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November 13, 2017

Ms. Carolyn Bury - LU-16J U.S. EPA Region 5 Corrective Action Section 77 West Jackson Boulevard Chicago, IL 60604-3507

> Re: Route 3 Drum Site Groundwater Monitoring Program 3rd Quarter 2017 Data Report Solutia Inc., W. G. Krummrich Plant, Sauget, IL

Dear Ms. Bury:

Enclosed please find the Route 3 Drum Site Groundwater Monitoring Program 3rd Quarter 2017 Data Report for Solutia Inc.'s W. G. Krummrich Plant, Sauget, IL.

On May 2, 2017, Solutia submitted a "Periodic Technical Review" recommending changes to this groundwater monitoring program, along with similar Reviews for the other programs. Solutia will continue each program unchanged, but I'd like to talk with you about getting US EPA's response to our recommendations before implementation of 4th quarter 2017 monitoring, currently postponed from ~ November 1 to ~ December 1 (similar to the 3rd quarter 2017 postponement from ~ August 1 to ~ September 1).

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

Sincerely,

hard the kill

Gerald M. Rinaldi Manager, Remediation Services

Enclosure

cc: Distribution List

DISTRIBUTION LIST

Route 3 Drum Site Groundwater Monitoring Program 3rd Quarter 2017 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



GROUNDWATER MONITORING REPORT

3rd QUARTER 2017 DATA REPORT ILLINOIS ROUTE 3 DRUM SITE GROUNDWATER MONITORING SOLUTIA INC., W.G. KRUMMRICH PLANT 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

November 2017

140-3345



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- Appendix D Groundwater Analytical Results (including data validation reports)



1.0 INTRODUCTION

Golder Associates Inc. (Golder) is pleased to submit this report summarizing the 3rd Quarter 2017 (3Q17) groundwater sampling activities at the Illinois Route 3 Drum Site (Site), located within "Lot F" on Figure 1. The Site is associated with the Solutia Inc. (Solutia) W.G. Krummrich (WGK) plant in Sauget, Illinois located at 500 Monsanto Avenue, Sauget, Illinois. The 3Q17 sampling event was performed in general accordance with the Revised Illinois Route 3 Drum Site Operation and Maintenance Plan (Work Plan) (Solutia 2008).

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

Two (2) monitoring wells, located in the shallow hydrogeologic unit (SHU), are sampled during the Drum Site monitoring event. The locations of the monitoring wells are shown on Figure 2 and the sample locations are included on the table below.

Area	Location Relative to Area	Sample Identification
Illinois Route 3 Drum Site	Adjacent	GM-31A
	Downgradient	GM-58A

The water levels of the two (2) monitoring wells are measured quarterly and total depths are measured in the 1st quarter of each year.

During the quarterly sampling events, monitoring wells are sampled for the following semi-volatile organic compound (SVOC) analytes: 1,1-biphenyl, 1-chloro-2,4-dinitrobenzene, 2,4,6-trichlorophenol, 2,4-dichlorophenol, 2-chloronitrobenzene/4-chloronitrobenzene, 2-nitrobiphenyl, 3,4-dichlorodinitrobenzene, 3-nitrobiphenyl, 3-nitrochlorobenzene, 4-nitrobiphenyl, nitrobenzene, and pentachlorophenol. In addition, the following monitored natural attenuation (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



2.0 FIELD ACTIVITIES

Golder conducted 3Q17 sampling activities on September 12, 2017. Activities were performed in general accordance with the Work Plan.

2.1 Water Level Measurement

Prior to sampling during the 3Q17 event, Golder performed a synoptic round of water level and total depth measurements at 76 monitoring wells and piezometers on August 31 and September 1, 2017. The following monitoring well series is included in the Drum Site program:

GM-series

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 3Q17 sampling event, NAPL was not detected in any of the monitoring wells or piezometers. Total depths are measured during the 1st quarter of each year. The 3Q17 well gauging information is shown on Table 1.

2.2 Groundwater Sample Collection

Monitoring wells sampled during the 3Q17 Drum Site event were purged and sampled using low-flow sampling techniques, low-density polyethylene tubing (LDPE) and a submersible (GM-31A) or peristaltic pump (GM-58A). The pump intake was placed at approximately the middle of the screened interval for each well. Purging occurred 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 for each well. Parameters were measured for each system volume purged using a multi-parameter meter. The system volume includes the volume of the tubing, the volume of the pump and the volume of the 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:

- SVOCs United States Environmental Protection Agency (USEPA) SW-846 Method 8270D
- 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)

Gas sensitive parameter sample bottles were filled first followed by SVOCs 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

One (1) analytical duplicate (AD), one (1) equipment blank (EB) and one (1) matrix spike/matrix spike duplicate (MS/MSD) pair were collected during the 3Q17 Drum Site sampling event. 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 "GM-##A-MMYY-QA/QC" where:

- **GM**" denotes "Geraghty & Miller" and "##A" denotes monitoring well location and number
- "MMYY" denotes month and year of sampling quarter, e.g.: September (3rd Quarter), 2017 (0917)
- "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. A copy of the COC is 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 Canton, Ohio.



2.4 Decontamination and Investigation Derived Waste

Sampling equipment was decontaminated upon 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 one (1) sample delivery group (SDG) as follows:

Sample Delivery Group (SDG)	Sample Identification
	GM-58A-0917
KOM038	GM-31A-0917
KOMU38	GM-31A-0917-AD
	GM-31A-0917-EB

Golder completed validation of the analytical data following the general guidelines in the Work Plan, and the most recent versions of the national data validation guidelines. 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 were deemed usable. Qualifications are included in Appendix C. The completeness for the data set was 100%.

4.0 **OBSERVATIONS**

SVOCs were not detected in groundwater samples collected from monitoring well GM-58A during the 3Q17 sampling event. The SVOC 2,4,6-trichlorophenol was detected in GM-31A and GM-31A-AD at a concentration of 15 μ g/L. Groundwater analytical data for SVOCs and MNA parameters is presented in Tables 2 and 3, respectively. The groundwater analytical laboratory results including data validation reports are included in Appendix D.





5.0 CLOSING

Golder appreciates the opportunity to assist Solutia Inc. with the Illinois Route 3 Drum Site groundwater sampling events. Please contact the undersigned if you need additional information.

Sincerely,

GOLDER ASSOCIATES INC.

Imolebake

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

Mail Aught

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



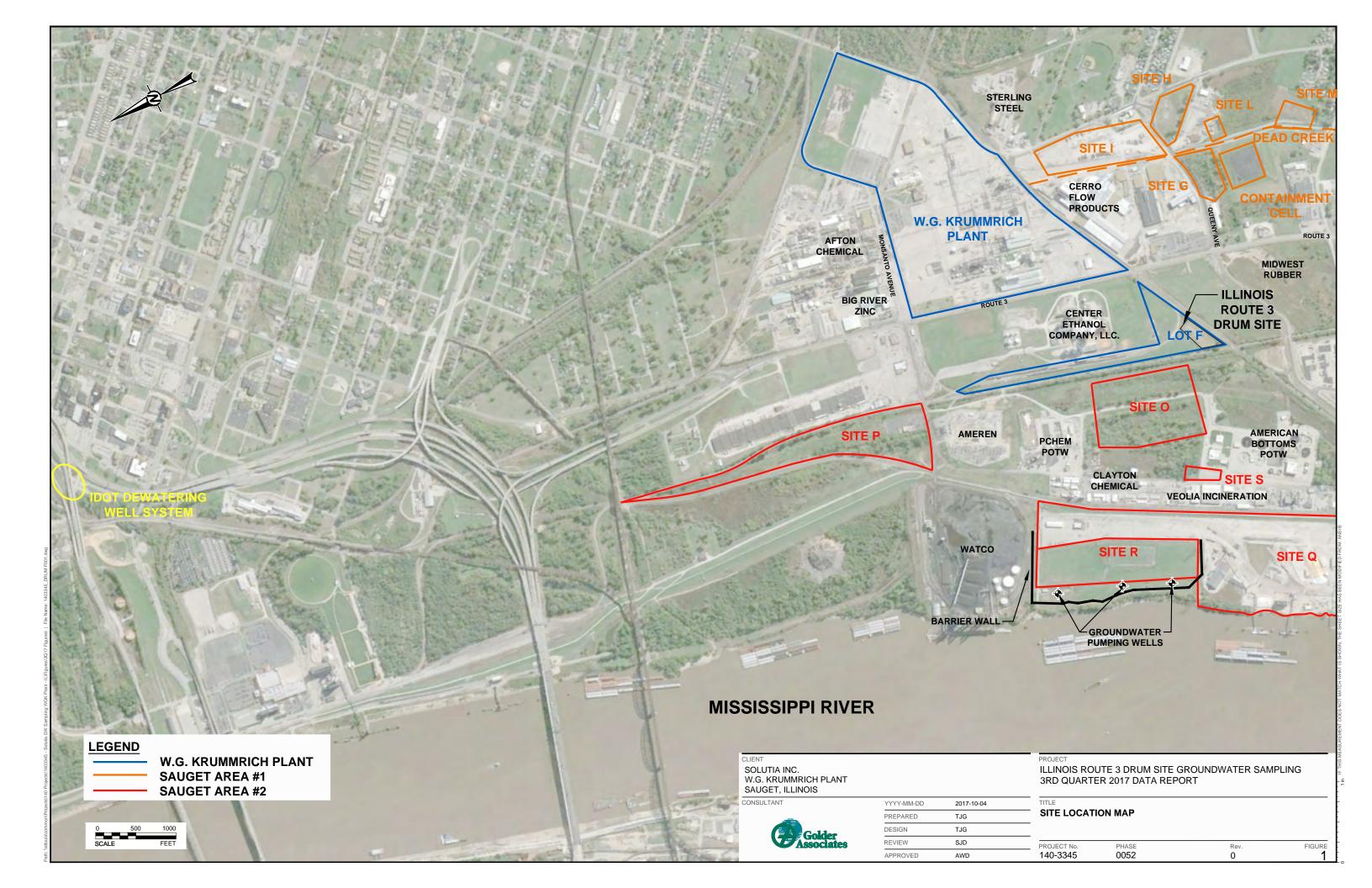


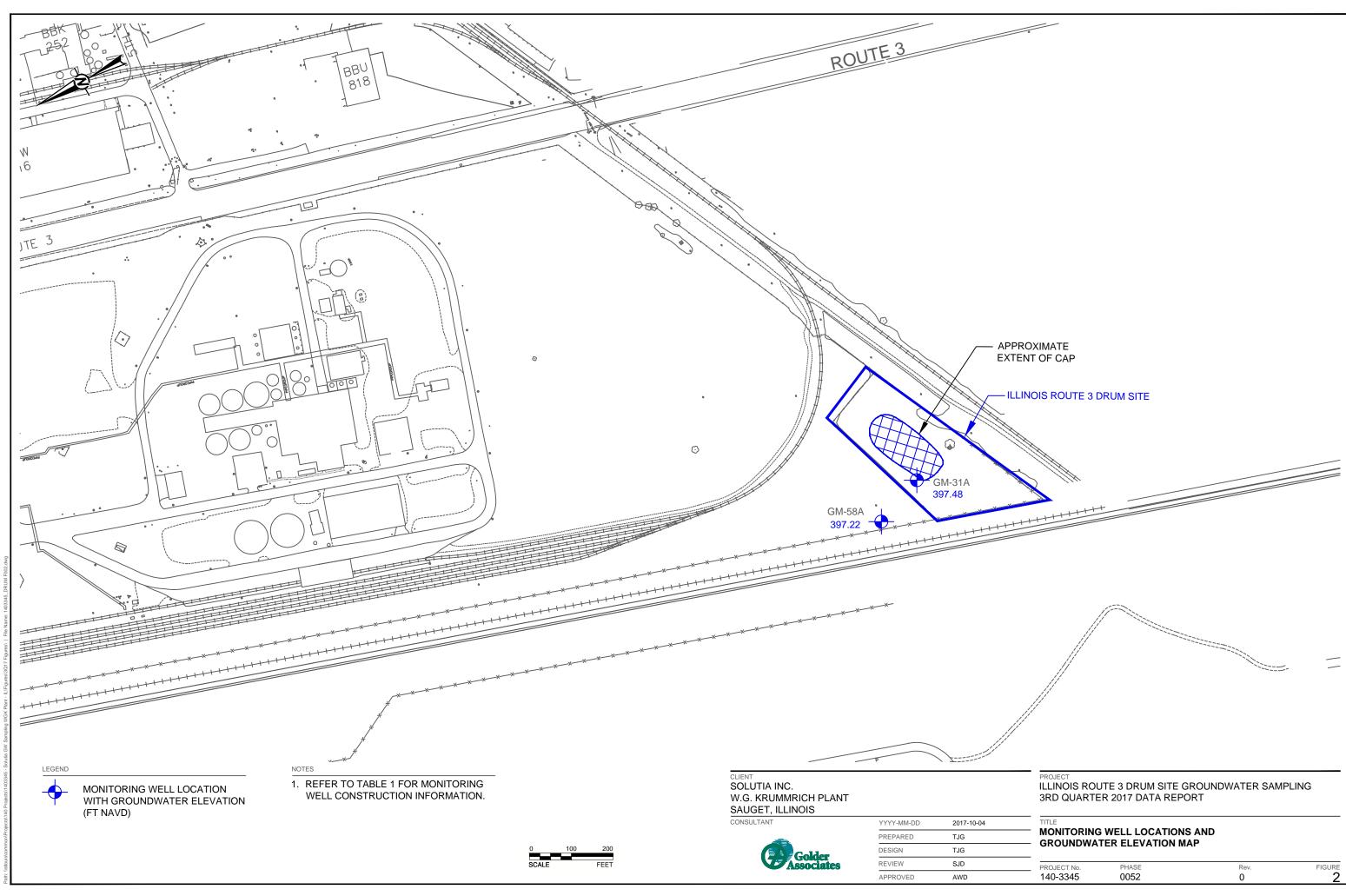
6.0 **REFERENCES**

- Solutia Inc., 2008. Revised Illinois Route 3 Drum Site Operation and Maintenance Plan, W.G. Krummrich Facility, Sauget, IL, May 2008.
- USEPA, 2008. Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review.
- USEPA, 2010. Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review.



