



# Northeast Utilities System

Public Service of New Hampshire  
Northeast Utilities System  
Merrimack Station  
97 River Road  
Bow, New Hampshire 03304

Phone (603) 224-4081  
Fax (603) 634-2334

February 28, 2013

Mr. Mike Butler  
Staff Engineer  
Lowell Regional Wastewater Utility  
451 First St. Blvd. (Rte 110)  
Lowell, Massachusetts 01850

Re: Monthly Self Monitoring Report  
January 2013  
Merrimack Station  
Public Service Company of New Hampshire  
Bow, New Hampshire

Dear Mr. Butler:

Public Service Company of New Hampshire (PSNH) is pleased to submit the attached **Self-Monitoring Report (SMR)** for the period January 1, 2013 through January 31, 2013. This SMR is intended to satisfy Conditions 7 and 8 of the Interim Discharge Authorization (IDA) issued to PSNH by the Lowell Regional Wastewater Utility (LRWU), dated October 3, 2012. Softened Stream A Wastewater flow was approximately 72,000 gallons and Softened Stream B Wastewater flow was approximately 120,000 for the monitoring period. Wastewater flow was estimated based on the actual number of tanker trucks sent to LRWU in January and tanker capacity.

The attached **SMR Summary Sheet** summarizes the analytical results for all required parameters as outlined in Condition 8 of the IDA. However, the attached **Analytical Data Reports** contain a more comprehensive list of parameters. The attached **Table 1** compares the results to the LRWU's Local Sewer Discharge Limits. The results indicate that pollutant concentrations were within the limits on the day of sampling. The attached **Table 2** included summarizes wastewater shipments to LRWU in the month of January 2013. The analysis of the Softened Stream A and Softened Stream B samples collected on January 18, 2013 and January 26, 2013 respectively, were performed in accordance with the United States Environmental Protection Agency (EPA) draft Standard Operating Procedure (SOP) for trace metals analysis of flue gas desulfurization (FGD) wastewater. The SOP is described below.

## **ANALYTICAL DISCUSSION**

FGD wastewater requires specialized analytical techniques to overcome matrix interferences for analysis of certain trace metals. To assist you in evaluating this issue further, we offer an excerpt below from the EPA web site and a link to their draft SOP for trace metals analysis of FGD wastewater that contains further guidance.

*CONFIDENTIAL BUSINESS INFORMATION*



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### LABORATORY ANALYSIS OF FGD WASTEWATER

Wastewater from FGD systems can contain constituents known to cause matrix interferences. EPA has observed that, during inductively coupled plasma-mass spectrometry (ICP-MS) analysis of FGD wastewater, certain elements commonly present in the wastewater may cause polyatomic interferences that bias the detection and/or quantization of certain elements of interest. These potential interferences may become significant when measuring trace elements at concentrations in the low parts-per-billion range.

As part of a recent sampling effort for the steam electric power generating effluent guidelines rulemaking, EPA developed an SOP that was used in conjunction with EPA Method 200.8 to conduct ICP-MS analyses of FGD wastewater. The SOP describes critical technical and quality assurance procedures that were implemented to mitigate anticipated interferences and generate reliable data for FGD wastewater. EPA regulations at 40 CFR 136.6 already allow the analytical community flexibility to modify approved methods to lower the costs of measurements, overcome matrix interferences, or otherwise improve the analysis. The draft SOP developed for FGD wastewater takes a proactive approach toward looking for and taking steps to mitigate matrix interferences, including using specialized interference check solutions (i.e., a synthetic FGD wastewater matrix). EPA's draft SOP is being made available to laboratories contemplating ICP-MS analysis of FGD wastewater, either for adoption as currently written or to serve as a framework for developing their own laboratory-specific SOPs. For further information, see:

- Standard Operating Procedure: Inductively Coupled Plasma/Mass Spectrometry for Trace Element Analysis in Flue Gas Desulfurization Wastewaters (30 pp, 174K), [http://water.epa.gov/scitech/wastetech/guide/upload/steam\\_draft\\_sop.pdf](http://water.epa.gov/scitech/wastetech/guide/upload/steam_draft_sop.pdf), EPA May 2011.

Considering that specialized analytical techniques are necessary to overcome matrix interference for certain analysis of trace metals in FGD wastewater, we recommend any analysis on FGD wastewater be conducted in accordance with the EPA draft SOP for trace metals analysis of FGD wastewater.

Sincerely,

PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE

Brad Owens, Station Manager

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Attachment

CONFIDENTIAL BUSINESS INFORMATION

LOWELL REGIONAL WASTEWATER UTILITY  
Industrial Sewer User Self-Monitoring Report Summary Sheet

Facility Information: Company Name Public Service of New Hampshire  
Facility Address 97 River Road Bow, New Hampshire Permit No. NA (Interim Discharge Authorization)  
Facility Contact Brad Owens Telephone (603) 224-4081

-----Use A Separate Summary Sheet For Each Monitoring Point-----

Monitoring Report: Monitoring Point End of pretreatment process Submittal Date February 27, 2013  
Reporting Period (circle applicable): Baseline Annually Semi-Annually Quarterly Monthly Re-Sample  
Reporting Period Start Date January 1, 2013 Reporting Period End Date January 31, 2013

Sample Analysis: Certified Analytical Lab Eastern Analytical, Inc. (EAI)  
Authorized Rep. Lorraine Olashaw Certification No. 1012  
Analytical Sub-Contractor Frontier Global Sciences Certification No. E87575

Sample Collection: Sampler (Lab/Self/Other) Paul Pepler, GZA

Sample Type(s) (circle all that apply): Grab Time Composite Flow Composite  
Grab Sampling: Sample Date 1/18/2013 (Softened Stream B) Sample Time 13:50 (Softened Stream B)  
1/26/2013 (Softened Stream A) 11:50 (Softened Stream A)  
pH (Standard Units) 7.24 (B) Instantaneous Flow Rate (GPM) N/A  
7.79 (A)

Composite Sampling: Start Date/Time N/A Stop Date/Time N/A

No. Aliquots N/A Aliquot Volume N/A Sample Volume N/A

Flow Data: Sampling Interval Volume (Gal) 8,000 Daily Flow Rate (GPD) 27,429 (Average of discharge days)

Monitoring Period Industrial Wastewater Flow (Gal) Softened Stream A: 72,000  
Softened Stream B: 120,000 [ ] Meter [ X ] Estimate

Monitoring Period Start Date January 1, 2013 Monitoring Period End Date January 31, 2013

Refer to Self-Monitoring Report Instructions for details on completing this SMR Summary Sheet

**LOWELL REGIONAL WASTEWATER UTILITY**  
**Industrial Sewer User Self-Monitoring Report Summary Sheet**

*Submit All Chains of Custody and Laboratory Result Sheets With SMR Summary Sheet*

**Analytical Results:**

Parameter	Analysis Date	Result (mg/L)	Parameter	Analysis Date	Result (mg/L)
BOD			Copper		
COD	1/24/13, 1/31/13	3,000 (B), 170 (A)	Cyanide (Total)		
O & G 413.1 / 1664			Fluoride		0.00296 (B), <0.0004 (A)
TSS			Lead	1/26/13, 2/03/13	0.000203 (B), 0.0000413 (A)
TOC *			Mercury	1/28/13, 2/04/13	
TTO ** 624 / 8260B - 625 / 8270			Molybdenum		
Aluminum			Nickel		
Antimony			Nitrogen (Kjeldahl)		
Arsenic	2/08/13, 2/08/13	0.013 (B), <0.0015 (A)	Phenols (Total)		
Barium			Selenium		
Beryllium			Silver	1/26/13, 2/09/13	<0.001 (B), <0.0002 (A)
Cadmium	1/26/13, 2/8/13	0.00163 (B), 0.000548 (A)	Thallium		
Chromium (Hexavalent)			Zinc		
Chromium (Total)			Sodium		

*BOD = Biochemical Oxygen Demand COD = Chemical Oxygen Demand O & G = Oil & Grease TSS = Total Suspended Solids TTO = Total Toxic Organics  
 \*TOC (Total Organic Carbon) = is the amount of carbon bound in an organic compound and is often used as a non-specific indicator of water quality. TOC measures both the total carbon present as well as the inorganic carbon (IC). Subtracting the inorganic carbon from the total carbon yields TOC.  
 \*\*TTO's = Summation of all quantifiable values greater than 0.01 mg/L for toxic organics listed in 40 CFR 413.02(i). TTO's include PCB's (Poly-Chlorinated Biphenyls), VOC's (Volatile Organic Compounds), SVOC's (Semi-Volatile Organic Compounds). PCB's, VOC's and SVOC's shall be analyzed using EPA Methods 608, 624, and 625, respectively.*

**Zero Discharge / Self-Monitoring (Initial if applicable):**

\_\_\_\_\_ No industrial wastewater from permitted processes has been discharged to sewer during the monitoring period

\_\_\_\_\_ No sampling has been conducted on permitted sewer discharges during the monitoring period

**Certification Statement:**

"I certify, under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Brad Owens

*Printed Name of Authorized Representative*  
  
*Signature of Authorized Representative*

Station Manager

*Title*  
 2/27/2013  
*Date*

**TABLE 1**  
**SUMMARY OF SOFTENED STREAM B CONCENTRATIONS**  
**COMPARED TO LOWELL SEWER DISCHARGE LIMITS**  
 Public Service Company of New Hampshire  
 Merrimack Station  
 Bow, New Hampshire

