*		*		*		*
S0296- -		pH	T	Units	Field		*		*		*		*
NS215		Eh	T	mV	Field		*		*		*		*
S0907 - -		Temperature	T	°C	Field		*		*		*		*
7429-90-5		Aluminum	T	mg/L	6020		*	<0.05		<0.05			*
7440-36-0		Antimony	T	mg/L	6020		*	<0.003		<0.003			*
7440-38-2		Arsenic	T	mg/L	6020		*	<0.005		<0.005			*
7440-39-3		Barium	T	mg/L	6020		*	<0.002		<0.002			*
7440-41-7		Beryllium	T	mg/L	6020		*	<0.0005		<0.0005			*
7440-42-8		Boron	T	mg/L	6020		*	<0.015		<0.015			*
7440-43-9		Cadmium	T	mg/L	6020		*	<0.001		<0.001			*
7440-70-2		Calcium	T	mg/L	6020		*	0.102	J	0.105	J		*
7440-47-3		Chromium	T	mg/L	6020		*	<0.01		<0.01			*
7440-48-4		Cobalt	T	mg/L	6020		*	<0.001		<0.001			*
7440-50-8		Copper	T	mg/L	6020		*	0.00038	J	<0.001			*
7439-89-6		Iron	T	mg/L	6020		*	<0.1		<0.1			*
7439-92-1		Lead	T	mg/L	6020		*	<0.002		<0.002			*
7439-95-4		Magnesium	T	mg/L	6020		*	<0.03		<0.03			*
7439-96-5		Manganese	T	mg/L	6020		*	<0.005		<0.005			*
7439-97-6		Mercury	T	mg/L	7470		*	<0.0002		<0.0002			*

## RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Number: 073-00045

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

LAB ID: None

For Official Use Only

## GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number					8004-0989		0000-0000		0000-0000		0000-0000			
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					377		E. BLANK		F. BLANK		T. BLANK 1			
CAS	RN <sup>4</sup>		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
7439-98-7			Molybdenum	T	mg/L	6020		*	<0.0005		<0.0005			*
7440-02-0			Nickel	T	mg/L	6020		*	<0.002		<0.002			*
7440-09-7			Potassium	T	mg/L	6020		*	1.72		2.71			*
7440-16-6			Rhodium	T	mg/L	6020		*	<0.005		<0.005			*
7782-49-2			Selenium	T	mg/L	6020		*	<0.005		<0.005			*
7440-22-4			Silver	T	mg/L	6020		*	<0.001		<0.001			*
7440-23-5			Sodium	T	mg/L	6020		*	0.213	J	0.283			*
7440-25-7			Tantalum	T	mg/L	6020		*	<0.005		<0.005			*
7440-28-0			Thallium	T	mg/L	6020		*	<0.002		<0.002			*
7440-61-1			Uranium	T	mg/L	6020		*	<0.0002		<0.0002			*
7440-62-2			Vanadium	T	mg/L	6010		*	<0.005		<0.005			*
7440-66-6			Zinc	T	mg/L	6020		*	<0.01		<0.01			*
108-05-4			Vinyl acetate	T	mg/L	8260		*	<0.005		<0.005		<0.005	
67-64-1			Acetone	T	mg/L	8260		*	0.00311	J	0.00311	J	0.0023	J
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		<0.001		<0.001	
108-90-7			Chlorobenzene	T	mg/L	8260		*	<0.001		<0.001		<0.001	
1330-20-7			Xylenes	T	mg/L	8260		*	<0.003		<0.003		<0.003	
100-42-5			Styrene	T	mg/L	8260		*	<0.001		<0.001		<0.001	
108-88-3			Toluene	T	mg/L	8260		*	<0.001		<0.001		<0.001	
74-97-5			Chlorobromomethane	T	mg/L	8260		*	<0.001		<0.001		<0.001	

## RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Number: 073-00045

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

LAB ID: None

For Official Use Only

## GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number					8004-0989		0000-0000		0000-0000		0000-0000	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					377		E. BLANK		F. BLANK		T. BLANK 1	
CAS RN <sup>4</sup>	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
75-27-4	Bromodichloromethane	T	mg/L	8260		*	<0.001		<0.001		<0.001	
75-25-2	Tribromomethane	T	mg/L	8260		*	<0.001		<0.001		<0.001	
74-83-9	Methyl bromide	T	mg/L	8260		*	<0.001		<0.001		<0.001	
78-93-3	Methyl ethyl ketone	T	mg/L	8260		*	<0.005		<0.005		0.0016	J
110-57-6	trans-1,4-Dichloro-2-butene	T	mg/L	8260		*	<0.005		<0.005		<0.005	
75-15-0	Carbon disulfide	T	mg/L	8260		*	<0.005		<0.005		<0.005	
75-00-3	Chloroethane	T	mg/L	8260		*	<0.001		<0.001		<0.001	
67-66-3	Chloroform	T	mg/L	8260		*	<0.001		<0.001		<0.001	
74-87-3	Methyl chloride	T	mg/L	8260		*	<0.001		<0.001		<0.001	
156-59-2	cis-1,2-Dichloroethene	T	mg/L	8260		*	<0.001		<0.001		<0.001	
74-95-3	Methylene bromide	T	mg/L	8260		*	<0.001		<0.001		<0.001	
75-34-3	1,1-Dichloroethane	T	mg/L	8260		*	<0.001		<0.001		<0.001	
107-06-2	1,2-Dichloroethane	T	mg/L	8260		*	<0.001		<0.001		<0.001	
75-35-4	1,1-Dichloroethylene	T	mg/L	8260		*	<0.001		<0.001		<0.001	
106-93-4	Ethane, 1,2-dibromo	T	mg/L	8260		*	<0.001		<0.001		<0.001	
79-34-5	Ethane, 1,1,2,2-Tetrachloro	T	mg/L	8260		*	<0.001		<0.001		<0.001	
71-55-6	Ethane, 1,1,1-Trichloro-	T	mg/L	8260		*	<0.001		<0.001		<0.001	
79-00-5	Ethane, 1,1,2-Trichloro	T	mg/L	8260		*	<0.001		<0.001		<0.001	
630-20-6	Ethane, 1,1,1,2-Tetrachloro	T	mg/L	8260		*	<0.001		<0.001		<0.001	
75-01-4	Vinyl chloride	T	mg/L	8260		*	<0.001		<0.001		<0.001	
127-18-4	Ethene, Tetrachloro-	T	mg/L	8260		*	<0.001		<0.001		<0.001	
79-01-6	Ethene, Trichloro-	T	mg/L	8260		*	<0.001		<0.001		<0.001	

## RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Number: 073-00045

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

LAB ID: None

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## GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number						8004-0989		0000-0000		0000-0000		0000-0000	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						377		E. BLANK		F. BLANK		T. BLANK 1	
CAS RN <sup>4</sup>		CONSTITUENT	T D <sup>5</sup>	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
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		0.00119	J
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		*	<0.00002		<0.00002		<0.0000202	
78-87-5		Propane, 1,2-Dichloro-	T	mg/L	8260		*	<0.001		<0.001		<0.001	
10061-02-6		trans-1,3-Dichloro-1-propene	T	mg/L	8260		*	<0.001		<0.001		<0.001	
10061-01-5		cis-1,3-Dichloro-1-propene	T	mg/L	8260		*	<0.001		<0.001		<0.001	
156-60-5		trans-1,2-Dichloroethene	T	mg/L	8260		*	<0.001		<0.001		<0.001	
75-69-4		Trichlorofluoromethane	T	mg/L	8260		*	<0.001		<0.001		<0.001	
96-18-4		1,2,3-Trichloropropane	T	mg/L	8260		*	<0.001		<0.001		<0.001	
95-50-1		Benzene, 1,2-Dichloro-	T	mg/L	8260		*	<0.001		<0.001		<0.001	
106-46-7		Benzene, 1,4-Dichloro-	T	mg/L	8260		*	<0.001		<0.001		<0.001	
1336-36-3		PCB, Total	T	ug/L	8082		*	<0.0962		<0.102			*
12674-11-2		PCB-1016	T	ug/L	8082		*	<0.0962		<0.102			*
11104-28-2		PCB-1221	T	ug/L	8082		*	<0.0962		<0.102			*
11141-16-5		PCB-1232	T	ug/L	8082		*	<0.0962		<0.102			*
53469-21-9		PCB-1242	T	ug/L	8082		*	<0.0962		<0.102			*
12672-29-6		PCB-1248	T	ug/L	8082		*	<0.0962		<0.102			*

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## RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Number: 073-00045

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

LAB ID: None

For Official Use Only

## GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number					8004-0989		0000-0000		0000-0000		0000-0000	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					377		E. BLANK		F. BLANK		T. BLANK 1	
CAS RN <sup>4</sup>	CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
11097-69-1	PCB-1254	T	ug/L	8082		*	<0.0962		<0.102			*
11096-82-5	PCB-1260	T	ug/L	8082		*	<0.0962		<0.102			*
11100-14-4	PCB-1268	T	ug/L	8082		*	<0.0962		<0.102			*
12587-46-1	Gross Alpha	T	pCi/L	9310		*	-1.37	*	0.12	*		*
12587-47-2	Gross Beta	T	pCi/L	9310		*	2.86	*	1.11	*		*
10043-66-0	Iodine-131	T	pCi/L			*		*		*		*
13982-63-3	Radium-226	T	pCi/L	903.1		*	0.178	*	0.186	*		*
10098-97-2	Strontium-90	T	pCi/L	905.0		*	-2.42	*	0.0673	*		*
14133-76-7	Technetium-99	T	pCi/L	Tc-02-RC		*	0.468	*	1.43	*		*
14269-63-7	Thorium-230	T	pCi/L	Th-01-RC		*	0.394	*	3.36	*		*
10028-17-8	Tritium	T	pCi/L	906.0		*	96.3	*	29.8	*		*
S0130- -	Chemical Oxygen Demand	T	mg/L	410.4		*		*		*		*
57-12-5	Cyanide	T	mg/L	9012		*		*		*		*
20461-54-5	Iodide	T	mg/L	300.0		*	<0.5		<0.5			*
S0268- -	Total Organic Carbon	T	mg/L	9060		*		*		*		*
S0586- -	Total Organic Halides	T	mg/L	9020		*		*		*		*



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

RESIDENTIAL/CONTAINED-QUARTERLY  
Facility: US DOE - Paducah Gaseous Diffusion Plant  
Permit Number: 073-00045

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

LAB ID: None  
For Official Use Only

## GROUNDWATER SAMPLE ANALYSIS<sub>(S)</sub>

AKGWA NUMBER <sup>1</sup> , 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.)					T. BLANK 2	T. BLANK 3	T. BLANK 4	T. BLANK 5					
Sample Sequence #					1	1	1	1					
If sample is a Blank, specify Type: (F)ield, (T)rip, (M)ethod, or (E)quipment					T	T	T	T					
Sample Date and Time (Month/Day/Year hour:minutes)					7/8/2014 06:50	7/9/2014 07:15	7/9/2014 07:20	7/10/2014 07:17					
Duplicate ("Y" or "N") <sup>2</sup>					N	N	N	N					
Split ("Y" or "N") <sup>3</sup>					N	N	N	N					
Facility Sample ID Number (if applicable)					TB2UG4-14	TB3UG4-14	TB4UG4-14	TB5UG4-14					
Laboratory Sample ID Number (if applicable)					352220007	352313005	352313010	352438006					
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis					7/12/2014	7/15/2014	7/15/2014	7/16/2014					
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)					NA	NA	NA	NA					
CAS RN <sup>4</sup>		CONSTITUENT	T D <sup>5</sup>	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S <sup>7</sup>	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
24959-67-9		Bromide	T	mg/L	9056		*		*		*		*
16887-00-6		Chloride(s)	T	mg/L	9056		*		*		*		*
16984-48-8		Fluoride	T	mg/L	9056		*		*		*		*
S0595- -		Nitrate & Nitrite	T	mg/L	9056		*		*		*		*
14808-79-8		Sulfate	T	mg/L	9056		*		*		*		*
NS1894		Barometric Pressure Reading	T	Inches/Hg	Field		*		*		*		*
S0145- -		Specific Conductance	T	µMH0/cm	Field		*		*		*		*

<sup>1</sup>AKGWA # is 0000-0000 for any type of blank.

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

<sup>3</sup>Respond "Y" if the sample was split and analyzed by separate laboratories.

<sup>4</sup>Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.

<sup>5</sup>"T" = Total; "D" = Dissolved

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

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

### STANDARD FLAGS:

\* = See Comments

J = Estimated Value

B = Analyte found in blank

A = Average value

N = Presumptive ID

D = Concentration from analysis of a secondary dilution

## RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Number: 073-00045

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

LAB ID: None

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## GROUNDWATER SAMPLE ANALYSIS - (Cont.)

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

## RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Number: 073-00045

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

LAB ID: None

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## GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number					0000-0000		0000-0000		0000-0000		0000-0000		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					T. BLANK 2		T. BLANK 3		T. BLANK 4		T. BLANK 5		
CAS RN <sup>4</sup>		CONSTITUENT	T D <sup>5</sup>	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
7439-98-7		Molybdenum	T	mg/L	6020		*		*		*		*
7440-02-0		Nickel	T	mg/L	6020		*		*		*		*
7440-09-7		Potassium	T	mg/L	6020		*		*		*		*
7440-16-6		Rhodium	T	mg/L	6020		*		*		*		*
7782-49-2		Selenium	T	mg/L	6020		*		*		*		*
7440-22-4		Silver	T	mg/L	6020		*		*		*		*
7440-23-5		Sodium	T	mg/L	6020		*		*		*		*
7440-25-7		Tantalum	T	mg/L	6020		*		*		*		*
7440-28-0		Thallium	T	mg/L	6020		*		*		*		*
7440-61-1		Uranium	T	mg/L	6020		*		*		*		*
7440-62-2		Vanadium	T	mg/L	6010		*		*		*		*
7440-66-6		Zinc	T	mg/L	6020		*		*		*		*
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	0.00301	J	0.00379	J	0.00385	J	0.00237	J
107-02-8		Acrolein	T	mg/L	8260		*	<0.005		<0.005		<0.005	
107-13-1		Acrylonitrile	T	mg/L	8260		*	<0.005		<0.005		<0.005	
71-43-2		Benzene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
108-90-7		Chlorobenzene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
1330-20-7		Xylenes	T	mg/L	8260	<0.003		<0.003		<0.003		<0.003	
100-42-5		Styrene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
108-88-3		Toluene	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	
74-97-5		Chlorobromomethane	T	mg/L	8260	<0.001		<0.001		<0.001		<0.001	

## RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Number: 073-00045

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

LAB ID: None

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## GROUNDWATER SAMPLE ANALYSIS - (Cont.)

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

## RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Number: 073-00045

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

LAB ID: None

For Official Use Only

## GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number						0000-0000		0000-0000		0000-0000		0000-0000	
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						T. BLANK 2		T. BLANK 3		T. BLANK 4		T. BLANK 5	
CAS RN <sup>4</sup>		CONSTITUENT	T D <sup>5</sup>	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
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		<0.00002	
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		*		*		*		*

## RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Number: 073-00045

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

LAB ID: None

For Official Use Only

## GROUNDWATER SAMPLE ANALYSIS - (Cont.)

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

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

RESIDENTIAL/CONTAINED-QUARTERLY  
Facility: US DOE - Paducah Gaseous Diffusion Plant  
Permit Number: 073-00045

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

LAB ID: None  
For Official Use Only

## GROUNDWATER SAMPLE ANALYSIS<sub>(S)</sub>

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number	8004-4799			
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)	358			
Sample Sequence #	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)	7/9/2014 12:50			
Duplicate ("Y" or "N") <sup>2</sup>	Y			
Split ("Y" or "N") <sup>3</sup>	N			
Facility Sample ID Number (if applicable)	MW358DUG4-14			
Laboratory Sample ID Number (if applicable)	352313007			
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis	7/15/2014			
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)	DOWN			

CAS RN <sup>4</sup>	CONSTITUENT	T D <sup>5</sup>	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G <sup>7</sup>	DETECTED VALUE OR PQL <sup>6</sup>	F L A G <sup>7</sup>	DETECTED VALUE OR PQL <sup>6</sup>	F L A G <sup>7</sup>	DETECTED VALUE OR PQL <sup>6</sup>	F L A G <sup>7</sup>
24959-67-9	Bromide	T	mg/L	9056	0.606							
16887-00-6	Chloride(s)	T	mg/L	9056	35.1							
16984-48-8	Fluoride	T	mg/L	9056	0.14							
S0595- -	Nitrate & Nitrite	T	mg/L	9056	0.65							
14808-79-8	Sulfate	T	mg/L	9056	85.8							
NS1894	Barometric Pressure Reading	T	Inches/Hg	Field	30.01							
S0145- -	Specific Conductance	T	μMH0/cm	Field	517							

### STANDARD FLAGS:

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

<sup>1</sup>AKGWA # is 0000-0000 for any type of blank.

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

<sup>3</sup>Respond "Y" if the sample was split and analyzed by separate laboratories.

<sup>4</sup>Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.

<sup>5</sup>"T" = Total; "D" = Dissolved

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

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

## RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Number: 073-00045

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

LAB ID: None

For Official Use Only

## GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number					8004-4799								
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)					358								
CAS RN <sup>4</sup>		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
S0906 - -		Static Water Level Elevation	T	Ft. MSL	Field	325.99							
N238		Dissolved Oxygen	T	mg/L	Field	1.48							
S0266- -		Total Dissolved Solids	T	mg/L	160.1	286							
S0296- -		pH	T	Units	Field	6.15							
NS215		Eh	T	mV	Field	184							
S0907 - -		Temperature	T	°C	Field	21.33							
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	0.0453							
7440-41-7		Beryllium	T	mg/L	6020	<0.0005							
7440-42-8		Boron	T	mg/L	6020	0.359							
7440-43-9		Cadmium	T	mg/L	6020	<0.001							
7440-70-2		Calcium	T	mg/L	6020	32							
7440-47-3		Chromium	T	mg/L	6020	<0.01							
7440-48-4		Cobalt	T	mg/L	6020	0.0033							
7440-50-8		Copper	T	mg/L	6020	0.00054	J						
7439-89-6		Iron	T	mg/L	6020	0.736							
7439-92-1		Lead	T	mg/L	6020	<0.002							
7439-95-4		Magnesium	T	mg/L	6020	14.2							
7439-96-5		Manganese	T	mg/L	6020	0.201							
7439-97-6		Mercury	T	mg/L	7470	<0.0002							



## RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Number: 073-00045

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

LAB ID: None

For Official Use Only

## GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number					8004-4799								
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					358								
CAS RN <sup>4</sup>		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
7439-98-7		Molybdenum	T	mg/L	6020	<0.0005							
7440-02-0		Nickel	T	mg/L	6020	0.00214							
7440-09-7		Potassium	T	mg/L	6020	2.11							
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	38.7							
7440-25-7		Tantalum	T	mg/L	6020	<0.005							
7440-28-0		Thallium	T	mg/L	6020	<0.002							
7440-61-1		Uranium	T	mg/L	6020	<0.0002							
7440-62-2		Vanadium	T	mg/L	6010	<0.005							
7440-66-6		Zinc	T	mg/L	6020	0.00583	J						
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							

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## RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Number: 073-00045

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

LAB ID: None

For Official Use Only

## GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number					8004-4799								
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					358								
CAS RN <sup>4</sup>		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
75-27-4		Bromodichloromethane	T	mg/L	8260	<0.001							
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	0.00537							

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## RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Number: 073-00045

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

LAB ID: None

For Official Use Only

## GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number						8004-4799							
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)						358							
CAS RN <sup>4</sup>		CONSTITUENT	T D <sup>5</sup>	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
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	<0.0000198							
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	<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							

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## RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Number: 073-00045

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

LAB ID: None

For Official Use Only

## GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number					8004-4799								
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					358								
CAS RN <sup>4</sup>		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
11097-69-1		PCB-1254	T	ug/L	8082	<0.0962							
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	0.0221	*						
12587-47-2		Gross Beta	T	pCi/L	9310	19.8	*						
10043-66-0		Iodine-131	T	pCi/L			*						
13982-63-3		Radium-226	T	pCi/L	AlphaSpec	0.363	*						
10098-97-2		Strontium-90	T	pCi/L	905.0	1.17	*						
14133-76-7		Technetium-99	T	pCi/L	Tc-02-RC	46.2	*						
14269-63-7		Thorium-230	T	pCi/L	Th-01-RC	0.365	*						
10028-17-8		Tritium	T	pCi/L	906.0	-61.8	*						
S0130- -		Chemical Oxygen Demand	T	mg/L	410.4	22.7							
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	1.02	J						
S0586- -		Total Organic Halides	T	mg/L	9020	0.00646	J						

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

RESIDENTIAL/CONTAINED-QUARTERLY  
Facility: US DOE - Paducah Gaseous Diffusion Plant  
Permit Number: 073-00045

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

LAB ID: None  
For Official Use Only

## GROUNDWATER SAMPLE ANALYSIS<sub>(S)</sub>

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number					8004-4820	8004-4818	8004-4819						
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					369	370	371						
Sample Sequence #					2	2	2						
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)					9/22/2014 13:59	9/22/2014 14:55	9/22/2014 14:27						
Duplicate ("Y" or "N") <sup>2</sup>					N	N	N						
Split ("Y" or "N") <sup>3</sup>					N	N	N						
Facility Sample ID Number (if applicable)					MW369UG4-14R	MW370UG4-14R	MW371UG4-14R						
Laboratory Sample ID Number (if applicable)					357252001	357252006	357252002						
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis					9/24/2014	9/24/2014	9/24/2014						
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)					UP	UP	UP						
CAS RN <sup>4</sup>		CONSTITUENT	T D S <sup>5</sup>	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S <sup>7</sup>	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
24959-67-9		Bromide	T	mg/L	9056		*		*		*		*
16887-00-6		Chloride(s)	T	mg/L	9056		*		*		*		*
16984-48-8		Fluoride	T	mg/L	9214		*		*		*		*
S0595- -		Nitrate & Nitrite	T	mg/L	9056		*		*		*		*
14808-79-8		Sulfate	T	mg/L	9056		*		*		*		*
NS1894		Barometric Pressure Reading	T	Inches/Hg	Field	30.24		30.24		30.24			*
S0145- -		Specific Conductance	T	µMH0/cm	Field	370		429		752			*

### STANDARD FLAGS:

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

<sup>1</sup>AKGWA # is 0000-0000 for any type of blank.

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

<sup>3</sup>Respond "Y" if the sample was split and analyzed by separate laboratories.

<sup>4</sup>Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.

<sup>5</sup>"T" = Total; "D" = Dissolved

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

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

## RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Number: 073-00045

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

LAB ID: None

For Official Use Only

## GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number					8004-4820		8004-4818		8004-4819				
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)					369		370		371				
CAS RN <sup>4</sup>		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
S0906 - -		Static Water Level Elevation	T	Ft. MSL	Field	324.09		324.06		341.13			*
N238		Dissolved Oxygen	T	mg/L	Field	2.29		3.67		1.34			*
S0266- -		Total Dissolved Solids	T	mg/L	160.1		*		*		*		*
S0296- -		pH	T	Units	Field	6.18		6.08		6.57			*
NS215		Eh	T	mV	Field	331		353		311			*
S0907 - -		Temperature	T	°C	Field	20.83		19.78		20.5			*
7429-90-5		Aluminum	T	mg/L	6020		*		*		*		*
7440-36-0		Antimony	T	mg/L	6020		*		*		*		*
7440-38-2		Arsenic	T	mg/L	6020		*		*		*		*
7440-39-3		Barium	T	mg/L	6020		*		*		*		*
7440-41-7		Beryllium	T	mg/L	6020		*		*		*		*
7440-42-8		Boron	T	mg/L	6020		*		*		*		*
7440-43-9		Cadmium	T	mg/L	6020		*		*		*		*
7440-70-2		Calcium	T	mg/L	6020		*		*		*		*
7440-47-3		Chromium	T	mg/L	6020		*		*		*		*
7440-48-4		Cobalt	T	mg/L	6020		*		*		*		*
7440-50-8		Copper	T	mg/L	6020		*		*		*		*
7439-89-6		Iron	T	mg/L	6020		*		*		*		*
7439-92-1		Lead	T	mg/L	6020		*		*		*		*
7439-95-4		Magnesium	T	mg/L	6020		*		*		*		*
7439-96-5		Manganese	T	mg/L	6020		*		*		*		*
7439-97-6		Mercury	T	mg/L	7470		*		*		*		*

## RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Number: 073-00045

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

LAB ID: None

For Official Use Only

## GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number					8004-4820		8004-4818		8004-4819				
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					369		370		371				
CAS RN <sup>4</sup>		CONSTITUENT	T D <sup>5</sup>	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
7439-98-7		Molybdenum	T	mg /L	6020		*		*		*		*
7440-02-0		Nickel	T	mg /L	6020		*		*		*		*
7440-09-7		Potassium	T	mg /L	6010		*		*		*		*
7440-16-6		Rhodium	T	mg /L	6020		*		*		*		*
7782-49-2		Selenium	T	mg /L	6020		*		*		*		*
7440-22-4		Silver	T	mg /L	6020		*		*		*		*
7440-23-5		Sodium	T	mg /L	6010		*		*		*		*
7440-25-7		Tantalum	T	mg /L	6020		*		*		*		*
7440-28-0		Thallium	T	mg /L	6020		*		*		*		*
7440-61-1		Uranium	T	mg /L	6020		*		*		*		*
7440-62-2		Vanadium	T	mg /L	6020		*		*		*		*
7440-66-6		Zinc	T	mg /L	6020		*		*		*		*
108-05-4		Vinyl acetate	T	mg /L	8260		*		*		*		*
67-64-1		Acetone	T	mg /L	8260		*		*		*		*
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		*		*		*		*
108-90-7		Chlorobenzene	T	mg /L	8260		*		*		*		*
1330-20-7		Xylenes	T	mg /L	8260		*		*		*		*
100-42-5		Styrene	T	mg /L	8260		*		*		*		*
108-88-3		Toluene	T	mg /L	8260		*		*		*		*
74-97-5		Chlorobromomethane	T	mg /L	8260		*		*		*		*

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

RESIDENTIAL/CONTAINED-QUARTERLY  
Facility: US DOE - Paducah Gaseous Diffusion Plant  
Permit Number: 073-00045

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

LAB ID: None  
For Official Use Only

## GROUNDWATER SAMPLE ANALYSIS(S)

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number									8004-0985				
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)									375				
Sample Sequence #					1		1		2		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)									9/22/2014 15:23				
Duplicate ("Y" or "N") <sup>2</sup>					N		N		N		N		
Split ("Y" or "N") <sup>3</sup>					N		N		N		N		
Facility Sample ID Number (if applicable)									MW375UG4-14R				
Laboratory Sample ID Number (if applicable)									357252007				
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis									9/24/2014				
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)									SIDE				
CAS RN <sup>4</sup>		CONSTITUENT	T D <sup>5</sup>	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S <sup>7</sup>	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
24959-67-9		Bromide	T	mg/L	9056		*		*		*		*
16887-00-6		Chloride(s)	T	mg/L	9056		*		*		*		*
16984-48-8		Fluoride	T	mg/L	9214		*		*		*		*
S0595- -		Nitrate & Nitrite	T	mg/L	9056		*		*		*		*
14808-79-8		Sulfate	T	mg/L	9056		*		*		*		*
NS1894		Barometric Pressure Reading	T	Inches/Hg	Field		*		*	30.22			*
S0145- -		Specific Conductance	T	µMH0/cm	Field		*		*	363			*

### STANDARD FLAGS:

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

<sup>1</sup>AKGWA # is 0000-0000 for any type of blank.

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

<sup>3</sup>Respond "Y" if the sample was split and analyzed by separate laboratories.

<sup>4</sup>Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.

<sup>5</sup>"T" = Total; "D" = Dissolved

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

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



## RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Number: 073-00045

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

LAB ID: None

For Official Use Only

## GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number									8004-0985				
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, BLANK-F, etc.)									375				
CAS RN <sup>4</sup>		CONSTITUENT	T D 5	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
S0906 - -		Static Water Level Elevation	T	Ft. MSL	Field		*		*	330.34			*
N238		Dissolved Oxygen	T	mg/L	Field		*		*	1.87			*
S0266- -		Total Dissolved Solids	T	mg/L	160.1		*		*		*		*
S0296- -		pH	T	Units	Field		*		*	6.41			*
NS215		Eh	T	mV	Field		*		*	311			*
S0907 - -		Temperature	T	°C	Field		*		*	19.78			*
7429-90-5		Aluminum	T	mg/L	6020		*		*		*		*
7440-36-0		Antimony	T	mg/L	6020		*		*		*		*
7440-38-2		Arsenic	T	mg/L	6020		*		*		*		*
7440-39-3		Barium	T	mg/L	6020		*		*		*		*
7440-41-7		Beryllium	T	mg/L	6020		*		*		*		*
7440-42-8		Boron	T	mg/L	6020		*		*		*		*
7440-43-9		Cadmium	T	mg/L	6020		*		*		*		*
7440-70-2		Calcium	T	mg/L	6020		*		*		*		*
7440-47-3		Chromium	T	mg/L	6020		*		*		*		*
7440-48-4		Cobalt	T	mg/L	6020		*		*		*		*
7440-50-8		Copper	T	mg/L	6020		*		*		*		*
7439-89-6		Iron	T	mg/L	6020		*		*		*		*
7439-92-1		Lead	T	mg/L	6020		*		*		*		*
7439-95-4		Magnesium	T	mg/L	6020		*		*		*		*
7439-96-5		Manganese	T	mg/L	6020		*		*		*		*
7439-97-6		Mercury	T	mg/L	7470		*		*		*		*

## RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Number: 073-00045

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

LAB ID: None

For Official Use Only

## GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number									8004-0985				
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)									375				
CAS RN <sup>4</sup>		CONSTITUENT	T D <sup>5</sup>	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
7439-98-7		Molybdenum	T	mg/L	6020		*		*		*		*
7440-02-0		Nickel	T	mg/L	6020		*		*		*		*
7440-09-7		Potassium	T	mg/L	6010		*		*		*		*
7440-16-6		Rhodium	T	mg/L	6020		*		*		*		*
7782-49-2		Selenium	T	mg/L	6020		*		*		*		*
7440-22-4		Silver	T	mg/L	6020		*		*		*		*
7440-23-5		Sodium	T	mg/L	6010		*		*		*		*
7440-25-7		Tantalum	T	mg/L	6020		*		*		*		*
7440-28-0		Thallium	T	mg/L	6020		*		*		*		*
7440-61-1		Uranium	T	mg/L	6020		*		*		*		*
7440-62-2		Vanadium	T	mg/L	6020		*		*		*		*
7440-66-6		Zinc	T	mg/L	6020		*		*		*		*
108-05-4		Vinyl acetate	T	mg/L	8260		*		*		*		*
67-64-1		Acetone	T	mg/L	8260		*		*		*		*
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		*		*		*		*
108-90-7		Chlorobenzene	T	mg/L	8260		*		*		*		*
1330-20-7		Xylenes	T	mg/L	8260		*		*		*		*
100-42-5		Styrene	T	mg/L	8260		*		*		*		*
108-88-3		Toluene	T	mg/L	8260		*		*		*		*
74-97-5		Chlorobromomethane	T	mg/L	8260		*		*		*		*

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

RESIDENTIAL/CONTAINED-QUARTERLY  
Facility: US DOE - Paducah Gaseous Diffusion Plant  
Permit Number: 073-00045

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

LAB ID: None  
For Official Use Only

## GROUNDWATER SAMPLE ANALYSIS<sub>(S)</sub>

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number					8004-0989	0000-0000	0000-0000	0000-0000					
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)					377	E. BLANK	F. BLANK	T. BLANK 9					
Sample Sequence #					1	2	2	2					
If sample is a Blank, specify Type: (F)ield, (T)rip, (M)ethod, or (E)quipment					NA	E	F	T					
Sample Date and Time (Month/Day/Year hour:minutes)					NA	9/22/2014 10:32	9/22/2014 14:21	9/22/2014 10:28					
Duplicate ("Y" or "N") <sup>2</sup>					N	N	N	N					
Split ("Y" or "N") <sup>3</sup>					N	N	N	N					
Facility Sample ID Number (if applicable)					NA	RI1UG4-14R	FB1UG4-14R	TB9UG4-14					
Laboratory Sample ID Number (if applicable)					NA	357252004	357252003	357252005					
Date of Analysis (Month/Day/Year) For <u>Volatile Organics</u> Analysis					NA	9/24/2014	9/24/2014	9/24/2014					
Gradient with respect to Monitored Unit (UP, DOWN, SIDE, UNKNOWN)					SIDE	NA	NA	NA					
CAS RN <sup>4</sup>		CONSTITUENT	T D <sup>5</sup>	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S <sup>7</sup>	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
24959-67-9		Bromide	T	mg/L	9056		*		*		*		*
16887-00-6		Chloride(s)	T	mg/L	9056		*		*		*		*
16984-48-8		Fluoride	T	mg/L	9056		*		*		*		*
S0595- -		Nitrate & Nitrite	T	mg/L	9056		*		*		*		*
14808-79-8		Sulfate	T	mg/L	9056		*		*		*		*
NS1894		Barometric Pressure Reading	T	Inches/Hg	Field		*		*		*		*
S0145- -		Specific Conductance	T	µMH0/cm	Field		*		*		*		*

<sup>1</sup>AKGWA # is 0000-0000 for any type of blank.

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

<sup>3</sup>Respond "Y" if the sample was split and analyzed by separate laboratories.

<sup>4</sup>Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.

<sup>5</sup>"T" = Total; "D" = Dissolved

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

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

### STANDARD FLAGS:

\* = See Comments

J = Estimated Value

B = Analyte found in blank

A = Average value

N = Presumptive ID

D = Concentration from analysis of a secondary dilution

## RESIDENTIAL/CONTAINED-QUARTERLY

Facility: US DOE - Paducah Gaseous Diffusion Plant

Permit Number: 073-00045

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

LAB ID: None

For Official Use Only

## GROUNDWATER SAMPLE ANALYSIS - (Cont.)

AKGWA NUMBER <sup>1</sup> , Facility Well/Spring Number							0000-0000		0000-0000		0000-0000		
Facility's Local Well or Spring Number (e.g., MW-1, MW-2, etc.)							E. BLANK		F. BLANK		T. BLANK 9		
CAS RN <sup>4</sup>		CONSTITUENT	T D <sup>5</sup>	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S	DETECTED VALUE OR PQL <sup>6</sup>	F L A G S
7439-98-7		Molybdenum	T	mg/L	6020		*		*				
7440-02-0		Nickel	T	mg/L	6020		*		*				
7440-09-7		Potassium	T	mg/L	6020		*		*				
7440-16-6		Rhodium	T	mg/L	6020		*		*				
7782-49-2		Selenium	T	mg/L	6020		*		*				
7440-22-4		Silver	T	mg/L	6020		*		*				
7440-23-5		Sodium	T	mg/L	6020		*		*				
7440-25-7		Tantalum	T	mg/L	6020		*		*				
7440-28-0		Thallium	T	mg/L	6020		*		*				
7440-61-1		Uranium	T	mg/L	6020		*		*				
7440-62-2		Vanadium	T	mg/L	6020		*		*				
7440-66-6		Zinc	T	mg/L	6020		*		*				
108-05-4		Vinyl acetate	T	mg/L	8260		*		*				
67-64-1		Acetone	T	mg/L	8260		*		*				
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		*		*				
108-90-7		Chlorobenzene	T	mg/L	8260		*		*				
1330-20-7		Xylenes	T	mg/L	8260		*		*				
100-42-5		Styrene	T	mg/L	8260		*		*				
108-88-3		Toluene	T	mg/L	8260		*		*				
74-97-5		Chlorobromomethane	T	mg/L	8260		*		*				

RESIDENTIAL/CONTAINED – QUARTERLY  
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 Permit Numbers: 073-00045

Finds/Unit: KY8-890-008-982 / 1  
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 For Official Use Only

## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4798 MW357	MW357UG4-14	Gross alpha	U	Indicates analyte/nucleide was analyzed for, but not detected. TPU is 5.52. Rad error is 5.45.
		Gross beta		TPU is 10.6. Rad error is 9.03.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226		TPU is 0.228. Rad error is 0.221.
		Strontium-90	U	Indicates analyte/nucleide was analyzed for, but not detected. TPU is 4.57. Rad error is 4.51.
		Technetium-99		TPU is 13.9. Rad error is 13.4.
		Thorium-230	U	Indicates analyte/nucleide was analyzed for, but not detected. TPU is 2.5. Rad error is 2.49.
8004-4799 MW358	MW358UG4-14	Tritium	U	Indicates analyte/nucleide was analyzed for, but not detected. TPU is 126. Rad error is 126.
		Gross alpha	U	Indicates analyte/nucleide was analyzed for, but not detected. TPU is 2.15. Rad error is 2.15.
		Gross beta	U	Indicates analyte/nucleide was analyzed for, but not detected. TPU is 8.42. Rad error is 8.26.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nucleide was analyzed for, but not detected. TPU is 0.386. Rad error is 0.383.
		Strontium-90	U	Indicates analyte/nucleide was analyzed for, but not detected. TPU is 2.57. Rad error is 2.57.
		Technetium-99		TPU is 15.6. Rad error is 14.1.
8004-0981 MW359	MW359UG4-14	Thorium-230	U	Indicates analyte/nucleide was analyzed for, but not detected. TPU is 1.3. Rad error is 1.3.
		Tritium	U	Indicates analyte/nucleide was analyzed for, but not detected. TPU is 128. Rad error is 128.
		Gross alpha	U	Indicates analyte/nucleide was analyzed for, but not detected. TPU is 3.95. Rad error is 3.95.
		Gross beta	U	Indicates analyte/nucleide was analyzed for, but not detected. TPU is 5.93. Rad error is 5.92.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nucleide was analyzed for, but not detected. TPU is 0.308. Rad error is 0.297.
		Strontium-90	U	Indicates analyte/nucleide was analyzed for, but not detected. TPU is 3.43. Rad error is 3.43.
		Technetium-99	U	Indicates analyte/nucleide was analyzed for, but not detected. TPU is 11.6. Rad error is 11.6.
		Thorium-230	U	Indicates analyte/nucleide was analyzed for, but not detected. TPU is 2.1. Rad error is 2.07.
		Tritium	U	Indicates analyte/nucleide was analyzed for, but not detected. TPU is 131. Rad error is 131.

RESIDENTIAL/CONTAINED – QUARTERLY  
 Facility: US DOE - Paducah Gaseous Diffusion Plant  
 Permit Numbers: 073-00045

Finds/Unit: KY8-890-008-982 / 1  
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## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4800 MW360	MW360UG4-14	Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.79. Rad error is 3.79.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.83. Rad error is 5.81.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.421. Rad error is 0.417.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.93. Rad error is 1.93.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 12.2. Rad error is 12.2.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.02. Rad error is 4.89.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 136. Rad error is 136.
8004-4795 MW361	MW361UG4-14	Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.21. Rad error is 4.21.
		Gross beta		TPU is 6.86. Rad error is 6.2.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.35. Rad error is 0.348.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.15. Rad error is 3.15.
		Technetium-99		TPU is 15. Rad error is 13.5.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.04. Rad error is 3.97.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 139. Rad error is 139.
8004-0986 MW362	MW362UG4-14	Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.44. Rad error is 6.34.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.75. Rad error is 3.75.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.683. Rad error is 0.68.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.5. Rad error is 1.5.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 12.7. Rad error is 12.7.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.13. Rad error is 3.11.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 133. Rad error is 133.