FIGURES





TABLES

Table 1 Monitoring Well Gauging Information 3Q17 Route 3 Drum Site Monitoring Program Solutia Inc., W.G. Krummrich Plant Sauget, Illinois

		Moni	toring Well	3Q17 - August 31, 2017						
Well Identification	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									
GM-31A	416.63	418.63	19.00	39.00	397.63	377.63	21.15	NP	39.67	397.48
GM-58A	412.24	414.24	19.40	39.40	392.84	372.84	17.02	NP	40.78	397.22

Notes

ft - feet

bgs - below ground surface

btoc - below top of casing

NP - no product observed

SHU - shallow hydrogeologic unit

¹ - Elevations 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 09/01/2017 Checked By: TJG 10/04/2017 Reviewed By: AWD 11/01/2017

Table 2Groundwater Analytical Results3Q17 Route 3 Drum Site Monitoring ProgramSolutia Inc., W.G. Krummrich PlantSauget, Illinois

					-	-	9	SVOCs (µg/L)					
Sample Identification	Sample Date	1,1'-Biphenyl	1-Chloro- 2,4-Dinitrobenzene	2,4,6-Trichlorophenol	2,4-Dichlorophenol	2-Chloronitrobenzene/ 4-Chloronitrobenzene	2-Nitrobiphenyl	3,4-Dichloronitrobenzene	3-Nitrobiphenyl	3-Nitrochlorobenzene	4-Nitrobiphenyl	Nitrobenzene	Pentachlorophenol
SHU													
GM-31A-0917	9/12/2017	<9.6	<9.6	15	<9.6	<19	<9.6	<9.6	<9.6	<9.6	<9.6	<9.6	<48
GM-31A-0917-AD	9/12/2017	<9.5	<9.5	15	<9.5	<19	<9.5	<9.5	<9.5	<9.5	<9.5	<9.5	<48
GM-58A-0917	9/12/2017	<9.6	<9.6	<9.6	<9.6	<19	<9.6	<9.6	<9.6	<9.6	<9.6	<9.6	<48

Notes

SVOCs - semi-volatile organic compounds

µg/L - micrograms per liter

< - result is non-detect, less than the reporting limit

AD - analytical duplicate

Prepared By: TJG 10/04/2017 Checked By: BCW 10/23/2017 Reviewed By: AWD 11/01/2017

Table 3 3Q17 Route 3 Drum Site Monitoring Program Solutia Inc., W.G. Krummrich Plant Sauget, Illinois

		Monitored Natural Attenuation Parameters																
Sample Identification	Sample Date	Alkalinity (mg/L)	Carbon Dioxide (mg/L)	Chloride (mg/L)	Dissolved Oxygen (mg/L)	Ethane (µg/L)	Ethylene (µg/L)	Ferrous Iron (mg/L)	Iron (mg/L)	Iron, Dissolved (mg/L)	Manganese (mg/L)	Manganese, Dissolved (mg/L)	Methane (дg/L)	Nitrogen, Nitrate (mg/L)	Sulfate as SO4 (mg/L)	Total Organic Carbon (mg/L)	Dissolved Organic Carbon (mg/L)	ORP (mV)
SHU																		
GM-31A-0917	9/12/2017	430	18	18	0.06	<0.50	<0.50		0.22	-	0.88	-	0.70	1.2	53 D	3.3	-	83.57
GM-31A-F(0.2)-0917	9/12/2017	-	-	-	-		-	0.0		<0.050	-	0.83	-	-			3.7	-
GM-58A-0917	9/12/2017	440	16	25	0	<0.50	<0.50	-	0.30	-	0.75	-	<0.50	0.93	71 D	3.4	-	70.65
GM-58A-F(0.2)-0917	9/12/2017	-	-	-	-	-	-	0.0	-	< 0.050	-	0.77	-	-	-		3.7	-

Notes

Dissolved Oxygen (DO) and Oxidation Reduction Potential (ORP) values represent the final field measurements prior to sampling

Ferrous Iron was field measured using a 0.2 μ m field filtered sample F(0.2) - sample was field filtered using a 0.2 μ m 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

SHU - shallow hydrogeologic unit

Prepared By: TJG 10/04/2017 Checked By: BCW 10/23/2017 Reviewed By: AWD 11/01/2017 APPENDIX A GROUNDWATER PURGING AND SAMPLING FORMS



	IIC.	9/12/2017	ISI Low-Flow Log
Project Information:		Pump Information:	
Operator Name	SJD	Pump Model/Type	SS Monsoon
Company Name	Golder Associates	Tubing Type	LDPE
Project Name	Drum	Tubing Diameter	0.19 in
Site Name	W.G.K.	Tubing Length	44.32 ft
		Pump Placement from TOC	31.00 ft
Well Information:		Pumping Information:	
Well Id	GM-31A	Final Pumping Rate	300 mL/min
Well Diameter	2 in	System Volume	437 mL
Well Total Depth	39.67 ft	Calculated Sample Rate	87 sec
Depth to Top of Screen	21.00 ft	Sample Rate	87 sec
Screen Length	20 ft	Stabilized Drawdown	0.00 ft
Depth to Water	21.83 ft		

Low-Flow System

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	+/-1	+/-0.2	+/-20
Stabilization Settings	Time Temp [C] 12:21:08 17.96 12:22:35 17.56 12:24:02 17.55 12:25:29 17.59 12:26:57 17.62 -0.01 0.04 0.03 0.03			+/-3%	+/-10%	+/-10%	
	12:21:08	17.96	6.72	895.21	14.2	0.12	89.88
	12:22:35	17.56	6.72	899.77	10.7	0.09	86.48
Last 5 Readings	12:24:02	17.55	6.73	897.92	11.2	0.07	85.10
	12:25:29	17.59	6.73	898.32	9.07	0.06	84.39
	12:26:57	17.62	6.74	892.71	7.30	0.06	83.57
		-0.01	0.01	-1.85	0.50	-0.02	-1.38
Variance in Last 3 Readings		0.04	0.00	0.40	-2.13	-0.01	-0.71
		0.03	0.01	-5.61	-1.77	0.00	-0.82

Notes:



	inc.	9/12/2017	ISI Low-Flow Log
Project Information:		Pump Information:	
Operator Name	SJD	Pump Model/Type	Peristaltic
Company Name	Golder Associates	Tubing Type	LDPE
Project Name	Drum	Tubing Diameter	0.19 in
Site Name	W.G.K.	Tubing Length	48.33 ft
		Pump Placement from TOC	31.40 ft
Well Information:		Pumping Information:	
Well Id	GM-58A	Final Pumping Rate	300 mL/min
Well Diameter	2 in	System Volume	359 mL
Well Total Depth	40.78 ft	Calculated Sample Rate	71 sec
Depth to Top of Screen	21.40 ft	Sample Rate	71 sec
Screen Length	20 ft	Stabilized Drawdown	0.00 ft
Depth to Water	17.73 ft		

Low-Flow System

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	+/-1	+/-0.2	+/-20
Stabilization Settings				+/-3%	+/-10%	+/-10%	
	11:37:21	16.27	6.84	918.14	10.5	0.01	71.20
	11:38:32	16.28	6.84	931.53	13.0	0.01	70.97
Last 5 Readings	11:39:43	16.31	6.84	935.34	+/-1 +/-0.2 +/-10% +/-10% 10.5 0.01	70.66	
	11:40:54	16.33	6.86	932.87	11.2	0.00	69.63
	11:42:05	16.37	6.86	936.11	8.48	0.00	70.65
		0.03	0.00	3.81	-1.60	-0.01	-0.31
Variance in Last 3 Readings		0.02	0.02	-2.47	-0.20	0.00	-1.03
		0.04	0.00	3.24	-2.72	0.00	1.02

Notes:

APPENDIX B CHAIN-OF-CUSTODY

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Sample Identification	Sample Date	Sample Time	Type (C+Comp. G+Grad)	Matrix	# of Cost, IL	Perform h	Total Fe/W	AMCO2 by 310.1	Chlonde by 325 2/	Methane b	TOC by 415 1	Dasolved Fe/Mn	DOC by 4					Sample Specif	fic Notes
G.M-31A-0917	9/12/17	1228	(A	W	12 N	П	_	1		3	3								
6-M-31A-F(0,2)-0917	interior of	1228	1	1	4 4	Ħ	-	t	††	1	T	T	3	-			+		
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Form No. CA-C-WI-002, Rev. 4.3, dated 12/05/2013



TestAmerica Canton 4101 Shuffel Street NW

Chain of Custody Record



TestAmerica

THE LEA

North Canton, OH 44720 Phone (330) 497-9396 Fax (330) 497-0772

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GN	A-31A-0917-AD (240-84874-3)	9/12/17	12:28 Central 13-14 Central		Water	IT)	c	T			2			
Gh	4-31A-0917-EB (240-84874-4)	0/12/17			Water						3	c				2			
Gh	A-58A-0017 (240-84874-5)	10/12/17	10.44 Central		Water		×	×	×	x	x)	6				12			
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APPENDIX C QUALITY ASSURANCE REPORT



QUALITY ASSURANCE REPORT

3rd QUARTER 2017 ILLINOIS ROUTE 3 DRUM SITE GROUNDWATER MONITORING SOLUTIA INC., W.G. KRUMMRICH PLANT 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

November 2017

140-3345



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A world of capabilities delivered locally



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1.0 INTRODUCTION

Golder Associates Inc. (Golder) completed a review of analytical data for the groundwater samples collected on September 12, 2017 at the Illinois Route 3 Drum Site (Site) associated with the Solutia Inc. (Solutia) W.G. Krummrich (WGK) plant in Sauget, Illinois. Golder collected a total of six (6) samples from groundwater monitoring wells as part of the 3rd Quarter 2017 (3Q17) Illinois Route 3 Drum Site groundwater monitoring. Two (2) groundwater samples, one (1) equipment blank (EB), one (1) analytical duplicate (AD), and one (1) matrix spike/matrix spike duplicate (MS/MSD) pair were prepared. Groundwater monitoring location GM-31A is located at the Site and monitoring location GM-58A is located just north of the Site. The samples were submitted to the TestAmerica Laboratories, Inc. (TestAmerica) facility located in Canton, Ohio and 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 semi-volatile organic compounds (SVOCs), total and dissolved metals, dissolved gases, and general chemistry parameters. The analytical results were placed into one (1) sample delivery group (SDG) as described in the table below:

Sample Delivery Group (SDG)	Sample Identification
	GM-58A-0917
KOM038	GM-31A-0917
KOW036	GM-31A-0917-AD
	GM-31A-0917-EB

The samples were collected and analyzed in general accordance with the Revised Illinois Route 3 Drum Site Operation and Maintenance Plan (Work Plan) (Solutia 2008). The groundwater monitoring well samples were analyzed for SVOCs, 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). One (1) EB, one (1) AD, and one (1) MS/MSD pair were submitted and analyzed for SVOCs only. The following analytical methods used are from USEPA document SW-846, <u>Test Methods for Evaluating Solid Waste</u>, Revision 6 contained in Final Update III August 2002 and listed below:

- SVOCs were analyzed using <u>USEPA SW-846 Method 8270D Semi-Volatile Organic</u> <u>Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)</u>
- Total and Dissolved Iron and Manganese analyzed by <u>USEPA SW-846 Method 6010C</u> <u>Inductively Coupled Plasma-Atomic Emission Spectrometry</u>

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 <u>USEPA Method 325.2 by Automated Colorimetry</u>



- Nitrogen, Nitrate analyzed by <u>USEPA Method 353.2 by Automated Colorimetry</u>
- Sulfate analyzed by <u>USEPA Method 375.4 by Spectrophotometer</u>
- Total and Dissolved Organic Carbon analyzed by USEPA Method 415.1

Golder completed validation of the analytical data following the general guidelines in the Work Plan. The most recent versions of the national data validation guidelines were 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 SDG was 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

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 4.0.



2.0 SEMI-VOLATILE ORGANIC COMPOUNDS

Samples were collected from two (2) groundwater monitoring locations and analyzed for SVOCs. An AD sample was collected from one (1) sampling location, GM-31A. One (1) EB was also prepared and shipped for laboratory analysis. The samples were submitted to TestAmerica, placed into one (1) data package or SDG (KOM038), and were prepared and analyzed using SW-846 Method 8270D. 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 checklists, and analysis dates were reviewed to verify analytical method holding times and proper preservation upon sampling. Samples were received by TestAmerica in good condition.

2.2 Blanks

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

One (1) EB was collected during the 3Q17 event, associated with sample GM-31A, to assess the effectiveness of the decontamination procedure. Results for the EB were non-detect.

2.3 Surrogate Spike Recoveries

Samples to be analyzed for SVOCs were spiked with surrogate compounds: 2-fluorobiphenyl, 2-fluorophenol, nitrobenzene-d5, phenol-d5, terphenyl-d14, and 2,4,6-tribromophenol, prior to analysis, to evaluate overall laboratory performance. Surrogate recoveries were within acceptance criteria; therefore, data qualification was not required.

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; therefore, data qualification was not required.

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)





4

MS/MSD pair was collected during the 3Q17 event associated with sample GM-58A. Results were within accuracy and precision criteria.

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. One (1) AD was collected during the 3Q17 event associated with sample GM-31A. The relative percent difference (RPD) between the sample GM-31A and the AD, GM-31A-AD, 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. Qualification of data was not required.

2.8 Results Reported From Dilutions

SVOC samples in the SDG did not require dilutions.



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3.0 INORGANICS AND GENERAL CHEMISTRY

Samples were collected from two (2) groundwater monitoring locations and analyzed for inorganics and general chemistry. The samples were submitted to TestAmerica, placed into one (1) data package or SDG (KOM037), and were prepared and analyzed using the following methods:

- Total and Dissolved Iron and Manganese analyzed by <u>USEPA Method 6010C Inductively</u> <u>Coupled Plasma-Atomic Emission Spectrometry</u>
- Dissolved Gases analyzed by <u>Method RSK-175</u>
- Alkalinity and Free Carbon Dioxide analyzed by <u>USEPA Method 310.1 by Titration</u>
- Chloride analyzed by <u>USEPA Method 325.2 by Automated Colorimetry</u>
- Nitrogen, Nitrate analyzed by <u>USEPA Method 353.2 by Automated Colorimetry</u>
- Sulfate analyzed by <u>USEPA Method 375.4 by Spectrophotometer</u>
- 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 checklists, and analysis dates were reviewed to verify analytical method holding times and proper preservation upon sampling. Samples were received by TestAmerica in good condition.

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 GM-31A and GM-58A for various analytes. Results were within accuracy and precision criteria.

3.5 Results Reported From Dilutions

Samples in the SDG required dilutions due to high levels of target analyte sulfate. Reporting limits were adjusted to reflect the dilution. Result qualifications are shown in Section 4.0.





4.0 SUMMARY

Golder validated the data collected during the 3Q17 sampling event from the Illinois Route 3 Drum Site 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	Sulfate	D	GM-31A and GM-58A





5.0 **REFERENCES**

- Solutia Inc., 2008. Revised Illinois Route 3 Drum Site Operation and Maintenance Plan, W.G. Krummrich Facility, Sauget, IL, May 2008.
- 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 REPORT)



1

140-3345

Level IV Data Validation Summary Solutia Inc., W.G. Krummrich, Sauget, Illinois 3Q17 Route 3 Drum Site Monitoring Program

Company Name: <u>Golder Associates</u> Project Name: <u>WGK-3Q17 Drum Site</u> Reviewer: A. Derhake Laboratory: TestAmerica SDG#: KOM038 Matrix: Water

Project Manager: A. Derhake Project Number: 140-3345 Sample Date: September 2017

Analytical Method: SVOC (8270D), 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: <u>GM-31A-0917, GM-31A-F(0.2)-0917, GM-31A-0917-AD, GM-31A-0917-EB, GM-58A-0917, GM-58A-F(0.2)-0917</u>

Field Information	YES	NO	NA
a) Sampling dates noted?	\boxtimes		
b) Does the laboratory narrative indicate deficiencies?	\boxtimes		
Comments:			
SVOC: No deficiencies noted.			
Dissolved Gases: No deficiencies noted.			
Metals: No deficiencies noted.			
Alkalinity: No deficiencies noted.			
Chloride: No deficiencies noted.			
Nitrate-Nitrite as Nitrogen: No deficiencies noted.			
Sulfate: Samples GM-31A and GM-58A required dilution prior to analysis, reporting limits were adju	usted acc	<u>ording</u>	<u>jly.</u>
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?	\boxtimes		
b) Were samples received in good condition?	\boxtimes		
Comments: Samples were received at 2.6°C, and 3.0°C, within the 4°C ± 2°C criteria.			
General	YES	NO	NA
a) Were hold times met for sample analysis?	\boxtimes		
b) Were the correct preservatives used?	\boxtimes		
c) Was the correct method used?	\boxtimes		
d) Any sample dilutions noted?	\boxtimes		
Comments: Detections in diluted analysis were qualified.			



	November 2017 2			140-3345
GC/N	IS Instrument Performance Check (IPC) and Internal Standards (IS)	YES	NO	NA
a)	IPC analyzed at the appropriate frequency and met the appropriate standards?	\boxtimes		
b)	Does DFTPP meet the ion abundance criteria?	\boxtimes		
c)	Internal Standard retention times and areas met appropriate criteria?	\boxtimes		
Co	mments: None			
Calik	prations	YES	NO	NA
a)	Initial calibration analyzed at the appropriate frequency and met the appropriate standards?	\boxtimes		
b)	Continuing calibrations analyzed at the appropriate frequency and met the appropriate standards	;?		
		\boxtimes		
c)	Initial calibration verifications and blanks analyzed at the appropriate frequency and met the appr	ropriate	stand	ards?
		\boxtimes		
d)	Continuing calibration verifications and blanks analyzed at the appropriate frequency and met the	e approp	oriate	standards?
Co	omments: None	\boxtimes		
Blar	ks	YES	NO	NA
a)	Were blanks (trip, equipment, method) performed at required frequency?			
b)	Were analytes detected in any blanks?		\boxtimes	
Co	mments: Equipment blank GM-31A-0917-EB was submitted with SDG KOM038			
Matri	ix Spike/Matrix Spike Duplicate (MS/MSD)	YES	NO	NA
a)	Was MS/MSD accuracy criteria met?	\boxtimes		
b)	Was MS/MSD precision criteria met?	\boxtimes		
Co	mments: None			
Labo	pratory Control Sample (LCS)	YES	NO	NA
a)	LCS analyzed at the appropriate frequency and met appropriate standards?	\boxtimes		
Co	omments: None			
Surr	ogate (System Monitoring) Compounds	YES	NO	NA
a)	Surrogate compounds analyzed at the appropriate frequency and met appropriate standards?	\boxtimes		
Cor	nments: None			
Dupl	icates	YES	NO	NA
a)	Were field duplicates collected?	\boxtimes		
b)	Was field duplicate precision criteria met?	\boxtimes		
Co	mments: Duplicate sample GM-31A-0917-AD was submitted with SDG KOM038.			

