Solutia Inc.
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July 15, 2016

Ms. Carolyn Bury - LU-9J
U.S. EPA Region 5
Corrective Action Section
77 West Jackson Boulevard
Chicago, IL 60604-3507

Re: Long-Term Monitoring Program
2nd Quarter 2016 Data Report
Solutia Inc., W. G. Krummrich Plant, Sauget, IL

Dear Ms. Bury:

Enclosed please find the Long-Term Monitoring Program 2nd Quarter 2016 Data Report for Solutia Inc.'s W. G. Krummrich Plant, Sauget, IL. Results from sampling of supplemental piezometers GWE-1D, 2D, and 3D and supplemental wells GWE-5D, ESL-MW-A and D1, and PM1D are also included in this report.

Per EPA's February 9, 2016, response to Solutia's December 23, 2015, submittal:

- sampling of supplemental piezometers GWE-5S and 5M and supplemental wells ESL-MW-C1and PM1M has been discontinued; and
- the sampling frequency for supplemental piezometer GWE-1D and supplemental well ESL-MW-A has been reduced to the first and third quarters.

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

Sincerely,

Gerald M. Rinaldi
Manager, Remediation Services

Enclosure

cc: Distribution List

DISTRIBUTION LIST

Long-Term Monitoring Program
2nd Quarter 2016 Data Report
Solutia Inc., W. G. Krummrich Plant, Sauget, IL

USEPA

Stephanie Linebaugh
USEPA Region 5 - SR6J, 77 West Jackson Boulevard, Chicago, IL 60604

Solutia

Donn Haines 500 Monsanto Avenue, Sauget, IL 62206-1198

GSI Environmental (CD only)

Chuck Newell 2211 Norfolk Street, Suite 1000, Houston, TX 77098-4044

GROUNDWATER MONITORING REPORT

GROUNDWATER MONITORING REPORT

2nd QUARTER 2016 DATA REPORT
LONG-TERM MONITORING PROGRAM
SOLUTIA INC., W.G. KRUMMRICH FACILITY
SAUGET, ILLINOIS

Prepared For: Solutia Inc.
575 Maryville Centre Drive
St. Louis, MO 63141 USA

Submitted By: Golder Associates Inc.
820 S. Main Street, Suite 100
St. Charles, MO 63301 USA

July 2016 **140-3345**

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Golder Associates

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Appendix E Microbial Insights Data Package

1.0 INTRODUCTION

Golder Associates Inc. (Golder) is pleased to submit this report summarizing the 2nd Quarter 2016 (2Q16) Long-Term Monitoring Program (LTMP) groundwater sampling activities at the Solutia Inc. (Solutia) W.G. Krummrich (WGK) facility (Site) in Sauget, Illinois. The facility is located at 500 Monsanto Avenue, Sauget, Illinois as shown on Figure 1.

The 2Q16 sampling event was performed in general accordance with the Revised LTMP Work Plan (Work Plan) (Solutia 2009). Work conducted during the LTMP is designed to evaluate the effectiveness of monitored natural attenuation (MNA). The effectiveness of MNA at the Site, is shown by the following:

- A clear and meaningful trend of decreasing contaminant mass
- Data that indirectly demonstrate the types and rates of natural attenuation process active at the Site
- Data that directly demonstrate the occurrence of biodegradation processes at the Site

The Work Plan addresses quarterly sampling requirements from the United States Environmental Protection Agency's (USEPA) February 26, 2008, Final Decision (USEPA, 2008). According to the Work Plan, ten (10) groundwater samples are to be collected from monitoring wells from two (2) source areas, former Benzene Storage Area and former Chlorobenzene Process Area; four (4) monitoring wells located downgradient of the former Benzene Storage Area; and four (4) monitoring wells located downgradient of the former Chlorobenzene Process Area. Monitoring wells are located in the Shallow Hydrogeologic Unit (SHU), Middle Hydrogeologic Unit (MHU) and Deep Hydrogeologic Unit (DHU). One (1) monitoring well is screened in the SHU at the former Benzene Storage Area. The remaining nine (9) wells are screened in the MHU and DHU. Analytical data from these wells are used to evaluate the attenuation processes in the America Bottoms aquifer, as impacted groundwater from these source areas migrates toward and discharges to the Mississippi River.

In addition to the monitoring wells specified in the Work Plan, the USEPA has also requested that groundwater samples be collected from additional monitoring wells and piezometers (supplemental wells) approximately 1.0 to 1.5 miles north of the Site. In response to Solutia's December 23, 2015, request, on February 9, 2016, the USEPA reduced the number of supplemental wells from eleven (11) to seven (7) for the first and third quarter sampling events and to five (5) for the second and fourth quarter sampling events.

The scope of work detailed in the Work Plan is summarized below.

Fifteen (15) monitoring wells and piezometers are sampled during the 2Q16 LTMP event. The locations of the monitoring wells, piezometers and source areas are shown on Figure 2 and the sample locations are included on the table below.

Area	Location Relative to Area	Sample Identification
Former Benzene Storage	Source Area Well	BSA-MW-1S
	Downgradient	BSA-MW-2D
		BSA-MW-3D
		BSA-MW-4D
		BSA-MW-5D
Former Chlorobenzene Process	Source Area Well	CPA-MW-1D
	Downgradient	CPA-MW-2D
		CPA-MW-3D
		CPA-MW-4D
		CPA-MW-5D
Supplemental Wells North of the Site	---	ESL-MW-D1
		GWE-2D
		GWE-3D
		GWE-5D
		PM1D

Water levels in the monitoring wells and piezometers are measured quarterly and total depths are measured in the 1st quarter of each year.

During the quarterly sampling events, monitoring wells and piezometers are sampled for the following volatile organic compound (VOC) analytes: benzene; chlorobenzene; 1,2-dichlorobenzene; 1,3-dichlorobenzene; and 1,4-dichlorobenzene. During the 1st and 3rd quarters, monitoring wells and piezometers are sampled for the following semi-volatile organic compound (SVOC) analytes: 4-chloroaniline (CPA-MW-3D, CPA-MW-4D and CPA-MW-5D); 2-chlorophenol (BSA and CPA wells); 1,2,4-trichlorobenzene (BSA and CPA wells); and 1,4-dioxane (BSA-MW-2D, BSA-MW-3D, BSA-MW-4D, and BSA-MW-5D). The following MNA parameters are sampled quarterly to evaluate active natural attenuation occurring at the Site:

- Electron Donors – total and dissolved organic carbon
- Electron Acceptors – iron, manganese, nitrate, sulfate
- Biodegradation Byproducts – carbon dioxide, chloride, methane
- Biodegradation Indicators – alkalinity

Microbial Insights BioTrap® samplers for Phospholipid Fatty Acid (PLFA) analysis and Stable Isotope Probes (SIPs) baited with benzene or chlorobenzene are deployed quarterly to demonstrate the occurrence of biodegradation occurring at the Site.

2.0 FIELD ACTIVITIES

Golder conducted 2Q16 sampling events between May 2 and May 4, 2016. Activities were performed in general accordance with the Work Plan.

2.1 Water Level Measurement

Prior to sampling during the 2Q16 event, Golder performed a synoptic round of water level measurements at 77 monitoring wells and piezometers on April 28 and April 29, 2016. The following monitoring well and piezometer series are included in the LTMP:

- BSA-series
- CPA-series
- ESL-series
- GM-series
- GWE-series
- K-series
- PS-MW-series
- PMA-series
- PM-series
- Piezometer clusters installed for Sauget Area 2 RI/FS and WGK CA-750 Environmental Indicator projects

An oil/water interface probe was used to measure the water level (to 0.01 feet) and, if present, detect and measure the thickness of non-aqueous phase liquid (NAPL). During the 2Q16 sampling event, NAPL was not detected in monitoring wells or piezometers. Total depths are measured during the 1st quarter of each year. The 2Q16 well gauging information is shown on Table 1. The information collected from the MHU and the DHU was used to create a groundwater potentiometric surface map, as shown on Figure 3.

2.2 Groundwater Sample Collection

Monitoring wells and piezometers sampled during the 2Q16 LTMP event were purged and sampled using low-flow sampling techniques, low-density polyethylene tubing (LDPE) and a submersible or peristaltic pump (GWE-1D, GWE-2D and GWE-3D). The pump intake was placed at approximately the middle of the screened interval for each well. Purging was conducted at a rate of approximately 300 mL/min to reduce drawdown. Drawdown was measured throughout purging activities to ensure that it did not exceed 25% of the distance between the pump intake and the top of the screen. Measurement of field parameters began once the flow rate and drawdown were stable. Parameters were measured for each system volume purged using a SmartTROLL™ multi-parameter meter. The system volume includes the volume of the tubing, the volume of the pump and the volume of flow-through cell containing the multi-parameter meter. Samples

were collected after field parameters were stabilized within the ranges below for three (3) consecutive measurements:

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

The flow rate was adjusted as needed to maintain approximately 300 mL/min during sampling activities. To reduce possible sample cross contamination, the flow-through cell was bypassed and gloves were replaced prior to sampling.

Sample bottles were provided by TestAmerica Laboratories, Inc. (TestAmerica) for the following analyses:

- VOCs – USEPA SW-846 Method 8260B
- SVOCs were analyzed using USEPA SW-846 Method 8270D Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)
- MNA parameters – alkalinity and carbon dioxide (USEPA Method 310.1), chloride (USEPA Method 352.5), total and dissolved iron and total and dissolved manganese (USEPA SW-846 Method 6010C), methane, ethane and ethylene (RSK-175), nitrate (USEPA Method 353.2), sulfate (USEPA Method 375.4), and total and dissolved organic carbon (USEPA Method 415.1)

VOC and SVOC sample bottles were filled first followed by gas sensitive parameters and general chemistry parameters. Ferrous iron was field analyzed with a HACH 890 Colorimeter and HACH AccuVac® ampules. Samples collected for ferrous iron and dissolved analyses were field filtered using an in-line 0.2 micron disposable filter. Groundwater purging and sampling forms are included in Appendix A.

2.3 Quality Assurance and Sample Handling

Two (2) analytical duplicates (AD), two (2) equipment blanks (EB) and one (1) matrix spike/matrix spike duplicate (MS/MSD) pairs were collected during the 2Q16 LTMP sampling event. Laboratory provided trip blanks were included in each cooler containing samples for VOC analysis, for a total of three (3) trip blanks. Sample bottles were labeled with the date and time of sample collection, sampler initials, analysis requested, preservative used, and sample identification based on the following nomenclature “AAA-MW#-MMYY-QA/QC” or “BBBB-MMYY-QA/QC” where:

- **“AAA”** denotes “Benzene Storage Area (BSA)”, “Chlorobenzene Process Area (CPA)”, “East St. Louis (ESL)”, or “Groundwater Elevation (GWE)” and **“MW#”** denotes “Monitoring Well Number”
- **“BBBB”** denotes PM1M or PM1D for monitoring wells installed in January 2015
- **“MMYY”** denotes month and year of sampling quarter, e.g.: May (2nd quarter), 2016 (0516)
- **“QA/QC”** denotes QA/QC sample
  - **AD** – Analytical Duplicate
  - **EB** – Equipment Blank

- **MS or MSD** – Matrix Spike or Matrix Spike Duplicate

Samples that were field filtered with an in-line 0.2 micron filter include “F(0.2)” prior to the “MMYY” portion of the sample identification. Sample information was recorded on a chain-of-custody (COC) that included project identification, sample identification, date and time of sample collection, analysis requested, preservative used, sample matrix and type, number of sample containers, sampler signature, and date COC was completed. Copies of the COCs are included in Appendix B.

Directly after sampling, sample bottles were placed in an iced cooler to maintain a sample temperature of approximately 4°C. Prior to sample shipment, samples and ice were placed inside two (2) contractor trash bags. The bags were tied and the cooler was sealed between the lid and sides with a signed and dated custody seal. Samples were shipped overnight via FedEx to the TestAmerica facility in Savannah, Georgia.

2.4 Biodegradation Sampling

Bio-Trap® and SIP results are evaluated to provide biodegradation potential information in the SHU, the MHU and the DHU. Bio-Trap® samplers and SIPs are passive sampling tools that collect microbes across the samplers membrane that is, after time, analyzed. SIPs are baited with a specially synthesized form of the contaminant (i.e., benzene, chlorobenzene) in order to measure the degradation of a specific contaminant.

Bio-Trap® samplers and Stable Isotope Probing samplers (SIPs), provided by Microbial Insights, Inc. in Rockford, Tennessee, were deployed on March 30, 2016 in monitoring wells downgradient of the former Chlorobenzene Process Area (CPA-MW-1D through CPA-MW-5D) and downgradient of the former Benzene Storage Area (BSA-MW-1S and BSA-MW-2D through BSA-MW-5D) for PLFA analysis. A benzene SIP was deployed in monitoring well BSA-MW-2D and a chlorobenzene SIP was deployed in monitoring well CPA-MW-3D. Bio-Trap® samplers and SIPs were weighted and fastened to a stainless steel cable. The cable was secured to the well cap and the Bio-Trap® or SIP was lowered into the well and placed in the middle of the well screen.

On April 28, 2016, Bio-Trap® samplers and SIPs were collected from the wells, placed in laboratory provided bags, labeled with appropriate well identification, placed in a cooler with ice, properly sealed, and shipped overnight to the Microbial Insights, Inc. facility in Rockford, Tennessee for analysis.

2.5 Decontamination and Investigation Derived Waste

Sampling equipment was decontaminated prior to mobilizing to the Site, between sample locations and prior to demobilizing from the Site. Non-dedicated sampling equipment was decontaminated between samples with a non-phosphatic detergent solution and a deionized water rinse.

Investigation derived waste (IDW) was placed in 55-gallon drums, labeled with the generation date and staged for disposal by Solutia. IDW such as gloves and other disposable sampling equipment was bagged for disposal by Solutia.

3.0 QUALITY ASSURANCE

Sample results were provided by TestAmerica in electronic format and reviewed for quality and completeness by Golder in accordance with the Work Plan. Results were submitted in three (3) sample delivery groups (SDGs) as follows:

Sample Delivery Group (SDG)	Sample Identification
KPS166	PM1D-0516
	GWE-2D-0516
	ESL-MW-D1-0516
	GWE-3D-0516
	2Q16 LTM Trip Blank #1
KPS167	GWE-5D-0516
	CPA-MW-5D-0516
	BSA-MW-5D-0516
	CPA-MW-4D-0516
	BSA-MW-4D-0516
	BSA-MW-3D-0516
	BSA-MW-3D-0516-EB
	2Q16 LTM Trip Blank #2
KPS168	CPA-MW-3D-0516
	CPA-MW-3D-0516-AD
	BSA-MW-2D-0516
	CPA-MW-1D-0516
	CPA-MW-2D-0516
	CPA-MW-2D-0516-AD
	BSA-MW-1S-0516
	BSA-MW-1S-0516-EB
	2Q16 LTM Trip Blank #3

Golder completed validation of the analytical data following the general guidelines in Section 4.4 Data Review and Validation of the Work Plan. The Work Plan specifies that the most recent versions of the national data validation guidelines be used for data review. The following guidelines were generally used:

- USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, EPA-540-R-08-01, June 2008
- USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, EPA 540-R-10-011, January 2010

Although some data required qualifications due to quality control criteria that were not achieved, the data was deemed usable. The completeness for the data set was 100%. Qualifications are included in Appendix C.

4.0 OBSERVATIONS

Groundwater analytical data for VOCs and MNA parameters are discussed below and presented in Table 2 and 3, respectively. The groundwater analytical laboratory results including data validation reports are included in Appendix D.

4.1 Benzene

Benzene was detected in seven (7) of the fifteen (15) monitoring wells and piezometers at concentrations ranging from 9.6 µg/L (GWE-5D) to 750,000 µg/L (BSA-MW-1S). Benzene results are summarized below.

- Former Benzene Storage Area: Benzene was detected in the former Benzene Storage Area source area well (BSA-MW-1S) at a concentration of 750,000 µg/L.
- Downgradient of Former Benzene Storage Area: Benzene was detected in three (3) of four (4) wells downgradient of the former Benzene Storage Area with concentrations ranging from 28 µg/L (BSA-MW-5D) in the DHU north of the GMCS, to 47,000 µg/L (BSA-MW-2D).
- Former Chlorobenzene Process Area: Benzene was detected in the former Chlorobenzene Process Area source area well (CPA-MW-1D) at a concentration of 4,300 µg/L.
- Downgradient of Former Chlorobenzene Process Area: Benzene was not detected in the wells downgradient of the former Chlorobenzene Process Area.
- North of the Site: Benzene was detected in two (2) of five (5) wells and piezometers north of the Site at concentrations of 9.6 µg/L (GWE-5D) and 25 µg/L (GWE-3D).

4.2 Chlorobenzenes (Total)

Total chlorobenzenes (i.e., sum of chlorobenzene, 1,2-dichlorobenzene, 1,3-dichlorobenzene, and 1,4-dichlorobenzene) were detected in thirteen (13) of the fifteen (15) wells at concentrations ranging from 28 µg/L (PM1D) to 35,600 µg/L / 35,600 µg/L (CPA-MW-2D / CPA-MW-2D-AD). Total chlorobenzenes results are summarized below.

- Former Benzene Storage Area: Total chlorobenzenes were not detected in the former Benzene Storage Area source area well (BSA-MW-1S).
- Downgradient of Former Benzene Storage Area: Total chlorobenzenes were detected in three (3) of four (4) wells downgradient of the former Benzene Storage Area with concentrations ranging from 120 µg/L (BSA-MW-5D) to 1,663 µg/L (BSA-MW-4D) in the DHU north of the GMCS.
- Former Chlorobenzene Process Area: Total chlorobenzenes were detected in the former Chlorobenzene Process Area source area well (CPA-MW-1D) at a concentration of 31,700 µg/L.
- Downgradient of Former Chlorobenzene Process Area: Total chlorobenzenes were detected in four (4) of four (4) wells downgradient of the former Chlorobenzene Process Area with concentrations ranging from 111.6 µg/L / 111.6 µg/L (CPA-MW-3D and AD) to

35,600 / 35,600 µg/L (CPA-MW-2D and AD). Total chlorobenzenes were detected at a concentration of 1,400 µg/L (CPA-MW-5D) north of the GMCS.

- North of the Site: Total chlorobenzenes were detected in five (5) of five (5) wells and piezometers north of the Site with concentrations ranging from 28 µg/L (PM1D) to 1,385 µg/L (GWE-3D).

4.3 Monitored Natural Attenuation

MNA parameter data for this quarter are presented in Table 3. Laboratory results for PLFA and SIP analysis are included in Appendix F. The SIP study (Appendix F) states the following, "The detection of ^{13}C-enriched biomass and DIC confirmed that benzene biodegradation had occurred at BSA-MW-2D-0516 during the deployment period" and "evidence for biodegradation of chlorobenzene in CPA-MW-3D-0516 was inconclusive, as the total PLFA biomass and ^{13}C-enriched biomass fell below the detection limit". Dissolved inorganic carbon (DIC) data for BSA-MW-2D-0516 indicate "moderate benzene mineralization" during the deployment period. The PLFA analysis in the remaining BSA and CPA wells show a community structure containing contaminant-reducing bacteria.

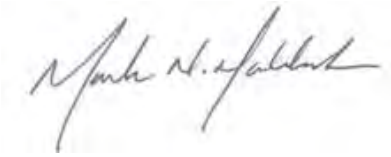
5.0 CLOSING

Golder appreciates the opportunity to assist Solutia Inc. with the Long-Term Monitoring Program sampling events. Please contact the undersigned if you need additional information.

Sincerely,

GOLDER ASSOCIATES INC.

Amanda W. Derhake, Ph.D., P.E.
Senior Project Engineer



Mark N. Haddock, R.G., P.E.
Principal, Senior Consultant

6.0 REFERENCES

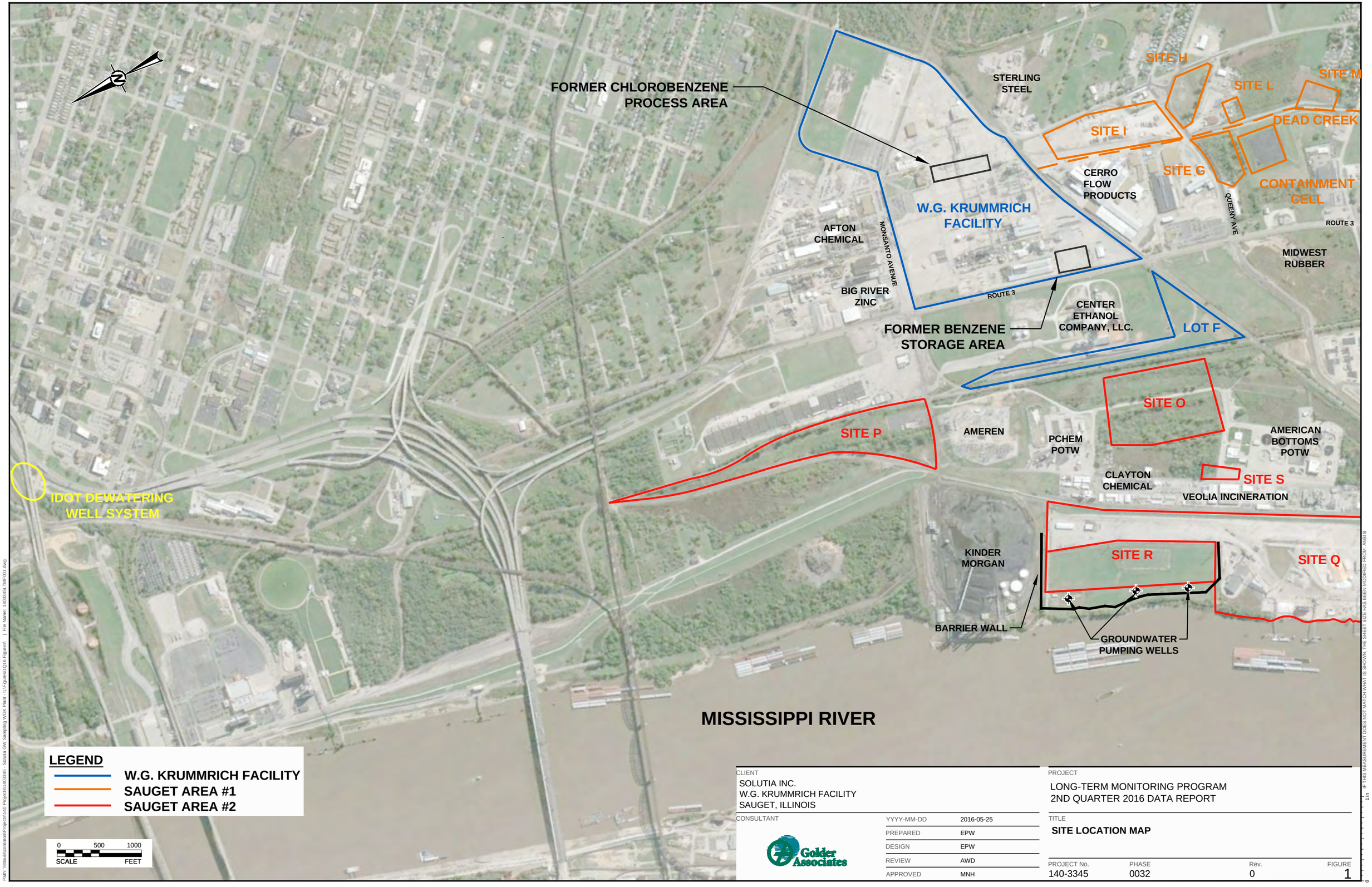
Solutia Inc., 2009. Revised Long Term Monitoring Program Work Plan, Solutia Inc., W.G. Krummrich Facility, Sauget, Illinois, May 2009.

USEPA, 2010. Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review.

USEPA, 2008. Contract Laboratory Program national Functional Guidelines for Superfund Organic Methods Data Review.

USEPA, 2008. Final Decision, Solutia Inc., Sauget, Illinois, February 2008.

FIGURES



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

CONSULTANT
Golder Associates

YYYY-MM-DD	2016-05-25
PREPARED	EPW
DESIGN	EPW
REVIEW	AWD
APPROVED	MNH

PROJECT
LONG-TERM MONITORING PROGRAM
2ND QUARTER 2016 DATA REPORT

TITLE
SITE LOCATION MAP

PROJECT No.	PHASE	Rev.	FIGURE
140-3345	0032	0	1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

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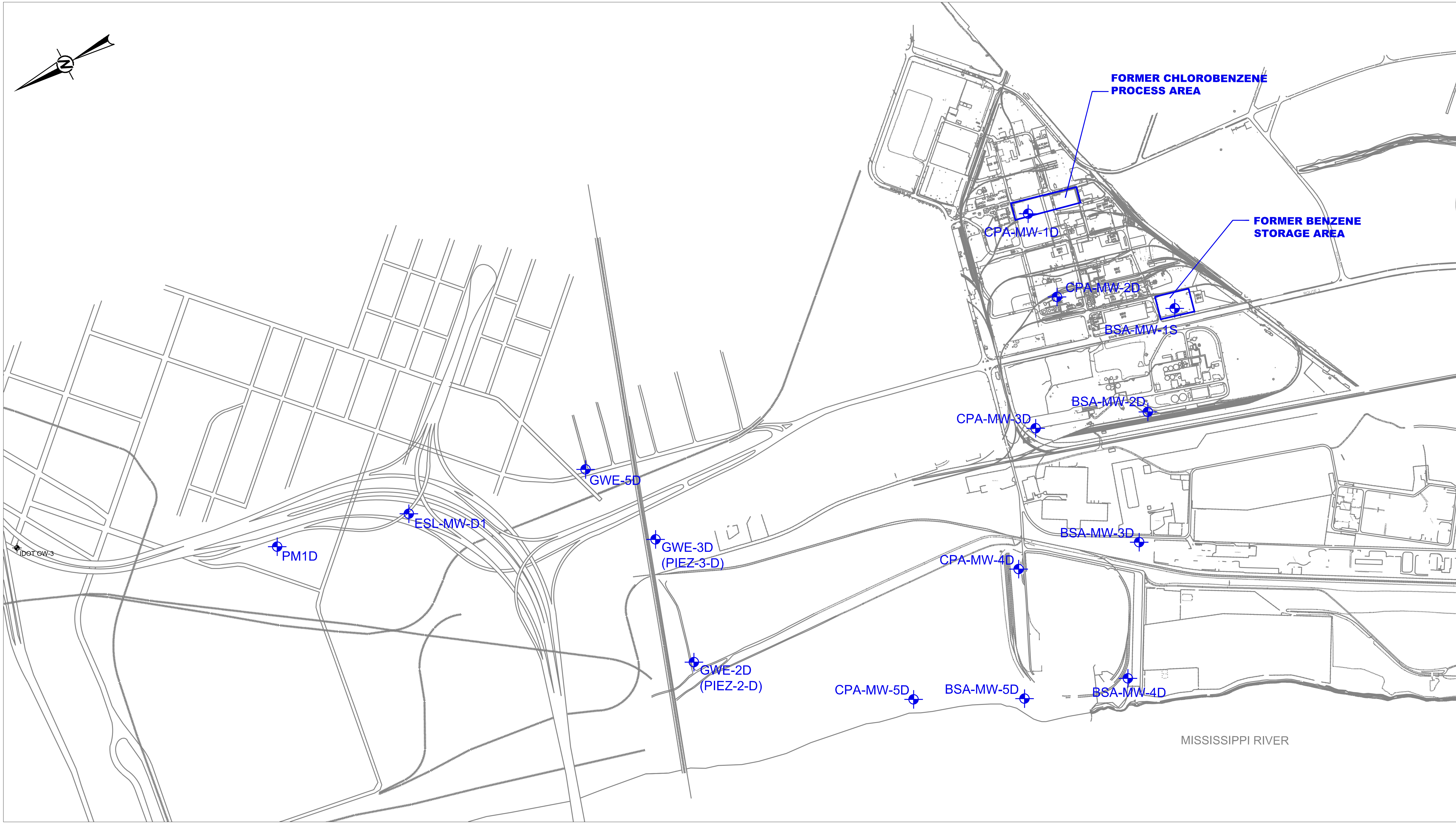


LEGEND

LONG-TERM MONITORING WELL LOCATION

NOTES

1. REFER TO TABLE 1 FOR MONITORING WELL CONSTRUCTION INFORMATION.

0 500 1000
SCALE FEET

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

CONSULTANT

Golder Associates

YYYY-MM-DD	2016-05-25
PREPARED	EPW
DESIGN	EPW
REVIEW	AWD
APPROVED	MNH

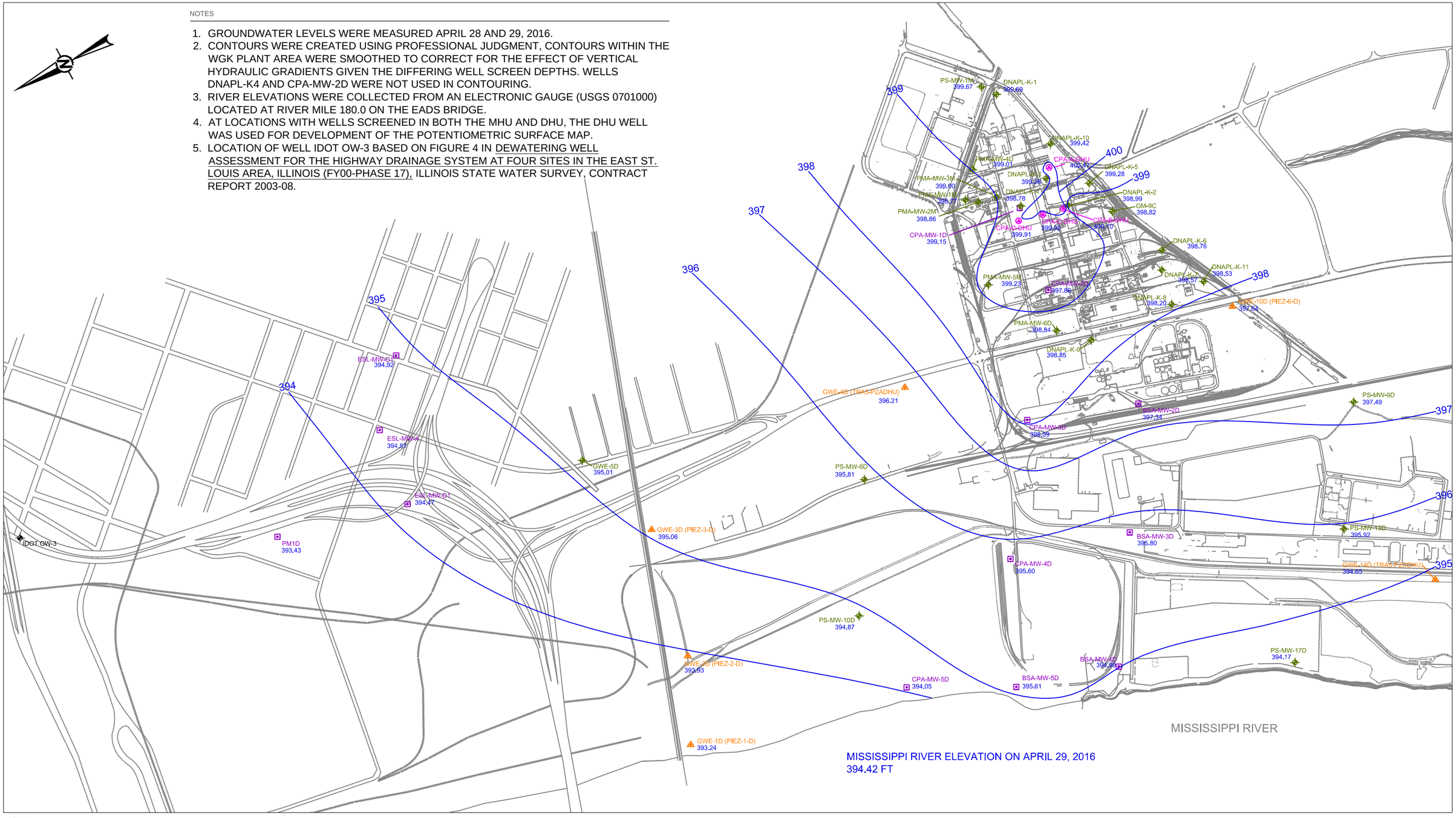
PROJECT
LONG-TERM MONITORING PROGRAM
2ND QUARTER 2016 DATA REPORT

TITLE
LONG-TERM MONITORING PROGRAM WELL LOCATIONS

PROJECT No.	PHASE:	Rev.	FIGURE:
140-3345	0032	0	2

NOTES

1. GROUNDWATER LEVELS WERE MEASURED APRIL 28 AND 29, 2016.
2. CONTOURS WERE CREATED USING PROFESSIONAL JUDGMENT, CONTOURS WITHIN THE WGK PLANT AREA WERE SMOOTHED TO CORRECT FOR THE EFFECT OF VERTICAL HYDRAULIC GRADIENTS GIVEN THE DIFFERING WELL SCREEN DEPTHS. WELLS DNAPL-K4 AND CPA-MW-2D WERE NOT USED IN CONTOURING.
3. RIVER ELEVATIONS WERE COLLECTED FROM AN ELECTRONIC GAUGE (USGS 0701000) LOCATED AT RIVER MILE 180.0 ON THE EADS BRIDGE.
4. AT LOCATIONS WITH WELLS SCREENED IN BOTH THE MHU AND DHU, THE DHU WELL WAS USED FOR DEVELOPMENT OF THE POTENTIOMETRIC SURFACE MAP.
5. LOCATION OF WELL IDOT OW-3 BASED ON FIGURE 4 IN DEWATERING WELL ASSESSMENT FOR THE HIGHWAY DRAINAGE SYSTEM AT FOUR SITES IN THE EAST ST. LOUIS AREA, ILLINOIS (FY00-PHASE 17), ILLINOIS STATE WATER SURVEY, CONTRACT REPORT 2003-08.



LEGEND

- LONG-TERM MONITORING WELL USED FOR GROUNDWATER CONTOURING
- OTHER MONITORING WELL USED FOR GROUNDWATER CONTOURING
- PIEZOMETER CLUSTER USED FOR GROUNDWATER CONTOURING
- CPA MONITORING WELL USED FOR GROUNDWATER CONTOURING
- IDOT GROUNDWATER WELL
- 394 APPROXIMATE GROUNDWATER ELEVATION CONTOUR (FT NAVD)

SCALE 0 500 1000 FEET

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

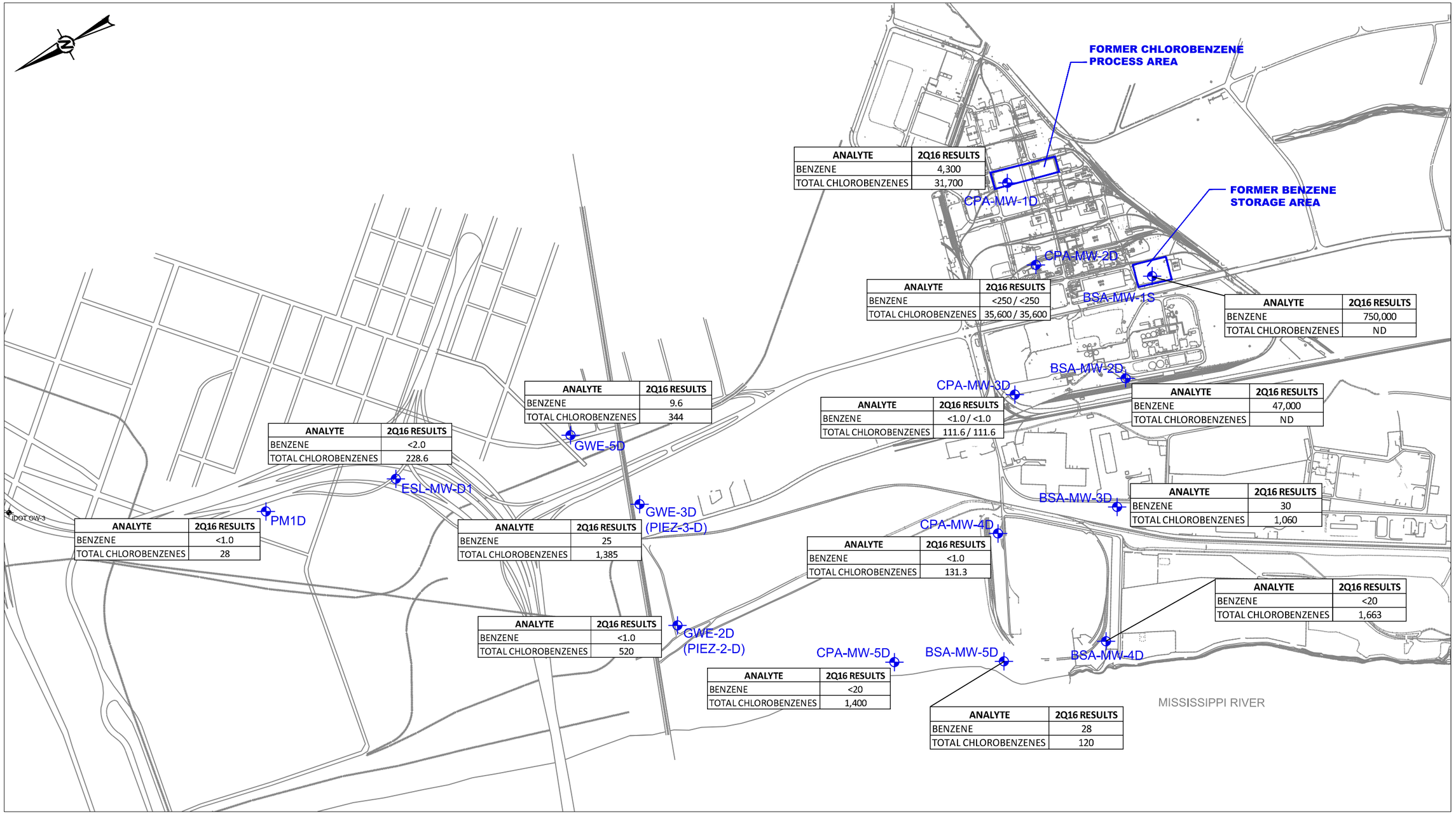
CONSULTANT
Golder Associates

YYYY-MM-DD	2016-05-12
PREPARED	EPW
DESIGN	SJD
REVIEW	AWD
APPROVED	MNH

PROJECT
LONG-TERM MONITORING PROGRAM
2ND QUARTER 2016 DATA REPORT

TITLE
POTENTIOMETRIC SURFACE MAP
MIDDLE/DEEP HYDROGEOLOGIC UNIT

PROJECT No.	PHASE:	Rev.	FIGURE:
140-3345	0032	0	3



ANALYTE	2Q16 RESULTS
BENZENE	4,300
TOTAL CHLOROBENZENES	31,700

ANALYTE	2Q16 RESULTS
BENZENE	<250 / <250
TOTAL CHLOROBENZENES	35,600 / 35,600

ANALYTE	2Q16 RESULTS
BENZENE	750,000
TOTAL CHLOROBENZENES	ND

ANALYTE	2Q16 RESULTS
BENZENE	9.6
TOTAL CHLOROBENZENES	344

ANALYTE	2Q16 RESULTS
BENZENE	<1.0 / <1.0
TOTAL CHLOROBENZENES	111.6 / 111.6

ANALYTE	2Q16 RESULTS
BENZENE	47,000
TOTAL CHLOROBENZENES	ND

ANALYTE	2Q16 RESULTS
BENZENE	<2.0
TOTAL CHLOROBENZENES	228.6

ANALYTE	2Q16 RESULTS
BENZENE	30
TOTAL CHLOROBENZENES	1,060

ANALYTE	2Q16 RESULTS
BENZENE	<1.0
TOTAL CHLOROBENZENES	28

ANALYTE	2Q16 RESULTS
BENZENE	25
TOTAL CHLOROBENZENES	1,385

ANALYTE	2Q16 RESULTS
BENZENE	<1.0
TOTAL CHLOROBENZENES	131.3

ANALYTE	2Q16 RESULTS
BENZENE	<20
TOTAL CHLOROBENZENES	1,663

ANALYTE	2Q16 RESULTS
BENZENE	<1.0
TOTAL CHLOROBENZENES	520

ANALYTE	2Q16 RESULTS
BENZENE	<20
TOTAL CHLOROBENZENES	1,400

ANALYTE	2Q16 RESULTS
BENZENE	28
TOTAL CHLOROBENZENES	120

LEGEND

LONG-TERM MONITORING WELL LOCATION

NOTES

1. TOTAL CHLOROBENZENES RESULTS INCLUDE THE SUM OF CHLOROBENZENE, 1,2-DICHLOROBENZENE, 1,3-DICHLOROBENZENE, AND 1,4-DICHLOROBENZENE.
2. RESULTS SHOWN ARE IN µg/L.
3. ND - NOT DETECTED.
4. MULTIPLE SAMPLE RESULTS INDICATE DUPLICATE SAMPLES.

0 500 1000
SCALE FEET

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

CONSULTANT
Golder Associates

YYYY-MM-DD	2016-05-25
PREPARED	SJD
DESIGN	EPW
REVIEW	AWD
APPROVED	MNH

PROJECT
LONG-TERM MONITORING PROGRAM
2ND QUARTER 2016 DATA REPORT

TITLE
BENZENE AND TOTAL CHLOROBENZENES RESULTS

PROJECT No.	PHASE:	Rev.	FIGURE:
140-3345	0032	0	4

Path: \\data\common\Projects\140 Projects\140345 - Solutia GW Sampling WGK Plant - IL\Figures\2016 Figures\ | File Name: 140345_LTMP_2.dwg

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B

TABLES

Table 1
Monitoring Well Gauging Information
2Q16 Long-Term Monitoring Program
Solutia Inc., W.G. Krummrich Facility
Sauget, Illinois

Well Identification	Monitoring Well Construction Data						2Q16 - April 28 and April 29, 2016			
	Ground Surface Elevation[1] (ft)	Top of Casing Elevation[1] (ft)	Top of Screen Depth (ft bgs)	Bottom of Screen Depth (ft bgs)	Top of Screen Elevation[1] (ft)	Bottom of Screen Elevation[1] (ft)	Water Level (ft btoc)	Depth to NAPL (ft btoc)	Total Depth[2] (ft btoc)	Water Level Elevation[1] (ft)
SHU 395-380 ft NAVD 88										
BSA-MW-1S	409.49	412.31	19.68	24.68	389.81	384.81	14.04	NP	27.29	398.27
GWE-5S	408.47	408.05	17.91	27.91	390.56	380.56	12.87	NP	27.82	395.18
MHU 380-350 ft NAVD 88										
GWE-5M	408.59	408.20	48.10	58.10	360.49	350.49	13.08	NP	58.02	395.12
PMA-MW-1M	410.32	410.08	54.54	59.54	355.78	350.78	11.31	NP	59.56	398.77
PMA-MW-2M	412.26	411.93	56.87	61.87	355.39	350.39	13.07	NP	61.23	398.86
PMA-MW-3M	412.36	412.10	57.07	62.07	355.29	350.29	13.10	NP	61.77	399.00
PMA-MW-5M	411.27	410.97	52.17	57.17	359.10	354.10	11.74	NP	56.93	399.23
PS-MW-1M	409.37	412.59	37.78	42.78	371.59	366.59	12.92	NP	46.02	399.67
PM1M	413.07	412.80	51.64	61.41	361.43	351.66	19.39	NP	60.56	393.41
DHU 350 ft NAVD 88 - Bedrock										
BSA-MW-2D	412.00	415.13	68.92	73.92	343.08	338.08	17.79	NP	76.98	397.34
BSA-MW-3D	412.91	415.74	107.02	112.02	305.89	300.89	19.94	NP	114.75	395.80
BSA-MW-4D	425.00	424.69	118.54	123.54	306.46	301.46	29.70	NP	123.13	394.99
BSA-MW-5D	420.80	420.49	115.85	120.82	304.95	299.95	24.88	NP	120.90	395.61
CPA-A-DHU	413.95	416.24	108.00	113.30	305.95	300.65	15.77	NP	115.12	400.47
CPA-B-DHU	409.12	408.68	101.00	106.50	308.12	302.62	8.58	NP	105.43	400.10
CPA-C-DHU	408.92	408.57	101.00	106.00	307.92	302.92	8.65	NP	105.47	399.92
CPA-D-DHU	409.63	412.20	101.00	105.90	308.63	303.73	12.29	NP	108.21	399.91
CPA-MW-1D	408.62	412.23	66.12	71.12	342.50	337.50	13.08	NP	74.64	399.15
CPA-MW-2D	408.51	408.20	99.96	104.96	308.55	303.55	10.34	NP	104.55	397.86
CPA-MW-3D	410.87	410.67	108.20	113.20	302.67	297.67	12.58	NP	112.75	398.09
CPA-MW-4D	421.57	421.20	116.44	121.44	305.13	300.13	25.60	NP	120.91	395.60
CPA-MW-5D	411.03	413.15	107.63	112.63	303.40	298.40	19.10	NP	114.60	394.05
DNAPL-K-1	413.07	415.56	108.20	123.20	304.87	289.87	15.87	NP	123.08	399.69
DNAPL-K-2	407.94	407.72	97.63	112.63	310.31	295.31	8.73	NP	112.32	398.99
DNAPL-K-3	412.13	415.91	104.80	119.80	307.33	292.33	16.63	NP	123.28	399.28
DNAPL-K-4	409.48	412.53	102.55	117.55	306.93	291.93	13.75	NP	118.12	398.78
DNAPL-K-5	412.27	411.91	102.15	117.15	310.12	295.12	12.63	NP	116.42	399.28
DNAPL-K-6	410.43	410.09	102.47	117.47	307.96	292.96	11.33	NP	116.80	398.76
DNAPL-K-7	408.32	407.72	100.40	115.40	307.92	292.92	9.15	NP	117.27	398.57
DNAPL-K-8	408.56	411.38	102.65	117.65	305.91	290.91	13.18	NP	117.54	398.20
DNAPL-K-9	406.45	405.97	97.42	112.42	309.03	294.03	7.12	NP	111.10	398.85
DNAPL-K-10	413.50	413.25	105.43	120.43	308.07	293.07	13.83	NP	120.23	399.42
DNAPL-K-11	412.20	411.78	105.46	120.46	306.74	291.74	13.25	NP	120.20	398.53
GM-9C	409.54	411.21	88.00	108.00	321.54	301.54	12.39	NP	108.18	398.82
GWE-1D	412.80	415.60	117.00	127.00	295.80	285.80	22.36	NP	127.06	393.24
GWE-2D	417.45	417.14	127.00	137.00	290.45	280.45	23.21	NP	136.55	393.93
GWE-3D	415.03	417.66	104.60	114.60	313.06	303.06	22.60	NP	114.87	395.06
GWE-4D	406.05	405.74	74.00	80.00	332.05	326.05	9.53	NP	78.73	396.21
GWE-5D	408.79	408.38	100.43	105.43	308.36	303.36	13.37	NP	105.17	395.01
GWE-10D	410.15	412.87	102.50	112.50	307.65	297.65	15.23	NP	114.80	397.64
GWE-14D	420.47	422.90	90.00	96.00	330.47	324.47	28.25	NP	96.99	394.65
ESL-MW-A	412.93	412.59	105.50	110.50	307.43	302.43	18.08	NP	109.86	394.51
ESL-MW-C1	410.09	409.79	104.00	109.00	306.09	301.09	14.87	NP	108.59	394.92
ESL-MW-D1	416.38	416.04	114.00	119.00	302.38	297.38	21.57	NP	119.21	394.47
PMA-MW-4D	411.22	410.88	68.84	73.84	342.38	337.38	11.87	NP	73.32	399.01
PMA-MW-6D	407.63	407.32	96.49	101.49	311.14	306.14	8.48	NP	101.22	398.84
PS-MW-6D	404.11	406.63	102.32	107.32	304.31	299.31	10.82	NP	109.75	395.81
PS-MW-9D	403.92	403.52	100.40	105.40	303.52	298.52	6.03	NP	105.06	397.49
PS-MW-10D	409.63	412.18	103.78	108.78	308.40	303.40	17.31	NP	111.21	394.87
PS-MW-13D	405.80	405.53	106.08	111.08	299.72	294.72	9.61	NP	110.34	395.92
PS-MW-17D	420.22	423.26	121.25	126.25	298.97	293.97	29.09	NP	133.93	394.17
SA2-MW-1D	403.79	406.03	105.01	115.01	301.02	291.02	18.47	NP	102.25	387.56
PM1D	413.41	412.78	101.42	106.45	311.99	306.96	19.35	NP	106.58	393.43

Notes
ft - feet
bgs - below ground surface
btoc - below top of casing
NP - no product observed
SHU - shallow hydrogeologic unit
MHU - middle hydrogeologic unit
DHU - deep hydrogeologic unit
[1] - Elevation based on North American Vertical Datum (NAVD) 88 datum
[2] - Total depths are measured annually during the first quarter of each year

Prepared By: SJD 4/29/2016
Checked By: EPW 4/29/2016
Reviewed By: AWD 06/29/2016

Table 2
Groundwater Analytical Results
2Q16 Long-Term Monitoring Program
Solutia Inc., W.G. Krummrich Facility
Sauget, Illinois

Sample Identification	Sample Date	VOCs (µg/L)				
		Benzene	Chlorobenzene	1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene
Benzene Storage Area						
BSA-MW-1S-0516	5/4/2016	750,000 D	<10,000	<10,000	<10,000	<10,000
BSA-MW-2D-0516	5/4/2016	47,000 D	<1,000	<1,000	<1,000	<1,000
BSA-MW-3D-0516	5/3/2016	30 D	840 D	<20	<20	220 D
BSA-MW-4D-0516	5/3/2016	<20	1,600 D	<20	<20	63 D
BSA-MW-5D-0516	5/3/2016	28	120	<1.0	<1.0	<1.0
Chlorobenzene Process Area						
CPA-MW-1D-0516	5/4/2016	4,300 D	14,000 D	8,200 D	1,000 D	8,500 D
CPA-MW-2D-0516	5/4/2016	<250	34,000 D	<250	<250	1,600 D
CPA-MW-2D-0516-AD	5/4/2016	<250	34,000 D	<250	<250	1,600 D
CPA-MW-3D-0516	5/4/2016	<1.0	110	<1.0	<1.0	1.6
CPA-MW-3D-0516-AD	5/4/2016	<1.0	110	<1.0	<1.0	1.6
CPA-MW-4D-0516	5/3/2016	<1.0	130	<1.0	<1.0	1.3
CPA-MW-5D-0516	5/3/2016	<20	1,400 D	<20	<20	<20
North of W.G. Krummrich Facility						
ESL-MW-D1-0516	5/2/2016	<2.0	200 D	2.6 D	<2.0	26 D
GWE-2D-0516	5/2/2016	<1.0	520 D	<1.0	<1.0	<1.0
GWE-3D-0516	5/2/2016	25 D	1,300 D	<10	<10	85 D
GWE-5D-0516	5/3/2016	9.6 D	310 D	<5.0	<5.0	34 D
PM1D-0516	5/2/2016	<1.0	28	<1.0	<1.0	<1.0

Notes
VOCs - volatile organic compounds
µg/L - micrograms per liter
< - result is non-detect, less than the reporting limit
D - compound analyzed at a dilution
AD - analytical duplicate
NA - sample not analyzed for select analyte
Bold - indicates concentration greater than reporting limit

Prepared By: SJD 06/06/2016
Checked By: RJF 06/07/2016
Reviewed By: AWD 06/29/2016

Table 3
Monitored Natural Attenuation Results
2Q16 Long-Term Monitoring Program
Solutia Inc., W.G. Krummrich Facility
Sauget, Illinois

Sample Identification	Sample Date	Monitored Natural Attenuation Parameters																
		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)	Total Organic Carbon (mg/L)	Dissolved Organic Carbon (mg/L)	ORP (mV)
Benzene Storage Area																		
BSA-MW-1S-0516	5/4/2016	1,100	110	120 D	0.07	<1.1	<1.0	-	13	-	1.1	-	12,000	<0.050	210 D	14	-	-121.92
BSA-MW-1S-F(0.2)-0516	5/4/2016	-	-	-	-	-	-	-	-	13	-	1.2	-	-	-	-	13	-
BSA-MW-2D-0516	5/4/2016	750	79	180 D	0.03	15	<1.0	-	5.2	-	0.73	-	22,000	<0.050	<100	9.1	-	-85.86
BSA-MW-2D-F(0.2)-0516	5/4/2016	-	-	-	-	-	-	>3.30	-	5.1	-	0.72	-	-	-	-	8.7	-
BSA-MW-3D-0516	5/3/2016	520	60	320 D	0.14	2.7	3.3	-	14	-	0.78	-	530	0.063	210 D	4.0	-	-80.77
BSA-MW-3D-F(0.2)-0516	5/3/2016	-	-	-	-	-	-	0.80	-	13	-	0.78	-	-	-	-	3.9	-
BSA-MW-4D-0516	5/3/2016	610	59	96 D	0.11	7.9	<1.0	-	7.0	-	0.53	-	680	<0.050	<5.0	4.3	-	-95.39
BSA-MW-4D-F(0.2)-0516	5/3/2016	-	-	-	-	-	-	>3.30	-	7.0	-	0.53	-	-	-	-	5.0	-
BSA-MW-5D-216	5/3/2016	670	71	180 D	0.10	25	<1.0	-	11	-	0.33	-	17,000	<0.050	<5.0	8.3	-	-109.66
BSA-MW-5D-F(0.2)-0516	5/3/2016	-	-	-	-	-	-	>3.30	-	10	-	0.31	-	-	-	-	8.4	-
Chlorobenzene Process Area																		
CPA-MW-1D-0516	5/4/2016	890	7.6	81 D	0.06	31	<1.0	-	0.13	-	0.064	-	19,000	<0.050	<5.0	8.7	-	-24.51
CPA-MW-1D-F(0.2)-0516	5/4/2016	-	-	-	-	-	-	0.00	-	0.18	-	0.071	-	-	-	-	9.4	-
CPA-MW-2D-0516	5/4/2016	500	55	57 D	0.10	1.9	1.4	-	8.6	-	0.48	-	780	<0.050	99 D	6.5	-	-35.16
CPA-MW-2D-F(0.2)-0516	5/4/2016	-	-	-	-	-	-	2.16	-	8.3	-	0.48	-	-	-	-	6.5	-
CPA-MW-3D-0516	5/4/2016	630	94	180 D	0.07	32	<1.0	-	14	-	0.74	-	25,000	<0.050	<5.0	7.6	-	-79.80
CPA-MW-3D-F(0.2)-0516	5/4/2016	-	-	-	-	-	-	3.28	-	14	-	0.74	-	-	-	-	7.7	-
CPA-MW-4D-0516	5/3/2016	690	72	280 D	0.09	34	<1.0	-	16	-	0.38	-	26,000	<0.050	<5.0	7.8	-	-125.71
CPA-MW-4D-F(0.2)-0516	5/3/2016	-	-	-	-	-	-	>3.30	-	16	-	0.37	-	-	-	-	7.8	-
CPA-MW-5D-0516	5/3/2016	590	160	220 D	0.30	1.8	<1.0	-	19	-	0.73	-	76	0.074	130 D	5.1	-	-47.83
CPA-MW-5D-F(0.2)-0516	5/3/2016	-	-	-	-	-	-	2.05	-	19	-	0.73	-	-	-	-	6.4	-
North of W.G. Krummrich Facility																		
ESL-MW-D1-0815	5/2/2016	390	49	90 D	0.16	<1.1	<1.0	-	13	-	0.39	-	48	<0.050	490 D	2.9	-	-93.88
ESL-MW-D1-F(0.2)-0516	5/2/2016	-	-	-	-	-	-	>3.30	-	13	-	0.40	-	-	-	-	3.1	-
GWE-2D-0516	5/2/2016	420	110	940 D	0.08	<1.1	<1.0	-	40	-	0.98	-	57	<0.050	1,100 D	4.6	-	-88.59
GWE-2D-F(0.2)-0516	5/2/2016	-	-	-	-	-	-	>3.30	-	40	-	0.97	-	-	-	-	6.0	-
GWE-3D-0516	5/2/2016	450	29	950 D	0.14	<1.1	<1.0	-	26	-	0.81	-	83	<0.050	230 D	5.0	-	-129.06
GWE-3D-F(0.2)-0516	5/2/2016	-	-	-	-	-	-	>3.30	-	27	-	0.84	-	-	-	-	8.4	-
GWE-5D-0516	5/3/2016	380	49	85 D	0.10	<1.1	<1.0	-	15	-	0.43	-	65	0.053	460 D	3.3	-	-67.86
GWE-5D-F(0.2)-0516	5/3/2016	-	-	-	-	-	-	2.38	-	14	-	0.42	-	-	-	-	3.3	-
PM1D-0516	5/2/2016	400	49	88 D	0.08	<1.1	<1.0	-	14	-	0.43	-	51	<0.050	390 D	2.6	-	-194.69
PM1D-F(0.2)-0516	5/2/2016	-	-	-	-	-	-	>3.30	-	14	-	0.42	-	-	-	-	2.7	-

Notes

Dissolved Oxygen (DO) and Oxidation Reduction Potential (ORP) values represent the final field measurements prior to sampling (In-Situ - SmartTroll™)
Ferrous Iron was field measured using a 0.2 µm field filtered sample (Hach DR-890 Colorimeter)
F(0.2) - sample was field filtered using a 0.2 µm filter during sample collection
µg/L - micrograms per liter
mg/L - milligrams per liter
mV - millivolts
< - result is non-detect, less than the reporting limit
"-" - not analyzed
D - compound analyzed at a dilution

Prepared By: SJD 06/06/2016
Checked By: RJF 06/07/2016
Reviewed By: AWD 06/29/2016

APPENDIX A
GROUNDWATER PURGING AND SAMPLING FORMS

(On CD)

In-Situ Inc.

