SOLUTIA

Solutions for a better life.

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May 26, 2009

Mr. Kenneth Bardo - LU-9J
U.S. EPA Region V
Corrective Action Section
77 West Jackson Boulevard
Chicago, IL 60604-3507

VIA FEDEX

Re: Long-Term Monitoring Program
1st Quarter 2009 Data Report
Solutia Inc., W. G. Krummrich Plant, Sauget, IL

Dear Mr. Bardo:

Enclosed please find the Long-Term Monitoring Program 1st Quarter 2009 Data Report for Solutia Inc.'s W. G. Krummrich Plant, Sauget, IL.

If you have any questions or comments regarding this report, please contact me at (314) 674-3312 or gmrina@solutia.com

Sincerely,

Gerald M. Rinaldi
Manager, Remediation Services

Enclosure

cc: Distribution List

DISTRIBUTION LIST

Long-Term Monitoring Program
1st Quarter 2009 Data Report
Solutia Inc., W. G. Krummrich Plant, Sauget, IL

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1ST QUARTER 2009
DATA REPORT

LONG-TERM MONITORING PROGRAM

SOLUTIA INC.
W.G. KRUMMRICH FACILITY
SAUGET, ILLINOIS

Prepared for

Solutia Inc.
575 Maryville Centre Drive
St. Louis, Missouri 63141

May 2009

URS Corporation
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Project # 21562154.00001

1.0 INTRODUCTION 1

2.0 FIELD PROCEDURES 2

3.0 LABORATORY PROCEDURES 7

4.0 QUALITY ASSURANCE 7

5.0 OBSERVATIONS 8

6.0 REFERENCES 11

List of Figures

Figure 1 Site Location Map
Figure 2 Long-Term Monitoring Program Well Locations and Surface Water/Sediment Sample Locations
Figure 3 Potentiometric Surface Map Middle/Deep Hydrogeologic Unit
Figure 4 1Q09 Benzene and Total Chlorobenzenes Results

List of Tables

Table 1 Monitoring Well Gauging Information
Table 2 Groundwater Analytical Results
Table 3 Monitored Natural Attenuation Results Summary

List of Appendices

Appendix A Groundwater Purging and Sampling Forms
Appendix B Chains-of-Custody
Appendix C Surface Water and Sediment Sampling Forms
Appendix D Quality Assurance Report
Appendix E Groundwater Analytical Results (with Data Review Sheets)
Appendix F Surface Water and Sediment Analytical Results (with Data Review Sheets)
Appendix G Microbial Insights Data Package

1.0 INTRODUCTION

This report presents the results of the 1st Quarter 2009 (1Q09) sampling event performed at the Solutia Inc. (Solutia) W.G. Krummrich (WGK) Facility located in Sauget, Illinois (Site). This sampling event was conducted in accordance with the Long-Term Monitoring Program (LTMP) Work Plan (Solutia 2008). The Site location is presented in **Figure 1**.

The LTMP was designed to evaluate the effectiveness of monitored natural attenuation (MNA), including: 1) a clear and meaningful trend of decreasing contaminant mass; 2) data that indirectly demonstrate the types and rates of natural attenuation processes active at the site; and 3) data that directly demonstrate the occurrence of biodegradation processes at the site.

Groundwater Sampling Location and Frequency - As specified in the LTMP Work Plan, groundwater samples will be collected for eight quarters from five monitoring wells downgradient of the Former Chlorobenzene Process Area (CPAMW-1D through CPAMW-5D) and five monitoring wells downgradient of the Former Benzene Storage Area (BSAMW-1S and BSAMW-2D through BSAMW-5D) to assess attenuation processes in the American Bottoms aquifer, as impacted groundwater from these source areas migrates toward and discharges to the Mississippi River.

Monitoring wells BSAMW-1S, 2D, 3D, 4D and 5D are located within the limiting flow lines downgradient of the Former Benzene Storage Area. Monitoring wells CPAMW-1D, 2D, 3D, 4D and 5D are located within the limiting flow lines downgradient of the Former Chlorobenzene Process Area. Source areas and monitoring well locations are presented in **Figure 2**.

Quarterly sampling under the Long-Term Monitoring Program commenced 3Q08 and will continue for a total of eight quarters. At the end of eight quarters, groundwater quality and attenuation process data will be evaluated to determine if longer sampling intervals (e.g., semi-annual or annual) are appropriate.

Groundwater Sampling Parameters - During the 1Q09 groundwater sampling event, groundwater samples were analyzed for benzene, monochlorobenzene, 1,2-dichlorobenzene, 1,3-dichlorobenzene, and 1,4-dichlorobenzene using USEPA Method 8260B to demonstrate a trend of decreasing contaminant mass and/or concentrations over time. In accordance with USEPA comments regarding the Long-Term Monitoring Plan, the following constituents were added to the groundwater monitoring parameter list on a semi-annual basis (1st and 3rd Quarters):

- 4-Chloroaniline: CPAMW-3D, CPAMW-4D, and CPAMW-5D
- 2-Chlorophenol: All wells
- 1, 2, 4-Trichlorobenzene: All wells
- 1,4-Dioxane: BSAMW-2D, BSAMW-3D, BSAMW-4D, and BSAMW-5D

A sample for SVOC analysis was collected from monitoring well CPAMW-5D. However, SVOC analysis was inadvertently not completed. Upon discovery, the sample was outside holding time criteria. The sample will be collected during the next scheduled event for SVOC analysis (i.e., 3Q09).

MNA samples were collected from all ten long-term monitoring program wells. Evaluation of the types of active natural attenuation processes at the site is based on the following key geochemical parameters:

- Electron Donors: Organic Carbon (Total and Dissolved)
- Electron Acceptors: Iron (Total and Dissolved)
Manganese (Total and Dissolved)
Nitrate
Sulfate
- Biodegradation Byproducts: Carbon Dioxide
Chloride
Methane
- Biodegradation Indicators: Alkalinity

Direct demonstration of the occurrence of biodegradation processes is completed quarterly utilizing Microbial Insights (www.microbe.com) Bio-Trap® Samplers for Phospholipid Fatty Acid Analysis, along with Stable Isotope Probes (SIPs) for benzene or chlorobenzene detection in select wells.

Surface Water and Sediment Sampling – Surface water and sediment samples are collected during winter low flow conditions and during summer low flow conditions as part of the site long-term monitoring program. This typically coincides with the 1st and 3rd quarter groundwater sampling events. The objective of the surface water and sediment monitoring program is to assess the impact of contaminated groundwater discharging to the Mississippi River north of the Groundwater Migration Control System (GMCS).

2.0 FIELD PROCEDURES

URS Corporation (URS) conducted 1Q09 field activities from February 23 through March 2, 2009, in accordance with procedures outlined in the LTMP Work Plan, including the collection of appropriate quality assurance and quality control (QA/QC) samples. The following section summarizes field investigative procedures:

Groundwater Level Measurements – URS personnel used an electronic oil/water interface probe to measure depth to static groundwater levels and if present, the thickness of non-aqueous phase liquid (NAPL), to 0.01 feet. Depth to groundwater measurements were collected from accessible existing wells (i.e., GM-, K- , PSMW- and PMA-series) and

piezometers clusters (installed for the Sauget Area 2 RI/FS and WGK CA-750 Environmental Indicator projects) specified in the LTMP Work Plan **(Figure 3**). NAPL was not detected within any of the LTMP monitoring wells.

Well gauging information for the 1Q09 event is presented in **Table 1**. As the middle and deep hydrogeologic units are the primary migration pathway for constituents present in groundwater at the WGK Facility, a groundwater potentiometric surface map based on water level data from wells screened in the Middle Hydrogeologic Unit (MHU) and Deep Hydrogeologic Unit (DHU) is presented as **Figure 3**.

Groundwater Sampling - Low-flow sampling techniques were used for groundwater sample collection. At each monitoring well, disposable, low-density polyethylene tubing was attached to a submersible pump, which was then lowered into the well to the middle of the screened interval. Monitoring wells were purged at a rate of 200 mL/minute to minimize drawdown. If significant drawdown occurred, flow rates were reduced.

Drawdown was measured periodically throughout purging to ensure that it did not exceed 25% of the distance between the pump intake and the top of the screen. Once the flow rate and drawdown were stable, field measurements were collected approximately every three to five minutes. Purging of a well was considered complete when the following water quality parameters remained stable over three consecutive flow-thru cell volumes:

Parameter	Stabilization Guidelines
Dissolved Oxygen (DO)	+/- 10% or +/-0.2 mg/L, whichever is greatest
Oxidation-Reduction Potential (ORP)	+/- 20 mV
pH	+/- 0.2 units
Specific Conductivity	+/- 3%

Sampling commenced upon completion of purging. Prior to sample collection, the flow-thru cell was bypassed to allow for collection of uncompromised groundwater. Samples were collected at a flow rate less than or equal to the rate at which stabilization was achieved. Sample containers were filled based on laboratory analysis to be performed, in the following order:

- Volatile Organic Compounds (VOCs)
- Gas Sensitive Parameters (e.g., methane, carbon dioxide)
- General Chemistry (i.e., alkalinity, chloride, total and dissolved iron, total and dissolved manganese, nitrate, sulfate, and total and dissolved organic carbon)
- Field Parameters (i.e., dissolved oxygen, ferrous iron, and oxidation-reduction potential).

Samples collected for ferrous iron, dissolved iron and dissolved manganese analysis were filtered in the field using in-line 0.2 micron disposable filters, represented by a notation of “F (0.2)” in the sample nomenclature.

Quality assurance/quality control (QA/QC) samples consisting of analytical duplicates (AD) and equipment blanks (EB) were collected at a rate of 10% and matrix spike/matrix spike duplicates (MS/MSD) were collected at a rate of 5%. In addition, trip blanks accompanied each shipment containing samples for VOC analysis.

Each investigative or QC sample was labeled immediately following collection. Each sample identification number consisted of the following nomenclature “AAAMW#-MMYY-QAC” where:

- “**AAA**” denotes "Chlorobenzene Process Area (CPA)" or "Benzene Storage Area (BSA)"and "**MW-#**” denotes "Monitoring Well Number":
- **MMYY –** Month and year of sampling quarter, e.g.: First quarter (February) 2009, 0209
- **“QAC”** denotes QA/QC sample
  - **AD –** analytical duplicate
  - **EB –** equipment blank
  - **MS or MSD –** Matrix Spike or Matrix Spike Duplicate

Upon collection and labeling, sample containers were immediately placed inside an iced cooler, packed in such a way as to help prevent breakage and maintain inside temperature at approximately 4°C. Field personnel recorded the project identification and number, sample description/location, required analysis, date and time of sample collection, type and matrix of sample, number of sample containers, preservative used (if applicable), analysis requested/comments, and sampler signature/date/time, with permanent ink on the chain-of-custody (COC). Prior to shipment, coolers were sealed between the lid and sides of the cooler with a custody seal, and then shipped to TestAmerica in Savannah, Georgia by means of an overnight delivery service. Field sampling data sheets are included in **Appendix A**, COC forms are included in **Appendix B**.

Field personnel and equipment were decontaminated according to procedures specified in the LTMP Work Plan to ensure the health and safety of those present, maintain sample integrity, and minimize movement of contamination between the work area and off-site locations. Equipment used on-site was decontaminated prior to beginning work, between sampling locations and/or uses, and prior to demobilizing from the site. Non-disposable purging and sampling equipment was decontaminated between each sample acquisition by washing with an Alconox® or equivalent detergent wash, a potable water rinse, and a distilled water rinse. Personnel and small equipment decontamination was performed at the sample locations. Disposable sampling equipment, such as gloves were collected and bagged on a daily basis

and managed in accordance with Solutia procedures. Purge water was containerized and handled per Solutia procedures.

Biodegradation Evaluation Sampling - Bio-Trap® samplers and Stable Isotope Probes (SIPs), provided by Microbial Insights, Inc. (Rockford, TN), were utilized in the LTMP to provide information regarding biodegradation potential of the Shallow Hydrogeologic Unit (SHU), the MHU and the DHU. Bio-Trap® samplers are passive sampling tools which, over time, collect microbes across a membrane that serves as the sampling matrix. SIPs are similar passive sampling tools that are analyzed to measure the degradation of a specific contaminant (i.e., benzene and chlorobenzene).

On March 6, 2009, URS field personnel deployed Bio-Trap® samplers in each of the ten LTMP wells for PLFA analysis. A benzene SIP and a monochlorobenzene SIP were placed in monitoring wells BSAMW02D and CPAMW03D, respectively. Bio-Trap® samplers and SIPs were tied to nylon line attached to the well cap and lowered to the middle of the well screen.

On April 6, 2009, the Bio-Trap® samplers and SIPs were retrieved from the wells, sealed in Ziploc® bags, labeled with the proper well identification and placed in an iced sample cooler with a signed COC. Sealed sample coolers were sent to Microbial Insights, Inc. for analysis.

Surface Water and Sediment Monitoring - The surface water and sediment sampling was conducted concurrent with the 1Q09 groundwater sampling event. This coordination of surface water/sediment and groundwater sampling events was completed to confirm groundwater was discharging to the river at the time of sampling, and to assess the relationship between VOC concentrations in the river and in groundwater. Fluid levels in groundwater monitoring wells CPAMW-5D (elev. 389.64), BSAMW-5D (elev. 391.20) and BSAMW-4D (elev. 390.78) were gauged on the same day in which the surface water and sediment sampling occurred. The water levels in the wells were higher than the Mississippi River (~389.58) confirming discharge to the river.

Surface water and sediment samples were collected at three locations, R2007-1 through R2007-3 (**Figure 2**). Coordinates for each of the three sample locations were preloaded into a Trimble Global Positioning System (GPS) unit, which URS field personnel used for navigation to the sample locations. The river bed is scoured in this vicinity; therefore, field personnel positioned the sampling boat near the planned sample location, where the dredge was able to reach the river bed. In an effort to collect a sample representing the water column above the sediments and minimize potential contamination from the sediments or the sampling system, surface water samples were collected prior to sediment samples at each of the three locations.

Samples were analyzed for the following VOCs: benzene, chlorobenzene, 1,2-dichlorobenzene, 1,3-dichlorobenzene, and 1,4-dichlorobenzene along with semivolatile organic compounds (SVOCs) 1,4-dioxane, 4-chloroaniline, 2-chlorophenol and 1,2,4-trichlorobenzene.

QA/QC and shipping procedures were similar to those described above.

In-situ water quality parameters (temperature, pH, dissolved oxygen and conductivity) were also recorded at each of the three sample locations. These parameters were measured with a Horiba Model U-22 at a depth of one foot below the water surface, and recorded on field data sheets (**Appendix C).**

Surface Water Sampling

Surface water samples were collected at the sediment-water interface (within one foot of the bottom) at the pre-designated sampling locations. Samples were collected with a peristaltic pump and weighted intake. New tubing was used at each sampling location. Tubing was clamped to the cable of the sediment sampler (ponar dredge) and lowered with the dredge to the bottom of the river. Unfiltered surface water samples were used for chemical analysis. The samples for VOC and SVOC analysis were collected by directly filling appropriate containers from the peristaltic pump tubing to minimize VOC and/or preservative loss. Pump velocity was reduced during sampling to minimize volatilization.

Sediment Sampling

Sediment samples were collected with an 11.1 liter ponar grab sampler. The sampler was deployed from a davit along the side of the boat, and was raised and lowered with a winch. Prior to sampling at each location, the grab sampler and the other sampling devices (stainless steel bowl and spoon) were decontaminated with a distilled water and Alconox® wash, followed by a distilled water rinse. A single grab sample was sufficient to provide the needed sample quantity. Sediment samples were collected from the upper 2 inches (5-6 centimeters) of the river bed. Upon retrieval, the sediment sampler was opened and the sediment was transferred to the stainless steel bowl. The samples for VOC analysis were obtained using a 5 milliliter TerraCore sampler, which was inserted into the sediment below the surface and removed with care to prevent VOC loss.

COCs for surface water and sediment sampling are included in **Appendix B**.

3.0 LABORATORY PROCEDURES

Samples were analyzed by TestAmerica for VOCs, SVOCs and MNA parameters, using the following methodologies:

- VOCs, via USEPA SW-846 Method 8260B
- SVOCs, via USEPA SW-846 Method 8270C
- MNA parameters: alkalinity (310.1), carbon dioxide (310.1), chloride (325.2), total and dissolved iron (6010B), total and dissolved manganese (6010B), methane (RSK 175), nitrate (353.2), sulfate (375.4), and total and dissolved organic carbon (415.1).

Dichlorobenzenes were quantitated using Method 8260B because of potential volatilization losses associated with Method 8270C. Laboratory results were provided in electronic and hard copy formats.

4.0 QUALITY ASSURANCE

Analytical data were reviewed for quality and completeness, as described in the WGK Long Term Monitoring Work Plan. Data qualifiers were added, as appropriate, and are included on the data tables and the laboratory result pages. The Quality Assurance report is included as **Appendix D**. Laboratory result pages (i.e. Form 1's) along with data validation review sheets are included in **Appendices E** and **F** (for groundwater and surface water/sediment sampling, respectively).

A total of 14 groundwater samples (10 investigative samples, 1 field duplicate, 1 MS/MSD pair and 1 equipment blank) were prepared and analyzed by TestAmerica for combinations of VOCs, SVOCs, dissolved gases, metals, and general chemistry. In addition, two trip blanks were included in the coolers that contained samples for VOC analysis and were analyzed for VOCs. The results for the various analyses were submitted as sample delivery groups (SDGs) KPS048 and KPS049. The samples contained in each SDG are listed below:

KPS048	KPS049
TB022509	BSAMW01S-0209
BSAMW04D-0209	CPAMW01D-0209
CPAMW04D-0209	CPAMW02D-0209
BSAMW05D-0209	CPAMW02D-0209-AD
BSAMW02D-0209	BSAMW03D-0209
CPAMW03D-0209	BSAMW03D-0209-EB
CPAMW05D-0209	
TB022609	

A total of 13 surface water and sediment samples (six investigative, two field duplicates, two MS/MSD pair and one equipment blank) were prepared and analyzed by TestAmerica for combinations of VOCs and SVOCs. In addition, one trip blank was included in the cooler that contained surface water samples for VOC analysis. The results for the various analyses were submitted as SDGs KRS005 and KRS006 (**Appendix F)**. The samples contained in each SDG are listed below:

KRS005	KRS006
SW-R2007-1-0209	SED-R2007-1-0209
SW-R2007-3-0209	SED-R2007-3-0209
SW-R2007-3-0209 DUP	SED-R2007-3-0209 DUP
SW-R2007-2-0209	SED-R2007-2-0209
SED-R2007-2-0209 EB	
TB-022609	

Evaluation of the groundwater analytical data followed procedures outlined in the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (USEPA, 1999), USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (USEPA, 2004), and the WGK Long Term Monitoring Plan (Solutia, 2008).

Evaluation of the surface water and sediment analytical data followed procedures outlined in the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, (USEPA, 1999) and the WGK Long Term Monitoring Plan (URS, 2008).

Based on the above mentioned criteria, groundwater, surface water and sediment results reported for the analyses performed were accepted for their intended use. Acceptable levels of accuracy and precision, based on MS/MSD, laboratory control sample (LCS), surrogate and field duplicate data were achieved for these SDGs to meet the project objectives. Completeness which is defined to be the percentage of analytical results which are judged to be valid, including estimated (**J/UJ**) data was 100 percent.

5.0 OBSERVATIONS

Groundwater analytical detections and MNA results for the 1Q09 LTMP sampling event are presented in **Tables 2** and **3,** respectively. Nine constituents - benzene, chlorobenzene, 1,2-dichlorobenzene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, 1,4-dioxane, 4-chloroaniline, 2-chlorophenol and 1,2,4-trichlorobenzene - were reported in samples collected from the ten LTMP wells during this sampling event. Each of these constituents is discussed below:

Benzene - Benzene was detected in collected samples at levels above the laboratory reporting limit in eight of the ten wells sampled in 1Q09, ranging from 30 µg/L (CPAMW-4D) to 830,000

µg/L (BSAMW-1S). Downgradient of the Former Benzene Storage Area, benzene was detected in the DHU at concentrations of 20,000 µg/L (BSAMW-2D) and 120 µg/L (BSAMW-3D). Near the river north of the Sauget Area 2 Groundwater Migration Control System (SA2 GMCS), benzene was detected in the DHU at concentrations of 82 µg/L (BSAMW-4D).

Benzene was detected at the Former Chlorobenzene Process Area at concentrations of 4,200 µg/L (CPAMW-1D) and 820/810 µg/L (CPAMW-2D and duplicate) at the North Tank Farm. Downgradient of the Former Chlorobenzene Storage Area, benzene was detected in the DHU at a concentration of 86 µg/L (CPAMW03D) and 30 µg/L (CPAMW-4D). Benzene was not detected near the river north of the SA2 GMCS in DHU well CPAMW05D.

Chlorobenzenes (Total) - Total chlorobenzenes (e.g., sum of chlorobenzene, 1,2-dichlorobenzene, 1,3-dichlorobenzene, and 1,4, dichlorobenzene) were detected at levels above the laboratory reporting limit in nine of the ten wells sampled in 1Q09, ranging from 297 µg/L (BSAMW-5D) to 51,720 µg/L (CPAMW-2D)/(49,700 µg/L-CPAMW-2D-AD). Elevated concentrations were also detected in source area well CPAMW01D (49,400 µg/L). Downgradient of the Former Chlorobenzene Storage Area, total chlorobenzenes were detected in the DHU at concentrations of 487 µg/L (CPAMW-3D) and 1,133 µg/L (CPAMW-4D). Total chlorobenzenes were detected in the DHU near the river north of SA2 GMCS at a concentration of 1,512 µg/L (CPAMW-5D).

Downgradient of the Former Benzene Storage Area, total chlorobenzenes were detected at concentrations of 2,900 µg/L (BSAMW-2D) and 1,616 µg/L (BSAMW-3D). North of the SA2 GMCS, near the river, total chlorobenzenes were detected in the DHU at concentrations of 2,390 µg/L (BSAMW04D) and 297 µg/L (BSAMW05D).

Figure 4 displays benzene and total chlorobenzenes results from the 1Q09 sampling event. These constituents provide a good depiction of the areal extent of contaminant migration from source areas at the WGK Facility.

1,4-Dioxane - Groundwater samples were collected from four monitoring wells downgradient of the Former Benzene and Chlorobenzene Storage Area to analyze for 1,4-Dioxane (BSAMW-2D, BSAMW-3D, BSAMW-4D, and BSAMW-5D). 1,4-Dioxane was detected in monitoring wells BSAMW-2D, BSAMW-3D, and BSAMW-4D at concentrations of 43 µg/L, 19 µg/L and 40 µg/L, respectively.

4-Chloroaniline - Groundwater samples for 4-Chloroaniline analysis were collected from monitoring wells CPAMW-3D and CPAMW-4D. 4-Chloroaniline was detected in monitoring wells CPAMW-3D (91 µg/L) and CPAMW-4D (170 µg/L).

2-Chlorophenol - Of the nine samples available for analysis during 1Q09, 2-Chlorophenol was detected in six of the LTMP wells at concentrations ranging from an estimated 12 µg/L (CPAMW-4D) to an estimated 42/79 µg/L (CPAMW-2D and duplicate), both located along the limiting flow lines from the Chlorobenzene Process Area. 2-Chlorophenol was detected in four additional wells at concentrations of 14 µg/L (BSAMW-2D), 17 µg/L (BSAMW-3D), 13 µg/L (BSAMW-4D) and an estimated 66 µg/L (CPAMW-1D).

1,2,4-Trichlorobenzene – Samples from nine of the ten LTMP wells were analyzed for 1,2,4-Trichlorobenzene. Of the wells sampled, only the sample from monitoring well CPAMW-1D indicated a detection, with a concentration of 660 µg/L.

Surface Water and Sediment Monitoring - Surface water and sediment samples were analyzed for VOCs benzene, chlorobenzene, 1,2-dichlorobenzene, 1,3-dichlorobenzene, and 1,4-dichlorobenzene along with SVOCs 1,4-dioxane, 4-chloroaniline, 2-chlorophenol and 1,2,4-trichlorobenzene. The results are summarized as follows**:**

- None of these constituents were detected in the surface water samples (VOC reporting limit 1 µg/L).
- Chlorobenzene was detected in one sediment sample at an estimated concentration of 2.9/2.0 µg/L (R2007-3 and duplicate). All other constituents were non-detect in the samples (variable reporting limits). Sample location R2007-3 is approximately 150 feet from the shoreline, and is downgradient from well BSAMW-4D.

These results indicate that constituents are attenuating prior to discharge to the river.

Monitored Natural Attenuation - The MNA results for this quarter are presented in **Table 3**. PLFA and SIP laboratory results are included in **Appendix G**. These data will be compared to other quarterly sampling data in the first annual natural attenuation evaluation report submitted following 2Q09 sampling.

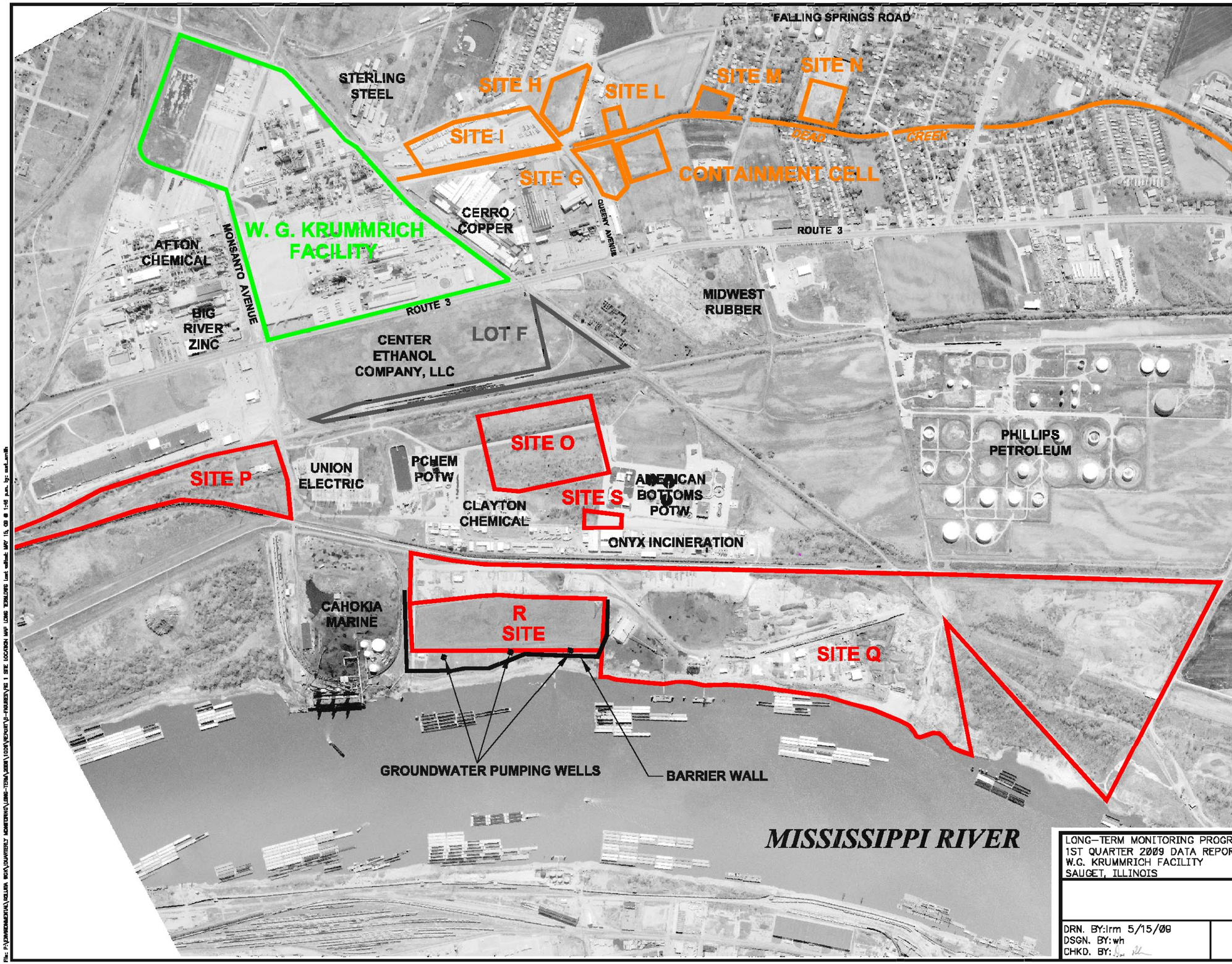
6.0 REFERENCES

Solutia Inc, 2008. Long Term Monitoring Program, Solutia, Inc., W.G. Krummrich Facility, Sauget, Illinois, April 2008.

USEPA, 1999. Contract Laboratory Program National Functional Guidelines for Organic Data Review.

USEPA, 2004. Contract Laboratory Program National Functional Guidelines for Inorganic Data Review.

Figures



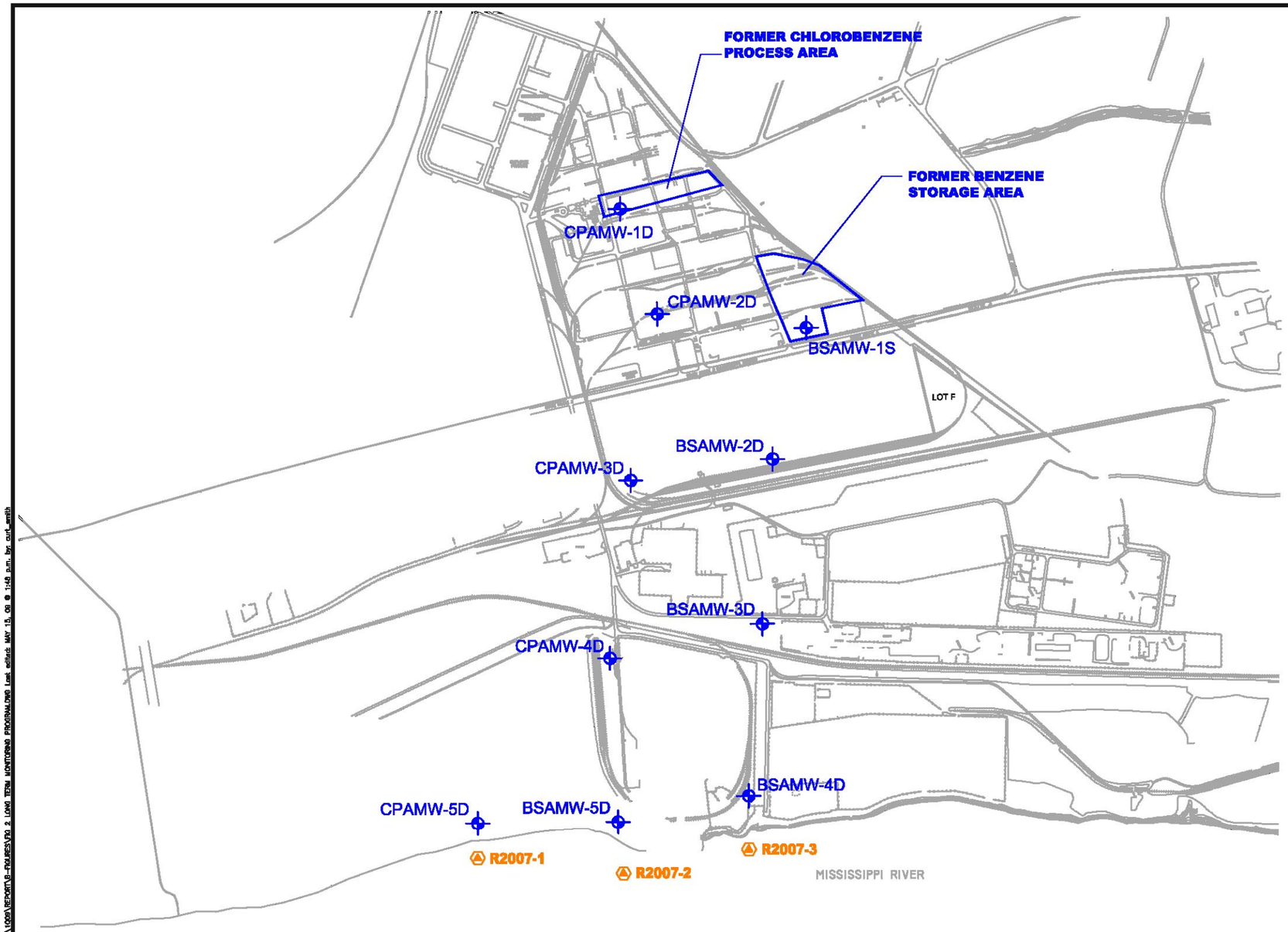
LEGEND

- W.G. KRUMMRICH FACILITY
- SAUGET AREA #1
- SAUGET AREA #2

0 1000

SCALE FEET

LONG-TERM MONITORING PROGRAM 1ST QUARTER 2009 DATA REPORT W.G. KRUMMRICH FACILITY SAUGET, ILLINOIS	PROJECT NO. 21562156
URS	
DRN. BY: lrm 5/15/09 DSGN. BY: wh CHKD. BY:	Site Location Map
	FIG. NO. 1



LEGEND

LONG-TERM MONITORING WELL LOCATION

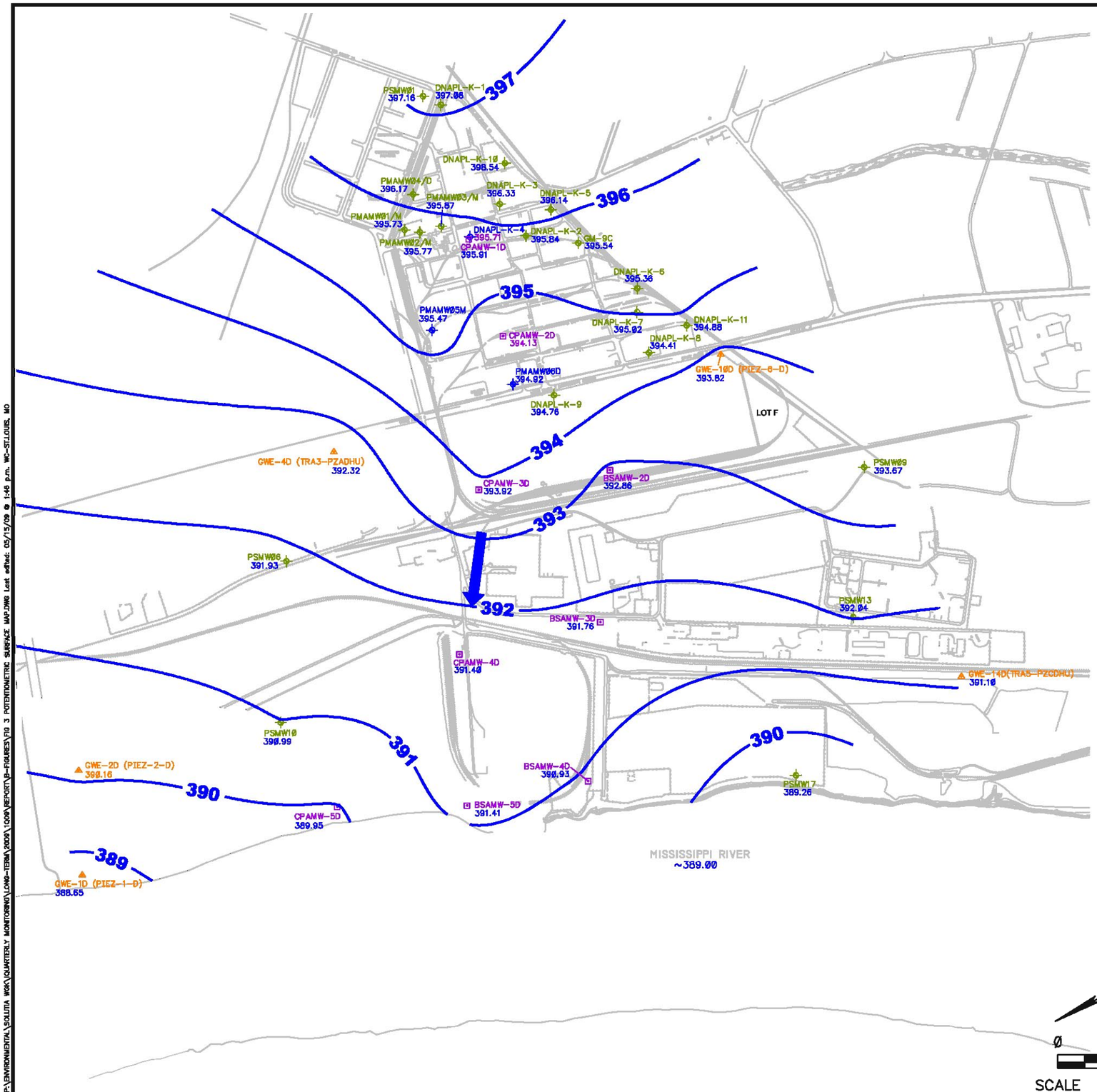
LONG-TERM MONITORING PROGRAM SURFACE WATER / SEDIMENT SAMPLING LOCATION

0 1000

SCALE FEET

LONG-TERM MONITORING PROGRAM 1ST QUARTER 2009 DATA REPORT W.G. KRUMMRICH FACILITY SAUGET, ILLINOIS	PROJECT NO. 21562156
URS	
DRN. BY:lrm 5/15/09 DSGN. BY:ekf CHKD. BY:	Long-Term Monitoring Program Well Locations
	FIG. NO. 2