Additional Comments: None





Qualifications:

Quality Control Issue	Compound(s)	Qualifier	Samples Affected
Compounds analyzed at a dilution	Sulfate	D	GM-31A-0917 and GM-58A-0917



SDG KOM038 Sample Results from:

> GM-58A GM-31A GM-31A-AD GM-31A-EB



THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc. TestAmerica Canton 4101 Shuffel Street NW North Canton, OH 44720 Tel: (330)497-9396

TestAmerica Job ID: 240-84874-1 TestAmerica Sample Delivery Group: KOM038 Client Project/Site: 3Q17 Drum Site GW Sampling - 1403345

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

Attn: Mr. Jerry Rinaldi

Michele R.Kersy

Authorized for release by: 9/25/2017 2:33:57 PM

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

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

SJD 10/11/17

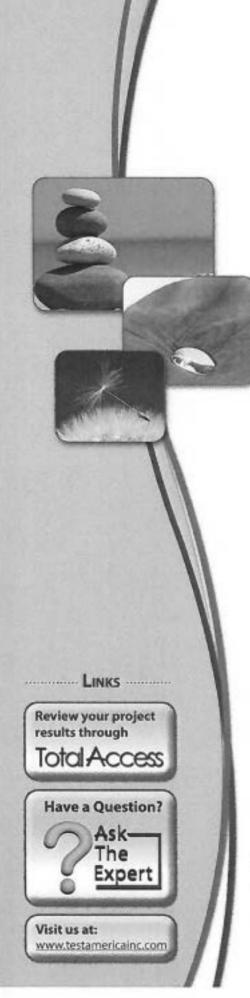


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Definitions/Glossary

Client: Solutia Inc. Project/Site: 3Q17 Drum Site GW Sampling - 1403345 TestAmerica Job ID: 240-84874-1 SDG: KOM038

Qualifiers

GC/MS Ser	ni 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 Ch	emistry
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	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
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 (Radiochemistry)
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)

TestAmerica Canton

Client: Solutia Inc. Project/Site: 3Q17 Drum Site GW Sampling - 1403345

Job ID: 240-84874-1

Laboratory: TestAmerica Canton

Narrative

CASE NARRATIVE

Client: Solutia Inc.

Project: 3Q17 Drum Site GW Sampling - 1403345

Report Number: 240-84874-1

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 9/13/2017 9:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 2.6° C and 3.0° C.

SEMIVOLATILE ORGANIC COMPOUNDS (AQUEOUS)

Samples GM-31A-0917 (240-84874-1), GM-31A-0917-AD (240-84874-3), GM-31A-0917-EB (240-84874-4) and GM-58A-0917 (240-84874-5) were analyzed for Semivolatile Organic Compounds (Aqueous) in accordance with EPA SW-846 Method 8270D. The samples were prepared on 09/18/2017 and analyzed on 09/20/2017.

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

DISSOLVED GASES

Samples GM-31A-0917 (240-84874-1) and GM-58A-0917 (240-84874-5) were analyzed for dissolved gases in accordance with RSK-175. The samples were analyzed on 09/21/2017.

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

METALS (ICP) - DISSOLVED

Samples GM-31A-F(0-2)-0917 (240-84874-2) and GM-58A-F(0-2)-0917 (240-84874-6) were analyzed for Metals (ICP) - Dissolved in accordance with EPA SW-846 Method 6010C. The samples were prepared on 09/14/2017 and analyzed on 09/16/2017.

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

METALS (ICP)

Samples GM-31A-0917 (240-84874-1) and GM-58A-0917 (240-84874-5) were analyzed for Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 09/14/2017 and analyzed on 09/16/2017.

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

ALKALINITY

Samples GM-31A-0917 (240-84874-1) and GM-58A-0917 (240-84874-5) were analyzed for alkalinity in accordance with EPA Method 310.1. The samples were analyzed on 09/14/2017.

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

CHLORIDE

Samples GM-31A-0917 (240-84874-1) and GM-58A-0917 (240-84874-5) were analyzed for Chloride in accordance with EPA Method

Client: Solutia Inc. Project/Site: 3Q17 Drum Site GW Sampling - 1403345

Job ID: 240-84874-1 (Continued)

Laboratory: TestAmerica Canton (Continued)

325.2. The samples were analyzed on 09/20/2017.

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

NITRATE-NITRITE AS NITROGEN

Samples GM-31A-0917 (240-84874-1) and GM-58A-0917 (240-84874-5) were analyzed for nitrate-nitrite as nitrogen in accordance with EPA Method 353.2. The samples were analyzed on 09/15/2017.

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

SULFATE

Samples GM-31A-0917 (240-84874-1) and GM-58A-0917 (240-84874-5) were analyzed for sulfate in accordance with EPA Method 375.4. The samples were analyzed on 09/16/2017.

Samples GM-31A-0917 (240-84874-1)(5X) and GM-58A-0917 (240-84874-5)[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.

TOTAL ORGANIC CARBON

Samples GM-31A-0917 (240-84874-1) and GM-58A-0917 (240-84874-5) were analyzed for total organic carbon in accordance with EPA Method 415.1. The samples were analyzed on 09/21/2017.

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

DISSOLVED ORGANIC CARBON (DOC)

Samples GM-31A-F(0-2)-0917 (240-84874-2) and GM-58A-F(0-2)-0917 (240-84874-6) were analyzed for Dissolved Organic Carbon (DOC) in accordance with EPA Method 415.1. The samples were analyzed on 09/20/2017.

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

Method Summary

Client: Solutia Inc. Project/Site: 3Q17 Drum Site GW Sampling - 1403345 TestAmerica Job ID: 240-84874-1 SDG: KOM038

Method	Method Description	Protocol	Laboratory
8270D	Semivolatile Organic Compounds (GC/MS)	SW846	TAL SAV
RSK-175	Dissolved Gases (GC)	RSK	TAL CAN
6010C	Metals (ICP)	SW846	TAL SAV
310.1-1978	Alkalinity	MCAWW	TAL SAV
325.2-1978	Chloride	MCAWW	TAL SAV
353.2	Nitrogen, Nitrate-Nitrite	MCAWW	TAL CAN
375.4-1978	Sulfate	MCAWW	TAL SAV
415.1-1974	TOC	MCAWW	TAL SAV
415.1-1974	DOC	MCAWW	TAL SAV

Protocol References:

MCAVW = "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 CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396 TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

Sample Summary

Client: Solutia Inc. Project/Site: 3Q17 Drum Site GW Sampling - 1403345 TestAmerica Job ID: 240-84874-1 SDG: KOM038

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-84874-1	GM-31A-0917	Water	09/12/17 12:28	09/13/17 09:30
240-84874-2	GM-31A-F(0-2)-0917	Water	09/12/17 12:28	09/13/17 09:30
240-84874-3	GM-31A-0917-AD	Water	09/12/17 12:28	09/13/17 09:30
240-84874-4	GM-31A-0917-EB	Water	09/12/17 13:14	09/13/17 09:30
240-84874-5	GM-58A-0917	Water	09/12/17 10:44	09/13/17 09:30
240-84874-6	GM-58A-F(0-2)-0917	Water	09/12/17 10:44	09/13/17 09:30

4 5 6 7 8 9 10 11 12 13 14

TestAmerica Canton 350 10/11/17

Detection Summary

Client: Solutia Inc. Project/Site: 3Q17 Drum Site GW Sampling - 1403345 TestAmerica Job ID: 240-84874-1 SDG: KOM038

Lab Sample ID: 240-84874-2

Lab Sample ID: 240-84874-3

Lab Sample ID: 240-84874-4

Lab Sample ID: 240-84874-6

Client Sample ID: GM-31A-0917 Lab Sample ID: 240-84874-1 Analyte **Result Qualifier** Unit Dil Fac D Method RL. MDL Prep Type 15 2.4.6-Trichlorophenol 9.6 1 8270D Total/NA ug/L **RSK-175** Methane 0.50 0.70 ug/L 1 Total/NA Iron 0.22 0.050 mg/L 1 6010C Total Recoverable Manganese 0.88 0.010 6010C mg/L 1 Total Recoverable Chloride 18 1.0 325.2-1978 Total/NA mg/L 1 Nitrate Nitrite as N 1.2 0.050 353.2 Total/NA mg/L 1 53 D Sulfate Total/NA 25 375.4-1978 mg/L 5 Total Organic Carbon 3.3 1.0 mg/L 1 415.1-1974 Total/NA Analyte **Result Qualifier** RL RL Unit Dil Fac D Method Prep Type Alkalinity 430 5.0 310.1-1978 TotaWNA mg/L 1 Carbon Dioxide, Free 18 5.0 mg/L 1 310.1-1978 **Total/NA**

Client Sample ID: GM-31A-F(0-2)-0917

Analyte	Result	Qualifier	RL	MDL.	Unit	Dil Fac	D	Method	Prep Type
Manganese, Dissolved	0.83		0.010		mg/L	1		6010C	Dissolved
Dissolved Organic Carbon	3.7		1.0		mg/L	1		415.1-1974	Dissolved

Client Sample ID: GM-31A-0917-AD

Analyte	Result Qualifier	RL	MDL Unit	Dil Fac D	Method	Prep Type
2,4,6-Trichlorophenol	15	9.5	ug/L	1	8270D	Total/NA

Client Sample ID: GM-31A-0917-EB

No Detections.

Analyte

Manganese

Iron

Client Sample ID: GM-58A-0917

Lab Sample ID: 240-84874-5 **Result Qualifier** RL. MDL Unit Dil Fac D Method Prep Type 0.050 0.30 mg/L 6010C 4 Total Recoverable 0.75 0.010 mg/L 6010C 1 Total

								Recoverable
25		1.0		mg/L	1		325.2-1978	Total/NA
0.93		0.050		mg/L	1		353.2	Total/NA
71	P	25		mg/L	5		375.4-1978	Total/NA
3.4		1.0		mg/L	1		415.1-1974	Total/NA
Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
440		5.0	-	mg/L	1	-	310.1-1978	Total/NA
16		5.0		mg/L	1		310.1-1978	Total/NA
	71 3.4 Result 440	0.93 71 D 3.4 Result Qualifier 440	0.93 0.050 71 D 25 3.4 1.0 Result Qualifier RL 440 5.0	0.93 0.050 71 D 25 3.4 1.0 Result Qualifier RL RL 440 5.0	0.93 0.050 mg/L 71 D 25 mg/L 3.4 1.0 mg/L Result Qualifier RL RL Unit 440 5.0 mg/L	0.93 0.050 mg/L 1 71 D 25 mg/L 5 3.4 1.0 mg/L 1 Result Qualifier RL RL Unit Dil Fac 440 5.0 mg/L 1	0.93 0.050 mg/L 1 71 D 25 mg/L 5 3.4 1.0 mg/L 1 Result Qualifier RL RL Unit Dil Fac D 440 5.0 mg/L 1	0.93 0.050 mg/L 1 353.2 71 D 25 mg/L 5 375.4-1978 3.4 1.0 mg/L 1 415.1-1974 Result Qualifier RL RL Unit Dil Fac D Method 440 5.0 mg/L 1 310.1-1978 1 10.1-1978

Client Sample ID: GM-58A-F(0-2)-0917

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Manganese, Dissolved	0.77		0.010		mg/L	1	-	6010C	Dissolved
Dissolved Organic Carbon	3.7		1.0		mg/L	1		415.1-1974	Dissolved

This Detection Summary does not include radiochemical test results.

Client: Solutia Inc. Project/Site: 3Q17 Drum Site GW Sampling - 1403345 TestAmerica Job ID: 240-84874-1 SDG: KOM038

Client Sample ID: GM-31A-0917

Date Collected: 09/12/17 12:28 Date Received: 09/13/17 09:30

Lab Sample ID: 240-84874-1 Matrix: Water

Method: 8270D - Semivolatile	Organic Co	mpounds	(GC/MS)						
Analyte		Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
.1'-Biphenyl	9.6	U	9.6		ug/L		09/18/17 15:45	09/20/17 18:23	1
-chloro-2,4-dinitrobenzene	9.6	U	9.6		ug/L		09/18/17 15:45	09/20/17 18:23	1
-Chloro-3-nitrobenzene	9.6	U	9.6		ug/L		09/18/17 15:45	09/20/17 18:23	1
2-chloronitrobenzene /	19	U	19		ug/L		09/18/17 15:45	09/20/17 18:23	1
-chioronitrobenzene									
3,4-Dichloronitrobenzene	9.6	100	9.6		ug/L			09/20/17 18:23	1
2,4-Dichlorophenol	9.6	· . ·	9.6		ug/L			09/20/17 18:23	1
Nitrobenzene	9.6		9.6		ug/L			09/20/17 18:23	1
2-Nitrobiphenyl	9.6	2.72.12	9.6		ug/L		070500000000	08/20/17 18:23	1
I-Nitrobiphenyl	9.6		9.6		ug/L		1.	09/20/17 18:23	1.1
-Nitrobiphenyl	9.6	(C-1)	9.6		ug/L		90100 05.0000	09/20/17 18:23	- 8
Pentachlorophenol	48	U	48		ug/L			09/20/17 18:23	
2,4,6-Trichlorophenol	15		9.6		ug/L		09/18/17 15:45	09/20/17 18:23	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
?-Fluarobiphenyl	73		32-113				09/18/17 15:45	09/20/17 18:23	1
?-Fluoropheno/	59		26-109				09/18/17 15:45	09/20/17 18:23	1
Wtrobenzene-d5	65		32-118				09/18/17 15.45	09/20/17 18:23	1
Phenol-d5	59		27-110				09/18/17 15:45	09/20/17 18:23	1
Terphenyl-d14	33		10.126				09/18/17 15:45	09/20/17 18:23	1
2,4,6-Tribramaphenol	81		39-124				09/18/17 15:45	09/20/17 18:23	1
Method: RSK-175 - Dissolved	Gases (GC)	(
Analyte		Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nethane	0.70		0.50		ug/L			09/21/17 14:52	1
Ethane	0.50	U	0.50		ug/L			09/21/17 14:52	1
Ethylene	0.50	U	0.50		ug/L			09/21/17 14:52	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1, 1, 1-Trifluoroethane	89		76-121					09/21/17 14:52	1
Mathead 20100 Matale (ICP)	Total Days								
Method: 6010C - Metals (ICP)		Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
ron	0.22		0.050		mg/L		09/14/17 13:00		1
Manganese	0.88		0.010		mg/L			09/16/17 03:50	1
General Chemistry									
Analyte	Result	Qualifier	RL	MDI	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	18	Second the	1.0	ALC L	mg/L	5	1 repared	09/20/17 10:54	1
Nitrate Nitrite as N	1.2		0.050		mg/L			09/15/17 15:54	1
Sulfate	53	D	25		mg/L			09/16/17 15:26	5
Total Organic Carbon	3.3	V	1.0		mg/L			09/21/17 04:03	1
Analyte		Qualifier	RL	RL	10700	D	Prepared	Analyzed	Dil Fac
and and a second se	and the second s	a nember		nL.	· · · · · · · · · · · · · · · · · · ·		riepareu	Particular and the second of the	
Alkalinity	430		5.0		mg/L			09/14/17 21:04	1

Client: Solutia Inc.	
Project/Site: 3Q17 Drum	Site GW Sampling - 1403345

TestAmerica Job ID: 240-84874-1 SDG: KOM038

Client Sample ID: GM-31A-F(0-2)-0917 Date Collected: 09/12/17 12:28 Date Received: 09/13/17 09:30							.ab Sample	e ID: 240-84 Matrix:	1874-2 : Water
Method: 6010C - Metals (ICP) - Analyte		Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
fron, Dissolved	0.050	U	0.050		mg/L		09/14/17 13:44	09/16/17 05:29	1
Manganese, Dissolved	0.83		0.010		mg/L		09/14/17 13:44	09/16/17 05:29	1
General Chemistry - Dissolved Analyte		Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	3.7	and an	1.0		mg/L			09/20/17 18:49	1

Client: Solutia Inc. Project/Site: 3Q17 Drum Site GW Sampling - 1403345 TestAmerica Job ID: 240-84874-1 SDG: KOM038

Client Sample ID: GM-31A-0917-AD Date Collected: 09/12/17 12:28 Date Received: 09/13/17 09:30

