AR-1332

GZA
GeoEnvironmental, Inc.

Engineers and Scientists

VIA EMAIL

March 9, 2012
File No. 04.0029307.00

Mr. Dana Clement
Superintendent
Allenstown Wastewater Treatment Facility
35 Canal Street
Allenstown, New Hampshire 03275

380 Harvey Road
Manchester
New Hampshire
03103-3347
603-623-3600
FAX 603-624-9463
www.gza.com

Re: Wastewater Discharge Monitoring Report
Treated Wastewater
Merrimack Station
Public Service of New Hampshire
Bow, New Hampshire

Dear Dana:

On behalf of Public Service of New Hampshire (PSNH), GZA GeoEnvironmental, Inc. is pleased to submit the attached **Wastewater Discharge Monitoring Report** for sampling conducted on February 9, 2012, as required to satisfy the round four of four initial weekly sampling requirement as outlined in Industrial Discharge Permit (IDP) No. HWIU-PSNH.

Table 1 included in the Wastewater Discharge Monitoring Report summarizes the analytical results for all required parameters as outlined Part 2 Section A of the IDP. The attached **Analytical Data Report**, however, contains a more comprehensive list of parameters.

ANALYTICAL DISCUSSION

Flue Gas Desulfurization (FGD) wastewater requires specialized analytical techniques to overcome matrix interference for certain analysis of trace metals. To assist you in evaluating this issue further, we offer an excerpt below from the United States Environmental Protection Agency (EPA) web site and a link to their draft Standard Operating Procedure (SOP) for trace metals analysis of FGD wastewater that contains further guidance.

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

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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 SOP. 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*, EPA May 2011.

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

Should you have any questions concerning this report, please do not hesitate to contact me at (603) 232-8744.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

Ronald A. Breton

Ronald A. Breton, P.E.
Principal

RAB:tmd
P:\04Jobs\0029300s\04.0029307.00\Work\SAMPLING AND REPORTING\REPORTS\Allenstown\REPORT\FINAL 04.0029307 Atown 4of4 DATA RPT 030812.docx

Attachments: Wastewater Discharge Monitoring Report
Analytical Data report

WASTEWATER DISCHARGE MONITORING REPORT

WASTEWATER DISCHARGE MONITORING REPORT
ALLENSTOWN WASTEWATER TREATMENT FACILITY

Public Service of New Hampshire - Merrimack Station
Industrial Discharge Permit - Class I
Permit No. HWIU-PSNH
Issued November 10, 2011
Expires November 9, 2012

Permitted Flow 100,000 gallons per day

FLOW DATA

Daily Flow Rate (gallons)	9,600	(average of actual discharge days)
Monitoring Period Flow (gallons)	47,999	(2/04/12 - 2/09/12)

FACILITY INFORMATION

Company Name: Public Service Company of New Hampshire - Merrimack Station
Company Owner: Public Service Company of New Hampshire
Facility Address: 97 River Road
Facility Contact: Harold Keyes
Telephone: (603) 224-4081

MONITORING REPORT

Submittal Date: 3/9/2012
Monitoring Point: End of treatment process
Reporting Period: First Month

SAMPLE ANALYSIS

Certified Analytical Laboratory: Eastern Analytical Inc. (EAI) — Certification Number: 1012
Authorized Representative: Lorraine Olashaw
Analytical Subcontractor: Frontier Global Sciences — Certification Number: E87575

SAMPLE COLLECTION

Sampler: Jeff Gagne (EAI)
Sample Type: Grab
Sample Date: 2/9/2012 — Sample Time: 9:15 AM
pH: 7.2

CATEGORICAL PRETREATMENT STANDARDS

40 CFR 423.16: Steam Electric Power Generating Category
NOTE: There are no numerical pretreatment standards for this source

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."

Harold Keyes
Printed Name of Authorized Representative

Station Manager
Title

Harold Keyes
Signature of Authorized Representative

3/7/2012
Date

TABLE 1 - SUMMARY ANALYTICAL DATA
Treated FGD Wastewater
Public Service Company of New Hampshire
Merrimack Station
Bow, New Hampshire

PARAMETER	RESULTS (mg/L) 2/9/2012 EAI/Frontier
Arsenic	< 0.00750
Cadmium	< 0.00100
Chromium (T)	< 0.00500
Copper	< 0.00500
Lead	< 0.00200
Mercury	0.0000209
Molybdenum	0.110
Nickel	0.0126
Selenium	0.0822
Silver	< 0.00100
Zinc	< 0.0100

Note:
The analytical results and the flow data from the monitoring period indicate that the estimated pollutant mass in the discharge is below mass limits outlined in IDP No. HWIU-PSNH.

ANALYTICAL DATA REPORT

eastern analytical

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

Subject: Laboratory Report

Eastern Analytical, Inc. ID: 107558
Client Identification: Wastewater Analysis - ***Weekly***
Date Received: 2/9/2012

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 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

2/29/12
Date

41
# of pages (excluding cover letter)

SAMPLE CONDITIONS PAGE

EAI ID#: 107558

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

Client Designation: Wastewater Analysis - ***Weekly***

Temperature upon receipt (°C): 20

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)
107558.01	Effluent Field Blank	2/9/12	2/9/12	aqueous		Adheres to Sample Acceptance Policy
107558.02	Treat Tank Effluent	2/9/12	2/9/12	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#: 107558

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

Client Designation: Wastewater Analysis - ***Weekly***

Sample ID: Treat Tank Effluent

Lab Sample ID:	107558.02					
Matrix:	aqueous					
Date Sampled:	2/9/12		**Analysis**			
Date Received:	2/9/12	**Units**	**Date**	**Time**	**Method**	**Analyst**
pH	**7.2**	SU	2/09/12	10:56	4500H+B	CJJ

QC REPORT

EAI ID#: 107558

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

Client Designation: Wastewater Analysis - ***Weekly***

Parameter Name	Blank	LCS	LCSD	Units	Date of Analysis	Limits	RPD	Method
pH		6.0 (101 %R)	6.0 (101 %R) (0 RPD)	SU	2/9/12	5.95 - 6.07	10	4500H+B

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.