SmartTroll
5/4/2016

Low-Flow System
ISI Low-Flow Log

Project Information:		**Pump Information:**	
Operator Name	EPW	Pump Model/Type	SS Monsoon
Company Name	Golder Associates	Tubing Type	LDPE
Project Name	W.G. Krummrich	Tubing Diameter	0.19 in
Site Name	LTM	Tubing Length	31.00 ft
		Pump Placement from TOC	25.00 ft

Well Information:		**Pumping Information:**	
Well Id	BSA-MW-1S	Final Pumping Rate	200 mL/min
Well Diameter	2 in	System Volume	363 mL
Well Total Depth	27.29 ft	Calculated Sample Rate	108 sec
Depth to Top of Screen	22.50 ft	Sample Rate	108 sec
Screen Length	5 ft	Stabilized Drawdown	0.03 ft
Depth to Water	14.04 ft		

Low-Flow Sampling Stabilization Summary

	Time	Temp [C]	pH [pH]	Cond [µS/cm]	Turb [NTU]	RDO [mg/L]	ORP [mV]
Stabilization Settings			+/-0.2	+/-0.1 +/-3%	+/-1 +/-10%	+/-0.2 +/-10%	+/-20
Last 5 Readings	13:39:10	19.81	7.13	2488.28	48.7	0.13	-114.89
	13:40:58	19.24	7.14	2485.30	39.2	0.09	-116.25
	13:42:46	19.13	7.13	2484.75	33.4	0.07	-118.36
	13:44:34	19.22	7.13	2496.09	35.8	0.08	-120.56
	13:46:24	19.07	7.13	2456.29	24.5	0.07	-121.92
Variance in Last 3 Readings		-0.11	-0.01	-0.55	-5.80	-0.02	-2.11
		0.09	0.00	11.34	2.40	0.01	-2.2
		-0.15	0.00	-39.80	-11.30	-0.01	-1.36

Notes:

In-Situ Inc.

SmartTroll
5/4/2016

Low-Flow System
ISI Low-Flow Log

Project Information:		**Pump Information:**	
Operator Name	EPW	Pump Model/Type	SS Monsoon
Company Name	Golder Associates	Tubing Type	LDPE
Project Name	W.G. Krummrich	Tubing Diameter	0.19 in
Site Name	LTM	Tubing Length	80.55 ft
		Pump Placement from TOC	74.55 ft

Well Information:		**Pumping Information:**	
Well Id	BSA-MW-2D	Final Pumping Rate	300 mL/min
Well Diameter	2 in	System Volume	639 mL
Well Total Depth	76.98 ft	Calculated Sample Rate	127 sec
Depth to Top of Screen	72.05 ft	Sample Rate	127 sec
Screen Length	5 ft	Stabilized Drawdown	0.00 ft
Depth to Water	17.79 ft		

Low-Flow Sampling Stabilization Summary

	Time	Temp [C]	pH [pH]	Cond [µS/cm]	Turb [NTU]	RDO [mg/L]	ORP [mV]
Stabilization Settings			+/-0.2	+/-0.1 +/-3%	+/-1 +/-10%	+/-0.2 +/-10%	+/-20
Last 5 Readings	10:02:39	17.56	7.00	1847.43	2.51	0.08	-79.96
	10:04:46	17.67	7.00	1842.48	2.00	0.07	-80.40
	10:06:53	17.85	7.00	1832.70	2.10	0.04	-82.09
	10:09:00	17.90	7.00	1833.87	2.19	0.05	-84.14
	10:11:07	18.07	7.00	1820.86	1.57	0.03	-85.86
Variance in Last 3 Readings		0.18	0.00	-9.78	0.10	-0.03	-1.69
		0.05	0.00	1.17	0.09	0.01	-2.05
		0.17	0.00	-13.01	-0.62	-0.02	-1.72

Notes:

In-Situ Inc.

SmartTroll
5/3/2016

Low-Flow System
ISI Low-Flow Log

Project Information:		**Pump Information:**	
Operator Name	EPW	Pump Model/Type	SS Monsoon
Company Name	Golder Associates	Tubing Type	LDPE
Project Name	W.G. Krummrich	Tubing Diameter	0.19 in
Site Name	LTM	Tubing Length	118.35 ft
		Pump Placement from TOC	112.35 ft

Well Information:		**Pumping Information:**	
Well Id	BSA-MW-3D	Final Pumping Rate	300 mL/min
Well Diameter	2 in	System Volume	850 mL
Well Total Depth	114.75 ft	Calculated Sample Rate	169 sec
Depth to Top of Screen	109.85 ft	Sample Rate	169 sec
Screen Length	5 ft	Stabilized Drawdown	0.00 ft
Depth to Water	19.94 ft		

Low-Flow Sampling Stabilization Summary

	Time	Temp [C]	pH [pH]	Cond [µS/cm]	Turb [NTU]	RDO [mg/L]	ORP [mV]
Stabilization Settings			+/-0.2	+/-0.1 +/-3%	+/-1 +/-10%	+/-0.2 +/-10%	+/-20
Last 5 Readings	15:17:18	17.06	6.95	2292.90	8.71	0.17	-91.86
	15:20:07	16.95	6.95	2294.28	17.2	0.16	-88.59
	15:22:56	16.83	6.95	2298.83	9.38	0.15	-85.68
	15:25:45	16.80	6.95	2282.76	5.85	0.15	-84.02
	15:28:34	16.74	6.95	2261.46	6.62	0.14	-80.77
Variance in Last 3 Readings		-0.12	0.00	4.55	-7.82	-0.01	2.91
		-0.03	0.00	-16.07	-3.53	0.00	1.66
		-0.06	0.00	-21.30	0.77	-0.01	3.25

Notes:

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Low-Flow System
ISI Low-Flow Log

Project Information:		**Pump Information:**	
Operator Name	EPW	Pump Model/Type	SS Monsoon
Company Name	Golder Associates	Tubing Type	LDPE
Project Name	W.G. Krummrich	Tubing Diameter	0.19 in
Site Name	LTM	Tubing Length	126.73 ft
		Pump Placement from TOC	120.73 ft

Well Information:		**Pumping Information:**	
Well Id	BSA-MW-4D	Final Pumping Rate	300 mL/min
Well Diameter	2 in	System Volume	897 mL
Well Total Depth	123.13 ft	Calculated Sample Rate	179 sec
Depth to Top of Screen	118.23 ft	Sample Rate	179 sec
Screen Length	5 ft	Stabilized Drawdown	0.00 ft
Depth to Water	29.70 ft		

Low-Flow Sampling Stabilization Summary

	Time	Temp [C]	pH [pH]	Cond [µS/cm]	Turb [NTU]	RDO [mg/L]	ORP [mV]
Stabilization Settings			+/-0.2	+/-0.1 +/-3%	+/-1 +/-10%	+/-0.2 +/-10%	+/-20
Last 5 Readings	14:17:45	17.65	7.06	1443.35	3.37	0.26	-94.84
	14:20:44	17.56	7.05	1445.02	1.08	0.19	-94.90
	14:23:43	17.36	7.05	1447.34	0.68	0.16	-95.11
	14:26:42	17.31	7.05	1448.72	2.65	0.13	-95.46
	14:29:41	17.54	7.05	1438.59	0.44	0.11	-95.39
Variance in Last 3 Readings		-0.20	0.00	2.32	-0.40	-0.03	-0.21
		-0.05	0.00	1.38	1.97	-0.03	-0.35
		0.23	0.00	-10.13	-2.21	-0.02	0.07

Notes:

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Low-Flow System
ISI Low-Flow Log

Project Information:		**Pump Information:**	
Operator Name	EPW	Pump Model/Type	SS Monsoon
Company Name	Golder Associates	Tubing Type	LDPE
Project Name	W.G. Krummrich	Tubing Diameter	0.19 in
Site Name	LTM	Tubing Length	124.04 ft
		Pump Placement from TOC	118.04 ft

Well Information:		**Pumping Information:**	
Well Id	BSA-MW-5D	Final Pumping Rate	300 mL/min
Well Diameter	2 in	System Volume	882 mL
Well Total Depth	120.90 ft	Calculated Sample Rate	176 sec
Depth to Top of Screen	115.54 ft	Sample Rate	176 sec
Screen Length	5 ft	Stabilized Drawdown	0.00 ft
Depth to Water	24.88 ft		

Low-Flow Sampling Stabilization Summary

	Time	Temp [C]	pH [pH]	Cond [µS/cm]	Turb [NTU]	RDO [mg/L]	ORP [mV]
Stabilization Settings			+/-0.2	+/-0.1 +/-3%	+/-1 +/-10%	+/-0.2 +/-10%	+/-20
Last 5 Readings	12:20:12	17.32	6.99	1782.38	49.30	0.20	-118.87
	12:23:08	17.20	7.00	1765.82	5.03	0.16	-114.49
	12:26:04	17.19	7.01	1768.28	4.67	0.14	-112.04
	12:29:00	17.16	7.02	1790.42	4.33	0.13	-111.62
	12:31:56	17.16	7.02	1779.28	5.03	0.10	-109.66
Variance in Last 3 Readings		-0.01	0.01	2.46	-0.36	-0.02	2.45
		-0.03	0.01	22.14	-0.34	-0.01	0.42
		0.00	0.00	-11.14	0.70	-0.03	1.96

Notes:

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Low-Flow System
ISI Low-Flow Log

Project Information:		**Pump Information:**	
Operator Name	EPW	Pump Model/Type	SS Monsoon
Company Name	Golder Associates	Tubing Type	LDPE
Project Name	W.G. Krummrich	Tubing Diameter	0.19 in
Site Name	LTM	Tubing Length	73.32 ft
		Pump Placement from TOC	68.32 ft

Well Information:		**Pumping Information:**	
Well Id	CPA-MW-1D	Final Pumping Rate	300 mL/min
Well Diameter	2 in	System Volume	599 mL
Well Total Depth	74.64 ft	Calculated Sample Rate	119 sec
Depth to Top of Screen	65.82 ft	Sample Rate	119 sec
Screen Length	5 ft	Stabilized Drawdown	0.00 ft
Depth to Water	13.08 ft		

Low-Flow Sampling Stabilization Summary

	Time	Temp [C]	pH [pH]	Cond [µS/cm]	Turb [NTU]	RDO [mg/L]	ORP [mV]
Stabilization Settings			+/-0.2	+/-0.1 +/-3%	+/-1 +/-10%	+/-0.2 +/-10%	+/-20
Last 5 Readings	11:13:47	20.27	7.93	1792.53	1.51	0.10	-24.51
	11:15:49	19.93	7.99	1799.74	1.13	0.07	-2.33
	11:17:48	20.24	8.04	1824.26	1.97	0.06	40.10
	11:19:48	20.48	8.10	1812.79	1.06	0.06	57.40
	11:21:51	20.45	8.18	1820.33	1.17	0.06	59.73
Variance in Last 3 Readings		0.31	0.05	24.52	0.84	-0.01	42.43
		0.24	0.06	-11.47	-0.91	0.00	17.30
		-0.03	0.08	7.54	0.11	0.00	2.33

Notes:

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Low-Flow System
ISI Low-Flow Log

Project Information:		**Pump Information:**	
Operator Name	EPW	Pump Model/Type	SS Monsoon
Company Name	Golder Associates	Tubing Type	LDPE
Project Name	W.G. Krummrich	Tubing Diameter	0.19 in
Site Name	LTM	Tubing Length	108.15 ft
		Pump Placement from TOC	102.15 ft

Well Information:		**Pumping Information:**	
Well Id	CPA-MW-2D	Final Pumping Rate	300 mL/min
Well Diameter	2 in	System Volume	793 mL
Well Total Depth	104.55 ft	Calculated Sample Rate	158 sec
Depth to Top of Screen	99.65 ft	Sample Rate	158 sec
Screen Length	5 ft	Stabilized Drawdown	0.01 ft
Depth to Water	10.34 ft		

Low-Flow Sampling Stabilization Summary

	Time	Temp [C]	pH [pH]	Cond [µS/cm]	Turb [NTU]	RDO [mg/L]	ORP [mV]
Stabilization Settings			+/-0.2	+/-0.1 +/-3%	+/-1 +/-10%	+/-0.2 +/-10%	+/-20
Last 5 Readings	12:37:53	19.84	7.03	1263.64	50.80	0.23	-62.13
	12:40:31	19.68	7.03	1271.60	36.10	0.16	-60.02
	12:43:09	19.36	7.03	1276.19	23.50	0.14	-51.06
	12:45:48	19.15	7.03	1285.66	15.70	0.12	-44.06
	12:48:27	19.47	7.03	1278.52	9.33	0.10	-35.16
Variance in Last 3 Readings		-0.32	0.00	4.59	-12.60	-0.02	8.96
		-0.21	0.00	9.47	-7.80	-0.02	7.00
		0.32	0.00	-7.14	-6.37	-0.02	8.90

Notes:

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Low-Flow System
ISI Low-Flow Log

Project Information:		**Pump Information:**	
Operator Name	EPW	Pump Model/Type	SS Monsoon
Company Name	Golder Associates	Tubing Type	LDPE
Project Name	W.G. Krummrich	Tubing Diameter	0.19 in
Site Name	LTM	Tubing Length	116.50 ft
		Pump Placement from TOC	110.50 ft

Well Information:		**Pumping Information:**	
Well Id	CPA-MW-3D	Final Pumping Rate	300 mL/min
Well Diameter	2 in	System Volume	840 mL
Well Total Depth	112.75 ft	Calculated Sample Rate	167 sec
Depth to Top of Screen	108.00 ft	Sample Rate	167 sec
Screen Length	5 ft	Stabilized Drawdown	0.00 ft
Depth to Water	12.58 ft		

Low-Flow Sampling Stabilization Summary

	Time	Temp [C]	pH [pH]	Cond [µS/cm]	Turb [NTU]	RDO [mg/L]	ORP [mV]
Stabilization Settings			+/-0.2	+/-0.1 +/-3%	+/-1 +/-10%	+/-0.2 +/-10%	+/-20
Last 5 Readings	9:06:00	16.84	6.85	1807.96	5.38	0.15	-78.39
	9:08:47	16.87	6.86	1778.84	3.67	0.11	-78.13
	9:11:34	16.91	6.86	1770.04	2.39	0.10	-78.44
	9:14:21	16.92	6.86	1777.81	2.20	0.07	-79.03
	9:17:08	16.93	6.86	1771.90	1.72	0.07	-79.80
Variance in Last 3 Readings		0.04	0.00	-8.80	-1.28	-0.01	-0.31
		0.01	0.00	7.77	-0.19	-0.03	-0.59
		0.01	0.00	-5.91	-0.48	0.00	-0.77

Notes:

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Low-Flow System
ISI Low-Flow Log

Project Information:		**Pump Information:**	
Operator Name	EPW	Pump Model/Type	SS Monsoon
Company Name	Golder Associates	Tubing Type	LDPE
Project Name	W.G. Krummrich	Tubing Diameter	0.19 in
Site Name	LTM	Tubing Length	124.57 ft
		Pump Placement from TOC	118.57 ft

Well Information:		**Pumping Information:**	
Well Id	CPA-MW-4D	Final Pumping Rate	300 mL/min
Well Diameter	2 in	System Volume	885 mL
Well Total Depth	120.91 ft	Calculated Sample Rate	176 sec
Depth to Top of Screen	116.07 ft	Sample Rate	176 sec
Screen Length	5 ft	Stabilized Drawdown	0.00 ft
Depth to Water	25.60 ft		

Low-Flow Sampling Stabilization Summary

	Time	Temp [C]	pH [pH]	Cond [µS/cm]	Turb [NTU]	RDO [mg/L]	ORP [mV]
Stabilization Settings			+/-0.2	+/-0.1 +/-3%	+/-1 +/-10%	+/-0.2 +/-10%	+/-20
Last 5 Readings	13:21:13	16.62	7.03	2092.51	7.32	0.16	-127.87
	13:24:09	16.65	7.03	2090.06	3.99	0.11	-127.33
	13:27:05	16.65	7.03	2095.66	2.80	0.10	-126.78
	13:30:01	16.67	7.03	2104.10	2.33	0.10	-126.54
	13:32:59	16.66	7.04	2114.29	1.73	0.09	-125.71
Variance in Last 3 Readings		0.00	0.00	5.60	-1.19	-0.01	0.55
		0.02	0.00	8.44	-0.47	0.00	0.24
		-0.01	0.01	10.19	-0.60	-0.01	0.83

Notes:

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Low-Flow System
ISI Low-Flow Log

Project Information:		**Pump Information:**	
Operator Name	EPW	Pump Model/Type	SS Monsoon
Company Name	Golder Associates	Tubing Type	LDPE
Project Name	W.G. Krummrich	Tubing Diameter	0.19 in
Site Name	LTM	Tubing Length	118.25 ft
		Pump Placement from TOC	112.25 ft

Well Information:		**Pumping Information:**	
Well Id	CPA-MW-5D	Final Pumping Rate	300 mL/min
Well Diameter	2 in	System Volume	849 mL
Well Total Depth	114.60 ft	Calculated Sample Rate	169 sec
Depth to Top of Screen	109.75 ft	Sample Rate	169 sec
Screen Length	5 ft	Stabilized Drawdown	0.01 ft
Depth to Water	19.10 ft		

Low-Flow Sampling Stabilization Summary

	Time	Temp [C]	pH [pH]	Cond [µS/cm]	Turb [NTU]	RDO [mg/L]	ORP [mV]
Stabilization Settings			+/-0.2	+/-0.1 +/-3%	+/-1 +/-10%	+/-0.2 +/-10%	+/-20
Last 5 Readings	10:18:54	16.26	6.73	2013.53	3.21	0.42	-23.92
	10:21:43	16.32	6.73	2008.69	2.95	0.36	-34.19
	10:24:32	16.32	6.73	2009.66	2.42	0.34	-40.81
	10:27:21	16.33	6.74	2000.84	1.54	0.30	-45.11
	10:30:12	16.34	6.74	2001.70	1.35	0.30	-47.83
Variance in Last 3 Readings		0.00	0.00	0.97	-0.53	-0.02	-6.62
		0.01	0.01	-8.82	-0.88	-0.04	-4.30
		0.01	0.00	0.86	-0.19	0.00	-2.72

Notes:

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Low-Flow System
ISI Low-Flow Log

Project Information:		**Pump Information:**	
Operator Name	EPW	Pump Model/Type	SS Monsoon
Company Name	Golder Associates	Tubing Type	LDPE
Project Name	W.G. Krummrich	Tubing Diameter	0.19 in
Site Name	LTM	Tubing Length	121.78 ft
		Pump Placement from TOC	116.16 ft

Well Information:		**Pumping Information:**	
Well Id	ESL-MW-D1	Final Pumping Rate	300 mL/min
Well Diameter	2 in	System Volume	869 mL
Well Total Depth	119.21 ft	Calculated Sample Rate	173 sec
Depth to Top of Screen	113.66 ft	Sample Rate	173 sec
Screen Length	5 ft	Stabilized Drawdown	0.00 ft
Depth to Water	21.57 ft		

Low-Flow Sampling Stabilization Summary

	Time	Temp [C]	pH [pH]	Cond [µS/cm]	Turb [NTU]	RDO [mg/L]	ORP [mV]
Stabilization Settings			+/-0.2	+/-0.1 +/-3%	+/-1 +/-10%	+/-0.2 +/-10%	+/-20
Last 5 Readings	13:32:36	15.71	6.95	1719.15	11.60	0.27	-45.74
	13:35:29	15.75	6.96	1727.45	0.72	0.23	-60.60
	13:38:22	15.75	7.00	1763.51	1.23	0.19	-80.38
	13:41:18	15.74	7.03	1791.40	1.30	0.16	-90.23
	13:44:11	15.75	7.04	1809.18	0.55	0.16	-93.88
Variance in Last 3 Readings		0.00	0.04	36.06	0.51	-0.04	-19.78
		-0.01	0.03	27.89	0.07	-0.03	-9.85
		0.01	0.01	17.78	-0.75	0.00	-3.65

Notes:

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Low-Flow System
ISI Low-Flow Log

Project Information:		**Pump Information:**	
Operator Name	EPW	Pump Model/Type	Peristaltic
Company Name	Golder Associates	Tubing Type	LDPE
Project Name	W.G. Krummrich	Tubing Diameter	0.17 in
Site Name	LTM	Tubing Length	138.00 ft
		Pump Placement from TOC	131.69 ft

Well Information:		**Pumping Information:**	
Well Id	GWE-2D	Final Pumping Rate	300 mL/min
Well Diameter	1 in	System Volume	806 mL
Well Total Depth	136.55 ft	Calculated Sample Rate	161 sec
Depth to Top of Screen	126.69 ft	Sample Rate	161 sec
Screen Length	10 ft	Stabilized Drawdown	0.00 ft
Depth to Water	23.21 ft		

Low-Flow Sampling Stabilization Summary

	Time	Temp [C]	pH [pH]	Cond [µS/cm]	Turb [NTU]	RDO [mg/L]	ORP [mV]
Stabilization Settings			+/-0.2	+/-0.1 +/-3%	+/-1 +/-10%	+/-0.2 +/-10%	+/-20
Last 5 Readings	9:42:12	15.48	6.81	5181.36	4.37	0.10	-95.84
	9:44:53	15.48	6.81	5164.53	1.45	0.09	-93.10
	9:47:34	15.46	6.82	5170.20	1.25	0.09	-91.15
	9:50:15	15.44	6.82	5161.32	1.17	0.09	-89.66
	9:52:57	15.47	6.82	5233.57	0.86	0.08	-88.59
Variance in Last 3 Readings		-0.02	0.01	5.67	-0.20	0.00	1.95
		-0.02	0.00	-8.88	-0.08	0.00	1.49
		0.03	0.00	72.25	-0.31	-0.01	1.07

Notes:

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Low-Flow System
ISI Low-Flow Log

Project Information:		**Pump Information:**	
Operator Name	EPW	Pump Model/Type	Peristaltic
Company Name	Golder Associates	Tubing Type	LDPE
Project Name	W.G. Krummrich	Tubing Diameter	0.17 in
Site Name	LTM	Tubing Length	116.0 ft
		Pump Placement from TOC	112.23 ft

Well Information:		**Pumping Information:**	
Well Id	GWE-3D	Final Pumping Rate	300 mL/min
Well Diameter	1 in	System Volume	708 mL
Well Total Depth	114.87 ft	Calculated Sample Rate	141 sec
Depth to Top of Screen	107.23 ft	Sample Rate	141 sec
Screen Length	10 ft	Stabilized Drawdown	0.00 ft
Depth to Water	22.60 ft		

Low-Flow Sampling Stabilization Summary

	Time	Temp [C]	pH [pH]	Cond [µS/cm]	Turb [NTU]	RDO [mg/L]	ORP [mV]
Stabilization Settings			+/-0.2	+/-0.1 +/-3%	+/-1 +/-10%	+/-0.2 +/-10%	+/-20
Last 5 Readings	10:51:42	14.92	6.88	3990.82	0.76	0.19	-147.60
	10:54:03	14.91	6.87	4061.67	0.74	0.17	-140.65
	10:56:24	14.93	6.87	4099.96	0.37	0.15	-134.58
	10:58:45	14.93	6.87	4128.94	0.67	0.14	-129.06
Variance in Last 3 Readings		-0.01	-0.01	70.85	-0.02	-0.02	6.95
		0.02	0.00	38.29	-0.37	-0.02	6.07
		0.00	0.00	28.98	0.30	-0.01	5.52

Notes:

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Low-Flow System
ISI Low-Flow Log

Project Information:		**Pump Information:**	
Operator Name	EPW	Pump Model/Type	SS Monsoon
Company Name	Golder Associates	Tubing Type	LDPE
Project Name	W.G. Krummrich	Tubing Diameter	0.17 in
Site Name	LTM	Tubing Length	108.52 ft
		Pump Placement from TOC	102.52 ft

Well Information:		**Pumping Information:**	
Well Id	GWE-5D	Final Pumping Rate	300 mL/min
Well Diameter	2 in	System Volume	674 mL
Well Total Depth	105.17 ft	Calculated Sample Rate	134 sec
Depth to Top of Screen	100.02 ft	Sample Rate	134 sec
Screen Length	5 ft	Stabilized Drawdown	0.00 ft
Depth to Water	13.37 ft		

Low-Flow Sampling Stabilization Summary

	Time	Temp [C]	pH [pH]	Cond [µS/cm]	Turb [NTU]	RDO [mg/L]	ORP [mV]
Stabilization Settings			+/-0.2	+/-0.1 +/-3%	+/-1 +/-10%	+/-0.2 +/-10%	+/-20
Last 5 Readings	9:10:27	15.33	7.00	1817.71	12.90	0.16	-76.32
	9:12:41	15.35	7.01	1817.99	10.30	0.15	-74.98
	9:14:57	15.39	7.01	1816.42	11.10	0.12	-72.92
	9:17:11	15.43	7.02	1813.84	11.00	0.11	-70.26
	9:19:25	15.48	7.02	1811.98	9.99	0.10	-67.86
Variance in Last 3 Readings		0.04	0.00	-1.57	0.80	-0.03	2.06
		0.04	0.01	-2.58	-0.10	-0.01	2.66
		0.05	0.00	-1.86	-1.01	-0.01	2.40

Notes:

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Low-Flow System
ISI Low-Flow Log

Project Information:		**Pump Information:**	
Operator Name	EPW	Pump Model/Type	SS Monsoon
Company Name	Golder Associates	Tubing Type	LDPE
Project Name	W.G. Krummrich	Tubing Diameter	0.19 in
Site Name	LTM	Tubing Length	112.00 ft
		Pump Placement from TOC	103.29 ft

Well Information:		**Pumping Information:**	
Well Id	PM1D	Final Pumping Rate	300 mL/min
Well Diameter	2 in	System Volume	814 mL
Well Total Depth	106.58 ft	Calculated Sample Rate	162 sec
Depth to Top of Screen	100.79 ft	Sample Rate	162 sec
Screen Length	5 ft	Stabilized Drawdown	0.00 ft
Depth to Water	19.35 ft		

Low-Flow Sampling Stabilization Summary

	Time	Temp [C]	pH [pH]	Cond [µS/cm]	Turb [NTU]	RDO [mg/L]	ORP [mV]
Stabilization Settings			+/-0.2	+/-0.1 +/-3%	+/-1 +/-10%	+/-0.2 +/-10%	+/-20
Last 5 Readings	12:39:41	14.85	7.05	1660.80	20.3	0.12	-200.99
	12:42:23	14.89	7.05	1660.96	16.6	0.11	-199.30
	12:45:05	14.94	7.05	1664.18	13.7	0.10	-197.70
	12:47:47	14.96	7.05	1661.02	11.5	0.08	-196.26
	12:50:29	15.01	7.05	1665.71	9.64	0.08	-194.69
Variance in Last 3 Readings		0.05	0.00	3.22	-2.90	-0.01	1.60
		0.02	0.00	-3.16	-2.20	-0.02	1.44
		0.05	0.00	4.69	-1.86	0.00	1.57

Notes:

APPENDIX B
CHAINS-OF-CUSTODY

(On CD)

TestAmerica Savannah
5102 LaRoche Avenue

Savannah, GA 31404
phone 912.354 7858 fax

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Regulatory Program: ☐ DW ☐ NPDES ☑ RCRA ☐ Other:

TestAmerica Laboratories, Inc.

Client Contact	Project Manager: Amanda Derhake	Site Contact: Emily White	Date: 05/02/16	COC No: —
Golder Associates Inc.	Tel/Fax: 636-724-9191	Lab Contact: Michele Kersey	Carrier: FedEx	1 of 1 COCs
820 South Main Street	Analysis Turnaround Time			Sampler:
St Charles, MO 63301	☑ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
(636) 724-9191 Phone	TAT if different from Below Standard			Walk-in Client:
(636) 724-9323 FAX	☑ 2 weeks			Lab Sampling:
Project Name: 2Q16 LTM GW Sampling-1403345	☐ 1 week			Job / SDG No.:
Site: Solutia WG Krummrich Facility	☐ 2 days			
P O # 42262863	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	VOCs by 8260	Total Fe/Mn by 6010C	Alk/CO2 by 310.1	Chloride by 325.2/Sulfate by 375.4	Dissolved Gases by RSK 175	Nitrate by 353.2	TOC by 415.1	Dissolved Fe/Mn by 6010C	DOC by 415.1	Sample Specific Notes:
GWE-2D-0516	05/02/16	1052	G	W	14			3	1	1	1	3	2	3			
GWE-2D-F(0.2)-0516	"	1052	G	W	4										1	3	
GWE-3D-0516	"	1200	G	W	14			3	1	1	1	3	2	3			
GWE-3D-F(0.2)-0516	"	1200	G	W	4										1	3	
PMID-0516	"	1350	G	W	14			3	1	1	1	3	2	3			
PMID-F(0.2)-0516	"	1350	G	W	4										1	3	
ESL-MW-D1-0516	"	1445	G	W	14			3	1	1	1	3	2	3			
ESL-MW-D1-F(0.2)-0516	"	1445	G	W	4										1	3	
2Q16 LTM Trip Blank #1	—	—	—	W	2			2									
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other								2	4	1	1	2	1,3	3	4	3	

680-124756 Chain of Custody

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☑ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments:
VOC headspace upon sampling: Yes/No

3.3/3.6

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: 749475 | Cooler Temp (°C): Obs'd: _____ Corr'd. _____ | Therm ID No.: _____

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Emily White	Golder	05/02/16 1600		TA-SAV	5-3-16 9:32
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Form No. CA-C-WI-002, Rev. 4.3, dated 12/05/2013

TestAmerica Savannah
5102 LaRoche Avenue

Savannah, GA 31404
phone 912.354 7858 fax

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Regulatory Program: ☐ DW ☐ NPDES ☑ RCRA ☐ Other:

Client Contact	Project Manager: Amanda Derhake	Site Contact: Emily White	Date: 05/03/16	COC No: —
Golder Associates Inc.	Tel/Fax: 636-724-9191	Lab Contact: Michele Kersey	Carrier: FedEx	1 of 2 COCs
820 South Main Street	Analysis Turnaround Time			Sampler: E. White
St. Charles, MO 63301	☑ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
(636) 724-9191 Phone	TAT if different from Below Standard			Walk-in Client:
(636) 724-9323 FAX	☑ 2 weeks			Lab Sampling:
Project Name 2Q16 LTM GW Sampling-1403345	☐ 1 week			Job / SDG No.:
Site: Solutia WG Krummrich Facility	☐ 2 days			
P O # 42262863	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y / N)	Perform MS / MSD (Y / N)	VOCs by 8260	Total Fe/Mn by 6010C	Alk/CO2 by 310.1	Chloride by 325.2/Sulfate by 375.4	Dissolved Gases by RSK 175	Nitrate by 353.2	TOC by 415.1	Dissolved Fe/Mn by 6010C	DOC by 415.1	Sample Specific Notes:
GWE-SD-0516	05/03/16	0920	G	W	14	N		3	1	1	1	3	2	3			2 coolers
GWE-SD-F(0.2)-0516	"	0920	"	"	4	Y									1	3	
CPA-MW-5D-0516	"	1030	"	"	14	N		3	1	1	1	3	2	3			
CPA-MW-5D-F(0.2)-0516	"	1030	"	"	4	Y									1	3	
BSA-MW-5D-0516	"	1232	"	"	14	N		3	1	1	1	3	2	3			
BSA-MW-5D-F(0.2)-0516	"	1232	"	"	4	Y									1	3	
BSA-MW-5D-0516-MS	"	1232	"	"	3	N		3									
BSA-MW-5D-0516-MSD	"	1232	"	"	3	N		3									
CPA-MW-4D-0516	"	1332	"	"	14	N		3	1	1	1	3	2	3			
CPA-MW-4D-F(0.2)-0516	"	1332	"	"	4	Y									1	3	
BSA-MW-4D-0516	"	1430	"	"	14	N		3	1	1	1	3	2	3			
BSA-MW-4D-F(0.2)-0516	"	1430	"	"	4	Y									1	3	
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other								2	4	1	1	2	1,3	3	4	3	

680-124817 Chain of Custody

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☑ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments:
VOC headspace upon sampling: Yes/No

1.0/1.3 0.1/0.4

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No.: 6981680/1698679	Cooler Temp. (°C): Obs'd.	Corr'd:	Therm ID No.:

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Emily White	Golder	05/03/16 1615		TA-SAV	5-4-16 9:15
Relinquished by:	Company	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Form No. CA-C-WI-002, Rev. 4.3, dated 12/05/2013

TestAmerica Savannah
5102 LaRoche Avenue

Savannah, GA 31404
phone 912.354.7858 fax

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Regulatory Program: ☐ DW ☐ NPDES ☑ RCRA ☐ Other:

TestAmerica Laboratories, Inc.

Client Contact	Project Manager: Amanda Derhake	Site Contact: Emily White	Date: 05/03/16	COC No: —
Golder Associates Inc.	Tel/Fax: 636-724-9191	Lab Contact: Michele Kersey	Carrier: FedEx	2 of 2 COCs
820 South Main Street	Analysis Turnaround Time			Sampler: E. White
St. Charles, MO 63301	☑ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
(636) 724-9191 Phone	TAT if different from Below Standard			Walk-in Client:
(636) 724-9323 FAX	☑ 2 weeks			Lab Sampling:
Project Name. 2Q16 LTM GW Sampling-1403345	☐ 1 week			Job / SDG No.:
Site: Solutia WG Krummrich Facility	☐ 2 days			
P O # 42262863	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	VOCs by 8260	Total Fe/Mn by 6010C	Alk/CO2 by 310.1	Chloride by 325.2/Sulfate by 375.4	Dissolved Gases by RSK 175	Nitrate by 353.2	TOC by 415.1	Dissolved Fe/Mn by 6010C	DOC by 415.1	Sample Specific Notes:
BSA-MW-3D-0516	05/03/16	1528	G	W	14	N		3	1	1	1	3	2	3			
BSA-MW-3D-F(0.2)-0516	"	1528	"	"	4	Y									1	3	
BSA-MW-3D-0516-EB	"	1600	"	"	3	N		3									
2016 LTM Trip Blank #2	—	—	—	"	2	N		2									
								2	4	1	1	2	1,3	3	4	3	

Preservation Used: 1= Ice, 2= HCl; 3= H_2SO_4; 4=HNO_3; 5=NaOH; 6= Other _____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☑ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments:
VOC headspace upon sampling Yes/No

680-124817 1.0/1.3 0.1/0.4

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No.: 1098680 / 1098679	Cooler Temp. (°C). Obs'd: _____ Corr'd: _____	Therm ID No.: _____
Relinquished by: Emily White	Company: Golder	Date/Time: 05/03/16 1615	Received by: [signature]	Company: TA-SAV	Date/Time: 5-4-16 9:15
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Form No. CA-C-WI-002, Rev. 4.3, dated 12/05/2013

TestAmerica Savannah
5102 LaRoche Avenue

Savannah, GA 31404
phone 912.354.7858 fax

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Regulatory Program: ☐DW ☐NPDES ☑RCRA ☐Other:

TestAmerica Laboratories, Inc.

Client Contact	Project Manager: Amanda Derhake	Site Contact: Emily White	Date: 05/04/16	COC No:
Golder Associates Inc.	Tel/Fax: 636-724-9191	Lab Contact: Michele Kersey	Carrier: FedEx	1 of 1 COCs
820 South Main Street	Analysis Turnaround Time			Sampler: E. White
St. Charles, MO 63301	☑ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
(636) 724-9191 Phone	TAT if different from Below Standard			Walk-in Client:
(636) 724-9323 FAX	☑ 2 weeks			Lab Sampling:
Project Name: 2Q16 LTM GW Sampling-1403345	☐ 1 week			Job / SDG No :
Site: Solutia WG Krummrich Facility	☐ 2 days			
P O # 42262863	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	VOCs by 8260	Total Fe/Mn by 6010C	Alk/CO2 by 310.1	Chloride by 325.2/Sulfate by 375.4	Dissolved Gases by RSK 175	Nitrate by 353.2	TOC by 415.1	Dissolved Fe/Mn by 6010C	DOC by 415.1	Sample Specific Notes:
CPA-MW-3D-0516	05/04/16	0918	G	W	14	N		3	1	1	1	3	2	3			2 coolers
CPA-MW-3D-F(0.2)-0516	"	0918	"	"	4	Y									1	3	
CPA-MW-3D-0516-AD	"	0918	"	"	3	N		3									
BSA-MW-2D-0516	"	1012	"	"	14	N		3	1	1	1	3	2	3			
BSA-MW-2D-F(0.2)-0516	"	1012	"	"	4	Y									1	3	
CPA-MW-1D-0516	"	1122	"	"	14	N		3	1	1	1	3	2	3			
CPA-MW-1D-F(0.2)-0516	"	1122	"	"	4	Y									1	3	
CPA-MW-2D-0516	"	1249	"	"	14	N		3	1	1	1	3	2	3			
CPA-MW-2D-F(0.2)-0516	"	1249	"	"	4	Y									1	3	
CPA-MW-2D-0516-AD	"	1249	"	"	3	N		3									
BSA-MW-1S-0516	"	1346	"	"	14	N		3	1	1	1	3	2	3			
BSA-MW-1S-F(0.2)-0516	"	1346	"	"	4	Y									1	3	
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other								2	4	1	1	2	1,3	3	4	3	

680-124913 Chain of Custody

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if s

☐ Return to Client ☑ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments:
VOC headspace upon sampling. Yes/No

680-124913 1.1 1.4

Custody Seals Intact. ☐ Yes ☐ No	Custody Seal No.: 6986691698670	Cooler Temp. (°C): Obs'd: 3.1 Corr'd 3.4	Therm ID No.:
Relinquished by: Emily White	Company: Golder	Date/Time: 05/04/16 1550	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company: TA	Date/Time: 5/5/16 09:25

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Page 42 of 45

TestAmerica Savannah
5102 LaRoche Avenue

Savannah GA 31404
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Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Regulatory Program: ☐ DW ☐ NPDES ☑ RCRA ☐ Other:

Client Contact	Project Manager: Amanda Derhake	Site Contact: Emily White	Date: 05/04/16	COC No:
Golder Associates Inc.	Tel/Fax: 636-724-9191	Lab Contact: Michele Kersey	Carrier: FedEx	2 of 2 COCs
820 South Main Street	Analysis Turnaround Time			Sampler: E. White
St. Charles, MO 63301	☑ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
(636) 724-9191 Phone	TAT if different from Below Standard			Walk-in Client:
(636) 724-9323 FAX	☑ 2 weeks			Lab Sampling:
Project Name: 2Q16 LTM GW Sampling-1403345	☐ 1 week			
Site: Solutia WG Krummrich Facility	☐ 2 days			Job / SDG No.:
P O # 42262863	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y / N)	Perform MS / MSD (Y / N)	VOCs by 8260	Total Fe/Mn by 6010C	Alk/CO2 by 310.1	Chloride by 325.2/Sulfate by 375.4	Dissolved Gases by RSK 175	Nitrate by 353.2	TOC by 415.1	Dissolved Fe/Mn by 6010C	DOC by 415.1	Sample Specific Notes:
BSA-MW-1S-0516-EB	05/04/16	1420	G	W	3	N		3									
2Q16 LTM Trip Blank #3				W	2	N		2									
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other								2	4	1	1	2	1,3	3	4	3	

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☑ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments:
VOC headspace upon sampling: Yes/No

680-124913 1.1 1.4

Custody Seals Intact. ☐ Yes ☐ No	Custody Seal No.: 1098d09 / 098d10	Cooler Temp. (°C): Obs'd 3.1 Corr'd: 3.4	Therm ID No.:

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Emily White	Golder	05/04/16 15			
Relinquished by:	Company:	Date/Time:	Received by.	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
				TA	5/5/16 09:25

Form No. CA-C-WI-002, Rev. 4.3, dated 12/05/2013

APPENDIX C
QUALITY ASSURANCE REPORT

(On CD)

QUALITY ASSURANCE REPORT

QUALITY ASSURANCE REPORT

2nd QUARTER 2016
LONG-TERM MONITORING PROGRAM
SOLUTIA INC. W.G. KRUMMRICH FACILITY
SAUGET, ILLINOIS

Prepared For: Solutia Inc.
575 Maryville Centre Drive
St. Louis, MO 63141 USA

Submitted By: Golder Associates Inc.
820 S. Main Street, Suite 100
St. Charles, MO 63301 USA

July 2016 **140-3345**

A world of capabilities delivered locally

Golder Associates

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1.0 INTRODUCTION

Golder Associates Inc. (Golder) completed a review of analytical data for the groundwater samples collected May 2 through May 4, 2016 at the Solutia Inc. (Solutia) W.G. Krummrich (WGK) facility (Site) in Sauget, Illinois. Golder collected a total of twenty one (21) samples from groundwater monitoring wells and piezometers as part of the 2nd Quarter 2016 (2Q16) Long-Term Monitoring Program (LTMP). Fifteen (15) groundwater samples, three (3) trip blanks, two (2) equipment blanks (EB), two (2) analytical duplicates (AD), and one (1) matrix spike/matrix spike duplicate (MS/MSD) pair were prepared. Groundwater monitoring locations were located at the WGK facility or approximately 1.0 to 1.5 miles north of the Site. The samples were submitted to the TestAmerica Laboratories, Inc. (TestAmerica) facility located in Savannah, Georgia for analysis using United States Environmental Protection Agency (USEPA) methods, standard methods and USEPA SW-846 test methods. Samples submitted to TestAmerica were analyzed for volatile organic compounds (VOCs), total and dissolved metals, dissolved gases, and general chemistry parameters. The analytical results were placed into three (3) sample delivery groups (SDGs) and described in the table below:

Sample Delivery Group (SDG)	Sample Identification
KPS166	PM1D-0516
	GWE-2D-0516
	ESL-MW-D1-0516
	GWE-3D-0516
	2Q16 LTM Trip Blank #1
KPS167	GWE-5D-0516
	CPA-MW-5D-0516
	BSA-MW-5D-0516
	CPA-MW-4D-0516
	BSA-MW-4D-0516
	BSA-MW-3D-0516
	BSA-MW-3D-0516-EB
	2Q16 LTM Trip Blank #2
KPS168	CPA-MW-3D-0516
	CPA-MW-3D-0516-AD
	BSA-MW-2D-0516
	CPA-MW-1D-0516
	CPA-MW-2D-0516
	CPA-MW-2D-0516-AD
	BSA-MW-1S-0516
	BSA-MW-1S-0516-EB
	2Q16 LTM Trip Blank #3

The samples were collected and analyzed in general accordance with the Revised Long-Term Monitoring Program (LTMP) Work Plan (Work Plan) (Solutia 2009). Groundwater samples were analyzed for VOCs, total and dissolved metals, dissolved gases, and general chemistry parameters. The general chemistry parameters included chloride, nitrate, sulfate, total organic carbon (TOC), alkalinity, carbon dioxide, and dissolved organic carbon (DOC). Three (3) trip blanks, two (2) EBs, two (2) ADs, and one (1) MS/MSD pairs were submitted and analyzed for VOC analysis. The following analytical methods used are from USEPA document SW-846, Test Methods for Evaluating Solid Waste, Revision 6 contained in Final Update III August 2002 and listed below:

- VOCs were analyzed using USEPA SW-846 Method 8260B Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)
- Total and Dissolved Iron and Manganese were analyzed by USEPA SW-846 Method 6010C Inductively Coupled Plasma-Atomic Emission Spectrometry

The following standard methods were used to analyze monitored natural attenuation (MNA) parameters:

- Dissolved Gases analyzed by Method RSK-175
- Alkalinity and Free Carbon Dioxide analyzed by USEPA Method 310.1 by Titration
- Chloride analyzed by USEPA Method 325.2 by Automated Colorimetry
- Nitrogen, Nitrate analyzed by USEPA Method 353.2 by Automated Colorimetry
- Sulfate analyzed by USEPA Method 375.4 by Spectrophotometer
- Total and Dissolved Organic Carbon analyzed by USEPA Method 415.1

Golder completed validation of the analytical data following the general guidelines in Section 4.4 Data Review and Validation of the Work Plan. The Work Plan specifies that the most recent versions of the national data validation guidelines be used for data review. The following guidelines were generally used:

- USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, EPA-540-R-08-01, June 2008
- USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, EPA 540-R-10-011, January 2010

These documents are hereafter referred to as the "functional guidelines". If there was a conflict between the functional guidelines and the quality control criteria specified in the analytical method, the method-specific criteria were used. The SDGs were prepared as a Level IV data report package containing quality control information and raw data. Golder completed Level III review of 100% of the analytical data and Level IV review of 10% of the analytical data.