File: P:\ENVIRONMENTAL\SOLUTIA WGK\QUARTERLY MONITORING\LONG-TERM\2009\1009\REPORTS-FIGURES\FIG 2 LONG TERM MONITORING PROGRAM.DWG Last edited: MAY 15, 09 @ 1:48 p.m. by: curt_smith



LEGEND

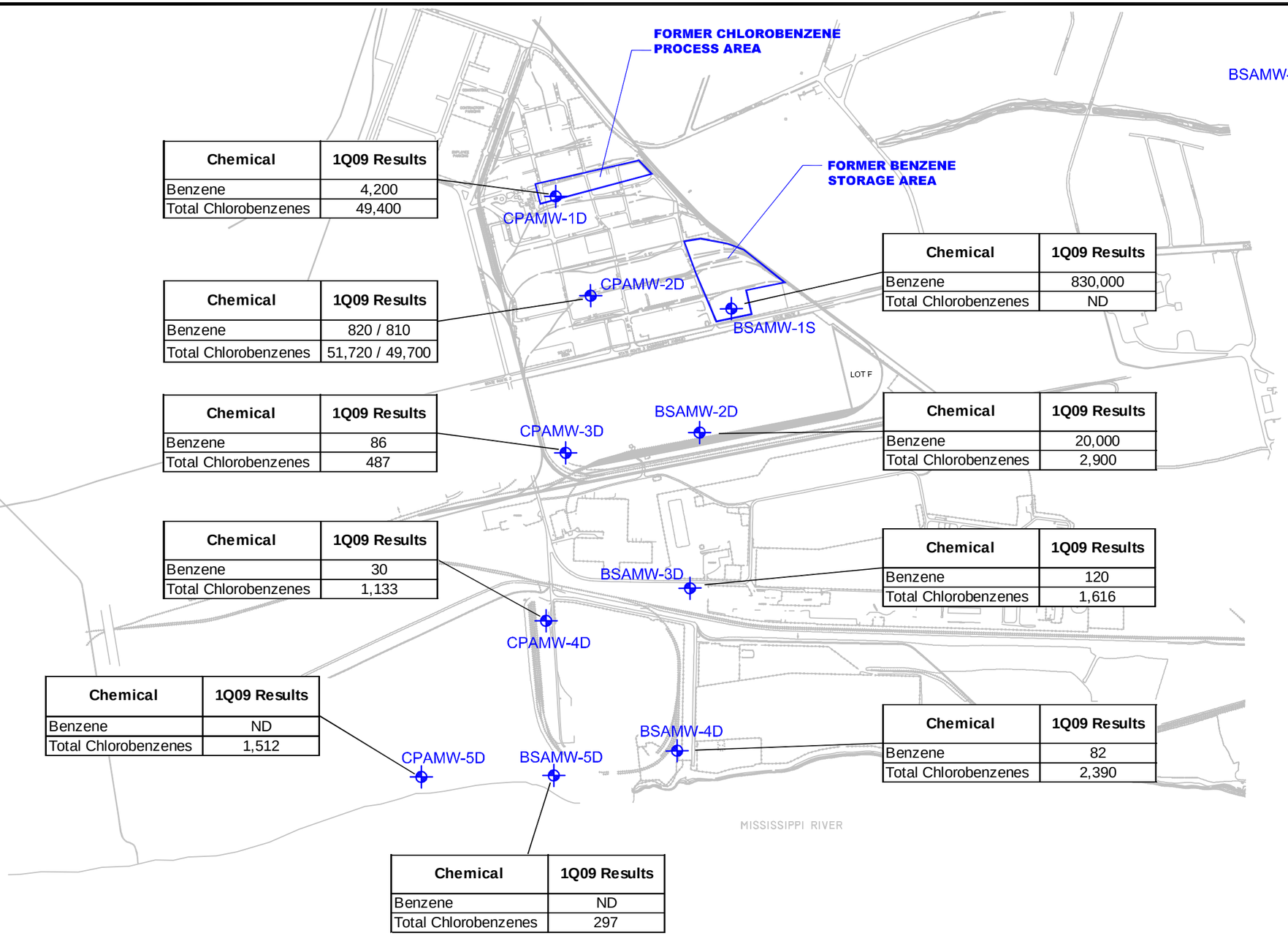
- LONG-TERM MONITORING WELL USED FOR GROUNDWATER CONTOURING
- OTHER MONITORING WELL USED FOR GROUNDWATER CONTOURING
- PIEZOMETER CLUSTER USED FOR GROUNDWATER CONTOURING
- GMCS EXTRACTION WELL USED FOR GROUNDWATER CONTOURING
- GMCS PIEZOMETER USED FOR GROUNDWATER CONTOURING
- —392— GROUNDWATER ELEVATION CONTOUR (FT NAVD)
- INDICATES GROUNDWATER FLOW DIRECTION

NOTES:

1. GROUNDWATER LEVELS WERE MEASURED FEBRUARY 23–25, 2009.
2. CONTOURS GENERATED PRIMARILY USING SURFER SOFTWARE VERSION 8. SOME INTERPRETATION WAS DONE USING PROFESSIONAL JUDGMENT AND CONTOUR LINES WERE MODIFIED BY HAND.
3. WELLS/PIEZOMETERS SHOWN IN GRAYSCALE WERE NOT USED FOR CONTOURING.
4. THE MISSISSIPPI RIVER STAGE ELEVATION PRESENTED ON THE FIGURE IS AN AVERAGE ELEVATION FOR THE TIME OF THE GAUGING EVENT. THE INFORMATION WAS OBTAINED FROM THE SITE R BUBBLER.
5. THE POTENTIOMETRIC SURFACE OBSERVED AROUND SITE R MAY BE ASSOCIATED WITH THE OPERATION OF THE SA2 GMCS.
6. NEITHER THE PHYSICAL NOR THE HYDROLOGIC BARRIERS CREATED BY THE SA2 GMCS WERE INCORPORATED INTO THE DEVELOPMENT OF THESE CONTOURS.
7. LOCATIONS WITH WELLS SCREENED IN BOTH THE MHU AND DHU UTILIZED THE DHU WELL FOR DEVELOPMENT OF THE POTENTIOMETRIC SURFACE MAP.

LONG-TERM MONITORING PROGRAM 1ST QUARTER 2009 DATA REPORT W.G. KRUMMRICH FACILITY SAUGET, ILLINOIS	PROJECT NO. 21562156
URS	
DRN. BY: lrm 5/15/09 DSGN. BY: ekf CHKD. BY:	Potentiometric Surface Map Middle/Deep Hydrogeologic Unit
	FIG. NO. 3

File: P:\ENVIRONMENTAL\SOLUTIA WGK\QUARTERLY MONITORING\LONG-TERM\2009\1Q09\REPORT\D-FIGURES\FIG 3 POTENTIOMETRIC SURFACE MAP.DWG Last edited: 05/15/09 @ 1:46 p.m. WG-STLOUIS, MO



Chemical	1Q09 Results
Benzene	4,200
Total Chlorobenzenes	49,400

Chemical	1Q09 Results
Benzene	820 / 810
Total Chlorobenzenes	51,720 / 49,700

Chemical	1Q09 Results
Benzene	86
Total Chlorobenzenes	487

Chemical	1Q09 Results
Benzene	30
Total Chlorobenzenes	1,133

Chemical	1Q09 Results
Benzene	ND
Total Chlorobenzenes	1,512

Chemical	1Q09 Results
Benzene	ND
Total Chlorobenzenes	297

Chemical	1Q09 Results
Benzene	830,000
Total Chlorobenzenes	ND

Chemical	1Q09 Results
Benzene	20,000
Total Chlorobenzenes	2,900

Chemical	1Q09 Results
Benzene	120
Total Chlorobenzenes	1,616

Chemical	1Q09 Results
Benzene	82
Total Chlorobenzenes	2,390

LEGEND

BSAMW-1D — LONG–TERM MONITORING WELL LOCATION

NOTES:

1. TOTAL CHLOROBENZENES RESULTS INCLUDE THE SUM OF MONOCHLOROBENZENE, 1,2–DICHLOROBENZENE, 1,3–DICHLOROBENZENE, AND 1,4–DICHLOROBENZENE.
2. RESULTS SHOWN ARE IN ug/L.
3. ND DENOTES ANALYTE OR ANALYTES NOT DETECTED.
4. MULTIPLE SAMPLE RESULTS INDICATE A DUPLICATE SAMPLE.

Ø 1ØØØ
SCALE FEET

LONG–TERM MONITORING PROGRAM
1ST QUARTER 2ØØ9 DATA REPORT
W.G. KRUMMRICH FACILITY
SAUGET, ILLINOIS

PROJECT NO. 21562156

URS

DRN. BY:lrm 5/15/Ø9
DSGN. BY:EKF
CHKD. BY:

1QØ9 Benzene and Total Chlorobenzenes Results

FIG. NO. 4

File: P:\ENVIRONMENTAL\SOLUTIA WGK\QUARTERLY MONITORING\LONG-TERM\2009\1Q09\REPORT\B-FIGURES\FIG 4 1Q09 BENZENE AND CHLOROBENZENE RESULTS LONG TERM.DWG Last edited: MAY 15, 09 @ 1:49 p.m. by: curt_smith

Tables

See last page of table for notes.

Table 1
Monitoring Well Gauging Information

Well ID	Construction Details						February 23-25, 2009				Area
	Ground Elevation (feet)*	Casing Elevation* (feet)	Depth to Top of Screen (feet bgs)	Depth to Bottom of Screen (feet bgs)	Top of Screen Elevation* (feet)	Bottom of Screen Elevation* (feet)	Depth to Water (feet btoc)	Depth to Product (feet btoc)	Depth to Bottom (feet btoc)	Water Elevation* (feet)	
Shallow Hydrogeologic Unit (SHU 395-380 feet NAVD 88)											
BSAMW-1S	409.49	412.31	19.68	24.86	389.63	384.63	17.82	--	27.33	394.49	WGK
Middle Hydrogeologic Unit (MHU 380-350 feet NAVD 88)											
PMAMW01M	410.08	410.08	54.54	59.54	355.54	350.54	14.35	--	59.66	395.73	WGK
PMAMW02M	411.93	411.93	56.87	61.87	355.06	350.06	16.16	--	27.42	395.77	WGK
PMAMW03M	412.10	412.10	57.07	62.07	355.03	350.03	16.23	--	61.88	395.87	WGK
PMAMW05M	411.27	410.97	52.17	57.17	359.10	354.10	15.50	--	57.02	395.47	WGK
PSMW01	409.37	412.59	34.56	39.56	374.81	369.81	15.43	--	46.09	397.16	WGK
Deep Hydrogeologic Unit (DHU 350 feet NAVD 88 - Bedrock)											
BSAMW-2D	412.00	415.13	65.79	70.79	346.21	341.21	22.27	--	77.10	392.86	WGK
BSAMW-3D	412.91	415.74	104.80	109.80	308.11	303.11	23.98	--	114.97	391.76	WGK
BSAMW-4D	425.00	424.69	118.54	123.54	306.46	301.46	33.76	--	123.21	390.93	WGK
BSAMW-5D	420.80	420.49	116.25	120.85	304.95	299.95	29.08	--	120.95	391.41	WGK
CPAMW-1D	408.62	408.32	66.12	71.12	342.50	337.50	12.41	--	70.88	395.91	WGK
CPAMW-2D	408.51	408.20	99.96	104.96	308.55	303.55	14.07	--	104.80	394.13	WGK
CPAMW-3D	410.87	410.67	101.90	106.90	308.97	303.97	16.75	--	113.20	393.92	WGK
CPAMW-4D	421.57	421.20	116.44	121.44	305.13	300.13	29.80	--	114.81	391.40	WGK
CPAMW-5D	411.03	413.15	105.51	110.51	305.52	300.52	23.20	--	114.69	389.95	WGK
DNAPL-K-1	413.07	415.56	108.2	123.2	304.87	289.87	18.48	--	123.35	397.08	WGK
DNAPL-K-2	407.94	407.72	97.63	112.63	310.31	295.31	11.88	--	112.59	395.84	WGK
DNAPL-K-3	412.13	411.91	104.8	119.8	307.33	292.33	15.58	--	119.47	396.33	WGK
DNAPL-K-4	409.48	409.15	102.55	117.55	306.93	291.93	13.44	--	115.80	395.71	WGK
DNAPL-K-5	412.27	411.91	102.15	117.15	310.12	295.12	15.77	--	116.61	396.14	WGK
DNAPL-K-6	410.43	410.09	102.47	117.47	307.96	292.96	14.73	--	117.09	395.36	WGK
DNAPL-K-7	408.32	407.72	100.4	115.4	307.92	292.92	12.70	--	115.59	395.02	WGK
DNAPL-K-8	408.56	411.38	102.65	117.65	305.91	290.91	16.97	--	117.71	394.41	WGK
DNAPL-K-9	406.45	405.97	97.42	112.42	309.03	294.03	11.21	--	111.35	394.76	WGK
DNAPL-K-10	413.50	413.25	105.43	120.43	308.07	293.07	16.71	--	120.40	396.54	WGK
DNAPL-K-11	412.20	411.78	105.46	120.46	306.74	291.74	16.90	--	120.36	394.88	WGK
GM-9C	409.54	411.21	88	108	321.54	301.54	15.67	--	108.46	395.54	WGK

See last page of table for notes.

Table 1
Monitoring Well Gauging Information

Well ID	Construction Details						February 23-25, 2009				Area
	Ground Elevation (feet)*	Casing Elevation* (feet)	Depth to Top of Screen (feet bgs)	Depth to Bottom of Screen (feet bgs)	Top of Screen Elevation* (feet)	Bottom of Screen Elevation* (feet)	Depth to Water (feet btoc)	Depth to Product (feet btoc)	Depth to Bottom (feet btoc)	Water Elevation* (feet)	
Deep Hydrogeologic Unit (DHU 350 feet NAVD 88 - Bedrock) (continued)											
GWE-1D (PIEZ-1D)	412.80	415.60	117	127	295.80	285.80	26.95	--	128.72	388.65	Sauget Area 2
GWE-2D (PIEZ-2D)	417.45	417.14	127	137	290.45	280.45	26.98	--	136.95	390.16	Sauget Area 2
GWE-4D (TRA3-PZADHU)	406.05	405.74	74	80	332.05	326.05	13.42	--	78.91	392.32	WGK
GWE-10D (PIEZ-6D)	410.15	412.87	102.5	112.5	307.65	297.65	19.05	--	115.00	393.82	Lot F
GWE-14D (TRA5-PZCDHU)	420.47	422.90	90	96	330.47	324.47	31.80	--	97.18	391.10	WGK
PMAMW04D	411.22	410.88	68.84	73.84	342.38	337.38	14.71	--	73.45	396.17	WGK
PMAMW06D	407.63	407.32	96.49	101.49	311.14	306.14	12.40	--	101.41	394.92	WGK
PSMW06	404.11	406.63	99.80	104.80	304.31	299.31	14.70	--	109.98	391.93	WGK
PSMW09	403.92	403.52	100.40	105.40	303.52	298.52	9.85	--	105.31	393.67	WGK
PSMW10	409.63	412.18	101.23	106.23	308.40	303.40	21.19	--	111.45	390.99	WGK
PSMW13	405.80	405.53	106.08	111.08	299.72	294.72	13.49	--	110.88	392.04	WGK
PSMW17 (BWMW-4D)	420.22	423.26	121.25	126.25	298.97	293.97	34.00	--	134.20	389.26	WGK

Notes:
* - Elevation based upon North American Vertical Datum (NAVD) 88 datum
bgs - below ground surface
btoc - Below top of casing
NG - not gauged

Table 2
Groundwater Analytical Results

		VOC (µg/L)					SVOC (µg/L)			
Sample ID	**Sample Date**	**Benzene**	**Chlorobenzene**	**1,2-Dichlorobenzene**	**1,3-Dichlorobenzene**	**1,4-Dichlorobenzene**	**4-Chloroaniline**	**2-Chlorophenol**	**1,4-Dioxane**	**1,2,4-Trichlorobenzene**
BENZENE STORAGE AREA										
BSAMW01S-0209	3/2/2009	**830000**	<5000	<5000	<5000	<5000	NA	<9.7	NA	<9.7
BSAMW02D-0209	2/26/2009	**20000**	**2900**	<200	<200	<200	NA	**14**	**43**	<9.7
BSAMW03D-0209	3/2/2009	**120**	**1200**	**32**	**14**	**370**	NA	**17**	**19**	<9.7
BSAMW04D-0209	2/25/2009	**82**	**2300**	**26**	<20	**64**	NA	**13**	**40**	<9.4
BSAMW05D-0209	2/25/2009	<4	**270**	**12**	<4	**15**	NA	<9.4	<9.4	<9.4
CHLOROBENZENE PROCESS AREA										
CPAMW01D-0209	3/2/2009	**4200**	**16000**	**20000**	**1400**	**12000**	NA	**66 J**	NA	**660**
CPAMW02D-0209	3/2/2009	**820**	**31000**	**3000**	**720**	**17000**	NA	**42 J**	NA	<9.7
CPAMW02D-0209-AD	3/2/2009	**810**	**30000**	**3000**	**700**	**16000**	NA	**79 J**	NA	9.7 UJ
CPAMW03D-0209	2/26/2009	**86**	**460**	**11**	<5	**16**	**91**	<9.4	NA	<9.4
CPAMW04D-0209	2/25/2009	**30**	**1100**	**15**	<10	**18**	**170**	**12**	NA	<9.7
CPAMW05D-0209	2/26/2009	<10	**1500**	<10	<10	**12**	NA*	NA*	NA*	NA*

Notes:
µg/L = micrograms per liter
< or U = Result is non-detect, less than the reporting limit given.
BOLD indicates concentration greater than reporting limit.
AD = Analytical Duplicate
J = Estimated value
NA = sample not analyzed for select analyte in accordance with LTMP Work Plan
NA* = Due to laboratory error, SVOCs were inadvertently not analyzed for this sample

Table 3
Monitored Natural Attenuation Results Summary

Sample ID	Sample Date	Alkalinity (mg/L)	Carbon Dioxide (mg/L)	Chloride (mg/L)	Dissolved Oxygen (mg/L)	Ethane (ug/L)	Ethylene (ug/L)	Ferrous Iron (mg/L)	Iron (mg/L)	Iron, Dissolved (mg/L)	Manganese (mg/L)	Manganese, Dissolved (mg/L)	Methane (ug/L)	Nitrogen, Nitrate (mg/L)	Sulfate as SO4 (mg/L)	Dissolved Organic Carbon (mg/L)	Total Organic Carbon (mg/L)	ORP (mV)
Benzene Storage Area																		
BSAMW01S-0209	3/2/2009	850	22	100	10.24	<0.35	<0.33		1.3		0.37		11000	<0.25	<5		6.9	-150.8
BSAMW01S-F(0.2)-0209	3/2/2009							0.75		1.1		0.36					13	
BSAMW02D-0209	2/26/2009	700	17	93	7.13	6.2	1.7		1.4		0.3		3200	<0.05	160		4.9	-166.3
BSAMW02D-F(0.2)-0209	2/26/2009							0.39		1.3		0.32				3.8	3.8	
BSAMW03D-0209	3/2/2009	490	26	64	9.23	3.5	8.1		12		0.57		540	<0.25	240		3.7	-139.2
BSAMW03D-F(0.2)-0209	3/2/2009							>5		12		0.59					3.6	
BSAMW04D-0209	2/25/2009	600	22	120	6.28	5.9	<0.33		8.7		0.55		110	<0.05	130		5.4	-122.5
BSAMW04D-F(0.2)-0209	2/25/2009							>5		8.6		0.55				4.6	4.6	
BSAMW05D-0209	2/25/2009	810	17	270	5.27	26	<0.33		19		0.88		13000	<0.05	<5		5.7	-171.9
BSAMW05D-F(0.2)-0209	2/25/2009							>5		18		0.83				5	5	
Chlorobenzene Process Area																		
CPAMW01D-0209	3/2/2009	1100	<5	130	9.26	92	<0.33		1.5		0.092		30000	<0.5	5.7		12	-123.6
CPAMW01D-F(0-2)-0209	3/2/2009							0.19		1		0.077					11	
CPAMW02D-0209	3/2/2009	610	25	67	13.43	14	0.7		6.1		0.35		2800	<0.25	<5		11	-144
CPAMW02D-F(0-2)-0209	3/2/2009							>5		5.2		0.33					10	
CPAMW03D-0209	2/26/2009	690	49	280	6.15	39	<0.33		13		0.62		30000	<0.05	<5		8.9	-150.8
CPAMW03D-F(0.2)-0209	2/26/2009							>5		14		0.69				7.5	7.5	
CPAMW04D-0209	2/25/2009	810	23	240	4.95	20	<0.33		14		0.31		4800	<0.05	72		5.6	-171.6
CPAMW04D-F(0.2)-0209	2/25/2009							>5		13		0.31				5	5	
CPAMW05D-0209	2/26/2009	280	66	280	6.37	7	<0.33		89		3.2		44	<0.05	1400		3.6	-94.7
CPAMW05D-F(0.2)-0209	2/26/2009							>5		85		3.1				3.5	3.5	

Notes:
DO and ORP were measured in the field using YSI 6920 equipped with a flow-thru cell. Values presented represent final measurements before sampling
Ferrous Iron readings were measured in the field using a LaMotte Colorimeter after the groundwater passed through a 0.2 µ filter.
mg/L = milligrams per liter
ug/L = micrograms per liter
< = Result is non-detect, less than the reporting limit given.
A blank space indicates sample not analyzed for select analyte.
F(0.2) = Sample was filtered utilizing a 0.2 µ filter in the field.
mV = millivolts
NC = Not collected

Appendix A

Groundwater Purging and Sampling Forms

LOW FLOW GROUNDWATER SAMPLING DATA SHEET

PROJECT NAME: LTM Program PROJECT NUMBER: 21562159.00001 FIELD PERSONNEL: M. Corbett, S. Moore
DATE: 3/2/09 WEATHER: mostly sunny, 25°
MONITORING WELL ID: ~~BSAMW01~~ Dmc BSAMW01S SAMPLE ID: ~~BSAMW01-0209~~ mc BSAMW01S-0209, BSAMW01S-F(0.2)-0209

INITIAL DATA

Well Diameter: 2 in
Total Well Depth (btoc): 27.50 ft
Depth to Water (btoc): 17.96 ft
Depth to LNAPL/DNAPL (btoc): — ft
Depth to Top of Screen (btoc): 22.50 ft
Screen Length: 5 ft

Water Column Height (do not include LNAPL or DNAPL): 9.54 ft btoc
If Depth to Top of Screen is > Depth to Water AND Screen Lenth is < 4 feet,
Place Pump at: Total Well Depth – 0.5 (Screen Length + DNAPL Column Height) = 25.00 ft btoc
If Depth to Top of Screen is < Depth to Water AND Water Column Height and Screen Length are < 4ft,
Place Pump at: Total Well Depth – (0.5 X Water Column Height + DNAPL Column Height) = — ft btoc
If Screen Length and/or water column height is < 4 ft, Place Pump at: Total Well Depth - 2 ft = — ft btoc

Volume of Flow Through Cell): 1,150 mL
Minimum Purge Volume =
(3 x Flow Through Cell Volume) 3,450 mL
Ambient PID/FID Reading: 0.0 ppm
Wellbore PID/FID Reading: 2633 ppm

PURGE DATA

Pump Type: Stainless Steel Monsoon

Purge Volume (mL)	Time	Depth to Water (ft)	Color	Odor	pH	Temp (°C)	Cond. (ms/cm)	Turbidity (NTUs)	DO (mg/l)	ORP (mv)
0	1000	18.10	colorless	hydrocarbon	6.95	13.35	1.633	19.2	8.16	64.4
1200	1006				7.26	13.84	1.655	14.6	8.51	42.0
2400	1012				7.30	13.75	1.680	5.7	9.69	1.3
3600	1018				7.30	14.03	1.684	1.4	10.62	-89.8
4800	1024				7.31	14.18	1.684	0.9	10.76	-101.6
6000	1030				7.30	14.28	1.687	0.1	10.78	-118.8
7200	1036				7.29	14.34	1.688	-0.6	10.64	-132.7
8400	1042				7.29	14.20	1.688	-1.0	10.54	-139.9
9600	1048				7.29	14.13	1.687	-1.1	10.31	-147.3
10800	1054				7.29	14.30	1.687	-1.3	10.24	-150.8

Start Time: 1000
Stop Time: 1054
Elapsed Time: ~~1100~~ 54 min.
Average Purge Rate (mL/min): 200
Water Quality Meter ID: YSI 6920
Date Calibrated: 3/2/09

SAMPLING DATA

Sample Date: 3/2/09
Sample Method: Stainless Steel Monsoon
Sample Time: 1100
Sample Flow Rate: 200 mL/min
Analysis: VOCs, SVOCs, Metals, MNA
Date Calibrated: NA

COMMENTS:

MNA – Alkilinity, CO2, Chloride, Ferrous Iron, Methane, Nitrate, Sulfate, TOC, DOC.
Ferrous Iron (Filtered 0.2 micron) = 0.75 ppm

LOW FLOW GROUNDWATER SAMPLING DATA SHEET

PROJECT NAME: LMT Program
PROJECT NUMBER: 21562154.00001
FIELD PERSONNEL: M. Corbett, C. Williams
DATE: 2/26/09
WEATHER: overcast, breezy, 50°
MONITORING WELL ID: BSAMW02 D
SAMPLE ID: ~~BSAMW02-0209mc~~, BSAMW02D-F(0.2)-0209
BSAMW02D-0269,

INITIAL DATA

Well Diameter: 2 in
Total Well Depth (btoc): 77.05 ft
Depth to Water (btoc): 22.15 ft
Depth to LNAPL/DNAPL (btoc): — ft
Depth to Top of Screen (btoc): 72.05 ft
Screen Length: 5 ft

Water Column Height (do not include LNAPL or DNAPL): ~~74mc~~ 54.90 ft btoc
If Depth to Top of Screen is > Depth to Water AND Screen Lenth is <4 feet,
Place Pump at: Total Well Depth – 0.5 (Screen Length + DNAPL Column Height) = 74.55 ft btoc
If Depth to Top of Screen is < Depth to Water AND Water Column Height and Screen Length are < 4ft,
Place Pump at: Total Well Depth – (0.5 X Water Column Height + DNAPL Column Height) = — ft btoc
If Screen Length and/or water column height is < 4 ft, Place Pump at: Total Well Depth - 2 ft = — ft btoc

Volume of Flow Through Cell): 1,150 mL
Minimum Purge Volume =
(3 x Flow Through Cell Volume) 3,450 mL
Ambient PID/FID Reading: 0.0 ppm
Wellbore PID/FID Reading: 3.3 ppm

PURGE DATA

Pump Type: Stainless Steel Monsoon

Purge Volume (mL)	Time	Depth to Water (ft)	Color	Odor	pH	Temp (°C)	Cond. (ms/cm)	Turbidity (NTUs)	DO (mg/l)	ORP (mv)
0	1109	22.16	colorless	hydrocarbon	7.06	16.01	1.801	1.2	5.08	-117.7
1200	1115	↓	↓	↓	7.11	15.85	1.829	0.3	5.33	-130.0
2400	1121				7.15	15.64	1.849	-0.2	5.35	-142.7
3600	1127				7.17	15.74	1.844	-0.3	6.38	-152.1
4800	1133				7.18	15.81	1.840	-0.5	6.80	-158.2
6000	1139				7.08	15.82	1.840	-0.5	6.99	-162.6
7200	1145				7.18	15.92	1.836	-0.7	7.09	-164.8
8400	1151				7.18	15.87	1.832	-0.8	7.13	-166.3

Start Time: 1109
Stop Time: 1151
Elapsed Time: 42 min.
Average Purge Rate (mL/min): 200
Water Quality Meter ID: YSI 6920
Date Calibrated: 2/26/09

SAMPLING DATA

Sample Date: 2/26/09
Sample Time: 1200
Analysis: VOCs, SVOCs, Metals, MNA
Sample Method: Stainless Steel Monsoon
Sample Flow Rate: 200 mL/min
Date Calibrated: NA

COMMENTS:

MNA – Alkilinity, CO2, Chloride, Ferrous Iron, Methane, Nitrate, Sulfate, TOC, DOC

Ferrous Iron (Filtered 0.2 micron) = 0.39 ppm

LOW FLOW GROUNDWATER SAMPLING DATA SHEET

PROJECT NAME: LTM Program PROJECT NUMBER: 21562154.00001 FIELD PERSONNEL: M. Corbett, S. Moore
DATE: 3/2/09 WEATHER: sunny, 32°
MONITORING WELL ID: BSAMW03D SAMPLE ID: ~~BSAMW03-0209~~ BSAMW03D-0209, BSAMW03D-F(0.2)-0209

INITIAL DATA

Well Diameter: 2 in
Total Well Depth (btoc): 114.85 ft
Depth to Water (btoc): 23.64 ft
Depth to LNAPL/DNAPL (btoc): — ft
Depth to Top of Screen (btoc): 109.85 ft
Screen Length: 5 ft

Water Column Height (do not include LNAPL or DNAPL): 91.21 ft btoc
If Depth to Top of Screen is > Depth to Water AND Screen Lenth is <4 feet,
Place Pump at: Total Well Depth – 0.5 (Screen Length + DNAPL Column Height) = 112.35 ft btoc
If Depth to Top of Screen is < Depth to Water AND Water Column Height and Screen Length are < 4ft,
Place Pump at: Total Well Depth – (0.5 X Water Column Height + DNAPL Column Height) = — ft btoc
If Screen Length and/or water column height is < 4 ft, Place Pump at: Total Well Depth - 2 ft = — ft btoc

Volume of Flow Through Cell): 1,150 mL
Minimum Purge Volume =
(3 x Flow Through Cell Volume) 3,450 mL
Ambient PID/FID Reading: 0.0 ppm
Wellbore PID/FID Reading: 0.0 ppm

PURGE DATA

Pump Type: Stainless Steel Monsoon

Purge Volume (mL)	Time	Depth to Water (ft)	Color	Odor	pH	Temp (°C)	Cond. (ms/cm)	Turbidity (NTUs)	DO (mg/l)	ORP (mv)
0	1535	23.64	colorless	hydrocarbon	6.85	14.56	1.456	0.2	5.38	-99.8
1200	1541	↓	↓	↓	6.81	14.12	1.495	-0.2	7.14	-110.6
2400	1547				6.80	13.86	1.511	-0.9	8.40	-121.6
3600	1553				6.81	13.92	1.516	-1.5	9.65	-129.7
4800	1559				6.82	13.92	1.516	-2.0	9.30	-137.0
6000	1605				6.82	14.08	1.517	-2.3	9.23	-139.2

Start Time: 1535
Stop Time: 1605
Elapsed Time: 30 min.
Average Purge Rate (mL/min): 200
Water Quality Meter ID: YSI 6920
Date Calibrated: 3/2/09

SAMPLING DATA

Sample Date: 3/2/09
Sample Method: Stainless Steel Monsoon
Sample Time: 1610
Sample Flow Rate: 200 mL/min
Analysis: VOCs, SVOCs, Metals, MNA
Date Calibrated: NA

COMMENTS:

MNA – Alkilinity, CO2, Chloride, Ferrous Iron, Methane, Nitrate, Sulfate, TOC, DOC
Ferrous Iron (Filtered 0.2 micron) = overrange
Collected Equipment Blank sample before this well: BSAMW03D-0209-EB

LOW FLOW GROUNDWATER SAMPLING DATA SHEET

PROJECT NAME: LTM Program PROJECT NUMBER: 21562154.00001 FIELD PERSONNEL: M. Corbett, C. Williams
DATE: 2/25/09 WEATHER: Sunny, 55°
MONITORING WELL ID: BSAMW04D SAMPLE ID: ~~BSAMW04-0209~~ MC BSAMW04D-0209, BSAMW04D-F(0.2)-0209

INITIAL DATA

Well Diameter: 2 in
Total Well Depth (btoc): ~~123.54~~ 123.17 ft
Depth to Water (btoc): 33.98 ft
Depth to LNAPL/DNAPL (btoc): — ft
Depth to Top of Screen (btoc): 118.54 ft
Screen Length: 5 ft

Water Column Height (do not include LNAPL or DNAPL): ~~89.56~~ 89.56 ft btoc
If Depth to Top of Screen is > Depth to Water AND Screen Lenth is <4 feet,
Place Pump at: Total Well Depth – 0.5 (Screen Length + DNAPL Column Height) = 121.04 ft btoc
If Depth to Top of Screen is < Depth to Water AND Water Column Height and Screen Length are < 4ft,
Place Pump at: Total Well Depth – (0.5 X Water Column Height + DNAPL Column Height) = — ft btoc
If Screen Length and/or water column height is < 4 ft, Place Pump at: Total Well Depth - 2 ft = — ft btoc

Volume of Flow Through Cell): 1,150 mL
Minimum Purge Volume =
(3 x Flow Through Cell Volume) 3,450 mL
Ambient PID/FID Reading: 0.0 ppm
Wellbore PID/FID Reading: 0.0 ppm

PURGE DATA

Pump Type: Stainless Steel Monsoon

Purge Volume (mL)	Time	Depth to Water (ft)	Color	Odor	pH	Temp (°C)	Cond. (mS/cm)	Turbidity (NTUs)	DO (mg/l)	ORP (mv)
0	1115	34.00	colorless	hydrocarbon	6.88	16.12	1.540	1.2	6.14	-134.5
1200	1121	↓	colorless	↓	6.88	16.13	1.546	-0.2	6.01	-136.0
2400	1127	↓	↓	↓	6.89	16.00	1.548	-0.7	6.51	-137.1
3600	1133	↓	↓	↓	6.90	15.83	1.548	-1.2	5.89	-132.0
4800	1139	↓	↓	↓	6.91	15.95	1.545	-1.3	6.48	-130.0
6000	1145	↓	↓	↓	6.92	15.84	1.544	-1.4	6.32	-129.1
7200	1151	↓	↓	↓	6.92	16.00	1.541	-1.4	6.32	-124.9
8400	1157	↓	↓	↓	6.92	15.95	1.538	-1.5	6.28	-122.5

Start Time: 1115
Stop Time: 1157
Elapsed Time: 42 min.
Average Purge Rate (mL/min): 200
Water Quality Meter ID: YSI 6920
Date Calibrated: 2/25/09

SAMPLING DATA

Sample Date: 2/25/09
Sample Method: Stainless Steel Monsoon
Sample Time: 1205
Sample Flow Rate: 200
Analysis: VOCs, SVOCs, Metals, MNA
Date Calibrated: NA

COMMENTS:

MNA – Alkilinity, CO2, Chloride, Ferrous Iron, Methane, Nitrate, Sulfate, TOC, DOC
Ferrous Iron (Filtered 0.2 micron) = overrange