FRONTIER
GLOBAL SCIENCES

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

27 February 2012

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,

Liz Siska

Liz Siska
Project Manager

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414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

ANALYTICAL REPORT FOR SAMPLES

Laboratory: Frontier Global Sciences, Inc.

SDG:

Client: Eastern Analytical, Inc

Project: Merrimack Station 200.8

Sample ID	Lab ID	Matrix	Date Sampled	Date Received
Effluent Field Blank	1202140-01	Water	09-Feb-12 00:00	10-Feb-12 09:25
Treat Tank Effluent	1202140-02	Water	09-Feb-12 00:00	10-Feb-12 09:25

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

Liz Siska, Project Manager

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414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

CASE NARRATIVE

SAMPLE RECEIPT

Samples were received at Frontier Global Sciences (FGS) on February 10th, 2012. The samples were received intact, on-ice with temperatures measured at 2.0 degrees Celsius.

SAMPLE PREPARATION AND ANALYSIS

Samples were prepared and analyzed for total metals in accordance with EPA Method 200.8 (modified).

Samples were prepared and analyzed for total mercury 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 were within the control limits.

As an additional measure of the accuracy of the methods utilized for analysis 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 with the exception of any QC flagged and described in the notes and definitions section of the following report.

A reasonable measure of the precision of the analytical methods utilized for analysis is the relative percent difference (RPD) between matrix spike and matrix spike duplicate recoveries and between laboratory control sample and laboratory control sample duplicate recoveries. All of the relative percent differences were within the control limits with the exception of any QC flagged and described in the notes and definitions section of the following report.

Frontier Global Sciences, Inc.

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Liz Siska

Liz Siska, Project Manager

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414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

CHAIN OF CUSTODY FORMS

12 02140

FRONTIER GLOBAL SCIENCES

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

107558

Seattle WA 98109
206 622-6960
206 622 6870
info@frontierGS.com
http://www.frontierGS.com

Page 1 of 1

12 02 140

Client: Eastern Analytical, Inc.
Address: 25 Chenell Drive
Concord NH 03301
Project Name: Merrimack Station
Contact: Jack Cooper
Phone: 603 228 1471 Fax: 603 228 1471
Email: jcooper@easternlab.com
Contract/PO: 27786

Report To: Same
Address:
Phone: 603 228 1471 Fax: 603 228 1471
Email: Customerservice@easternlab.com

Invoice To: Same
Address:
Phone: Fax:
Email: Customerservice@easternlab.com

FGS PM: Liz Siska
Date: 2/9/12
TAT (business days): 20 (std) 15 (10) 5 4 3 2 24 hrs.
(for TAT < 10 days, contact PM for charges apply for expedited TAT)
Saturday delivery? ☐ Y ☐ N
(if yes, please co-sign PM)
FGS: ☒ Y ☐ N
QA: ☐ Standard ☐ High

No	Engraved Bottle ID	Sample ID	# of Bottles	Matrix	Date & Time	Sampled By	Field Filtered (Y/N)	Field Preserved (HNO3, HCl, BrO, Other (%))	Analyses Requested: Total Metals				Comments
1	C-3042	Effluent Field Blank	1	AQ	2/9/12	GT/JH	N	–	X				1) Please include As, Cd, Cr, Cu, Pb, Hg, Mo, Ni, Se, Ag, Zn
2	C-3062, C-3012, C-3018	Treat Tank Effluent	3	WW	2/9/12	GT/JH	N	–	X				2) AWI values provided for project specific MS/MSD
3													3) Please use EPA 200.8 for FGD Effluent.
4													Add Al and Mn per client 2-10-12. AWI, FGS
5													2/10: B, Co, and V
6													
7													
8													
9													
10													
11													
12													

For Laboratory Use Only
COC Seal: N
Cooler Temp: 2.0
Carrier: UPS
VTSR: 02-25
# of Coolers: 1 (one)
Comments: 12 XA 5996 1 12 XA 9882

Matrix Codes:
FW: Fresh Water
WW: Waste Water
SB: Sea and Brackish Water
SS: Soil and Sediment
TS: Plant and Animal Tissue
HC: Hydrocarbons
TR: Trap
OT: Other

Relinquished By: Gregg Thompson
Organization: EAI
Date & Time: 2/9/12 09:50
Tracking number:

Received By: Chris Johnson
Organization: EAI
Date & Time: 2/9/12 09:50

Received By: [illegible]
Organization: FGS
Date & Time: 2-10-12 10:31

Sample Disposal:
☐ Return (shipping fees may apply)
☐ Standard Disposal - 30 Days after report
☐ Retain for __ weeks after report (storage fees may apply)

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:

Frontier Global Sciences, Inc.

