

June 28, 2017

# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Richland

2800 George Washington Way

Richland, WA 99352

Tel: (509)375-3131

TestAmerica Job ID: 300-5656-1

TestAmerica Sample Delivery Group: WC2109

Client Project/Site: F16-036

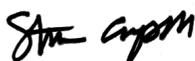
For:

CH2M Hill Plateau Remediation Company

825 Jadwin Avenue

Richland, Washington 99352

Attn: CPP Sample Management



Authorized for release by:

6/28/2017 8:04:10 AM

Steven Campbell, Project Mgmt. Assistant

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Designee for

Whitney Ritari, Project Manager I

(509)375-3131 ext164

[whitney.ritari@testamericainc.com](mailto:whitney.ritari@testamericainc.com)

### LINKS

Review your project  
results through

TotalAccess

Have a Question?



Visit us at:

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

*I certify that this Certificate of Analysis is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed in this package. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager, or a designee as verified by the attached signature.*

*The laboratory is accredited to EPA 7196A in Solid and Chemical Materials, per Washington State Department of Ecology this is approved for non-discharge water samples.*



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## Qualifiers

### HPLC/IC

Qualifier	Qualifier Description
D	The reported value is from a dilution.
U	Analyzed for but not detected.

### General Chemistry

Qualifier	Qualifier Description
U	Analyzed for but not detected.

## Glossary

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

Client: CH2M Hill Plateau Remediation Company  
Project/Site: F16-036

TestAmerica Job ID: 300-5656-1  
SDG: WC2109

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**Job ID: 300-5656-1**

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**Laboratory: TestAmerica Richland**

**Narrative**

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**Job Narrative  
300-5656-1**

**Comments**

No additional comments.

**Receipt**

The sample was received on 6/14/2017 3:00 PM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 6.3° C.

**HPLC/IC**

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

**General Chemistry**

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.



June 28, 2017

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F16-036-083	PAGE 1 OF 1
COLLECTOR Dave Floyd CHPRC	COMPANY CONTACT TODAK, D	TELEPHONE NO. 376-6427	PROJECT COORDINATOR TODAK, D	PRICE CODE 7H	DATA TURNAROUND 30 Days / 30 Days
SAMPLING LOCATION C9711, I-010	PROJECT DESIGNATION 100-KR-4 Long Term & Interim Action Monitoring - Water	FIELD LOGBOOK NO. HMF-N- (645-7/59)	ACTUAL SAMPLE DEPTH 79.7'	SAF NO. F16-036	METHOD OF SHIPMENT GOVERNMENT VEHICLE
ICE CHEST NO. NA	OFFSITE PROPERTY NO. NA	COA 300085	BILL OF LADING/AIR BILL NO. NA	<b>ORIGINAL</b>	
SHIPPED TO TestAmerica Incorporated, Richland					

MATRIX* A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WF=Wipe X=Other	POSSIBLE SAMPLE HAZARDS/ REMARKS *Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/DATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.	PRESERVATION Cool=4C Cool <=6C	HOLDING TIME 24 Hours 48 Hours	TYPE OF CONTAINER ag P	NO. OF CONTAINER(S) 1 1	VOLUME 60ml 500ml	7196, GR6: COMMON; SEE ITEM (1) IN SPECIAL INSTRUCTIONS
SAMPLE NO. B39HY6	MATRIX* WATER	SAMPLE DATE 6-14-17	SAMPLE TIME 0910				

A SLOP  
WU2109

300-5656 COC



**FILTER**

CHAIN OF POSSESSION

RELINQUISHED BY/REMOVED FROM Dave Floyd CHPRC	DATE/TIME JUN 14 2017 1000	RECEIVED BY/STORED IN Janelle Zanker CHPRC	DATE/TIME JUN 14 2017 1500
RELINQUISHED BY/REMOVED FROM Janelle Zanker CHPRC	DATE/TIME JUN 14 2017 1500	RECEIVED BY/STORED IN Janelle Zanker CHPRC	DATE/TIME JUN 14 2017 1500
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-17-101  
(1) 300.0 ANIONS IC: COMMON {Chloride, Fluoride, Nitrogen in Nitrate, Sulfate}; 300.0 ANIONS IC: COMMON (Add-on) {Phosphorus in phosphate};

**FILTER**

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

June 28, 2017  
Detection Summary

Client: CH2M Hill Plateau Remediation Company  
Project/Site: F16-036

TestAmerica Job ID: 300-5656-1  
SDG: WC2109

Client Sample ID: B39HY6

Lab Sample ID: 300-5656-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	13	D	0.40	0.20	mg/L	2		300.0	Total/NA
Nitrate as N	6.4	D	0.056	0.028	mg/L	2		300.0	Total/NA
Fluoride	0.39	D	0.10	0.050	mg/L	2		300.0	Total/NA
Sulfate	56	D	0.50	0.25	mg/L	2		300.0	Total/NA
Cr (VI)	0.016		0.0040	0.0015	mg/L	1		7196A	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Richland

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# June 28, 2017 Client Sample Results