Data that has been qualified by the data validator has been added to the laboratory report. The qualifiers indicate data that did not meet acceptance criteria and corrective actions were not successful or not performed. Laboratory data qualifiers are defined below:

- U – The analyte was analyzed for but not was not detected

- 4 – The analyte present in the original sample is greater than 4 times the matrix spike concentration for the MS/MSD; therefore, control limits are not applicable.
- F1 – MS/MSD Recovery is outside acceptance limits

Golder data qualifiers are defined below:

- D – The analyte was analyzed at a dilution

Sections 2 and 3 summarize the specific instances where quality control criteria in the functional guidelines were not met. As specified in the functional guidelines, if the non-adherence to quality control criteria is slight, professional judgment was used in qualification of the data. However, if the non-adherence is significant, qualification and rejection of the data may be necessary. A summary of qualified data is provided in Section 5.0.

2.0 VOLATILE ORGANIC COMPOUNDS

Samples were collected from fifteen (15) groundwater monitoring locations and analyzed for VOCs. Analytical duplicate samples were collected from two (2) sampling locations, CPA-MW-2D and CPA-MW-3D. Two (2) EBs and three (3) trip blanks were also prepared and shipped for laboratory analysis. The samples were submitted to TestAmerica, placed into three (3) data packages or SDGs (KPS166, KPS167, and KPS168) and were prepared and analyzed using SW-846 Method 8260B. Samples were validated in general accordance with the functional guidelines. Results of the validation are summarized below.

2.1 Receipt Condition and Sample Holding Times

The SDG Case Narrative, chain-of-custody, login sample receipt checklist, and analysis dates were reviewed to verify analytical method holding times and proper preservation upon sampling. A summary of affected SDGs is provided below.

KPS167 and KPS168 – Samples were received at temperatures below the 4°C+/-2°C criteria. The samples were otherwise received in good condition and data qualification was not required.

2.2 Blanks

Laboratory and field blanks, including trip blanks, method blanks and equipment blanks are prepared and analyzed to determine if contamination occurred as a result of laboratory or field activities.

Three (3) laboratory prepared trip blanks were shipped and analyzed for VOCs during the 2Q16 event to evaluate whether cross contamination occurred during sample shipment. Results for contaminants of concern for the received trip blanks were non-detect.

Laboratory method blanks were performed for each laboratory system as outlined for each analytical method to evaluate whether cross contamination occurred during laboratory analysis activities. Results for the method blanks were non-detect.

Two (2) EBs were collected during the 2Q16 event to assess the effectiveness of the decontamination procedure. Detections were noted in the following EB:

- BSA-MW-1S-0516-EB (SDG KPS168): benzene at 520 µg/L and chlorobenzene at 6.0 µg/L

The samples associated with the EBs were not qualified based on the 5Xs concentration criteria.

2.3 Surrogate Spike Recoveries

Samples to be analyzed for VOCs were spiked with surrogate compounds: 4-bromofluorobenzene, 1,2-dichloroethane-d4, dibromofluoromethane, and toluene-d8, prior to analysis, to evaluate overall laboratory performance. Surrogate recoveries were within control limits.

2.4 Laboratory Control Sample Recoveries

A laboratory control sample (LCS) is analyzed on each laboratory system to evaluate the analytical method accuracy and laboratory performance. LCS recoveries were within acceptance criteria.

2.5 Matrix Spike/Matrix Spike Duplicate (MS/MSD) Samples

MS/MSD samples are analyzed to determine long term precision and accuracy of the analytical method on various matrices. One (1) MS/MSD pair is sampled for every twenty (20) field samples. One (1) MS/MSD pair was collected during the 2Q16 event associated with sample BSA-MW-5D. Some MS/MSD data for these samples was outside acceptance criteria. Since MS/MSD data alone cannot be used to evaluate the precision and accuracy of data, data qualification was not required.

2.6 Analytical Duplicates

One (1) AD is collected for every ten (10) field samples to determine the overall precision of field and laboratory methods. Two (2) ADs were collected during the 2Q16 event associated with samples CPA-MW-2D and CPA-MW-3D. The relative percent difference (RPD) between the samples and the associated ADs did not exceed 25%; therefore, data qualification was not required.

2.7 Internal Standard Responses

Internal standard performance criteria ensure that GC/MS sensitivity and response are stable during each analysis. Internal standard area counts did not vary by more than a factor of two (2) from the associated 12 hour calibration standard. Internal standard retention times did not vary more than +/-30 seconds from the retention time of the associated 12 hour calibration standard. Data qualification was not required.

2.8 Results Reported From Dilutions

Several VOC samples required dilutions due to high levels of target analytes. Reporting limits were adjusted to reflect the dilution. Result qualifications are shown in Section 5.0.

3.0 INORGANICS AND GENERAL CHEMISTRY

Samples were collected from fifteen (15) groundwater monitoring locations and analyzed for inorganics and general chemistry. The samples were submitted to TestAmerica, placed into three (3) data packages or SDGs (KPS166, KPS167, and KPS168), and were prepared and analyzed using the following methods:

- Total and Dissolved Iron and Manganese analyzed by Method 6010C Inductively Coupled Plasma-Atomic Emission Spectrometry
- Dissolved Gases analyzed by Method RSK-175
- Alkalinity and Free Carbon Dioxide analyzed by USEPA Method 310.1 by Titration
- Chloride analyzed by USEPA Method 325.2 by Automated Colorimetry
- Nitrogen, Nitrate analyzed by USEPA Method 353.2 by Automated Colorimetry
- Sulfate analyzed by USEPA Method 375.4 by Spectrophotometer
- Total and Dissolved Organic Carbon analyzed by USEPA Method 415.1

Samples were validated in general accordance with the functional guidelines. Results of the validation are summarized below.

3.1 Receipt Condition and Sample Holding Times

The SDG Case Narrative, chain-of-custody, login sample receipt checklist, and analysis dates were reviewed to verify analytical method holding times and proper preservation upon sampling. A summary of affected SDGs is provided below.

KPS167 and KPS168 – Samples were received at temperatures below the 4°C+/-2°C criteria. The samples were otherwise received in good condition and data qualification was not required.

3.2 Blanks

Laboratory method blanks are prepared and analyzed to determine if contamination occurred as a result of laboratory activities.

Laboratory method blanks were performed for each laboratory system as outlined for each analytical method to evaluate whether cross contamination occurred during laboratory analysis activities. Results for the method blanks were non-detect.

3.3 Laboratory Control Sample Recoveries

A LCS is analyzed on each laboratory system to evaluate the analytical method accuracy and laboratory performance. LCS recoveries were within acceptance criteria; therefore, data qualification was not required.

3.4 Matrix Spike/Matrix Spike Duplicate (MS/MSD) Samples

MS/MSD samples are analyzed to determine long term precision and accuracy of the analytical method on various matrices. Although MS/MSD analysis was not required for inorganic and general chemistry per the Work Plan, the laboratory spiked groundwater samples BSA-MW-2D, BSA-MW-4D, and BSA-MW-5D, for various analytes. Some MS/MSD data for these samples was outside acceptance criteria. Since MS/MSD data alone cannot be used to evaluate the precision and accuracy of data, data qualification was not required for associated samples.

3.5 Results Reported From Dilutions

Samples in each SDG required dilutions due to high levels of target analytes. Reporting limits were adjusted to reflect the dilution. Result qualifications are shown in Section 5.0.

4.0 SUMMARY

Golder validated the data collected during the 2Q16 sampling event from the Solutia Inc. WGK facility in general accordance with the Work Plan and USEPA functional guidelines. Although some data required qualifications due to quality control criteria that were not achieved, the data were deemed usable. Where a positive result was qualified as estimated, the analyte should be considered present. Similarly, a result that was qualified as an estimated reporting limit should be considered not present for the purposes of this program, although the limit itself may not be precise. The completeness for the entire data set was 100%.

Qualification Summary Table

Quality Control Issue	Compound(s)	Qualifier	Samples Affected
Compounds analyzed at a dilution	Benzene, Chlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, Chloride, Sulfate	D	PM1D, ESL-MW-D1, GWE-2D, GWE-3D, GWE-5D, BSA-MW-1S, BSA-MW-1S-EB, BSA-MW-2D, BSA-MW-3D, BSA-MW-4D, BSA-MW-5D, CPA-MW-1D, CPA-MW-2D, CPA-MW-2D-AD, CPA-MW-3D, CPA-MW-4D, CPA-MW-5D

5.0 REFERENCES

Solutia Inc., 2009. Revised Long Term Monitoring Program Work Plan, Solutia Inc., W.G. Krummrich Facility, Sauget, Illinois, May 2009.

USEPA, 2010. Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review.

USEPA, 2008. Contract Laboratory Program national Functional Guidelines for Superfund Organic Methods Data Review.

APPENDIX D
GROUNDWATER ANALYTICAL RESULTS
(INCLUDING DATA VALIDATION REPORTS)

(On CD)

Level IV Data Validation Summary
Solutia Inc., W.G. Krummrich, Sauget, Illinois
2Q16 Long-Term Monitoring Program

Company Name: Golder Associates
Project Name: WGK-2Q16 LTM
Reviewer: A. Derhake
Laboratory: TestAmerica
SDG#: KPS166
Matrix: Water

Project Manager: A. Derhake
Project Number: 140-3345
Sample Date: May 2016

Analytical Method: VOC (8260B), Dissolved Gases (RSK-175), Metals (6010C), Alkalinity (310.1), Chloride (325.2), Nitrogen, Nitrate-Nitrite (353.2), Sulfate (375.4), TOC (415.1), and DOC (415.1)

Sample Names: PM1D-0516, PM1D-F(0.2)-0516, ESL-MW-D1-0516, ESL-MW-D1-F(0.2)-0516, GWE-2D-0516, GWE-2D-F(0.2)-0516, GWE-3D-0516, GWE-3D-F(0.2)-0516, 2Q16 LTM Trip Blank #1

Field Information	**YES**	**NO**	**NA**
a) Sampling dates noted?	☒	☐	☐
b) Does the laboratory narrative indicate deficiencies?	☒	☐	☐

Comments:

VOC: Insufficient volume to perform MS/MSD associated with batch 433123. Samples GWE-2D-0516, GWE-3D-0516, and ESL-MW-D1-0516 required dilution prior to analysis, reporting limits were adjusted accordingly.

Dissolved Gases: No deficiencies noted.

Metals: No deficiencies noted.

Alkalinity: No deficiencies noted.

Chloride: Samples PM1D-0516, ESL-MW-D1-0516, GWE-2D-0516, and GWE-3D-0516 required dilution prior to analysis, reporting limits were adjusted accordingly.

Nitrate-Nitrite as Nitrogen: No deficiencies noted.

Sulfate: Samples PM1D-0516, ESL-MW-D1-0516, GWE-2D-0516, and GWE-3D-0516 required dilution prior to analysis, reporting limits were adjusted accordingly.

TOC: No deficiencies noted.

DOC: No deficiencies noted.

Chain-of-Custody (COC)	**YES**	**NO**	**NA**
a) Was the COC signed by both field and laboratory personnel?	☒	☐	☐
b) Were samples received in good condition?	☒	☐	☐

Comments: Samples were received at 3.6°C, within the 4°C +/- 2°C criteria.

General	YES	NO	NA
a) Were hold times met for sample analysis?	☒	☐	☐
b) Were the correct preservatives used?	☒	☐	☐
c) Was the correct method used?	☒	☐	☐
d) Any sample dilutions noted?	☒	☐	☐

Comments: Detections in diluted analysis were qualified.

GC/MS Instrument Performance Check (IPC) and Internal Standards (IS)	YES	NO	NA
a) IPC analyzed at the appropriate frequency and met the appropriate standards?	☒	☐	☐
b) Does BFB meet the ion abundance criteria?	☒	☐	☐
c) Internal Standard retention times and areas met appropriate criteria?	☒	☐	☐

Comments: None

Calibrations	YES	NO	NA
a) Initial calibration analyzed at the appropriate frequency and met the appropriate standards?	☐	☒	☐
b) Continuing calibrations analyzed at the appropriate frequency and met the appropriate standards?	☐	☒	☐
c) Initial calibration verifications and blanks analyzed at the appropriate frequency and met the appropriate standards?	☒	☐	☐
d) Continuing calibration verifications and blanks analyzed at the appropriate frequency and met the appropriate standards?	☒	☐	☐

Comments: Analytes of interest met calibration standards.

Blanks	YES	NO	NA
a) Were blanks (trip, equipment, method) performed at required frequency?	☒	☐	☐
b) Were analytes detected in any blanks?	☐	☒	☐

Comments: None.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)	YES	NO	NA
a) Was MS/MSD accuracy criteria met?	☐	☐	☒
b) Was MS/MSD precision criteria met?	☐	☐	☒

Comments: None

Laboratory Control Sample (LCS)	YES	NO	NA
a) LCS analyzed at the appropriate frequency and met appropriate standards?	☒	☐	☐

Comments: None

Surrogate (System Monitoring) Compounds	YES	NO	NA
a) Surrogate compounds analyzed at the appropriate frequency and met appropriate standards?	☒	☐	☐

Comments: None

Duplicates	**YES**	**NO**	**NA**
a) Were field duplicates collected?	☐	☒	☐
b) Was field duplicate precision criteria met?	☐	☐	☒

Comments: None.

Additional Comments: None

Qualifications:

Quality Control Issue	Compound(s)	Qualifier	Samples Affected
Compounds analyzed at a dilution	Benzene, Chlorobenzene, 1,2-Dichlorobenzene, 1,4-Dichlorobenzene, Chloride, and Sulfate	D	PM1D, ESL-MW-D1, GWE-2D, GWE-3D

SDG KPS166

Sample Results from:

GWE-2D
GWE-3D
PM1D
ESL-MW-D1

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Tel: (912)354-7858

TestAmerica Job ID: 680-124756-1
TestAmerica Sample Delivery Group: KPS166
Client Project/Site: 2Q16 LTM GW Sampling - 1403345

For:
Solutia Inc.
575 Maryville Centre Dr.
Saint Louis, Missouri 63141

Attn: Mr. Jerry Rinaldi

Michele R Kersey

Authorized for release by:
5/18/2016 12:31:02 PM

Michele Kersey, Project Manager I
(912)354-7858
michele.kersey@testamericainc.com

AWD 5/20/16

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AWD
5/20/16

Job ID: 680-124756-1

Laboratory: TestAmerica Savannah

Narrative

CASE NARRATIVE

Client: Solutia Inc.

Project: 2Q16 LTM GW Sampling - 1403345

Report Number: 680-124756-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In the event of interference or analytes present at high concentrations, samples may be diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

RECEIPT
The samples were received on 5/3/2016 9:32 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.6° C.

VOLATILE ORGANIC COMPOUNDS (GC-MS)
Samples GWE-2D-0516 (680-124756-1), GWE-3D-0516 (680-124756-3), PM1D-0516 (680-124756-5), ESL-MW-D1-0516 (680-124756-7) and 2Q16 LTM Trip Blank #1 (680-124756-9) were analyzed for Volatile Organic Compounds (GC-MS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 05/13/2016 and 05/16/2016.

Samples GWE-2D-0516 (680-124756-1)[5X], GWE-3D-0516 (680-124756-3)[10X] and ESL-MW-D1-0516 (680-124756-7)[2X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with 680-433123.

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with analytical batch 680-433433.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

DISSOLVED GASES
Samples GWE-2D-0516 (680-124756-1), GWE-3D-0516 (680-124756-3), PM1D-0516 (680-124756-5) and ESL-MW-D1-0516 (680-124756-7) were analyzed for dissolved gases in accordance with RSK-175. The samples were analyzed on 05/13/2016.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

METALS (ICP)
Samples GWE-2D-F (0.2)-0516 (680-124756-2), GWE-3D-F (0.2)-0516 (680-124756-4), PM1D-F (0.2)-0516 (680-124756-6) and ESL-MW-D1-F (0.2)-0516 (680-124756-8) were analyzed for Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared and analyzed on 05/05/2016.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

METALS (ICP)
Samples GWE-2D-0516 (680-124756-1), GWE-3D-0516 (680-124756-3), PM1D-0516 (680-124756-5) and ESL-MW-D1-0516 (680-124756-7) were analyzed for Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared and analyzed on 05/05/2016.

MWP 5/20/16
TestAmerica Savannah

Job ID: 680-124756-1 (Continued)

Laboratory: TestAmerica Savannah (Continued)

on 05/05/2016.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

ALKALINITY
Samples GWE-2D-0516 (680-124756-1), GWE-3D-0516 (680-124756-3), PM1D-0516 (680-124756-5) and ESL-MW-D1-0516 (680-124756-7) were analyzed for alkalinity in accordance with EPA Method 310.1. The samples were analyzed on 05/10/2016 and 05/13/2016.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

CHLORIDE
Samples GWE-2D-0516 (680-124756-1), GWE-3D-0516 (680-124756-3), PM1D-0516 (680-124756-5) and ESL-MW-D1-0516 (680-124756-7) were analyzed for Chloride in accordance with EPA Method 325.2. The samples were analyzed on 05/10/2016 and 05/13/2016.

Samples GWE-2D-0516 (680-124756-1)[20X], GWE-3D-0516 (680-124756-3)[20X], PM1D-0516 (680-124756-5)[2X] and ESL-MW-D1-0516 (680-124756-7)[2X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

NITRATE-NITRITE AS NITROGEN
Samples GWE-2D-0516 (680-124756-1), GWE-3D-0516 (680-124756-3), PM1D-0516 (680-124756-5) and ESL-MW-D1-0516 (680-124756-7) were analyzed for nitrate-nitrite as nitrogen in accordance with EPA Method 353.2. The samples were analyzed on 05/03/2016.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

SULFATE
Samples GWE-2D-0516 (680-124756-1), GWE-3D-0516 (680-124756-3), PM1D-0516 (680-124756-5) and ESL-MW-D1-0516 (680-124756-7) were analyzed for sulfate in accordance with EPA Method 375.4. The samples were analyzed on 05/10/2016.

Samples GWE-2D-0516 (680-124756-1)[50X], GWE-3D-0516 (680-124756-3)[10X], PM1D-0516 (680-124756-5)[20X] and ESL-MW-D1-0516 (680-124756-7)[20X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL ORGANIC CARBON
Samples GWE-2D-0516 (680-124756-1), GWE-3D-0516 (680-124756-3), PM1D-0516 (680-124756-5) and ESL-MW-D1-0516 (680-124756-7) were analyzed for total organic carbon in accordance with EPA Method 415.1. The samples were analyzed on 05/10/2016.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

DISSOLVED ORGANIC CARBON (DOC)
Samples GWE-2D-F (0.2)-0516 (680-124756-2), GWE-3D-F (0.2)-0516 (680-124756-4), PM1D-F (0.2)-0516 (680-124756-6) and ESL-MW-D1-F (0.2)-0516 (680-124756-8) were analyzed for Dissolved Organic Carbon (DOC) in accordance with EPA Method 415.1. The samples were analyzed on 05/03/2016.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

AWO 5/20/16
TestAmerica Savannah

Sample Summary

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124756-1
SDG: KPS166

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
680-124756-1	GWE-2D-0516	Water	05/02/16 10:52	05/03/16 09:32
680-124756-2	GWE-2D-F (0.2)-0516	Water	05/02/16 10:52	05/03/16 09:32
680-124756-3	GWE-3D-0516	Water	05/02/16 12:00	05/03/16 09:32
680-124756-4	GWE-3D-F (0.2)-0516	Water	05/02/16 12:00	05/03/16 09:32
680-124756-5	PM1D-0516	Water	05/02/16 13:50	05/03/16 09:32
680-124756-6	PM1D-F (0.2)-0516	Water	05/02/16 13:50	05/03/16 09:32
680-124756-7	ESL-MW-D1-0516	Water	05/02/16 14:45	05/03/16 09:32
680-124756-8	ESL-MW-D1-F (0.2)-0516	Water	05/02/16 14:45	05/03/16 09:32
680-124756-9	2Q16 LTM Trip Blank #1	Water	05/02/16 00:00	05/03/16 09:32

AWD 5/20/16
TestAmerica Savannah

Method Summary

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124756-1
SDG: KPS166

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL SAV
RSK-175	Dissolved Gases (GC)	RSK	TAL SAV
6010C	Metals (ICP)	SW846	TAL SAV
310.1	Alkalinity	MCAWW	TAL SAV
325.2	Chloride	MCAWW	TAL SAV
353.2	Nitrogen, Nitrate-Nitrite	MCAWW	TAL SAV
375.4	Sulfate	MCAWW	TAL SAV
415.1	TOC	MCAWW	TAL SAV
415.1	DOC	MCAWW	TAL SAV

Protocol References:

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

RSK = Sample Prep And Calculations For Dissolved Gas Analysis In Water Samples Using A GC Headspace Equilibration Technique, RSKSOP-175, Rev. 0, 8/11/94, USEPA Research Lab

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

AWD 5/20/16

TestAmerica Savannah

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

GC VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Metals

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

General Chemistry

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

MWD 5/20/16

TestAmerica Savannah

Detection Summary

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124756-1
SDG: KPS166

Client Sample ID: GWE-2D-0516 — Lab Sample ID: 680-124756-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chlorobenzene - DL	520	D	5.0		ug/L	5		8260B	Total/NA
Methane	57		0.58		ug/L	1		RSK-175	Total/NA
Iron	40		0.050		mg/L	1		6010C	Total Recoverable
Manganese	0.98		0.010		mg/L	1		6010C	Total Recoverable
Chloride	940	D	20		mg/L	20		325.2	Total/NA
Sulfate	1100	D	250		mg/L	50		375.4	Total/NA
Total Organic Carbon	4.6		1.0		mg/L	1		415.1	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Alkalinity	420		5.0		mg/L	1		310.1	Total/NA
Carbon Dioxide, Free	110		5.0		mg/L	1		310.1	Total/NA

Client Sample ID: GWE-2D-F (0.2)-0516 — Lab Sample ID: 680-124756-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron, Dissolved	40		0.050		mg/L	1		6010C	Dissolved
Manganese, Dissolved	0.97		0.010		mg/L	1		6010C	Dissolved
Dissolved Organic Carbon	6.0		1.0		mg/L	1		415.1	Dissolved

Client Sample ID: GWE-3D-0516 — Lab Sample ID: 680-124756-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	25	D	10		ug/L	10		8260B	Total/NA
Chlorobenzene	1300	D	10		ug/L	10		8260B	Total/NA
1,4-Dichlorobenzene	85	D	10		ug/L	10		8260B	Total/NA
Methane	83		0.58		ug/L	1		RSK-175	Total/NA
Iron	26		0.050		mg/L	1		6010C	Total Recoverable
Manganese	0.81		0.010		mg/L	1		6010C	Total Recoverable
Chloride	950	D	20		mg/L	20		325.2	Total/NA
Sulfate	230	D	50		mg/L	10		375.4	Total/NA
Total Organic Carbon	5.0		1.0		mg/L	1		415.1	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Alkalinity	450		5.0		mg/L	1		310.1	Total/NA
Carbon Dioxide, Free	29		5.0		mg/L	1		310.1	Total/NA

Client Sample ID: GWE-3D-F (0.2)-0516 — Lab Sample ID: 680-124756-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron, Dissolved	27		0.050		mg/L	1		6010C	Dissolved
Manganese, Dissolved	0.84		0.010		mg/L	1		6010C	Dissolved
Dissolved Organic Carbon	8.4		1.0		mg/L	1		415.1	Dissolved

Client Sample ID: PM1D-0516 — Lab Sample ID: 680-124756-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chlorobenzene	28		1.0		ug/L	1		8260B	Total/NA
Methane	51		0.58		ug/L	1		RSK-175	Total/NA

This Detection Summary does not include radiochemical test results.

MWD 5/20/16
TestAmerica Savannah

Detection Summary

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124756-1
SDG: KPS166

Client Sample ID: PM1D-0516 (Continued)

Lab Sample ID: 680-124756-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron	14		0.050		mg/L	1		6010C	Total Recoverable
Manganese	0.43		0.010		mg/L	1		6010C	Total Recoverable
Chloride	88	D	2.0		mg/L	2		325.2	Total/NA
Sulfate	390	D	100		mg/L	20		375.4	Total/NA
Total Organic Carbon	2.6		1.0		mg/L	1		415.1	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Alkalinity	400		5.0		mg/L	1		310.1	Total/NA
Carbon Dioxide, Free	49		5.0		mg/L	1		310.1	Total/NA

Client Sample ID: PM1D-F (0.2)-0516

Lab Sample ID: 680-124756-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron, Dissolved	14		0.050		mg/L	1		6010C	Dissolved
Manganese, Dissolved	0.42		0.010		mg/L	1		6010C	Dissolved
Dissolved Organic Carbon	2.7		1.0		mg/L	1		415.1	Dissolved

Client Sample ID: ESL-MW-D1-0516

Lab Sample ID: 680-124756-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chlorobenzene	200	D	2.0		ug/L	2		8260B	Total/NA
1,2-Dichlorobenzene	2.6	D	2.0		ug/L	2		8260B	Total/NA
1,4-Dichlorobenzene	26	D	2.0		ug/L	2		8260B	Total/NA
Methane	48		0.58		ug/L	1		RSK-175	Total/NA
Iron	13		0.050		mg/L	1		6010C	Total Recoverable
Manganese	0.39		0.010		mg/L	1		6010C	Total Recoverable
Chloride	90	D	2.0		mg/L	2		325.2	Total/NA
Sulfate	490	D	100		mg/L	20		375.4	Total/NA
Total Organic Carbon	2.9		1.0		mg/L	1		415.1	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Alkalinity	390		5.0		mg/L	1		310.1	Total/NA
Carbon Dioxide, Free	49		5.0		mg/L	1		310.1	Total/NA

Client Sample ID: ESL-MW-D1-F (0.2)-0516

Lab Sample ID: 680-124756-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron, Dissolved	13		0.050		mg/L	1		6010C	Dissolved
Manganese, Dissolved	0.40		0.010		mg/L	1		6010C	Dissolved
Dissolved Organic Carbon	3.1		1.0		mg/L	1		415.1	Dissolved

Client Sample ID: 2Q16 LTM Trip Blank #1

Lab Sample ID: 680-124756-9

No Detections.

This Detection Summary does not include radiochemical test results.

AWD 5/20/16
TestAmerica Savannah

Client Sample Results

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124756-1
SDG: KPS166

Client Sample ID: GWE-2D-0516
Date Collected: 05/02/16 10:52
Date Received: 05/03/16 09:32

Lab Sample ID: 680-124756-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	1.0	U	1.0		ug/L			05/13/16 12:12	1
1,2-Dichlorobenzene	1.0	U	1.0		ug/L			05/13/16 12:12	1
1,3-Dichlorobenzene	1.0	U	1.0		ug/L			05/13/16 12:12	1
1,4-Dichlorobenzene	1.0	U	1.0		ug/L			05/13/16 12:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*97*		*70 - 130*		*05/13/16 12:12*	*1*
1,2-Dichloroethane-d4 (Surr)	*94*		*70 - 130*		*05/13/16 12:12*	*1*
Dibromofluoromethane (Surr)	*100*		*70 - 130*		*05/13/16 12:12*	*1*
4-Bromofluorobenzene (Surr)	*94*		*70 - 130*		*05/13/16 12:12*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS) - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorobenzene	520	D	5.0		ug/L			05/13/16 18:07	5

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*106*		*70 - 130*		*05/13/16 18:07*	*5*
1,2-Dichloroethane-d4 (Surr)	*113*		*70 - 130*		*05/13/16 18:07*	*5*
Dibromofluoromethane (Surr)	*116*		*70 - 130*		*05/13/16 18:07*	*5*
4-Bromofluorobenzene (Surr)	*102*		*70 - 130*		*05/13/16 18:07*	*5*

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	1.1	U	1.1		ug/L			05/13/16 20:47	1
Ethylene	1.0	U	1.0		ug/L			05/13/16 20:47	1
Methane	57		0.58		ug/L			05/13/16 20:47	1

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	40		0.050		mg/L		05/05/16 08:14	05/05/16 23:01	1
Manganese	0.98		0.010		mg/L		05/05/16 08:14	05/05/16 23:01	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	940	D	20		mg/L			05/13/16 12:13	20
Nitrate as N	0.050	U	0.050		mg/L			05/03/16 15:40	1
Sulfate	1100	D	250		mg/L			05/10/16 17:07	50
Total Organic Carbon	4.6		1.0		mg/L			05/10/16 04:28	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	420		5.0		mg/L			05/13/16 07:33	1
Carbon Dioxide, Free	110		5.0		mg/L			05/13/16 07:33	1

AWD 5/20/16
TestAmerica Savannah

Client Sample Results

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124756-1
SDG: KPS166

Client Sample ID: GWE-2D-F (0.2)-0516
Date Collected: 05/02/16 **10:52**
Date Received: 05/03/16 **09:32**

Lab Sample ID: 680-124756-2
Matrix: Water

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron, Dissolved	40		0.050		mg/L		05/05/16 08:14	05/05/16 23:05	1
Manganese, Dissolved	0.97		0.010		mg/L		05/05/16 08:14	05/05/16 23:05	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	5.0		1.0		mg/L			05/03/16 17:43	1

AWD
5/20/16
TestAmerica Savannah

Client Sample Results

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124756-1
SDG: KPS166

Client Sample ID: GWE-3D-0516

Date Collected: 05/02/16 12:00
Date Received: 05/03/16 09:32

Lab Sample ID: 680-124756-3

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	25	B	10		ug/L			05/13/16 15:22	10
Chlorobenzene	1300	B	10		ug/L			05/13/16 15:22	10
1,2-Dichlorobenzene	10	U	10		ug/L			05/13/16 15:22	10
1,3-Dichlorobenzene	10	U	10		ug/L			05/13/16 15:22	10
1,4-Dichlorobenzene	85	D	10		ug/L			05/13/16 15:22	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*88*		*70 - 130*		*05/13/16 15:22*	*10*
1,2-Dichloroethane-d4 (Surr)	*121*		*70 - 130*		*05/13/16 15:22*	*10*
Dibromofluoromethane (Surr)	*122*		*70 - 130*		*05/13/16 15:22*	*10*
4-Bromofluorobenzene (Surr)	*81*		*70 - 130*		*05/13/16 15:22*	*10*

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	1.1	U	1.1		ug/L			05/13/16 21:00	1
Ethylene	1.0	U	1.0		ug/L			05/13/16 21:00	1
Methane	83		0.58		ug/L			05/13/16 21:00	1

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	26		0.050		mg/L		05/05/16 08:14	05/05/16 23:09	1
Manganese	0.81		0.010		mg/L		05/05/16 08:14	05/05/16 23:09	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	950	D	20		mg/L			05/10/16 16:36	20
Nitrate as N	0.050	U D	0.050		mg/L			05/03/16 15:41	1
Sulfate	230	D	50		mg/L			05/10/16 17:05	10
Total Organic Carbon	5.0		1.0		mg/L			05/10/16 05:13	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	450		5.0		mg/L			05/10/16 19:42	1
Carbon Dioxide, Free	29		5.0		mg/L			05/10/16 19:42	1

AWD 5/20/16

TestAmerica Savannah

Client Sample Results

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124756-1
SDG: KPS166

Client Sample ID: GWE-3D-F (0.2)-0516
Date Collected: 05/02/16 **12:00**
Date Received: 05/03/16 **09:32**

Lab Sample ID: 680-124756-4
Matrix: Water

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron, Dissolved	27		0.050		mg/L		05/05/16 08:14	05/05/16 23:13	1
Manganese, Dissolved	0.84		0.010		mg/L		05/05/16 08:14	05/05/16 23:13	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	8.4		1.0		mg/L			05/03/16 18:00	1

AWD
5/20/16
TestAmerica Savannah

Client Sample Results

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124756-1
SDG: KPS166

Client Sample ID: PM1D-0516

Date Collected: 05/02/16 13:50
Date Received: 05/03/16 09:32

Lab Sample ID: 680-124756-5

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	1.0	U	1.0		ug/L			05/16/16 12:51	1
Chlorobenzene	28		1.0		ug/L			05/16/16 12:51	1
1,2-Dichlorobenzene	1.0	U	1.0		ug/L			05/16/16 12:51	1
1,3-Dichlorobenzene	1.0	U	1.0		ug/L			05/16/16 12:51	1
1,4-Dichlorobenzene	1.0	U	1.0		ug/L			05/16/16 12:51	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*101*		*70 - 130*		*05/16/16 12:51*	*1*
1,2-Dichloroethane-d4 (Surr)	*89*		*70 - 130*		*05/16/16 12:51*	*1*
Dibromofluoromethane (Surr)	*92*		*70 - 130*		*05/16/16 12:51*	*1*
4-Bromofluorobenzene (Surr)	*94*		*70 - 130*		*05/16/16 12:51*	*1*

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	1.1	U	1.1		ug/L			05/13/16 21:13	1
Ethylene	1.0	U	1.0		ug/L			05/13/16 21:13	1
Methane	51		0.58		ug/L			05/13/16 21:13	1

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	14		0.050		mg/L		05/05/16 08:14	05/05/16 23:16	1
Manganese	0.43		0.010		mg/L		05/05/16 08:14	05/05/16 23:16	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	88	D	2.0		mg/L			05/10/16 16:38	2
Nitrate as N	0.050	U	0.050		mg/L			05/03/16 15:42	1
Sulfate	390	D	100		mg/L			05/10/16 17:07	20
Total Organic Carbon	2.6		1.0		mg/L			05/10/16 05:29	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	400		5.0		mg/L			05/13/16 07:42	1
Carbon Dioxide, Free	49		5.0		mg/L			05/13/16 07:42	1

AWD 5/20/16

TestAmerica Savannah

Client Sample Results

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124756-1
SDG: KPS166

Client Sample ID: PM1D-F (0.2)-0516
Date Collected: 05/02/16 13:50
Date Received: 05/03/16 09:32

Lab Sample ID: 680-124756-6
Matrix: Water

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron, Dissolved	14		0.050		mg/L		05/05/16 08:14	05/05/16 23:20	1
Manganese, Dissolved	0.42		0.010		mg/L		05/05/16 08:14	05/05/16 23:20	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	2.7		1.0		mg/L			05/03/16 18:19	1

AWD
5/20/16
TestAmerica Savannah

Client Sample Results

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124756-1
SDG: KPS166

Client Sample ID: ESL-MW-D1-0516

Lab Sample ID: 680-124756-7

Date Collected: 05/02/16 14:45
Date Received: 05/03/16 09:32

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	2.0	U	2.0		ug/L			05/16/16 15:06	2
Chlorobenzene	200	D	2.0		ug/L			05/16/16 15:06	2
1,2-Dichlorobenzene	2.6	D	2.0		ug/L			05/16/16 15:06	2
1,3-Dichlorobenzene	2.0	U	2.0		ug/L			05/16/16 15:06	2
1,4-Dichlorobenzene	26	D	2.0		ug/L			05/16/16 15:06	2

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*100*		*70 - 130*		*05/16/16 15:06*	*2*
1,2-Dichloroethane-d4 (Surr)	*89*		*70 - 130*		*05/16/16 15:06*	*2*
Dibromofluoromethane (Surr)	*92*		*70 - 130*		*05/16/16 15:06*	*2*
4-Bromofluorobenzene (Surr)	*92*		*70 - 130*		*05/16/16 15:06*	*2*

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	1.1	U	1.1		ug/L			05/13/16 21:26	1
Ethylene	1.0	U	1.0		ug/L			05/13/16 21:26	1
Methane	48		0.58		ug/L			05/13/16 21:26	1

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	13		0.050		mg/L		05/05/16 08:14	05/05/16 23:24	1
Manganese	0.39		0.010		mg/L		05/05/16 08:14	05/05/16 23:24	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	90	D	2.0		mg/L			05/10/16 16:38	2
Nitrate as N	0.050	U	0.050		mg/L			05/03/16 15:44	1
Sulfate	490	D	100		mg/L			05/10/16 17:07	20
Total Organic Carbon	2.9		1.0		mg/L			05/10/16 07:31	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	390		5.0		mg/L			05/13/16 07:51	1
Carbon Dioxide, Free	49		5.0		mg/L			05/13/16 07:51	1

AWD
5/20/16
TestAmerica Savannah

Client Sample Results

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124756-1
SDG: KPS166

Client Sample ID: ESL-MW-D1-F (0.2)-0516
Date Collected: 05/02/16 14:45
Date Received: 05/03/16 09:32

Lab Sample ID: 680-124756-8
Matrix: Water

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron, Dissolved	13		0.050		mg/L		05/05/16 08:14	05/05/16 23:28	1
Manganese, Dissolved	0.40		0.010		mg/L		05/05/16 08:14	05/05/16 23:28	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	3.1		1.0		mg/L			05/03/16 18:35	1

AWD
5/20/16
TestAmerica Savannah

Client Sample Results

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124756-1
SDG: KPS166

Client Sample ID: 2Q16 LTM Trip Blank #1
Date Collected: 05/02/16 00:00
Date Received: 05/03/16 09:32

Lab Sample ID: 680-124756-9
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	1.0	U	1.0		ug/L			05/13/16 10:48	1
Chlorobenzene	1.0	U	1.0		ug/L			05/13/16 10:48	1
1,2-Dichlorobenzene	1.0	U	1.0		ug/L			05/13/16 10:48	1
1,3-Dichlorobenzene	1.0	U	1.0		ug/L			05/13/16 10:48	1
1,4-Dichlorobenzene	1.0	U	1.0		ug/L			05/13/16 10:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*97*		*70 - 130*		*05/13/16 10:48*	*1*
1,2-Dichloroethane-d4 (Surr)	*98*		*70 - 130*		*05/13/16 10:48*	*1*
Dibromofluoromethane (Surr)	*98*		*70 - 130*		*05/13/16 10:48*	*1*
4-Bromofluorobenzene (Surr)	*89*		*70 - 130*		*05/13/16 10:48*	*1*

MWD
5/20/16
TestAmerica Savannah

Surrogate Summary

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124756-1
SDG: KPS166

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)			
Lab Sample ID	Client Sample ID	TOL (70-130)	12DCE (70-130)	DBFM (70-130)	BFB (70-130)
680-124756-1 - DL	GWE-2D-0516	106	113	116	102
680-124756-1	GWE-2D-0516	97	94	100	94
680-124756-3	GWE-3D-0516	86	121	122	81
680-124756-5	PM1D-0516	101	89	92	94
680-124756-7	ESL-MW-D1-0516	100	89	92	92
680-124756-9	2Q16 LTM Trip Blank #1	97	98	98	89
LCS 680-433121/4	Lab Control Sample	106	94	103	96
LCS 680-433123/4	Lab Control Sample	102	94	97	89
LCS 680-433433/4	Lab Control Sample	99	92	96	91
LCSD 680-433121/5	Lab Control Sample Dup	105	93	101	96
LCSD 680-433123/5	Lab Control Sample Dup	100	91	100	89
LCSD 680-433433/5	Lab Control Sample Dup	99	94	96	92
MB 680-433121/9	Method Blank	102	94	102	102
MB 680-433123/9	Method Blank	98	89	97	92
MB 680-433433/9	Method Blank	100	89	93	93

Surrogate Legend

TOL = Toluene-d8 (Surr)
12DCE = 1,2-Dichloroethane-d4 (Surr)
DBFM = Dibromofluoromethane (Surr)
BFB = 4-Bromofluorobenzene (Surr)

AWD 5/20/16
TestAmerica Savannah

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124756-1
SDG: KPS166

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 680-433121/9
Matrix: Water
Analysis Batch: 433121

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	1.0	U	1.0		ug/L			05/13/16 10:41	1
Chlorobenzene	1.0	U	1.0		ug/L			05/13/16 10:41	1
1,2-Dichlorobenzene	1.0	U	1.0		ug/L			05/13/16 10:41	1
1,3-Dichlorobenzene	1.0	U	1.0		ug/L			05/13/16 10:41	1
1,4-Dichlorobenzene	1.0	U	1.0		ug/L			05/13/16 10:41	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*102*		*70 - 130*		*05/13/16 10:41*	*1*
1,2-Dichloroethane-d4 (Surr)	*94*		*70 - 130*		*05/13/16 10:41*	*1*
Dibromofluoromethane (Surr)	*102*		*70 - 130*		*05/13/16 10:41*	*1*
4-Bromofluorobenzene (Surr)	*102*		*70 - 130*		*05/13/16 10:41*	*1*

Lab Sample ID: LCS 680-433121/4
Matrix: Water
Analysis Batch: 433121

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	50.0	52.7		ug/L		105	73 - 131
Chlorobenzene	50.0	54.3		ug/L		109	80 - 120
1,2-Dichlorobenzene	50.0	50.9		ug/L		102	80 - 120
1,3-Dichlorobenzene	50.0	51.1		ug/L		102	80 - 120
1,4-Dichlorobenzene	50.0	48.9		ug/L		98	80 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Toluene-d8 (Surr)	*106*		*70 - 130*
1,2-Dichloroethane-d4 (Surr)	*94*		*70 - 130*
Dibromofluoromethane (Surr)	*103*		*70 - 130*
4-Bromofluorobenzene (Surr)	*96*		*70 - 130*

Lab Sample ID: LCSD 680-433121/5
Matrix: Water
Analysis Batch: 433121

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene	50.0	51.5		ug/L		103	73 - 131	2	30
Chlorobenzene	50.0	52.4		ug/L		105	80 - 120	4	20
1,2-Dichlorobenzene	50.0	50.1		ug/L		100	80 - 120	2	20
1,3-Dichlorobenzene	50.0	50.1		ug/L		100	80 - 120	2	20
1,4-Dichlorobenzene	50.0	48.0		ug/L		96	80 - 120	2	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Toluene-d8 (Surr)	*105*		*70 - 130*
1,2-Dichloroethane-d4 (Surr)	*93*		*70 - 130*
Dibromofluoromethane (Surr)	*101*		*70 - 130*
4-Bromofluorobenzene (Surr)	*96*		*70 - 130*

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Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-433123/9
Matrix: Water
Analysis Batch: 433123

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	1.0	U	1.0		ug/L			05/13/16 10:27	1
Chlorobenzene	1.0	U	1.0		ug/L			05/13/16 10:27	1
1,2-Dichlorobenzene	1.0	U	1.0		ug/L			05/13/16 10:27	1
1,3-Dichlorobenzene	1.0	U	1.0		ug/L			05/13/16 10:27	1
1,4-Dichlorobenzene	1.0	U	1.0		ug/L			05/13/16 10:27	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	98		70 - 130		05/13/16 10:27	1
1,2-Dichloroethane-d4 (Surr)	89		70 - 130		05/13/16 10:27	1
Dibromofluoromethane (Surr)	97		70 - 130		05/13/16 10:27	1
4-Bromofluorobenzene (Surr)	92		70 - 130		05/13/16 10:27	1

Lab Sample ID: LCS 680-433123/4
Matrix: Water
Analysis Batch: 433123

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	50.0	46.1		ug/L		92	73 - 131
Chlorobenzene	50.0	49.0		ug/L		98	80 - 120
1,2-Dichlorobenzene	50.0	46.6		ug/L		93	80 - 120
1,3-Dichlorobenzene	50.0	45.3		ug/L		91	80 - 120
1,4-Dichlorobenzene	50.0	45.5		ug/L		91	80 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Toluene-d8 (Surr)	102		70 - 130
1,2-Dichloroethane-d4 (Surr)	94		70 - 130
Dibromofluoromethane (Surr)	97		70 - 130
4-Bromofluorobenzene (Surr)	89		70 - 130

Lab Sample ID: LCSD 680-433123/5
Matrix: Water
Analysis Batch: 433123

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene	50.0	45.4		ug/L		91	73 - 131	1	30
Chlorobenzene	50.0	48.2		ug/L		96	80 - 120	2	20
1,2-Dichlorobenzene	50.0	46.8		ug/L		94	80 - 120	0	20
1,3-Dichlorobenzene	50.0	45.2		ug/L		90	80 - 120	0	20
1,4-Dichlorobenzene	50.0	45.3		ug/L		91	80 - 120	0	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Toluene-d8 (Surr)	100		70 - 130
1,2-Dichloroethane-d4 (Surr)	91		70 - 130
Dibromofluoromethane (Surr)	100		70 - 130
4-Bromofluorobenzene (Surr)	89		70 - 130

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Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-433433/9
Matrix: Water
Analysis Batch: 433433

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	1.0	U	1.0		ug/L			05/16/16 12:06	1
Chlorobenzene	1.0	U	1.0		ug/L			05/16/16 12:06	1
1,2-Dichlorobenzene	1.0	U	1.0		ug/L			05/16/16 12:06	1
1,3-Dichlorobenzene	1.0	U	1.0		ug/L			05/16/16 12:06	1
1,4-Dichlorobenzene	1.0	U	1.0		ug/L			05/16/16 12:06	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*100*		*70 - 130*		*05/16/16 12:06*	*1*
1,2-Dichloroethane-d4 (Surr)	*89*		*70 - 130*		*05/16/16 12:06*	*1*
Dibromofluoromethane (Surr)	*93*		*70 - 130*		*05/16/16 12:06*	*1*
4-Bromofluorobenzene (Surr)	*93*		*70 - 130*		*05/16/16 12:06*	*1*

Lab Sample ID: LCS 680-433433/4
Matrix: Water
Analysis Batch: 433433

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	50.0	45.8		ug/L		92	73 - 131
Chlorobenzene	50.0	48.5		ug/L		97	80 - 120
1,2-Dichlorobenzene	50.0	48.0		ug/L		96	80 - 120
1,3-Dichlorobenzene	50.0	47.6		ug/L		95	80 - 120
1,4-Dichlorobenzene	50.0	47.9		ug/L		96	80 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Toluene-d8 (Surr)	*99*		*70 - 130*
1,2-Dichloroethane-d4 (Surr)	*92*		*70 - 130*
Dibromofluoromethane (Surr)	*95*		*70 - 130*
4-Bromofluorobenzene (Surr)	*91*		*70 - 130*

Lab Sample ID: LCSD 680-433433/5
Matrix: Water
Analysis Batch: 433433

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene	50.0	45.9		ug/L		92	73 - 131	0	30
Chlorobenzene	50.0	48.8		ug/L		98	80 - 120	1	20
1,2-Dichlorobenzene	50.0	48.2		ug/L		96	80 - 120	0	20
1,3-Dichlorobenzene	50.0	48.1		ug/L		96	80 - 120	1	20
1,4-Dichlorobenzene	50.0	48.2		ug/L		96	80 - 120	1	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Toluene-d8 (Surr)	*99*		*70 - 130*
1,2-Dichloroethane-d4 (Surr)	*94*		*70 - 130*
Dibromofluoromethane (Surr)	*96*		*70 - 130*
4-Bromofluorobenzene (Surr)	*92*		*70 - 130*

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Method: RSK-175 - Dissolved Gases (GC)

Lab Sample ID: MB 680-433272/62
Matrix: Water
Analysis Batch: 433272

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	1.1	U	1.1		ug/L			05/13/16 19:11	1
Ethylene	1.0	U	1.0		ug/L			05/13/16 19:11	1
Methane	0.58	U	0.58		ug/L			05/13/16 19:11	1
Methane (TCD)	390	U	390		ug/L			05/13/16 19:11	1

Lab Sample ID: LCS 680-433272/6
Matrix: Water
Analysis Batch: 433272

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Methane (TCD)	1920	1910		ug/L		99	75 - 125

Lab Sample ID: LCS 680-433272/9
Matrix: Water
Analysis Batch: 433272

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ethane	288	310		ug/L		107	75 - 125
Ethylene	269	288		ug/L		107	75 - 125
Methane	154	161		ug/L		105	75 - 125

Lab Sample ID: LCSD 680-433272/61
Matrix: Water
Analysis Batch: 433272

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Ethane	288	315		ug/L		109	75 - 125	2	30
Ethylene	269	291		ug/L		108	75 - 125	1	30
Methane	154	165		ug/L		107	75 - 125	2	30

Lab Sample ID: LCSD 680-433272/7
Matrix: Water
Analysis Batch: 433272

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Methane (TCD)	1920	1970		ug/L		102	75 - 125	3	30

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 680-431971/1-A
Matrix: Water
Analysis Batch: 432234

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 431971

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	0.050	U	0.050		mg/L		05/05/16 08:14	05/05/16 21:39	1
Iron, Dissolved	0.050	U	0.050		mg/L		05/05/16 08:14	05/05/16 21:39	1
Manganese	0.010	U	0.010		mg/L		05/05/16 08:14	05/05/16 21:39	1
Manganese, Dissolved	0.010	U	0.010		mg/L		05/05/16 08:14	05/05/16 21:39	1

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Method: 6010C - Metals (ICP) (Continued)

