

7/27/2016

# 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: 160-17995-1

TestAmerica Sample Delivery Group: SL2230  
Client Project/Site: F13-002

For:

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

Attn: Mr. Scot Fitzgerald



Authorized for release by:  
7/27/2016 3:54:52 PM

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

### LINKS

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[www.testamericainc.com](http://www.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.*

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## Case Narrative

Client: CH2M Hill Plateau Remediation Company  
Project/Site: F13-002

TestAmerica Job ID: 160-17995-1  
SDG: SL2230

**Job ID: 160-17995-1**

**Laboratory: TestAmerica St. Louis**

**Narrative**

**CASE NARRATIVE**

CH2M Hill Plateau Remediation Company  
P.O. Box 1600  
Richland, Washington 99352  
July 27, 2016  
Attention: Scot Fitzgerald

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SDG : SL2230  
Number of Samples : 1 sample  
Sample Matrix : Water  
Data Deliverable : Summary  
Date SDG Closed : June 29, 2016

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II. Introduction

On June 29, 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: F13-002

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: F13-002

TestAmerica Job ID: 160-17995-1  
SDG: SL2230

### Job ID: 160-17995-1 (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: 258631

The continuing calibration verification (CCV) associated with batch 160-258631 recovered above the upper control limit for Chloromethane and Vinyl chloride. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data has been reported. (CCVIS 160-258631/5).

#### TDS

##### Batch: 259267

The following sample in TDS batch 160-259267 was analyzed within 7 day hold, but was analyzed at dilution due to the sample conductivity reading which indicated that dilution was required. However, that dilution yielded a result of non-detect (ND) with an elevated reporting limit (RL), which made out of hold, undiluted re-analysis required. As a result, the out of hold undiluted re-analysis is reportable, but we do not have an undiluted duplicate for precision. Note: Re-analysis was performed 1 day out of holding time, which was within 2x hold. B35K26 (160-17995-1)

#### Cyanide

##### Batch: 258759

## Case Narrative

Client: CH2M Hill Plateau Remediation Company  
Project/Site: F13-002

TestAmerica Job ID: 160-17995-1  
SDG: SL2230

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**Job ID: 160-17995-1 (Continued)**

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

Due to an error that occurred in the program software during analysis of the following matrix spike (MS) in CN preparation batch 160-258624 and analytical batch 160-258759, a closing CCV/CCB was not analyzed: (160-17822-E-6-C MS). As it only affected the matrix spike (MS), and samples go out of hold tomorrow, this data is being reported with this narration.

**TIC****Batch: 260337**

The MS recovery in TIC batch 160-260337 was outside QC limits due to matrix interference/carryover throughout the run: (160-18000-A-5 MS). This analyte has been qualified accordingly with an "N" flag in the associated samples.

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

**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

## Login Sample Receipt Checklist

Client: CH2M Hill Plateau Remediation Company

Job Number: 160-17995-1

SDG Number: SL2230

Login Number: 17995

List Source: TestAmerica St. Louis

List Number: 1

Creator: Clarke, Jill C

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	0.8°
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	