Lab Sample ID: 240-84874-3 Matrix: Water

Method: 8270D - Semivola Analyte		Qualifier	(GC/MS) RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
1,1'-Biphenyl	9.5	U	9.5		ug/L		09/18/17 15:45	09/20/17 18:47	1	5
1-chloro-2,4-dinitrobenzene	9.5	U	9.5		ug/L		09/18/17 15:45	09/20/17 18:47	1	
I-Chloro-3-nitrobenzene	9.5	U	9.5		ug/L		09/18/17 15:45	09/20/17 18:47	1	
2-chloronitrobenzene / 4-chloronitrobenzene	19	U	19		ug/L		09/18/17 15:45	09/20/17 18:47	1	Į
3,4-Dichloronitrobenzene	9.5	U	9.5		ug/L		09/18/17 15:45	09/20/17 18:47	1	1
2,4-Dichlorophenol	9.5	U	9.5		ug/L		09/18/17 15:45	09/20/17 18:47	1	
Nitrobenzene	9.5	U	9.5		ug/L		09/18/17 15:45	09/20/17 18:47	1	
2-Nitrobiphenyl	9.5	U	9.5		ug/L		09/18/17 15:45	09/20/17 18:47	1	
3-Nitrobiphenyl	9.5	U	9.5		ug/L		09/18/17 15:45	09/20/17 18:47	1	
4-Nitrobiphenyl	9.5	U	9.5		ug/L		09/18/17 15:45	09/20/17 18:47	1	
Pentachlorophenol	48	U	48		ug/L		09/18/17 15:45	09/20/17 18:47	1	
2,4,6-Trichlorophenol	15		9.5		ug/L		09/18/17 15:45	09/20/17 18:47	1	
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac	
2-Fluorobiphenyl	70	and the second se	32-113				09/18/17 15 45	09/20/17 18:47	1	1
2-Fluorophenol	57		26-109				09/18/17 15:45	09/20/17 18:47	1	
Wtrobenzene-d5	65		32-118				09/18/17 15:45	09/20/17 18:47	1	1
Phenol-d5	60		27-110				09/18/17 15:45	09/20/17 18:47	1	
Terphenyl-d14	31		10.126				09/18/17 15:45	09/20/17 18:47	1	
2,4,6-Tribromophenol	79		39-124				09/18/17 15:45	09/20/17 18:47	1	

SSD 10/11/17

Client: Solutia Inc. Project/Site: 3Q17 Drum Site GW Sampling - 1403345

Client Sample ID: GM-31A-0917-EB

Date Collected: 09/12/17 13:14 Date Received: 09/13/17 09:30 TestAmerica Job ID: 240-84874-1 SDG: KOM038

Lab Sample ID: 240-84874-4 Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	10	U	10		ug/L		09/18/17 15:45	09/20/17 19:11	1
1-chloro-2,4-dinitrobenzene	10	U	10		ug/L		09/18/17 15:45	09/20/17 19:11	1
1-Chloro-3-nitrobenzene	10	U	10		ug/L		09/18/17 15:45	09/20/17 19:11	1
2-chloronitrobenzene /	20	U	20		ug/L		09/18/17 15:45	09/20/17 19:11	
4-chioronitrobenzene			723						
3,4-Dichloronitrobenzene	10	U	10		ug/L		09/18/17 15:45	09/20/17 19:11	
2,4-Dichlorophenol	10	U	10		ug/L		09/18/17 15:45	09/20/17 19:11	1
Nitrobenzene	10	U	10		ug/L		09/18/17 15:45	09/20/17 19:11	1
2-Nitrobiphenyl	10	U	10		ug/L		09/18/17 15:45	09/20/17 19:11	1
3-Nitrobiphenyl	10	U	10		ug/L		09/18/17 15:45	09/20/17 19:11	1
4-Nitrobiphenyl	10	U	10		ug/L		09/18/17 15:45	09/20/17 19:11	1
Pentachlorophenol	50	U	50		ug/L		09/18/17 15:45	09/20/17 19:11	1
2,4,6-Trichlorophenol	10	U	10		ug/L		09/18/17 15:45	09/20/17 19:11	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl	70		32-113				09/18/17 15:45	09/20/17 19.11	1
2-Fluorophenol	58		26-109				09/18/17 15:45	09/20/17 19:11	1
Witrobenzene-d5	64		32-118				09/18/17 15:45	09/20/17 19:11	
Phenol-d5	61		27-110				09/18/17 15.45	09/20/17 19:11	1
Terphenyl-d14	88		10-126				09/18/17 15:45	09/20/17 19:11	8
2,4,6-Tribromophenol	79		39-124				09/18/17 15:45	09/20/17 19:11	- 24

TestAmerica Canton 35D 10/11/17

Client: Solutia Inc. Project/Site: 3Q17 Drum Site GW Sampling - 1403345 TestAmerica Job ID: 240-84874-1 SDG: KOM038

Date Collected: 09/12/17 10:44 Date Received: 09/13/17 09:30

Lab	Sample	ID:	240-84874-5
			Matrix: Water

Inalyte		mpounds Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1'-Biphenyl	9.6	U	9.6	1	ug/L		09/18/17 15:45	09/20/17 19:35	1
chloro-2,4-dinitrobenzene	9.6	U	9.6		ug/L		09/18/17 15:45	09/20/17 19:35	1
Chloro-3-nitrobenzene	9.6	U	9.6		ug/L		09/18/17 15:45	09/20/17 19:35	1
chloronitrobenzene / chloronitrobenzene	19	U	19		ug/L		09/18/17 15:45	09/20/17 19:35	1
4-Dichioronitrobenzene	9.6	U	9.6		ug/L		08/18/17 15:45	09/20/17 19:35	1
I-Dichlorophenol	9.6	U	9.6		ug/L		09/18/17 15:45	09/20/17 19:35	1
trobenzene	9.6	U	9.6		ug/L		09/18/17 15:45	09/20/17 19:35	1
Nitrobiphenyl	9.6	U	9.6		Ug/L		09/18/17 15:45	09/20/17 19:35	1
Nitrobiphenyl	9.6	U	9.6		ug/L		09/18/17 15:45	09/20/17 19:35	1
Nitrobiphenyl	9.6	U	9.6		ug/L		09/18/17 15:45	09/20/17 19:35	1
antachlorophenol	48	U	48		ug/L		09/18/17 15:45	09/20/17 19:35	1
4,6-Trichlorophenol	9.6	U	9.6		ug/L		09/18/17 15:45	09/20/17 19:35	1
urrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Fluorobiphenyl	68		32-113				09/18/17 15:45	09/20/17 19:35	1
Fluorophenol	54		26-109				09/18/17 15:45	09/20/17 19:35	1
trobenzene-d5	58		32-118				09/18/17 15:45	09/20/17 19:35	1
tenci-d5	54		27-110				09/18/17 15:45	09/20/17 19:35	1
irphenyi-d14	28		10-126				09/18/17 15:45	09/20/17 19:35	1
4,6-Tribromophenol	74		39-124				09/18/17 15:45	09/20/17 19:35	1
	221203000000000000000000000000000000000								
ethod: RSK-175 - Dissolved									
		Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
nalyte		Qualifier	RL 0.50	MDL	Unit ug/L	D	Prepared	Analyzed 09/21/17 15:09	Dil Fac 1
nalyte ethane	Result	Qualifier U		MDL	- <u></u>	D	Prepared		
nalyte ethane fhane	Result 0.50	Qualifier U U	0.50	MDL	ug/L	D	Prepared	09/21/17 15:09	
nalyte ethane Ihane Ihylene	Result 0.50 0.50	Qualifier U U U	0.50 0.50	MDL	ug/L ug/L	D	Prepared	09/21/17 15:09 09/21/17 15:09	1
nalyte ethane hane frylene wrrogate	Result 0.50 0.50 0.50	Qualifier U U U	0.50 0.50 0.50	MDL	ug/L ug/L	D		09/21/17 15:09 09/21/17 15:09 09/21/17 15:09	1 1 1
nalyte lethane thane thylene <i>urrogate</i> 1,1-7 <i>niluoroethane</i> lethod: 6010C - Metals (ICP)	Result 0.50 0.50 %Recovery 84 - Total Reco	Qualifier U U Qualifier	0.50 0.50 0.50 <i>Limits</i> 76.121		ug/L ug/L	D		09/21/17 15:09 09/21/17 15:09 09/21/17 15:09 09/21/17 15:09 Analyzed	1 1 Dil Fac
nalyte ethane thane thylene 1.1-7nfluoroethane lethod: 6010C - Metals (ICP)	Result 0.50 0.50 %Recovery 84 - Total Reco	Qualifier U U Qualifier	0.50 0.50 0.50 Limits 76.121 RL	MDL	ug/L ug/L	D	Prepared	09/21/17 15:09 09/21/17 15:09 09/21/17 15:09 Analyzed 09/21/17 15:09 Analyzed	1 1 Dil Fac
nalyte ethane hane hylene <i>urrogate</i> 1,1-7nfluoroethane lethod: 6010C - Metals (ICP) nalyte	Result 0.50 0.50 %Recovery 84 - Total Reco	Qualifier U U Qualifier	0.50 0.50 0.50 <i>Limits</i> 76.121		սց/Լ սց/Լ սց/Լ	_ 0	Prepared	09/21/17 15:09 09/21/17 15:09 09/21/17 15:09 09/21/17 15:09 Analyzed 09/21/17 15:09	1 1 Dil Fac
nalyte ethane hane hylene urrogate 1,1-7nfluoroethane lethod: 6010C - Metals (ICP) nalyte on	Result 0.50 0.50 %Recovery 84 - Total Reco Result	Qualifier U U Qualifier	0.50 0.50 0.50 Limits 76.121 RL		ug/L ug/L ug/L	_ 0	Prepared	09/21/17 15:09 09/21/17 15:09 09/21/17 15:09 Analyzed 09/21/17 15:09 Analyzed	1 1 Dil Fac 1 Dil Fac
nalyte ethane hane hylene urrogate 1,1-7ntluoroethane lethod: 6010C - Metals (ICP) nalyte on anganese eneral Chemistry	Result 0.50 0.50 %Recovery 84 - Total Reco Result 0.30 0.75	Qualifier U U Qualifier	0.50 0.50 Limits 76 - 121 RL 0.050 0.010	MDL	ug/L ug/L ug/L mg/L mg/L	D	Prepared Prepared 09/14/17 13:00 09/14/17 13:00	09/21/17 15:09 09/21/17 15:09 09/21/17 15:09 Analyzed 09/21/17 15:09 Analyzed 09/16/17 03:55 09/16/17 03:55	1 1 Dil Fac 7 Dil Fac 1 1
nalyte ethane hane hylene 1,1-7nfluoroethane lethod: 6010C - Metals (ICP) nalyte on anganese eneral Chemistry nalyte	Result 0.50 0.50 %Recovery 84 - Total Reco Result 0.30 0.75 Result	Qualifier U U Qualifier	0.50 0.50 Limits 76 - 121 RL 0.050 0.010 RL	MDL	ug/L ug/L ug/L Unit mg/L	_ 0	Prepared Prepared 09/14/17 13:00	09/21/17 15:09 09/21/17 15:09 09/21/17 15:09 Analyzed 09/21/17 15:09 Analyzed 09/16/17 03:55 09/16/17 03:55	1 1 1 Dil Fac 1 Dil Fac
nalyte ethane hane hylene urrogate 1,1-7nfluoroethane lethod: 6010C - Metals (ICP) nalyte on anganese eneral Chemistry nalyte	Result 0.50 0.50 %Recovery 84 - Total Reco Result 0.30 0.75 Result 25	Qualifier U U Qualifier	0.50 0.50 Limits 76.121 RL 0.050 0.010 RL 1.0	MDL	ug/L ug/L ug/L mg/L mg/L	D	Prepared Prepared 09/14/17 13:00 09/14/17 13:00	09/21/17 15:09 09/21/17 15:09 09/21/17 15:09 Analyzed 09/21/17 15:09 Analyzed 09/16/17 03:55 09/16/17 03:55 09/16/17 03:55	1 1 Dil Fac 7 Dil Fac 1 1
nalyte ethane hane hylene urrogate 1,1-7nfluoroethane lethod: 6010C - Metals (ICP) nalyte on anganese seneral Chemistry nalyte hiloride	Result 0.50 0.50 %Recovery 84 - Total Reco Result 0.30 0.75 Result 25 0.93	Qualifier U U Qualifier	0.50 0.50 <u>Limits</u> 76.121 <u>RL</u> 0.050 0.010 <u>RL</u> 1.0 0.050	MDL	ug/L ug/L ug/L Unit mg/L mg/L	D	Prepared Prepared 09/14/17 13:00 09/14/17 13:00	09/21/17 15:09 09/21/17 15:09 09/21/17 15:09 Analyzed 09/21/17 15:09 Analyzed 09/16/17 03:55 09/16/17 03:55	1 1 1 Dil Fac 1 1 Dil Fac 1 1
nalyte ethane hane hylene 1,1-7nfluoroethane lethod: 6010C - Metals (ICP) halyte on anganese eneral Chemistry halyte hloride itrate Nitrite as N	Result 0.50 0.50 %Recovery 84 - Total Reco Result 0.30 0.75 Result 25	Qualifier U U Qualifier	0.50 0.50 Limits 76.121 RL 0.050 0.010 RL 1.0	MDL	ug/L ug/L ug/L mg/L mg/L Unit mg/L	D	Prepared Prepared 09/14/17 13:00 09/14/17 13:00	09/21/17 15:09 09/21/17 15:09 09/21/17 15:09 Analyzed 09/21/17 15:09 Analyzed 09/16/17 03:55 09/16/17 03:55 09/16/17 03:55	1 1 1 Dil Fac 1 Dil Fac 1 Dil Fac
nalyte ethane hane hylene 1,1-7nfluoroethane lethod: 6010C - Metals (ICP) nalyte on langanese eneral Chemistry nalyte hiloride litrate Nitrite as N ulfate	Result 0.50 0.50 %Recovery 84 - Total Reco Result 0.30 0.75 Result 25 0.93	Qualifier U U Qualifier Qualifier	0.50 0.50 <u>Limits</u> 76.121 <u>RL</u> 0.050 0.010 <u>RL</u> 1.0 0.050	MDL	ug/L ug/L ug/L mg/L mg/L mg/L mg/L mg/L	D	Prepared Prepared 09/14/17 13:00 09/14/17 13:00	09/21/17 15:09 09/21/17 15:09 09/21/17 15:09 Analyzed 09/21/17 15:09 Analyzed 09/16/17 03:55 09/16/17 03:55 09/16/17 03:55	1 1 1 Dil Fac 1 1 Dil Fac 1 1
nalyte ethane hane hylene urrogate 1,1-7ntluoroethane lethod: 6010C - Metals (ICP) nalyte on langanese seneral Chemistry nalyte hiloride litrate Nitrite as N ulfate otal Organic Carbon nalyte	Result 0.50 0.50 %Recovery 84 - Total Reco Result 0.30 0.75 Result 25 0.93 71 3.4 Result	Qualifier U U Qualifier Qualifier	0.50 0.50 0.50 <u>Limits</u> 76.121 RL 0.050 0.010 RL 1.0 0.050 25 1.0 RL	MDL	Unit mg/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L	D	Prepared Prepared 09/14/17 13:00 09/14/17 13:00	09/21/17 15:09 09/21/17 15:09 09/21/17 15:09 Analyzed 09/21/17 15:09 Analyzed 09/16/17 03:55 09/16/17 03:55 09/16/17 03:55 09/16/17 10:55 09/16/17 10:54 09/16/17 15:55 09/16/17 14:36 09/21/17 04:20 Analyzed	1 1 1 Dil Fac 1 1 Dil Fac 1 1 5
Nethod: RSK-175 - Dissolved nalyte lethane thane thylene urrogate .1,1-7ntluoroethane Nethod: 6010C - Metals (ICP) nalyte on langanese General Chemistry nalyte chloride litrate Nitrite as N ulfate otal Organic Carbon malyte likalinity	Result 0.50 0.50 %Recovery 84 - Total Reco Result 0.30 0.75 Result 25 0.93 71 3.4	Qualifier U U Qualifier Qualifier	0.50 0.50 0.50 <u>Limits</u> 76.121 RL 0.050 0.010 RL 1.0 0.050 25 1.0	MDL.	Unit mg/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L	D	Prepared 09/14/17 13:00 09/14/17 13:00 Prepared	09/21/17 15:09 09/21/17 15:09 09/21/17 15:09 Analyzed 09/21/17 15:09 Analyzed 09/21/17 15:09 Analyzed 09/16/17 03:55 09/16/17 03:55 09/16/17 10:54 09/20/17 10:54 09/16/17 15:55 09/16/17 14:36 09/21/17 04:20	1 1 1 1 1 1 1 1 1 1 1 1 1 5 1

Client: Solutia Inc.		
Project/Site: 3Q17 I	Drum Site GW Sampling - 140)3345

TestAmerica Job ID: 240-84874-1 SDG: KOM038

Client Sample ID: GM-58A-F Date Collected: 09/12/17 10:44 Date Received: 09/13/17 09:30		L	.ab Sample	e ID: 240-84 Matrix:	4874-6 : Water				
Method: 6010C - Metals (ICP) - D Analyte		Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron, Dissolved	0.050	U	0.050		mg/L		09/14/17 13:44	09/16/17 05:34	1
Manganese, Dissolved	0.77		0.010		mg/L		09/14/17 13:44	09/16/17 05:34	1
General Chemistry - Dissolved Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	3.7		1.0		mg/L			09/20/17 19:06	1