Lab Sample ID: LCS 680-431971/2-A
Matrix: Water
Analysis Batch: 432234

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 431971

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Iron	5.00	4.94		mg/L		99	80 - 120
Iron, Dissolved	5.00	4.94		mg/L		99	80 - 120
Manganese	0.500	0.515		mg/L		103	80 - 120
Manganese, Dissolved	0.500	0.515		mg/L		103	80 - 120

Method: 310.1 - Alkalinity

Lab Sample ID: MB 680-432735/7
Matrix: Water
Analysis Batch: 432735

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	5.0	U	5.0		mg/L			05/10/16 16:17	1
Carbon Dioxide, Free	5.0	U	5.0		mg/L			05/10/16 16:17	1

Lab Sample ID: LCS 680-432735/8
Matrix: Water
Analysis Batch: 432735

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Alkalinity	250	244		mg/L		97	80 - 120

Lab Sample ID: LCSD 680-432735/33
Matrix: Water
Analysis Batch: 432735

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Alkalinity	250	241		mg/L		97	80 - 120	1	30

Lab Sample ID: MB 680-433193/7
Matrix: Water
Analysis Batch: 433193

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	5.0	U	5.0		mg/L			05/13/16 06:42	1
Carbon Dioxide, Free	5.0	U	5.0		mg/L			05/13/16 06:42	1

Lab Sample ID: LCS 680-433193/8
Matrix: Water
Analysis Batch: 433193

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Alkalinity	250	240		mg/L		96	80 - 120

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Method: 310.1 - Alkalinity (Continued)

Lab Sample ID: LCSD 680-433193/34
Matrix: Water
Analysis Batch: 433193

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Alkalinity	250	251		mg/L		100	80 - 120	4	30

Method: 325.2 - Chloride

Lab Sample ID: MB 680-432769/2
Matrix: Water
Analysis Batch: 432769

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	1.0	U	1.0		mg/L			05/10/16 15:13	1

Lab Sample ID: LCS 680-432769/1
Matrix: Water
Analysis Batch: 432769

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	25.0	25.3		mg/L		101	85 - 115

Lab Sample ID: LCSD 680-432769/6
Matrix: Water
Analysis Batch: 432769

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	25.0	25.6		mg/L		102	85 - 115	1	30

Lab Sample ID: MB 680-433466/36
Matrix: Water
Analysis Batch: 433466

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	1.0	U	1.0		mg/L			05/13/16 12:24	1

Lab Sample ID: LCS 680-433466/1
Matrix: Water
Analysis Batch: 433466

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	25.0	25.8		mg/L		103	85 - 115

Lab Sample ID: LCSD 680-433466/5
Matrix: Water
Analysis Batch: 433466

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	25.0	26.0		mg/L		104	85 - 115	1	30

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Method: 353.2 - Nitrogen, Nitrate-Nitrite

Lab Sample ID: MB 680-431740/13
Matrix: Water
Analysis Batch: 431740

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	0.050	U	0.050		mg/L			05/03/16 15:24	1

Lab Sample ID: LCS 680-431740/16
Matrix: Water
Analysis Batch: 431740

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	0.500	0.526		mg/L		105	75 - 125
Nitrate Nitrite as N	1.00	1.05		mg/L		105	90 - 110
Nitrite as N	0.500	0.524		mg/L		105	90 - 110

Method: 375.4 - Sulfate

Lab Sample ID: MB 680-432771/2
Matrix: Water
Analysis Batch: 432771

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	5.0	U	5.0		mg/L			05/10/16 15:15	1

Lab Sample ID: LCS 680-432771/4
Matrix: Water
Analysis Batch: 432771

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	20.0	20.4		mg/L		102	75 - 125

Lab Sample ID: LCSD 680-432771/6
Matrix: Water
Analysis Batch: 432771

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfate	20.0	19.6		mg/L		98	75 - 125	4	30

Method: 415.1 - TOC

Lab Sample ID: MB 680-432669/2
Matrix: Water
Analysis Batch: 432669

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	1.0	U	1.0		mg/L			05/09/16 22:10	1

Lab Sample ID: LCS 680-432669/3
Matrix: Water
Analysis Batch: 432669

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	20.0	21.4		mg/L		107	80 - 120

RWD 5/20/16
TestAmerica Savannah

QC Sample Results

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124756-1
SDG: KPS166

Lab Sample ID: LCSD 680-432669/4
Matrix: Water
Analysis Batch: 432669

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Organic Carbon	20.0	21.3		mg/L		106	80 - 120	0	25

Lab Sample ID: MB 680-432670/2
Matrix: Water
Analysis Batch: 432670

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	1.0	U	1.0		mg/L			05/10/16 08:01	1

Lab Sample ID: LCS 680-432670/3
Matrix: Water
Analysis Batch: 432670

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	20.0	21.3		mg/L		107	80 - 120

Lab Sample ID: LCSD 680-432670/4
Matrix: Water
Analysis Batch: 432670

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Organic Carbon	20.0	21.5		mg/L		107	80 - 120	1	25

AWD 5/20/16
TestAmerica Savannah

QC Association Summary

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124756-1
SDG: KPS166

GC/MS VOA

Analysis Batch: 433121

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-124756-1 - DL	GWE-2D-0516	Total/NA	Water	8260B	
LCS 680-433121/4	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-433121/5	Lab Control Sample Dup	Total/NA	Water	8260B	
MB 680-433121/9	Method Blank	Total/NA	Water	8260B	

Analysis Batch: 433123

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-124756-1	GWE-2D-0516	Total/NA	Water	8260B	
680-124756-3	GWE-3D-0516	Total/NA	Water	8260B	
680-124756-9	2Q16 LTM Trip Blank #1	Total/NA	Water	8260B	
LCS 680-433123/4	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-433123/5	Lab Control Sample Dup	Total/NA	Water	8260B	
MB 680-433123/9	Method Blank	Total/NA	Water	8260B	

Analysis Batch: 433433

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-124756-5	PM1D-0516	Total/NA	Water	8260B	
680-124756-7	ESL-MW-D1-0516	Total/NA	Water	8260B	
LCS 680-433433/4	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-433433/5	Lab Control Sample Dup	Total/NA	Water	8260B	
MB 680-433433/9	Method Blank	Total/NA	Water	8260B	

GC VOA

Analysis Batch: 433272

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-124756-1	GWE-2D-0516	Total/NA	Water	RSK-175	
680-124756-3	GWE-3D-0516	Total/NA	Water	RSK-175	
680-124756-5	PM1D-0516	Total/NA	Water	RSK-175	
680-124756-7	ESL-MW-D1-0516	Total/NA	Water	RSK-175	
LCS 680-433272/6	Lab Control Sample	Total/NA	Water	RSK-175	
LCS 680-433272/9	Lab Control Sample	Total/NA	Water	RSK-175	
LCSD 680-433272/61	Lab Control Sample Dup	Total/NA	Water	RSK-175	
LCSD 680-433272/7	Lab Control Sample Dup	Total/NA	Water	RSK-175	
MB 680-433272/62	Method Blank	Total/NA	Water	RSK-175	

Metals

Prep Batch: 431971

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-124756-1	GWE-2D-0516	Total Recoverable	Water	3005A	
680-124756-2	GWE-2D-F (0.2)-0516	Dissolved	Water	3005A	
680-124756-3	GWE-3D-0516	Total Recoverable	Water	3005A	
680-124756-4	GWE-3D-F (0.2)-0516	Dissolved	Water	3005A	
680-124756-5	PM1D-0516	Total Recoverable	Water	3005A	
680-124756-6	PM1D-F (0.2)-0516	Dissolved	Water	3005A	
680-124756-7	ESL-MW-D1-0516	Total Recoverable	Water	3005A	
680-124756-8	ESL-MW-D1-F (0.2)-0516	Dissolved	Water	3005A	
LCS 680-431971/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
MB 680-431971/1-A	Method Blank	Total Recoverable	Water	3005A	

AWD 5/20/16
TestAmerica Savannah

Metals (Continued)

Analysis Batch: 432234

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-124756-1	GWE-2D-0516	Total Recoverable	Water	6010C	431971
680-124756-2	GWE-2D-F (0.2)-0516	Dissolved	Water	6010C	431971
680-124756-3	GWE-3D-0516	Total Recoverable	Water	6010C	431971
680-124756-4	GWE-3D-F (0.2)-0516	Dissolved	Water	6010C	431971
680-124756-5	PM1D-0516	Total Recoverable	Water	6010C	431971
680-124756-6	PM1D-F (0.2)-0516	Dissolved	Water	6010C	431971
680-124756-7	ESL-MW-D1-0516	Total Recoverable	Water	6010C	431971
680-124756-8	ESL-MW-D1-F (0.2)-0516	Dissolved	Water	6010C	431971
LCS 680-431971/2-A	Lab Control Sample	Total Recoverable	Water	6010C	431971
MB 680-431971/1-A	Method Blank	Total Recoverable	Water	6010C	431971

General Chemistry

Analysis Batch: 431740

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-124756-1	GWE-2D-0516	Total/NA	Water	353.2	
680-124756-3	GWE-3D-0516	Total/NA	Water	353.2	
680-124756-5	PM1D-0516	Total/NA	Water	353.2	
680-124756-7	ESL-MW-D1-0516	Total/NA	Water	353.2	
LCS 680-431740/16	Lab Control Sample	Total/NA	Water	353.2	
MB 680-431740/13	Method Blank	Total/NA	Water	353.2	

Analysis Batch: 431789

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-124756-2	GWE-2D-F (0.2)-0516	Dissolved	Water	415.1	
680-124756-4	GWE-3D-F (0.2)-0516	Dissolved	Water	415.1	
680-124756-6	PM1D-F (0.2)-0516	Dissolved	Water	415.1	
680-124756-8	ESL-MW-D1-F (0.2)-0516	Dissolved	Water	415.1	

Analysis Batch: 432669

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-124756-1	GWE-2D-0516	Total/NA	Water	415.1	
680-124756-3	GWE-3D-0516	Total/NA	Water	415.1	
680-124756-5	PM1D-0516	Total/NA	Water	415.1	
LCS 680-432669/3	Lab Control Sample	Total/NA	Water	415.1	
LCSD 680-432669/4	Lab Control Sample Dup	Total/NA	Water	415.1	
MB 680-432669/2	Method Blank	Total/NA	Water	415.1	

Analysis Batch: 432670

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-124756-7	ESL-MW-D1-0516	Total/NA	Water	415.1	
LCS 680-432670/3	Lab Control Sample	Total/NA	Water	415.1	
LCSD 680-432670/4	Lab Control Sample Dup	Total/NA	Water	415.1	
MB 680-432670/2	Method Blank	Total/NA	Water	415.1	

Analysis Batch: 432735

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-124756-3	GWE-3D-0516	Total/NA	Water	310.1	
LCS 680-432735/8	Lab Control Sample	Total/NA	Water	310.1	
LCSD 680-432735/33	Lab Control Sample Dup	Total/NA	Water	310.1	

General Chemistry (Continued)

Analysis Batch: 432735 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 680-432735/7	Method Blank	Total/NA	Water	310.1	

Analysis Batch: 432769

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-124756-3	GWE-3D-0516	Total/NA	Water	325.2	
680-124756-5	PM1D-0516	Total/NA	Water	325.2	
680-124756-7	ESL-MW-D1-0516	Total/NA	Water	325.2	
LCS 680-432769/1	Lab Control Sample	Total/NA	Water	325.2	
LCSD 680-432769/6	Lab Control Sample Dup	Total/NA	Water	325.2	
MB 680-432769/2	Method Blank	Total/NA	Water	325.2	

Analysis Batch: 432771

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-124756-1	GWE-2D-0516	Total/NA	Water	375.4	
680-124756-3	GWE-3D-0516	Total/NA	Water	375.4	
680-124756-5	PM1D-0516	Total/NA	Water	375.4	
680-124756-7	ESL-MW-D1-0516	Total/NA	Water	375.4	
LCS 680-432771/4	Lab Control Sample	Total/NA	Water	375.4	
LCSD 680-432771/6	Lab Control Sample Dup	Total/NA	Water	375.4	
MB 680-432771/2	Method Blank	Total/NA	Water	375.4	

Analysis Batch: 433193

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-124756-1	GWE-2D-0516	Total/NA	Water	310.1	
680-124756-5	PM1D-0516	Total/NA	Water	310.1	
680-124756-7	ESL-MW-D1-0516	Total/NA	Water	310.1	
LCS 680-433193/8	Lab Control Sample	Total/NA	Water	310.1	
LCSD 680-433193/34	Lab Control Sample Dup	Total/NA	Water	310.1	
MB 680-433193/7	Method Blank	Total/NA	Water	310.1	

Analysis Batch: 433466

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-124756-1	GWE-2D-0516	Total/NA	Water	325.2	
LCS 680-433466/1	Lab Control Sample	Total/NA	Water	325.2	
LCSD 680-433466/5	Lab Control Sample Dup	Total/NA	Water	325.2	
MB 680-433466/36	Method Blank	Total/NA	Water	325.2	

TestAmerica Savannah
AWO 5/20/16

Lab Chronicle

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124756-1
SDG: KPS166

Client Sample ID: GWE-2D-0516

Lab Sample ID: 680-124756-1
Matrix: Water

Date Collected: 05/02/16 10:52
Date Received: 05/03/16 09:32

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B	DL	5	433121	05/13/16 18:07	CAR	TAL SAV
Total/NA	Analysis	8260B		1	433123	05/13/16 12:12	CAR	TAL SAV
Total/NA	Analysis	RSK-175		1	433272	05/13/16 20:47	MKA	TAL SAV
Total Recoverable	Prep	3005A			431971	05/05/16 08:14	BJB	TAL SAV
Total Recoverable	Analysis	6010C		1	432234	05/05/16 23:01	BCB	TAL SAV
Total/NA	Analysis	310.1		1	433193	05/13/16 07:33	DAM	TAL SAV
Total/NA	Analysis	325.2		20	433466	05/13/16 12:13	JME	TAL SAV
Total/NA	Analysis	353.2		1	431740	05/03/16 15:40	GRX	TAL SAV
Total/NA	Analysis	375.4		50	432771	05/10/16 17:07	JME	TAL SAV
Total/NA	Analysis	415.1		1	432669	05/10/16 04:28	KLD	TAL SAV

Client Sample ID: GWE-2D-F (0.2)-0516

Lab Sample ID: 680-124756-2
Matrix: Water

Date Collected: 05/02/16 10:52
Date Received: 05/03/16 09:32

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			431971	05/05/16 08:14	BJB	TAL SAV
Dissolved	Analysis	6010C		1	432234	05/05/16 23:05	BCB	TAL SAV
Dissolved	Analysis	415.1		1	431789	05/03/16 17:43	KLD	TAL SAV

Client Sample ID: GWE-3D-0516

Lab Sample ID: 680-124756-3
Matrix: Water

Date Collected: 05/02/16 12:00
Date Received: 05/03/16 09:32

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		10	433123	05/13/16 15:22	CAR	TAL SAV
Total/NA	Analysis	RSK-175		1	433272	05/13/16 21:00	MKA	TAL SAV
Total Recoverable	Prep	3005A			431971	05/05/16 08:14	BJB	TAL SAV
Total Recoverable	Analysis	6010C		1	432234	05/05/16 23:09	BCB	TAL SAV
Total/NA	Analysis	310.1		1	432735	05/10/16 19:42	DAM	TAL SAV
Total/NA	Analysis	325.2		20	432769	05/10/16 16:36	JME	TAL SAV
Total/NA	Analysis	353.2		1	431740	05/03/16 15:41	GRX	TAL SAV
Total/NA	Analysis	375.4		10	432771	05/10/16 17:05	JME	TAL SAV
Total/NA	Analysis	415.1		1	432669	05/10/16 05:13	KLD	TAL SAV

Client Sample ID: GWE-3D-F (0.2)-0516

Lab Sample ID: 680-124756-4
Matrix: Water

Date Collected: 05/02/16 12:00
Date Received: 05/03/16 09:32

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			431971	05/05/16 08:14	BJB	TAL SAV

Lab Chronicle

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124756-1
SDG: KPS166

Client Sample ID: GWE-3D-F (0.2)-0516

Lab Sample ID: 680-124756-4
Matrix: Water

Date Collected: 05/02/16 12:00
Date Received: 05/03/16 09:32

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Analysis	6010C		1	432234	05/05/16 23:13	BCB	TAL SAV
Dissolved	Analysis	415.1		1	431789	05/03/16 18:00	KLD	TAL SAV

Client Sample ID: PM1D-0516

Lab Sample ID: 680-124756-5
Matrix: Water

Date Collected: 05/02/16 13:50
Date Received: 05/03/16 09:32

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	433433	05/16/16 12:51	DAS	TAL SAV
Total/NA	Analysis	RSK-175		1	433272	05/13/16 21:13	MKA	TAL SAV
Total Recoverable	Prep	3005A			431971	05/05/16 08:14	BJB	TAL SAV
Total Recoverable	Analysis	6010C		1	432234	05/05/16 23:16	BCB	TAL SAV
Total/NA	Analysis	310.1		1	433193	05/13/16 07:42	DAM	TAL SAV
Total/NA	Analysis	325.2		2	432769	05/10/16 16:38	JME	TAL SAV
Total/NA	Analysis	353.2		1	431740	05/03/16 15:42	GRX	TAL SAV
Total/NA	Analysis	375.4		20	432771	05/10/16 17:07	JME	TAL SAV
Total/NA	Analysis	415.1		1	432669	05/10/16 05:29	KLD	TAL SAV

Client Sample ID: PM1D-F (0.2)-0516

Lab Sample ID: 680-124756-6
Matrix: Water

Date Collected: 05/02/16 13:50
Date Received: 05/03/16 09:32

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			431971	05/05/16 08:14	BJB	TAL SAV
Dissolved	Analysis	6010C		1	432234	05/05/16 23:20	BCB	TAL SAV
Dissolved	Analysis	415.1		1	431789	05/03/16 18:19	KLD	TAL SAV

Client Sample ID: ESL-MW-D1-0516

Lab Sample ID: 680-124756-7
Matrix: Water

Date Collected: 05/02/16 14:45
Date Received: 05/03/16 09:32

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		2	433433	05/16/16 15:06	DAS	TAL SAV
Total/NA	Analysis	RSK-175		1	433272	05/13/16 21:26	MKA	TAL SAV
Total Recoverable	Prep	3005A			431971	05/05/16 08:14	BJB	TAL SAV
Total Recoverable	Analysis	6010C		1	432234	05/05/16 23:24	BCB	TAL SAV
Total/NA	Analysis	310.1		1	433193	05/13/16 07:51	DAM	TAL SAV
Total/NA	Analysis	325.2		2	432769	05/10/16 16:38	JME	TAL SAV
Total/NA	Analysis	353.2		1	431740	05/03/16 15:44	GRX	TAL SAV
Total/NA	Analysis	375.4		20	432771	05/10/16 17:07	JME	TAL SAV
Total/NA	Analysis	415.1		1	432670	05/10/16 07:31	KLD	TAL SAV

Lab Chronicle

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124756-1
SDG: KPS166

Client Sample ID: ESL-MW-D1-F (0.2)-0516

Lab Sample ID: 680-124756-8

Date Collected: 05/02/16 14:45
Matrix: Water
Date Received: 05/03/16 09:32

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			431971	05/05/16 08:14	BJB	TAL SAV
Dissolved	Analysis	6010C		1	432234	05/05/16 23:28	BCB	TAL SAV
Dissolved	Analysis	415.1		1	431789	05/03/16 18:35	KLD	TAL SAV

Client Sample ID: 2Q16 LTM Trip Blank #1

Lab Sample ID: 680-124756-9

Date Collected: 05/02/16 00:00
Matrix: Water
Date Received: 05/03/16 09:32

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	433123	05/13/16 10:48	CAR	TAL SAV

Laboratory References:

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

TestAmerica Savannah
5102 LaRoche Avenue

Savannah, GA 31404
phone 912.354 7858 fax

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Regulatory Program: ☐ DW ☐ NPDES ☑ RCRA ☐ Other:

Client Contact	Project Manager: Amanda Derhake	Site Contact: Emily White	Date: 05/02/16	COC No: —
Golder Associates Inc.	Tel/Fax: 636-724-9191	Lab Contact: Michele Kersey	Carrier: FedEx	1 of 1 COCs
820 South Main Street	Analysis Turnaround Time			Sampler:
St. Charles, MO 63301	☑ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
(636) 724-9191 Phone	TAT if different from Below Standard			Walk-in Client:
(636) 724-9323 FAX	☑ 2 weeks			Lab Sampling:
Project Name: 2Q16 LTM GW Sampling-1403345	☐ 1 week			
Site: Solutia WG Krummrich Facility	☐ 2 days			Job / SDG No.:
P O # 42262863	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y / N)	Perform MS / MSD (Y / N)	VOCs by 8260	Total Fe/Mn by 6010C	Alk/CO2 by 310.1	Chloride by 325.2/Sulfate by 375.4	Dissolved Gases by RSK 175	Nitrate by 353.2	TOC by 415.1	Dissolved Fe/Mn by 6010C	DOC by 415.1	Sample Specific Notes:
GWE-2D-0516	05/02/16	1052	G	W	14			3	1	1	1	3	2	3			
GWE-2D-F(0.2)-0516		1052	G	W	4										1	3	
GWE-3D-0516		1200	G	W	14			3	1	1	1	3	2	3			
GWE-3D-F(0.2)-0516		1200	G	W	4										1	3	
PMID-0516		1350	G	W	14			3	1	1	1	3	2	3			
PMID-F(0.2)-0516		1350	G	W	4										1	3	
ESL-MW-DI-0516		1445	G	W	14			3	1	1	1	3	2	3			
ESL-MW-DI-F(0.2)-0516		1445	G	W	4										1	3	
2Q16 LTM Trip Blank #1	—	—	—	W	2			2									

680-124758 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

2	4	1	1	2	1,3	3	4	3			

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☑ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments:
VOC headspace upon sampling: Yes/No

3.3/3.4

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No.: 749475	Cooler Temp. (°C): Obs'd: _____ Corr'd: _____	Therm ID No.: _____

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Emily White	Golder	05/02/16 1600		TA-SAV	5-3-16 9:32
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Form No. CA-C-WI-002, Rev. 4.3, dated 12/05/2013

Login Sample Receipt Checklist

Client: Solutia Inc.

Job Number: 680-124756-1
SDG Number: KPS166

Login Number: 124756
List Number: 1
Creator: White, Menica R

List Source: TestAmerica Savannah

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	N/A	
Samples do not require splitting or compositing.	N/A	
Residual Chlorine Checked.	N/A	

Certification Summary

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124756-1
SDG: KPS166

Laboratory: TestAmerica Savannah

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
	AFCEE		SAVLAB	
A2LA	DoD ELAP		399.01	02-28-17
A2LA	ISO/IEC 17025		399.01	02-28-17
Alabama	State Program	4	41450	06-30-16 *
Alaska (UST)	State Program	10	UST-104	11-05-16
Arkansas DEQ	State Program	6	88-0692	01-31-17
California	State Program	9	2939	07-31-16 *
Colorado	State Program	8	N/A	12-31-16
Connecticut	State Program	1	PH-0161	03-31-17
Florida	NELAP	4	E87052	06-30-16 *
GA Dept. of Agriculture	State Program	4	N/A	06-12-17
Georgia	State Program	4	803	06-30-16 *
Guam	State Program	9	15-005r	04-16-16 *
Hawaii	State Program	9	N/A	06-30-16 *
Illinois	NELAP	5	200022	11-30-16
Indiana	State Program	5	N/A	06-30-16 *
Iowa	State Program	7	353	06-30-17
Kentucky (DW)	State Program	4	90084	12-31-16
Kentucky (UST)	State Program	4	18	06-30-16 *
Kentucky (WW)	State Program	4	90084	12-31-16
Louisiana	NELAP	6	30690	06-30-16 *
Louisiana (DW)	NELAP	6	LA160019	12-31-16
Maine	State Program	1	GA00006	09-24-16
Maryland	State Program	3	250	12-31-16
Massachusetts	State Program	1	M-GA006	06-30-16 *
Michigan	State Program	5	9925	06-30-16 *
Mississippi	State Program	4	N/A	06-30-16 *
Nebraska	State Program	7	TestAmerica-Savannah	06-30-16 *
New Jersey	NELAP	2	GA769	06-30-16 *
New Mexico	State Program	6	N/A	06-30-16 *
New York	NELAP	2	10842	03-31-17
North Carolina (DW)	State Program	4	13701	07-31-16 *
North Carolina (WW/SW)	State Program	4	269	12-31-16
Oklahoma	State Program	6	9984	08-31-16
Pennsylvania	NELAP	3	68-00474	06-30-16 *
Puerto Rico	State Program	2	GA00006	12-31-16
South Carolina	State Program	4	98001	06-30-16 *
Tennessee	State Program	4	TN02961	06-30-16 *
Texas	NELAP	6	T104704185-14-7	11-30-16
USDA	Federal		SAV 3-04	06-11-17
Virginia	NELAP	3	460161	06-14-16 *
Washington	State Program	10	C805	06-10-16 *
West Virginia (DW)	State Program	3	9950C	12-31-16
West Virginia DEP	State Program	3	094	06-30-16 *
Wisconsin	State Program	5	999819810	08-31-16
Wyoming	State Program	8	8TMS-L	06-30-16 *

* Certification renewal pending - certification considered valid.

Level IV Data Validation Summary
Solutia Inc., W.G. Krummrich, Sauget, Illinois
2Q16 Long-Term Monitoring Program

Company Name: Golder Associates
Project Name: WGK-2Q16 LTM
Reviewer: A. Derhake
Laboratory: TestAmerica
SDG#: KPS167
Matrix: Water

Project Manager: A. Derhake
Project Number: 140-3345
Sample Date: May 2016

Analytical Method: VOC (8260B), Dissolved Gases (RSK-175), Metals (6010C), Alkalinity (310.1), Chloride (325.2), Nitrogen, Nitrate-Nitrite (353.2), Sulfate (375.4), TOC (415.1), and DOC (415.1)

Sample Names: GWE-5D-0516, GWE-5D-F(0.2)-0516, CPA-MW-5D-0516, CPA-MW-5D-F(0.2)-0516, BSA-MW-5D-0516, BSA-MW-5D-F(0.2)-0516, CPA-MW-4D-0516, CPA-MW-4D-F(0.2)-0516, BSA-MW-4D-0516, BSA-MW-4D-F(0.2)-0516, BSA-MW-3D-0516, BSA-MW-3D-F(0.2)-0516, BSA-MW-3D-0516-EB, 2Q16 LTM Trip Blank #2

Field Information	**YES**	**NO**	**NA**
a) Sampling dates noted?	☒	☐	☐
b) Does the laboratory narrative indicate deficiencies?	☒	☐	☐

Comments:

VOC: Chlorobenzene exceeded the recovery criteria high for the MSD of sample BSA-MW-5D-0516MSD in batch 433431. Samples GWE-5D-0516, CPA-MW-5D-0516, BSA-MW-4D-0516, and BSA-MW-3D-0516 required dilution prior to analysis, reporting limits were adjusted accordingly.

Dissolved Gases: No deficiencies noted.

Metals: No deficiencies noted.

Alkalinity: No deficiencies noted.

Chloride: Samples GWE-5D-0516, CPA-MW-5D-0516, BSA-MW-5D-0516, CPA-MW-4D-0516, BSA-MW-4D-0516, and BSA-MW-3D-0516, required dilution prior to analysis, reporting limits were adjusted accordingly.

Nitrate-Nitrite as Nitrogen: No deficiencies noted.

Sulfate: Samples GWE-5D-0516, CPA-MW-5D-0516, and BSA-MW-3D-0516, required dilution prior to analysis, reporting limits were adjusted accordingly.

TOC: No deficiencies noted.

DOC: No deficiencies noted.

Chain-of-Custody (COC)	**YES**	**NO**	**NA**
a) Was the COC signed by both field and laboratory personnel?	☒	☐	☐
b) Were samples received in good condition?	☒	☐	☐

Comments: Samples were received at 0.4°C and 1.3°C, outside the 4°C +/- 2°C criteria.

General	YES	NO	NA
a) Were hold times met for sample analysis?	☒	☐	☐
b) Were the correct preservatives used?	☒	☐	☐
c) Was the correct method used?	☒	☐	☐
d) Any sample dilutions noted?	☒	☐	☐

Comments: Detections in diluted analysis were qualified.

GC/MS Instrument Performance Check (IPC) and Internal Standards (IS)	YES	NO	NA
a) IPC analyzed at the appropriate frequency and met the appropriate standards?	☒	☐	☐
b) Does BFB meet the ion abundance criteria?	☒	☐	☐
c) Internal Standard retention times and areas met appropriate criteria?	☒	☐	☐

Comments: None

Calibrations	YES	NO	NA
a) Initial calibration analyzed at the appropriate frequency and met the appropriate standards?	☐	☒	☐
b) Continuing calibrations analyzed at the appropriate frequency and met the appropriate standards?	☐	☒	☐
c) Initial calibration verifications and blanks analyzed at the appropriate frequency and met the appropriate standards?	☒	☐	☐
d) Continuing calibration verifications and blanks analyzed at the appropriate frequency and met the appropriate standards?	☒	☐	☐

Comments: Analytes of interest met calibration standards.

Blanks	YES	NO	NA
a) Were blanks (trip, equipment, method) performed at required frequency?	☒	☐	☐
b) Were analytes detected in any blanks?	☐	☒	☐

Comments: None

Matrix Spike/Matrix Spike Duplicate (MS/MSD)	YES	NO	NA
a) Was MS/MSD accuracy criteria met?	☐	☒	☐
b) Was MS/MSD precision criteria met?	☒	☐	☐

Comments: Chlorobenzene exceeded the recovery criteria for MSD sample associated with batch 433431. Data was not qualified on MS/MSD data alone.

Laboratory Control Sample (LCS)	YES	NO	NA
a) LCS analyzed at the appropriate frequency and met appropriate standards?	☒	☐	☐

Comments: None

Surrogate (System Monitoring) Compounds	YES	NO	NA
a) Surrogate compounds analyzed at the appropriate frequency and met appropriate standards?	☒	☐	☐

Comments: None

Duplicates	**YES**	**NO**	**NA**
a) Were field duplicates collected?	☐	☒	☐
b) Was field duplicate precision criteria met?	☐	☐	☒

Comments: None.

Additional Comments: None

Qualifications:

Quality Control Issue	Compound(s)	Qualifier	Samples Affected
Compounds analyzed at a dilution	Benzene, Chlorobenzene, 1,4-Dichlorobenzene, Chloride, and Sulfate	D	GWE-5D, CPA-MW-5D, BSA-MW-5D, CPA-MW-4D, BSA-MW-4D, BSA-MW-3D,

SDG KPS167

Sample Results from:

GWE-5D
CPA-MW-5D
BSA-MW-5D
CPA-MW-4D
BSA-MW-4D
BSA-MW-3D
BSA-MW-3D-EB

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Tel: (912)354-7858

TestAmerica Job ID: 680-124817-1
TestAmerica Sample Delivery Group: KPS167
Client Project/Site: 2Q16 LTM GW Sampling - 1403345

For:
Solutia Inc.
575 Maryville Centre Dr.
Saint Louis, Missouri 63141

Attn: Mr. Jerry Rinaldi

Michele R Kersey

Authorized for release by:
5/18/2016 12:34:38 PM

Michele Kersey, Project Manager I
(912)354-7858
michele.kersey@testamericainc.com

AWD 5/23/16

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AWD
5/23/16

Job ID: 680-124817-1

Laboratory: TestAmerica Savannah

Narrative

CASE NARRATIVE

Client: Solutia Inc.

Project: 2Q16 LTM GW Sampling - 1403345

Report Number: 680-124817-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In the event of interference or analytes present at high concentrations, samples may be diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

RECEIPT
The samples were received on 5/4/2016 9:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 0.4° C and 1.3° C.

VOLATILE ORGANIC COMPOUNDS (GC-MS)
Samples GWE-5D-0516 (680-124817-1), CPA-MW-5D-0516 (680-124817-3), BSA-MW-5D-0516 (680-124817-5), CPA-MW-4D-0516 (680-124817-7), BSA-MW-4D-0516 (680-124817-9), BSA-MW-3D-0516 (680-124817-11), BSA-MW-3D-0516-EB (680-124817-13) and 2Q16 LTM Trip Blank # 2 (680-124817-14) were analyzed for Volatile Organic Compounds (GC-MS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 05/16/2016 and 05/17/2016.

Chlorobenzene exceeded the recovery criteria high for the MSD of sample BSA-MW-5D-0516MSD (680-124817-5) in batch 680-433431.

Samples GWE-5D-0516 (680-124817-1)[5X], CPA-MW-5D-0516 (680-124817-3)[20X], BSA-MW-4D-0516 (680-124817-9)[20X] and BSA-MW-3D-0516 (680-124817-11)[20X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

DISSOLVED GASES
Samples GWE-5D-0516 (680-124817-1), CPA-MW-5D-0516 (680-124817-3), BSA-MW-5D-0516 (680-124817-5), CPA-MW-4D-0516 (680-124817-7), BSA-MW-4D-0516 (680-124817-9) and BSA-MW-3D-0516 (680-124817-11) were analyzed for dissolved gases in accordance with RSK-175. The samples were analyzed on 05/13/2016 and 05/14/2016.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

METALS (ICP)
Samples GWE-5D-F (0.2)-0516 (680-124817-2), CPA-MW-5D-F (0.2)-0516 (680-124817-4), BSA-MW-5D-F (0.2)-0516 (680-124817-6), CPA-MW-4D-F (0.2)-0516 (680-124817-8), BSA-MW-4D-F (0.2)-0516 (680-124817-10) and BSA-MW-3D-F (0.2)-0516 (680-124817-12) were analyzed for Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 05/10/2016 and analyzed on 05/11/2016.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

METALS (ICP)
Samples GWE-5D-0516 (680-124817-1), CPA-MW-5D-0516 (680-124817-3), BSA-MW-5D-0516 (680-124817-5), CPA-MW-4D-0516 (680-124817-7), BSA-MW-4D-0516 (680-124817-9) and BSA-MW-3D-0516 (680-124817-11) were analyzed for Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 05/10/2016 and analyzed on 05/10/2016 and 05/11/2016.

AWD 5/23/16
TestAmerica Savannah

Job ID: 680-124817-1 (Continued)

Laboratory: TestAmerica Savannah (Continued)

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

ALKALINITY
Samples GWE-5D-0516 (680-124817-1), CPA-MW-5D-0516 (680-124817-3), BSA-MW-5D-0516 (680-124817-5), CPA-MW-4D-0516 (680-124817-7), BSA-MW-4D-0516 (680-124817-9) and BSA-MW-3D-0516 (680-124817-11) were analyzed for alkalinity in accordance with EPA Method 310.1. The samples were analyzed on 05/13/2016.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

CHLORIDE
Samples GWE-5D-0516 (680-124817-1), CPA-MW-5D-0516 (680-124817-3), BSA-MW-5D-0516 (680-124817-5), CPA-MW-4D-0516 (680-124817-7), BSA-MW-4D-0516 (680-124817-9) and BSA-MW-3D-0516 (680-124817-11) were analyzed for Chloride in accordance with EPA Method 325.2. The samples were analyzed on 05/10/2016.

Samples GWE-5D-0516 (680-124817-1)[2X], CPA-MW-5D-0516 (680-124817-3)[5X], BSA-MW-5D-0516 (680-124817-5)[5X], CPA-MW-4D-0516 (680-124817-7)[10X], BSA-MW-4D-0516 (680-124817-9)[2X] and BSA-MW-3D-0516 (680-124817-11)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

NITRATE-NITRITE AS NITROGEN
Samples GWE-5D-0516 (680-124817-1), CPA-MW-5D-0516 (680-124817-3), BSA-MW-5D-0516 (680-124817-5), CPA-MW-4D-0516 (680-124817-7), BSA-MW-4D-0516 (680-124817-9) and BSA-MW-3D-0516 (680-124817-11) were analyzed for nitrate-nitrite as nitrogen in accordance with EPA Method 353.2. The samples were analyzed on 05/04/2016.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

SULFATE
Samples GWE-5D-0516 (680-124817-1), CPA-MW-5D-0516 (680-124817-3), BSA-MW-5D-0516 (680-124817-5), CPA-MW-4D-0516 (680-124817-7), BSA-MW-4D-0516 (680-124817-9) and BSA-MW-3D-0516 (680-124817-11) were analyzed for sulfate in accordance with EPA Method 375.4. The samples were analyzed on 05/10/2016.

Samples GWE-5D-0516 (680-124817-1)[20X], CPA-MW-5D-0516 (680-124817-3)[5X] and BSA-MW-3D-0516 (680-124817-11)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL ORGANIC CARBON
Samples GWE-5D-0516 (680-124817-1), CPA-MW-5D-0516 (680-124817-3), BSA-MW-5D-0516 (680-124817-5), CPA-MW-4D-0516 (680-124817-7), BSA-MW-4D-0516 (680-124817-9) and BSA-MW-3D-0516 (680-124817-11) were analyzed for total organic carbon in accordance with EPA Method 415.1. The samples were analyzed on 05/10/2016.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

DISSOLVED ORGANIC CARBON (DOC)
Samples GWE-5D-F (0.2)-0516 (680-124817-2), CPA-MW-5D-F (0.2)-0516 (680-124817-4), BSA-MW-5D-F (0.2)-0516 (680-124817-6), CPA-MW-4D-F (0.2)-0516 (680-124817-8), BSA-MW-4D-F (0.2)-0516 (680-124817-10) and BSA-MW-3D-F (0.2)-0516 (680-124817-12) were analyzed for Dissolved Organic Carbon (DOC) in accordance with EPA Method 415.1. The samples were analyzed on 05/10/2016.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

AWP 5/23/16

Sample Summary

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124817-1
SDG: KPS167

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
680-124817-1	GWE-5D-0516	Water	05/03/16 09:20	05/04/16 09:15
680-124817-2	GWE-5D-F (0.2)-0516	Water	05/03/16 09:20	05/04/16 09:15
680-124817-3	CPA-MW-5D-0516	Water	05/03/16 10:30	05/04/16 09:15
680-124817-4	CPA-MW-5D-F (0.2)-0516	Water	05/03/16 10:30	05/04/16 09:15
680-124817-5	BSA-MW-5D-0516	Water	05/03/16 12:32	05/04/16 09:15
680-124817-6	BSA-MW-5D-F (0.2)-0516	Water	05/03/16 12:32	05/04/16 09:15
680-124817-7	CPA-MW-4D-0516	Water	05/03/16 13:32	05/04/16 09:15
680-124817-8	CPA-MW-4D-F (0.2)-0516	Water	05/03/16 13:32	05/04/16 09:15
680-124817-9	BSA-MW-4D-0516	Water	05/03/16 14:30	05/04/16 09:15
680-124817-10	BSA-MW-4D-F (0.2)-0516	Water	05/03/16 14:30	05/04/16 09:15
680-124817-11	BSA-MW-3D-0516	Water	05/03/16 15:28	05/04/16 09:15
680-124817-12	BSA-MW-3D-F (0.2)-0516	Water	05/03/16 15:28	05/04/16 09:15
680-124817-13	BSA-MW-3D-0516-EB	Water	05/03/16 16:00	05/04/16 09:15
680-124817-14	2Q16 LTM Trip Blank # 2	Water	05/03/16 00:00	05/04/16 09:15

Method Summary

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124817-1
SDG: KPS167

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL SAV
RSK-175	Dissolved Gases (GC)	RSK	TAL SAV
6010C	Metals (ICP)	SW846	TAL SAV
310.1	Alkalinity	MCAWW	TAL SAV
325.2	Chloride	MCAWW	TAL SAV
353.2	Nitrogen, Nitrate-Nitrite	MCAWW	TAL SAV
375.4	Sulfate	MCAWW	TAL SAV
415.1	TOC	MCAWW	TAL SAV
415.1	DOC	MCAWW	TAL SAV

Protocol References:

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

RSK = Sample Prep And Calculations For Dissolved Gas Analysis In Water Samples Using A GC Headspace Equilibration Technique, RSKSOP-175, Rev. 0, 8/11/94, USEPA Research Lab

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

RWD 5/23/16
TestAmerica Savannah

Definitions/Glossary

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124817-1
SDG: KPS167

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.
F1	MS and/or MSD Recovery is outside acceptance limits.

GC VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Metals

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

General Chemistry

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

RWD
5/23/16
TestAmerica Savannah

Detection Summary

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124817-1
SDG: KPS167

Client Sample ID: GWE-5D-0516 — Lab Sample ID: 680-124817-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	9.6	D	5.0		ug/L	5		8260B	Total/NA
Chlorobenzene	310	D	5.0		ug/L	5		8260B	Total/NA
1,4-Dichlorobenzene	34	D	5.0		ug/L	5		8260B	Total/NA
Methane	65		0.58		ug/L	1		RSK-175	Total/NA
Iron	15		0.050		mg/L	1		6010C	Total
Manganese	0.43		0.010		mg/L	1		6010C	Recoverable Total
Chloride	85	D	2.0		mg/L	2		325.2	Recoverable Total/NA
Nitrate as N	0.053		0.050		mg/L	1		353.2	Total/NA
Sulfate	460	D	100		mg/L	20		375.4	Total/NA
Total Organic Carbon	3.3		1.0		mg/L	1		415.1	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Alkalinity	380		5.0		mg/L	1		310.1	Total/NA
Carbon Dioxide, Free	49		5.0		mg/L	1		310.1	Total/NA

Client Sample ID: GWE-5D-F (0.2)-0516 — Lab Sample ID: 680-124817-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron, Dissolved	14		0.050		mg/L	1		6010C	Dissolved
Manganese, Dissolved	0.42		0.010		mg/L	1		6010C	Dissolved
Dissolved Organic Carbon	3.3		1.0		mg/L	1		415.1	Dissolved

Client Sample ID: CPA-MW-5D-0516 — Lab Sample ID: 680-124817-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chlorobenzene	1400	D	20		ug/L	20		8260B	Total/NA
Ethane	1.8		1.1		ug/L	1		RSK-175	Total/NA
Methane	76		0.58		ug/L	1		RSK-175	Total/NA
Iron	19		0.050		mg/L	1		6010C	Total
Manganese	0.73		0.010		mg/L	1		6010C	Recoverable Total
Chloride	220	D	5.0		mg/L	5		325.2	Recoverable Total/NA
Nitrate as N	0.074		0.050		mg/L	1		353.2	Total/NA
Sulfate	130	D	25		mg/L	5		375.4	Total/NA
Total Organic Carbon	5.1		1.0		mg/L	1		415.1	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Alkalinity	590		5.0		mg/L	1		310.1	Total/NA
Carbon Dioxide, Free	160		5.0		mg/L	1		310.1	Total/NA

Client Sample ID: CPA-MW-5D-F (0.2)-0516 — Lab Sample ID: 680-124817-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron, Dissolved	19		0.050		mg/L	1		6010C	Dissolved
Manganese, Dissolved	0.73		0.010		mg/L	1		6010C	Dissolved
Dissolved Organic Carbon	6.4		1.0		mg/L	1		415.1	Dissolved

Client Sample ID: BSA-MW-5D-0516 — Lab Sample ID: 680-124817-5

This Detection Summary does not include radiochemical test results.

AWD 5/23/16
TestAmerica Savannah

Detection Summary

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124817-1
SDG: KPS167

Client Sample ID: BSA-MW-5D-0516 (Continued)

Lab Sample ID: 680-124817-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	28		1.0		ug/L	1		8260B	Total/NA
Chlorobenzene	120		1.0		ug/L	1		8260B	Total/NA
Ethane	25		1.1		ug/L	1		RSK-175	Total/NA
Methane (TCD)	17000		390		ug/L	1		RSK-175	Total/NA
Iron	11		0.050		mg/L	1		6010C	Total Recoverable
Manganese	0.33		0.010		mg/L	1		6010C	Total Recoverable
Chloride	180	D	5.0		mg/L	5		325.2	Total/NA
Total Organic Carbon	8.3		1.0		mg/L	1		415.1	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Alkalinity	670		5.0		mg/L	1		310.1	Total/NA
Carbon Dioxide, Free	71		5.0		mg/L	1		310.1	Total/NA

Client Sample ID: BSA-MW-5D-F (0.2)-0516

Lab Sample ID: 680-124817-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron, Dissolved	10		0.050		mg/L	1		6010C	Dissolved
Manganese, Dissolved	0.31		0.010		mg/L	1		6010C	Dissolved
Dissolved Organic Carbon	8.4		1.0		mg/L	1		415.1	Dissolved

Client Sample ID: CPA-MW-4D-0516

Lab Sample ID: 680-124817-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chlorobenzene	130		1.0		ug/L	1		8260B	Total/NA
1,4-Dichlorobenzene	1.3		1.0		ug/L	1		8260B	Total/NA
Ethane	34		1.1		ug/L	1		RSK-175	Total/NA
Methane (TCD)	26000		390		ug/L	1		RSK-175	Total/NA
Iron	16		0.050		mg/L	1		6010C	Total Recoverable
Manganese	0.38		0.010		mg/L	1		6010C	Total Recoverable
Chloride	280	D	10		mg/L	10		325.2	Total/NA
Total Organic Carbon	7.8		1.0		mg/L	1		415.1	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Alkalinity	690		5.0		mg/L	1		310.1	Total/NA
Carbon Dioxide, Free	72		5.0		mg/L	1		310.1	Total/NA

Client Sample ID: CPA-MW-4D-F (0.2)-0516

Lab Sample ID: 680-124817-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron, Dissolved	16		0.050		mg/L	1		6010C	Dissolved
Manganese, Dissolved	0.37		0.010		mg/L	1		6010C	Dissolved
Dissolved Organic Carbon	7.8		1.0		mg/L	1		415.1	Dissolved

Client Sample ID: BSA-MW-4D-0516

Lab Sample ID: 680-124817-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chlorobenzene	1600	D	20		ug/L	20		8260B	Total/NA
1,4-Dichlorobenzene	63	D	20		ug/L	20		8260B	Total/NA
Ethane	7.9		1.1		ug/L	1		RSK-175	Total/NA

This Detection Summary does not include radiochemical test results.

MWD 5/23/16
TestAmerica Savannah

Detection Summary

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124817-1
SDG: KPS167

Client Sample ID: BSA-MW-4D-0516 (Continued)

Lab Sample ID: 680-124817-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Methane (TCD)	680		390		ug/L	1		RSK-175	Total/NA
Iron	7.0		0.050		mg/L	1		6010C	Total Recoverable
Manganese	0.53		0.010		mg/L	1		6010C	Total Recoverable
Chloride	96	D	2.0		mg/L	2		325.2	Total/NA
Total Organic Carbon	4.3		1.0		mg/L	1		415.1	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Alkalinity	610		5.0		mg/L	1		310.1	Total/NA
Carbon Dioxide, Free	59		5.0		mg/L	1		310.1	Total/NA

Client Sample ID: BSA-MW-4D-F (0.2)-0516

Lab Sample ID: 680-124817-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron, Dissolved	7.0		0.050		mg/L	1		6010C	Dissolved
Manganese, Dissolved	0.53		0.010		mg/L	1		6010C	Dissolved
Dissolved Organic Carbon	5.0		1.0		mg/L	1		415.1	Dissolved

Client Sample ID: BSA-MW-3D-0516

Lab Sample ID: 680-124817-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	30	D	20		ug/L	20		8260B	Total/NA
Chlorobenzene	840	D	20		ug/L	20		8260B	Total/NA
1,4-Dichlorobenzene	220	D	20		ug/L	20		8260B	Total/NA
Ethane	2.7		1.1		ug/L	1		RSK-175	Total/NA
Ethylene	3.3		1.0		ug/L	1		RSK-175	Total/NA
Methane (TCD)	530		390		ug/L	1		RSK-175	Total/NA
Iron	14		0.050		mg/L	1		6010C	Total Recoverable
Manganese	0.78		0.010		mg/L	1		6010C	Total Recoverable
Chloride	320	D	10		mg/L	10		325.2	Total/NA
Nitrate as N	0.063		0.050		mg/L	1		353.2	Total/NA
Sulfate	210	D	50		mg/L	10		375.4	Total/NA
Total Organic Carbon	4.0		1.0		mg/L	1		415.1	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Alkalinity	520		5.0		mg/L	1		310.1	Total/NA
Carbon Dioxide, Free	60		5.0		mg/L	1		310.1	Total/NA

Client Sample ID: BSA-MW-3D-F (0.2)-0516

Lab Sample ID: 680-124817-12

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron, Dissolved	13		0.050		mg/L	1		6010C	Dissolved
Manganese, Dissolved	0.78		0.010		mg/L	1		6010C	Dissolved
Dissolved Organic Carbon	3.9		1.0		mg/L	1		415.1	Dissolved

Client Sample ID: BSA-MW-3D-0516-EB

Lab Sample ID: 680-124817-13

No Detections.

This Detection Summary does not include radiochemical test results.

AWD 5/23/16
TestAmerica Savannah

Detection Summary

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124817-1
SDG: KPS167

Client Sample ID: 2Q16 LTM Trip Blank # 2 — **Lab Sample ID: 680-124817-14**

No Detections.

This Detection Summary does not include radiochemical test results.