LOW FLOW GROUNDWATER SAMPLING DATA SHEET

PROJECT NAME: LTM Program PROJECT NUMBER: 21562154.00001 FIELD PERSONNEL: M. Corbett, C. Williams
DATE: 2/25/09 WEATHER: partly cloudy, 60°
MONITORING WELL ID: BSAMW05D SAMPLE ID: ~~BSAMW05-0209~~ mc BSAMW05D-0209, BSAMW05D-F(0.2)-0209
BSAMW05D-0209-MS, BSAMW05D-0209-MSD

INITIAL DATA

Well Diameter: 2 in
Total Well Depth (btoc): 121.25 ft
Depth to Water (btoc): 29.37 ft
Depth to LNAPL/DNAPL (btoc): — ft
Depth to Top of Screen (btoc): 116.25 ft
Screen Length: 5 ft

Water Column Height (do not include LNAPL or DNAPL): ~~8~~ mc ~~92~~ mc 91.88 ft btoc
If Depth to Top of Screen is > Depth to Water AND Screen Lenth is < 4 feet,
Place Pump at: Total Well Depth – 0.5 (Screen Length + DNAPL Column Height) = 118.75 ft btoc
If Depth to Top of Screen is < Depth to Water AND Water Column Height and Screen Length are < 4ft,
Place Pump at: Total Well Depth – (0.5 X Water Column Height + DNAPL Column Height) = — ft btoc
If Screen Length and/or water column height is < 4 ft, Place Pump at: Total Well Depth - 2 ft = — ft btoc

Volume of Flow Through Cell): 1,150 mL
Minimum Purge Volume =
(3 x Flow Through Cell Volume) 3,450 mL
Ambient PID/FID Reading: 0.0 ppm
Wellbore PID/FID Reading: 0.0 ppm

PURGE DATA

Pump Type: Stainless Steel Monsoon

Purge Volume (mL)	Time	Depth to Water (ft)	Color	Odor	pH	Temp (°C)	Cond. (ms/cm)	Turbidity (NTUs)	DO (mg/l)	ORP (mv)
0	1600	29.37	colorless	hydrocarbon	6.93	16.92	2.112	8.4	6.89	-159.4
1200	1612	29.40	colorless	↓	6.93	16.92	2.111	7.7	6.73	-163.5
2400	1618	↓	↓	↓	6.93	16.81	2.124	4.9	5.59	-168.2
3600	1624				6.93	16.72	2.126	3.1	5.41	-172.4
4800	1630				6.92	16.68	2.119	2.0	5.27	-171.9

Start Time: 1606
Stop Time: 1630
Elapsed Time: 24 min
Average Purge Rate (mL/min): 200
Water Quality Meter ID: YSI 6920
Date Calibrated: 2/25/09

SAMPLING DATA

Sample Date: 2/25/09
Sample Method: Stainless Steel Monsoon
Sample Time: 1640
Sample Flow Rate: 200
Analysis: VOCs, SVOCs, Metals, MNA
Date Calibrated: NA

COMMENTS:

MNA – Alkilinity, CO2, Chloride, Ferrous Iron, Methane, Nitrate, Sulfate, TOC, DOC
Ferrous Iron (Filtered 0.2 micron) = overrange

LOW FLOW GROUNDWATER SAMPLING DATA SHEET

PROJECT NAME: LTM Program PROJECT NUMBER: 21562154.00001 FIELD PERSONNEL: M. Corbett, S. Moore
DATE: 3/2/09 WEATHER: sunny, 30°
MONITORING WELL ID: CPAMW01D SAMPLE ID: ~~CPAMW01-0209~~ CPAMW01D-0209, CPAMW01D-F(0.2)-0209

INITIAL DATA

Well Diameter: 2 in
Total Well Depth (btoc): 71.12 ft
Depth to Water (btoc): 12.65 ft
Depth to LNAPL/DNAPL (btoc): — ft
Depth to Top of Screen (btoc): 66.12 ft
Screen Length: 5 ft

Water Column Height (do not include LNAPL or DNAPL): 58.47 ft btoc
If Depth to Top of Screen is > Depth to Water AND Screen Lenth is <4 feet,
Place Pump at: Total Well Depth – 0.5 (Screen Length + DNAPL Column Height) = 68.62 ft btoc
If Depth to Top of Screen is < Depth to Water AND Water Column Height and Screen Length are < 4ft,
Place Pump at: Total Well Depth – (0.5 X Water Column Height + DNAPL Column Height) = — ft btoc
If Screen Length and/or water column height is < 4 ft, Place Pump at: Total Well Depth - 2 ft = — ft btoc

Volume of Flow Through Cell): 1,150 mL
Minimum Purge Volume =
(3 x Flow Through Cell Volume) 3,450 mL
Ambient PID/FID Reading: 0.0 ppm
Wellbore PID/FID Reading: 5.1 ppm

PURGE DATA

Pump Type: Stainless Steel Monsoon

Purge Volume (mL)	Time	Depth to Water (ft)	Color	Odor	pH	Temp (°C)	Cond. (ms/cm)	Turbidity (NTUs)	DO (mg/l)	ORP (mv)
0	1140	12.66	light brown	hydrocarbon	9.00	15.16	0.942	139.4	7.49	-108.7
1200	1146	↓	↓	↓	8.98	15.26	1.614	61.3	7.06	-131.6
2400	1152				9.04	15.25	1.942	17.1	11.30	-134.3
3600	1158				9.14	15.29	1.648	8.9	10.94	-137.6
4800	1204				9.16	15.30	1.675	7.0	10.66	-134.4
6000	1210				9.21	15.32	2.133	4.9	9.85	-126.6
7200	1216				9.22	15.36	2.141	6.3	9.66	-126.0
8400	1222				9.22	15.38	2.158	7.7	9.39	-125.4
9600	1228				9.24	15.57	2.180	6.8	9.26	-123.6

Start Time: 1140
Stop Time: 1228
Elapsed Time: 48 min.
Average Purge Rate (mL/min): 200
Water Quality Meter ID: YSI 6920
Date Calibrated: 3/2/09

SAMPLING DATA

Sample Date: 3/2/09
Sample Method: Stainless Steel Monsoon
Sample Time: 1230
Sample Flow Rate: 200 mL/min
Analysis: VOCs, SVOCs, Metals, MNA
Date Calibrated: NA

COMMENTS:

MNA – Alkilinity, CO2, Chloride, Ferrous Iron, Methane, Nitrate, Sulfate, TOC, DOC

Ferrous Iron (Filtered 0.2 micron) = 0.19 ppm

LOW FLOW GROUNDWATER SAMPLING DATA SHEET

PROJECT NAME: LTM Program PROJECT NUMBER: 21562154.00001 FIELD PERSONNEL: S. Moore / M. Corbett
DATE: 3/2/09 WEATHER: Sunny, 32°
MONITORING WELL ID: CPAMW02D SAMPLE ID: ~~CPAMW02-0209~~ CPAMW01D-0209, CPAMW01D-0209-AD
CPAMW01D-F(0.2)-0209

INITIAL DATA

Well Diameter: 2 in
Total Well Depth (btoc): 104.96 ft
Depth to Water (btoc): 14.09 ft
Depth to LNAPL/DNAPL (btoc): — ft
Depth to Top of Screen (btoc): 99.96 ft
Screen Length: 5 ft

Water Column Height (do not include LNAPL or DNAPL): 90.87 ft btoc
If Depth to Top of Screen is > Depth to Water AND Screen Lenth is <4 feet,
Place Pump at: Total Well Depth – 0.5 (Screen Length + DNAPL Column Height) = 102.46 ft btoc
If Depth to Top of Screen is < Depth to Water AND Water Column Height and Screen Length are < 4ft,
Place Pump at: Total Well Depth – (0.5 X Water Column Height + DNAPL Column Height) = — ft btoc
If Screen Length and/or water column height is < 4 ft, Place Pump at: Total Well Depth - 2 ft = — ft btoc

Volume of Flow Through Cell): 1,150 mL
Minimum Purge Volume =
(3 x Flow Through Cell Volume) 3,450 mL
Ambient PID/FID Reading: 0.0 ppm
Wellbore PID/FID Reading: 0.0 ppm

PURGE DATA

Pump Type: Stainless Steel Monsoon

Purge Volume (mL)	Time	Depth to Water (ft)	Color	Odor	pH	Temp (°C)	Cond. (ms/cm)	Turbidity (NTUs)	DO (mg/l)	ORP (mv)
1200	1326	14.10	colorless	hydrocarbon	6.89	15.91	1.293	36.8	8.97	-129.9
2400	1332	↓	↓	↓	6.89	16.24	1.308	19.3	13.77	-138.5
3600	1338	↓	↓	↓	6.86	16.22	1.321	9.0	13.85	-142.4
4800	1344	↓	↓	↓	6.86	16.23	1.327	3.8	13.43	-144.0
~~6000~~	~~1350~~	~~↓~~								

Start Time: 1320
Stop Time: 1344
Elapsed Time: 24 min.
Average Purge Rate (mL/min): 200
Water Quality Meter ID: YSI 6920
Date Calibrated: 3/2/09

SAMPLING DATA

Sample Date: 3/2/09
Sample Method: Stainless Steel Monsoon
Sample Time: 1350
Sample Flow Rate: 200 mL/min.
Analysis: VOCs, SVOCs, Metals, MNA
Date Calibrated: NA

COMMENTS:

MNA – Alkilinity, CO2, Chloride, Ferrous Iron, Methane, Nitrate, Sulfate, TOC, DOC

Ferrous Iron (Filtered 0.2 micron) = ~~0.75 ppm~~ mc
Overrange

LOW FLOW GROUNDWATER SAMPLING DATA SHEET

PROJECT NAME: LMT Program PROJECT NUMBER: 21562154.03001 FIELD PERSONNEL: M. Corbett, C. Williams
DATE: 2/26/09 WEATHER: overcast, strong winds, 55°
MONITORING WELL ID: CPAMW03D SAMPLE ID: ~~CPAMW03-0209~~ mc CPAMW03D-0209, CPAMW03D-F(0.2)-0209

INITIAL DATA

Well Diameter: 2 in
Total Well Depth (btoc): ~~TOW~~ 113.0 ft
Depth to Water (btoc): 16.65 ft
Depth to LNAPL/DNAPL (btoc): — ft
Depth to Top of Screen (btoc): 108.00 ft
Screen Length: 5 ft

Water Column Height (do not include LNAPL or DNAPL): 96.35 ft btoc
If Depth to Top of Screen is > Depth to Water AND Screen Lenth is <4 feet,
Place Pump at: Total Well Depth – 0.5 (Screen Length + DNAPL Column Height) = 110.50 ft btoc
If Depth to Top of Screen is < Depth to Water AND Water Column Height and Screen Length are < 4ft,
Place Pump at: Total Well Depth – (0.5 X Water Column Height + DNAPL Column Height) = — ft btoc
If Screen Length and/or water column height is < 4 ft, Place Pump at: Total Well Depth - 2 ft = — ft btoc

Volume of Flow Through Cell): 1,150 mL
Minimum Purge Volume =
(3 x Flow Through Cell Volume) 3,450 mL
Ambient PID/FID Reading: 0.0 ppm
Wellbore PID/FID Reading: 0.0 ppm

PURGE DATA

Pump Type: Stainless Steel Monsoon

Purge Volume (mL)	Time	Depth to Water (ft)	Color	Odor	pH	Temp (°C)	Cond. (ms/cm)	Turbidity (NTUs)	DO (mg/l)	ORP (mv)
0	1304	16.67	colorless	hydrocarbon	6.84	17.35	2.138	7.4	5.89	-139.1
1200	1310	↓	↓	↓	6.79	17.22	2.171	13.9	5.97	-144.9
2400	1316				6.78	17.00	2.159	3.8	5.93	-147.9
3600	1322				6.79	16.88	2.147	6.9	6.15	-150.8

Start Time: 1304
Stop Time: 1322
Elapsed Time: 18 min.
Average Purge Rate (mL/min): 200
Water Quality Meter ID: YSI 6920
Date Calibrated: 2/26/09

SAMPLING DATA

Sample Date: 2/26/09
Sample Method: Stainless Steel Monsoon
Sample Time: 1330
Sample Flow Rate: 200 mL/min
Analysis: VOCs, SVOCs, Metals, MNA
Date Calibrated: NA

COMMENTS:

MNA – Alkilinity, CO2, Chloride, Ferrous Iron, Methane, Nitrate, Sulfate, TOC, DOC
Ferrous Iron (Filtered 0.2 micron) = overrange

LOW FLOW GROUNDWATER SAMPLING DATA SHEET

PROJECT NAME: LTM Program PROJECT NUMBER: 21562154.00001 FIELD PERSONNEL: M. Corbett, C. Williams
DATE: 2/25/09 WEATHER: sunny, 60°
MONITORING WELL ID: CPAMW04D SAMPLE ID: ~~CPAMW04-0209~~ MC CPAMW04D-0209, CPAMW04D-F(0.2)-0209

INITIAL DATA

Well Diameter: 2 in
Total Well Depth (btoc): ~~121.76~~ 121.44 ft
Depth to Water (btoc): 29.79 ft
Depth to LNAPL/DNAPL (btoc): — ft
Depth to Top of Screen (btoc): 116.44 ft
Screen Length: 5 ft

Water Column Height (do not include LNAPL or DNAPL): ~~81.37~~ MC 81.65 ft btoc
If Depth to Top of Screen is > Depth to Water AND Screen Lenth is <4 feet,
Place Pump at: Total Well Depth – 0.5 (Screen Length + DNAPL Column Height) = 118.94 ft btoc
If Depth to Top of Screen is < Depth to Water AND Water Column Height and Screen Length are < 4ft,
Place Pump at: Total Well Depth – (0.5 X Water Column Height + DNAPL Column Height) = ____ ft btoc
If Screen Length and/or water column height is < 4 ft, Place Pump at: Total Well Depth - 2 ft = — ft btoc

Volume of Flow Through Cell): 1,150 mL
Minimum Purge Volume =
(3 x Flow Through Cell Volume) 3,450 mL
Ambient PID/FID Reading: 0.0 ppm
Wellbore PID/FID Reading: 0.0 ppm

PURGE DATA

Pump Type: Stainless Steel Monsoon

Purge Volume (mL)	Time	Depth to Water (ft)	Color	Odor	pH	Temp (°C)	Cond. (ms/cm)	Turbidity (NTUs)	DO (mg/l)	ORP (mv)
0	1410	29.79	colorless	hydrocarbon	6.94	16.77	2.131	5.0	4.72	-151.5
1200	1416	↓	↓	↓	6.94	16.69	2.159	0.7	4.94	-160.6
2400	1422				6.94	16.67	2.158	-0.8	4.96 ~~5.15~~ MC	-162.4
3600	1428				6.95	16.61	2.148	-1.2	4.94	-167.7
4800	1434				6.95	16.61	2.145	-1.3	4.95	-171.6

Start Time: 1410
Stop Time: ~~1440~~ MC 1434
Elapsed Time: 30 min
Average Purge Rate (mL/min): 200
Water Quality Meter ID: YSI 6920
Date Calibrated: 2/25/09

SAMPLING DATA

Sample Date: 2/25/09
Sample Method: Stainless Steel Monsoon
Sample Time: 1440
Sample Flow Rate: 200 mL/min
Analysis: VOCs, SVOCs, Metals, MNA
Date Calibrated: NA

COMMENTS:

MNA – Alkilinity, CO2, Chloride, Ferrous Iron, Methane, Nitrate, Sulfate, TOC, DOC
Ferrous Iron (Filtered 0.2 micron) = overrange

LOW FLOW GROUNDWATER SAMPLING DATA SHEET

PROJECT NAME: LTM Program PROJECT NUMBER: 21562154.00001 FIELD PERSONNEL: M. Corbett, C. Williams
DATE: 2/26/09 WEATHER: overcast, breezy, 55°
MONITORING WELL ID: CPAMW05D SAMPLE ID: ~~CPAMW05-0209-MC~~ CPAMW05D-0209, CPAMW05D-F(0.2)-0209

INITIAL DATA

Well Diameter: 2 in
Total Well Depth (btoc): 114.75 ft
Depth to Water (btoc): 23.42 ft
Depth to LNAPL/DNAPL (btoc): — ft
Depth to Top of Screen (btoc): 109.75 ft
Screen Length: 5 ft

Water Column Height (do not include LNAPL or DNAPL): 91.33 ft btoc
If Depth to Top of Screen is > Depth to Water AND Screen Lenth is <4 feet,
Place Pump at: Total Well Depth – 0.5 (Screen Length + DNAPL Column Height) = 112.25 ft btoc
If Depth to Top of Screen is < Depth to Water AND Water Column Height and Screen Length are < 4ft,
Place Pump at: Total Well Depth – (0.5 X Water Column Height + DNAPL Column Height) = — ft btoc
If Screen Length and/or water column height is < 4 ft, Place Pump at: Total Well Depth - 2 ft = — ft btoc

Volume of Flow Through Cell): 1,150 mL
Minimum Purge Volume =
(3 x Flow Through Cell Volume) 3,450 mL
Ambient PID/FID Reading: 0.0 ppm
Wellbore PID/FID Reading: 0.0 ppm

PURGE DATA

Pump Type: Stainless Steel Monsoon

Purge Volume (mL)	Time	Depth to Water (ft)	Color	Odor	pH	Temp (°C)	Cond. (ms/cm)	Turbidity (NTUs)	DO (mg/l)	ORP (mv)
0	1500	23.42	colorless	none	6.41	14.91	3.604	8.5	3.51	-76.2
1200	1506				6.36	14.93	3.674	4.1	4.66	-81.5
2400	1512				6.37	14.77	3.718	0.4	5.35	-87.9
3600	1518				6.38	14.74	3.724	-0.8	5.88	-90.1
4800	1524				6.39	14.70	3.725	-1.1	6.30	-91.4
6000	1530				6.39	14.70	3.726	-1.4	6.68	-92.6
7200	1536				6.39	14.76	3.726	-1.4	6.52	-94.5
8400	1542				6.40	14.73	3.730	-1.5	6.37	-94.7

Start Time: 1500
Stop Time: 1542
Elapsed Time: 42 min
Average Purge Rate (mL/min): 200
Water Quality Meter ID: YSI 6920
Date Calibrated: 2/26/09

SAMPLING DATA

Sample Date: 2/26/09
Sample Method: Stainless Steel Monsoon
Sample Time: 1550
Sample Flow Rate: 200 mL/min
Analysis: VOCs, SVOCs, Metals, MNA
Date Calibrated: NA

COMMENTS:

MNA – Alkilinity, CO2, Chloride, Ferrous Iron, Methane, Nitrate, Sulfate, TOC, DOC
Ferrous Iron (Filtered 0.2 micron) = overrange

Appendix B

Chains-of-Custody

Serial Number 019021

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Savannah
5102 LaRoche Avenue
Savannah, GA 31404

Website: www.testamericainc.com
Phone: (912) 354-7858
Fax: (912) 352-0165

Alternate Laboratory Name/Location
Phone:
Fax:

PROJECT REFERENCE	PROJECT NO.	PROJECT LOCATION (STATE)	PAGE	OF
WGK LTM	21562154.00001	IL	1	1

TAL (LAB) PROJECT MANAGER	P.O. NUMBER	CONTRACT NO.
Lidya Gulizia		

CLIENT (SITE) PM	CLIENT PHONE	CLIENT FAX
Thomas Adams	314-429-0100	314-429-0462

CLIENT NAME	CLIENT E-MAIL
URS Corporation	thomas_adams@urscorp.com

CLIENT ADDRESS: 1001 Highlands Plaza Dr. West, Ste 300 St. Louis, MO 63110

COMPANY CONTRACTING THIS WORK (if applicable): Solutia

STANDARD REPORT DELIVERY ◯
DATE DUE _____
EXPEDITED REPORT DELIVERY (SURCHARGE) ◯
DATE DUE _____
NUMBER OF COOLERS SUBMITTED PER SHIPMENT: 2

REQUIRED ANALYSIS / NUMBER OF CONTAINERS SUBMITTED

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	COMPOSITE (C) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT, ...)	VOC 8260B HCl	SVOC 8270C* none	Total Fe/Mn (6010B) HNO_3	Alk/CO_2 310.1 none	Sulfate/Chloride 375.4/325.2 none	Methane RSK-175 none	Nitrate 353.2 H_2SO_4/none	TOC 415.1 HCl	DOC 415.1 HCl	Diss. Fe/Mn (6010B) HNO_3	REMARKS
2/25/09	—	TB022509		X				X										*SVOCs per
	1205	BSAMW04D-0209		X				3	2	1	1	1	3	2	1			semi-annual list.
	1205	BSAMW04D-F(0.2)-0209		X												1	1	
	1440	CPAMW04D-0209		X				3	2	1	1	1	3	2	1			
	1440	CPAMW04D-F(0.2)-0209		X												1	1	
	1640	BSAMW05D-0209		X				3	2	1	1	1	3	2	1			
	1640	BSAMW05D-0209-MS		X				3	2									
	1640	BSAMW05D-0209-MSD		X				3	2									
	1640	BSAMW05D-F(0.2)-0209		X												1	1	

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
[signature]	2/25/09	1800						

RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	SAVANNAH LOG NO.	LABORATORY REMARKS
[signature]	2/26/09	0852	YES ◯ NO ◯		680-45017	3.2 / 0.7°C

TAL8240-680 (1207)

Serial Number 019026

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Savannah
5102 LaRoche Avenue
Savannah, GA 31404

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Phone: (912) 354-7858
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Alternate Laboratory Name/Location

Phone:
Fax:

PROJECT REFERENCE	PROJECT NO.	PROJECT LOCATION (STATE)
WGK LTM	21562154.00001	IL

TAL (LAB) PROJECT MANAGER	P.O. NUMBER	CONTRACT NO.
Lidya Gulizia		

CLIENT (SITE) PM	CLIENT PHONE	CLIENT FAX
Thomas Adams	314-429-0100	314-429-0462

CLIENT NAME	CLIENT E-MAIL
URS Corporation	thomas_adams@urscorp.com

CLIENT ADDRESS: 1001 Highlands Plaza Dr. West, Ste 300 St. Louis, MO 63110

COMPANY CONTRACTING THIS WORK (if applicable): Solutia

PAGE 1 OF 1

STANDARD REPORT DELIVERY ◯

DATE DUE _____

EXPEDITED REPORT DELIVERY (SURCHARGE) ◯

DATE DUE _____

NUMBER OF COOLERS SUBMITTED PER SHIPMENT: 2

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	COMPOSITE (C) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT, ...)	VOC 8260B (HCl)	SVOC 8270C* (none)	Total Fe/Mn 6010B (HNO_3)	Alk/CO_2 310.1 (none)	Sulfate 375.4/ Chloride 325.2 (none)	Methane RSK175 (none)	Nitrate 353.2 (H_2SO_4/none)	TOC 415.1 (HCl)	DOC 415.1 (HCl)	Diss. Fe/Mn 6010B (HNO_3)	REMARKS
2/26/09	1200	BSAMW02D-0209		X				3	2	1	1	1	3	2	1			* SVOCs per
	1200	BSAMW02D-F(0.2)-0209		X												1	1	semi-annual list.
	1330	CPAMW03D-0209		X				3	2	1	1	1	3	2	1			
	1330	CPAMW03D-F(0.2)-0209		X												1	1	
	—	TB022609		X				X										
	1550	CPAMW05D-0209		X				3	2	1	1	1	3	2	1			
	1550	CPAMW05D-F(0.2)-0209		X												1	1	

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
[signature]	2/26/09	1800						
RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	SAVANNAH LOG NO.	LABORATORY REMARKS
[signature]	2/27/09	1004	YES ◯ NO ◯		680-45055	2.1/2.4

TAL8240-680 (1207)

Serial Number 014686

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

TestAmerica

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Alternate Laboratory Name/Location

Phone:
Fax:

PROJECT REFERENCE: WGK LTM	PROJECT NO.: 21562154.00001	PROJECT LOCATION (STATE): IL
TAL (LAB) PROJECT MANAGER: Lidya Gulizia	P.O. NUMBER:	CONTRACT NO.:
CLIENT (SITE) PM: Thomas Adams	CLIENT PHONE: 314-429-0100	CLIENT FAX: 314-429-0462
CLIENT NAME: URS Corporation	CLIENT E-MAIL: thomas.adams@urscorp.com	
CLIENT ADDRESS: 1001 Highlands Plaza Dr. West Ste 300 St. Louis, MO 63110		
COMPANY CONTRACTING THIS WORK (if applicable): Solutia		

PAGE 1 OF 1

STANDARD REPORT DELIVERY ◯

DATE DUE _____

EXPEDITED REPORT DELIVERY (SURCHARGE) ◯

DATE DUE _____

NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	COMPOSITE (C) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT, ...)	VOC 8260B (HCl)	SVOC 8270C* (none)	Total Fe/Mn 6010B (HNO_3)	Alk/CO_2 310.1 (none)	Sulfate 375.4 Chloride 325.2 (none)	Methane RSK 175 (none)	Nitrate 353.2 (H2SO4/none)	TOC 415.1 (HCl)	DOC 415.1 (HCl)	Diss Fe/Mn 6010B (HNO_3)	REMARKS
3/2/09	1100	BSAMW01S-0209	G	X				3	2	1	1	1	3	2	1			* SVOCs per
	1100	BSAMW01S-F(0.2)-0209	G	X												1	1	semi-annual
	1230	CPAMW01D-0209	G	X				3	2	1	1	1	3	2	1			list
	1230	CPAMW01D-F(0.2)-0209	G	X												1	1	
	1350	CPAMW02D-0209	G	X				3	2	1	1	1	3	2	1			
	1350	CPAMW02D-0209-AD	G	X				3	2	1	1	1	3	2	1	~~1~~	~~1~~ SET 3/2/09	
	1350	CPAMW02D-F(0.2)-0209	G	X				3	2	~~1~~	~~1~~	~~1~~	~~3~~	~~2~~	~~1~~	SET 3/2/09		
		~~CPAMW02D-F(0.2)-0209-AD~~ SET 3/2/09	G	X												~~1~~	~~1~~ SET 3/2/09	
	1610	BSAMW03D-0209	G	X				3	2	1	1	1	3	2	1			
	1610	BSAMW03D-F(0.2)-0209	G	X												1	1	
	1530	BSAMW03D-0209-EB	G	X				3	2									
	—	TB030209	G	X				3										

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
Jilly Moore	3/2/09	1700						
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	SAVANNAH LOG NO.	LABORATORY REMARKS
KL	3/3/09	0908	YES ◯ NO ◯		680-45126	3.8 | 3.6

Page 9 of 10

TAL8240-680 (1207)

Serial Number 014364

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

TestAmerica

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TestAmerica Savannah
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Fax: (912) 352-0165

Alternate Laboratory Name/Location

Phone:
Fax:

PROJECT REFERENCE: IGK River Sampling	PROJECT NO.: 21562154	PROJECT LOCATION (STATE): IL
L (LAB) PROJECT MANAGER: Lidya Gulizia	P.O. NUMBER	CONTRACT NO.
IENT (SITE) PM: Bob Billman	CLIENT PHONE: 314429 0100	CLIENT FAX: 314429 0462
IENT NAME: URS Corp	CLIENT E-MAIL: Bob_Billman@urscorp.com	
IENT ADDRESS: 001 Highlands Plaza Dr W. Ste 300 St. Louis, MO 63110		
MPANY CONTRACTING THIS WORK (if applicable)		

PAGE 1 OF 2

STANDARD REPORT DELIVERY ◯

DATE DUE _____

EXPEDITED REPORT DELIVERY (SURCHARGE) ◯

DATE DUE _____

NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

MATRIX TYPE: COMPOSITE (C) OR GRAB (G) INDICATE; AQUEOUS (WATER); SOLID OR SEMISOLID; AIR; NONAQUEOUS LIQUID (OIL, SOLVENT, ...)

REQUIRED ANALYSIS / NUMBER OF CONTAINERS SUBMITTED

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	COMPOSITE (C) OR GRAB (G)	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID	8260B (Benzene, 1,4-Dioxane, Total Chlorobenzene) PRESERVATIVE: HCl, Sod. Thio	8270C (4-Chloroaniline, 2-Chlorophenol) PRESERVATIVE: Sod. Thio		8260B (Benzene, 1,4-Dioxane, Total Chlorobenzene) PRESERVATIVE: MeOH, Sod. Bis	8270C (4-Chloroaniline, 2-Chlorophenol)						REMARKS
2/26/09	0930	SW-R2007-1-0209	G	X				3	2									
	0930	SW-R2007-1-0209 MS		X				3	2									
	0930	SW-R2007-1-0209 MSD		X				3	2									
	0940	SED-R2007-1-0209			X						4	1						
	0940	SED-R2007-1-0209 MS			X						4	1						
	0940	SED-R2007-1-0209 MSD			X						4	1						
	1115	SW-R2007-3-0209		X				3	2									
	1115	SW-R2007-3-0209 DUP		X				3	2									
	1130	SED-R2007-3-0209			X						4	1						
	1130	SED-R2007-3-0209 DUP			X						4	1						
	1230	SW-R2007-2-0209		X				3	2									
	1240	SED-R2007-2-0209			X						4	1						

Page 28 of 29

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
[signature]	2/26/09	1700						
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	SAVANNAH LOG NO.	LABORATORY REMARKS
[signature]	022709	1004	YES ◯ NO ◯		680 45056	3.8/1.2/2.1/1.2 TEMP

TAL8240-680 (1207)

Serial Number 014312

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

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Alternate Laboratory Name/Location

Phone:
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PROJECT REFERENCE: WGK River Sampling	PROJECT NO.: 21562154	PROJECT LOCATION (STATE): IL
TAL (LAB) PROJECT MANAGER: Lidya Gulizia	P.O. NUMBER:	CONTRACT NO.:
CLIENT (SITE) PM: Bob Billman	CLIENT PHONE: 314 429 0100	CLIENT FAX:
CLIENT NAME: URS Corp	CLIENT E-MAIL: Bob_Billman@urscorp.com	
CLIENT ADDRESS: 1001 Highlands Plaza Dr W Ste 300 St. Louis MO 63110		
COMPANY CONTRACTING THIS WORK (if applicable):		

PAGE 2 OF 2

STANDARD REPORT DELIVERY ◯

DATE DUE _____

EXPEDITED REPORT DELIVERY (SURCHARGE) ◯

DATE DUE _____

NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

REQUIRED ANALYSIS: 8260B (Benzene, 1,4-Dioxane, Total Chlorobenzenes); 8270C (4-Chloroaniline, 2-Chlorophenol)

PRESERVATIVE: HCl Sod Thio; Sod Thio

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	COMPOSITE (C) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT, ...)	NUMBER OF CONTAINERS SUBMITTED		REMARKS
2/26/09	1355	SED-R-2007-2-0908 EB	G	X				3	2	
↓	0930	TB 022609	G	X				2		

Page 28 of 30

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
	2/26/09	1700						
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	SAVANNAH LOG NO.	LABORATORY REMARKS
	022709	1004	YES ◯ NO ◯		68045056	

TAL8240-680 (1207)

Appendix C

Surface Water and Sediment Sampling Forms

URS

Surface Water / Sediment Sampling Field Data Sheet

Project Number: 21562154	**Sampling Event:** FEB-09 (WGK)
Sampling Personnel: S. Jansen / B. Muller	**Sample Location:** R-2007-1
Sample Date/Time: 2/26/09 SW: 0930 Sed: 0940	**Sample Coordinates:**

Field Descriptions and Observations: Sed is gray silty sand (med). 15.5' Depth

Weather Conditions: 50s, calm, cloudy

Water Quality Parameters turb = 68.9

Specific Conductance (~~umhos~~ mS/cm): .654	pH: 5.68
Water Temperature (°C) 2.79	Dissolved Oxygen (mg/L): ~~25.01~~ 25.01

Sample Collected (check)

SW	Sed		SW	Sed	
✓	✓	Volatile Orgaic Compounds			Pesticides
✓	✓	Semi-volatile Organic Compounds			Metals
		Herbicides			Other _____

Photographs

Photo Date/Time:			Camera/Disk ID:		
Number	Direction	Description	Number	Direction	Description

Comments/Notes: DUP collected

URS

Surface Water / Sediment Sampling Field Data Sheet

Project Number: 21562154	**Sampling Event:** Feb 2009 (WGK
Sampling Personnel: S. Jensen, B. Mullay	**Sample Location:** R-2007-2
Sample Date/Time: 2/26/09	**Sample Coordinates:**
SW: 1230 Sed: 1240	

Field Descriptions and Observations: 25.3'

Brown Coarse Sand & gravel

Weather Conditions: Cloudy 50

Water Quality Parameters Turb 66.1

Specific Conductance (µmhos): 0.6845	pH: 7.74
Water Temperature (°C) 2.81	Dissolved Oxygen (mg/L): 17.59

Sample Collected (check)

SW	Sed		SW	Sed	
✓	✓	Volatile Orgaic Compounds			Pesticides
✓	✓	Semi-volatile Organic Compounds			Metals
		Herbicides			Other _____

Photographs

Photo Date/Time:			Camera/Disk ID:		
Number	Direction	Description	Number	Direction	Description

Comments/Notes:

URS

Surface Water / Sediment Sampling Field Data Sheet

Project Number: 21562154	**Sampling Event:** Feb 09 (WGK)
Sampling Personnel: S. Jansen / B. Muller	**Sample Location:** RZ007-3
Sample Date/Time: 2/26/09 SW: 1115 Sed: 1130	**Sample Coordinates:**

Field Descriptions and Observations: 25.2'

med sand brown w/ small black gravel possibly coal?

Weather Conditions:

50s, some wind

Water Quality Parameters 67.1

Specific Conductance (µmhos): 0.648	pH: 7.03
Water Temperature (°C) 2.85	Dissolved Oxygen (mg/L): 18.66

Sample Collected (check)

SW	Sed		SW	Sed	
✓	✓	Volatile Orgaic Compounds			Pesticides
✓	✓	Semi-volatile Organic Compounds			Metals
		Herbicides			Other _____

Photographs

Photo Date/Time:			Camera/Disk ID:		
Number	Direction	Description	Number	Direction	Description

Comments/Notes: MS & MSD collected here

Appendix D

Quality Assurance Report

QUALITY ASSURANCE REPORT

Solutia Inc.
W.G. Krummrich Facility
Sauget, Illinois

Long-Term Monitoring Program
1st Quarter 2009 Data Report

Prepared for

Solutia Inc.
575 Maryville Centre Drive
St. Louis, MO 63141

May 2009

URS Corporation
1001 Highland Plaza Drive West, Suite 300
St. Louis, MO 63110
(314) 429-0100
Project # 21562154.00001

1.0 INTRODUCTION 1

2.0 RECEIPT CONDITION AND SAMPLE HOLDING TIMES 4

3.0 TRIP BLANKS, LABORATORY METHOD BLANK AND EQUIPMENT BLANK SAMPLES 5

4.0 SURROGATE SPIKE RECOVERIES 5

5.0 LABORATORY CONTROL SAMPLES RECOVERIES 5

6.0 MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD) SAMPLES 6

7.0 FIELD DUPLICATE RESULTS 6

8.0 INTERNAL STANDARD RESPONSES 7

9.0 RESULTS REPORTED FROM DILUTIONS 7

1.0 INTRODUCTION

This Quality Assurance Report presents the findings of a review of analytical data for groundwater, surface water and sediment samples collected in February and March of 2009 at the Solutia W.G. Krummrich plant as part of the 1st Quarter 2009 Long-Term Monitoring Program. The samples were collected by URS Corporation personnel and analyzed by TestAmerica Laboratories located in Savannah, Georgia using USEPA methods, Standard methods and USEPA SW-846 methodologies. Groundwater samples were tested for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), metals, dissolved gasses, and general chemistry.

One hundred percent of the data were subjected to a data quality review (Level III validation). The Level III validations were performed in order to confirm that the analytical data provided by Test America were acceptable in quality for their intended use.

