

December 21, 2015

# 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: 160-15282-2

TestAmerica Sample Delivery Group: SL2055  
Client Project/Site: F15-005

For:

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

Attn: Mr. Scot Fitzgerald



Authorized for release by:  
12/21/2015 4:11:08 PM

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

[jayna.awalt@testamericainc.com](mailto: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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Client: CH2M Hill Plateau Remediation Company  
Project/Site: F15-005

TestAmerica Job ID: 160-15282-2  
SDG: SL2055

**Job ID: 160-15282-2**

**Laboratory: TestAmerica St. Louis**

**Narrative**

**CASE NARRATIVE**

CH2MHill Plateau Remediation Company  
P.O. Box 1600  
Richland, Washington 99352  
December 21, 2015  
Attention: Scot Fitzgerald

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SDG : SL2055  
Number of Samples : 2 samples  
Sample Matrix : Water  
Data Deliverable : Summary  
Date SDG Closed : December 9, 2015

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II. Introduction

On December 9, 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: F15-005

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 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.

Per CHPRC direction, data for pH analysis will be reported outside 1x 24 hour hold time due to this being a field parameter.

IV. Definitions



Client: CH2M Hill Plateau Remediation Company  
Project/Site: F15-005

TestAmerica Job ID: 160-15282-2  
SDG: SL2055

**Job ID: 160-15282-2 (Continued)**

**Laboratory: TestAmerica St. Louis (Continued)**

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: 226481**

The continuing calibration verification (CCV) associated with batch 160-226481 recovered outside recommended criteria, minimum relative response factor, for Acetone. A reporting limit (RL) standard was analyzed, and the target analyte was detected; therefore, the data have been qualified and reported. (CCVIS 160-226481/3)

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. 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

Client: CH2M Hill Plateau Remediation Company  
Project/Site: F15-005

TestAmerica Job ID: 160-15282-2  
SDG: SL2055

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**Job ID: 160-15282-2 (Continued)**

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Laboratory: TestAmerica St. Louis (Continued)

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Login Sample Receipt Checklist

Client: CH2M Hill Plateau Remediation Company

Job Number: 160-15282-2

SDG Number: SL2055

Login Number: 15282

List Source: TestAmerica St. Louis

List Number: 1

Creator: Daniels, Brian J

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	1.2°
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.	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		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F15-005-576	PAGE 1 OF 1
COLLECTOR K.C. Patterson/CHPRC	SL2054	COMPANY CONTACT SUMNER, LC	TELEPHONE NO. 376-3922	PROJECT COORDINATOR SUMNER, LC	PRICE CODE 7H
SAMPLING LOCATION 289-TA Pre Tc99IX Resin Tanks Valve V05-Y20 FXR		PROJECT DESIGNATION 200W Pump & Treat - Treatment Plant Water Sampling		SAF NO. F15-005	AIR QUALITY <input type="checkbox"/>
ICE CHEST NO. CWS-482		FIELD LOGBOOK NO. HNF-N-49115	ACTUAL SAMPLE DEPTH (N/A)	COA 303700	METHOD OF SHIPMENT FEDERAL EXPRESS
SHIPPED TO TestAmerica St. Louis		OFFSITE PROPERTY NO. (N/A)		BILL OF LADING/AIR BILL NO. 775152447577	

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 regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1. N/A	PRESERVATION HCl or H2SO4 to pH <2/Cool 14 Days	HOLDING TIME	TYPE OF CONTAINER ags*	NO. OF CONTAINER(S) 4	VOLUME 40ml	SAMPLE ANALYSIS SEE ITEM (1) IN SPECIAL INSTRUCTIONS
SPECIAL HANDLING AND/OR STORAGE							
SAMPLE NO. 833YB9	MATRIX* WATER	SAMPLE DATE DEC 08 2015	SAMPLE TIME 1045				

CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS	
RELINQUISHED BY/REMOVED FROM K.C. Patterson/CHPRC	DATE/TIME DEC 08 2015 1130	RECEIVED BY/STORED IN T.L. BACON/CHPRC	DATE/TIME DEC 08 2015 1130	TRVL-16-034 (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 T.L. BACON/CHPRC	DATE/TIME DEC 08 2015 1400	RECEIVED BY/STORED IN FEDEX	DATE/TIME DEC 08 2015 1400		
RELINQUISHED BY/REMOVED FROM FEDEX	DATE/TIME DEC 08 2015 1400	RECEIVED BY/STORED IN Brian Danahy	DATE/TIME 12/15/2015		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	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	
PRINTED ON 11/30/2015	FSR ID = FSR10967	TRVL NUM = TRVL-16-034		A-6003-618 (REV 2)	