AWD 5/23/16
TestAmerica Savannah

Client Sample Results

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124817-1
SDG: KPS167

Client Sample ID: GWE-5D-0516

Date Collected: 05/03/16 09:20
Date Received: 05/04/16 09:15

Lab Sample ID: 680-124817-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	9.6	D	5.0		ug/L			05/16/16 16:18	5
Chlorobenzene	310	D	5.0		ug/L			05/16/16 16:18	5
1,2-Dichlorobenzene	5.0	U	5.0		ug/L			05/16/16 16:18	5
1,3-Dichlorobenzene	5.0	U	5.0		ug/L			05/16/16 16:18	5
1,4-Dichlorobenzene	34	D	5.0		ug/L			05/16/16 16:18	5

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*87*		*70 - 130*		*05/16/16 16:18*	*5*
1,2-Dichloroethane-d4 (Surr)	*96*		*70 - 130*		*05/16/16 16:18*	*5*
Dibromofluoromethane (Surr)	*113*		*70 - 130*		*05/16/16 16:18*	*5*
4-Bromofluorobenzene (Surr)	*92*		*70 - 130*		*05/16/16 16:18*	*5*

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	1.1	U	1.1		ug/L			05/13/16 21:39	1
Ethylene	1.0	U	1.0		ug/L			05/13/16 21:39	1
Methane	65		0.58		ug/L			05/13/16 21:39	1

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	15		0.050		mg/L		05/10/16 07:43	05/11/16 00:20	1
Manganese	0.43		0.010		mg/L		05/10/16 07:43	05/11/16 00:20	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	85	D	2.0		mg/L			05/10/16 16:38	2
Nitrate as N	0.053		0.050		mg/L			05/04/16 15:55	1
Sulfate	460	D	100		mg/L			05/10/16 17:07	20
Total Organic Carbon	3.3		1.0		mg/L			05/10/16 07:47	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	380		5.0		mg/L			05/13/16 07:59	1
Carbon Dioxide, Free	49		5.0		mg/L			05/13/16 07:59	1

RWP 5/23/16
TestAmerica Savannah

Client Sample Results

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124817-1
SDG: KPS167

Client Sample ID: GWE-5D-F (0.2)-0516
Date Collected: 05/03/16 **09:20**
Date Received: 05/04/16 **09:15**

Lab Sample ID: 680-124817-2
Matrix: Water

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron, Dissolved	14		0.050		mg/L		05/10/16 07:43	05/11/16 00:32	1
Manganese, Dissolved	0.42		0.010		mg/L		05/10/16 07:43	05/11/16 00:32	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	3.3		1.0		mg/L			05/10/16 17:56	1

MWD 5/23/16
TestAmerica Savannah

Client Sample Results

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124817-1
SDG: KPS167

Client Sample ID: CPA-MW-5D-0516

Lab Sample ID: 680-124817-3
Matrix: Water

Date Collected: 05/03/16 10:30
Date Received: 05/04/16 09:15

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	20	U	20		ug/L			05/16/16 16:39	20
Chlorobenzene	1400	D	20		ug/L			05/16/16 16:39	20
1,2-Dichlorobenzene	20	U	20		ug/L			05/16/16 16:39	20
1,3-Dichlorobenzene	20	U	20		ug/L			05/16/16 16:39	20
1,4-Dichlorobenzene	20	U	20		ug/L			05/16/16 16:39	20

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	99		*70 - 130*		*05/16/16 16:39*	*20*
1,2-Dichloroethane-d4 (Surr)	91		*70 - 130*		*05/16/16 16:39*	*20*
Dibromofluoromethane (Surr)	89		*70 - 130*		*05/16/16 16:39*	*20*
4-Bromofluorobenzene (Surr)	89		*70 - 130*		*05/16/16 16:39*	*20*

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	1.8		1.1		ug/L			05/13/16 21:51	1
Ethylene	1.0	U	1.0		ug/L			05/13/16 21:51	1
Methane	76		0.58		ug/L			05/13/16 21:51	1

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	19		0.050		mg/L		05/10/16 07:43	05/11/16 00:36	1
Manganese	0.73		0.010		mg/L		05/10/16 07:43	05/11/16 00:36	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	220	D	5.0		mg/L			05/10/16 16:17	5
Nitrate as N	0.074		0.050		mg/L			05/04/16 15:57	1
Sulfate	130	D	25		mg/L			05/10/16 16:23	5
Total Organic Carbon	5.1		1.0		mg/L			05/10/16 08:03	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	590		5.0		mg/L			05/13/16 08:23	1
Carbon Dioxide, Free	160		5.0		mg/L			05/13/16 08:23	1

MWD 5/23/16
TestAmerica Savannah

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124817-1
SDG: KPS167

Client Sample ID: CPA-MW-5D-F (0.2)-0516
Date Collected: 05/03/16 **10:30**
Date Received: 05/04/16 **09:15**

Lab Sample ID: 680-124817-4
Matrix: Water

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron, Dissolved	19		0.050		mg/L		05/10/16 07:43	05/11/16 00:40	1
Manganese, Dissolved	0.73		0.010		mg/L		05/10/16 07:43	05/11/16 00:40	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	6.4		1.0		mg/L			05/10/16 18:41	1

PWD 5/23/16
TestAmerica Savannah

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124817-1
SDG: KPS167

Client Sample ID: BSA-MW-5D-0516
Date Collected: 05/03/16 12:32
Date Received: 05/04/16 09:15

Lab Sample ID: 680-124817-5
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	28		1.0		ug/L			05/17/16 02:15	1
Chlorobenzene	120		1.0		ug/L			05/17/16 02:15	1
1,2-Dichlorobenzene	1.0	U	1.0		ug/L			05/17/16 02:15	1
1,3-Dichlorobenzene	1.0	U	1.0		ug/L			05/17/16 02:15	1
1,4-Dichlorobenzene	1.0	U	1.0		ug/L			05/17/16 02:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*101*		*70 - 130*		*05/17/16 02:15*	*1*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 130*		*05/17/16 02:15*	*1*
Dibromofluoromethane (Surr)	*85*		*70 - 130*		*05/17/16 02:15*	*1*
4-Bromofluorobenzene (Surr)	*101*		*70 - 130*		*05/17/16 02:15*	*1*

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	25		1.1		ug/L			05/13/16 22:04	1
Ethylene	1.0	U	1.0		ug/L			05/13/16 22:04	1
Methane (TCD)	17000		390		ug/L			05/13/16 22:04	1

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	11		0.050		mg/L		05/10/16 07:43	05/11/16 00:44	1
Manganese	0.33		0.010		mg/L		05/10/16 07:43	05/11/16 00:44	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	180	D	5.0		mg/L			05/10/16 16:36	5
Nitrate as N	0.050	U	0.050		mg/L			05/04/16 16:01	1
Sulfate	5.0	U	5.0		mg/L			05/10/16 15:26	1
Total Organic Carbon	8.3		1.0		mg/L			05/10/16 08:20	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	670		5.0		mg/L			05/13/16 08:35	1
Carbon Dioxide, Free	71		5.0		mg/L			05/13/16 08:35	1

AWD
5/23/16
TestAmerica Savannah

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124817-1
SDG: KPS167

Client Sample ID: BSA-MW-5D-F (0.2)-0516
Date Collected: 05/03/16 **12:32**
Date Received: 05/04/16 **09:15**

Lab Sample ID: 680-124817-6
Matrix: Water

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron, Dissolved	10		0.050		mg/L		05/10/16 07:43	05/11/16 00:48	1
Manganese, Dissolved	0.31		0.010		mg/L		05/10/16 07:43	05/11/16 00:48	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	8.4		1.0		mg/L			05/10/16 18:58	1

MWD
5/23/16
TestAmerica Savannah

Client Sample Results

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124817-1
SDG: KPS167

Client Sample ID: CPA-MW-4D-0516

Lab Sample ID: 680-124817-7
Matrix: Water

Date Collected: 05/03/16 13:32
Date Received: 05/04/16 09:15

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	1.0	U	1.0		ug/L			05/16/16 15:15	1
Chlorobenzene	130		1.0		ug/L			05/16/16 15:15	1
1,2-Dichlorobenzene	1.0	U	1.0		ug/L			05/16/16 15:15	1
1,3-Dichlorobenzene	1.0	U	1.0		ug/L			05/16/16 15:15	1
1,4-Dichlorobenzene	1.3		1.0		ug/L			05/16/16 15:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	97		70 - 130		05/16/16 15:15	1
1,2-Dichloroethane-d4 (Surr)	87		70 - 130		05/16/16 15:15	1
Dibromofluoromethane (Surr)	98		70 - 130		05/16/16 15:15	1
4-Bromofluorobenzene (Surr)	91		70 - 130		05/16/16 15:15	1

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	34		1.1		ug/L			05/13/16 22:17	1
Ethylene	1.0	U	1.0		ug/L			05/13/16 22:17	1
Methane (TCD)	26000		390		ug/L			05/13/16 22:17	1

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	16		0.050		mg/L		05/10/16 07:43	05/11/16 00:52	1
Manganese	0.38		0.010		mg/L		05/10/16 07:43	05/11/16 00:52	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	280	D	10		mg/L			05/10/16 17:12	10
Nitrate as N	0.050	U	0.050		mg/L			05/04/16 16:02	1
Sulfate	5.0	U	5.0		mg/L			05/10/16 15:26	1
Total Organic Carbon	7.8		1.0		mg/L			05/10/16 08:36	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	690		5.0		mg/L			05/13/16 08:48	1
Carbon Dioxide, Free	72		5.0		mg/L			05/13/16 08:48	1

RWD
5/23/16
TestAmerica Savannah

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124817-1
SDG: KPS167

Client Sample ID: CPA-MW-4D-F (0.2)-0516
Date Collected: 05/03/16 13:32
Date Received: 05/04/16 09:15

Lab Sample ID: 680-124817-8
Matrix: Water

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron, Dissolved	16		0.050		mg/L		05/10/16 07:43	05/11/16 00:56	1
Manganese, Dissolved	0.37		0.010		mg/L		05/10/16 07:43	05/11/16 00:56	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	7.8		1.0		mg/L			05/10/16 19:14	1

MWD
5/23/16
TestAmerica Savannah

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124817-1
SDG: KPS167

Client Sample ID: BSA-MW-4D-0516
Date Collected: 05/03/16 14:30
Date Received: 05/04/16 09:15

Lab Sample ID: 680-124817-9
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	20	U	20		ug/L			05/16/16 17:22	20
Chlorobenzene	1600	D	20		ug/L			05/16/16 17:22	20
1,2-Dichlorobenzene	20	U	20		ug/L			05/16/16 17:22	20
1,3-Dichlorobenzene	20	U	20		ug/L			05/16/16 17:22	20
1,4-Dichlorobenzene	63	D	20		ug/L			05/16/16 17:22	20

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	98		70 - 130		05/16/16 17:22	20
1,2-Dichloroethane-d4 (Surr)	98		70 - 130		05/16/16 17:22	20
Dibromofluoromethane (Surr)	99		70 - 130		05/16/16 17:22	20
4-Bromofluorobenzene (Surr)	92		70 - 130		05/16/16 17:22	20

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	7.9		1.1		ug/L			05/14/16 10:26	1
Ethylene	1.0	U	1.0		ug/L			05/14/16 10:26	1
Methane (TCD)	680		390		ug/L			05/14/16 10:26	1

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	7.0		0.050		mg/L		05/10/16 07:43	05/10/16 23:51	1
Manganese	0.53		0.010		mg/L		05/10/16 07:43	05/10/16 23:51	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	96	D	2.0		mg/L			05/10/16 16:38	2
Nitrate as N	0.050	U	0.050		mg/L			05/04/16 16:03	1
Sulfate	5.0	U	5.0		mg/L			05/10/16 15:26	1
Total Organic Carbon	4.3		1.0		mg/L			05/10/16 08:53	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	610		5.0		mg/L			05/13/16 08:58	1
Carbon Dioxide, Free	59		5.0		mg/L			05/13/16 08:58	1

AWD
5/23/16

TestAmerica Savannah

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124817-1
SDG: KPS167

Client Sample ID: BSA-MW-4D-F (0.2)-0516
Date Collected: 05/03/16 **14:30**
Date Received: 05/04/16 **09:15**

Lab Sample ID: 680-124817-10
Matrix: Water

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron, Dissolved	7.0		0.050		mg/L		05/10/16 07:43	05/11/16 01:00	1
Manganese, Dissolved	0.53		0.010		mg/L		05/10/16 07:43	05/11/16 01:00	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	5.0		1.0		mg/L			05/10/16 19:31	1

MWD
5/23/16
TestAmerica Savannah

Client Sample Results

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124817-1
SDG: KPS167

Client Sample ID: BSA-MW-3D-0516
Date Collected: 05/03/16 **15:28**
Date Received: 05/04/16 **09:15**

Lab Sample ID: 680-124817-11
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	30	B	20		ug/L			05/16/16 17:43	20
Chlorobenzene	840	B	20		ug/L			05/16/16 17:43	20
1,2-Dichlorobenzene	20	U	20		ug/L			05/16/16 17:43	20
1,3-Dichlorobenzene	20	U	20		ug/L			05/16/16 17:43	20
1,4-Dichlorobenzene	220	B	20		ug/L			05/16/16 17:43	20

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	97		70 - 130		05/16/16 17:43	20
1,2-Dichloroethane-d4 (Surr)	96		70 - 130		05/16/16 17:43	20
Dibromofluoromethane (Surr)	99		70 - 130		05/16/16 17:43	20
4-Bromofluorobenzene (Surr)	90		70 - 130		05/16/16 17:43	20

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	2.7		1.1		ug/L			05/14/16 10:39	1
Ethylene	3.3		1.0		ug/L			05/14/16 10:39	1
Methane (TCD)	530		390		ug/L			05/14/16 10:39	1

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	14		0.050		mg/L		05/10/16 07:43	05/11/16 01:05	1
Manganese	0.78		0.010		mg/L		05/10/16 07:43	05/11/16 01:05	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	320	D	10		mg/L			05/10/16 17:12	10
Nitrate as N	0.063		0.050		mg/L			05/04/16 16:04	1
Sulfate	210	D	50		mg/L			05/10/16 17:02	10
Total Organic Carbon	4.0		1.0		mg/L			05/10/16 09:11	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	520		5.0		mg/L			05/13/16 09:09	1
Carbon Dioxide, Free	60		5.0		mg/L			05/13/16 09:09	1

RWD
5/23/16
TestAmerica Savannah

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124817-1
SDG: KPS167

Client Sample ID: BSA-MW-3D-F (0.2)-0516
Date Collected: 05/03/16 **15:28**
Date Received: 05/04/16 **09:15**

Lab Sample ID: 680-124817-12
Matrix: Water

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron, Dissolved	13		0.050		mg/L		05/10/16 07:43	05/11/16 01:09	1
Manganese, Dissolved	0.78		0.010		mg/L		05/10/16 07:43	05/11/16 01:09	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	3.9		1.0		mg/L			05/10/16 19:47	1

AWD 5/23/16

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124817-1
SDG: KPS167

Client Sample ID: BSA-MW-3D-0516-EB
Date Collected: 05/03/16 **16:00**
Date Received: 05/04/16 **09:15**

Lab Sample ID: 680-124817-13
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	1.0	U	1.0		ug/L			05/16/16 14:33	1
Chlorobenzene	1.0	U	1.0		ug/L			05/16/16 14:33	1
1,2-Dichlorobenzene	1.0	U	1.0		ug/L			05/16/16 14:33	1
1,3-Dichlorobenzene	1.0	U	1.0		ug/L			05/16/16 14:33	1
1,4-Dichlorobenzene	1.0	U	1.0		ug/L			05/16/16 14:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	113		70 - 130		05/16/16 14:33	1
1,2-Dichloroethane-d4 (Surr)	97		70 - 130		05/16/16 14:33	1
Dibromofluoromethane (Surr)	109		70 - 130		05/16/16 14:33	1
4-Bromofluorobenzene (Surr)	93		70 - 130		05/16/16 14:33	1

5/23/16
TestAmerica Savannah

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124817-1
SDG: KPS167

Client Sample ID: 2Q16 LTM Trip Blank # 2
Date Collected: 05/03/16 00:00
Date Received: 05/04/16 09:15

Lab Sample ID: 680-124817-14
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	1.0	U	1.0		ug/L			05/16/16 14:12	1
Chlorobenzene	1.0	U	1.0		ug/L			05/16/16 14:12	1
1,2-Dichlorobenzene	1.0	U	1.0		ug/L			05/16/16 14:12	1
1,3-Dichlorobenzene	1.0	U	1.0		ug/L			05/16/16 14:12	1
1,4-Dichlorobenzene	1.0	U	1.0		ug/L			05/16/16 14:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	92		70 - 130		05/16/16 14:12	1
1,2-Dichloroethane-d4 (Surr)	98		70 - 130		05/16/16 14:12	1
Dibromofluoromethane (Surr)	99		70 - 130		05/16/16 14:12	1
4-Bromofluorobenzene (Surr)	91		70 - 130		05/16/16 14:12	1

MWP 5/23/16
TestAmerica Savannah

Surrogate Summary

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124817-1
SDG: KPS167

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)			
Lab Sample ID	Client Sample ID	TOL (70-130)	12DCE (70-130)	DBFM (70-130)	BFB (70-130)
680-124817-1	GWE-5D-0516	87	96	113	92
680-124817-3	CPA-MW-5D-0516	99	91	89	89
680-124817-5	BSA-MW-5D-0516	101	83	85	101
680-124817-5MS	BSA-MW-5D-0516	100	89	96	90
680-124817-5MSD	BSA-MW-5D-0516	101	92	98	93
680-124817-7	CPA-MW-4D-0516	97	87	98	91
680-124817-9	BSA-MW-4D-0516	98	98	99	92
680-124817-11	BSA-MW-3D-0516	97	96	99	90
680-124817-13	BSA-MW-3D-0516-EB	113	97	109	93
680-124817-14	2Q16 LTM Trip Blank # 2	92	98	99	91
LCS 680-433431/4	Lab Control Sample	102	94	97	91
LCS 680-433564/14	Lab Control Sample	102	97	104	105
LCSD 680-433431/5	Lab Control Sample Dup	99	100	116	85
LCSD 680-433564/15	Lab Control Sample Dup	102	100	104	104
MB 680-433431/9	Method Blank	110	95	100	92
MB 680-433564/16	Method Blank	100	97	99	104

Surrogate Legend

TOL = Toluene-d8 (Surr)
12DCE = 1,2-Dichloroethane-d4 (Surr)
DBFM = Dibromofluoromethane (Surr)
BFB = 4-Bromofluorobenzene (Surr)

RWD
5/23/16
TestAmerica Savannah

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124817-1
SDG: KPS167

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 680-433431/9
Matrix: Water
Analysis Batch: 433431

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	1.0	U	1.0		ug/L			05/16/16 11:38	1
Chlorobenzene	1.0	U	1.0		ug/L			05/16/16 11:38	1
1,2-Dichlorobenzene	1.0	U	1.0		ug/L			05/16/16 11:38	1
1,3-Dichlorobenzene	1.0	U	1.0		ug/L			05/16/16 11:38	1
1,4-Dichlorobenzene	1.0	U	1.0		ug/L			05/16/16 11:38	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*110*		*70 - 130*		*05/16/16 11:38*	*1*
1,2-Dichloroethane-d4 (Surr)	*95*		*70 - 130*		*05/16/16 11:38*	*1*
Dibromofluoromethane (Surr)	*100*		*70 - 130*		*05/16/16 11:38*	*1*
4-Bromofluorobenzene (Surr)	*92*		*70 - 130*		*05/16/16 11:38*	*1*

Lab Sample ID: LCS 680-433431/4
Matrix: Water
Analysis Batch: 433431

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	50.0	46.0		ug/L		92	73 - 131
Chlorobenzene	50.0	48.7		ug/L		97	80 - 120
1,2-Dichlorobenzene	50.0	47.0		ug/L		94	80 - 120
1,3-Dichlorobenzene	50.0	44.9		ug/L		90	80 - 120
1,4-Dichlorobenzene	50.0	45.5		ug/L		91	80 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Toluene-d8 (Surr)	*102*		*70 - 130*
1,2-Dichloroethane-d4 (Surr)	*94*		*70 - 130*
Dibromofluoromethane (Surr)	*97*		*70 - 130*
4-Bromofluorobenzene (Surr)	*91*		*70 - 130*

Lab Sample ID: LCSD 680-433431/5
Matrix: Water
Analysis Batch: 433431

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene	50.0	43.9		ug/L		88	73 - 131	5	30
Chlorobenzene	50.0	46.7		ug/L		93	80 - 120	4	20
1,2-Dichlorobenzene	50.0	45.6		ug/L		91	80 - 120	3	20
1,3-Dichlorobenzene	50.0	43.8		ug/L		88	80 - 120	2	20
1,4-Dichlorobenzene	50.0	44.0		ug/L		88	80 - 120	4	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Toluene-d8 (Surr)	*99*		*70 - 130*
1,2-Dichloroethane-d4 (Surr)	*100*		*70 - 130*
Dibromofluoromethane (Surr)	*116*		*70 - 130*
4-Bromofluorobenzene (Surr)	*85*		*70 - 130*

MVD 5/23/16
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Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 680-124817-5MS
Matrix: Water
Analysis Batch: 433431

Client Sample ID: BSA-MW-5D-0516
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	22		50.0	69.6		ug/L		96	73 - 131
Chlorobenzene	100	F1	50.0	161		ug/L		112	80 - 120
1,2-Dichlorobenzene	5.0	U	50.0	48.0		ug/L		96	80 - 120
1,3-Dichlorobenzene	5.0	U	50.0	47.5		ug/L		95	80 - 120
1,4-Dichlorobenzene	5.0	U	50.0	47.3		ug/L		95	80 - 120

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Toluene-d8 (Surr)	*100*		*70 - 130*
1,2-Dichloroethane-d4 (Surr)	*89*		*70 - 130*
Dibromofluoromethane (Surr)	*96*		*70 - 130*
4-Bromofluorobenzene (Surr)	*90*		*70 - 130*

Lab Sample ID: 680-124817-5MSD
Matrix: Water
Analysis Batch: 433431

Client Sample ID: BSA-MW-5D-0516
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene	22		50.0	74.2		ug/L		105	73 - 131	6	30
Chlorobenzene	100	F1	50.0	165	F1	ug/L		122	80 - 120	3	20
1,2-Dichlorobenzene	5.0	U	50.0	48.3		ug/L		97	80 - 120	1	20
1,3-Dichlorobenzene	5.0	U	50.0	47.1		ug/L		94	80 - 120	1	20
1,4-Dichlorobenzene	5.0	U	50.0	47.3		ug/L		95	80 - 120	0	20

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
Toluene-d8 (Surr)	*101*		*70 - 130*
1,2-Dichloroethane-d4 (Surr)	*92*		*70 - 130*
Dibromofluoromethane (Surr)	*98*		*70 - 130*
4-Bromofluorobenzene (Surr)	*93*		*70 - 130*

Lab Sample ID: MB 680-433564/18
Matrix: Water
Analysis Batch: 433564

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	1.0	U	1.0		ug/L			05/16/16 20:26	1
Chlorobenzene	1.0	U	1.0		ug/L			05/16/16 20:26	1
1,2-Dichlorobenzene	1.0	U	1.0		ug/L			05/16/16 20:26	1
1,3-Dichlorobenzene	1.0	U	1.0		ug/L			05/16/16 20:26	1
1,4-Dichlorobenzene	1.0	U	1.0		ug/L			05/16/16 20:26	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*100*		*70 - 130*		*05/16/16 20:26*	*1*
1,2-Dichloroethane-d4 (Surr)	*97*		*70 - 130*		*05/16/16 20:26*	*1*
Dibromofluoromethane (Surr)	*99*		*70 - 130*		*05/16/16 20:26*	*1*
4-Bromofluorobenzene (Surr)	*104*		*70 - 130*		*05/16/16 20:26*	*1*

5/23/16
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Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-433564/14
Matrix: Water
Analysis Batch: 433564

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	50.0	48.1		ug/L		96	73 - 131
Chlorobenzene	50.0	49.0		ug/L		98	80 - 120
1,2-Dichlorobenzene	50.0	50.0		ug/L		100	80 - 120
1,3-Dichlorobenzene	50.0	51.2		ug/L		102	80 - 120
1,4-Dichlorobenzene	50.0	49.5		ug/L		99	80 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Toluene-d8 (Surr)	*102*		*70 - 130*
1,2-Dichloroethane-d4 (Surr)	*97*		*70 - 130*
Dibromofluoromethane (Surr)	*104*		*70 - 130*
4-Bromofluorobenzene (Surr)	*105*		*70 - 130*

Lab Sample ID: LCSD 680-433564/15
Matrix: Water
Analysis Batch: 433564

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene	50.0	48.1		ug/L		96	73 - 131	0	30
Chlorobenzene	50.0	48.6		ug/L		97	80 - 120	1	20
1,2-Dichlorobenzene	50.0	49.9		ug/L		100	80 - 120	0	20
1,3-Dichlorobenzene	50.0	50.9		ug/L		102	80 - 120	1	20
1,4-Dichlorobenzene	50.0	49.7		ug/L		99	80 - 120	0	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Toluene-d8 (Surr)	*102*		*70 - 130*
1,2-Dichloroethane-d4 (Surr)	*100*		*70 - 130*
Dibromofluoromethane (Surr)	*104*		*70 - 130*
4-Bromofluorobenzene (Surr)	*104*		*70 - 130*

Method: RSK-175 - Dissolved Gases (GC)

Lab Sample ID: MB 680-433272/62
Matrix: Water
Analysis Batch: 433272

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	1.1	U	1.1		ug/L			05/13/16 19:11	1
Ethylene	1.0	U	1.0		ug/L			05/13/16 19:11	1
Methane	0.58	U	0.58		ug/L			05/13/16 19:11	1
Methane (TCD)	390	U	390		ug/L			05/13/16 19:11	1

Lab Sample ID: LCS 680-433272/6
Matrix: Water
Analysis Batch: 433272

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Methane (TCD)	1920	1910		ug/L		99	75 - 125

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Method: RSK-175 - Dissolved Gases (GC) (Continued)

Lab Sample ID: LCS 680-433272/9
Matrix: Water
Analysis Batch: 433272

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ethane	288	310		ug/L		107	75 - 125
Ethylene	269	288		ug/L		107	75 - 125
Methane	154	161		ug/L		105	75 - 125

Lab Sample ID: LCSD 680-433272/61
Matrix: Water
Analysis Batch: 433272

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Ethane	288	315		ug/L		109	75 - 125	2	30
Ethylene	269	291		ug/L		108	75 - 125	1	30
Methane	154	165		ug/L		107	75 - 125	2	30

Lab Sample ID: LCSD 680-433272/7
Matrix: Water
Analysis Batch: 433272

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Methane (TCD)	1920	1970		ug/L		102	75 - 125	3	30

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 680-432572/1-A
Matrix: Water
Analysis Batch: 432777

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 432572

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	0.050	U	0.050		mg/L		05/10/16 07:43	05/10/16 23:43	1
Iron, Dissolved	0.050	U	0.050		mg/L		05/10/16 07:43	05/10/16 23:43	1
Manganese	0.010	U	0.010		mg/L		05/10/16 07:43	05/10/16 23:43	1
Manganese, Dissolved	0.010	U	0.010		mg/L		05/10/16 07:43	05/10/16 23:43	1

Lab Sample ID: LCS 680-432572/2-A
Matrix: Water
Analysis Batch: 432777

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 432572

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Iron	5.00	4.71		mg/L		94	80 - 120
Iron, Dissolved	5.00	4.71		mg/L		94	80 - 120
Manganese	0.500	0.491		mg/L		98	80 - 120
Manganese, Dissolved	0.500	0.491		mg/L		98	80 - 120

Lab Sample ID: 680-124817-9 MS
Matrix: Water
Analysis Batch: 432777

Client Sample ID: BSA-MW-4D-0516
Prep Type: Total Recoverable
Prep Batch: 432572

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Iron	7.0		5.00	11.7		mg/L		93	75 - 125
Iron, Dissolved	7.0		5.00	11.7		mg/L		93	75 - 125

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Method: 6010C - Metals (ICP) (Continued)

Lab Sample ID: 680-124817-9 MS
Matrix: Water
Analysis Batch: 432777

Client Sample ID: BSA-MW-4D-0516
Prep Type: Total Recoverable
Prep Batch: 432572

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Manganese	0.53		0.500	1.03		mg/L		99	75 - 125
Manganese, Dissolved	0.53		0.500	1.03		mg/L		99	75 - 125

Lab Sample ID: 680-124817-9 MSD
Matrix: Water
Analysis Batch: 432777

Client Sample ID: BSA-MW-4D-0516
Prep Type: Total Recoverable
Prep Batch: 432572

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Iron	7.0		5.00	11.4		mg/L		88	75 - 125	2	20
Iron, Dissolved	7.0		5.00	11.4		mg/L		88	75 - 125	2	20
Manganese	0.53		0.500	1.00		mg/L		94	75 - 125	2	20
Manganese, Dissolved	0.53		0.500	1.00		mg/L		94	75 - 125	2	20

Method: 310.1 - Alkalinity

Lab Sample ID: MB 680-433193/7
Matrix: Water
Analysis Batch: 433193

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	5.0	U	5.0		mg/L			05/13/16 06:42	1
Carbon Dioxide, Free	5.0	U	5.0		mg/L			05/13/16 06:42	1

Lab Sample ID: LCS 680-433193/8
Matrix: Water
Analysis Batch: 433193

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Alkalinity	250	240		mg/L		96	80 - 120

Lab Sample ID: LCSD 680-433193/34
Matrix: Water
Analysis Batch: 433193

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Alkalinity	250	251		mg/L		100	80 - 120	4	30

Lab Sample ID: 680-124817-1 DU
Matrix: Water
Analysis Batch: 433193

Client Sample ID: GWE-5D-0516
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Alkalinity	380		392		mg/L		3	30
Carbon Dioxide, Free	49		39.8		mg/L		21	30

Method: 325.2 - Chloride

Lab Sample ID: MB 680-432769/2
Matrix: Water
Analysis Batch: 432769

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	1.0	U	1.0		mg/L			05/10/16 15:13	1

Lab Sample ID: LCS 680-432769/1
Matrix: Water
Analysis Batch: 432769

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	25.0	25.3		mg/L		101	85 - 115

Lab Sample ID: LCSD 680-432769/6
Matrix: Water
Analysis Batch: 432769

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	25.0	25.6		mg/L		102	85 - 115	1	30

Method: 353.2 - Nitrogen, Nitrate-Nitrite

Lab Sample ID: MB 680-431942/13
Matrix: Water
Analysis Batch: 431942

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	0.050	U	0.050		mg/L			05/04/16 15:46	1

Lab Sample ID: LCS 680-431942/16
Matrix: Water
Analysis Batch: 431942

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	0.500	0.521		mg/L		104	75 - 125
Nitrate Nitrite as N	1.00	1.06		mg/L		106	90 - 110
Nitrite as N	0.500	0.539		mg/L		108	90 - 110

Lab Sample ID: 680-124817-1 DU
Matrix: Water
Analysis Batch: 431942

Client Sample ID: GWE-5D-0516
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Nitrate as N	0.053		0.0567		mg/L		7	30

Method: 375.4 - Sulfate

Lab Sample ID: MB 680-432771/2
Matrix: Water
Analysis Batch: 432771

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	5.0	U	5.0		mg/L			05/10/16 15:15	1

Lab Sample ID: LCS 680-432771/4
Matrix: Water
Analysis Batch: 432771

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	20.0	20.4		mg/L		102	75 - 125

Lab Sample ID: LCSD 680-432771/6
Matrix: Water
Analysis Batch: 432771

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfate	20.0	19.6		mg/L		98	75 - 125	4	30

Method: 415.1 - DOC

Lab Sample ID: MB 680-432794/2
Matrix: Water
Analysis Batch: 432794

Client Sample ID: Method Blank
Prep Type: Dissolved

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	1.0	U	1.0		mg/L			05/10/16 16:57	1

Lab Sample ID: LCS 680-432794/4
Matrix: Water
Analysis Batch: 432794

Client Sample ID: Lab Control Sample
Prep Type: Dissolved

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Dissolved Organic Carbon	20.0	21.6		mg/L		108	80 - 120

Lab Sample ID: LCSD 680-432794/5
Matrix: Water
Analysis Batch: 432794

Client Sample ID: Lab Control Sample Dup
Prep Type: Dissolved

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Dissolved Organic Carbon	20.0	21.4		mg/L		107	80 - 120	1	20

Lab Sample ID: 680-124817-2 MS
Matrix: Water
Analysis Batch: 432794

Client Sample ID: GWE-5D-F (0.2)-0516
Prep Type: Dissolved

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Dissolved Organic Carbon	3.3		25.0	24.2		mg/L		84	80 - 120

Lab Sample ID: 680-124817-2 MSD
Matrix: Water
Analysis Batch: 432794

Client Sample ID: GWE-5D-F (0.2)-0516
Prep Type: Dissolved

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Dissolved Organic Carbon	3.3		25.0	23.9		mg/L		83	80 - 120	1	20

AWD 5/23/16
TestAmerica Savannah

QC Sample Results

Client: Solutia Inc
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124817-1
SDG: KPS167

Method: 415.1 - TOC

Lab Sample ID: MB 680-432670/2
Matrix: Water
Analysis Batch: 432670

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	1.0	U	1.0		mg/L			05/10/16 08:01	1

Lab Sample ID: LCS 680-432670/3
Matrix: Water
Analysis Batch: 432670

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	20.0	21.3		mg/L		107	80 - 120

Lab Sample ID: LCSD 680-432670/4
Matrix: Water
Analysis Batch: 432670

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Organic Carbon	20.0	21.5		mg/L		107	80 - 120	1	25

AWD 5/23/16
TestAmerica Savannah

QC Association Summary

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124817-1
SDG: KPS167

GC/MS VOA

Analysis Batch: 433431

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-124817-1	GWE-5D-0516	Total/NA	Water	8260B	
680-124817-3	CPA-MW-5D-0516	Total/NA	Water	8260B	
680-124817-5MS	BSA-MW-5D-0516	Total/NA	Water	8260B	
680-124817-5MSD	BSA-MW-5D-0516	Total/NA	Water	8260B	
680-124817-7	CPA-MW-4D-0516	Total/NA	Water	8260B	
680-124817-9	BSA-MW-4D-0516	Total/NA	Water	8260B	
680-124817-11	BSA-MW-3D-0516	Total/NA	Water	8260B	
680-124817-13	BSA-MW-3D-0516-EB	Total/NA	Water	8260B	
680-124817-14	2Q16 LTM Trip Blank # 2	Total/NA	Water	8260B	
LCS 680-433431/4	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-433431/5	Lab Control Sample Dup	Total/NA	Water	8260B	
MB 680-433431/9	Method Blank	Total/NA	Water	8260B	

Analysis Batch: 433564

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-124817-5	BSA-MW-5D-0516	Total/NA	Water	8260B	
LCS 680-433564/14	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-433564/15	Lab Control Sample Dup	Total/NA	Water	8260B	
MB 680-433564/18	Method Blank	Total/NA	Water	8260B	

GC VOA

Analysis Batch: 433272

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-124817-1	GWE-5D-0516	Total/NA	Water	RSK-175	
680-124817-3	CPA-MW-5D-0516	Total/NA	Water	RSK-175	
680-124817-5	BSA-MW-5D-0516	Total/NA	Water	RSK-175	
680-124817-7	CPA-MW-4D-0516	Total/NA	Water	RSK-175	
680-124817-9	BSA-MW-4D-0516	Total/NA	Water	RSK-175	
680-124817-11	BSA-MW-3D-0516	Total/NA	Water	RSK-175	
LCS 680-433272/6	Lab Control Sample	Total/NA	Water	RSK-175	
LCS 680-433272/9	Lab Control Sample	Total/NA	Water	RSK-175	
LCSD 680-433272/61	Lab Control Sample Dup	Total/NA	Water	RSK-175	
LCSD 680-433272/7	Lab Control Sample Dup	Total/NA	Water	RSK-175	
MB 680-433272/62	Method Blank	Total/NA	Water	RSK-175	

Metals

Prep Batch: 432572

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-124817-1	GWE-5D-0516	Total Recoverable	Water	3005A	
680-124817-2	GWE-5D-F (0.2)-0516	Dissolved	Water	3005A	
680-124817-3	CPA-MW-5D-0516	Total Recoverable	Water	3005A	
680-124817-4	CPA-MW-5D-F (0.2)-0516	Dissolved	Water	3005A	
680-124817-5	BSA-MW-5D-0516	Total Recoverable	Water	3005A	
680-124817-6	BSA-MW-5D-F (0.2)-0516	Dissolved	Water	3005A	
680-124817-7	CPA-MW-4D-0516	Total Recoverable	Water	3005A	
680-124817-8	CPA-MW-4D-F (0.2)-0516	Dissolved	Water	3005A	
680-124817-9	BSA-MW-4D-0516	Total Recoverable	Water	3005A	
680-124817-9 MS	BSA-MW-4D-0516	Total Recoverable	Water	3005A	

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Metals (Continued)

Prep Batch: 432572 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-124817-9 MSD	BSA-MW-4D-0516	Total Recoverable	Water	3005A	
680-124817-10	BSA-MW-4D-F (0.2)-0516	Dissolved	Water	3005A	
680-124817-11	BSA-MW-3D-0516	Total Recoverable	Water	3005A	
680-124817-12	BSA-MW-3D-F (0.2)-0516	Dissolved	Water	3005A	
LCS 680-432572/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
MB 680-432572/1-A	Method Blank	Total Recoverable	Water	3005A	

Analysis Batch: 432777

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-124817-1	GWE-5D-0516	Total Recoverable	Water	6010C	432572
680-124817-2	GWE-5D-F (0.2)-0516	Dissolved	Water	6010C	432572
680-124817-3	CPA-MW-5D-0516	Total Recoverable	Water	6010C	432572
680-124817-4	CPA-MW-5D-F (0.2)-0516	Dissolved	Water	6010C	432572
680-124817-5	BSA-MW-5D-0516	Total Recoverable	Water	6010C	432572
680-124817-6	BSA-MW-5D-F (0.2)-0516	Dissolved	Water	6010C	432572
680-124817-7	CPA-MW-4D-0516	Total Recoverable	Water	6010C	432572
680-124817-8	CPA-MW-4D-F (0.2)-0516	Dissolved	Water	6010C	432572
680-124817-9	BSA-MW-4D-0516	Total Recoverable	Water	6010C	432572
680-124817-9 MS	BSA-MW-4D-0516	Total Recoverable	Water	6010C	432572
680-124817-9 MSD	BSA-MW-4D-0516	Total Recoverable	Water	6010C	432572
680-124817-10	BSA-MW-4D-F (0.2)-0516	Dissolved	Water	6010C	432572
680-124817-11	BSA-MW-3D-0516	Total Recoverable	Water	6010C	432572
680-124817-12	BSA-MW-3D-F (0.2)-0516	Dissolved	Water	6010C	432572
LCS 680-432572/2-A	Lab Control Sample	Total Recoverable	Water	6010C	432572
MB 680-432572/1-A	Method Blank	Total Recoverable	Water	6010C	432572

General Chemistry

Analysis Batch: 431942

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-124817-1	GWE-5D-0516	Total/NA	Water	353.2	
680-124817-1 DU	GWE-5D-0516	Total/NA	Water	353.2	
680-124817-3	CPA-MW-5D-0516	Total/NA	Water	353.2	
680-124817-5	BSA-MW-5D-0516	Total/NA	Water	353.2	
680-124817-7	CPA-MW-4D-0516	Total/NA	Water	353.2	
680-124817-9	BSA-MW-4D-0516	Total/NA	Water	353.2	
680-124817-11	BSA-MW-3D-0516	Total/NA	Water	353.2	
LCS 680-431942/16	Lab Control Sample	Total/NA	Water	353.2	
MB 680-431942/13	Method Blank	Total/NA	Water	353.2	

Analysis Batch: 432670

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-124817-1	GWE-5D-0516	Total/NA	Water	415.1	
680-124817-3	CPA-MW-5D-0516	Total/NA	Water	415.1	
680-124817-5	BSA-MW-5D-0516	Total/NA	Water	415.1	
680-124817-7	CPA-MW-4D-0516	Total/NA	Water	415.1	
680-124817-9	BSA-MW-4D-0516	Total/NA	Water	415.1	
680-124817-11	BSA-MW-3D-0516	Total/NA	Water	415.1	
LCS 680-432670/3	Lab Control Sample	Total/NA	Water	415.1	
LCSD 680-432670/4	Lab Control Sample Dup	Total/NA	Water	415.1	

AMP 5/23/16
TestAmerica Savannah

General Chemistry (Continued)

Analysis Batch: 432670 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 680-432670/2	Method Blank	Total/NA	Water	415.1	

Analysis Batch: 432769

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-124817-1	GWE-5D-0516	Total/NA	Water	325.2	
680-124817-3	CPA-MW-5D-0516	Total/NA	Water	325.2	
680-124817-5	BSA-MW-5D-0516	Total/NA	Water	325.2	
680-124817-7	CPA-MW-4D-0516	Total/NA	Water	325.2	
680-124817-9	BSA-MW-4D-0516	Total/NA	Water	325.2	
680-124817-11	BSA-MW-3D-0516	Total/NA	Water	325.2	
LCS 680-432769/1	Lab Control Sample	Total/NA	Water	325.2	
LCSD 680-432769/6	Lab Control Sample Dup	Total/NA	Water	325.2	
MB 680-432769/2	Method Blank	Total/NA	Water	325.2	

Analysis Batch: 432771

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-124817-1	GWE-5D-0516	Total/NA	Water	375.4	
680-124817-3	CPA-MW-5D-0516	Total/NA	Water	375.4	
680-124817-5	BSA-MW-5D-0516	Total/NA	Water	375.4	
680-124817-7	CPA-MW-4D-0516	Total/NA	Water	375.4	
680-124817-9	BSA-MW-4D-0516	Total/NA	Water	375.4	
680-124817-11	BSA-MW-3D-0516	Total/NA	Water	375.4	
LCS 680-432771/4	Lab Control Sample	Total/NA	Water	375.4	
LCSD 680-432771/6	Lab Control Sample Dup	Total/NA	Water	375.4	
MB 680-432771/2	Method Blank	Total/NA	Water	375.4	

Analysis Batch: 432794

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-124817-2	GWE-5D-F (0.2)-0516	Dissolved	Water	415.1	
680-124817-2 MS	GWE-5D-F (0.2)-0516	Dissolved	Water	415.1	
680-124817-2 MSD	GWE-5D-F (0.2)-0516	Dissolved	Water	415.1	
680-124817-4	CPA-MW-5D-F (0.2)-0516	Dissolved	Water	415.1	
680-124817-6	BSA-MW-5D-F (0.2)-0516	Dissolved	Water	415.1	
680-124817-8	CPA-MW-4D-F (0.2)-0516	Dissolved	Water	415.1	
680-124817-10	BSA-MW-4D-F (0.2)-0516	Dissolved	Water	415.1	
680-124817-12	BSA-MW-3D-F (0.2)-0516	Dissolved	Water	415.1	
LCS 680-432794/4	Lab Control Sample	Dissolved	Water	415.1	
LCSD 680-432794/5	Lab Control Sample Dup	Dissolved	Water	415.1	
MB 680-432794/2	Method Blank	Dissolved	Water	415.1	

Analysis Batch: 433193

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-124817-1	GWE-5D-0516	Total/NA	Water	310.1	
680-124817-1 DU	GWE-5D-0516	Total/NA	Water	310.1	
680-124817-3	CPA-MW-5D-0516	Total/NA	Water	310.1	
680-124817-5	BSA-MW-5D-0516	Total/NA	Water	310.1	
680-124817-7	CPA-MW-4D-0516	Total/NA	Water	310.1	
680-124817-9	BSA-MW-4D-0516	Total/NA	Water	310.1	
680-124817-11	BSA-MW-3D-0516	Total/NA	Water	310.1	
LCS 680-433193/8	Lab Control Sample	Total/NA	Water	310.1	
LCSD 680-433193/34	Lab Control Sample Dup	Total/NA	Water	310.1	

MWD 5/23/16
TestAmerica Savannah

General Chemistry (Continued)

Analysis Batch: 433193 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 680-433193/7	Method Blank	Total/NA	Water	310.1	

RWD 5/23/14
TestAmerica Savannah

Lab Chronicle

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124817-1
SDG: KPS167

Client Sample ID: GWE-5D-0516

Lab Sample ID: 680-124817-1
Matrix: Water

Date Collected: 05/03/16 09:20
Date Received: 05/04/16 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		5	433431	05/16/16 16:18	DAS	TAL SAV
Total/NA	Analysis	RSK-175		1	433272	05/13/16 21:39	MKA	TAL SAV
Total Recoverable	Prep	3005A			432572	05/10/16 07:43	CRW	TAL SAV
Total Recoverable	Analysis	6010C		1	432777	05/11/16 00:20	BCB	TAL SAV
Total/NA	Analysis	310.1		1	433193	05/13/16 07:59	DAM	TAL SAV
Total/NA	Analysis	325.2		2	432789	05/10/16 16:38	JME	TAL SAV
Total/NA	Analysis	353.2		1	431942	05/04/16 15:55	GRX	TAL SAV
Total/NA	Analysis	375.4		20	432771	05/10/16 17:07	JME	TAL SAV
Total/NA	Analysis	415.1		1	432670	05/10/16 07:47	KLD	TAL SAV

Client Sample ID: GWE-5D-F (0.2)-0516

Lab Sample ID: 680-124817-2
Matrix: Water

Date Collected: 05/03/16 09:20
Date Received: 05/04/16 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			432572	05/10/16 07:43	CRW	TAL SAV
Dissolved	Analysis	6010C		1	432777	05/11/16 00:32	BCB	TAL SAV
Dissolved	Analysis	415.1		1	432794	05/10/16 17:56	KLD	TAL SAV

Client Sample ID: CPA-MW-5D-0516

Lab Sample ID: 680-124817-3
Matrix: Water

Date Collected: 05/03/16 10:30
Date Received: 05/04/16 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		20	433431	05/16/16 16:39	DAS	TAL SAV
Total/NA	Analysis	RSK-175		1	433272	05/13/16 21:51	MKA	TAL SAV
Total Recoverable	Prep	3005A			432572	05/10/16 07:43	CRW	TAL SAV
Total Recoverable	Analysis	6010C		1	432777	05/11/16 00:36	BCB	TAL SAV
Total/NA	Analysis	310.1		1	433193	05/13/16 08:23	DAM	TAL SAV
Total/NA	Analysis	325.2		5	432789	05/10/16 16:17	JME	TAL SAV
Total/NA	Analysis	353.2		1	431942	05/04/16 15:57	GRX	TAL SAV
Total/NA	Analysis	375.4		5	432771	05/10/16 16:23	JME	TAL SAV
Total/NA	Analysis	415.1		1	432670	05/10/16 08:03	KLD	TAL SAV

Client Sample ID: CPA-MW-5D-F (0.2)-0516

Lab Sample ID: 680-124817-4
Matrix: Water

Date Collected: 05/03/16 10:30
Date Received: 05/04/16 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			432572	05/10/16 07:43	CRW	TAL SAV
Dissolved	Analysis	6010C		1	432777	05/11/16 00:40	BCB	TAL SAV

5/23/16
TestAmerica Savannah

Lab Chronicle

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124817-1
SDG: KPS167

Client Sample ID: CPA-MW-5D-F (0.2)-0516

Lab Sample ID: 680-124817-4
Matrix: Water

Date Collected: 05/03/16 10:30
Date Received: 05/04/16 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Analysis	415.1		1	432794	05/10/16 18:41	KLD	TAL SAV

Client Sample ID: BSA-MW-5D-0516

Lab Sample ID: 680-124817-5
Matrix: Water

Date Collected: 05/03/16 12:32
Date Received: 05/04/16 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	433564	05/17/16 02:15	CEJ	TAL SAV
Total/NA	Analysis	RSK-175		1	433272	05/13/16 22:04	MKA	TAL SAV
Total Recoverable	Prep	3005A			432572	05/10/16 07:43	CRW	TAL SAV
Total Recoverable	Analysis	6010C		1	432777	05/11/16 00:44	BCB	TAL SAV
Total/NA	Analysis	310.1		1	433193	05/13/16 08:35	DAM	TAL SAV
Total/NA	Analysis	325.2		5	432769	05/10/16 16:36	JME	TAL SAV
Total/NA	Analysis	353.2		1	431942	05/04/16 16:01	GRX	TAL SAV
Total/NA	Analysis	375.4		1	432771	05/10/16 15:26	JME	TAL SAV
Total/NA	Analysis	415.1		1	432670	05/10/16 08:20	KLD	TAL SAV

Client Sample ID: BSA-MW-5D-F (0.2)-0516

Lab Sample ID: 680-124817-6
Matrix: Water

Date Collected: 05/03/16 12:32
Date Received: 05/04/16 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			432572	05/10/16 07:43	CRW	TAL SAV
Dissolved	Analysis	6010C		1	432777	05/11/16 00:48	BCB	TAL SAV
Dissolved	Analysis	415.1		1	432794	05/10/16 18:58	KLD	TAL SAV

Client Sample ID: CPA-MW-4D-0516

Lab Sample ID: 680-124817-7
Matrix: Water

Date Collected: 05/03/16 13:32
Date Received: 05/04/16 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	433431	05/16/16 15:15	DAS	TAL SAV
Total/NA	Analysis	RSK-175		1	433272	05/13/16 22:17	MKA	TAL SAV
Total Recoverable	Prep	3005A			432572	05/10/16 07:43	CRW	TAL SAV
Total Recoverable	Analysis	6010C		1	432777	05/11/16 00:52	BCB	TAL SAV
Total/NA	Analysis	310.1		1	433193	05/13/16 08:48	DAM	TAL SAV
Total/NA	Analysis	325.2		10	432769	05/10/16 17:12	JME	TAL SAV
Total/NA	Analysis	353.2		1	431942	05/04/16 16:02	GRX	TAL SAV
Total/NA	Analysis	375.4		1	432771	05/10/16 15:26	JME	TAL SAV
Total/NA	Analysis	415.1		1	432670	05/10/16 08:36	KLD	TAL SAV

AWD 5/23/16
TestAmerica Savannah

Lab Chronicle

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124817-1
SDG: KPS167

Client Sample ID: CPA-MW-4D-F (0.2)-0516

Lab Sample ID: 680-124817-8
Matrix: Water

Date Collected: 05/03/16 13:32
Date Received: 05/04/16 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			432572	05/10/16 07:43	CRW	TAL SAV
Dissolved	Analysis	6010C		1	432777	05/11/16 00:56	BCB	TAL SAV
Dissolved	Analysis	415.1		1	432794	05/10/16 19:14	KLD	TAL SAV

Client Sample ID: BSA-MW-4D-0516

Lab Sample ID: 680-124817-9
Matrix: Water

Date Collected: 05/03/16 14:30
Date Received: 05/04/16 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		20	433431	05/16/16 17:22	DAS	TAL SAV
Total/NA	Analysis	RSK-175		1	433272	05/14/16 10:26	MKA	TAL SAV
Total Recoverable	Prep	3005A			432572	05/10/16 07:43	CRW	TAL SAV
Total Recoverable	Analysis	6010C		1	432777	05/10/16 23:51	BCB	TAL SAV
Total/NA	Analysis	310.1		1	433193	05/13/16 08:58	DAM	TAL SAV
Total/NA	Analysis	325.2		2	432769	05/10/16 16:38	JME	TAL SAV
Total/NA	Analysis	353.2		1	431942	05/04/16 16:03	GRX	TAL SAV
Total/NA	Analysis	375.4		1	432771	05/10/16 15:26	JME	TAL SAV
Total/NA	Analysis	415.1		1	432670	05/10/16 08:53	KLD	TAL SAV

