July 17, 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: 160-23000-1
TestAmerica Sample Delivery Group: SL2574
Client Project/Site: I17-008

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

Attn: Mr. Scot Fitzgerald

Authorized for release by:
7/17/2017 4:14:42 PM

Jayna Awalt, Project Manager II
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LINKS

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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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Job ID: 160-23000-1

Laboratory: TestAmerica St. Louis

Narrative

CASE NARRATIVE

CH2MHill Plateau Remediation Company
P.O. Box 1600
Richland, Washington 99352
July 17, 2017
Attention: Scot Fitzgerald

SDG	: SL2574
Number of Samples	: 5 samples
Sample Matrix	: Water
Data Deliverable	: Summary
Date SDG Closed	: June 23, 2017

II. Introduction

On June 23, 5 samples were received by TestAmerica - St. Louis for 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: I17-008

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

Job ID: 160-23000-1 (Continued)

Laboratory: TestAmerica St. Louis (Continued)

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.
- **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.

ICP Metals

Batch: 317101

The native sample, matrix spike, and matrix spike duplicate (MS/MSD) associated with preparation batch 160-316896 and analytical batch 160-317101 was performed at the same dilution. Due to the additional level of analyte present in the spiked samples, the concentration of Sodium in the MS/MSD was above the instrument calibration range. The data have been reported and qualified. (160-23080-A-11-E MS) and (160-23080-A-11-F MSD)

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

WTPH Diesel

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.

Job ID: 160-23000-1 (Continued)

Laboratory: TestAmerica St. Louis (Continued)

Reviewed and approved:

Jayna Awalt
St. Louis Project Manager

Login Sample Receipt Checklist

Client: CH2M Hill Plateau Remediation Company

Job Number: 160-23000-1
SDG Number: SL2574

Login Number: 23000
List Number: 1
Creator: Taylor, Kristene N

List Source: TestAmerica St. Louis

Question	Answer	Comment
Radioactivity wasn't checked or is </= 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	2.7
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 <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

CH2MHill Plateau Remediation Company 812574

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # I17-008-033

Collector	Juan Aguilar /CHPRC	Contact/Requester	Karen Waters-Husted	Telephone No.	509-376-4650
SAF No.	I17-008	Sampling Origin	Hanford Site	Purchase Order/Charge Code	303064
Project Title	100-NR-2 GW-OU Monitoring Apatite B	Logbook No.	HNF-N-506 84 / 22	Ice Chest No.	GW5568
Shipped To (Lab)	TestAmerica St. Louis	Method of Shipment	Commercial Carrier	Bill of Lading/Air Bill No.	7794 7314 5225
Protocol	CERCLA	Priority:	30 Days PRIORITY	Offsite Property No.	N/A

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

SPECIAL INSTRUCTIONS **Hold Time** Total Activity Exemption: Yes ☑ No ☐

N/A

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B39N09	Y	W	6-22-17	0901	1x500-mL G/P	6010_METALS_ICP: COMMON	6 Months	HNO3 to pH <2
B39N05	N	W	6-22-17	0901	1x500-mL G/P	6010_METALS_ICP: COMMON	6 Months	HNO3 to pH <2

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Juan Aguilar /CHPRC		JUN 2 2 2017	1030	Curt Hoffman CHPRC		JUN 2 2 2017	1030
Curt Hoffman CHPRC		JUN 2 2 2017	1400	FEDEX			
Fed Ex				Kristene Taylor			6-23-17 0850

Matrix *

S	Soil	DS	Drum Solids
SE	Sediment	DL	Drum Liquids
SO	Solid	T	Tissue
SL	Sludge	WI	Wipe
W	Water	L	Liquid
O	Oil	V	Vegetation
A	Air	X	Other

FINAL SAMPLE DISPOSITION Disposal Method (e.g., Return to customer, per lab procedure, used in process) Disposed By Date/Time

PRINTED ON 4/26/2017 FSR ID = FSR44617 A-6004-842 (REV 2)

July 17, 2017

CH2MHill Plateau Remediation Company 82574

85165

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # I17-008-039

Collector	Juan Aguilar /CHPRC	Contact/Requester	Karen Waters-Husted	Telephone No.	509-376-4650
SAF No.	I17-008	Sampling Origin	Hanford Site	Purchase Order/Charge Code	303064
Project Title	100-NR-2 GW-OU Monitoring Apatite B	Logbook No.	HNF-N-506 84/22	Ice Chest No.	GWS-568
Shipped To (Lab)	TestAmerica St. Louis	Method of Shipment	Commercial Carrier	Bill of Lading/Air Bill No.	7794 7314 5225
Protocol	CERCLA	Priority:	30 Days PRIORITY	Offsite Property No.	N/A