**CH2M Hill Plateau Remediation Company**

**COLLECTOR:** K.C. Patterson/CHPRC *SL2054*

**SAMPLING LOCATION:** 289-T, Effluent Tank, Valve V07-Y80 C\* DUP

**ICE CHEST NO.:** *205-482*

**SHIPPED TO:** *205-482*  
TestAmerica St. Louis

**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**

**COMPANY CONTACT:** SUMNER, LC  
**TELEPHONE NO.:** 376-3922

**PROJECT DESIGNATION:** 200W Pump & Treat - Treatment Plant Water Sampling

**FIELD LOGBOOK NO.:** *HNF-N-49115*

**OFFSITE PROPERTY NO.:** (N/A)

**PROJECT COORDINATOR:** SUMNER, LC

**SAF NO.:** F15-005

**COA:** 303700

**BILL OF LADING/AIR BILL NO.:** *775152447577*

**PRICE CODE:** 7H

**AIR QUALITY:**

**METHOD OF SHIPMENT:** FEDERAL EXPRESS

**PAGE 1 OF 1**

**DATA TURNAROUND:** 30 Days / 30 Days

**ORIGINAL**

MATRIX*	POSSIBLE SAMPLE HAZARDS/ REMARKS	PRESERVATION	HOLDING TIME	TYPE OF CONTAINER	NO. OF CONTAINER(S)	VOLUME	SAMPLE ANALYSIS	SAMPLE DATE	SAMPLE TIME	DATE/TIME
A=Air DL=Drum L=Liquid DS=Drum S=Soil SF=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1. N/A	HCl or H2SO4 to pH <2/Cool 14 Days	14 Days	aGs*	4	40mL	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	DEC 08 2015	0825	✓
		Cool <=6C	7 Days	G/P	1	500mL	160.1_TDS: COMMON;	✓	✓	✓
		Cool <=6C	7 Days	G/P	1	500mL	160.1_TDS: COMMON;	✓	✓	✓
		Cool <=6C	7 Days	G/P	1	500mL	415.1_TOC: COMMON (Total organic carbon);	✓	✓	✓

**SAMPLE NO.:** B33YB1

**MATRIX\*:** WATER

**SPECIAL HANDLING AND/OR STORAGE:**

**RECEIVED BY/STORED IN:** T.L. BACON/CHPRC *12/16/15 Bacon*

**RECEIVED BY/STORED IN:** FEDEX *12/16/15*

**RECEIVED BY/STORED IN:** *Brian Daniels 12/16/15*

**CHAIN OF POSSESSION**

RELINQUISHED BY/REMOVED FROM	DATE/TIME	SIGN/PRINT NAMES	RECEIVED BY/STORED IN	DATE/TIME
K.C. Patterson/CHPRC	DEC 08 2015 0920	<i>T.L. Bacon</i>	T.L. BACON/CHPRC	DEC 08 2015 0920
T.L. BACON/CHPRC	DEC 08 2015 1400	<i>T.L. Bacon</i>	FEDEX	
T.L. BACON/CHPRC	DEC 08 2015 1400	<i>T.L. Bacon</i>	Brian Daniels	12/16/15

**LABORATORY SECTION:** RECEIVED BY

**FINAL SAMPLE DISPOSITION:** DISPOSAL METHOD

**DATE/TIME:**

**DISPOSED BY:**

**DATE/TIME:**

**FRSD ID = FSR10965**

**TRVL NUM = TRVL-16-034**

**PRINTED ON 11/30/2015**

**A-6003-618 (REV 2)**





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FedEx® Tracking

**775152447577**

Ship date	Actual delivery
<b>Tue 12/08/2015</b>	<b>Wed 12/09/2015 9:18 am</b>
RICHLAND, WA US	<b>Delivered</b>
	<i>Signed for by: B DANIELS</i>
	EARTH CITY, MO US

Travel History

Date/Time	Activity	Location
<b>12/09/2015 - Wednesday</b>		
9:18 am	Delivered	EARTH CITY, MO
7:16 am	On FedEx vehicle for delivery	EARTH CITY, MO
7:10 am	At local FedEx facility	EARTH CITY, MO
5:12 am	At destination sort facility	BERKELEY, MO
4:25 am	Departed FedEx location	MEMPHIS, TN
12:41 am	Arrived at FedEx location	MEMPHIS, TN
<b>12/08/2015 - Tuesday</b>		
5:07 pm	Left FedEx origin facility	PASCO, WA
3:40 pm	Shipment information sent to FedEx	
3:24 pm	Picked up	PASCO, WA