TestAmerica Canton 550 10/11/M

Surrogate Summary

Client: Solutia Inc. Project/Site: 3Q17 Drum Site GW Sampling - 1403345

TestAmerica Job ID: 240-84874-1 SDG: KOM038

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

		Percent Surrogate Recovery (Acceptance Limits)								
		FBP	2FP	NBZ	PHL	TPH	TBP			
ab Sample ID	Client Sample ID	(32-113)	(26-109)	(32-118)	(27-110)	(10-126)	(39-124)			
40-84874-1	GM-31A-0917	73	59	65	59	33	81			
40-84874-3	GM-31A-0917-AD	70	57	65	60	31	79			
40-84874-4	GM-31A-0917-EB	70	58	64	61	88	79			
40-84874-5	GM-58A-0917	68	54	58	54	28	74			
40-84874-5 MS	GM-58A-0917	65	48	55	52	32	80			
40-84874-5 MSD	GM-58A-0917	72	55	63	60	34	85			
CS 680-495028/6-A	Lab Control Sample	70	56	63	69	89	88			
/B 680-495028/5-A	Method Blank	69	63	62	65	92	79			

2FP = 2-Fluorophenol

NBZ = Nitrobenzene-d5

PHL = Phenol-d5

TPH = Terphenyl-d14

TBP = 2,4,6-Tribromophenol

Method: RSK-175 - Dissolved Gases (GC) Matrix: Water

			Percent Surrogate Recovery (Acceptance Limits)
Lab Sample ID	Client Sample ID	'rifluoroet (76-121)	
240-84874-1	GM-31A-0917	89	
240-84874-5	GM-58A-0917	84	
LCS 240-295693/5	Lab Control Sample	86	
MB 240-295693/4	Method Blank	87	

Surrogate Legend

1,1,1-Trifluoroethane = 1,1,1-Trifluoroethane

Prep Type: Total/NA

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: MB 680-495 Matrix: Water	028/5-A							le ID: Method Prep Type: To	
Analysis Batch: 495314								Prep Batch:	
Analysis battin 400014	MB	MB						Trop Batom	100020
Analyte	Result	Qualifier	RL.	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	10	U	10		ug/L	-	09/18/17 15:45	09/20/17 17:59	1
1-chloro-2,4-dinitrobenzene	10	U	10		ug/L		09/18/17 15:45	09/20/17 17:59	1
1-Chloro-3-nitrobenzene	10	U	10		ug/L		09/18/17 15:45	09/20/17 17:59	1
2-chloronitrobenzene / 4-chloronitrobenzene	20	U	20		ug/L		09/18/17 15:45	09/20/17 17:59	1
3,4-Dichloronitrobenzene	10	U	10		ug/L		09/18/17 15:45	09/20/17 17:59	1
2,4-Dichlorophenol	10	U	10		ug/L		09/18/17 15:45	09/20/17 17:59	1
Nitrobenzene	10	u	10		ug/L		09/18/17 15:45	09/20/17 17:59	1
2-Nitrobiphenyl	10	U	10		ug/L		09/18/17 15:45	08/20/17 17:59	1
3-Nitrobiphenyl	10	u	10		ug/L		09/18/17 15:45	09/20/17 17:59	1
4-Nitrobiphenyl	10	U	10		ug/L		09/18/17 15:45	09/20/17 17:59	1
Pentachlorophenol	50	U	50		ug/L		09/18/17 15:45	09/20/17 17:59	1
2,4,6-Trichlorophenol	10	U	10		ug/L		09/18/17 15:45	09/20/17 17:59	1
	MB	MB							
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-Fluarabiphenyl	69		32-113				09/18/17 15:45	09/20/17 17:59	1
2-Fluorophenal	63		26-109				09/18/17 15:45	09/20/17 17:59	1
Nitrobenzene-d5	62		32-118				09/18/17 15:45	09/20/17 17:59	1
Phenol-d5	65		27-110				09/18/17 15:45	09/20/17 17:59	1
Terphenyl-d14	92		10-126				09/18/17 15:45	09/20/17 17:59	1
2,4,6-Tribramophenoi	79		39.124				09/18/17 15:45	09/20/17 17:59	1

Lab Sample ID: LCS 680-495028/6-A Matrix: Water Analysis Batch: 495314

Client Sample ID: Lab Control Sample

Prep Type: Total/NA Prep Batch: 495028

Analysis Batch. 490314	Spike	LCS	LCS				%Rec.
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits
1,1'-Biphenyl	100	74.8		ug/L		75	45 - 130
1-chloro-2,4-dinitrobenzene	100	102		ug/L		102	51 - 130
1-Chloro-3-nitrobenzene	100	87.9		ug/L		88	31 - 130
2-chioronitrobenzene / 4-chioronitrobenzene	200	172		ug/L		86	34 - 130
3,4-Dichloronitrobenzene	100	95.1		ug/L		95	34 - 130
2,4-Dichlorophenol	100	76.5		ug/L		77	44 - 130
Nitrobenzene	100	88.8		ug/L		89	43 - 130
2-Nitrobiphenyl	100	91.6		ug/L		92	39 - 130
3-Nitrobiphenyl	100	90.7		ug/L		91	40-130
4-Nitrobiphenyl	100	94.1		ug/L		94	39 - 130
Pentachiorophenol	200	173		ug/L		87	33.130
2,4,6-Trichlorophenol	100	82.1		ug/L		82	47 - 130

	LCS	LCS	
Surrogate	%Recovery	Qualifier	Limits
2-Fluorobiphenyl	70		32-113
2-Fluorophenol	56		26.109
Nitrobenzene-d5	63		32-118
Phenol-d5	59		27-110
Terphenyl-d14	89		10-126
2,4,6-Tribromophenol	88		39-124

Client: Solutia Inc. Project/Site: 3Q17 Drum Site GW Sampling - 1403345

Lab Sample ID: 240-84874 Matrix: Water Analysis Batch: 495314		Sample	Spike	MS	MS		Cli	ent Sar	nple ID: G Prep Typ Prep Ba %Rec.	e: Tot	al/NA
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits		
1-chloro-2,4-dinitrobenzene	9.6	U	96.2	91.0	, Jaho haipe en anti-alighead	ug/L		95	51-130		
1-Chloro-3-nitrobenzene	9.6	U	96.2	71.8		ug/L		75	31 - 130		
2-chloronitrobenzene / 4-chloronitrobenzene	19		192	152		ug/L		79	34 - 130		
3,4-Dichloronitrobenzene	9.6		96.2	79.2		ug/L		82	34 - 130		
2-Nitrobiphenyl	9.6		96.2	87.3		ug/L		85	39-130		
3-Nitrobiphenyl	9.6	U	96.2	84.6		ug/L		88	40-130		
4-Nitrobiphenyl	9.6	U	96.2	90.7		ug/L		94	39 - 130		
	MS	MS									
Surrogate	%Recovery	Qualifier	Limits								
2-Fluorobiphenyl	65		32.113								
2-Fluoraphenol	48		26-109								
Nitrobenzene-d5	55		32.118								
Phenol-d5	52		27-110								
Terphenyl-d14	32		10-126								
2,4,6-Tribromophenol	80		39.124								
Analyte	Result	Sample Qualifier	Added	Result	MSD Qualifier	Unit	D	%Rec	%Rec.	RPD	RPD Limi
1-chloro-2,4-dinitrobenzene	9.6	and the second se	95.8	93.0		ug/L	- 19	97	51.130	2	50
1-Chloro-3-nitrobenzene	9.6	2.5.1.2	95.8	80.3		ug/L		84	31 - 130	11	50
2-chioronitrobenzene / 4-chioronitrobenzene 3,4-Dichioronitrobenzene	19	0	192 95.8	176 88.1		ug/L ug/L		92 92	34-130 34-130	15	50
2-Nitrobiphenyl	9.6	1.25	95.8	84.7		ug/L		83	39-130	3	50
3-Nitrobiphenyl	9.6	52.5748 S	95.8	85.5		ug/L		89	40 - 130	1	50
4-Nitrobiphenyi	9.6	1000	95.8	89.0		ug/L		93	39-130	2	50
a can amplian de	MSD	85.64	00.0	00.0		oger		00	00-100	5	
Surrogate	%Recovery	Qualifier	Limits								
2-Fluorobiphenyi	72		32-113								
2-Fluorophenal	55		26-109								
Mtrobenzene-d5	63		32-118								
Phenol-d5	60		27-110								
Terphenyl-d14	34		10-126								
2,4,6-Tribramophenol	85		39-124								
Method: RSK-175 - Dis	ssolved G	ases (GC	;)								
Lab Sample ID: MB 240-2 Matrix: Water Analysis Batch: 295693	95693/4						Cli	ent Sar	nple ID: M Prep Tyj		

MB	MB							
Result	Qualifier	RL.	MDL	Unit	D	Prepared	Analyzed	Dil Fac
0.50	U	0.50		ug/L			09/21/17 12:50	1
0.50	U	0.50		ug/L			09/21/17 12:50	1
0.50	U	0.50		ug/L			09/21/17 12:50	1
	Result 0.50 0.50	MB MB Result Qualifier 0.50 U 0.50 U 0.50 U	Result Qualifier RL 0.50 U 0.50 0.50 U 0.50	Result Qualifier RL MDL 0.50 U 0.50 0.50 0.50 U 0.50 0.50	Result Qualifier RL MDL Unit 0.50 U 0.50 ug/L 0.50 U 0.50 ug/L	Result Qualifier RL MDL Unit D 0.50 U 0.50 ug/L ug/L	Result Qualifier RL MDL Unit D Prepared 0.50 U 0.50 ug/L 0.50 0.50 ug/L 0.50	Result Qualifier RL MDL Unit D Prepared Analyzed 0.50 U 0.50 ug/L 09/21/17 12:50 09/21/17 12:50 0.50 U 0.50 ug/L 09/21/17 12:50

TestAmerica Canton SSD /0/II//7

Method: RSK-175 - Dissolved Gases (GC) (Continued)

Lab Sample ID: MB 240-29 Matrix: Water Analysis Batch: 295693	5693/4								CI	ie		le ID: Metho Prep Type: T	
1000000 • 10000000000000000000000000000	MB	MB											
Surrogate	%Recovery	Qualifier	Limits	s						Pr	epared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	87	-	76-12	21					-			09/21/17 12:50	1
Lab Sample ID: LCS 240-2	05603/5							Clie	nt C			Lab Control	Sampla
Matrix: Water	50053/0							Cile	int of	all		Prep Type: T	
Analysis Batch: 295693											-255		
westall			Spike		LCS	LCS	E., .				59870	%Rec.	
Analyte			Added		Result	Qua	lifier	Unit		D		Limits	
Methane			199		206			ug/L			222366	80 - 130	
Ethane			374		405			ug/L			15532	76 - 131	
Ethylene			349		377			ug/L			108	79.132	
	LCS LCS	5											
Surrogate	%Recovery Qui	alifier	Limits										
1,1,1-Trifluoroethane	86		76-121										
Method: 6010C - Metals	s (ICP)												
Lab Sample ID: MB 680-49 Matrix: Water Analysis Batch: 495053	4735/1-A											le ID: Metho : Total Reco Prep Batch:	verable
		MB											
Analyte		Qualifier		RL		MDL	Unit		_	0.27	repared	Analyzed	Dil Fac
Iron	0.050			050			mg/L		100		4/17 12:59		1.10
Manganese	0.010	U	0.0	010			mg/L		09	W14	4/17 12:59	09/16/17 02:49	1
Lab Sample ID: LCS 680-4 Matrix: Water Analysis Batch: 495053	94735/2-A		Spike		LCS	LCS		Clie	ent S			Lab Control : Total Reco Prep Batch: %Rec.	verable
Analyte			Added		Result		Sec.	Unit		D	%Rec	Limits	
Iron			5.00	_	5.44			mg/L	- 3	-	109	80 - 120	
Manganese			0.500		0.548			mg/L			110	80 - 120	
Lab Sample ID: MB 680-49 Matrix: Water Analysis Batch: 495053		мв							С	-		ele ID: Metho Total Reco Prep Batch:	verable
Analyte	Result	Qualifier		RL		MDL	Unit		D	Pr	repared	Analyzed	Dil Fac
Iron, Dissolved	0.050			050			mg/L		05	<u></u>	4/17 13:44		
Manganese, Dissolved	0.010	U	0.	010			mg/L		09	11	4/17 13:44	09/16/17 04:28	1
Lab Sample ID: LCS 680-4	94750/2-A							Clie	ent S	ar	nple ID:	Lab Control	Sample
Matrix: Water												: Total Reco	
Analysis Batch: 495053												Prep Batch:	
			Spike		LCS	LCS	3					%Rec.	
Analyte			Added		Result	Qua	lifier	Unit]	D	%Rec	Limits	
Iron, Dissolved			5.00		5.44			mg/L			109	80 - 120	
Manganese, Dissolved			0.500		0.546			mg/L			109	80-120	

TestAmerica Canton 35D 10/11/17

Client: Solutia Inc. Project/Site: 3Q17 Drum Site GW Sampling - 1403345

Method: 310.1-1978 - Alkalinity

Lab Sample ID: MB 680-494830/7 Matrix: Water									C	lier	nt Sam	Prep Typ		
Analysis Batch: 494830												1.000.000		
,,	MB	MB												
Analyte	Result	Qualifier		RL		RL	Unit		D	Pre	pared	Analyza	d	Dil Fac
Alkalinity	5.0	U		5.0			mg/L					09/14/17 1	7:53	1
Carbon Dioxide, Free	5.0	u		5.0			mg/L					09/14/17 1	7:53	1
Lab Sample ID: LCS 680-494830/8								CI	ient S	am	ple ID	: Lab Cont	rol Sa	ample
Matrix: Water											2000-000	Prep Typ	e: Tot	al/NA
Analysis Batch: 494830														
			Spike		LCS	LCS						%Rec.		
Analyte			Added	- 19	Result	Qual	lifier	Unit		D	%Rec	Limits		
Alkalinity	123.0	120	250		260			mg/L			104	80.120		
Lab Sample ID: LCSD 680-494830	34						c	lient \$	Samp	le I	D: Lat	Control S	ample	e Dup
Matrix: Water									- 6			Prep Typ	e: Tot	al/NA
Analysis Batch: 494830														
			Spike		LCSD	LCS	D					%Rec.		RPD
Analyte			Added		Result	Qual	lifier	Unit		D	%Rec	Limits	RPD	Limit
Alkalinity			250		264		000901000	mg/L			106	80 - 120	1	30
Lab Sample ID: 240-84874-1 DU									C	lie	nt San	nple ID: GI	M-31A	-0917
Matrix: Water												Prep Typ		
Analysis Batch: 494830														
	nple Sa	mple			DU	DU								RPD
Analyte Re	sult Qu	alifier			Result	Quai	lifier	Unit		D			RPD	Limit
Alkalinity	430				413		_	mg/L				-	3	30
Carbon Dioxide, Free	18				16.3			mg/L					8	30

Method: 325.2-1978 - Chloride

Lab Sample ID: MB 680-495356/17 Matrix: Water									CI	ient Sa	mple ID: M Prep Ty		
Analysis Batch: 495356	мв	MB										102:123	
Analyte	Result	Qualifier		RL		MDL	Unit		DI	Prepared	Analy:	bed	Dil Fac
Chloride	1.0	U	_	1.0			mg/L		-		09/20/17	10.56	1
Lab Sample ID: LCS 680-495356/18	5							Cli	ent Sa	imple I	D: Lab Cor	trol Sa	ample
Matrix: Water										999 . 1998)	Prep Ty		
Analysis Batch: 495356													
			Spike		LCS	LCS	÷				%Rec.		
Analyte			Added		Result	Qua	lifier	Unit	0	%Rec	Limits		
Chloride			25.0		26.9			mg/L		108	85.115		
Lab Sample ID: LCSD 680-495356/	20						c	lient S	Sample	e ID: La	ab Control	Sampl	e Dup
Matrix: Water											Prep Ty		
Analysis Batch: 495356													10.00
12 YO YO M THE THE PRESENCE A REPORT OF THE			Spike		LCSD	LCS	D				%Rec.		RPD
Analyte			Added		Result	Qua	lifier	Unit	0	%Rec	Limits	RPD	Limit
Chloride			25.0		26.9	Carlotter		mg/L		108	85-115	0	30

