

8/11/2016

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
Tel: (314)298-8566

TestAmerica Job ID: 160-18549-1

TestAmerica Sample Delivery Group: SL2268
Client Project/Site: X16-049

For:

CH2M Hill Plateau Remediation Company
PO BOX 1600, MS H8-41
Richland, Washington 99352

Attn: Mr. Scot Fitzgerald



Authorized for release by:
8/11/2016 3:22:27 PM

Jayna Awalt, Project Manager II
(314)298-8566

jayna.awalt@testamericainc.com

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



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Case Narrative

Client: CH2M Hill Plateau Remediation Company
Project/Site: X16-049

TestAmerica Job ID: 160-18549-1
SDG: SL2268

Job ID: 160-18549-1

Laboratory: TestAmerica St. Louis

Narrative

CASE NARRATIVE

CH2M Hill Plateau Remediation Company
P.O. Box 1600
Richland, Washington 99352
August 11, 2016
Attention: Scot Fitzgerald

SDG : SL2268
Number of Samples : 1 sample
Sample Matrix : Water
Data Deliverable : Summary
Date SDG Closed : August 9, 2016

II. Introduction

On August 9, 1 sample was received by TestAmerica - St. Louis for chemical analysis. The samples were received within temperature criteria. See the COC and receipt checklists for documentation of any variations on receipt conditions and temperature. Upon receipt, samples were given laboratory Ids to correspond with specific client Ids. Please refer to the Sample Summary sheets attached to this case narrative. This report is incomplete without the narrative.

The following SAFs are associated with this SDG: X16-049

III. Analytical Results/ Methodology

The analytical results for this report are presented by analytical test. Each set of data includes sample identification information, analytical results and the appropriate detection limits. All results are based upon samples as they were received, i.e. wet weight, unless otherwise noted on the data sheets. See the attached Methods Summary Form for the methods used in this SDG.

MS/MSD/Dup analysis was done per the client requirements. Analytical batches that did not contain matrix QC were analyzed with an LCS/LCS duplicate.

Note: For Metals analyses, per standard practice, all 6020 water and soil samples are initially prepared at 2x dilution. This standard dilution does not affect reporting limits as MDL studies are also prepared in the same manner. These dilutions do not necessitate flagging unless otherwise noted in the case narrative.

For solid matrices, all Metals analyses (including Hg) use a Standard Reference Material for the Laboratory Control Sample (LCS). Certificate for this source material may be obtained from TASL.

For Anion analysis, samples have been started at a 2x dilution per CHPRC direction. The samples are flagged accordingly with a "D" flag if sample concentration is above the MDL/RL. Non-conformance will be included in the below section only if dilution is greater than 2x.

For WTPH methods, the lab utilizes method 8015B. Per CHPRC direction, the method name in the electronic data has been modified to read WTPH in the place of 8015B.

Per CHPRC direction (June 2014), Boron will be reported for Metals using method 6010. Boron will no longer be reported by method 6020.

Per CHPRC direction, due to the short hold times for Nitrate, Nitrite and Phosphate by IC (48 hours) as well as pH analysis (24 hours), a SIR request is not needed when samples are run outside 1x hold but within 2x hold. A narrative comment will be included below if a sample is run outside the lab-specified hold time for waters.

Case Narrative

Client: CH2M Hill Plateau Remediation Company
Project/Site: X16-049

TestAmerica Job ID: 160-18549-1
SDG: SL2268

Job ID: 160-18549-1 (Continued)

Laboratory: TestAmerica St. Louis (Continued)

For extractable and volatile organic analyses, several analytes are considered poor performers and will not meet CHPRC QC limits. Per CHPRC direction, the lab's statistical limits have been reported. Excursions outside these statistical limits will include a non-conformance in the sections below.

IV. Definitions

QCBLK-	Quality Control Blank, Method Blank
QCLCS-	Quality Control Laboratory Control Sample, Blank Spike
DUP-	Laboratory Duplicate
MS-	Matrix Spike
MSD-	Matrix Spike Duplicate

The term "Detection Limit" used in the analytical data report refers to either the lab's standard reporting limits or contractually required reporting limits, whichever is applicable.