Shipment Facts

<b>Tracking number</b>	775152447577	<b>Service</b>	FedEx Priority Overnight
<b>Weight</b>	88 lbs / 39.92 kgs	<b>Delivered To</b>	Shipping/Receiving
<b>Total pieces</b>	1	<b>Total shipment weight</b>	88 lbs / 39.92 kgs
<b>Shipper reference</b>	GWS-482	<b>Packaging</b>	Your Packaging
<b>Special handling section</b>	Deliver Weekday		



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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.
B	Estimated result. Result is less than the RL, but greater than MDL

## 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)

Client: CH2M Hill Plateau Remediation Company  
Project/Site: F15-005

TestAmerica Job ID: 160-15282-2  
SDG: SL2055

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
415.1	TOC	MCAWW	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



Client: CH2M Hill Plateau Remediation Company  
Project/Site: F15-005

TestAmerica Job ID: 160-15282-2  
SDG: SL2055

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
160-15282-3	B33YB9	Water	12/08/15 10:45	12/09/15 13:33
160-15282-4	B33YB1	Water	12/08/15 08:25	12/09/15 13:33

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~~December 21, 2015~~  
Client Sample Results

Client: CH2M Hill Plateau Remediation Company  
Project/Site: F15-005

TestAmerica Job ID: 160-15282-2  
SDG: SL2055

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

**Client Sample ID: B33YB9**  
**Date Collected: 12/08/15 10:45**  
**Date Received: 12/09/15 13:33**

**Lab Sample ID: 160-15282-3**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	0.34	U	2.0	0.34	ug/L			12/10/15 14:55	1
Carbon tetrachloride	0.13	U	1.0	0.13	ug/L			12/10/15 14:55	1
Chloroform	0.10	U	1.0	0.10	ug/L			12/10/15 14:55	1
Chloromethane	0.080	U	2.0	0.080	ug/L			12/10/15 14:55	1
cis-1,2-Dichloroethylene	0.090	U	1.0	0.090	ug/L			12/10/15 14:55	1
<b>Methylene Chloride</b>	<b>1.6</b>		1.0	0.27	ug/L			12/10/15 14:55	1
Trichloroethene	0.25	U	1.0	0.25	ug/L			12/10/15 14:55	1
Vinyl chloride	0.080	U	2.0	0.080	ug/L			12/10/15 14:55	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	93		75 - 129					12/10/15 14:55	1
4-Bromofluorobenzene (Surr)	97		81 - 130					12/10/15 14:55	1
Dibromofluoromethane (Surr)	93		81 - 124					12/10/15 14:55	1
Toluene-d8 (Surr)	96		87 - 128					12/10/15 14:55	1

**Client Sample ID: B33YB1**  
**Date Collected: 12/08/15 08:25**  
**Date Received: 12/09/15 13:33**

**Lab Sample ID: 160-15282-4**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	0.34	U	2.0	0.34	ug/L			12/10/15 15:20	1
Carbon tetrachloride	0.13	U	1.0	0.13	ug/L			12/10/15 15:20	1
Chloroform	0.10	U	1.0	0.10	ug/L			12/10/15 15:20	1
Chloromethane	0.080	U	2.0	0.080	ug/L			12/10/15 15:20	1
cis-1,2-Dichloroethylene	0.090	U	1.0	0.090	ug/L			12/10/15 15:20	1
Methylene Chloride	0.27	U	1.0	0.27	ug/L			12/10/15 15:20	1
Trichloroethene	0.25	U	1.0	0.25	ug/L			12/10/15 15:20	1
Vinyl chloride	0.080	U	2.0	0.080	ug/L			12/10/15 15:20	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	97		75 - 129					12/10/15 15:20	1
4-Bromofluorobenzene (Surr)	95		81 - 130					12/10/15 15:20	1
Dibromofluoromethane (Surr)	94		81 - 124					12/10/15 15:20	1
Toluene-d8 (Surr)	94		87 - 128					12/10/15 15:20	1