PARAMETER	LOWELL SEWER DISCHARGE LIMITS (mg/L)	SOFTENED STREAM B RESULTS 1/18/2013 (mg/L)	SOFTENED STREAM A RESULTS 1/26/2013 (mg/L)
Arsenic	0.556	0.0130	<0.00150
Cadmium	0.056	0.00163	0.000548
COD	-	3,000	170
Copper	3.124	-	0.00632
Lead	0.857	0.00296	<0.000400
Mercury	0.004	0.000203	0.0000413
Nickel	1.541	-	<0.00100
pH	5.0-9.5	7.24	7.79
Silver	0.053	<0.00100	<0.000200

**TABLE 2**  
**SUMMARY OF WASTEWATER SHIPMENTS TO LOWELL REGIONAL WASTEWATER UTILITY**  
 Public Service Company of New Hampshire  
 Merrimack Station  
 Bow, New Hampshire

DATE	DAY	TICKET	TRUCKING COMPANY	pH	SOFTENED STREAM A VOLUME (gallons)	SOFTENED STREAM B VOLUME (gallons)	TOTAL DAILY VOLUME (gallons)
1/18/2013	Friday	1004	O'Brien	-	-	8,000	16,000
		1003	O'Brien	-	-	8,000	
1/19/2013	Saturday	1005	O'Brien	-	-	8,000	48,000
		1006	O'Brien	-	-	8,000	
		1007	O'Brien	-	-	8,000	
		1008	O'Brien	-	-	8,000	
		1009	O'Brien	-	-	8,000	
		1010	O'Brien	-	-	8,000	
1/20/2013	Sunday	1011	O'Brien	-	-	8,000	32,000
		1012	O'Brien	-	-	8,000	
		1013	O'Brien	-	-	8,000	
		1014	O'Brien	-	-	8,000	
1/25/2013	Friday	1015	O'Brien	7.46	8,000	-	16,000
		1016	O'Brien	7.58	8,000	-	
1/26/2013	Saturday	1017	O'Brien	-	-	8,000	40,000
		1062	O'Brien	-	8,000	-	
		1061	O'Brien	7.85	8,000	-	
		1063	O'Brien	7.49	8,000	-	
		1018	O'Brien	-	-	8,000	
1/27/2013	Sunday	1020	O'Brien	-	-	8,000	32,000
		1065	O'Brien	-	8,000	-	
		1019	O'Brien	7.29	8,000	-	
		1064	O'Brien	-	8,000	-	
1/28/2013	Monday	1021	O'Brien	7.51	8,000	-	8,000

Shipments (Number of Trucks)	24
Truck Volume (Gallons)	8,000
Total Stream A Volume Discharged (Gallons)	72,000
Total Stream B Volume Discharged (Gallons)	120,000
Total Volume Discharged (Gallons)	192,000
Maximum Daily Flow (gallons per day)	48,000
Average Daily Flow (gallons per discharge day)	27,429
<b>PERMITTED FLOW (GPD):</b>	<b>70,000</b>



Paul Pepler  
GZA GeoEnvironmental, Inc. (NH)  
380 Harvey Road  
Manchester, NH 03103



Subject: Laboratory Report

Eastern Analytical, Inc. ID: 117908  
Client Identification: PSNH-MK  
Date Received: 1/28/2013

Dear Mr. Pepler:

Enclosed please find the laboratory report for the above identified project. All analyses were performed in accordance with our QA/QC Program. Unless otherwise stated, holding times, preservation techniques, container types, and sample conditions adhered to EPA Protocol. Samples which were collected by Eastern Analytical, Inc. (EAI) were collected in accordance with approved EPA procedures. Eastern Analytical, Inc. certifies that the enclosed test results meet all requirements of NELAP and other applicable state certifications. Please refer to our website at [www.eailabs.com](http://www.eailabs.com) for a copy of our NELAP certificate and accredited parameters.

The following standard abbreviations and conventions apply to all EAI reports:

- Solid samples are reported on a dry weight basis, unless otherwise noted
- < : "less than" followed by the reporting limit
- > : "greater than" followed by the reporting limit
- %R : % Recovery

Eastern Analytical Inc. maintains certification in the following states: Connecticut (PH-0492), Maine (NH005), Massachusetts (M-NH005), New Hampshire/NELAP (1012), Rhode Island (269) and Vermont (VT1012).

The following information is contained within this report: Sample Conditions summary, Analytical Results/Data, Quality Control data (if requested) and copies of the Chain of Custody. This report may not be reproduced except in full, without the the written approval of the laboratory.

If you have any questions regarding the results contained within, please feel free to directly contact me or the chemist(s) who performed the testing in question. Unless otherwise requested, we will dispose of the sample(s) 30 days from the sample receipt date.

We appreciate this opportunity to be of service and look forward to your continued patronage.

Sincerely,

  
Lorraine Olashaw, Lab Director

2-14-13  
Date

37  
# of pages (excluding cover letter)



# SAMPLE CONDITIONS PAGE

EAI ID#: 117908

Client: **GZA GeoEnvironmental, Inc. (NH)**

Client Designation: **PSNH-MK**

Temperature upon receipt (°C): **4.4**

Received on ice or cold packs (Yes/No): **Y**

Acceptable temperature range (°C): 0-6

Lab ID	Sample ID	Date Received	Date Sampled	Sample Matrix	% Dry Weight	Exceptions/Comments (other than thermal preservation)
117908.01	Softened Stream A WW	1/28/13	1/26/13	aqueous		Adheres to Sample Acceptance Policy

*Samples were properly preserved and the pH measured when applicable unless otherwise noted. Analysis of solids for pH, Flashpoint, Ignitibility, Paint Filter, Corrosivity, Conductivity and Specific Gravity are reported on an "as received" basis.*

*All results contained in this report relate only to the above listed samples.*

*References include:*

- 1) EPA 600/4-79-020, 1983*
- 2) Standard Methods for Examination of Water and Wastewater : Inorganics, 19th Edition, 1995; Microbiology, 20th Edition, 1998*
- 3) Test Methods for Evaluating Solid Waste SW 846 3rd Edition including updates IVA and IVB*
- 4) Hach Water Analysis Handbook, 2nd edition, 1992*



# LABORATORY REPORT

EAI ID#: 117908

Client: **GZA GeoEnvironmental, Inc. (NH)**  
Client Designation: **PSNH-MK**

**Sample ID:** Softened Stream A  
VW

**Lab Sample ID:** 117908.01

**Matrix:** aqueous

**Date Sampled:** 1/26/13

**Date Received:** 1/28/13

Solids Suspended < 5

Solids Dissolved **23000**

BOD < 60

COD **170**

Units	Analysis		Method	Analyst
	Date	Time		
mg/L	1/29/13	10:10	2540D	SCW
mg/L	1/30/13	15:50	2540C	SCW
mg/L	1/28/13	10:45	5210B	SKC
mg/L	1/31/13	8:35	H8000	SCW

BOD: Although several dilutions were run on sample "Softened", oxygen depletion was not great enough to calculate a valid BOD result. An elevated detection limit has been reported.



# QC REPORT

EAI ID#: 117908

Client: GZA GeoEnvironmental, Inc. (NH)

Client Designation: PSNH-MK

Parameter Name	Blank	LCS	LCSD	Units	Date of Analysis	Limits	RPD	Method
Solids Suspended	< 5	96 (96 %R)	93 (93 %R) (3 RPD)	mg/L	1/29/13	90 - 110	20	2540D
Solids Dissolved	< 5	990 (99 %R)	NA	mg/L	1/30/13	85 - 115		2540C
BOD	< 6	410 (102 %R)	420 (106 %R) (4 RPD)	mg/L	1/28/13	84 - 115	20	5210B
COD	< 10	100 (101 %R)	95 (95 %R) (6 RPD)	mg/L	1/31/13	85 - 115	20	H8000

Samples were analyzed within holding times unless noted on the sample results page.  
 Instrumentation was calibrated in accordance with the method requirements.  
 The method blanks were free of contamination at the reporting limits.  
 The associated matrix spikes and/or Laboratory Control Samples met the above stated criteria.  
 Exceptions to the above statements are flagged or noted above or on the QC Narrative page.  
 \*/I Flagged analyte recoveries deviated from the QA/QC limits.



11720 North Creek Parkway North, Suite 400  
Bothell, WA 98011  
Ph: 425-686-1996  
Fx: 425-686-3096

12 February 2013

Jeff Gagne  
Eastern Analytical, Inc  
25 Chenell Drive  
Concord, NH 03301  
RE: Merrimack Station 200.8

Enclosed are the analytical results for samples received by Frontier Global Sciences. All quality control measurements are within established control limits and there were no analytical difficulties encountered with the exception of those listed in the case narrative section of this report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in cursive script that reads "Liz Siska".

Liz Siska  
Project Manager



11720 North Creek Parkway North, Suite 400  
Bothell, WA 98011  
Ph: 425-686-1996  
Fx: 425-686-3096

### ANALYTICAL REPORT FOR SAMPLES

Laboratory: Eurofins Frontier Global Sciences, Inc.

SDG:

Client: Eastern Analytical, Inc

Project: Merrimack Station 200.8

Sample ID	Lab ID	Matrix	Date Sampled	Date Received
Softened Stream A WW	1301407-01	Water	26-Jan-13 11:50	29-Jan-13 09:25
Field Blank Hg	1301407-02	Water	26-Jan-13 11:50	29-Jan-13 09:25

Eurofins Frontier Global Sciences, Inc.

*The results in this report only apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*

Liz Siska, Project Manager



11720 North Creek Parkway North, Suite 400  
Bothell, WA 98011  
Ph: 425-686-1996  
Fx: 425-686-3096

## CASE NARRATIVE

### SAMPLE RECEIPT

Two (2) water samples were received January 29th, 2013 at Eurofins Frontier Global Sciences (EFGS). The samples were received intact, on-ice within a cooler at 6.0 degrees Celsius.