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## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4796 MW363	MW363UG4-14	Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.7. Rad error is 2.7.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.06. Rad error is 4.94.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.381. Rad error is 0.378.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.19. Rad error is 2.19.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 12.7. Rad error is 12.5.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.01. Rad error is 3.92.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 140. Rad error is 140.
8004-4797 MW364	MW364UG4-14	Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.6. Rad error is 3.6.
		Gross beta		TPU is 11.4. Rad error is 9.85.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226		TPU is 0.591. Rad error is 0.57.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.27. Rad error is 1.27.
		Technetium-99		TPU is 15.1. Rad error is 13.6.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.21. Rad error is 4.14.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 143. Rad error is 143.
8004-0984 MW365	MW365UG4-14	Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.37. Rad error is 3.37.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.74. Rad error is 4.74.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.444. Rad error is 0.442.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.15. Rad error is 3.13.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 11.9. Rad error is 11.8.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.87. Rad error is 1.86.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 131. Rad error is 130.

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## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-0982 MW366	MW366UG4-14	Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.97. Rad error is 3.97.
		Gross beta		TPU is 12.6. Rad error is 11.4.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.388. Rad error is 0.385.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.32. Rad error is 2.32.
		Technetium-99		TPU is 14.9. Rad error is 13.6.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.33. Rad error is 1.32.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 125. Rad error is 125.
8004-4793 MW367	MW367UG4-14	Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.77. Rad error is 2.76.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 7.26. Rad error is 7.07.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226		TPU is 0.674. Rad error is 0.649.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.68. Rad error is 2.68.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 11.3. Rad error is 11.3.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.33. Rad error is 1.33.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 129. Rad error is 129.
8004-0983 MW368	MW368UG4-14	Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.07. Rad error is 2.07.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.52. Rad error is 6.51.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.261. Rad error is 0.261.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.92. Rad error is 1.92.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 12.1. Rad error is 12.1.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.98. Rad error is 2.91.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 125. Rad error is 125.



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## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4820 MW369	MW369UG4-14	Acrolein		Collected during a second sampling event.
		Acrylonitrile		Collected during a second sampling event.
		Gross alpha	U	Indicates analyte/nucleide was analyzed for, but not detected. TPU is 4.24. Rad error is 4.24.
		Gross beta	U	Indicates analyte/nucleide was analyzed for, but not detected. TPU is 5.76. Rad error is 5.68.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226		TPU is 0.294. Rad error is 0.271.
		Strontium-90	U	Indicates analyte/nucleide was analyzed for, but not detected. TPU is 4.7. Rad error is 4.67.
		Technetium-99	U	Indicates analyte/nucleide was analyzed for, but not detected. TPU is 12.2. Rad error is 12.
		Thorium-230	U	Indicates analyte/nucleide was analyzed for, but not detected. TPU is 1.81. Rad error is 1.81.
		Tritium	U	Indicates analyte/nucleide was analyzed for, but not detected. TPU is 123. Rad error is 123.
8004-4818 MW370	MW370UG4-14	Acrolein		Collected during a second sampling event.
		Acrylonitrile		Collected during a second sampling event.
		Gross alpha	U	Indicates analyte/nucleide was analyzed for, but not detected. TPU is 3.67. Rad error is 3.67.
		Gross beta		TPU is 7.51. Rad error is 6.82.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226		TPU is 0.368. Rad error is 0.336.
		Strontium-90	U	Indicates analyte/nucleide was analyzed for, but not detected. TPU is 2.2. Rad error is 2.2.
		Technetium-99		TPU is 13.5. Rad error is 13.1.
		Thorium-230	U	Indicates analyte/nucleide was analyzed for, but not detected. TPU is 1.54. Rad error is 1.54.
		Tritium	U	Indicates analyte/nucleide was analyzed for, but not detected. TPU is 126. Rad error is 126.
8004-4819 MW371	MW371UG4-14	Acrolein		Collected during a second sampling event.
		Acrylonitrile		Collected during a second sampling event.
		Gross alpha	U	Indicates analyte/nucleide was analyzed for, but not detected. TPU is 5.16. Rad error is 5.15.
		Gross beta	U	Indicates analyte/nucleide was analyzed for, but not detected. TPU is 6.35. Rad error is 6.27.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226		TPU is 0.292. Rad error is 0.273.
		Strontium-90	U	Indicates analyte/nucleide was analyzed for, but not detected. TPU is 3.52. Rad error is 3.52.
		Technetium-99	U	Indicates analyte/nucleide was analyzed for, but not detected. TPU is 11.5. Rad error is 11.5.
		Thorium-230	U	Indicates analyte/nucleide was analyzed for, but not detected. TPU is 2.26. Rad error is 2.21.
		Tritium	U	Indicates analyte/nucleide was analyzed for, but not detected. TPU is 132. Rad error is 131.

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## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-4808 MW372	MW372UG4-14	Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.69. Rad error is 4.69.
		Gross beta		TPU is 12.4. Rad error is 11.4.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226		TPU is 0.342. Rad error is 0.314.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.3. Rad error is 2.3.
		Technetium-99		TPU is 12.6. Rad error is 12.2.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.7. Rad error is 1.69.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 128. Rad error is 128.
8004-4792 MW373	MW373UG4-14	Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.59. Rad error is 4.59.
		Gross beta		TPU is 9.54. Rad error is 9.14.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226		TPU is 0.292. Rad error is 0.275.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.05. Rad error is 2.05.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 12.9. Rad error is 12.7.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.59. Rad error is 1.57.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 125. Rad error is 125.
8004-0990 MW374	MW374UG4-14	Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.88. Rad error is 5.88.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 8.62. Rad error is 8.62.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226		TPU is 0.336. Rad error is 0.321.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.27. Rad error is 2.27.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 11.7. Rad error is 11.7.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.5. Rad error is 1.49.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 127. Rad error is 127.

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## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-0985 MW375	MW375UG4-14	Acrolein		Collected during a second sampling event.
		Acrylonitrile		Collected during a second sampling event.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.96. Rad error is 6.88.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.29. Rad error is 5.26.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226		TPU is 0.211. Rad error is 0.203.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.65. Rad error is 2.64.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 12.2. Rad error is 12.2.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.59. Rad error is 1.59.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 127. Rad error is 127.

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## GROUNDWATER WRITTEN COMMENTS

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

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Permit Numbers: 073-00045

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

## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-0988 MW376		Magnesium		During sampling, the well went dry; therefore, no sample was collected.
		Manganese		During sampling, the well went dry; therefore, no sample was collected.
		Mercury		During sampling, the well went dry; therefore, no sample was collected.
		Molybdenum		During sampling, the well went dry; therefore, no sample was collected.
		Nickel		During sampling, the well went dry; therefore, no sample was collected.
		Potassium		During sampling, the well went dry; therefore, no sample was collected.
		Rhodium		During sampling, the well went dry; therefore, no sample was collected.
		Selenium		During sampling, the well went dry; therefore, no sample was collected.
		Silver		During sampling, the well went dry; therefore, no sample was collected.
		Sodium		During sampling, the well went dry; therefore, no sample was collected.
		Tantalum		During sampling, the well went dry; therefore, no sample was collected.
		Thallium		During sampling, the well went dry; therefore, no sample was collected.
		Uranium		During sampling, the well went dry; therefore, no sample was collected.
		Vanadium		During sampling, the well went dry; therefore, no sample was collected.
		Zinc		During sampling, the well went dry; therefore, no sample was collected.
		Vinyl acetate		During sampling, the well went dry; therefore, no sample was collected.
		Acetone		During sampling, the well went dry; therefore, no sample was collected.
		Acrolein		During sampling, the well went dry; therefore, no sample was collected.
		Acrylonitrile		During sampling, the well went dry; therefore, no sample was collected.
		Benzene		During sampling, the well went dry; therefore, no sample was collected.
		Chlorobenzene		During sampling, the well went dry; therefore, no sample was collected.
		Xylenes		During sampling, the well went dry; therefore, no sample was collected.
		Styrene		During sampling, the well went dry; therefore, no sample was collected.
		Toluene		During sampling, the well went dry; therefore, no sample was collected.
		Chlorobromomethane		During sampling, the well went dry; therefore, no sample was collected.
		Bromodichloromethane		During sampling, the well went dry; therefore, no sample was collected.

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## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-0988 MW376		Tribromomethane		During sampling, the well went dry; therefore, no sample was collected.
		Methyl bromide		During sampling, the well went dry; therefore, no sample was collected.
		Methyl Ethyl Ketone		During sampling, the well went dry; therefore, no sample was collected.
		trans-1,4-Dichloro-2-butene		During sampling, the well went dry; therefore, no sample was collected.
		Carbon disulfide		During sampling, the well went dry; therefore, no sample was collected.
		Chloroethane		During sampling, the well went dry; therefore, no sample was collected.
		Chloroform		During sampling, the well went dry; therefore, no sample was collected.
		Methyl chloride		During sampling, the well went dry; therefore, no sample was collected.
		cis-1,2-Dichloroethene		During sampling, the well went dry; therefore, no sample was collected.
		Methylene bromide		During sampling, the well went dry; therefore, no sample was collected.
		1,1-Dichloroethane		During sampling, the well went dry; therefore, no sample was collected.
		1,2-Dichloroethane		During sampling, the well went dry; therefore, no sample was collected.
		1,1-Dichloroethylene		During sampling, the well went dry; therefore, no sample was collected.
		1,2-Dibromoethane		During sampling, the well went dry; therefore, no sample was collected.
		1,1,2,2-Tetrachloroethane		During sampling, the well went dry; therefore, no sample was collected.
		1,1,1-Trichloroethane		During sampling, the well went dry; therefore, no sample was collected.
		1,1,2-Trichloroethane		During sampling, the well went dry; therefore, no sample was collected.
		1,1,1,2-Tetrachloroethane		During sampling, the well went dry; therefore, no sample was collected.
		Vinyl chloride		During sampling, the well went dry; therefore, no sample was collected.
		Tetrachloroethene		During sampling, the well went dry; therefore, no sample was collected.
		Trichloroethene		During sampling, the well went dry; therefore, no sample was collected.
		Ethylbenzene		During sampling, the well went dry; therefore, no sample was collected.
		2-Hexanone		During sampling, the well went dry; therefore, no sample was collected.
		Iodomethane		During sampling, the well went dry; therefore, no sample was collected.
		Dibromochloromethane		During sampling, the well went dry; therefore, no sample was collected.
		Carbon tetrachloride		During sampling, the well went dry; therefore, no sample was collected.

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## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-0988 MW376		Dichloromethane		During sampling, the well went dry; therefore, no sample was collected.
		Methyl Isobutyl Ketone		During sampling, the well went dry; therefore, no sample was collected.
		1,2-Dibromo-3-chloropropane		During sampling, the well went dry; therefore, no sample was collected.
		1,2-Dichloropropane		During sampling, the well went dry; therefore, no sample was collected.
		trans-1,3-Dichloropropene		During sampling, the well went dry; therefore, no sample was collected.
		cis-1,3-Dichloropropene		During sampling, the well went dry; therefore, no sample was collected.
		trans-1,2-Dichloroethene		During sampling, the well went dry; therefore, no sample was collected.
		Trichlorofluoromethane		During sampling, the well went dry; therefore, no sample was collected.
		1,2,3-Trichloropropane		During sampling, the well went dry; therefore, no sample was collected.
		1,2-Dichlorobenzene		During sampling, the well went dry; therefore, no sample was collected.
		1,4-Dichlorobenzene		During sampling, the well went dry; therefore, no sample was collected.
		PCB, Total		During sampling, the well went dry; therefore, no sample was collected.
		PCB-1016		During sampling, the well went dry; therefore, no sample was collected.
		PCB-1221		During sampling, the well went dry; therefore, no sample was collected.
		PCB-1232		During sampling, the well went dry; therefore, no sample was collected.
		PCB-1242		During sampling, the well went dry; therefore, no sample was collected.
		PCB-1248		During sampling, the well went dry; therefore, no sample was collected.
		PCB-1254		During sampling, the well went dry; therefore, no sample was collected.
		PCB-1260		During sampling, the well went dry; therefore, no sample was collected.
		PCB-1268		During sampling, the well went dry; therefore, no sample was collected.
		Gross alpha		During sampling, the well went dry; therefore, no sample was collected.
		Gross beta		During sampling, the well went dry; therefore, no sample was collected.
		Iodine-131		During sampling, the well went dry; therefore, no sample was collected.
		Radium-226		During sampling, the well went dry; therefore, no sample was collected.
		Strontium-90		During sampling, the well went dry; therefore, no sample was collected.
		Technetium-99		During sampling, the well went dry; therefore, no sample was collected.

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## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-0988 MW376		Thorium-230		During sampling, the well went dry; therefore, no sample was collected.
		Tritium		During sampling, the well went dry; therefore, no sample was collected.
		Chemical Oxygen Demand		During sampling, the well went dry; therefore, no sample was collected.
		Cyanide		During sampling, the well went dry; therefore, no sample was collected.
		Iodide		During sampling, the well went dry; therefore, no sample was collected.
		Total Organic Carbon		During sampling, the well went dry; therefore, no sample was collected.
		Total Organic Halides		During sampling, the well went dry; therefore, no sample was collected.



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## GROUNDWATER WRITTEN COMMENTS

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

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## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-0989 MW377		Magnesium		During sampling, the well went dry; therefore, no sample was collected.
		Manganese		During sampling, the well went dry; therefore, no sample was collected.
		Mercury		During sampling, the well went dry; therefore, no sample was collected.
		Molybdenum		During sampling, the well went dry; therefore, no sample was collected.
		Nickel		During sampling, the well went dry; therefore, no sample was collected.
		Potassium		During sampling, the well went dry; therefore, no sample was collected.
		Rhodium		During sampling, the well went dry; therefore, no sample was collected.
		Selenium		During sampling, the well went dry; therefore, no sample was collected.
		Silver		During sampling, the well went dry; therefore, no sample was collected.
		Sodium		During sampling, the well went dry; therefore, no sample was collected.
		Tantalum		During sampling, the well went dry; therefore, no sample was collected.
		Thallium		During sampling, the well went dry; therefore, no sample was collected.
		Uranium		During sampling, the well went dry; therefore, no sample was collected.
		Vanadium		During sampling, the well went dry; therefore, no sample was collected.
		Zinc		During sampling, the well went dry; therefore, no sample was collected.
		Vinyl acetate		During sampling, the well went dry; therefore, no sample was collected.
		Acetone		During sampling, the well went dry; therefore, no sample was collected.
		Acrolein		During sampling, the well went dry; therefore, no sample was collected.
		Acrylonitrile		During sampling, the well went dry; therefore, no sample was collected.
		Benzene		During sampling, the well went dry; therefore, no sample was collected.
		Chlorobenzene		During sampling, the well went dry; therefore, no sample was collected.
		Xylenes		During sampling, the well went dry; therefore, no sample was collected.
		Styrene		During sampling, the well went dry; therefore, no sample was collected.
		Toluene		During sampling, the well went dry; therefore, no sample was collected.
		Chlorobromomethane		During sampling, the well went dry; therefore, no sample was collected.
		Bromodichloromethane		During sampling, the well went dry; therefore, no sample was collected.

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## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-0989 MW377		Tribromomethane		During sampling, the well went dry; therefore, no sample was collected.
		Methyl bromide		During sampling, the well went dry; therefore, no sample was collected.
		Methyl Ethyl Ketone		During sampling, the well went dry; therefore, no sample was collected.
		trans-1,4-Dichloro-2-butene		During sampling, the well went dry; therefore, no sample was collected.
		Carbon disulfide		During sampling, the well went dry; therefore, no sample was collected.
		Chloroethane		During sampling, the well went dry; therefore, no sample was collected.
		Chloroform		During sampling, the well went dry; therefore, no sample was collected.
		Methyl chloride		During sampling, the well went dry; therefore, no sample was collected.
		cis-1,2-Dichloroethene		During sampling, the well went dry; therefore, no sample was collected.
		Methylene bromide		During sampling, the well went dry; therefore, no sample was collected.
		1,1-Dichloroethane		During sampling, the well went dry; therefore, no sample was collected.
		1,2-Dichloroethane		During sampling, the well went dry; therefore, no sample was collected.
		1,1-Dichloroethylene		During sampling, the well went dry; therefore, no sample was collected.
		1,2-Dibromoethane		During sampling, the well went dry; therefore, no sample was collected.
		1,1,2,2-Tetrachloroethane		During sampling, the well went dry; therefore, no sample was collected.
		1,1,1-Trichloroethane		During sampling, the well went dry; therefore, no sample was collected.
		1,1,2-Trichloroethane		During sampling, the well went dry; therefore, no sample was collected.
		1,1,1,2-Tetrachloroethane		During sampling, the well went dry; therefore, no sample was collected.
		Vinyl chloride		During sampling, the well went dry; therefore, no sample was collected.
		Tetrachloroethene		During sampling, the well went dry; therefore, no sample was collected.
		Trichloroethene		During sampling, the well went dry; therefore, no sample was collected.
		Ethylbenzene		During sampling, the well went dry; therefore, no sample was collected.
		2-Hexanone		During sampling, the well went dry; therefore, no sample was collected.
		Iodomethane		During sampling, the well went dry; therefore, no sample was collected.
		Dibromochloromethane		During sampling, the well went dry; therefore, no sample was collected.
		Carbon tetrachloride		During sampling, the well went dry; therefore, no sample was collected.

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## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-0989 MW377		Dichloromethane		During sampling, the well went dry; therefore, no sample was collected.
		Methyl Isobutyl Ketone		During sampling, the well went dry; therefore, no sample was collected.
		1,2-Dibromo-3-chloropropane		During sampling, the well went dry; therefore, no sample was collected.
		1,2-Dichloropropane		During sampling, the well went dry; therefore, no sample was collected.
		trans-1,3-Dichloropropene		During sampling, the well went dry; therefore, no sample was collected.
		cis-1,3-Dichloropropene		During sampling, the well went dry; therefore, no sample was collected.
		trans-1,2-Dichloroethene		During sampling, the well went dry; therefore, no sample was collected.
		Trichlorofluoromethane		During sampling, the well went dry; therefore, no sample was collected.
		1,2,3-Trichloropropane		During sampling, the well went dry; therefore, no sample was collected.
		1,2-Dichlorobenzene		During sampling, the well went dry; therefore, no sample was collected.
		1,4-Dichlorobenzene		During sampling, the well went dry; therefore, no sample was collected.
		PCB, Total		During sampling, the well went dry; therefore, no sample was collected.
		PCB-1016		During sampling, the well went dry; therefore, no sample was collected.
		PCB-1221		During sampling, the well went dry; therefore, no sample was collected.
		PCB-1232		During sampling, the well went dry; therefore, no sample was collected.
		PCB-1242		During sampling, the well went dry; therefore, no sample was collected.
		PCB-1248		During sampling, the well went dry; therefore, no sample was collected.
		PCB-1254		During sampling, the well went dry; therefore, no sample was collected.
		PCB-1260		During sampling, the well went dry; therefore, no sample was collected.
		PCB-1268		During sampling, the well went dry; therefore, no sample was collected.
		Gross alpha		During sampling, the well went dry; therefore, no sample was collected.
		Gross beta		During sampling, the well went dry; therefore, no sample was collected.
		Iodine-131		During sampling, the well went dry; therefore, no sample was collected.
		Radium-226		During sampling, the well went dry; therefore, no sample was collected.
		Strontium-90		During sampling, the well went dry; therefore, no sample was collected.
		Technetium-99		During sampling, the well went dry; therefore, no sample was collected.

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## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
8004-0989 MW377		Thorium-230		During sampling, the well went dry; therefore, no sample was collected.
		Tritium		During sampling, the well went dry; therefore, no sample was collected.
		Chemical Oxygen Demand		During sampling, the well went dry; therefore, no sample was collected.
		Cyanide		During sampling, the well went dry; therefore, no sample was collected.
		Iodide		During sampling, the well went dry; therefore, no sample was collected.
		Total Organic Carbon		During sampling, the well went dry; therefore, no sample was collected.
		Total Organic Halides		During sampling, the well went dry; therefore, no sample was collected.

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## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	RI1UG4-14	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.
		Acrolein		Collected during a second sampling event.
		Acrylonitrile		Collected during a second sampling event.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.44. Rad error is 3.44.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.27. Rad error is 5.25.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226		TPU is 1.49. Rad error is 1.44.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.216. Rad error is 0.212.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.08. Rad error is 2.08.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 11.1. Rad error is 11.1.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.46. Rad error is 1.45.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 135. Rad error is 134.
		Chemical Oxygen Demand		Analysis of constituent not required and not performed.
		Cyanide		Analysis of constituent not required and not performed.
		Total Organic Carbon		Analysis of constituent not required and not performed.
		Total Organic Halides		Analysis of constituent not required and not performed.

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## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	FB1UG4-14	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
		Acrolein		Collected during a second sampling event.
		Acrylonitrile		Collected during a second sampling event.
		Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.32. Rad error is 3.32.
		Gross beta	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 6.65. Rad error is 6.65.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.221. Rad error is 0.216.
		Radium-226		TPU is 1.68. Rad error is 1.6.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.25. Rad error is 2.25.
		Technetium-99	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 11.2. Rad error is 11.2.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.91. Rad error is 2.8.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 134. Rad error is 134.
		Chemical Oxygen Demand		Analysis of constituent not required and not performed.
		Cyanide		Analysis of constituent not required and not performed.
		Total Organic Carbon		Analysis of constituent not required and not performed.
		Total Organic Halides		Analysis of constituent not required and not performed.

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## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB1UG4-14	Bromide		Analysis of constituent not required and not performed.
		Chloride		Analysis of constituent not required and not performed.
		Fluoride		Analysis of constituent not required and not performed.
		Nitrate & Nitrite		Analysis of constituent not required and not performed.
		Sulfate		Analysis of constituent not required and not performed.
		Barometric Pressure Reading		Analysis of constituent not required and not performed.
		Specific Conductance		Analysis of constituent not required and not performed.
		Static Water Level Elevation		Analysis of constituent not required and not performed.
		Dissolved Oxygen		Analysis of constituent not required and not performed.
		Total Dissolved Solids		Analysis of constituent not required and not performed.
		pH		Analysis of constituent not required and not performed.
		Eh		Analysis of constituent not required and not performed.
		Temperature		Analysis of constituent not required and not performed.
		Aluminum		Analysis of constituent not required and not performed.
		Antimony		Analysis of constituent not required and not performed.
		Arsenic		Analysis of constituent not required and not performed.
		Barium		Analysis of constituent not required and not performed.
		Beryllium		Analysis of constituent not required and not performed.
		Boron		Analysis of constituent not required and not performed.
		Cadmium		Analysis of constituent not required and not performed.
		Calcium		Analysis of constituent not required and not performed.
		Chromium		Analysis of constituent not required and not performed.
		Cobalt		Analysis of constituent not required and not performed.
		Copper		Analysis of constituent not required and not performed.
		Iron		Analysis of constituent not required and not performed.
		Lead		Analysis of constituent not required and not performed.
		Magnesium		Analysis of constituent not required and not performed.
		Manganese		Analysis of constituent not required and not performed.
		Mercury		Analysis of constituent not required and not performed.
		Molybdenum		Analysis of constituent not required and not performed.
		Nickel		Analysis of constituent not required and not performed.
		Potassium		Analysis of constituent not required and not performed.
		Rhodium		Analysis of constituent not required and not performed.
		Selenium		Analysis of constituent not required and not performed.
		Silver		Analysis of constituent not required and not performed.
		Sodium		Analysis of constituent not required and not performed.
		Tantalum		Analysis of constituent not required and not performed.
		Thallium		Analysis of constituent not required and not performed.
		Uranium		Analysis of constituent not required and not performed.
		Vanadium		Analysis of constituent not required and not performed.



RESIDENTIAL/CONTAINED – QUARTERLY  
Facility: US DOE - Paducah Gaseous Diffusion Plant  
Permit Numbers: 073-00045

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	TB1UG4-14	Zinc		Analysis of constituent not required and not performed.
		PCB, Total		Analysis of constituent not required and not performed.
		PCB-1016		Analysis of constituent not required and not performed.
		PCB-1221		Analysis of constituent not required and not performed.
		PCB-1232		Analysis of constituent not required and not performed.
		PCB-1242		Analysis of constituent not required and not performed.
		PCB-1248		Analysis of constituent not required and not performed.
		PCB-1254		Analysis of constituent not required and not performed.
		PCB-1260		Analysis of constituent not required and not performed.
		PCB-1268		Analysis of constituent not required and not performed.
		Gross alpha		Analysis of constituent not required and not performed.
		Gross beta		Analysis of constituent not required and not performed.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226		Analysis of constituent not required and not performed.
		Strontium-90		Analysis of constituent not required and not performed.
		Technetium-99		Analysis of constituent not required and not performed.
		Thorium-230		Analysis of constituent not required and not performed.
		Tritium		Analysis of constituent not required and not performed.
		Chemical Oxygen Demand		Analysis of constituent not required and not performed.
		Cyanide		Analysis of constituent not required and not performed.
		Iodide		Analysis of constituent not required and not performed.
		Total Organic Carbon		Analysis of constituent not required and not performed.
		Total Organic Halides		Analysis of constituent not required and not performed.

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

## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB2UG4-14	Bromide		Analysis of constituent not required and not performed.
		Chloride		Analysis of constituent not required and not performed.
		Fluoride		Analysis of constituent not required and not performed.
		Nitrate & Nitrite		Analysis of constituent not required and not performed.
		Sulfate		Analysis of constituent not required and not performed.
		Barometric Pressure Reading		Analysis of constituent not required and not performed.
		Specific Conductance		Analysis of constituent not required and not performed.
		Static Water Level Elevation		Analysis of constituent not required and not performed.
		Dissolved Oxygen		Analysis of constituent not required and not performed.
		Total Dissolved Solids		Analysis of constituent not required and not performed.
		pH		Analysis of constituent not required and not performed.
		Eh		Analysis of constituent not required and not performed.
		Temperature		Analysis of constituent not required and not performed.
		Aluminum		Analysis of constituent not required and not performed.
		Antimony		Analysis of constituent not required and not performed.
		Arsenic		Analysis of constituent not required and not performed.
		Barium		Analysis of constituent not required and not performed.
		Beryllium		Analysis of constituent not required and not performed.
		Boron		Analysis of constituent not required and not performed.
		Cadmium		Analysis of constituent not required and not performed.
		Calcium		Analysis of constituent not required and not performed.
		Chromium		Analysis of constituent not required and not performed.
		Cobalt		Analysis of constituent not required and not performed.
		Copper		Analysis of constituent not required and not performed.
		Iron		Analysis of constituent not required and not performed.
		Lead		Analysis of constituent not required and not performed.
		Magnesium		Analysis of constituent not required and not performed.
		Manganese		Analysis of constituent not required and not performed.
		Mercury		Analysis of constituent not required and not performed.
		Molybdenum		Analysis of constituent not required and not performed.
		Nickel		Analysis of constituent not required and not performed.
		Potassium		Analysis of constituent not required and not performed.
		Rhodium		Analysis of constituent not required and not performed.
		Selenium		Analysis of constituent not required and not performed.
		Silver		Analysis of constituent not required and not performed.
		Sodium		Analysis of constituent not required and not performed.
		Tantalum		Analysis of constituent not required and not performed.
		Thallium		Analysis of constituent not required and not performed.
		Uranium		Analysis of constituent not required and not performed.
		Vanadium		Analysis of constituent not required and not performed.

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

## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB2UG4-14	Zinc		Analysis of constituent not required and not performed.
		Acrolein		Collected during a second sampling event..
		Acrylonitrile		Collected during a second sampling event.
		PCB, Total		Analysis of constituent not required and not performed.
		PCB-1016		Analysis of constituent not required and not performed.
		PCB-1221		Analysis of constituent not required and not performed.
		PCB-1232		Analysis of constituent not required and not performed.
		PCB-1242		Analysis of constituent not required and not performed.
		PCB-1248		Analysis of constituent not required and not performed.
		PCB-1254		Analysis of constituent not required and not performed.
		PCB-1260		Analysis of constituent not required and not performed.
		PCB-1268		Analysis of constituent not required and not performed.
		Gross alpha		Analysis of constituent not required and not performed.
		Gross beta		Analysis of constituent not required and not performed.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226		Analysis of constituent not required and not performed.
		Strontium-90		Analysis of constituent not required and not performed.
		Technetium-99		Analysis of constituent not required and not performed.
		Thorium-230		Analysis of constituent not required and not performed.
		Tritium		Analysis of constituent not required and not performed.
		Chemical Oxygen Demand		Analysis of constituent not required and not performed.
		Cyanide		Analysis of constituent not required and not performed.
		Iodide		Analysis of constituent not required and not performed.
		Total Organic Carbon		Analysis of constituent not required and not performed.
		Total Organic Halides		Analysis of constituent not required and not performed.

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

## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB3UG4-14	Bromide		Analysis of constituent not required and not performed.
		Chloride		Analysis of constituent not required and not performed.
		Fluoride		Analysis of constituent not required and not performed.
		Nitrate & Nitrite		Analysis of constituent not required and not performed.
		Sulfate		Analysis of constituent not required and not performed.
		Barometric Pressure Reading		Analysis of constituent not required and not performed.
		Specific Conductance		Analysis of constituent not required and not performed.
		Static Water Level Elevation		Analysis of constituent not required and not performed.
		Dissolved Oxygen		Analysis of constituent not required and not performed.
		Total Dissolved Solids		Analysis of constituent not required and not performed.
		pH		Analysis of constituent not required and not performed.
		Eh		Analysis of constituent not required and not performed.
		Temperature		Analysis of constituent not required and not performed.
		Aluminum		Analysis of constituent not required and not performed.
		Antimony		Analysis of constituent not required and not performed.
		Arsenic		Analysis of constituent not required and not performed.
		Barium		Analysis of constituent not required and not performed.
		Beryllium		Analysis of constituent not required and not performed.
		Boron		Analysis of constituent not required and not performed.
		Cadmium		Analysis of constituent not required and not performed.
		Calcium		Analysis of constituent not required and not performed.
		Chromium		Analysis of constituent not required and not performed.
		Cobalt		Analysis of constituent not required and not performed.
		Copper		Analysis of constituent not required and not performed.
		Iron		Analysis of constituent not required and not performed.
		Lead		Analysis of constituent not required and not performed.
		Magnesium		Analysis of constituent not required and not performed.
		Manganese		Analysis of constituent not required and not performed.
		Mercury		Analysis of constituent not required and not performed.
		Molybdenum		Analysis of constituent not required and not performed.
		Nickel		Analysis of constituent not required and not performed.
		Potassium		Analysis of constituent not required and not performed.
		Rhodium		Analysis of constituent not required and not performed.
		Selenium		Analysis of constituent not required and not performed.
		Silver		Analysis of constituent not required and not performed.
		Sodium		Analysis of constituent not required and not performed.
		Tantalum		Analysis of constituent not required and not performed.
		Thallium		Analysis of constituent not required and not performed.
		Uranium		Analysis of constituent not required and not performed.
		Vanadium		Analysis of constituent not required and not performed.

RESIDENTIAL/CONTAINED – QUARTERLY  
Facility: US DOE - Paducah Gaseous Diffusion Plant  
Permit Numbers: 073-00045

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	TB3UG4-14	Zinc		Analysis of constituent not required and not performed.
		PCB, Total		Analysis of constituent not required and not performed.
		PCB-1016		Analysis of constituent not required and not performed.
		PCB-1221		Analysis of constituent not required and not performed.
		PCB-1232		Analysis of constituent not required and not performed.
		PCB-1242		Analysis of constituent not required and not performed.
		PCB-1248		Analysis of constituent not required and not performed.
		PCB-1254		Analysis of constituent not required and not performed.
		PCB-1260		Analysis of constituent not required and not performed.
		PCB-1268		Analysis of constituent not required and not performed.
		Gross alpha		Analysis of constituent not required and not performed.
		Gross beta		Analysis of constituent not required and not performed.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226		Analysis of constituent not required and not performed.
		Strontium-90		Analysis of constituent not required and not performed.
		Technetium-99		Analysis of constituent not required and not performed.
		Thorium-230		Analysis of constituent not required and not performed.
		Tritium		Analysis of constituent not required and not performed.
		Chemical Oxygen Demand		Analysis of constituent not required and not performed.
		Cyanide		Analysis of constituent not required and not performed.
		Iodide		Analysis of constituent not required and not performed.
		Total Organic Carbon		Analysis of constituent not required and not performed.
		Total Organic Halides		Analysis of constituent not required and not performed.

RESIDENTIAL/CONTAINED – QUARTERLY  
Facility: US DOE - Paducah Gaseous Diffusion Plant  
Permit Numbers: 073-00045

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	TB4UG4-14	Bromide		Analysis of constituent not required and not performed.
		Chloride		Analysis of constituent not required and not performed.
		Fluoride		Analysis of constituent not required and not performed.
		Nitrate & Nitrite		Analysis of constituent not required and not performed.
		Sulfate		Analysis of constituent not required and not performed.
		Barometric Pressure Reading		Analysis of constituent not required and not performed.
		Specific Conductance		Analysis of constituent not required and not performed.
		Static Water Level Elevation		Analysis of constituent not required and not performed.
		Dissolved Oxygen		Analysis of constituent not required and not performed.
		Total Dissolved Solids		Analysis of constituent not required and not performed.
		pH		Analysis of constituent not required and not performed.
		Eh		Analysis of constituent not required and not performed.
		Temperature		Analysis of constituent not required and not performed.
		Aluminum		Analysis of constituent not required and not performed.
		Antimony		Analysis of constituent not required and not performed.
		Arsenic		Analysis of constituent not required and not performed.
		Barium		Analysis of constituent not required and not performed.
		Beryllium		Analysis of constituent not required and not performed.
		Boron		Analysis of constituent not required and not performed.
		Cadmium		Analysis of constituent not required and not performed.
		Calcium		Analysis of constituent not required and not performed.
		Chromium		Analysis of constituent not required and not performed.
		Cobalt		Analysis of constituent not required and not performed.
		Copper		Analysis of constituent not required and not performed.
		Iron		Analysis of constituent not required and not performed.
		Lead		Analysis of constituent not required and not performed.
		Magnesium		Analysis of constituent not required and not performed.
		Manganese		Analysis of constituent not required and not performed.
		Mercury		Analysis of constituent not required and not performed.
		Molybdenum		Analysis of constituent not required and not performed.
		Nickel		Analysis of constituent not required and not performed.
		Potassium		Analysis of constituent not required and not performed.
		Rhodium		Analysis of constituent not required and not performed.
		Selenium		Analysis of constituent not required and not performed.
		Silver		Analysis of constituent not required and not performed.
		Sodium		Analysis of constituent not required and not performed.
		Tantalum		Analysis of constituent not required and not performed.
		Thallium		Analysis of constituent not required and not performed.
		Uranium		Analysis of constituent not required and not performed.
		Vanadium		Analysis of constituent not required and not performed.

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

## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB4UG4-14	Zinc		Analysis of constituent not required and not performed.
		PCB, Total		Analysis of constituent not required and not performed.
		PCB-1016		Analysis of constituent not required and not performed.
		PCB-1221		Analysis of constituent not required and not performed.
		PCB-1232		Analysis of constituent not required and not performed.
		PCB-1242		Analysis of constituent not required and not performed.
		PCB-1248		Analysis of constituent not required and not performed.
		PCB-1254		Analysis of constituent not required and not performed.
		PCB-1260		Analysis of constituent not required and not performed.
		PCB-1268		Analysis of constituent not required and not performed.
		Gross alpha		Analysis of constituent not required and not performed.
		Gross beta		Analysis of constituent not required and not performed.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226		Analysis of constituent not required and not performed.
		Strontium-90		Analysis of constituent not required and not performed.
		Technetium-99		Analysis of constituent not required and not performed.
		Thorium-230		Analysis of constituent not required and not performed.
		Tritium		Analysis of constituent not required and not performed.
		Chemical Oxygen Demand		Analysis of constituent not required and not performed.
		Cyanide		Analysis of constituent not required and not performed.
		Iodide		Analysis of constituent not required and not performed.
		Total Organic Carbon		Analysis of constituent not required and not performed.
		Total Organic Halides		Analysis of constituent not required and not performed.

RESIDENTIAL/CONTAINED – QUARTERLY  
Facility: US DOE - Paducah Gaseous Diffusion Plant  
Permit Numbers: 073-00045

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	TB5UG4-14	Bromide		Analysis of constituent not required and not performed.
		Chloride		Analysis of constituent not required and not performed.
		Fluoride		Analysis of constituent not required and not performed.
		Nitrate & Nitrite		Analysis of constituent not required and not performed.
		Sulfate		Analysis of constituent not required and not performed.
		Barometric Pressure Reading		Analysis of constituent not required and not performed.
		Specific Conductance		Analysis of constituent not required and not performed.
		Static Water Level Elevation		Analysis of constituent not required and not performed.
		Dissolved Oxygen		Analysis of constituent not required and not performed.
		Total Dissolved Solids		Analysis of constituent not required and not performed.
		pH		Analysis of constituent not required and not performed.
		Eh		Analysis of constituent not required and not performed.
		Temperature		Analysis of constituent not required and not performed.
		Aluminum		Analysis of constituent not required and not performed.
		Antimony		Analysis of constituent not required and not performed.
		Arsenic		Analysis of constituent not required and not performed.
		Barium		Analysis of constituent not required and not performed.
		Beryllium		Analysis of constituent not required and not performed.
		Boron		Analysis of constituent not required and not performed.
		Cadmium		Analysis of constituent not required and not performed.
		Calcium		Analysis of constituent not required and not performed.
		Chromium		Analysis of constituent not required and not performed.
		Cobalt		Analysis of constituent not required and not performed.
		Copper		Analysis of constituent not required and not performed.
		Iron		Analysis of constituent not required and not performed.
		Lead		Analysis of constituent not required and not performed.
		Magnesium		Analysis of constituent not required and not performed.
		Manganese		Analysis of constituent not required and not performed.
		Mercury		Analysis of constituent not required and not performed.
		Molybdenum		Analysis of constituent not required and not performed.
		Nickel		Analysis of constituent not required and not performed.
		Potassium		Analysis of constituent not required and not performed.
		Rhodium		Analysis of constituent not required and not performed.
		Selenium		Analysis of constituent not required and not performed.
		Silver		Analysis of constituent not required and not performed.
		Sodium		Analysis of constituent not required and not performed.
		Tantalum		Analysis of constituent not required and not performed.
		Thallium		Analysis of constituent not required and not performed.
		Uranium		Analysis of constituent not required and not performed.
		Vanadium		Analysis of constituent not required and not performed.



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

## GROUNDWATER WRITTEN COMMENTS

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
0000-0000 QC	TB5UG4-14	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.
8004-4799 MW358	MW358DUG4-14	Gross alpha	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 3.8. Rad error is 3.8.
		Gross beta		TPU is 8.55. Rad error is 7.92.
		Iodine-131		Analysis of constituent not required and not performed.
		Radium-226	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 0.445. Rad error is 0.439.
		Strontium-90	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 2.61. Rad error is 2.6.
		Technetium-99		TPU is 14.4. Rad error is 13.4.
		Thorium-230	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 1.58. Rad error is 1.57.
		Tritium	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 124. Rad error is 124.

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**APPENDIX D**

**STATISTICAL ANALYSES AND  
QUALIFICATION STATEMENT**

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# GROUNDWATER STATISTICAL COMMENTS

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## Introduction

The statistical analyses conducted on the third quarter 2014 groundwater data collected from the C-746-U Landfill monitoring wells (MWs) were performed in accordance with Permit GSTR0001, Standard Requirement 3, using the U.S. Environmental Protection Agency (EPA) guidance document, *EPA Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Interim Final Guidance* (1989). 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 included from two wells considered to represent background conditions were compared with at least three test wells or sidegradient wells (Exhibit 1). The third quarter 2014 data used to conduct the statistical analyses were collected in July 2014. The statistical analyses for this report first 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. Then a second set of statistical analyses is run, utilizing the last eight quarters, on analytes that had at least one well that exceeded the historical background. The sampling dates associated with both the historical and the current background data are listed next to the result in the statistical analysis sheets of this appendix.