The following data qualifiers may be applicable to the results in this report, as appropriate.

- **B** - For inorganic analyses, the sample result is greater than the MDL but less than the RL.
- **B** - For organic analyses, Method Blank contamination. The Method Blank contains the target analyte at a concentration above the MDL.
- **J** - For organic analyses, the sample is estimated and less than the RL.
- **C** - For inorganic analyses, Method Blank contamination. The Method Blank contains the target analyte at a concentration above the MDL.
- **D** - For all analyses, the sample result was obtained from the analysis of a dilution. For Metals analyses, per standard practice, all solid samples are initially prepared at a 2x dilution. This standard dilution does not affect reporting limits as MDL studies are also prepared in the same manner. These dilutions do not necessitate qualification unless otherwise noted in the case narrative.
- **N** - For inorganics and GC analyses, the spike/spike duplicate recoveries are outside QC limits.
- **T** - For GCMS analyses, the spike/spike duplicate recoveries are outside QC limits.
- **O** - For all analyses, the LCS (LCSD) recoveries are outside QC limits.
- **M** - For inorganic analyses, the precision was outside control limits.
- **P** - For organic analyses (PCB/Pests only), the aroclor target analyte has greater than 25% difference for detected concentrations between the two GC columns.

Volatiles

Batch: 264115

The following compounds did not meet the minimum relative response factor limits in the continuing calibration verification (CCV) associated with batch 264115: Acetone, 2- Butanone and 4- Methyl- 2- pentanone. A low level CCV was analyzed at the reporting limit (1ug/L) and the affected analytes were detected. The associated sample was not detected above the reporting limit for the affected analytes. (CCVIS 160-264115/4)

The matrix spike / matrix spike duplicate (MS/MSD) precision for batch 264115 was outside control limits for 4- Methyl- 2- pentanone. MS/MSD recoveries are within QC limits demonstrating good extraction performance in the sample matrix. No further action is required. (160-18549-D-1 MS) and (160-18549-C-1 MSD)

We certify that this data package is in compliance with the SOW, both technically and for completeness, including a full description of, explanation of, and corrective actions for, any and all deviations, from either the analyses requested or the case narrative requested. Release of the data contained in this hard copy data package has been authorized by the Laboratory Analytical Manager or designee and the laboratory's client services representative as verified by their signature on this report.

Reviewed and approved:

Jayna Awalt

Case Narrative

Client: CH2M Hill Plateau Remediation Company
Project/Site: X16-049

TestAmerica Job ID: 160-18549-1
SDG: SL2268

Job ID: 160-18549-1 (Continued)

Laboratory: TestAmerica St. Louis (Continued)

St. Louis Project Manager

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Login Sample Receipt Checklist

Client: CH2M Hill Plateau Remediation Company

Job Number: 160-18549-1

SDG Number: SL2268

Login Number: 18549

List Number: 1

Creator: Daniels, Brian J

List Source: TestAmerica St. Louis

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	True	
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	4.1
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

CH2M Hill Plateau Remediation Company S-2268		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		C.O.C. # X16-049-097
Collector Frank Hill /CHPRC	Contact/Requester Karen Waters-Husted	Telephone No. 509-376-4650	Page 1 of 1	
SAF No. X16-049	Sampling Origin Hanford Site	Purchase Order/Charge Code 304027	Ice Chest No. 605-473605184 Bill of Lading/Air Bill No. 7776939290430 Offsite Property No. N/A	
Project Title 100-KW Rebound Study, July 25, 2016	Logbook No. HNF-N-506.86 / 73	Method of Shipment Commercial Carrier	Priority: 30 Days	SPECIAL INSTRUCTIONS Hold Time N/A
Shipped To (Lab) TestAmerica St. Louis	Protocol CERCLA	Priority: 30 Days	SPECIAL INSTRUCTIONS Hold Time N/A	Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
POSSIBLE SAMPLE HAZARDS/REMARKS *** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1				
Sample No. B36792	Filter N	Date 8-5-16	Time 1148	No/Type Container 4x40-mL aGs*
Sample Analysis HCl or H2SO4 to pH <2/Cool <=6C	Holding Time 14 Days	Sample Analysis 8260_VOA_GCMS: COMMON	Holding Time 14 Days	Preservative

