

July 6, 2017

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: 160-22981-1

TestAmerica Sample Delivery Group: SL2571
Client Project/Site: F16-046

For:

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

Attn: Mr. Scot Fitzgerald



Authorized for release by:
7/6/2017 2:34:54 PM

Jayna Awalt, Project Manager II
(314)298-8566
jayna.awalt@testamericainc.com

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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.

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July 6, 2017

Client: CH2M Hill Plateau Remediation Company
Project/Site: F16-046

TestAmerica Job ID: 160-22981-1
SDG: SL2571



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Job ID: 160-22981-1

Laboratory: TestAmerica St. Louis

Narrative

CASE NARRATIVE

CH2MHill Plateau Remediation Company
P.O. Box 1600
Richland, Washington 99352
July 6, 2017
Attention: Scot Fitzgerald

SDG	: SL2571
Number of Samples	: 2 samples
Sample Matrix	: Water
Data Deliverable	: Summary
Date SDG Closed	: June 22, 2017

II. Introduction

On June 22, 2 samples were 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: F16-046

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 a narrative note; however, they are flagged "D" due to a limitation in the LIMS.

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, 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.

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.

Job ID: 160-22981-1 (Continued)

Laboratory: TestAmerica St. Louis (Continued)

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.
- **B** - For radiochemistry, Method Blank reported above the MDC. Sample activity is > 5% the method blank.
- **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/RL but not greater than 5% the MB.
- **D** - For all analyses, the sample result was obtained from the analysis of a dilution. For ICPMS Metals analyses, per standard practice, all 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 and will not be narrated below. Only dilutions above 2x will be narrated and considered a true dilution for these samples.
- **N** - For inorganics, rad 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.
- **P** - For organic analyses (PCB/Pests only), the aroclor target analyte has greater than 25% difference for detected concentrations between the two GC columns.
- **X**- Organics and Anions IC - Sample concentration over calibration and/or surrogate recovery outside QC limits.
- **X**- Inorganics - The analyte present in the original sample is > 4x the spike concentration.
- **X**- Radiochemistry - Carrier or Tracer recovery is outside limits.
- **Z**- Sample was prepped or analyzed beyond the specified sample holding time.
- **y** - RPD is outside established limits.

Volatiles

Batch: 315555

The following compound did not meet the minimum relative response factor limits in the continuing calibration verification (CCV) associated with batch 315555: Acetone. A low level CCV was analyzed at the reporting limit (1ug/L) and the affected analyte was detected. The associated sample was not detected above the reporting limit for the affected analytes. (CCVIS 160-315555/4)

There were no observations or non-conformances associated with the following methods:

- TDS**
- TSS**
- Alkalinity**
- TOC**

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.

Client: CH2M Hill Plateau Remediation Company
Project/Site: F16-046

TestAmerica Job ID: 160-22981-1
SDG: SL2571

Job ID: 160-22981-1 (Continued)

Laboratory: TestAmerica St. Louis (Continued)

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
St. Louis Project Manager

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Login Sample Receipt Checklist

Client: CH2M Hill Plateau Remediation Company

Job Number: 160-22981-1
SDG Number: SL2571

Login Number: 22981

List Number: 1

Creator: Clarke, Jill C

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	0.3
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	

July 6, 2017

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F16-046-957	PAGE 1 OF 1
COLLECTOR Kevin Patterson CHPRC	SN 2571	COMPANY CONTACT SUMNER, LC	TELEPHONE NO. 376-3922	PROJECT COORDINATOR SUMNER, LC	PRICE CODE 7C
SAMPLING LOCATION 289-T, Effluent Tank, Valve V07-Y80* DUP		PROJECT DESIGNATION 200W Pump & Treat - Treatment Plant Compliance Sampling - Water		SAF NO. F16-046	AIR QUALITY <input type="checkbox"/>
ICE CHEST NO. 605-623		FIELD LOGBOOK NO. HNF-N-49116	ACTUAL SAMPLE DEPTH N/A	COA 304235	METHOD OF SHIPMENT FEDERAL EXPRESS
SHIPPED TO TestAmerica St. Louis		OFFSITE PROPERTY NO. N/A		BILL OF LADING/AIR BILL NO. 7794 8960 1925	
MATRIX* A=Air DL=Drum L=Liquid DS=Drum S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	POSSIBLE SAMPLE HAZARDS/ REMARKS *Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/HATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.	PRESERVATION HCl or H2SO4 to pH <2/Cool 14 Days	Cool <=6C	Cool <=6C	HCl or H2SO4 to pH <2/Cool 28 Days
		HOLDING TIME	14 Days	7 Days	7 Days
		TYPE OF CONTAINER	aGs*	G/P	aG
		NO. OF CONTAINER(S)	4	1	1
		VOLUME	40mL	250mL	500mL
		SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	160.1 TDS: COMMON;	160.2 TSS: COMMON;
SPECIAL HANDLING AND/OR STORAGE NA					9060 TOC: COMMON;
SAMPLE NO. B3B990	MATRIX* WATER	SAMPLE DATE JUN 20 2017	SAMPLE TIME 1210		

CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS	
RELINQUISHED BY/REMOVED FROM Kevin Patterson CHPRC	DATE/TIME JUN 20 2017 1315	RECEIVED BY/STORED IN Christina Aguilar CHPRC	DATE/TIME JUN 20 2017 1315	TRVL-17-147	
RELINQUISHED BY/REMOVED FROM Christina Aguilar CHPRC	DATE/TIME JUN 20 2017 1330	RECEIVED BY/STORED IN SSU-1	DATE/TIME JUN 20 2017 1330	(1) 8260_VOA_GCMS: CH 01 {Chloromethane}; 8260_VOA_GCMS: COMMON {Acetone, Carbon tetrachloride, Chloroform, Methylene chloride, Trichloroethene, Vinyl chloride}; 8260_VOA_GCMS: COMMON (Add-on) {cis-1,2-Dichloroethylene};	
RELINQUISHED BY/REMOVED FROM Janelle Zunker CHPRC	DATE/TIME JUN 21 2017 0740	RECEIVED BY/STORED IN Janelle Zunker CHPRC	DATE/TIME JUN 21 2017 0740		
RELINQUISHED BY/REMOVED FROM Janelle Zunker CHPRC	DATE/TIME JUN 21 2017 1100	RECEIVED BY/STORED IN FEDEX	DATE/TIME JUN 21 2017 1100		
RELINQUISHED BY/REMOVED FROM	DATE/TIME FED EX	RECEIVED BY/STORED IN	DATE/TIME		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME		
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME		



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FedEx® Tracking

779459601925

Ship date:
Wed 6/21/2017

Actual delivery:
Thu 6/22/2017 9:06 am

RICHLAND, WA US

Delivered

EARTH CITY, MO US

Signed for by: *B.DANIELS*

Travel History

Date/Time	Activity	Location
- 6/22/2017 - Thursday		
9:06 am	Delivered	EARTH CITY, MO
7:11 am	On FedEx vehicle for delivery	EARTH CITY, MO
7:05 am	At local FedEx facility	EARTH CITY, MO
5:25 am	At destination sort facility	BERKELEY, MO
4:37 am	Departed FedEx location	MEMPHIS, TN
12:38 am	Arrived at FedEx location	MEMPHIS, TN
- 6/21/2017 - Wednesday		
4:48 pm	Left FedEx origin facility	PASCO, WA
3:13 pm	Picked up	PASCO, WA
1:13 pm	Shipment information sent to FedEx	

Shipment Facts

Tracking number	779459601925	Service	FedEx Standard Overnight
Weight	72 lbs / 32.66 kgs	Dimensions	28x16x16 in.
Delivered To	Shipping/Receiving	Total pieces	1
Total shipment weight	72 lbs / 32.66 kgs	Terms	Recipient
Shipper reference	GWS-623	Packaging	Your Packaging
Special handling section	Deliver Weekday, Additional Handling Surcharge	Standard transit	6/22/2017 by 3:00 pm



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Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Analyzed for but not detected.

General Chemistry

Qualifier	Qualifier Description
U	Analyzed for but not detected.

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	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)

Client: CH2M Hill Plateau Remediation Company
Project/Site: F16-046

TestAmerica Job ID: 160-22981-1
SDG: SL2571

Method	Method Description	Protocol	Laboratory
8260C	Volatile Organic Compounds (GC/MS)	SW846	TAL SL
160.1	Solids, Total Dissolved (TDS)	MCAWW	TAL SL
160.2	Solids, Total Suspended (TSS)	MCAWW	TAL SL
310.1	Alkalinity	MCAWW	TAL SL
9060	Organic Carbon, Total (TOC)	SW846	TAL SL

Protocol References:

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



July 6, 2017 Sample Summary

Client: CH2M Hill Plateau Remediation Company
Project/Site: F16-046

TestAmerica Job ID: 160-22981-1
SDG: SL2571

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
160-22981-1	B3B984	Water	06/20/17 12:10	06/22/17 09:15
160-22981-2	B3B990	Water	06/20/17 12:10	06/22/17 09:15