## Statistical Analysis Process

For chemicals of concern that have Kentucky maximum contaminant levels (MCLs) and the results that do not exceed their respective MCL, no exceedance is reported. Parameters that have MCLs can be found in 401 KAR 47:030 § 6. For parameters with no established MCL and those parameters that exceed their MCLs, the 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 was conducted. The test well results were compared to both an upper and lower tolerance limit 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 was 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, was conducted. The second one-sided tolerance interval statistical test was conducted to determine whether the current concentration in downgradient wells exceeds the current background, as determined by a comparison against the statistically derived upper tolerance limit using the most recent eight quarters of data for the relevant background wells. For the statistical analysis of pH, a two-sided tolerance interval statistical test is conducted, if required. The test well pH results are compared to both an upper and lower tolerance limit to determine if the current pH is different from the current background level to a statistically significant level. The tolerance interval statistical analysis was conducted separately for each parameter in each well (no pooling of downgradient data).

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

A stepwise list of the one-sided tolerance interval statistical procedure applied to the data is summarized below:<sup>1</sup>

1. The tolerance limit (TL) was calculated for the background data (first using the first eight quarters, then using the last eight quarters, if required).
  - For each parameter, the background data were used to establish a baseline. On this data set, the mean (X) and the standard deviation (S) were computed.
  - The data set was checked for normality using coefficient of variation (CV). If  $CV \leq 1.0$ , then the data are assumed to be potentially 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 tolerance limit with 95% minimum coverage was 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 tolerance limit was calculated using the following equation:  
$$TL = X + (K \times S)$$
2. Each observation from downgradient wells was compared to the calculated one-sided upper tolerance limit in Step 1. If an observation value exceeds the tolerance limit, then there is statistically significant evidence that the well concentration exceeds the historical background.

### **Type of Data Used**

Exhibit 1 presents the upgradient or background wells (identified as “BG”), the downgradient or test wells (identified as “TW”), and the sidegradient wells (identified as “SG”) for the C-746-U Contained Landfill. Exhibit 2 presents the parameters by groundwater system from the available data set and the statistical test performed using the one-sided tolerance interval.

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

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

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

Exhibits 3, 4, and 5 list the number of analyses (observations), nondetects (censored observations), detects (uncensored observations), and missing observations by parameter in the UCRS, the URG, 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 3, 4, and 5 were collected during the current quarter, third quarter 2014. The observations that are listed are not background data. Background data are presented in Attachments D1 and D2. The sampling dates associated with background data are listed next to the result in Attachments D1 and D2. When field duplicate data are available, the higher of the two readings is retained for further evaluation. When a well is sampled on two different dates, the most current available data are used.

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

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

**NOTE:** UCRS wells considered to be “background” wells are those located in the same general direction as the RGA wells considered to be upgradient. The actual gradients in the UCRS wells are downward.

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

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Parameters
Aluminum
Boron
Bromide
Calcium
Chemical Oxygen Demand (COD)
Chloride
<i>cis</i> -1,2-Dichloroethene
Cobalt
Conductivity
Dissolved Oxygen
Dissolved Solids
Iron
Magnesium
Manganese
Molybdenum
Nickel
Oxidation-Reduction Potential
PCB, Total
PCB-1242
pH*
Radium-226
Sodium
Sulfate
Technetium-99
Total Organic Carbon (TOC)
Total Organic Halides (TOX)
Trichloroethene
Uranium
Vanadium
Zinc

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\*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 3. Summary of Missing, Censored, and Uncensored Data—UCRS

Parameters	Observations	Missing Observation	Censored Observation	Uncensored Observation	Statistical Analysis?
1,1,1,2-Tetrachloroethane	7	0	7	0	No
1,1,2,2-Tetrachloroethane	7	0	7	0	No
1,1,2-Trichloroethane	7	0	7	0	No
1,1-Dichloroethane	7	0	7	0	No
1,2,3-Trichloropropane	7	0	7	0	No
1,2-Dibromo-3-chloropropane	7	0	7	0	No
1,2-Dibromoethane	7	0	7	0	No
1,2-Dichlorobenzene	7	0	7	0	No
1,2-Dichloropropane	7	0	7	0	No
2-Butanone	7	0	7	0	No
2-Hexanone	7	0	7	0	No
4-Methyl-2-pentanone	7	0	7	0	No
Acetone	7	0	7	0	No
Acrolein	7	0	7	0	No
Acrylonitrile	7	0	7	0	No
<b>Aluminum</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>YES</b>
Antimony	7	0	7	0	No
Beryllium	7	0	7	0	No
<b>Boron</b>	<b>7</b>	<b>0</b>	<b>2</b>	<b>5</b>	<b>YES</b>
<b>Bromide</b>	<b>7</b>	<b>0</b>	<b>4</b>	<b>3</b>	<b>YES</b>
Bromochloromethane	7	0	7	0	No
Bromodichloromethane	7	0	7	0	No
Bromoform	7	0	7	0	No
Bromomethane	7	0	7	0	No
<b>Calcium</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>YES</b>
Carbon disulfide	7	0	7	0	No
<b>Chemical Oxygen Demand (COD)</b>	<b>7</b>	<b>0</b>	<b>1</b>	<b>6</b>	<b>YES</b>
<b>Chloride</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>YES</b>
Chlorobenzene	7	0	7	0	No
Chloroethane	7	0	7	0	No
Chloroform	7	0	7	0	No
Chloromethane	7	0	7	0	No
<i>cis</i> -1,2-Dichloroethene	7	0	7	0	No
<i>cis</i> -1,3-Dichloropropene	7	0	7	0	No
<b>Cobalt</b>	<b>7</b>	<b>0</b>	<b>1</b>	<b>6</b>	<b>YES</b>
<b>Conductivity</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>YES</b>
Copper	7	0	7	0	No
Cyanide	7	0	7	0	No
Dibromochloromethane	7	0	7	0	No
Dibromomethane	7	0	7	0	No

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

Parameters	Observations	Missing Observation	Censored Observation	Uncensored Observation	Statistical Analysis?
Dimethylbenzene, Total	7	0	7	0	No
<b>Dissolved Oxygen</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>YES</b>
<b>Dissolved Solids</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>YES</b>
Ethylbenzene	7	0	7	0	No
Iodide	7	0	7	0	No
Iodomethane	7	0	7	0	No
<b>Iron</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>YES</b>
<b>Magnesium</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>YES</b>
<b>Manganese</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>YES</b>
Methylene chloride	7	0	7	0	No
<b>Molybdenum</b>	<b>7</b>	<b>0</b>	<b>2</b>	<b>5</b>	<b>YES</b>
<b>Nickel</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>YES</b>
<b>Oxidation-Reduction Potential</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>YES</b>
<b>PCB, Total</b>	<b>7</b>	<b>0</b>	<b>5</b>	<b>2</b>	<b>YES</b>
PCB-1016	7	0	7	0	No
PCB-1221	7	0	7	0	No
PCB-1232	7	0	7	0	No
<b>PCB-1242</b>	<b>7</b>	<b>0</b>	<b>5</b>	<b>2</b>	<b>YES</b>
PCB-1248	7	0	7	0	No
PCB-1254	7	0	7	0	No
PCB-1260	7	0	7	0	No
PCB-1268	7	0	7	0	No
<b>pH</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>YES</b>
Potassium	7	0	7	0	No
<b>Radium-226</b>	<b>7</b>	<b>0</b>	<b>4</b>	<b>3</b>	<b>YES</b>
Rhodium	7	0	7	0	No
<b>Sodium</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>YES</b>
Styrene	7	0	7	0	No
<b>Sulfate</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>YES</b>
Tantalum	7	0	7	0	No
Technetium-99	7	0	7	0	No
Tetrachloroethene	7	0	7	0	No
Thallium	7	0	7	0	No
Thorium-230	7	0	7	0	No
Toluene	7	0	7	0	No
<b>Total Organic Carbon (TOC)</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>YES</b>
<b>Total Organic Halides (TOX)</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>YES</b>
<i>trans</i> -1,2-Dichloroethene	7	0	7	0	No
<i>trans</i> -1,3-Dichloropropene	7	0	7	0	No
<i>trans</i> -1,4-Dichloro-2-butene	7	0	7	0	No

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

Parameters	Observations	Missing Observation	Censored Observation	Uncensored Observation	Statistical Analysis?
Trichlorofluoromethane	7	0	7	0	No
<b>Uranium</b>	<b>7</b>	<b>0</b>	<b>1</b>	<b>6</b>	<b>YES</b>
<b>Vanadium</b>	<b>7</b>	<b>0</b>	<b>6</b>	<b>1</b>	<b>YES</b>
Vinyl acetate	7	0	7	0	No
<b>Zinc</b>	<b>7</b>	<b>0</b>	<b>2</b>	<b>5</b>	<b>YES</b>

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

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

Parameters	Observations	Missing Observation	Censored Observation	Uncensored Observation	Statistical Analysis?
1,1,1,2-Tetrachloroethane	6	0	6	0	No
1,1,2,2-Tetrachloroethane	6	0	6	0	No
1,1,2-Trichloroethane	6	0	6	0	No
1,1-Dichloroethane	6	0	6	0	No
1,2,3-Trichloropropane	6	0	6	0	No
1,2-Dibromo-3-chloropropane	6	0	6	0	No
1,2-Dibromoethane	6	0	6	0	No
1,2-Dichlorobenzene	6	0	6	0	No
1,2-Dichloropropane	6	0	6	0	No
2-Butanone	6	0	6	0	No
2-Hexanone	6	0	6	0	No
4-Methyl-2-pentanone	6	0	6	0	No
Acetone	6	0	6	0	No
Acrolein	6	0	6	0	No
Acrylonitrile	6	0	6	0	No
<b>Aluminum</b>	<b>6</b>	<b>0</b>	<b>2</b>	<b>4</b>	<b>YES</b>
Antimony	6	0	6	0	No
Beryllium	6	0	6	0	No
<b>Boron</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>YES</b>
<b>Bromide</b>	<b>6</b>	<b>0</b>	<b>1</b>	<b>5</b>	<b>YES</b>
Bromochloromethane	6	0	6	0	No
Bromodichloromethane	6	0	6	0	No
Bromoform	6	0	6	0	No
Bromomethane	6	0	6	0	No
<b>Calcium</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>YES</b>
Carbon disulfide	6	0	6	0	No
<b>Chemical Oxygen Demand (COD)</b>	<b>6</b>	<b>0</b>	<b>1</b>	<b>5</b>	<b>YES</b>
<b>Chloride</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>YES</b>
Chlorobenzene	6	0	6	0	No
Chloroethane	6	0	6	0	No
Chloroform	6	0	6	0	No
Chloromethane	6	0	6	0	No
<i>cis</i> -1,2-Dichloroethene	6	0	6	0	No
<i>cis</i> -1,3-Dichloropropene	6	0	6	0	No
<b>Cobalt</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>YES</b>
<b>Conductivity</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>YES</b>
Copper	6	0	6	0	No
Cyanide	6	0	6	0	No
Dibromochloromethane	6	0	6	0	No

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

Parameters	Observations	Missing Observation	Censored Observation	Uncensored Observation	Statistical Analysis?
Dibromomethane	6	0	6	0	No
Dimethylbenzene, Total	6	0	6	0	No
<b>Dissolved Oxygen</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>YES</b>
<b>Dissolved Solids</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>YES</b>
Ethylbenzene	6	0	6	0	No
Iodide	6	0	6	0	No
Iodomethane	6	0	6	0	No
<b>Iron</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>YES</b>
<b>Magnesium</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>YES</b>
<b>Manganese</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>YES</b>
Methylene chloride	6	0	6	0	No
<b>Molybdenum</b>	<b>6</b>	<b>0</b>	<b>4</b>	<b>2</b>	<b>YES</b>
<b>Nickel</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>YES</b>
<b>Oxidation-Reduction Potential</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>YES</b>
<b>PCB, Total</b>	<b>6</b>	<b>0</b>	<b>2</b>	<b>4</b>	<b>YES</b>
PCB-1016	6	0	6	0	No
PCB-1221	6	0	6	0	No
PCB-1232	6	0	6	0	No
<b>PCB-1242</b>	<b>6</b>	<b>0</b>	<b>2</b>	<b>4</b>	<b>YES</b>
PCB-1248	6	0	6	0	No
PCB-1254	6	0	6	0	No
PCB-1260	6	0	6	0	No
PCB-1268	6	0	6	0	No
<b>pH</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>YES</b>
Potassium	6	0	6	0	No
<b>Radium-226</b>	<b>6</b>	<b>0</b>	<b>3</b>	<b>3</b>	<b>YES</b>
Rhodium	6	0	6	0	No
<b>Sodium</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>YES</b>
Styrene	6	0	6	0	No
<b>Sulfate</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>YES</b>
Tantalum	6	0	6	0	No
<b>Technetium-99</b>	<b>6</b>	<b>0</b>	<b>3</b>	<b>3</b>	<b>YES</b>
Tetrachloroethene	6	0	6	0	No
Thallium	6	0	6	0	No
Thorium-230	6	0	6	0	No
Toluene	6	0	6	0	No
<b>Total Organic Carbon (TOC)</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>YES</b>
<b>Total Organic Halides (TOX)</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>YES</b>
trans-1,2-Dichloroethene	6	0	6	0	No
trans-1,3-Dichloropropene	6	0	6	0	No

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

<b>Parameters</b>	<b>Observations</b>	<b>Missing Observation</b>	<b>Censored Observation</b>	<b>Uncensored Observation</b>	<b>Statistical Analysis?</b>
<i>trans</i> -1,4-Dichloro-2-butene	6	0	6	0	No
Trichlorofluoromethane	6	0	6	0	No
<b>Uranium</b>	<b>6</b>	<b>0</b>	<b>5</b>	<b>1</b>	<b>YES</b>
Vanadium	6	0	6	0	No
Vinyl acetate	6	0	6	0	No
<b>Zinc</b>	<b>6</b>	<b>0</b>	<b>4</b>	<b>2</b>	<b>YES</b>

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

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

Parameters	Observations	Missing Observation	Censored Observation	Uncensored Observation	Statistical Analysis?
Aluminum	6	0	6	0	No
Antimony	6	0	6	0	No
Beryllium	6	0	6	0	No
<b>Boron</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>YES</b>
<b>Bromide</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>YES</b>
Bromochloromethane	6	0	6	0	No
Bromodichloromethane	6	0	6	0	No
Bromoform	6	0	6	0	No
Bromomethane	6	0	6	0	No
<b>Calcium</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>YES</b>
Carbon disulfide	6	0	6	0	No
<b>Chemical Oxygen Demand (COD)</b>	<b>6</b>	<b>0</b>	<b>1</b>	<b>5</b>	<b>YES</b>
<b>Chloride</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>YES</b>
Chlorobenzene	6	0	6	0	No
Chloroethane	6	0	6	0	No
Chloroform	6	0	6	0	No
Chloromethane	6	0	6	0	No
<b>cis-1,2-Dichloroethene</b>	<b>6</b>	<b>0</b>	<b>5</b>	<b>1</b>	<b>YES</b>
cis-1,3-Dichloropropene	6	0	6	0	No
<b>Cobalt</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>YES</b>
<b>Conductivity</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>YES</b>
Copper	6	0	6	0	No
Cyanide	6	0	6	0	No
Dibromochloromethane	6	0	6	0	No
Dibromomethane	6	0	6	0	No
Dimethylbenzene, Total	6	0	6	0	No
<b>Dissolved Oxygen</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>YES</b>
<b>Dissolved Solids</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>YES</b>
Ethylbenzene	6	0	6	0	No
Iodide	6	0	6	0	No
Iodomethane	6	0	6	0	No
<b>Iron</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>YES</b>
<b>Magnesium</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>YES</b>
<b>Manganese</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>YES</b>
Methylene chloride	6	0	6	0	No
Molybdenum	6	0	6	0	No
<b>Nickel</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>YES</b>
<b>Oxidation-Reduction Potential</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>YES</b>
PCB, Total	6	0	6	0	No
PCB-1016	6	0	6	0	No
PCB-1221	6	0	6	0	No
PCB-1232	6	0	6	0	No

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

Parameters	Observations	Missing Observation	Censored Observation	Uncensored Observation	Statistical Analysis?
PCB-1242	6	0	6	0	No
PCB-1248	6	0	6	0	No
PCB-1254	6	0	6	0	No
PCB-1260	6	0	6	0	No
PCB-1268	6	0	6	0	No
<b>pH</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>YES</b>
Potassium	6	0	6	0	No
<b>Radium-226</b>	<b>6</b>	<b>0</b>	<b>2</b>	<b>4</b>	<b>YES</b>
Rhodium	6	0	6	0	No
<b>Sodium</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>YES</b>
Styrene	6	0	6	0	No
<b>Sulfate</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>YES</b>
Tantalum	6	0	6	0	No
<b>Technetium-99</b>	<b>6</b>	<b>0</b>	<b>2</b>	<b>4</b>	<b>YES</b>
Tetrachloroethene	6	0	6	0	No
Thallium	6	0	6	0	No
Thorium-230	6	0	6	0	No
Toluene	6	0	6	0	No
<b>Total Organic Carbon (TOC)</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>YES</b>
<b>Total Organic Halides (TOX)</b>	<b>6</b>	<b>0</b>	<b>1</b>	<b>5</b>	<b>YES</b>
<i>trans</i> -1,2-Dichloroethene	6	0	6	0	No
<i>trans</i> -1,3-Dichloropropene	6	0	6	0	No
<i>trans</i> -1,4-Dichloro-2-butene	6	0	6	0	No
Trichlorofluoromethane	6	0	6	0	No
Uranium	6	0	6	0	No
Vanadium	6	0	6	0	No
Vinyl acetate	6	0	6	0	No
<b>Zinc</b>	<b>6</b>	<b>0</b>	<b>2</b>	<b>4</b>	<b>YES</b>

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



## Discussion of Results from Historical Background Comparison

For the UCRS, URGAs, and LRGA, the concentrations of this quarter were compared to the results of the one-sided upper tolerance interval test compared to historical background, and are presented in Attachment D1, and the statistician qualification statement is presented in Attachment D3. For the UCRS, URGAs, and LRGA, the test was applied to 27, 27, and 23 parameters, respectively, including those listed in bold print in Exhibits 3, 4, and 5 plus those constituents (TCE) that exceeded their MCL. A summary of exceedances when compared to statistically derived historical upgradient background by well number is shown in Exhibit 6.

### UCRS

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

### URGA

This quarter's results identified historical background exceedances for calcium, conductivity, oxidation-reduction potential, sodium, and sulfate.

### LRGA

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

### Conclusion

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

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

UCRS	URGA	LRGA
<b>MW359:</b> Dissolved Oxygen, Oxidation-Reduction Potential, Sulfate	<b>MW357:</b> Oxidation-Reduction Potential	<b>MW358:</b> Oxidation-Reduction Potential, Technetium-99
<b>MW362:</b> Dissolved Oxygen, Oxidation-Reduction Potential, Sulfate	<b>MW360:</b> Sodium	<b>MW361:</b> Oxidation-Reduction Potential, Technetium-99
<b>MW365:</b> Dissolved Oxygen, Oxidation-Reduction Potential, Sulfate	<b>MW363:</b> Oxidation-Reduction Potential	<b>MW364:</b> Oxidation-Reduction Potential, Technetium-99
<b>MW368:</b> Dissolved Oxygen, Oxidation-Reduction Potential, Sulfate	<b>MW366:</b> Oxidation-Reduction Potential	<b>MW367:</b> Oxidation-Reduction Potential
<b>MW371:</b> Oxidation-Reduction Potential, Sulfate	<b>MW369:</b> Oxidation-Reduction Potential	<b>MW370:</b> Oxidation-Reduction Potential
<b>MW374:</b> Oxidation-Reduction Potential		
<b>MW375:</b> Oxidation-Reduction Potential, Sulfate	<b>MW372:</b> Calcium, Conductivity, Sulfate	<b>MW373:</b> Calcium, Oxidation-Reduction Potential

**Exhibit 7. Tests Summary for Qualified Parameters—UCRS**

<b>Parameter</b>	<b>Performed Test</b>	<b>CV Normality Test*</b>	<b>Results of Tolerance Interval Test Conducted</b>
Aluminum	Tolerance Interval	2.08	No exceedance of statistically derived historical background concentration
Boron	Tolerance Interval	1.24	No exceedance of statistically derived historical background concentration
Bromide	Tolerance Interval	0.34	No exceedance of statistically derived historical background concentration
Calcium	Tolerance Interval	0.40	No exceedance of statistically derived historical background concentration
Chemical Oxygen Demand (COD)	Tolerance Interval	0.97	No exceedance of statistically derived historical background concentration
Chloride	Tolerance Interval	0.95	No exceedance of statistically derived historical background concentration
Cobalt	Tolerance Interval	1.31	No exceedance of statistically derived historical background concentration
Conductivity	Tolerance Interval	0.45	No exceedance of statistically derived historical background concentration
Dissolved Oxygen	Tolerance Interval	0.55	Current results exceed statistically derived historical background concentration in MW359, MW362, MW365, and MW368
Dissolved Solids	Tolerance Interval	0.42	No exceedance of statistically derived historical background concentration
Iron	Tolerance Interval	0.98	No exceedance of statistically derived historical background concentration
Magnesium	Tolerance Interval	0.27	No exceedance of statistically derived historical background concentration
Manganese	Tolerance Interval	0.89	No exceedance of statistically derived historical background concentration
Molybdenum	Tolerance Interval	1.65	No exceedance of statistically derived historical background concentration
Nickel	Tolerance Interval	0.98	No exceedance of statistically derived historical background concentration

**Exhibit 7. Tests Summary for Qualified Parameters—UCRS (Continued)**

<b>Parameter</b>	<b>Performed Test</b>	<b>CV Normality Test*</b>	<b>Results of Tolerance Interval Test Conducted</b>
Oxidation-Reduction Potential	Tolerance Interval	3.54	Current results exceed statistically derived historical background concentration in MW359, MW362, MW365, MW368, MW371, MW374, and MW375
PCB, Total	Tolerance Interval	0.92	No exceedance of statistically derived historical background concentration
PCB-1242	Tolerance Interval	1.41	No exceedance of statistically derived historical background concentration
pH	Tolerance Interval	0.05	No exceedance of statistically derived historical background concentration
Radium-226	Tolerance Interval	3.79	No exceedance of statistically derived historical background concentration
Sodium	Tolerance Interval	0.40	No exceedance of statistically derived historical background concentration
Sulfate	Tolerance Interval	0.49	Current results exceed statistically derived historical background concentration in MW359, MW362, MW365, MW368, MW371, and MW375
Total Organic Carbon	Tolerance Interval	1.38	No exceedance of statistically derived historical background concentration
Total Organic Halides	Tolerance Interval	1.08	No exceedance of statistically derived historical background concentration
Uranium	Tolerance Interval	1.68	No exceedance of statistically derived historical background concentration
Vanadium	Tolerance Interval	1.32	No exceedance of statistically derived historical background concentration
Zinc	Tolerance Interval	1.38	No exceedance of statistically derived historical background concentration

CV: coefficient of variation

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

**Exhibit 8. Tests Summary for Qualified Parameters—URGA**

<b>Parameter</b>	<b>Performed Test</b>	<b>CV Normality Test*</b>	<b>Results of Tolerance Interval Test Conducted</b>
Aluminum	Tolerance Interval	1.24	No exceedance of statistically derived historical background concentration
Boron	Tolerance Interval	0.84	No exceedance of statistically derived historical background concentration
Bromide	Tolerance Interval	0.00	No exceedance of statistically derived historical background concentration
Calcium	Tolerance Interval	0.29	Current results exceed statistically derived historical background concentration in MW372
Chemical Oxygen Demand (COD)	Tolerance Interval	0.10	No exceedance of statistically derived historical background concentration
Chloride	Tolerance Interval	0.10	No exceedance of statistically derived historical background concentration
Cobalt	Tolerance Interval	0.85	No exceedance of statistically derived historical background concentration
Conductivity	Tolerance Interval	0.12	Current results exceed statistically derived historical background concentration in MW372
Dissolved Oxygen	Tolerance Interval	0.76	No exceedance of statistically derived historical background concentration
Dissolved Solids	Tolerance Interval	0.16	No exceedance of statistically derived historical background concentration
Iron	Tolerance Interval	0.95	No exceedance of statistically derived historical background concentration
Magnesium	Tolerance Interval	0.27	No exceedance of statistically derived historical background concentration
Manganese	Tolerance Interval	0.66	No exceedance of statistically derived historical background concentration
Molybdenum	Tolerance Interval	1.20	No exceedance of statistically derived historical background concentration
Nickel	Tolerance Interval	0.91	No exceedance of statistically derived historical background concentration
Oxidation-Reduction Potential	Tolerance Interval	1.26	Current results exceed statistically derived historical background concentration in MW357, MW363, MW366, and MW369
PCB, Total	Tolerance Interval	0.90	No exceedance of statistically derived historical background concentration

**Exhibit 8. Tests Summary for Qualified Parameters—URGA (Continued)**

<b>Parameter</b>	<b>Performed Test</b>	<b>CV Normality Test*</b>	<b>Results of Tolerance Interval Test Conducted</b>
PCB-1242	Tolerance Interval	1.36	No exceedance of statistically derived historical background concentration
pH	Tolerance Interval	0.03	No exceedance of statistically derived historical background concentration
Radium-226	Tolerance Interval	2.61	No exceedance of statistically derived historical background concentration
Sodium	Tolerance Interval	0.26	Current results exceed statistically derived historical background concentration in MW360
Sulfate	Tolerance Interval	0.75	Current results exceed statistically derived historical background concentration in MW372
Technetium-99	Tolerance Interval	0.87	No exceedance of statistically derived historical background concentration
Total Organic Carbon	Tolerance Interval	1.23	No exceedance of statistically derived historical background concentration
Total Organic Halides	Tolerance Interval	0.95	No exceedance of statistically derived historical background concentration
Trichloroethene <sup>1</sup>	Tolerance Interval	0.64	No exceedance of statistically derived historical background concentration
Uranium	Tolerance Interval	0.92	No exceedance of statistically derived historical background concentration
Zinc	Tolerance Interval	1.49	No exceedance of statistically derived historical background concentration

CV: coefficient of variation

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

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

**Exhibit 9. Tests Summary for Qualified Parameters—LRGA**

<b>Parameter</b>	<b>Performed Test</b>	<b>CV Normality Test</b>	<b>Results of Tolerance Interval Test Conducted</b>
Boron	Tolerance Interval	0.68	No exceedance of statistically derived historical background concentration
Bromide	Tolerance Interval	0.00	No exceedance of statistically derived historical background concentration
Calcium	Tolerance Interval	0.31	Current results exceed statistically derived historical background concentration in MW373
Chemical Oxygen Demand (COD)	Tolerance Interval	0.59	No exceedance of statistically derived historical background concentration
Chloride	Tolerance Interval	0.16	No exceedance of statistically derived historical background concentration
<i>cis</i> -1,2-Dichloroethene	Tolerance Interval	0.80	No exceedance of statistically derived historical background concentration
Cobalt	Tolerance Interval	1.17	No exceedance of statistically derived historical background concentration
Conductivity	Tolerance Interval	0.26	No exceedance of statistically derived historical background concentration
Dissolved Oxygen	Tolerance Interval	0.83	No exceedance of statistically derived historical background concentration
Dissolved Solids	Tolerance Interval	0.30	No exceedance of statistically derived historical background concentration
Iron	Tolerance Interval	0.96	No exceedance of statistically derived historical background concentration
Magnesium	Tolerance Interval	0.34	No exceedance of statistically derived historical background concentration
Manganese	Tolerance Interval	0.62	No exceedance of statistically derived historical background concentration
Nickel	Tolerance Interval	0.90	No exceedance of statistically derived historical background concentration
Oxidation-Reduction Potential	Tolerance Interval	1.31	Current results exceed statistically derived historical background concentration in MW358, MW361, MW364, MW367, MW370, and MW373
pH	Tolerance Interval	0.03	No exceedance of statistically derived historical background concentration

**Exhibit 9. Tests Summary for Qualified Parameters—LRGA  
(Continued)**

<b>Parameter</b>	<b>Performed Test</b>	<b>CV Normality Test</b>	<b>Results of Tolerance Interval Test Conducted</b>
Radium-226	Tolerance Interval	2.66	No exceedance of statistically derived historical background concentration
Sodium	Tolerance Interval	0.30	No exceedance of statistically derived historical background concentration
Sulfate	Tolerance Interval	1.59	No exceedance of statistically derived historical background concentration
Technetium-99	Tolerance Interval	1.73	Current results exceed statistically derived historical background concentration in MW358, MW361, and MW364
Total Organic Carbon	Tolerance Interval	1.96	No exceedance of statistically derived historical background concentration
Total Organic Halides	Tolerance Interval	0.98	No exceedance of statistically derived historical background concentration
Trichloroethene <sup>1</sup>	Tolerance Interval	0.57	No exceedance of statistically derived historical background concentration
Zinc	Tolerance Interval	0.67	No exceedance of statistically derived historical background concentration

CV: coefficient of variation

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

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

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

For the UCRS, URGAs, and LRGA, the concentrations from downgradient wells were compared to the results of the one-sided upper tolerance interval test compared to current background, and are presented in Attachment D2 and the statistician qualification statement is presented in Attachment D3. For the UCRS, URGAs, and LRGA, the test was applied to 3, 5, and 3 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 10, presented by well number.

### **UCRS**

Because gradients in the UCRS are downward, there are no downgradient UCRS wells that exceed current background TL derived using the most recent eight quarters of data. NOTE: Sulfate concentrations in some UCRS wells exceeded the current TL this quarter.

### **URGA**

This quarter's results showed no exceedances of the current TL in wells located downgradient of the landfill.

### **LRGA**

This quarter's results showed no exceedances of the current TL in wells located downgradient of the landfill.

## **Conclusion**

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

**Exhibit 10. Summary of  
Exceedances (in downgradient wells)  
of the TL Calculated Using  
Current Background Concentrations**

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None

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**Exhibit 11. Tests Summary for Qualified Parameters—UCRS**

<b>Parameter</b>	<b>Performed Test</b>	<b>CV Normality Test</b>	<b>Results of Tolerance Interval Test Conducted</b>
Dissolved Oxygen	Tolerance Interval	0.53	No exceedance of statistically derived current background concentration
Oxidation-Reduction Potential	Tolerance Interval	0.42	No exceedance of statistically derived current background concentration
Sulfate	Tolerance Interval	0.49	Because gradients in UCRS wells are downward, there are no UCRS wells that are actually downgradient of the landfill. However, sulfate concentrations exceeded the TL calculated using current background data in MW359, MW362, MW365, MW368, and MW375

CV: coefficient of variation

**Exhibit 12. Tests Summary for Qualified Parameters—URGA**

<b>Parameter</b>	<b>Performed Test</b>	<b>CV Normality Test</b>	<b>Results of Tolerance Interval Test Conducted</b>
Calcium	Tolerance Interval	0.62	No exceedance of statistically derived current background concentration
Conductivity	Tolerance Interval	0.38	No exceedance of statistically derived current background concentration
Oxidation-Reduction Potential	Tolerance Interval	0.69	No exceedance of statistically derived current background concentration
Sodium	Tolerance Interval	0.31	No exceedance of statistically derived current background concentration
Sulfate	Tolerance Interval	0.93	No exceedance of statistically derived current background concentration

CV: coefficient of variation

**Exhibit 13. Tests Summary for Qualified Parameters—LRGA**

<b>Parameter</b>	<b>Performed Test</b>	<b>CV Normality Test</b>	<b>Results of Tolerance Interval Test Conducted</b>
Calcium	Tolerance Interval	0.45	No exceedance of statistically derived current background concentration
Oxidation-Reduction Potential	Tolerance Interval	0.31	No exceedance of statistically derived current background concentration
Technetium-99	Tolerance Interval	0.57	No exceedance of statistically derived current background concentration

CV: coefficient of variation

**ATTACHMENT D1**

**ONE-SIDED UPPER TOLERANCE INTERVAL TEST  
COMPARED TO  
HISTORICAL BACKGROUND DATA**

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## C-746-U Third Quarter 2014 Statistical Analysis Aluminum

UCRS  
UNITS: mg/L

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

Background Data from Upgradient Wells		Statistics on Background Data	Transformed Background Data from Upgradient Wells	
Well Number: MW371		<b>X= 3.300</b> <b>S= 6.859</b> <b>CV= 2.078</b> <b>K factor** = 2.523</b> <b>TL= 20.604</b>	Well Number: MW371	
Date Collected	Result		Date Collected	LN(Result)
3/18/2002	2.240		3/18/2002	0.806
4/22/2002	0.200		4/22/2002	-1.609
7/15/2002	0.200		7/15/2002	-1.609
10/8/2002	0.200		10/8/2002	-1.609
1/8/2003	0.200		1/8/2003	-1.609
4/3/2003	0.200		4/3/2003	-1.609
7/9/2003	0.200		7/9/2003	-1.609
10/6/2003	0.200		10/6/2003	-1.609
Well Number: MW374		<b>X= -0.371</b> <b>S= 1.678</b> <b>CV= -4.521</b> <b>K factor** = 2.523</b> <b>TL= 3.863</b>	Well Number: MW374	
Date Collected	Result		Date Collected	LN(Result)
10/8/2002	21.300		10/8/2002	3.059
1/7/2003	20.000		1/7/2003	2.996
4/2/2003	4.110		4/2/2003	1.413
7/9/2003	1.410		7/9/2003	0.344
10/7/2003	1.090		10/7/2003	0.086
1/6/2004	0.854		1/6/2004	-0.158
4/7/2004	0.200		4/7/2004	-1.609
7/14/2004	0.200		7/14/2004	-1.609

Third Quarter 2014 Data Collected in July 2014				Third Quarter 2014 Dry/Partially Dry Wells		Transformed Third Quarter 2014 Data Collected in July 2014		
Well No.	Result	Gradient	Result > TL?	Well No.	Gradient	Well Number	LN(Result)	Result > TL?
MW359	0.055	Downgradient	N/A	MW376	Sidegradient	MW359	-2.908	NO
MW362	2.790	Downgradient	N/A	MW377	Sidegradient	MW362	1.026	NO
MW365	0.020	Downgradient	N/A			MW365	-3.907	NO
MW368	1.090	Sidegradient	N/A			MW368	0.086	NO
MW371	0.137	Upgradient	N/A			MW371	-1.988	NO
MW374	0.279	Upgradient	N/A			MW374	-1.277	NO
MW375	0.039	Sidegradient	N/A			MW375	-3.249	NO

### Conclusion of Statistical Analysis on Transformed Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

# C-746-U Third Quarter 2014 Statistical Analysis

## Boron

UCRS  
UNITS: mg/L

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

Background Data from Upgradient Wells		Statistics on Background Data	Transformed Background Data from Upgradient Wells	
Well Number: MW371		<b>X= 0.650</b> <b>S= 0.805</b> <b>CV= 1.238</b> <b>K factor** = 2.523</b> <b>TL= 2.681</b>	Well Number: MW371	
Date Collected	Result		Date Collected	LN(Result)
3/18/2002	2.000		3/18/2002	0.693
4/22/2002	2.000		4/22/2002	0.693
7/15/2002	2.000		7/15/2002	0.693
10/8/2002	0.200		10/8/2002	-1.609
1/8/2003	0.200		1/8/2003	-1.609
4/3/2003	0.200		4/3/2003	-1.609
7/9/2003	0.200		7/9/2003	-1.609
10/6/2003	0.200		10/6/2003	-1.609
Well Number: MW374		<b>X= -1.034</b> <b>S= 1.030</b> <b>CV= -0.996</b> <b>K factor** = 2.523</b> <b>TL= 1.564</b>	Well Number: MW374	
Date Collected	Result		Date Collected	LN(Result)
10/8/2002	2.000		10/8/2002	0.693
1/7/2003	0.200		1/7/2003	-1.609
4/2/2003	0.200		4/2/2003	-1.609
7/9/2003	0.200		7/9/2003	-1.609
10/7/2003	0.200		10/7/2003	-1.609
1/6/2004	0.200		1/6/2004	-1.609
4/7/2004	0.200		4/7/2004	-1.609
7/14/2004	0.200		7/14/2004	-1.609

Because CV is greater than 1, the natural logarithm of background and test well results were calculated.