**CH2MHill Plateau Remediation Company**

**COLLECTOR** CHRIS FULTON CHPRC SL2220

**SAMPLING LOCATION** 299-E33-350, YE29 Wk 6 - FTB

**ICE CHEST NO.** GWS-554

**SHIPPED TO** TestAmerica St. Louis

**CHAIN OF CUSTODY / SAMPLE ANALYSIS REQUEST**

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

**PROJECT COORDINATOR** SUMNER, LC

**PRICE CODE** 7H **7H** **DATA TURNAROUND** 30 Days / 30 Days

**PROJECT DESIGNATION** 200W Pump & Treat - Extraction Well Water Sampling

**SAF NO.** F13-002

**AIR QUALITY**

**FIELD LOGBOOK NO.** HNF-491-15 **ACTUAL SAMPLE DEPTH** N/A

**COA** 303111 **METHOD OF SHIPMENT** FEDERAL EXPRESS

**OFFSITE PROPERTY NO.** N/A **BILL OF LADING/AIR BILL NO.** 77662854 4874

**PAGE 1 OF 1**

MATRIX*	PREPARATION	PRESERVATION	HOLDING TIME	TYPE OF CONTAINER	NO. OF CONTAINER(S)	VOLUME	SAMPLE ANALYSIS	SAMPLE DATE	SAMPLE TIME
A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SF=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	NaOH to pH >=12/Cool <=6C 14 Days	HCl or H2SO4 to pH <2/Cool 14 Days	7 Days	G/P	1	60mL	9012_CYANIDE: COMMON; 310.1_ALKALINITY: COMMON (Add-on); SEE ITEM (1) IN SPECIAL INSTRUCTIONS	JUN 28 2016	0945
	Cool <=6C 14 Days	Cool <=6C 7 Days	7 Days	G/P	1	125mL	160.1_TDS: COMMON;		
	28 Days	28 Days	28 Days	aG	1	60mL	9060_TIC: COMMON;		
	28 Days	28 Days	28 Days	aG	1	60mL	9060_TIC: COMMON;		
	28 Days	28 Days	28 Days	aG	1	60mL	9060_TIC: COMMON;		
	28 Days	28 Days	28 Days	aG	1	60mL	9060_TIC: COMMON;		

**SPECIAL HANDLING AND/OR STORAGE**

**SAMPLE NO.** B35K26 **MATRIX\*** WATER

**CHAIN OF POSSESSION**

RELINQUISHED BY/REMOVED FROM	DATE/TIME	SIGN/PRINT NAMES	RECEIVED BY/STORED IN	DATE/TIME
CHRIS FULTON	JUN 28 2016 1246		Dan Woehle CHPRC	JUN 28 2016 1246
RELINQUISHED BY/REMOVED FROM	DATE/TIME		RECEIVED BY/STORED IN	DATE/TIME
Dan Woehle	JUN 28 2016 1400		JILL CLARK & Jill Clark	6-28-16 0920
RELINQUISHED BY/REMOVED FROM	DATE/TIME		RECEIVED BY/STORED IN	DATE/TIME
FEDEX				
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
RELINQUISHED BY/REMOVED FROM	DATE/TIME		RECEIVED BY/STORED IN	DATE/TIME

**SPECIAL INSTRUCTIONS**  
TRVL-16-137  
(1) 8260\_VOA\_GCMS: CH 01 {Chloromethane}; 8260\_VOA\_GCMS: COMMON {Carbon tetrachloride, Chloroform, Methylene chloride, Trichloroethene, Vinyl chloride}; 8260\_VOA\_GCMS: COMMON (Add-on) {cis-1,2-Dichloroethylene};

**LABORATORY SECTION** RECEIVED BY

**FINAL SAMPLE DISPOSITION** DISPOSAL METHOD

**PRINTED ON** 5/5/2016 **FRS ID = FSR32149** **TRVL NUM = TRVL-16-137** **A-6003-618 (REV 2)**

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**776628544874**

Ship date: <b>Tue 6/28/2016</b>	Actual delivery: <b>Wed 6/29/2016 9:19 am</b>
RICHLAND, WA US	<b>Delivered</b> <i>Signed for by: J CLARKE</i>
	EARTH CITY, MO US

Travel History

Date/Time	Activity	Location
<b>6/29/2016 - Wednesday</b>		
9:19 am	Delivered	EARTH CITY, MO
7:17 am	On FedEx vehicle for delivery	EARTH CITY, MO
7:12 am	At local FedEx facility	EARTH CITY, MO
5:22 am	At destination sort facility	BERKELEY, MO
4:28 am	Departed FedEx location	MEMPHIS, TN
1:35 am	Arrived at FedEx location	MEMPHIS, TN
<b>6/28/2016 - Tuesday</b>		
5:13 pm	Left FedEx origin facility	PASCO, WA
3:46 pm	Shipment information sent to FedEx	
3:23 pm	Picked up	PASCO, WA

Shipment Facts

<b>Tracking number</b>	776628544874	<b>Service</b>	FedEx Standard Overnight
<b>Weight</b>	47 lbs / 21.32 kgs	<b>Delivered To</b>	Shipping/Receiving
<b>Total pieces</b>	1	<b>Total shipment weight</b>	47 lbs / 21.32 kgs
<b>Terms</b>	Recipient	<b>Shipper reference</b>	GWS-554
<b>Packaging</b>	Your Packaging	<b>Special handling section</b>	Deliver Weekday, Additional Handling Surcharge



Search or tracking number | Subr

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## Definitions/Glossary

Client: CH2M Hill Plateau Remediation Company  
Project/Site: F13-002

TestAmerica Job ID: 160-17995-1  
SDG: SL2230

## Qualifiers

### GC/MS VOA

Qualifier	Qualifier Description
U	Analyzed for but not detected.