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Liz Siska

Liz Siska, Project Manager

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414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

ANALYTICAL RESULTS

Effluent Field Blank

Matrix: Water **Laboratory ID:** 1202140-01

Analyte	Result	MDL	MRL	Units	Dilution	Batch	Sequence	Analyzed	Method	Notes
Aluminum	ND	0.4	4.0	µg/L	1	F202131	2B18016	02/17/12	EPA 200.8 Mod	U
Arsenic	ND	0.05	0.15	µg/L	1	F202131	2B18016	02/17/12	EPA 200.8 Mod	U
Cadmium	ND	0.004	0.020	µg/L	1	F202215	2B21010	02/21/12	EPA 200.8 Mod	U
Chromium	ND	0.009	0.10	µg/L	1	F202131	2B18016	02/17/12	EPA 200.8 Mod	U
Copper	ND	0.01	0.10	µg/L	1	F202131	2B18016	02/17/12	EPA 200.8 Mod	QM-12, U
Lead	ND	0.004	0.040	µg/L	1	F202131	2B18016	02/17/12	EPA 200.8 Mod	U
Manganese	ND	0.007	0.10	µg/L	1	F202131	2B18016	02/17/12	EPA 200.8 Mod	U
Mercury	ND	0.08	0.50	ng/L	1	F202196	2B17024	02/17/12	EPA 1631E	U
Molybdenum	ND	0.006	0.06	µg/L	1	F202131	2B18016	02/17/12	EPA 200.8 Mod	U
Nickel	ND	0.008	0.10	µg/L	1	F202131	2B18016	02/17/12	EPA 200.8 Mod	U
Selenium	ND	0.19	0.60	µg/L	1	F202131	2B18016	02/17/12	EPA 200.8 Mod	QM-12, U
Silver	ND	0.006	0.020	µg/L	1	F202149	2B15001	02/14/12	EPA 200.8 Mod	QM-12, U
Zinc	ND	0.02	0.20	µg/L	1	F202215	2B21010	02/21/12	EPA 200.8 Mod	U

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Liz Siska

Liz Siska, Project Manager

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GLOBAL SCIENCES

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

ANALYTICAL RESULTS

Treat Tank Effluent

Matrix: Water **Laboratory ID:** 1202140-02

Analyte	Result	MDL	MRL	Units	Dilution	Batch	Sequence	Analyzed	Method	Notes
Aluminum	ND	22.2	200	µg/L	50	F202131	2B18016	02/17/12	EPA 200.8 Mod	U
Arsenic	ND	2.55	7.50	µg/L	50	F202131	2B18016	02/17/12	EPA 200.8 Mod	U
Cadmium	ND	0.208	1.00	µg/L	50	F202215	2B21010	02/21/12	EPA 200.8 Mod	U
Chromium	ND	0.45	5.00	µg/L	50	F202131	2B18016	02/17/12	EPA 200.8 Mod	U
Copper	ND	0.50	5.00	µg/L	50	F202131	2B18016	02/17/12	EPA 200.8 Mod	QM-12, U
Lead	ND	0.195	2.00	µg/L	50	F202131	2B18016	02/17/12	EPA 200.8 Mod	U
Manganese	**1730**	0.37	5.00	µg/L	50	F202131	2B18016	02/17/12	EPA 200.8 Mod	
Mercury	**20.9**	0.17	1.01	ng/L	2	F202196	2B17024	02/17/12	EPA 1631E	
Molybdenum	**110**	0.30	3.00	µg/L	50	F202131	2B18016	02/17/12	EPA 200.8 Mod	
Nickel	**12.6**	0.40	5.00	µg/L	50	F202131	2B18016	02/17/12	EPA 200.8 Mod	
Selenium	**82.2**	9.69	30.0	µg/L	50	F202131	2B24005	02/23/12	EPA 200.8 Mod	
Silver	ND	0.300	1.00	µg/L	50	F202149	2B15001	02/14/12	EPA 200.8 Mod	QM-12, U
Zinc	ND	0.82	10.0	µg/L	50	F202215	2B21010	02/21/12	EPA 200.8 Mod	U

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Liz Siska

Liz Siska, Project Manager

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414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

MATRIX DUPLICATES/TRIPLICATES

SOURCE: 1202140-02RE1

Batch: F202196 **Sequence:** 2B17024

Preparation: BrCl Oxidation **Lab Number:** F202196-DUP1

Analyte	Sample Concentration ng/L	Duplicate Concentration ng/L	MRL	% RPD	RPD Limit	Method	Notes
Mercury	24.34	22.57	10.1	7.52	24	EPA 1631E	

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Liz Siska

Liz Siska, Project Manager

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414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD

SOURCE: 1202140-02

Batch: F202131 **Sequence:** 2B18016

Preparation: Closed Vessel Nitric Oven Digestion **Lab Number:** F202131-MS/MSD1

Analyte	Sample Concentration (µg/L)	Spike Added (µg/L)	MS Concentration (µg/L)	MS % Recovery	Recovery Limits	Method	Notes
Aluminum	48.4	151.50	199.9	100	70 - 130	EPA 200.8 Mod	
Chromium	1.07	7.0700	8.66	107	70 - 130	EPA 200.8 Mod	
Manganese	1735	6.0600	1712	-373	70 - 130	EPA 200.8 Mod	QM-02
Nickel	12.62	4.0400	17.66	125	70 - 130	EPA 200.8 Mod	
Copper	0.83	4.0400	5.07	105	70 - 130	EPA 200.8 Mod	
Zinc	2.32	10.100	81.69	786	70 - 130	EPA 200.8 Mod	QM-07
Arsenic	5.61	15.150	21.94	108	70 - 130	EPA 200.8 Mod	
Selenium	97.17	30.300	123.0	85.2	70 - 130	EPA 200.8 Mod	
Molybdenum	110.1	2.0200	111.5	71.9	70 - 130	EPA 200.8 Mod	
Lead	ND	1.5150	1.567	103	70 - 130	EPA 200.8 Mod	