Third Quarter 2014 Data Collected in July 2014				Third Quarter 2014 Dry/Partially Dry Wells		Transformed Third Quarter 2014 Data Collected in July 2014		
Well No.	Result	Gradient	Result >TL?	Well No.	Gradient	Well Number	LN(Result)	Result >TL?
MW359	0.015	Downgradient	N/A	MW376	Sidegradient	MW359	-4.200	NO
MW362	0.018	Downgradient	N/A	MW377	Sidegradient	MW362	-4.034	NO
MW365	0.012	Downgradient	N/A			MW365	-4.465	NO
MW368	0.016	Sidegradient	N/A			MW368	-4.160	NO
MW371	0.015	Upgradient	N/A			MW371	-4.200	NO
MW374	0.009	Upgradient	N/A			MW374	-4.692	NO
MW375	0.005	Sidegradient	N/A			MW375	-5.231	NO

### Conclusion of Statistical Analysis on Transformed Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

# C-746-U Third Quarter 2014 Statistical Analysis Bromide

UCRS  
UNITS: mg/L

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

## Background Data from Upgradient Wells

Well Number: MW371

Date Collected	Result
3/18/2002	1.000
4/22/2002	1.000
7/15/2002	1.000
10/8/2002	1.000
1/8/2003	1.000
4/3/2003	1.000
7/9/2003	1.000
10/6/2003	1.000

Well Number: MW374

Date Collected	Result
10/8/2002	2.100
1/7/2003	2.100
4/2/2003	1.900
7/9/2003	1.000
10/7/2003	1.900
1/6/2004	1.900
4/7/2004	1.800
7/14/2004	1.600

## Statistics on Background Data

X= **1.394**  
S= **0.474**  
CV= **0.340**  
K factor\*\* = **2.523**  
TL= **2.590**

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

## Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW359	0.200	Downgradient	NO
MW362	0.145	Downgradient	NO
MW365	0.200	Downgradient	NO
MW368	0.200	Sidegradient	NO
MW371	0.134	Upgradient	NO
MW374	0.927	Upgradient	NO
MW375	0.200	Sidegradient	NO

## Third Quarter 2014 Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

## Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

## C-746-U Third Quarter 2014 Statistical Analysis Calcium

UCRS  
UNITS: mg/L

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

### Background Data from Upgradient Wells

Well Number: MW371

Date Collected	Result
3/18/2002	17.200
4/22/2002	22.400
7/15/2002	25.500
10/8/2002	26.400
1/8/2003	27.200
4/3/2003	30.300
7/9/2003	25.900
10/6/2003	27.000

Well Number: MW374

Date Collected	Result
10/8/2002	67.300
1/7/2003	60.600
4/2/2003	47.200
7/9/2003	34.700
10/7/2003	37.100
1/6/2004	37.700
4/7/2004	32.200
7/14/2004	26.900

### Statistics on Background Data

X= 34.100  
S= 13.637  
CV= 0.400  
K factor\*\* = 2.523  
TL= 68.505

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

### Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW359	6.390	Downgradient	NO
MW362	21.900	Downgradient	NO
MW365	23.700	Downgradient	NO
MW368	19.600	Sidegradient	NO
MW371	24.400	Upgradient	NO
MW374	21.100	Upgradient	NO
MW375	14.900	Sidegradient	NO

### Third Quarter 2014 Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

### Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,



# C-746-U Third Quarter 2014 Statistical Analysis Chemical Oxygen Demand (COD)

UCRS  
UNITS: mg/L

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

## Background Data from Upgradient Wells

Well Number: MW371

Date Collected	Result
3/18/2002	35.000
4/22/2002	35.000
7/15/2002	35.000
10/8/2002	35.000
1/8/2003	35.000
4/3/2003	35.000
7/9/2003	35.000
10/6/2003	35.000

Well Number: MW374

Date Collected	Result
10/8/2002	260.000
1/7/2003	214.000
4/2/2003	147.000
7/9/2003	72.000
10/7/2003	56.000
1/6/2004	68.000
4/7/2004	35.000
7/14/2004	35.000

## Statistics on Background Data

X= 72.938  
S= 70.749  
CV= 0.970  
K factor\*\* = 2.523  
TL= 251.437

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

## Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW359	20.400	Downgradient	NO
MW362	21.500	Downgradient	NO
MW365	7.110	Downgradient	NO
MW368	20.000	Sidegradient	NO
MW371	16.000	Upgradient	NO
MW374	20.400	Upgradient	NO
MW375	27.100	Sidegradient	NO

## Third Quarter 2014 Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

## Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

# C-746-U Third Quarter 2014 Statistical Analysis Chloride

UCRS  
UNITS: mg/L

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

## Background Data from Upgradient Wells

Well Number: MW371

Date Collected	Result
7/15/2002	8.300
10/8/2002	7.600
1/8/2003	7.700
4/3/2003	8.800
7/9/2003	8.100
10/6/2003	8.600
1/7/2004	7.600
4/6/2004	7.600

Well Number: MW374

Date Collected	Result
10/8/2002	199.200
1/7/2003	199.700
4/2/2003	171.800
7/9/2003	178.700
10/7/2003	175.600
1/6/2004	170.400
4/7/2004	156.400
7/14/2004	144.700

## Statistics on Background Data

X= 91.300  
S= 86.959  
CV= 0.952  
K factor\*\* = 2.523  
TL= 310.697

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

## Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW359	1.310	Downgradient	NO
MW362	9.930	Downgradient	NO
MW365	5.870	Downgradient	NO
MW368	1.960	Sidegradient	NO
MW371	7.220	Upgradient	NO
MW374	76.400	Upgradient	NO
MW375	5.130	Sidegradient	NO

## Third Quarter 2014 Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

## Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

# C-746-U Third Quarter 2014 Statistical Analysis Cobalt

UCRS  
UNITS: mg/L

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

Background Data from Upgradient Wells		Statistics on Background Data	Transformed Background Data from Upgradient Wells	
Well Number: MW371		<b>X= 0.007</b> <b>S= 0.009</b> <b>CV= 1.314</b> <b>K factor** = 2.523</b> <b>TL= 0.031</b>	Well Number: MW371	
Date Collected	Result		Date Collected	LN(Result)
3/18/2002	0.025		3/18/2002	-3.689
4/22/2002	0.025		4/22/2002	-3.689
7/15/2002	0.025		7/15/2002	-3.689
10/8/2002	0.001		10/8/2002	-6.908
1/8/2003	0.001		1/8/2003	-6.908
4/3/2003	0.001		4/3/2003	-6.908
7/9/2003	0.001		7/9/2003	-6.908
10/6/2003	0.001		10/6/2003	-6.908
Well Number: MW374		<b>X= -5.843</b> <b>S= 1.392</b> <b>CV= -0.238</b> <b>K factor** = 2.523</b> <b>TL= -2.331</b>	Well Number: MW374	
Date Collected	Result		Date Collected	LN(Result)
10/8/2002	0.010		10/8/2002	-4.605
1/7/2003	0.010		1/7/2003	-4.605
4/2/2003	0.010		4/2/2003	-4.605
7/9/2003	0.002		7/9/2003	-6.432
10/7/2003	0.001		10/7/2003	-6.908
1/6/2004	0.001		1/6/2004	-6.908
4/7/2004	0.001		4/7/2004	-6.908
7/14/2004	0.001		7/14/2004	-6.908

Third Quarter 2014 Data Collected in July 2014				Third Quarter 2014 Dry/Partially Dry Wells		Transformed Third Quarter 2014 Data Collected in July 2014		
Well No.	Result	Gradient	Result >TL?	Well No.	Gradient	Well Number	LN(Result)	Result >TL?
MW359	0.000	Downgradient	N/A	MW376	Sidegradient	MW359	-8.680	NO
MW362	0.001	Downgradient	N/A	MW377	Sidegradient	MW362	-6.742	NO
MW365	0.003	Downgradient	N/A			MW365	-5.809	NO
MW368	0.001	Sidegradient	N/A			MW368	-7.106	NO
MW371	0.001	Upgradient	N/A			MW371	-6.908	NO
MW374	0.001	Upgradient	N/A			MW374	-7.524	NO
MW375	0.000	Sidegradient	N/A			MW375	-8.623	NO

## Conclusion of Statistical Analysis on Transformed Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

## C-746-U Third Quarter 2014 Statistical Analysis Conductivity

UCRS  
UNITS: umho/cm

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

### Background Data from Upgradient Wells

Well Number: MW371

Date Collected	Result
3/18/2002	541.000
4/22/2002	643.000
7/15/2002	632.000
10/8/2002	631.000
1/8/2003	680.000
4/3/2003	749.000
7/9/2003	734.000
10/6/2003	753.000

Well Number: MW374

Date Collected	Result
3/18/2002	1007.00
10/8/2002	1680.00
1/7/2003	1715.90
4/2/2003	172.000
7/9/2003	1231.00
10/7/2003	1214.00
1/6/2004	1172.00
4/7/2004	1145.00

### Statistics on Background Data

X= 918.744  
S= 417.257  
CV= 0.454  
K factor\*\* = 2.523  
TL= 1971.483

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

### Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW359	244.00	Downgradient	NO
MW362	729.00	Downgradient	NO
MW365	446.00	Downgradient	NO
MW368	655.00	Sidegradient	NO
MW371	752.00	Upgradient	NO
MW374	707.00	Upgradient	NO
MW375	363.00	Sidegradient	NO

### Third Quarter 2014 Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

### Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

# C-746-U Third Quarter 2014 Statistical Analysis Dissolved Oxygen

UCRS  
UNITS: mg/L

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

## Background Data from Upgradient Wells

Well Number: MW371

Date Collected	Result
3/18/2002	2.260
4/22/2002	1.150
7/15/2002	0.940
10/8/2002	0.740
1/8/2003	2.620
4/3/2003	1.500
7/9/2003	1.660
10/6/2003	1.280

Well Number: MW374

Date Collected	Result
3/18/2002	0.600
10/8/2002	0.670
1/7/2003	0.230
4/2/2003	0.650
7/9/2003	0.920
10/7/2003	0.990
1/6/2004	1.110
4/7/2004	0.880

## Statistics on Background Data

X= 1.138  
S= 0.621  
CV= 0.546  
K factor\*\* = 2.523  
TL= 2.704

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

## Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW359	4.800	Downgradient	YES
MW362	5.360	Downgradient	YES
MW365	5.030	Downgradient	YES
MW368	5.690	Sidegradient	YES
MW371	1.340	Upgradient	NO
MW374	1.760	Upgradient	NO
MW375	1.870	Sidegradient	NO

## Third Quarter 2014 Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

## Conclusion of Statistical Analysis on Historical Data

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

MW359

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

**C-746-U Third Quarter 2014 Statistical Analysis**  
**Dissolved Oxygen\***

**UCRS**  
**UNITS: mg/L**

MW362
MW365
MW368

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

# C-746-U Third Quarter 2014 Statistical Analysis Dissolved Solids

UCRS  
UNITS: mg/L

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

## Background Data from Upgradient Wells

Well Number: MW371

Date Collected	Result
3/18/2002	274.000
4/22/2002	409.000
7/15/2002	418.000
10/8/2002	424.000
1/8/2003	431.000
4/3/2003	444.000
7/9/2003	445.000
10/6/2003	438.000

Well Number: MW374

Date Collected	Result
10/8/2002	1136.00
1/7/2003	1101.00
4/2/2003	863.000
7/9/2003	682.000
10/7/2003	589.000
1/6/2004	603.000
4/7/2004	601.000
7/14/2004	582.000

## Statistics on Background Data

X= 590.000  
S= 248.068  
CV= 0.420  
K factor\*\* = 2.523  
TL= 1215.876

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

## Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW359	144.00	Downgradient	NO
MW362	437.00	Downgradient	NO
MW365	231.00	Downgradient	NO
MW368	416.00	Sidegradient	NO
MW371	351.00	Upgradient	NO
MW374	366.00	Upgradient	NO
MW375	210.00	Sidegradient	NO

## Third Quarter 2014 Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

## Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

# C-746-U Third Quarter 2014 Statistical Analysis Iron

UCRS  
UNITS: mg/L

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

## Background Data from Upgradient Wells

Well Number: MW371

Date Collected	Result
3/18/2002	1.310
4/22/2002	0.913
7/15/2002	0.881
10/8/2002	3.860
1/8/2003	1.880
4/3/2003	3.180
7/9/2003	0.484
10/6/2003	2.720

Well Number: MW374

Date Collected	Result
10/8/2002	23.000
1/7/2003	13.900
4/2/2003	14.000
7/9/2003	14.200
10/7/2003	7.920
1/6/2004	7.860
4/7/2004	4.820
7/14/2004	4.870

## Statistics on Background Data

X= 6.612  
S= 6.487  
CV= 0.981  
K factor\*\* = 2.523  
TL= 22.979

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

## Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW359	0.064	Downgradient	NO
MW362	1.740	Downgradient	NO
MW365	0.111	Downgradient	NO
MW368	0.581	Sidegradient	NO
MW371	0.165	Upgradient	NO
MW374	0.511	Upgradient	NO
MW375	0.201	Sidegradient	NO

## Third Quarter 2014 Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

## Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,



# C-746-U Third Quarter 2014 Statistical Analysis Magnesium

UCRS  
UNITS: mg/L

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

## Background Data from Upgradient Wells

Well Number: MW371

Date Collected	Result
3/18/2002	7.100
4/22/2002	9.770
7/15/2002	10.400
10/8/2002	10.200
1/8/2003	10.700
4/3/2003	11.900
7/9/2003	10.800
10/6/2003	10.900

Well Number: MW374

Date Collected	Result
10/8/2002	20.000
1/7/2003	16.100
4/2/2003	13.100
7/9/2003	10.300
10/7/2003	11.100
1/6/2004	11.000
4/7/2004	9.690
7/14/2004	8.490

## Statistics on Background Data

X= 11.347  
S= 3.019  
CV= 0.266  
K factor\*\* = 2.523  
TL= 18.963

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

## Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW359	3.660	Downgradient	NO
MW362	9.380	Downgradient	NO
MW365	11.000	Downgradient	NO
MW368	5.960	Sidegradient	NO
MW371	9.840	Upgradient	NO
MW374	5.640	Upgradient	NO
MW375	5.570	Sidegradient	NO

## Third Quarter 2014 Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

## Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

# C-746-U Third Quarter 2014 Statistical Analysis Manganese

UCRS  
UNITS: mg/L

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

## Background Data from Upgradient Wells

Well Number: MW371

Date Collected	Result
3/18/2002	0.063
4/22/2002	0.067
7/15/2002	0.074
10/8/2002	0.052
1/8/2003	0.039
4/3/2003	0.055
7/9/2003	0.055
10/6/2003	0.054

Well Number: MW374

Date Collected	Result
10/8/2002	0.596
1/7/2003	0.565
4/2/2003	0.675
7/9/2003	0.397
10/7/2003	0.312
1/6/2004	0.299
4/7/2004	0.329
7/14/2004	0.342

## Statistics on Background Data

X= 0.248  
S= 0.222  
CV= 0.894  
K factor\*\* = 2.523  
TL= 0.809

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

## Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW359	0.001	Downgradient	NO
MW362	0.011	Downgradient	NO
MW365	0.043	Downgradient	NO
MW368	0.008	Sidegradient	NO
MW371	0.003	Upgradient	NO
MW374	0.188	Upgradient	NO
MW375	0.005	Sidegradient	NO

## Third Quarter 2014 Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

## Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

# C-746-U Third Quarter 2014 Statistical Analysis Molybdenum

UCRS  
UNITS: mg/L

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

Background Data from Upgradient Wells		Statistics on Background Data	Transformed Background Data from Upgradient Wells	
Well Number: MW371		<b>X= 0.006</b> <b>S= 0.010</b> <b>CV= 1.650</b> <b>K factor** = 2.523</b> <b>TL= 0.030</b>	Well Number: MW371	
Date Collected	Result		Date Collected	LN(Result)
3/18/2002	0.025		3/18/2002	-3.689
4/22/2002	0.025		4/22/2002	-3.689
7/15/2002	0.025		7/15/2002	-3.689
10/8/2002	0.001		10/8/2002	-6.908
1/8/2003	0.001		1/8/2003	-6.717
4/3/2003	0.001		4/3/2003	-6.908
7/9/2003	0.001		7/9/2003	-6.803
10/6/2003	0.001		10/6/2003	-6.908
Well Number: MW374		<b>X= -6.108</b> <b>S= 1.239</b> <b>CV= -0.203</b> <b>K factor** = 2.523</b> <b>TL= -2.983</b>	Well Number: MW374	
Date Collected	Result		Date Collected	LN(Result)
10/8/2002	0.002		10/8/2002	-6.110
1/7/2003	0.002		1/7/2003	-6.210
4/2/2003	0.002		4/2/2003	-6.444
7/9/2003	0.002		7/9/2003	-6.024
10/7/2003	0.001		10/7/2003	-6.908
1/6/2004	0.001		1/6/2004	-6.908
4/7/2004	0.001		4/7/2004	-6.908
7/14/2004	0.001		7/14/2004	-6.908

Third Quarter 2014 Data Collected in July 2014				Third Quarter 2014 Dry/Partially Dry Wells		Transformed Third Quarter 2014 Data Collected in July 2014		
Well No.	Result	Gradient	Result >TL?	Well No.	Gradient	Well Number	LN(Result)	Result >TL?
MW359	0.001	Downgradient	N/A	MW376	Sidegradient	MW359	-7.601	NO
MW362	0.001	Downgradient	N/A	MW377	Sidegradient	MW362	-6.859	NO
MW365	0.000	Downgradient	N/A			MW365	-8.294	NO
MW368	0.004	Sidegradient	N/A			MW368	-5.534	NO
MW371	0.000	Upgradient	N/A			MW371	-8.255	NO
MW374	0.000	Upgradient	N/A			MW374	-8.217	NO
MW375	0.001	Sidegradient	N/A			MW375	-7.601	NO

## Conclusion of Statistical Analysis on Transformed Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

# C-746-U Third Quarter 2014 Statistical Analysis Nickel

UCRS  
UNITS: mg/L

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

## Background Data from Upgradient Wells

Well Number: MW371

Date Collected	Result
3/18/2002	0.050
4/22/2002	0.050
7/15/2002	0.050
10/8/2002	0.012
1/8/2003	0.005
4/3/2003	0.005
7/9/2003	0.005
10/6/2003	0.005

Well Number: MW374

Date Collected	Result
10/8/2002	0.050
1/7/2003	0.050
4/2/2003	0.050
7/9/2003	0.008
10/7/2003	0.005
1/6/2004	0.005
4/7/2004	0.005
7/14/2004	0.005

## Statistics on Background Data

X= 0.023  
S= 0.022  
CV= 0.980  
K factor\*\* = 2.523  
TL= 0.078

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

## Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW359	0.001	Downgradient	NO
MW362	0.003	Downgradient	NO
MW365	0.007	Downgradient	NO
MW368	0.004	Sidegradient	NO
MW371	0.001	Upgradient	NO
MW374	0.002	Upgradient	NO
MW375	0.001	Sidegradient	NO

## Third Quarter 2014 Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

## Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

# C-746-U Third Quarter 2014 Statistical Analysis Oxidation-Reduction Potential

UCRS  
UNITS: mV

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

Background Data from Upgradient Wells	Statistics on Background Data	Transformed Background Data from Upgradient Wells
Well Number: MW371	<b>X= 22.281</b>	Well Number: MW371
Date Collected Result	<b>S= 78.889</b>	Date Collected LN(Result)
3/18/2002 75.000	<b>CV= 3.541</b>	3/18/2002 4.317
4/22/2002 165.000	<b>K factor** = 2.523</b>	4/22/2002 5.106
7/15/2002 65.000	<b>TL= 221.319</b>	7/15/2002 4.174
4/3/2003 -19.000	Because CV is greater than 1, the natural logarithm of background and test well results were calculated.	4/3/2003 #Func!
7/9/2003 114.000		7/9/2003 4.736
10/6/2003 -22.000		10/6/2003 #Func!
1/7/2004 20.500		1/7/2004 3.020
4/6/2004 113.000		4/6/2004 4.727
Well Number: MW374	Statistics on Transformed Background Data	Well Number: MW374
Date Collected Result	<b>X = error</b>	Date Collected LN(Result)
3/18/2002 135.000	<b>S = error</b>	3/18/2002 4.905
4/2/2003 -56.000	<b>CV = error</b>	4/2/2003 #Func!
7/9/2003 -68.000	<b>K factor** = 2.523</b>	7/9/2003 #Func!
10/7/2003 -50.000	<b>TL# = 5.106</b>	10/7/2003 #Func!
1/6/2004 -85.000	# Because the natural log was not possible for all background values, the TL was considered equal to the maximum background value.	1/6/2004 #Func!
4/7/2004 6.000		4/7/2004 1.792
7/14/2004 -38.000		7/14/2004 #Func!
10/7/2004 1.000		10/7/2004 0.000

Third Quarter 2014 Data Collected in July 2014	Third Quarter 2014 Dry/Partially Dry Wells	Transformed Third Quarter 2014 Data Collected in July 2014
Well No. Result Gradient Result >TL?	Well No. Gradient	Well Number LN(Result) Result >TL?
MW359 376.000 Downgradient N/A	MW376 Sidegradient	MW359 5.930 YES
MW362 215.000 Downgradient N/A	MW377 Sidegradient	MW362 5.371 YES
MW365 234.000 Downgradient N/A		MW365 5.455 YES
MW368 345.000 Sidegradient N/A		MW368 5.844 YES
MW371 311.000 Upgradient N/A		MW371 5.740 YES
MW374 259.000 Upgradient N/A		MW374 5.557 YES
MW375 311.000 Sidegradient N/A		MW375 5.740 YES

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

**C-746-U Third Quarter 2014 Statistical Analysis**  
**Oxidation-Reduction Potential\*\*Eqvlpwgf +**

**UCRS**  
**UNITS: mV**

Conclusion of Statistical Analysis on Transformed Historical Data
The following test well(s) exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to historical background data.
MW359
MW362
MW365
MW368
MW371
MW374
MW375

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

# C-746-U Third Quarter 2014 Statistical Analysis PCB, Total

UCRS  
UNITS: ug/L

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

## Background Data from Upgradient Wells

Well Number: MW371

Date Collected	Result
3/18/2002	1.000
4/22/2002	0.170
7/15/2002	0.170
7/9/2003	0.170
10/6/2003	0.170
7/13/2004	0.180
7/25/2005	0.170
4/5/2006	0.180

Well Number: MW374

Date Collected	Result
7/9/2003	0.170
10/7/2003	0.170
7/14/2004	0.180
7/26/2005	0.170
4/6/2006	0.180
7/10/2006	0.170
10/12/2006	0.170
1/8/2007	0.170

## Statistics on Background Data

X= 0.224  
S= 0.207  
CV= 0.922  
K factor\*\* = 2.523  
TL= 0.746

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

## Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW359	0.106	Downgradient	NO
MW362	0.099	Downgradient	NO
MW365	0.245	Downgradient	NO
MW368	0.251	Sidegradient	NO
MW371	0.098	Upgradient	NO
MW374	0.098	Upgradient	NO
MW375	0.096	Sidegradient	NO

## Third Quarter 2014 Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

## Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

# C-746-U Third Quarter 2014 Statistical Analysis PCB-1242

UCRS  
UNITS: ug/L

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

Background Data from Upgradient Wells		Statistics on Background Data	Transformed Background Data from Upgradient Wells	
Well Number: MW371		<b>X= 0.159</b> <b>S= 0.224</b> <b>CV= 1.409</b> <b>K factor** = 2.523</b> <b>TL= 0.726</b>	Well Number: MW371	
Date Collected	Result		Date Collected	LN(Result)
3/18/2002	1.000		3/18/2002	0.000
4/22/2002	0.110		4/22/2002	-2.207
7/15/2002	0.110		7/15/2002	-2.207
7/9/2003	0.130		7/9/2003	-2.040
10/6/2003	0.090		10/6/2003	-2.408
7/13/2004	0.100		7/13/2004	-2.303
7/25/2005	0.090		7/25/2005	-2.408
4/5/2006	0.100		4/5/2006	-2.303
Well Number: MW374		<b>X= -2.134</b> <b>S= 0.579</b> <b>CV= -0.272</b> <b>K factor** = 2.523</b> <b>TL= -0.672</b>	Well Number: MW374	
Date Collected	Result		Date Collected	LN(Result)
7/9/2003	0.130		7/9/2003	-2.040
10/7/2003	0.090		10/7/2003	-2.408
7/14/2004	0.100		7/14/2004	-2.303
7/26/2005	0.100		7/26/2005	-2.303
4/6/2006	0.100		4/6/2006	-2.303
7/10/2006	0.100		7/10/2006	-2.303
10/12/2006	0.100		10/12/2006	-2.303
1/8/2007	0.100		1/8/2007	-2.303

Because CV is greater than 1, the natural logarithm of background and test well results were calculated.

Third Quarter 2014 Data Collected in July 2014				Third Quarter 2014 Dry/Partially Dry Wells		Transformed Third Quarter 2014 Data Collected in July 2014		
Well No.	Result	Gradient	Result >TL?	Well No.	Gradient	Well Number	LN(Result)	Result >TL?
MW359	0.106	Downgradient	N/A	MW376	Sidegradient	MW359	-2.244	NO
MW362	0.099	Downgradient	N/A	MW377	Sidegradient	MW362	-2.313	NO
MW365	0.245	Downgradient	N/A			MW365	-1.406	NO
MW368	0.251	Sidegradient	N/A			MW368	-1.382	NO
MW371	0.098	Upgradient	N/A			MW371	-2.323	NO
MW374	0.098	Upgradient	N/A			MW374	-2.323	NO
MW375	0.096	Sidegradient	N/A			MW375	-2.341	NO

## Conclusion of Statistical Analysis on Transformed Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,



## C-746-U Third Quarter 2014 Statistical Analysis pH

UCRS  
UNITS: Std Unit

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL and LL. If the test well result exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

### Background Data from Upgradient Wells

Well Number: MW371

Date Collected	Result
3/18/2002	6.300
4/22/2002	6.500
7/15/2002	6.500
10/8/2002	6.600
1/8/2003	6.600
4/3/2003	6.900
7/9/2003	6.700
10/6/2003	7.000

Well Number: MW374

Date Collected	Result
3/18/2002	5.750
10/8/2002	6.600
1/7/2003	6.820
4/2/2003	6.860
7/9/2003	6.700
10/7/2003	6.600
1/6/2004	6.900
4/7/2004	6.580

### Statistics on Background Data

X= 6.619  
S= 0.295  
CV= 0.045  
K factor\*\* = 2.904  
TL= 7.475  
LL= 5.764

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

### Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result >TL?	Result <LL?
MW359	5.940	Downgradient	NO	NO
MW362	7.090	Downgradient	NO	NO
MW365	6.390	Downgradient	NO	NO
MW368	6.790	Sidegradient	NO	NO
MW371	6.570	Upgradient	NO	NO
MW374	6.590	Upgradient	NO	NO
MW375	6.410	Sidegradient	NO	NO

### Third Quarter 2014 Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

### Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

\*\* The K-factor was adjusted for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K- factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

# C-746-U Third Quarter 2014 Statistical Analysis Radium-226

UCRS  
UNITS: pCi/L

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

Background Data from Upgradient Wells		Statistics on Background Data	Transformed Background Data from Upgradient Wells	
Well Number: MW371		<b>X= 3.560</b> <b>S= 13.483</b> <b>CV= 3.787</b> <b>K factor** = 2.523</b> <b>TL= 37.577</b>	Well Number: MW371	
Date Collected	Result		Date Collected	LN(Result)
7/15/2002	54.100		7/15/2002	3.991
10/8/2002	0.094		10/8/2002	-2.368
1/8/2003	0.378		1/8/2003	-0.973
10/6/2003	0.179		10/6/2003	-1.720
1/7/2004	0.898		1/7/2004	-0.108
4/6/2004	0.108		4/6/2004	-2.226
7/13/2004	-0.149		7/13/2004	#Func!
10/7/2004	0.154		10/7/2004	-1.871
Well Number: MW374		<b>X = error</b> <b>S = error</b> <b>CV = error</b> <b>K factor** = 2.523</b> <b>TL# = 3.991</b>	Well Number: MW374	
Date Collected	Result		Date Collected	LN(Result)
10/8/2002	0.298		10/8/2002	-1.211
1/7/2003	-0.844		1/7/2003	#Func!
10/7/2003	0.806		10/7/2003	-0.216
1/6/2004	0.031		1/6/2004	-3.487
4/7/2004	0.350		4/7/2004	-1.050
7/14/2004	0.273		7/14/2004	-1.298
10/7/2004	0.205		10/7/2004	-1.585
1/11/2005	0.080		1/11/2005	-2.527

Because CV is greater than 1, the natural logarithm of background and test well results were calculated.

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

Third Quarter 2014 Data Collected in July 2014				Third Quarter 2014 Dry/Partially Dry Wells		Transformed Third Quarter 2014 Data Collected in July 2014		
Well No.	Result	Gradient	Result >TL?	Well No.	Gradient	Well Number	LN(Result)	Result >TL?
MW359	0.344	Downgradient	N/A	MW376	Sidegradient	MW359	-1.067	NO
MW362	0.315	Downgradient	N/A	MW377	Sidegradient	MW362	-1.155	NO
MW365	0.241	Downgradient	N/A			MW365	-1.423	NO
MW368	0.071	Sidegradient	N/A			MW368	-2.649	NO
MW371	0.457	Upgradient	N/A			MW371	-0.783	NO
MW374	0.435	Upgradient	N/A			MW374	-0.832	NO
MW375	0.253	Sidegradient	N/A			MW375	-1.374	NO

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

**C-746-U Third Quarter 2014 Statistical Analysis**  
**Radium-226\*\*EqvLpwgf +**

**UCRS**  
**UNITS: pCi/L**

**Conclusion of Statistical Analysis on Transformed Historical Data**

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

# C-746-U Third Quarter 2014 Statistical Analysis Sodium

UCRS  
UNITS: mg/L

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

## Background Data from Upgradient Wells

Well Number: MW371

Date Collected	Result
3/18/2002	129.000
4/22/2002	131.000
7/15/2002	127.000
10/8/2002	123.000
1/8/2003	128.000
4/3/2003	144.000
7/9/2003	126.000
10/6/2003	120.000

Well Number: MW374

Date Collected	Result
10/8/2002	336.000
1/7/2003	329.000
4/2/2003	287.000
7/9/2003	181.000
10/7/2003	182.000
1/6/2004	206.000
4/7/2004	182.000
7/14/2004	198.000

## Statistics on Background Data

X= 183.063  
S= 73.222  
CV= 0.400  
K factor\*\* = 2.523  
TL= 367.800

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

## Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW359	36.200	Downgradient	NO
MW362	139.00	Downgradient	NO
MW365	57.500	Downgradient	NO
MW368	133.00	Sidegradient	NO
MW371	120.00	Upgradient	NO
MW374	132.00	Upgradient	NO
MW375	68.400	Sidegradient	NO

## Third Quarter 2014 Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

## Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

# C-746-U Third Quarter 2014 Statistical Analysis Sulfate

UCRS  
UNITS: mg/L

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

## Background Data from Upgradient Wells

Well Number: MW371

Date Collected	Result
3/18/2002	16.300
4/22/2002	8.600
7/15/2002	6.700
10/8/2002	5.000
1/8/2003	5.000
4/3/2003	5.000
7/9/2003	5.000
10/6/2003	5.000

Well Number: MW374

Date Collected	Result
10/8/2002	5.000
1/7/2003	5.000
4/2/2003	5.000
7/9/2003	5.600
10/7/2003	5.000
1/6/2004	5.000
4/7/2004	11.300
7/14/2004	5.000

## Statistics on Background Data

X= 6.469  
S= 3.153  
CV= 0.487  
K factor\*\* = 2.523  
TL= 14.423

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

## Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW359	48.500	Downgradient	YES
MW362	34.600	Downgradient	YES
MW365	59.900	Downgradient	YES
MW368	43.200	Sidegradient	YES
MW371	18.600	Upgradient	YES
MW374	5.640	Upgradient	NO
MW375	30.500	Sidegradient	YES

## Third Quarter 2014 Dry/Partially Dry Wells

Well No.	Gradient
MW376	Sidegradient
MW377	Sidegradient

## Conclusion of Statistical Analysis on Historical Data

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

MW359

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

**C-746-U Third Quarter 2014 Statistical Analysis**  
**Sulfate\*\*Eqvlpwgf +**

**UCRS**  
**UNITS: mg/L**

MW362
MW365
MW368
MW371
MW375

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

# C-746-U Third Quarter 2014 Statistical Analysis Total Organic Carbon (TOC)

UCRS  
UNITS: mg/L

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

Background Data from Upgradient Wells		Statistics on Background Data	Transformed Background Data from Upgradient Wells	
Well Number: MW371		<b>X= 17.631</b> <b>S= 24.314</b> <b>CV= 1.379</b> <b>K factor** = 2.523</b> <b>TL= 78.977</b>	Well Number: MW371	
Date Collected	Result		Date Collected	LN(Result)
3/18/2002	11.100		3/18/2002	2.407
4/22/2002	7.000		4/22/2002	1.946
7/15/2002	4.100		7/15/2002	1.411
10/8/2002	6.000		10/8/2002	1.792
1/8/2003	5.300		1/8/2003	1.668
4/3/2003	5.300		4/3/2003	1.668
7/9/2003	2.900		7/9/2003	1.065
10/6/2003	3.200		10/6/2003	1.163
Well Number: MW374		<b>X= 2.318</b> <b>S= 0.979</b> <b>CV= 0.422</b> <b>K factor** = 2.523</b> <b>TL= 4.788</b>	Well Number: MW374	
Date Collected	Result		Date Collected	LN(Result)
10/8/2002	90.000		10/8/2002	4.500
1/7/2003	64.000		1/7/2003	4.159
4/2/2003	25.000		4/2/2003	3.219
7/9/2003	16.000		7/9/2003	2.773
10/7/2003	13.000		10/7/2003	2.565
1/6/2004	10.000		1/6/2004	2.303
4/7/2004	7.200		4/7/2004	1.974
7/14/2004	12.000		7/14/2004	2.485

Because CV is greater than 1, the natural logarithm of background and test well results were calculated.

Third Quarter 2014 Data Collected in July 2014				Third Quarter 2014 Dry/Partially Dry Wells		Transformed Third Quarter 2014 Data Collected in July 2014		
Well No.	Result	Gradient	Result >TL?	Well No.	Gradient	Well Number	LN(Result)	Result >TL?
MW359	1.150	Downgradient	N/A	MW376	Sidegradient	MW359	0.140	NO
MW362	3.180	Downgradient	N/A	MW377	Sidegradient	MW362	1.157	NO
MW365	2.440	Downgradient	N/A			MW365	0.892	NO
MW368	2.120	Sidegradient	N/A			MW368	0.751	NO
MW371	1.940	Upgradient	N/A			MW371	0.663	NO
MW374	2.160	Upgradient	N/A			MW374	0.770	NO
MW375	1.370	Sidegradient	N/A			MW375	0.315	NO

## Conclusion of Statistical Analysis on Transformed Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

# C-746-U Third Quarter 2014 Statistical Analysis Total Organic Halides (TOX)

UCRS  
UNITS: ug/L

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

Background Data from Upgradient Wells		Statistics on Background Data	Transformed Background Data from Upgradient Wells	
Well Number: MW371		<b>X= 214.094</b> <b>S= 231.089</b> <b>CV= 1.079</b> <b>K factor** = 2.523</b> <b>TL= 797.131</b>	Well Number: MW371	
Date Collected	Result		Date Collected	LN(Result)
3/18/2002	50.000		3/18/2002	3.912
4/22/2002	105.000		4/22/2002	4.654
7/15/2002	70.000		7/15/2002	4.248
10/8/2002	52.000		10/8/2002	3.951
1/8/2003	20.200		1/8/2003	3.006
4/3/2003	104.000		4/3/2003	4.644
7/9/2003	34.200		7/9/2003	3.532
10/6/2003	46.100		10/6/2003	3.831
Well Number: MW374		<b>X= 4.867</b> <b>S= 1.065</b> <b>CV= 0.219</b> <b>K factor** = 2.523</b> <b>TL= 7.554</b>	Well Number: MW374	
Date Collected	Result		Date Collected	LN(Result)
10/8/2002	903.000		10/8/2002	6.806
1/7/2003	539.000		1/7/2003	6.290
4/2/2003	295.000		4/2/2003	5.687
7/9/2003	272.000		7/9/2003	5.606
10/7/2003	197.000		10/7/2003	5.283
1/6/2004	330.000		1/6/2004	5.799
4/7/2004	183.000		4/7/2004	5.209
7/14/2004	225.000		7/14/2004	5.416

Because CV is greater than 1, the natural logarithm of background and test well results were calculated.

Third Quarter 2014 Data Collected in July 2014				Third Quarter 2014 Dry/Partially Dry Wells		Transformed Third Quarter 2014 Data Collected in July 2014		
Well No.	Result	Gradient	Result >TL?	Well No.	Gradient	Well Number	LN(Result)	Result >TL?
MW359	3.520	Downgradient	N/A	MW376	Sidegradient	MW359	1.258	NO
MW362	27.300	Downgradient	N/A	MW377	Sidegradient	MW362	3.307	NO
MW365	22.400	Downgradient	N/A			MW365	3.109	NO
MW368	6.720	Sidegradient	N/A			MW368	1.905	NO
MW371	5.520	Upgradient	N/A			MW371	1.708	NO
MW374	13.000	Upgradient	N/A			MW374	2.565	NO
MW375	17.200	Sidegradient	N/A			MW375	2.845	NO

## Conclusion of Statistical Analysis on Transformed Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,



# C-746-U Third Quarter 2014 Statistical Analysis Uranium

UCRS  
UNITS: mg/L

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

Background Data from Upgradient Wells		Statistics on Background Data	Transformed Background Data from Upgradient Wells	
Well Number: MW371		<b>X= 0.007</b> <b>S= 0.012</b> <b>CV= 1.678</b> <b>K factor** = 2.523</b> <b>TL= 0.037</b>	Well Number: MW371	
Date Collected	Result		Date Collected	LN(Result)
3/18/2002	0.001		3/18/2002	-6.908
4/22/2002	0.001		4/22/2002	-6.908
7/15/2002	0.001		7/15/2002	-6.908
10/8/2002	0.027		10/8/2002	-3.612
1/8/2003	0.001		1/8/2003	-6.908
4/3/2003	0.001		4/3/2003	-6.908
7/9/2003	0.001		7/9/2003	-6.822
10/6/2003	0.001		10/6/2003	-6.908
Well Number: MW374		<b>X= -5.884</b> <b>S= 1.299</b> <b>CV= -0.221</b> <b>K factor** = 2.523</b> <b>TL= -2.607</b>	Well Number: MW374	
Date Collected	Result		Date Collected	LN(Result)
10/8/2002	0.044		10/8/2002	-3.128
1/7/2003	0.011		1/7/2003	-4.510
4/2/2003	0.009		4/2/2003	-4.705
7/9/2003	0.007		7/9/2003	-4.970
10/7/2003	0.001		10/7/2003	-6.908
1/6/2004	0.003		1/6/2004	-5.760
4/7/2004	0.003		4/7/2004	-5.960
7/14/2004	0.002		7/14/2004	-6.320

Because CV is greater than 1, the natural logarithm of background and test well results were calculated.