**General Chemistry**

**Client Sample ID: B33YB1**  
**Date Collected: 12/08/15 08:25**  
**Date Received: 12/09/15 13:33**

**Lab Sample ID: 160-15282-4**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Total Dissolved Solids (TDS)</b>	<b>419</b>		5.0	3.5	mg/L			12/10/15 07:57	1
Total Suspended Solids	4.0	U	4.0	4.0	mg/L			12/10/15 07:43	1
<b>Alkalinity</b>	<b>116</b>		5.0	0.54	mg/L			12/11/15 08:04	1
<b>Total Organic Carbon</b>	<b>0.70</b>	<b>B</b>	1.0	0.35	mg/L			12/14/15 17:51	1

Client: CH2M Hill Plateau Remediation Company  
Project/Site: F15-005

TestAmerica Job ID: 160-15282-2  
SDG: SL2055

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

**Lab Sample ID: MB 160-226481/7**  
**Matrix: Water**  
**Analysis Batch: 226481**

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	0.34	U	2.0	0.34	ug/L			12/10/15 08:29	1
Carbon tetrachloride	0.13	U	1.0	0.13	ug/L			12/10/15 08:29	1
Chloroform	0.10	U	1.0	0.10	ug/L			12/10/15 08:29	1
Chloromethane	0.080	U	2.0	0.080	ug/L			12/10/15 08:29	1
cis-1,2-Dichloroethylene	0.090	U	1.0	0.090	ug/L			12/10/15 08:29	1
Methylene Chloride	0.27	U	1.0	0.27	ug/L			12/10/15 08:29	1
Trichloroethene	0.25	U	1.0	0.25	ug/L			12/10/15 08:29	1
Vinyl chloride	0.080	U	2.0	0.080	ug/L			12/10/15 08:29	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	99		75 - 129		12/10/15 08:29	1
4-Bromofluorobenzene (Surr)	98		81 - 130		12/10/15 08:29	1
Dibromofluoromethane (Surr)	94		81 - 124		12/10/15 08:29	1
Toluene-d8 (Surr)	98		87 - 128		12/10/15 08:29	1

**Lab Sample ID: LCS 160-226481/4**  
**Matrix: Water**  
**Analysis Batch: 226481**

**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	9.42		ug/L		94	69 - 129
Carbon tetrachloride	10.0	10.0		ug/L		100	83 - 125
Chloroform	10.0	9.91		ug/L		99	80 - 120
Chloromethane	10.0	9.55		ug/L		96	72 - 124
cis-1,2-Dichloroethylene	10.0	9.68		ug/L		97	80 - 120
Methylene Chloride	10.0	9.69		ug/L		97	80 - 120
Trichloroethene	10.0	9.98		ug/L		100	80 - 120
Vinyl chloride	10.0	9.26		ug/L		93	77 - 122

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	98		75 - 129
4-Bromofluorobenzene (Surr)	100		81 - 130
Dibromofluoromethane (Surr)	94		81 - 124
Toluene-d8 (Surr)	98		87 - 128

**Lab Sample ID: LCSD 160-226481/5**  
**Matrix: Water**  
**Analysis Batch: 226481**

**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	10.9		ug/L		109	69 - 129	15	20
Carbon tetrachloride	10.0	10.3		ug/L		103	83 - 125	3	20
Chloroform	10.0	10.3		ug/L		103	80 - 120	4	20
Chloromethane	10.0	9.88		ug/L		99	72 - 124	3	20
cis-1,2-Dichloroethylene	10.0	9.94		ug/L		99	80 - 120	3	20
Methylene Chloride	10.0	10.2		ug/L		102	80 - 120	5	20
Trichloroethene	10.0	10.2		ug/L		102	80 - 120	2	20

TestAmerica St. Louis

Client: CH2M Hill Plateau Remediation Company  
 Project/Site: F15-005

TestAmerica Job ID: 160-15282-2  
 SDG: SL2055

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

**Lab Sample ID: LCSD 160-226481/5**  
**Matrix: Water**  
**Analysis Batch: 226481**

**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	
Vinyl chloride	10.0	9.49		ug/L		95	77 - 122	2	20	
<b>Surrogate</b>	<b>%Recovery</b>	<b>LCSD Qualifier</b>	<b>Limits</b>							
1,2-Dichloroethane-d4 (Surr)	105		75 - 129							
4-Bromofluorobenzene (Surr)	100		81 - 130							
Dibromofluoromethane (Surr)	98		81 - 124							
Toluene-d8 (Surr)	99		87 - 128							