A total of 14 groundwater samples (10 investigative samples, one field duplicate pair, one MS/MSD pair, and one equipment blank) were analyzed by Test America. In addition, three trip blank sets were included in the coolers that contained groundwater samples for VOC analysis and were analyzed for VOCs by USEPA SW-846 Method 8260B. These samples were analyzed as two Sample Delivery Groups (SDGs) KPS048 and KPS049 utilizing the following USEPA SW-846 Methods:

- Method 8260B for VOCs (Benzene, Chlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene and 1,4-Dichlorobenzene)
- Method 8270 for SVOCs (4-Chloroaniline, 2-Chlorophenol, 1,4-Dioxane and 1,2,4-Trichlorobenzene)
- Method 6010B for total and dissolved iron and manganese

Samples were also analyzed for dissolved gasses and general chemistry parameters by the following methods:

- Method RSK-175 for Dissolved Gasses (Ethane, Ethylene, and Methane)
- USEPA Method 310.1 for Alkalinity and Free Carbon Dioxide
- USEPA Method 325.2 for Chloride
- USEPA Method 353.2 for Nitrogen, Nitrate-Nitrite
- USEPA Method 375.4 for Sulfate
- USEPA Method 415.1 for Total and Dissolved Organic Carbon

A total of 13 surface water and sediment samples (six investigative surface water and sediment), two field duplicates, two MS/MSD pairs and one equipment blank) were analyzed by TestAmerica for combinations of VOCs and SVOCs. In addition, one trip blank was included in the cooler that contained surface water samples for VOC analysis and were analyzed for VOCs by USEPA SW-846 Method 8260B. The results

were analyzed as two sample delivery groups (SDGs) KRS005 and KRS006 utilizing the following USEPA SW-846 Methods:

- Method 8260 for VOCs (benzene, chlorobenzene, 1,2-dichlorobenzene, 1,3-dichlorobenzene, and 1,4-dichlorobenzene).
- Method 8270C for SVOCs (2-chlorophenol, 4-chloroaniline, 1,4-dioxane, and 1,2,4-trichlorobenzene).

Samples were reviewed following procedures outlined in the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, October 1999, USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, October 2004 and the Long-Term Monitoring Plan, 2008.

The above guidelines provided the criteria to review the data. Additional quantitative criteria are given in the analytical methods. Qualifiers assigned by the data reviewer have been applied to the laboratory reporting forms (Form-1s). The qualifiers indicate data that did not meet acceptance criteria and corrective actions were not successful or not performed. The various qualifiers are explained in **Tables 1** and **2** below.

TABLE 1 Laboratory Data Qualifiers

Lab Qualifier	Definition
U	Analyte was not detected at or above the reporting limit.
*	LCS, LCSD, MS, MSD, MD or surrogate exceeds the control limits.
E	Result exceeded the calibration range, secondary dilution required.
D	Surrogate or matrix spike recoveries were not obtained because the extract was diluted for analysis; also compounds analyzed at a dilution will be flagged with a D.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
X	Spike recovery exceeds upper or lower control limits.
F	MS, MSD or RPD exceeds upper or lower control limits.
P	The difference between the results of the two GC columns is greater than 40%
H	Sample was prepped or analyzed beyond the specified holding time.
B	Compound was found in the blank and sample.
4	MS, MSD: The analyte present in the original sample is 4 times greater than the matrix spike concentration; therefore, control limits are not applicable.

TABLE 2 URS Data Qualifiers

URS Qualifier	Definition
U	The analyte was analyzed for but was not detected.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

Based on the criteria outlined, it is recommended that the results reported for these analyses are accepted for their intended use. Acceptable levels of accuracy, precision, and representativeness (based on MS/MSD, matrix duplicate, LCS, surrogate compounds and field duplicate results) were achieved for this data set, except where noted in this report. In addition, analytical completeness, defined as the percentage of analytical results that are judged to be valid, including estimated (**J/UJ**) data was 100 percent, which meets the completeness goal of 95 percent.

The data review included evaluation of the following criteria:

Organics

- Receipt condition and sample holding times
- Laboratory method blanks, field equipment blanks and trip blank samples
- Surrogate spike recoveries
- Laboratory control sample (LCS) recoveries
- Matrix spike/matrix spike duplicate (MS/MSD) sample recoveries and relative percent difference (RPD) values
- Field duplicate results
- Results reported from dilutions
- Internal standard responses

Inorganics/General chemistry

- Receipt condition and sample holding times
- Laboratory method blank and field equipment blank samples
- LCS recoveries
- MS/MSD sample recoveries and matrix duplicate RPD values
- Field duplicate and laboratory duplicate results
- Results reported from dilutions

The following sections present the results of the data review.

2.0 RECEIPT CONDITION AND SAMPLE HOLDING TIMES

Sample holding time requirements for the analyses performed are presented in the methods and/or in the data review guidelines. Review of the sample collection, extraction and analysis dates involved comparing the chain-of-custody and the laboratory data summary forms for accuracy, consistency, and holding time compliance. Upon review of the KPS048 data, the COC designated sample CPAMW05D-0209 for SVOC analysis. The laboratory did not analyze sample CPAMW05D-0209 for SVOCs. The URS project officer was notified and since the SVOC sample was outside holding time criteria it was decided that the sample would be recollected during the next scheduled event for SVOC analysis (i.e., 3Q09). The laboratory case narrative indicated that three out of three unpreserved vials for dissolved gases and two out of three HCl preserved vials for VOC analysis for sample CPAMW03D-0209 were received by the laboratory with headspace. The remaining vial without headspace was used for the requested analysis. Also, one out of two 1-Liter Ambers for sample BSAMW02D-0209 was received by the laboratory broken. The remaining intact bottles contained sufficient sample for the requested analyses. No qualifications of data were required.

Upon review of the KPS049 data, the cooler receipt form indicated that all three vials for trip blank TB030209 were received by the laboratory broken. All requested VOC analyses for the investigative samples were completed, without an associated trip blank.

Upon review of the KRS005 and KRS006 data, the cooler receipt forms indicated a sample ID discrepancy between the COCs and sample labels. The field duplicate samples on the COCs were listed as DUP and the sample labels listed –AD at the end of the sample ID. Samples were logged in by the laboratory using the DUP sample ID designation. This did not affect the quality of the data. No qualification of data was required.

Additionally, upon review of the KRS006 data, the cooler receipt form indicated that one MS sample vial and two MSD sample vials for sample SED-R2007-1-0209 were received by the laboratory with low sample volume. Sufficient sample was available to perform all requested analyses. No qualification of data was required.

3.0 TRIP BLANKS, LABORATORY METHOD BLANK AND EQUIPMENT BLANK SAMPLES

Trip blank samples are used to assess VOC cross contamination of samples during shipment to the laboratory. Trip blanks were submitted with each cooler shipped containing samples for VOC analyses for a total of three trip blank samples. All associated samples were nondetect; therefore, no qualification of data was required.

Laboratory method blank samples evaluate the existence and magnitude of contamination problems resulting from laboratory activities. All laboratory method blank samples were analyzed at the method prescribed frequencies. All method blank samples were nondetect. No qualification of data was required.

Equipment blank samples are used to assess the effectiveness of equipment decontamination procedures. All equipment blank samples were nondetect with the exception of those that are further discussed in data reviews in **Appendix E**. Analytical data that were reported nondetect or at concentrations greater than five times (5X) the associated blank concentration (10X for common laboratory contaminants) did not require qualification. No qualification of data was required.

4.0 SURROGATE SPIKE RECOVERIES

Surrogate compounds are used to evaluate overall laboratory performance for sample preparation efficiency on a per sample basis. All samples analyzed for VOCs and SVOCs were spiked with surrogate compounds during sample preparation. USEPA National Functional Guidelines for Organic Data Review state how data is qualified, if surrogate spike recoveries do not meet acceptance criteria.

All groundwater surrogate recoveries were within evaluation criteria with the exception of those that are further discussed in data reviews in **Appendix E**. Analytical data that required qualification based on surrogate data are included in the table below. Surrogates that were associated with quality control samples or were diluted out and not recovered did not require qualification. In addition, no qualification of data was required if only one SVOC acid or base fraction surrogate was outside criteria and USEPA National Functional Guidelines for Organic Data Review indicates to qualify data if two or more surrogates per SVOC fraction are outside criteria. Qualifications based on surrogate spike recoveries are included in the table below:

Field ID	Parameter	Analyte	Qualification
CPAMW01D-0209	SVOCs	2-Chlorophenol	**J**
CPAMW02D-0209-AD	SVOCs	2-Chlorophenol	**J**

Surface water and sediment surrogate recoveries were within evaluation criteria; therefore, no qualification of data was required.

5.0 LABORATORY CONTROL SAMPLE RECOVERIES

Groundwater, surface water and sediment laboratory control samples (LCS) are analyzed with each analytical batch to assess the accuracy of the analytical process. All LCS recoveries were within evaluation criteria. No qualification of data was required.

6.0 MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD) SAMPLES

MS/MSD samples are analyzed to assess the accuracy and precision of the analytical process on an analytical sample in a particular matrix. MS/MSD samples were required to be collected at a frequency of one per 20 investigative samples in accordance with the work plan. URS Corporation submitted one MS/MSD sample set for 10 investigative samples meeting the work plan frequency requirement.

No qualifications were made to the data if the MS/MSD percent RPD was the only factor out of criteria. Also, USEPA National Functional Guidelines for Organic Data Review (October 1999) states that organic data should not be qualified based on MS/MSD criteria alone. Therefore, if recoveries were outside evaluation criteria due to matrix interference or abundance of analytes, no qualifiers were assigned unless these analytes had other quality control criteria outside evaluation criteria.

Groundwater samples spiked and analyzed as MS/MSDs and their respective recoveries are discussed further in data reviews in **Appendix E**. No qualification of data was required.

Surface water and sediment samples spiked and analyzed as MS/MSDs and their respective recoveries are discussed further in data reviews in **Appendix F**. No qualification of data was required.

7.0 FIELD DUPLICATE RESULTS

Field duplicate results are used to evaluate precision of the entire data collection activity, including sampling, analysis and site heterogeneity. When results for both duplicate and sample values are greater than five times the practical quantitation limit (PQL), satisfactory precision is indicated by an RPD less than or equal to 25 percent for aqueous samples. Where one or both of the results of a field duplicate pair are reported at less than five times the PQL, satisfactory precision is indicated if the field duplicate results agree within 2 times the quantitation limit. Field duplicate results that do not meet these criteria may indicate unsatisfactory precision of the results.

One pair of field duplicate samples were collected for the 10 investigative samples. This satisfies the requirement in the work plan (one per 10 investigative samples or 10 percent). All groundwater field duplicate RPDs were within evaluation criteria with the exception of the field duplicates discussed further in data reviews in **Appendix E**. Qualifications based on groundwater field duplicates are included in the table below.

Field ID	Field duplicate ID	Parameter	Analyte	RPD	Qualification
CPAMW02D-0209	CPAMW02D-0209-AD	SVOCs	2-Chlorophenol	**> 2x RL**	**J**

All surface water and sediment field duplicate RPDs were within evaluation criteria; therefore, no qualification of data was required.

8.0 INTERNAL STANDARD RESPONSES

Internal standard (IS) performance criteria ensure that the GC/MS sensitivity and response are stable during each analytical run. IS areas must be within -50 percent to +100 percent for VOCs and SVOCs.

The internal standards area responses for VOCs and SVOCs were verified for the data review. All groundwater IS responses met the criteria as described above with the exception of those that are further discussed in data reviews in **Appendix E**. Qualifications based on internal standard responses are included in the table below. The compound 2-Chlorophenol was detected and previously qualified due to high surrogate recovery. No additional qualification was required.

Field ID	Parameter	Analyte	Qualification
CPAMW02D-0209-AD	SVOCs	1,2,4-Trichlorobenzene	**UJ**

All surface water and sediment internal standard responses met the criteria as described above; therefore, no qualification of data was required.

9.0 RESULTS REPORTED FROM DILUTIONS

VOC, SVOC, chloride, sulfate, alkalinity, and free carbon dioxide groundwater samples were diluted due to high levels of target analytes. The diluted sample results for these analytes were reported for the associated samples. Surface water and sediment samples did not require a dilution.

Appendix E
Groundwater Analytical Results (with Data Review Sheets)

SDG KPS048

Results of Samples from Wells:

BSAMW-2D
BSAMW-4D
BSAMW-5D
CPAMW-3D
CPAMW-4D
CPAMW-5D

Solutia Krummrich Data Review

Laboratory SDG: KPS048

Reviewer: Elizabeth Kunkel

Date Reviewed: 4/1/2009

Guidance: USEPA National Functional Guidelines for Organic Data Review 1999. USEPA National Functional Guidelines for Inorganic Data Review 2004.

Applicable Work Plan: Long-Term Monitoring Program (LTMP) Work Plan (Solutia 2008)

Sample Identification #	Sample Identification #
TB022509	BSAMW04D-0209
BSAMW04D-F(0.2)-0209	CPAMW04D-0209
CPAMW04D- F(0.2)-0209	BSAMW05D-0209
BSAMW05D- F(0.2)-0209	BSAMW02D-0209
BSAMW02D- F(0.2)-0209	CPAMW03D-0209
CPAMW03D- F(0.2)-0209	TB022609
CPAMW05D-0209	CPAMW05D- F(0.2)-0209

1.0 Data Package Completeness

Were all items delivered as specified in the QAPP and COC?

No, sample CPAMW05D-0209 on the COC was designated for SVOC analysis. However, the laboratory mistakenly did not analyze CPAMW05D-0209 for SVOCs. The URS project officer was notified and since the SVOC samples were outside holding time criteria it was decided that the sample would be recollected at a future date.

2.0 Laboratory Case Narrative \ Cooler Receipt Form

Were problems noted in the laboratory case narrative or cooler receipt form?

Yes, the laboratory case narrative indicated that three out of three unpreserved vials for dissolved gases analyses and two out of three HCl preserved vials for VOC analysis for sample CPAMW03D-0209 were received by the laboratory with headspace. The MSD recovery for chlorobenzene was outside evaluation criteria in sample BSAMW05D-0209. Samples were diluted due to high levels of target analytes. These issues did not require qualification of the data.

The cooler receipt form indicated that one out of two 1-Liter Ambers for sample BSAMW02D-0209 was received by the laboratory broken. The remaining intact bottles contained sufficient sample for the requested analyses. This did not affect the quality of the data. No qualification of data was required.

3.0 Holding Times

Were samples extracted/analyzed within QAPP limits?

Yes

4.0 Blank Contamination

Were any analytes detected in the Method Blanks, Field Blanks or Trip Blanks?

No

5.0 Laboratory Control Sample

Were LCS recoveries within evaluation criteria?

Yes

6.0 Surrogate Recoveries

Were surrogate recoveries within evaluation criteria?

Yes

7.0 Matrix Spike and Matrix Spike Duplicate Recoveries

Were MS/MSD samples reported as part of this SDG?

Yes, sample BSAMW05D-0209 was spiked and analyzed for VOCs and SVOCs. Sample BSAMW02D-0209 was spiked and analyzed for total and dissolved iron and manganese. Sample CPAMW05D-F(0.2)-0209 was spiked and analyzed for dissolved organic carbon.

Were MS/MSD recoveries within evaluation criteria?

No

MS/MSD ID	Parameter	Analyte	MS/MSD Recovery	RPD	MS/MSD/RPD Criteria
BSAMW05D-0209	VOCs	Chlorobenzene	85/**71**	7	85-116/30

USEPA National Functional Guidelines for Organic Data Review indicates that organic data should not be qualified based on MS/MSD data alone and LCS recoveries were within evaluation criteria, therefore no qualification of the data was required.

8.0 Internal Standard (IS) Recoveries

Were internal standard area recoveries within evaluation criteria?

Yes

9.0 Laboratory Duplicate Results

Were laboratory duplicate samples collected as part of this SDG?

Yes, sample BSAMW02D-0209 was duplicated and analyzed for alkalinity and carbon dioxide.

Were laboratory duplicate sample RPDs within criteria?

Yes

10.0 Field Duplicate Results

Were field duplicate samples collected as part of this SDG?

No

11.0 Sample Dilutions

For samples that were diluted and nondetect, were undiluted results also reported?

Analytes were detected in samples that were diluted.

12.0 Additional Qualifications

Were additional qualifications applied?

No

SAMPLE SUMMARY

Client: URS Corporation

Job Number: 680-45017-1
Sdg Number: KPS048

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
680-45017-1	TB022509	Water	02/25/2009 0000	02/26/2009 0852
680-45017-2	BSAMW04D-0209	Water	02/25/2009 1205	02/26/2009 0852
680-45017-3	BSAMW04D-F(0.2)-0209	Water	02/25/2009 1205	02/26/2009 0852
680-45017-4	CPAMW04D-0209	Water	02/25/2009 1440	02/26/2009 0852
680-45017-5	CPAMW04D-F(0.2)-0209	Water	02/25/2009 1440	02/26/2009 0852
680-45017-6	BSAMW05D-0209	Water	02/25/2009 1640	02/26/2009 0852
680-45017-6MS	BSAMW05D-0209-MS	Water	02/25/2009 1640	02/26/2009 0852
680-45017-6MSD	BSAMW05D-0209-MSD	Water	02/25/2009 1640	02/26/2009 0852
680-45017-7	BSAMW05D-F(0.2)-0209	Water	02/25/2009 1640	02/26/2009 0852
680-45055-1	BSAMW02D-0209	Water	02/26/2009 1200	02/27/2009 1004
680-45055-2	BSAMW02D-F(0.2)-0209	Water	02/26/2009 1200	02/27/2009 1004
680-45055-3	CPAMW03D-0209	Water	02/26/2009 1330	02/27/2009 1004
680-45055-4	CPAMW03D-F(0.2)-0209	Water	02/26/2009 1330	02/27/2009 1004
680-45055-5TB	TB022609	Water	02/26/2009 0000	02/27/2009 1004
680-45055-6	CPAMW05D-0209	Water	02/26/2009 1550	02/27/2009 1004
680-45055-7	CPAMW05D-F(0.2)-0209	Water	02/26/2009 1550	02/27/2009 1004

SAMPLE RESULTS

Analytical Data

Client: URS Corporation

Job Number: 680-45017-1
Sdg Number: KPS048

Client Sample ID: **TB022509**

Lab Sample ID: 680-45017-1
Client Matrix: Water

Date Sampled: 02/25/2009 0000
Date Received: 02/26/2009 0852

8260B Volatile Organic Compounds (GC/MS)

Method: 8260B
Preparation: 5030B
Dilution: 1.0
Date Analyzed: 02/27/2009 1638
Date Prepared: 02/27/2009 1638

Analysis Batch: 680-131584

Instrument ID: GC/MS Volatiles - A C2
Lab File ID: a1730.d
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	RL
Benzene	1.0	U	1.0
Chlorobenzene	1.0	U	1.0
1,2-Dichlorobenzene	1.0	U	1.0
1,3-Dichlorobenzene	1.0	U	1.0
1,4-Dichlorobenzene	1.0	U	1.0

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	92	75 - 120
Dibromofluoromethane	107	75 - 121
Toluene-d8 (Surr)	100	75 - 120

Analytical Data

Client: URS Corporation

Job Number: 680-45017-1
Sdg Number: KPS048

Client Sample ID: **BSAMW04D-0209**

Lab Sample ID: 680-45017-2
Client Matrix: Water

Date Sampled: 02/25/2009 1205
Date Received: 02/26/2009 0852

8260B Volatile Organic Compounds (GC/MS)

Method: 8260B
Preparation: 5030B
Dilution: 20
Date Analyzed: 02/27/2009 1736
Date Prepared: 02/27/2009 1736

Analysis Batch: 680-131584

Instrument ID: GC/MS Volatiles - A C2
Lab File ID: a1734.d
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	RL
Benzene	82		20
Chlorobenzene	2300		20
1,2-Dichlorobenzene	26		20
1,3-Dichlorobenzene	20	U	20
1,4-Dichlorobenzene	64		20

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	90	75 - 120
Dibromofluoromethane	99	75 - 121
Toluene-d8 (Surr)	102	75 - 120

Client: URS Corporation

Job Number: 680-45017-1
Sdg Number: KPS048

Client Sample ID: **CPAMW04D-0209**

Lab Sample ID: 680-45017-4
Client Matrix: Water

Date Sampled: 02/25/2009 1440
Date Received: 02/26/2009 0852

8260B Volatile Organic Compounds (GC/MS)

Method: 8260B
Preparation: 5030B
Dilution: 10
Date Analyzed: 02/27/2009 1804
Date Prepared: 02/27/2009 1804

Analysis Batch: 680-131584

Instrument ID: GC/MS Volatiles - A C2
Lab File ID: a1736.d
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	RL
Benzene	30		10
Chlorobenzene	1100		10
1,2-Dichlorobenzene	15		10
1,3-Dichlorobenzene	10	U	10
1,4-Dichlorobenzene	18		10

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	94	75 - 120
Dibromofluoromethane	96	75 - 121
Toluene-d8 (Surr)	102	75 - 120

Client: URS Corporation

Job Number: 680-45017-1
Sdg Number: KPS048

Client Sample ID: **BSAMW05D-0209**

Lab Sample ID: 680-45017-6
Client Matrix: Water

Date Sampled: 02/25/2009 1640
Date Received: 02/26/2009 0852

8260B Volatile Organic Compounds (GC/MS)

Method: 8260B
Preparation: 5030B
Dilution: 4.0
Date Analyzed: 03/02/2009 1547
Date Prepared: 03/02/2009 1547

Analysis Batch: 680-131676

Instrument ID: GC/MS Volatiles - A C2
Lab File ID: a1760.d
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	RL
Benzene	4.0	U	4.0
Chlorobenzene	270		4.0
1,2-Dichlorobenzene	12		4.0
1,3-Dichlorobenzene	4.0	U	4.0
1,4-Dichlorobenzene	15		4.0

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	93	75 - 120
Dibromofluoromethane	96	75 - 121
Toluene-d8 (Surr)	102	75 - 120

Client: URS Corporation

Job Number: 680-45017-1
Sdg Number: KPS048

Client Sample ID: **BSAMW02D-0209**

Lab Sample ID: 680-45055-1
Client Matrix: Water

Date Sampled: 02/26/2009 1200
Date Received: 02/27/2009 1004

8260B Volatile Organic Compounds (GC/MS)

Method: 8260B
Preparation: 5030B
Dilution: 200
Date Analyzed: 03/05/2009 1509
Date Prepared: 03/05/2009 1509

Analysis Batch: 680-131967

Instrument ID: GC/MS Volatiles - A C2
Lab File ID: a1846.d
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	RL
Benzene	20000		200
Chlorobenzene	2900		200
1,2-Dichlorobenzene	200	U	200
1,3-Dichlorobenzene	200	U	200
1,4-Dichlorobenzene	200	U	200

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	88	75 - 120
Dibromofluoromethane	101	75 - 121
Toluene-d8 (Surr)	103	75 - 120

Analytical Data

Client: URS Corporation

Job Number: 680-45017-1
Sdg Number: KPS048

Client Sample ID: **CPAMW03D-0209**

Lab Sample ID: 680-45055-3
Client Matrix: Water

Date Sampled: 02/26/2009 1330
Date Received: 02/27/2009 1004

8260B Volatile Organic Compounds (GC/MS)

Method: 8260B
Preparation: 5030B
Dilution: 5.0
Date Analyzed: 03/05/2009 1536
Date Prepared: 03/05/2009 1536

Analysis Batch: 680-131967

Instrument ID: GC/MS Volatiles - A C2
Lab File ID: a1847.d
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	RL
Benzene	86		5.0
Chlorobenzene	460		5.0
1,2-Dichlorobenzene	11		5.0
1,3-Dichlorobenzene	5.0	U	5.0
1,4-Dichlorobenzene	16		5.0

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	94	75 - 120
Dibromofluoromethane	95	75 - 121
Toluene-d8 (Surr)	107	75 - 120

Client: URS Corporation

Job Number: 680-45017-1
Sdg Number: KPS048

Client Sample ID: **TB022609**

Lab Sample ID: 680-45055-5TB
Client Matrix: Water

Date Sampled: 02/26/2009 0000
Date Received: 02/27/2009 1004

8260B Volatile Organic Compounds (GC/MS)

Method: 8260B
Preparation: 5030B
Dilution: 1.0
Date Analyzed: 03/05/2009 1443
Date Prepared: 03/05/2009 1443

Analysis Batch: 680-131967

Instrument ID: GC/MS Volatiles - A C2
Lab File ID: a1845.d
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	RL
Benzene	1.0	U	1.0
Chlorobenzene	1.0	U	1.0
1,2-Dichlorobenzene	1.0	U	1.0
1,3-Dichlorobenzene	1.0	U	1.0
1,4-Dichlorobenzene	1.0	U	1.0

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	91	75 - 120
Dibromofluoromethane	105	75 - 121
Toluene-d8 (Surr)	101	75 - 120

Client: URS Corporation

Job Number: 680-45017-1
Sdg Number: KPS048

Client Sample ID: **CPAMW05D-0209**

Lab Sample ID: 680-45055-6
Client Matrix: Water

Date Sampled: 02/26/2009 1550
Date Received: 02/27/2009 1004

8260B Volatile Organic Compounds (GC/MS)

Method: 8260B
Preparation: 5030B
Dilution: 10
Date Analyzed: 03/05/2009 1602
Date Prepared: 03/05/2009 1602

Analysis Batch: 680-131967

Instrument ID: GC/MS Volatiles - A C2
Lab File ID: a1848.d
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	RL
Benzene	10	U	10
Chlorobenzene	1500		10
1,2-Dichlorobenzene	10	U	10
1,3-Dichlorobenzene	10	U	10
1,4-Dichlorobenzene	12		10

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	94	75 - 120
Dibromofluoromethane	97	75 - 121
Toluene-d8 (Surr)	106	75 - 120

Client: URS Corporation

Job Number: 680-45017-1
Sdg Number: KPS048

Client Sample ID: **BSAMW04D-0209**

Lab Sample ID: 680-45017-2
Client Matrix: Water

Date Sampled: 02/25/2009 1205
Date Received: 02/26/2009 0852

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method: 8270C
Preparation: 3520C
Dilution: 1.0
Date Analyzed: 03/04/2009 1134
Date Prepared: 02/27/2009 1308

Analysis Batch: 680-131778
Prep Batch: 680-131376

Instrument ID: GC/MS SemiVolatiles - T
Lab File ID: t4914.d
Initial Weight/Volume: 1060 mL
Final Weight/Volume: 1 mL
Injection Volume: 1.0 uL

Analyte	Result (ug/L)	Qualifier	RL
1,2,4-Trichlorobenzene	9.4	U	9.4
1,4-Dioxane	40		9.4
2-Chlorophenol	13		9.4

Surrogate	%Rec	Acceptance Limits
Phenol-d5	83	38 - 116
2,4,6-Tribromophenol	96	40 - 139
2-Fluorobiphenyl	78	50 - 113
2-Fluorophenol	93	36 - 110
Nitrobenzene-d5	83	45 - 112
Terphenyl-d14	43	10 - 121

Client: URS Corporation

Job Number: 680-45017-1
Sdg Number: KPS048

Client Sample ID: **CPAMW04D-0209**

Lab Sample ID: 680-45017-4
Client Matrix: Water

Date Sampled: 02/25/2009 1440
Date Received: 02/26/2009 0852

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method: 8270C
Preparation: 3520C
Dilution: 1.0
Date Analyzed: 03/04/2009 1157
Date Prepared: 02/27/2009 1308

Analysis Batch: 680-131778
Prep Batch: 680-131376

Instrument ID: GC/MS SemiVolatiles - T
Lab File ID: t4915.d
Initial Weight/Volume: 1030 mL
Final Weight/Volume: 1 mL
Injection Volume: 1.0 uL

Analyte	Result (ug/L)	Qualifier	RL
4-Chloroaniline	170		19
2-Chlorophenol	12		9.7
1,2,4-Trichlorobenzene	9.7	U	9.7

Surrogate	%Rec	Acceptance Limits
Phenol-d5	72	38 - 116
2-Fluorophenol	79	36 - 110
2,4,6-Tribromophenol	87	40 - 139
Nitrobenzene-d5	71	45 - 112
2-Fluorobiphenyl	77	50 - 113
Terphenyl-d14	51	10 - 121

Analytical Data

Client: URS Corporation

Job Number: 680-45017-1
Sdg Number: KPS048

Client Sample ID: **BSAMW05D-0209**

Lab Sample ID: 680-45017-6
Client Matrix: Water

Date Sampled: 02/25/2009 1640
Date Received: 02/26/2009 0852

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 680-131778		Instrument ID:	GC/MS SemiVolatiles - T
Preparation:	3520C	Prep Batch: 680-131376		Lab File ID:	t4916.d
Dilution:	1.0			Initial Weight/Volume:	1060 mL
Date Analyzed:	03/04/2009 1221			Final Weight/Volume:	1 mL
Date Prepared:	02/27/2009 1308			Injection Volume:	1.0 uL

Analyte	Result (ug/L)	Qualifier	RL
1,2,4-Trichlorobenzene	9.4	U	9.4
1,4-Dioxane	9.4	U	9.4
2-Chlorophenol	9.4	U	9.4

Surrogate	%Rec	Acceptance Limits
Phenol-d5	76	38 - 116
2,4,6-Tribromophenol	87	40 - 139
2-Fluorobiphenyl	72	50 - 113
2-Fluorophenol	81	36 - 110
Nitrobenzene-d5	72	45 - 112
Terphenyl-d14	53	10 - 121

Client: URS Corporation

Job Number: 680-45017-1
Sdg Number: KPS048

Client Sample ID: **BSAMW02D-0209**

Lab Sample ID: 680-45055-1
Client Matrix: Water

Date Sampled: 02/26/2009 1200
Date Received: 02/27/2009 1004

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method: 8270C
Preparation: 3520C
Dilution: 1.0
Date Analyzed: 03/05/2009 2144
Date Prepared: 03/03/2009 1213

Analysis Batch: 680-131938
Prep Batch: 680-131614

Instrument ID: GC/MS SemiVolatiles - N
Lab File ID: n2167.d
Initial Weight/Volume: 1030 mL
Final Weight/Volume: 1 mL
Injection Volume: 1.0 uL

Analyte	Result (ug/L)	Qualifier	RL
1,2,4-Trichlorobenzene	9.7	U	9.7
1,4-Dioxane	43		9.7
2-Chlorophenol	14		9.7

Surrogate	%Rec	Acceptance Limits
Phenol-d5	81	38 - 116
2,4,6-Tribromophenol	99	40 - 139
2-Fluorobiphenyl	86	50 - 113
2-Fluorophenol	88	36 - 110
Nitrobenzene-d5	88	45 - 112
Terphenyl-d14	27	10 - 121

Client: URS Corporation

Job Number: 680-45017-1
Sdg Number: KPS048

Client Sample ID: **CPAMW03D-0209**

Lab Sample ID: 680-45055-3
Client Matrix: Water

Date Sampled: 02/26/2009 1330
Date Received: 02/27/2009 1004

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 680-131938	Instrument ID:	GC/MS SemiVolatiles - N	
Preparation:	3520C	Prep Batch: 680-131614	Lab File ID:	n2168.d	
Dilution:	1.0		Initial Weight/Volume:	1060 mL	
Date Analyzed:	03/05/2009 2206		Final Weight/Volume:	1 mL	
Date Prepared:	03/03/2009 1213		Injection Volume:	1.0 uL	

Analyte	Result (ug/L)	Qualifier	RL
4-Chloroaniline	91		19
2-Chlorophenol	9.4	U	9.4
1,2,4-Trichlorobenzene	9.4	U	9.4

Surrogate	%Rec	Acceptance Limits
Phenol-d5	82	38 - 116
2-Fluorophenol	83	36 - 110
2,4,6-Tribromophenol	107	40 - 139
Nitrobenzene-d5	88	45 - 112
2-Fluorobiphenyl	85	50 - 113
Terphenyl-d14	52	10 - 121

Client: URS Corporation

Job Number: 680-45017-1
Sdg Number: KPS048

Client Sample ID: **BSAMW04D-0209**

Lab Sample ID: 680-45017-2
Client Matrix: Water

Date Sampled: 02/25/2009 1205
Date Received: 02/26/2009 0852

RSK-175 Dissolved Gases (GC)

Method: RSK-175
Preparation: N/A
Dilution: 1.0
Date Analyzed: 03/03/2009 2005
Date Prepared: N/A

Analysis Batch: 680-131702

Instrument ID: GC Volatiles - U FID
Lab File ID: U03049.D
Initial Weight/Volume: 1000 uL
Final Weight/Volume: 1 mL
Injection Volume: 1 uL
Column ID: PRIMARY

Analyte	Result (ug/L)	Qualifier	RL
Ethane	5.9		0.35
Ethylene	0.33	U	0.33
Methane	110		0.19

Client: URS Corporation

Job Number: 680-45017-1
Sdg Number: KPS048

Client Sample ID: **CPAMW04D-0209**

Lab Sample ID: 680-45017-4
Client Matrix: Water

Date Sampled: 02/25/2009 1440
Date Received: 02/26/2009 0852

RSK-175 Dissolved Gases (GC)

Method: RSK-175
Preparation: N/A
Dilution: 1.0
Date Analyzed: 03/03/2009 2017
Date Prepared: N/A

Analysis Batch: 680-131702

Instrument ID: GC Volatiles - U FID
Lab File ID: U03050.D
Initial Weight/Volume: 1000 uL
Final Weight/Volume: 1 mL
Injection Volume: 1 uL
Column ID: PRIMARY

Analyte	Result (ug/L)	Qualifier	RL
Ethane	20		0.35
Ethylene	0.33	U	0.33

Method: RSK-175
Preparation: N/A
Dilution: 1.0
Date Analyzed: 03/03/2009 2017
Date Prepared: N/A

Analysis Batch: 680-131790

Instrument ID: GC Volatiles - U TCD
Lab File ID: U03050.D
Initial Weight/Volume: 1000 uL
Final Weight/Volume: 1 mL
Injection Volume: 1 uL
Column ID: PRIMARY

Analyte	Result (ug/L)	Qualifier	RL
Methane	4800		0.19

Client: URS Corporation

Job Number: 680-45017-1
Sdg Number: KPS048

Client Sample ID: **BSAMW05D-0209**

Lab Sample ID: 680-45017-6
Client Matrix: Water

Date Sampled: 02/25/2009 1640
Date Received: 02/26/2009 0852

RSK-175 Dissolved Gases (GC)

Method: RSK-175
Preparation: N/A
Dilution: 1.0
Date Analyzed: 03/03/2009 2030
Date Prepared: N/A

Analysis Batch: 680-131702

Instrument ID: GC Volatiles - U FID
Lab File ID: U03051.D
Initial Weight/Volume: 1000 uL
Final Weight/Volume: 1 mL
Injection Volume: 1 uL
Column ID: PRIMARY

Analyte	Result (ug/L)	Qualifier	RL
Ethane	26		0.35
Ethylene	0.33	U	0.33

Method: RSK-175
Preparation: N/A
Dilution: 1.0
Date Analyzed: 03/03/2009 2030
Date Prepared: N/A

Analysis Batch: 680-131790

Instrument ID: GC Volatiles - U TCD
Lab File ID: U03051.D
Initial Weight/Volume: 1000 uL
Final Weight/Volume: 1 mL
Injection Volume: 1 uL
Column ID: PRIMARY

Analyte	Result (ug/L)	Qualifier	RL
Methane	13000		0.19

Client: URS Corporation

Job Number: 680-45017-1
Sdg Number: KPS048

Client Sample ID: **BSAMW02D-0209**

Lab Sample ID: 680-45055-1
Client Matrix: Water

Date Sampled: 02/26/2009 1200
Date Received: 02/27/2009 1004

RSK-175 Dissolved Gases (GC)

Method: RSK-175
Preparation: N/A
Dilution: 1.0
Date Analyzed: 03/03/2009 2043
Date Prepared: N/A

Analysis Batch: 680-131702

Instrument ID: GC Volatiles - U FID
Lab File ID: U03052.D
Initial Weight/Volume: 1000 uL
Final Weight/Volume: 1 mL
Injection Volume: 1 uL
Column ID: PRIMARY

Analyte	Result (ug/L)	Qualifier	RL
Ethane	6.2		0.35
Ethylene	1.7		0.33

Method: RSK-175
Preparation: N/A
Dilution: 1.0
Date Analyzed: 03/03/2009 2043
Date Prepared: N/A