Client: CH2M Hill Plateau Remediation Company  
Project/Site: F16-036

TestAmerica Job ID: 300-5656-1  
SDG: WC2109

**Client Sample ID: B39HY6**  
**Date Collected: 06/14/17 09:10**  
**Date Received: 06/14/17 15:00**

**Lab Sample ID: 300-5656-1**  
**Matrix: Water**

### Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	13	D	0.40	0.20	mg/L			06/14/17 16:52	2
Nitrate as N	6.4	D	0.056	0.028	mg/L			06/14/17 16:52	2
Fluoride	0.39	D	0.10	0.050	mg/L			06/14/17 16:52	2
Orthophosphate as P	0.082	U D	0.16	0.082	mg/L			06/14/17 16:52	2
Sulfate	56	D	0.50	0.25	mg/L			06/14/17 16:52	2

### General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cr (VI)	0.016		0.0040	0.0015	mg/L			06/14/17 16:30	1

Client: CH2M Hill Plateau Remediation Company  
Project/Site: F16-036

TestAmerica Job ID: 300-5656-1  
SDG: WC2109

**Method: 300.0 - Anions, Ion Chromatography**

**Lab Sample ID: MB 300-8268/5**  
**Matrix: Water**  
**Analysis Batch: 8268**

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	0.014	U	0.028	0.014	mg/L			06/14/17 12:47	1
Orthophosphate as P	0.041	U	0.082	0.041	mg/L			06/14/17 12:47	1

**Lab Sample ID: LCS 300-8268/6**  
**Matrix: Water**  
**Analysis Batch: 8268**

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	2.26	2.28		mg/L		101	80 - 120
Orthophosphate as P	6.53	6.64		mg/L		102	80 - 120

**Lab Sample ID: 300-5656-1 MS**  
**Matrix: Water**  
**Analysis Batch: 8268**

**Client Sample ID: B39HY6**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	6.4	D	0.452	6.91	D	mg/L		121	75 - 125
Orthophosphate as P	0.082	U D	1.31	1.11	D	mg/L		85	75 - 125

**Lab Sample ID: 300-5656-1 DU**  
**Matrix: Water**  
**Analysis Batch: 8268**

**Client Sample ID: B39HY6**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	Limit
Nitrate as N	6.4	D	6.45	D	mg/L		1	20
Orthophosphate as P	0.082	U D	0.082	U D	mg/L		NC	20

**Lab Sample ID: MB 300-8269/5**  
**Matrix: Water**  
**Analysis Batch: 8269**

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.10	U	0.20	0.10	mg/L			06/14/17 12:47	1
Fluoride	0.025	U	0.050	0.025	mg/L			06/14/17 12:47	1
Sulfate	0.13	U	0.25	0.13	mg/L			06/14/17 12:47	1

**Lab Sample ID: LCS 300-8269/6**  
**Matrix: Water**  
**Analysis Batch: 8269**

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	16.0	16.2		mg/L		101	80 - 120
Fluoride	4.00	3.96		mg/L		99	80 - 120
Sulfate	20.0	20.8		mg/L		104	80 - 120

Client: CH2M Hill Plateau Remediation Company  
Project/Site: F16-036

TestAmerica Job ID: 300-5656-1  
SDG: WC2109

**Method: 300.0 - Anions, Ion Chromatography (Continued)**

Lab Sample ID: 300-5656-1 MS  
Matrix: Water  
Analysis Batch: 8269

Client Sample ID: B39HY6  
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	13	D	3.20	17.0	D	mg/L		109	75 - 125
Fluoride	0.39	D	0.800	1.13	D	mg/L		93	75 - 125
Sulfate	56	D	4.00	60.4	D	mg/L		103	75 - 125

Lab Sample ID: 300-5656-1 DU  
Matrix: Water  
Analysis Batch: 8269

Client Sample ID: B39HY6  
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Chloride	13	D	13.7	D	mg/L		2	20
Fluoride	0.39	D	0.388	D	mg/L		0.3	20
Sulfate	56	D	57.1	D	mg/L		1	20

**Method: 7196A - Chromium, Hexavalent**

Lab Sample ID: MB 300-8284/3  
Matrix: Water  
Analysis Batch: 8284

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cr (VI)	0.0015	U	0.0040	0.0015	mg/L			06/14/17 16:27	1

Lab Sample ID: LCS 300-8284/4  
Matrix: Water  
Analysis Batch: 8284

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cr (VI)	0.250	0.252		mg/L		101	80 - 120

Lab Sample ID: 300-5656-1 MS  
Matrix: Water  
Analysis Batch: 8284

Client Sample ID: B39HY6  
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Cr (VI)	0.016		0.0501	0.0666		mg/L		102	75 - 125

Lab Sample ID: 300-5656-1 DU  
Matrix: Water  
Analysis Batch: 8284

Client Sample ID: B39HY6  
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Cr (VI)	0.016		0.0161		mg/L		4	20