Third Quarter 2014 Data Collected in July 2014				Third Quarter 2014 Dry/Partially Dry Wells		Transformed Third Quarter 2014 Data Collected in July 2014		
Well No.	Result	Gradient	Result >TL?	Well No.	Gradient	Well Number	LN(Result)	Result >TL?
MW359	0.000	Downgradient	N/A	MW376	Sidegradient	MW359	-8.517	NO
MW362	0.007	Downgradient	N/A	MW377	Sidegradient	MW362	-4.968	NO
MW365	0.000	Downgradient	N/A			MW365	-8.255	NO
MW368	0.001	Sidegradient	N/A			MW368	-7.308	NO
MW371	0.001	Upgradient	N/A			MW371	-6.638	NO
MW374	0.001	Upgradient	N/A			MW374	-7.236	NO
MW375	0.000	Sidegradient	N/A			MW375	-9.210	NO

## Conclusion of Statistical Analysis on Transformed Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

# C-746-U Third Quarter 2014 Statistical Analysis Vanadium

UCRS  
UNITS: mg/L

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

Background Data from Upgradient Wells		Statistics on Background Data	Transformed Background Data from Upgradient Wells	
Well Number: MW371		<b>X= 0.055</b> <b>S= 0.072</b> <b>CV= 1.319</b> <b>K factor** = 2.523</b> <b>TL= 0.237</b>	Well Number: MW371	
Date Collected	Result		Date Collected	LN(Result)
3/18/2002	0.025		3/18/2002	-3.689
4/22/2002	0.025		4/22/2002	-3.689
7/15/2002	0.025		7/15/2002	-3.689
10/8/2002	0.020		10/8/2002	-3.912
1/8/2003	0.020		1/8/2003	-3.912
4/3/2003	0.020		4/3/2003	-3.912
7/9/2003	0.020		7/9/2003	-3.912
10/6/2003	0.020		10/6/2003	-3.912
Well Number: MW374		<b>X= -3.438</b> <b>S= 0.912</b> <b>CV= -0.265</b> <b>K factor** = 2.523</b> <b>TL= -1.138</b>	Well Number: MW374	
Date Collected	Result		Date Collected	LN(Result)
10/8/2002	0.200		10/8/2002	-1.609
1/7/2003	0.200		1/7/2003	-1.609
4/2/2003	0.200		4/2/2003	-1.609
7/9/2003	0.020		7/9/2003	-3.912
10/7/2003	0.020		10/7/2003	-3.912
1/6/2004	0.020		1/6/2004	-3.912
4/7/2004	0.020		4/7/2004	-3.912
7/14/2004	0.020		7/14/2004	-3.912

Third Quarter 2014 Data Collected in July 2014				Third Quarter 2014 Dry/Partially Dry Wells		Transformed Third Quarter 2014 Data Collected in July 2014		
Well No.	Result	Gradient	Result >TL?	Well No.	Gradient	Well Number	LN(Result)	Result >TL?
MW359	0.005	Downgradient	N/A	MW376	Sidegradient	MW359	-5.298	NO
MW362	0.004	Downgradient	N/A	MW377	Sidegradient	MW362	-5.473	NO
MW365	0.005	Downgradient	N/A			MW365	-5.298	NO
MW368	0.003	Sidegradient	N/A			MW368	-5.720	NO
MW371	0.005	Upgradient	N/A			MW371	-5.298	NO
MW374	0.005	Upgradient	N/A			MW374	-5.298	NO
MW375	0.005	Sidegradient	N/A			MW375	-5.298	NO

## Conclusion of Statistical Analysis on Transformed Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

# C-746-U Third Quarter 2014 Statistical Analysis

## Zinc

UCRS  
UNITS: mg/L

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

Background Data from Upgradient Wells		Statistics on Background Data	Transformed Background Data from Upgradient Wells	
Well Number: MW371		<b>X= 0.060</b> <b>S= 0.083</b> <b>CV= 1.380</b> <b>K factor** = 2.523</b> <b>TL= 0.270</b>	Well Number: MW371	
Date Collected	Result		Date Collected	LN(Result)
3/18/2002	0.100		3/18/2002	-2.303
4/22/2002	0.100		4/22/2002	-2.303
7/15/2002	0.100		7/15/2002	-2.303
10/8/2002	0.025		10/8/2002	-3.689
1/8/2003	0.035		1/8/2003	-3.352
4/3/2003	0.035		4/3/2003	-3.352
7/9/2003	0.038		7/9/2003	-3.281
10/6/2003	0.020		10/6/2003	-3.912
Well Number: MW374		<b>X= -3.259</b> <b>S= 0.840</b> <b>CV= -0.258</b> <b>K factor** = 2.523</b> <b>TL= -1.140</b>	Well Number: MW374	
Date Collected	Result		Date Collected	LN(Result)
10/8/2002	0.025		10/8/2002	-3.689
1/7/2003	0.350		1/7/2003	-1.050
4/2/2003	0.035		4/2/2003	-3.352
7/9/2003	0.020		7/9/2003	-3.912
10/7/2003	0.020		10/7/2003	-3.912
1/6/2004	0.020		1/6/2004	-3.912
4/7/2004	0.020		4/7/2004	-3.912
7/14/2004	0.020		7/14/2004	-3.912

Third Quarter 2014 Data Collected in July 2014				Third Quarter 2014 Dry/Partially Dry Wells		Transformed Third Quarter 2014 Data Collected in July 2014		
Well No.	Result	Gradient	Result >TL?	Well No.	Gradient	Well Number	LN(Result)	Result >TL?
MW359	0.006	Downgradient	N/A	MW376	Sidegradient	MW359	-5.051	NO
MW362	0.006	Downgradient	N/A	MW377	Sidegradient	MW362	-5.048	NO
MW365	0.004	Downgradient	N/A			MW365	-5.477	NO
MW368	0.004	Sidegradient	N/A			MW368	-5.458	NO
MW371	0.010	Upgradient	N/A			MW371	-4.605	NO
MW374	0.004	Upgradient	N/A			MW374	-5.555	NO
MW375	0.010	Sidegradient	N/A			MW375	-4.605	NO

### Conclusion of Statistical Analysis on Transformed Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

## C-746-U Third Quarter 2014 Statistical Analysis Aluminum

**URGA**  
**UNITS: mg/L**

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

Background Data from Upgradient Wells		Statistics on Background Data		Transformed Background Data from Upgradient Wells	
Well Number: MW369		<b>X= 0.625</b> <b>S= 0.774</b> <b>CV= 1.239</b> <b>K factor** = 2.523</b> <b>TL= 2.578</b>		Well Number: MW369	
Date Collected	Result			Date Collected	LN(Result)
3/18/2002	0.255			3/18/2002	-1.366
4/22/2002	0.200			4/22/2002	-1.609
7/15/2002	0.322			7/15/2002	-1.133
10/8/2002	0.200			10/8/2002	-1.609
1/8/2003	0.200			1/8/2003	-1.609
4/3/2003	0.200			4/3/2003	-1.609
7/8/2003	0.200			7/8/2003	-1.609
10/6/2003	0.689			10/6/2003	-0.373
Well Number: MW372		<b>X= -0.973</b> <b>S= 0.935</b> <b>CV= -0.961</b> <b>K factor** = 2.523</b> <b>TL= 1.386</b>		Well Number: MW372	
Date Collected	Result			Date Collected	LN(Result)
3/19/2002	2.610			3/19/2002	0.959
4/23/2002	0.200			4/23/2002	-1.609
7/16/2002	1.140			7/16/2002	0.131
10/8/2002	0.862			10/8/2002	-0.149
1/7/2003	2.320			1/7/2003	0.842
4/2/2003	0.200			4/2/2003	-1.609
7/9/2003	0.200			7/9/2003	-1.609
10/7/2003	0.200			10/7/2003	-1.609

Because CV is greater than 1, the natural logarithm of background and test well results were calculated.

Third Quarter 2014 Data Collected in July 2014				Transformed Third Quarter 2014 Data Collected in July 2014		
Well No.	Result	Gradient	Result >TL?	Well Number	LN(Result)	Result >TL?
MW357	0.019	Downgradient	N/A	MW357	-3.958	NO
MW360	0.026	Downgradient	N/A	MW360	-3.646	NO
MW363	0.050	Downgradient	N/A	MW363	-2.996	NO
MW366	0.050	Sidegradient	N/A	MW366	-2.996	NO
MW369	0.140	Upgradient	N/A	MW369	-1.966	NO
MW372	0.016	Upgradient	N/A	MW372	-4.167	NO

### Conclusion of Statistical Analysis on Transformed Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

# C-746-U Third Quarter 2014 Statistical Analysis Boron

**URGA**  
**UNITS: mg/L**

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

## Background Data from Upgradient Wells

Well Number: MW369

Date Collected	Result
3/18/2002	2.000
4/22/2002	2.000
7/15/2002	2.000
10/8/2002	0.200
1/8/2003	0.200
4/3/2003	0.200
7/8/2003	0.200
10/6/2003	0.200

Well Number: MW372

Date Collected	Result
3/19/2002	2.000
4/23/2002	2.000
7/16/2002	2.000
10/8/2002	0.492
1/7/2003	0.492
4/2/2003	0.600
7/9/2003	0.570
10/7/2003	0.604

## Statistics on Background Data

**X= 0.985**  
**S= 0.825**  
**CV= 0.838**  
**K factor\*\* = 2.523**  
**TL= 3.067**

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

## Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW357	0.345	Downgradient	NO
MW360	0.027	Downgradient	NO
MW363	0.021	Downgradient	NO
MW366	0.103	Sidegradient	NO
MW369	0.007	Upgradient	NO
MW372	1.040	Upgradient	NO

## Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

## C-746-U Third Quarter 2014 Statistical Analysis Bromide

**URGA**  
**UNITS: mg/L**

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

### Background Data from Upgradient Wells

Well Number: MW369

Date Collected	Result
3/18/2002	1.000
4/22/2002	1.000
7/15/2002	1.000
10/8/2002	1.000
1/8/2003	1.000
4/3/2003	1.000
7/8/2003	1.000
10/6/2003	1.000

Well Number: MW372

Date Collected	Result
3/19/2002	1.000
4/23/2002	1.000
7/16/2002	1.000
10/8/2002	1.000
1/7/2003	1.000
4/2/2003	1.000
7/9/2003	1.000
10/7/2003	1.000

### Statistics on Background Data

**X= 1.000**  
**S= 0.000**  
**CV= 0.000**  
**K factor\*\* = 2.523**  
**TL= 1.000**

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

### Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW357	0.481	Downgradient	NO
MW360	0.200	Downgradient	NO
MW363	0.142	Downgradient	NO
MW366	0.671	Sidegradient	NO
MW369	0.364	Upgradient	NO
MW372	0.610	Upgradient	NO

### Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

## C-746-U Third Quarter 2014 Statistical Analysis Calcium

**URGA**  
**UNITS: mg/L**

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

### Background Data from Upgradient Wells

Well Number: MW369

Date Collected	Result
3/18/2002	29.500
4/22/2002	29.800
7/15/2002	25.300
10/8/2002	21.900
1/8/2003	20.900
4/3/2003	22.200
7/8/2003	22.900
10/6/2003	21.700

Well Number: MW372

Date Collected	Result
3/19/2002	41.500
4/23/2002	43.600
7/16/2002	40.400
10/8/2002	38.800
1/7/2003	41.100
4/2/2003	42.900
7/9/2003	35.100
10/7/2003	46.600

### Statistics on Background Data

**X= 32.763**  
**S= 9.391**  
**CV= 0.287**  
**K factor\*\* = 2.523**  
**TL= 56.456**

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

### Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW357	27.300	Downgradient	NO
MW360	26.700	Downgradient	NO
MW363	27.700	Downgradient	NO
MW366	28.200	Sidegradient	NO
MW369	15.500	Upgradient	NO
MW372	59.100	Upgradient	<b>YES</b>

### Conclusion of Statistical Analysis on Historical Data

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

**MW372**

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

## C-746-U Third Quarter 2014 Statistical Analysis Chemical Oxygen Demand (COD)

**URGA**  
**UNITS: mg/L**

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

### Background Data from Upgradient Wells

Well Number: MW369

Date Collected	Result
3/18/2002	35.000
4/22/2002	35.000
7/15/2002	35.000
10/8/2002	50.000
1/8/2003	35.000
4/3/2003	35.000
7/8/2003	35.000
10/6/2003	35.000

Well Number: MW372

Date Collected	Result
3/19/2002	35.000
4/23/2002	35.000
7/16/2002	35.000
10/8/2002	35.000
1/7/2003	35.000
4/2/2003	35.000
7/9/2003	35.000
10/7/2003	35.000

### Statistics on Background Data

**X= 35.938**  
**S= 3.750**  
**CV= 0.104**  
**K factor\*\* = 2.523**  
**TL= 45.399**

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

### Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW357	9.330	Downgradient	NO
MW360	17.800	Downgradient	NO
MW363	6.690	Downgradient	NO
MW366	20.000	Sidegradient	NO
MW369	18.200	Upgradient	NO
MW372	7.110	Upgradient	NO

### Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,



# C-746-U Third Quarter 2014 Statistical Analysis Chloride

**URGA**  
**UNITS: mg/L**

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

## Background Data from Upgradient Wells

Well Number: MW369

Date Collected	Result
7/15/2002	48.300
10/8/2002	47.700
1/8/2003	45.700
4/3/2003	47.400
7/8/2003	55.900
10/6/2003	47.400
1/7/2004	45.500
4/7/2004	43.400

Well Number: MW372

Date Collected	Result
7/16/2002	39.800
10/8/2002	41.000
1/7/2003	39.400
4/2/2003	39.200
7/9/2003	39.800
10/7/2003	40.000
1/5/2004	43.400
4/5/2004	42.000

## Statistics on Background Data

**X= 44.119**  
**S= 4.554**  
**CV= 0.103**  
**K factor\*\* = 2.523**  
**TL= 55.607**

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

## Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW357	34.400	Downgradient	NO
MW360	10.300	Downgradient	NO
MW363	27.500	Downgradient	NO
MW366	37.700	Sidegradient	NO
MW369	28.700	Upgradient	NO
MW372	44.500	Upgradient	NO

## Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

# C-746-U Third Quarter 2014 Statistical Analysis Cobalt

**URGA**  
**UNITS: mg/L**

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

## Background Data from Upgradient Wells

Well Number: MW369

Date Collected	Result
3/18/2002	0.025
4/22/2002	0.025
7/15/2002	0.025
10/8/2002	0.009
1/8/2003	0.005
4/3/2003	0.006
7/8/2003	0.054
10/6/2003	0.069

Well Number: MW372

Date Collected	Result
3/19/2002	0.025
4/23/2002	0.025
7/16/2002	0.025
10/8/2002	0.002
1/7/2003	0.015
4/2/2003	0.012
7/9/2003	0.065
10/7/2003	0.008

## Statistics on Background Data

**X= 0.025**  
**S= 0.021**  
**CV= 0.845**  
**K factor\*\* = 2.523**  
**TL= 0.077**

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

## Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW357	0.000	Downgradient	NO
MW360	0.020	Downgradient	NO
MW363	0.001	Downgradient	NO
MW366	0.000	Sidegradient	NO
MW369	0.007	Upgradient	NO
MW372	0.000	Upgradient	NO

## Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

## C-746-U Third Quarter 2014 Statistical Analysis Conductivity

**URGA**  
**UNITS: umho/cm**

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

### Background Data from Upgradient Wells

Well Number: MW369

Date Collected	Result
3/18/2002	388.000
4/22/2002	404.000
7/15/2002	394.000
10/8/2002	403.000
1/8/2003	520.000
4/3/2003	487.000
7/8/2003	478.000
10/6/2003	476.000

Well Number: MW372

Date Collected	Result
3/19/2002	508.000
4/23/2002	501.000
7/16/2002	507.000
10/8/2002	495.000
1/7/2003	508.700
4/2/2003	515.000
7/9/2003	576.000
10/7/2003	565.000

### Statistics on Background Data

**X= 482.856**  
**S= 57.603**  
**CV= 0.119**  
**K factor\*\* = 2.523**  
**TL= 628.189**

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

### Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW357	440.00	Downgradient	NO
MW360	568.00	Downgradient	NO
MW363	402.00	Downgradient	NO
MW366	459.00	Sidegradient	NO
MW369	370.00	Upgradient	NO
MW372	839.00	Upgradient	<b>YES</b>

### Conclusion of Statistical Analysis on Historical Data

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

**MW372**

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

## C-746-U Third Quarter 2014 Statistical Analysis Dissolved Oxygen

**URGA**  
**UNITS: mg/L**

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

### Background Data from Upgradient Wells

Well Number: MW369

Date Collected	Result
3/18/2002	5.410
4/22/2002	1.570
7/15/2002	0.800
10/8/2002	1.090
1/8/2003	2.690
4/3/2003	2.040
7/8/2003	1.190
10/6/2003	1.780

Well Number: MW372

Date Collected	Result
3/19/2002	3.890
4/23/2002	0.050
7/16/2002	1.330
10/8/2002	2.660
1/7/2003	0.400
4/2/2003	0.910
7/9/2003	1.420
10/7/2003	1.260

### Statistics on Background Data

**X= 1.781**  
**S= 1.351**  
**CV= 0.759**  
**K factor\*\* = 2.523**  
**TL= 5.190**

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

### Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW357	4.180	Downgradient	NO
MW360	1.700	Downgradient	NO
MW363	1.360	Downgradient	NO
MW366	2.860	Sidegradient	NO
MW369	2.290	Upgradient	NO
MW372	1.260	Upgradient	NO

### Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

## C-746-U Third Quarter 2014 Statistical Analysis Dissolved Solids

**URGA**  
**UNITS: mg/L**

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

### Background Data from Upgradient Wells

Well Number: MW369

Date Collected	Result
3/18/2002	173.000
4/22/2002	246.000
7/15/2002	232.000
10/8/2002	275.000
1/8/2003	269.000
4/3/2003	250.000
7/8/2003	295.000
10/6/2003	276.000

Well Number: MW372

Date Collected	Result
3/19/2002	295.000
4/23/2002	322.000
7/16/2002	329.000
10/8/2002	290.000
1/7/2003	316.000
4/2/2003	311.000
7/9/2003	347.000
10/7/2003	337.000

### Statistics on Background Data

**X= 285.188**  
**S= 44.908**  
**CV= 0.157**  
**K factor\*\* = 2.523**  
**TL= 398.489**

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

### Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW357	216.00	Downgradient	NO
MW360	334.00	Downgradient	NO
MW363	219.00	Downgradient	NO
MW366	219.00	Sidegradient	NO
MW369	150.00	Upgradient	NO
MW372	314.00	Upgradient	NO

### Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

## C-746-U Third Quarter 2014 Statistical Analysis Iron

**URGA**  
**UNITS: mg/L**

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

### Background Data from Upgradient Wells

Well Number: MW369

Date Collected	Result
3/18/2002	0.656
4/22/2002	0.695
7/15/2002	7.100
10/8/2002	21.500
1/8/2003	18.500
4/3/2003	14.900
7/8/2003	11.300
10/6/2003	14.900

Well Number: MW372

Date Collected	Result
3/19/2002	5.950
4/23/2002	0.792
7/16/2002	1.780
10/8/2002	0.776
1/7/2003	3.550
4/2/2003	5.020
7/9/2003	10.000
10/7/2003	0.733

### Statistics on Background Data

**X= 7.385**  
**S= 6.991**  
**CV= 0.947**  
**K factor\*\* = 2.523**  
**TL= 25.024**

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

### Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW357	0.121	Downgradient	NO
MW360	5.020	Downgradient	NO
MW363	0.125	Downgradient	NO
MW366	0.071	Sidegradient	NO
MW369	0.483	Upgradient	NO
MW372	0.520	Upgradient	NO

### Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

## C-746-U Third Quarter 2014 Statistical Analysis Magnesium

**URGA**  
**UNITS: mg/L**

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

### Background Data from Upgradient Wells

Well Number: MW369

Date Collected	Result
3/18/2002	11.400
4/22/2002	12.000
7/15/2002	10.000
10/8/2002	8.620
1/8/2003	7.890
4/3/2003	7.970
7/8/2003	10.300
10/6/2003	9.140

Well Number: MW372

Date Collected	Result
3/19/2002	15.700
4/23/2002	16.600
7/16/2002	15.400
10/8/2002	15.800
1/7/2003	15.800
4/2/2003	16.400
7/9/2003	15.200
10/7/2003	17.600

### Statistics on Background Data

**X= 12.864**  
**S= 3.505**  
**CV= 0.272**  
**K factor\*\* = 2.523**  
**TL= 21.707**

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

### Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW357	11.500	Downgradient	NO
MW360	9.810	Downgradient	NO
MW363	10.700	Downgradient	NO
MW366	12.000	Sidegradient	NO
MW369	5.660	Upgradient	NO
MW372	21.600	Upgradient	NO

### Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

## C-746-U Third Quarter 2014 Statistical Analysis Manganese

**URGA**  
**UNITS: mg/L**

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

### Background Data from Upgradient Wells

Well Number: MW369

Date Collected	Result
3/18/2002	0.034
4/22/2002	0.062
7/15/2002	0.436
10/8/2002	0.867
1/8/2003	0.828
4/3/2003	0.672
7/8/2003	0.321
10/6/2003	0.714

Well Number: MW372

Date Collected	Result
3/19/2002	0.205
4/23/2002	0.345
7/16/2002	0.210
10/8/2002	0.054
1/7/2003	0.537
4/2/2003	0.415
7/9/2003	0.654
10/7/2003	0.254

### Statistics on Background Data

**X= 0.413**  
**S= 0.274**  
**CV= 0.664**  
**K factor\*\* = 2.523**  
**TL= 1.105**

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

### Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW357	0.032	Downgradient	NO
MW360	0.255	Downgradient	NO
MW363	0.265	Downgradient	NO
MW366	0.003	Sidegradient	NO
MW369	0.033	Upgradient	NO
MW372	0.017	Upgradient	NO

### Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,



# C-746-U Third Quarter 2014 Statistical Analysis Molybdenum

**URGA**  
**UNITS: mg/L**

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

Background Data from Upgradient Wells		Statistics on Background Data		Transformed Background Data from Upgradient Wells	
Well Number:	MW369	<b>X= 0.010</b> <b>S= 0.012</b> <b>CV= 1.199</b> <b>K factor** = 2.523</b> <b>TL= 0.040</b>	Because CV is greater than 1, the natural logarithm of background and test well results were calculated.	Well Number:	MW369
Date Collected	Result			Date Collected	LN(Result)
3/18/2002	0.025			3/18/2002	-3.689
4/22/2002	0.025			4/22/2002	-3.689
7/15/2002	0.025			7/15/2002	-3.689
10/8/2002	0.001			10/8/2002	-6.908
1/8/2003	0.001			1/8/2003	-6.908
4/3/2003	0.001			4/3/2003	-6.908
7/8/2003	0.001	<b>Statistics on Transformed Background Data</b>		7/8/2003	-6.908
10/6/2003	0.001			10/6/2003	-6.908
Well Number:	MW372			Well Number:	MW372
Date Collected	Result			Date Collected	LN(Result)
3/19/2002	0.025			3/19/2002	-3.689
4/23/2002	0.025			4/23/2002	-3.689
7/16/2002	0.025			7/16/2002	-3.689
10/8/2002	0.001			10/8/2002	-6.908
1/7/2003	0.001	<b>X= -5.698</b> <b>S= 1.607</b> <b>CV= -0.282</b> <b>K factor** = 2.523</b> <b>TL= -1.643</b>		1/7/2003	-6.908
4/2/2003	0.001			4/2/2003	-6.908
7/9/2003	0.001			7/9/2003	-6.859
10/7/2003	0.001			10/7/2003	-6.908

Because CV is greater than 1, the natural logarithm of background and test well results were calculated.

Third Quarter 2014 Data Collected in July 2014				Transformed Third Quarter 2014 Data Collected in July 2014		
Well No.	Result	Gradient	Result >TL?	Well Number	LN(Result)	Result >TL?
MW357	0.001	Downgradient	N/A	MW357	-7.601	NO
MW360	0.000	Downgradient	N/A	MW360	-7.775	NO
MW363	0.001	Downgradient	N/A	MW363	-7.601	NO
MW366	0.001	Sidegradient	N/A	MW366	-7.601	NO
MW369	0.000	Upgradient	N/A	MW369	-8.181	NO
MW372	0.000	Upgradient	N/A	MW372	-7.663	NO

## Conclusion of Statistical Analysis on Transformed Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

**C-746-U Third Quarter 2014 Statistical Analysis  
Nickel****URGA  
UNITS: mg/L**

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

**Background Data from  
Upgradient Wells**

Well Number: MW369

Date Collected	Result
3/18/2002	0.050
4/22/2002	0.050
7/15/2002	0.050
10/8/2002	0.005
1/8/2003	0.005
4/3/2003	0.005
7/8/2003	0.013
10/6/2003	0.010

Well Number: MW372

Date Collected	Result
3/19/2002	0.050
4/23/2002	0.050
7/16/2002	0.050
10/8/2002	0.005
1/7/2003	0.005
4/2/2003	0.005
7/9/2003	0.019
10/7/2003	0.005

**Statistics on  
Background Data**

**X= 0.024**  
**S= 0.021**  
**CV= 0.910**  
**K factor\*\* = 2.523**  
**TL= 0.078**

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

**Third Quarter 2014 Data Collected in  
July 2014**

Well No.	Result	Gradient	Result > TL?
MW357	0.001	Downgradient	NO
MW360	0.002	Downgradient	NO
MW363	0.001	Downgradient	NO
MW366	0.001	Sidegradient	NO
MW369	0.011	Upgradient	NO
MW372	0.002	Upgradient	NO

**Conclusion of Statistical Analysis on Historical Data**

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

# C-746-U Third Quarter 2014 Statistical Analysis Oxidation-Reduction Potential

**URGA**  
**UNITS: mV**

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

Background Data from Upgradient Wells		Statistics on Background Data	Transformed Background Data from Upgradient Wells	
Well Number: MW369		<b>X= 74.563</b> <b>S= 94.243</b> <b>CV= 1.264</b> <b>K factor** = 2.523</b> <b>TL= 312.337</b>	Well Number: MW369	
Date Collected	Result		Date Collected	LN(Result)
3/18/2002	215.000		3/18/2002	5.371
4/22/2002	110.000		4/22/2002	4.700
7/15/2002	20.000		7/15/2002	2.996
1/8/2003	-5.000		1/8/2003	#Func!
4/3/2003	-18.000		4/3/2003	#Func!
7/8/2003	-67.000		7/8/2003	#Func!
10/6/2003	-1.000		10/6/2003	#Func!
1/7/2004	55.000		1/7/2004	4.007
Well Number: MW372		<b>X = error</b> <b>S = error</b> <b>CV = error</b> <b>K factor** = 2.523</b> <b>TL# = 5.371</b>	Well Number: MW372	
Date Collected	Result		Date Collected	LN(Result)
3/19/2002	210.000		3/19/2002	5.347
4/23/2002	65.000		4/23/2002	4.174
7/16/2002	215.000		7/16/2002	5.371
10/8/2002	185.000		10/8/2002	5.220
1/7/2003	45.000		1/7/2003	3.807
4/2/2003	65.000		4/2/2003	4.174
7/9/2003	-39.000		7/9/2003	#Func!
10/7/2003	138.000		10/7/2003	4.927

Because CV is greater than 1, the natural logarithm of background and test well results were calculated.

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

Third Quarter 2014 Data Collected in July 2014				Transformed Third Quarter 2014 Data Collected in July 2014		
Well No.	Result	Gradient	Result >TL?	Well Number	LN(Result)	Result >TL?
MW357	416.000	Downgradient	N/A	MW357	6.031	YES
MW360	189.000	Downgradient	N/A	MW360	5.242	NO
MW363	354.000	Downgradient	N/A	MW363	5.869	YES
MW366	377.000	Sidegradient	N/A	MW366	5.932	YES
MW369	331.000	Upgradient	N/A	MW369	5.802	YES
MW372	126.000	Upgradient	N/A	MW372	4.836	NO

Conclusion of Statistical Analysis on Transformed Historical Data	
The following test well(s) exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to historical background data.	
MW357	

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

**C-746-U Third Quarter 2014 Statistical Analysis**  
**Oxidation-Reduction Potential\*\*Eqvlpwgf +**

**URGA**  
**UNITS: mV**

MW363

MW366

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

# C-746-U Third Quarter 2014 Statistical Analysis PCB, total

**URGA**  
**UNITS: ug/L**

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

## Background Data from Upgradient Wells

Well Number: MW369

Date Collected	Result
3/18/2002	1.000
4/22/2002	0.170
7/15/2002	0.170
7/8/2003	1.150
10/6/2003	0.605
7/13/2004	0.420
7/20/2005	0.280
4/4/2006	0.230

Well Number: MW372

Date Collected	Result
3/19/2002	1.000
4/23/2002	0.170
7/16/2002	0.170
7/9/2003	0.170
10/7/2003	0.170
7/14/2004	0.180
7/21/2005	0.170
4/5/2006	0.180

## Statistics on Background Data

**X= 0.390**  
**S= 0.350**  
**CV= 0.897**  
**K factor\*\* = 2.523**  
**TL= 1.272**

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

## Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW357	0.098	Downgradient	NO
MW360	0.080	Downgradient	NO
MW363	0.090	Downgradient	NO
MW366	0.102	Sidegradient	NO
MW369	0.118	Upgradient	NO
MW372	0.087	Upgradient	NO

## Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

# C-746-U Third Quarter 2014 Statistical Analysis PCB-1242

**URGA**  
**UNITS: ug/L**

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

## Background Data from Upgradient Wells

Well Number: MW369

Date Collected	Result
3/18/2002	1.000
4/22/2002	0.110
7/15/2002	0.110
7/8/2003	1.150
10/6/2003	0.090
7/13/2004	0.100
7/20/2005	0.100
4/4/2006	0.100

Well Number: MW372

Date Collected	Result
3/19/2002	1.000
4/23/2002	0.110
7/16/2002	0.110
7/9/2003	0.130
10/7/2003	0.090
7/14/2004	0.100
7/21/2005	0.100
4/5/2006	0.100

## Statistics on Background Data

**X= 0.281**  
**S= 0.383**  
**CV= 1.361**  
**K factor\*\* = 2.523**  
**TL= 1.247**

Because CV is greater than 1, the natural logarithm of background and test well results were calculated.

## Statistics on Transformed Background Data

**X= -1.835**  
**S= 0.938**  
**CV= -0.511**  
**K factor\*\* = 2.523**  
**TL= 0.532**

## Transformed Background Data from Upgradient Wells

Well Number: MW369

Date Collected	LN(Result)
3/18/2002	0.000
4/22/2002	-2.207
7/15/2002	-2.207
7/8/2003	0.140
10/6/2003	-2.408
7/13/2004	-2.303
7/20/2005	-2.303
4/4/2006	-2.303

Well Number: MW372

Date Collected	LN(Result)
3/19/2002	0.000
4/23/2002	-2.207
7/16/2002	-2.207
7/9/2003	-2.040
10/7/2003	-2.408
7/14/2004	-2.303
7/21/2005	-2.303
4/5/2006	-2.303

## Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW357	0.098	Downgradient	N/A
MW360	0.080	Downgradient	N/A
MW363	0.090	Downgradient	N/A
MW366	0.102	Sidegradient	N/A
MW369	0.118	Upgradient	N/A
MW372	0.087	Upgradient	N/A

## Transformed Third Quarter 2014 Data Collected in July 2014

Well Number	LN(Result)	Result > TL?
MW357	-2.323	NO
MW360	-2.522	NO
MW363	-2.412	NO
MW366	-2.283	NO
MW369	-2.137	NO
MW372	-2.442	NO

## Conclusion of Statistical Analysis on Transformed Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

# C-746-U Third Quarter 2014 Statistical Analysis pH

**URGA  
UNITS: Std Unit**

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL and LL. If the test well result exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

## Background Data from Upgradient Wells

Well Number: MW369

Date Collected	Result
3/18/2002	6.100
4/22/2002	6.100
7/15/2002	6.100
10/8/2002	6.500
1/8/2003	6.500
4/3/2003	6.600
7/8/2003	6.500
10/6/2003	6.500

Well Number: MW372

Date Collected	Result
3/19/2002	6.100
4/23/2002	6.120
7/16/2002	6.100
10/8/2002	6.060
1/7/2003	6.260
4/2/2003	6.150
7/9/2003	6.300
10/7/2003	6.400

## Statistics on Background Data

**X= 6.274**  
**S= 0.194**  
**CV= 0.031**  
**K factor\*\* = 2.904**  
**TL= 6.837**  
**LL= 5.711**

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

## Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result >TL?	Result <LL?
MW357	6.180	Downgradient	NO	NO
MW360	6.410	Downgradient	NO	NO
MW363	6.250	Downgradient	NO	NO
MW366	6.160	Sidegradient	NO	NO
MW369	6.180	Upgradient	NO	NO
MW372	6.160	Upgradient	NO	NO

## Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

\*\* The K-factor was adjusted for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K- factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

## C-746-U Third Quarter 2014 Statistical Analysis Radium-226

**URGA**  
**UNITS: pCi/L**

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

Background Data from Upgradient Wells		Statistics on Background Data		Transformed Background Data from Upgradient Wells		
Well Number: MW369		<b>X= 3.398</b> <b>S= 8.854</b> <b>CV= 2.605</b> <b>K factor** = 2.523</b> <b>TL= 25.736</b>		Well Number: MW369		
Date Collected	Result			Date Collected	LN(Result)	
7/15/2002	28.400			7/15/2002	3.346	
10/8/2002	0.167			10/8/2002	-1.790	
1/8/2003	0.173			1/8/2003	-1.754	
10/6/2003	0.168			10/6/2003	-1.784	
1/7/2004	0.702			1/7/2004	-0.354	
4/7/2004	0.195			4/7/2004	-1.635	
7/13/2004	0.256			7/13/2004	-1.363	
10/7/2004	0.228			10/7/2004	-1.478	
Well Number: MW372		<b>Statistics on Transformed Background Data</b>  <b>X = error</b> <b>S = error</b> <b>CV = error</b> <b>K factor** = 2.523</b> <b>TL# = 3.346</b>		Well Number: MW372		
Date Collected	Result			Date Collected	LN(Result)	
7/16/2002	23.500			7/16/2002	3.157	
10/8/2002	0.195			10/8/2002	-1.635	
1/7/2003	-0.844			1/7/2003	#Func!	
10/7/2003	0.349			10/7/2003	-1.053	
1/5/2004	0.239			1/5/2004	-1.431	
4/5/2004	0.308			4/5/2004	-1.178	
7/14/2004	0.147			7/14/2004	-1.917	
10/7/2004	0.188			10/7/2004	-1.671	
<p>Because CV is greater than 1, the natural logarithm of background and test well results were calculated.</p> <p># Because the natural log was not possible for all background values, the TL was considered equal to the maximum background value.</p>						
Third Quarter 2014 Data Collected in July 2014				Transformed Third Quarter 2014 Data Collected in July 2014		
Well No.	Result	Gradient	Result >TL?	Well Number	LN(Result)	Result >TL?
MW357	0.245	Downgradient	N/A	MW357	-1.406	NO
MW360	0.297	Downgradient	N/A	MW360	-1.214	NO
MW363	0.209	Downgradient	N/A	MW363	-1.565	NO
MW366	0.221	Sidegradient	N/A	MW366	-1.510	NO
MW369	0.502	Upgradient	N/A	MW369	-0.689	NO
MW372	0.597	Upgradient	N/A	MW372	-0.516	NO
Conclusion of Statistical Analysis on Transformed Historical Data						
None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.						

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,



# C-746-U Third Quarter 2014 Statistical Analysis Sodium

**URGA**  
**UNITS: mg/L**

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

## Background Data from Upgradient Wells

Well Number: MW369

Date Collected	Result
3/18/2002	35.700
4/22/2002	37.600
7/15/2002	42.400
10/8/2002	66.900
1/8/2003	67.900
4/3/2003	61.800
7/8/2003	45.600
10/6/2003	59.100

Well Number: MW372

Date Collected	Result
3/19/2002	37.200
4/23/2002	38.600
7/16/2002	35.600
10/8/2002	37.500
1/7/2003	34.100
4/2/2003	34.400
7/9/2003	44.100
10/7/2003	43.100

## Statistics on Background Data

**X= 45.100**  
**S= 11.875**  
**CV= 0.263**  
**K factor\*\* = 2.523**  
**TL= 75.061**

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

## Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW357	41.400	Downgradient	NO
MW360	85.500	Downgradient	<b>YES</b>
MW363	37.600	Downgradient	NO
MW366	42.200	Sidegradient	NO
MW369	48.800	Upgradient	NO
MW372	60.700	Upgradient	NO

## Conclusion of Statistical Analysis on Historical Data

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

**MW360**

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

# C-746-U Third Quarter 2014 Statistical Analysis Sulfate

**URGA**  
**UNITS: mg/L**

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

## Background Data from Upgradient Wells

Well Number: MW369

Date Collected	Result
3/18/2002	15.500
4/22/2002	15.800
7/15/2002	13.800
10/8/2002	6.900
1/8/2003	10.500
4/3/2003	10.500
7/8/2003	10.900
10/6/2003	16.300

Well Number: MW372

Date Collected	Result
3/19/2002	71.700
4/23/2002	74.700
7/16/2002	74.100
10/8/2002	70.500
1/7/2003	75.800
4/2/2003	81.800
7/9/2003	83.600
10/7/2003	88.100

## Statistics on Background Data

**X= 45.031**  
**S= 33.919**  
**CV= 0.753**  
**K factor\*\* = 2.523**  
**TL= 130.609**

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

## Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW357	54.700	Downgradient	NO
MW360	41.200	Downgradient	NO
MW363	31.100	Downgradient	NO
MW366	47.900	Sidegradient	NO
MW369	8.170	Upgradient	NO
MW372	170.00	Upgradient	<b>YES</b>

## Conclusion of Statistical Analysis on Historical Data

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

**MW372**

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

## C-746-U Third Quarter 2014 Statistical Analysis Technetium-99

**URGA**  
**UNITS: pCi/L**

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

### Background Data from Upgradient Wells

Well Number: MW369

Date Collected	Result
3/18/2002	41.700
4/22/2002	53.100
7/15/2002	18.100
10/8/2002	16.400
1/8/2003	3.490
4/3/2003	9.340
7/8/2003	17.500
10/6/2003	17.000

Well Number: MW372

Date Collected	Result
3/19/2002	44.800
4/23/2002	0.802
7/16/2002	19.800
10/8/2002	46.100
1/7/2003	-0.973
4/2/2003	9.070
7/9/2003	0.000
10/7/2003	36.900

### Statistics on Background Data

**X= 20.821**  
**S= 18.044**  
**CV= 0.867**  
**K factor\*\* = 2.523**  
**TL= 66.344**

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

### Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW357	31.700	Downgradient	NO
MW360	0.025	Downgradient	NO
MW363	18.800	Downgradient	NO
MW366	54.300	Sidegradient	NO
MW369	15.800	Upgradient	NO
MW372	26.600	Upgradient	NO

### Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

# C-746-U Third Quarter 2014 Statistical Analysis Total Organic Carbon (TOC)

**URGA**  
**UNITS: mg/L**

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

Background Data from Upgradient Wells		Statistics on Background Data		Transformed Background Data from Upgradient Wells	
Well Number: MW369		<b>X= 3.513</b> <b>S= 4.307</b> <b>CV= 1.226</b> <b>K factor** = 2.523</b> <b>TL= 14.378</b>		Well Number: MW369	
Date Collected	Result			Date Collected	LN(Result)
3/18/2002	1.700			3/18/2002	0.531
4/22/2002	1.600			4/22/2002	0.470
7/15/2002	3.100			7/15/2002	1.131
10/8/2002	17.700			10/8/2002	2.874
1/8/2003	9.000			1/8/2003	2.197
4/3/2003	4.000			4/3/2003	1.386
7/8/2003	4.900			7/8/2003	1.589
10/6/2003	2.400	10/6/2003	0.875		
Well Number: MW372		<b>Statistics on Transformed Background Data</b> <b>X= 0.851</b> <b>S= 0.828</b> <b>CV= 0.973</b> <b>K factor** = 2.523</b> <b>TL= 2.940</b>		Well Number: MW372	
Date Collected	Result			Date Collected	LN(Result)
3/19/2002	1.000			3/19/2002	0.000
4/23/2002	1.200			4/23/2002	0.182
7/16/2002	1.000			7/16/2002	0.000
10/8/2002	1.000			10/8/2002	0.000
1/7/2003	1.600			1/7/2003	0.470
4/2/2003	1.500			4/2/2003	0.405
7/9/2003	3.000			7/9/2003	1.099
10/7/2003	1.500	10/7/2003	0.405		

Because CV is greater than 1, the natural logarithm of background and test well results were calculated.

Third Quarter 2014 Data Collected in July 2014				Transformed Third Quarter 2014 Data Collected in July 2014		
Well No.	Result	Gradient	Result >TL?	Well Number	LN(Result)	Result >TL?
MW357	0.905	Downgradient	N/A	MW357	-0.100	NO
MW360	3.270	Downgradient	N/A	MW360	1.185	NO
MW363	1.110	Downgradient	N/A	MW363	0.104	NO
MW366	0.982	Sidegradient	N/A	MW366	-0.018	NO
MW369	1.260	Upgradient	N/A	MW369	0.231	NO
MW372	1.380	Upgradient	N/A	MW372	0.322	NO

## Conclusion of Statistical Analysis on Transformed Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

# C-746-U Third Quarter 2014 Statistical Analysis Total Organic Halides (TOX)

**URGA**  
**UNITS: ug/L**

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

## Background Data from Upgradient Wells

Well Number: MW369

Date Collected	Result
3/18/2002	50.000
4/22/2002	50.000
7/15/2002	81.000
10/8/2002	202.000
1/8/2003	177.000
4/3/2003	93.100
7/8/2003	17.500
10/6/2003	37.500

Well Number: MW372

Date Collected	Result
3/19/2002	184.000
4/23/2002	50.000
7/16/2002	50.000
10/8/2002	50.000
1/7/2003	10.000
4/2/2003	12.700
7/9/2003	10.000
10/7/2003	12.600

## Statistics on Background Data

**X= 67.963**  
**S= 64.316**  
**CV= 0.946**  
**K factor\*\* = 2.523**  
**TL= 230.231**

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

## Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW357	6.720	Downgradient	NO
MW360	21.800	Downgradient	NO
MW363	9.720	Downgradient	NO
MW366	6.760	Sidegradient	NO
MW369	20.600	Upgradient	NO
MW372	11.100	Upgradient	NO

## Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

## C-746-U Third Quarter 2014 Statistical Analysis Trichloroethene

**URGA**  
**UNITS: ug/L**

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

### Background Data from Upgradient Wells

Well Number: MW369

Date Collected	Result
3/18/2002	11.000
4/22/2002	16.000
7/15/2002	8.000
10/8/2002	3.000
1/8/2003	2.000
4/3/2003	3.000
7/8/2003	3.000
10/6/2003	2.000

Well Number: MW372

Date Collected	Result
3/19/2002	5.000
4/23/2002	5.000
7/16/2002	4.000
10/8/2002	6.000
1/7/2003	5.000
4/2/2003	6.000
7/9/2003	5.000
10/7/2003	6.000

### Statistics on Background Data

**X= 5.625**  
**S= 3.594**  
**CV= 0.639**  
**K factor\*\* = 2.523**  
**TL= 14.693**

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

### Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW357	6.420	Downgradient	NO
MW360	1.000	Downgradient	NO
MW363	0.510	Downgradient	NO
MW366	3.860	Sidegradient	NO
MW369	0.480	Upgradient	NO
MW372	9.820	Upgradient	NO

### Conclusion of Statistical Analysis on Historical Data

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

\*\*Trichloroethene has an MCL of 5.0 ug/L. A TL calculation was performed for the URGA because some of the URGA wells have current concentrations that exceed the MCL.