### SAMPLE PREPARATION AND ANALYSIS

Sample preparation and analysis for trace metals was performed in accordance with EPA Method 200.8 with the use of a collision cell.

Sample preparation and analysis for total mercury was performed in accordance with EPA Method 1631E.

### ANALYTICAL ISSUES

Liquid spikes were prepared for every preparation as a measure of accuracy. All liquid spikes and certified reference material (if applicable) were within the control limits.

As an additional measure of the accuracy of the methods used and to check for matrix interference, matrix spikes (MS) and matrix spike duplicates (MSD) were digested and analyzed. All of the matrix spike recoveries were within the control limits.

A reasonable measure of the precision of the analytical methods is the relative percent difference (RPD) between a matrix spike recovery and a matrix spike duplicate recovery and between laboratory control sample recovery and laboratory control sample duplicate recoveries. All of the relative percent differences were within the control limits.

Eurofins Frontier Global Sciences, Inc.

A handwritten signature in cursive script that reads "Liz Siska".

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Liz Siska, Project Manager

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1301407 Final Report  
02/12/2013



### CHAIN OF CUSTODY FORMS

FGS Work Order: 1301407 **Sample Receipt Checklist** Frontier Global Sciences

Client: Eastex Analytical Date & Time Received: 1/29/13 0925 Date Logged In: 1/29/13 Date Labeled: 1/29/13  
 Project: \_\_\_\_\_ Received By: CD Logged By: AMB Labeled By: AMB  
 # of Coolers Received: 1 Samples Arrived By:  Shipping Service \_\_\_\_\_ Courier \_\_\_\_\_ Hand \_\_\_\_\_ Other (Specify: \_\_\_\_\_)  
 Tracking/Airbill Number(s): LD 12 X46 599 01 9726 7464  
 Thermal Preservation: \_\_\_\_\_ None (Ambient)  Loose Ice \_\_\_\_\_ Gel/Blue Ice \_\_\_\_\_ Other (Specify: \_\_\_\_\_) Thermal Preservation Required:  Y/ N

Cooler Information:	Y/N	Comments	Thermometer ID:	CF: <u>-0.1°C</u>			
The coolers do not appear to be tampered with:	<u>Y</u>		<u>3150</u>	Cooler 1: <u>3°C</u>	Cooler 4: °C	Cooler 7: °C	Cooler 10: °C
Custody Seals are present and intact:	<u>Y</u>	<u>None used</u>		Cooler 2: °C	Cooler 5: °C	Cooler 8: °C	Cooler 11: °C
Custody seals signed by:	<u>AK</u>			Cooler 3: °C	Cooler 6: °C	Cooler 9: °C	Cooler 12: °C

Chain of Custody:	Y/N	Comments	Sample Condition/Integrity:	Y/N	Comments
Sample ID/Description:	<u>Y</u>		Sample containers intact:	<u>Y</u>	
Date/Time of collection:	<u>Y</u>		Sample labels are present and legible:	<u>Y</u>	
Sampled by:	<u>Y</u>		Sample ID on container matches COC:	<u>Y</u>	
Preservation type:	<u>N/A</u>		Correct sample containers used:	<u>Y</u>	
Requested analyses:	<u>Y</u>		Samples received within holding times:	<u>Y</u>	
Required signatures:	<u>Y</u>		Sample volume sufficient for requested analyses:	<u>Y</u>	
Internal COC required:	<u>Y</u>		Correct preservative used for requested analyses:	<u>N/A</u>	
			pH of preserved samples verified and recorded:	<u>N/A</u>	

Client Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Method: \_\_\_\_\_  
 Anomalies/Non-conformances (attach additional pages if needed): \_\_\_\_\_ Discussion/Resolution: \_\_\_\_\_

Ice was completely melted prior to arrival at FGS. - CD 1/29/13  
Sample bags all had a small bright pink sticker on them that reads: "117908.01 Softened" AMB 1/29/13

FGS Sample Receipt Checklist Revision 2; 07/09/2012

Eurofins Frontier Global Sciences, Inc.

*Liz Siska*

Liz Siska, Project Manager

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 Bothell, WA 98011  
 Ph: 425-686-1996  
 Fx: 425-686-3096

### CHAIN OF CUSTODY FORMS



Chain of Custody Record & Laboratory Analysis Request:  
 Air, Water, Sediments, Plant and Animal Tissue,  
 Hydrocarbon & Other Samples

11720 North Creek Parkway N  
 Bothell, WA 98011  
 Phone: 425-686-1996  
 Fax: 425-686-3096  
 info@FrontierGS.com  
 http://www.FrontierGS.com

Page    of   

Client: <u>Eastern Analytical, Inc</u>		Contact: <u>Jeff Bagne</u>		Analyses Requested		FGS PM: <u>Liz Siska</u>				
Address: <u>25 Chenell Drive</u> <u>Concord, NH 03301</u>		Phone: <u>603/228-4600</u> Fax: <u>603/228-4591</u>				Date: <u>1/28/2013</u>				
Project Name		E-mail: <u>jeff@eastanalabs.com</u>				TAT (business days): <u>20</u> (std)				
Report To: <u>Same as above</u>		Contract/PD: <u>39862</u>				<u>15</u> (0) <u>5</u> <u>4</u> <u>3</u> <u>2</u> <u>24</u> hrs.				
Address: <u>603/ 603/</u>		Invoice To: <u>Same</u>				(For TAT < 10 days, contact PM)				
Phone: <u>228-0525</u> Fax: <u>228-4591</u>		Address: <u>Same</u>				Saturday delivery? <input type="checkbox"/> Y <input type="checkbox"/> N				
E-mail: <u>customer.service@eastanalabs.com</u>		Phone:                      Fax:				(If yes, please contact PM)				
		E-mail:				EDD <input type="checkbox"/> Y <input type="checkbox"/> N				
						QA <input type="checkbox"/> Standard <input type="checkbox"/> High				
No.	Engraved Bottle ID	Sample ID	# of Bottles	Matrix	Date & Time	Sampled By	Field Filtered (Y/N)	Field Preserved: HNO <sub>3</sub> HCl BrCl Other (%)	Total Metals	Comments
1	C-6502/6504	Softened Stream A W/W	2	AQ	1/24/13 1150	PTP	N	-	✓	Metals include As, Ag, Cd, Cu, Mo, Na, Ni, Pb, Hg, Se  200.5 via Collision cell
2	C-7604	Field Blank Hg	1	AQ	1/24/13 1150	PTP	N	-	Hg	
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
For Laboratory Use Only		Matrix Codes:		Relinquished By:		Received By:		Received By:		
COC Seal: <u>Done</u>	Comments:	FW: Fresh Water		<u>Chris Johnson</u>	<u>UPS</u>	<u>Chris Johnson</u>	<u>UPS</u>	<u>Chris Johnson</u>		
Cooler Temp: <u>6.0 °C</u>		WW: Waste Water		Name: <u>Chris Johnson</u>	Name:	Name: <u>Chris Johnson</u>	Name:	Name: <u>Chris Johnson</u>		
Carrier: <u>UPS</u>		SB: Sea and Brackish Water		Organization: <u>Eastern Analytical</u>	Organization:	Organization: <u>Eastern Analytical</u>	Organization:	Organization: <u>Eastern Analytical</u>		
VTSR: <u>CRS</u>	<u>TID 3150</u>	SS: Soil and Sediment		Date & Time: <u>1/23/13 1530</u>	Date & Time:	Date & Time: <u>1/23/13 1530</u>	Date & Time:	Date & Time: <u>1/23/13 0905</u>		
# of Coolers:		TS: Plant and Animal Tissue		Tracking number: <u>12 X-16 579 01 9726 7464</u>						
		HC: Hydrocarbons		By signing, you declare that you agree with FGS' terms and conditions, and that you authorize FGS to perform the specified analyses.		Customer Approval: _____		Date: _____		
		TR: Trap								
		OT: Other								

Eurofins Frontier Global Sciences, Inc.

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*Liz Siska*

Liz Siska, Project Manager

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 02/12/2013



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## ANALYTICAL RESULTS

### Softened Stream A WW

Matrix: Water

Laboratory ID: 1301407-01

Analyte	Result	MDL	MRL	Units	Dilution	Batch	Sequence	Analyzed	Method	Notes
Arsenic	ND	0.43	1.50	µg/L	10	F302022	3B08012	02/08/13	EPA 200.8	U
Cadmium	<b>0.548</b>	0.032	0.200	µg/L	10	F302022	3B08012	02/08/13	EPA 200.8	
Copper	<b>6.32</b>	0.10	1.00	µg/L	10	F301262	3B04004	02/03/13	EPA 200.8	
Lead	ND	0.032	0.400	µg/L	10	F301262	3B04004	02/03/13	EPA 200.8	U
Mercury	<b>41.3</b>	0.84	5.05	ng/L	10	F302012	3B05007	02/04/13	EPA 1631E	
Molybdenum	<b>120</b>	0.077	1.20	µg/L	10	F301262	3B11008	02/08/13	EPA 200.8	
Nickel	ND	0.12	1.00	µg/L	10	F301262	3B04004	02/03/13	EPA 200.8	U
Selenium	<b>44.5</b>	3.15	6.00	µg/L	10	F302063	3B12002	02/12/13	EPA 200.8	
Silver	ND	0.020	0.200	µg/L	10	F302022	3B11007	02/09/13	EPA 200.8	U
Sodium	<b>7190000</b>	4990	2500000	µg/L	5000	F301262	3B11001	02/08/13	EPA 200.8	