Analysis Batch: 680-131790

Instrument ID: GC Volatiles - U TCD
Lab File ID: U03052.D
Initial Weight/Volume: 1000 uL
Final Weight/Volume: 1 mL
Injection Volume: 1 uL
Column ID: PRIMARY

Analyte	Result (ug/L)	Qualifier	RL
Methane	3200		0.19

Client: URS Corporation

Job Number: 680-45017-1
Sdg Number: KPS048

Client Sample ID: **CPAMW03D-0209**

Lab Sample ID: 680-45055-3
Client Matrix: Water

Date Sampled: 02/26/2009 1330
Date Received: 02/27/2009 1004

RSK-175 Dissolved Gases (GC)

Method: RSK-175
Preparation: N/A
Dilution: 1.0
Date Analyzed: 03/03/2009 2056
Date Prepared: N/A

Analysis Batch: 680-131702

Instrument ID: GC Volatiles - U FID
Lab File ID: U03053.D
Initial Weight/Volume: 1000 uL
Final Weight/Volume: 1 mL
Injection Volume: 1 uL
Column ID: PRIMARY

Analyte	Result (ug/L)	Qualifier	RL
Ethane	39		0.35
Ethylene	0.33	U	0.33

Method: RSK-175
Preparation: N/A
Dilution: 1.0
Date Analyzed: 03/03/2009 2056
Date Prepared: N/A

Analysis Batch: 680-131790

Instrument ID: GC Volatiles - U TCD
Lab File ID: U03053.D
Initial Weight/Volume: 1000 uL
Final Weight/Volume: 1 mL
Injection Volume: 1 uL
Column ID: PRIMARY

Analyte	Result (ug/L)	Qualifier	RL
Methane	30000		0.19

Client: URS Corporation

Job Number: 680-45017-1
Sdg Number: KPS048

Client Sample ID: **CPAMW05D-0209**

Lab Sample ID: 680-45055-6
Client Matrix: Water

Date Sampled: 02/26/2009 1550
Date Received: 02/27/2009 1004

RSK-175 Dissolved Gases (GC)

Method: RSK-175
Preparation: N/A
Dilution: 1.0
Date Analyzed: 03/03/2009 2108
Date Prepared: N/A

Analysis Batch: 680-131702

Instrument ID: GC Volatiles - U FID
Lab File ID: U03054.D
Initial Weight/Volume: 1000 uL
Final Weight/Volume: 1 mL
Injection Volume: 1 uL
Column ID: PRIMARY

Analyte	Result (ug/L)	Qualifier	RL
Ethane	7.0		0.35
Ethylene	0.33	U	0.33
Methane	44		0.19

Analytical Data

Client: URS Corporation

Job Number: 680-45017-1
Sdg Number: KPS048

Client Sample ID: **BSAMW04D-0209**

Lab Sample ID:	680-45017-2	Date Sampled:	02/25/2009 1205
Client Matrix:	Water	Date Received:	02/26/2009 0852

6010B Metals (ICP)-Total Recoverable

Method:	6010B	Analysis Batch: 680-131870	Instrument ID:	ICP/AES - D
Preparation:	3005A	Prep Batch: 680-131644	Lab File ID:	N/A
Dilution:	1.0		Initial Weight/Volume:	50 mL
Date Analyzed:	03/04/2009 1809		Final Weight/Volume:	50 mL
Date Prepared:	03/03/2009 1050			

Analyte	Result (mg/L)	Qualifier	RL
Iron	8.7		0.050
Manganese	0.55		0.010

Client: URS Corporation

Job Number: 680-45017-1
Sdg Number: KPS048

Client Sample ID: **BSAMW04D-F(0.2)-0209**

Lab Sample ID:	680-45017-3	Date Sampled:	02/25/2009 1205
Client Matrix:	Water	Date Received:	02/26/2009 0852

6010B Metals (ICP)-Dissolved

Method:	6010B	Analysis Batch: 680-131870	Instrument ID:	ICP/AES - D
Preparation:	3005A	Prep Batch: 680-131644	Lab File ID:	N/A
Dilution:	1.0		Initial Weight/Volume:	50 mL
Date Analyzed:	03/04/2009 1814		Final Weight/Volume:	50 mL
Date Prepared:	03/03/2009 1050			

Analyte	Result (mg/L)	Qualifier	RL
Iron, Dissolved	8.6		0.050
Manganese, Dissolved	0.55		0.010

Client: URS Corporation

Job Number: 680-45017-1
Sdg Number: KPS048

Client Sample ID: **CPAMW04D-0209**

Lab Sample ID: 680-45017-4
Client Matrix: Water

Date Sampled: 02/25/2009 1440
Date Received: 02/26/2009 0852

6010B Metals (ICP)-Total Recoverable

Method:	6010B	Analysis Batch: 680-131870		Instrument ID:	ICP/AES - D
Preparation:	3005A	Prep Batch: 680-131644		Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	50 mL
Date Analyzed:	03/04/2009 1819			Final Weight/Volume:	50 mL
Date Prepared:	03/03/2009 1050				

Analyte	Result (mg/L)	Qualifier	RL
Iron	14		0.050
Manganese	0.31		0.010

Client: URS Corporation

Job Number: 680-45017-1
Sdg Number: KPS048

Client Sample ID: **CPAMW04D-F(0.2)-0209**

Lab Sample ID:	680-45017-5	Date Sampled:	02/25/2009 1440
Client Matrix:	Water	Date Received:	02/26/2009 0852

6010B Metals (ICP)-Dissolved

Method:	6010B	Analysis Batch: 680-131870	Instrument ID:	ICP/AES - D
Preparation:	3005A	Prep Batch: 680-131644	Lab File ID:	N/A
Dilution:	1.0		Initial Weight/Volume:	50 mL
Date Analyzed:	03/04/2009 1824		Final Weight/Volume:	50 mL
Date Prepared:	03/03/2009 1050			

Analyte	Result (mg/L)	Qualifier	RL
Iron, Dissolved.	13		0.050
Manganese, Dissolved	0.31		0.010

Client: URS Corporation

Job Number: 680-45017-1
Sdg Number: KPS048

Client Sample ID: **BSAMW05D-0209**

Lab Sample ID:	680-45017-6	Date Sampled:	02/25/2009 1640
Client Matrix:	Water	Date Received:	02/26/2009 0852

6010B Metals (ICP)-Total Recoverable

Method:	6010B	Analysis Batch: 680-131870	Instrument ID:	ICP/AES - D
Preparation:	3005A	Prep Batch: 680-131644	Lab File ID:	N/A
Dilution:	1.0		Initial Weight/Volume:	50 mL
Date Analyzed:	03/04/2009 1829		Final Weight/Volume:	50 mL
Date Prepared:	03/03/2009 1050			

Analyte	Result (mg/L)	Qualifier	RL
Iron	19		0.050
Manganese	0.88		0.010

Client: URS Corporation

Job Number: 680-45017-1
Sdg Number: KPS048

Client Sample ID: **BSAMW05D-F(0.2)-0209**

Lab Sample ID:	680-45017-7	Date Sampled:	02/25/2009 1640
Client Matrix:	Water	Date Received:	02/26/2009 0852

6010B Metals (ICP)-Dissolved

Method:	6010B	Analysis Batch: 680-131870	Instrument ID:	ICP/AES - D
Preparation:	3005A	Prep Batch: 680-131644	Lab File ID:	N/A
Dilution:	1.0		Initial Weight/Volume:	50 mL
Date Analyzed:	03/04/2009 1834		Final Weight/Volume:	50 mL
Date Prepared:	03/03/2009 1050			

Analyte	Result (mg/L)	Qualifier	RL
Iron, Dissolved	18		0.050
Manganese, Dissolved	0.83		0.010

Client: URS Corporation

Job Number: 680-45017-1
Sdg Number: KPS048

Client Sample ID: **BSAMW02D-0209**

Lab Sample ID:	680-45055-1	Date Sampled:	02/26/2009 1200
Client Matrix:	Water	Date Received:	02/27/2009 1004

6010B Metals (ICP)-Total Recoverable

Method:	6010B	Analysis Batch: 680-131870	Instrument ID:	ICP/AES - D
Preparation:	3005A	Prep Batch: 680-131644	Lab File ID:	N/A
Dilution:	1.0		Initial Weight/Volume:	50 mL
Date Analyzed:	03/04/2009 1839		Final Weight/Volume:	50 mL
Date Prepared:	03/03/2009 1050			

Analyte	Result (mg/L)	Qualifier	RL
Iron	1.4		0.050
Manganese	0.30		0.010

Client: URS Corporation

Job Number: 680-45017-1
Sdg Number: KPS048

Client Sample ID: **BSAMW02D-F(0.2)-0209**

Lab Sample ID:	680-45055-2	Date Sampled:	02/26/2009 1200
Client Matrix:	Water	Date Received:	02/27/2009 1004

6010B Metals (ICP)-Dissolved

Method:	6010B	Analysis Batch: 680-131870	Instrument ID:	ICP/AES - D
Preparation:	3005A	Prep Batch: 680-131644	Lab File ID:	N/A
Dilution:	1.0		Initial Weight/Volume:	50 mL
Date Analyzed:	03/04/2009 1914		Final Weight/Volume:	50 mL
Date Prepared:	03/03/2009 1050			

Analyte	Result (mg/L)	Qualifier	RL
Iron, Dissolved	1.3		0.050
Manganese, Dissolved	0.32		0.010

Analytical Data

Client: URS Corporation

Job Number: 680-45017-1
Sdg Number: KPS048

Client Sample ID: **CPAMW03D-0209**

Lab Sample ID:	680-45055-3	Date Sampled:	02/26/2009 1330
Client Matrix:	Water	Date Received:	02/27/2009 1004

6010B Metals (ICP)-Total Recoverable

Method:	6010B	Analysis Batch: 680-131870	Instrument ID:	ICP/AES - D
Preparation:	3005A	Prep Batch: 680-131644	Lab File ID:	N/A
Dilution:	1.0		Initial Weight/Volume:	50 mL
Date Analyzed:	03/04/2009 1919		Final Weight/Volume:	50 mL
Date Prepared:	03/03/2009 1050			

Analyte	Result (mg/L)	Qualifier	RL
Iron	13		0.050
Manganese	0.62		0.010

Client: URS Corporation

Job Number: 680-45017-1
Sdg Number: KPS048

Client Sample ID: **CPAMW03D-F(0.2)-0209**

Lab Sample ID:	680-45055-4	Date Sampled:	02/26/2009 1330
Client Matrix:	Water	Date Received:	02/27/2009 1004

6010B Metals (ICP)-Dissolved

Method:	6010B	Analysis Batch: 680-131870	Instrument ID:	ICP/AES - D
Preparation:	3005A	Prep Batch: 680-131644	Lab File ID:	N/A
Dilution:	1.0		Initial Weight/Volume:	50 mL
Date Analyzed:	03/04/2009 1924		Final Weight/Volume:	50 mL
Date Prepared:	03/03/2009 1050			

Analyte	Result (mg/L)	Qualifier	RL
Iron, Dissolved	14		0.050
Manganese, Dissolved	0.69		0.010

Analytical Data

Client: URS Corporation

Job Number: 680-45017-1
Sdg Number: KPS048

Client Sample ID: **CPAMW05D-0209**

Lab Sample ID: 680-45055-6
Client Matrix: Water

Date Sampled: 02/26/2009 1550
Date Received: 02/27/2009 1004

6010B Metals (ICP)-Total Recoverable

Method: 6010B
Preparation: 3005A
Dilution: 1.0
Date Analyzed: 03/04/2009 1929
Date Prepared: 03/03/2009 1050

Analysis Batch: 680-131870
Prep Batch: 680-131644

Instrument ID: ICP/AES - D
Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Result (mg/L)	Qualifier	RL
Iron	89		0.050
Manganese	3.2		0.010

Client: URS Corporation

Job Number: 680-45017-1
Sdg Number: KPS048

Client Sample ID: **CPAMW05D-F(0.2)-0209**

Lab Sample ID: 680-45055-7
Client Matrix: Water

Date Sampled: 02/26/2009 1550
Date Received: 02/27/2009 1004

6010B Metals (ICP)-Dissolved

Method: 6010B
Preparation: 3005A
Dilution: 1.0
Date Analyzed: 03/04/2009 1934
Date Prepared: 03/03/2009 1050

Analysis Batch: 680-131870
Prep Batch: 680-131644

Instrument ID: ICP/AES - D
Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Result (mg/L)	Qualifier	RL
Iron, Dissolved	85		0.050
Manganese, Dissolved	3.1		0.010

Client: URS Corporation

Job Number: 680-45017-1
Sdg Number: KPS048

General Chemistry

Client Sample ID: **BSAMW04D-0209**

Lab Sample ID: 680-45017-2
Client Matrix: Water

Date Sampled: 02/25/2009 1205
Date Received: 02/26/2009 0852

Analyte	Result	Qual	Units		RL	Dil	Method
Chloride	120		mg/L		2.0	2.0	325.2
	Anly Batch: 680-131572		Date Analyzed	03/02/2009 1311			
Nitrate as N	0.050	U	mg/L		0.050	1.0	353.2
	Anly Batch: 680-131374		Date Analyzed	02/26/2009 1425			
Sulfate	130		mg/L		25	5.0	375.4
	Anly Batch: 680-131582		Date Analyzed	03/02/2009 1439			
Total Organic Carbon	5.4		mg/L		1.0	1.0	415.1
	Anly Batch: 680-132774		Date Analyzed	03/13/2009 1353			

Analyte	Result	Qual	Units		RL	Dil	Method
Alkalinity	600		mg/L		5.0	1.0	310.1
	Anly Batch: 680-131820		Date Analyzed	03/04/2009 2107			
Carbon Dioxide, Free	22		mg/L		5.0	1.0	310.1
	Anly Batch: 680-131820		Date Analyzed	03/04/2009 2107			

Client Sample ID: **BSAMW04D-F(0.2)-0209**

Lab Sample ID: 680-45017-3
Client Matrix: Water

Date Sampled: 02/25/2009 1205
Date Received: 02/26/2009 0852

Analyte	Result	Qual	Units		RL	Dil	Method
Dissolved Organic Carbon-D	4.6		mg/L		1.0	1.0	415.1
	Anly Batch: 680-132784		Date Analyzed	03/13/2009 1915			

General Chemistry

Client Sample ID: **CPAMW04D-0209**

Lab Sample ID: 680-45017-4
Client Matrix: Water

Date Sampled: 02/25/2009 1440
Date Received: 02/26/2009 0852

Analyte	Result	Qual	Units		RL	Dil	Method
Chloride	240		mg/L		5.0	5.0	325.2
	Anly Batch: 680-131572		Date Analyzed	03/02/2009 1313			
Nitrate as N	0.050	U	mg/L		0.050	1.0	353.2
	Anly Batch: 680-131374		Date Analyzed	02/26/2009 1425			
Sulfate	72		mg/L		25	5.0	375.4
	Anly Batch: 680-131582		Date Analyzed	03/02/2009 1445			
Total Organic Carbon	5.6		mg/L		1.0	1.0	415.1
	Anly Batch: 680-132774		Date Analyzed	03/13/2009 1409			

Analyte	Result	Qual	Units		RL	Dil	Method
Alkalinity	810		mg/L		5.0	1.0	310.1
	Anly Batch: 680-131820		Date Analyzed	03/04/2009 2046			
Carbon Dioxide, Free	23		mg/L		5.0	1.0	310.1
	Anly Batch: 680-131820		Date Analyzed	03/04/2009 2046			

Client Sample ID: **CPAMW04D-F(0.2)-0209**

Lab Sample ID: 680-45017-5
Client Matrix: Water

Date Sampled: 02/25/2009 1440
Date Received: 02/26/2009 0852

Analyte	Result	Qual	Units		RL	Dil	Method
Dissolved Organic Carbon-D	5.0		mg/L		1.0	1.0	415.1
	Anly Batch: 680-132784		Date Analyzed	03/13/2009 1915			

General Chemistry

Client Sample ID: **BSAMW05D-0209**

Lab Sample ID: 680-45017-6
Client Matrix: Water

Date Sampled: 02/25/2009 1640
Date Received: 02/26/2009 0852

Analyte	Result	Qual	Units		RL	Dil	Method
Chloride	270		mg/L		5.0	5.0	325.2
	Anly Batch: 680-131572		Date Analyzed	03/02/2009 1313			
Nitrate as N	0.050	U	mg/L		0.050	1.0	353.2
	Anly Batch: 680-131374		Date Analyzed	02/26/2009 1425			
Sulfate	5.0	U	mg/L		5.0	1.0	375.4
	Anly Batch: 680-131582		Date Analyzed	03/02/2009 1430			
Total Organic Carbon	5.7		mg/L		1.0	1.0	415.1
	Anly Batch: 680-132774		Date Analyzed	03/13/2009 1425			

Analyte	Result	Qual	Units		RL	Dil	Method
Alkalinity	810		mg/L		5.0	1.0	310.1
	Anly Batch: 680-131820		Date Analyzed	03/04/2009 2058			
Carbon Dioxide, Free	17		mg/L		5.0	1.0	310.1
	Anly Batch: 680-131820		Date Analyzed	03/04/2009 2058			

Client Sample ID: **BSAMW05D-F(0.2)-0209**

Lab Sample ID: 680-45017-7
Client Matrix: Water

Date Sampled: 02/25/2009 1640
Date Received: 02/26/2009 0852

Analyte	Result	Qual	Units		RL	Dil	Method
Dissolved Organic Carbon-D	5.0		mg/L		1.0	1.0	415.1
	Anly Batch: 680-132784		Date Analyzed	03/13/2009 1915			

General Chemistry

Client Sample ID: **BSAMW02D-0209**

Lab Sample ID: 680-45055-1
Client Matrix: Water

Date Sampled: 02/26/2009 1200
Date Received: 02/27/2009 1004

Analyte	Result	Qual	Units		RL	Dil	Method
Chloride	93		mg/L		1.0	1.0	325.2
	Anly Batch: 680-132741		Date Analyzed	03/16/2009 1543			
Nitrate as N	0.050	U	mg/L		0.050	1.0	353.2
	Anly Batch: 680-131520		Date Analyzed	02/27/2009 1326			
Sulfate	160		mg/L		25	5.0	375.4
	Anly Batch: 680-132708		Date Analyzed	03/16/2009 1313			
Total Organic Carbon	4.9		mg/L		1.0	1.0	415.1
	Anly Batch: 680-132774		Date Analyzed	03/13/2009 1506			

Analyte	Result	Qual	Units		RL	Dil	Method
Alkalinity	700		mg/L		5.0	1.0	310.1
	Anly Batch: 680-131820		Date Analyzed	03/04/2009 2137			
Carbon Dioxide, Free	17		mg/L		5.0	1.0	310.1
	Anly Batch: 680-131820		Date Analyzed	03/04/2009 2137			

Client Sample ID: **BSAMW02D-F(0.2)-0209**

Lab Sample ID: 680-45055-2
Client Matrix: Water

Date Sampled: 02/26/2009 1200
Date Received: 02/27/2009 1004

Analyte	Result	Qual	Units		RL	Dil	Method
Dissolved Organic Carbon-D	3.8		mg/L		1.0	1.0	415.1
	Anly Batch: 680-132784		Date Analyzed	03/13/2009 1915			

General Chemistry

Client Sample ID: **CPAMW03D-0209**

Lab Sample ID: 680-45055-3
Client Matrix: Water

Date Sampled: 02/26/2009 1330
Date Received: 02/27/2009 1004

Analyte	Result	Qual	Units		RL	Dil	Method
Chloride	280		mg/L		5.0	5.0	325.2
	Anly Batch: 680-132741		Date Analyzed	03/16/2009 1634			
Nitrate as N	0.050	U	mg/L		0.050	1.0	353.2
	Anly Batch: 680-131520		Date Analyzed	02/27/2009 1326			
Sulfate	5.0	U	mg/L		5.0	1.0	375.4
	Anly Batch: 680-132708		Date Analyzed	03/16/2009 1242			
Total Organic Carbon	8.9		mg/L		1.0	1.0	415.1
	Anly Batch: 680-132774		Date Analyzed	03/13/2009 1520			

Analyte	Result	Qual	Units		RL	Dil	Method
Alkalinity	690		mg/L		5.0	1.0	310.1
	Anly Batch: 680-131820		Date Analyzed	03/04/2009 2118			
Carbon Dioxide, Free	49		mg/L		5.0	1.0	310.1
	Anly Batch: 680-131820		Date Analyzed	03/04/2009 2118			

Client Sample ID: **CPAMW03D-F(0.2)-0209**

Lab Sample ID: 680-45055-4
Client Matrix: Water

Date Sampled: 02/26/2009 1330
Date Received: 02/27/2009 1004

Analyte	Result	Qual	Units		RL	Dil	Method
Dissolved Organic Carbon-D	7.5		mg/L		1.0	1.0	415.1
	Anly Batch: 680-132784		Date Analyzed	03/13/2009 1915			

General Chemistry

Client Sample ID: **CPAMW05D-0209**

Lab Sample ID: 680-45055-6
Client Matrix: Water

Date Sampled: 02/26/2009 1550
Date Received: 02/27/2009 1004

Analyte	Result	Qual	Units		RL	Dil	Method
Chloride	280		mg/L		5.0	5.0	325.2
	Anly Batch: 680-132741		Date Analyzed	03/16/2009 1634			
Nitrate as N	0.050	U	mg/L		0.050	1.0	353.2
	Anly Batch: 680-131520		Date Analyzed	02/27/2009 1326			
Sulfate	1400		mg/L		250	50	375.4
	Anly Batch: 680-132708		Date Analyzed	03/16/2009 1337			
Total Organic Carbon	3.6		mg/L		1.0	1.0	415.1
	Anly Batch: 680-132774		Date Analyzed	03/13/2009 1536			

Analyte	Result	Qual	Units		RL	Dil	Method
Alkalinity	280		mg/L		5.0	1.0	310.1
	Anly Batch: 680-131820		Date Analyzed	03/04/2009 2125			
Carbon Dioxide, Free	66		mg/L		5.0	1.0	310.1
	Anly Batch: 680-131820		Date Analyzed	03/04/2009 2125			

Client Sample ID: **CPAMW05D-F(0.2)-0209**

Lab Sample ID: 680-45055-7
Client Matrix: Water

Date Sampled: 02/26/2009 1550
Date Received: 02/27/2009 1004

Analyte	Result	Qual	Units		RL	Dil	Method
Dissolved Organic Carbon-D	3.5		mg/L		1.0	1.0	415.1
	Anly Batch: 680-132784		Date Analyzed	03/13/2009 1915			

DATA REPORTING QUALIFIERS

Client: URS Corporation

Job Number: 680-45017-1
Sdg Number: KPS048

Lab Section	Qualifier	Description
GC/MS VOA		
	U	Indicates the analyte was analyzed for but not detected.
	F	MS or MSD exceeds the control limits
GC/MS Semi VOA		
	U	Indicates the analyte was analyzed for but not detected.
GC VOA		
	U	Indicates the analyte was analyzed for but not detected.
Metals		
	U	Indicates the analyte was analyzed for but not detected.
General Chemistry		
	U	Indicates the analyte was analyzed for but not detected.

SDG KPS049

Results of Samples from Wells:

BSAMW-1S
BSAMW-3D
CPAMW-1D
CPAMW-2D

Solutia Krummrich Data Review

Laboratory SDG: KPS049

Reviewer: Elizabeth Kunkel

Date Reviewed: 4/1/2009

Guidance: USEPA National Functional Guidelines for Organic Data Review 1999. USEPA National Functional Guidelines for Inorganic Data Review 2004.

Applicable Work Plan: Long-Term Monitoring Program (LTMP) Work Plan (Solutia 2008)

Sample Identification #	Sample Identification #
BSAMW01S-0209	BSAMW01S-F(0.2)-0209
CPAMW01D-0209	CPAMW01D-F(0-2)-0209
CPAMW02D-0209	CPAMW02D-0209-AD
CPAMW02D-F(0-2)-0209	BSAMW03D-0209
BSAMW03D-F(0.2)-0209	BSAMW03D-0209-EB

1.0 Data Package Completeness

Were all items delivered as specified in the QAPP and COC?

No, all three vials for trip blank TB030209 were received by the laboratory broken, please see section 2.0 of this report.

2.0 Laboratory Case Narrative \ Cooler Receipt Form

Were problems noted in the laboratory case narrative or cooler receipt form?

Yes, the laboratory case narrative indicated that VOCs were detected in the equipment blank. Surrogate recoveries were outside evaluation criteria in samples CPAMW01D-0209, CPAMW02D-0209 and CPAMW02D-0209-AD. The internal standard recovery for 1,4-Dichlorobenzene-d_4 was outside evaluation criteria in sample CPAMW02D-0209-AD. In addition samples were qualified due to a greater than two times (2X) the reporting limit difference between the parent and field duplicate results. These issues are addressed further in the appropriate sections below.

The cooler receipt form indicated that all three vials for trip blank TB030209 were received by the laboratory broken. All requested VOC analyses for the investigative

samples were completed.

3.0 Holding Times

Were samples extracted/analyzed within QAPP limits?

Yes

4.0 Blank Contamination

Were any analytes detected in the Method Blanks, Field Blanks or Trip Blanks?

Yes

Blank ID	Parameter	Analyte	Concentration	Units
BSAMW03D-0209-EB	VOCs	Benzene	5.0	ug/L
BSAMW03D-0209-EB	VOCs	Chlorobenzene	6.2	ug/L
BSAMW03D-0209-EB	VOCs	1,2-Dichlorobenzene	4.1	ug/L
BSAMW03D-0209-EB	VOCs	1,4-Dichlorobenzene	11	ug/L

Analytical data that were reported nondetect or at concentrations greater than five times (5X) the associated blank concentration (10X for common laboratory contaminants) did not require qualification.

5.0 Laboratory Control Sample

Were LCS recoveries within evaluation criteria?

Yes

6.0 Surrogate Recoveries

Were surrogate recoveries within evaluation criteria?

No

Field ID	Parameter	Surrogate	Recovery	Criteria
CPAMW01D-0209	SVOCs	Phenol-d_5	**125**	38-116
CPAMW01D-0209	SVOCs	2-Fluorophenol	**181**	36-110
CPAMW02D-0209	SVOCs	2-Fluorophenol	**135**	36-110
CPAMW02D-0209-AD	SVOCs	Phenol-d_5	**236**	38-116
CPAMW02D-0209-AD	SVOCs	2-Fluorophenol	**274**	36-110

Analytical data that required qualification based on surrogate data are included in the table below. Analytical data which were reported as nondetect and associated with surrogate recoveries above evaluation criteria, indicating a possible high bias, did not require qualification. Since only one acid fraction surrogate was outside criteria for sample CPAMW02D-0209 and Functional Guidelines indicates to qualify data if two or more surrogates per SVOC fraction are outside criteria, no qualification of the SVOC data was required.

Field ID	Parameter	Analyte	Qualification
CPAMW01D-0209	SVOCs	2-Chlorophenol	**J**
CPAMW02D-0209-AD	SVOCs	2-Chlorophenol	**J**

7.0 Matrix Spike and Matrix Spike Duplicate Recoveries

Were MS/MSD samples reported as part of this SDG?

Yes, sample BSAMW01S-0209 was spiked and analyzed for total and dissolved iron and manganese. Sample BSAMW03D-F(0.2)-0209 was spiked and analyzed for dissolved organic carbon.

Were MS/MSD recoveries within evaluation criteria?

Yes

8.0 Internal Standard (IS) Recoveries

Were internal standard area recoveries within evaluation criteria?

No

Field ID	Parameter	Analyte	IS Area Recovery	IS Criteria
CPAMW02D-0209-AD	SVOCs	1,4-Dichlorobenzene-d_4	**57311**	82470-329880

Analytical data that required qualification based on IS data are included in the table below. The compound 2-chlorophenol was detected and previously qualified due to high surrogate recovery; therefore, no additional qualification was required.

Field ID	Parameter	Analyte	Qualification
CPAMW02D-0209-AD	SVOCs	1,2,4-Trichlorobenzene	**UJ**

9.0 Laboratory Duplicate Results

Were laboratory duplicate samples collected as part of this SDG?

No

10.0 Field Duplicate Results

Were field duplicate samples collected as part of this SDG?

Yes

Field ID	Field Duplicate ID
CPAMW02D-0209	CPAMW02D-0209-AD

Were field duplicates within evaluation criteria?

No

Field ID	Field Duplicate ID	Parameter	Analyte	RPD	Qualification
CPAMW02D-0209	CPAMW02D-0209-AD	SVOCs	2-Chlorophenol	**> 2x RL**	**J**

11.0 Sample Dilutions

For samples that were diluted and nondetect, were undiluted results also reported?

Analytes were detected in samples that were diluted.

12.0 Additional Qualifications

Were additional qualifications applied?

No

SAMPLE SUMMARY

Client: URS Corporation

Job Number: 680-45126-1
Sdg Number: KPS049

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
680-45126-1	BSAMW01S-0209	Water	03/02/2009 1100	03/03/2009 0908
680-45126-2	BSAMW01S-F(0.2)-0209	Water	03/02/2009 1100	03/03/2009 0908
680-45126-3	CPAMW01D-0209	Water	03/02/2009 1230	03/03/2009 0908
680-45126-4	CPAMW01D-F(0-2)-0209	Water	03/02/2009 1230	03/03/2009 0908
680-45126-5	CPAMW02D-0209	Water	03/02/2009 1350	03/03/2009 0908
680-45126-6FD	CPAMW02D-0209-AD	Water	03/02/2009 1350	03/03/2009 0908
680-45126-7	CPAMW02D-F(0-2)-0209	Water	03/02/2009 1350	03/03/2009 0908
680-45126-8	BSAMW03D-0209	Water	03/02/2009 1610	03/03/2009 0908
680-45126-9	BSAMW03D-F(0.2)-0209	Water	03/02/2009 1610	03/03/2009 0908
680-45126-10EB	BSAMW03D-0209-EB	Water	03/02/2009 1530	03/03/2009 0908

SAMPLE RESULTS

Client: URS Corporation

Job Number: 680-45126-1
Sdg Number: KPS049

Client Sample ID: **BSAMW01S-0209**

Lab Sample ID: 680-45126-1
Client Matrix: Water

Date Sampled: 03/02/2009 1100
Date Received: 03/03/2009 0908

8260B Volatile Organic Compounds (GC/MS)

Method: 8260B
Preparation: 5030B
Dilution: 5000
Date Analyzed: 03/04/2009 1323
Date Prepared: 03/04/2009 1323

Analysis Batch: 680-131794

Instrument ID: GC/MS Volatiles - P C2
Lab File ID: p0882.d
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	RL
Benzene	830000		5000
Chlorobenzene	5000	U	5000
1,2-Dichlorobenzene	5000	U	5000
1,3-Dichlorobenzene	5000	U	5000
1,4-Dichlorobenzene	5000	U	5000

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	93	75 - 120
Dibromofluoromethane	103	75 - 121
Toluene-d8 (Surr)	105	75 - 120

Client: URS Corporation

Job Number: 680-45126-1
Sdg Number: KPS049

Client Sample ID: **CPAMW01D-0209**

Lab Sample ID: 680-45126-3
Client Matrix: Water

Date Sampled: 03/02/2009 1230
Date Received: 03/03/2009 0908

8260B Volatile Organic Compounds (GC/MS)

Method: 8260B
Preparation: 5030B
Dilution: 200
Date Analyzed: 03/04/2009 1352
Date Prepared: 03/04/2009 1352

Analysis Batch: 680-131794

Instrument ID: GC/MS Volatiles - P C2
Lab File ID: p0884.d
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	RL
Benzene	4200		200
Chlorobenzene	16000		200
1,2-Dichlorobenzene	20000		200
1,3-Dichlorobenzene	1400		200
1,4-Dichlorobenzene	12000		200

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	97	75 - 120
Dibromofluoromethane	103	75 - 121
Toluene-d8 (Surr)	109	75 - 120

Client: URS Corporation

Job Number: 680-45126-1
Sdg Number: KPS049

Client Sample ID: **CPAMW02D-0209**

Lab Sample ID: 680-45126-5
Client Matrix: Water

Date Sampled: 03/02/2009 1350
Date Received: 03/03/2009 0908

8260B Volatile Organic Compounds (GC/MS)

Method: 8260B
Preparation: 5030B
Dilution: 200
Date Analyzed: 03/04/2009 1422
Date Prepared: 03/04/2009 1422

Analysis Batch: 680-131794

Instrument ID: GC/MS Volatiles - P C2
Lab File ID: p0886.d
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	RL
Benzene	820		200
Chlorobenzene	31000		200
1,2-Dichlorobenzene	3000		200
1,3-Dichlorobenzene	720		200
1,4-Dichlorobenzene	17000		200

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	96	75 - 120
Dibromofluoromethane	103	75 - 121
Toluene-d8 (Surr)	107	75 - 120

Client: URS Corporation

Job Number: 680-45126-1
Sdg Number: KPS049

Client Sample ID: **CPAMW02D-0209-AD**

Lab Sample ID: 680-45126-6FD
Client Matrix: Water

Date Sampled: 03/02/2009 1350
Date Received: 03/03/2009 0908

8260B Volatile Organic Compounds (GC/MS)

Method: 8260B
Preparation: 5030B
Dilution: 200
Date Analyzed: 03/04/2009 1451
Date Prepared: 03/04/2009 1451

Analysis Batch: 680-131794

Instrument ID: GC/MS Volatiles - P C2
Lab File ID: p0888.d
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	RL
Benzene	810		200
Chlorobenzene	30000		200
1,2-Dichlorobenzene	3000		200
1,3-Dichlorobenzene	700		200
1,4-Dichlorobenzene	16000		200

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	95	75 - 120
Dibromofluoromethane	103	75 - 121
Toluene-d8 (Surr)	106	75 - 120

Analytical Data

Client: URS Corporation

Job Number: 680-45126-1
Sdg Number: KPS049

Client Sample ID: **BSAMW03D-0209**

Lab Sample ID: 680-45126-8
Client Matrix: Water

Date Sampled: 03/02/2009 1610
Date Received: 03/03/2009 0908

8260B Volatile Organic Compounds (GC/MS)

Method: 8260B
Preparation: 5030B
Dilution: 10
Date Analyzed: 03/04/2009 1520
Date Prepared: 03/04/2009 1520

Analysis Batch: 680-131794

Instrument ID: GC/MS Volatiles - P C2
Lab File ID: p0890.d
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	RL
Benzene	120		10
Chlorobenzene	1200		10
1,2-Dichlorobenzene	32		10
1,3-Dichlorobenzene	14		10
1,4-Dichlorobenzene	370		10

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	95	75 - 120
Dibromofluoromethane	104	75 - 121
Toluene-d8 (Surr)	108	75 - 120

Client: URS Corporation

Job Number: 680-45126-1
Sdg Number: KPS049

Client Sample ID: **BSAMW03D-0209-EB**

Lab Sample ID: 680-45126-10EB
Client Matrix: Water

Date Sampled: 03/02/2009 1530
Date Received: 03/03/2009 0908

8260B Volatile Organic Compounds (GC/MS)

Method: 8260B
Preparation: 5030B
Dilution: 1.0
Date Analyzed: 03/04/2009 1254
Date Prepared: 03/04/2009 1254

Analysis Batch: 680-131794

Instrument ID: GC/MS Volatiles - P C2
Lab File ID: p0880.d
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	RL
Benzene	5.0		1.0
Chlorobenzene	6.2		1.0
1,2-Dichlorobenzene	4.1		1.0
1,3-Dichlorobenzene	1.0	U	1.0
1,4-Dichlorobenzene	11		1.0

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	96	75 - 120
Dibromofluoromethane	106	75 - 121
Toluene-d8 (Surr)	105	75 - 120

Analytical Data

Client: URS Corporation

Job Number: 680-45126-1
Sdg Number: KPS049

Client Sample ID: **BSAMW03D-0209-EB**

Lab Sample ID: 680-45126-10EB
Client Matrix: Water

Date Sampled: 03/02/2009 1530
Date Received: 03/03/2009 0908

8260B Volatile Organic Compounds (GC/MS)

Method: 8260B
Preparation: 5030B
Dilution: 1.0
Date Analyzed: 03/04/2009 1648
Date Prepared: 03/04/2009 1648