Relinquished By Frank Hill /CHPRC	Date/Time AUG 05 2016 1300	Received By SSV #1	Date/Time AUG 05 2016 1300	Sign 	Matrix * DS = Drum Solids DL = Drum Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation X = Other
Relinquished By SSV #1	Date/Time AUG 08 2016 0730	Received By Janelle Zunker /CHPRC	Date/Time AUG 08 2016 0730	Sign 	Matrix * S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air
Relinquished By Janelle Zunker /CHPRC	Date/Time AUG 08 2016 1400	Received By FEDEx	Date/Time AUG 08 2016 1400	Sign 	Matrix * S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air
Relinquished By FEDEx	Date/Time AUG 08 2016 0910	Received By S. J. Brian (Handy)	Date/Time 8/9/16 0910	Sign 	Matrix * S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air
FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Disposed By	Date/Time	Date/Time	Date/Time



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776939290436

Ship date:

Mon 8/08/2016

RICHLAND, WA US

Actual delivery:

Tue 8/09/2016 9:13 am

EARTH CITY, MO US

Delivered

Signed for by: J.CLARKE

Travel History

Date/Time	Activity	Location
- 8/09/2016 - Tuesday		
9:13 am	Delivered	EARTH CITY, MO
7:07 am	On FedEx vehicle for delivery	EARTH CITY, MO
7:02 am	At local FedEx facility	EARTH CITY, MO
5:05 am	At destination sort facility	BERKELEY, MO
4:19 am	Departed FedEx location	MEMPHIS, TN
12:27 am	Arrived at FedEx location	MEMPHIS, TN
- 8/08/2016 - Monday		
4:55 pm	Left FedEx origin facility	PASCO, WA
3:20 pm	Picked up	PASCO, WA
10:27 am	Shipment information sent to FedEx	

Shipment Facts

Tracking number	776939290436	Service	FedEx Standard Overnight
Weight	24 lbs / 10.89 kgs	Delivered To	Shipping/Receiving
Total pieces	1	Total shipment weight	24 lbs / 10.89 kgs
Terms	Recipient	Shipper reference	GWS-184
Packaging	Your Packaging	Special handling section	Deliver Weekday
Standard transit	8/09/2016 by 3:00 pm		



Search or tracking number Subr

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 Small Business Center
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Definitions/Glossary

Client: CH2M Hill Plateau Remediation Company
Project/Site: X16-049

TestAmerica Job ID: 160-18549-1
SDG: SL2268

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Analyzed for but not detected.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

GC/MS VOA TICs

Qualifier	Qualifier Description
T	MS, MSD: Recovery exceeds upper or lower control limits.

Glossary

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

Method Summary

Client: CH2M Hill Plateau Remediation Company
Project/Site: X16-049

TestAmerica Job ID: 160-18549-1
SDG: SL2268

Method	Method Description	Protocol	Laboratory
8260C	Volatile Organic Compounds (GC/MS)	SW846	TAL SL

Protocol References:

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

Laboratory References:

TAL SL = TestAmerica St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566



Sample Summary

Client: CH2M Hill Plateau Remediation Company
Project/Site: X16-049

TestAmerica Job ID: 160-18549-1
SDG: SL2268

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
160-18549-1	B36792	Water	08/05/16 11:48	08/09/16 09:20