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### ANALYTICAL RESULTS

#### Field Blank Hg

Matrix: Water

Laboratory ID: 1301407-02

Analyte	Result	MDL	MRL	Units	Dilution	Batch	Sequence	Analyzed	Method	Notes
Mercury	ND	0.08	0.50	ng/L	1	F302012	3B05007	02/04/13	EPA 1631E	U

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### MATRIX DUPLICATES/TRIPPLICATES

**SOURCE: 1301386-02**

Batch: F302012

Sequence: 3B05007

Preparation: BrCl Oxidation

Lab Number: F302012-DUP1

Analyte	Sample Concentration ng/L	Duplicate Concentration ng/L	MRL	% RPD	RPD Limit	Method	Notes
Mercury	66.24	66.08	5.05	0.247	24	EPA 1631E	

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**MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD**

**SOURCE: 1301407-01**

Batch: F301262

Sequence: 3B04004

Preparation: Closed Vessel Nitric Oven Digestion

Lab Number: F301262-MS/MSD1

Analyte	Sample Concentration (µg/L)	Spike Added (µg/L)	MS Concentration (µg/L)	MS % Recovery	Recovery Limits	Method	Notes
Nickel	0.39	4.0600	2.53	52.7	70 - 130	EPA 200.8	QM-07
Copper	6.32	4.0600	8.90	63.5	70 - 130	EPA 200.8	QM-02
Lead	ND	1.5225	1.294	85.0	70 - 130	EPA 200.8	

Analyte	Spike Added (µg/L)	MSD Concentration (µg/L)	MSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Nickel	4.0600	2.30	47.0	9.54	70 - 130	20	EPA 200.8	QM-07
Copper	4.0600	8.40	51.3	5.75	70 - 130	20	EPA 200.8	QM-02
Lead	1.5225	1.335	87.7	3.15	70 - 130	20	EPA 200.8	

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**MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD**

**SOURCE: 1301407-01**

Batch: F301262

Sequence: 3B04004

Preparation: Closed Vessel Nitric Oven Digestion

Lab Number: F301262-MS/MSD3

Analyte	Sample Concentration (µg/L)	Spike Added (µg/L)	MS Concentration (µg/L)	MS % Recovery	Recovery Limits	Method	Notes
Nickel	0.39	253.75	198.2	77.9	70 - 130	EPA 200.8	AS
Copper	6.32	253.75	200.9	76.7	70 - 130	EPA 200.8	AS
Lead	ND	50.750	43.61	85.9	70 - 130	EPA 200.8	AS

Analyte	Spike Added (µg/L)	MSD Concentration (µg/L)	MSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Nickel	253.75	196.9	77.4	0.662	70 - 130	20	EPA 200.8	AS
Copper	253.75	204.3	78.0	1.70	70 - 130	20	EPA 200.8	AS
Lead	50.750	44.57	87.8	2.16	70 - 130	20	EPA 200.8	AS

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**MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD**

**SOURCE: 1301407-01RE2**

Batch: F301262

Sequence: 3B11001

Preparation: Closed Vessel Nitric Oven Digestion

Lab Number: F301262-MS/MSD7

Analyte	Sample Concentration (µg/L)	Spike Added (µg/L)	MS Concentration (µg/L)	MS % Recovery	Recovery Limits	Method	Notes
Sodium	7186000	507.50	7311000	24700	70 - 130	EPA 200.8	QM-02

Analyte	Spike Added (µg/L)	MSD Concentration (µg/L)	MSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Sodium	507.50	6370000	-161000	13.7	70 - 130	20	EPA 200.8	QM-02

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**MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD**

**SOURCE: 1301407-01RE2**

Batch: F301262

Sequence: 3B11001

Preparation: Closed Vessel Nitric Oven Digestion

Lab Number: F301262-MS/MSD8

Analyte	Sample Concentration (µg/L)	Spike Added (µg/L)	MS Concentration (µg/L)	MS % Recovery	Recovery Limits	Method	Notes
Sodium	7186000	10150000	17430000	101	70 - 130	EPA 200.8	AS

  

Analyte	Spike Added (µg/L)	MSD Concentration (µg/L)	MSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Sodium	10150000	17090000	97.6	1.98	70 - 130	20	EPA 200.8	AS

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**MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD**

**SOURCE: 1301407-01RE3**

Batch: F301262

Sequence: 3B11008

Preparation: Closed Vessel Nitric Oven Digestion

Lab Number: F301262-MS/MSD9

Analyte	Sample Concentration (µg/L)	Spike Added (µg/L)	MS Concentration (µg/L)	MS % Recovery	Recovery Limits	Method	Notes
Molybdenum	119.9	2.0300	121.2	67.0	70 - 130	EPA 200.8	QM-02

Analyte	Spike Added (µg/L)	MSD Concentration (µg/L)	MSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Molybdenum	2.0300	121.8	96.5	0.494	70 - 130	20	EPA 200.8	

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**MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD**

**SOURCE: 1301407-01RE3**

Batch: F301262

Sequence: 3B11008

Preparation: Closed Vessel Nitric Oven Digestion

Lab Number: F301262-MS/MSDA

Analyte	Sample Concentration (µg/L)	Spike Added (µg/L)	MS Concentration (µg/L)	MS % Recovery	Recovery Limits	Method	Notes
Molybdenum	119.9	101.50	236.7	115	70 - 130	EPA 200.8	AS

Analyte	Spike Added (µg/L)	MSD Concentration (µg/L)	MSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Molybdenum	101.50	232.7	111	1.69	70 - 130	20	EPA 200.8	AS

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**MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD**

**SOURCE: 1301386-02**

Batch: F302012

Sequence: 3B05007

Preparation: BrCl Oxidation

Lab Number: F302012-MS/MSD1

Analyte	Sample Concentration (ng/L)	Spike Added (ng/L)	MS Concentration (ng/L)	MS % Recovery	Recovery Limits	Method	Notes
Mercury	66.24	204.00	261.8	95.8	71 - 125	EPA 1631E	

Analyte	Spike Added (ng/L)	MSD Concentration (ng/L)	MSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Mercury	204.00	265.6	97.7	1.44	71 - 125	24	EPA 1631E	

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**MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD**

**SOURCE: 1302024-04**

Batch: F302012

Sequence: 3B05007

Preparation: BrCl Oxidation

Lab Number: F302012-MS/MSD2

Analyte	Sample Concentration (ng/L)	Spike Added (ng/L)	MS Concentration (ng/L)	MS % Recovery	Recovery Limits	Method	Notes
Mercury	2.43	5.1000	8.19	113	71 - 125	EPA 1631E	

Analyte	Spike Added (ng/L)	MSD Concentration (ng/L)	MSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Mercury	5.1000	8.15	112	0.497	71 - 125	24	EPA 1631E	

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**MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD**

**SOURCE: 1301407-01RE2**

Batch: F302022

Sequence: 3B08012

Preparation: Closed Vessel Nitric Oven Digestion

Lab Number: F302022-MS/MSD1

Analyte	Sample Concentration (µg/L)	Spike Added (µg/L)	MS Concentration (µg/L)	MS % Recovery	Recovery Limits	Method	Notes
Arsenic	1.21	15.225	17.80	109	70 - 130	EPA 200.8	
Cadmium	0.548	0.81200	1.278	89.9	70 - 130	EPA 200.8	

Analyte	Spike Added (µg/L)	MSD Concentration (µg/L)	MSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Arsenic	15.225	18.30	112	2.74	70 - 130	20	EPA 200.8	
Cadmium	0.81200	1.366	101	6.73	70 - 130	20	EPA 200.8	

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**MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD**

**SOURCE: 1301407-01RE2**

Batch: F302022

Sequence: 3B08012

Preparation: Closed Vessel Nitric Oven Digestion

Lab Number: F302022-MS/MSD2

Analyte	Sample Concentration (µg/L)	Spike Added (µg/L)	MS Concentration (µg/L)	MS % Recovery	Recovery Limits	Method	Notes
Arsenic	1.21	203.00	230.1	113	70 - 130	EPA 200.8	AS
Cadmium	0.548	20.300	21.38	103	70 - 130	EPA 200.8	AS

Analyte	Spike Added (µg/L)	MSD Concentration (µg/L)	MSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Arsenic	203.00	232.6	114	1.05	70 - 130	20	EPA 200.8	AS
Cadmium	20.300	20.90	100	2.29	70 - 130	20	EPA 200.8	AS

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**MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD**

**SOURCE: 1301407-01RE2**

Batch: F302022

Sequence: 3B11007

Preparation: Closed Vessel Nitric Oven Digestion

Lab Number: F302022-MS/MSD3

Analyte	Sample Concentration (µg/L)	Spike Added (µg/L)	MS Concentration (µg/L)	MS % Recovery	Recovery Limits	Method	Notes
Silver	ND	1.5225	1.134	74.5	70 - 130	EPA 200.8	

  

Analyte	Spike Added (µg/L)	MSD Concentration (µg/L)	MSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Silver	1.5225	1.176	77.3	3.66	70 - 130	20	EPA 200.8	

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**MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD**

**SOURCE: 1301407-01RE2**

Batch: F302022

Sequence: 3B11007

Preparation: Closed Vessel Nitric Oven Digestion

Lab Number: F302022-MS/MSD4

Analyte	Sample Concentration (µg/L)	Spike Added (µg/L)	MS Concentration (µg/L)	MS % Recovery	Recovery Limits	Method	Notes
Silver	ND	10.150	7.578	74.7	70 - 130	EPA 200.8	AS

Analyte	Spike Added (µg/L)	MSD Concentration (µg/L)	MSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Silver	10.150	7.607	75.0	0.382	70 - 130	20	EPA 200.8	AS