Analyte	Spike Added (µg/L)	MSD Concentration (µg/L)	MSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Aluminum	151.50	203.2	102	1.64	70 - 130	20	EPA 200.8 Mod	
Chromium	7.0700	8.56	106	1.15	70 - 130	20	EPA 200.8 Mod	
Manganese	6.0600	1727	-131	0.852	70 - 130	20	EPA 200.8 Mod	QM-02
Nickel	4.0400	16.18	88.1	8.76	70 - 130	20	EPA 200.8 Mod	
Copper	4.0400	4.84	99.3	4.59	70 - 130	20	EPA 200.8 Mod	
Zinc	10.100	16.88	144	131	70 - 130	20	EPA 200.8 Mod	QM-07, QR-08
Arsenic	15.150	24.85	127	12.4	70 - 130	20	EPA 200.8 Mod	
Selenium	30.300	135.1	125	9.38	70 - 130	20	EPA 200.8 Mod	
Molybdenum	2.0200	112.5	119	0.846	70 - 130	20	EPA 200.8 Mod	
Lead	1.5150	1.468	96.9	6.56	70 - 130	20	EPA 200.8 Mod	

Frontier Global Sciences, Inc.

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Liz Siska, Project Manager

FRONTIER
GLOBAL SCIENCES

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD

SOURCE: 1202140-02

Batch: F202131 **Sequence:** 2B18016

Preparation: Closed Vessel Nitric Oven Digestion **Lab Number:** F202131-MS/MSD2

Analyte	Sample Concentration (µg/L)	Spike Added (µg/L)	MS Concentration (µg/L)	MS % Recovery	Recovery Limits	Method	Notes
Aluminum	48.4	10100	10380	102	70 - 130	EPA 200.8 Mod	AS
Chromium	1.07	1010.0	1060	105	70 - 130	EPA 200.8 Mod	AS
Manganese	1735	1010.0	2770	102	70 - 130	EPA 200.8 Mod	AS
Nickel	12.62	1262.5	1303	102	70 - 130	EPA 200.8 Mod	AS
Copper	0.83	1262.5	1253	99.2	70 - 130	EPA 200.8 Mod	AS
Zinc	2.32	2525.0	2530	100	70 - 130	EPA 200.8 Mod	AS
Arsenic	5.61	1010.0	1073	106	70 - 130	EPA 200.8 Mod	AS
Selenium	97.17	1010.0	1127	102	70 - 130	EPA 200.8 Mod	AS
Molybdenum	110.1	505.00	630.5	103	70 - 130	EPA 200.8 Mod	AS
Lead	ND	252.50	251.4	99.5	70 - 130	EPA 200.8 Mod	AS

Analyte	Spike Added (µg/L)	MSD Concentration (µg/L)	MSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Aluminum	10100	10120	99.8	2.52	70 - 130	20	EPA 200.8 Mod	AS
Chromium	1010.0	1050	104	0.947	70 - 130	20	EPA 200.8 Mod	AS
Manganese	1010.0	2755	101	0.548	70 - 130	20	EPA 200.8 Mod	AS
Nickel	1262.5	1302	102	0.101	70 - 130	20	EPA 200.8 Mod	AS
Copper	1262.5	1258	99.6	0.384	70 - 130	20	EPA 200.8 Mod	AS
Zinc	2525.0	2511	99.3	0.770	70 - 130	20	EPA 200.8 Mod	AS
Arsenic	1010.0	1092	108	1.73	70 - 130	20	EPA 200.8 Mod	AS
Selenium	1010.0	1169	106	3.69	70 - 130	20	EPA 200.8 Mod	AS
Molybdenum	505.00	616.8	100	2.18	70 - 130	20	EPA 200.8 Mod	AS
Lead	252.50	249.9	99.0	0.581	70 - 130	20	EPA 200.8 Mod	AS

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Liz Siska

Liz Siska, Project Manager

FRONTIER
GLOBAL SCIENCES

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD

SOURCE: 1202140-02RE1

Batch: F202149 **Sequence:** 2B15001

Preparation: Closed Vessel Nitric Oven Digestion **Lab Number:** F202149-MS/MSD1

Analyte	Sample Concentration (µg/L)	Spike Added (µg/L)	MS Concentration (µg/L)	MS % Recovery	Recovery Limits	Method	Notes
Silver	ND	1.5180	1.529	101	70 - 130	EPA 200.8 Mod	

Analyte	Spike Added (µg/L)	MSD Concentration (µg/L)	MSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Silver	1.5180	1.577	104	3.13	70 - 130	20	EPA 200.8 Mod	

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Liz Siska, Project Manager

FRONTIER
GLOBAL SCIENCES

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD

SOURCE: 1202140-02RE1

Batch: F202149 **Sequence:** 2B15001

Preparation: Closed Vessel Nitric Oven Digestion **Lab Number:** F202149-MS/MSD2

Analyte	Sample Concentration (µg/L)	Spike Added (µg/L)	MS Concentration (µg/L)	MS % Recovery	Recovery Limits	Method	Notes
Silver	ND	50.500	44.17	87.5	70 - 130	EPA 200.8 Mod	AS