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

SPECIAL INSTRUCTIONS **Hold Time** Total Activity Exemption: Yes ☑ No ☐

N/A

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B39N44	Y	W	6-22-17	1047	1x500-mL G/P	6010_METALS_ICP: COMMON	6 Months	HNO3 to pH <2
B39N39	N	W	6-22-17	1047	1x500-mL G/P	6010_METALS_ICP: COMMON	6 Months	HNO3 to pH <2

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Juan Aguilar /CHPRC			JUN 22 2017 1205	Troy Bacon CHPRC		Troy L. Bacon	JUN 22 2017 1205
Troy Bacon CHPRC		Troy L. Bacon	JUN 22 2017 1400	FEDEX			
Fed Ex				Kristene Taylor			6-23-17 0850

Matrix *

S	= Soil	DS	= Drum Solids
SE	= Sediment	DL	= Drum Liquids
SO	= Solid	T	= Tissue
SL	= Sludge	WI	= Wipe
W	= Water	L	= Liquid
O	= Oil	V	= Vegetation
A	= Air	X	= Other

FINAL SAMPLE DISPOSITION Disposal Method (e.g., Return to customer, per lab procedure, used in process) Disposed By Date/Time

PRINTED ON 4/26/2017 FSR ID = FSR34740 A-6004-842 (REV 2)

CH2MHill Plateau Remediation Company SL2574	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	C.O.C. # I17-008-268 Page 1 of 1

Collector	Juan Aguilar /CHPRC	Contact/Requester	Karen Waters-Husted	Telephone No.	509-376-4650
SAF No.	I17-008	Sampling Origin	Hanford Site	Purchase Order/Charge Code	303064
Project Title	100-NR-2 GW-OU Monitoring Apatite B	Logbook No.	HNF-N-506 84 / 22	Ice Chest No.	GWS-568
Shipped To (Lab)	TestAmerica St. Louis	Method of Shipment	Commercial Carrier	Bill of Lading/Air Bill No.	7794 7814 5225
Protocol	CERCLA	Priority:	30 Days **PRIORITY**	Offsite Property No.	N/A

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

SPECIAL INSTRUCTIONS **Hold Time** Total Activity Exemption: Yes ☑ No ☐

N/A

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B39N24	N	W	6-22-17	0921	4x1-L aG	WTPH_DIESEL: COMMON	14/40 Days	HCl to pH <2/Cool <=6C

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Juan Aguilar /CHPRC			JUN 2 2 2017 1030	Curt Hoffman CHPRC			JUN 2 2 2017 1030
Curt Hoffman CHPRC			JUN 2 2 2017 1400	FEDEX			
FedEx				Kristene Taylor			6/23/17 0850

Matrix *

S = Soil	DS = Drum Solids		
SE = Sediment	DL = Drum Liquids		
SO = Solid	T = Tissue		
SL = Sludge	WI = Wipe		
W = Water	L = Liquid		
O = Oil	V = Vegetation		
A = Air	X = Other		

FINAL SAMPLE DISPOSITION Disposal Method (e.g., Return to customer, per lab procedure, used in process) Disposed By Date/Time

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July 17, 2017

7/17/2017

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779473145225

Ship date:
Thu 6/22/2017

RICHLAND, WA US

Delivered
Signed for by: B.DANIELS

Actual delivery:
Fri 6/23/2017 8:45 am

EARTH CITY, MO US

Travel History

Date/Time	Activity	Location
- 6/23/2017 - Friday		
8:45 am	Delivered	EARTH CITY, MO
7:09 am	On FedEx vehicle for delivery	EARTH CITY, MO
7:01 am	At local FedEx facility	EARTH CITY, MO
5:49 am	At destination sort facility	BERKELEY, MO
5:07 am	Departed FedEx location	MEMPHIS, TN
12:30 am	Arrived at FedEx location	MEMPHIS, TN
- 6/22/2017 - Thursday		
4:46 pm	Left FedEx origin facility	PASCO, WA
3:43 pm	Shipment information sent to FedEx	
3:15 pm	Picked up	PASCO, WA

Shipment Facts

Tracking number	779473145225	**Service**	FedEx Standard Overnight
Weight	85 lbs / 38.56 kgs	**Dimensions**	28x16x16 in.
Delivered To	Shipping/Receiving	**Total pieces**	1
Total shipment weight	85 lbs / 38.56 kgs	**Terms**	Recipient
Shipper reference	GWS-568	**Packaging**	Your Packaging
Special handling section	Deliver Weekday, Additional Handling Surcharge	**Standard transit**	6/23/2017 by 3:00 pm

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Qualifiers

GC Semi VOA

Qualifier	Qualifier Description
U	Analyzed for but not detected.