5 6 7 8 9 10 12 13 14

Client: Solutia Inc. Project/Site: 3Q17 Drum Site GW Sampling - 1403345 TestAmerica Job ID: 240-84874-1 SDG: KOM038

Method: 353.2 - Nitrogen, Nitrate-Nitrite

Lab Sample ID: MB 240-295072/4 Matrix: Water									0	Clie	nt Sam	ple ID: Me Prep Typ		
Analysis Batch: 295072												Fieb ish	9.101	airnin
Analysis Datch. 255072	MB	MB												
Analyte	1.000	Qualifier		RL		Inter	Unit		D		epared	Analyz		Dil Fac
Nitrate Nitrite as N	0.050			.050		MDL.				- 1	epared	09/15/17 1		
Nitrale Nitrite as N	0.000	U	0	.050			mg/L					09/10/17 1	15:49	
Lab Sample ID: LCS 240-295072/5 Matrix: Water								CI	ent	San	nple ID:	Lab Con Prep Typ		
Analysis Batch: 295072			Spike		LCS	1.09	ic.					%Rec.		
Analyte			Added		Result			Unit		D	%Rec	Limits		
Nitrate Nitrite as N			1.22		1.26	Gold	morer	mg/L	_	-	103	90.110		
Norale Norite as N			1.22		1.20			mg/L			103	90,110		
lethod: 375.4-1978 - Sulfate														
Lab Sample ID: MB 680-495124/4 Matrix: Water										Clie	nt Sam	ple ID: Me Prep Typ		
Analysis Batch: 495124														
and and an another and the	MB	MB												
Analyte	Result	Qualifier		RL		MDL	Unit		D	Pr	epared	Analyz	eri	Dil Fa
Sulfate		U		5.0	-		mg/L		-		obuied	09/16/17 1	and the second s	
ab Ramala ID: 1 CR 690 405124/5								0	and a	e	anta ID	I ah Can	tral C.	
Lab Sample ID: LCS 680-495124/5 Matrix: Water								CI	ient	San	nple ID	: Lab Con Prep Typ		
Analysis Batch: 495124			Spike		LCS	LCS						%Rec.		
Analyte			Added		Result	Qua	lifier	Unit		D	%Rec	Limits		
Sulfate	100		20.0		19.8			mg/L		-	99	75-125	-	-
Lab Sample ID: LCSD 680-495124/	7						C	lient \$	Sam	ple	ID: Lab	Control S	2 mmint	
Matrix: Water												Prep Typ		tal/N/
Matrix: Water												Prep Typ		
Matrix: Water Analysis Batch: 495124			Spike		LCSD		CR. Server	19.23			222000	Prep Typ %Rec.	e: To	RPI
Matrix: Water Analysis Batch: 495124 Analyte			Added		Result		CR. Server	Unit		D	%Rec	Prep Typ %Rec. Limits		RPI Lim
Matrix: Water Analysis Batch: 495124 Analyte							CR. Server	Unit mg/L		D	%Rec 100	Prep Typ %Rec.	e: To	RPI Lim
Matrix: Water Analysis Batch: 495124 Analyte Sulfate Lab Sample ID: 240-84874-1 MS			Added		Result		CR. Server				100	Prep Typ %Rec. Limits	RPD T M-31A	RP Lim 3
Matrix: Water Analysis Batch: 495124 ^{Analyte} Suffate Lab Sample ID: 240-84874-1 MS Matrix: Water			Added		Result		CR. Server				100	Prep Typ %Rec. Limits 75.125	RPD T M-31A	RPI Lim 3
Matrix: Water Analysis Batch: 495124 Analyte Suffate Lab Sample ID: 240-84874-1 MS Matrix: Water Analysis Batch: 495124	nple Sa	mple	Added		Result 20.1		CR. Server				100	Prep Typ %Rec. Limits 75.125	RPD T M-31A	RPI Lim 3
Matrix: Water Analysis Batch: 495124 ^{Analyte} Suffate Lab Sample ID: 240-84874-1 MS Matrix: Water Analysis Batch: 495124 Sam	sple Sa		Added 20.0		Result 20.1	Qua	lifier			Clie	100	Prep Typ %Rec. Limits 75.125 nple ID: Gi Prep Typ	RPD T M-31A	RPI Limi 3
Matrix: Water Analysis Batch: 495124 Analyte Suffate Lab Sample ID: 240-84874-1 MS Matrix: Water Analysis Batch: 495124 Sam Analyte Re	Sec. 20.00		Added 20.0 Spike		Result 20.1 MS	Qua	lifier	mg/L		Clie	100 ent San	Prep Typ %Rec. Limits 75-125 nple ID: Gi Prep Typ %Rec.	RPD T M-31A	RPI Lim 3
Matrix: Water Analysis Batch: 495124 Analyte Suffate Lab Sample ID: 240-84874-1 MS Matrix: Water Analysis Batch: 495124 Analyte Sulfate Lab Sample ID: 240-84874-1 MSD	sult Qu		Added 20.0 Spike Added		Result 20.1 MS Result	Qua	lifier	mg/L Unit		Clie	100 ent San %Rec 121	Prep Typ %Rec. Limits 75.125 nple ID: Gi Prep Typ %Rec. Limits	M-31A	RP Lim 3 (-091 tal/N/
Matrix: Water Analysis Batch: 495124 Analyte Sulfate Lab Sample ID: 240-84874-1 MS Matrix: Water Analysis Batch: 495124 Analyte Sulfate Lab Sample ID: 240-84874-1 MSD Matrix: Water	sult Qu		Added 20.0 Spike Added		Result 20.1 MS Result	Qua	lifier	mg/L Unit	i i	Clie	100 ent San %Rec 121	Prep Typ %Rec. Limits 75 - 125 nple ID: Gi Prep Typ %Rec. Limits 75 - 125 nple ID: Gi	M-31A	RP Lim 3 -091 tal/N/
Matrix: Water Analysis Batch: 495124 Analyte Sulfate Lab Sample ID: 240-84874-1 MS Matrix: Water Analysis Batch: 495124 Sulfate Lab Sample ID: 240-84874-1 MSD Matrix: Water Analysis Batch: 495124	sult Qu	alifier	Added 20.0 Spike Added		Result 20.1 MS Result	Qua MS Qua	lifier	mg/L Unit	1	Clie	100 ent San %Rec 121	Prep Typ %Rec. Limits 75 - 125 nple ID: Gi Prep Typ %Rec. Limits 75 - 125 nple ID: Gi	M-31A	RPI Lim 3 (-091) tal/N/ (-091) tal/N/
Matrix: Water Analysis Batch: 495124 Analyte Sulfate Lab Sample ID: 240-84874-1 MS Matrix: Water Analysis Batch: 495124 Sam Analyte Sulfate Lab Sample ID: 240-84874-1 MSD Matrix: Water Analysis Batch: 495124 Sam	53 Qu	mple	Added 20.0 Spike Added 20.0		Result 20.1 MS Result 77.3	Qua MS Qua	lifier differ	mg/L Unit		Clie	100 ent San %Rec 121	Prep Typ %Rec. Limits 75.125 nple ID: Gi Prep Typ %Rec. Limits 75.125 nple ID: Gi Prep Typ	M-31A	RP0 Limi 30 -0917 tal/NA

Client: Solutia Inc. Project/Site: 3Q17 Drum Site GW Sampling - 1403345 TestAmerica Job ID: 240-84874-1 SDG: KOM038

Method: 375.4-1978 - Sulfate (Continued)

Lab Sample ID: 240-84874-	5 MS						Cli	ent San	nple ID: G		
Matrix: Water									Prep Typ	pe: Tot	al/NA
Analysis Batch: 495124											
	Sample	Sample	Spike	MS	MS				%Rec.		
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits		
Sulfate	71		20.0	91.5		mg/L	_	101	75.125		
Lab Sample ID: 240-84874-	5 MSD						CI	ent San	nple ID: G	M-58A	091
									Prep Typ		
Matrix: Water											
	Sample	Sample	Spike	MSD	MSD				%Rec.		RP
Matrix: Water Analysis Batch: 495124 ^{Analyte}		Sample Qualifier	Spike Added		MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RP

Method: 415.1-1974 - DOC

Lab Sample ID: MB 680-495462/2 Matrix: Water Analysis Batch: 495462									C	lier		ple ID: Metho Prep Type: Di	
Analysis Datch. 430402	MB	MB											
Analyte	Result	Qualifier		RL		MDL	Unit		D	Pre	epared	Analyzed	Dil Fac
Dissolved Organic Carbon	1.0	U		1.0			mg/L					09/20/17 08:10	1
Lab Sample ID: LCS 680-495462/4								Cli	ent S	am	ple ID	: Lab Control	Sample
Matrix: Water											erer de	Prep Type: Di	solved
Analysis Batch: 495462													
			Spike		LCS	LCS						%Rec.	
Amahda			Added	-	Result	Qual	lifier	Unit		D	%Rec	Limits	
Analyte													
			20.0		20.0			mg/L			100	80 - 120	
Dissolved Organic Carbon	5		20.0		20.0		c	1.50	Samp	lel		80 - 120 Control Sam	ple Dup
	5		20.0	23	20.0	-	c	1.50	Samp	le l	D: Lab	Control Sam	
Dissolved Organic Carbon Lab Sample ID: LCSD 680-495462/6 Matrix: Water	5		20.0	51	20.0		c	1.50	Samp	le l	D: Lab		
Dissolved Organic Carbon Lab Sample ID: LCSD 680-495462/6 Matrix: Water	5		20.0 Spike	21	20.0	LCS		1.50	Samp	le l	D: Lab	Control Sam	
	5		100000		2020	1000	D	1.50	10		D: Lab	Control Sam Prep Type: Di	ssolved RPC

Method: 415.1-1974 - TOC

Lab Sample ID: MB 680-495460/2 Matrix: Water Analysis Batch: 495460									Cli	ent San	ple ID: Method Prep Type: To	
	MB	MB										
Analyte	Result	Qualifier		RL		IDL	Unit		DI	repared	Analyzed	Dil Fac
Total Organic Carbon	1.0	U		1.0			mg/L				09/20/17 20:13	1
Lab Sample ID: LCS 680-495460/3 Matrix: Water								Cli	ent Sa	mple IC	E Lab Control S Prep Type: To	
Analysis Batch: 495460			Spike		LCS	LCS					%Rec.	
Analyte			Added	R	lesult	Qual	lifier	Unit	D	%Rec	Limits	
Total Organic Carbon			20.0		20.8	-		mg/L		104	80.120	

TestAmerica Canton 33D 10/11/17

Client: Solutia Inc. Project/Site: 3Q17 Drum Site GW Sampling - 1403345

Method: 415.1-1974 - TOC (Continued)

		0	Client Sa	mple	ID: Lat			· · · · · · · · · · · · · · · · · · ·
Spike	LCSD	LCSD				%Rec.		RPD
Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
20.0	21.0		mg/L		105	80.120	1	25
	Added	Added Result	Spike LCSD LCSD Added Result Qualifier	Spike LCSD LCSD Added Result Qualifier Unit	Spike LCSD LCSD Added Result Qualifier Unit D	Spike LCSD LCSD Added Result Qualifier Unit D %Rec	Prep Ty Spike LCSD LCSD %Rec. Added Result Qualifier Unit D %Rec Limits	Added Result Qualifier Unit D %Rec Limits RPD

9 10 11 12 13

TestAmerica Canton 35D 10/11/17

QC Association Summary

Client: Solutia Inc. Project/Site: 3Q17 Drum Site GW Sampling - 1403345 TestAmerica Job ID: 240-84874-1 SDG: KOM038

GC/MS Semi VOA

Prep Batch: 495028

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-84874-1	GM-31A-0917	Total/NA	Water	3520C	
40-84874-3	GM-31A-0917-AD	Total/NA.	Water	3520C	
40-84874-4	GM-31A-0917-EB	Total/NA	Water	3520C	
40-84874-5	GM-68A-0917	Total/NA	Water	3520C	
B 680-495028/5-A	Method Blank	Total/NA	Water	3520C	
CS 680-495028/6-A	Lab Control Sample	Total/NA	Water	3520C	
40-84874-5 MS	GM-58A-0917	Total/NA	Water	3520C	
240-84874-5 MSD	GM-58A-0917	Total/NA	Water	3520C	
nalysis Batch: 495	314				
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
40-84874-1	GM-31A-0917	Total/NA	Water	8270D	495028
240-84874-3	GM-31A-0917-AD	Total/NA	Water	8270D	495028
240-84874-4	GM-31A-0917-EB	Total/NA	Water	8270D	495028
240-84874-5	GM-58A-0917	Total/NA	Water	8270D	495028
MB 680-495028/5-A	Method Blank	Total/NA	Water	8270D	495028
CS 680-495028/6-A	Lab Control Sample	Total/NA	Water	8270D	495028
		TetelBIA	Water	8270D	495028
240-84874-5 MS	GM-58A-0917	Total/NA	A A GINGI	OK YOLY	400020

GC VOA

Analysis Batch: 295693

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-84874-1	GM-31A-0917	Total/NA	Water	RSK-175	
240-84874-5	GM-58A-0917	Total/NA	Water	RSK-175	
MB 240-295693/4	Method Blank	Total/NA	Water	RSK-175	
LCS 240-295693/5	Lab Control Sample	Total/NA	Water	RSK-175	

Metals

Prep Batch: 494735

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-84874-1	GM-31A-0917	Total Recoverable	Water	3005A	
240-84874-5	GM-58A-0917	Total Recoverable	Water	3005A	
MB 680-494735/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-494735/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
Prep Batch: 494750					
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-84874-2	GM-31A-F(0-2)-0917	Dissolved	Water	3005A	
240-84874-6	GM-58A-F(0-2)-0917	Dissolved	Water	3005A	
MB 680-494750/1-A	Method Blank	Total Recoverable	Water	3005A	

Analysis Batch: 495053

Lab Control Sample

LCS 680-494750/2-A

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-84874-1	GM-31A-0917	Total Recoverable	Water	6010C	494735
240-84874-2	GM-31A-F(0-2)-0917	Dissolved	Water	6010C	494750
240-84874-5	GM-58A-0917	Total Recoverable	Water	6010C	494735

Total Recoverable Water

4 5 6 7 8 9 10 11 12 13

3005A

QC Association Summary

Client: Solutia Inc. Project/Site: 3Q17 Drum Site GW Sampling - 1403345

TestAmerica Job ID: 240-84874-1 SDG: KOM038

Metals (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-84874-6	GM-58A-F(0-2)-0917	Dissolved	Water	6010C	494750
MB 680-494735/1-A	Method Blank	Total Recoverable	Water	6010C	49473
MB 680-494750/1-A	Method Blank	Total Recoverable	Water	6010C	49475
LCS 680-494735/2-A	Lab Control Sample	Total Recoverable	Water	6010C	49473
LCS 680-494750/2-A	Lab Control Sample	Total Recoverable	Water	6010C	49475

General Chemistry

Analysis	Batch:	295072	
ECO. CO.			

