

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Denver

4955 Yarrow Street

Arvada, CO 80002

Tel: (303)736-0100

TestAmerica Job ID: 280-95032-2

TestAmerica Sample Delivery Group: DN0110A

Client Project/Site: S17-003

For:

CH2M Hill Plateau Remediation Company

PO BOX 1600, MS H8-41

Richland, Washington 99352

Attn: Mr. Scot Fitzgerald



Authorized for release by:

7/18/2017 12:07:14 PM

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The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

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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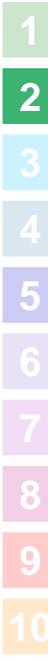


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RECHECK, RECOUNT, OR REANALYSIS ORDER

07/07/2017

Order Number: 170707TADN-R9169

TestAmerica Denver

4955 Yarrow

Denver, CO 80002

Sample Delivery Group:DN0110

Method Name:6010_METALS_ICP

Sample#: B38PX5

Sample Date:3/17/2017 12:30:00 PM

SAF #:S17-003

Lab Sample ID	RDR Action Start Date	Constituent	Action	TAT (Hardcopy/EDD)
368486-54	7/7/2017 3:01:55 PM	Potassium	REANALYZE	15 Days / 15 Days
Special Instructions:	Results do not concur with trend or unfiltered sample. Please report all originally requested 6010 metals. SLF 07/07/17.			
368486-54	7/7/2017 3:01:55 PM	Magnesium	REANALYZE	15 Days / 15 Days
Special Instructions:	Results do not concur with trend or unfiltered sample. Please report all originally requested 6010 metals. SLF 07/07/17.			
368486-54	7/7/2017 3:01:55 PM	Calcium	REANALYZE	15 Days / 15 Days
Special Instructions:	Results do not concur with trend or unfiltered sample. Please report all originally requested 6010 metals. SLF 07/07/17.			
368486-54	7/7/2017 3:01:55 PM	Sodium	REANALYZE	15 Days / 15 Days
Special Instructions:	Results do not concur with trend or unfiltered sample. Please report all originally requested 6010 metals. SLF 07/07/17.			

Deliver Report Results to:CHPRC

P.O. Box 1600

Richland, WA 99352

C/O Mr.Scot Fitzgerald

Case Narrative

Client: CH2M Hill Plateau Remediation Company
Project/Site: S17-003

TestAmerica Job ID: 280-95032-2
SDG: DN0110A

Job ID: 280-95032-2

Laboratory: TestAmerica Denver

Narrative

CASE NARRATIVE

Client: CH2M Hill Plateau Remediation Company

Project: S17-003

Report Number: 280-95032-2

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

The samples were received on 3/21/2017 10:20 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.9° C.

On 7/7/17, data reanalysis order 170707TADN-R9169 was received at TestAmerica Denver. A copy of the RDR has been included in this report.

DISSOLVED METALS

Reanalysis of samples B38PX5 (280-95032-2) for 6010C ICP Dissolved Metals yielded results greater than those originally reported for all analytes.

A deviation from the Standard Operating Procedure (SOP) occurred. Details are as follows: due to limited sample volume, B38PX5 (280-95032-2), B38PX5 (280-95032-2[MS]) and B38PX5 (280-95032-2[MSD]) were digested at 25ml to 25ml with half the normal amount of reagent used. As this is a client required MS/D sample was spiked at half volume (0.25ml).

Sample B38PX5 (280-95032-2) was analyzed for Dissolved Metals in accordance with EPA SW-846 Method 6010C. The samples were prepared on 07/12/2017 and analyzed on 07/13/2017.