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July 6, 2017 Client Sample Results

Client: CH2M Hill Plateau Remediation Company
Project/Site: F16-046

TestAmerica Job ID: 160-22981-1
SDG: SL2571

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

Client Sample ID: B3B984
Date Collected: 06/20/17 12:10
Date Received: 06/22/17 09:15

Lab Sample ID: 160-22981-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	0.55	U	2.0	0.55	ug/L			06/28/17 10:01	1
Carbon tetrachloride	0.18	U	1.0	0.18	ug/L			06/28/17 10:01	1
Chloroform	0.10	U	1.0	0.10	ug/L			06/28/17 10:01	1
Chloromethane	0.10	U	2.0	0.10	ug/L			06/28/17 10:01	1
cis-1,2-Dichloroethylene	0.10	U	1.0	0.10	ug/L			06/28/17 10:01	1
Methylene Chloride	0.27	U	1.0	0.27	ug/L			06/28/17 10:01	1
Trichloroethene	0.25	U	1.0	0.25	ug/L			06/28/17 10:01	1
Vinyl chloride	0.19	U	2.0	0.19	ug/L			06/28/17 10:01	1

Tentatively Identified Compound	Est. Result	Qualifier	Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
Tentatively Identified Compound	None		ug/L					06/28/17 10:01	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	99		75 - 129		06/28/17 10:01	1
4-Bromofluorobenzene (Surr)	113		81 - 130		06/28/17 10:01	1
Dibromofluoromethane (Surr)	103		81 - 124		06/28/17 10:01	1
Toluene-d8 (Surr)	115		87 - 128		06/28/17 10:01	1

Client Sample ID: B3B990
Date Collected: 06/20/17 12:10
Date Received: 06/22/17 09:15

Lab Sample ID: 160-22981-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	0.55	U	2.0	0.55	ug/L			06/28/17 10:25	1
Carbon tetrachloride	0.18	U	1.0	0.18	ug/L			06/28/17 10:25	1
Chloroform	0.10	U	1.0	0.10	ug/L			06/28/17 10:25	1
Chloromethane	0.10	U	2.0	0.10	ug/L			06/28/17 10:25	1
cis-1,2-Dichloroethylene	0.10	U	1.0	0.10	ug/L			06/28/17 10:25	1
Methylene Chloride	0.27	U	1.0	0.27	ug/L			06/28/17 10:25	1
Trichloroethene	0.25	U	1.0	0.25	ug/L			06/28/17 10:25	1
Vinyl chloride	0.19	U	2.0	0.19	ug/L			06/28/17 10:25	1

Tentatively Identified Compound	Est. Result	Qualifier	Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
Tentatively Identified Compound	None		ug/L					06/28/17 10:25	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	101		75 - 129		06/28/17 10:25	1
4-Bromofluorobenzene (Surr)	110		81 - 130		06/28/17 10:25	1
Dibromofluoromethane (Surr)	103		81 - 124		06/28/17 10:25	1
Toluene-d8 (Surr)	115		87 - 128		06/28/17 10:25	1

General Chemistry

Client Sample ID: B3B984
Date Collected: 06/20/17 12:10
Date Received: 06/22/17 09:15

Lab Sample ID: 160-22981-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (TDS)	426		5.0	3.5	mg/L			06/26/17 08:45	1
Total Suspended Solids	4.0	U	4.0	4.0	mg/L			06/26/17 08:49	1
Alkalinity	104		5.0	0.54	mg/L			06/23/17 23:57	1
Total Organic Carbon	2.4		1.0	0.72	mg/L			06/23/17 22:34	1

TestAmerica St. Louis

July 6, 2017
Client Sample Results

Client: CH2M Hill Plateau Remediation Company
Project/Site: F16-046

TestAmerica Job ID: 160-22981-1
SDG: SL2571

General Chemistry

Client Sample ID: B3B990
Date Collected: 06/20/17 12:10
Date Received: 06/22/17 09:15

Lab Sample ID: 160-22981-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (TDS)	439		5.0	3.5	mg/L			06/26/17 08:45	1
Total Suspended Solids	4.0	U	4.0	4.0	mg/L			06/26/17 08:49	1
Alkalinity	104		5.0	0.54	mg/L			06/24/17 00:10	1
Total Organic Carbon	2.4		1.0	0.72	mg/L			06/23/17 22:46	1