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\*, Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

## C-746-U Third Quarter 2014 Statistical Analysis Uranium

**URGA**  
**UNITS: mg/L**

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

### Background Data from Upgradient Wells

Well Number: MW369

Date Collected	Result
3/18/2002	0.001
4/22/2002	0.001
7/15/2002	0.001
10/8/2002	0.004
1/8/2003	0.001
4/3/2003	0.001
7/8/2003	0.001
10/6/2003	0.001

Well Number: MW372

Date Collected	Result
3/19/2002	0.001
4/23/2002	0.001
7/16/2002	0.001
10/8/2002	0.006
1/7/2003	0.001
4/2/2003	0.001
7/9/2003	0.001
10/7/2003	0.001

### Statistics on Background Data

**X= 0.001**  
**S= 0.001**  
**CV= 0.917**  
**K factor\*\* = 2.523**  
**TL= 0.005**

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

### Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW357	0.000	Downgradient	NO
MW360	0.000	Downgradient	NO
MW363	0.000	Downgradient	NO
MW366	0.000	Sidegradient	NO
MW369	0.000	Upgradient	NO
MW372	0.000	Upgradient	NO

### Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

# C-746-U Third Quarter 2014 Statistical Analysis Zinc

**URGA**  
**UNITS: mg/L**

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

Background Data from Upgradient Wells		Statistics on Background Data		Transformed Background Data from Upgradient Wells	
Well Number: MW369		<b>X= 0.116</b> <b>S= 0.173</b> <b>CV= 1.490</b> <b>K factor** = 2.523</b> <b>TL= 0.552</b>		Well Number: MW369	
Date Collected	Result			Date Collected	LN(Result)
3/18/2002	0.100			3/18/2002	-2.303
4/22/2002	0.100			4/22/2002	-2.303
7/15/2002	0.100			7/15/2002	-2.303
10/8/2002	0.025			10/8/2002	-3.689
1/8/2003	0.035			1/8/2003	-3.352
4/3/2003	0.035			4/3/2003	-3.352
7/8/2003	0.020	Because CV is greater than 1, the natural logarithm of background and test well results were calculated.		7/8/2003	-3.912
10/6/2003	0.020			10/6/2003	-3.912
Well Number: MW372				Well Number: MW372	
Date Collected	Result			Date Collected	LN(Result)
3/19/2002	0.725			3/19/2002	-0.322
4/23/2002	0.100			4/23/2002	-2.303
7/16/2002	0.100			7/16/2002	-2.303
10/8/2002	0.025			10/8/2002	-3.689
1/7/2003	0.035	<b>X= -2.729</b> <b>S= 1.014</b> <b>CV= -0.371</b> <b>K factor** = 2.523</b> <b>TL= -0.172</b>		1/7/2003	-3.352
4/2/2003	0.035			4/2/2003	-3.352
7/9/2003	0.200			7/9/2003	-1.609
10/7/2003	0.200			10/7/2003	-1.609

Third Quarter 2014 Data Collected in July 2014				Transformed Third Quarter 2014 Data Collected in July 2014		
Well No.	Result	Gradient	Result >TL?	Well Number	LN(Result)	Result >TL?
MW357	0.006	Downgradient	N/A	MW357	-5.072	NO
MW360	0.010	Downgradient	N/A	MW360	-4.605	NO
MW363	0.010	Downgradient	N/A	MW363	-4.605	NO
MW366	0.010	Sidegradient	N/A	MW366	-4.605	NO
MW369	0.004	Upgradient	N/A	MW369	-5.591	NO
MW372	0.010	Upgradient	N/A	MW372	-4.605	NO

## Conclusion of Statistical Analysis on Transformed Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,



# C-746-U Third Quarter 2014 Statistical Analysis Boron

**LRGA**  
**UNITS: mg/L**

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

## Background Data from Upgradient Wells

Well Number: MW370

Date Collected	Result
3/17/2002	2.000
4/23/2002	2.000
7/15/2002	2.000
10/8/2002	0.200
1/8/2003	0.200
4/3/2003	0.200
7/9/2003	0.200
10/6/2003	0.200

Well Number: MW373

Date Collected	Result
3/18/2002	2.000
4/23/2002	2.000
7/16/2002	2.000
10/8/2002	0.790
1/7/2003	0.807
4/2/2003	1.130
7/9/2003	1.280
10/7/2003	1.240

## Statistics on Background Data

**X= 1.140**  
**S= 0.780**  
**CV= 0.684**  
**K factor\*\* = 2.523**  
**TL= 3.108**

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

## Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW358	0.405	Downgradient	NO
MW361	0.247	Downgradient	NO
MW364	0.011	Downgradient	NO
MW367	0.014	Sidegradient	NO
MW370	0.029	Upgradient	NO
MW373	1.670	Upgradient	NO

## Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

## C-746-U Third Quarter 2014 Statistical Analysis Bromide

**LRGA**  
**UNITS: mg/L**

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

### Background Data from Upgradient Wells

Well Number: MW370

Date Collected	Result
3/17/2002	1.000
4/23/2002	1.000
7/15/2002	1.000
10/8/2002	1.000
1/8/2003	1.000
4/3/2003	1.000
7/9/2003	1.000
10/6/2003	1.000

Well Number: MW373

Date Collected	Result
3/18/2002	1.000
4/23/2002	1.000
7/16/2002	1.000
10/8/2002	1.000
1/7/2003	1.000
4/2/2003	1.000
7/9/2003	1.000
10/7/2003	1.000

### Statistics on Background Data

**X= 1.000**  
**S= 0.000**  
**CV= 0.000**  
**K factor\*\* = 2.523**  
**TL= 1.000**

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

### Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW358	0.606	Downgradient	NO
MW361	0.412	Downgradient	NO
MW364	0.438	Downgradient	NO
MW367	0.268	Sidegradient	NO
MW370	0.529	Upgradient	NO
MW373	0.608	Upgradient	NO

### Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

## C-746-U Third Quarter 2014 Statistical Analysis Calcium

**LRGA**  
**UNITS: mg/L**

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

### Background Data from Upgradient Wells

Well Number: MW370

Date Collected	Result
3/17/2002	34.800
4/23/2002	43.400
7/15/2002	33.200
10/8/2002	29.200
1/8/2003	31.300
4/3/2003	32.400
7/9/2003	22.900
10/6/2003	28.000

Well Number: MW373

Date Collected	Result
3/18/2002	61.900
4/23/2002	59.200
7/16/2002	47.600
10/8/2002	46.100
1/7/2003	49.200
4/2/2003	57.800
7/9/2003	52.700
10/7/2003	64.900

### Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW358	33.600	Downgradient	NO
MW361	31.600	Downgradient	NO
MW364	28.600	Downgradient	NO
MW367	19.400	Sidegradient	NO
MW370	26.100	Upgradient	NO
MW373	78.400	Upgradient	YES

### Conclusion of Statistical Analysis on Historical Data

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

MW373

### Statistics on Background Data

X= 43.413

S= 13.444

CV= 0.310

K factor\*\* = 2.523

TL= 77.331

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

# C-746-U Third Quarter 2014 Statistical Analysis Chemical Oxygen Demand (COD)

**LRGA**  
**UNITS: mg/L**

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

## Background Data from Upgradient Wells

Well Number: MW370

Date Collected	Result
3/17/2002	35.000
4/23/2002	134.000
7/15/2002	35.000
10/8/2002	35.000
1/8/2003	35.000
4/3/2003	35.000
7/9/2003	35.000
10/6/2003	35.000

Well Number: MW373

Date Collected	Result
3/18/2002	35.000
4/23/2002	47.000
7/16/2002	35.000
10/8/2002	35.000
1/7/2003	35.000
4/2/2003	35.000
7/9/2003	35.000
10/7/2003	35.000

## Statistics on Background Data

**X= 41.938**  
**S= 24.732**  
**CV= 0.590**  
**K factor\*\* = 2.523**  
**TL= 104.336**

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

## Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW358	22.700	Downgradient	NO
MW361	17.800	Downgradient	NO
MW364	12.200	Downgradient	NO
MW367	20.000	Sidegradient	NO
MW370	51.600	Upgradient	NO
MW373	11.600	Upgradient	NO

## Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

## C-746-U Third Quarter 2014 Statistical Analysis Chloride

**LRGA**  
**UNITS: mg/L**

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

### Background Data from Upgradient Wells

Well Number: MW370

Date Collected	Result
7/15/2002	55.500
10/8/2002	53.600
1/8/2003	52.900
4/3/2003	53.600
7/9/2003	51.900
10/6/2003	53.000
1/7/2004	53.000
4/7/2004	51.600

Well Number: MW373

Date Collected	Result
7/16/2002	40.600
10/8/2002	38.800
1/7/2003	39.000
4/2/2003	38.400
7/9/2003	38.100
10/7/2003	38.000
1/6/2004	37.900
4/7/2004	38.800

### Statistics on Background Data

**X= 45.919**  
**S= 7.524**  
**CV= 0.164**  
**K factor\*\* = 2.523**  
**TL= 64.901**

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

### Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW358	35.400	Downgradient	NO
MW361	32.000	Downgradient	NO
MW364	30.400	Downgradient	NO
MW367	18.400	Sidegradient	NO
MW370	39.500	Upgradient	NO
MW373	44.200	Upgradient	NO

### Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

# C-746-U Third Quarter 2014 Statistical Analysis cis-1,2-Dichloroethene

**LRGA**  
**UNITS: ug/L**

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

## Background Data from Upgradient Wells

Well Number: MW370

Date Collected	Result
3/17/2002	5.000
4/23/2002	5.000
7/15/2002	5.000
10/8/2002	5.000
1/8/2003	5.000
4/3/2003	5.000
7/9/2003	5.000
10/6/2003	5.000

Well Number: MW373

Date Collected	Result
3/18/2002	5.000
4/23/2002	25.000
7/16/2002	5.000
10/8/2002	5.000
1/7/2003	5.000
4/2/2003	5.000
7/9/2003	5.000
10/7/2003	5.000

## Statistics on Background Data

**X= 6.250**  
**S= 5.000**  
**CV= 0.800**  
**K factor\*\* = 2.523**  
**TL= 18.865**

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

## Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW358	1.000	Downgradient	NO
MW361	1.000	Downgradient	NO
MW364	1.000	Downgradient	NO
MW367	1.000	Sidegradient	NO
MW370	1.000	Upgradient	NO
MW373	0.320	Upgradient	NO

## Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

# C-746-U Third Quarter 2014 Statistical Analysis Cobalt

**LRGA**  
**UNITS: mg/L**

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

Background Data from Upgradient Wells		Statistics on Background Data	Transformed Background Data from Upgradient Wells	
Well Number: MW370		<b>X= 0.027</b> <b>S= 0.032</b> <b>CV= 1.165</b> <b>K factor** = 2.523</b> <b>TL= 0.108</b>	Well Number: MW370	
Date Collected	Result		Date Collected	LN(Result)
3/17/2002	0.025		3/17/2002	-3.689
4/23/2002	0.025		4/23/2002	-3.689
7/15/2002	0.025		7/15/2002	-3.689
10/8/2002	0.017		10/8/2002	-4.051
1/8/2003	0.011		1/8/2003	-4.556
4/3/2003	0.009		4/3/2003	-4.677
7/9/2003	0.137		7/9/2003	-1.988
10/6/2003	0.046		10/6/2003	-3.073
Well Number: MW373		<b>X= -4.058</b> <b>S= 1.011</b> <b>CV= -0.249</b> <b>K factor** = 2.523</b> <b>TL= -1.507</b>	Well Number: MW373	
Date Collected	Result		Date Collected	LN(Result)
3/18/2002	0.025		3/18/2002	-3.689
4/23/2002	0.034		4/23/2002	-3.381
7/16/2002	0.025		7/16/2002	-3.689
10/8/2002	0.004		10/8/2002	-5.494
1/7/2003	0.003		1/7/2003	-5.672
4/2/2003	0.004		4/2/2003	-5.605
7/9/2003	0.041		7/9/2003	-3.206
10/7/2003	0.008		10/7/2003	-4.776

Because CV is greater than 1, the natural logarithm of background and test well results were calculated.

Third Quarter 2014 Data Collected in July 2014				Transformed Third Quarter 2014 Data Collected in July 2014		
Well No.	Result	Gradient	Result >TL?	Well Number	LN(Result)	Result >TL?
MW358	0.003	Downgradient	N/A	MW358	-5.714	NO
MW361	0.000	Downgradient	N/A	MW361	-8.805	NO
MW364	0.001	Downgradient	N/A	MW364	-7.169	NO
MW367	0.004	Sidegradient	N/A	MW367	-5.583	NO
MW370	0.001	Upgradient	N/A	MW370	-7.562	NO
MW373	0.000	Upgradient	N/A	MW373	-8.805	NO

## Conclusion of Statistical Analysis on Transformed Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

## C-746-U Third Quarter 2014 Statistical Analysis Conductivity

**LRGA**  
**UNITS: umho/cm**

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

### Background Data from Upgradient Wells

Well Number: MW370

Date Collected	Result
3/17/2002	406.000
4/23/2002	543.000
7/15/2002	476.000
10/8/2002	441.000
1/8/2003	486.000
4/3/2003	466.000
7/9/2003	479.000
10/6/2003	435.000

Well Number: MW373

Date Collected	Result
3/18/2002	661.000
4/23/2002	801.000
7/16/2002	774.000
10/8/2002	680.000
1/7/2003	686.500
4/2/2003	763.000
7/9/2003	828.000
10/7/2003	814.000

### Statistics on Background Data

**X= 608.719**  
**S= 156.157**  
**CV= 0.257**  
**K factor\*\* = 2.523**  
**TL= 1002.702**

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

### Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW358	517.00	Downgradient	NO
MW361	484.00	Downgradient	NO
MW364	476.00	Downgradient	NO
MW367	335.00	Sidegradient	NO
MW370	429.00	Upgradient	NO
MW373	904.00	Upgradient	NO

### Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,



## C-746-U Third Quarter 2014 Statistical Analysis Dissolved Oxygen

**LRGA**  
**UNITS: mg/L**

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

### Background Data from Upgradient Wells

Well Number: MW370

Date Collected	Result
3/17/2002	4.320
4/23/2002	1.240
7/15/2002	0.750
10/8/2002	0.940
1/8/2003	3.080
4/3/2003	1.450
7/9/2003	1.220
10/6/2003	1.070

Well Number: MW373

Date Collected	Result
3/18/2002	3.040
4/23/2002	0.030
7/16/2002	0.230
10/8/2002	0.860
1/7/2003	0.210
4/2/2003	1.190
7/9/2003	1.100
10/7/2003	1.460

### Statistics on Background Data

**X= 1.387**  
**S= 1.153**  
**CV= 0.831**  
**K factor\*\* = 2.523**  
**TL= 4.295**

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

### Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW358	1.480	Downgradient	NO
MW361	3.120	Downgradient	NO
MW364	2.870	Downgradient	NO
MW367	2.800	Sidegradient	NO
MW370	3.670	Upgradient	NO
MW373	2.400	Upgradient	NO

### Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

## C-746-U Third Quarter 2014 Statistical Analysis Dissolved Solids

**LRGA**  
**UNITS: mg/L**

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

### Background Data from Upgradient Wells

Well Number: MW370

Date Collected	Result
3/17/2002	236.000
4/23/2002	337.000
7/15/2002	266.000
10/8/2002	240.000
1/8/2003	282.000
4/3/2003	238.000
7/9/2003	248.000
10/6/2003	224.000

Well Number: MW373

Date Collected	Result
3/18/2002	427.000
4/23/2002	507.000
7/16/2002	464.000
10/8/2002	408.000
1/7/2003	404.000
4/2/2003	450.000
7/9/2003	487.000
10/7/2003	481.000

### Statistics on Background Data

**X= 356.188**  
**S= 106.752**  
**CV= 0.300**  
**K factor\*\* = 2.523**  
**TL= 625.523**

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

### Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW358	286.00	Downgradient	NO
MW361	263.00	Downgradient	NO
MW364	277.00	Downgradient	NO
MW367	140.00	Sidegradient	NO
MW370	119.00	Upgradient	NO
MW373	540.00	Upgradient	NO

### Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

## C-746-U Third Quarter 2014 Statistical Analysis Iron

**LRGA**  
**UNITS: mg/L**

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

### Background Data from Upgradient Wells

Well Number: MW370

Date Collected	Result
3/17/2002	9.340
4/23/2002	4.330
7/15/2002	3.520
10/8/2002	7.450
1/8/2003	7.040
4/3/2003	4.640
7/9/2003	15.800
10/6/2003	6.490

Well Number: MW373

Date Collected	Result
3/18/2002	37.600
4/23/2002	19.000
7/16/2002	10.700
10/8/2002	3.750
1/7/2003	3.870
4/2/2003	3.500
7/9/2003	7.720
10/7/2003	2.930

### Statistics on Background Data

**X= 9.230**  
**S= 8.841**  
**CV= 0.958**  
**K factor\*\* = 2.523**  
**TL= 31.535**

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

### Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW358	0.736	Downgradient	NO
MW361	0.103	Downgradient	NO
MW364	4.200	Downgradient	NO
MW367	9.070	Sidegradient	NO
MW370	0.066	Upgradient	NO
MW373	0.146	Upgradient	NO

### Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

## C-746-U Third Quarter 2014 Statistical Analysis Magnesium

**LRGA**  
**UNITS: mg/L**

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

### Background Data from Upgradient Wells

Well Number: MW370

Date Collected	Result
3/17/2002	12.100
4/23/2002	15.100
7/15/2002	12.400
10/8/2002	12.200
1/8/2003	11.500
4/3/2003	12.300
7/9/2003	10.000
10/6/2003	12.100

Well Number: MW373

Date Collected	Result
3/18/2002	24.800
4/23/2002	22.700
7/16/2002	18.800
10/8/2002	21.100
1/7/2003	19.900
4/2/2003	25.500
7/9/2003	23.300
10/7/2003	26.900

### Statistics on Background Data

**X= 17.544**  
**S= 5.911**  
**CV= 0.337**  
**K factor\*\* = 2.523**  
**TL= 32.458**

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

### Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW358	15.000	Downgradient	NO
MW361	13.500	Downgradient	NO
MW364	12.400	Downgradient	NO
MW367	9.180	Sidegradient	NO
MW370	11.000	Upgradient	NO
MW373	27.500	Upgradient	NO

### Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

## C-746-U Third Quarter 2014 Statistical Analysis Manganese

**LRGA**  
**UNITS: mg/L**

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

### Background Data from Upgradient Wells

Well Number: MW370

Date Collected	Result
3/17/2002	0.244
4/23/2002	1.820
7/15/2002	1.220
10/8/2002	0.988
1/8/2003	0.729
4/3/2003	0.637
7/9/2003	2.510
10/6/2003	1.050

Well Number: MW373

Date Collected	Result
3/18/2002	0.355
4/23/2002	2.160
7/16/2002	1.390
10/8/2002	0.717
1/7/2003	0.587
4/2/2003	0.545
7/9/2003	1.760
10/7/2003	0.570

### Statistics on Background Data

**X= 1.080**  
**S= 0.674**  
**CV= 0.624**  
**K factor\*\* = 2.523**  
**TL= 2.780**

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

### Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW358	0.201	Downgradient	NO
MW361	0.016	Downgradient	NO
MW364	0.412	Downgradient	NO
MW367	1.320	Sidegradient	NO
MW370	0.002	Upgradient	NO
MW373	0.003	Upgradient	NO

### Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

# C-746-U Third Quarter 2014 Statistical Analysis Nickel

**LRGA**  
**UNITS: mg/L**

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

## Background Data from Upgradient Wells

Well Number: MW370

Date Collected	Result
3/17/2002	0.050
4/23/2002	0.050
7/15/2002	0.050
10/8/2002	0.005
1/8/2003	0.005
4/3/2003	0.005
7/9/2003	0.026
10/6/2003	0.010

Well Number: MW373

Date Collected	Result
3/18/2002	0.050
4/23/2002	0.050
7/16/2002	0.050
10/8/2002	0.005
1/7/2003	0.005
4/2/2003	0.005
7/9/2003	0.011
10/7/2003	0.005

## Statistics on Background Data

**X= 0.024**  
**S= 0.022**  
**CV= 0.901**  
**K factor\*\* = 2.523**  
**TL= 0.078**

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

## Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW358	0.002	Downgradient	NO
MW361	0.001	Downgradient	NO
MW364	0.002	Downgradient	NO
MW367	0.002	Sidegradient	NO
MW370	0.001	Upgradient	NO
MW373	0.001	Upgradient	NO

## Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

# C-746-U Third Quarter 2014 Statistical Analysis Oxidation-Reduction Potential

**LRGA**  
**UNITS: mV**

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

Background Data from Upgradient Wells		Statistics on Background Data	Transformed Background Data from Upgradient Wells	
Well Number: MW370		<b>X= 46.688</b> <b>S= 60.986</b> <b>CV= 1.306</b> <b>K factor** = 2.523</b> <b>TL= 200.555</b>	Well Number: MW370	
Date Collected	Result		Date Collected	LN(Result)
3/17/2002	140.000		3/17/2002	4.942
4/23/2002	-15.000		4/23/2002	#Func!
7/15/2002	5.000		7/15/2002	1.609
4/3/2003	49.000		4/3/2003	3.892
7/9/2003	-35.000		7/9/2003	#Func!
10/6/2003	40.000		10/6/2003	3.689
1/7/2004	101.000		1/7/2004	4.615
4/7/2004	105.000		4/7/2004	4.654
Well Number: MW373		<b>X = error</b> <b>S = error</b> <b>CV = error</b> <b>K factor** = 2.523</b> <b>TL# = 4.942</b>	Well Number: MW373	
Date Collected	Result		Date Collected	LN(Result)
3/18/2002	140.000		3/18/2002	4.942
4/23/2002	-20.000		4/23/2002	#Func!
10/8/2002	10.000		10/8/2002	2.303
1/7/2003	10.000		1/7/2003	2.303
4/2/2003	67.000		4/2/2003	4.205
7/9/2003	-29.000		7/9/2003	#Func!
10/7/2003	127.000		10/7/2003	4.844
1/6/2004	52.000		1/6/2004	3.951

Because CV is greater than 1, the natural logarithm of background and test well results were calculated.

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

Third Quarter 2014 Data Collected in July 2014				Transformed Third Quarter 2014 Data Collected in July 2014		
Well No.	Result	Gradient	Result >TL?	Well Number	LN(Result)	Result >TL?
MW358	184.000	Downgradient	N/A	MW358	5.215	YES
MW361	429.000	Downgradient	N/A	MW361	6.061	YES
MW364	204.000	Downgradient	N/A	MW364	5.318	YES
MW367	159.000	Sidegradient	N/A	MW367	5.069	YES
MW370	353.000	Upgradient	N/A	MW370	5.866	YES
MW373	374.000	Upgradient	N/A	MW373	5.924	YES

Conclusion of Statistical Analysis on Transformed Historical Data	
The following test well(s) exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to historical background data.	
MW358	

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

**C-746-U Third Quarter 2014 Statistical Analysis**  
**Oxidation-Reduction Potential\*\*Eqvlpwgf +**

**LRGA**  
**UNITS: mV**

MW361
MW364
MW367
MW370
MW373

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,



# C-746-U Third Quarter 2014 Statistical Analysis pH

**LRGA**  
**UNITS: Std Unit**

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL and LL. If the test well result exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

## Background Data from Upgradient Wells

Well Number: MW370

Date Collected	Result
3/17/2002	6.300
4/23/2002	6.400
7/15/2002	6.300
10/8/2002	6.300
1/8/2003	6.400
4/3/2003	6.500
7/9/2003	6.300
10/6/2003	6.500

Well Number: MW373

Date Collected	Result
3/18/2002	6.000
4/23/2002	6.300
7/16/2002	6.450
10/8/2002	6.180
1/7/2003	6.350
4/2/2003	6.140
7/9/2003	6.100
10/7/2003	6.000

## Statistics on Background Data

**X= 6.283**  
**S= 0.159**  
**CV= 0.025**  
**K factor\*\* = 2.904**  
**TL= 6.745**  
**LL= 5.820**

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

## Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result >TL?	Result <LL?
MW358	6.150	Downgradient	NO	NO
MW361	6.130	Downgradient	NO	NO
MW364	6.190	Downgradient	NO	NO
MW367	6.100	Sidegradient	NO	NO
MW370	6.080	Upgradient	NO	NO
MW373	6.080	Upgradient	NO	NO

## Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

\*\* The K-factor was adjusted for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K- factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, <http://www.itl.nist.gov/div898/handbook/>, 2009.

# C-746-U Third Quarter 2014 Statistical Analysis Radium-226

**LRGA**  
**UNITS: pCi/L**

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

Background Data from Upgradient Wells		Statistics on Background Data		Transformed Background Data from Upgradient Wells		
Well Number:	MW370	X= 2.158 S= 5.739 CV= 2.660 K factor** = 2.523 TL= 16.637	Because CV is greater than 1, the natural logarithm of background and test well results were calculated.	Well Number:	MW370	
Date Collected	Result			Date Collected	LN(Result)	
7/15/2002	10.100			7/15/2002	2.313	
10/8/2002	-0.825			10/8/2002	#Func!	
1/8/2003	0.415			1/8/2003	-0.879	
10/6/2003	0.520			10/6/2003	-0.654	
1/7/2004	1.030			1/7/2004	0.030	
4/7/2004	0.434			4/7/2004	-0.835	
7/13/2004	0.532	Statistics on Transformed Background Data	# Because the natural log was not possible for all background values, the TL was considered equal to the maximum background value.	7/13/2004	-0.631	
10/7/2004	0.299			10/7/2004	-1.207	
Well Number:	MW373			Well Number:	MW373	
Date Collected	Result			Date Collected	LN(Result)	
7/16/2002	21.500			7/16/2002	3.068	
10/8/2002	0.033			10/8/2002	-3.420	
1/7/2003	-0.844			1/7/2003	#Func!	
10/7/2003	0.000			10/7/2003	#Func!	
1/6/2004	0.177	X = error S = error CV = error K factor** = 2.523 TL# = 3.068		1/6/2004	-1.732	
4/7/2004	0.792			4/7/2004	-0.233	
7/14/2004	0.327			7/14/2004	-1.118	
10/7/2004	0.033			10/7/2004	-3.411	
Third Quarter 2014 Data Collected in July 2014				Transformed Third Quarter 2014 Data Collected in July 2014		
Well No.	Result	Gradient	Result >TL?	Well Number	LN(Result)	Result >TL?
MW358	0.363	Downgradient	N/A	MW358	-1.013	NO
MW361	0.154	Downgradient	N/A	MW361	-1.871	NO
MW364	0.792	Downgradient	N/A	MW364	-0.233	NO
MW367	0.909	Sidegradient	N/A	MW367	-0.095	NO
MW370	0.635	Upgradient	N/A	MW370	-0.454	NO
MW373	0.425	Upgradient	N/A	MW373	-0.856	NO
Conclusion of Statistical Analysis on Transformed Historical Data						
None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.						

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

## C-746-U Third Quarter 2014 Statistical Analysis Sodium

**LRGA**  
**UNITS: mg/L**

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

### Background Data from Upgradient Wells

Well Number: MW370

Date Collected	Result
3/17/2002	31.800
4/23/2002	50.000
7/15/2002	44.700
10/8/2002	40.000
1/8/2003	44.600
4/3/2003	41.900
7/9/2003	40.000
10/6/2003	38.100

Well Number: MW373

Date Collected	Result
3/18/2002	43.400
4/23/2002	79.800
7/16/2002	87.700
10/8/2002	61.600
1/7/2003	59.300
4/2/2003	62.100
7/9/2003	50.100
10/7/2003	49.600

### Statistics on Background Data

**X= 51.544**  
**S= 15.227**  
**CV= 0.295**  
**K factor\*\* = 2.523**  
**TL= 89.962**

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

### Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW358	41.000	Downgradient	NO
MW361	42.600	Downgradient	NO
MW364	42.300	Downgradient	NO
MW367	23.600	Sidegradient	NO
MW370	36.900	Upgradient	NO
MW373	66.000	Upgradient	NO

### Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

# C-746-U Third Quarter 2014 Statistical Analysis Sulfate

**LRGA**  
**UNITS: mg/L**

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

Background Data from Upgradient Wells		Statistics on Background Data	Transformed Background Data from Upgradient Wells	
Well Number: MW370		<b>X= 122.381</b> <b>S= 195.095</b> <b>CV= 1.594</b> <b>K factor** = 2.523</b> <b>TL= 614.606</b>	Well Number: MW370	
Date Collected	Result		Date Collected	LN(Result)
3/17/2002	17.400		3/17/2002	2.856
4/23/2002	37.900		4/23/2002	3.635
7/15/2002	15.700		7/15/2002	2.754
10/8/2002	13.400		10/8/2002	2.595
1/8/2003	14.400		1/8/2003	2.667
4/3/2003	18.100		4/3/2003	2.896
7/9/2003	9.600		7/9/2003	2.262
10/6/2003	16.500		10/6/2003	2.803
Well Number: MW373		<b>X= 3.985</b> <b>S= 1.323</b> <b>CV= 0.332</b> <b>K factor** = 2.523</b> <b>TL= 7.322</b>	Well Number: MW373	
Date Collected	Result		Date Collected	LN(Result)
3/18/2002	163.300		3/18/2002	5.096
4/23/2002	809.600		4/23/2002	6.697
7/16/2002	109.400		7/16/2002	4.695
10/8/2002	110.600		10/8/2002	4.706
1/7/2003	113.700		1/7/2003	4.734
4/2/2003	133.000		4/2/2003	4.890
7/9/2003	182.100		7/9/2003	5.205
10/7/2003	193.400		10/7/2003	5.265

Because CV is greater than 1, the natural logarithm of background and test well results were calculated.

Third Quarter 2014 Data Collected in July 2014				Transformed Third Quarter 2014 Data Collected in July 2014		
Well No.	Result	Gradient	Result >TL?	Well Number	LN(Result)	Result >TL?
MW358	85.800	Downgradient	N/A	MW358	4.452	NO
MW361	78.900	Downgradient	N/A	MW361	4.368	NO
MW364	65.700	Downgradient	N/A	MW364	4.185	NO
MW367	29.800	Sidegradient	N/A	MW367	3.395	NO
MW370	19.000	Upgradient	N/A	MW370	2.944	NO
MW373	203.000	Upgradient	N/A	MW373	5.313	NO

## Conclusion of Statistical Analysis on Transformed Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

# C-746-U Third Quarter 2014 Statistical Analysis Technetium-99

**LRGA**  
**UNITS: pCi/L**

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

Background Data from Upgradient Wells	Statistics on Background Data	Transformed Background Data from Upgradient Wells
Well Number: MW370	<b>X= 7.655</b>	Well Number: MW370
Date Collected Result	<b>S= 13.274</b>	Date Collected LN(Result)
3/17/2002 10.800	<b>CV= 1.734</b>	3/17/2002 2.380
4/23/2002 8.530	<b>K factor** = 2.523</b>	4/23/2002 2.144
7/15/2002 5.090	<b>TL= 41.146</b>	7/15/2002 1.627
10/8/2002 4.780	Because CV is greater than 1, the natural logarithm of background and test well results were calculated.	10/8/2002 1.564
1/8/2003 -5.120		1/8/2003 #Func!
4/3/2003 5.110		4/3/2003 1.631
7/9/2003 4.250		7/9/2003 1.447
10/6/2003 6.540		10/6/2003 1.878
Well Number: MW373	Statistics on Transformed Background Data	Well Number: MW373
Date Collected Result	<b>X = error</b>	Date Collected LN(Result)
3/18/2002 16.500	<b>S = error</b>	3/18/2002 2.803
4/23/2002 3.490	<b>CV = error</b>	4/23/2002 1.250
7/16/2002 1.420	<b>K factor** = 2.523</b>	7/16/2002 0.351
10/8/2002 -6.060	<b>TL# = 3.833</b>	10/8/2002 #Func!
1/7/2003 -8.410	# Because the natural log was not possible for all background values, the TL was considered equal to the maximum background value.	1/7/2003 #Func!
4/2/2003 26.300		4/2/2003 3.270
7/9/2003 3.060		7/9/2003 1.118
10/7/2003 46.200		10/7/2003 3.833

Third Quarter 2014 Data Collected in July 2014	Transformed Third Quarter 2014 Data Collected in July 2014
Well No. Result Gradient Result >TL?	Well Number LN(Result) Result >TL?
MW358 60.600 Downgradient N/A	MW358 4.104 <b>YES</b>
MW361 58.900 Downgradient N/A	MW361 4.076 <b>YES</b>
MW364 59.700 Downgradient N/A	MW364 4.089 <b>YES</b>
MW367 8.960 Sidegradient N/A	MW367 2.193 NO
MW370 30.800 Upgradient N/A	MW370 3.428 NO
MW373 20.100 Upgradient N/A	MW373 3.001 NO

Conclusion of Statistical Analysis on Transformed Historical Data
The following test well(s) exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to historical background data.
<b>MW358</b>

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

**C-746-U Third Quarter 2014 Statistical Analysis**  
**Technetium-99m Equipwgf +**

**LRGA**  
**UNITS: pCi/L**

MW361

MW364

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

# C-746-U Third Quarter 2014 Statistical Analysis Total Organic Carbon (TOC)

**LRGA**  
**UNITS: mg/L**

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

Background Data from Upgradient Wells		Statistics on Background Data		Transformed Background Data from Upgradient Wells	
Well Number: MW370		<b>X= 6.169</b> <b>S= 12.072</b> <b>CV= 1.957</b> <b>K factor** = 2.523</b> <b>TL= 36.626</b>		Well Number: MW370	
Date Collected	Result			Date Collected	LN(Result)
3/17/2002	1.200			3/17/2002	0.182
4/23/2002	4.300			4/23/2002	1.459
7/15/2002	2.600			7/15/2002	0.956
10/8/2002	2.300			10/8/2002	0.833
1/8/2003	3.000			1/8/2003	1.099
4/3/2003	1.200			4/3/2003	0.182
7/9/2003	2.600			7/9/2003	0.956
10/6/2003	1.700			10/6/2003	0.531
Well Number: MW373		<b>X= 1.069</b> <b>S= 1.014</b> <b>CV= 0.948</b> <b>K factor** = 2.523</b> <b>TL= 3.626</b>		Well Number: MW373	
Date Collected	Result			Date Collected	LN(Result)
3/18/2002	1.100			3/18/2002	0.095
4/23/2002	17.500			4/23/2002	2.862
7/16/2002	49.000			7/16/2002	3.892
10/8/2002	2.900			10/8/2002	1.065
1/7/2003	3.900			1/7/2003	1.361
4/2/2003	2.500			4/2/2003	0.916
7/9/2003	1.700			7/9/2003	0.531
10/7/2003	1.200			10/7/2003	0.182

Because CV is greater than 1, the natural logarithm of background and test well results were calculated.

Third Quarter 2014 Data Collected in July 2014				Transformed Third Quarter 2014 Data Collected in July 2014		
Well No.	Result	Gradient	Result >TL?	Well Number	LN(Result)	Result >TL?
MW358	1.020	Downgradient	N/A	MW358	0.020	NO
MW361	0.814	Downgradient	N/A	MW361	-0.206	NO
MW364	0.989	Downgradient	N/A	MW364	-0.011	NO
MW367	0.969	Sidegradient	N/A	MW367	-0.031	NO
MW370	0.852	Upgradient	N/A	MW370	-0.160	NO
MW373	1.200	Upgradient	N/A	MW373	0.182	NO

## Conclusion of Statistical Analysis on Transformed Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

# C-746-U Third Quarter 2014 Statistical Analysis Total Organic Halides (TOX)

**LRGA**  
**UNITS: ug/L**

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

## Background Data from Upgradient Wells

Well Number: MW370

Date Collected	Result
3/17/2002	50.000
4/23/2002	228.000
7/15/2002	88.000
10/8/2002	58.000
1/8/2003	72.400
4/3/2003	26.600
7/9/2003	16.400
10/6/2003	31.100

Well Number: MW373

Date Collected	Result
3/18/2002	50.000
4/23/2002	276.000
7/16/2002	177.000
10/8/2002	76.000
1/7/2003	45.900
4/2/2003	57.800
7/9/2003	10.000
10/7/2003	13.900

## Statistics on Background Data

**X= 79.819**  
**S= 78.470**  
**CV= 0.983**  
**K factor\*\* = 2.523**  
**TL= 277.798**

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

## Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW358	6.920	Downgradient	NO
MW361	6.600	Downgradient	NO
MW364	7.980	Downgradient	NO
MW367	10.000	Sidegradient	NO
MW370	7.520	Upgradient	NO
MW373	11.800	Upgradient	NO

## Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,



## C-746-U Third Quarter 2014 Statistical Analysis Trichloroethene

**LRGA**  
**UNITS: ug/L**

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

### Background Data from Upgradient Wells

Well Number: MW370

Date Collected	Result
3/17/2002	19.000
4/23/2002	17.000
7/15/2002	15.000
10/8/2002	18.000
1/8/2003	17.000
4/3/2003	18.000
7/9/2003	15.000
10/6/2003	16.000

Well Number: MW373

Date Collected	Result
3/18/2002	5.000
4/23/2002	25.000
7/16/2002	3.000
10/8/2002	4.000
1/7/2003	6.000
4/2/2003	5.000
7/9/2003	6.000
10/7/2003	6.000

### Statistics on Background Data

**X= 12.188**  
**S= 6.950**  
**CV= 0.570**  
**K factor\*\* = 2.523**  
**TL= 29.721**

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

### Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW358	5.580	Downgradient	NO
MW361	4.700	Downgradient	NO
MW364	3.480	Downgradient	NO
MW367	1.130	Sidegradient	NO
MW370	1.350	Upgradient	NO
MW373	9.640	Upgradient	NO

### Conclusion of Statistical Analysis on Historical Data

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

\*\*Trichloroethene has an MCL of 5.0 ug/L. A TL calculation was performed for the URGAs because some of the URGAs wells have current concentrations that exceed the MCL.