Client Sample ID: BSA-MW-4D-F (0.2)-0516

Lab Sample ID: 680-124817-10
Matrix: Water

Date Collected: 05/03/16 14:30
Date Received: 05/04/16 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			432572	05/10/16 07:43	CRW	TAL SAV
Dissolved	Analysis	6010C		1	432777	05/11/16 01:00	BCB	TAL SAV
Dissolved	Analysis	415.1		1	432794	05/10/16 19:31	KLD	TAL SAV

Client Sample ID: BSA-MW-3D-0516

Lab Sample ID: 680-124817-11
Matrix: Water

Date Collected: 05/03/16 15:28
Date Received: 05/04/16 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		20	433431	05/16/16 17:43	DAS	TAL SAV
Total/NA	Analysis	RSK-175		1	433272	05/14/16 10:39	MKA	TAL SAV
Total Recoverable	Prep	3005A			432572	05/10/16 07:43	CRW	TAL SAV
Total Recoverable	Analysis	6010C		1	432777	05/11/16 01:05	BCB	TAL SAV
Total/NA	Analysis	310.1		1	433193	05/13/16 09:09	DAM	TAL SAV
Total/NA	Analysis	325.2		10	432769	05/10/16 17:12	JME	TAL SAV
Total/NA	Analysis	353.2		1	431942	05/04/16 16:04	GRX	TAL SAV
Total/NA	Analysis	375.4		10	432771	05/10/16 17:02	JME	TAL SAV

MMD 5/23/16
TestAmerica Savannah

Lab Chronicle

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124817-1
SDG: KPS167

Client Sample ID: BSA-MW-3D-0516

Lab Sample ID: 680-124817-11
Matrix: Water

Date Collected: 05/03/16 15:28
Date Received: 05/04/16 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	415.1		1	432670	05/10/16 09:11	KLD	TAL SAV

Client Sample ID: BSA-MW-3D-F (0.2)-0516

Lab Sample ID: 680-124817-12
Matrix: Water

Date Collected: 05/03/16 15:28
Date Received: 05/04/16 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			432572	05/10/16 07:43	CRW	TAL SAV
Dissolved	Analysis	6010C		1	432777	05/11/16 01:09	BCB	TAL SAV
Dissolved	Analysis	415.1		1	432794	05/10/16 19:47	KLD	TAL SAV

Client Sample ID: BSA-MW-3D-0516-EB

Lab Sample ID: 680-124817-13
Matrix: Water

Date Collected: 05/03/16 16:00
Date Received: 05/04/16 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	433431	05/16/16 14:33	DAS	TAL SAV

Client Sample ID: 2Q16 LTM Trip Blank # 2

Lab Sample ID: 680-124817-14
Matrix: Water

Date Collected: 05/03/16 00:00
Date Received: 05/04/16 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	433431	05/16/16 14:12	DAS	TAL SAV

Laboratory References:

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

TestAmerica Savannah
5102 LaRoche Avenue

Savannah, GA 31404
phone 912.354 7858 fax

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Regulatory Program: ☐DW ☐NPDES ☑RCRA ☐Other:

Client Contact	Project Manager: Amanda Derhake	Site Contact: Emily White	Date: 05/02/16	COC No: —
Golder Associates Inc.	Tel/Fax: 636-724-9191	Lab Contact: Michele Kersey	Carrier: FedEx	1 of 2 COCs
820 South Main Street	Analysis Turnaround Time			Sampler: E.White
St. Charles, MO 63301	☑ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
(636) 724-9191 Phone	TAT if different from Below Standard			Walk-in Client:
(636) 724-9323 FAX	☑ 2 weeks			Lab Sampling:
Project Name: 2Q16 LTM GW Sampling-1403345	☐ 1 week			
Site: Solutia WG Krummrich Facility	☐ 2 days			Job / SDG No.:
P O # 42282863	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y / N)	Perform MS / MSD (Y / N)	VOCs by 8260	Total Fe/Mn by 6010C	Alk/CO2 by 310.1	Chloride by 325.2/Sulfate by 375.4	Dissolved Gases by RSK 175	Nitrate by 353.2	TOC by 415.1	Dissolved Fe/Mn by 6010C	DOC by 415.1	Sample Specific Notes:
GWE-SD-0516	05/03/16	0920	G	W	14	N		3	1	1	1	3	2	3			2 coolers
GWE-SD-F(0.2)-0516		0920			4	Y									1	3	
CPA-MW-5D-0516		1030			14	N		3	1	1	1	3	2	3			
CPA-MW-5D-F(0.2)-0516		1030			4	Y									1	3	
BSA-MW-5D-0516		1232			14	N		3	1	1	1	3	2	3			
BSA-MW-5D-F(0.2)-0516		1232			4	Y									1	3	
BSA-MW-5D-0516-MS		1232			3	N		3									
BSA-MW-5D-0516-MSD		1232			3	N		3									
CPA-MW-4D-0516		1332			14	N		3	1	1	1	3	2	3			
CPA-MW-4D-F(0.2)-0516		1332			4	Y									1	3	
BSA-MW-4D-0516		1430			14	N		3	1	1	1	3	2	3			
BSA-MW-4D-F(0.2)-0516		1430			4	Y									1	3	
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other								2	4	1	1	2	1,3	3	4	3	

680-124817 Chain of Custody

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☑ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments:
VOC headspace upon sampling: Yes/No

1.0/1.3 0.1/0.4

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No.: 698168216987679	Cooler Temp. (°C): Obs'd:	Corr'd:	Therm ID No.:
Relinquished by: Emily White	Company: Golder	Date/Time: 05/03/16 1605	Received by:	Company: TA-SAV	Date/Time: 5-4-16 9:15
Relinquished by:	Company	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Form No. CA-C-WI-002, Rev. 4.3, dated 12/05/2013

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AWO 5/23/16

TestAmerica Savannah
5102 LaRoche Avenue

Savannah, GA 31404
phone 912.354.7858 fax

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Regulatory Program: ☐ DW ☐ NPDES ☑ RCRA ☐ Other:

Client Contact	Project Manager: Amanda Derhake	Site Contact: Emily White	Date: 05/03/16	COC No: —
Golder Associates Inc.	Tel/Fax: 636-724-9191	Lab Contact: Michele Kersey	Carrier: FedEx	2 of 2 COCs
820 South Main Street	Analysis Turnaround Time			Sampler: E. White
St. Charles, MO 63301	☑ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
(636) 724-9191 Phone	TAT if different from Below: Standard			Walk-in Client:
(636) 724-9323 FAX	☑ 2 weeks			Lab Sampling:
Project Name: 2Q16 LTM GW Sampling-1403345	☐ 1 week			
Site: Solutia WG Krummrich Facility	☐ 2 days			Job / SDG No.:
P O # 42282883	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y / N)	Perform MS / MSD (Y / N)	VOCs by 8260	Total Fe/Mn by 6010C	Alk/CO2 by 310.1	Chloride by 325.2/Sulfate by 375.4	Dissolved Gases by RSK 175	Nitrate by 353.2	TOC by 415.1	Dissolved Fe/Mn by 6010C	DOC by 415.1	Sample Specific Notes:
BSA-MW-3D-0516	05/03/16	1528	G	W	14	N		3	1	1	1	3	2	3			
BSA-MW-3D-F(0.2)-0516	1	1528	1	1	4	Y									1	3	
BSA-MW-3D-0516-EB	1	1600	1	1	3	N		3									
2Q16 LTM Trip Blank #2	—	—	—	1	2	N		2									
								2	4	1	1	2	1,3	3	4	3	

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☑ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments:
VOC headspace upon sampling Yes/No

680-124817 1.0/1.3 0.1/0.4

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No.: 1698680 / 1698679	Cooler Temp. (°C): Obs'd:	Corr'd:	Therm ID No.:
Relinquished by: Emily White	Company: Golder	Date/Time: 05/03/16 1615	Received by:	Company: TA-SAV	Date/Time: 5-4-16 9:15
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Form No. CA-C-WI-002, Rev. 4.3, dated 12/05/2013

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MWD 5/23/16

Login Sample Receipt Checklist

Client: Solutia Inc.

Job Number: 680-124817-1
SDG Number: KPS167

Login Number: 124817
List Number: 1
Creator: White, Menica R

List Source: TestAmerica Savannah

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	N/A	
Samples do not require splitting or compositing.	N/A	
Residual Chlorine Checked.	N/A	

AWD 5/23/16

Certification Summary

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124817-1
SDG: KPS167

Laboratory: TestAmerica Savannah

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
	AFCEE		SAVLAB	
A2LA	DoD ELAP		399.01	02-28-17
A2LA	ISO/IEC 17025		399.01	02-28-17
Alabama	State Program	4	41450	06-30-16 *
Alaska (UST)	State Program	10	UST-104	11-06-16
Arkansas DEQ	State Program	6	88-0692	01-31-17
California	State Program	9	2939	07-31-16 *
Colorado	State Program	8	N/A	12-31-16
Connecticut	State Program	1	PH-0161	03-31-17
Florida	NELAP	4	E87052	06-30-16 *
GA Dept. of Agriculture	State Program	4	N/A	06-12-17
Georgia	State Program	4	803	06-30-16 *
Guam	State Program	9	15-005r	04-16-16 *
Hawaii	State Program	9	N/A	06-30-16 *
Illinois	NELAP	5	200022	11-30-16
Indiana	State Program	5	N/A	06-30-16 *
Iowa	State Program	7	353	06-30-17
Kentucky (DW)	State Program	4	90084	12-31-16
Kentucky (UST)	State Program	4	18	06-30-16 *
Kentucky (WW)	State Program	4	90084	12-31-16
Louisiana	NELAP	6	30690	06-30-16 *
Louisiana (DW)	NELAP	6	LA160019	12-31-16
Maine	State Program	1	GA00006	09-24-16
Maryland	State Program	3	250	12-31-16
Massachusetts	State Program	1	M-GA006	06-30-16 *
Michigan	State Program	5	9925	06-30-16 *
Mississippi	State Program	4	N/A	06-30-16 *
Nebraska	State Program	7	TestAmerica-Savannah	06-30-16 *
New Jersey	NELAP	2	GA769	06-30-16 *
New Mexico	State Program	6	N/A	06-30-16 *
New York	NELAP	2	10842	03-31-17
North Carolina (DW)	State Program	4	13701	07-31-16 *
North Carolina (WW/SW)	State Program	4	269	12-31-16
Oklahoma	State Program	6	9984	08-31-16
Pennsylvania	NELAP	3	68-00474	06-30-16 *
Puerto Rico	State Program	2	GA00006	12-31-16
South Carolina	State Program	4	98001	06-30-16 *
Tennessee	State Program	4	TN02961	06-30-16 *
Texas	NELAP	6	T104704185-14-7	11-30-16
USDA	Federal		SAV 3-04	06-11-17
Virginia	NELAP	3	460161	06-14-16 *
Washington	State Program	10	C805	06-10-16 *
West Virginia (DW)	State Program	3	9950C	12-31-16
West Virginia DEP	State Program	3	094	06-30-16 *
Wisconsin	State Program	5	999819810	08-31-16
Wyoming	State Program	8	8TMS-L	06-30-16 *

* Certification renewal pending - certification considered valid.

RWD 5/23/16
TestAmerica Savannah

Level IV Data Validation Summary
Solutia Inc., W.G. Krummrich, Sauget, Illinois
2Q16 Long-Term Monitoring Program

Company Name: Golder Associates
Project Name: WGK-2Q16 LTM
Reviewer: A. Derhake
Laboratory: TestAmerica
SDG#: KPS168
Matrix: Water

Project Manager: A. Derhake
Project Number: 140-3345
Sample Date: May 2016

Analytical Method: VOC (8260B), Dissolved Gases (RSK-175), Metals (6010C), Alkalinity (310.1), Chloride (325.2), Nitrogen, Nitrate-Nitrite (353.2), Sulfate (375.4), TOC (415.1), and DOC (415.1)

Sample Names: CPA-MW-3D-0516, CPA-MW-3D-F(0.2)-0516, CPA-MW-3D-0516-AD, BSA-MW-2D-0516, BSA-MW-2D-F(0.2)-0516, CPA-MW-1D-0516, CPA-MW-1D-F(0.2)-0516, CPA-MW-2D-0516, CPA-MW-2D-F(0.2)-0516, CPA-MW-2D-0516-AD, BSA-MW-1S-0516, BSA-MW-1S-F(0.2)-0516, BSA-MW-1S-0516-EB, and 2Q16 LTM Trip Blank #3

Field Information	**YES**	**NO**	**NA**
a) Sampling dates noted?	☒	☐	☐
b) Does the laboratory narrative indicate deficiencies?	☒	☐	☐

Comments:

VOC: Insufficient volume to perform MS/MSD associated with batches 433699 and 433790. Samples BSA-MW-2D-0516, CPA-MW-1D-0516, CPA-MW-2D-0516, CPA-MW-2D-0516-AD, BSA-MW-1S-0516 and BSA-MW-1S-0516-EB required dilution prior to analysis, reporting limits were adjusted accordingly.

Dissolved Gases: No deficiencies noted.

Metals: No deficiencies noted.

Alkalinity: No deficiencies noted.

Chloride: Chloride exceeded recovery low for the MS and MSD of sample BSA-MW-2D-0516 associated with batch 432769. Samples CPA-MW-3D-0516, BSA-MW-2D-0516, CPA-MW-1D-0516, CPA-MW-2D-0516, and BSA-MW-1S-0516 required dilution prior to analysis, reporting limits were adjusted accordingly.

Nitrate-Nitrite as Nitrogen: No deficiencies noted.

Sulfate: Samples BSA-MW-2D-0516, CPA-MW-2D-0516, and BSA-MW-1S-0516 required dilution prior to analysis, reporting limits were adjusted accordingly.

TOC: No deficiencies noted.

DOC: No deficiencies noted.

Chain-of-Custody (COC)	**YES**	**NO**	**NA**
a) Was the COC signed by both field and laboratory personnel?	☒	☐	☐
b) Were samples received in good condition?	☒	☐	☐

Comments: Samples were received at 1.4°C and 3.4°C, some outside the 4°C +/- 2°C criteria.

General	YES	NO	NA
a) Were hold times met for sample analysis?	☒	☐	☐
b) Were the correct preservatives used?	☒	☐	☐
c) Was the correct method used?	☒	☐	☐
d) Any sample dilutions noted?	☒	☐	☐

Comments: Detections in diluted analysis were qualified.

GC/MS Instrument Performance Check (IPC) and Internal Standards (IS)	YES	NO	NA
a) IPC analyzed at the appropriate frequency and met the appropriate standards?	☒	☐	☐
b) Does BFB/DFTPP meet the ion abundance criteria?	☒	☐	☐
c) Internal Standard retention times and areas met appropriate criteria?	☒	☐	☐

Comments: None

Calibrations	YES	NO	NA
a) Initial calibration analyzed at the appropriate frequency and met the appropriate standards?	☐	☒	☐
b) Continuing calibrations analyzed at the appropriate frequency and met the appropriate standards?	☐	☒	☐
c) Initial calibration verifications and blanks analyzed at the appropriate frequency and met the appropriate standards?	☒	☐	☐
d) Continuing calibration verifications and blanks analyzed at the appropriate frequency and met the appropriate standards?	☒	☐	☐

Comments: Analytes of interest met calibration standards.

Blanks	YES	NO	NA
a) Were blanks (trip, equipment, method) performed at required frequency?	☒	☐	☐
b) Were analytes detected in any blanks?	☒	☐	☐

Comments: Benzene and chlorobenzene were detected in the equipment blank BSA-MW-1S-EB.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)	YES	NO	NA
a) Was MS/MSD accuracy criteria met?	☐	☒	☐
b) Was MS/MSD precision criteria met?	☐	☒	☐

Comments: Chloride exceeded the recovery criteria for MS and MSD sample associated with batch 432769. Data was not qualified on MS/MSD alone.

Laboratory Control Sample (LCS)	YES	NO	NA
a) LCS analyzed at the appropriate frequency and met appropriate standards?	☒	☐	☐

Comments: None

Surrogate (System Monitoring) Compounds	YES	NO	NA
a) Surrogate compounds analyzed at the appropriate frequency and met appropriate standards?	☒	☐	☐

Comments: None

Duplicates	**YES**	**NO**	**NA**
a) Were field duplicates collected?	☒	☐	☐
b) Was field duplicate precision criteria met?	☒	☐	☐

Comments: Duplicate samples CPA-MW-2D-0516-AD and CPA-MW-3D-0516-AD were submitted with SDG KPS168.

Additional Comments: None

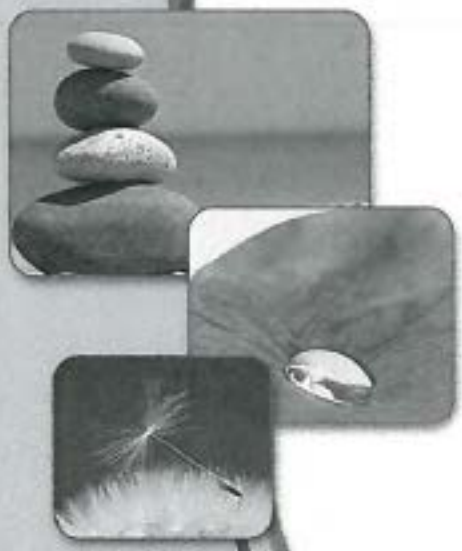
Qualifications:

Quality Control Issue	Compound(s)	Qualifier	Samples Affected
Compounds analyzed at a dilution	Benzene, Chlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, Chloride, and Sulfate	D	BSA-MW-2D, CPA-MW-1D, CPA-MW-2D, CPA-MW-2D-AD, CPA-MW-3D BSA-MW-1S, and BSA-MW-1S-EB

SDG KPS168

Sample Results from:

CPA-MW-3D
CPA-MW-3D-AD
BSA-MW-2D
CPA-MW-1D
CPA-MW-2D
CPA-MW-2D-AD
BSA-MW-1S
BSA-MW-1S-EB



TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Tel: (912)354-7858

TestAmerica Job ID: 680-124913-1
TestAmerica Sample Delivery Group: KPS168
Client Project/Site: 2Q16 LTM GW Sampling - 1403345

For:
Solutia Inc.
575 Maryville Centre Dr.
Saint Louis, Missouri 63141

Attn: Mr. Jerry Rinaldi

Michele R Kersey

Authorized for release by:
5/19/2016 9:21:30 AM

Michele Kersey, Project Manager I
(912)354-7858
michele.kersey@testamericainc.com

MJD 5/23/16

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AWD 5/23/16

Job ID: 680-124913-1

Laboratory: TestAmerica Savannah

Narrative

CASE NARRATIVE

Client: Solutia Inc.

Project: 2Q16 LTM GW Sampling - 1403345

Report Number: 680-124913-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In the event of interference or analytes present at high concentrations, samples may be diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

RECEIPT
The samples were received on 5/5/2016 9:25 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 1.4° C and 3.4° C.

VOLATILE ORGANIC COMPOUNDS (GC-MS)
Samples CPA-MW-3D-0516 (680-124913-1), CPA-MW-3D-0516-AD (680-124913-3), BSA-MW-2D-0516 (680-124913-4), CPA-MW-1D-0516 (680-124913-6), CPA-MW-2D-0516 (680-124913-8), CPA-MW-2D-0516-AD (680-124913-10), BSA-MW-1S-0516 (680-124913-11), BSA-MW-1S-0516-EB (680-124913-13) and 2Q16 LTM Trip Blank #3 (680-124913-14) were analyzed for Volatile Organic Compounds (GC-MS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 05/17/2016 and 05/18/2016.

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with 680-433699.

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with 433790.

Samples BSA-MW-2D-0516 (680-124913-4)[1000X], CPA-MW-1D-0516 (680-124913-6)[250X], CPA-MW-2D-0516 (680-124913-8)[250X], CPA-MW-2D-0516-AD (680-124913-10)[250X], BSA-MW-1S-0516 (680-124913-11)[10000X] and BSA-MW-1S-0516-EB (680-124913-13) [5X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

DISSOLVED GASES
Samples CPA-MW-3D-0516 (680-124913-1), BSA-MW-2D-0516 (680-124913-4), CPA-MW-1D-0516 (680-124913-6), CPA-MW-2D-0516 (680-124913-8) and BSA-MW-1S-0516 (680-124913-11) were analyzed for dissolved gases in accordance with RSK-175. The samples were analyzed on 05/14/2016 and 05/16/2016.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

METALS (ICP)
Samples CPA-MW-3D-F(0.2)-0516 (680-124913-2), BSA-MW-2D-F(0.2)-0516 (680-124913-5), CPA-MW-1D-F(0.2)-0516 (680-124913-7), CPA-MW-2D-F(0.2)-0516 (680-124913-9) and BSA-MW-1S-F(0.2)-0516 (680-124913-12) were analyzed for Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 05/10/2016 and 05/11/2016 and analyzed on 05/11/2016.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

METALS (ICP)
Samples CPA-MW-3D-0516 (680-124913-1), BSA-MW-2D-0516 (680-124913-4), CPA-MW-1D-0516 (680-124913-6), CPA-MW-2D-0516

RWD 5/23/16

Job ID: 680-124913-1 (Continued)

Laboratory: TestAmerica Savannah (Continued)

(680-124913-8) and BSA-MW-1S-0516 (680-124913-11) were analyzed for Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 05/10/2016 and 05/11/2016 and analyzed on 05/11/2016.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

ALKALINITY
Samples CPA-MW-3D-0516 (680-124913-1), BSA-MW-2D-0516 (680-124913-4), CPA-MW-1D-0516 (680-124913-6), CPA-MW-2D-0516 (680-124913-8) and BSA-MW-1S-0516 (680-124913-11) were analyzed for alkalinity in accordance with EPA Method 310.1. The samples were analyzed on 05/18/2016.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

CHLORIDE
Samples CPA-MW-3D-0516 (680-124913-1), BSA-MW-2D-0516 (680-124913-4), CPA-MW-1D-0516 (680-124913-6), CPA-MW-2D-0516 (680-124913-8) and BSA-MW-1S-0516 (680-124913-11) were analyzed for Chloride in accordance with EPA Method 325.2. The samples were analyzed on 05/10/2016.

Chloride exceeded the recovery criteria low for the MS and MSD of sample BSA-MW-2D-0516 (680-124913-4) in batch 680-432769.

Samples CPA-MW-3D-0516 (680-124913-1)[5X], BSA-MW-2D-0516 (680-124913-4)[5X], CPA-MW-1D-0516 (680-124913-6)[2X], CPA-MW-2D-0516 (680-124913-8)[2X] and BSA-MW-1S-0516 (680-124913-11)[5X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

NITRATE-NITRITE AS NITROGEN
Samples CPA-MW-3D-0516 (680-124913-1), BSA-MW-2D-0516 (680-124913-4), CPA-MW-1D-0516 (680-124913-6), CPA-MW-2D-0516 (680-124913-8) and BSA-MW-1S-0516 (680-124913-11) were analyzed for nitrate-nitrite as nitrogen in accordance with EPA Method 353.2. The samples were analyzed on 05/05/2016.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

SULFATE
Samples CPA-MW-3D-0516 (680-124913-1), BSA-MW-2D-0516 (680-124913-4), CPA-MW-1D-0516 (680-124913-6), CPA-MW-2D-0516 (680-124913-8) and BSA-MW-1S-0516 (680-124913-11) were analyzed for sulfate in accordance with EPA Method 375.4. The samples were analyzed on 05/10/2016.

Samples BSA-MW-2D-0516 (680-124913-4)[20X], CPA-MW-2D-0516 (680-124913-8)[2X] and BSA-MW-1S-0516 (680-124913-11)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL ORGANIC CARBON
Samples CPA-MW-3D-0516 (680-124913-1), BSA-MW-2D-0516 (680-124913-4), CPA-MW-1D-0516 (680-124913-6), CPA-MW-2D-0516 (680-124913-8) and BSA-MW-1S-0516 (680-124913-11) were analyzed for total organic carbon in accordance with EPA Method 415.1. The samples were analyzed on 05/11/2016.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

DISSOLVED ORGANIC CARBON (DOC)
Samples CPA-MW-3D-F(0.2)-0516 (680-124913-2), BSA-MW-2D-F(0.2)-0516 (680-124913-5), CPA-MW-1D-F(0.2)-0516 (680-124913-7), CPA-MW-2D-F(0.2)-0516 (680-124913-9) and BSA-MW-1S-F(0.2)-0516 (680-124913-12) were analyzed for Dissolved Organic Carbon (DOC) in accordance with EPA Method 415.1. The samples were analyzed on 05/10/2016.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

AWD 5/23/16
TestAmerica Savannah

Sample Summary

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124913-1
SDG: KPS168

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
680-124913-1	CPA-MW-3D-0516	Water	05/04/16 09:18	05/05/16 09:25
680-124913-2	CPA-MW-3D-F(0.2)-0516	Water	05/04/16 09:18	05/05/16 09:25
680-124913-3	CPA-MW-3D-0516-AD	Water	05/04/16 09:18	05/05/16 09:25
680-124913-4	BSA-MW-2D-0516	Water	05/04/16 10:12	05/05/16 09:25
680-124913-5	BSA-MW-2D-F(0.2)-0516	Water	05/04/16 10:12	05/05/16 09:25
680-124913-6	CPA-MW-1D-0516	Water	05/04/16 11:22	05/05/16 09:25
680-124913-7	CPA-MW-1D-F(0.2)-0516	Water	05/04/16 11:22	05/05/16 09:25
680-124913-8	CPA-MW-2D-0516	Water	05/04/16 12:49	05/05/16 09:25
680-124913-9	CPA-MW-2D-F(0.2)-0516	Water	05/04/16 12:49	05/05/16 09:25
680-124913-10	CPA-MW-2D-0516-AD	Water	05/04/16 12:49	05/05/16 09:25
680-124913-11	BSA-MW-1S-0516	Water	05/04/16 13:46	05/05/16 09:25
680-124913-12	BSA-MW-1S-F(0.2)-0516	Water	05/04/16 13:46	05/05/16 09:25
680-124913-13	BSA-MW-1S-0516-EB	Water	05/04/16 14:20	05/05/16 09:25
680-124913-14	2Q16 LTM Trip Blank #3	Water	05/04/16 00:00	05/05/16 09:25

MWD 5/23/16
TestAmerica Savannah

Method Summary

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124913-1
SDG: KPS168

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL SAV
RSK-175	Dissolved Gases (GC)	RSK	TAL SAV
6010C	Metals (ICP)	SW846	TAL SAV
310.1	Alkalinity	MCAWW	TAL SAV
325.2	Chloride	MCAWW	TAL SAV
353.2	Nitrogen, Nitrate-Nitrite	MCAWW	TAL SAV
375.4	Sulfate	MCAWW	TAL SAV
415.1	TOC	MCAWW	TAL SAV
415.1	DOC	MCAWW	TAL SAV

Protocol References:

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

RSK = Sample Prep And Calculations For Dissolved Gas Analysis In Water Samples Using A GC Headspace Equilibration Technique, RSKSOP-175, Rev. 0, 8/11/94, USEPA Research Lab

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

AWD 5/23/16
TestAmerica Savannah

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

GC VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Metals

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

General Chemistry

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

KWD 5/23/16
TestAmerica Savannah

Detection Summary

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124913-1
SDG: KPS168

Client Sample ID: CPA-MW-3D-0516 — Lab Sample ID: 680-124913-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chlorobenzene	110		1.0		ug/L	1		8260B	Total/NA
1,4-Dichlorobenzene	1.6		1.0		ug/L	1		8260B	Total/NA
Ethane	32		1.1		ug/L	1		RSK-175	Total/NA
Methane (TCD)	25000		390		ug/L	1		RSK-175	Total/NA
Iron	14		0.050		mg/L	1		6010C	Total Recoverable
Manganese	0.74		0.010		mg/L	1		6010C	Total Recoverable
Chloride	180	D	5.0		mg/L	5		325.2	Total/NA
Total Organic Carbon	7.6		1.0		mg/L	1		415.1	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Alkalinity	630		5.0		mg/L	1		310.1	Total/NA
Carbon Dioxide, Free	94		5.0		mg/L	1		310.1	Total/NA

Client Sample ID: CPA-MW-3D-F(0.2)-0516 — Lab Sample ID: 680-124913-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron, Dissolved	14		0.050		mg/L	1		6010C	Dissolved
Manganese, Dissolved	0.74		0.010		mg/L	1		6010C	Dissolved
Dissolved Organic Carbon	7.7		1.0		mg/L	1		415.1	Dissolved

Client Sample ID: CPA-MW-3D-0516-AD — Lab Sample ID: 680-124913-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chlorobenzene	110		1.0		ug/L	1		8260B	Total/NA
1,4-Dichlorobenzene	1.6		1.0		ug/L	1		8260B	Total/NA

Client Sample ID: BSA-MW-2D-0516 — Lab Sample ID: 680-124913-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	47000	D	1000		ug/L	1000		8260B	Total/NA
Ethane	15		1.1		ug/L	1		RSK-175	Total/NA
Methane (TCD)	22000		390		ug/L	1		RSK-175	Total/NA
Iron	5.2		0.050		mg/L	1		6010C	Total Recoverable
Manganese	0.73		0.010		mg/L	1		6010C	Total Recoverable
Chloride	180	D	5.0		mg/L	5		325.2	Total/NA
Total Organic Carbon	9.1		1.0		mg/L	1		415.1	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Alkalinity	750		5.0		mg/L	1		310.1	Total/NA
Carbon Dioxide, Free	79		5.0		mg/L	1		310.1	Total/NA

Client Sample ID: BSA-MW-2D-F(0.2)-0516 — Lab Sample ID: 680-124913-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron, Dissolved	5.1		0.050		mg/L	1		6010C	Dissolved
Manganese, Dissolved	0.72		0.010		mg/L	1		6010C	Dissolved
Dissolved Organic Carbon	8.7		1.0		mg/L	1		415.1	Dissolved

This Detection Summary does not include radiochemical test results.

AMD 5/23/16
TestAmerica Savannah

Detection Summary

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124913-1
SDG: KPS168

Client Sample ID: CPA-MW-1D-0516 — Lab Sample ID: 680-124913-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	4300	D	250		ug/L	250		8260B	Total/NA
Chlorobenzene	14000	D	250		ug/L	250		8260B	Total/NA
1,2-Dichlorobenzene	8200	D	250		ug/L	250		8260B	Total/NA
1,3-Dichlorobenzene	1000	D	250		ug/L	250		8260B	Total/NA
1,4-Dichlorobenzene	8500	D	250		ug/L	250		8260B	Total/NA
Ethane	31		1.1		ug/L	1		RSK-175	Total/NA
Methane (TCD)	19000		390		ug/L	1		RSK-175	Total/NA
Iron	0.13		0.050		mg/L	1		6010C	Total Recoverable
Manganese	0.064		0.010		mg/L	1		6010C	Total Recoverable
Chloride	81	D	2.0		mg/L	2		325.2	Total/NA
Total Organic Carbon	8.7		1.0		mg/L	1		415.1	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Alkalinity	890		5.0		mg/L	1		310.1	Total/NA
Carbon Dioxide, Free	7.6		5.0		mg/L	1		310.1	Total/NA

Client Sample ID: CPA-MW-1D-F(0.2)-0516 — Lab Sample ID: 680-124913-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron, Dissolved	0.18		0.050		mg/L	1		6010C	Dissolved
Manganese, Dissolved	0.071		0.010		mg/L	1		6010C	Dissolved
Dissolved Organic Carbon	9.4		1.0		mg/L	1		415.1	Dissolved

Client Sample ID: CPA-MW-2D-0516 — Lab Sample ID: 680-124913-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chlorobenzene	34000	D	250		ug/L	250		8260B	Total/NA
1,4-Dichlorobenzene	1600	D	250		ug/L	250		8260B	Total/NA
Ethane	1.9		1.1		ug/L	1		RSK-175	Total/NA
Ethylene	1.4		1.0		ug/L	1		RSK-175	Total/NA
Methane (TCD)	780		390		ug/L	1		RSK-175	Total/NA
Iron	8.6		0.050		mg/L	1		6010C	Total Recoverable
Manganese	0.48		0.010		mg/L	1		6010C	Total Recoverable
Chloride	57	D	2.0		mg/L	2		325.2	Total/NA
Sulfate	99	D	10		mg/L	2		375.4	Total/NA
Total Organic Carbon	6.5		1.0		mg/L	1		415.1	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Alkalinity	500		5.0		mg/L	1		310.1	Total/NA
Carbon Dioxide, Free	55		5.0		mg/L	1		310.1	Total/NA

Client Sample ID: CPA-MW-2D-F(0.2)-0516 — Lab Sample ID: 680-124913-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron, Dissolved	8.3		0.050		mg/L	1		6010C	Dissolved
Manganese, Dissolved	0.48		0.010		mg/L	1		6010C	Dissolved
Dissolved Organic Carbon	6.5		1.0		mg/L	1		415.1	Dissolved

This Detection Summary does not include radiochemical test results.

AWD 5/23/16
TestAmerica Savannah

Detection Summary

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124913-1
SDG: KPS168

Client Sample ID: CPA-MW-2D-0516-AD — Lab Sample ID: 680-124913-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chlorobenzene	34000	D	250		ug/L	250		8260B	Total/NA
1,4-Dichlorobenzene	1600	D	250		ug/L	250		8260B	Total/NA

Client Sample ID: BSA-MW-1S-0516 — Lab Sample ID: 680-124913-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	750000	D	10000		ug/L	10000		8260B	Total/NA
Methane (TCD)	12000		390		ug/L	1		RSK-175	Total/NA
Iron	13		0.050		mg/L	1		6010C	Total Recoverable
Manganese	1.1		0.010		mg/L	1		6010C	Total Recoverable
Chloride	120	B	5.0		mg/L	5		325.2	Total/NA
Sulfate	210	B	50		mg/L	10		375.4	Total/NA
Total Organic Carbon	14		1.0		mg/L	1		415.1	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Alkalinity	1100		5.0		mg/L	1		310.1	Total/NA
Carbon Dioxide, Free	110		5.0		mg/L	1		310.1	Total/NA

Client Sample ID: BSA-MW-1S-F(0.2)-0516 — Lab Sample ID: 680-124913-12

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron, Dissolved	13		0.050		mg/L	1		6010C	Dissolved
Manganese, Dissolved	1.2		0.010		mg/L	1		6010C	Dissolved
Dissolved Organic Carbon	13		1.0		mg/L	1		415.1	Dissolved

Client Sample ID: BSA-MW-1S-0516-EB — Lab Sample ID: 680-124913-13

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	520	D	5.0		ug/L	5		8260B	Total/NA
Chlorobenzene	6.0	D	5.0		ug/L	5		8260B	Total/NA

Client Sample ID: 2Q16 LTM Trip Blank #3 — Lab Sample ID: 680-124913-14

No Detections.

This Detection Summary does not include radiochemical test results.

AWD 5/23/16
TestAmerica Savannah

Client Sample Results

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124913-1
SDG: KPS168

Client Sample ID: CPA-MW-3D-0516

Lab Sample ID: 680-124913-1
Matrix: Water

Date Collected: 05/04/16 09:18
Date Received: 05/05/16 09:25

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	1.0	U	1.0		ug/L			05/17/16 16:35	1
Chlorobenzene	110		1.0		ug/L			05/17/16 16:35	1
1,2-Dichlorobenzene	1.0	U	1.0		ug/L			05/17/16 16:35	1
1,3-Dichlorobenzene	1.0	U	1.0		ug/L			05/17/16 16:35	1
1,4-Dichlorobenzene	1.6		1.0		ug/L			05/17/16 16:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*98*		*70 - 130*		*05/17/16 16:35*	*1*
1,2-Dichloroethane-d4 (Surr)	*95*		*70 - 130*		*05/17/16 16:35*	*1*
Dibromofluoromethane (Surr)	*94*		*70 - 130*		*05/17/16 16:35*	*1*
4-Bromofluorobenzene (Surr)	*96*		*70 - 130*		*05/17/16 16:35*	*1*

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	32		1.1		ug/L			05/14/16 10:52	1
Ethylene	1.0	U	1.0		ug/L			05/14/16 10:52	1
Methane (TCD)	25000		390		ug/L			05/14/16 10:52	1

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	14		0.050		mg/L		05/10/16 07:43	05/11/16 01:21	1
Manganese	0.74		0.010		mg/L		05/10/16 07:43	05/11/16 01:21	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	180	D	5.0		mg/L			05/10/16 16:36	5
Nitrate as N	0.050	U	0.050		mg/L			05/05/16 15:16	1
Sulfate	5.0	U	5.0		mg/L			05/10/16 15:28	1
Total Organic Carbon	7.6		1.0		mg/L			05/11/16 01:39	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	630		5.0		mg/L			05/18/16 12:21	1
Carbon Dioxide, Free	94		5.0		mg/L			05/18/16 12:21	1

RWD 5/23/16
TestAmerica Savannah

Client Sample Results

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124913-1
SDG: KPS168

Client Sample ID: CPA-MW-3D-F(0.2)-0516
Date Collected: 05/04/16 09:18
Date Received: 05/05/16 09:25

Lab Sample ID: 680-124913-2
Matrix: Water

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron, Dissolved	14		0.050		mg/L		05/10/16 07:43	05/11/16 01:25	1
Manganese, Dissolved	0.74		0.010		mg/L		05/10/16 07:43	05/11/16 01:25	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	7.7		1.0		mg/L			05/10/16 20:03	1

PWD 5/23/16
TestAmerica Savannah

Client Sample Results

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124913-1
SDG: KPS168

Client Sample ID: CPA-MW-3D-0516-AD
Date Collected: 05/04/16 09:18
Date Received: 05/05/16 09:25

Lab Sample ID: 680-124913-3
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	1.0	U	1.0		ug/L			05/17/16 16:56	1
Chlorobenzene	110		1.0		ug/L			05/17/16 16:56	1
1,2-Dichlorobenzene	1.0	U	1.0		ug/L			05/17/16 16:56	1
1,3-Dichlorobenzene	1.0	U	1.0		ug/L			05/17/16 16:56	1
1,4-Dichlorobenzene	1.6		1.0		ug/L			05/17/16 16:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*99*		*70 - 130*		*05/17/16 16:56*	*1*
1,2-Dichloroethane-d4 (Surr)	*94*		*70 - 130*		*05/17/16 16:56*	*1*
Dibromofluoromethane (Surr)	*81*		*70 - 130*		*05/17/16 16:56*	*1*
4-Bromofluorobenzene (Surr)	*97*		*70 - 130*		*05/17/16 16:56*	*1*

AWD 5/23/16
TestAmerica Savannah

Client Sample Results

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124913-1
SDG: KPS168

Client Sample ID: BSA-MW-2D-0516

Lab Sample ID: 680-124913-4
Matrix: Water

Date Collected: 05/04/16 10:12
Date Received: 05/05/16 09:25

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	47000	D	1000		ug/L			05/17/16 18:38	1000
Chlorobenzene	1000	U	1000		ug/L			05/17/16 18:38	1000
1,2-Dichlorobenzene	1000	U	1000		ug/L			05/17/16 18:38	1000
1,3-Dichlorobenzene	1000	U	1000		ug/L			05/17/16 18:38	1000
1,4-Dichlorobenzene	1000	U	1000		ug/L			05/17/16 18:38	1000

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	98		70 - 130		05/17/16 18:38	1000
1,2-Dichloroethane-d4 (Surr)	96		70 - 130		05/17/16 18:38	1000
Dibromofluoromethane (Surr)	86		70 - 130		05/17/16 18:38	1000
4-Bromofluorobenzene (Surr)	97		70 - 130		05/17/16 18:38	1000

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	15		1.1		ug/L			05/14/16 11:04	1
Ethylene	1.0	U	1.0		ug/L			05/14/16 11:04	1
Methane (TCD)	22000		390		ug/L			05/14/16 11:04	1

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	5.2		0.050		mg/L		05/10/16 07:43	05/11/16 01:29	1
Manganese	0.73		0.010		mg/L		05/10/16 07:43	05/11/16 01:29	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	180	D	5.0		mg/L			05/10/16 16:17	5
Nitrate as N	0.050	U	0.050		mg/L			05/05/16 15:17	1
Sulfate	100	U	100		mg/L			05/10/16 17:00	20
Total Organic Carbon	9.1		1.0		mg/L			05/11/16 01:56	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	750		5.0		mg/L			05/18/16 12:34	1
Carbon Dioxide, Free	79		5.0		mg/L			05/18/16 12:34	1

RWD 5/23/16
TestAmerica Savannah

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124913-1
SDG: KPS168

Client Sample ID: BSA-MW-2D-F(0.2)-0516
Date Collected: 05/04/16 10:12
Date Received: 05/05/16 09:25

Lab Sample ID: 680-124913-5
Matrix: Water

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron, Dissolved	5.1		0.050		mg/L		05/10/16 07:43	05/11/16 01:33	1
Manganese, Dissolved	0.72		0.010		mg/L		05/10/16 07:43	05/11/16 01:33	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	8.7		1.0		mg/L			05/10/16 20:20	1

RWD 5/23/16
TestAmerica Savannah

Client Sample Results

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124913-1
SDG: KPS168

Client Sample ID: CPA-MW-1D-0516

Lab Sample ID: 680-124913-6

Date Collected: 05/04/16 11:22
Date Received: 05/05/16 09:25

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	4300	D	250		ug/L			05/17/16 18:59	250
Chlorobenzene	14000	D	250		ug/L			05/17/16 18:59	250
1,2-Dichlorobenzene	8200	D	250		ug/L			05/17/16 18:59	250
1,3-Dichlorobenzene	1000	D	250		ug/L			05/17/16 18:59	250
1,4-Dichlorobenzene	8500	D	250		ug/L			05/17/16 18:59	250

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	99		70 - 130		05/17/16 18:59	250
1,2-Dichloroethane-d4 (Surr)	99		70 - 130		05/17/16 18:59	250
Dibromofluoromethane (Surr)	85		70 - 130		05/17/16 18:59	250
4-Bromofluorobenzene (Surr)	96		70 - 130		05/17/16 18:59	250

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	31		1.1		ug/L			05/14/16 11:17	1
Ethylene	1.0	U	1.0		ug/L			05/14/16 11:17	1
Methane (TCD)	19000		390		ug/L			05/14/16 11:17	1

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	0.13		0.050		mg/L		05/10/16 07:43	05/11/16 01:37	1
Manganese	0.064		0.010		mg/L		05/10/16 07:43	05/11/16 01:37	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	81	D	2.0		mg/L			05/10/16 16:39	2
Nitrate as N	0.050	U	0.050		mg/L			05/05/16 15:18	1
Sulfate	5.0	U	5.0		mg/L			05/10/16 15:30	1
Total Organic Carbon	8.7		1.0		mg/L			05/11/16 02:44	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	890		5.0		mg/L			05/18/16 12:48	1
Carbon Dioxide, Free	7.6		5.0		mg/L			05/18/16 12:48	1

AWD 5/23/16
TestAmerica Savannah

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124913-1
SDG: KPS168

Client Sample ID: CPA-MW-1D-F(0.2)-0516
Date Collected: 05/04/16 **11:22**
Date Received: 05/05/16 **09:25**

Lab Sample ID: 680-124913-7
Matrix: Water

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron, Dissolved	0.18		0.050		mg/L		05/10/16 07:43	05/11/16 01:41	1
Manganese, Dissolved	0.071		0.010		mg/L		05/10/16 07:43	05/11/16 01:41	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	9.4		1.0		mg/L			05/10/16 21:08	1

AWD 5/23/16
TestAmerica Savannah

Client Sample Results

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124913-1
SDG: KPS168

Client Sample ID: CPA-MW-2D-0516

Lab Sample ID: 680-124913-8
Matrix: Water

Date Collected: 05/04/16 12:49
Date Received: 05/05/16 09:25

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	250	U	250		ug/L			05/17/16 19:19	250
Chlorobenzene	34000	D	250		ug/L			05/17/16 19:19	250
1,2-Dichlorobenzene	250	U	250		ug/L			05/17/16 19:19	250
1,3-Dichlorobenzene	250	U	250		ug/L			05/17/16 19:19	250
1,4-Dichlorobenzene	1600	D	250		ug/L			05/17/16 19:19	250

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*98*		*70 - 130*		*05/17/16 19:19*	*250*
1,2-Dichloroethane-d4 (Surr)	*87*		*70 - 130*		*05/17/16 19:19*	*250*
Dibromofluoromethane (Surr)	*85*		*70 - 130*		*05/17/16 19:19*	*250*
4-Bromofluorobenzene (Surr)	*95*		*70 - 130*		*05/17/16 19:19*	*250*

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	1.9		1.1		ug/L			05/16/16 16:46	1
Ethylene	1.4		1.0		ug/L			05/16/16 16:46	1
Methane (TCD)	780		390		ug/L			05/16/16 16:46	1

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	8.6		0.050		mg/L		05/11/16 09:35	05/11/16 19:40	1
Manganese	0.48		0.010		mg/L		05/11/16 09:35	05/11/16 19:40	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	57	D	2.0		mg/L			05/10/16 16:39	2
Nitrate as N	0.050	U	0.050		mg/L			05/05/16 15:20	1
Sulfate	99	D	10		mg/L			05/10/16 16:15	2
Total Organic Carbon	6.5		1.0		mg/L			05/11/16 03:00	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	500		5.0		mg/L			05/18/16 12:57	1
Carbon Dioxide, Free	55		5.0		mg/L			05/18/16 12:57	1

MWD 5/23/16
TestAmerica Savannah

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124913-1
SDG: KPS168

Client Sample ID: CPA-MW-2D-F(0.2)-0516
Date Collected: 05/04/16 12:49
Date Received: 05/05/16 09:25

Lab Sample ID: 680-124913-9
Matrix: Water

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron, Dissolved	8.3		0.050		mg/L		05/11/16 09:35	05/11/16 19:45	1
Manganese, Dissolved	0.48		0.010		mg/L		05/11/16 09:35	05/11/16 19:45	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	6.5		1.0		mg/L			05/10/16 21:25	1

KWD 5/23/16
TestAmerica Savannah

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124913-1
SDG: KPS168

Client Sample ID: CPA-MW-2D-0516-AD
Date Collected: 05/04/16 12:49
Date Received: 05/05/16 09:25

Lab Sample ID: 680-124913-10
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	250	U	250		ug/L			05/17/16 19:40	250
Chlorobenzene	34000	D	250		ug/L			05/17/16 19:40	250
1,2-Dichlorobenzene	250	U	250		ug/L			05/17/16 19:40	250
1,3-Dichlorobenzene	250	U	250		ug/L			05/17/16 19:40	250
1,4-Dichlorobenzene	1600	D	250		ug/L			05/17/16 19:40	250

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	98		70 - 130		05/17/16 19:40	250
1,2-Dichloroethane-d4 (Surr)	97		70 - 130		05/17/16 19:40	250
Dibromofluoromethane (Surr)	85		70 - 130		05/17/16 19:40	250
4-Bromofluorobenzene (Surr)	96		70 - 130		05/17/16 19:40	250

AWD 5/23/16
TestAmerica Savannah

Client Sample Results

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124913-1
SDG: KPS168

Client Sample ID: BSA-MW-1S-0516
Date Collected: 05/04/16 13:46
Date Received: 05/05/16 09:25

Lab Sample ID: 680-124913-11
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	750000	D	10000		ug/L			05/17/16 20:00	10000
Chlorobenzene	10000	U	10000		ug/L			05/17/16 20:00	10000
1,2-Dichlorobenzene	10000	U	10000		ug/L			05/17/16 20:00	10000
1,3-Dichlorobenzene	10000	U	10000		ug/L			05/17/16 20:00	10000
1,4-Dichlorobenzene	10000	U	10000		ug/L			05/17/16 20:00	10000

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	98		70 - 130		05/17/16 20:00	10000
1,2-Dichloroethane-d4 (Surr)	99		70 - 130		05/17/16 20:00	10000
Dibromofluoromethane (Surr)	87		70 - 130		05/17/16 20:00	10000
4-Bromofluorobenzene (Surr)	100		70 - 130		05/17/16 20:00	10000

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	1.1	U	1.1		ug/L			05/16/16 16:59	1
Ethylene	1.0	U	1.0		ug/L			05/16/16 16:59	1
Methane (TCD)	12000		390		ug/L			05/16/16 16:59	1

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	13		0.050		mg/L		05/11/16 09:35	05/11/16 19:59	1
Manganese	1.1		0.010		mg/L		05/11/16 09:35	05/11/16 19:59	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	120	D	5.0		mg/L			05/10/16 17:12	5
Nitrate as N	0.060	U	0.050		mg/L			05/05/16 15:21	1
Sulfate	210	D	50		mg/L			05/10/16 17:05	10
Total Organic Carbon	14		1.0		mg/L			05/11/16 03:20	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	1100		5.0		mg/L			05/18/16 13:27	1
Carbon Dioxide, Free	110		5.0		mg/L			05/18/16 13:27	1

AWD 5/23/16
TestAmerica Savannah

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124913-1
SDG: KPS168

Client Sample ID: BSA-MW-1S-F(0.2)-0516
Date Collected: 05/04/16 13:46
Date Received: 05/05/16 09:25

Lab Sample ID: 680-124913-12
Matrix: Water

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron, Dissolved	13		0.050		mg/L		05/11/16 09:35	05/11/16 20:04	1
Manganese, Dissolved	1.2		0.010		mg/L		05/11/16 09:35	05/11/16 20:04	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	13		1.0		mg/L			05/10/16 21:42	1

RWD 5/23/16
TestAmerica Savannah

Client Sample Results

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124913-1
SDG: KPS168

Client Sample ID: BSA-MW-1S-0516-EB
Date Collected: 05/04/16 14:20
Date Received: 05/05/16 09:25

Lab Sample ID: 680-124913-13
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	520	B	5.0		ug/L			05/18/16 12:36	5
Chlorobenzene	6.0	B	5.0		ug/L			05/18/16 12:36	5
1,2-Dichlorobenzene	5.0	U	5.0		ug/L			05/18/16 12:36	5
1,3-Dichlorobenzene	5.0	U	5.0		ug/L			05/18/16 12:36	5
1,4-Dichlorobenzene	5.0	U	5.0		ug/L			05/18/16 12:36	5