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July 6, 2017
QC Sample Results

Client: CH2M Hill Plateau Remediation Company
Project/Site: F16-046

TestAmerica Job ID: 160-22981-1
SDG: SL2571

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

Lab Sample ID: MB 160-315555/8
Matrix: Water
Analysis Batch: 315555

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	0.55	U	2.0	0.55	ug/L			06/28/17 08:48	1
Carbon tetrachloride	0.18	U	1.0	0.18	ug/L			06/28/17 08:48	1
Chloroform	0.10	U	1.0	0.10	ug/L			06/28/17 08:48	1
Chloromethane	0.10	U	2.0	0.10	ug/L			06/28/17 08:48	1
cis-1,2-Dichloroethylene	0.10	U	1.0	0.10	ug/L			06/28/17 08:48	1
Methylene Chloride	0.27	U	1.0	0.27	ug/L			06/28/17 08:48	1
Trichloroethene	0.25	U	1.0	0.25	ug/L			06/28/17 08:48	1
Vinyl chloride	0.19	U	2.0	0.19	ug/L			06/28/17 08:48	1

Tentatively Identified Compound	MB Est. Result	MB Qualifier	Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
Tentatively Identified Compound	None		ug/L					06/28/17 08:48	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	91		75 - 129		06/28/17 08:48	1
4-Bromofluorobenzene (Surr)	105		81 - 130		06/28/17 08:48	1
Dibromofluoromethane (Surr)	97		81 - 124		06/28/17 08:48	1
Toluene-d8 (Surr)	112		87 - 128		06/28/17 08:48	1

Lab Sample ID: LCS 160-315555/5
Matrix: Water
Analysis Batch: 315555

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	10.0	8.69		ug/L		87	69 - 129
Carbon tetrachloride	10.0	10.8		ug/L		108	83 - 125
Chloroform	10.0	9.85		ug/L		99	80 - 120
Chloromethane	10.0	10.1		ug/L		101	72 - 124
cis-1,2-Dichloroethylene	10.0	10.0		ug/L		100	80 - 120
Methylene Chloride	10.0	9.22		ug/L		92	80 - 120
Trichloroethene	10.0	10.2		ug/L		102	80 - 120
Vinyl chloride	10.0	9.99		ug/L		100	77 - 122

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	94		75 - 129
4-Bromofluorobenzene (Surr)	95		81 - 130
Dibromofluoromethane (Surr)	100		81 - 124
Toluene-d8 (Surr)	104		87 - 128

Lab Sample ID: LCSD 160-315555/6
Matrix: Water
Analysis Batch: 315555

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
Acetone	10.0	8.69		ug/L		87	69 - 129	0	20
Carbon tetrachloride	10.0	11.2		ug/L		112	83 - 125	4	20
Chloroform	10.0	10.1		ug/L		101	80 - 120	2	20
Chloromethane	10.0	10.2		ug/L		102	72 - 124	1	20

TestAmerica St. Louis

Client: CH2M Hill Plateau Remediation Company
Project/Site: F16-046

TestAmerica Job ID: 160-22981-1
SDG: SL2571

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

Lab Sample ID: LCSD 160-31555/6
Matrix: Water
Analysis Batch: 315555

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
cis-1,2-Dichloroethylene	10.0	10.3		ug/L		103	80 - 120	3	20
Methylene Chloride	10.0	9.33		ug/L		93	80 - 120	1	20
Trichloroethene	10.0	10.9		ug/L		109	80 - 120	6	20
Vinyl chloride	10.0	10.2		ug/L		102	77 - 122	2	20

Surrogate	LCSD %Recovery	LCSD Qualifier	LCSD Limits
1,2-Dichloroethane-d4 (Surr)	93		75 - 129
4-Bromofluorobenzene (Surr)	97		81 - 130
Dibromofluoromethane (Surr)	99		81 - 124
Toluene-d8 (Surr)	104		87 - 128

Lab Sample ID: 160-22980-B-3 MS
Matrix: Water
Analysis Batch: 315555

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	0.55	U	10.0	10.9		ug/L		109	50 - 137
Carbon tetrachloride	15		10.0	26.8		ug/L		115	77 - 131
Chloroform	5.1		10.0	15.9		ug/L		108	80 - 120
Chloromethane	0.10	U	10.0	10.0		ug/L		100	62 - 132
cis-1,2-Dichloroethylene	0.10	U	10.0	10.9		ug/L		109	80 - 120
Methylene Chloride	0.27	U	10.0	10.3		ug/L		103	80 - 120
Trichloroethene	0.25	U	10.0	11.2		ug/L		112	81 - 125
Vinyl chloride	0.19	U	10.0	10.2		ug/L		102	70 - 129