### GC/MS VOA TICs

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

### General Chemistry

Qualifier	Qualifier Description
U	Analyzed for but not detected.
N	MS, MSD: Spike recovery is outside acceptance limits.
D	The reported value is from a dilution.

## 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: F13-002

TestAmerica Job ID: 160-17995-1  
SDG: SL2230

Method	Method Description	Protocol	Laboratory
8260C	Volatile Organic Compounds (GC/MS)	SW846	TAL SL
160.1	Solids, Total Dissolved (TDS)	MCAWW	TAL SL
310.1	Alkalinity	MCAWW	TAL SL
9012B	Cyanide, Total and/or Amenable	SW846	TAL SL
9060	Organic Carbon, Total (TOC)	SW846	TAL SL
9060	Carbon, Total and Total Inorganic	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

7/27/2016

## Sample Summary

Client: CH2M Hill Plateau Remediation Company  
Project/Site: F13-002

TestAmerica Job ID: 160-17995-1  
SDG: SL2230

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Lab Sample ID	Client Sample ID	Matrix	Collected	Received
160-17995-1	B35K26	Water	06/28/16 09:45	06/29/16 09:20

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## Client Sample Results

Client: CH2M Hill Plateau Remediation Company  
Project/Site: F13-002

TestAmerica Job ID: 160-17995-1  
SDG: SL2230

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

Client Sample ID: B35K26  
Date Collected: 06/28/16 09:45  
Date Received: 06/29/16 09:20

Lab Sample ID: 160-17995-1  
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon tetrachloride	0.18	U	1.0	0.18	ug/L			06/30/16 10:45	1
<b>Chloroform</b>	<b>1.5</b>		1.0	0.10	ug/L			06/30/16 10:45	1
Chloromethane	0.10	U	2.0	0.10	ug/L			06/30/16 10:45	1
cis-1,2-Dichloroethylene	0.10	U	1.0	0.10	ug/L			06/30/16 10:45	1
Methylene Chloride	0.27	U	1.0	0.27	ug/L			06/30/16 10:45	1
Trichloroethene	0.25	U	1.0	0.25	ug/L			06/30/16 10:45	1
Vinyl chloride	0.19	U	2.0	0.19	ug/L			06/30/16 10:45	1

Tentatively Identified Compound	Est. Result	Qualifier	Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
Tentatively Identified Compound	None		ug/L					06/30/16 10:45	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	113		81 - 130		06/30/16 10:45	1
Dibromofluoromethane (Surr)	93		81 - 124		06/30/16 10:45	1
1,2-Dichloroethane-d4 (Surr)	91		75 - 129		06/30/16 10:45	1
Toluene-d8 (Surr)	108		87 - 128		06/30/16 10:45	1

## General Chemistry

Client Sample ID: B35K26  
Date Collected: 06/28/16 09:45  
Date Received: 06/29/16 09:20

Lab Sample ID: 160-17995-1  
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Total Dissolved Solids (TDS)</b>	<b>11.0</b>		5.0	3.5	mg/L			07/06/16 06:58	1
<b>Bicarbonate Alkalinity as CaCO3</b>	<b>8.0</b>		5.0	0.54	mg/L			06/30/16 08:57	1
Carbonate Alkalinity as CaCO3	0.54	U	5.0	0.54	mg/L			06/30/16 08:57	1
Hydroxide Alkalinity	0.54	U	5.0	0.54	mg/L			06/30/16 08:57	1
Cyanide, Total	3.1	U	10.0	3.1	ug/L		06/29/16 19:45	06/29/16 23:13	1
<b>Total Inorganic Carbon</b>	<b>1.1</b>	<b>N</b>	1.0	0.22	mg/L			07/12/16 14:36	1
Total Organic Carbon	0.72	U	1.0	0.72	mg/L			07/05/16 21:41	1