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**MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD**

**SOURCE: 1301407-01RE3**

**Batch:** F302063

**Sequence:** 3B12002

**Preparation:** Closed Vessel Nitric Oven Digestion

**Lab Number:** F302063-MS/MSD1

Analyte	Sample Concentration (µg/L)	Spike Added (µg/L)	MS Concentration (µg/L)	MS % Recovery	Recovery Limits	Method	Notes
Selenium	44.47	30.450	55.00	34.6	70 - 130	EPA 200.8	QM-02

  

Analyte	Spike Added (µg/L)	MSD Concentration (µg/L)	MSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Selenium	30.450	63.41	62.2	14.2	70 - 130	20	EPA 200.8	QM-02

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**MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD**

**SOURCE: 1301407-01RE3**

Batch: F302063

Sequence: 3B12002

Preparation: Closed Vessel Nitric Oven Digestion

Lab Number: F302063-MS/MSD2

Analyte	Sample Concentration (µg/L)	Spike Added (µg/L)	MS Concentration (µg/L)	MS % Recovery	Recovery Limits	Method	Notes
Selenium	44.47	203.00	220.1	86.5	70 - 130	EPA 200.8	

Analyte	Spike Added (µg/L)	MSD Concentration (µg/L)	MSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Selenium	203.00	228.8	90.8	3.89	70 - 130	20	EPA 200.8	

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**LABORATORY CONTROL SAMPLE/ LABORATORY CONTROL SAMPLE DUPLICATE**

**RECOVERY AND RPD**

Batch: F301262

Sequence: 3B04004

Preparation: Closed Vessel Nitric Oven Digestion

Lab Number: F301262-BS/BSD1

LCS Source: Blank Spike

Analyte	Spike Added (µg/L)	LCS Concentration (µg/L)	LCS % Recovery	Recovery Limits	Method	Notes
Sodium	500.00	473	94.6	85 - 115	EPA 200.8	
Nickel	4.0000	3.63	90.7	85 - 115	EPA 200.8	
Copper	4.0000	3.70	92.5	85 - 115	EPA 200.8	
Molybdenum	2.0000	1.778	88.9	85 - 115	EPA 200.8	
Lead	1.5000	1.317	87.8	85 - 115	EPA 200.8	

Analyte	Spike Added (µg/L)	LCSD Concentration (µg/L)	LCSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Sodium	500.00	471	94.2	0.449	85 - 115	20	EPA 200.8	
Nickel	4.0000	3.60	90.0	0.776	85 - 115	20	EPA 200.8	
Copper	4.0000	3.85	96.2	3.89	85 - 115	20	EPA 200.8	
Molybdenum	2.0000	1.723	86.1	3.14	85 - 115	20	EPA 200.8	
Lead	1.5000	1.361	90.7	3.28	85 - 115	20	EPA 200.8	

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**LABORATORY CONTROL SAMPLE/ LABORATORY CONTROL SAMPLE DUPLICATE**

**RECOVERY AND RPD**

Batch: F302012

Sequence: 3B05007

Preparation: BrCl Oxidation

Lab Number: F302012-BS/BSD1

LCS Source: NIST

Analyte	Spike Added (ng/L)	LCS Concentration (ng/L)	LCS % Recovery	Recovery Limits	Method	Notes
Mercury	15.679	16.00	102	77 - 123	EPA 1631E	

Analyte	Spike Added (ng/L)	LCSD Concentration (ng/L)	LCSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Mercury	15.679	16.19	103	1.17	77 - 123	24	EPA 1631E	

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**LABORATORY CONTROL SAMPLE/ LABORATORY CONTROL SAMPLE DUPLICATE**

**RECOVERY AND RPD**

Batch: F302022

Sequence: 3B08012

Preparation: Closed Vessel Nitric Oven Digestion

Lab Number: F302022-BS/BSD1

LCS Source: Blank Spike

Analyte	Spike Added (µg/L)	LCS Concentration (µg/L)	LCS % Recovery	Recovery Limits	Method	Notes
Arsenic	15.000	17.06	114	85 - 115	EPA 200.8	
Cadmium	0.80000	0.811	101	85 - 115	EPA 200.8	

Analyte	Spike Added (µg/L)	LCSD Concentration (µg/L)	LCSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Arsenic	15.000	17.25	115	1.09	85 - 115	20	EPA 200.8	
Cadmium	0.80000	0.844	105	3.93	85 - 115	20	EPA 200.8	

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**LABORATORY CONTROL SAMPLE/ LABORATORY CONTROL SAMPLE DUPLICATE**

**RECOVERY AND RPD**

Batch: F302022

Sequence: 3B11007

Preparation: Closed Vessel Nitric Oven Digestion

Lab Number: F302022-BS/BSD2

LCS Source: Blank Spike

Analyte	Spike Added (µg/L)	LCS Concentration (µg/L)	LCS % Recovery	Recovery Limits	Method	Notes
Silver	1.5000	1.493	99.5	85 - 115	EPA 200.8	

Analyte	Spike Added (µg/L)	LCSD Concentration (µg/L)	LCSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Silver	1.5000	1.522	101	1.89	85 - 115	20	EPA 200.8	

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**LABORATORY CONTROL SAMPLE/ LABORATORY CONTROL SAMPLE DUPLICATE**

**RECOVERY AND RPD**

Batch: F302063

Sequence: 3B12002

Preparation: Closed Vessel Nitric Oven Digestion

Lab Number: F302063-BS/BSD1

LCS Source: Blk Spk

Analyte	Spike Added (µg/L)	LCS Concentration (µg/L)	LCS % Recovery	Recovery Limits	Method	Notes
Selenium	30.000	28.08	93.6	85 - 115	EPA 200.8	

Analyte	Spike Added (µg/L)	LCSD Concentration (µg/L)	LCSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Selenium	30.000	28.15	93.8	0.226	85 - 115	20	EPA 200.8	

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### PREPARATION BLANKS

Instrument: ICPMS-5

Sequence: 3B04004

Preparation: Closed Vessel Nitric Oven Digestion

Lab Sample ID	Analyte	Found	MRL	Units	Batch	Method	Notes
F301262-BLK1	Sodium	9	20	µg/L	F301262	EPA 200.8	U
F301262-BLK1	Nickel	0.04	0.10	µg/L	F301262	EPA 200.8	U
F301262-BLK1	Copper	0.03	0.10	µg/L	F301262	EPA 200.8	U
F301262-BLK1	Molybdenum	0.017	0.060	µg/L	F301262	EPA 200.8	U
F301262-BLK1	Lead	0.001	0.040	µg/L	F301262	EPA 200.8	U

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### PREPARATION BLANKS

Instrument: Hg2600-2

Sequence: 3B05007

Preparation: BrCl Oxidation

Lab Sample ID	Analyte	Found	MRL	Units	Batch	Method	Notes
F302012-BLK1	Mercury	0.007	0.50	ng/L	F302012	EPA 1631E	U
F302012-BLK2	Mercury	-0.01	0.50	ng/L	F302012	EPA 1631E	U
F302012-BLK3	Mercury	-0.003	0.50	ng/L	F302012	EPA 1631E	U
F302012-BLK4	Mercury	0.02	0.50	ng/L	F302012	EPA 1631E	U, QB-04

Eurofins Frontier Global Sciences, Inc.

Liz Siska, Project Manager

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11720 North Creek Parkway North, Suite 400  
Bothell, WA 98011  
Ph: 425-686-1996  
Fx: 425-686-3096

### PREPARATION BLANKS

Instrument: ICPMS-3

Sequence: 3B08012

Preparation: Closed Vessel Nitric Oven Digestion

Lab Sample ID	Analyte	Found	MRL	Units	Batch	Method	Notes
F302022-BLK1	Arsenic	0.05	0.15	µg/L	F302022	EPA 200.8	U
F302022-BLK1	Cadmium	0.0003	0.020	µg/L	F302022	EPA 200.8	U

Eurofins Frontier Global Sciences, Inc.

Liz Siska, Project Manager

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Bothell, WA 98011  
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Fx: 425-686-3096

### PREPARATION BLANKS

Instrument: ICPMS-6

Sequence: 3B11007

Preparation: Closed Vessel Nitric Oven Digestion

Lab Sample ID	Analyte	Found	MRL	Units	Batch	Method	Notes
F302022-BLK2	Silver	-0.0008	0.020	µg/L	F302022	EPA 200.8	U

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Liz Siska, Project Manager

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Bothell, WA 98011  
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### PREPARATION BLANKS

Instrument: ICPMS-6

Sequence: 3B12002

Preparation: Closed Vessel Nitric Oven Digestion

Lab Sample ID	Analyte	Found	MRL	Units	Batch	Method	Notes
F302063-BLK1	Selenium	0.11	0.60	µg/L	F302063	EPA 200.8	U

Eurofins Frontier Global Sciences, Inc.

Liz Siska, Project Manager

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## Notes and Definitions

- U Analyte included in the analysis, but not detected
- QM-07 The spike recovery was outside control limits for the MS and/or MSD. The batch was accepted based on LCS and LCSD recoveries within control limits and, when analysis permits, acceptable AS/ASD.
- QM-02 The MS and/or MSD recoveries outside acceptance limits, due to spike concentration less than 1 times the sample concentration. The batch was accepted based on LCS and LCSD recoveries within control limits and, when analysis permits, acceptable AS/ASD.
- QB-04 The blank was preserved to 2% BrCl rather than 1%. The control limit for blanks preserved to greater than 1% BrCl is the preservation percentage multiplied by the MRL.
- AS This MS and/or MSD is an analytical spike and/or an analytical spike duplicate.
- DET Analyte Detected
- MDL Minimum Detection Limit
- MRL Minimum Reporting Limit
- ND Analyte Not Detected at or above the reporting limit
- wet Sample results reported on a wet weight basis
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- RSD Relative Standard Deviation

Eurofins Frontier Global Sciences, Inc.