Analyte	Spike Added (µg/L)	MSD Concentration (µg/L)	MSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Silver	50.500	43.81	86.8	0.808	70 - 130	20	EPA 200.8 Mod	AS

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Liz Siska, Project Manager

FRONTIER
GLOBAL SCIENCES

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD

SOURCE: 1202223-02

Batch: F202196 **Sequence:** 2B17024

Preparation: BrCl Oxidation **Lab Number:** F202196-MS/MSD1

Analyte	Sample Concentration (ng/L)	Spike Added (ng/L)	MS Concentration (ng/L)	MS % Recovery	Recovery Limits	Method	Notes
Mercury	39.63	102.00	145.3	104	71 - 125	EPA 1631E	

Analyte	Spike Added (ng/L)	MSD Concentration (ng/L)	MSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Mercury	102.00	143.6	102	1.12	71 - 125	24	EPA 1631E	

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Liz Siska

Liz Siska, Project Manager

FRONTIER
GLOBAL SCIENCES

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD

SOURCE: 1202140-02RE1

Batch: F202196 **Sequence:** 2B17024

Preparation: BrCl Oxidation **Lab Number:** F202196-MS/MSD2

Analyte	Sample Concentration (ng/L)	Spike Added (ng/L)	MS Concentration (ng/L)	MS % Recovery	Recovery Limits	Method	Notes
Mercury	24.34	71.400	96.61	101	71 - 125	EPA 1631E	

Analyte	Spike Added (ng/L)	MSD Concentration (ng/L)	MSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Mercury	71.400	96.20	101	0.422	71 - 125	24	EPA 1631E	

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Liz Siska, Project Manager

FRONTIER
GLOBAL SCIENCES

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD

SOURCE: 1202140-02RE1

Batch: F202215 **Sequence:** 2B21010

Preparation: Closed Vessel Nitric Oven Digestion **Lab Number:** F202215-MS/MSD1

Analyte	Sample Concentration (µg/L)	Spike Added (µg/L)	MS Concentration (µg/L)	MS % Recovery	Recovery Limits	Method	Notes
Zinc	ND	10.100	9.65	95.5	70 - 130	EPA 200.8 Mod	
Cadmium	0.216	0.80800	1.142	115	70 - 130	EPA 200.8 Mod	

Analyte	Spike Added (µg/L)	MSD Concentration (µg/L)	MSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Zinc	10.100	9.99	98.9	3.47	70 - 130	20	EPA 200.8 Mod	
Cadmium	0.80800	1.189	120	4.07	70 - 130	20	EPA 200.8 Mod	

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Liz Siska, Project Manager

FRONTIER
GLOBAL SCIENCES

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD

SOURCE: 1202140-02RE1

Batch: F202215 **Sequence:** 2B21010

Preparation: Closed Vessel Nitric Oven Digestion **Lab Number:** F202215-MS/MSD2

Analyte	Sample Concentration (µg/L)	Spike Added (µg/L)	MS Concentration (µg/L)	MS % Recovery	Recovery Limits	Method	Notes
Zinc	ND	2525.0	2297	91.0	70 - 130	EPA 200.8 Mod	AS
Cadmium	0.216	101.00	87.31	86.2	70 - 130	EPA 200.8 Mod	AS

Analyte	Spike Added (µg/L)	MSD Concentration (µg/L)	MSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Zinc	2525.0	2300	91.1	0.162	70 - 130	20	EPA 200.8 Mod	AS
Cadmium	101.00	89.53	88.4	2.50	70 - 130	20	EPA 200.8 Mod	AS

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Liz Siska, Project Manager

FRONTIER
GLOBAL SCIENCES

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

LABORATORY CONTROL SAMPLE/ LABORATORY CONTROL SAMPLE DUPLICATE

RECOVERY AND RPD

Batch: F202131 **Sequence:** 2B18016

Preparation: Closed Vessel Nitric Oven Digestion **Lab Number:** F202131-BS/BSD1

LCS Source: Blank Spike

Analyte	Spike Added (µg/L)	LCS Concentration (µg/L)	LCS % Recovery	Recovery Limits	Method	Notes
Aluminum	150.00	145.9	97.3	85 - 115	EPA 200.8 Mod	
Chromium	7.0000	6.94	99.1	85 - 115	EPA 200.8 Mod	
Manganese	6.0000	5.91	98.5	85 - 115	EPA 200.8 Mod	
Nickel	4.0000	4.19	105	85 - 115	EPA 200.8 Mod	
Copper	4.0000	4.40	110	85 - 115	EPA 200.8 Mod	
Zinc	10.000	11.13	111	85 - 115	EPA 200.8 Mod	
Arsenic	15.000	15.05	100	85 - 115	EPA 200.8 Mod	
Selenium	30.000	30.61	102	85 - 115	EPA 200.8 Mod	
Molybdenum	2.0000	1.93	96.6	85 - 115	EPA 200.8 Mod	
Lead	1.5000	1.560	104	85 - 115	EPA 200.8 Mod	