## QC Sample Results

Client: CH2M Hill Plateau Remediation Company  
Project/Site: F13-002TestAmerica Job ID: 160-17995-1  
SDG: SL2230

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

Lab Sample ID: MB 160-258631/9

Matrix: Water

Analysis Batch: 258631

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon tetrachloride	0.18	U	1.0	0.18	ug/L			06/30/16 08:24	1
Chloroform	0.10	U	1.0	0.10	ug/L			06/30/16 08:24	1
Chloromethane	0.10	U	2.0	0.10	ug/L			06/30/16 08:24	1
cis-1,2-Dichloroethylene	0.10	U	1.0	0.10	ug/L			06/30/16 08:24	1
Methylene Chloride	0.27	U	1.0	0.27	ug/L			06/30/16 08:24	1
Trichloroethene	0.25	U	1.0	0.25	ug/L			06/30/16 08:24	1
Vinyl chloride	0.19	U	2.0	0.19	ug/L			06/30/16 08:24	1

Tentatively Identified Compound	MB Est. Result	MB Qualifier	Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
Tentatively Identified Compound	None		ug/L					06/30/16 08:24	1
Naphthalene	0.214	J	ug/L		16.20	91-20-3		06/30/16 08:24	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	112		81 - 130		06/30/16 08:24	1
Dibromofluoromethane (Surr)	91		81 - 124		06/30/16 08:24	1
1,2-Dichloroethane-d4 (Surr)	87		75 - 129		06/30/16 08:24	1
Toluene-d8 (Surr)	104		87 - 128		06/30/16 08:24	1

Lab Sample ID: LCS 160-258631/6

Matrix: Water

Analysis Batch: 258631

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Carbon tetrachloride	10.0	10.3		ug/L		103	83 - 125
Chloroform	10.0	10.1		ug/L		101	80 - 120
Chloromethane	10.0	11.2		ug/L		112	72 - 124
cis-1,2-Dichloroethylene	10.0	9.81		ug/L		98	80 - 120
Methylene Chloride	10.0	9.82		ug/L		98	80 - 120
Trichloroethene	10.0	10.1		ug/L		101	80 - 120
Vinyl chloride	10.0	10.8		ug/L		108	77 - 122

Surrogate	LCS %Recovery	LCS Qualifier	Limits
4-Bromofluorobenzene (Surr)	104		81 - 130
Dibromofluoromethane (Surr)	97		81 - 124
1,2-Dichloroethane-d4 (Surr)	94		75 - 129
Toluene-d8 (Surr)	102		87 - 128

Lab Sample ID: LCSD 160-258631/7

Matrix: Water

Analysis Batch: 258631

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
Carbon tetrachloride	10.0	10.6		ug/L		106	83 - 125	3	20
Chloroform	10.0	10.5		ug/L		105	80 - 120	4	20
Chloromethane	10.0	11.3		ug/L		113	72 - 124	0	20
cis-1,2-Dichloroethylene	10.0	10.3		ug/L		103	80 - 120	5	20
Methylene Chloride	10.0	10.3		ug/L		103	80 - 120	5	20

TestAmerica St. Louis

## QC Sample Results

Client: CH2M Hill Plateau Remediation Company  
Project/Site: F13-002TestAmerica Job ID: 160-17995-1  
SDG: SL2230

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

Lab Sample ID: LCSD 160-258631/7

Matrix: Water

Analysis Batch: 258631

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
Trichloroethene	10.0	10.7		ug/L		107	80 - 120	5	20
Vinyl chloride	10.0	11.1		ug/L		111	77 - 122	2	20

Surrogate	LCSD %Recovery	LCSD Qualifier	LCSD Limits
4-Bromofluorobenzene (Surr)	104		81 - 130
Dibromofluoromethane (Surr)	98		81 - 124
1,2-Dichloroethane-d4 (Surr)	95		75 - 129
Toluene-d8 (Surr)	101		87 - 128