Surrogate	MS %Recovery	MS Qualifier	MS Limits
1,2-Dichloroethane-d4 (Surr)	97		75 - 129
4-Bromofluorobenzene (Surr)	98		81 - 130
Dibromofluoromethane (Surr)	106		81 - 124
Toluene-d8 (Surr)	104		87 - 128

Lab Sample ID: 160-22980-C-3 MSD
Matrix: Water
Analysis Batch: 315555

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acetone	0.55	U	10.0	11.1		ug/L		111	50 - 137	2	20
Carbon tetrachloride	15		10.0	26.4		ug/L		111	77 - 131	2	20
Chloroform	5.1		10.0	15.5		ug/L		104	80 - 120	2	20
Chloromethane	0.10	U	10.0	9.23		ug/L		92	62 - 132	8	20
cis-1,2-Dichloroethylene	0.10	U	10.0	10.3		ug/L		103	80 - 120	5	20
Methylene Chloride	0.27	U	10.0	9.60		ug/L		96	80 - 120	7	20
Trichloroethene	0.25	U	10.0	10.5		ug/L		105	81 - 125	7	20
Vinyl chloride	0.19	U	10.0	9.82		ug/L		98	70 - 129	3	20

Surrogate	MSD %Recovery	MSD Qualifier	MSD Limits
1,2-Dichloroethane-d4 (Surr)	94		75 - 129

TestAmerica St. Louis

July 6, 2017 QC Sample Results

Client: CH2M Hill Plateau Remediation Company
Project/Site: F16-046

TestAmerica Job ID: 160-22981-1
SDG: SL2571

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

Lab Sample ID: 160-22980-C-3 MSD
Matrix: Water
Analysis Batch: 315555

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Surrogate	MSD %Recovery	MSD Qualifier	Limits
4-Bromofluorobenzene (Surr)	101		81 - 130
Dibromofluoromethane (Surr)	104		81 - 124
Toluene-d8 (Surr)	107		87 - 128

Method: 160.1 - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 160-315119/1
Matrix: Water
Analysis Batch: 315119

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (TDS)	3.5	U	5.0	3.5	mg/L			06/26/17 08:45	1

Lab Sample ID: LCS 160-315119/2
Matrix: Water
Analysis Batch: 315119

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids (TDS)	500	504.0		mg/L		101	90 - 110

Lab Sample ID: 160-22981-1 DU
Matrix: Water
Analysis Batch: 315119

Client Sample ID: B3B984
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids (TDS)	426		438.0		mg/L		3	5

Method: 160.2 - Solids, Total Suspended (TSS)

Lab Sample ID: MB 160-315120/1
Matrix: Water
Analysis Batch: 315120

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	4.0	U	4.0	4.0	mg/L			06/26/17 08:49	1

Lab Sample ID: LCS 160-315120/2
Matrix: Water
Analysis Batch: 315120

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	500	476.0		mg/L		95	78 - 124

Lab Sample ID: 160-22981-1 DU
Matrix: Water
Analysis Batch: 315120

Client Sample ID: B3B984
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Suspended Solids	4.0	U	4.0	U	mg/L		NC	5

TestAmerica St. Louis

July 6, 2017 QC Sample Results

Client: CH2M Hill Plateau Remediation Company
Project/Site: F16-046

TestAmerica Job ID: 160-22981-1
SDG: SL2571

Method: 310.1 - Alkalinity

Lab Sample ID: MB 160-315073/1
Matrix: Water
Analysis Batch: 315073

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	0.54	U	5.0	0.54	mg/L			06/23/17 21:02	1

Lab Sample ID: HLCS 160-315073/3
Matrix: Water
Analysis Batch: 315073

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

Analyte	Spike Added	HLCS Result	HLCS Qualifier	Unit	D	%Rec	%Rec. Limits
Alkalinity	400	374.0		mg/L		93	90 - 110

Lab Sample ID: LCS 160-315073/2
Matrix: Water
Analysis Batch: 315073

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Alkalinity	200	188.0		mg/L		94	90 - 110

Lab Sample ID: 160-22883-F-5 MS
Matrix: Water
Analysis Batch: 315073

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Alkalinity	106		100	198.0		mg/L		92	80 - 120

Lab Sample ID: 160-22883-F-5 DU
Matrix: Water
Analysis Batch: 315073

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Alkalinity	106		104.0		mg/L		2	20