Metals

Qualifier	Qualifier Description
U	Analyzed for but not detected.
B	Estimated result. Result is less than the RL, but greater than MDL
X	See case narrative notes for explanation of the 'X' flag

Glossary

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

Method Summary

Client: CH2M Hill Plateau Remediation Company
Project/Site: I17-008

TestAmerica Job ID: 160-23000-1
SDG: SL2574

Method	Method Description	Protocol	Laboratory
8015B	Diesel Range Organics (DRO) (GC)	SW846	TAL SL
6010C	Metals (ICP)	SW846	TAL SL

Protocol References:

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

Laboratory References:

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

Sample Summary

Client: CH2M Hill Plateau Remediation Company
Project/Site: I17-008

TestAmerica Job ID: 160-23000-1
SDG: SL2574

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
160-23000-1	B39N09	Water	06/22/17 09:01	06/23/17 08:50
160-23000-2	B39N05	Water	06/22/17 09:01	06/23/17 08:50
160-23000-3	B39N44	Water	06/22/17 10:47	06/23/17 08:50
160-23000-4	B39N39	Water	06/22/17 10:47	06/23/17 08:50
160-23000-6	B39N24	Water	06/22/17 09:21	06/23/17 08:50

Client: CH2M Hill Plateau Remediation Company
Project/Site: I17-008

TestAmerica Job ID: 160-23000-1
SDG: SL2574

Method: 8015B - Diesel Range Organics (DRO) (GC)

Client Sample ID: B39N24
Date Collected: 06/22/17 09:21
Date Received: 06/23/17 08:50

Lab Sample ID: 160-23000-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	0.050	U	0.50	0.050	mg/L		06/27/17 13:10	07/06/17 13:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*65*		*47 - 136*	*06/27/17 13:10*	*07/06/17 13:01*	*1*

Method: 6010C - Metals (ICP)

Client Sample ID: B39N05
Date Collected: 06/22/17 09:01
Date Received: 06/23/17 08:50

Lab Sample ID: 160-23000-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	3.0	U	10.0	3.0	ug/L		07/11/17 09:57	07/12/17 15:27	1
Arsenic	4.0	U	10.0	4.0	ug/L		07/11/17 09:57	07/12/17 15:27	1
Barium	**37.4**	**B**	50.0	15.0	ug/L		07/11/17 09:57	07/12/17 15:27	1
Cadmium	1.5	U	5.0	1.5	ug/L		07/11/17 09:57	07/12/17 15:27	1
Calcium	**26000**		1000	300	ug/L		07/11/17 09:57	07/12/17 15:27	1
Chromium	3.0	U	10.0	3.0	ug/L		07/11/17 09:57	07/12/17 15:27	1
Cobalt	15.0	U	50.0	15.0	ug/L		07/11/17 09:57	07/12/17 15:27	1
Copper	7.0	U	25.0	7.0	ug/L		07/11/17 09:57	07/12/17 15:27	1
Iron	**633**		100	30.0	ug/L		07/11/17 09:57	07/12/17 15:27	1
Magnesium	**4320**		1000	300	ug/L		07/11/17 09:57	07/12/17 15:27	1
Manganese	**54.9**		15.0	4.0	ug/L		07/11/17 09:57	07/12/17 15:27	1
Nickel	10.0	U	40.0	10.0	ug/L		07/11/17 09:57	07/12/17 15:27	1
Potassium	1500	U	5000	1500	ug/L		07/11/17 09:57	07/12/17 15:27	1
Silver	3.0	U	10.0	3.0	ug/L		07/11/17 09:57	07/12/17 15:27	1
Sodium	**2560**		1000	300	ug/L		07/11/17 09:57	07/12/17 15:27	1
Vanadium	4.0	U	50.0	4.0	ug/L		07/11/17 09:57	07/12/17 15:27	1
Zinc	6.0	U	20.0	6.0	ug/L		07/11/17 09:57	07/12/17 15:27	1