Lab Sample ID: 160-17993-B-1 MS

Matrix: Water

Analysis Batch: 258631

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
Carbon tetrachloride	0.18	U	10.0	9.59		ug/L		96	77 - 131
Chloroform	15		10.0	24.0		ug/L		90	80 - 120
Chloromethane	0.10	U	10.0	10.7		ug/L		107	62 - 132
cis-1,2-Dichloroethylene	0.10	U	10.0	9.61		ug/L		96	80 - 120
Methylene Chloride	0.27	U	10.0	9.61		ug/L		96	80 - 120
Trichloroethene	0.25	U	10.0	10.0		ug/L		100	81 - 125
Vinyl chloride	0.19	U	10.0	9.99		ug/L		100	70 - 129

Surrogate	MS %Recovery	MS Qualifier	MS Limits
4-Bromofluorobenzene (Surr)	102		81 - 130
Dibromofluoromethane (Surr)	93		81 - 124
1,2-Dichloroethane-d4 (Surr)	89		75 - 129
Toluene-d8 (Surr)	100		87 - 128

Lab Sample ID: 160-17993-C-1 MSD

Matrix: Water

Analysis Batch: 258631

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
Carbon tetrachloride	0.18	U	10.0	9.91		ug/L		99	77 - 131	3	20
Chloroform	15		10.0	24.6		ug/L		97	80 - 120	3	20
Chloromethane	0.10	U	10.0	11.5		ug/L		115	62 - 132	7	20
cis-1,2-Dichloroethylene	0.10	U	10.0	9.91		ug/L		99	80 - 120	3	20
Methylene Chloride	0.27	U	10.0	9.74		ug/L		97	80 - 120	1	20
Trichloroethene	0.25	U	10.0	9.90		ug/L		99	81 - 125	1	20
Vinyl chloride	0.19	U	10.0	10.9		ug/L		109	70 - 129	9	20

Surrogate	MSD %Recovery	MSD Qualifier	MSD Limits
4-Bromofluorobenzene (Surr)	105		81 - 130
Dibromofluoromethane (Surr)	97		81 - 124
1,2-Dichloroethane-d4 (Surr)	93		75 - 129
Toluene-d8 (Surr)	101		87 - 128

TestAmerica St. Louis

QC Sample Results

Client: CH2M Hill Plateau Remediation Company  
Project/Site: F13-002

TestAmerica Job ID: 160-17995-1  
SDG: SL2230

Method: 160.1 - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 160-259267/1  
Matrix: Water  
Analysis Batch: 259267

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			07/06/16 06:58	1

Lab Sample ID: LCS 160-259267/2  
Matrix: Water  
Analysis Batch: 259267

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

Method: 310.1 - Alkalinity

Lab Sample ID: MB 160-258642/1  
Matrix: Water  
Analysis Batch: 258642

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3	0.54	U	5.0	0.54	mg/L			06/30/16 08:57	1
Carbonate Alkalinity as CaCO3	0.54	U	5.0	0.54	mg/L			06/30/16 08:57	1
Hydroxide Alkalinity	0.54	U	5.0	0.54	mg/L			06/30/16 08:57	1

Lab Sample ID: HLCS 160-258642/3  
Matrix: Water  
Analysis Batch: 258642

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

Analyte	Spike Added	HLCS Result	HLCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bicarbonate Alkalinity as CaCO3	400	380.0		mg/L		95	90 - 110

Lab Sample ID: LCS 160-258642/2  
Matrix: Water  
Analysis Batch: 258642

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bicarbonate Alkalinity as CaCO3	200	189.0		mg/L		95	90 - 110

Lab Sample ID: 160-17941-E-1 MS  
Matrix: Water  
Analysis Batch: 258642

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
Bicarbonate Alkalinity as CaCO3	108		100	203.0		mg/L		95	80 - 120

Lab Sample ID: 160-17941-E-1 DU  
Matrix: Water  
Analysis Batch: 258642

Client Sample ID: Duplicate  
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Bicarbonate Alkalinity as CaCO3	108		110.0		mg/L		2	20
Carbonate Alkalinity as CaCO3	0.54	U	0.54	U	mg/L		NC	20
Hydroxide Alkalinity	0.54	U	0.54	U	mg/L		NC	20