Method: 9060 - Organic Carbon, Total (TOC)

Lab Sample ID: MB 160-315318/4
Matrix: Water
Analysis Batch: 315318

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	0.72	U	1.0	0.72	mg/L			06/23/17 20:32	1

Lab Sample ID: LCS 160-315318/5
Matrix: Water
Analysis Batch: 315318

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	10.0	9.97		mg/L		100	90 - 110

TestAmerica St. Louis

July 6, 2017
QC Sample Results

Client: CH2M Hill Plateau Remediation Company
Project/Site: F16-046

TestAmerica Job ID: 160-22981-1
SDG: SL2571

Method: 9060 - Organic Carbon, Total (TOC) (Continued)

Lab Sample ID: 160-22644-C-1 MS
Matrix: Water
Analysis Batch: 315318

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	0.74	B	5.00	5.58		mg/L		97	76 - 120

Lab Sample ID: 160-22644-C-1 DU
Matrix: Water
Analysis Batch: 315318

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Organic Carbon	0.74	B	0.72	U	mg/L		NC	20

July 6, 2017
QC Association Summary

Client: CH2M Hill Plateau Remediation Company
Project/Site: F16-046

TestAmerica Job ID: 160-22981-1
SDG: SL2571

GC/MS VOA

Analysis Batch: 315555

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-22981-1	B3B984	Total/NA	Water	8260C	
160-22981-2	B3B990	Total/NA	Water	8260C	
MB 160-315555/8	Method Blank	Total/NA	Water	8260C	
LCS 160-315555/5	Lab Control Sample	Total/NA	Water	8260C	
LCS 160-315555/6	Lab Control Sample Dup	Total/NA	Water	8260C	
160-22980-B-3 MS	Matrix Spike	Total/NA	Water	8260C	
160-22980-C-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260C	

General Chemistry

Analysis Batch: 315073

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-22981-1	B3B984	Total/NA	Water	310.1	
160-22981-2	B3B990	Total/NA	Water	310.1	
MB 160-315073/1	Method Blank	Total/NA	Water	310.1	
HLCS 160-315073/3	Lab Control Sample	Total/NA	Water	310.1	
LCS 160-315073/2	Lab Control Sample	Total/NA	Water	310.1	
160-22883-F-5 MS	Matrix Spike	Total/NA	Water	310.1	
160-22883-F-5 DU	Duplicate	Total/NA	Water	310.1	

Analysis Batch: 315119

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-22981-1	B3B984	Total/NA	Water	160.1	
160-22981-2	B3B990	Total/NA	Water	160.1	
MB 160-315119/1	Method Blank	Total/NA	Water	160.1	
LCS 160-315119/2	Lab Control Sample	Total/NA	Water	160.1	
160-22981-1 DU	B3B984	Total/NA	Water	160.1	

Analysis Batch: 315120

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-22981-1	B3B984	Total/NA	Water	160.2	
160-22981-2	B3B990	Total/NA	Water	160.2	
MB 160-315120/1	Method Blank	Total/NA	Water	160.2	
LCS 160-315120/2	Lab Control Sample	Total/NA	Water	160.2	
160-22981-1 DU	B3B984	Total/NA	Water	160.2	

Analysis Batch: 315318

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-22981-1	B3B984	Total/NA	Water	9060	
160-22981-2	B3B990	Total/NA	Water	9060	
MB 160-315318/4	Method Blank	Total/NA	Water	9060	
LCS 160-315318/5	Lab Control Sample	Total/NA	Water	9060	
160-22644-C-1 MS	Matrix Spike	Total/NA	Water	9060	
160-22644-C-1 DU	Duplicate	Total/NA	Water	9060	

July 6, 2017
Surrogate Summary

Client: CH2M Hill Plateau Remediation Company
Project/Site: F16-046

TestAmerica Job ID: 160-22981-1
SDG: SL2571

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 (75-129)	BFB (81-130)	DBFM (81-124)	TOL (87-128)
160-22980-B-3 MS	Matrix Spike	97	98	106	104
160-22980-C-3 MSD	Matrix Spike Duplicate	94	101	104	107
160-22981-1	B3B984	99	113	103	115
160-22981-2	B3B990	101	110	103	115
LCS 160-315555/5	Lab Control Sample	94	95	100	104
LCSD 160-315555/6	Lab Control Sample Dup	93	97	99	104
MB 160-315555/8	Method Blank	91	105	97	112

Surrogate Legend

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