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\*, Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

## C-746-U Third Quarter 2014 Statistical Analysis Zinc

**LRGA**  
**UNITS: mg/L**

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

### Background Data from Upgradient Wells

Well Number: MW370

Date Collected	Result
3/17/2002	0.100
4/23/2002	0.100
7/15/2002	0.100
10/8/2002	0.025
1/8/2003	0.035
4/3/2003	0.035
7/9/2003	0.020
10/6/2003	0.020

Well Number: MW373

Date Collected	Result
3/18/2002	0.100
4/23/2002	0.100
7/16/2002	0.100
10/8/2002	0.025
1/7/2003	0.035
4/2/2003	0.035
7/9/2003	0.023
10/7/2003	0.020

### Statistics on Background Data

**X= 0.055**  
**S= 0.037**  
**CV= 0.673**  
**K factor\*\* = 2.523**  
**TL= 0.147**

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

### Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW358	0.006	Downgradient	NO
MW361	0.007	Downgradient	NO
MW364	0.037	Downgradient	NO
MW367	0.004	Sidegradient	NO
MW370	0.010	Upgradient	NO
MW373	0.010	Upgradient	NO

### Conclusion of Statistical Analysis on Historical Data

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

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

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

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

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

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

Interim Guidance, EPA, 1989, based on total number of background results

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*,

**ATTACHMENT D2**

**ONE-SIDED UPPER TOLERANCE INTERVAL TEST  
COMPARED TO  
CURRENT BACKGROUND DATA**

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## C-746-U Third Quarter 2014 Statistical Analysis Dissolved Oxygen

UCRS  
UNITS: mg/L

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

### Background Data from Upgradient Wells

Well Number: MW371

Date Collected	Result
9/6/2012	1.140
10/3/2012	1.650
1/10/2013	1.350
4/9/2013	1.610
7/16/2013	2.760
10/8/2013	1.380
1/14/2014	1.970
4/14/2014	3.870

Well Number: MW374

Date Collected	Result
7/19/2012	1.800
10/2/2012	2.980
1/9/2013	3.890
4/8/2013	6.520
7/16/2013	3.410
10/9/2013	2.740
1/14/2014	1.670
4/15/2014	3.440

### Statistics on Background Data

X= 2.636  
S= 1.394  
CV= 0.529  
K factor\*\* = 2.523  
TL= 6.153

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

### Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW359	4.800	Downgradient	NO
MW362	5.360	Downgradient	NO
MW365	5.030	Downgradient	NO
MW368	5.690	Sidegradient	NO
MW371	1.340	Upgradient	NO
MW374	1.760	Upgradient	NO
MW375	1.870	Sidegradient	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 upgradient background concentrations to a statistically-significant level.

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

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

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

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

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*, Interim Guidance, EPA, 1989, based on total number of background results

## C-746-U Third Quarter 2014 Statistical Analysis Oxidation-Reduction Potential

UCRS  
UNITS: mV

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

### Background Data from Upgradient Wells

Well Number: MW371

Date Collected	Result
9/6/2012	820.000
10/3/2012	524.000
1/10/2013	286.000
4/9/2013	690.000
7/16/2013	390.000
10/8/2013	544.000
1/14/2014	374.000
4/14/2014	476.000

Well Number: MW374

Date Collected	Result
7/19/2012	127.000
10/2/2012	211.000
1/9/2013	534.000
4/8/2013	313.000
7/16/2013	344.000
10/9/2013	802.000
1/14/2014	515.000
4/15/2014	499.000

### Statistics on Background Data

X= 465.563  
S= 195.094  
CV= 0.419  
K factor\*\* = 2.523  
TL= 957.785

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

### Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW359	376.000	Downgradient	NO
MW362	215.000	Downgradient	NO
MW365	234.000	Downgradient	NO
MW368	345.000	Sidegradient	NO
MW371	311.000	Upgradient	NO
MW374	259.000	Upgradient	NO
MW375	311.000	Sidegradient	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 ewt t g p v background concentrations to a statistically-significant level.

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

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

TL Upper Tolerance Limit,  $TL = X + (K * S)$

X Mean,  $X = (\text{sum of background results})/(\text{count of background results})$

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*, Interim Guidance, EPA, 1989, based on total number of background results

# C-746-U Third Quarter 2014 Statistical Analysis Sulfate

UCRS  
UNITS: mg/L

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is statistically significant evidence of elevated concentration in that well.

## Background Data from Upgradient Wells

Well Number: MW371

Date Collected	Result
7/26/2012	12.000
10/3/2012	11.000
1/10/2013	9.600
4/9/2013	14.000
7/16/2013	19.000
10/8/2013	13.000
1/14/2014	9.900
4/14/2014	16.400

Well Number: MW374

Date Collected	Result
7/19/2012	5.100
10/2/2012	5.100
1/9/2013	5.300
4/8/2013	6.000
7/16/2013	5.600
10/9/2013	6.600
1/14/2014	5.100
4/15/2014	5.630

## Statistics on Background Data

X= 9.333  
S= 4.510  
CV= 0.483  
K factor\*\* = 2.523  
TL= 20.713

Because CV is less than or equal to 1, assume normal distribution and continue with statistical analysis.

## Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW359	48.500	Downgradient	YES
MW362	34.600	Downgradient	YES
MW365	59.900	Downgradient	YES
MW368	43.200	Sidegradient	YES
MW371	18.600	Upgradient	NO
MW374	5.640	Upgradient	NO
MW375	30.500	Sidegradient	YES

## Conclusion of Statistical Analysis on Current Data

The following test well(s) exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to current background data.

MW359

MW362

MW365

MW368

MW375

CV Coefficient-of-Variation,  $CV = S/X$  If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit,  $TL = X + (K * S)$

X Mean,  $X = (\text{sum of background results})/(\text{count of background results})$

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*, Interim Guidance, EPA, 1989, based on total number of background results

## C-746-U Third Quarter 2014 Statistical Analysis Calcium

**URGA**  
**UNITS: mg/L**

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is statistically significant evidence of elevated concentration in that well.

### Background Data from Upgradient Wells

Well Number: MW369

Date Collected	Result
7/23/2012	15.900
10/3/2012	16.400
1/10/2013	16.300
4/10/2013	16.400
7/16/2013	19.900
10/8/2013	16.200
1/14/2014	21.800
4/14/2014	16.400

Well Number: MW372

Date Collected	Result
7/19/2012	62.400
10/2/2012	67.000
1/9/2013	66.900
4/8/2013	65.900
7/16/2013	63.500
10/9/2013	60.200
1/14/2014	31.300
4/16/2014	70.500

### Statistics on Background Data

**X= 39.188**  
**S= 24.078**  
**CV= 0.614**  
**K factor\*\* = 2.523**  
**TL= 99.935**

Because CV is less than or equal to 1,  
assume normal distribution and continue  
with statistical analysis.

### Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW357	27.300	Downgradient	NO
MW360	26.700	Downgradient	NO
MW363	27.700	Downgradient	NO
MW366	28.200	Sidegradient	NO
MW369	15.500	Upgradient	NO
MW372	59.100	Upgradient	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 ewt t g p v background concentrations to a statistically-significant level.**

CV Coefficient-of-Variation,  $CV = S/X$  If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation,  $S = [\text{Sum } ((\text{background result} - X)^2) / (\text{count of background results} - 1)]^{0.5}$

TL Upper Tolerance Limit,  $TL = X + (K * S)$

X Mean,  $X = (\text{sum of background results}) / (\text{count of background results})$

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*, Interim Guidance, EPA, 1989, based on total number of background results



## C-746-U Third Quarter 2014 Statistical Analysis Conductivity

**URGA**  
**UNITS: umho/cm**

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test 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.

### Background Data from Upgradient Wells

Well Number: MW369

Date Collected	Result
7/23/2012	401.000
10/3/2012	392.000
1/10/2013	365.000
4/10/2013	392.000
7/16/2013	427.000
10/8/2013	376.000
1/14/2014	392.000
4/14/2014	380.000

Well Number: MW372

Date Collected	Result
9/6/2012	833.000
10/2/2012	855.000
1/9/2013	860.000
4/8/2013	879.000
7/16/2013	822.000
10/9/2013	791.000
1/14/2014	759.000
4/16/2014	837.000

### Statistics on Background Data

**X= 610.063**  
**S= 228.542**  
**CV= 0.375**  
**K factor\*\* = 2.523**  
**TL= 1186.674**

Because CV is less than or equal to 1,  
assume normal distribution and continue  
with statistical analysis.

### Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW357	440.000	Downgradient	NO
MW360	568.000	Downgradient	NO
MW363	402.000	Downgradient	NO
MW366	459.000	Sidegradient	NO
MW369	370.000	Upgradient	NO
MW372	839.000	Upgradient	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 ewt tgp\background concentrations to a statistically-significant level.**

CV Coefficient-of-Variation,  $CV = S/X$  If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation,  $S = [\text{Sum } ((\text{background result} - X)^2) / [\text{count of background results} - 1]]^{0.5}$

TL Upper Tolerance Limit,  $TL = X + (K * S)$

X Mean,  $X = (\text{sum of background results}) / (\text{count of background results})$

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*, Interim Guidance, EPA, 1989, based on total number of background results

## C-746-U Third Quarter 2014 Statistical Analysis Oxidation-Reduction Potential

**URGA**  
**UNITS: mV**

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is statistically significant evidence of elevated concentration in that well.

### Background Data from Upgradient Wells

Well Number: MW369

Date Collected	Result
7/23/2012	393.000
10/3/2012	588.000
1/10/2013	675.000
4/10/2013	580.000
7/16/2013	284.000
10/8/2013	750.000
1/14/2014	438.000
4/14/2014	514.000

Well Number: MW372

Date Collected	Result
9/6/2012	41.000
10/2/2012	-6.000
1/9/2013	43.000
4/8/2013	28.000
7/16/2013	273.000
10/9/2013	519.000
1/14/2014	740.000
4/16/2014	236.000

### Statistics on Background Data

**X= 381.000**  
**S= 260.816**  
**CV= 0.685**  
**K factor\*\* = 2.523**  
**TL= 1039.039**

Because CV is less than or equal to 1,  
assume normal distribution and continue  
with statistical analysis.

### Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW357	416.000	Downgradient	NO
MW360	189.000	Downgradient	NO
MW363	354.000	Downgradient	NO
MW366	377.000	Sidegradient	NO
MW369	331.000	Upgradient	NO
MW372	126.000	Upgradient	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 ewt t g p v background concentrations to a statistically-significant level.**

CV Coefficient-of-Variation,  $CV = S/X$  If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation,  $S = [\text{Sum } ((\text{background result} - X)^2) / (\text{count of background results} - 1)]^{0.5}$

TL Upper Tolerance Limit,  $TL = X + (K * S)$

X Mean,  $X = (\text{sum of background results}) / (\text{count of background results})$

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*, Interim Guidance, EPA, 1989, based on total number of background results

## C-746-U Third Quarter 2014 Statistical Analysis Sodium

**URGA**  
**UNITS: mg/L**

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is statistically significant evidence of elevated concentration in that well.

### Background Data from Upgradient Wells

Well Number: MW369

Date Collected	Result
7/23/2012	50.000
10/3/2012	56.500
1/10/2013	54.000
4/10/2013	52.400
7/16/2013	54.700
10/8/2013	52.600
1/14/2014	30.600
4/14/2014	58.700

Well Number: MW372

Date Collected	Result
7/19/2012	62.000
10/2/2012	64.300
1/9/2013	63.700
4/8/2013	59.700
7/16/2013	61.600
10/9/2013	61.500
1/14/2014	123.000
4/16/2014	65.500

### Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW357	41.400	Downgradient	NO
MW360	85.500	Downgradient	NO
MW363	37.600	Downgradient	NO
MW366	42.200	Sidegradient	NO
MW369	48.800	Upgradient	NO
MW372	60.700	Upgradient	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 ewt t g p v background concentrations to a statistically-significant level.**

CV Coefficient-of-Variation,  $CV = S/X$  If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation,  $S = [\text{Sum } ((\text{background result} - X)^2) / (\text{count of background results} - 1)]^{0.5}$

TL Upper Tolerance Limit,  $TL = X + (K * S)$

X Mean,  $X = (\text{sum of background results}) / (\text{count of background results})$

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*, Interim Guidance, EPA, 1989, based on total number of background results

## C-746-U Third Quarter 2014 Statistical Analysis Sulfate

**URGA**  
**UNITS: mg/L**

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is statistically significant evidence of elevated concentration in that well.

### Background Data from Upgradient Wells

Well Number: MW369

Date Collected	Result
7/23/2012	9.400
10/3/2012	7.700
1/10/2013	6.500
4/10/2013	7.500
7/16/2013	8.700
10/8/2013	13.000
1/14/2014	8.100
4/14/2014	8.090

Well Number: MW372

Date Collected	Result
7/19/2012	160.000
10/2/2012	170.000
1/9/2013	160.000
4/8/2013	170.000
7/16/2013	150.000
10/9/2013	150.000
1/14/2014	140.000
4/16/2014	176.000

### Statistics on Background Data

**X= 84.062**  
**S= 78.373**  
**CV= 0.932**  
**K factor\*\* = 2.523**  
**TL= 281.798**

Because CV is less than or equal to 1,  
assume normal distribution and continue  
with statistical analysis.

### Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW357	54.700	Downgradient	NO
MW360	41.200	Downgradient	NO
MW363	31.100	Downgradient	NO
MW366	47.900	Sidegradient	NO
MW369	8.170	Upgradient	NO
MW372	170.000	Upgradient	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 ewt tgp\background concentrations to a statistically-significant level.**

CV Coefficient-of-Variation,  $CV = S/X$  If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit,  $TL = X + (K * S)$

X Mean,  $X = (\text{sum of background results})/(\text{count of background results})$

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*, Interim Guidance, EPA, 1989, based on total number of background results

## C-746-U Third Quarter 2014 Statistical Analysis Calcium

**LRGA**  
**UNITS: mg/L**

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is statistically significant evidence of elevated concentration in that well.

### Background Data from Upgradient Wells

Well Number: MW370

Date Collected	Result
7/25/2012	27.700
10/3/2012	27.600
1/14/2013	29.500
4/10/2013	28.200
7/16/2013	29.200
10/8/2013	27.600
1/14/2014	75.800
4/15/2014	28.000

Well Number: MW373

Date Collected	Result
7/23/2012	83.400
10/2/2012	76.200
1/9/2013	82.500
4/9/2013	76.100
7/16/2013	79.000
10/9/2013	76.400
1/14/2014	61.100
4/16/2014	78.400

### Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW358	33.600	Downgradient	NO
MW361	31.600	Downgradient	NO
MW364	28.600	Downgradient	NO
MW367	19.400	Sidegradient	NO
MW370	26.100	Upgradient	NO
MW373	78.400	Upgradient	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 ewt t gp\background concentrations to a statistically-significant level.**

CV Coefficient-of-Variation,  $CV = S/X$  If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation,  $S = [\text{Sum } ((\text{background result} - X)^2) / (\text{count of background results} - 1)]^{0.5}$

TL Upper Tolerance Limit,  $TL = X + (K * S)$

X Mean,  $X = (\text{sum of background results}) / (\text{count of background results})$

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*, Interim Guidance, EPA, 1989, based on total number of background results

## C-746-U Third Quarter 2014 Statistical Analysis Oxidation-Reduction Potential

**LRGA**  
**UNITS: mV**

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is statistically significant evidence of elevated concentration in that well.

### Background Data from Upgradient Wells

Well Number: MW370

Date Collected	Result
7/25/2012	576.000
10/3/2012	551.000
1/14/2013	725.000
4/10/2013	505.000
7/16/2013	387.000
10/8/2013	811.000
1/14/2014	443.000
4/15/2014	535.000

Well Number: MW373

Date Collected	Result
7/23/2012	481.000
10/2/2012	664.000
1/9/2013	83.000
4/9/2013	498.000
7/16/2013	500.000
10/9/2013	627.000
1/14/2014	494.000
4/16/2014	398.000

### Statistics on Background Data

**X= 517.375**  
**S= 162.456**  
**CV= 0.314**  
**K factor\*\* = 2.523**  
**TL= 927.252**

Because CV is less than or equal to 1,  
assume normal distribution and continue  
with statistical analysis.

### Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW358	184.000	Downgradient	NO
MW361	429.000	Downgradient	NO
MW364	204.000	Downgradient	NO
MW367	159.000	Sidegradient	NO
MW370	353.000	Upgradient	NO
MW373	374.000	Upgradient	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 ewt t g p v background concentrations to a statistically-significant level.**

CV Coefficient-of-Variation,  $CV = S/X$  If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation,  $S = [\text{Sum}([(background\ result - X)^2]/[\text{count of background results} - 1])]^{0.5}$

TL Upper Tolerance Limit,  $TL = X + (K * S)$

X Mean,  $X = (\text{sum of background results})/(\text{count of background results})$

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*, Interim Guidance, EPA, 1989, based on total number of background results

## C-746-U Third Quarter 2014 Statistical Analysis Technetium-99

**LRGA**  
**UNITS: pCi/L**

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is statistically significant evidence of elevated concentration in that well.

### Background Data from Upgradient Wells

Well Number: MW370

Date Collected	Result
7/25/2012	3.290
10/3/2012	28.000
1/14/2013	18.300
4/10/2013	12.000
7/16/2013	33.200
10/8/2013	27.900
1/14/2014	10.600
4/15/2014	27.900

Well Number: MW373

Date Collected	Result
7/23/2012	30.700
10/2/2012	62.600
1/9/2013	64.000
4/9/2013	63.700
7/16/2013	63.700
10/9/2013	59.900
1/14/2014	37.800
4/16/2014	43.600

### Statistics on Background Data

**X= 36.699**  
**S= 20.794**  
**CV= 0.567**  
**K factor\*\* = 2.523**  
**TL= 89.163**

Because CV is less than or equal to 1,  
assume normal distribution and continue  
with statistical analysis.

### Third Quarter 2014 Data Collected in July 2014

Well No.	Result	Gradient	Result > TL?
MW358	60.600	Downgradient	NO
MW361	58.900	Downgradient	NO
MW364	59.700	Downgradient	NO
MW367	8.960	Sidegradient	NO
MW370	30.800	Upgradient	NO
MW373	20.100	Upgradient	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 ewt tgp\background concentrations to a statistically-significant level.**

CV Coefficient-of-Variation,  $CV = S/X$  If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation,  $S = [\text{Sum } ((\text{background result} - X)^2) / (\text{count of background results} - 1)]^{0.5}$

TL Upper Tolerance Limit,  $TL = X + (K * S)$

X Mean,  $X = (\text{sum of background results}) / (\text{count of background results})$

\*\* Read from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*, Interim Guidance, EPA, 1989, based on total number of background results

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**ATTACHMENT D2**

**ONE-SIDED UPPER TOLERANCE INTERVAL TEST  
COMPARED TO  
CURRENT BACKGROUND DATA**

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November 3<sup>rd</sup>, 2014

Mr. Craig Jones  
LATA Environmental Services of Kentucky, LLC  
761 Veterans Avenue  
Kevil, Kentucky 42053


Dear Mr. Jones:

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 mathematics, I have over two 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 LATA.

For this project, the statistical analyses conducted on the second quarter 2014 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). For pH, an additional lower tolerance interval was established. For pH only, the test well data was compared to both the upper and lower tolerance intervals to determine if statistically significant deviations in concentration with respect to upgradient well exist.

Sincerely,



Cory Tackett  
LATA Project Chemist

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**APPENDIX E**

**GROUNDWATER FLOW RATE AND DIRECTION**

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## **GROUNDWATER FLOW RATE AND DIRECTION**

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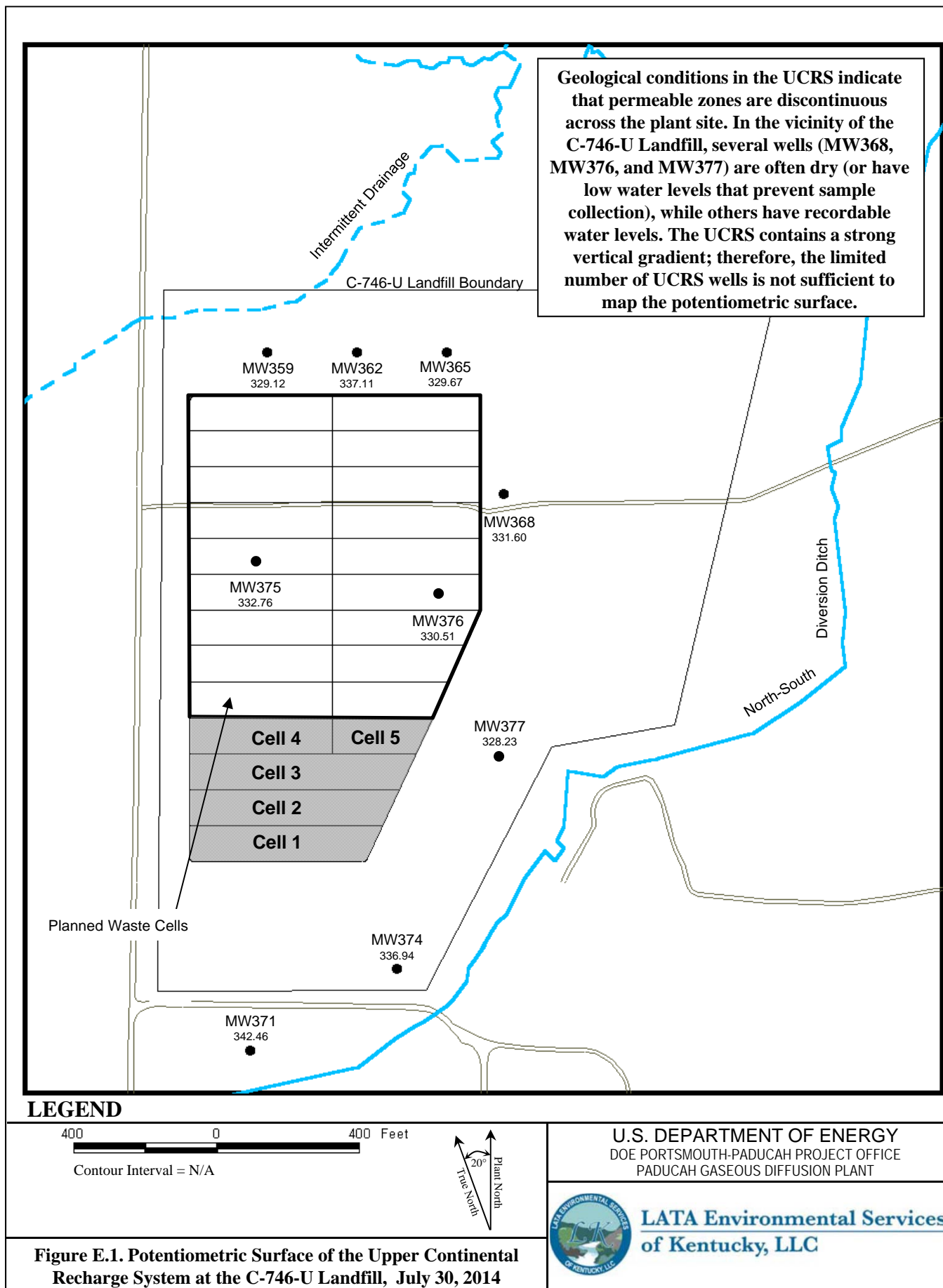
Determination of groundwater flow rate and direction of flow in the uppermost aquifer whenever the monitoring wells (MWs) are sampled is a requirement of 401 KAR 48.300 § 11. The uppermost aquifer below C-746-U Landfill is the Regional Gravel Aquifer (RGA). Water level measurements currently are recorded in several wells at the landfill on a quarterly basis. These measurements were used to plot the potentiometric surface of the RGA for the third quarter 2014 and determine groundwater flow rate and direction.

Water levels during this reporting period were measured on July 30, 2014. As shown on Figure E.1, all Upper Continental Recharge System (UCRS) wells had sufficient water to permit water level measurement during this reporting period. UCRS wells MW376 and MW377 had insufficient water to permit sampling.

The UCRS has a strong vertical hydraulic gradient; therefore, the available UCRS wells screened over different elevations are not sufficient for mapping the potentiometric surface. As shown in Table E.1, the RGA data were converted to elevations to plot the potentiometric surfaces within the Upper Regional Gravel Aquifer (URGA) and Lower Regional Gravel Aquifer (LRGA). (At the request of the Commonwealth of Kentucky, the RGA is differentiated into two zones, the URGA and LRGA.) Based on the potentiometric maps (Figures E.2 and E.3), the hydraulic gradient for both the URGA and LRGA at the C-746-U Landfill were similar ( $7.69 \times 10^{-4}$  ft/ft and  $7.44 \times 10^{-4}$  ft/ft, respectively). Water level measurements in wells at the C-746-U Landfill and in wells of the surrounding region (MW98, MW100, MW125, MW139, MW173, MW193, MW197, and MW200), along with the C-746-S&T Landfill wells, were used to contour the general RGA potentiometric surface (Figure E.4). The hydraulic gradient for the RGA, as a whole, in the vicinity of the C-746-U Landfill was  $3.51 \times 10^{-4}$  ft/ft. The hydraulic gradients are shown in Table E.2.

The average linear groundwater flow velocity ( $v$ ) is determined by multiplying the hydraulic gradient ( $i$ ) by the hydraulic conductivity ( $K$ ) [resulting in the specific discharge ( $q$ )] and dividing by the effective porosity ( $n_e$ ). The RGA hydraulic conductivity values used are reported in the Administrative Application for the New Solid Waste Landfill Permit No. 073-00045NWC1 and range from 425 to 725 ft/day (0.150 to 0.256 cm/s). RGA (both URGA and LRGA) effective porosity is assumed to be 25%. Flow velocities were calculated for the URGA and LRGA using the low and high values for hydraulic conductivity, as shown in the Table E.3.

Groundwater flow beneath the C-746-U Landfill typically trends northeastward toward the Ohio River. As demonstrated on the potentiometric map for July 2014, the groundwater flow direction in the immediate area of the landfill conforms to the typical regional flow direction.





**Table E.1. C-746-U Landfill Third Quarter 2014 (July) Water Levels**

<b>C-746-U Landfill (July 2014) Water Levels</b>										
<b>Date</b>	<b>Time</b>	<b>Well</b>	<b>Aquifer</b>	<b>Datum Elev (ft amsl)</b>	<b>BP (in Hg)</b>	<b>Delta BP (ft H<sub>2</sub>O)</b>	<b>Raw Data</b>		<b>*Corrected Data</b>	
							<b>DTW (ft)</b>	<b>Elev (ft amsl)</b>	<b>DTW (ft)</b>	<b>Elev (ft amsl)</b>
7/30/2014	9:34	MW357	URGA	368.99	30.11	0.00	44.03	324.96	44.03	324.96
7/30/2014	9:36	MW358	LRGA	369.13	30.11	0.00	44.20	324.93	44.20	324.93
7/30/2014	9:35	MW359	UCRS	369.11	30.11	0.00	39.99	329.12	39.99	329.12
7/30/2014	9:32	MW360	URGA	362.30	30.11	0.00	37.36	324.94	37.36	324.94
7/30/2014	9:30	MW361	LRGA	361.54	30.11	0.00	36.61	324.93	36.61	324.93
7/30/2011	9:31	MW362	UCRS	362.04	30.11	0.00	24.93	337.11	24.93	337.11
7/30/2014	16:03	MW363	URGA	368.83	30.10	0.01	43.92	324.91	43.93	324.90
7/30/2014	16:04	MW364	LRGA	367.75	30.10	0.01	42.88	324.87	42.89	324.86
7/30/2014	9:41	MW365	UCRS	368.37	30.11	0.00	38.70	329.67	38.70	329.67
7/30/2014	16:07	MW366	URGA	369.27	30.10	0.01	44.15	325.12	44.16	325.11
7/30/2014	16:06	MW367	LRGA	369.66	30.10	0.01	44.57	325.09	44.58	325.08
7/30/2014	9:46	MW368	UCRS	369.27	30.11	0.00	37.67	331.60	37.67	331.60
7/30/2014	15:50	MW369	URGA	364.48	30.10	0.01	38.11	326.37	38.12	326.36
7/30/2014	15:51	MW370	LRGA	365.35	30.10	0.01	39.02	326.33	39.03	326.32
7/30/2014	10:01	MW371	UCRS	364.88	30.11	0.00	22.42	342.46	22.42	342.46
7/30/2014	15:47	MW372	URGA	359.66	30.10	0.01	33.34	326.32	33.35	326.31
7/30/2014	15:48	MW373	LRGA	359.95	30.10	0.01	33.65	326.30	33.66	326.29
7/30/2014	10:07	MW374	UCRS	359.71	30.11	0.00	22.77	336.94	22.77	336.94
7/30/2014	10:13	MW375	UCRS	370.53	30.11	0.00	37.77	332.76	37.77	332.76
7/30/2014	10:11	MW376	UCRS	370.61	30.11	0.00	40.10	330.51	40.10	330.51
7/30/2014	10:10	MW377	UCRS	365.92	30.11	0.00	37.69	328.23	37.69	328.23

Initial Barometric Pressure                      **30.11**

Elev = elevation

amsl = above mean sea level

BP = barometric pressure

DTW = depth to water in feet below datum

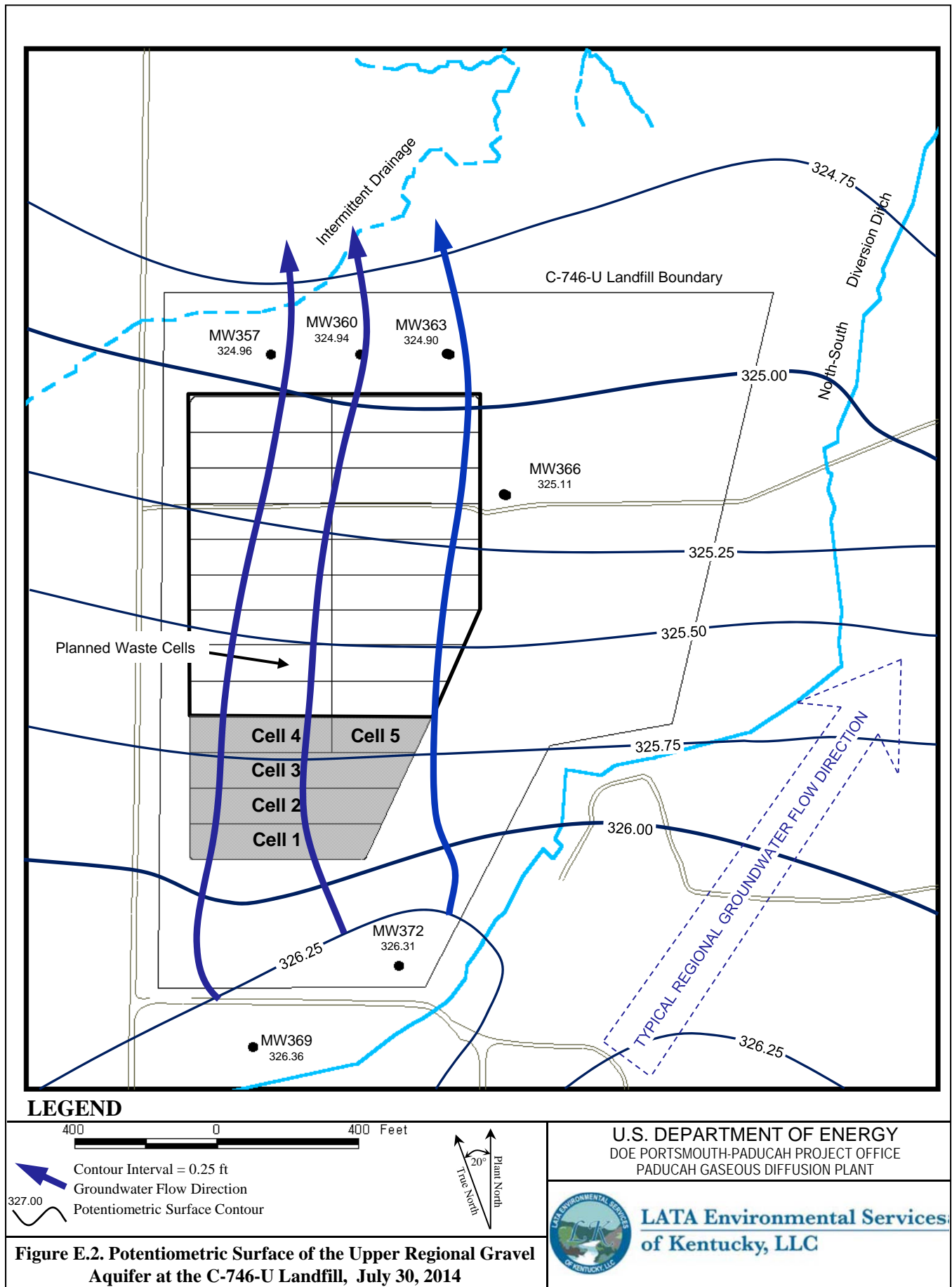
URGA = Upper Regional Gravel Aquifer

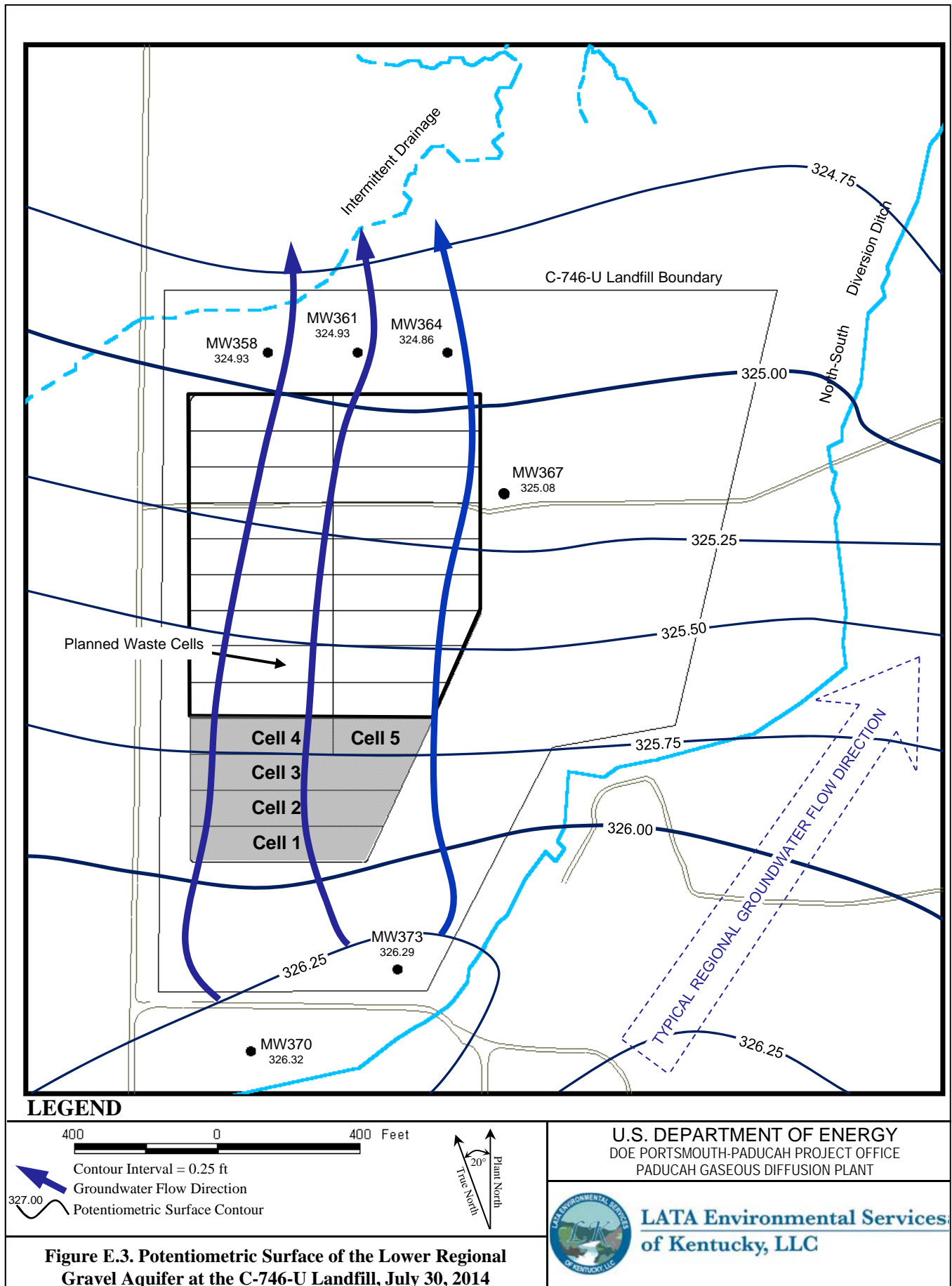
LRGA = Lower Regional Gravel Aquifer

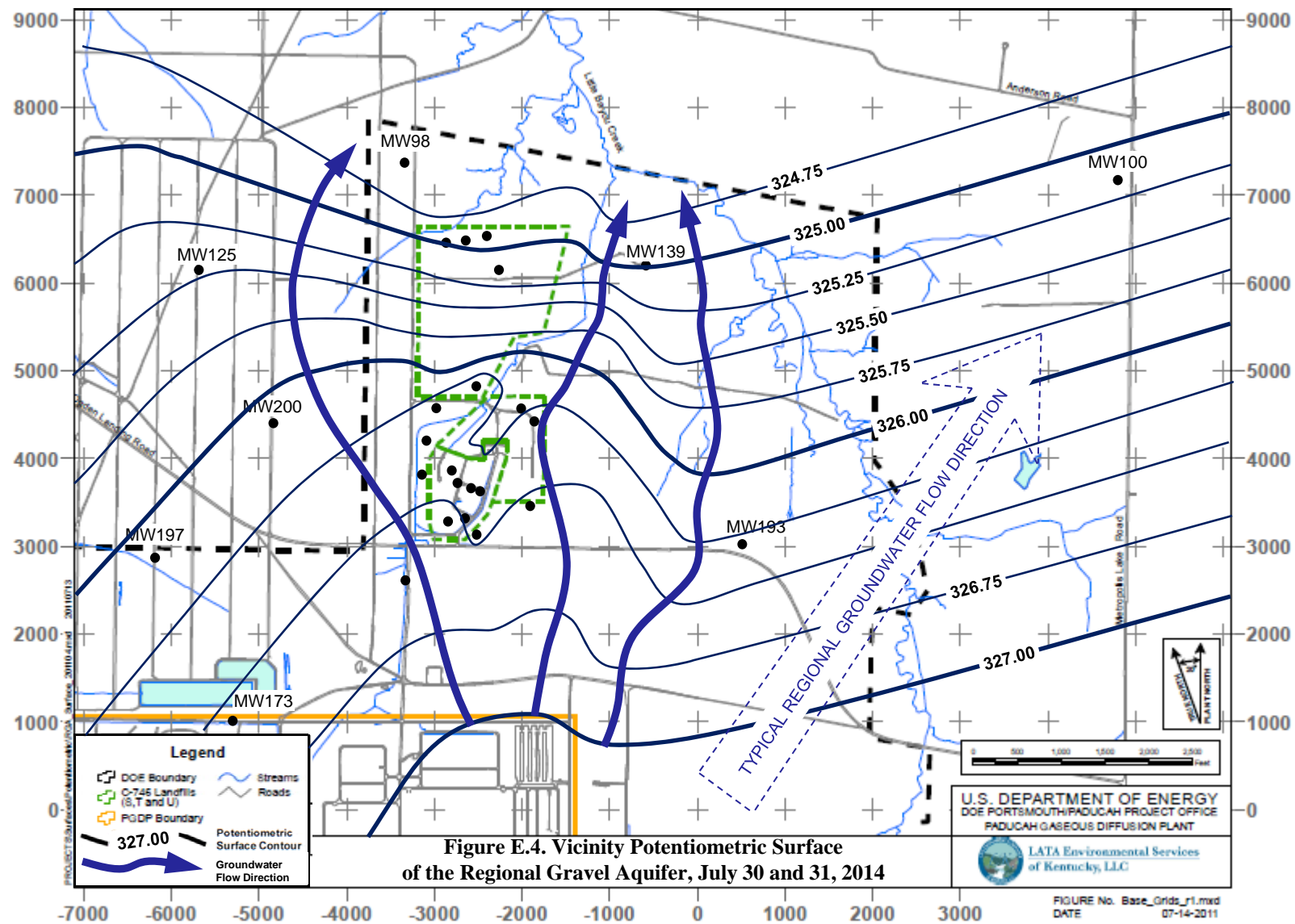
UCRS = Upper Continental Recharge System

ND = No data acquired

\*Assumes a barometric efficiency of 1.0.