TestAmerica St. Louis

## QC Sample Results

Client: CH2M Hill Plateau Remediation Company  
Project/Site: F13-002

TestAmerica Job ID: 160-17995-1  
SDG: SL2230

## Method: 9012B - Cyanide, Total and/or Amenable

Lab Sample ID: MB 160-258624/1-A  
Matrix: Water  
Analysis Batch: 258759

Client Sample ID: Method Blank  
Prep Type: Total/NA  
Prep Batch: 258624

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	3.1	U	10.0	3.1	ug/L		06/29/16 19:45	06/29/16 22:52	1

Lab Sample ID: HLCS 160-258624/3-A  
Matrix: Water  
Analysis Batch: 258759

Client Sample ID: Lab Control Sample  
Prep Type: Total/NA  
Prep Batch: 258624

Analyte	Spike Added	HLCS Result	HLCS Qualifier	Unit	D	%Rec	Limits
Cyanide, Total	400	379.6		ug/L		95	85 - 115

Lab Sample ID: LCS 160-258624/2-A  
Matrix: Water  
Analysis Batch: 258759

Client Sample ID: Lab Control Sample  
Prep Type: Total/NA  
Prep Batch: 258624

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Cyanide, Total	200	194.6		ug/L		97	85 - 115

Lab Sample ID: 160-17822-E-6-C MS  
Matrix: Water  
Analysis Batch: 258759

Client Sample ID: Matrix Spike  
Prep Type: Total/NA  
Prep Batch: 258624

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Cyanide, Total	201		200	418.7		ug/L		109	66 - 120

Lab Sample ID: 160-17822-E-6-B DU  
Matrix: Water  
Analysis Batch: 258759

Client Sample ID: Duplicate  
Prep Type: Total/NA  
Prep Batch: 258624

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	Limit
Cyanide, Total	201		204.7		ug/L		2	20

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

Lab Sample ID: MB 160-259381/5  
Matrix: Water  
Analysis Batch: 259381

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			07/05/16 15:32	1

Lab Sample ID: LCS 160-259381/6  
Matrix: Water  
Analysis Batch: 259381

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Total Organic Carbon	10.0	9.66		mg/L		97	90 - 110

TestAmerica St. Louis

## QC Sample Results

Client: CH2M Hill Plateau Remediation Company  
Project/Site: F13-002

TestAmerica Job ID: 160-17995-1  
SDG: SL2230

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

Lab Sample ID: 160-17938-E-1 MS

Matrix: Water

Analysis Batch: 259381

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	2.4		5.00	7.04		mg/L		93	76 - 120

Lab Sample ID: 160-17938-E-1 DU

Matrix: Water

Analysis Batch: 259381

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	2.4		2.68		mg/L		12	20

## Method: 9060 - Carbon, Total and Total Inorganic

Lab Sample ID: MB 160-260337/4

Matrix: Water

Analysis Batch: 260337

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Inorganic Carbon	0.22	U	1.0	0.22	mg/L			07/12/16 13:47	1

Lab Sample ID: LCS 160-260337/5

Matrix: Water

Analysis Batch: 260337

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Inorganic Carbon	10.0	10.45		mg/L		104	85 - 129

Lab Sample ID: LCSD 160-260337/6

Matrix: Water

Analysis Batch: 260337

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Inorganic Carbon	10.0	10.07		mg/L		101	85 - 129	4	20

## Method: 9060 - Carbon, Total and Total Inorganic - DL

Lab Sample ID: 160-18000-A-5 MS ^2

Matrix: Water

Analysis Batch: 260337

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 Inorganic Carbon - DL	5.2	D N	10000	14.11	D N	mg/L		0.09	76 - 120

Lab Sample ID: 160-18000-A-5 DU ^2

Matrix: Water

Analysis Batch: 260337

Client Sample ID: Duplicate

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Inorganic Carbon - DL	5.2	D N	5.46	D	mg/L		6	20

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## QC Association Summary

Client: CH2M Hill Plateau Remediation Company  
 Project/Site: F13-002

TestAmerica Job ID: 160-17995-1  
 SDG: SL2230

## GC/MS VOA

## Analysis Batch: 258631

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-17995-1	B35K26	Total/NA	Water	8260C	
MB 160-258631/9	Method Blank	Total/NA	Water	8260C	
LCS 160-258631/6	Lab Control Sample	Total/NA	Water	8260C	
LCS D 160-258631/7	Lab Control Sample Dup	Total/NA	Water	8260C	
160-17993-B-1 MS	Matrix Spike	Total/NA	Water	8260C	
160-17993-C-1 MSD	Matrix Spike Duplicate	Total/NA	Water	8260C	