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

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:

Jamie Ide
Project Manager

Login Sample Receipt Checklist

Client: CH2M Hill Plateau Remediation Company

Job Number: 280-95032-2

SDG Number: DN0110A

Login Number: 95032**List Number: 1****Creator: Pottruff, Reed W****List Source: TestAmerica Denver**

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	0.9°C
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	

8115

CH2M Hill Plateau Remediation Company C.O.C. # **S17-003-254**
 Page 1 of 4
 Telephone No. 509-376-4650
 Purchase Order/Charge Code 300071
 Ice Chest No. GWS-442-413
 Bill of Lading/Air Bill No. 778094760915
 Offsite Property No. 7661

Contact/Requester: Karen Waters-Husted
 Sampling Origin: Hanford Site
 Logbook No. HNF-N-506 8/15
 Method of Shipment: Commercial Carrier
 Priority: 30 Days **PRIORITY**

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

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B38PX0	N	W	MAR 17 2017	1230	1x500-mL G/P	7470_MERCURY_CV: COMMON (AQUEOUS); 6020_METALS_ICPMS: GW 01; 6010_METALS_ICP: GW 04	28 Days	HNO3 to pH <2
B38PX5	Y	W	Y	Y	1x500-mL G/P	7470_MERCURY_CV: COMMON (AQUEOUS); 6020_METALS_ICPMS: GW 01; 6010_METALS_ICP: GW 04	28 Days	HNO3 to pH <2

SPECIAL INSTRUCTIONS: N/A
 Hold Time: 30 Days
 Total Activity Exemption: Yes No



280-95032 Chain of Custody

O.9 TR#70.0 Transfer RP 3-21-17

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Matrix *
Leah West ICP/PC	Leah West	[Signature]	MAR 17 2017 1250	G.C. HOFFMAN/ICP/PC	G.C. HOFFMAN/ICP/PC	[Signature]	MAR 17 2017 1250	S = Soil, SE = Sediment, SO = Solid, SL = Sludge, W = Water, O = Oil, A = Air, DS = Drum Solids, DL = Drum Liquids, T = Tissue, WI = Wipe, L = Liquid, V = Vegetation, X = Other
G.C. HOFFMAN/ICP/PC	G.C. HOFFMAN/ICP/PC	[Signature]	MAR 17 2017 1305	SSU-1	SSU-1	[Signature]	MAR 17 2017 1305	
SSU-1	SSU-1	[Signature]	MAR 20 2017 1120	Leah West ICP/PC	Leah West	[Signature]	MAR 20 2017 1120	
Leah West ICP/PC	Leah West	[Signature]	MAR 20 2017 1400	FEDEX	FEDEX	[Signature]	MAR 20 2017 1400	

Disposal Method (e.g., Return to customer, per lab procedure, used in process)

Disposed By: [Signature] Date/Time: [Blank]

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778694766915

Ship date:

Mon 3/20/2017

Actual delivery:

Tue 3/21/2017 10:20 am

Richland, WA US

Delivered

Signed for by: G.PARROT

ARVADA, CO US

Travel History

Date/Time	Activity	Location
- 3/21/2017 - Tuesday		
12:20 am	Delivered	ARVADA, CO
10:08 am	On FedEx vehicle for delivery	ARVADA, CO
7:00 am	At local FedEx facility	ARVADA, CO
4:48 am	At destination sort facility	DENVER, CO
3:47 am	Departed FedEx location	MEMPHIS, TN
12:06 am	Arrived at FedEx location	MEMPHIS, TN
- 3/20/2017 - Monday		
5:02 pm	Left FedEx origin facility	PASCO, WA
3:34 pm	Shipment information sent to FedEx	
3:19 pm	Picked up	PASCO, WA

Shipment Facts

Tracking number	778694766915	Service	FedEx Priority Overnight
Weight	88 lbs / 39.92 kgs	Signature services	Direct signature required
Delivered To	Receptionist/Front Desk	Total pieces	1
Total shipment weight	88 lbs / 39.92 kgs	Terms	Third Party
Shipper reference	7661	Packaging	Your Packaging
Special handling section	Deliver Weekday, Direct Signature Required	Standard transit	3/21/2017 by 10:30 am