Client Sample ID: B39N39
Date Collected: 06/22/17 10:47
Date Received: 06/23/17 08:50

Lab Sample ID: 160-23000-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	3.0	U	10.0	3.0	ug/L		07/11/17 09:57	07/12/17 15:36	1
Arsenic	4.0	U	10.0	4.0	ug/L		07/11/17 09:57	07/12/17 15:36	1
Barium	**29.2**	**B**	50.0	15.0	ug/L		07/11/17 09:57	07/12/17 15:36	1
Cadmium	1.5	U	5.0	1.5	ug/L		07/11/17 09:57	07/12/17 15:36	1
Calcium	**28800**		1000	300	ug/L		07/11/17 09:57	07/12/17 15:36	1
Chromium	3.0	U	10.0	3.0	ug/L		07/11/17 09:57	07/12/17 15:36	1
Cobalt	15.0	U	50.0	15.0	ug/L		07/11/17 09:57	07/12/17 15:36	1
Copper	7.0	U	25.0	7.0	ug/L		07/11/17 09:57	07/12/17 15:36	1
Iron	**162**		100	30.0	ug/L		07/11/17 09:57	07/12/17 15:36	1
Magnesium	**4930**		1000	300	ug/L		07/11/17 09:57	07/12/17 15:36	1
Manganese	**13.7**	**B**	15.0	4.0	ug/L		07/11/17 09:57	07/12/17 15:36	1
Nickel	10.0	U	40.0	10.0	ug/L		07/11/17 09:57	07/12/17 15:36	1
Potassium	1500	U	5000	1500	ug/L		07/11/17 09:57	07/12/17 15:36	1
Silver	3.0	U	10.0	3.0	ug/L		07/11/17 09:57	07/12/17 15:36	1
Sodium	**2440**		1000	300	ug/L		07/11/17 09:57	07/12/17 15:36	1
Vanadium	4.0	U	50.0	4.0	ug/L		07/11/17 09:57	07/12/17 15:36	1
Zinc	6.0	U	20.0	6.0	ug/L		07/11/17 09:57	07/12/17 15:36	1

Client Sample Results

Client: CH2M Hill Plateau Remediation Company
Project/Site: I17-008

TestAmerica Job ID: 160-23000-1
SDG: SL2574

Method: 6010C - Metals (ICP) - Dissolved

Client Sample ID: B39N09
Date Collected: 06/22/17 09:01
Date Received: 06/23/17 08:50

Lab Sample ID: 160-23000-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	3.0	U	10.0	3.0	ug/L		07/11/17 09:57	07/12/17 15:22	1
Arsenic	4.0	U	10.0	4.0	ug/L		07/11/17 09:57	07/12/17 15:22	1
Barium	**29.3**	**B**	50.0	15.0	ug/L		07/11/17 09:57	07/12/17 15:22	1
Cadmium	1.5	U	5.0	1.5	ug/L		07/11/17 09:57	07/12/17 15:22	1
Calcium	**26100**		1000	300	ug/L		07/11/17 09:57	07/12/17 15:22	1
Chromium	3.0	U	10.0	3.0	ug/L		07/11/17 09:57	07/12/17 15:22	1
Cobalt	15.0	U	50.0	15.0	ug/L		07/11/17 09:57	07/12/17 15:22	1
Copper	7.0	U	25.0	7.0	ug/L		07/11/17 09:57	07/12/17 15:22	1
Iron	30.0	U	100	30.0	ug/L		07/11/17 09:57	07/12/17 15:22	1
Magnesium	**4160**		1000	300	ug/L		07/11/17 09:57	07/12/17 15:22	1
Manganese	4.0	U	15.0	4.0	ug/L		07/11/17 09:57	07/12/17 15:22	1
Nickel	10.0	U	40.0	10.0	ug/L		07/11/17 09:57	07/12/17 15:22	1
Potassium	1500	U	5000	1500	ug/L		07/11/17 09:57	07/12/17 15:22	1
Silver	3.0	U	10.0	3.0	ug/L		07/11/17 09:57	07/12/17 15:22	1
Sodium	**2510**		1000	300	ug/L		07/11/17 09:57	07/12/17 15:22	1
Vanadium	4.0	U	50.0	4.0	ug/L		07/11/17 09:57	07/12/17 15:22	1
Zinc	6.0	U	20.0	6.0	ug/L		07/11/17 09:57	07/12/17 15:22	1