Liz Siska, Project Manager

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**CHAIN-OF-CUSTODY RECORD**

117908

**BOLD FIELDS REQUIRED. PLEASE CIRCLE REQUESTED ANALYSIS.**

SAMPLE I.D.	SAMPLING DATE/TIME *If COMPOSITE, INDICATE BOTH START & FINISH DATE/TIME	MATRIX (SEE BELOW) GRAB/*COMPOSITE	VOC										SVOC										TCMP METALS										INORGANICS										MICRO OTHER										NOTES MeOH Vial # # of Containers																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
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**Eastern Analytical, Inc.**

Paul Pepler  
GZA GeoEnvironmental, Inc. (NH)  
380 Harvey Road  
Manchester, NH 03103



Subject: Laboratory Report

Eastern Analytical, Inc. ID: 117794  
Client Identification: PSNH-MK  
Date Received: 1/22/2013

Dear Mr. Pepler :

Enclosed please find the laboratory report for the above identified project. All analyses were performed in accordance with our QA/QC Program. Unless otherwise stated, holding times, preservation techniques, container types, and sample conditions adhered to EPA Protocol. Samples which were collected by Eastern Analytical, Inc. (EAI) were collected in accordance with approved EPA procedures. Eastern Analytical, Inc. certifies that the enclosed test results meet all requirements of NELAP and other applicable state certifications. Please refer to our website at [www.eailabs.com](http://www.eailabs.com) for a copy of our NELAP certificate and accredited parameters.

The following standard abbreviations and conventions apply to all EAI reports:

- Solid samples are reported on a dry weight basis, unless otherwise noted
- < : "less than" followed by the reporting limit
- > : "greater than" followed by the reporting limit
- %R : % Recovery

Eastern Analytical Inc. maintains certification in the following states: Connecticut (PH-0492), Maine (NH005), Massachusetts (M-NH005), New Hampshire/NELAP (1012), Rhode Island (269) and Vermont (VT1012).

The following information is contained within this report: Sample Conditions summary, Analytical Results/Data, Quality Control data (if requested) and copies of the Chain of Custody. This report may not be reproduced except in full, without the the written approval of the laboratory.

If you have any questions regarding the results contained within, please feel free to directly contact me or the chemist(s) who performed the testing in question. Unless otherwise requested, we will dispose of the sample(s) 30 days from the sample receipt date.

We appreciate this opportunity to be of service and look forward to your continued patronage.

Sincerely,

  
Lorraine Olashaw, Lab Director

2.14.13  
Date

27  
# of pages (excluding cover letter)



# SAMPLE CONDITIONS PAGE

EAI ID#: 117794

Client: GZA GeoEnvironmental, Inc. (NH)

Client Designation: PSNH-MK

Temperature upon receipt (°C): 2.1

Received on ice or cold packs (Yes/No): Y

Acceptable temperature range (°C): 0-6

Lab ID	Sample ID	Date Received	Date Sampled	Sample Matrix	% Dry Weight	Exceptions/Comments (other than thermal preservation)
117794.01	Softened Stream B WW	1/22/13	1/18/13	aqueous		Adheres to Sample Acceptance Policy

Samples were properly preserved and the pH measured when applicable unless otherwise noted. Analysis of solids for pH, Flashpoint, Ignitibility, Paint Filter, Corrosivity, Conductivity and Specific Gravity are reported on an "as received" basis. All results contained in this report relate only to the above listed samples.

References include:

- 1) EPA 600/4-79-020, 1983
- 2) Standard Methods for Examination of Water and Wastewater : Inorganics, 19th Edition, 1995; Microbiology, 20th Edition, 1998
- 3) Test Methods for Evaluating Solid Waste SW 846 3rd Edition including updates IVA and IVB
- 4) Hach Water Analysis Handbook, 2nd edition, 1992



# LABORATORY REPORT

EAI ID#: 117794

Client: **GZA GeoEnvironmental, Inc. (NH)**

Client Designation: **PSNH-MK**

**Sample ID:** Softened Stream B  
WW

**Lab Sample ID:** 117794.01

**Matrix:** aqueous

**Date Sampled:** 1/18/13

**Date Received:** 1/22/13

**COD** 3000

<b>Analysis</b>				
<b>Units</b>	<b>Date</b>	<b>Time</b>	<b>Method</b>	<b>Analyst</b>
mg/L	1/24/13	11:20	H8000	SCW



# QC REPORT

EAI ID#: 117794

Client: GZA GeoEnvironmental, Inc. (NH)

Client Designation: PSNH-MK

Parameter Name	Blank	LCS	LCSD	Units	Date of Analysis	Limits	RPD	Method
COD	< 10	99 (99 %R)	95 (95 %R) (4 RPD)	mg/L	1/24/13	85 - 115	20	H8000

Samples were analyzed within holding times unless noted on the sample results page.  
Instrumentation was calibrated in accordance with the method requirements.  
The method blanks were free of contamination at the reporting limits.  
The associated matrix spikes and/or Laboratory Control Samples met the above stated criteria.  
Exceptions to the above statements are flagged or noted above or on the QC Narrative page.  
\*! Flagged analyte recoveries deviated from the QA/QC limits.



11720 North Creek Parkway North, Suite 400  
Bothell, WA 98011  
Ph: 425-686-1996  
Fx: 425-686-3096

11 February 2013

Jeff Gagne  
Eastern Analytical, Inc  
25 Chenell Drive  
Concord, NH 03301  
RE: Merrimack Station 200.8

Enclosed are the analytical results for samples received by Frontier Global Sciences. All quality control measurements are within established control limits and there were no analytical difficulties encountered with the exception of those listed in the case narrative section of this report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in cursive script that reads "Liz Siska".

Liz Siska  
Project Manager



11720 North Creek Parkway North, Suite 400  
Bothell, WA 98011  
Ph: 425-686-1996  
Fx: 425-686-3096

### ANALYTICAL REPORT FOR SAMPLES

Laboratory: Eurofins Frontier Global Sciences, Inc.

SDG:

Client: Eastern Analytical, Inc

Project: Merrimack Station 200.8

Sample ID	Lab ID	Matrix	Date Sampled	Date Received
Softened Stream B WW TM C-4596	1301328-01	Water	18-Jan-13 13:50	23-Jan-13 09:50
Softened Stream B WW Hg C-4590	1301328-02	Water	18-Jan-13 13:50	23-Jan-13 09:50
Field Blank Hg B-5980	1301328-03	Water	18-Jan-13 13:50	23-Jan-13 09:50

Eurofins Frontier Global Sciences, Inc.

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Liz Siska, Project Manager

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## CASE NARRATIVE

### SAMPLE RECEIPT

Two (2) water samples were received January 23rd, 2013 at Eurofins Frontier Global Sciences (EFGS). The samples were received intact, on-ice within a cooler at 4.3 degrees Celsius.

### SAMPLE PREPARATION AND ANALYSIS

Sample preparation and analysis for trace metals was performed in accordance with EPA Method 200.8 with the use of a collision cell.

Sample preparation and analysis for total mercury was performed in accordance with EPA Method 1631E.

### ANALYTICAL ISSUES

Liquid spikes were prepared for every preparation as a measure of accuracy. All liquid spikes and certified reference material (if applicable) were within the control limits.

As an additional measure of the accuracy of the methods used and to check for matrix interference, matrix spikes (MS) and matrix spike duplicates (MSD) were digested and analyzed. All of the matrix spike recoveries were within the control limits.

A reasonable measure of the precision of the analytical methods is the relative percent difference (RPD) between a matrix spike recovery and a matrix spike duplicate recovery and between laboratory control sample recovery and laboratory control sample duplicate recoveries. All of the relative percent differences were within the control limits.

Eurofins Frontier Global Sciences, Inc.

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Liz Siska, Project Manager

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 Fx: 425-686-3096

### CHAIN OF CUSTODY FORMS

Chain of Custody Record & Laboratory Analysis Request:  
 Air, Water, Sediments, Plant and Animal Tissue,  
 Hydrocarbon & Other Samples

11720 Northcreek Pkwy N, Suite 400  
 Bothell, WA 98011  
 Phone: 425-686-1996  
 Fax: 425-686-3096  
 info@FrontierGS.com  
 http://www.FrontierGS.com