**Lab Sample ID: 160-15256-A-16 MS**  
**Matrix: Water**  
**Analysis Batch: 226481**

**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	0.34	U	10.0	9.84		ug/L		98	50 - 137	
Carbon tetrachloride	0.13	U	10.0	10.2		ug/L		102	77 - 131	
Chloroform	0.10	U	10.0	10.2		ug/L		102	80 - 120	
Chloromethane	0.080	U	10.0	9.70		ug/L		97	62 - 132	
cis-1,2-Dichloroethylene	0.090	U	10.0	9.88		ug/L		99	80 - 120	
Methylene Chloride	0.27	U	10.0	10.9		ug/L		109	80 - 120	
Trichloroethene	0.25	U	10.0	10.2		ug/L		102	81 - 125	
Vinyl chloride	0.080	U	10.0	9.97		ug/L		100	70 - 129	
<b>Surrogate</b>	<b>%Recovery</b>	<b>MS Qualifier</b>	<b>Limits</b>							
1,2-Dichloroethane-d4 (Surr)	103		75 - 129							
4-Bromofluorobenzene (Surr)	102		81 - 130							
Dibromofluoromethane (Surr)	97		81 - 124							
Toluene-d8 (Surr)	100		87 - 128							

**Lab Sample ID: 160-15256-A-16 MSD**  
**Matrix: Water**  
**Analysis Batch: 226481**

**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	0.34	U	10.0	10.0		ug/L		100	50 - 137	2	20
Carbon tetrachloride	0.13	U	10.0	10.0		ug/L		100	77 - 131	2	20
Chloroform	0.10	U	10.0	10.0		ug/L		100	80 - 120	2	20
Chloromethane	0.080	U	10.0	9.94		ug/L		99	62 - 132	2	20
cis-1,2-Dichloroethylene	0.090	U	10.0	9.82		ug/L		98	80 - 120	1	20
Methylene Chloride	0.27	U	10.0	10.7		ug/L		107	80 - 120	2	20
Trichloroethene	0.25	U	10.0	9.94		ug/L		99	81 - 125	3	20
Vinyl chloride	0.080	U	10.0	9.85		ug/L		99	70 - 129	1	20
<b>Surrogate</b>	<b>%Recovery</b>	<b>MSD Qualifier</b>	<b>Limits</b>								
1,2-Dichloroethane-d4 (Surr)	96		75 - 129								
4-Bromofluorobenzene (Surr)	98		81 - 130								
Dibromofluoromethane (Surr)	93		81 - 124								
Toluene-d8 (Surr)	97		87 - 128								

Client: CH2M Hill Plateau Remediation Company  
Project/Site: F15-005

TestAmerica Job ID: 160-15282-2  
SDG: SL2055

**Method: 160.1 - Solids, Total Dissolved (TDS)**

Lab Sample ID: MB 160-226501/1  
Matrix: Water  
Analysis Batch: 226501

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			12/10/15 07:57	1

Lab Sample ID: LCS 160-226501/2  
Matrix: Water  
Analysis Batch: 226501

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	503.0		mg/L		101	90 - 110

Lab Sample ID: 160-15282-4 DU  
Matrix: Water  
Analysis Batch: 226501

Client Sample ID: B33YB1  
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids (TDS)	419		424.0		mg/L		3	20

**Method: 160.2 - Solids, Total Suspended (TSS)**

Lab Sample ID: MB 160-226492/1  
Matrix: Water  
Analysis Batch: 226492

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			12/10/15 07:43	1

Lab Sample ID: LCS 160-226492/2  
Matrix: Water  
Analysis Batch: 226492

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	496.0		mg/L		99	78 - 124

Lab Sample ID: 160-15282-4 DU  
Matrix: Water  
Analysis Batch: 226492

Client Sample ID: B33YB1  
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	20

**Method: 310.1 - Alkalinity**

Lab Sample ID: MB 160-226695/1  
Matrix: Water  
Analysis Batch: 226695

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			12/11/15 08:04	1

Client: CH2M Hill Plateau Remediation Company  
Project/Site: F15-005

TestAmerica Job ID: 160-15282-2  
SDG: SL2055

**Method: 310.1 - Alkalinity (Continued)**

Lab Sample ID: HLCS 160-226695/3  
Matrix: Water  
Analysis Batch: 226695

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

Analyte	Spike Added	HLCS Result	HLCS Qualifier	Unit	D	%Rec	%Rec. Limits
Alkalinity	400	376.0		mg/L		94	90 - 110

Lab Sample ID: LCS 160-226695/2  
Matrix: Water  
Analysis Batch: 226695

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: 160-15263-A-3 MS  
Matrix: Water  
Analysis Batch: 226695