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-84874-1	GM-31A-0917	Total/NA	Water	353.2	
240-84874-5	GM-58A-0917	Total/NA	Water	353.2	
MB 240-295072/4	Method Blank	Total/NA	Water	353.2	1
LCS 240-295072/5	Lab Control Sample	Total/NA	Water	353.2	

Analysis Batch: 494830

Analysis Batch: 4950	053 (Continued)					
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch	
240-84874-6	GM-58A-F(0-2)-0917	Dissolved	Water	6010C	494750	
MB 680-494735/1-A	Method Blank	Total Recoverable	Water	6010C	494735	1
MB 680-494750/1-A	Method Blank	Total Recoverable	Water	6010C	494750	
LCS 680-494735/2-A	Lab Control Sample	Total Recoverable	Water	6010C	494735	
LCS 680-494750/2-A	Lab Control Sample	Total Recoverable	Water	6010C	494750	
General Chemist	ry					
Analysis Batch: 2950	072					
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch	
240-84874-1	GM-31A-0917	Total/NA	Water	353.2		
240-84874-5	GM-58A-0917	Total/NA	Water	353.2		
MB 240-295072/4	Method Blank	Total/NA	Water	353.2		1
LCS 240-295072/5	Lab Control Sample	Total/NA	Water	353.2		1
Analysis Batch: 4948	330					
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch	
240-84874-1	GM-31A-0917	TotaVNA	Water	310.1-1978	-	
240-84874-5	GM-58A-0917	Total/NA	Water	310.1-1978		
MB 680-494830/7	Method Blank	Total/NA	Water	310.1-1978		
LCS 680-494830/8	Lab Control Sample	Total/NA	Water	310.1-1978		
LCSD 680-494830/34	Lab Control Sample Dup	Total/NA	Water	310.1-1978		
240-84874-1 DU	GM-31A-0917	Total/NA	Water	310.1-1978		

Analysis Batch: 495124

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-84874-1	GM-31A-0917	Total/NA	Water	375.4-1978	
240-84874-5	GM-58A-0917	Total/NA	Water	375.4-1978	
MB 680-495124/4	Method Blank	Total/NA	Water	375.4-1978	
LCS 680-495124/5	Lab Control Sample	Total/NA	Water	375.4-1978	
LCSD 680-495124/7	Lab Control Sample Dup	Total/NA	Water	375.4-1978	
240-84874-1 MS	GM-31A-0917	Total/NA	Water	375.4-1978	
240-84874-1 MSD	GM-31A-0917	Total/NA	Water	375.4-1978	
240-84874-5 MS	GM-58A-0917	Total/NA	Water	375.4-1978	
240-84874-5 MSD	GM-58A-0917	Total/NA	Water	375.4-1978	

Analysis Batch: 495356

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-84874-1	GM-31A-0917	TotaWNA	Water	325.2-1978	
240-84874-5	GM-58A-0917	TotaVNA	Water	325.2-1978	
MB 680-495356/17	Method Blank	Total/NA	Water	325.2-1978	
LCS 680-495356/18	Lab Control Sample	Total/NA.	Water	325.2-1978	
LCSD 680-495356/20	Lab Control Sample Dup	Total/NA	Water	325.2-1978	

Analysis Batch: 495460

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-84874-1	GM-31A-0917	Total/NA	Water	415.1-1974	
240-84874-5	GM-58A-0917	Total/NA	Water	415.1-1974	
MB 680-495460/2	Method Blank	Total/NA	Water	415.1-1974	
LCS 680-495460/3	Lab Control Sample	Total/NA	Water	415.1-1974	

TestAmerica Canton 55D 10/11/17

QC Association Summary

Client: Solutia Inc. Project/Site: 3Q17 Drum Site GW Sampling - 1403345

TestAmerica Job ID: 240-84874-1 SDG: KOM038

General Chemistry (Continued)

Analysis Batch: 495460 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCSD 680-495460/4	Lab Control Sample Dup	Total/NA	Water	415.1-1974	
Analysis Batch: 495	462				
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-84874-2	GM-31A-F(0-2)-0917	Dissolved	Water	415.1-1974	
240-84874-6	GM-58A-F(0-2)-0917	Dissolved	Water	415.1-1974	
MB 680-495462/2	Method Blank	Dissolved	Water	415.1-1974	
LCS 680-495462/4	Lab Control Sample	Dissolved	Water	415.1-1974	
LCSD 680-495462/5	Lab Control Sample Dup	Dissolved	Water	415.1-1974	

Client: Solutia Inc. Project/Site: 3Q17 Drum Site GW Sampling - 1403345 TestAmerica Job ID: 240-84874-1 SDG: KOM038

Client Sample ID: GM-31A-0917 Date Collected: 09/12/17 12:28 Date Received: 09/13/17 09:30

Lab Sample ID: 240-84874-1 Matrix: Water

> 12 13

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
otal/NA	Ртер	3520C			495028	09/18/17 15:45	CEW	TAL SAV
otaVNA	Analysis	8270D		1	495314	09/20/17 18:23	KNW	TAL SAV
otal/NA	Analysis	RSK-175		1	295693	09/21/17 14:52	SEM	TAL CAN
otal Recoverable	Prep	3005A			494735	09/14/17 13:00	BJB	TAL SAV
otal Recoverable	Analysis	6010C		1	495053	09/16/17 03:50	BCB	TAL SAV
otal/NA	Analysis	310.1-1978		1	494830	09/14/17 21:04	JEC	TAL SAV
otal/NA	Analysis	325.2-1978		1	495356	09/20/17 10:54	ALG	TAL SAV
otal/NA	Analysis	353.2		1	295072	09/15/17 15:54	JWW	TAL CAN
otal/NA	Analysis	375.4-1978		5	495124	09/16/17 15:26	ALG	TAL SAV
otal/NA	Analysis	415.1-1974		1	495460	09/21/17 04:03	KLD	TAL SAV

Client Sample ID: GM-31A-F(0-2)-0917 Date Collected: 09/12/17 12:28 Date Received: 09/13/17 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			494750	09/14/17 13:44	BJB	TAL SAV
Dissolved	Analysis	6010C		1	495053	09/16/17 05:29	BCB	TAL SAV
Dissolved	Analysis	415.1-1974		1	495462	09/20/17 18:49	KLD	TAL SAV

Client Sample ID: GM-31A-0917-AD Date Collected: 09/12/17 12:28

Date Received: 09/13/17 09:30

Lab Sample ID: 240-84874-3

Lab Sample ID: 240-84874-4

Lab Sample ID: 240-84874-5

Lab Sample ID: 240-84874-2

Matrix: Water

Matrix: Water

Matrix: Water

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			495028	09/18/17 15:45	CEW	TAL SAV
Total/NA	Analysis	82700		1	495314	09/20/17 18:47	KNW	TAL SAV

Client Sample ID: GM-31A-0917-EB

Date Collected: 09/12/17 13:14 Date Received: 09/13/17 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C				09/18/17 15:45		TAL SAV
Total/NA	Analysis	8270D		1	495314	09/20/17 19:11	KNW	TAL SAV

Client Sample ID: GM-58A-0917 Date Collected: 09/12/17 10:44

Date Received: 09/13/17 09:30

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			495028	09/18/17 15:45	CEW	TAL SAV

TestAmerica Canton

Client: Solutia Inc. Project/Site: 3Q17 Drum Site GW Sampling - 1403345 TestAmerica Job ID: 240-84874-1 SDG: KOM038

Client Sample ID: GM-58A-0917 Date Collected: 09/12/17 10:44 Date Received: 09/13/17 09:30

Lab Sample ID: 240-84874-5

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8270D		1	495314	09/20/17 19:35	KNW	TAL SAV
TotaWNA	Analysis	RSK-175		1	295693	09/21/17 15:09	SEM	TAL CAN
Total Recoverable Total Recoverable	Prep Analysis	3005A 6010C		1	494735 495053	09/14/17 13:00 09/16/17 03:55	10000	TAL SAV TAL SAV
Total/NA	Analysis	310,1-1978		1	494830	09/14/17 19:40	JEC	TAL SAV
Total/NA	Analysis	325.2-1978		1	495356	09/20/17 10:54	ALG	TAL SAV
Total/NA	Analysis	353.2		1	295072	09/15/17 15:55	JWW	TAL CAN
Total/NA	Analysis	375.4-1978		5	496124	09/16/17 14:36	ALG	TAL SAV
Total/NA	Analysis	415.1-1974		1	495460	09/21/17 04:20	KLD	TAL SAV

Client Sample ID: GM-58A-F(0-2)-0917 Date Collected: 09/12/17 10:44 Date Received: 09/13/17 09:30

Lab Sample ID: 240-84874-6

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A		-	494750	09/14/17 13:44	BJB	TAL SAV
Dissolved	Analysis	6010C		1	495053	09/16/17 05:34	BCB	TAL SAV
Dissolved	Analysis	415.1-1974		1	495462	09/20/17 19:06	KLD	TAL SAV

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

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

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Accreditation/Certification Summary

Client: Solutia Inc. Project/Site: 3Q17 Drum Site GW Sampling - 1403345

Laboratory: TestAmerica Canton

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

Authority	Program	EPA Region	Identification Number	Expiration Date
California	State Program	9	2927	02-23-18
Connecticut	State Program	1	PH-0590	12-31-17*
Florida	NELAP	4	E87225	05-30-18
linois	NELAP	5	200004	07-31-18
Cansas	NELAP	7	E-10336	01-31-18*
Centucky (UST)	State Program	4	58	02-23-18
Centucky (VWV)	State Program	4	98016	12-31-17 *
Minnesota	NELAP	5	039-999-348	12-31-17 *
Minnesota (Petrofund)	State Program	1	3506	07-31-17 *
Nevada	State Program	9	OH-000482008A	07-31-18
New Jersey	NELAP	2	OH001	06-30-18
New York	NELAP	2	10975	03-31-18
Dhio VAP	State Program	5	CL0024	09-06-19
Dregon	NELAP	10	4062	02-23-18
Pennsylvania	NELAP	3	68-00340	08-31-18
Texas	NELAP	6	T104704517-17-9	08-31-18
JSDA	Federal		P330-16-00404	12-28-19
/irginia	NELAP	3	460175	09-14-18
Washington	State Program	10	C971	01-12-18 *
West Virginia DEP	State Program	3	210	12-31-17 *

Laboratory: TestAmerica Savannah

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program		EPA Region	Identification Number	Expiration Date
llinois	NELAP		5	200022	11-30-17
The following analytes	s are included in this repo	rt, but are not accre	dited/certified under	this accreditation/certificatio	n:
Analysis Method	Prep Method	Matrix.	Analy	te	
8270D	3520C	Water	4-Nitr	obiphenyl	
The following analytes	s are included in this repo	rt, but accreditation/	certification is not of	ered by the governing authority	prity:
Analysis Method	Prep Method	Matrix	Analy	te	
310.1-1978		Water	Alkali	nity	
310.1-1978		Water	Carbo	n Dioxide, Free	
325.2-1978		Water	Chlori	de	
375.4-1978		Water	Sulfat	e	
415.1-1974		Water	Disso	lved Organic Carbon	
415.1-1974		Water	Total	Organic Carbon	
8270D	3520C	Water	1,1'-8	iphenyl	
8270D	3520C	Water	1-chio	ro-2,4-dinitrobenzene	
8270D	3520C	Water	1-Chi	oro-3-nitrobenzene	
8270D	3520C	Water	2-chio	ronitrobenzene /	
			4-chio	ronitrobenzene	
8270D	3520C	Water	2-Nitr	obiphenyl	
8270D	3520C	Water	3,4-D	chloronitrobenzene	
8270D	3520C	Water	3-Nitr	obiphenyl	