Analyte	Spike Added (µg/L)	LCSD Concentration (µg/L)	LCSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Aluminum	150.00	147.3	98.2	0.925	85 - 115	20	EPA 200.8 Mod	
Chromium	7.0000	6.94	99.1	0.0117	85 - 115	20	EPA 200.8 Mod	
Manganese	6.0000	6.00	99.9	1.48	85 - 115	20	EPA 200.8 Mod	
Nickel	4.0000	4.23	106	1.04	85 - 115	20	EPA 200.8 Mod	
Copper	4.0000	4.43	111	0.541	85 - 115	20	EPA 200.8 Mod	
Zinc	10.000	10.92	109	1.97	85 - 115	20	EPA 200.8 Mod	
Arsenic	15.000	14.83	98.9	1.46	85 - 115	20	EPA 200.8 Mod	
Selenium	30.000	32.03	107	4.53	85 - 115	20	EPA 200.8 Mod	
Molybdenum	2.0000	1.91	95.4	1.17	85 - 115	20	EPA 200.8 Mod	
Lead	1.5000	1.586	106	1.66	85 - 115	20	EPA 200.8 Mod	

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Liz Siska, Project Manager

FRONTIER
GLOBAL SCIENCES

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

LABORATORY CONTROL SAMPLE/ LABORATORY CONTROL SAMPLE DUPLICATE

RECOVERY AND RPD

Batch: F202149

Sequence: 2B15001

Preparation: Closed Vessel Nitric Oven Digestion

Lab Number: F202149-BS/BSD1

LCS Source: Blank Spike

Analyte	Spike Added (µg/L)	LCS Concentration (µg/L)	LCS % Recovery	Recovery Limits	Method	Notes
Silver	1.5000	1.709	114	85 - 115	EPA 200.8 Mod	

Analyte	Spike Added (µg/L)	LCSD Concentration (µg/L)	LCSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Silver	1.5000	1.738	116	1.68	85 - 115	20	EPA 200.8 Mod	QM-12

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Liz Siska, Project Manager

FRONTIER
GLOBAL SCIENCES

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

LABORATORY CONTROL SAMPLE/ LABORATORY CONTROL SAMPLE DUPLICATE

RECOVERY AND RPD

Batch: F202196

Sequence: 2B17024

Preparation: BrCl Oxidation

Lab Number: F202196-BS/BSD1

LCS Source: LCS

Analyte	Spike Added (ng/L)	LCS Concentration (ng/L)	LCS % Recovery	Recovery Limits	Method	Notes
Mercury	15.679	16.27	104	80 - 120	EPA 1631E	

Analyte	Spike Added (ng/L)	LCSD Concentration (ng/L)	LCSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Mercury	15.679	16.20	103	0.396	80 - 120	24	EPA 1631E	

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Liz Siska, Project Manager

FRONTIER
GLOBAL SCIENCES

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

LABORATORY CONTROL SAMPLE/ LABORATORY CONTROL SAMPLE DUPLICATE

RECOVERY AND RPD

Batch: F202215

Sequence: 2B21010

Preparation: Closed Vessel Nitric Oven Digestion

Lab Number: F202215-BS/BSD1

LCS Source: Blank Spike

Analyte	Spike Added (µg/L)	LCS Concentration (µg/L)	LCS % Recovery	Recovery Limits	Method	Notes
Zinc	10.000	9.99	99.9	85 - 115	EPA 200.8 Mod	
Cadmium	0.80000	0.892	112	85 - 115	EPA 200.8 Mod	

Analyte	Spike Added (µg/L)	LCSD Concentration (µg/L)	LCSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Zinc	10.000	9.93	99.3	0.528	85 - 115	20	EPA 200.8 Mod	
Cadmium	0.80000	0.897	112	0.517	85 - 115	20	EPA 200.8 Mod	

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Liz Siska, Project Manager

FRONTIER
GLOBAL SCIENCES

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

PREPARATION BLANKS

Instrument: ICPMS-6

Sequence: 2B15001

Preparation: Closed Vessel Nitric Oven Digestion

Lab Sample ID	Analyte	Found	MRL	Units	Batch	Method	Notes
F202149-BLK1	Silver	-0.0002	0.020	µg/L	F202149	EPA 200.8 Mod	U

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Liz Siska

Liz Siska, Project Manager

FRONTIER
GLOBAL SCIENCES

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

PREPARATION BLANKS

Instrument: Hg-16

Sequence: 2B17024

Preparation: BrCl Oxidation

Lab Sample ID	Analyte	Found	MRL	Units	Batch	Method	Notes
F202196-BLK1	Mercury	0.04	0.50	ng/L	F202196	EPA 1631E	U
F202196-BLK2	Mercury	0.04	0.50	ng/L	F202196	EPA 1631E	U
F202196-BLK3	Mercury	0.05	0.50	ng/L	F202196	EPA 1631E	U
F202196-BLK4	Mercury	0.08	0.50	ng/L	F202196	EPA 1631E	QB-04, U

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Liz Siska, Project Manager

FRONTIER
GLOBAL SCIENCES

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

PREPARATION BLANKS

Instrument: ICPMS-6

Sequence: 2B18016

Preparation: Closed Vessel Nitric Oven Digestion

Lab Sample ID	Analyte	Found	MRL	Units	Batch	Method	Notes
F202131-BLK1	Aluminum	0.09	4.0	µg/L	F202131	EPA 200.8 Mo	U
F202131-BLK1	Chromium	-0.02	0.10	µg/L	F202131	EPA 200.8 Mo	U
F202131-BLK1	Manganese	0.004	0.10	µg/L	F202131	EPA 200.8 Mo	U
F202131-BLK1	Nickel	0.004	0.10	µg/L	F202131	EPA 200.8 Mo	U
F202131-BLK1	Copper	0.005	0.10	µg/L	F202131	EPA 200.8 Mo	U
F202131-BLK1	Zinc	0.07	0.20	µg/L	F202131	EPA 200.8 Mo	U
F202131-BLK1	Arsenic	-0.10	0.15	µg/L	F202131	EPA 200.8 Mo	U
F202131-BLK1	Selenium	-0.06	0.60	µg/L	F202131	EPA 200.8 Mo	U
F202131-BLK1	Molybdenum	0.01	0.06	µg/L	F202131	EPA 200.8 Mo	U
F202131-BLK1	Lead	0.002	0.040	µg/L	F202131	EPA 200.8 Mo	U