Client Sample ID: B39N44
Date Collected: 06/22/17 10:47
Date Received: 06/23/17 08:50

Lab Sample ID: 160-23000-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	3.0	U	10.0	3.0	ug/L		07/11/17 09:57	07/12/17 15:31	1
Arsenic	4.0	U	10.0	4.0	ug/L		07/11/17 09:57	07/12/17 15:31	1
Barium	**26.5**	**B**	50.0	15.0	ug/L		07/11/17 09:57	07/12/17 15:31	1
Cadmium	1.5	U	5.0	1.5	ug/L		07/11/17 09:57	07/12/17 15:31	1
Calcium	**29000**		1000	300	ug/L		07/11/17 09:57	07/12/17 15:31	1
Chromium	3.0	U	10.0	3.0	ug/L		07/11/17 09:57	07/12/17 15:31	1
Cobalt	15.0	U	50.0	15.0	ug/L		07/11/17 09:57	07/12/17 15:31	1
Copper	7.0	U	25.0	7.0	ug/L		07/11/17 09:57	07/12/17 15:31	1
Iron	30.0	U	100	30.0	ug/L		07/11/17 09:57	07/12/17 15:31	1
Magnesium	**4900**		1000	300	ug/L		07/11/17 09:57	07/12/17 15:31	1
Manganese	**4.8**	**B**	15.0	4.0	ug/L		07/11/17 09:57	07/12/17 15:31	1
Nickel	10.0	U	40.0	10.0	ug/L		07/11/17 09:57	07/12/17 15:31	1
Potassium	1500	U	5000	1500	ug/L		07/11/17 09:57	07/12/17 15:31	1
Silver	3.0	U	10.0	3.0	ug/L		07/11/17 09:57	07/12/17 15:31	1
Sodium	**2460**		1000	300	ug/L		07/11/17 09:57	07/12/17 15:31	1
Vanadium	4.0	U	50.0	4.0	ug/L		07/11/17 09:57	07/12/17 15:31	1
Zinc	6.0	U	20.0	6.0	ug/L		07/11/17 09:57	07/12/17 15:31	1

Method: 8015B - Diesel Range Organics (DRO) (GC)

Lab Sample ID: MB 160-315529/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 316261 — **Prep Batch: 315529**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	0.050	U	0.50	0.050	mg/L		06/27/17 13:10	07/06/17 10:48	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*69*		*47 - 136*	*06/27/17 13:10*	*07/06/17 10:48*	*1*

Lab Sample ID: LCS 160-315529/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 316261 — **Prep Batch: 315529**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Diesel Range Organics [C10-C28]	2.50	1.45		mg/L		58	30 - 100

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
o-Terphenyl	*76*		*47 - 136*

Lab Sample ID: 160-23000-B-5-A MS — **Client Sample ID: Matrix Spike**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 316261 — **Prep Batch: 315529**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Diesel Range Organics [C10-C28]	0.047	U	2.36	1.06		mg/L		45	28 - 115

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
o-Terphenyl	*59*		*47 - 136*

Lab Sample ID: 160-23000-C-5-A MSD — **Client Sample ID: Matrix Spike Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 316261 — **Prep Batch: 315529**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Diesel Range Organics [C10-C28]	0.047	U	2.43	1.29		mg/L		53	28 - 115	20	20

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
o-Terphenyl	*71*		*47 - 136*

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 160-316896/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 317101 — **Prep Batch: 316896**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	3.0	U	10.0	3.0	ug/L		07/11/17 09:57	07/12/17 14:16	1
Arsenic	4.0	U	10.0	4.0	ug/L		07/11/17 09:57	07/12/17 14:16	1

Method: 6010C - Metals (ICP) (Continued)