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	91.0		100	185.0		mg/L		94	80 - 120

Lab Sample ID: 160-15263-A-3 DU  
Matrix: Water  
Analysis Batch: 226695

Client Sample ID: Duplicate  
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Alkalinity	91.0		92.00		mg/L		1	20

**Method: 415.1 - TOC**

Lab Sample ID: MB 160-227442/5  
Matrix: Water  
Analysis Batch: 227442

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	0.35	U	1.0	0.35	mg/L			12/14/15 16:14	1

Lab Sample ID: LCS 160-227442/6  
Matrix: Water  
Analysis Batch: 227442

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	9.57		mg/L		96	90 - 110

Lab Sample ID: 160-15282-B-5 MS  
Matrix: Water  
Analysis Batch: 227442

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	2.0		5.00	6.46		mg/L		89	76 - 120

Client: CH2M Hill Plateau Remediation Company  
 Project/Site: F15-005

TestAmerica Job ID: 160-15282-2  
 SDG: SL2055

**Method: 415.1 - TOC (Continued)**

Lab Sample ID: 160-15282-B-5 DU  
 Matrix: Water  
 Analysis Batch: 227442

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	2.0		1.95		mg/L		3	20

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

December 21, 2015  
**QC Association Summary**

Client: CH2M Hill Plateau Remediation Company  
 Project/Site: F15-005

TestAmerica Job ID: 160-15282-2  
 SDG: SL2055

**GC/MS VOA**

**Analysis Batch: 226481**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-15256-A-16 MS	Matrix Spike	Total/NA	Water	8260C	
160-15256-A-16 MSD	Matrix Spike Duplicate	Total/NA	Water	8260C	
160-15282-3	B33YB9	Total/NA	Water	8260C	
160-15282-4	B33YB1	Total/NA	Water	8260C	
LCS 160-226481/4	Lab Control Sample	Total/NA	Water	8260C	
LCS 160-226481/5	Lab Control Sample Dup	Total/NA	Water	8260C	
MB 160-226481/7	Method Blank	Total/NA	Water	8260C	

**General Chemistry**

**Analysis Batch: 226492**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-15282-4	B33YB1	Total/NA	Water	160.2	
160-15282-4 DU	B33YB1	Total/NA	Water	160.2	
LCS 160-226492/2	Lab Control Sample	Total/NA	Water	160.2	
MB 160-226492/1	Method Blank	Total/NA	Water	160.2	

**Analysis Batch: 226501**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-15282-4	B33YB1	Total/NA	Water	160.1	
160-15282-4 DU	B33YB1	Total/NA	Water	160.1	
LCS 160-226501/2	Lab Control Sample	Total/NA	Water	160.1	
MB 160-226501/1	Method Blank	Total/NA	Water	160.1	

**Analysis Batch: 226695**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-15263-A-3 DU	Duplicate	Total/NA	Water	310.1	
160-15263-A-3 MS	Matrix Spike	Total/NA	Water	310.1	
160-15282-4	B33YB1	Total/NA	Water	310.1	
HLCS 160-226695/3	Lab Control Sample	Total/NA	Water	310.1	
LCS 160-226695/2	Lab Control Sample	Total/NA	Water	310.1	
MB 160-226695/1	Method Blank	Total/NA	Water	310.1	

**Analysis Batch: 227442**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-15282-4	B33YB1	Total/NA	Water	415.1	
160-15282-B-5 DU	Duplicate	Total/NA	Water	415.1	
160-15282-B-5 MS	Matrix Spike	Total/NA	Water	415.1	
LCS 160-227442/6	Lab Control Sample	Total/NA	Water	415.1	
MB 160-227442/5	Method Blank	Total/NA	Water	415.1	

December 21, 2015  
Surrogate Summary

Client: CH2M Hill Plateau Remediation Company  
Project/Site: F15-005

TestAmerica Job ID: 160-15282-2  
SDG: SL2055

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)
160-15256-A-16 MS	Matrix Spike	103	102	97	100
160-15256-A-16 MSD	Matrix Spike Duplicate	96	98	93	97
160-15282-3	B33YB9	93	97	93	96
160-15282-4	B33YB1	97	95	94	94
LCS 160-226481/4	Lab Control Sample	98	100	94	98
LCSD 160-226481/5	Lab Control Sample Dup	105	100	98	99
MB 160-226481/7	Method Blank	99	98	94	98

Surrogate Legend

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