Frontier Global Sciences

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1301328

Client: <i>Eastern Analytical Inc.</i>		Contact: <i>Jeff Coane</i>		Analyses Requested		FGS PM: <i>Liz Siska</i>					
Address: <i>25 Chancell Drive Concord NH 03301</i>		Phone: <i>603/228-0525</i> Fax: <i>603/228-4591</i>				Date: <i>1/22/2013</i>					
Project Name: <i>Merimaek Station/117297</i>		E-mail: <i>office@eas-lab.com</i>				TAT (business days): <i>20 (std)</i> <i>15 (10 5 4 3 2 24 hrs.)</i> (For TAT < 10 days, contact PM. Surcharges apply for expedited TAT)					
Report To: <i>Same as above</i>		Contract/PO: <i>39838</i>				Saturday delivery? <input type="checkbox"/> Y <input type="checkbox"/> N (If yes, please contact PM)					
Address:		Invoice To: <i>Same</i>				EDD <input type="checkbox"/> Y <input type="checkbox"/> N					
Phone: <i>603/228-0525</i> Fax: <i>603/228-4591</i>		Address:				QA <input type="checkbox"/> Standard <input type="checkbox"/> High					
E-mail: <i>customer.service@eas-lab.com</i>		Phone: Fax:				Comments					
E-mail:		E-mail:									
No.	Engraved Bottle ID	Sample ID	# of Bottles	Matrix	Date & Time	Sampled By	Field Filtered (Y/N)	Field Preserved (Y/N)	Field Packed (Y/N)	Other (Y/N)	Total Metals
1	<i>C-4596/4590</i>	<i>softened Stream</i>	<i>2</i>	<i>AQ</i>	<i>1/22/13 1350</i>	<i>PTP</i>	<i>N</i>	<i>-</i>	<i>-</i>	<i>-</i>	<input checked="" type="checkbox"/>
2	<i>B-590</i>	<i>Field blank Hg</i>	<i>1</i>	<i>AA</i>	<i>1/22/13 1350</i>	<i>PTP</i>	<i>N</i>	<i>-</i>	<i>-</i>	<i>-</i>	<input checked="" type="checkbox"/>
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
For Laboratory Use Only			Matrix Codes:			Relinquished By:		Received By:		Received By:	
COC Seal: <i>NA</i>		Comments:		FW: Fresh Water WW: Waste Water SB: Soft and Brackish Water SS: Soil and Sediment TS: Plant and Animal Tissue HC: Hydrocarbon TT: Trip OT: Other		Name: <i>Jeff Coane</i>		Name: <i>Liz Siska</i>		Name:	
Cooler Temp: <i>4°C</i>						Organization: <i>Eastern Analytical</i>		Organization: <i>EFGS</i>		Organization:	
Carrier: <i>ICS</i>						Date & Time: <i>1/22/2013 1350</i>		Date & Time: <i>1/22/13 0950</i>		Date & Time:	
VTSR: <i>0952</i>						Tracking number: <i>12 K46 599 13 9651 L801</i>					
# of Coolers: <i>2</i>											
Sample Disposal:						By signing, you declare that you agree with EFGS' terms and conditions, and that you authorize EFGS to perform the specified analyses.					
<input type="checkbox"/> Return (shipping fees may apply)						Customer Approval: _____ Date: _____					
<input type="checkbox"/> Standard Disposal - 30 Days after report											
<input type="checkbox"/> Retain for _____ weeks after report (storage fees may apply)											

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### CHAIN OF CUSTODY FORMS

FGS Work Order: 1301328 **Sample Receipt Checklist** Frontier Global Sciences

Client: Eastern Anly. Date & Time Received: 1/23/13 0930 Date Logged In: 1/23/13 Date Labeled: 1/23/13

Project: Merrimack Received By: CS Logged By: CS Labeled By: CS

# of Coolers Received: \_\_\_\_\_ Samples Arrived By: \_\_\_\_\_ Shipping Service \_\_\_\_\_ Courier \_\_\_\_\_ Hand \_\_\_\_\_ Other (Specify: \_\_\_\_\_)

Tracking/Airbill Number(s): US 12 X40 599 13 9631 480

Thermal Preservation: \_\_\_\_\_ None (Ambient)  Loose Ice \_\_\_\_\_ Gel/Blue Ice \_\_\_\_\_ Other (Specify: \_\_\_\_\_) Thermal Preservation Required:  Y/N

Cooler Information:	Y/N	Comments	Thermometer ID:	CF:
The coolers do not appear to be tampered with:	Y		5150	-0.1 °C
Custody Seals are present and intact:	N	None used	Cooler 1: °C	Cooler 4: °C
Custody seals signed by:	N/A		Cooler 7: °C	Cooler 10: °C
			Cooler 2: °C	Cooler 5: °C
			Cooler 8: °C	Cooler 11: °C
			Cooler 3: °C	Cooler 6: °C
			Cooler 9: °C	Cooler 12: °C

Chain of Custody:	Y/N	Comments	Sample Condition/Integrity:	Y/N	Comments
Sample ID/Description:	Y/N	on 1/23/13	Sample containers intact:	Y	
Date/Time of collection:	Y		Sample labels are present and legible:	Y	
Sampled by:	Y		Sample ID on container matches COC:	N	Missing trip blank on COC
Preservation type:	N/A		Correct sample containers used:	Y	
Requested analyses:	Y		Samples received within holding times:	Y	
Required signatures:	Y		Sample volume sufficient for requested analyses:	Y	
Internal COC required:	N		Correct preservative used for requested analyses:	N/A	
			pH of preserved samples verified and recorded:	N/A	

Client Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Method: \_\_\_\_\_  
 Anomalies/Non-conformances (attach additional pages if needed): \_\_\_\_\_ Discussion/Resolution: \_\_\_\_\_  
Trip Blank added as last sample of work  
order w/ no analyses while client is contacted  
for info - CS 1/23/13

FGS Sample Receipt Checklist Revision 2; 07/09/2012

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### CHAIN OF CUSTODY FORMS

WORK ORDER

Printed: 1/24/2013 12:14:33PM

**1301328**

**Eurofins Frontier Global Sciences, Inc.**

Client: Eastern Analytical, Inc  
 Project: Merrimack Station 200.8

Project Manager: Liz Siska

#### Preservation Label Confirmation

Sample Bottle	Bottle Type	Preservative	Label Color	Labeled By
<del>1301328-01 A</del>	<del>500 mL PETG 1638/200.8</del>	<del>HNO3</del>	<del>RED</del>	<del>Samples 1, 2, and 3</del>
<del>1301328-02 A</del>	<del>500 mL PETG 1631</del>	<del>BrCl</del>	<del>YELLOW</del>	<del>Previously labeled - AMB</del>
<del>1301328-03 A</del>	<del>250 mL PETG 1631</del>	<del>BrCl</del>	<del>YELLOW</del>	<del>1/24/13</del>
1301328-04 A	250 mL PETG 1631	BrCl	YELLOW	AMB 1/24/13
1301328-04 B	250 mL PETG 1638/200.8 Split	HNO3 - Split	RED	AMB 1/24/13

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## ANALYTICAL RESULTS

### Softened Stream B WW TM C-4596

Matrix: Water

Laboratory ID: 1301328-01

Analyte	Result	MDL	MRL	Units	Dilution	Batch	Sequence	Analyzed	Method	Notes
Arsenic	13.0	2.14	7.50	µg/L	50	F301226	3B08012	02/08/13	EPA 200.8	R-05
Cadmium	1.63	0.160	1.00	µg/L	50	F301226	3A28004	01/26/13	EPA 200.8	
Lead	2.96	0.160	2.00	µg/L	50	F301226	3A28004	01/26/13	EPA 200.8	
Silver	ND	0.100	1.00	µg/L	50	F301226	3A28004	01/26/13	EPA 200.8	U
Sodium	99800000	9970	5000000	µg/L	10000	F301226	3B11001	02/08/13	EPA 200.8	

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### ANALYTICAL RESULTS

#### Softened Stream B WW Hg C-4590

Matrix: Water

Laboratory ID: 1301328-02

Analyte	Result	MDL	MRL	Units	Dilution	Batch	Sequence	Analyzed	Method	Notes
Mercury	203	0.84	5.05	ng/L	10	F301229	3A28012	01/28/13	EPA 1631E	

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**ANALYTICAL RESULTS**

**Field Blank Hg B-5980**

Matrix: Water

Laboratory ID: 1301328-03

Analyte	Result	MDL	MRL	Units	Dilution	Batch	Sequence	Analyzed	Method	Notes
Mercury	ND	0.08	0.50	ng/L	1	F301229	3A28012	01/28/13	EPA 1631E	U

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### MATRIX DUPLICATES/TRIPPLICATES

SOURCE: 1301342-01

Batch: F301229

Sequence: 3A28012

Preparation: BrCl Oxidation

Lab Number: F301229-DUP1

Analyte	Sample Concentration ng/L	Duplicate Concentration ng/L	MRL	% RPD	RPD Limit	Method	Notes
Mercury	716.6	715.7	252	0.118	24	EPA 1631E	

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**MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD**

**SOURCE: 1301328-01**

Batch: F301226

Sequence: 3A28004

Preparation: Closed Vessel Nitric Oven Digestion

Lab Number: F301226-MS/MSD1

Analyte	Sample Concentration (µg/L)	Spike Added (µg/L)	MS Concentration (µg/L)	MS % Recovery	Recovery Limits	Method	Notes
Silver	0.175	1.5225	1.390	79.8	70 - 130	EPA 200.8	
Cadmium	1.626	0.81200	2.674	129	70 - 130	EPA 200.8	
Lead	2.958	1.5225	4.414	95.6	70 - 130	EPA 200.8	

Analyte	Spike Added (µg/L)	MSD Concentration (µg/L)	MSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Silver	1.5225	1.222	68.8	12.9	70 - 130	20	EPA 200.8	QM-07
Cadmium	0.81200	2.525	111	5.72	70 - 130	20	EPA 200.8	
Lead	1.5225	4.397	94.5	0.369	70 - 130	20	EPA 200.8	

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**MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD**

**SOURCE: 1301328-01**

Batch: F301226

Sequence: 3A28004

Preparation: Closed Vessel Nitric Oven Digestion

Lab Number: F301226-MS/MSD2

Analyte	Sample Concentration (µg/L)	Spike Added (µg/L)	MS Concentration (µg/L)	MS % Recovery	Recovery Limits	Method	Notes
Arsenic	32.47	1015.0	963.0	91.7	70 - 130	EPA 200.8	AS, QB-01
Silver	0.175	50.750	38.67	75.9	70 - 130	EPA 200.8	AS
Cadmium	1.626	101.50	77.52	74.8	70 - 130	EPA 200.8	AS
Lead	2.958	253.75	228.6	88.9	70 - 130	EPA 200.8	AS