June 28, 2017  
**QC Association Summary**

Client: CH2M Hill Plateau Remediation Company  
 Project/Site: F16-036

TestAmerica Job ID: 300-5656-1  
 SDG: WC2109

**HPLC/IC**

**Analysis Batch: 8268**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
300-5656-1	B39HY6	Total/NA	Water	300.0	
MB 300-8268/5	Method Blank	Total/NA	Water	300.0	
LCS 300-8268/6	Lab Control Sample	Total/NA	Water	300.0	
300-5656-1 MS	B39HY6	Total/NA	Water	300.0	
300-5656-1 DU	B39HY6	Total/NA	Water	300.0	

**Analysis Batch: 8269**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
300-5656-1	B39HY6	Total/NA	Water	300.0	
MB 300-8269/5	Method Blank	Total/NA	Water	300.0	
LCS 300-8269/6	Lab Control Sample	Total/NA	Water	300.0	
300-5656-1 MS	B39HY6	Total/NA	Water	300.0	
300-5656-1 DU	B39HY6	Total/NA	Water	300.0	

**General Chemistry**

**Analysis Batch: 8284**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
300-5656-1	B39HY6	Total/NA	Water	7196A	
MB 300-8284/3	Method Blank	Total/NA	Water	7196A	
LCS 300-8284/4	Lab Control Sample	Total/NA	Water	7196A	
300-5656-1 MS	B39HY6	Total/NA	Water	7196A	
300-5656-1 DU	B39HY6	Total/NA	Water	7196A	



Client: CH2M Hill Plateau Remediation Company  
Project/Site: F16-036

TestAmerica Job ID: 300-5656-1  
SDG: WC2109

**Client Sample ID: B39HY6**  
**Date Collected: 06/14/17 09:10**  
**Date Received: 06/14/17 15:00**

**Lab Sample ID: 300-5656-1**  
**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2			8268	06/14/17 16:52	ALR	TAL RCH
Total/NA	Analysis	300.0		2			8269	06/14/17 16:52	ALR	TAL RCH
Total/NA	Analysis	7196A		1			8284	06/14/17 16:30	TP	TAL RCH

**Client Sample ID: Method Blank**  
**Date Collected: N/A**  
**Date Received: N/A**

**Lab Sample ID: MB 300-8268/5**  
**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1			8268	06/14/17 12:47	ALR	TAL RCH

**Client Sample ID: Method Blank**  
**Date Collected: N/A**  
**Date Received: N/A**

**Lab Sample ID: MB 300-8269/5**  
**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1			8269	06/14/17 12:47	ALR	TAL RCH

**Client Sample ID: Method Blank**  
**Date Collected: N/A**  
**Date Received: N/A**

**Lab Sample ID: MB 300-8284/3**  
**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	7196A		1			8284	06/14/17 16:27	TP	TAL RCH

**Client Sample ID: Lab Control Sample**  
**Date Collected: N/A**  
**Date Received: N/A**

**Lab Sample ID: LCS 300-8268/6**  
**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1			8268	06/14/17 13:02	ALR	TAL RCH

**Client Sample ID: Lab Control Sample**  
**Date Collected: N/A**  
**Date Received: N/A**

**Lab Sample ID: LCS 300-8269/6**  
**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1			8269	06/14/17 13:02	ALR	TAL RCH

Client: CH2M Hill Plateau Remediation Company  
Project/Site: F16-036

TestAmerica Job ID: 300-5656-1  
SDG: WC2109

**Client Sample ID: Lab Control Sample**

**Lab Sample ID: LCS 300-8284/4**

Date Collected: N/A

Matrix: Water

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	7196A		1			8284	06/14/17 16:27	TP	TAL RCH

**Client Sample ID: B39HY6**

**Lab Sample ID: 300-5656-1 MS**

Date Collected: 06/14/17 09:10

Matrix: Water

Date Received: 06/14/17 15:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2			8268	06/14/17 17:07	ALR	TAL RCH
Total/NA	Analysis	300.0		2			8269	06/14/17 17:07	ALR	TAL RCH
Total/NA	Analysis	7196A		1			8284	06/14/17 16:27	TP	TAL RCH

**Laboratory References:**

TAL RCH = TestAmerica Richland, 2800 George Washington Way, Richland, WA 99352, TEL (509)375-3131

Client: CH2M Hill Plateau Remediation Company  
Project/Site: F16-036

TestAmerica Job ID: 300-5656-1  
SDG: WC2109

Method	Method Description	Protocol	Laboratory
300.0	Anions, Ion Chromatography	MCAWW	TAL RCH
7196A	Chromium, Hexavalent	SW846	TAL RCH

**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 RCH = TestAmerica Richland, 2800 George Washington Way, Richland, WA 99352, TEL (509)375-3131



Client: CH2M Hill Plateau Remediation Company  
Project/Site: F16-036

TestAmerica Job ID: 300-5656-1  
SDG: WC2109

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Lab Sample ID	Client Sample ID	Matrix	Collected	Received
300-5656-1	B39HY6	Water	06/14/17 09:10	06/14/17 15:00

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- 13

June 28, 2017

Login Sample Receipt Checklist

Client: CH2M Hill Plateau Remediation Company

Job Number: 300-5656-1

SDG Number: WC2109

Login Number: 5656

List Number: 1

Creator: Bock, Julie A

List Source: TestAmerica Richland

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.	N/A	
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	
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.	N/A	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