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11

Client Sample Results

Client: CH2M Hill Plateau Remediation Company
Project/Site: X16-049

TestAmerica Job ID: 160-18549-1
SDG: SL2268

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

Client Sample ID: B36792

Date Collected: 08/05/16 11:48

Date Received: 08/09/16 09:20

Lab Sample ID: 160-18549-1

Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	0.17	U	1.0	0.17	ug/L			08/10/16 10:40	1
1,1,2-Trichloroethane	0.13	U	1.0	0.13	ug/L			08/10/16 10:40	1
1,1-Dichloroethane	0.070	U	1.0	0.070	ug/L			08/10/16 10:40	1
1,1-Dichloroethene	0.10	U	1.0	0.10	ug/L			08/10/16 10:40	1
1,2-Dichloroethane	0.22	U	1.0	0.22	ug/L			08/10/16 10:40	1
2-Butanone (MEK)	0.47	U	5.0	0.47	ug/L			08/10/16 10:40	1
4-Methyl-2-pentanone (MIBK)	0.22	U	5.0	0.22	ug/L			08/10/16 10:40	1
Acetone	0.86	J	2.0	0.55	ug/L			08/10/16 10:40	1
Benzene	0.10	U	1.0	0.10	ug/L			08/10/16 10:40	1
Carbon disulfide	0.10	U	1.0	0.10	ug/L			08/10/16 10:40	1
Carbon tetrachloride	0.18	U	1.0	0.18	ug/L			08/10/16 10:40	1
Chlorobenzene	0.11	U	1.0	0.11	ug/L			08/10/16 10:40	1
Chloroform	0.49	J	1.0	0.10	ug/L			08/10/16 10:40	1
Ethylbenzene	0.12	U	1.0	0.12	ug/L			08/10/16 10:40	1
Methylene Chloride	0.27	U	1.0	0.27	ug/L			08/10/16 10:40	1
Tetrachloroethene	0.18	U	1.0	0.18	ug/L			08/10/16 10:40	1
Toluene	0.14	U	1.0	0.14	ug/L			08/10/16 10:40	1
Trichloroethene	2.7		1.0	0.25	ug/L			08/10/16 10:40	1
Vinyl chloride	0.19	U	2.0	0.19	ug/L			08/10/16 10:40	1
Xylenes, Total	0.26	U	3.0	0.26	ug/L			08/10/16 10:40	1

Tentatively Identified Compound	Est. Result	Qualifier	Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
Isopropyl alcohol	110	T	ug/L		6.05	67-63-0		08/10/16 10:40	1
Tentatively Identified Compound	None		ug/L					08/10/16 10:40	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	99		75 - 129		08/10/16 10:40	1
4-Bromofluorobenzene (Surr)	107		81 - 130		08/10/16 10:40	1
Dibromofluoromethane (Surr)	103		81 - 124		08/10/16 10:40	1
Toluene-d8 (Surr)	110		87 - 128		08/10/16 10:40	1

QC Sample Results

Client: CH2M Hill Plateau Remediation Company
 Project/Site: X16-049

TestAmerica Job ID: 160-18549-1
 SDG: SL2268

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

Lab Sample ID: MB 160-264115/8
 Matrix: Water
 Analysis Batch: 264115

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	0.17	U	1.0	0.17	ug/L			08/10/16 08:42	1
1,1,2-Trichloroethane	0.13	U	1.0	0.13	ug/L			08/10/16 08:42	1
1,1-Dichloroethane	0.070	U	1.0	0.070	ug/L			08/10/16 08:42	1
1,1-Dichloroethene	0.10	U	1.0	0.10	ug/L			08/10/16 08:42	1
1,2-Dichloroethane	0.22	U	1.0	0.22	ug/L			08/10/16 08:42	1
2-Butanone (MEK)	0.47	U	5.0	0.47	ug/L			08/10/16 08:42	1
4-Methyl-2-pentanone (MIBK)	0.22	U	5.0	0.22	ug/L			08/10/16 08:42	1
Acetone	0.55	U	2.0	0.55	ug/L			08/10/16 08:42	1
Benzene	0.10	U	1.0	0.10	ug/L			08/10/16 08:42	1
Carbon disulfide	0.10	U	1.0	0.10	ug/L			08/10/16 08:42	1
Carbon tetrachloride	0.18	U	1.0	0.18	ug/L			08/10/16 08:42	1
Chlorobenzene	0.11	U	1.0	0.11	ug/L			08/10/16 08:42	1
Chloroform	0.10	U	1.0	0.10	ug/L			08/10/16 08:42	1
Ethylbenzene	0.12	U	1.0	0.12	ug/L			08/10/16 08:42	1
Methylene Chloride	0.27	U	1.0	0.27	ug/L			08/10/16 08:42	1
Tetrachloroethene	0.18	U	1.0	0.18	ug/L			08/10/16 08:42	1
Toluene	0.14	U	1.0	0.14	ug/L			08/10/16 08:42	1
Trichloroethene	0.25	U	1.0	0.25	ug/L			08/10/16 08:42	1
Vinyl chloride	0.19	U	2.0	0.19	ug/L			08/10/16 08:42	1
Xylenes, Total	0.26	U	3.0	0.26	ug/L			08/10/16 08:42	1