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GLOBAL SCIENCES

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

PREPARATION BLANKS

Instrument: ICPMS-6

Sequence: 2B21010

Preparation: Closed Vessel Nitric Oven Digestion

Lab Sample ID	Analyte	Found	MRL	Units	Batch	Method	Notes
F202215-BLK1	Zinc	-0.03	0.20	µg/L	F202215	EPA 200.8 Mod	U
F202215-BLK1	Cadmium	-0.001	0.020	µg/L	F202215	EPA 200.8 Mod	U

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GLOBAL SCIENCES

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Fx: 206-622-6870

Notes and Definitions

U	Analyte included in the analysis, but not detected
QR-08	The RPD value for the MS/MSD was outside of acceptance limits. Batch QC acceptable based on matrix duplicate and/or LCS/LCSD RPD values within control limits.
QM-12	Initial or continuing calibration verification and/or blank spike/blank spike duplicate recoveries above upper control limits. All reported sample concentrations were below the reporting limit.
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

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Liz Siska, Project Manager

FRONTIER
GLOBAL SCIENCES

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

27 February 2012

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,

Liz Siska

Liz Siska
Project Manager

FRONTIER
GLOBAL SCIENCES

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

ANALYTICAL REPORT FOR SAMPLES

Laboratory: Frontier Global Sciences, Inc.

SDG:

Client: Eastern Analytical, Inc

Project: Merrimack Station 200.8

Sample ID	Lab ID	Matrix	Date Sampled	Date Received
Effluent Field Blank	1202140-01	Water	09-Feb-12 00:00	10-Feb-12 09:25
Treat Tank Effluent	1202140-02	Water	09-Feb-12 00:00	10-Feb-12 09:25

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Liz Siska, Project Manager

FRONTIER
GLOBAL SCIENCES

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

CASE NARRATIVE

SAMPLE RECEIPT

Samples were received at Frontier Global Sciences (FGS) on February 10th, 2012. The samples were received intact, on-ice with temperatures measured at 2.0 degrees Celsius.

SAMPLE PREPARATION AND ANALYSIS

Samples were prepared and analyzed for total metals in accordance with EPA Method 200.8 (modified).

ANALYTICAL ISSUES

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

As an additional measure of the accuracy of the methods utilized for analysis 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 with the exception of any QC flagged and described in the notes and definitions section of the following report.

A reasonable measure of the precision of the analytical methods utilized for analysis is the relative percent difference (RPD) between matrix spike and matrix spike duplicate recoveries and between laboratory control sample and laboratory control sample duplicate recoveries. All of the relative percent differences were within the control limits with the exception of any QC flagged and described in the notes and definitions section of the following report.

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Liz Siska, Project Manager

FRONTIER
GLOBAL SCIENCES

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

CHAIN OF CUSTODY FORMS

12 02140

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

107558

Seattle WA 98109
206 622 6960
206 622 6870
info@frontierGS.com
http://www.frontierGS.com

Page 1 of 1

12 0 2 14 0

Client: Eurofins Analytical, Inc.
Address: 25 Chenell Drive
Concord NH 03301
Project Name: Merrimack Station
Contact: Tess Engers
Phone: 603 228 1471 Fax: 603 228 4571
E-mail: jessica@eurofinslabs.com
Contract (PO): 27710

Report To: Same
Address:
Phone: 603 228 1471 Fax: 603 228 4571
E-mail: Customer.service@eurofinslabs.com

Invoice To: same
Address:
Phone: Fax:
E-mail: Customer.service@eurofinslabs.com

Analysis Requested: Total Metals

Rush PM: Liz Siska
Date: 2/9/12
TAT (business days): 20 (std) 15 (10) 5 4 3 2 24 hrs.
(for TAT < 10 days, notify PM. Surcharges apply for expedited TAT)
Saturday delivery? ☐ Y ☐ N
(If yes, please contact PM)
FDR: ☒ Y ☐ N
QA: ☐ Standard ☐ High

No	Engraved Bottle ID	Sample ID	# of Bottles	Matrix	Date & Time	Sampled By	Field Filtered (Y/N)	Field Preserved (HNO3, HCl, BSO, Other (%))	Total Metals				Comments
1	C-3042	Effluent Field Blank	1	AQ	2/9/12	CJ/JN	N	–	X				1) Metals include As, Cd, Cr, Cu, Pb, Hg, Mo, Ni, Se, Ag, Zn
2	C-3062, C-3012	Treat Tank Effluent	3	WW	2/9/12	CJ/JN	N	–	X				2) All 1 values provided for report specific MS/MSD
3	C-3018												3) Please use EPA 200.8 since FGD Effluent.
4													Add Al and Mn per client 2-10-12 AMB, FGS
5													Also B, Co, and V
6													
7													
8													
9													
10													
11													
12													