Analyte	Spike Added (µg/L)	MSD Concentration (µg/L)	MSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Arsenic	1015.0	975.8	92.9	1.32	70 - 130	20	EPA 200.8	AS, QB-01
Silver	50.750	38.57	75.7	0.247	70 - 130	20	EPA 200.8	AS
Cadmium	101.50	76.98	74.2	0.695	70 - 130	20	EPA 200.8	AS
Lead	253.75	230.3	89.6	0.743	70 - 130	20	EPA 200.8	AS

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**MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD**

**SOURCE: 1301328-01RE3**

Batch: F301226

Sequence: 3B08012

Preparation: Closed Vessel Nitric Oven Digestion

Lab Number: F301226-MS/MSD8

Analyte	Sample Concentration (µg/L)	Spike Added (µg/L)	MS Concentration (µg/L)	MS % Recovery	Recovery Limits	Method	Notes
Arsenic	12.97	15.225	29.12	106	70 - 130	EPA 200.8	R-05

Analyte	Spike Added (µg/L)	MSD Concentration (µg/L)	MSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Arsenic	15.225	28.50	102	2.15	70 - 130	20	EPA 200.8	R-05

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**MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD**

**SOURCE: 1301328-01RE3**

Batch: F301226

Sequence: 3B08012

Preparation: Closed Vessel Nitric Oven Digestion

Lab Number: F301226-MS/MSDA

Analyte	Sample Concentration (µg/L)	Spike Added (µg/L)	MS Concentration (µg/L)	MS % Recovery	Recovery Limits	Method	Notes
Arsenic	12.97	1015.0	1141	111	70 - 130	EPA 200.8	AS, R-05

Analyte	Spike Added (µg/L)	MSD Concentration (µg/L)	MSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Arsenic	1015.0	1170	114	2.53	70 - 130	20	EPA 200.8	AS, R-05

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**MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD**

**SOURCE: 1301328-01RE3**

Batch: F301226

Sequence: 3B11001

Preparation: Closed Vessel Nitric Oven Digestion

Lab Number: F301226-MS/MSDB

Analyte	Sample Concentration (µg/L)	Spike Added (µg/L)	MS Concentration (µg/L)	MS % Recovery	Recovery Limits	Method	Notes
Sodium	99770000	507.50	94320000	-1070000	70 - 130	EPA 200.8	QM-02

Analyte	Spike Added (µg/L)	MSD Concentration (µg/L)	MSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Sodium	507.50	92770000	-1380000	1.65	70 - 130	20	EPA 200.8	QM-02

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**MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD**

**SOURCE: 1301328-01RE3**

Batch: F301226

Sequence: 3B11001

Preparation: Closed Vessel Nitric Oven Digestion

Lab Number: F301226-MS/MSDC

Analyte	Sample Concentration (µg/L)	Spike Added (µg/L)	MS Concentration (µg/L)	MS % Recovery	Recovery Limits	Method	Notes
Sodium	99770000	20300000	109500000	48.1	70 - 130	EPA 200.8	AS, QM-02

Analyte	Spike Added (µg/L)	MSD Concentration (µg/L)	MSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Sodium	20300000	109700000	49.0	0.169	70 - 130	20	EPA 200.8	AS, QM-02

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**MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD**

**SOURCE: 1301342-01**

Batch: F301229

Sequence: 3A28012

Preparation: BrCl Oxidation

Lab Number: F301229-MS/MSD1

Analyte	Sample Concentration (ng/L)	Spike Added (ng/L)	MS Concentration (ng/L)	MS % Recovery	Recovery Limits	Method	Notes
Mercury	716.6	2550.0	3212	97.8	71 - 125	EPA 1631E	

Analyte	Spike Added (ng/L)	MSD Concentration (ng/L)	MSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Mercury	2550.0	3321	102	3.35	71 - 125	24	EPA 1631E	

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**MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD**

**SOURCE: 1301342-03**

**Batch:** F301229

**Sequence:** 3A28012

**Preparation:** BrCl Oxidation

**Lab Number:** F301229-MS/MSD2

Analyte	Sample Concentration (ng/L)	Spike Added (ng/L)	MS Concentration (ng/L)	MS % Recovery	Recovery Limits	Method	Notes
Mercury	8.43	25.500	34.93	104	71 - 125	EPA 1631E	

  

Analyte	Spike Added (ng/L)	MSD Concentration (ng/L)	MSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Mercury	25.500	35.21	105	0.793	71 - 125	24	EPA 1631E	

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**LABORATORY CONTROL SAMPLE/ LABORATORY CONTROL SAMPLE DUPLICATE**

**RECOVERY AND RPD**

Batch: F301226

Sequence: 3A28004

Preparation: Closed Vessel Nitric Oven Digestion

Lab Number: F301226-BS/BSD1

LCS Source: Blank Spike

Analyte	Spike Added (µg/L)	LCS Concentration (µg/L)	LCS % Recovery	Recovery Limits	Method	Notes
Sodium	500.00	476	95.1	85 - 115	EPA 200.8	
Arsenic	15.000	14.21	94.7	85 - 115	EPA 200.8	QB-01
Silver	1.5000	1.552	103	85 - 115	EPA 200.8	
Cadmium	0.80000	0.773	96.6	85 - 115	EPA 200.8	
Lead	1.5000	1.519	101	85 - 115	EPA 200.8	

Analyte	Spike Added (µg/L)	LCSD Concentration (µg/L)	LCSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Sodium	500.00	472	94.4	0.770	85 - 115	20	EPA 200.8	
Arsenic	15.000	14.23	94.9	0.203	85 - 115	20	EPA 200.8	QB-01
Silver	1.5000	1.522	101	1.92	85 - 115	20	EPA 200.8	
Cadmium	0.80000	0.767	95.9	0.808	85 - 115	20	EPA 200.8	
Lead	1.5000	1.494	99.6	1.66	85 - 115	20	EPA 200.8	

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**LABORATORY CONTROL SAMPLE/ LABORATORY CONTROL SAMPLE DUPLICATE**

**RECOVERY AND RPD**

Batch: F301229

Sequence: 3A28012

Preparation: BrCl Oxidation

Lab Number: F301229-BS/BS1

LCS Source: Nist 1641d

Analyte	Spike Added (ng/L)	LCS Concentration (ng/L)	LCS % Recovery	Recovery Limits	Method	Notes
Mercury	15.679	15.29	97.5	77 - 123	EPA 1631E	

Analyte	Spike Added (ng/L)	LCSD Concentration (ng/L)	LCSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Mercury	15.679	15.65	99.8	2.28	77 - 123	24	EPA 1631E	

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### PREPARATION BLANKS

Instrument: ICPMS-6

Sequence: 3A28004

Preparation: Closed Vessel Nitric Oven Digestion

Lab Sample ID	Analyte	Found	MRL	Units	Batch	Method	Notes
F301226-BLK1	Sodium	5	20	µg/L	F301226	EPA 200.8	U
F301226-BLK1	Arsenic	0.002	0.15	µg/L	F301226	EPA 200.8	QB-02, U
F301226-BLK1	Silver	0.0006	0.020	µg/L	F301226	EPA 200.8	U
F301226-BLK1	Cadmium	0.0006	0.020	µg/L	F301226	EPA 200.8	U
F301226-BLK1	Lead	0.003	0.040	µg/L	F301226	EPA 200.8	U

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### PREPARATION BLANKS

Instrument: Hg2600-2

Sequence: 3A28012

Preparation: BrCl Oxidation

Lab Sample ID	Analyte	Found	MRL	Units	Batch	Method	Notes
F301229-BLK1	Mercury	0.02	0.50	ng/L	F301229	EPA 1631E	U
F301229-BLK2	Mercury	0.008	0.50	ng/L	F301229	EPA 1631E	U
F301229-BLK3	Mercury	0.01	0.50	ng/L	F301229	EPA 1631E	U
F301229-BLK4	Mercury	0.03	0.50	ng/L	F301229	EPA 1631E	U, QB-04

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## Notes and Definitions

- U Analyte included in the analysis, but not detected
- R-05 The sample was diluted due to the presence of high levels of non-target analytes or particulates resulting in elevated reporting limits.
- QM-07 The spike recovery was outside control limits for the MS and/or MSD. The batch was accepted based on LCS and LCSD recoveries within control limits and, when analysis permits, acceptable AS/ASD.
- QM-02 The MS and/or MSD recoveries outside acceptance limits, due to spike concentration less than 1 times the sample concentration. The batch was accepted based on LCS and LCSD recoveries within control limits and, when analysis permits, acceptable AS/ASD.
- QB-04 The blank was preserved to 2% BrCl rather than 1%. The control limit for blanks preserved to greater than 1% BrCl is the preservation percentage multiplied by the MRL.
- QB-02 The method blank and/or initial/continuing calibration blank contains analyte at a concentration above the MRL. However, the sample concentrations are less than the MRL.
- QB-01 The method blank and/or initial/continuing calibration blank contains analyte at a concentration above the MRL. However, the blank concentration(s) are less than 10% of the sample result.
- AS This MS and/or MSD is an analytical spike and/or an analytical spike duplicate.
- DET Analyte Detected
- MDL Minimum Detection Limit
- MRL Minimum Reporting Limit
- ND Analyte Not Detected at or above the reporting limit
- wet Sample results reported on a wet weight basis
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- RSD Relative Standard Deviation

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A handwritten signature in cursive script that reads "Liz Siska".

Liz Siska, Project Manager

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