Tentatively Identified Compound	MB Est. Result	MB Qualifier	Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
Tentatively Identified Compound	None		ug/L					08/10/16 08:42	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	92		75 - 129		08/10/16 08:42	1
4-Bromofluorobenzene (Surr)	108		81 - 130		08/10/16 08:42	1
Dibromofluoromethane (Surr)	98		81 - 124		08/10/16 08:42	1
Toluene-d8 (Surr)	98		87 - 128		08/10/16 08:42	1

Lab Sample ID: LCS 160-264115/5
 Matrix: Water
 Analysis Batch: 264115

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1,1-Trichloroethane	10.0	11.1		ug/L		111	85 - 116
1,1,2-Trichloroethane	10.0	9.59		ug/L		96	80 - 120
1,1-Dichloroethane	10.0	10.5		ug/L		105	80 - 120
1,1-Dichloroethene	10.0	11.2		ug/L		112	80 - 120
1,2-Dichloroethane	10.0	10.4		ug/L		104	80 - 115
2-Butanone (MEK)	10.0	9.45		ug/L		95	67 - 127
4-Methyl-2-pentanone (MIBK)	10.0	9.52		ug/L		95	75 - 126
Acetone	10.0	10.8		ug/L		108	69 - 129
Benzene	10.0	10.9		ug/L		109	80 - 120
Carbon disulfide	10.0	11.3		ug/L		113	80 - 121
Carbon tetrachloride	10.0	11.4		ug/L		114	83 - 125
Chlorobenzene	10.0	10.9		ug/L		109	80 - 120

TestAmerica St. Louis

QC Sample Results

Client: CH2M Hill Plateau Remediation Company
Project/Site: X16-049

TestAmerica Job ID: 160-18549-1
SDG: SL2268

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

Lab Sample ID: LCS 160-264115/5

Matrix: Water

Analysis Batch: 264115

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloroform	10.0	10.7		ug/L		107	80 - 120
Ethylbenzene	10.0	10.2		ug/L		102	80 - 120
Methylene Chloride	10.0	9.76		ug/L		98	80 - 120
Tetrachloroethene	10.0	11.1		ug/L		111	83 - 123
Toluene	10.0	10.4		ug/L		104	80 - 120
Trichloroethene	10.0	11.0		ug/L		110	80 - 120
Vinyl chloride	10.0	10.8		ug/L		108	77 - 122
Xylenes, Total	20.0	21.3		ug/L		107	80 - 120

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	102		75 - 129
4-Bromofluorobenzene (Surr)	96		81 - 130
Dibromofluoromethane (Surr)	107		81 - 124
Toluene-d8 (Surr)	99		87 - 128