Analysis Batch: 680-131794
Run Type: RA

Instrument ID: GC/MS Volatiles - P C2
Lab File ID: p0896.d
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	RL
Benzene	4.2		1.0
Chlorobenzene	6.0		1.0
1,2-Dichlorobenzene	4.0		1.0
1,3-Dichlorobenzene	1.0	U	1.0
1,4-Dichlorobenzene	11		1.0

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	96	75 - 120
Dibromofluoromethane	103	75 - 121
Toluene-d8 (Surr)	107	75 - 120

Client: URS Corporation

Job Number: 680-45126-1
Sdg Number: KPS049

Client Sample ID: **BSAMW01S-0209**

Lab Sample ID: 680-45126-1
Client Matrix: Water

Date Sampled: 03/02/2009 1100
Date Received: 03/03/2009 0908

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 680-132146		Instrument ID:	GC/MS SemiVolatiles - F
Preparation:	3520C	Prep Batch: 680-131720		Lab File ID:	f0454.d
Dilution:	1.0			Initial Weight/Volume:	1030 mL
Date Analyzed:	03/09/2009 1713			Final Weight/Volume:	1 mL
Date Prepared:	03/04/2009 1334			Injection Volume:	1.0 uL

Analyte	Result (ug/L)	Qualifier	RL
2-Chlorophenol	9.7	U	9.7
1,2,4-Trichlorobenzene	9.7	U	9.7

Surrogate	%Rec	Acceptance Limits
Phenol-d5	65	38 - 116
2-Fluorophenol	69	36 - 110
2,4,6-Tribromophenol	132	40 - 139
Nitrobenzene-d5	75	45 - 112
2-Fluorobiphenyl	75	50 - 113
Terphenyl-d14	73	10 - 121

Client: URS Corporation

Job Number: 680-45126-1
Sdg Number: KPS049

Client Sample ID: **CPAMW01D-0209**

Lab Sample ID: 680-45126-3
Client Matrix: Water

Date Sampled: 03/02/2009 1230
Date Received: 03/03/2009 0908

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 680-132233	Instrument ID:	GC/MS SemiVolatiles - F	
Preparation:	3520C	Prep Batch: 680-131720	Lab File ID:	f0486.d	
Dilution:	4.0		Initial Weight/Volume:	1030 mL	
Date Analyzed:	03/10/2009 1511		Final Weight/Volume:	1 mL	
Date Prepared:	03/04/2009 1334		Injection Volume:	1.0 uL	

Analyte	Result (ug/L)	Qualifier	RL
2-Chlorophenol	66	"J"	39
1,2,4-Trichlorobenzene	660		39

Surrogate	%Rec		Acceptance Limits
Phenol-d5	125	X	38 - 116
2-Fluorophenol	181	X	36 - 110
2,4,6-Tribromophenol	121		40 - 139
Nitrobenzene-d5	81		45 - 112
2-Fluorobiphenyl	90		50 - 113
Terphenyl-d14	33		10 - 121

Client: URS Corporation

Job Number: 680-45126-1
Sdg Number: KPS049

Client Sample ID: **CPAMW02D-0209**

Lab Sample ID: 680-45126-5
Client Matrix: Water

Date Sampled: 03/02/2009 1350
Date Received: 03/03/2009 0908

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 680-132146		Instrument ID:	GC/MS SemiVolatiles - F
Preparation:	3520C	Prep Batch: 680-131720		Lab File ID:	f0456.d
Dilution:	1.0			Initial Weight/Volume:	1030 mL
Date Analyzed:	03/09/2009 1759			Final Weight/Volume:	1 mL
Date Prepared:	03/04/2009 1334			Injection Volume:	1.0 uL

Analyte	Result (ug/L)	Qualifier	RL
2-Chlorophenol	42	"J"	9.7
1,2,4-Trichlorobenzene	9.7	U	9.7

Surrogate	%Rec		Acceptance Limits
Phenol-d5	101		38 - 116
2-Fluorophenol	135	X	36 - 110
2,4,6-Tribromophenol	87		40 - 139
Nitrobenzene-d5	48		45 - 112
2-Fluorobiphenyl	53		50 - 113
Terphenyl-d14	64		10 - 121

Analytical Data

Client: URS Corporation

Job Number: 680-45126-1
Sdg Number: KPS049

Client Sample ID: **CPAMW02D-0209-AD**

Lab Sample ID: 680-45126-6FD
Client Matrix: Water

Date Sampled: 03/02/2009 1350
Date Received: 03/03/2009 0908

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 680-132146	Instrument ID:	GC/MS SemiVolatiles - F	
Preparation:	3520C	Prep Batch: 680-131720	Lab File ID:	f0457.d	
Dilution:	1.0		Initial Weight/Volume:	1030 mL	
Date Analyzed:	03/09/2009 1821		Final Weight/Volume:	1 mL	
Date Prepared:	03/04/2009 1334		Injection Volume:	1.0 uL	

Analyte	Result (ug/L)	Qualifier	RL
2-Chlorophenol	79	"J"	9.7
1,2,4-Trichlorobenzene	9.7	~~U~~ "UJ"	9.7

Surrogate	%Rec		Acceptance Limits
Phenol-d5	236	E X	38 - 116
2-Fluorophenol	274	E X	36 - 110
2,4,6-Tribromophenol	121		40 - 139
Nitrobenzene-d5	83		45 - 112
2-Fluorobiphenyl	82		50 - 113
Terphenyl-d14	51		10 - 121

Client: URS Corporation

Job Number: 680-45126-1
Sdg Number: KPS049

Client Sample ID: **BSAMW03D-0209**

Lab Sample ID: 680-45126-8
Client Matrix: Water

Date Sampled: 03/02/2009 1610
Date Received: 03/03/2009 0908

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method: 8270C
Preparation: 3520C
Dilution: 1.0
Date Analyzed: 03/09/2009 1844
Date Prepared: 03/04/2009 1334

Analysis Batch: 680-132146
Prep Batch: 680-131720

Instrument ID: GC/MS SemiVolatiles - F
Lab File ID: f0458.d
Initial Weight/Volume: 1030 mL
Final Weight/Volume: 1 mL
Injection Volume: 1.0 uL

Analyte	Result (ug/L)	Qualifier	RL
1,2,4-Trichlorobenzene	9.7	U	9.7
1,4-Dioxane	19		9.7
2-Chlorophenol	17		9.7

Surrogate	%Rec	Acceptance Limits
Phenol-d5	76	38 - 116
2,4,6-Tribromophenol	112	40 - 139
2-Fluorobiphenyl	81	50 - 113
2-Fluorophenol	80	36 - 110
Nitrobenzene-d5	82	45 - 112
Terphenyl-d14	42	10 - 121

Analytical Data

Client: URS Corporation

Job Number: 680-45126-1
Sdg Number: KPS049

Client Sample ID: **BSAMW03D-0209-EB**

Lab Sample ID: 680-45126-10EB
Client Matrix: Water

Date Sampled: 03/02/2009 1530
Date Received: 03/03/2009 0908

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method: 8270C
Preparation: 3520C
Dilution: 1.0
Date Analyzed: 03/09/2009 1906
Date Prepared: 03/04/2009 1334

Analysis Batch: 680-132146
Prep Batch: 680-131720

Instrument ID: GC/MS SemiVolatiles - F
Lab File ID: f0459.d
Initial Weight/Volume: 1030 mL
Final Weight/Volume: 1 mL
Injection Volume: 1.0 uL

Analyte	Result (ug/L)	Qualifier	RL
1,2,4-Trichlorobenzene	9.7	U	9.7
1,4-Dioxane	9.7	U	9.7
2-Chlorophenol	9.7	U	9.7

Surrogate	%Rec	Acceptance Limits
Phenol-d5	76	38 - 116
2,4,6-Tribromophenol	115	40 - 139
2-Fluorobiphenyl	85	50 - 113
2-Fluorophenol	79	36 - 110
Nitrobenzene-d5	81	45 - 112
Terphenyl-d14	64	10 - 121

Client: URS Corporation

Job Number: 680-45126-1
Sdg Number: KPS049

Client Sample ID: **BSAMW01S-0209**

Lab Sample ID: 680-45126-1
Client Matrix: Water

Date Sampled: 03/02/2009 1100
Date Received: 03/03/2009 0908

RSK-175 Dissolved Gases (GC)

Method: RSK-175
Preparation: N/A
Dilution: 1.0
Date Analyzed: 03/11/2009 1652
Date Prepared: N/A

Analysis Batch: 680-132366

Instrument ID: GC Volatiles - U FID
Lab File ID: U03114.D
Initial Weight/Volume: 1000 uL
Final Weight/Volume: 1 mL
Injection Volume: 1 uL
Column ID: PRIMARY

Analyte	Result (ug/L)	Qualifier	RL
Ethane	0.35	U	0.35
Ethylene	0.33	U	0.33

Method: RSK-175
Preparation: N/A
Dilution: 1.0
Date Analyzed: 03/11/2009 1652
Date Prepared: N/A

Analysis Batch: 680-132368

Instrument ID: GC Volatiles - U TCD
Lab File ID: U03114.D
Initial Weight/Volume: 1000 uL
Final Weight/Volume: 1 mL
Injection Volume: 1 uL
Column ID: PRIMARY

Analyte	Result (ug/L)	Qualifier	RL
Methane	11000		0.19

Client: URS Corporation

Job Number: 680-45126-1
Sdg Number: KPS049

Client Sample ID: **CPAMW01D-0209**

Lab Sample ID: 680-45126-3
Client Matrix: Water

Date Sampled: 03/02/2009 1230
Date Received: 03/03/2009 0908

RSK-175 Dissolved Gases (GC)

Method: RSK-175
Preparation: N/A
Dilution: 1.0
Date Analyzed: 03/11/2009 1704
Date Prepared: N/A

Analysis Batch: 680-132366

Instrument ID: GC Volatiles - U FID
Lab File ID: U03115.D
Initial Weight/Volume: 1000 uL
Final Weight/Volume: 1 mL
Injection Volume: 1 uL
Column ID: PRIMARY

Analyte	Result (ug/L)	Qualifier	RL
Ethane	92		0.35
Ethylene	0.33	U	0.33

Method: RSK-175
Preparation: N/A
Dilution: 1.0
Date Analyzed: 03/11/2009 1704
Date Prepared: N/A

Analysis Batch: 680-132368

Instrument ID: GC Volatiles - U TCD
Lab File ID: U03115.D
Initial Weight/Volume: 1000 uL
Final Weight/Volume: 1 mL
Injection Volume: 1 uL
Column ID: PRIMARY

Analyte	Result (ug/L)	Qualifier	RL
Methane	30000		0.19

Client: URS Corporation

Job Number: 680-45126-1
Sdg Number: KPS049

Client Sample ID: **CPAMW02D-0209**

Lab Sample ID: 680-45126-5
Client Matrix: Water

Date Sampled: 03/02/2009 1350
Date Received: 03/03/2009 0908

RSK-175 Dissolved Gases (GC)

Method: RSK-175
Preparation: N/A
Dilution: 1.0
Date Analyzed: 03/11/2009 1717
Date Prepared: N/A

Analysis Batch: 680-132366

Instrument ID: GC Volatiles - U FID
Lab File ID: U03116.D
Initial Weight/Volume: 1000 uL
Final Weight/Volume: 1 mL
Injection Volume: 1 uL
Column ID: PRIMARY

Analyte	Result (ug/L)	Qualifier	RL
Ethane	14		0.35
Ethylene	0.70		0.33

Method: RSK-175
Preparation: N/A
Dilution: 1.0
Date Analyzed: 03/11/2009 1717
Date Prepared: N/A

Analysis Batch: 680-132368

Instrument ID: GC Volatiles - U TCD
Lab File ID: U03116.D
Initial Weight/Volume: 1000 uL
Final Weight/Volume: 1 mL
Injection Volume: 1 uL
Column ID: PRIMARY

Analyte	Result (ug/L)	Qualifier	RL
Methane	2800		0.19

Client: URS Corporation

Job Number: 680-45126-1
Sdg Number: KPS049

Client Sample ID: **BSAMW03D-0209**

Lab Sample ID: 680-45126-8
Client Matrix: Water

Date Sampled: 03/02/2009 1610
Date Received: 03/03/2009 0908

RSK-175 Dissolved Gases (GC)

Method: RSK-175
Preparation: N/A
Dilution: 1.0
Date Analyzed: 03/11/2009 1730
Date Prepared: N/A

Analysis Batch: 680-132366

Instrument ID: GC Volatiles - U FID
Lab File ID: U03117.D
Initial Weight/Volume: 1000 uL
Final Weight/Volume: 1 mL
Injection Volume: 1 uL
Column ID: PRIMARY

Analyte	Result (ug/L)	Qualifier	RL
Ethane	3.5		0.35
Ethylene	8.1		0.33

Method: RSK-175
Preparation: N/A
Dilution: 1.0
Date Analyzed: 03/11/2009 1730
Date Prepared: N/A

Analysis Batch: 680-132368

Instrument ID: GC Volatiles - U TCD
Lab File ID: U03117.D
Initial Weight/Volume: 1000 uL
Final Weight/Volume: 1 mL
Injection Volume: 1 uL
Column ID: PRIMARY

Analyte	Result (ug/L)	Qualifier	RL
Methane	540		0.19

Analytical Data

Client: URS Corporation

Job Number: 680-45126-1
Sdg Number: KPS049

Client Sample ID: **BSAMW01S-0209**

Lab Sample ID:	680-45126-1	Date Sampled:	03/02/2009 1100
Client Matrix:	Water	Date Received:	03/03/2009 0908

6010B Metals (ICP)-Total Recoverable

Method:	6010B	Analysis Batch: 680-133188	Instrument ID:	ICP/AES - D
Preparation:	3005A	Prep Batch: 680-132687	Lab File ID:	N/A
Dilution:	1.0		Initial Weight/Volume:	50 mL
Date Analyzed:	03/19/2009 1510		Final Weight/Volume:	50 mL
Date Prepared:	03/16/2009 1153			

Analyte	Result (mg/L)	Qualifier	RL
Iron	1.3		0.050
Manganese	0.37		0.010

Analytical Data

Client: URS Corporation

Job Number: 680-45126-1
Sdg Number: KPS049

Client Sample ID: **BSAMW01S-F(0.2)-0209**

Lab Sample ID: 680-45126-2
Client Matrix: Water

Date Sampled: 03/02/2009 1100
Date Received: 03/03/2009 0908

6010B Metals (ICP)-Dissolved

Method:	6010B	Analysis Batch: 680-133188		Instrument ID:	ICP/AES - D
Preparation:	3005A	Prep Batch: 680-132687		Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	50 mL
Date Analyzed:	03/19/2009 1525			Final Weight/Volume:	50 mL
Date Prepared:	03/16/2009 1153				

Analyte	Result (mg/L)	Qualifier	RL
Iron, Dissolved	1.1		0.050
Manganese, Dissolved	0.36		0.010

Client: URS Corporation

Job Number: 680-45126-1
Sdg Number: KPS049

Client Sample ID: **CPAMW01D-0209**

Lab Sample ID: 680-45126-3
Client Matrix: Water

Date Sampled: 03/02/2009 1230
Date Received: 03/03/2009 0908

6010B Metals (ICP)-Total Recoverable

Method:	6010B	Analysis Batch: 680-133188		Instrument ID:	ICP/AES - D
Preparation:	3005A	Prep Batch: 680-132687		Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	50 mL
Date Analyzed:	03/19/2009 1540			Final Weight/Volume:	50 mL
Date Prepared:	03/16/2009 1153				

Analyte	Result (mg/L)	Qualifier	RL
Iron	1.5		0.050
Manganese	0.092		0.010

Analytical Data

Client: URS Corporation

Job Number: 680-45126-1
Sdg Number: KPS049

Client Sample ID: **CPAMW01D-F(0-2)-0209**

Lab Sample ID:	680-45126-4	Date Sampled:	03/02/2009 1230
Client Matrix:	Water	Date Received:	03/03/2009 0908

6010B Metals (ICP)-Dissolved

Method:	6010B	Analysis Batch: 680-133188	Instrument ID:	ICP/AES - D
Preparation:	3005A	Prep Batch: 680-132687	Lab File ID:	N/A
Dilution:	1.0		Initial Weight/Volume:	50 mL
Date Analyzed:	03/19/2009 1555		Final Weight/Volume:	50 mL
Date Prepared:	03/16/2009 1153			

Analyte	Result (mg/L)	Qualifier	RL
Iron, Dissolved	1.0		0.050
Manganese, Dissolved	0.077		0.010

Client: URS Corporation

Job Number: 680-45126-1
Sdg Number: KPS049

Client Sample ID: **CPAMW02D-0209**

Lab Sample ID:	680-45126-5	Date Sampled:	03/02/2009 1350
Client Matrix:	Water	Date Received:	03/03/2009 0908

6010B Metals (ICP)-Total Recoverable

Method:	6010B	Analysis Batch: 680-133188	Instrument ID:	ICP/AES - D
Preparation:	3005A	Prep Batch: 680-132687	Lab File ID:	N/A
Dilution:	1.0		Initial Weight/Volume:	50 mL
Date Analyzed:	03/19/2009 1600		Final Weight/Volume:	50 mL
Date Prepared:	03/16/2009 1153			

Analyte	Result (mg/L)	Qualifier	RL
Iron	6.1		0.050
Manganese	0.35		0.010

Analytical Data

Client: URS Corporation

Job Number: 680-45126-1
Sdg Number: KPS049

Client Sample ID: **CPAMW02D-F(0-2)-0209**

Lab Sample ID:	680-45126-7	Date Sampled:	03/02/2009 1350
Client Matrix:	Water	Date Received:	03/03/2009 0908

6010B Metals (ICP)-Dissolved

Method:	6010B	Analysis Batch: 680-133188	Instrument ID:	ICP/AES - D
Preparation:	3005A	Prep Batch: 680-132687	Lab File ID:	N/A
Dilution:	1.0		Initial Weight/Volume:	50 mL
Date Analyzed:	03/19/2009 1605		Final Weight/Volume:	50 mL
Date Prepared:	03/16/2009 1153			

Analyte	Result (mg/L)	Qualifier	RL
Iron, Dissolved	5.2		0.050
Manganese, Dissolved	0.33		0.010

Analytical Data

Client: URS Corporation

Job Number: 680-45126-1
Sdg Number: KPS049

Client Sample ID: **BSAMW03D-0209**

Lab Sample ID:	680-45126-8	Date Sampled:	03/02/2009 1610
Client Matrix:	Water	Date Received:	03/03/2009 0908

6010B Metals (ICP)-Total Recoverable

Method:	6010B	Analysis Batch: 680-133188	Instrument ID:	ICP/AES - D
Preparation:	3005A	Prep Batch: 680-132687	Lab File ID:	N/A
Dilution:	1.0		Initial Weight/Volume:	50 mL
Date Analyzed:	03/19/2009 1610		Final Weight/Volume:	50 mL
Date Prepared:	03/16/2009 1153			

Analyte	Result (mg/L)	Qualifier	RL
Iron	12		0.050
Manganese	0.57		0.010

Client: URS Corporation

Job Number: 680-45126-1
Sdg Number: KPS049

Client Sample ID: **BSAMW03D-F(0.2)-0209**

Lab Sample ID:	680-45126-9	Date Sampled:	03/02/2009 1610
Client Matrix:	Water	Date Received:	03/03/2009 0908

6010B Metals (ICP)-Dissolved

Method:	6010B	Analysis Batch: 680-133188		Instrument ID:	ICP/AES - D
Preparation:	3005A	Prep Batch: 680-132687		Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	50 mL
Date Analyzed:	03/19/2009 1615			Final Weight/Volume:	50 mL
Date Prepared:	03/16/2009 1153				

Analyte	Result (mg/L)	Qualifier	RL
Iron, Dissolved	12		0.050
Manganese, Dissolved	0.59		0.010

General Chemistry

Client Sample ID: **BSAMW01S-0209**

Lab Sample ID: 680-45126-1
Client Matrix: Water

Date Sampled: 03/02/2009 1100
Date Received: 03/03/2009 0908

Analyte	Result	Qual	Units		RL	Dil	Method
Chloride	100		mg/L		2.0	2.0	325.2
	Anly Batch: 680-132265		Date Analyzed	03/10/2009 1200			
Nitrate as N	0.25	U	mg/L		0.25	5.0	353.2
	Anly Batch: 680-131729		Date Analyzed	03/03/2009 1602			
Sulfate	5.0	U	mg/L		5.0	1.0	375.4
	Anly Batch: 680-132708		Date Analyzed	03/16/2009 1244			
Total Organic Carbon	6.9		mg/L		1.0	1.0	415.1
	Anly Batch: 680-133129		Date Analyzed	03/18/2009 1551			

Analyte	Result	Qual	Units		RL	Dil	Method
Alkalinity	850		mg/L		5.0	1.0	310.1
	Anly Batch: 680-132390		Date Analyzed	03/10/2009 1656			
Carbon Dioxide, Free	22		mg/L		5.0	1.0	310.1
	Anly Batch: 680-132390		Date Analyzed	03/10/2009 1656			

Client Sample ID: **BSAMW01S-F(0.2)-0209**

Lab Sample ID: 680-45126-2
Client Matrix: Water

Date Sampled: 03/02/2009 1100
Date Received: 03/03/2009 0908

Analyte	Result	Qual	Units		RL	Dil	Method
Dissolved Organic Carbon-D	13		mg/L		1.0	1.0	415.1
	Anly Batch: 680-133130		Date Analyzed	03/18/2009 1836			

General Chemistry

Client Sample ID: **CPAMW01D-0209**

Lab Sample ID: 680-45126-3
Client Matrix: Water

Date Sampled: 03/02/2009 1230
Date Received: 03/03/2009 0908

Analyte	Result	Qual	Units	RL	Dil	Method
Chloride	130		mg/L	2.0	2.0	325.2
	Anly Batch: 680-132265	Date Analyzed	03/10/2009 1200			
Nitrate as N	0.50	U	mg/L	0.50	10	353.2
	Anly Batch: 680-131729	Date Analyzed	03/03/2009 1602			
Sulfate	5.7		mg/L	5.0	1.0	375.4
	Anly Batch: 680-132708	Date Analyzed	03/16/2009 1244			
Total Organic Carbon	12		mg/L	1.0	1.0	415.1
	Anly Batch: 680-133129	Date Analyzed	03/18/2009 1608			

Analyte	Result	Qual	Units	RL	Dil	Method
Alkalinity	1100		mg/L	5.0	1.0	310.1
	Anly Batch: 680-132390	Date Analyzed	03/10/2009 1710			
Carbon Dioxide, Free	5.0	U	mg/L	5.0	1.0	310.1
	Anly Batch: 680-132390	Date Analyzed	03/10/2009 1710			

Client Sample ID: **CPAMW01D-F(0-2)-0209**

Lab Sample ID: 680-45126-4
Client Matrix: Water

Date Sampled: 03/02/2009 1230
Date Received: 03/03/2009 0908

Analyte	Result	Qual	Units	RL	Dil	Method
Dissolved Organic Carbon-D	11		mg/L	1.0	1.0	415.1
	Anly Batch: 680-133130	Date Analyzed	03/18/2009 1836			

General Chemistry

Client Sample ID: **CPAMW02D-0209**

Lab Sample ID: 680-45126-5
Client Matrix: Water

Date Sampled: 03/02/2009 1350
Date Received: 03/03/2009 0908

Analyte	Result	Qual	Units	RL	Dil	Method
Chloride	67		mg/L	1.0	1.0	325.2
	Anly Batch: 680-132265	Date Analyzed	03/10/2009 1150			
Nitrate as N	0.25	U	mg/L	0.25	5.0	353.2
	Anly Batch: 680-131729	Date Analyzed	03/03/2009 1602			
Sulfate	5.0	U	mg/L	5.0	1.0	375.4
	Anly Batch: 680-132708	Date Analyzed	03/16/2009 1244			
Total Organic Carbon	11		mg/L	1.0	1.0	415.1
	Anly Batch: 680-133129	Date Analyzed	03/18/2009 1622			

Analyte	Result	Qual	Units	RL	Dil	Method
Alkalinity	610		mg/L	5.0	1.0	310.1
	Anly Batch: 680-132390	Date Analyzed	03/10/2009 1720			
Carbon Dioxide, Free	25		mg/L	5.0	1.0	310.1
	Anly Batch: 680-132390	Date Analyzed	03/10/2009 1720			

Client Sample ID: **CPAMW02D-F(0-2)-0209**

Lab Sample ID: 680-45126-7
Client Matrix: Water

Date Sampled: 03/02/2009 1350
Date Received: 03/03/2009 0908

Analyte	Result	Qual	Units	RL	Dil	Method
Dissolved Organic Carbon-D	10		mg/L	1.0	1.0	415.1
	Anly Batch: 680-133130	Date Analyzed	03/18/2009 1836			

General Chemistry

Client Sample ID: **BSAMW03D-0209**

Lab Sample ID: 680-45126-8
Client Matrix: Water

Date Sampled: 03/02/2009 1610
Date Received: 03/03/2009 0908

Analyte	Result	Qual	Units		RL	Dil	Method
Chloride	64		mg/L		1.0	1.0	325.2
	Anly Batch: 680-132265		Date Analyzed	03/10/2009 1151			
Nitrate as N	0.25	U	mg/L		0.25	5.0	353.2
	Anly Batch: 680-131729		Date Analyzed	03/03/2009 1602			
Sulfate	240		mg/L		50	10	375.4
	Anly Batch: 680-132708		Date Analyzed	03/16/2009 1328			
Total Organic Carbon	3.7		mg/L		1.0	1.0	415.1
	Anly Batch: 680-133129		Date Analyzed	03/18/2009 1639			

Analyte	Result	Qual	Units		RL	Dil	Method
Alkalinity	490		mg/L		5.0	1.0	310.1
	Anly Batch: 680-132390		Date Analyzed	03/10/2009 1729			
Carbon Dioxide, Free	26		mg/L		5.0	1.0	310.1
	Anly Batch: 680-132390		Date Analyzed	03/10/2009 1729			

Client Sample ID: **BSAMW03D-F(0.2)-0209**

Lab Sample ID: 680-45126-9
Client Matrix: Water

Date Sampled: 03/02/2009 1610
Date Received: 03/03/2009 0908

Analyte	Result	Qual	Units		RL	Dil	Method
Dissolved Organic Carbon-D	3.6		mg/L		1.0	1.0	415.1
	Anly Batch: 680-133130		Date Analyzed	03/18/2009 1836			

DATA REPORTING QUALIFIERS

Client: URS Corporation

Job Number: 680-45126-1
Sdg Number: KPS049

Lab Section	Qualifier	Description
GC/MS VOA		
	U	Indicates the analyte was analyzed for but not detected.
GC/MS Semi VOA		
	U	Indicates the analyte was analyzed for but not detected.
	E	Result exceeded calibration range, secondary dilution required.
	X	Surrogate exceeds the control limits
GC VOA		
	U	Indicates the analyte was analyzed for but not detected.
Metals		
	U	Indicates the analyte was analyzed for but not detected.
General Chemistry		
	U	Indicates the analyte was analyzed for but not detected.

Appendix F
Surface Water and Sediment Analytical Results
(with Data Review Sheets)

SDG KRS005

Results of Surface Water Samples from Sampling Points:

R2007-1
R2007-2
R2007-3

Solutia Krummrich Data Review

Laboratory SDG: KRS005

Reviewer: Elizabeth Kunkel

Date Reviewed: 4/3/2009

Guidance: USEPA National Functional Guidelines for Organic Data Review 1999.

Applicable Work Plan: Long-Term Monitoring Program (LTMP) Work Plan (Solutia 2008)

Sample Identification #	Sample Identification #
SW-R2007-1-0209	SW-R2007-3-0209
SW- R2007-3-0209 DUP	SW-R2007-2-0209
SED-R2007-2-0209 EB	TB-022609

1.0 Data Package Completeness

Were all items delivered as specified in the QAPP and COC?

Yes

2.0 Laboratory Case Narrative \ Cooler Receipt Form

Were problems noted in the laboratory case narrative or cooler receipt form?

Yes, the laboratory case narrative indicated that the MS/MSD RPD for 1,4-Dioxane was outside evaluation criteria in sample SW-R2007-1-0209. This issue is addressed further in the appropriate section below.

The cooler receipt form indicates a sample ID discrepancy between the COC and sample labels. The field duplicate samples on the COC were listed as DUP and the sample labels listed -AD at the end of the sample ID. Samples were logged in by the laboratory using the DUP sample ID designated. This did not affect the quality of the data. No qualification of data was required.

3.0 Holding Times

Were samples extracted/analyzed within QAPP limits?

Yes

4.0 Blank Contamination

Were any analytes detected in the Method Blanks, Field Blanks or Trip Blanks?

No

5.0 Laboratory Control Sample

Were LCS recoveries within evaluation criteria?

Yes

6.0 Surrogate Recoveries

Were surrogate recoveries within evaluation criteria?

Yes

7.0 Matrix Spike and Matrix Spike Duplicate Recoveries

Were MS/MSD samples reported as part of this SDG?

Yes, sample SW-R2007-1-0209 was spiked and analyzed for VOCs and SVOCs.

Were MS/MSD recoveries within evaluation criteria?

No

MS/MSD ID	Parameter	Analyte	MS/MSD Recovery	RPD	MS/MSD/RPD Criteria
SW-R2007-1-0209	SVOCs	1,4-Dioxane	36/57	**45**	11-110/40

USEPA National Functional Guidelines for Organic Data Review indicates that organic data should not be qualified based on MS/MSD data alone and LCS recoveries were within evaluation criteria; therefore, no qualification of data was required.

8.0 Internal Standard (IS) Recoveries

Were internal standard area recoveries within evaluation criteria?

Yes

Field ID	Parameter	Analyte	IS Area Recovery	IS Criteria
N/A				

9.0 Laboratory Duplicate Results

Were laboratory duplicate samples collected as part of this SDG?

No

10.0 Field Duplicate Results

Were field duplicate samples collected as part of this SDG?

Yes

Field ID	Field Duplicate ID
SW-R2007-3-0209	SW- R2007-3-0209 DUP

Were field duplicates within evaluation criteria?

Yes

11.0 Sample Dilutions

For samples that were diluted and nondetect, were undiluted results also reported?

Samples were not analyzed at a dilution.

12.0 Additional Qualifications

Were additional qualifications applied?

No

SAMPLE SUMMARY

Client: Solutia Inc.

Job Number: 680-45056-1
Sdg Number: KRS005

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
680-45056-1	SW-R2007-1-0209	Water	02/26/2009 0930	02/27/2009 1116
680-45056-1MS	SW-R2007-1-0209	Water	02/26/2009 0930	02/27/2009 1116
680-45056-1MSD	SW-R2007-1-0209	Water	02/26/2009 0930	02/27/2009 1116
680-45056-3	SW-R2007-3-0209	Water	02/26/2009 1115	02/27/2009 1116
680-45056-4	SW-R2007-3-0209 DUP	Water	02/26/2009 1115	02/27/2009 1116
680-45056-7	SW-R2007-2-0209	Water	02/26/2009 1230	02/27/2009 1116
680-45056-9	SED-R2007-2-0209 EB	Water	02/26/2009 1355	02/27/2009 1116
680-45056-10	TB-022609	Water	02/26/2009 0930	02/27/2009 1116

SAMPLE RESULTS

Analytical Data

Client: Solutia Inc.

Job Number: 680-45056-1
Sdg Number: KRS005

Client Sample ID: **SW-R2007-1-0209**

Lab Sample ID: 680-45056-1
Client Matrix: Water

Date Sampled: 02/26/2009 0930
Date Received: 02/27/2009 1116

8260B Volatile Organic Compounds (GC/MS)

Method: 8260B
Preparation: 5030B
Dilution: 1.0
Date Analyzed: 03/03/2009 1525
Date Prepared: 03/03/2009 1525

Analysis Batch: 680-131678

Instrument ID: GC/MS Volatiles - P C2
Lab File ID: p0854.d
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Benzene	1.0	U	0.32	1.0
Chlorobenzene	1.0	U	0.34	1.0
1,2-Dichlorobenzene	1.0	U	0.33	1.0
1,3-Dichlorobenzene	1.0	U	0.31	1.0
1,4-Dichlorobenzene	1.0	U	0.33	1.0

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	97	75 - 120
Dibromofluoromethane	109	75 - 121
Toluene-d8 (Surr)	101	75 - 120

Analytical Data

Client: Solutia Inc.

Job Number: 680-45056-1
Sdg Number: KRS005

Client Sample ID: **SW-R2007-3-0209**

Lab Sample ID: 680-45056-3
Client Matrix: Water

Date Sampled: 02/26/2009 1115
Date Received: 02/27/2009 1116

8260B Volatile Organic Compounds (GC/MS)

Method: 8260B
Preparation: 5030B
Dilution: 1.0
Date Analyzed: 03/03/2009 1555
Date Prepared: 03/03/2009 1555

Analysis Batch: 680-131678

Instrument ID: GC/MS Volatiles - P C2
Lab File ID: p0856.d
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Benzene	1.0	U	0.32	1.0
Chlorobenzene	1.0	U	0.34	1.0
1,2-Dichlorobenzene	1.0	U	0.33	1.0
1,3-Dichlorobenzene	1.0	U	0.31	1.0
1,4-Dichlorobenzene	1.0	U	0.33	1.0

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	96	75 - 120
Dibromofluoromethane	107	75 - 121
Toluene-d8 (Surr)	103	75 - 120

Client: Solutia Inc.

Job Number: 680-45056-1
Sdg Number: KRS005

Client Sample ID: **SW-R2007-3-0209 DUP**

Lab Sample ID: 680-45056-4
Client Matrix: Water

Date Sampled: 02/26/2009 1115
Date Received: 02/27/2009 1116

8260B Volatile Organic Compounds (GC/MS)

Method: 8260B
Preparation: 5030B
Dilution: 1.0
Date Analyzed: 03/03/2009 1624
Date Prepared: 03/03/2009 1624

Analysis Batch: 680-131678

Instrument ID: GC/MS Volatiles - P C2
Lab File ID: p0858.d
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Benzene	1.0	U	0.32	1.0
Chlorobenzene	1.0	U	0.34	1.0
1,2-Dichlorobenzene	1.0	U	0.33	1.0
1,3-Dichlorobenzene	1.0	U	0.31	1.0
1,4-Dichlorobenzene	1.0	U	0.33	1.0

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	99	75 - 120
Dibromofluoromethane	106	75 - 121
Toluene-d8 (Surr)	104	75 - 120

Analytical Data

Client: Solutia Inc.

Job Number: 680-45056-1
Sdg Number: KRS005

Client Sample ID: **SW-R2007-2-0209**

Lab Sample ID: 680-45056-7
Client Matrix: Water

Date Sampled: 02/26/2009 1230
Date Received: 02/27/2009 1116

8260B Volatile Organic Compounds (GC/MS)

Method: 8260B
Preparation: 5030B
Dilution: 1.0
Date Analyzed: 03/03/2009 1653
Date Prepared: 03/03/2009 1653

Analysis Batch: 680-131678

Instrument ID: GC/MS Volatiles - P C2
Lab File ID: p0860.d
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Benzene	1.0	U	0.32	1.0
Chlorobenzene	1.0	U	0.34	1.0
1,2-Dichlorobenzene	1.0	U	0.33	1.0
1,3-Dichlorobenzene	1.0	U	0.31	1.0
1,4-Dichlorobenzene	1.0	U	0.33	1.0

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	97	75 - 120
Dibromofluoromethane	103	75 - 121
Toluene-d8 (Surr)	102	75 - 120

Client: Solutia Inc.

Job Number: 680-45056-1
Sdg Number: KRS005

Client Sample ID: **SED-R2007-2-0209 EB**

Lab Sample ID: 680-45056-9
Client Matrix: Water

Date Sampled: 02/26/2009 1355
Date Received: 02/27/2009 1116

8260B Volatile Organic Compounds (GC/MS)

Method: 8260B
Preparation: 5030B
Dilution: 1.0
Date Analyzed: 03/03/2009 1456
Date Prepared: 03/03/2009 1456

Analysis Batch: 680-131678

Instrument ID: GC/MS Volatiles - P C2
Lab File ID: p0852.d
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Benzene	1.0	U	0.32	1.0
Chlorobenzene	1.0	U	0.34	1.0
1,2-Dichlorobenzene	1.0	U	0.33	1.0
1,3-Dichlorobenzene	1.0	U	0.31	1.0
1,4-Dichlorobenzene	1.0	U	0.33	1.0

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	97	75 - 120
Dibromofluoromethane	108	75 - 121
Toluene-d8 (Surr)	101	75 - 120

Analytical Data

Client: Solutia Inc.