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	101		70 - 130		05/18/16 12:36	5
1,2-Dichloroethane-d4 (Surr)	89		70 - 130		05/18/16 12:36	5
Dibromofluoromethane (Surr)	94		70 - 130		05/18/16 12:36	5
4-Bromofluorobenzene (Surr)	95		70 - 130		05/18/16 12:36	5

AWD 5/23/16
TestAmerica Savannah

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124913-1
SDG: KPS168

Client Sample ID: 2Q16 LTM Trip Blank #3
Date Collected: 05/04/16 00:00
Date Received: 05/05/16 09:25

Lab Sample ID: 680-124913-14
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	1.0	U	1.0		ug/L			05/17/16 14:53	1
Chlorobenzene	1.0	U	1.0		ug/L			05/17/16 14:53	1
1,2-Dichlorobenzene	1.0	U	1.0		ug/L			05/17/16 14:53	1
1,3-Dichlorobenzene	1.0	U	1.0		ug/L			05/17/16 14:53	1
1,4-Dichlorobenzene	1.0	U	1.0		ug/L			05/17/16 14:53	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*97*		*70 - 130*		*05/17/16 14:53*	*1*
1,2-Dichloroethane-d4 (Surr)	*93*		*70 - 130*		*05/17/16 14:53*	*1*
Dibromofluoromethane (Surr)	*96*		*70 - 130*		*05/17/16 14:53*	*1*
4-Bromofluorobenzene (Surr)	*97*		*70 - 130*		*05/17/16 14:53*	*1*

AWD 5/23/16
TestAmerica Savannah

Surrogate Summary

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124913-1
SDG: KPS168

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)			
Lab Sample ID	Client Sample ID	TOL (70-130)	12DCE (70-130)	DBFM (70-130)	BFB (70-130)
680-124913-1	CPA-MW-3D-0516	98	95	94	96
680-124913-3	CPA-MW-3D-0516-AD	99	94	91	97
680-124913-4	BSA-MW-2D-0516	98	96	88	97
680-124913-6	CPA-MW-1D-0516	99	99	85	96
680-124913-8	CPA-MW-2D-0516	98	87	85	95
680-124913-10	CPA-MW-2D-0516-AD	98	97	85	98
680-124913-11	BSA-MW-1S-0516	98	99	87	100
680-124913-13	BSA-MW-1S-0516-EB	101	89	94	95
680-124913-14	2Q16 LTM Trip Blank #3	97	93	96	97
LCS 680-433699/4	Lab Control Sample	103	105	106	102
LCS 680-433790/4	Lab Control Sample	99	89	92	91
LCSD 680-433699/5	Lab Control Sample Dup	103	101	106	102
LCSD 680-433790/5	Lab Control Sample Dup	96	90	91	89
MB 680-433699/9	Method Blank	98	95	83	98
MB 680-433790/9	Method Blank	99	88	93	94

Surrogate Legend

TOL = Toluene-d8 (Surr)
12DCE = 1,2-Dichloroethane-d4 (Surr)
DBFM = Dibromofluoromethane (Surr)
BFB = 4-Bromofluorobenzene (Surr)

AWD 5/23/16
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Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 680-433699/9
Matrix: Water
Analysis Batch: 433699

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	1.0	U	1.0		ug/L			05/17/16 14:28	1
Chlorobenzene	1.0	U	1.0		ug/L			05/17/16 14:28	1
1,2-Dichlorobenzene	1.0	U	1.0		ug/L			05/17/16 14:28	1
1,3-Dichlorobenzene	1.0	U	1.0		ug/L			05/17/16 14:28	1
1,4-Dichlorobenzene	1.0	U	1.0		ug/L			05/17/16 14:28	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	98		70 - 130		05/17/16 14:28	1
1,2-Dichloroethane-d4 (Surr)	95		70 - 130		05/17/16 14:28	1
Dibromofluoromethane (Surr)	83		70 - 130		05/17/16 14:28	1
4-Bromofluorobenzene (Surr)	98		70 - 130		05/17/16 14:28	1

Lab Sample ID: LCS 680-433699/4
Matrix: Water
Analysis Batch: 433699

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	50.0	49.3		ug/L		99	73 - 131
Chlorobenzene	50.0	49.2		ug/L		98	80 - 120
1,2-Dichlorobenzene	50.0	49.8		ug/L		100	80 - 120
1,3-Dichlorobenzene	50.0	50.2		ug/L		100	80 - 120
1,4-Dichlorobenzene	50.0	49.0		ug/L		98	80 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Toluene-d8 (Surr)	103		70 - 130
1,2-Dichloroethane-d4 (Surr)	105		70 - 130
Dibromofluoromethane (Surr)	106		70 - 130
4-Bromofluorobenzene (Surr)	102		70 - 130

Lab Sample ID: LCSD 680-433699/5
Matrix: Water
Analysis Batch: 433699

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene	50.0	49.3		ug/L		99	73 - 131	0	30
Chlorobenzene	50.0	49.5		ug/L		99	80 - 120	1	20
1,2-Dichlorobenzene	50.0	49.5		ug/L		99	80 - 120	1	20
1,3-Dichlorobenzene	50.0	50.4		ug/L		101	80 - 120	1	20
1,4-Dichlorobenzene	50.0	49.2		ug/L		98	80 - 120	0	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Toluene-d8 (Surr)	103		70 - 130
1,2-Dichloroethane-d4 (Surr)	101		70 - 130
Dibromofluoromethane (Surr)	106		70 - 130
4-Bromofluorobenzene (Surr)	102		70 - 130

RWD 5/23/16
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Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-433790/9
Matrix: Water
Analysis Batch: 433790

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	1.0	U	1.0		ug/L			05/18/16 09:25	1
Chlorobenzene	1.0	U	1.0		ug/L			05/18/16 09:25	1
1,2-Dichlorobenzene	1.0	U	1.0		ug/L			05/18/16 09:25	1
1,3-Dichlorobenzene	1.0	U	1.0		ug/L			05/18/16 09:25	1
1,4-Dichlorobenzene	1.0	U	1.0		ug/L			05/18/16 09:25	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*99*		*70 - 130*		*05/18/16 09:25*	*1*
1,2-Dichloroethane-d4 (Surr)	*88*		*70 - 130*		*05/18/16 09:25*	*1*
Dibromofluoromethane (Surr)	*93*		*70 - 130*		*05/18/16 09:25*	*1*
4-Bromofluorobenzene (Surr)	*94*		*70 - 130*		*05/18/16 09:25*	*1*

Lab Sample ID: LCS 680-433790/4
Matrix: Water
Analysis Batch: 433790

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	50.0	45.6		ug/L		91	73 - 131
Chlorobenzene	50.0	48.7		ug/L		97	80 - 120
1,2-Dichlorobenzene	50.0	47.7		ug/L		95	80 - 120
1,3-Dichlorobenzene	50.0	48.0		ug/L		96	80 - 120
1,4-Dichlorobenzene	50.0	47.2		ug/L		94	80 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Toluene-d8 (Surr)	*99*		*70 - 130*
1,2-Dichloroethane-d4 (Surr)	*89*		*70 - 130*
Dibromofluoromethane (Surr)	*92*		*70 - 130*
4-Bromofluorobenzene (Surr)	*91*		*70 - 130*

Lab Sample ID: LCSD 680-433790/5
Matrix: Water
Analysis Batch: 433790

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene	50.0	44.9		ug/L		90	73 - 131	1	30
Chlorobenzene	50.0	47.7		ug/L		95	80 - 120	2	20
1,2-Dichlorobenzene	50.0	46.6		ug/L		93	80 - 120	2	20
1,3-Dichlorobenzene	50.0	47.4		ug/L		95	80 - 120	1	20
1,4-Dichlorobenzene	50.0	47.0		ug/L		94	80 - 120	0	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Toluene-d8 (Surr)	*98*		*70 - 130*
1,2-Dichloroethane-d4 (Surr)	*90*		*70 - 130*
Dibromofluoromethane (Surr)	*91*		*70 - 130*
4-Bromofluorobenzene (Surr)	*89*		*70 - 130*

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Method: RSK-175 - Dissolved Gases (GC)

Lab Sample ID: MB 680-433272/62
Matrix: Water
Analysis Batch: 433272

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	1.1	U	1.1		ug/L			05/13/16 19:11	1
Ethylene	1.0	U	1.0		ug/L			05/13/16 19:11	1
Methane	0.58	U	0.58		ug/L			05/13/16 19:11	1
Methane (TCD)	390	U	390		ug/L			05/13/16 19:11	1

Lab Sample ID: LCS 680-433272/6
Matrix: Water
Analysis Batch: 433272

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Methane (TCD)	1920	1910		ug/L		99	75 - 125

Lab Sample ID: LCS 680-433272/9
Matrix: Water
Analysis Batch: 433272

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ethane	288	310		ug/L		107	75 - 125
Ethylene	269	288		ug/L		107	75 - 125
Methane	154	161		ug/L		105	75 - 125

Lab Sample ID: LCSD 680-433272/61
Matrix: Water
Analysis Batch: 433272

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Ethane	288	315		ug/L		109	75 - 125	2	30
Ethylene	269	291		ug/L		108	75 - 125	1	30
Methane	154	165		ug/L		107	75 - 125	2	30

Lab Sample ID: LCSD 680-433272/7
Matrix: Water
Analysis Batch: 433272

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Methane (TCD)	1920	1970		ug/L		102	75 - 125	3	30

Lab Sample ID: MB 680-433510/9
Matrix: Water
Analysis Batch: 433510

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	1.1	U	1.1		ug/L			05/16/16 13:23	1
Ethylene	1.0	U	1.0		ug/L			05/16/16 13:23	1
Methane	0.58	U	0.58		ug/L			05/16/16 13:23	1
Methane (TCD)	390	U	390		ug/L			05/16/16 13:23	1

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Method: RSK-175 - Dissolved Gases (GC) (Continued)

Lab Sample ID: LCS 680-433510/3
Matrix: Water
Analysis Batch: 433510

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ethane	288	328		ug/L		114	75 - 125
Ethylene	269	304		ug/L		113	75 - 125
Methane	154	171		ug/L		111	75 - 125

Lab Sample ID: LCS 680-433510/6
Matrix: Water
Analysis Batch: 433510

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Methane (TCD)	1920	2040		ug/L		106	75 - 125

Lab Sample ID: LCSD 680-433510/4
Matrix: Water
Analysis Batch: 433510

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Ethane	288	309		ug/L		107	75 - 125	6	30
Ethylene	269	283		ug/L		105	75 - 125	7	30
Methane	154	162		ug/L		105	75 - 125	6	30

Lab Sample ID: LCSD 680-433510/7
Matrix: Water
Analysis Batch: 433510

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Methane (TCD)	1920	1980		ug/L		103	75 - 125	3	30

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 680-432572/1-A
Matrix: Water
Analysis Batch: 432777

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 432572

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	0.050	U	0.050		mg/L		05/10/16 07:43	05/10/16 23:43	1
Iron, Dissolved	0.050	U	0.050		mg/L		05/10/16 07:43	05/10/16 23:43	1
Manganese	0.010	U	0.010		mg/L		05/10/16 07:43	05/10/16 23:43	1
Manganese, Dissolved	0.010	U	0.010		mg/L		05/10/16 07:43	05/10/16 23:43	1

Lab Sample ID: LCS 680-432572/2-A
Matrix: Water
Analysis Batch: 432777

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 432572

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Iron	5.00	4.71		mg/L		94	80 - 120
Iron, Dissolved	5.00	4.71		mg/L		94	80 - 120
Manganese	0.500	0.491		mg/L		98	80 - 120
Manganese, Dissolved	0.500	0.491		mg/L		98	80 - 120

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Method: 6010C - Metals (ICP) (Continued)

Lab Sample ID: MB 680-432775/1-A
Matrix: Water
Analysis Batch: 432941

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 432775

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	0.050	U	0.050		mg/L		05/11/16 09:35	05/11/16 18:07	1
Iron, Dissolved	0.050	U	0.050		mg/L		05/11/16 09:35	05/11/16 18:07	1
Manganese	0.010	U	0.010		mg/L		05/11/16 09:35	05/11/16 18:07	1
Manganese, Dissolved	0.010	U	0.010		mg/L		05/11/16 09:35	05/11/16 18:07	1

Lab Sample ID: LCS 680-432775/2-A
Matrix: Water
Analysis Batch: 432941

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 432775

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Iron	5.00	4.96		mg/L		99	80 - 120
Iron, Dissolved	5.00	4.96		mg/L		99	80 - 120
Manganese	0.500	0.514		mg/L		103	80 - 120
Manganese, Dissolved	0.500	0.514		mg/L		103	80 - 120

Method: 310.1 - Alkalinity

Lab Sample ID: MB 680-433889/7
Matrix: Water
Analysis Batch: 433889

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	5.0	U	5.0		mg/L			05/18/16 10:21	1
Carbon Dioxide, Free	5.0	U	5.0		mg/L			05/18/16 10:21	1

Lab Sample ID: LCS 680-433889/8
Matrix: Water
Analysis Batch: 433889

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Alkalinity	250	257		mg/L		103	80 - 120

Lab Sample ID: LCSD 680-433889/34
Matrix: Water
Analysis Batch: 433889

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Alkalinity	250	257		mg/L		103	80 - 120	0	30

Lab Sample ID: 680-124913-8 DU
Matrix: Water
Analysis Batch: 433889

Client Sample ID: CPA-MW-2D-0516
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Alkalinity	500		505		mg/L		1	30
Carbon Dioxide, Free	55		53.2		mg/L		3	30

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Method: 325.2 - Chloride

Lab Sample ID: MB 680-432769/2
Matrix: Water
Analysis Batch: 432769

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	1.0	U	1.0		mg/L			05/10/16 15:13	1

Lab Sample ID: LCS 680-432769/1
Matrix: Water
Analysis Batch: 432769

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	25.0	25.3		mg/L		101	85 - 115

Lab Sample ID: LCSD 680-432769/6
Matrix: Water
Analysis Batch: 432769

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	25.0	25.6		mg/L		102	85 - 115	1	30

Lab Sample ID: 680-124913-4 MS
Matrix: Water
Analysis Batch: 432769

Client Sample ID: BSA-MW-2D-0516
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	180		25.0	195	4	mg/L		65	85 - 115

Lab Sample ID: 680-124913-4 MSD
Matrix: Water
Analysis Batch: 432769

Client Sample ID: BSA-MW-2D-0516
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	180		25.0	197	4	mg/L		73	85 - 115	1	30

Method: 353.2 - Nitrogen, Nitrate-Nitrite

Lab Sample ID: MB 680-432106/14
Matrix: Water
Analysis Batch: 432106

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	0.050	U	0.050		mg/L			05/05/16 15:03	1

Lab Sample ID: LCS 680-432106/13
Matrix: Water
Analysis Batch: 432106

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	0.500	0.516		mg/L		103	75 - 125
Nitrate Nitrite as N	1.00	1.04		mg/L		104	90 - 110
Nitrite as N	0.500	0.524		mg/L		105	90 - 110

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Method: 375.4 - Sulfate

Lab Sample ID: MB 680-432771/2
Matrix: Water
Analysis Batch: 432771

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	5.0	U	5.0		mg/L			05/10/16 15:15	1

Lab Sample ID: LCS 680-432771/4
Matrix: Water
Analysis Batch: 432771

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	20.0	20.4		mg/L		102	75 - 125

Lab Sample ID: LCSD 680-432771/6
Matrix: Water
Analysis Batch: 432771

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfate	20.0	19.6		mg/L		98	75 - 125	4	30

Lab Sample ID: 680-124913-4 MS
Matrix: Water
Analysis Batch: 432771

Client Sample ID: BSA-MW-2D-0516
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	100	U	20.0	100	U	mg/L		NC	75 - 125

Lab Sample ID: 680-124913-4 MSD
Matrix: Water
Analysis Batch: 432771

Client Sample ID: BSA-MW-2D-0516
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfate	100	U	20.0	100	U	mg/L		NC	75 - 125	NC	30

Method: 415.1 - DOC

Lab Sample ID: MB 680-432794/2
Matrix: Water
Analysis Batch: 432794

Client Sample ID: Method Blank
Prep Type: Dissolved

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	1.0	U	1.0		mg/L			05/10/16 16:57	1

Lab Sample ID: LCS 680-432794/4
Matrix: Water
Analysis Batch: 432794

Client Sample ID: Lab Control Sample
Prep Type: Dissolved

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Dissolved Organic Carbon	20.0	21.6		mg/L		108	80 - 120

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Method: 415.1 - DOC (Continued)

Lab Sample ID: LCSD 680-432794/5
Matrix: Water
Analysis Batch: 432794

Client Sample ID: Lab Control Sample Dup
Prep Type: Dissolved

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Dissolved Organic Carbon	20.0	21.4		mg/L		107	80 - 120	1	20

Method: 415.1 - TOC

Lab Sample ID: MB 680-432792/2
Matrix: Water
Analysis Batch: 432792

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	1.0	U	1.0		mg/L			05/10/16 22:54	1

Lab Sample ID: LCS 680-432792/3
Matrix: Water
Analysis Batch: 432792

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	20.0	21.5		mg/L		108	80 - 120

Lab Sample ID: LCSD 680-432792/4
Matrix: Water
Analysis Batch: 432792

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Organic Carbon	20.0	21.4		mg/L		107	80 - 120	0	25

AWD 5/23/16
TestAmerica Savannah

QC Association Summary

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124913-1
SDG: KPS168

GC/MS VOA

Analysis Batch: 433699

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-124913-1	CPA-MW-3D-0516	Total/NA	Water	8260B	
680-124913-3	CPA-MW-3D-0516-AD	Total/NA	Water	8260B	
680-124913-4	BSA-MW-2D-0516	Total/NA	Water	8260B	
680-124913-6	CPA-MW-1D-0516	Total/NA	Water	8260B	
680-124913-8	CPA-MW-2D-0516	Total/NA	Water	8260B	
680-124913-10	CPA-MW-2D-0516-AD	Total/NA	Water	8260B	
680-124913-11	BSA-MW-1S-0516	Total/NA	Water	8260B	
680-124913-14	2Q16 LTM Trip Blank #3	Total/NA	Water	8260B	
LCS 680-433699/4	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-433699/5	Lab Control Sample Dup	Total/NA	Water	8260B	
MB 680-433699/9	Method Blank	Total/NA	Water	8260B	

Analysis Batch: 433790

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-124913-13	BSA-MW-1S-0516-EB	Total/NA	Water	8260B	
LCS 680-433790/4	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-433790/5	Lab Control Sample Dup	Total/NA	Water	8260B	
MB 680-433790/9	Method Blank	Total/NA	Water	8260B	

GC VOA

Analysis Batch: 433272

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-124913-1	CPA-MW-3D-0516	Total/NA	Water	RSK-175	
680-124913-4	BSA-MW-2D-0516	Total/NA	Water	RSK-175	
680-124913-6	CPA-MW-1D-0516	Total/NA	Water	RSK-175	
LCS 680-433272/6	Lab Control Sample	Total/NA	Water	RSK-175	
LCS 680-433272/9	Lab Control Sample	Total/NA	Water	RSK-175	
LCSD 680-433272/61	Lab Control Sample Dup	Total/NA	Water	RSK-175	
LCSD 680-433272/7	Lab Control Sample Dup	Total/NA	Water	RSK-175	
MB 680-433272/62	Method Blank	Total/NA	Water	RSK-175	

Analysis Batch: 433510

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-124913-8	CPA-MW-2D-0516	Total/NA	Water	RSK-175	
680-124913-11	BSA-MW-1S-0516	Total/NA	Water	RSK-175	
LCS 680-433510/3	Lab Control Sample	Total/NA	Water	RSK-175	
LCS 680-433510/6	Lab Control Sample	Total/NA	Water	RSK-175	
LCSD 680-433510/4	Lab Control Sample Dup	Total/NA	Water	RSK-175	
LCSD 680-433510/7	Lab Control Sample Dup	Total/NA	Water	RSK-175	
MB 680-433510/9	Method Blank	Total/NA	Water	RSK-175	

Metals

Prep Batch: 432572

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-124913-1	CPA-MW-3D-0516	Total Recoverable	Water	3005A	
680-124913-2	CPA-MW-3D-F(0.2)-0516	Dissolved	Water	3005A	
680-124913-4	BSA-MW-2D-0516	Total Recoverable	Water	3005A	
680-124913-5	BSA-MW-2D-F(0.2)-0516	Dissolved	Water	3005A	

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Metals (Continued)

Prep Batch: 432572 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-124913-6	CPA-MW-1D-0516	Total Recoverable	Water	3005A	
680-124913-7	CPA-MW-1D-F(0.2)-0516	Dissolved	Water	3005A	
LCS 680-432572/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
MB 680-432572/1-A	Method Blank	Total Recoverable	Water	3005A	

Prep Batch: 432775

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-124913-8	CPA-MW-2D-0516	Total Recoverable	Water	3005A	
680-124913-9	CPA-MW-2D-F(0.2)-0516	Dissolved	Water	3005A	
680-124913-11	BSA-MW-1S-0516	Total Recoverable	Water	3005A	
680-124913-12	BSA-MW-1S-F(0.2)-0516	Dissolved	Water	3005A	
LCS 680-432775/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
MB 680-432775/1-A	Method Blank	Total Recoverable	Water	3005A	

Analysis Batch: 432777

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-124913-1	CPA-MW-3D-0516	Total Recoverable	Water	6010C	432572
680-124913-2	CPA-MW-3D-F(0.2)-0516	Dissolved	Water	6010C	432572
680-124913-4	BSA-MW-2D-0516	Total Recoverable	Water	6010C	432572
680-124913-5	BSA-MW-2D-F(0.2)-0516	Dissolved	Water	6010C	432572
680-124913-6	CPA-MW-1D-0516	Total Recoverable	Water	6010C	432572
680-124913-7	CPA-MW-1D-F(0.2)-0516	Dissolved	Water	6010C	432572
LCS 680-432572/2-A	Lab Control Sample	Total Recoverable	Water	6010C	432572
MB 680-432572/1-A	Method Blank	Total Recoverable	Water	6010C	432572

Analysis Batch: 432941

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-124913-8	CPA-MW-2D-0516	Total Recoverable	Water	6010C	432775
680-124913-9	CPA-MW-2D-F(0.2)-0516	Dissolved	Water	6010C	432775
680-124913-11	BSA-MW-1S-0516	Total Recoverable	Water	6010C	432775
680-124913-12	BSA-MW-1S-F(0.2)-0516	Dissolved	Water	6010C	432775
LCS 680-432775/2-A	Lab Control Sample	Total Recoverable	Water	6010C	432775
MB 680-432775/1-A	Method Blank	Total Recoverable	Water	6010C	432775

General Chemistry

Analysis Batch: 432106

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-124913-1	CPA-MW-3D-0516	Total/NA	Water	353.2	
680-124913-4	BSA-MW-2D-0516	Total/NA	Water	353.2	
680-124913-6	CPA-MW-1D-0516	Total/NA	Water	353.2	
680-124913-8	CPA-MW-2D-0516	Total/NA	Water	353.2	
680-124913-11	BSA-MW-1S-0516	Total/NA	Water	353.2	
LCS 680-432106/13	Lab Control Sample	Total/NA	Water	353.2	
MB 680-432106/14	Method Blank	Total/NA	Water	353.2	

Analysis Batch: 432769

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-124913-1	CPA-MW-3D-0516	Total/NA	Water	325.2	
680-124913-4	BSA-MW-2D-0516	Total/NA	Water	325.2	

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TestAmerica Savannah

General Chemistry (Continued)

Analysis Batch: 432769 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-124913-4 MS	BSA-MW-2D-0516	Total/NA	Water	325.2	
680-124913-4 MSD	BSA-MW-2D-0516	Total/NA	Water	325.2	
680-124913-6	CPA-MW-1D-0516	Total/NA	Water	325.2	
680-124913-8	CPA-MW-2D-0516	Total/NA	Water	325.2	
680-124913-11	BSA-MW-1S-0516	Total/NA	Water	325.2	
LCS 680-432769/1	Lab Control Sample	Total/NA	Water	325.2	
LCSD 680-432769/6	Lab Control Sample Dup	Total/NA	Water	325.2	
MB 680-432769/2	Method Blank	Total/NA	Water	325.2	

Analysis Batch: 432771

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-124913-1	CPA-MW-3D-0516	Total/NA	Water	375.4	
680-124913-4	BSA-MW-2D-0516	Total/NA	Water	375.4	
680-124913-4 MS	BSA-MW-2D-0516	Total/NA	Water	375.4	
680-124913-4 MSD	BSA-MW-2D-0516	Total/NA	Water	375.4	
680-124913-6	CPA-MW-1D-0516	Total/NA	Water	375.4	
680-124913-8	CPA-MW-2D-0516	Total/NA	Water	375.4	
680-124913-11	BSA-MW-1S-0516	Total/NA	Water	375.4	
LCS 680-432771/4	Lab Control Sample	Total/NA	Water	375.4	
LCSD 680-432771/6	Lab Control Sample Dup	Total/NA	Water	375.4	
MB 680-432771/2	Method Blank	Total/NA	Water	375.4	

Analysis Batch: 432792

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-124913-1	CPA-MW-3D-0516	Total/NA	Water	415.1	
680-124913-4	BSA-MW-2D-0516	Total/NA	Water	415.1	
680-124913-6	CPA-MW-1D-0516	Total/NA	Water	415.1	
680-124913-8	CPA-MW-2D-0516	Total/NA	Water	415.1	
680-124913-11	BSA-MW-1S-0516	Total/NA	Water	415.1	
LCS 680-432792/3	Lab Control Sample	Total/NA	Water	415.1	
LCSD 680-432792/4	Lab Control Sample Dup	Total/NA	Water	415.1	
MB 680-432792/2	Method Blank	Total/NA	Water	415.1	

Analysis Batch: 432794

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-124913-2	CPA-MW-3D-F(0.2)-0516	Dissolved	Water	415.1	
680-124913-5	BSA-MW-2D-F(0.2)-0516	Dissolved	Water	415.1	
680-124913-7	CPA-MW-1D-F(0.2)-0516	Dissolved	Water	415.1	
680-124913-9	CPA-MW-2D-F(0.2)-0516	Dissolved	Water	415.1	
680-124913-12	BSA-MW-1S-F(0.2)-0516	Dissolved	Water	415.1	
LCS 680-432794/4	Lab Control Sample	Dissolved	Water	415.1	
LCSD 680-432794/5	Lab Control Sample Dup	Dissolved	Water	415.1	
MB 680-432794/2	Method Blank	Dissolved	Water	415.1	

Analysis Batch: 433889

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-124913-1	CPA-MW-3D-0516	Total/NA	Water	310.1	
680-124913-4	BSA-MW-2D-0516	Total/NA	Water	310.1	
680-124913-6	CPA-MW-1D-0516	Total/NA	Water	310.1	
680-124913-8	CPA-MW-2D-0516	Total/NA	Water	310.1	
680-124913-8 DU	CPA-MW-2D-0516	Total/NA	Water	310.1	

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General Chemistry (Continued)

Analysis Batch: 433889 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-124913-11	BSA-MW-1S-0516	Total/NA	Water	310.1	
LCS 680-433889/8	Lab Control Sample	Total/NA	Water	310.1	
LCSD 680-433889/34	Lab Control Sample Dup	Total/NA	Water	310.1	
MB 680-433889/7	Method Blank	Total/NA	Water	310.1	

AWD 5/23/16
TestAmerica Savannah

Lab Chronicle

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124913-1
SDG: KPS168

Client Sample ID: CPA-MW-3D-0516

Lab Sample ID: 680-124913-1
Matrix: Water

Date Collected: 05/04/16 09:18
Date Received: 05/05/16 09:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	433699	05/17/16 16:35	CEJ	TAL SAV
Total/NA	Analysis	RSK-175		1	433272	05/14/16 10:52	MKA	TAL SAV
Total Recoverable	Prep	3005A			432572	05/10/16 07:43	CRW	TAL SAV
Total Recoverable	Analysis	6010C		1	432777	05/11/16 01:21	BCB	TAL SAV
Total/NA	Analysis	310.1		1	433889	05/18/16 12:21	LAF	TAL SAV
Total/NA	Analysis	325.2		5	432769	05/10/16 16:36	JME	TAL SAV
Total/NA	Analysis	353.2		1	432106	05/05/16 15:16	GRX	TAL SAV
Total/NA	Analysis	375.4		1	432771	05/10/16 15:28	JME	TAL SAV
Total/NA	Analysis	415.1		1	432792	05/11/16 01:39	KLD	TAL SAV

Client Sample ID: CPA-MW-3D-F(0.2)-0516

Lab Sample ID: 680-124913-2
Matrix: Water

Date Collected: 05/04/16 09:18
Date Received: 05/05/16 09:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			432572	05/10/16 07:43	CRW	TAL SAV
Dissolved	Analysis	6010C		1	432777	05/11/16 01:25	BCB	TAL SAV
Dissolved	Analysis	415.1		1	432794	05/10/16 20:03	KLD	TAL SAV

Client Sample ID: CPA-MW-3D-0516-AD

Lab Sample ID: 680-124913-3
Matrix: Water

Date Collected: 05/04/16 09:18
Date Received: 05/05/16 09:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	433699	05/17/16 16:56	CEJ	TAL SAV

Client Sample ID: BSA-MW-2D-0516

Lab Sample ID: 680-124913-4
Matrix: Water

Date Collected: 05/04/16 10:12
Date Received: 05/05/16 09:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1000	433699	05/17/16 18:38	CEJ	TAL SAV
Total/NA	Analysis	RSK-175		1	433272	05/14/16 11:04	MKA	TAL SAV
Total Recoverable	Prep	3005A			432572	05/10/16 07:43	CRW	TAL SAV
Total Recoverable	Analysis	6010C		1	432777	05/11/16 01:29	BCB	TAL SAV
Total/NA	Analysis	310.1		1	433889	05/18/16 12:34	LAF	TAL SAV
Total/NA	Analysis	325.2		5	432769	05/10/16 16:17	JME	TAL SAV
Total/NA	Analysis	353.2		1	432106	05/05/16 15:17	GRX	TAL SAV
Total/NA	Analysis	375.4		20	432771	05/10/16 17:00	JME	TAL SAV
Total/NA	Analysis	415.1		1	432792	05/11/16 01:56	KLD	TAL SAV

AWD 5/23/16
TestAmerica Savannah

Lab Chronicle

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124913-1
SDG: KPS168

Client Sample ID: BSA-MW-2D-F(0.2)-0516

Lab Sample ID: 680-124913-5
Matrix: Water

Date Collected: 05/04/16 10:12
Date Received: 05/05/16 09:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			432572	05/10/16 07:43	CRW	TAL SAV
Dissolved	Analysis	6010C		1	432777	05/11/16 01:33	BCB	TAL SAV
Dissolved	Analysis	415.1		1	432794	05/10/16 20:20	KLD	TAL SAV

Client Sample ID: CPA-MW-1D-0516

Lab Sample ID: 680-124913-6
Matrix: Water

Date Collected: 05/04/16 11:22
Date Received: 05/05/16 09:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		250	433699	05/17/16 18:59	CEJ	TAL SAV
Total/NA	Analysis	RSK-175		1	433272	05/14/16 11:17	MKA	TAL SAV
Total Recoverable	Prep	3005A			432572	05/10/16 07:43	CRW	TAL SAV
Total Recoverable	Analysis	6010C		1	432777	05/11/16 01:37	BCB	TAL SAV
Total/NA	Analysis	310.1		1	433889	05/18/16 12:48	LAF	TAL SAV
Total/NA	Analysis	325.2		2	432789	05/10/16 16:39	JME	TAL SAV
Total/NA	Analysis	353.2		1	432106	05/05/16 15:18	GRX	TAL SAV
Total/NA	Analysis	375.4		1	432771	05/10/16 15:30	JME	TAL SAV
Total/NA	Analysis	415.1		1	432792	05/11/16 02:44	KLD	TAL SAV

Client Sample ID: CPA-MW-1D-F(0.2)-0516

Lab Sample ID: 680-124913-7
Matrix: Water

Date Collected: 05/04/16 11:22
Date Received: 05/05/16 09:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			432572	05/10/16 07:43	CRW	TAL SAV
Dissolved	Analysis	6010C		1	432777	05/11/16 01:41	BCB	TAL SAV
Dissolved	Analysis	415.1		1	432794	05/10/16 21:08	KLD	TAL SAV

Client Sample ID: CPA-MW-2D-0516

Lab Sample ID: 680-124913-8
Matrix: Water

Date Collected: 05/04/16 12:49
Date Received: 05/05/16 09:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		250	433699	05/17/16 19:19	CEJ	TAL SAV
Total/NA	Analysis	RSK-175		1	433510	05/16/16 16:46	MKA	TAL SAV
Total Recoverable	Prep	3005A			432775	05/11/16 09:35	CRW	TAL SAV
Total Recoverable	Analysis	6010C		1	432941	05/11/16 19:40	BCB	TAL SAV
Total/NA	Analysis	310.1		1	433889	05/18/16 12:57	LAF	TAL SAV
Total/NA	Analysis	325.2		2	432789	05/10/16 16:39	JME	TAL SAV
Total/NA	Analysis	353.2		1	432106	05/05/16 15:20	GRX	TAL SAV
Total/NA	Analysis	375.4		2	432771	05/10/16 16:15	JME	TAL SAV

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TestAmerica Savannah

Client Sample ID: CPA-MW-2D-0516

Lab Sample ID: 680-124913-8
Matrix: Water

Date Collected: 05/04/16 12:49
Date Received: 05/05/16 09:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	415.1		1	432792	05/11/16 03:00	KLD	TAL SAV

Client Sample ID: CPA-MW-2D-F(0.2)-0516

Lab Sample ID: 680-124913-9
Matrix: Water

Date Collected: 05/04/16 12:49
Date Received: 05/05/16 09:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			432775	05/11/16 09:35	CRW	TAL SAV
Dissolved	Analysis	6010C		1	432941	05/11/16 19:45	BCB	TAL SAV
Dissolved	Analysis	415.1		1	432794	05/10/16 21:25	KLD	TAL SAV

Client Sample ID: CPA-MW-2D-0516-AD

Lab Sample ID: 680-124913-10
Matrix: Water

Date Collected: 05/04/16 12:49
Date Received: 05/05/16 09:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		250	433699	05/17/16 19:40	CEJ	TAL SAV

Client Sample ID: BSA-MW-1S-0516

Lab Sample ID: 680-124913-11
Matrix: Water

Date Collected: 05/04/16 13:46
Date Received: 05/05/16 09:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		10000	433699	05/17/16 20:00	CEJ	TAL SAV
Total/NA	Analysis	RSK-175		1	433510	05/16/16 16:59	MKA	TAL SAV
Total Recoverable	Prep	3005A			432775	05/11/16 09:35	CRW	TAL SAV
Total Recoverable	Analysis	6010C		1	432941	05/11/16 19:59	BCB	TAL SAV
Total/NA	Analysis	310.1		1	433889	05/18/16 13:27	LAF	TAL SAV
Total/NA	Analysis	325.2		5	432769	05/10/16 17:12	JME	TAL SAV
Total/NA	Analysis	353.2		1	432106	05/05/16 15:21	GRX	TAL SAV
Total/NA	Analysis	375.4		10	432771	05/10/16 17:05	JME	TAL SAV
Total/NA	Analysis	415.1		1	432792	05/11/16 03:20	KLD	TAL SAV

Client Sample ID: BSA-MW-1S-F(0.2)-0516

Lab Sample ID: 680-124913-12
Matrix: Water

Date Collected: 05/04/16 13:46
Date Received: 05/05/16 09:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			432775	05/11/16 09:35	CRW	TAL SAV
Dissolved	Analysis	6010C		1	432941	05/11/16 20:04	BCB	TAL SAV
Dissolved	Analysis	415.1		1	432794	05/10/16 21:42	KLD	TAL SAV

PWD 5/23/16
TestAmerica Savannah

Lab Chronicle

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124913-1
SDG: KPS168

Client Sample ID: BSA-MW-1S-0516-EB

Lab Sample ID: 680-124913-13
Matrix: Water

Date Collected: 05/04/16 14:20
Date Received: 05/05/16 09:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		5	433790	05/18/16 12:36	CEJ	TAL SAV

Client Sample ID: 2Q16 LTM Trip Blank #3

Lab Sample ID: 680-124913-14
Matrix: Water

Date Collected: 05/04/16 00:00
Date Received: 05/05/16 09:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	433699	05/17/16 14:53	CEJ	TAL SAV

Laboratory References:

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

AWD 5/23/16
TestAmerica Savannah

TestAmerica Savannah
5102 LaRoche Avenue

Savannah, GA 31404
phone 912.354.7858 fax

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Regulatory Program: ☐DW ☐NPDES ☑RCRA ☐Other

Client Contact	Project Manager: Amanda Derhake	Site Contact: Emily White	Date: 05/04/16	COC No:
Golder Associates Inc.	Tel/Fax: 636-724-9191	Lab Contact: Michele Kersey	Carrier: FedEx	1 of 7 COCs
820 South Main Street	Analysis Turnaround Time			Sampler: E. White
St. Charles, MO 63301	☑ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
(636) 724-9191 Phone	TAT if different from Below Standard			Walk-in Client:
(636) 724-9323 FAX	☑ 2 weeks			Lab Sampling:
Project Name: 2Q16 LTM GW Sampling-1403345	☐ 1 week			
Site: Solutia WG Krummrich Facility	☐ 2 days			Job / SDG No :
P O # 42262863	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y / N)	Perform MS / MSD (Y / N)	VOCs by 8260	Total Fe/Mn by 6010C	Alk/CO2 by 310.1	Chloride by 325.2/Sulfate by 375.4	Dissolved Gases by RSK 175	Nitrate by 353.2	TOC by 415.1	Dissolved Fe/Mn by 6010C	DOC by 415.1	Sample Specific Notes:
CPA-MW-3D-0516	05/04/16	0918	G	W	14	N		3	1	1	1	3	2	3			2 coolers
CPA-MW-3D-F(0.2)-0516		0918			4	Y									1	3	
CPA-MW-3D-0516-AD		0918			3	N		3									
BSA-MW-2D-0516		1012			14	N		3	1	1	1	3	2	3			
BSA-MW-2D-F(0.2)-0516		1012			4	Y									1	3	
CPA-MW-1D-0516		1122			14	N		3	1	1	1	3	2	3			
CPA-MW-1D-F(0.2)-0516		1122			4	Y									1	3	
CPA-MW-2D-0516		1249			14	N		3	1	1	1	3	2	3			
CPA-MW-2D-F(0.2)-0516		1249			4	Y									1	3	
CPA-MW-2D-0516-AD		1249			3	N		3									
BSA-MW-1S-0516		1346			14	N		3	1	1	1	3	2	3			
BSA-MW-1S-F(0.2)-0516		1346			4	Y									1	3	
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other								2	4	1	1	2	1,3	3	4	3	

680-124913 Chain of Custody

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if s

☐ Return to Client ☑ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments:
VOC headspace upon sampling. Yes/No

680-124913 1.1 1.4

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No.: 698669/698670	Cooler Temp. (°C): Obs'd: 3.1	Corr'd 3.4	Therm ID No.:

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Emily White	Golder	05/04/16 1530			
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
				TA	5/5/16 09:25

Form No. CA-C-WI-002, Rev. 4.3, dated 12/05/2013

Page 42 of 45

05/05/16 AMW

TestAmerica Savannah
5102 LaRoche Avenue

Savannah GA 31404
phone 912.354.7858 fax

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Regulatory Program: ☐ DW ☐ NPDES ☑ RCRA ☐ Other:

TestAmerica Laboratories, Inc.

Client Contact	**Project Manager:** Amanda Derhake	**Site Contact:** Emily White	**Date:** 05/04/16	COC No:
Golder Associates Inc.	**Tel/Fax:** 636-724-9191	**Lab Contact:** Michele Kersey	**Carrier:** FedEx	2 of 2 COCs
820 South Main Street	**Analysis Turnaround Time**			Sampler: E. White
St. Charles, MO 63301	☑ CALENDAR DAYS ☐ WORKING DAYS			**For Lab Use Only:**
(636) 724-9191 Phone	TAT if different from Below Standard			Walk-in Client:
(636) 724-9323 FAX	☑ 2 weeks			Lab Sampling:
Project Name: 2Q16 LTM GW Sampling-1403345	☐ 1 week			
Site: Solutia WG Krummrich Facility	☐ 2 days			Job / SDG No.:
P O # 42262863	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y / N)	Perform MS / MSD (Y / N)	VOCs by 8260	Total Fe/Mn by 6010C	Alk/CO2 by 310.1	Chloride by 325.2/Sulfate by 375.4	Dissolved Gases by RSK 175	Nitrate by 353.2	TOC by 415.1	Dissolved Fe/Mn by 6010C	DOC by 415.1	Sample Specific Notes:
BSA-MW-1S-0516-EB	05/04/16	1420	G	W	3	N		3									
2Q16 LTM Trip Blank #3	—	—		W	2	N		2									
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other								2	4	1	1	2	1,3	3	4	3	

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal by Lab ☐ Archive for ______ Months

Special Instructions/QC Requirements & Comments:
VOC headspace upon sampling: Yes/No

680-124913 — 1.1 / 3.1, 1.4 / 3.4

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No.: 1098009/1098010	Cooler Temp. (°C): Obs'd: 3.1 Corr'd: 3.4	Therm ID No.:

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Emily White	Golder	05/04/16			
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by: [signature]	Company: TA	Date/Time: 5/5/16 09:25

Form No. CA-C-WI-002, Rev. 4.3, dated 12/05/2013

AMD 5/23/16

Login Sample Receipt Checklist

Client: Solutia Inc.

Job Number: 680-124913-1
SDG Number: KPS168

Login Number: 124913
List Number: 1
Creator: Kicklighter, Marilyn D

List Source: TestAmerica Savannah

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	N/A	
Samples do not require splitting or compositing.	N/A	
Residual Chlorine Checked.	N/A	

MWP 5/23/16

Certification Summary

Client: Solutia Inc.
Project/Site: 2Q16 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-124913-1
SDG: KPS168

Laboratory: TestAmerica Savannah

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
	AFCEE		SAVLAB	
A2LA	DoD ELAP		399.01	02-28-17
A2LA	ISO/IEC 17025		399.01	02-28-17
Alabama	State Program	4	41450	06-30-16 *
Alaska (UST)	State Program	10	UST-104	11-05-16
Arkansas DEQ	State Program	6	88-0692	01-31-17
California	State Program	9	2939	07-31-16 *
Colorado	State Program	8	N/A	12-31-16
Connecticut	State Program	1	PH-0161	03-31-17
Florida	NELAP	4	E87052	06-30-16 *
GA Dept. of Agriculture	State Program	4	N/A	06-12-17
Georgia	State Program	4	803	06-30-16 *
Guam	State Program	9	15-005r	04-16-16 *
Hawaii	State Program	9	N/A	06-30-16 *
Illinois	NELAP	5	200022	11-30-16
Indiana	State Program	5	N/A	06-30-16 *
Iowa	State Program	7	353	06-30-17
Kentucky (DW)	State Program	4	90084	12-31-16
Kentucky (UST)	State Program	4	18	06-30-16 *
Kentucky (WW)	State Program	4	90084	12-31-16
Louisiana	NELAP	6	30690	06-30-16 *
Louisiana (DW)	NELAP	6	LA160019	12-31-16
Maine	State Program	1	GA00006	09-24-16
Maryland	State Program	3	250	12-31-16
Massachusetts	State Program	1	M-GA006	06-30-16 *
Michigan	State Program	5	9925	06-30-16 *
Mississippi	State Program	4	N/A	06-30-16 *
Nebraska	State Program	7	TestAmerica-Savannah	06-30-16 *
New Jersey	NELAP	2	GA769	06-30-16 *
New Mexico	State Program	6	N/A	06-30-16 *
New York	NELAP	2	10842	03-31-17
North Carolina (DW)	State Program	4	13701	07-31-16 *
North Carolina (WW/SW)	State Program	4	269	12-31-16
Oklahoma	State Program	6	9984	08-31-16
Pennsylvania	NELAP	3	68-00474	06-30-16 *
Puerto Rico	State Program	2	GA00006	12-31-16
South Carolina	State Program	4	98001	06-30-16 *
Tennessee	State Program	4	TN02961	06-30-16 *
Texas	NELAP	6	T104704185-14-7	11-30-16
USDA	Federal		SAV 3-04	06-11-17
Virginia	NELAP	3	460161	06-14-16 *
Washington	State Program	10	C805	06-10-16 *
West Virginia (DW)	State Program	3	9950C	12-31-16
West Virginia DEP	State Program	3	094	06-30-16 *
Wisconsin	State Program	5	999819810	08-31-16
Wyoming	State Program	8	8TMS-L	06-30-16 *

* Certification renewal pending - certification considered valid.

TestAmerica Savannah
AMD 5/23/16

APPENDIX E
MICROBIAL INSIGHTS DATA PACKAGE

(On CD)

10515 Research Drive
Knoxville, TN 37932
Phone: (865) 573-8188
Fax: (865) 573-8133

Client: Amanda Derhake
Golder Associates Inc.
820 S. Main Street
Suite 100
St. Charles, MO 63301

Phone: 636-724-9191

Fax: 636-724-9393

Identifier: 107ND **Date Rec:** 04/29/2016 **Report Date:** 06/15/2016

Client Project #: 140-3345 **Client Project Name:** W.G. Krummrich

Purchase Order #:

Analysis Requested: PLFA, Stable Isotope Probing, Standard Bio-Trap

Reviewed By:

MICROBIAL INSIGHTS, INC.

10515 Research Dr., Knoxville, TN 37932
Tel. (865) 573-8188 Fax. (865) 573-8133

PLFA

Client: **Golder Associates Inc.**
Project: W.G. Krummrich

MI Project Number: **107ND**
Date Received: 04/29/2016

Sample Information

Sample Name:	**BSA-MW-1S-0516**	**BSA-MW-2D-0516**	**BSA-MW-3D-0516**	**BSA-MW-4D-0516**	**BSA-MW-5D-0516**
Sample Date:	04/28/2016	04/28/2016	04/28/2016	04/28/2016	04/28/2016
Sample Matrix:	Std. Bio-Trap	Adv. Bio-Trap	Std. Bio-Trap	Std. Bio-Trap	Std. Bio-Trap
Analyst:	JS	JS	JS	JS	JS

Biomass Concentrations

Total Biomass (cells/bead)	**1.55E+05**	**3.82E+05**	**3.37E+04**	**<1.66E+04**	**3.17E+04**

Community Structure (% total PLFA)

Firmicutes (TerBrSats)	**23.64**	**7.45**	**0.00**	**0.00**	**0.00**
Proteobacteria (Monos)	**49.64**	**63.09**	**14.81**	**0.00**	**68.09**
Anaerobic metal reducers (BrMonos)	**0.00**	**1.07**	**0.00**	**0.00**	**0.00**
SRB/Actinomycetes (MidBrSats)	**0.00**	**2.47**	**0.00**	**0.00**	**0.00**
General (Nsats)	**23.20**	**18.41**	**32.96**	**0.00**	**31.91**
Eukaryotes (polyenoics)	**3.51**	**7.53**	**52.24**	**0.00**	**0.00**

Physiological Status (Proteobacteria only)

Slowed Growth	**1.19**	**0.14**	**0.00**	**0.00**	**0.00**
Decreased Permeability	**2.59**	**0.10**	**0.00**	**0.00**	**0.00**

Legend:
NA = Not Analyzed NS = Not Sampled

MICROBIAL INSIGHTS, INC.