Search or tracking number

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Definitions/Glossary

Client: CH2M Hill Plateau Remediation Company
Project/Site: S17-003

TestAmerica Job ID: 280-95032-2
SDG: DN0110A

Qualifiers

Metals

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

Method Summary

Client: CH2M Hill Plateau Remediation Company
Project/Site: S17-003

TestAmerica Job ID: 280-95032-2
SDG: DN0110A

Method	Method Description	Protocol	Laboratory
6010C	Metals (ICP)	SW846	TAL DEN

Protocol References:

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

Laboratory References:

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100



Sample Summary

Client: CH2M Hill Plateau Remediation Company
Project/Site: S17-003

TestAmerica Job ID: 280-95032-2
SDG: DN0110A

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
280-95032-2	B38PX5	Water	03/17/17 12:30	03/21/17 10:20

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

Client Sample Results

Client: CH2M Hill Plateau Remediation Company
 Project/Site: S17-003

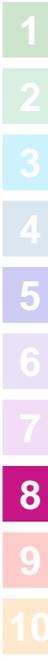
TestAmerica Job ID: 280-95032-2
 SDG: DN0110A

Method: 6010C - Metals (ICP) - Dissolved

Client Sample ID: B38PX5
Date Collected: 03/17/17 12:30
Date Received: 03/21/17 10:20

Lab Sample ID: 280-95032-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	28.6	B	100	4.4	ug/L		07/12/17 07:03	07/13/17 02:26	1
Calcium	86100		200	34.5	ug/L		07/12/17 07:03	07/13/17 02:26	1
Iron	138		100	22.0	ug/L		07/12/17 07:03	07/13/17 14:36	1
Magnesium	21700		200	10.7	ug/L		07/12/17 07:03	07/13/17 02:26	1
Potassium	9310		3000	237	ug/L		07/12/17 07:03	07/13/17 02:26	1
Sodium	92000		1000	117	ug/L		07/12/17 07:03	07/13/17 02:26	1
Vanadium	17.7		10.0	1.1	ug/L		07/12/17 07:03	07/13/17 02:26	1



QC Sample Results

Client: CH2M Hill Plateau Remediation Company
 Project/Site: S17-003

TestAmerica Job ID: 280-95032-2
 SDG: DN0110A

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 280-380334/1-A
 Matrix: Water
 Analysis Batch: 380647

Client Sample ID: Method Blank
 Prep Type: Total Recoverable
 Prep Batch: 380334

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	4.4	U	100	4.4	ug/L		07/12/17 07:03	07/13/17 02:21	1
Calcium	34.5	U	200	34.5	ug/L		07/12/17 07:03	07/13/17 02:21	1
Magnesium	10.7	U	200	10.7	ug/L		07/12/17 07:03	07/13/17 02:21	1
Potassium	237	U	3000	237	ug/L		07/12/17 07:03	07/13/17 02:21	1
Sodium	117	U	1000	117	ug/L		07/12/17 07:03	07/13/17 02:21	1
Vanadium	1.1	U	10.0	1.1	ug/L		07/12/17 07:03	07/13/17 02:21	1

Lab Sample ID: MB 280-380334/1-A
 Matrix: Water
 Analysis Batch: 380791

Client Sample ID: Method Blank
 Prep Type: Total Recoverable
 Prep Batch: 380334

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	22.0	U	100	22.0	ug/L		07/12/17 07:03	07/13/17 14:31	1

Lab Sample ID: LCS 280-380334/2-A
 Matrix: Water
 Analysis Batch: 380647

Client Sample ID: Lab Control Sample
 Prep Type: Total Recoverable
 Prep Batch: 380334

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	1000	1022		ug/L		102	80 - 120
Calcium	50000	48910		ug/L		98	80 - 120
Magnesium	50000	47510		ug/L		95	80 - 120
Potassium	50000	50880		ug/L		102	80 - 120
Sodium	50000	53250		ug/L		106	80 - 120
Vanadium	500	485.8		ug/L		97	80 - 120