Job Number: 680-45056-1
Sdg Number: KRS005

Client Sample ID: **TB-022609**

Lab Sample ID: 680-45056-10
Client Matrix: Water

Date Sampled: 02/26/2009 0930
Date Received: 02/27/2009 1116

8260B Volatile Organic Compounds (GC/MS)

Method: 8260B
Preparation: 5030B
Dilution: 1.0
Date Analyzed: 03/03/2009 1427
Date Prepared: 03/03/2009 1427

Analysis Batch: 680-131678

Instrument ID: GC/MS Volatiles - P C2
Lab File ID: p0850.d
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Benzene	1.0	U	0.32	1.0
Chlorobenzene	1.0	U	0.34	1.0
1,2-Dichlorobenzene	1.0	U	0.33	1.0
1,3-Dichlorobenzene	1.0	U	0.31	1.0
1,4-Dichlorobenzene	1.0	U	0.33	1.0

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	97	75 - 120
Dibromofluoromethane	109	75 - 121
Toluene-d8 (Surr)	100	75 - 120

Client: Solutia Inc.

Job Number: 680-45056-1
Sdg Number: KRS005

Client Sample ID: **SW-R2007-1-0209**

Lab Sample ID: 680-45056-1
Client Matrix: Water

Date Sampled: 02/26/2009 0930
Date Received: 02/27/2009 1116

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method: 8270C
Preparation: 3520C
Dilution: 1.0
Date Analyzed: 03/05/2009 2229
Date Prepared: 03/03/2009 1213

Analysis Batch: 680-131938
Prep Batch: 680-131614

Instrument ID: GC/MS SemiVolatiles - N
Lab File ID: n2169.d
Initial Weight/Volume: 1030 mL
Final Weight/Volume: 1 mL
Injection Volume: 1.0 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
2-Chlorophenol	9.7	U	0.97	9.7
4-Chloroaniline	19	U	4.7	19
1,4-Dioxane	9.7	U	2.5	9.7
1,2,4-Trichlorobenzene	9.7	U	0.69	9.7

Surrogate	%Rec	Acceptance Limits
Phenol-d5	83	38 - 116
2-Fluorophenol	82	36 - 110
2,4,6-Tribromophenol	102	40 - 139
Nitrobenzene-d5	89	45 - 112
2-Fluorobiphenyl	90	50 - 113
Terphenyl-d14	48	10 - 121

Analytical Data

Client: Solutia Inc.

Job Number: 680-45056-1
Sdg Number: KRS005

Client Sample ID: **SW-R2007-3-0209**

Lab Sample ID: 680-45056-3
Client Matrix: Water

Date Sampled: 02/26/2009 1115
Date Received: 02/27/2009 1116

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 680-131938	Instrument ID:	GC/MS SemiVolatiles - N	
Preparation:	3520C	Prep Batch: 680-131614	Lab File ID:	n2170.d	
Dilution:	1.0		Initial Weight/Volume:	1030 mL	
Date Analyzed:	03/05/2009 2251		Final Weight/Volume:	1 mL	
Date Prepared:	03/03/2009 1213		Injection Volume:	1.0 uL	

Analyte	Result (ug/L)	Qualifier	MDL	RL
2-Chlorophenol	9.7	U	0.97	9.7
4-Chloroaniline	19	U	4.7	19
1,4-Dioxane	9.7	U	2.5	9.7
1,2,4-Trichlorobenzene	9.7	U	0.69	9.7

Surrogate	%Rec	Acceptance Limits
Phenol-d5	79	38 - 116
2-Fluorophenol	78	36 - 110
2,4,6-Tribromophenol	97	40 - 139
Nitrobenzene-d5	86	45 - 112
2-Fluorobiphenyl	82	50 - 113
Terphenyl-d14	41	10 - 121

Analytical Data

Client: Solutia Inc.

Job Number: 680-45056-1
Sdg Number: KRS005

Client Sample ID: **SW-R2007-3-0209 DUP**

Lab Sample ID: 680-45056-4
Client Matrix: Water

Date Sampled: 02/26/2009 1115
Date Received: 02/27/2009 1116

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method: 8270C
Preparation: 3520C
Dilution: 1.0
Date Analyzed: 03/05/2009 2314
Date Prepared: 03/03/2009 1213

Analysis Batch: 680-131938
Prep Batch: 680-131614

Instrument ID: GC/MS SemiVolatiles - N
Lab File ID: n2171.d
Initial Weight/Volume: 1030 mL
Final Weight/Volume: 1 mL
Injection Volume: 1.0 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
2-Chlorophenol	9.7	U	0.97	9.7
4-Chloroaniline	19	U	4.7	19
1,4-Dioxane	9.7	U	2.5	9.7
1,2,4-Trichlorobenzene	9.7	U	0.69	9.7

Surrogate	%Rec	Acceptance Limits
Phenol-d5	86	38 - 116
2-Fluorophenol	87	36 - 110
2,4,6-Tribromophenol	105	40 - 139
Nitrobenzene-d5	91	45 - 112
2-Fluorobiphenyl	91	50 - 113
Terphenyl-d14	55	10 - 121

Analytical Data

Client: Solutia Inc.

Job Number: 680-45056-1
Sdg Number: KRS005

Client Sample ID: **SW-R2007-2-0209**

Lab Sample ID: 680-45056-7
Client Matrix: Water

Date Sampled: 02/26/2009 1230
Date Received: 02/27/2009 1116

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method: 8270C
Preparation: 3520C
Dilution: 1.0
Date Analyzed: 03/05/2009 2336
Date Prepared: 03/03/2009 1213

Analysis Batch: 680-131938
Prep Batch: 680-131614

Instrument ID: GC/MS SemiVolatiles - N
Lab File ID: n2172.d
Initial Weight/Volume: 1030 mL
Final Weight/Volume: 1 mL
Injection Volume: 1.0 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
2-Chlorophenol	9.7	U	0.97	9.7
4-Chloroaniline	19	U	4.7	19
1,4-Dioxane	9.7	U	2.5	9.7
1,2,4-Trichlorobenzene	9.7	U	0.69	9.7

Surrogate	%Rec	Acceptance Limits
Phenol-d5	87	38 - 116
2-Fluorophenol	87	36 - 110
2,4,6-Tribromophenol	106	40 - 139
Nitrobenzene-d5	89	45 - 112
2-Fluorobiphenyl	90	50 - 113
Terphenyl-d14	51	10 - 121

Client: Solutia Inc.

Job Number: 680-45056-1
Sdg Number: KRS005

Client Sample ID: **SED-R2007-2-0209 EB**

Lab Sample ID: 680-45056-9
Client Matrix: Water

Date Sampled: 02/26/2009 1355
Date Received: 02/27/2009 1116

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method: 8270C
Preparation: 3520C
Dilution: 1.0
Date Analyzed: 03/05/2009 2359
Date Prepared: 03/03/2009 1213

Analysis Batch: 680-131938
Prep Batch: 680-131614

Instrument ID: GC/MS SemiVolatiles - N
Lab File ID: n2173.d
Initial Weight/Volume: 1030 mL
Final Weight/Volume: 1 mL
Injection Volume: 1.0 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
2-Chlorophenol	9.7	U	0.97	9.7
4-Chloroaniline	19	U	4.7	19
1,4-Dioxane	9.7	U	2.5	9.7
1,2,4-Trichlorobenzene	9.7	U	0.69	9.7

Surrogate	%Rec	Acceptance Limits
Phenol-d5	84	38 - 116
2-Fluorophenol	84	36 - 110
2,4,6-Tribromophenol	103	40 - 139
Nitrobenzene-d5	87	45 - 112
2-Fluorobiphenyl	83	50 - 113
Terphenyl-d14	38	10 - 121

DATA REPORTING QUALIFIERS

Client: Solutia Inc.

Job Number: 680-45056-1
Sdg Number: KRS005

Lab Section	Qualifier	Description
GC/MS VOA		
	U	Indicates the analyte was analyzed for but not detected.
GC/MS Semi VOA		
	U	Indicates the analyte was analyzed for but not detected.
	F	RPD of the MS and MSD exceeds the control limits

SDG KRS006

Results of Sediment Samples from Sampling Points:

R2007-1
R2007-2
R2007-3

Solutia Krummrich Data Review

Laboratory SDG: KRS006

Reviewer: Elizabeth Kunkel

Date Reviewed: 4/3/2009

Guidance: USEPA National Functional Guidelines for Organic Data Review 1999.

Applicable Work Plan: Long-Term Monitoring Program (LTMP) Work Plan (Solutia 2008)

Sample Identification #	Sample Identification #
SED-R2007-1-0209	SED-R2007-3-0209
SED-R2007-3-0209 DUP	SED-R2007-2-0209

1.0 Data Package Completeness

Were all items delivered as specified in the QAPP and COC?

Yes

2.0 Laboratory Case Narrative \ Cooler Receipt Form

Were problems noted in the laboratory case narrative or cooler receipt form?

Yes, the laboratory case narrative indicated that SVOC MS/MSD recoveries and MS/MSD RPDs were outside evaluation criteria in sample SED-R2007-1-0209. This issue is addressed further in the appropriate section below.

The cooler receipt form indicated that one MS sample vial and two MSD sample vials for sample SED-R2007-1-0209 were received by the laboratory with low sample volume. However, sufficient sample was available to perform all requested analyses. Additionally, there was a sample ID discrepancy between the COC and sample labels. The field duplicate samples on the COC were listed as DUP and the sample labels listed -AD at the end of the sample ID. Samples were logged in by the laboratory using the DUP sample ID designated. This did not affect the quality of the data. No qualification of data was required.

3.0 Holding Times

Were samples extracted/analyzed within QAPP limits?

Yes

4.0 Blank Contamination

Were any analytes detected in the Method Blanks, Field Blanks or Trip Blanks?

No

5.0 Laboratory Control Sample

Were LCS recoveries within evaluation criteria?

Yes

6.0 Surrogate Recoveries

Were surrogate recoveries within evaluation criteria?

Yes

7.0 Matrix Spike and Matrix Spike Duplicate Recoveries

Were MS/MSD samples reported as part of this SDG?

Yes, sample SED-R2007-1-0209 was spiked and analyzed for VOCs and SVOCs.

Were MS/MSD recoveries within evaluation criteria?

No

MS/MSD ID	Parameter	Analyte	MS/MSD Recovery	RPD	MS/MSD/RPD Criteria
SED-R-2007-1-0209	SVOCs	4-Chloroaniline	60/**143**	**82**	21-110/50
SED-R-2007-1-0209	SVOCs	2-Chlorophenol	51/105	**70**	44-110/50
SED-R-2007-1-0209	SVOCs	1,4-Dioxane	**0**/65	**200**	10-110/50
SED-R-2007-1-0209	SVOCs	1,2,4-Trichlorobenzene	48/108	**77**	42-110/50

USEPA National Functional Guidelines for Organic Data Review indicates that organic data should not be qualified based on MS/MSD data alone and LCS recoveries were within evaluation criteria; therefore, no qualification of data was required.

8.0 Internal Standard (IS) Recoveries

Were internal standard area recoveries within evaluation criteria?

Yes

9.0 Laboratory Duplicate Results

Were laboratory duplicate samples collected as part of this SDG?

No

10.0 Field Duplicate Results

Were field duplicate samples collected as part of this SDG?

Yes

Field ID	Field Duplicate ID
SED-R2007-3-0209	SED-R2007-3-0209 DUP

Were field duplicates within evaluation criteria?

Yes

11.0 Sample Dilutions

For samples that were diluted and nondetect, were undiluted results also reported?

Samples were not analyzed at a dilution.

12.0 Additional Qualifications

Were additional qualifications applied?

No

SAMPLE SUMMARY

Client: Solutia Inc.

Job Number: 680-45056-2
Sdg Number: KRS006

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
680-45056-2	SED-R2007-1-0209	Solid	02/26/2009 0940	02/27/2009 1116
680-45056-2MS	SED-R2007-1-0209	Solid	02/26/2009 0940	02/27/2009 1116
680-45056-2MSD	SED-R2007-1-0209	Solid	02/26/2009 0940	02/27/2009 1116
680-45056-5	SED-R2007-3-0209	Solid	02/26/2009 1130	02/27/2009 1116
680-45056-6	SED-R2007-3-0209 DUP	Solid	02/26/2009 1130	02/27/2009 1116
680-45056-8	SED-R2007-2-0209	Solid	02/26/2009 1240	02/27/2009 1116

SAMPLE RESULTS

Analytical Data

Client: Solutia Inc.

Job Number: 680-45056-2
Sdg Number: KRS006

Client Sample ID: **SED-R2007-1-0209**

Lab Sample ID: 680-45056-2
Client Matrix: Solid
% Moisture: 29.3
Date Sampled: 02/26/2009 0940
Date Received: 02/27/2009 1116

8260B Volatile Organic Compounds (GC/MS)

Method: 8260B
Preparation: 5035
Dilution: 1.0
Date Analyzed: 03/09/2009 1331
Date Prepared: 03/02/2009 1053

Analysis Batch: 680-132158
Prep Batch: 680-131535

Instrument ID: GC/MS Volatiles - M
Lab File ID: m0165.d
Initial Weight/Volume: 2.7 g
Final Weight/Volume: 5 g

Analyte	DryWt Corrected: Y Result (ug/Kg)	Qualifier	MDL	RL
Benzene	13	U	2.1	13
Chlorobenzene	13	U	1.9	13
1,2-Dichlorobenzene	13	U	1.7	13
1,3-Dichlorobenzene	13	U	2.2	13
1,4-Dichlorobenzene	13	U	1.3	13

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	71	65 - 124
Dibromofluoromethane	90	65 - 124
Toluene-d8 (Surr)	88	65 - 132

Analytical Data

Client: Solutia Inc.

Job Number: 680-45056-2
Sdg Number: KRS006

Client Sample ID: **SED-R2007-3-0209**

Lab Sample ID:	680-45056-5			Date Sampled:	02/26/2009 1130
Client Matrix:	Solid	% Moisture:	18.3	Date Received:	02/27/2009 1116

8260B Volatile Organic Compounds (GC/MS)

Method:	8260B	Analysis Batch: 680-132158		Instrument ID:	GC/MS Volatiles - M
Preparation:	5035	Prep Batch: 680-131535		Lab File ID:	m0166.d
Dilution:	1.0			Initial Weight/Volume:	7.7 g
Date Analyzed:	03/09/2009 1354			Final Weight/Volume:	5 g
Date Prepared:	03/02/2009 1053				

Analyte	DryWt Corrected: Y Result (ug/Kg)	Qualifier	MDL	RL
Benzene	4.0	U	0.63	4.0
Chlorobenzene	2.9	J	0.58	4.0
1,2-Dichlorobenzene	4.0	U	0.52	4.0
1,3-Dichlorobenzene	4.0	U	0.66	4.0
1,4-Dichlorobenzene	4.0	U	0.41	4.0

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	80	65 - 124
Dibromofluoromethane	92	65 - 124
Toluene-d8 (Surr)	92	65 - 132

Client: Solutia Inc.

Job Number: 680-45056-2
Sdg Number: KRS006

Client Sample ID: **SED-R2007-3-0209 DUP**

Lab Sample ID:	680-45056-6			Date Sampled:	02/26/2009 1130
Client Matrix:	Solid	% Moisture:	17.1	Date Received:	02/27/2009 1116

8260B Volatile Organic Compounds (GC/MS)

Method:	8260B	Analysis Batch: 680-132158		Instrument ID:	GC/MS Volatiles - M
Preparation:	5035	Prep Batch: 680-131535		Lab File ID:	m0167.d
Dilution:	1.0			Initial Weight/Volume:	6.3 g
Date Analyzed:	03/09/2009 1417			Final Weight/Volume:	5 g
Date Prepared:	03/02/2009 1053				

Analyte	DryWt Corrected: Y Result (ug/Kg)	Qualifier	MDL	RL
Benzene	4.8	U	0.76	4.8
Chlorobenzene	2.0	J	0.70	4.8
1,2-Dichlorobenzene	4.8	U	0.62	4.8
1,3-Dichlorobenzene	4.8	U	0.79	4.8
1,4-Dichlorobenzene	4.8	U	0.49	4.8

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	75	65 - 124
Dibromofluoromethane	98	65 - 124
Toluene-d8 (Surr)	91	65 - 132

Analytical Data

Client: Solutia Inc.

Job Number: 680-45056-2
Sdg Number: KRS006

Client Sample ID: **SED-R2007-2-0209**

Lab Sample ID:	680-45056-8			Date Sampled:	02/26/2009 1240
Client Matrix:	Solid	% Moisture:	16.5	Date Received:	02/27/2009 1116

8260B Volatile Organic Compounds (GC/MS)

Method:	8260B	Analysis Batch: 680-132158		Instrument ID:	GC/MS Volatiles - M
Preparation:	5035	Prep Batch: 680-131535		Lab File ID:	m0168.d
Dilution:	1.0			Initial Weight/Volume:	6.3 g
Date Analyzed:	03/09/2009 1439			Final Weight/Volume:	5 g
Date Prepared:	03/02/2009 1053				

Analyte	DryWt Corrected: Y Result (ug/Kg)	Qualifier	MDL	RL
Benzene	4.8	U	0.75	4.8
Chlorobenzene	4.8	U	0.69	4.8
1,2-Dichlorobenzene	4.8	U	0.62	4.8
1,3-Dichlorobenzene	4.8	U	0.79	4.8
1,4-Dichlorobenzene	4.8	U	0.48	4.8

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	89	65 - 124
Dibromofluoromethane	92	65 - 124
Toluene-d8 (Surr)	94	65 - 132

Analytical Data

Client: Solutia Inc.

Job Number: 680-45056-2
Sdg Number: KRS006

Client Sample ID: **SED-R2007-1-0209**

Lab Sample ID:	680-45056-2			Date Sampled:	02/26/2009 0940
Client Matrix:	Solid	% Moisture:	29.3	Date Received:	02/27/2009 1116

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 680-131776		Instrument ID:	GC/MS SemiVolatiles - G
Preparation:	3550B	Prep Batch: 680-131485		Lab File ID:	g5497.d
Dilution:	1.0			Initial Weight/Volume:	30.06 g
Date Analyzed:	03/02/2009 1924			Final Weight/Volume:	1 mL
Date Prepared:	03/01/2009 1436			Injection Volume:	1.0 uL

Analyte	DryWt Corrected: Y Result (ug/Kg)	Qualifier	MDL	RL
4-Chloroaniline	930	U	24	930
2-Chlorophenol	470	U	24	470
1,4-Dioxane	470	U	120	470
1,2,4-Trichlorobenzene	470	U	24	470

Surrogate	%Rec	Acceptance Limits
2-Fluorobiphenyl	73	44 - 110
2-Fluorophenol	76	41 - 110
Nitrobenzene-d5	55	36 - 110
Phenol-d5	68	43 - 110
Terphenyl-d14	76	10 - 112
2,4,6-Tribromophenol	88	36 - 128

Analytical Data

Client: Solutia Inc.

Job Number: 680-45056-2
Sdg Number: KRS006

Client Sample ID: **SED-R2007-3-0209**

Lab Sample ID:	680-45056-5			Date Sampled:	02/26/2009 1130
Client Matrix:	Solid	% Moisture:	18.3	Date Received:	02/27/2009 1116

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 680-131776		Instrument ID:	GC/MS SemiVolatiles - G
Preparation:	3550B	Prep Batch: 680-131485		Lab File ID:	g5500.d
Dilution:	1.0			Initial Weight/Volume:	30.08 g
Date Analyzed:	03/02/2009 2032			Final Weight/Volume:	1 mL
Date Prepared:	03/01/2009 1436			Injection Volume:	1.0 uL

Analyte	DryWt Corrected: Y Result (ug/Kg)	Qualifier	MDL	RL
4-Chloroaniline	810	U	21	810
2-Chlorophenol	400	U	21	400
1,4-Dioxane	400	U	100	400
1,2,4-Trichlorobenzene	400	U	21	400

Surrogate	%Rec	Acceptance Limits
2-Fluorobiphenyl	75	44 - 110
2-Fluorophenol	79	41 - 110
Nitrobenzene-d5	58	36 - 110
Phenol-d5	68	43 - 110
Terphenyl-d14	79	10 - 112
2,4,6-Tribromophenol	85	36 - 128

Analytical Data

Client: Solutia Inc.

Job Number: 680-45056-2
Sdg Number: KRS006

Client Sample ID: **SED-R2007-3-0209 DUP**

Lab Sample ID:	680-45056-6			Date Sampled:	02/26/2009 1130
Client Matrix:	Solid	% Moisture:	17.1	Date Received:	02/27/2009 1116

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 680-132488		Instrument ID:	GC/MS SemiVolatiles - T
Preparation:	3550B	Prep Batch: 680-131485		Lab File ID:	t5054.d
Dilution:	1.0			Initial Weight/Volume:	30.02 g
Date Analyzed:	03/11/2009 1156			Final Weight/Volume:	1 mL
Date Prepared:	03/01/2009 1436			Injection Volume:	1.0 uL

Analyte	DryWt Corrected: Y Result (ug/Kg)	Qualifier	MDL	RL
4-Chloroaniline	800	U	20	800
2-Chlorophenol	400	U	20	400
1,4-Dioxane	400	U	100	400
1,2,4-Trichlorobenzene	400	U	20	400

Surrogate	%Rec	Acceptance Limits
2-Fluorobiphenyl	64	44 - 110
2-Fluorophenol	68	41 - 110
Nitrobenzene-d5	55	36 - 110
Phenol-d5	64	43 - 110
Terphenyl-d14	60	10 - 112
2,4,6-Tribromophenol	67	36 - 128

Analytical Data

Client: Solutia Inc.

Job Number: 680-45056-2
Sdg Number: KRS006

Client Sample ID: **SED-R2007-2-0209**

Lab Sample ID:	680-45056-8			Date Sampled:	02/26/2009 1240
Client Matrix:	Solid	% Moisture:	16.5	Date Received:	02/27/2009 1116

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 680-132487		Instrument ID:	GC/MS SemiVolatiles - T
Preparation:	3550B	Prep Batch: 680-131485		Lab File ID:	t5041.d
Dilution:	1.0			Initial Weight/Volume:	30.18 g
Date Analyzed:	03/10/2009 1649			Final Weight/Volume:	1 mL
Date Prepared:	03/01/2009 1436			Injection Volume:	1.0 uL

Analyte	DryWt Corrected: Y Result (ug/Kg)	Qualifier	MDL	RL
4-Chloroaniline	790	U	20	790
2-Chlorophenol	390	U	20	390
1,4-Dioxane	390	U	99	390
1,2,4-Trichlorobenzene	390	U	20	390

Surrogate	%Rec	Acceptance Limits
2-Fluorobiphenyl	52	44 - 110
2-Fluorophenol	57	41 - 110
Nitrobenzene-d5	51	36 - 110
Phenol-d5	54	43 - 110
Terphenyl-d14	53	10 - 112
2,4,6-Tribromophenol	66	36 - 128

General Chemistry

Client Sample ID: **SED-R2007-1-0209**

Lab Sample ID: 680-45056-2
Client Matrix: Solid

Date Sampled: 02/26/2009 0940
Date Received: 02/27/2009 1116

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	29		%	0.010	0.010	1.0	PercentMoisture
	Anly Batch: 680-131530		Date Analyzed	03/02/2009 1049			

Client Sample ID: **SED-R2007-3-0209**

Lab Sample ID: 680-45056-5
Client Matrix: Solid

Date Sampled: 02/26/2009 1130
Date Received: 02/27/2009 1116

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	18		%	0.010	0.010	1.0	PercentMoisture
	Anly Batch: 680-131530		Date Analyzed	03/02/2009 1049			

Client Sample ID: **SED-R2007-3-0209 DUP**

Lab Sample ID: 680-45056-6
Client Matrix: Solid

Date Sampled: 02/26/2009 1130
Date Received: 02/27/2009 1116

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	17		%	0.010	0.010	1.0	PercentMoisture
	Anly Batch: 680-131530		Date Analyzed	03/02/2009 1049			

Client Sample ID: **SED-R2007-2-0209**

Lab Sample ID: 680-45056-8
Client Matrix: Solid

Date Sampled: 02/26/2009 1240
Date Received: 02/27/2009 1116

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	16		%	0.010	0.010	1.0	PercentMoisture
	Anly Batch: 680-131530		Date Analyzed	03/02/2009 1049			

DATA REPORTING QUALIFIERS

Client: Solutia Inc.

Job Number: 680-45056-2
Sdg Number: KRS006

Lab Section	Qualifier	Description
GC/MS VOA		
	U	Indicates the analyte was analyzed for but not detected.
	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
GC/MS Semi VOA		
	U	Indicates the analyte was analyzed for but not detected.
	F	MS or MSD exceeds the control limits
	E	Result exceeded calibration range, secondary dilution required.
	F	RPD of the MS and MSD exceeds the control limits
	X	Surrogate exceeds the control limits

Appendix G
Microbial Insights Data Package

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Email: info@microbe.com

Client: Thomas Adams
URS Corp
1001 Highlands Plaza Dr. West
Suite 300
St. Louis, MO 63110

Phone: 314.429.0100

Fax: 314.429.0462

Identifier: 016GC **Date Rec:** 03/07/2009 **Report Date:** 04/20/2009

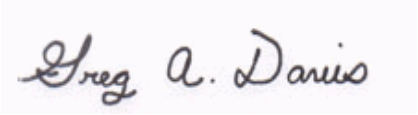
Client Project #: 21562154.00001 **Client Project Name:** Solutia WG Krummrich Long Term Monit

Purchase Order #:

Analysis Requested: PLFA, PLFA+SIP

Comments:

Reviewed By:



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PLFA

Client: **URS Corp**
Project: Solutia WG Krummrich Long Term Monitoring

MI Project Number: **016GC**
Date Received: 03/07/2009

Sample Information

Sample Name:	**CPAMW01D-0209**	**CPAMW02D-0209**	**CPAMW03D-0209**	**CPAMW03D-0209**	**CPAMW04D-0209**
Sample Date:	03/06/2009	03/06/2009	03/06/2009	03/06/2009	03/06/2009
Sample Matrix:	beads	beads	beads	beads	beads
Analyst:	MG	MG	MG	MG	MG

Biomass Concentrations

Total Biomass (cells/bead)	**1.19E+05**	**8.19E+04**	**9.33E+04**	**3.73E+05**	**9.50E+04**

Community Structure (% total PLFA)

Firmicutes (TerBrSats)	**1.62**	**1.99**	**5.60**	**7.26**	**1.38**
Proteobacteria (Monos)	**58.60**	**64.76**	**63.06**	**45.19**	**72.08**
Anaerobic metal reducers (BrMonos)	**0.51**	**0.15**	**0.84**	**0.00**	**0.00**
SRB/Actinomycetes (MidBrSats)	**0.86**	**0.00**	**2.45**	**0.53**	**0.31**
General (Nsats)	**36.26**	**27.29**	**23.16**	**11.32**	**22.04**
Eukaryotes (polyenoics)	**2.13**	**5.82**	**4.90**	**35.71**	**4.20**

Physiological Status (Proteobacteria only)

Slowed Growth	**0.20**	**0.11**	**0.47**	**0.14**	**0.18**
Decreased Permeability	**0.10**	**0.16**	**0.16**	**0.48**	**0.13**

Legend:
NA = Not Analyzed NS = Not Sampled

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PLFA

Client: **URS Corp**
Project: Solutia WG Krummrich Long Term Monitoring

MI Project Number: **016GC**
Date Received: 03/07/2009

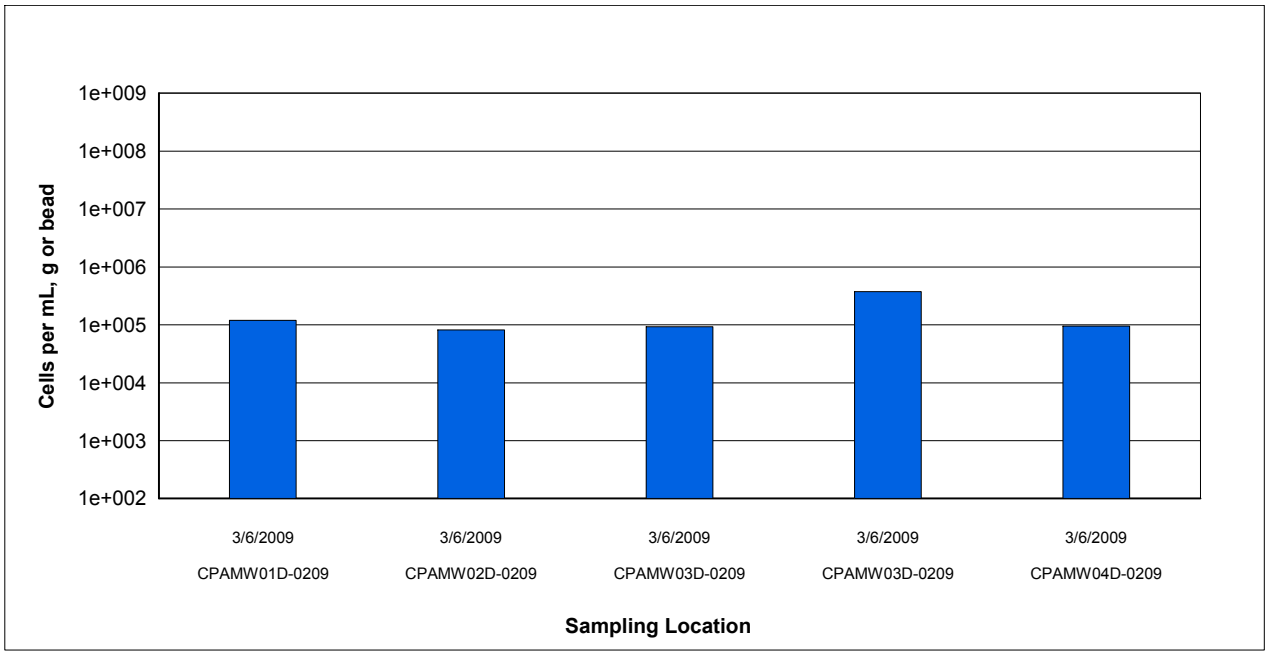

Figure 1. Biomass content is presented as a cell equivalent based on the total amount of phospholipid fatty acids (PLFA) extracted from a given sample. Total biomass is calculated based upon PLFA attributed to bacterial and eukaryotic biomass

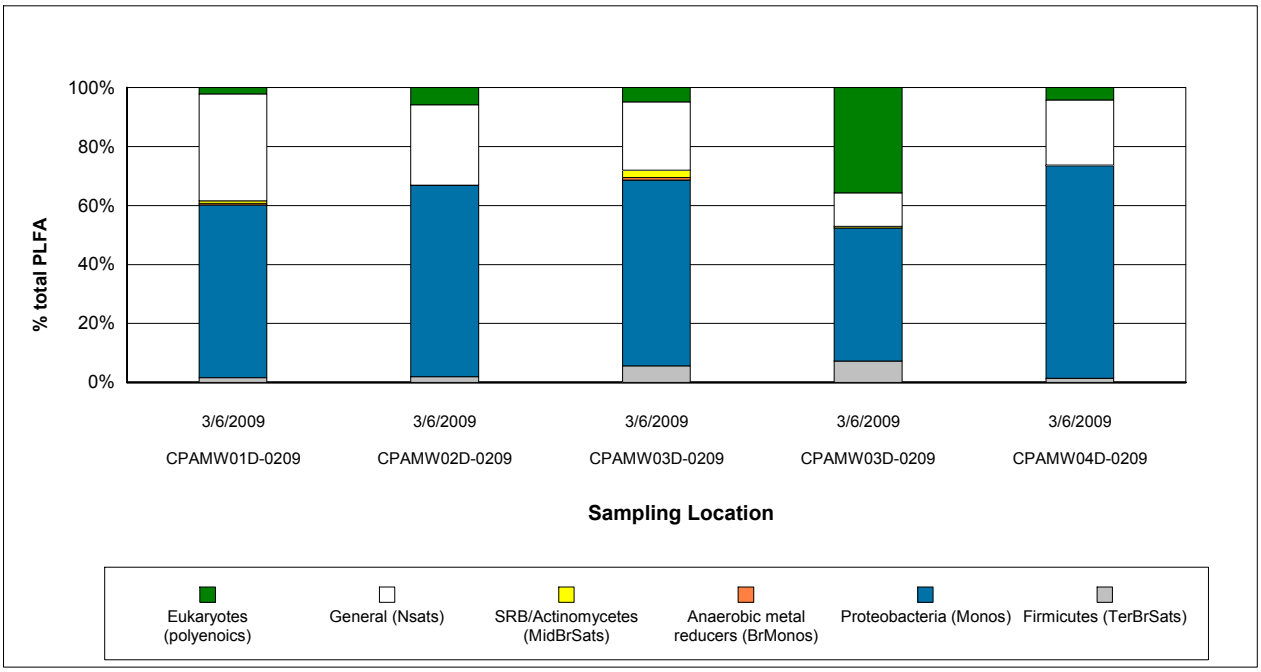

Figure 2. Relative percentages of total PLFA structural groups in the samples analyzed. Structural groups are assigned according to PLFA chemical structure, which is related to fatty acid biosynthesis.