Lab Sample ID: MB 160-316896/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 317101 — **Prep Batch: 316896**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	15.0	U	50.0	15.0	ug/L		07/11/17 09:57	07/12/17 14:16	1
Cadmium	1.5	U	5.0	1.5	ug/L		07/11/17 09:57	07/12/17 14:16	1
Calcium	300	U	1000	300	ug/L		07/11/17 09:57	07/12/17 14:16	1
Chromium	3.0	U	10.0	3.0	ug/L		07/11/17 09:57	07/12/17 14:16	1
Cobalt	15.0	U	50.0	15.0	ug/L		07/11/17 09:57	07/12/17 14:16	1
Copper	7.0	U	25.0	7.0	ug/L		07/11/17 09:57	07/12/17 14:16	1
Iron	30.0	U	100	30.0	ug/L		07/11/17 09:57	07/12/17 14:16	1
Magnesium	300	U	1000	300	ug/L		07/11/17 09:57	07/12/17 14:16	1
Manganese	4.0	U	15.0	4.0	ug/L		07/11/17 09:57	07/12/17 14:16	1
Nickel	10.0	U	40.0	10.0	ug/L		07/11/17 09:57	07/12/17 14:16	1
Potassium	1500	U	5000	1500	ug/L		07/11/17 09:57	07/12/17 14:16	1
Silver	3.0	U	10.0	3.0	ug/L		07/11/17 09:57	07/12/17 14:16	1
Sodium	300	U	1000	300	ug/L		07/11/17 09:57	07/12/17 14:16	1
Vanadium	4.0	U	50.0	4.0	ug/L		07/11/17 09:57	07/12/17 14:16	1
Zinc	6.0	U	20.0	6.0	ug/L		07/11/17 09:57	07/12/17 14:16	1

Lab Sample ID: LCS 160-316896/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 317101 — **Prep Batch: 316896**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	500	470.5		ug/L		94	80 - 120
Arsenic	1000	977.9		ug/L		98	80 - 120
Barium	1000	974.3		ug/L		97	80 - 120
Cadmium	1000	992.7		ug/L		99	80 - 120
Calcium	10000	10700		ug/L		107	80 - 120
Chromium	1000	1039		ug/L		104	80 - 120
Cobalt	1000	1048		ug/L		105	80 - 120
Copper	1000	1011		ug/L		101	80 - 120
Iron	10000	9910		ug/L		99	80 - 120
Magnesium	10000	9450		ug/L		95	80 - 120
Manganese	1000	968.9		ug/L		97	80 - 120
Nickel	1000	1050		ug/L		105	80 - 120
Potassium	10000	9648		ug/L		96	80 - 120
Silver	200	200.3		ug/L		100	80 - 120
Sodium	10000	9784		ug/L		98	80 - 120
Vanadium	1000	967.5		ug/L		97	80 - 120
Zinc	1000	1019		ug/L		102	80 - 120

Lab Sample ID: 160-23080-A-11-E MS — **Client Sample ID: Matrix Spike**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 317101 — **Prep Batch: 316896**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	3.0	U	500	478.4		ug/L		96	75 - 125
Arsenic	4.0	U	1000	1023		ug/L		102	75 - 125
Barium	49.5	B	1000	996.5		ug/L		95	75 - 125
Cadmium	1.5	U	1000	1020		ug/L		102	75 - 125
Calcium	52400		10000	64010	X	ug/L		116	75 - 125

Method: 6010C - Metals (ICP) (Continued)

Lab Sample ID: 160-23080-A-11-E MS — **Client Sample ID: Matrix Spike**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 317101 — **Prep Batch: 316896**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium	6.1	B	1000	1042		ug/L		104	75 - 125
Cobalt	15.0	U	1000	1038		ug/L		104	75 - 125
Copper	7.0	U	1000	1012		ug/L		101	75 - 125
Iron	30.0	U	10000	9748		ug/L		97	75 - 125
Magnesium	9530		10000	18930		ug/L		94	75 - 125
Manganese	4.0	U	1000	946.4		ug/L		95	75 - 125
Nickel	21.9	B	1000	1067		ug/L		105	75 - 125
Potassium	5610		10000	15170		ug/L		96	75 - 125
Silver	3.0	U	200	205.2		ug/L		103	75 - 125
Sodium	92400		10000	103300	X	ug/L		109	75 - 125
Vanadium	11.3	B	1000	962.6		ug/L		95	75 - 125
Zinc	6.0	U	1000	1056		ug/L		106	75 - 125