Lab Sample ID: LCS 280-380334/2-A
 Matrix: Water
 Analysis Batch: 380791

Client Sample ID: Lab Control Sample
 Prep Type: Total Recoverable
 Prep Batch: 380334

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Iron	1000	1005		ug/L		100	80 - 120

Lab Sample ID: 280-95032-2 MS
 Matrix: Water
 Analysis Batch: 380647

Client Sample ID: B38PX5
 Prep Type: Dissolved
 Prep Batch: 380334

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	28.6	B	1000	1009		ug/L		98	75 - 125
Calcium	86100		50000	135700		ug/L		99	75 - 125
Magnesium	21700		50000	67710		ug/L		92	75 - 125
Potassium	9310		50000	59320		ug/L		100	75 - 125
Sodium	92000		50000	145600		ug/L		107	75 - 125
Vanadium	17.7		500	493.4		ug/L		95	75 - 125

QC Sample Results

Client: CH2M Hill Plateau Remediation Company
 Project/Site: S17-003

TestAmerica Job ID: 280-95032-2
 SDG: DN0110A

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

Lab Sample ID: 280-95032-2 MS
 Matrix: Water
 Analysis Batch: 380791

Client Sample ID: B38PX5
 Prep Type: Dissolved
 Prep Batch: 380334

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Iron	138		1000	1114		ug/L		98	75 - 125

Lab Sample ID: 280-95032-2 MSD
 Matrix: Water
 Analysis Batch: 380647

Client Sample ID: B38PX5
 Prep Type: Dissolved
 Prep Batch: 380334

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Boron	28.6	B	1000	989.7		ug/L		96	75 - 125	2	20
Calcium	86100		50000	136400		ug/L		101	75 - 125	1	20
Magnesium	21700		50000	67900		ug/L		92	75 - 125	0	20
Potassium	9310		50000	58980		ug/L		99	75 - 125	1	20
Sodium	92000		50000	146200		ug/L		108	75 - 125	0	20
Vanadium	17.7		500	493.7		ug/L		95	75 - 125	0	20

Lab Sample ID: 280-95032-2 MSD
 Matrix: Water
 Analysis Batch: 380791

Client Sample ID: B38PX5
 Prep Type: Dissolved
 Prep Batch: 380334

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Iron	138		1000	1196		ug/L		106	75 - 125	7	20

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QC Association Summary

Client: CH2M Hill Plateau Remediation Company
 Project/Site: S17-003

TestAmerica Job ID: 280-95032-2
 SDG: DN0110A

Metals

Prep Batch: 380334

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-95032-2	B38PX5	Dissolved	Water	3005A	
MB 280-380334/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 280-380334/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
280-95032-2 MS	B38PX5	Dissolved	Water	3005A	
280-95032-2 MSD	B38PX5	Dissolved	Water	3005A	

Analysis Batch: 380647

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-95032-2	B38PX5	Dissolved	Water	6010C	380334
MB 280-380334/1-A	Method Blank	Total Recoverable	Water	6010C	380334
LCS 280-380334/2-A	Lab Control Sample	Total Recoverable	Water	6010C	380334
280-95032-2 MS	B38PX5	Dissolved	Water	6010C	380334
280-95032-2 MSD	B38PX5	Dissolved	Water	6010C	380334

Analysis Batch: 380791

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-95032-2	B38PX5	Dissolved	Water	6010C	380334
MB 280-380334/1-A	Method Blank	Total Recoverable	Water	6010C	380334
LCS 280-380334/2-A	Lab Control Sample	Total Recoverable	Water	6010C	380334
280-95032-2 MS	B38PX5	Dissolved	Water	6010C	380334
280-95032-2 MSD	B38PX5	Dissolved	Water	6010C	380334