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Gr.M - 3(A - OP(7) 9/12/17 1228 0 W Gr.M - 3(A - F(0.2) - OP(7) 1228 1 1228 1 Gr.M - 3(A - OP(7 - AD) 1228 1 1228 1 Gr.M - 3(A - OP(7 - AD) 1228 1 1 1228 1 Gr.M - 3(A - OP(7 - AD) 1228 13/4 1 1 Gr.M - 53A - OP(7 - EB) 13/4 10/4/ 1 10/4/ 1 Gr.M - 53A - OP(7 - MS) 10/4/ 10/4/ 1 1 1 1 Gr.M - 53A - OP(7 - MS) 10/4/ 1 1 1 1 1 1 Gr.M - 53A - OP(7 - MS) 10/4/ 1 1 1 1 1 1 Gr.M - 53A - OP(7 - MS) 10/4/ 1 <	Chain	of	Cu	ist	od	y I	Re	col	rd						TestAmeri
phone 912 354 7858 fax Regulatory Program:															USE LEADER IN STRANDWARD THE
Golder Associates Inc. TellFax: 538-724-9191 820 South Main Street Analysis Turnaround Time St. Charles, MD 63301 CALENON DAYS (636) 724-9323 FAX Project Name: 3017 Drum Site GW Sampling-1403345 1 vest. Site: Solutia WG Krummrich Facility 2 versis P of 42262863 1 vest. Sample Sample Identification	INPOS	E		٨	Doe	Nor:									TestAmerica Laboratori
Basel Analysis Turnaround Time St. Charles, MD 63301 Calexove Dars WORKAGE St. Charles, MD 63301 Calexove Dars WORKAGE (636) 724-9191 Phone TAT 6 dataset ton Base (636) 724-9191 Phone Tat 6 dataset ton Base (636) 724-9191 Phone Tat 6 dataset ton Base (636) 724-9191 Sample Zarets Project Name 3017 Drum Site GW Samping-1403345 I west I west Site: Solutio WG Krummitch Facility 2 days I west Sample Sample Sample Time Sample Identification Date Time Gase Gr.M - 3/A - OPI7 I/12/28 I Mat Gr.M - 3/A - OPI7 - AD 1/295 I Mat Gr.M - 3/A - OPI7 - AD 1/295 I Mat Gr.M - 3/A - OPI7 - AD 1/295 I Mat Gr.M - S3A - OPI7 - MS IO4/4 I I Gr.M - S3A - OPI7 - MS IO4/4 I I Gr.M - S3A - OPI7 - MSD IO4/4	8	Site	Con	tact.	San	nan/	ha D	Cent	io)	Date:	9/12	717			COC No.
St. Charles, MO 83301 Culletow Dars WORKHOLS (636) 724-9191 Phone TAT 6 different from Balow (636) 724-923 FAX PAX (636) 724-9323 FAX PAX (7600) Mark WG Krummich Facility 1 yeeks 3 yeeks (7600) Mark WG Krummich Facility 2 days 2 days (7600) Mark WG Krummich Facility 2 days 0 N (7600) Mark WG Krummich Facility 2 days 0 N (7600) Mark WG Krummich Facility 2 days 0 N (760) Mark WG Krummich Facility 2 days 0 N (760) Mark WG Krummich Facility 2 days 0 N (760) Mark WG Krummich Facility 2 days 0 N (770) Mark WG Krummich Facility 2 days 0 N (771) Mark WG Krummich Facility 1 228 0 N (771) Mark WG Krummich Facility 1 228 0 N (771) Mark WG Krummich Facility 1 0 10 10 11 10 10 10 10 10 10 10 10 1		Lab	Con	tact	Kall	hy Sa	mith				r: FedE	_			of COCs
Baseling Phone TAT 6 determination therew (536) 724-9121 Phone TAT 6 determination therew	ne	Т	T			2	Т	1			TT		T	TT	Sampler
836) 724-9323 FAX Project Name: 3017 Drum Site GW Sampling-1403345 3 west Site: Solutia WG Krummrich Facility 2 days P O # 42262863 3 ample Sample Identification Sample Sample Identification Sample Sample Identification Date Time Sample Sample Identification Date GM - 31A - OAIT 911917 (MM - 31A - OAIT - AD 1228 (MM - 33A - OAIT - AD 1244 (MM - 53A - OAIT - AD 1044 (AM - 53A - OAIT - MS) 1044 (MM - 53A - OA	DAYS					SLIE AN							1	11	For Lab Use Only:
Project Name: 3017 Drum Site GW Samping-1403345 1 west Site: Solutia WG Krummrich Facility 2 days > 0 # 42262863 1 day Sample Identification Sample Sample Type Sample Identification Date Sample JA - 0917 9/12/17 (M - 3/A - 0917 - AD 1/228 (M - 3/A - 0917 - AD 1/228 (M - 3/A - 0917 - AD 1/226 (M - 53A - 0917 - AD 1/226 (M - 53A - 0917 - AD 10/4 (AM - 53A - 0917 - MS) 10/4 (M - 53A - 0917 - MS) 10/4		2	z			ē.			18						Walk-in Client
Site: Solutia WG Krummich Facility 2 days 2 0 # 42262863 1 days Sample Sample Sample Samp	2012	2 2	E	0		휜			60100						Lab Sampling
Sample Sample Sample Sample Sample Sample		2 5	2	60100	-	2/Suffate			10						
Sample Identification Sample Date Sample Type Trans Gr.M - 31A - O917 91121/7 1228 0 National State Gr.M - 31A - O917 1228 1 1 1228 1 1 Gr.M - 31A - O917 1228 1 1 1228 1 1 Gr.M - 31A - O917 - AD 1228 1 1 1228 1 1 Gr.M - 31A - O917 - AD 1228 1314 1 <t< td=""><td></td><td>ed Sample (Y</td><td>E R</td><td>100</td><td>2</td><td>100</td><td></td><td>1.</td><td>1g</td><td>-</td><td></td><td></td><td></td><td></td><td>Job / SDG No</td></t<>		ed Sample (Y	E R	100	2	100		1.	1g	-					Job / SDG No
Sample Identification Sample Type (PC-Corp.) Mad Gr.M - 3(A - OP(7) 9/12/17 1.228 N Gr.M - 3(A - OP(7) 9/12/17 1.228 N Gr.M - 3(A - OP(7) 1.228 1 1 Gr.M - 3(A - OP(7) 1.044 1 1 Gr.M - 58A - OP(7) Mast 1044 1 Gr.M - 58A - OP(7) MSD 1044 1 Gr.M - 58A - OP(7) MSD 1044 1 Gr.M - 58A - OP(7) MSD 1044 1 Preservation Used: 1= Ize, 2= HGI; 3= H2504; 4=HINO3; 5=NaOH; 6= Other 1 Presolable Hazard Gam		Ban	8 2	-	3	A	No P	1 12	1	5					
Ch.M3/A - F(0.2) - O(17 1228 Ch.M3/A - O(17 - AD 1228 Ch.M53/A - O(17 - AD 1044 Ch.M53/A - O(17 - MS) 1044 Preservation Used: 1= kas, 2= HCI: 3= H2804; 4=HN03; 5=NaOH; 6= Other Preservation Used: 1= kas, 2= HCI: 3= H2804; 4=HN03; 5=NaOH; 6= Other Preservation Used: 1= kas, 2= HCI: 3= H2804; 4=HN03; 5=NaOH; 6= Other Preservation Used: 1= kas, 2= HCI: 3= H2804; 4=HN03; 5=NaOH; 6= Other Preservation Used: 1= kas, 2= HCI: 3= H2804; 4=HN03; 5=NaOH; 6= Other Preservation Used: 1= ka	sof Cont.	51	SVOCs by 8270	Total FeMn by	AMC02 by 310 1	Chlonde	Methane by RSK 175	YOC by 415 1	Dispotent Fe/Min	DOC by 4151					Sample Specific Note:
(mm-3/A - F(0.2) - ONT 1228 (mm-3/A - ORT - AD 1228 (mm-53A - ORT - AD 1044 (mm-53A - ORT - MS) 1044 (mmmons Section If the lab is to dispose of the sample. (mm-53A - ORT - MS) Immode (mm-53A - ORT - MS)	N 12	N	2	1	1	1	3	13						T	
(n_M-31A - 0917 - AD 1226 (n_M-31A - 0917 - AB 1314 (n_M-31A - 0917 - AB 1314 (n_M-53A - 0917 1044 (n_M-53A - 0917 - MS 1044 (n_M-53A - 0917 - MS 1044 (n_M-53A - 0917 - MS 1044 (n_S3A - 0917 - MS) 1044 (n_S3A - 0917 - 0917 1041 (n_S3A - 0918<	1 4	Y	T	T		T		T	ì	3		T		T	
CAM-3IA - 0917 - 6B 1314 GM-53A - 0917 1044 GM-53A - F(0.3) - 0917 1044 GM-53A - 0917 - MS 1044 GM-53A - 0917 - MSD 1044 Preservation Used: 1= ise, 2= HCI; 3= H2804; 4=HN03; 5=Na0H; 6= Other Possible Hazard Identification: The sample. Prometrize Section if the lab is to dispose of the sample. Imaxinable Mon-Hazard Imaxinable Biol intent Mon-Hazard Imaxinable Biol intent Becial Instructions/QC Requirements & Comments: Company Data And	2	N	2				1		Ť		T	T	1	Ħ	
G.M58A - 0717 1044 G.M58A - 0717 - MS 1044 G.M58A - 0717 - MS 1044 G.M58A - 0717 - MS 1044 G.M58A - 0717 - MSD 1044 Freeervation Used: 1* ice, 2* HCI; 3* H2804; 4*HN03; 5*NaOH; 6* Other 1044 Possible Hazard Identification: Arrange Issue I	2	N	2			1	1	+	T		11			+ +	
GrM-53A - F(0.2) - 0917 1044 GrM-53A - 0917 - MS 1044 GrM-53A - 0917 - MSD 1044 GrM-53A - 0917 - MSD 1044 Greeervation Used: 1= ice, 2= HCI; 3= H2804; 4=HN03; 5=NaOH; 6= Other Preservation Used: 1= ice, 2= HCI; 3= H2804; 4=HN03; 5=NaOH; 6= Other Preservation Used: 1= ice, 2= HCI; 3= H2804; 4=HN03; 5=NaOH; 6= Other Preservation Used: 1= ice, 2= HCI; 3= H2804; 4=HN03; 5=NaOH; 6= Other Preservation Used: 1= ice, 2= HCI; 3= H2804; 4=HN03; 5=NaOH; 6= Other Preservation Used: 1= ice, 2= HCI; 3= H2804; 4=HN03; 5=NaOH; 6= Other Preservation Used: 1= ice, 2= HCI; 3= H2804; 4=HN03; 5=NaOH; 6= Other Preservation Used: 1= ice, 2= HCI; 3= H2804; 4=HN03; 5=NaOH; 6= Other Preservation Used: 1= ice, 2= HCI; 3= H2804; 4=HN03; 5=NaOH; 6= Other Preservation Used: 1= ice, 2= HCI; 3= H2804; 4=HN03; 5=NaOH; 6= Other Preservation Used: 1= ice, 2= HCI; 3= H2804; 4=HN03; 5=NaOH; 6= Other Preservation Used: 1= ice, 2= HCI; 3= H2804; 4=HN03; 5=NaOH; 6= Other Preservation Used: 1= ice, 2= HCI; 3= H2804; 4=HN03; 5=NaOH; 6= Other Comments Section If the lub is to dispose of the sample. Preservation If the lub is to dispose of the sample. Preservations/QC Requirements & Comments: Custody Seals Intact Tes Custody Seals Intact Tes No Custody Seal No. Custody Seals Intact Tes <tr< td=""><td>12</td><td>N</td><td></td><td>1</td><td>1</td><td>1</td><td>31</td><td>13</td><td>t</td><td>T</td><td>+</td><td></td><td></td><td></td><td></td></tr<>	12	N		1	1	1	31	13	t	T	+				
GM-58A-09IT - MS I044 GM-58A-09IT - MSD I044 GM-58A-09IT - MSD I044 I044 I044 I046 I046 I046 I046	4	7	Ť	ŕ	1		1	1	h	3	+				
GM-53A-0917 - MSD L 1044 L Preservation Used: 1= ice, 2= HGI; 3= H2804; 4=HN03; 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. Omments Section If the lub is to dispose of the sample. Mon-Hazard Please of the sample. Mon-Hazard Please dist intent Poson #	2	N	2	t			+	1	t	tt	+	240-	84874	4 Chai	in of Custody
Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Comments Section If the lub is to dispose of the sample. Internate Internate Special Instructions/QC Requirements & Comments: Custody Seals Intact Tes Relinquished by Waste Custody Seals Intact Tes Output Company Output Output Output Company Output Output Output	12	N	2	2							T.	1.1	1	1.1	1
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Possible Hazard Identification: We any samples from a listed EPA Hazardous Waste? Comments Section if the lab is to dispose of the sample. Mon-Hazard Mon-Hazard Internable Bkm Imterit Poson # Junknown Special Instructions/QC Requirements & Comments: Custody Seals Intact: Yes No Custody Seals Intact: Yes No Company Date Junknown	-	Н	+	+	+	+	+	+	+	++	++	++	+	+	
Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Comments Section if the lab is to dispose of the sample. Internate Mon-Hazard Internation: Mon-Hazard Internation: Special Instructions/QC Requirements & Comments: Custody Seals Intact: Tes Relinguished by Mon-Hazard Custody Seals Intact: Tess Relinquished by Mon-Hazard		Ħ	t	T			1		t			11	t	Ħ	
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample. Comments Section If the lab is to dispose of the sample. If annuable Mon-Hazard Iffannuable Skin Intant Peson # Special Instructions/QC Requirements & Comments: Custody Seals Intact Tes Relinquished by Company Date Odder			1	4	1	1	2 3	1,1 3	4	3					
Custody Seals Intact: Tes No. Custody Seal No. Relinquished by A. Ref. Custody Seal No. Data Company Data Data Company Data	mple in the		Sam	ple D	ispo	sal	(A1	ee mi	ay b	0 A550	ised if i				ined longer than 1 month)
Custody Seals Intact: Tes I No Custody Seal No. Relinquished by Company Dat Domonth Dice Udder 111			- 0	Return	10.0	NO.		_	100	sposal by	Lab		Arch	ive far_	Plantha
Demonstry Dec Company Data															
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	ate/Time 170	0	Rece	ived	by)					Comp				Date/Time 09/02/1-
Relinquished by Data	112/17 Time	-	Rece	wed	by	d	-	-	-	-	Comp	AL_	-	-	09/3/17 9 Dee/Time
Relinquished by Dat	ate/Time	-	Rece	ived	inLa	bon	aton	by	-		Comp	any.		_	Date/Time

Form No. CA-C-W1-002, Rev. 4.3, dated 12/05/2013



Canton Facility	Cooler unpacked by:
Client Site Name Site Name Sulut	
Cooler Received on 09/13/17- Opened on 09/13	UI7 DOD
FedEx: 1" Grd Fxp UPS FAS Clipper Client Drop Off To	
Receipt After-hours: Drop-off Date/Time	Storage Location
TestAmerica Coeler # Foam Box Client Coeler Packing material used: Bubble Dap Foam Plastic Bag COOLANT: Wet for Blue lee Dry Ice Water	Box Other None Other See Multiple Cooler Form Corrected Cooler Temp. "C Corrected Cooler Temp. "C Corrected Cooler Temp. "C Quantity Yes No NA Yes No NA Mon the COC? Yes No Yes No Yes Yes No Yes Yes No NA Yes No NA Yes No NA Yes
Contacted PM Date by	via Verbal Voice Mail Other
Concerning	
16. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES	Samples processed by:
	e recommended holding time had expired.
Sample(s)	were received in a broken container.
	with bubble >6 mm in diameter. (Notify PM)
sample(s)were received	
18. SAMPLE PRESERVATION	2012/26 20 1000L
	were further preserved in the laboratory.

50D 10/11/17

14

Ref. SOP NC-SC-0005, Songle Receiving 1st: corp torp1QAQA_Facilities/Canton-QADocumen-Monogement/Work-Instruction Word Person Wark Instruction=WI-NC-499-09/117 Conter Receipt Form (3) dec 67

n Facility		Narrative	Login #: <u>848</u> :	
Cooler #	IR Gun #	Observed Temp °C	Corrected Temp °C	Coolar
Client	8	2.6	2.6	Ice
Ś	Jo -	3.0	3.0	b

EUX-Drive Decument Control (30Ps1)Work Instructional Word Version Work Instructional W3-WC-0000H-071813 Cooler Receipt Form page 3 - Multiple Coolers doe no SSD 10/11/17

9/13/2017

Login Container Summary Report

12 13

Temperature readings:

Client Sample ID	Lab ID	Container Type	Container pH	Preservative Added (mls)	<u>Lot #</u>
GM-31A-0917	240-84874-1-1	Plastic 250ml - with Sulfuric Acid	<2		
GM-31A-0917	240-84874-J-1	Plastic 250ml - with Nitric Acid	<2		
GM-31A-F(0-2)-0917	240-84874-D-2	Plastic 250ml - w/nitric - dis	<2		
GM-58A-0917	240-84874-1-5	Plastic 250ml - with Sulfuric Acid	<2		
GM-58A-0917	240-84874-J-5	Plastic 250ml - with Nitric Acid	<2		_
GM-58A-F(0-2)-0917	240-84874-D-6	Plastic 250ml - winitric - dis	<2		

35D 10/11/17

TestAmerica Canton 4101 Shuffel Street NW

Chain of Custody Record



TestAmerica

11 1 4 1

THE LEA

North Canton, OH 44720 Phone (330) 497-9396 Fax (330) 497-0772

	Client Information (Sub Contract Lab)					PM rsey, Michele R					C	Caroler Tracking Note:			COC No 240-76706.1			
0 0 0 1	Clark Contact Shipping/Receiving	Prone E.b					-						Sibre of Oxiger Blances			Page 1 of 1		
	unter and a second					Ap, reducers Required (See reps).						-	-	tenthili.			Job #	
	estAmenica Laboratories. Inc.						P - 16	nois	_	_	_	_	_			_	240-84874-1	
	Addess 5102 LaRoche Avenue.	Due Date Recepted 8/25/2017				Analysis Re							quested				Preservation Codes A - HCL M -	M - Hexarie
I	Cry Savannah	TAT Requested (sleys):															B - NEOH C - Za Apilute	H - Nore D - AnNaD/
ł	Stars Zip	10/				1.52						5 4	- 10				D - Nviz Apd E - NvHSO4	P - NsJ045 0 - NsJ507
	GA, 31404 Phose										1.3	5 4	9		111		F-MIOH R	H - M25201 5 - H2504
	912-354-7858(Tel) 912-352-0165(Fax)	WD A				(in)			1		- 1	a luk				mainers	H - Ascrabe Acid I - Ro J - Di Water K - EDITA	T - TSP Dobecanyst U - Abustone
	ET M					Na)						Distant in						V - MECAA W - pH 4-5
	Pour Name WGK Long Term Monitoring (LTM)	Project # 08001754				e (Ye es Dr	Free					No. (Nema						2 - stree (specify)
	See	SSOWA				dura du	0										Offer:	
	Sample Identification - Client ID (Lob ID)	Sample Date	Sample (C=c Time G=g		Matrix (dream, 3%add Granesier, ar-lana anta)	Field Fatered S. Perform MS/MS	TID 1/ AURITURY &	125.2/ Chiorido	375 4/ Suitate	415.1		CONTRACTOR IN FLERO	The second			Total Number c	Special In	structions/Note:
ł	Chi 145 0017 (240 84674 4)	9/12/17	12.28	mesen	Water	A^	4		x	x	x	x	÷	+++	+++	-		
ł	GM-31A-0917 (240-84874-1)		Central 12:28			-	X	X	^	^	1	-	+	++		8		
4.32	GM-31A-F(0-2)-0917 (240-84874-2)	9/12/17	Central 12:28 Central 13:14 Central 10:44 Central 10:64 Central		Water	-		-	-	+	+	-	12	++	+++	4		
	GM-31A-0917-AD (240-84874-3)	9/12/17		-	Water	4		-	-	-		x	+			2		
	GM-31A-0917-EB (240-84874-4)	9/12/17			Water						1	ĸ				2		
	GM-58A-0917 (240-84874-5)	9/12/17			Water		х	х	х	x	x	x				12		
	GM-58A-0017 (240-84874-5MS)	9/12/17		MS	Water							ĸ				1		
	GM-58A-0917 (240-84874-5MSD)	9/12/17	10;44 Central	MSD	Water							ĸ	T			1		
	GM-58A-F(0-2)-0917 (240-84874-6)	9/12/17	10-44 Central		Water							,				4		
l	Noe Snoe laboratory accrediations are subject to change. Tetrakmench L currently memain accrediation in the Salte of Origin Nited above for and/o Lateratories. We alterate investigately. If all requested accreditions are	is reasonable being analyze	d the samples i	nust be shippe	U DAILA IN PHO THE	wheel Motal	a laber lagskra	alory a enca L	aba et	instra Ignes I	ctions -	will ten	prive	ed Jary da	arges ti aicreora	icri sta	an shiudi be krough	to ficid/merica
	ssible Hazard Identification confirmed					Sample Disposel (A fee may be assessed if samples are retained longer than 1 month) Return To Chent Disposed By Lab Archivo For Months								1999.000				
ł	iverable Requested 1, II, III, IV, Other (specify) Primary Deliverable Rank 2					Special Indirucions/QC Requirements												
ł	A FALLY A REAL PROPERTY AND A REAL PROPERTY AN					Time	Time. Wetnod al Shipmani											
IN/IN/	Average hed by	9-13-17 00007mc	14	30	ZYK		Roue	ver by	6. 3	N	6				Outoffine Marilia	2	075	-AC
	Revenued by	02ei7me		Dovesny		Hecover by						9-14-17 935 autore		-102	Govpeny			
ł	Reference in the second s	Desitive		Company	-	Museu et by				(Dona/Figure		-		Campairs				
ł	Custody Seals Intact. Custody Seal No.						Cooper Tayropersourg(a) "C and Other Romarks											
1	A Yes A No		_						1	1	-	-	-			-		

Login Sample Receipt Checklist

Client: Solutia Inc.

Login Number: 84874 List Number: 2

Creator: Flanagan, Naomi V

Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey<br 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.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <8mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Job Number: 240-84874-1 SDG Number: KOM038

List Source: TestAmerica Savannah

List Creation: 09/14/17 11:06 AM

Client: Solutia Inc.

Login Number: 84874 List Number: 3 Creator: Flanagan, Naomi V Job Number: 240-84874-1 SDG Number: KOM038

List Source: TestAmerica Savannah List Creation: 09/14/17 11:25 AM

Greator: Flanagan, Naomi V		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey<br 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.	N/A	
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").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

At Golder Associates we strive to be the most respected global group of companies specializing in ground engineering and environmental services. Employee owned since our formation in 1960, we have created a unique culture with pride in ownership, resulting in long-term organizational stability. Golder professionals take the time to build an understanding of client needs and of the specific environments in which they operate. We continue to expand our technical capabilities and have experienced steady growth with employees now operating from offices located throughout Africa, Asia, Australasia, Europe, North America and South America.

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