## General Chemistry

## Prep Batch: 258624

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-17995-1	B35K26	Total/NA	Water	9010C	
MB 160-258624/1-A	Method Blank	Total/NA	Water	9010C	
HLCS 160-258624/3-A	Lab Control Sample	Total/NA	Water	9010C	
LCS 160-258624/2-A	Lab Control Sample	Total/NA	Water	9010C	
160-17822-E-6-C MS	Matrix Spike	Total/NA	Water	9010C	
160-17822-E-6-B DU	Duplicate	Total/NA	Water	9010C	

## Analysis Batch: 258642

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-17995-1	B35K26	Total/NA	Water	310.1	
MB 160-258642/1	Method Blank	Total/NA	Water	310.1	
HLCS 160-258642/3	Lab Control Sample	Total/NA	Water	310.1	
LCS 160-258642/2	Lab Control Sample	Total/NA	Water	310.1	
160-17941-E-1 MS	Matrix Spike	Total/NA	Water	310.1	
160-17941-E-1 DU	Duplicate	Total/NA	Water	310.1	

## Analysis Batch: 258759

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-17995-1	B35K26	Total/NA	Water	9012B	258624
MB 160-258624/1-A	Method Blank	Total/NA	Water	9012B	258624
HLCS 160-258624/3-A	Lab Control Sample	Total/NA	Water	9012B	258624
LCS 160-258624/2-A	Lab Control Sample	Total/NA	Water	9012B	258624
160-17822-E-6-C MS	Matrix Spike	Total/NA	Water	9012B	258624
160-17822-E-6-B DU	Duplicate	Total/NA	Water	9012B	258624

## Analysis Batch: 259267

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-17995-1	B35K26	Total/NA	Water	160.1	
MB 160-259267/1	Method Blank	Total/NA	Water	160.1	
LCS 160-259267/2	Lab Control Sample	Total/NA	Water	160.1	

## Analysis Batch: 259381

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-17995-1	B35K26	Total/NA	Water	9060	
MB 160-259381/5	Method Blank	Total/NA	Water	9060	
LCS 160-259381/6	Lab Control Sample	Total/NA	Water	9060	
160-17938-E-1 MS	Matrix Spike	Total/NA	Water	9060	
160-17938-E-1 DU	Duplicate	Total/NA	Water	9060	

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## QC Association Summary

Client: CH2M Hill Plateau Remediation Company  
 Project/Site: F13-002

TestAmerica Job ID: 160-17995-1  
 SDG: SL2230

### General Chemistry (Continued)

#### Analysis Batch: 260337

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-17995-1	B35K26	Total/NA	Water	9060	
MB 160-260337/4	Method Blank	Total/NA	Water	9060	
LCS 160-260337/5	Lab Control Sample	Total/NA	Water	9060	
LCSD 160-260337/6	Lab Control Sample Dup	Total/NA	Water	9060	
160-18000-A-5 MS ^2 - DL	Matrix Spike	Total/NA	Water	9060	
160-18000-A-5 DU ^2 - DL	Duplicate	Total/NA	Water	9060	

## Surrogate Summary

Client: CH2M Hill Plateau Remediation Company  
 Project/Site: F13-002

TestAmerica Job ID: 160-17995-1  
 SDG: SL2230

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

## Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)			
		BFB (81-130)	DBFM (81-124)	12DCE (75-129)	TOL (87-128)
160-17993-B-1 MS	Matrix Spike	102	93	89	100
160-17993-C-1 MSD	Matrix Spike Duplicate	105	97	93	101
160-17995-1	B35K26	113	93	91	108
LCS 160-258631/6	Lab Control Sample	104	97	94	102
LCSD 160-258631/7	Lab Control Sample Dup	104	98	95	101
MB 160-258631/9	Method Blank	112	91	87	104

**Surrogate Legend**

BFB = 4-Bromofluorobenzene (Surr)

DBFM = Dibromofluoromethane (Surr)

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

TOL = Toluene-d8 (Surr)