Lab Sample ID: 160-23080-A-11-F MSD — **Client Sample ID: Matrix Spike Duplicate**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 317101 — **Prep Batch: 316896**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony	3.0	U	500	469.5		ug/L		94	75 - 125	2	20
Arsenic	4.0	U	1000	998.1		ug/L		100	75 - 125	2	20
Barium	49.5	B	1000	998.5		ug/L		95	75 - 125	0	20
Cadmium	1.5	U	1000	999.5		ug/L		100	75 - 125	2	20
Calcium	52400		10000	63170	X	ug/L		108	75 - 125	1	20
Chromium	6.1	B	1000	1022		ug/L		102	75 - 125	2	20
Cobalt	15.0	U	1000	1017		ug/L		102	75 - 125	2	20
Copper	7.0	U	1000	986.5		ug/L		99	75 - 125	3	20
Iron	30.0	U	10000	9786		ug/L		98	75 - 125	0	20
Magnesium	9530		10000	19080		ug/L		95	75 - 125	1	20
Manganese	4.0	U	1000	948.6		ug/L		95	75 - 125	0	20
Nickel	21.9	B	1000	1045		ug/L		102	75 - 125	2	20
Potassium	5610		10000	15280		ug/L		97	75 - 125	1	20
Silver	3.0	U	200	201.4		ug/L		101	75 - 125	2	20
Sodium	92400		10000	104000	X	ug/L		116	75 - 125	1	20
Vanadium	11.3	B	1000	968.9		ug/L		96	75 - 125	1	20
Zinc	6.0	U	1000	1035		ug/L		104	75 - 125	2	20

QC Association Summary

Client: CH2M Hill Plateau Remediation Company
Project/Site: I17-008

TestAmerica Job ID: 160-23000-1
SDG: SL2574

GC Semi VOA

Prep Batch: 315529

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-23000-6	B39N24	Total/NA	Water	3510C	
MB 160-315529/1-A	Method Blank	Total/NA	Water	3510C	
LCS 160-315529/2-A	Lab Control Sample	Total/NA	Water	3510C	
160-23000-B-5-A MS	Matrix Spike	Total/NA	Water	3510C	
160-23000-C-5-A MSD	Matrix Spike Duplicate	Total/NA	Water	3510C	

Analysis Batch: 316261

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-23000-6	B39N24	Total/NA	Water	8015B	315529
MB 160-315529/1-A	Method Blank	Total/NA	Water	8015B	315529
LCS 160-315529/2-A	Lab Control Sample	Total/NA	Water	8015B	315529
160-23000-B-5-A MS	Matrix Spike	Total/NA	Water	8015B	315529
160-23000-C-5-A MSD	Matrix Spike Duplicate	Total/NA	Water	8015B	315529

Metals

Prep Batch: 316896

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-23000-1	B39N09	Dissolved	Water	3010A	
160-23000-2	B39N05	Total/NA	Water	3010A	
160-23000-3	B39N44	Dissolved	Water	3010A	
160-23000-4	B39N39	Total/NA	Water	3010A	
MB 160-316896/1-A	Method Blank	Total/NA	Water	3010A	
LCS 160-316896/2-A	Lab Control Sample	Total/NA	Water	3010A	
160-23080-A-11-E MS	Matrix Spike	Dissolved	Water	3010A	
160-23080-A-11-F MSD	Matrix Spike Duplicate	Dissolved	Water	3010A	

Analysis Batch: 317101

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-23000-1	B39N09	Dissolved	Water	6010C	316896
160-23000-2	B39N05	Total/NA	Water	6010C	316896
160-23000-3	B39N44	Dissolved	Water	6010C	316896
160-23000-4	B39N39	Total/NA	Water	6010C	316896
MB 160-316896/1-A	Method Blank	Total/NA	Water	6010C	316896
LCS 160-316896/2-A	Lab Control Sample	Total/NA	Water	6010C	316896
160-23080-A-11-E MS	Matrix Spike	Dissolved	Water	6010C	316896
160-23080-A-11-F MSD	Matrix Spike Duplicate	Dissolved	Water	6010C	316896

Surrogate Summary

Client: CH2M Hill Plateau Remediation Company
Project/Site: I17-008

TestAmerica Job ID: 160-23000-1
SDG: SL2574

Method: 8015B - Diesel Range Organics (DRO) (GC)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
Lab Sample ID	**Client Sample ID**	**OTPH1 (47-136)**							
160-23000-6	B39N24	65							
160-23000-B-5-A MS	Matrix Spike	59							
160-23000-C-5-A MSD	Matrix Spike Duplicate	71							
LCS 160-315529/2-A	Lab Control Sample	76							
MB 160-315529/1-A	Method Blank	69							

Surrogate Legend

OTPH = o-Terphenyl