**Table E.2. C-746-U Landfill Hydraulic Gradients**

	ft/ft
Beneath Landfill—Upper RGA	$7.69 \times 10^{-4}$
Beneath Landfill—Lower RGA	$7.44 \times 10^{-4}$
Vicinity	$3.51 \times 10^{-4}$

**Table E.3. C-746-U Landfill Groundwater Flow Rate**

Hydraulic Conductivity (K)		Specific Discharge (q)		Average Linear Velocity (v)	
ft/day	cm/s	ft/day	cm/s	ft/day	cm/s
<b>Upper RGA</b>					
725	0.256	0.56	$1.97 \times 10^{-4}$	2.23	$7.88 \times 10^{-4}$
425	0.150	0.33	$1.15 \times 10^{-4}$	1.31	$4.61 \times 10^{-4}$
<b>Lower RGA</b>					
725	0.256	0.54	$1.91 \times 10^{-4}$	2.16	$7.62 \times 10^{-4}$
425	0.150	0.32	$1.12 \times 10^{-4}$	1.27	$4.47 \times 10^{-4}$

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**APPENDIX F**  
**NOTIFICATIONS**

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## NOTIFICATIONS

In accordance with 401 KAR 48:300 § 7, the notification for parameters that exceed the maximum contaminant level has been submitted to the Kentucky Division of Waste Management. The parameters submitted are listed on page F-4. The notification for parameters that had statistically significant increased concentrations relative to background concentrations is provided below.

### Statistical Analysis of Parameters Notification

The statistical analyses conducted on the third quarter 2014 groundwater data collected from the C-746-U Landfill monitoring wells were performed in accordance with *Groundwater Monitoring Plan for the Solid Waste Permitted Landfills (C-746-S Residential Landfill, C-746-T Inert Landfill, and C-746-U Contained Landfill) at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky* (LATA Kentucky 2014).

The following are the parameters in 40 CFR § 302.4, Appendix A, which had statistically significant increased concentrations relative to historical background concentrations.

	<u>Parameter</u>	<u>Monitoring Well</u>
<b>Upper Continental Recharge System</b>	None	
<b>Upper Regional Gravel Aquifer</b>	Sodium	MW360
<b>Lower Regional Gravel Aquifer</b>	Technetium-99	MW358, MW361, MW364

**NOTE:** Although technetium-99 is not cited in 40 CFR § 302.4, Appendix A, this radionuclide is being reported along with the parameters of this regulation.

8/27/2014

**LATA Environmental Services of Kentucky  
PROJECT ENVIRONMENTAL MEASUREMENTS SYSTEM  
C-746-U LANDFILL  
PERMIT NUMBER 073-00045  
MAXIMUM CONTAMINANT LIMIT (MCL) EXCEEDANCE REPORT  
Quarterly Groundwater Sampling**

<b>AKGWA</b>	<b>Station</b>	<b>Analysis</b>	<b>Method</b>	<b>Results</b>	<b>Units</b>	<b>MCL</b>
8004-4798	MW357	Trichloroethene	8260B	6.42	ug/L	5
8004-4799	MW358	Trichloroethene	8260B	5.58	ug/L	5
		Trichloroethene	8260B	5.37	ug/L	5
8004-4808	MW372	Trichloroethene	8260B	9.82	ug/L	5
8004-4792	MW373	Trichloroethene	8260B	9.64	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**

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**Chart of MCL and Historical UTL Exceedances for C-746-U Contained Landfill**

Groundwater Flow System	UCRS										URGA						LRGA					
Gradient	S	S	S	S	D	D	D	U	U		S	D	D	D	U	U	S	D	D	D	U	U
Monitoring Well	368	375	376	377	359	362	365	371	374		366	360	363	357	369	372	367	361	364	358	370	373
<b>ACETONE</b>																						
Quarter 3, 2002											*	*	*									
Quarter 4, 2002											*	*	*									
Quarter 1, 2003												*	*									
Quarter 2, 2003												*	*									
Quarter 3, 2003	*						*				*	*	*			*			*			
Quarter 4, 2003						*	*					*			*							
Quarter 3, 2004						*											*					
Quarter 3, 2005						*																
Quarter 4, 2005						*																
<b>ALPHA ACTIVITY</b>																						
Quarter 1, 2004																						■
Quarter 2, 2004						■																
Quarter 3, 2009						■																
<b>ALUMINUM</b>																						
Quarter 3, 2003												*										
<b>BETA ACTIVITY</b>																						
Quarter 1, 2004																■						
Quarter 2, 2004																■						■
Quarter 3, 2004																■						
Quarter 4, 2004																■						
Quarter 4, 2005																■						
Quarter 1, 2006																■						■
Quarter 2, 2006																						■
Quarter 3, 2006																■						■
Quarter 4, 2006																■						■
Quarter 1, 2007											■					■						■
Quarter 2, 2007											■					■						■
Quarter 3, 2007											■					■						
Quarter 4, 2007											■					■						■
Quarter 1, 2008											■					■						
Quarter 2, 2008															■		■					
Quarter 3, 2008											■					■				■		
Quarter 4, 2008											■					■				■		
Quarter 1, 2009											■					■						
Quarter 2, 2009																■	■	■				
Quarter 3, 2009											■					■						
Quarter 4, 2009											■					■						
Quarter 1, 2010																■						
Quarter 2, 2010											■						■					
Quarter 3, 2010											■											
Quarter 4, 2010																■						
Quarter 2, 2011											■						■					
Quarter 4, 2011																■						
Quarter 1, 2012											■											
Quarter 2, 2012											■								■			

**Chart of MCL and Historical UTL Exceedances for C-746-U Contained Landfill**

<b>Groundwater Flow System</b>	<b>UCRS</b>										<b>URGA</b>						<b>LRGA</b>					
<b>Gradient</b>	S	S	S	S	D	D	D	U	U		S	D	D	D	U	U	S	D	D	D	U	U
<b>Monitoring Well</b>	368	375	376	377	359	362	365	371	374	366	360	363	357	369	372		367	361	364	358	370	373
Quarter 3, 2012										■					■							
Quarter 4, 2012															■							■
Quarter 1, 2013															■							■
Quarter 3, 2013															■							■
Quarter 4, 2013															■							
Quarter 1, 2014															■							
<b>BROMIDE</b>																						
Quarter 2, 2004													*									
<b>CALCIUM</b>																						
Quarter 3, 2003										*												
Quarter 2, 2005																						*
Quarter 3, 2006																*						
Quarter 2, 2008																*						
Quarter 3, 2009																*						
Quarter 4, 2009																*						
Quarter 1, 2010																*						
Quarter 2, 2010																*						
Quarter 3, 2010																*						
Quarter 1, 2011																*						
Quarter 2, 2011																*						
Quarter 3, 2011																						*
Quarter 4, 2011																*						*
Quarter 1, 2012																*						*
Quarter 2, 2012																*						*
Quarter 3, 2012																*						*
Quarter 4, 2012																*						*
Quarter 1, 2013																*						*
Quarter 2, 2013																*						*
Quarter 3, 2013																*						*
Quarter 4, 2013																*						*
Quarter 2, 2014																*						*
Quarter 3, 2014																*						*
<b>CARBON DISULFIDE</b>																						
Quarter 3, 2003										*												
Quarter 2, 2005						*																
Quarter 3, 2005					*																	
Quarter 4, 2005					*																	
Quarter 1, 2006					*																	
Quarter 2, 2006					*																	
Quarter 3, 2010		*									*											
Quarter 4, 2010														*								
Quarter 1, 2011															*							
<b>CHEMICAL OXYGEN DEMAND</b>																						
Quarter 3, 2002										*	*	*	*	*	*							
Quarter 4, 2002										*	*											
Quarter 1, 2003										*	*											
Quarter 2, 2003										*	*	*										

**Chart of MCL and Historical UTL Exceedances for C-746-U Contained Landfill**

<b>Groundwater Flow System</b>	<b>UCRS</b>										<b>URGA</b>						<b>LRGA</b>					
<b>Gradient</b>	S	S	S	S	D	D	D	U	U		S	D	D	D	U	U	S	D	D	D	U	U
<b>Monitoring Well</b>	368	375	376	377	359	362	365	371	374		366	360	363	357	369	372	367	361	364	358	370	373
Quarter 3, 2003	*										*	*					*					
Quarter 4, 2003						*					*	*										
Quarter 3, 2004											*											
Quarter 3, 2005						*					*					*	*			*		
Quarter 4, 2005						*													*	*		
Quarter 1, 2006																				*		
<b>CHLORIDE</b>																						
Quarter 1, 2006																					*	
Quarter 2, 2014																*						
<b>COBALT</b>																						
Quarter 3, 2003	*						*				*	*		*	*	*	*	*	*		*	
Quarter 1, 2004															*							
<b>CONDUCTIVITY</b>																						
Quarter 4, 2002											*											
Quarter 1, 2003											*											
Quarter 2, 2003											*	*										
Quarter 4, 2003											*											
Quarter 1, 2004											*											
Quarter 2, 2004											*											
Quarter 3, 2004											*											
Quarter 1, 2005																*						
Quarter 2, 2005																*						
Quarter 3, 2005						*														*		
Quarter 4, 2005																*		*				
Quarter 1, 2006																*						
Quarter 2, 2006																*						
Quarter 3, 2006																*						
Quarter 1, 2007																*						
Quarter 2, 2007																*						
Quarter 3, 2007																*						
Quarter 4, 2007																*						
Quarter 1, 2008																*						
Quarter 2, 2008																*						
Quarter 3, 2008																*						
Quarter 4, 2008																*						
Quarter 1, 2009																*						
Quarter 2, 2009																*						
Quarter 3, 2009																*						
Quarter 4, 2009																*						
Quarter 1, 2010																*						
Quarter 2, 2010																*						
Quarter 3, 2010																*						
Quarter 4, 2010																*						
Quarter 1, 2011																*						
Quarter 2, 2011																*						
Quarter 3, 2011																*						
Quarter 4, 2011																*						

**Chart of MCL and Historical UTL Exceedances for C-746-U Contained Landfill**

<b>Groundwater Flow System</b>	<b>UCRS</b>										<b>URGA</b>						<b>LRGA</b>					
<b>Gradient</b>	S	S	S	S	D	D	D	U	U		S	D	D	D	U	U	S	D	D	D	U	U
<b>Monitoring Well</b>	368	375	376	377	359	362	365	371	374		366	360	363	357	369	372	367	361	364	358	370	373
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																*						
<b>DISSOLVED OXYGEN</b>																						
Quarter 1, 2003					*	*					*											
Quarter 3, 2003					*						*											
Quarter 4, 2003					*																	
Quarter 1, 2004					*																	
Quarter 2, 2004								*									*					
Quarter 1, 2005					*																	
Quarter 2, 2005								*														
Quarter 1, 2006					*																	
Quarter 2, 2006					*			*														
Quarter 3, 2006					*			*														
Quarter 4, 2006					*				*													
Quarter 2, 2007					*			*														
Quarter 3, 2007					*			*	*													
Quarter 1, 2008					*														*			
Quarter 2, 2008								*	*													
Quarter 3, 2008								*														
Quarter 1, 2009							*															
Quarter 2, 2009					*			*	*													
Quarter 3, 2009						*		*	*													
Quarter 1, 2010					*		*															
Quarter 2, 2010					*	*		*	*											*	*	
Quarter 3, 2010					*	*																
Quarter 4, 2010							*					*								*		
Quarter 1, 2011						*																
Quarter 2, 2011					*	*	*	*	*						*							
Quarter 3, 2011						*			*													
Quarter 1, 2012							*		*													
Quarter 2, 2012	*			*	*	*		*	*													
Quarter 3, 2012						*																
Quarter 4, 2012									*													
Quarter 1, 2013						*			*													
Quarter 2, 2013							*		*													
Quarter 3, 2013	*				*		*	*	*													



**Chart of MCL and Historical UTL Exceedances for C-746-U Contained Landfill**

<b>Groundwater Flow System</b>	<b>UCRS</b>										<b>URGA</b>						<b>LRGA</b>					
<b>Gradient</b>	S	S	S	S	D	D	D	U	U		S	D	D	D	U	U	S	D	D	D	U	U
<b>Monitoring Well</b>	368	375	376	377	359	362	365	371	374		366	360	363	357	369	372	367	361	364	358	370	373
Quarter 4, 2013									*												*	
Quarter 2, 2014	*				*	*	*	*	*										*			
Quarter 3, 2014	*				*	*	*															
<b>DISSOLVED SOLIDS</b>																						
Quarter 4, 2002											*											
Quarter 1, 2003											*											
Quarter 2, 2003											*											
Quarter 3, 2003							*				*	*										
Quarter 4, 2003											*											
Quarter 3, 2005						*																
Quarter 4, 2006																						
Quarter 1, 2007																						
Quarter 2, 2007																						
Quarter 4, 2008																						
Quarter 1, 2009																						
Quarter 2, 2009																						
Quarter 3, 2009																						
Quarter 4, 2009																						
Quarter 1, 2010																						
Quarter 2, 2010																						
Quarter 3, 2010																						
Quarter 4, 2010																						
Quarter 1, 2011																						
Quarter 2, 2011																						
Quarter 3, 2011																						
Quarter 4, 2011																						
Quarter 1, 2012															*	*						
Quarter 2, 2012																*						*
Quarter 3, 2012																*						*
Quarter 4, 2012																*						
Quarter 1, 2013																*						
Quarter 2, 2013																*						
Quarter 3, 2013																*						
Quarter 4, 2013																*						
Quarter 1, 2014																*						
Quarter 2, 2014																*						
<b>IODIDE</b>																						
Quarter 2, 2003																	*					
Quarter 3, 2003	*										*											
Quarter 4, 2003							*															
Quarter 3, 2010						*		*					*					*				
<b>IODINE-131</b>																						
Quarter 3, 2010																			■			
<b>IODOMETHANE</b>																						
Quarter 4, 2003						*																

**Chart of MCL and Historical UTL Exceedances for C-746-U Contained Landfill**

Groundwater Flow System	UCRS										URGA						LRGA					
Gradient	S	S	S	S	D	D	D	U	U		S	D	D	D	U	U	S	D	D	D	U	U
Monitoring Well	368	375	376	377	359	362	365	371	374		366	360	363	357	369	372	367	361	364	358	370	373
<b>IRON</b>																						
Quarter 4, 2002						*																
Quarter 3, 2003																	*					
Quarter 4, 2003											*						*					
Quarter 1, 2004											*						*					
Quarter 2, 2004											*											
Quarter 3, 2004											*											
Quarter 3, 2005																	*					
<b>MAGNESIUM</b>																						
Quarter 2, 2005																*						*
Quarter 3, 2005						*																*
Quarter 2, 2006																*						*
Quarter 3, 2006																*						
Quarter 1, 2007																*						
Quarter 2, 2008																*						
Quarter 2, 2009																*						
Quarter 3, 2009																*						
Quarter 4, 2009																*						
Quarter 1, 2010																*						
Quarter 2, 2010																*						
Quarter 3, 2010																*						
Quarter 1, 2011																*						
Quarter 2, 2011																*						
Quarter 3, 2011																*						
Quarter 4, 2011																*						
Quarter 1, 2012																*						
Quarter 2, 2012																*						
Quarter 3, 2012																*						
Quarter 4, 2012																*						
Quarter 1, 2013																*						
Quarter 2, 2013																*						
Quarter 3, 2013																*						
Quarter 4, 2013																*						
Quarter 2, 2014																*						
<b>MANGANESE</b>																						
Quarter 3, 2002											*		*									
Quarter 4, 2002		*				*	*				*		*		*							
Quarter 2, 2003											*		*									
Quarter 3, 2003											*		*	*			*	*	*	*		
Quarter 4, 2003											*	*	*	*				*	*			
Quarter 1, 2004											*	*	*				*	*	*			
Quarter 2, 2004						*					*	*	*						*			
Quarter 3, 2004						*					*	*	*				*					
Quarter 4, 2004											*		*				*					
Quarter 1, 2005											*		*									
Quarter 2, 2005											*		*									
Quarter 3, 2005											*		*				*					

**Chart of MCL and Historical UTL Exceedances for C-746-U Contained Landfill**

<b>Groundwater Flow System</b>	<b>UCRS</b>										<b>URGA</b>						<b>LRGA</b>					
<b>Gradient</b>	S	S	S	S	D	D	D	U	U		S	D	D	D	U	U	S	D	D	D	U	U
<b>Monitoring Well</b>	368	375	376	377	359	362	365	371	374		366	360	363	357	369	372	367	361	364	358	370	373
Quarter 4, 2005											*						*					
Quarter 1, 2006											*											
Quarter 2, 2006							*				*		*									
Quarter 3, 2006											*						*					
Quarter 4, 2006											*											
Quarter 1, 2007											*											
Quarter 2, 2007							*				*											
Quarter 3, 2007							*															
Quarter 3, 2008							*															
Quarter 4, 2008							*															
Quarter 3, 2009							*															
Quarter 3, 2011							*															
<b>NICKEL</b>																						
Quarter 3, 2003											*											
<b>OXIDATION-REDUCTION POTENTIAL</b>																						
Quarter 4, 2002																		*		*		
Quarter 1, 2003																		*		*		
Quarter 2, 2003																				*		
Quarter 3, 2003	*																					
Quarter 4, 2003					*																	
Quarter 2, 2004														*				*				*
Quarter 3, 2004					*			*						*	*	*		*			*	*
Quarter 4, 2004													*									*
Quarter 1, 2005																		*			*	*
Quarter 2, 2005								*						*				*			*	
Quarter 3, 2005					*	*		*				*	*	*				*		*	*	*
Quarter 4, 2005		*						*						*				*			*	
Quarter 1, 2006					*			*	*									*				*
Quarter 2, 2006					*		*	*						*				*			*	
Quarter 3, 2006					*			*						*				*			*	
Quarter 4, 2006					*		*				*		*	*				*			*	*
Quarter 1, 2007		*			*			*						*				*			*	*
Quarter 2, 2007					*									*				*			*	*
Quarter 3, 2007					*			*										*			*	
Quarter 4, 2007																		*			*	*
Quarter 1, 2008					*			*					*	*						*	*	
Quarter 2, 2008					*			*			*			*	*				*		*	*
Quarter 3, 2008					*		*	*	*		*		*	*	*			*	*	*	*	*
Quarter 4, 2008								*			*		*	*				*	*		*	*
Quarter 1, 2009							*	*			*		*	*					*		*	
Quarter 2, 2009					*		*	*			*		*	*				*	*		*	*
Quarter 3, 2009		*			*	*	*	*	*		*		*	*	*			*	*	*	*	*
Quarter 4, 2009		*			*	*	*	*	*		*		*	*				*	*	*	*	*
Quarter 1, 2010		*			*		*	*	*		*		*	*				*	*	*	*	
Quarter 2, 2010					*	*		*			*	*	*	*				*	*	*	*	*
Quarter 3, 2010		*			*	*	*	*	*		*	*	*	*	*	*		*	*	*	*	*
Quarter 4, 2010		*			*	*	*	*	*		*	*	*	*	*	*		*	*	*	*	*

**Chart of MCL and Historical UTL Exceedances for C-746-U Contained Landfill**

<b>Groundwater Flow System</b>	<b>UCRS</b>										<b>URGA</b>						<b>LRGA</b>					
<b>Gradient</b>	S	S	S	S	D	D	D	U	U		S	D	D	D	U	U	S	D	D	D	U	U
<b>Monitoring Well</b>	368	375	376	377	359	362	365	371	374		366	360	363	357	369	372	367	361	364	358	370	373
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	*	*			*	*	*	*	*		*		*	*	*		*	*	*	*	*	*
<b>PCB, TOTAL</b>																						
Quarter 4, 2003																		*				
Quarter 3, 2004													*									
Quarter 3, 2005							*															
Quarter 2, 2006							*															
Quarter 3, 2006							*															
Quarter 1, 2007							*															
Quarter 2, 2007							*															
Quarter 3, 2007							*															
Quarter 1, 2008							*															
Quarter 2, 2008							*															
Quarter 4, 2008							*															
Quarter 3, 2009							*															
Quarter 1, 2010							*															
Quarter 2, 2010							*															
Quarter 4, 2010							*															
<b>PCB-1016</b>																						
Quarter 3, 2004													*									
Quarter 2, 2006							*						*									
Quarter 1, 2007							*															
Quarter 2, 2007							*															
Quarter 3, 2007							*															
Quarter 2, 2008							*															
Quarter 4, 2008							*															
Quarter 3, 2009							*															
Quarter 1, 2010							*															
Quarter 2, 2010							*															
Quarter 4, 2010							*															

**Chart of MCL and Historical UTL Exceedances for C-746-U Contained Landfill**

<b>Groundwater Flow System</b>	<b>UCRS</b>										<b>URGA</b>						<b>LRGA</b>					
<b>Gradient</b>	S	S	S	S	D	D	D	U	U		S	D	D	D	U	U	S	D	D	D	U	U
<b>Monitoring Well</b>	368	375	376	377	359	362	365	371	374		366	360	363	357	369	372	367	361	364	358	370	373
<b>PCB-1242</b>																						
Quarter 3, 2006							*						*									
Quarter 4, 2006											*											
Quarter 1, 2008							*															
Quarter 2, 2012							*															
<b>PCB-1248</b>																						
Quarter 2, 2008							*															
<b>PCB-1260</b>																						
Quarter 2, 2006							*															
<b>pH</b>																						
Quarter 3, 2002											*											
Quarter 4, 2002											*											
Quarter 1, 2003											*											
Quarter 2, 2003											*											
Quarter 3, 2003	*						*				*											
Quarter 4, 2003							*										*					
Quarter 1, 2004							*										*					
Quarter 3, 2005						*													*	*		
Quarter 4, 2005						*													*			
Quarter 3, 2006																	*					
Quarter 2, 2011															*							
Quarter 3, 2011															*							
Quarter 4, 2011															*							
Quarter 1, 2012																	*	*				
Quarter 2, 2012													*									
Quarter 1, 2013											*		*				*					
<b>POTASSIUM</b>																						
Quarter 1, 2014																	*					
<b>RADIUM-228</b>																						
Quarter 2, 2005																■						
Quarter 4, 2005						■						■						■				
<b>SELENIUM</b>																						
Quarter 4, 2003									■													
<b>SODIUM</b>																						
Quarter 3, 2002											*	*		*								
Quarter 4, 2002											*	*			*							
Quarter 1, 2003											*											
Quarter 2, 2003											*	*										
Quarter 3, 2003												*										
Quarter 1, 2007												*										
Quarter 1, 2012															*							
Quarter 1, 2014																*						
Quarter 3, 2014											*											
<b>STRONTIUM-90</b>																						
Quarter 3, 2003							■															

**Chart of MCL and Historical UTL Exceedances for C-746-U Contained Landfill**

Groundwater Flow System	UCRS										URGA						LRGA					
Gradient	S	S	S	S	D	D	D	U	U		S	D	D	D	U	U	S	D	D	D	U	U
Monitoring Well	368	375	376	377	359	362	365	371	374		366	360	363	357	369	372	367	361	364	358	370	373
<b>SULFATE</b>																						
Quarter 1, 2003							*															
Quarter 2, 2003						*	*															
Quarter 3, 2003	*					*																
Quarter 4, 2003					*	*	*															
Quarter 1, 2004					*	*	*															
Quarter 2, 2004					*	*	*															
Quarter 3, 2004					*	*	*															
Quarter 1, 2005					*	*			*													
Quarter 2, 2005					*	*	*		*							*						
Quarter 3, 2005					*	*	*															
Quarter 4, 2005																*						
Quarter 1, 2006					*				*													
Quarter 2, 2006						*	*		*							*						
Quarter 3, 2006							*															
Quarter 1, 2007							*															
Quarter 2, 2007							*															
Quarter 3, 2007							*															
Quarter 4, 2007		*																				
Quarter 1, 2008		*			*		*		*													
Quarter 2, 2008		*			*	*	*															
Quarter 3, 2008		*			*	*	*															
Quarter 4, 2008		*				*	*															
Quarter 1, 2009		*					*															
Quarter 2, 2009		*			*	*	*															
Quarter 3, 2009		*			*	*	*									*						
Quarter 4, 2009		*			*	*										*						
Quarter 1, 2010		*			*	*	*									*						
Quarter 2, 2010		*			*	*	*									*						
Quarter 3, 2010		*			*	*	*									*						
Quarter 4, 2010		*				*	*									*						
Quarter 1, 2011		*																				
Quarter 2, 2011		*			*	*	*									*						
Quarter 3, 2011		*				*	*	*								*						
Quarter 4, 2011		*				*										*						
Quarter 1, 2012		*					*	*								*						
Quarter 2, 2012	*	*		*	*	*	*	*	*							*						
Quarter 3, 2012		*				*										*						
Quarter 4, 2012		*														*						
Quarter 1, 2013		*				*										*						
Quarter 2, 2013		*														*						
Quarter 3, 2013	*	*		*	*	*	*									*						
Quarter 4, 2013		*														*						
Quarter 1, 2014		*														*						
Quarter 2, 2014	*	*			*		*	*								*						
Quarter 3, 2014	*	*			*	*	*	*								*						

**Chart of MCL and Historical UTL Exceedances for C-746-U Contained Landfill**

Groundwater Flow System	UCRS										URGA						LRGA					
Gradient	S	S	S	S	D	D	D	U	U		S	D	D	D	U	U	S	D	D	D	U	U
Monitoring Well	368	375	376	377	359	362	365	371	374		366	360	363	357	369	372	367	361	364	358	370	373
<b>TECHNETIUM-99</b>																						
Quarter 4, 2002																		*	*	*		
Quarter 2, 2003							*						*				*	*	*	*		*
Quarter 3, 2003																		*				
Quarter 4, 2003																		*				*
Quarter 1, 2004																*		*				*
Quarter 2, 2004																*						*
Quarter 3, 2004																*						*
Quarter 4, 2004																*		*				*
Quarter 3, 2005																		*				
Quarter 1, 2006																*						*
Quarter 2, 2006		*							*													*
Quarter 3, 2006																						*
Quarter 4, 2006																*						*
Quarter 1, 2007																						*
Quarter 2, 2007													*			*					*	
Quarter 3, 2007																*		*	*			
Quarter 4, 2007										*						*				*		*
Quarter 1, 2008																*					*	*
Quarter 2, 2008						*	*								*		*			*		
Quarter 3, 2008																*						
Quarter 4, 2008										*								*		*		
Quarter 1, 2009										*												
Quarter 2, 2009																			*			
Quarter 3, 2009							*			*						*						
Quarter 4, 2009										*						*			*	*		
Quarter 2, 2010										*							*	*	*	*		
Quarter 3, 2010										*						*						
Quarter 4, 2010																			*			
Quarter 1, 2011		*								*								*				
Quarter 2, 2011																	*	*	*	*		
Quarter 1, 2012																		*	*			
Quarter 2, 2012							*												*			
Quarter 3, 2012																		*	*			
Quarter 4, 2012																*			*			*
Quarter 1, 2013																			*			*
Quarter 2, 2013																						*
Quarter 3, 2013										*												*
Quarter 4, 2013																*		*	*			*
Quarter 1, 2014																*		*	*			
Quarter 2, 2014																			*			
Quarter 3, 2014																		*	*	*		
<b>TOLUENE</b>																						
Quarter 2, 2014										*					*							

**Chart of MCL and Historical UTL Exceedances for C-746-U Contained Landfill**

Groundwater Flow System	UCRS										URGA						LRGA					
Gradient	S	S	S	S	D	D	D	U	U		S	D	D	D	U	U	S	D	D	D	U	U
Monitoring Well	368	375	376	377	359	362	365	371	374		366	360	363	357	369	372	367	361	364	358	370	373
<b>TOTAL ORGANIC CARBON</b>																						
Quarter 3, 2002											*	*	*		*							*
Quarter 4, 2002											*	*			*							
Quarter 1, 2003												*										
Quarter 3, 2003	*										*	*					*					
Quarter 4, 2003											*	*										
Quarter 1, 2004												*										
Quarter 3, 2005						*					*					*	*			*		
Quarter 4, 2005						*													*	*		
Quarter 1, 2006																				*		
<b>TOTAL ORGANIC HALIDES</b>																						
Quarter 4, 2002											*											
Quarter 1, 2003											*											
Quarter 2, 2003											*											
Quarter 1, 2004																	*					
<b>TRICHLOROETHENE</b>																						
Quarter 3, 2002																■					■	
Quarter 4, 2002																■					■	
Quarter 1, 2003																					■	■
Quarter 2, 2003																■					■	
Quarter 3, 2003							■														■	■
Quarter 4, 2003																■					■	■
Quarter 1, 2004																■					■	■
Quarter 2, 2004																■					■	■
Quarter 3, 2004																■					■	■
Quarter 4, 2004																■					■	■
Quarter 1, 2005																■					■	■
Quarter 2, 2005																■					■	■
Quarter 3, 2005																■					■	■
Quarter 4, 2005																■					■	■
Quarter 1, 2006																■					■	■
Quarter 2, 2006																■					■	■
Quarter 3, 2006																■					■	■
Quarter 4, 2006																■						■
Quarter 1, 2007																■					■	■
Quarter 2, 2007																■						■
Quarter 3, 2007																■						■
Quarter 4, 2007																■						■
Quarter 1, 2008																■						■
Quarter 2, 2008																■			■			■
Quarter 3, 2008																■						■
Quarter 4, 2008																■						■
Quarter 1, 2009																■						■
Quarter 2, 2009																■						■
Quarter 3, 2009																■						■
Quarter 4, 2009						■	■					■		■	■	■		■				■
Quarter 1, 2010														■		■						■



**Chart of MCL and Historical UTL Exceedances for C-746-U Contained Landfill**

<b>Groundwater Flow System</b>	<b>UCRS</b>										<b>URGA</b>						<b>LRGA</b>					
<b>Gradient</b>	S	S	S	S	D	D	D	U	U		S	D	D	D	U	U	S	D	D	D	U	U
<b>Monitoring Well</b>	368	375	376	377	359	362	365	371	374		366	360	363	357	369	372	367	361	364	358	370	373
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														■		■				■		■
<b>TURBIDITY</b>																						
Quarter 1, 2003											*											
<b>URANIUM</b>																						
Quarter 4, 2002		*			*	*	*				*	*	*	*	*	*	*		*	*	*	*
Quarter 4, 2006																						*
<b>ZINC</b>																						
Quarter 3, 2005																				*		
* Statistical test results indicate an elevated concentration (i.e., a statistical exceedance) ■ MCL Exceedance UCRS Upper Continental Recharge System URGA Upper Regional Gravel Aquifer LRGA Lower Regional Gravel Aquifer																						

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**APPENDIX H**  
**METHANE MONITORING DATA**

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## C-746-U LANDFILL METHANE LOG

## PADUCAH GASEOUS DIFFUSION PLANT

Permit #: 073-00045

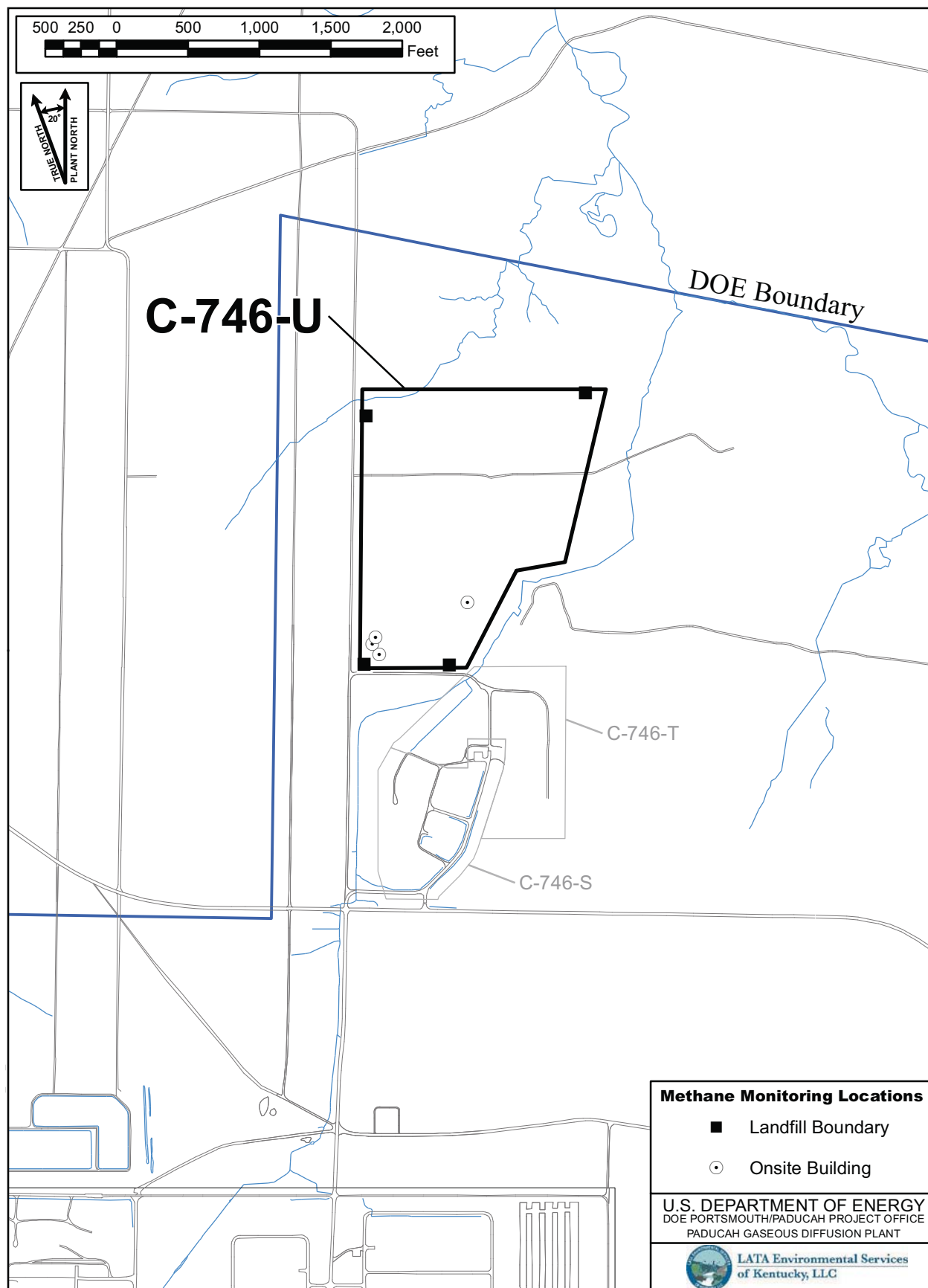
McCracken County, Kentucky

Date: September 25, 2014

[illegible]

Swung at  $83.7^\circ$   
Cabin winds out of  
North

*Benny Smith*  
Signature



**Figure H.1. C-746-U Methane Monitoring Locations**

**APPENDIX I**

**SURFACE WATER SAMPLE ANALYSES AND WRITTEN COMMENTS**

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Division of Waste Management  
Solid Waste Branch  
14 Reilly Road  
Frankfort, KY 40601 (502)564-6716

RESIDENTIAL/CONTAINED-QUARTERLY  
Facility: US DOE - Paducah Gaseous Diffusion Plant  
Permit Number: 073-00045

FINDS/UNIT: KY8-890-008-982 / 1

LAB ID: None  
For Official Use Only

## SURFACE WATER SAMPLE ANALYSIS (S)

Monitoring Point (KPDES Discharge Number, or "UPSTREAM", or "DOWNSTREAM")					L150 AT SITE		L154 UPSTREAM		L351 DOWNSTREAM				
Sample Sequence #					1		1		1				
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)					9/11/2014 12:10		9/11/2014 12:20		9/11/2014 12:00				
Duplicate ("Y" or "N") <sup>1</sup>					N		N		N				
Split ('Y' or "N") <sup>2</sup>					N		N		N				
Facility Sample ID Number (if applicable)					L150US4-14		L154US4-14		L351US4-14				
Laboratory Sample ID Number (if applicable)					356720001		356720002		356720003				
Date of Analysis (Month/Day/Year)					9/29/2014		9/29/2014		9/29/2014				
CAS RN <sup>3</sup>		CONSTITUENT	T D 4	Unit OF MEASURE	METHOD	DETECTED VALUE OR PQL <sup>5</sup>	F L A G S <sup>7</sup>	DETECTED VALUE OR PQL <sup>5</sup>	F L A G S <sup>7</sup>	DETECTED VALUE OR PQL <sup>5</sup>	F L A G S <sup>7</sup>	DETECTED VALUE OR PQL <sup>5</sup>	F L A G S <sup>7</sup>
A200-00-0	0	Flow	T	MGD	Field	0.01		0.21		0.15			
16887-00-6	2	Chloride(s)	T	mg/L	300.0	7.01		6.04		4.39			
14808-79-8	0	Sulfate	T	mg/L	300.0	52.6		7.22		10.2			
7439-89-6	0	Iron	T	mg/L	200.8	0.225		0.501		0.589			
7440-23-5	0	Sodium	T	mg/L	200.8	5.64		5.36		5.05			
S0268- -	0	Organic Carbon <sup>6</sup>	T	mg/L	9060	13.7		20.2		19.8			
S0097- -	0	BOD <sup>6</sup>	T	mg/L	not applicable		*		*		*		
S0130- -	0	Chemical Oxygen Demand	T	mg/L	410.4	49.1		109		99.1			

3-1

<sup>1</sup>Respond "Y" if the sample was a duplicate of another sample in this report

<sup>2</sup>Respond "Y" if the sample was split and analyzed by separate laboratories.

<sup>3</sup>Chemical Abstracts Service Registry Number or unique identifier number assigned by agency.

<sup>4</sup>"T" = Total; "D" = Dissolved

<sup>5</sup>"<" indicates a non-detect; do not use "ND" or "BDL". Value then shown is Practical Quantification Limit

<sup>6</sup>Facility has either/or option on Organic Carbon and (BOD) Biochemical Oxygen Demand - both are not required

<sup>7</sup>Flags are as designated, do not use any other type. Use "\*", " then describe on "Written Comments" page.

### STANDARD FLAGS:

\* = See Comments

J = Estimated Value

B = Analyte found in blank

A = Average value

N = Presumptive ID

D = Concentration from analysis of  
a secondary dilution factor

I-4

**RESIDENTIAL/INERT – QUARTERLY****Facility: US DOE - Paducah Gaseous Diffusion Plant****Permit Numbers: 073-00014 & 073-00015****Finds/Unit: KY8-890-008-982 / 1****LAB ID: None****For Official Use Only**

## **SURFACE WATER WRITTEN COMMENTS**

Monitoring Point	Facility Sample ID	Constituent	Flag	Description
L150	L150US4-14	Biochemical Oxygen Demand (BOD)		Analysis of constituent not required and not performed.
		Alpha activity	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 4.42. Rad error is 4.42.
		Beta activity		TPU is 7.03. Rad error is 6.8.
L154	L154US4-14	Biochemical Oxygen Demand (BOD)		Analysis of constituent not required and not performed.
		Alpha activity	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.31. Rad error is 5.29.
		Beta activity		TPU is 9.22. Rad error is 8.18.
L351	L351US4-14	Biochemical Oxygen Demand (BOD)		Analysis of constituent not required and not performed.
		Alpha activity	U	Indicates analyte/nuclide was analyzed for, but not detected. TPU is 5.07. Rad error is 5.06.
		Beta activity		TPU is 7.96. Rad error is 7.38.

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