10515 Research Dr., Knoxville, TN 37932
Tel. (865) 573-8188 Fax. (865) 573-8133

PLFA

Client: **Golder Associates Inc.**
Project: W.G. Krummrich

MI Project Number: **107ND**
Date Received: 04/29/2016

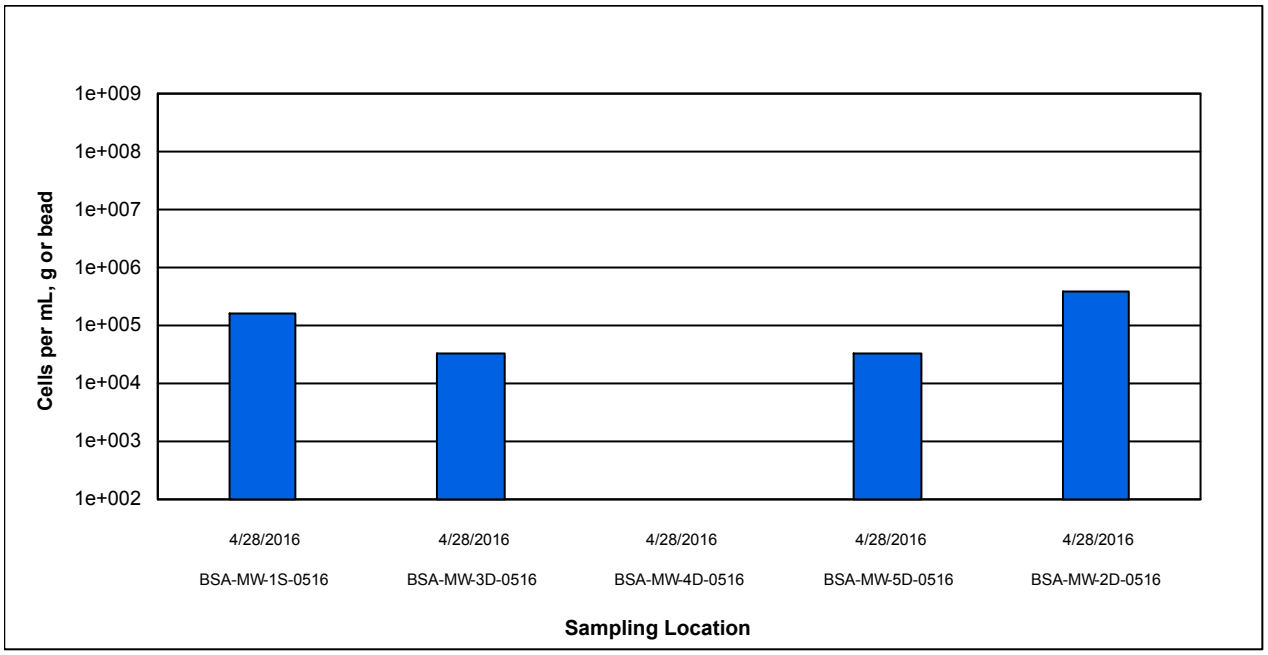

Figure 1. Biomass content is presented as a cell equivalent based on the total amount of phospholipid fatty acids (PLFA) extracted from a given sample. Total biomass is calculated based upon PLFA attributed to bacterial and eukaryotic biomass

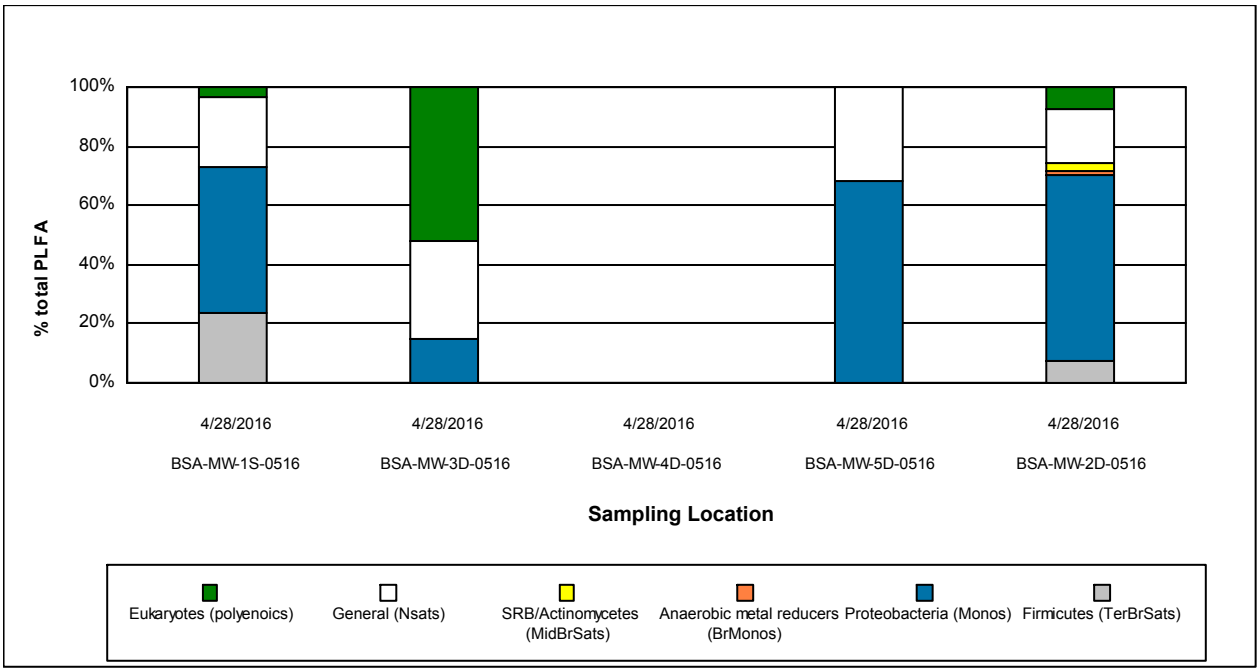

Figure 2. Relative percentages of total PLFA structural groups in the samples analyzed. Structural groups are assigned according to PLFA chemical structure, which is related to fatty acid biosynthesis.

MICROBIAL INSIGHTS, INC.

10515 Research Dr., Knoxville, TN 37932
Tel. (865) 573-8188 Fax. (865) 573-8133

PLFA

Client: **Golder Associates Inc.**
Project: W.G. Krummrich

MI Project Number: **107ND**
Date Received: 04/29/2016

Sample Information

Sample Name:	**CPA-MW-1D-0516**	**CPA-MW-2D-0516**	**CPA-MW-3D-0516**	**CPA-MW-4D-0516**	**CPA-MW-5D-0516**
Sample Date:	04/28/2016	04/28/2016	04/28/2016	04/28/2016	04/28/2016
Sample Matrix:	Std. Bio-Trap	Std. Bio-Trap	Adv. Bio-Trap	Std. Bio-Trap	Std. Bio-Trap
Analyst:	JS	JS	JS	JS	JS

Biomass Concentrations

Total Biomass (cells/bead)	**1.03E+05**	**<1.66E+04**	**<1.65E+04**	**<1.66E+04**	**<1.66E+04**

Community Structure (% total PLFA)

Firmicutes (TerBrSats)	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Proteobacteria (Monos)	**56.14**	**0.00**	**0.00**	**0.00**	**0.00**
Anaerobic metal reducers (BrMonos)	**3.24**	**0.00**	**0.00**	**0.00**	**0.00**
SRB/Actinomycetes (MidBrSats)	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
General (Nsats)	**40.62**	**0.00**	**0.00**	**0.00**	**0.00**
Eukaryotes (polyenoics)	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Physiological Status (Proteobacteria only)

Slowed Growth	**0.74**	**0.00**	**0.00**	**0.00**	**0.00**
Decreased Permeability	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Legend:
NA = Not Analyzed NS = Not Sampled

MICROBIAL INSIGHTS, INC.

10515 Research Dr., Knoxville, TN 37932
Tel. (865) 573-8188 Fax. (865) 573-8133

PLFA

Client: **Golder Associates Inc.**
Project: W.G. Krummrich

MI Project Number: **107ND**
Date Received: 04/29/2016

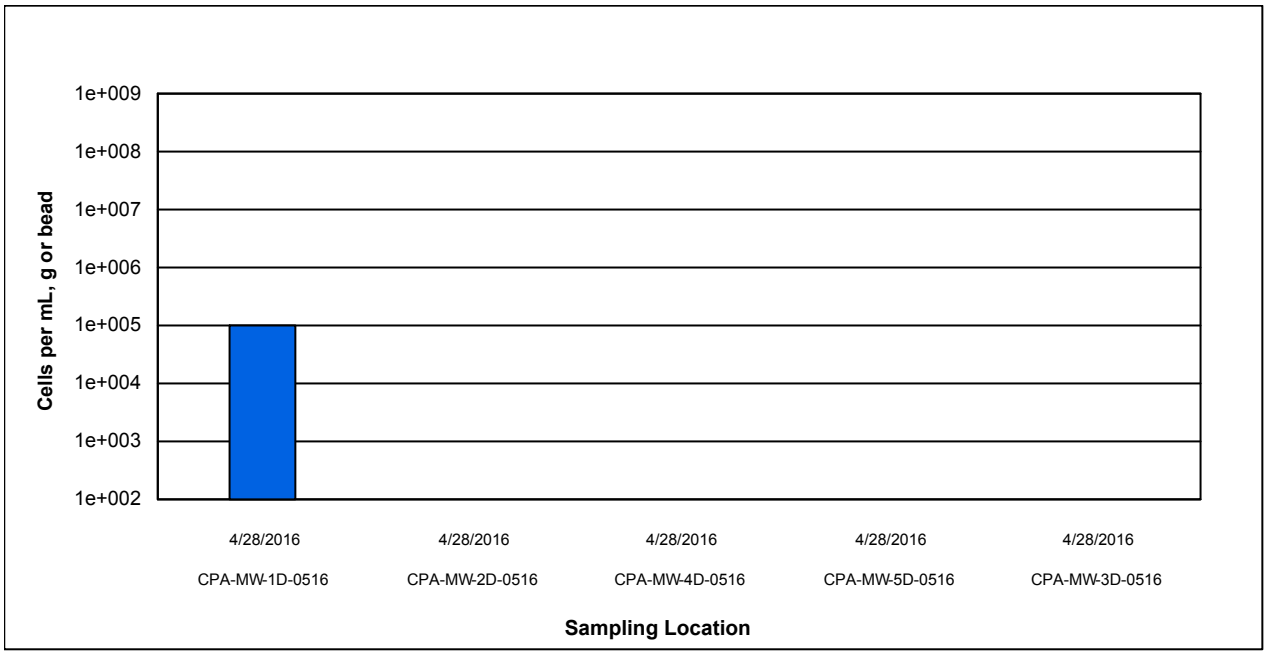

Figure 1. Biomass content is presented as a cell equivalent based on the total amount of phospholipid fatty acids (PLFA) extracted from a given sample. Total biomass is calculated based upon PLFA attributed to bacterial and eukaryotic biomass

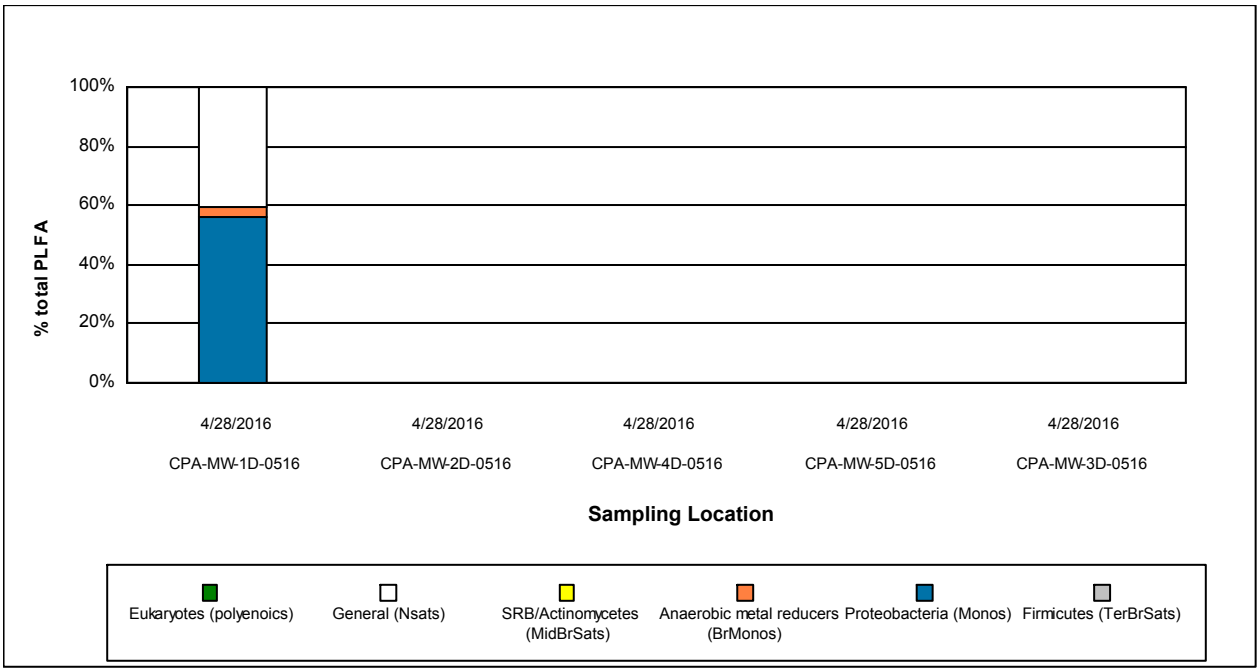

Figure 2. Relative percentages of total PLFA structural groups in the samples analyzed. Structural groups are assigned according to PLFA chemical structure, which is related to fatty acid biosynthesis.

10515 Research Drive
Knoxville, TN 37932
Phone: (865) 573-8188
Fax: (865) 573-8133

Identifier: 107ND **Date Rec:** 04/29/2016 **Report Date:** 06/15/2016

Client Project #: 140-3345 **Client Project Name:** W.G. Krummrich

Purchase Order #:

Comments: Please note results for samples BSA-MW-4D-0516, CPA-MW-2D-0516, CPA-MW-3D-0516, CPA-MW-4D-0516, and CPA-MW-5D-0516 fell beneath detection limits for PLFA analysis, and results for sample BSA-MW-3D-0516 fell between reporting and detection limits for PLFA analysis.

10515 Research Drive
Knoxville, TN 37932
Phone (865) 573-8188
Fax: (865) 573-8133
Email: info@microbe.com

Phospholipid Fatty Acid Analysis

Interpretation Guidelines

Phospholipids fatty acids (PLFA) are a main component of the membrane (essentially the "skin") of microbes and provide a powerful tool for assessing microbial responses to changes in their environment. This type of analysis provides direct information for assessing and monitoring sites where bioremediation processes, including natural attenuation, are of interest. Analysis of the types and amount of PLFA provides a broad based understanding of the entire microbial community with information obtained in three key areas viable biomass, community structure and metabolic activity.

What is the detection limit for PLFA?

Our limit of detection for PLFA analysis is ~150 picomoles of total PLFA and our limit of quantification is ~500 picomoles of total PLFA. Samples which contain PLFA amounts at or below 150 pmol cannot be used to determine biomass, likewise samples with PLFA content below ~500 pmol are generally considered to contain too few fatty acids to discuss community composition.

How should I interpret the PLFA results?

Interpreting the results obtained from PLFA analysis can be somewhat difficult, so this document was designed to provide a technical guideline. For convenience, this guideline has been divided into the three key areas.

Viable Biomass

PLFA analysis is one of the most reliable and accurate methods available for the determination of viable microbial biomass. Phospholipids break down rapidly upon cell death (21, 23), so biomass calculations based on PLFA content do not contain 'fossil' lipids of dead cells.

How is biomass measured?

Viable biomass is determined from the total amount of PLFA detected in a given sample. Since, phospholipids are an essential part of intact cell membranes they provide an accurate measure of viable cells.

How is biomass calculated?

Biomass levels are reported as cells per gram, mL or bead, and are calculated using a conversion factor of 20,000 cells/pmole of PLFA. This conversation factor is based upon cells grown in laboratory media, and varies somewhat with the type of organism and environmental conditions.

What does the concentration of biomass mean?

The overall abundance of microbes within a given sample is often used as an indicator of the potential for bioremediation to occur, but understanding the levels of biomass within each sample can be cumbersome. The following are benchmarks that can be used to understand whether the biomass levels are low, moderate or high.

Low	Moderate	High
10^3 to 10^4 cells	10^5 to 10^6 cells	10^7 to 10^8 cells

How do I know if a change in biomass is significant?

One of the primary functions of using PLFA analysis at contaminated sites is to evaluate how a community responds following a given treatment, but how does one know if the changes observed between two events are significant? As a general rule, biomass levels which increase or decrease by at least an order of magnitude are considered to be significant. However, changes in biomass levels of less than an order of magnitude may still show a trend. It is important to remember that many factors can affect microbial growth, so factors other than the treatment could be influencing the changes observed between sampling events. Some of the factors to consider are: temperature, moisture, pH, etc. The following illustration depicts three types of changes that occurred over time and the conclusions that could be drawn.

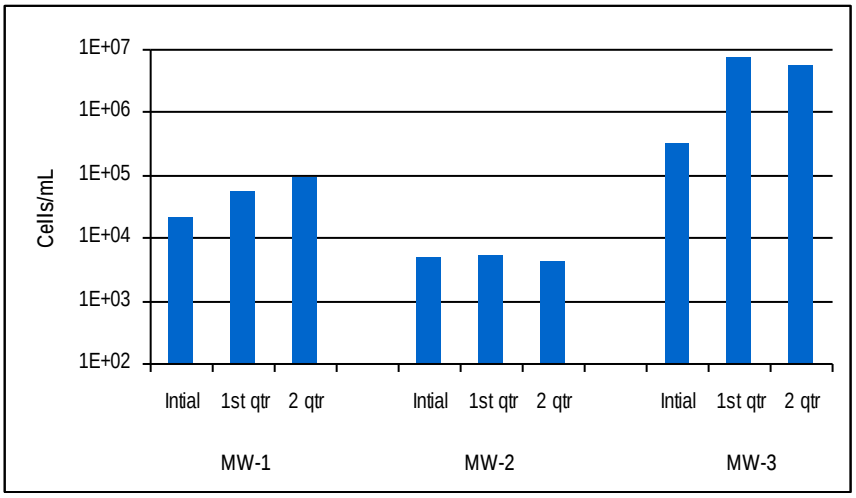

Figure 1. Biomass content is presented as a cell equivalent based on the total amount of phospholipid fatty acids (PLFA) extracted from a given sample. Total biomass is calculated based upon PLFA attributed to bacterial and eukaryotic biomass (associated with higher organisms).

Conclusions from graph above:

- MW-1 showed a trend of biomass levels increasing steadily over time, although cell concentrations were ~10^4 cells/mL at each sampling event.
- MW-2 showed no notable trends or significant changes in biomass concentrations.
- MW-3 showed a significant increase in biomass levels between the initial and 1st quarter sampling events (from ~10^5 to ~10^6 cells/mL).

Community Structure:

The PLFA in a sample can be separated into particular types, and the resulting PLFA "profile" reflects the proportions of the categories of organisms present in the sample. Because groups of bacteria differ in their metabolic capabilities, determining which bacterial groups are present and their relative distributions within the community can provide information on what metabolic processes are occurring at that location. This in turn can also provide information on the subsurface conditions (i.e oxidation/reduction status, etc.). Table 1 describes the six major structural groups used and their potential relevance to site specific projects.

Table 1. 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

Following are answers to some of the common questions about community composition and some detailed descriptions of some typical shifts which can be observed between sampling events.

How is the community structure data presented?

Community structure data is presented as percentage (%) of the total amount of PLFA. In order to relate the complex mixture of PLFA to the organisms present, the ratio of a specific PLFA group is determined (detailed in Table 1 above), and this corresponds to the proportion of the related bacterial classification within the overall community structure. Because normal saturated PLFA are found in both prokaryotes (bacteria) and eukaryotes (fungi, protozoa, diatoms etc), their distribution provides little insight into the types of microbes that are present at a sampling location. However, high proportions of normal saturates are often associated with less diverse microbial populations.

How can community structure data be used to manage my site?

It is important to understand that microbial communities are often a mixture of different types of bacteria (e.g. aerobes, sulfate reducers, methanogens, etc) with the abundance of each group behaving like a seesaw, i.e. as the population of one group increases, another is likely decreasing, mostly due to competition for available resources. The PLFA profile of a sample provides a "fingerprint" of the microbial community, showing relative proportions of the specific bacterial types at the time of sampling. This is a great tool for detecting shifts within the community over time and also to evaluate similarities/differences between sampling locations. It is important to note that PLFA analysis of community structure is analyzing the microbes directly, not just secondary breakdown products. So this provides evidence of how the entire microbial community is responding to the treatment.

How do I recognize community shifts and what they mean?

Shifts in the community structure are indications of changing conditions and their effect on the microbial community, and, by extension on the metabolic processes occurring at the sampling location. Some of the more commonly seen shifts within the community are illustrated and discussed below:

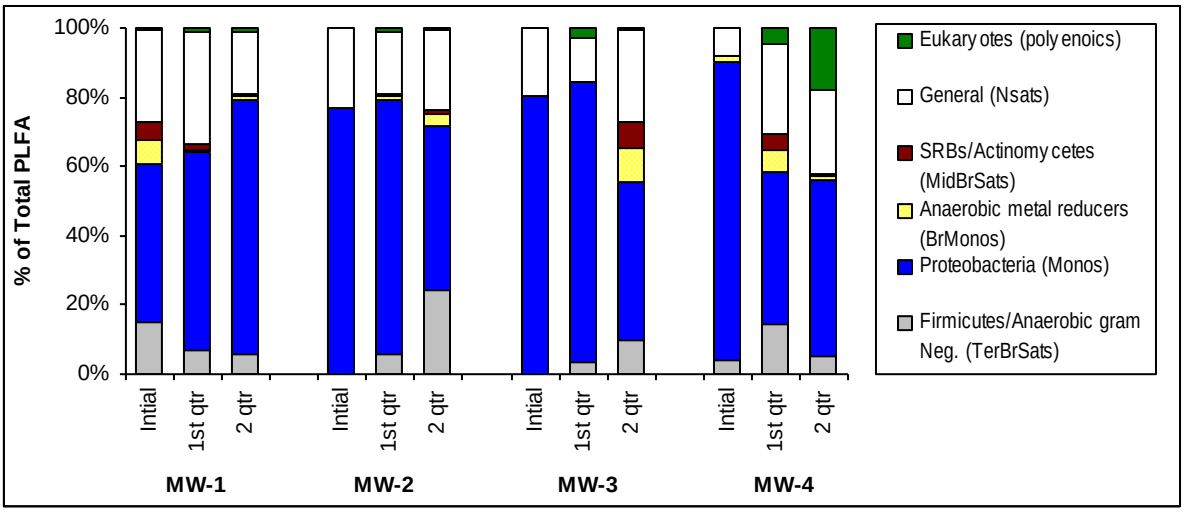

Figure 2. Relative percentages of total PLFA structural groups in the samples analyzed. Structural groups are assigned according to PLFA chemical structure, which is related to fatty acid biosynthesis. See Table 1 for detailed descriptions of structural groups.

- **Increased Proteobacteria**

Proportions of Proteobacteria are of interest because it is one of the largest groups of bacteria and represents a wide variety of both aerobe and anaerobes. The majority of hydrocarbons (including benzene and naphthalene) are metabolized by some member of Proteobacteria, mainly due to their ability to grow opportunistically, quickly taking advantage of available food (i.e. hydrocarbons), and adapting quickly to changes in the environment. The detection of increased proportions of Proteobacteria coupled with increased biomass suggests that the Proteobacteria are consuming something. In situations where it is important to determine the extent to which the Proteobacteria are utilizing anaerobic or aerobic pathways, it is possible to measure relative proportions of specific biomarkers that are associated with anaerobic or aerobic pathways thus separating the Proteobacteria into different groups, based on pathways used. Sample MW-1 from Figure 2 depicts a shift in community structure where the proportion of Proteobacteria has increased over time.

- **Increased Firmicutes/Anaerobic Gram negative bacteria**

Increased proportions of Firmicutes/Anaerobic Gram negative bacteria generally indicate that conditions are becoming more reductive (i.e. more anaerobic). Proportions of Firmicutes are of particular interest in sites contaminated with chlorinated hydrocarbons because Firmicutes include anaerobic fermenting bacteria (mainly *Clostridia/Bacteriodes*-like), which produce the H_2 necessary for reductive dechlorination.

Enhanced bioremediation of chlorinated solvents often employs the injection of fermentable substrates which, when utilized by fermenting bacteria, results in the release of H_2. Engineered shifts in the microbial community can be shown by observing increased proportions Firmicutes following an injection of fermentable substrate. Through long-term monitoring of the community structure it is possible to know when re-injection may be necessary or desirable. Sample MW-2 from Figure 2 depicts a shift in community structure where the proportion of Firmicutes has increased over time.

- **Increased anaerobic metal reducing bacteria (BrMonos) and SRB/Actinomycetes (MidBrSats)**

An increase in the proportions of metal and sulfate reducing bacterial groups, especially when combined with shifts in the other bacterial groups, can provide information helpful to monitoring bioremediation. Generally, an increase in metal and sulfate reducers points to more reduced (anaerobic) conditions at the sampled location. This is especially true if there is an increase in Firmicutes at the same time. Large increases in either metal and sulfate reducers, particularly if accompanied by a decrease in Firmicutes, may suggest that conditions are becoming increasingly reduced. In this situation the metal and sulfate reducers may be out-competing dechlorinators for available H_2, thereby limiting the potential for reductive dechlorination at that location. Sample MW-3 from Figure 2 depicts a shift in community structure where the proportion of metal reducing bacteria has increased over time.

- **Increased Eukaryotes**

Eukaryotes include organisms such as fungi, protozoa, and diatoms. At a contaminated location, an increase in eukaryotes, particularly if seen with a decrease in the contaminant utilizing bacteria, suggests that eukaryotic scavengers are preying upon what had been an abundance of bacteria which were consuming the contaminant. Sample MW-4 from Figure 2 depicts a shift in community structure where the proportion of eukaryotes has increased over time.

Physiological status of Proteobacteria

The membrane of a microbe adapts to the changing conditions of its environment, and these changes are reflected in the PLFA. Toxic compounds or environmental conditions may disrupt the membrane and some bacteria respond by making *trans* fatty acids instead of the usual *cis* fatty acids (7) in order to strengthen the cell membrane, making it less permeable. Many Proteobacteria respond to lack of available substrate or to highly toxic conditions by making cyclopropyl (7) or mid-chain branched fatty acids (20) which point to less energy expenditure and a slowed growth rate. The physiological status ratios for Decreased Permeability (trans/cis ratio) and for Slowed Growth (cy/cis ratio) are based on dividing the amount of the fatty acid induced by environmental conditions by the amount of its biosynthetic precursor.

What does slowed growth or decreased permeability mean?

Ratios for slowed growth and for decreased permeability of the cell membrane provide information on the “health” of the Gram negative community, that is, how this population is responding to the conditions present in the environment. It should be noted that one must be cautious when interpreting these measures from only one sampling event. The most effective way to use the physiological status indicators is in long term monitoring and comparing how these ratios increase/decrease over time.

A marked increase in either of these ratios suggests a change in environment which is less favorable to the Gram negative Proteobacteria population. The ratio for slowed growth is a relative measure, and does not directly correspond to log or stationary phases of growth, but is useful as a comparison of growth rates among sampling locations and also over time. An increase in this ratio (i.e. slower growth rate) suggests a change in conditions which is not as supportive of rapid, “healthy” growth of the Gram negative population, often due to reduced available substrate (food). A larger ratio for decreased permeability suggests that the environment has become more toxic to the Gram negative population, requiring energy expenditure to produce *trans* fatty acids in order to make the membrane more rigid.

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SITE LOGIC Report

Stable Isotope Probing (SIP) Study

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Report Date: June 15, 2016

Project: WG Krummrich, 140-3345

Comments:

Executive Summary

A Stable Isotope Probing (SIP) study was performed to determine whether biodegradation of benzene and chlorobenzene is occurring under existing site conditions. Bio-Trap® samplers baited with ^{13}C labeled benzene and ^{13}C labeled chlorobenzene were deployed in monitoring wells BSA-MW-2D-0516 and CPA-MW-3D-0516, respectively. Following a 29-day deployment period, the Bio-Traps were recovered to quantify ^{13}C incorporation into biomass and dissolved inorganic carbon (DIC). A complete summary of the SIP results is provided in Table 1 and Figures 1 through 5. Tables 2 and 3 and Figures 6 through 9 contain summaries of PLFA analysis performed on standard Bio-Trap samplers deployed in BSA and CPA monitoring wells.

Stable Isotope Probing (SIP)

- The detection of ^{13}C-enriched biomass and DIC confirmed that benzene biodegradation had occurred at BSA-MW-2D-0516 during the deployment period.
    - Total PLFA biomass for well BSA-MW-2D-0516 (3.82E+05 cells/bead) was in the moderate range.
    - The average PLFA $\delta^{13}C$ value was 1,887‰, indicating a high incorporation of ^{13}C-labeled benzene into microbial biomass.
    - The average DIC $\delta^{13}C$ value was 521‰, showing moderate benzene mineralization.
    - The PLFA community structure was primarily composed of monoenoics (63.09%). Normal saturates (18.41%), eukaryotes, and firmicutes (7.45%) were the next most abundant groups. Indicators of actinomycetes and anaerobic metal reducers were also detected.

- Evidence for biodegradation of chlorobenzene in CPA-MW-3D-0516 was inconclusive, as the total PLFA biomass and ^{13}C-enriched biomass fell below the detection limit.
    - The average DIC $\delta^{13}C$ value, -11‰, was near background levels and indicated little to no chlorobenzene was mineralized during the deployment period.

PLFA Analysis - Standard Bio-Traps

- Total biomass concentrations in the standard BSA bio-traps fell within the low to moderate range (10^4 to 10^5 cells/bead) except for BSA-MW-4D-0516, which fell below the detection limit.
- The community structures in the standard BSA bio-traps indicated that, typically, monoenoics and normal saturates were the most abundant groups. Eukaryotes were the most abundant group in BSA-MW-3D-0516.

- In the CPA wells, total PLFA biomass concentrations fell below the detection limit except for CPA-MW-1D-0516, where the total biomass was on the order of 10^5 cells/bead.
- The microbial community structure in CPA-MW-1D-0516 was composed of a large portion of monoenoics (56.14%) and normal saturates (40.62%) followed by anaerobic metal reducers (3.24%).

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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 the Bio-Trap® Units. Interpretation guidelines and definitions are found later in the document.

Sample Name	BSA-MW-2D-0516	CPA-MW-3D-0516
^{13}C Contaminant Loss		
^{13}C Benzene Pre-deployment (µg/bead)	157 ± 18	---
^{13}C Benzene Post-deployment (µg/bead)	135 ± 12	---
^{13}C Chlorobenzene Pre-deployment (µg/bead)	---	188 ± 37
^{13}C Chlorobenzene Post-deployment (µg/bead)	---	120 ± 2
Biomass & ^{13}C Incorporation		
Total Biomass (Cells/bead)	3.82E+05	<1.65E+04
^{13}C Enriched Biomass (Cells/bead)	1.02E+03	ND
Average PLFA Del (‰)	1,887	ND
Maximum PLFA Del (‰)	6,511	ND
^{13}C Mineralization		
DIC Del (‰)	521	-11
% 13C	1.67	1.09
Community Structure (% total PLFA)		
Firmicutes (TerBrSats)	7.45	0.00
Proteobacteria (Monos)	63.09	0.00
Anaerobic metal reducers (BrMonos)	1.07	0.00
Actinomycetes (MidBrSats)	2.47	0.00
General (Nsats)	18.41	0.00
Eukaryotes (Polyenoics)	7.53	0.00
Physiological Status (Proteobacteria only)		
Slowed Growth	0.14	0.00
Decreased Permeability	0.10	0.00

Legend: ND= Non Detect J = Estimated value between detection limit and reporting limit

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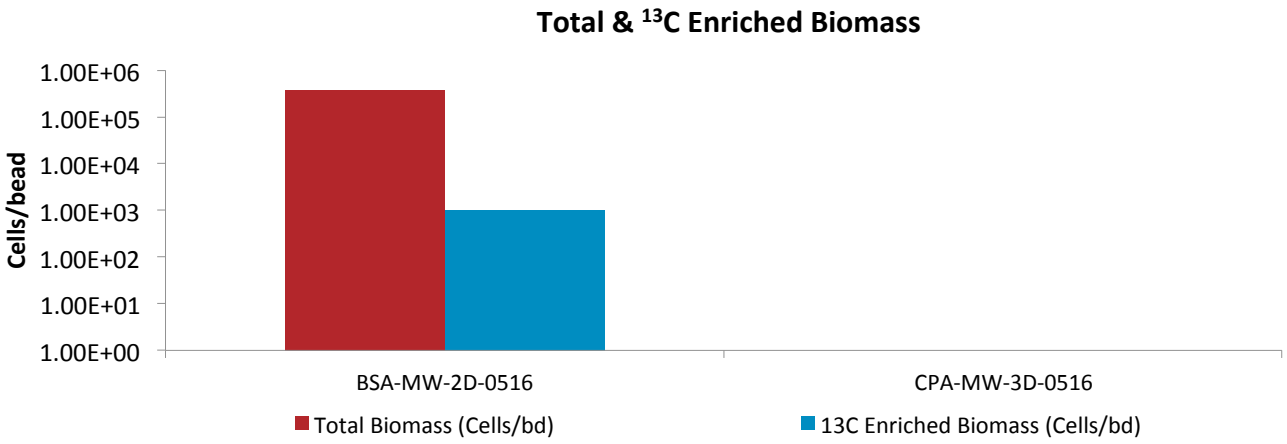

Figure 1. Biomass content is presented as a cell equivalent based on the total amount of phospholipid fatty acids (PLFA) extracted from a given sample. Total biomass is calculated based upon PLFA attributed to bacterial and eukaryotic biomass (associated with higher organisms).

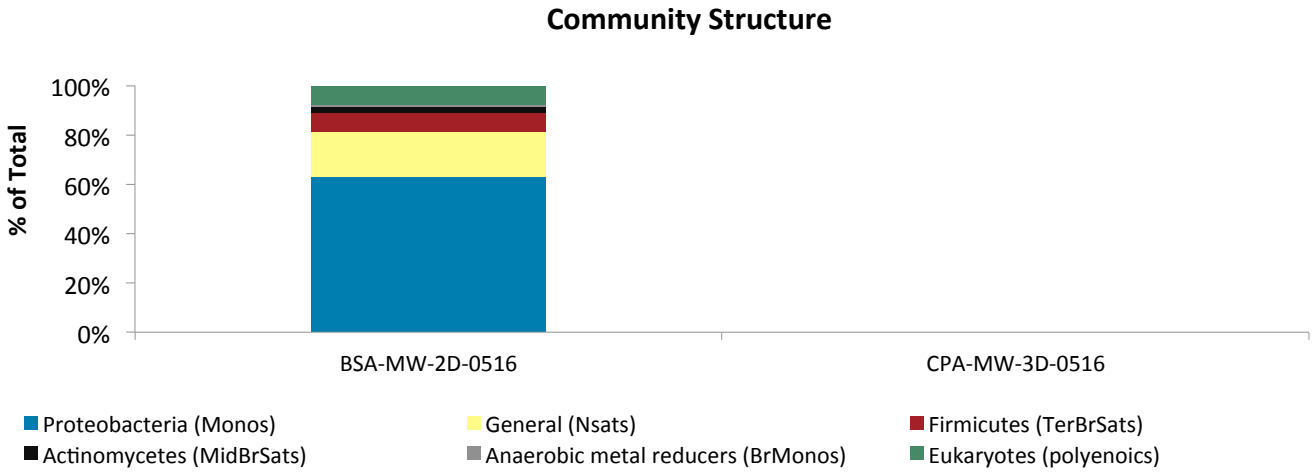

Figure 2. Relative percentages of total PLFA structural groups in the samples analyzed. Structural groups are assigned according to PLFA chemical structure, which is related to fatty acid biosynthesis. See the table in the interpretation section for detailed descriptions of the structural groups.

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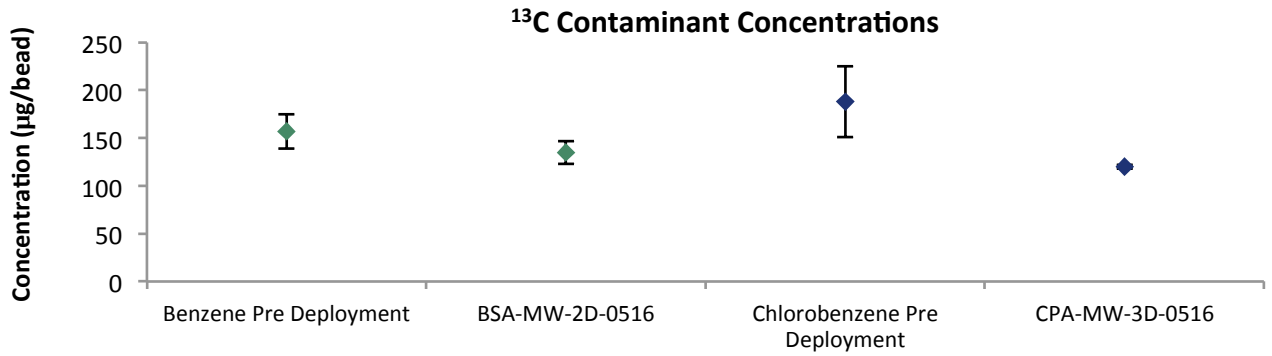

Figure 3. Comparison of Pre-deployment concentrations loaded on Bio-Sep beads to the concentrations detected after incubation.

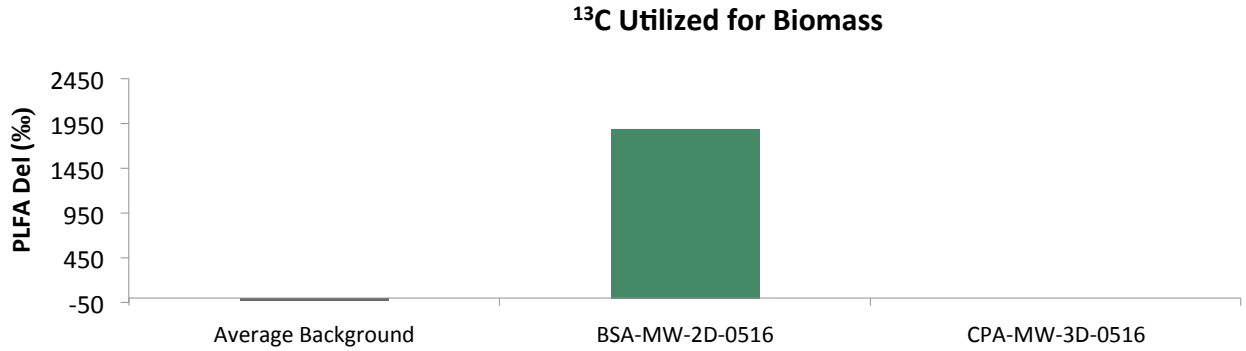

Figure 4. Comparison of the average Del value obtained from PLFA biomarkers from each Bio-Trap® unit to the average background Del observed in samples not exposed to ^{13}C enriched compounds.

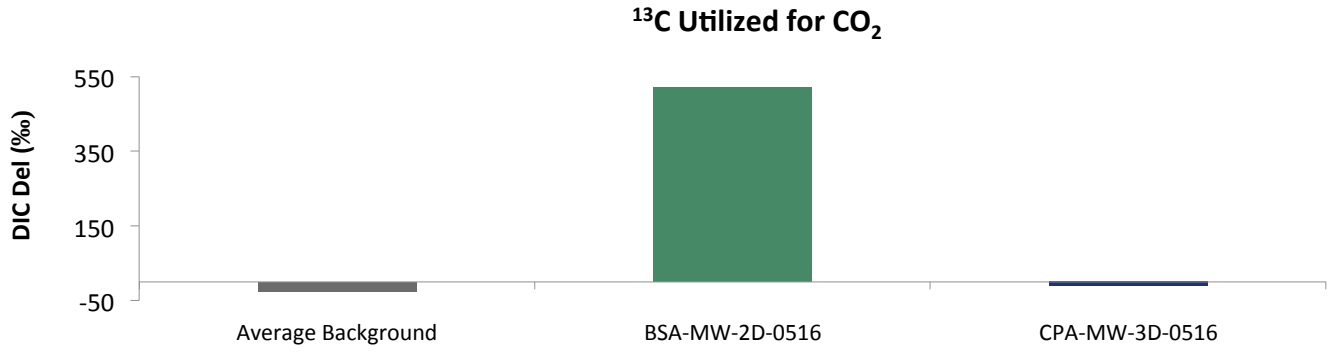

Figure 5. Comparison of the Del value obtained from DIC from each Bio-Trap® unit to the average background Del observed in samples not exposed to ^{13}C enriched compounds.

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Table 2. Summary of the PLFA results for the benzene wells obtained from the Bio-Trap® Units.

Sample Name	BSA-MW-1S	BSA-MW-2D	BSA-MW-3D	BSA-MW-4D	BSA-MW-5D
Biomass Concentration					
Total Biomass (Cells/bead)	1.55E+05	3.82E+05	3.37E+04	<1.66E+04	3.17E+04
Community Structure (% total PLFA)					
Firmicutes (TerBrSats)	23.64	7.45	0.00	0.00	0.00
Proteobacteria (Monos)	49.64	63.09	14.81	0.00	68.09
Anaerobic metal reducers (BrMonos)	0.00	1.07	0.00	0.00	0.00
Actinomycetes (MidBrSats)	0.00	2.47	0.00	0.00	0.00
General (Nsats)	23.20	18.41	32.96	0.00	31.91
Eukaryotes (Polyenoics)	3.51	7.53	52.24	0.00	0.00
Physiological Status (Proteobacteria only)					
Slowed Growth	1.19	0.14	0.00	0.00	0.00
Decreased Permeability	2.59	0.10	0.00	0.00	0.00

Legend: ND= Non Detect J = Estimated value between detection limit and reporting limit

Table 3. Summary of the PLFA results for the chlorobenzene wells obtained from the Bio-Trap® Units.

Sample Name	CPA-MW-1D	CPA-MW-2D	CPA-MW-3D	CPA-MW-4D	CPA-MW-5D
Biomass Concentration					
Total Biomass (Cells/bead)	1.03E+05	<1.66E+04	<1.65E+04	<1.66E+04	<1.66E+04
Community Structure (% total PLFA)					
Firmicutes (TerBrSats)	0	0.00	0.00	0.00	0.00
Proteobacteria (Monos)	56.14	0.00	0.00	0.00	0.00
Anaerobic metal reducers (BrMonos)	3.24	0.00	0.00	0.00	0.00
Actinomycetes (MidBrSats)	0	0.00	0.00	0.00	0.00
General (Nsats)	40.62	0.00	0.00	0.00	0.00
Eukaryotes (Polyenoics)	0	0.00	0.00	0.00	0.00
Physiological Status (Proteobacteria only)					
Slowed Growth	0.74	0.00	0.00	0.00	0.00
Decreased Permeability	0.00	0.00	0.00	0.00	0.00

Legend: ND= Non Detect J = Estimated value between detection limit and reporting limit

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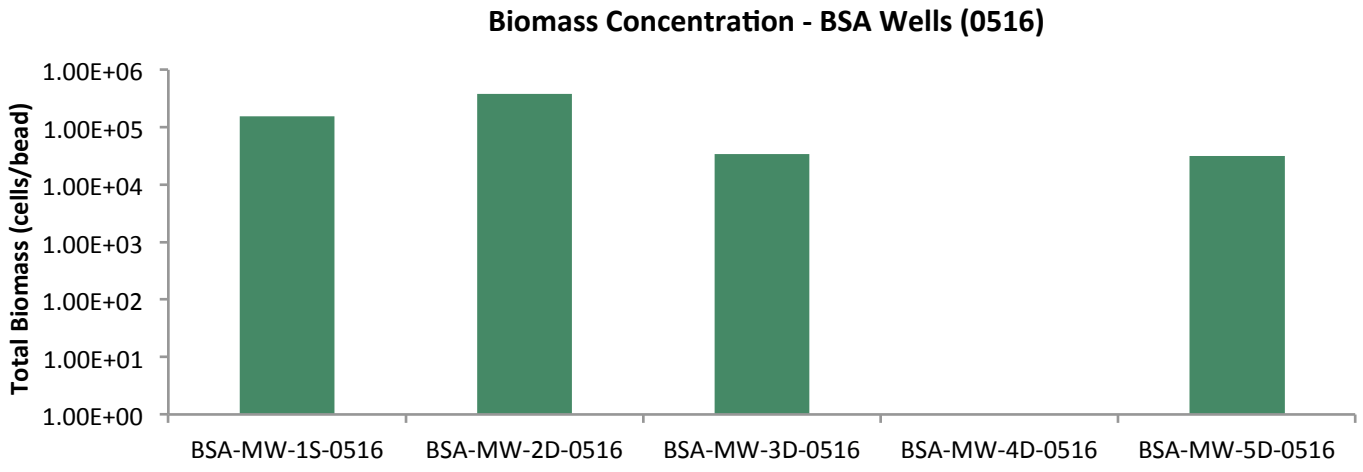

Figure 6. Biomass content is presented as a cell equivalent based on the total amount of phospholipid fatty acids (PLFA) extracted from a given sample. Total biomass is calculated based upon PLFA attributed to bacterial and eukaryotic biomass (associated with higher organisms).

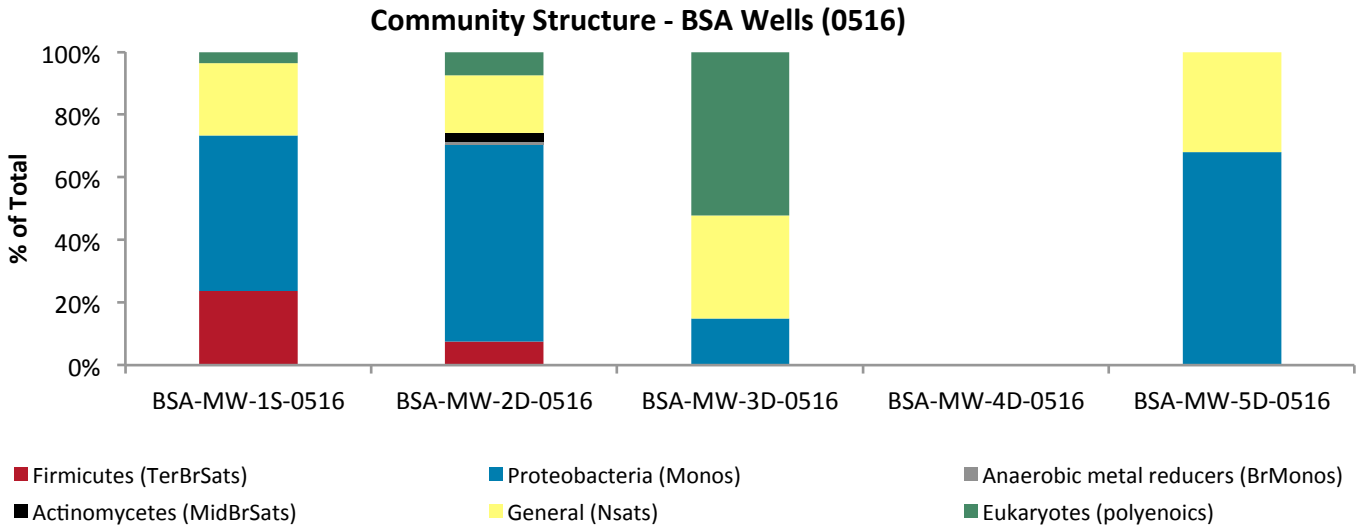

Figure 7. Relative percentages of total PLFA structural groups in the samples analyzed. Structural groups are assigned according to PLFA chemical structure, which is related to fatty acid biosynthesis. See the table in the interpretation section for detailed descriptions of the structural groups.

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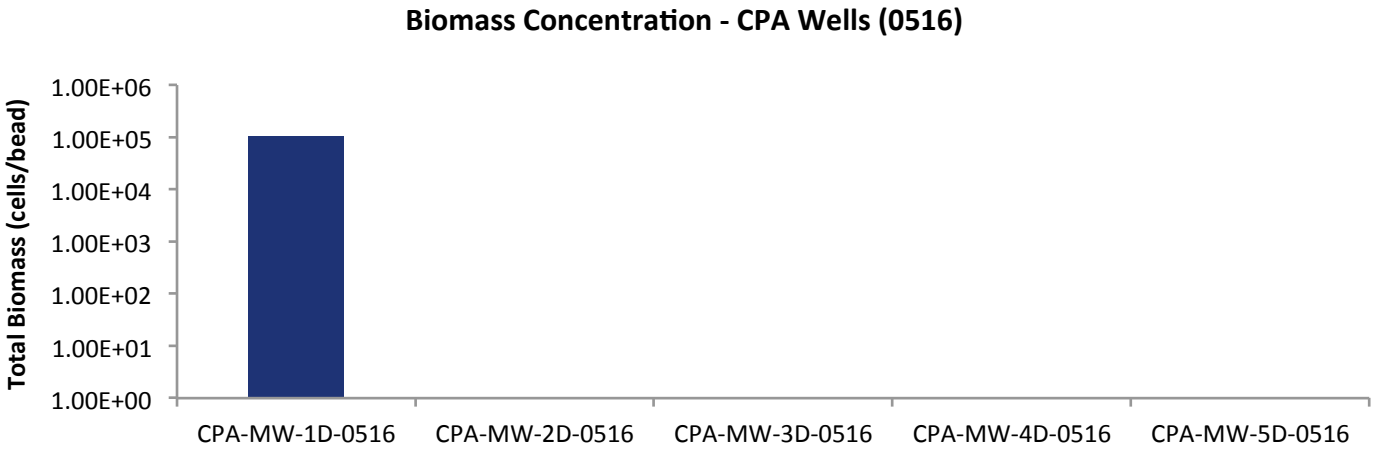

Figure 8. Biomass content is presented as a cell equivalent based on the total amount of phospholipid fatty acids (PLFA) extracted from a given sample. Total biomass is calculated based upon PLFA attributed to bacterial and eukaryotic biomass (associated with higher organisms).

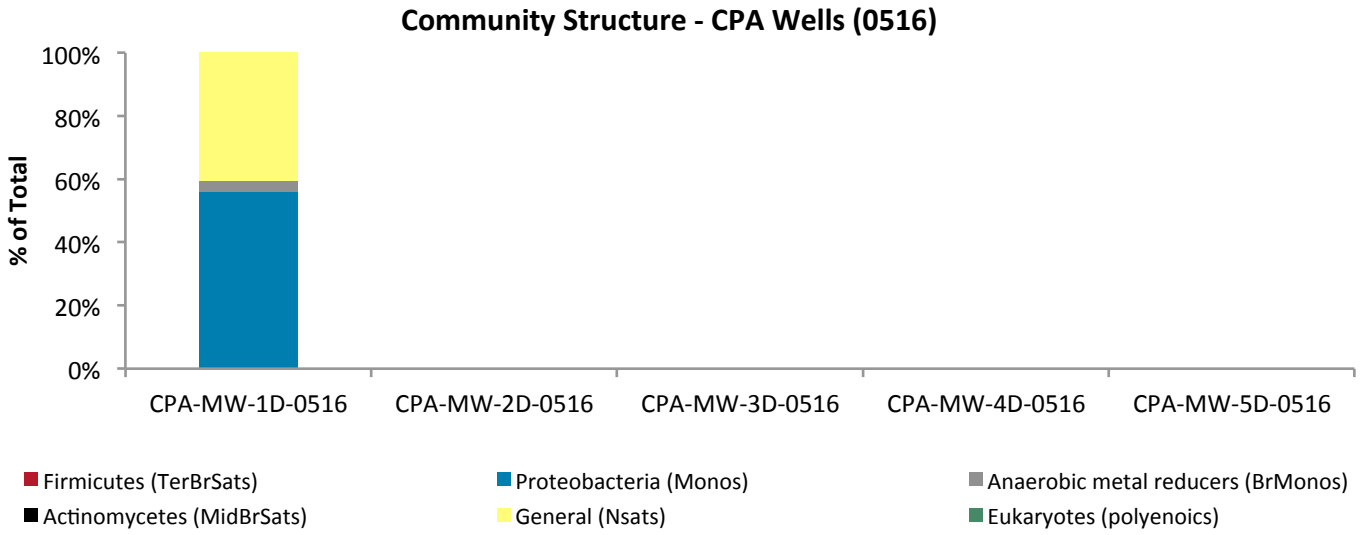

Figure 9. Relative percentages of total PLFA structural groups in the samples analyzed. Structural groups are assigned according to PLFA chemical structure, which is related to fatty acid biosynthesis. See the table in the interpretation section for detailed descriptions of the structural groups.

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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.

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 ‰).

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

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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.

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 higher plants, and animals.	Eukaryotic scavengers will often prey on contaminant utilizing bacteria.

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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.

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 ‰).

$$Del = (R_x - R_{std})/R_{std} \times 1000$$

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