Lab Sample ID: LCSD 160-264115/6

Matrix: Water

Analysis Batch: 264115

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1,1-Trichloroethane	10.0	10.4		ug/L		104	85 - 116	7	20
1,1,2-Trichloroethane	10.0	9.52		ug/L		95	80 - 120	1	20
1,1-Dichloroethane	10.0	10.1		ug/L		101	80 - 120	4	20
1,1-Dichloroethene	10.0	11.5		ug/L		115	80 - 120	3	20
1,2-Dichloroethane	10.0	9.73		ug/L		97	80 - 115	6	20
2-Butanone (MEK)	10.0	8.96		ug/L		90	67 - 127	5	20
4-Methyl-2-pentanone (MIBK)	10.0	9.50		ug/L		95	75 - 126	0	20
Acetone	10.0	10.0		ug/L		100	69 - 129	8	20
Benzene	10.0	10.4		ug/L		104	80 - 120	5	20
Carbon disulfide	10.0	11.7		ug/L		117	80 - 121	3	20
Carbon tetrachloride	10.0	10.6		ug/L		106	83 - 125	7	20
Chlorobenzene	10.0	10.3		ug/L		103	80 - 120	6	20
Chloroform	10.0	10.0		ug/L		100	80 - 120	6	20
Ethylbenzene	10.0	9.71		ug/L		97	80 - 120	5	20
Methylene Chloride	10.0	9.20		ug/L		92	80 - 120	6	20
Tetrachloroethene	10.0	10.8		ug/L		108	83 - 123	3	20
Toluene	10.0	10.8		ug/L		108	80 - 120	4	20
Trichloroethene	10.0	10.1		ug/L		101	80 - 120	8	20
Vinyl chloride	10.0	11.9		ug/L		119	77 - 122	10	20
Xylenes, Total	20.0	21.0		ug/L		105	80 - 120	1	20

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	98		75 - 129
4-Bromofluorobenzene (Surr)	99		81 - 130
Dibromofluoromethane (Surr)	106		81 - 124
Toluene-d8 (Surr)	109		87 - 128

TestAmerica St. Louis

QC Sample Results

Client: CH2M Hill Plateau Remediation Company
 Project/Site: X16-049

TestAmerica Job ID: 160-18549-1
 SDG: SL2268

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

Lab Sample ID: 160-18549-1 MSD
 Matrix: Water
 Analysis Batch: 264115

Client Sample ID: B36792
 Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Toluene	0.14	U	10.0	9.78		ug/L		98	85 - 123	7	20
Trichloroethene	2.7		10.0	12.5		ug/L		99	81 - 125	3	20
Vinyl chloride	0.19	U	10.0	10.0		ug/L		100	70 - 129	3	20
Xylenes, Total	0.26	U	20.0	20.1		ug/L		101	80 - 120	5	20
Surrogate	%Recovery	MSD Qualifier	MSD Limits								
1,2-Dichloroethane-d4 (Surr)	93		75 - 129								
4-Bromofluorobenzene (Surr)	94		81 - 130								
Dibromofluoromethane (Surr)	103		81 - 124								
Toluene-d8 (Surr)	96		87 - 128								

QC Association Summary

Client: CH2M Hill Plateau Remediation Company
 Project/Site: X16-049

TestAmerica Job ID: 160-18549-1
 SDG: SL2268

GC/MS VOA

Analysis Batch: 264115

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-18549-1	B36792	Total/NA	Water	8260C	
MB 160-264115/8	Method Blank	Total/NA	Water	8260C	
LCS 160-264115/5	Lab Control Sample	Total/NA	Water	8260C	
LCSD 160-264115/6	Lab Control Sample Dup	Total/NA	Water	8260C	
160-18549-1 MS	B36792	Total/NA	Water	8260C	
160-18549-1 MSD	B36792	Total/NA	Water	8260C	

Surrogate Summary

Client: CH2M Hill Plateau Remediation Company
 Project/Site: X16-049

TestAmerica Job ID: 160-18549-1
 SDG: SL2268

Method: 8260C - Volatile Organic Compounds (GC/MS)
Matrix: Water
Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	12DCE	BFB	DBFM	TOL
		(75-129)	(81-130)	(81-124)	(87-128)
160-18549-1	B36792	99	107	103	110
160-18549-1 MS	B36792	104	97	106	101
160-18549-1 MSD	B36792	93	94	103	96
LCS 160-264115/5	Lab Control Sample	102	96	107	99
LCSD 160-264115/6	Lab Control Sample Dup	98	99	106	109
MB 160-264115/8	Method Blank	92	108	98	98

Surrogate Legend

12DCE = 1,2-Dichloroethane-d4 (Surr)

BFB = 4-Bromofluorobenzene (Surr)

DBFM = Dibromofluoromethane (Surr)

TOL = Toluene-d8 (Surr)