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PLFA

Client: **URS Corp**
Project: Solutia WG Krummrich Long Term Monitoring

MI Project Number: **016GC**
Date Received: 03/07/2009

Sample Information

Sample Name:	**CPAMW05D-0209**	**BSAMW01S-0209**	**BSAMW02D-0209**	**BSAMW02D-0209**	**BSAMW03D-0209**
Sample Date:	03/06/2009	03/06/2009	03/06/2009	03/06/2009	03/06/2009
Sample Matrix:	beads	beads	beads	beads	beads
Analyst:	MG	MG	MG	MG	MG

Biomass Concentrations

Total Biomass (cells/bead)	**6.15E+04**	**8.18E+04**	**3.35E+04**	**8.08E+04**	**7.53E+04**

Community Structure (% total PLFA)

Firmicutes (TerBrSats)	**2.55**	**6.92**	**3.94**	**8.49**	**2.75**
Proteobacteria (Monos)	**62.99**	**55.62**	**63.08**	**68.29**	**63.22**
Anaerobic metal reducers (BrMonos)	**0.31**	**0.00**	**0.00**	**0.69**	**0.00**
SRB/Actinomycetes (MidBrSats)	**0.00**	**0.00**	**1.05**	**2.19**	**0.00**
General (Nsats)	**28.53**	**34.26**	**30.04**	**18.69**	**27.14**
Eukaryotes (polyenoics)	**5.62**	**3.17**	**1.91**	**1.64**	**6.90**

Physiological Status (Proteobacteria only)

Slowed Growth	**0.06**	**0.37**	**0.03**	**0.02**	**0.43**
Decreased Permeability	**0.13**	**0.59**	**0.12**	**0.10**	**0.16**

Legend:
NA = Not Analyzed NS = Not Sampled

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Project: Solutia WG Krummrich Long Term Monitoring

MI Project Number: **016GC**
Date Received: 03/07/2009

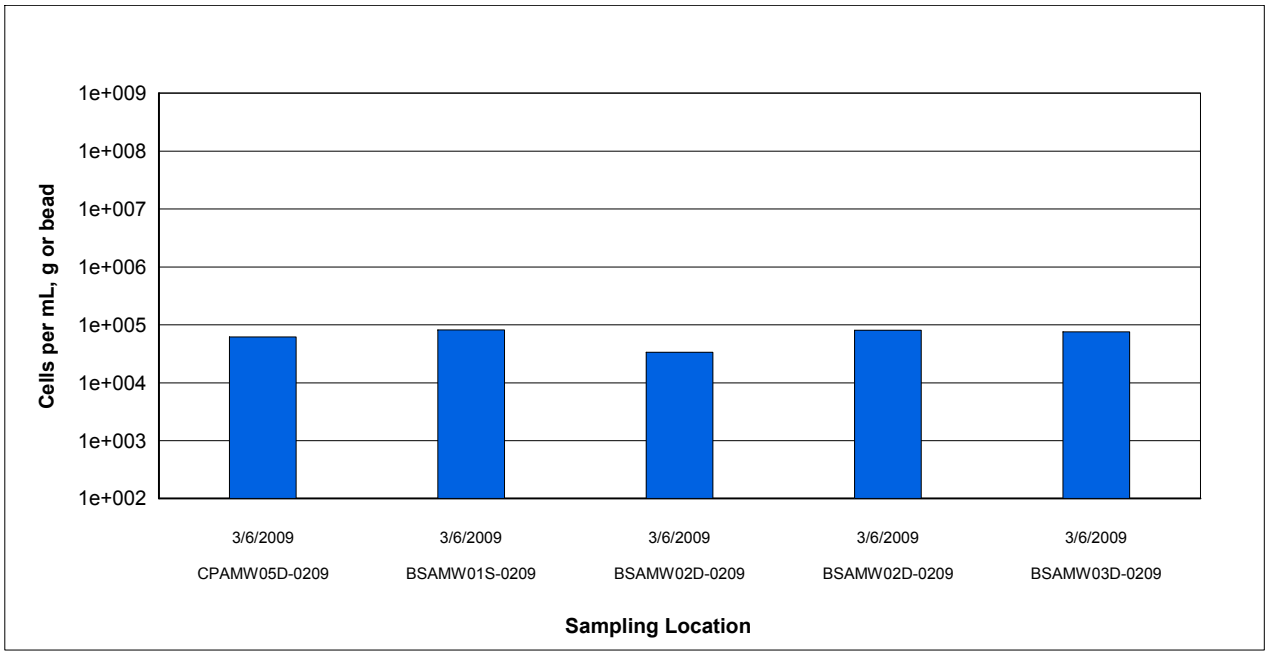

Figure 1. Biomass content is presented as a cell equivalent based on the total amount of phospholipid fatty acids (PLFA) extracted from a given sample. Total biomass is calculated based upon PLFA attributed to bacterial and eukaryotic biomass

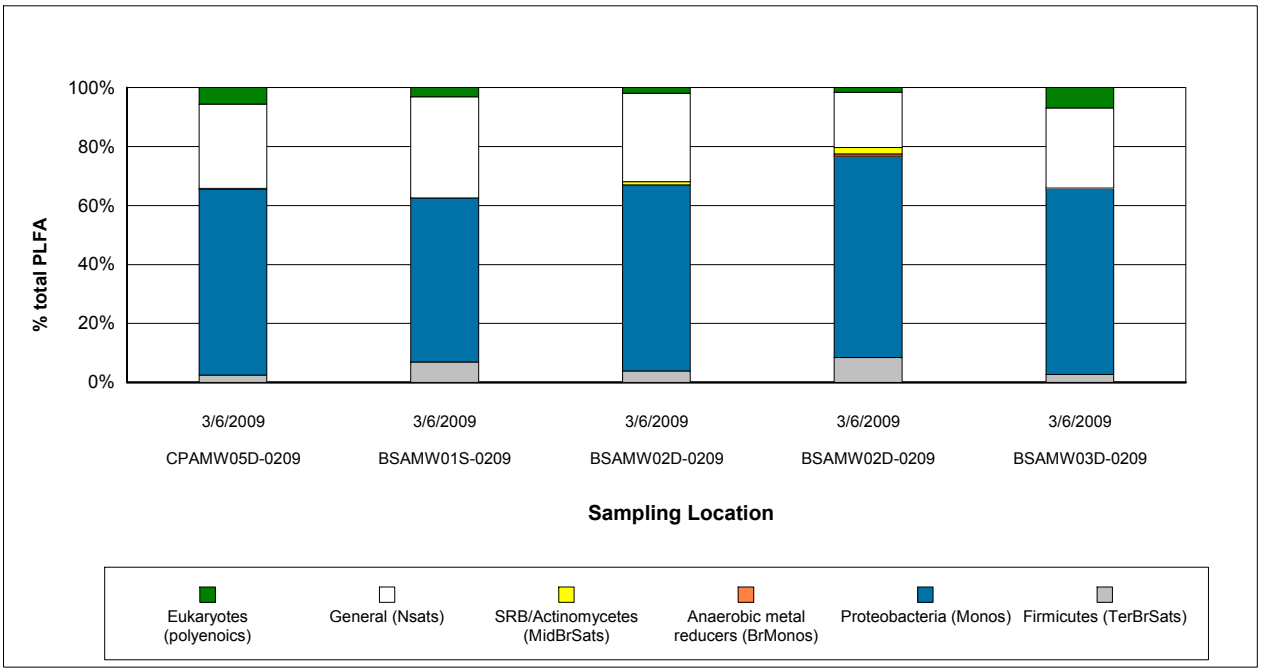

Figure 2. Relative percentages of total PLFA structural groups in the samples analyzed. Structural groups are assigned according to PLFA chemical structure, which is related to fatty acid biosynthesis.

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PLFA

Client: **URS Corp**
Project: Solutia WG Krummrich Long Term Monitoring

MI Project Number: **016GC**
Date Received: 03/07/2009

Sample Information

Sample Name:	**BSAMW04D-0209**	**BSAMW05D-0209**
Sample Date:	03/06/2009	03/06/2009
Sample Matrix:	beads	beads
Analyst:	MG	MG

Biomass Concentrations

Total Biomass (cells/bead)	**2.99E+04**	**4.26E+04**

Community Structure (% total PLFA)

Firmicutes (TerBrSats)	**0.00**	**0.00**
Proteobacteria (Monos)	**68.54**	**66.11**
Anaerobic metal reducers (BrMonos)	**0.00**	**0.00**
SRB/Actinomycetes (MidBrSats)	**0.00**	**0.00**
General (Nsats)	**28.24**	**29.37**
Eukaryotes (polyenoics)	**3.23**	**4.53**

Physiological Status (Proteobacteria only)

Slowed Growth	**0.20**	**0.09**
Decreased Permeability	**0.05**	**0.16**

Legend:
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Project: Solutia WG Krummrich Long Term Monitoring

MI Project Number: **016GC**
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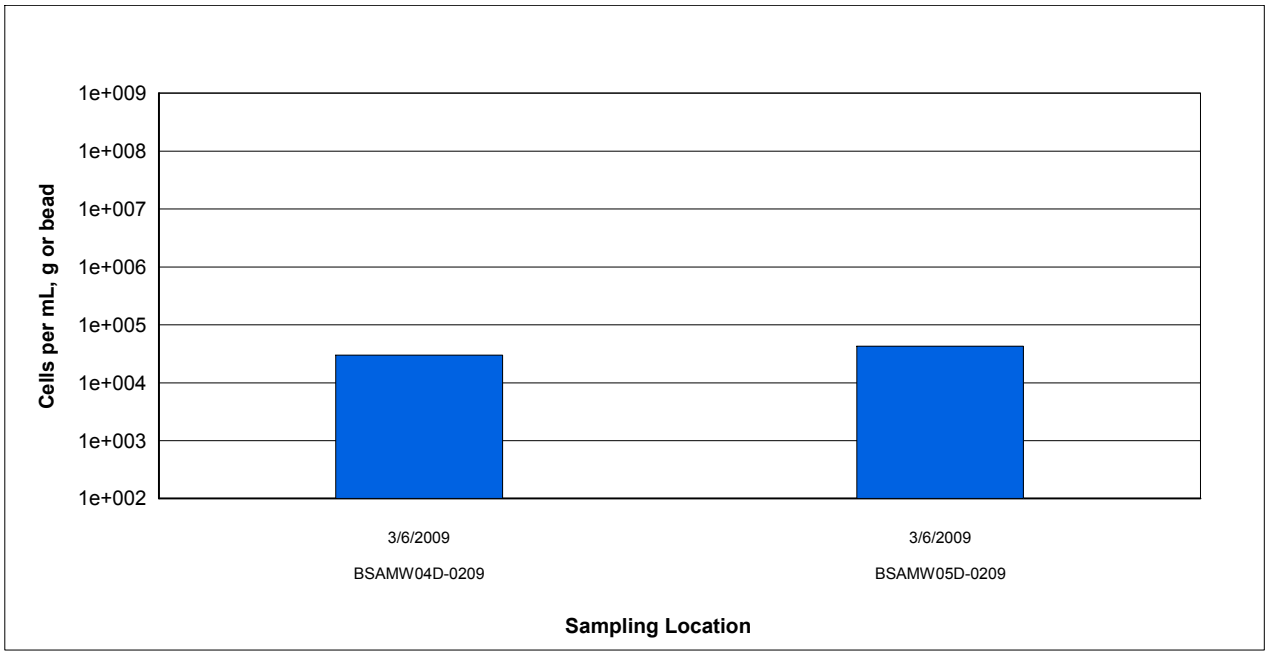

Figure 1. Biomass content is presented as a cell equivalent based on the total amount of phospholipid fatty acids (PLFA) extracted from a given sample. Total biomass is calculated based upon PLFA attributed to bacterial and eukaryotic biomass

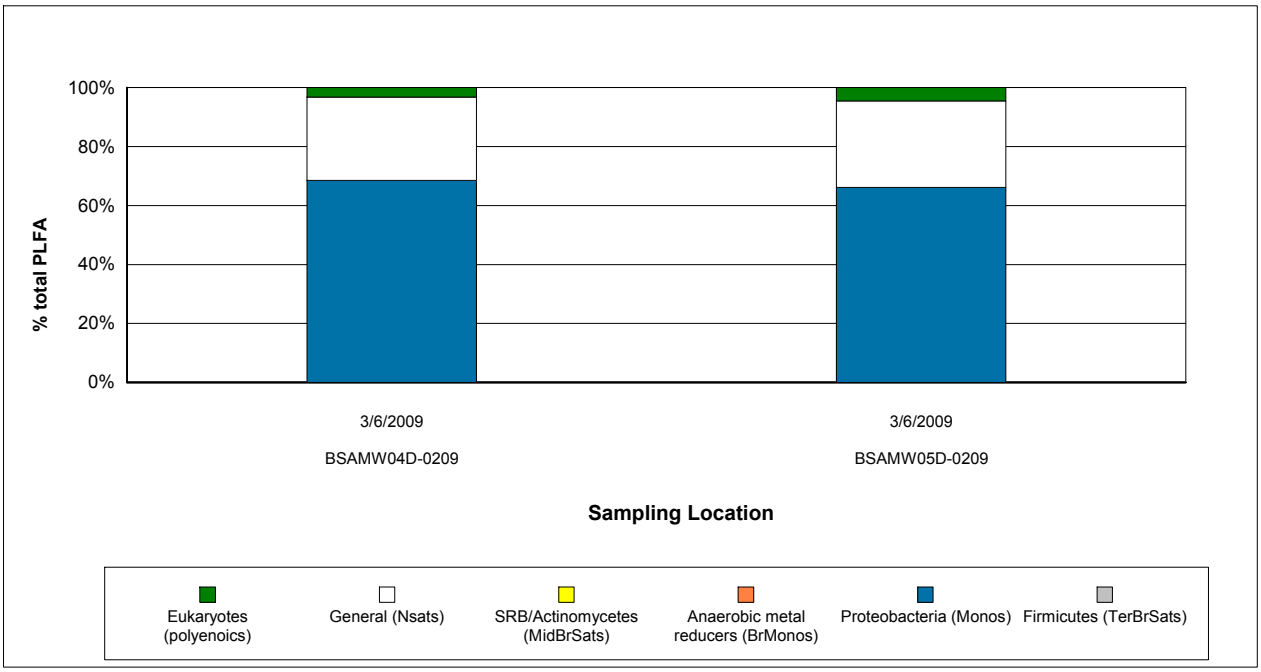

Figure 2. Relative percentages of total PLFA structural groups in the samples analyzed. Structural groups are assigned according to PLFA chemical structure, which is related to fatty acid biosynthesis.

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SITE LOGIC Report

Stable Isotope Probing (SIP) Study

Contact: Thomas Adams
Address: URS Corp – St. Louis MO
1001 Highlands Plaza Drive West
Suite 300
St. Louis, MO 63110

Phone: 314.429.0100

Email: thomas_adams@urscorp.com

MI Identifier: 016GC

Report Date: April 28, 2009

Project: Solutia WG Krummrich Long Term Monitoring

Comments:

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Executive Summary

Bio-Trap® samplers baited with ^{13}C chlorobenzene (CPAMW03D) or ^{13}C labeled benzene (BSAMW02D) were deployed in monitoring wells for 30 days and then recovered for analysis. A complete summary of the results is provided in Table 1.

- A moderate level (~10^5 cells/bead) of total biomass was detected in well CPAMW03 and a low level (~10^4 cells/bead) in BSAMW02.
- Quantification of the ^{13}C enriched biomass demonstrated a high level of utilization of benzene by the indigenous microbes in well BSAMW02.
- No incorporation of the ^{13}C into the biomass was seen in the chlorobenzene baited Bio-Trap in well CPAMW03.
- Quantification of ^{13}C dissolved inorganic carbon (DIC) demonstrated high levels of benzene mineralization in well BSAMW02. There was no mineralization of chlorobenzene in CPAMW03.
- Comparison of pre- and post-deployment ^{13}C labeled benzene in well BSAMW02 showed an 11% loss of the ^{13}C labeled benzene. There was a 62% loss of the ^{13}C labeled chlorobenzene in CPAMW03.

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Overview of Approach

Stable Isotope Probing (SIP)

Stable isotope probing (SIP) is an innovative method to track the environmental fate of a "labeled" contaminant of concern to unambiguously demonstrate biodegradation. Two stable carbon isotopes exist in nature – carbon 12 (^{12}C) which accounts for 99% of carbon and carbon 13 (^{13}C) which is considerably less abundant (~1%). With the SIP method, the Bio-Trap® sampler is baited with a specially synthesized form of the contaminant containing ^{13}C labeled carbon. Since ^{13}C is rare, the labeled compound can be readily differentiated from the contaminants present at the site. Following deployment, the Bio-Trap® is recovered and three approaches are used to conclusively demonstrate biodegradation of the contaminant of concern.

- The loss of the labeled compound provides an estimate of the degradation rate (% loss of ^{13}C).
- Quantification of ^{13}C enriched phospholipid fatty acids (PLFA) indicates incorporation into microbial biomass.
- Quantification of ^{13}C enriched dissolved inorganic carbon (DIC) indicates contaminant mineralization.

Phospholipid Fatty Acids (PLFA): PLFA are a primary component of the membrane of all living cells including bacteria. PLFA decomposes rapidly upon cell death (1, 2), so the total amount of PLFA present in a sample is indicative of the viable biomass. When combined with stable isotope probing (SIP), incorporation of ^{13}C into PLFA is a conclusive indicator of biodegradation.

Some organisms produce "signature" types of PLFA allowing quantification of important microbial functional groups (e.g. iron reducers, sulfate reducers, or fermenters). The relative proportions of the groups of PLFA provide a "fingerprint" of the microbial community. In addition, *Proteobacteria* modify specific PLFA during periods of slow growth or in response to environmental stress providing an index of their health and metabolic activity.

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Results

Table 1. Summary of the results obtained from MICRO, GEO, and COC samplers within Bio-Trap® Units. Interpretation guidelines and definitions are found later in the document.

Sample Name	CPAMW03D-0209-13C Chlorobenzene	BSAMW02D-0209-13C Benzene
^{13}C Contaminant Loss		
Chlorobenzene Pre-deployment (mg/bd)	0.34	-----
Chlorobenzene Post-deployment (mg/bd)	0.13	-----
Benzene Pre-deployment (mg/bd)	-----	1.34
Benzene Post-deployment (mg/bd)	-----	1.20
% Loss	62%	11%
First Order Rate Constant (1/days)	0.032	0.004
Half Life (days)	22	185
Biomass & ^{13}C Incorporation		
Total Biomass (Cells/bd)	3.73E+05	8.08E+04
^{13}C Enriched Biomass (Cells/bd)	1.57E+01	6.3E+02
% ^{13}C Incorporation	0.00%	0.78%
Average PLFA Del (‰)	47	2,330
Maximum PLFA Del (‰)	47	4,034
^{13}C Mineralization		
DIC Del (‰)	0	7,683
% 13C	1.10%	8.85%
Community Structure (% total PLFA)		
Firmicutes (TerBrSats)	7.3	8.5
Proteobacteria (Monos)	45.2	68.3
Anaerobic metal reducers (BrMonos)	0.0	0.7
Actinomycetes (MidBrSats)	0.5	2.2
General (Nsats)	11.3	18.7
Eukaryotes (Polyenoics)	35.7	1.6
Physiological Status (Proteobacteria only)		
Slowed Growth	0.14	0.02
Decreased Permeability	0.48	0.10

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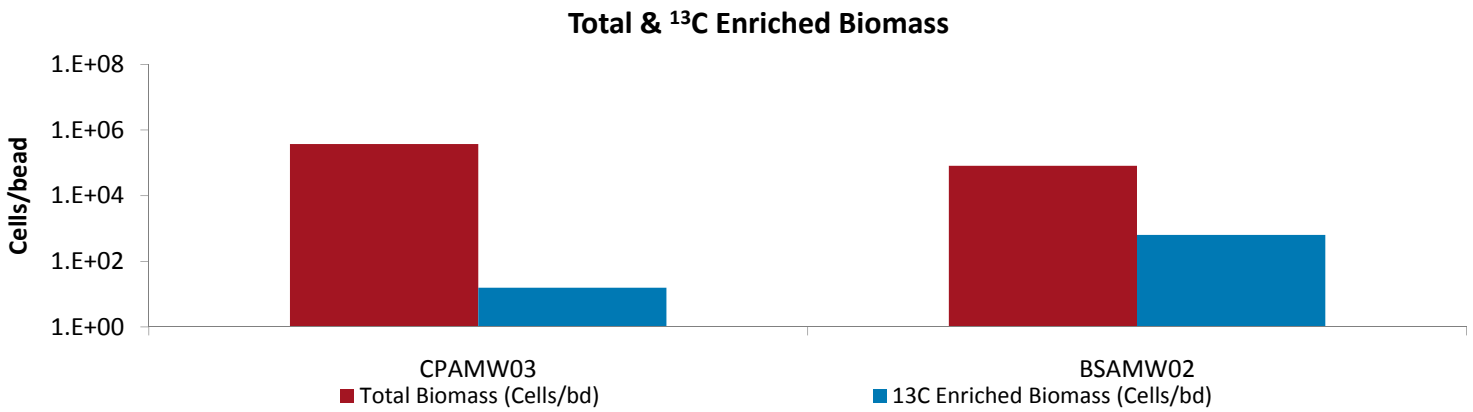

Figure 1. Biomass content is presented as a cell equivalent based on the total amount of phospholipid fatty acids (PLFA) extracted from a given sample. Total biomass is calculated based upon PLFA attributed to bacterial and eukaryotic biomass (associated with higher organisms).

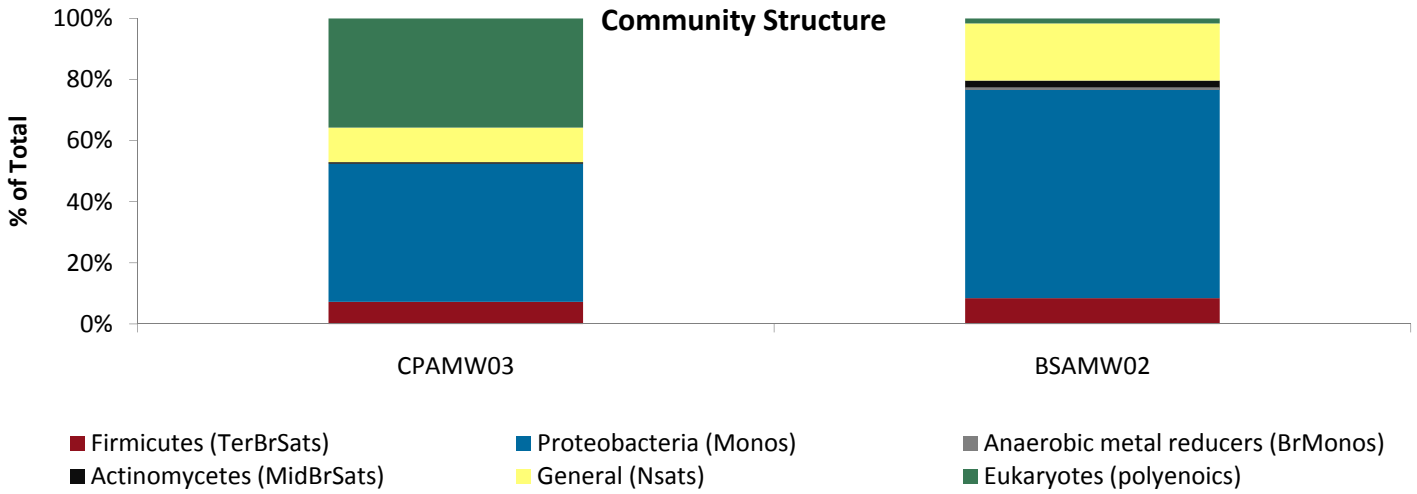

Figure 2. Relative percentages of total PLFA structural groups in the samples analyzed. Structural groups are assigned according to PLFA chemical structure, which is related to fatty acid biosynthesis. See the table in the interpretation section for detailed descriptions of the structural groups.

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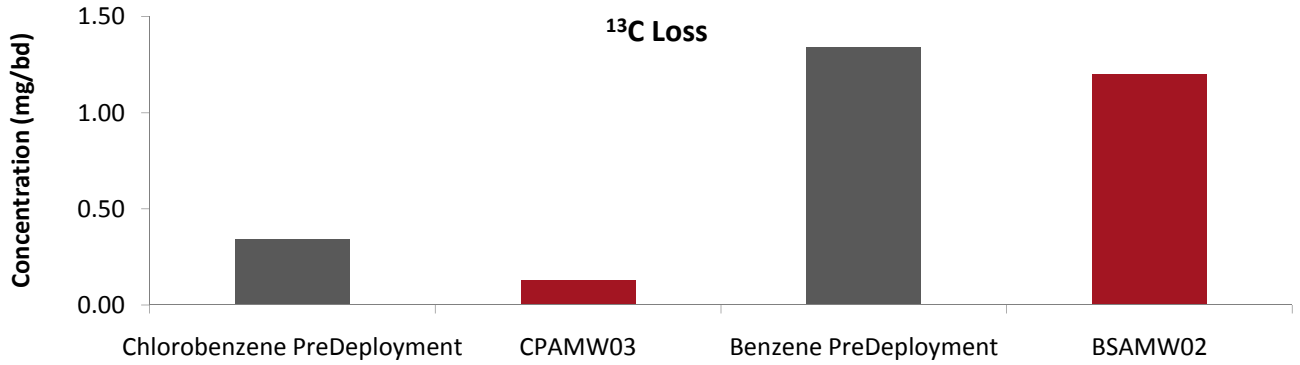

Figure 3. Comparison of Pre-deployment concentrations loaded on Bio-Sep beads to the concentrations detected after incubation.

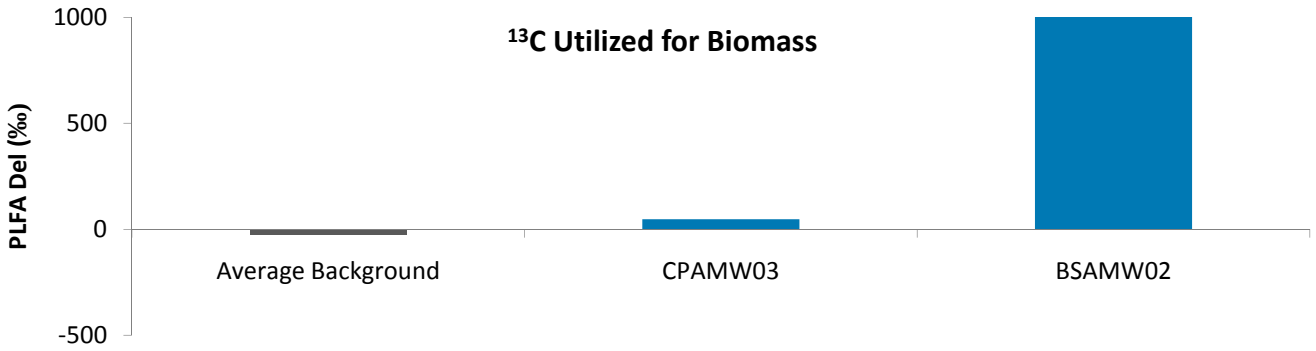

Figure 4. Comparison of the average Del value obtained from PLFA biomarkers from each Bio-Trap® unit to the average background Del observed in samples not exposed to ^{13}C enriched compounds.

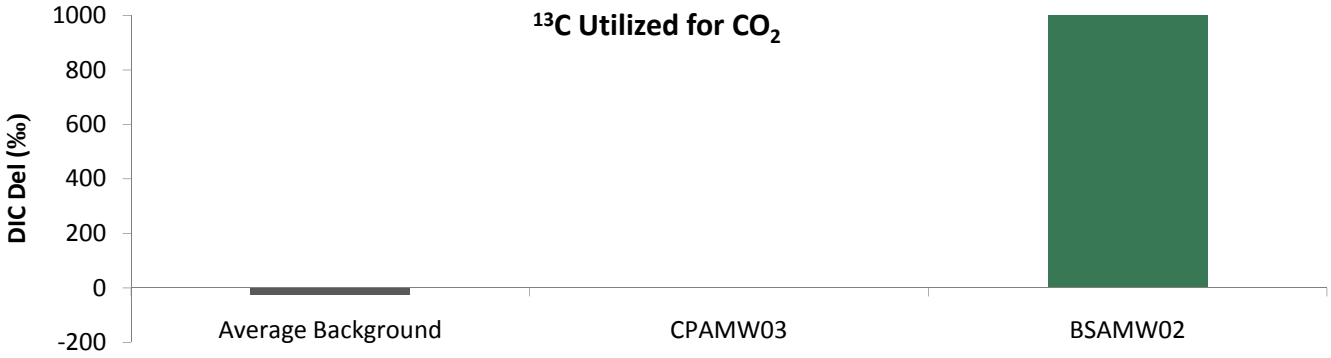

Figure 5. Comparison of the Del value obtained from DIC from each Bio-Trap® unit to the average background Del observed in samples not exposed to ^{13}C enriched compounds.

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Interpretation

Interpretation of the results of the SIP Bio-Trap® study must be performed with due consideration of site conditions, site activities, and the desired treatment mechanism. The following discussion describes interpretation of results in general terms and is meant to serve as a guide.

Contaminant Concentration: Bio-Traps® are baited with a ^{13}C labeled contaminant of concern and a pre-deployment concentration is determined prior to shipping. Following deployment, Bio-Traps® are recovered for analysis including measurement of the concentration of the ^{13}C labeled contaminant remaining. Pre- and post-deployment concentrations are used to calculate percent loss, to estimate the first order degradation rate constant (k), and to estimate the contaminant half life (Results Summary Table). For a description of how the first order rate constant is calculated, please see the glossary at the end of the report. The first order rate constant can be used to compare different wells or treatments depending on the design of the study. A higher value is indicative of a greater biodegradation rate.

Alternatively, the contaminant half life can be used to make the same types of comparisons between wells and treatments. By definition, half life is the amount of time required for the contaminant concentration to equal half of the initial concentration (see glossary for calculation).

Biomass Concentrations: PLFA analysis is one of the most reliable and accurate methods available for the determination of viable (live) biomass. Phospholipids break down rapidly upon cell death, so biomass calculations based on PLFA content do not include "fossil" lipids from dead cells. Total biomass (cells/bead) is calculated from total PLFA using a conversion factor of 20,000 cells/pmole of PLFA. When making comparisons between wells, treatments, or over time, differences of one order of magnitude or more are considered significant.

Total Biomass		
Low	**Moderate**	**High**
10^3 to 10^4 cells	10^5 to 10^6 cells	10^7 to 10^8 cells

For SIP studies, the ^{13}C enriched PLFA is also determined to conclusively demonstrate contaminant biodegradation and quantify incorporation into biomass as a result of the ^{13}C being used for cellular growth. The % ^{13}C incorporation (^{13}C enriched biomass/total biomass) is also provided in the data summary table, but the value must be interpreted carefully especially when comparing wells or treatments. Typically, biodegradation of a contaminant of concern is performed by a small subset of the total microbial community. For Bio-Traps® with large total biomass, the % ^{13}C incorporation value could be low despite significant ^{13}C labeled biomass and loss of the compound. The % ^{13}C incorporation should be viewed in light of total biomass, percent loss, and dissolved inorganic carbon (DIC) results.

^{13}C enrichment data is often reported as a del value. The del value is the difference between the isotopic ratio ($^{13}C/^{12}C$) of the sample (R_x) and a standard (R_{std}) normalized to the isotopic ratio of the standard (R_{std}) and multiplied by 1,000 (units are parts per thousand, denoted ‰).

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R_{std} is the naturally occurring isotopic ratio and is approximately 0.011180 (roughly 1% of naturally occurring carbon is ^{13}C). The isotopic ratio, R_x, of PLFA is typically less than the R_{std} under natural conditions, resulting in a del value between -20 and -30‰. For a SIP Bio-Trap® study, biodegradation and incorporation of the ^{13}C labeled compound into PLFA results in a larger $^{13}C/^{12}C$ ratio (R_x) and thus del values greater than under natural conditions. Typical PLFA del values are provided below.

PLFA Del (‰)		
Low	**Moderate**	**High**
0 to 100	100 to 1,000	>1,000

Dissolved Inorganic Carbon (DIC): Often, bacteria can utilize the ^{13}C labeled compound as both a carbon and energy source. The ^{13}C portion used as a carbon source for growth can be incorporated into PLFA as discussed above, while the ^{13}C used for energy is oxidized to $^{13}CO_2$ (mineralized).

^{13}C enriched CO_2 data is often reported as a del value as described above for PLFA. Under natural conditions, the R_x of CO_2 is approximately the same as R_{std} (0.01118 or about 1.1% ^{13}C). For an SIP Bio-Trap® study, mineralization of the ^{13}C labeled contaminant of concern would lead to a greater value of R_x (increased $^{13}CO_2$ production) and thus a positive del value. As with PLFA, del values between 0 and 100‰ are considered low, values between 100 and 1,000‰ are considered moderate, and values greater than 1,000‰ are considered high. Thus DIC %^{13}C are considered low if the value is less than 1.23%, moderate if between 1.23 and 2.24%, and high if greater than 2.24%.

Dissolved Inorganic Carbon (DIC) Del and % ^{13}C		
Low	**Moderate**	**High**
0 to 100	100 to 1,000	>1,000
1.11 to 1.23%	1.23 to 2.24 %	>2.24 %

Community Structure (% total PLFA): Community structure data is presented as a percentage of PLFA structural groups normalized to the total PLFA biomass. The relative proportions of the PLFA structural groups provide a "fingerprint" of the types of microbial groups (e.g. anaerobes, sulfate reducers, etc.) present and therefore offer insight into the dominant metabolic processes occurring at the sample location. Thorough interpretation of the PLFA structural groups depends in part on an understanding of site conditions and the desired microbial biodegradation pathways. For example, an increase in mid chain branched saturated PLFA (MidBrSats), indicative of sulfate reducing bacteria (SRB) and *Actinomycetes*, may be desirable at a site where anaerobic BTEX biodegradation is the treatment mechanism, but would not be desirable for a corrective action promoting aerobic BTEX or MTBE biodegradation. The following table provides a brief summary of each PLFA structural group and its potential relevance to bioremediation.

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Table 2. Description of PLFA structural groups.

PLFA Structural Group	General classification	Potential Relevance to Bioremediation Studies
Monoenoic (Monos)	Abundant in Proteobacteria (Gram negative bacteria), typically fast growing, utilize many carbon sources, and adapt quickly to a variety of environments.	Proteobacteria is one of the largest groups of bacteria and represents a wide variety of both aerobes and anaerobes. The majority of Hydrocarbon utilizing bacteria fall within the Proteobacteria
Terminally Branched Saturated (TerBrSats)	Characteristic of Firmicutes (Low G+C Gram-positive bacteria), and also found in Bacteriodes, and some Gram-negative bacteria (especially anaerobes).	Firmicutes are indicative of presence of anaerobic fermenting bacteria (mainly *Clostridia/Bacteriodes*-like), which produce the H_2 necessary for reductive dechlorination
Branched Monoenoic (BrMonos)	Found in the cell membranes of micro-aerophiles and anaerobes, such as sulfate- or iron-reducing bacteria	In contaminated environments high proportions are often associated with anaerobic sulfate and iron reducing bacteria
Mid-Chain Branched Saturated (MidBrSats)	Common in sulfate reducing bacteria and also Actinobacteria (High G+C Gram-positive bacteria).	In contaminated environments high proportions are often associated with anaerobic sulfate and iron reducing bacteria
Normal Saturated (Nsats)	Found in all organisms.	High proportions often indicate less diverse populations.
Polyenoic	Found in eukaryotes such as fungi, protozoa, algae, higher plants, and animals.	Eukaryotic scavengers will often rise up and prey on contaminant utilizing bacteria

Physiological Status (*Proteobacteria*): Some *Proteobacteria* modify specific PLFA as a strategy to adapt to stressful environmental conditions (3, 4). For example, *cis* monounsaturated fatty acids may be modified to cyclopropyl fatty acids during periods of slowed growth or modified to *trans* monounsaturated fatty acids to decrease membrane permeability in response to environmental stress. The ratio of product to substrate fatty acid thus provides an index of their health and metabolic activity. In general, status ratios greater than 0.25 indicate a response to unfavorable environmental conditions.

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Glossary

Del: A Del value is the difference between the isotopic ratio ($^{13}C/^{12}C$) of the sample (R_x) and a standard (R_{std}) normalized to the isotopic ratio of the standard (R_{std}) and multiplied by 1,000 (units are parts per thousand denoted ‰).

$$Del = (R_x - R_{std})/R_{std} \times 1000$$

First Order Rate Constant: The first order rate is expression is $C=C_o e^{-kt}$ where C is the post-deployment concentration (mg/bead), C_o is the pre-deployment concentration (mg/bead), k is the first order rate constant (1/days), and t is the deployment time (days). Upon rearrangement and using pre-and post-deployment concentrations, $k=-\ln(C/C_o)/t$.

Half Life: Half life is the amount of time required for the contaminant concentration to equal half of the initial concentration and is expressed as $C=C_o/2$. Substituting into the rate expression and solving for half life ($t_{1/2}$), $t_{1/2} = \ln(0.5)/-k$. As opposed to the rate constant, a higher half life ($t_{1/2}$) indicates a lower degradation rate.

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Sample Information											CENSUS: Please select the target organism/gene																							
MI ID (Laboratory Use Only)	Sample Name	Date Sampled	Time Sampled	Matrix	PLFA	VFA	MGE				qDHC (dehalococcoides)	qDHC Functional (genes)	qDHB (Dehalobacter)	qDSM (desulfitobacterium)	qDSB (Desulfitobacterium)	qFRAM (Toluene)	qDSR (SRBs only)	qSRB (SRB)	qMGN (methanogens)	qMOB (methanotrophs)	qDNF (denitrifying)	qAOB (ammonia oxidizing)	qPMI (MTBE aerobic)	qTOD (Intra PAHs aerobic)	qCAT (intermediate PAHs aerobic)	qBSS (Toluene/Xylene Anaerobic)	qNAH (Naphthalene aerobic)	add qPCR	add qPCR	add qPCR	RNA (Expression Option)*	Other: Benzene SIP	Other: Chlorobenzene SIP	Other:	Other:
016GC 7	BSAMW01S-0209	3/6/09	1320	water	X																													
8, 9	BSAMW02D-0209		1235		X																											X		
10	BSAMW03D-0209		1220		X																													
11	BSAMW04D-0209		1120		X																													
12	BSAMW05D-0209	1155	~~1126~~		X																													
1	CPAMW01D-0209		1340		X																													
2	CPAMW02D-0209		1330		X																													
3, 4	CPAMW03D-0209		1245		X																												X	
5	CPAMW04D-0209		1145		X																													
6	CPAMW05D-0209	↓	1205	↓	X																													

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