For Laboratory Use Only
COC Seal: N/A
Comments: 12 X 4L 30 [illegible]
Cooler Temp: 2.6
Carrier: UPS
VTSR: 02-25
# of Coolers: 1 (size)

Matrix Codes:
FW: Fresh Water
WW: Waste Water
SB: Sea and Brackish Water
SS: Soil and Sediment
TS: Plant and Animal Tissue
HC: Hydrocarbons
TR: Trap
OT: Other

Relinquished By: [signature]
Name: Gregg Thayer
Organization: EAI
Date & Time: 2/9/12 05:30

Received By: [signature]
Name: Chris Johnson
Organization: EAI
Date & Time: 2/9/12 05:30

Received By: [signature]
Name: Andrea Brown (USPS), FGS
Organization: FGS
Date & Time: 2-10-12 10:51

Tracking number:

Sample Disposal:
☐ Return (shipping fees may apply)
☐ Standard Disposal - 30 Days after report
☐ Retain for weeks after report (storage fees may apply)

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:

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Liz Siska

Liz Siska, Project Manager

FRONTIER
GLOBAL SCIENCES

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

ANALYTICAL RESULTS

Effluent Field Blank

Matrix: Water **Laboratory ID:** 1202140-01

Analyte	Result	MDL	MRL	Units	Dilution	Batch	Sequence	Analyzed	Method	Notes
Boron	ND	0.21	3.00	µg/L	1	F202131	2B18016	02/17/12	EPA 200.8 Mod	QB-02, QM-12, U
Cobalt	ND	0.007	0.10	µg/L	1	F202131	2B18016	02/17/12	EPA 200.8 Mod	U
Vanadium	ND	0.01	0.10	µg/L	1	F202131	2B18016	02/17/12	EPA 200.8 Mod	U

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Seattle, WA 98109
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Fx: 206-622-6870

ANALYTICAL RESULTS

Treat Tank Effluent

Matrix: Water **Laboratory ID:** 1202140-02

Analyte	Result	MDL	MRL	Units	Dilution	Batch	Sequence	Analyzed	Method	Notes
Boron	**357000**	412	6000	µg/L	2000	F202131	2B24005	02/23/12	EPA 200.8 Mod	
Cobalt	ND	0.34	5.00	µg/L	50	F202131	2B18016	02/17/12	EPA 200.8 Mod	U
Vanadium	ND	0.68	5.00	µg/L	50	F202131	2B18016	02/17/12	EPA 200.8 Mod	U

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MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD

SOURCE: 1202140-02

Batch: F202131 **Sequence:** 2B18016

Preparation: Closed Vessel Nitric Oven Digestion **Lab Number:** F202131-MS/MSD1

Analyte	Sample Concentration (µg/L)	Spike Added (µg/L)	MS Concentration (µg/L)	MS % Recovery	Recovery Limits	Method	Notes
Vanadium	1.21	5.0500	8.07	136	70 - 130	EPA 200.8 Mod	QM-07
Cobalt	0.76	5.0500	5.83	100	70 - 130	EPA 200.8 Mod	

Analyte	Spike Added (µg/L)	MSD Concentration (µg/L)	MSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Vanadium	5.0500	6.58	106	20.2	70 - 130	20	EPA 200.8 Mod	QR-08
Cobalt	5.0500	6.06	105	3.84	70 - 130	20	EPA 200.8 Mod	

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Ph: 206-622-6960
Fx: 206-622-6870

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD

SOURCE: 1202140-02

Batch: F202131 **Sequence:** 2B18016

Preparation: Closed Vessel Nitric Oven Digestion **Lab Number:** F202131-MS/MSD2

Analyte	Sample Concentration (µg/L)	Spike Added (µg/L)	MS Concentration (µg/L)	MS % Recovery	Recovery Limits	Method	Notes
Vanadium	1.21	1010.0	1097	108	70 - 130	EPA 200.8 Mod	AS
Cobalt	0.76	505.00	517.4	102	70 - 130	EPA 200.8 Mod	AS

Analyte	Spike Added (µg/L)	MSD Concentration (µg/L)	MSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Vanadium	1010.0	1052	104	4.20	70 - 130	20	EPA 200.8 Mod	AS
Cobalt	505.00	518.3	102	0.187	70 - 130	20	EPA 200.8 Mod	AS

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GLOBAL SCIENCES

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Fx: 206-622-6870

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD

SOURCE: 1202140-02RE2

Batch: F202131 **Sequence:** 2B24005

Preparation: Closed Vessel Nitric Oven Digestion **Lab Number:** F202131-MS/MSD5

Analyte	Sample Concentration (µg/L)	Spike Added (µg/L)	MS Concentration (µg/L)	MS % Recovery	Recovery Limits	Method	Notes
Boron	356800	75.750	356500	-478	70 - 130	EPA 200.8 Mod	QM-02

Analyte	Spike Added (µg/L)	MSD Concentration (µg/L)	MSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Boron	75.750	359700	3820	0.909	70 - 130	20	EPA 200.8 Mod	QM-02

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FRONTIER
GLOBAL SCIENCES

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD

SOURCE: 1202140-02RE2

Batch: F202131 **Sequence:** 2B24005

Preparation: Closed Vessel Nitric Oven Digestion **Lab Number:** F202131-MS/MSD6

Analyte	Sample Concentration (µg/L)	Spike Added (µg/L)	MS Concentration (µg/L)	MS % Recovery	Recovery Limits	Method	Notes
Boron	356800	161600	530100	107	70 - 130	EPA 200.8 Mod	AS

Analyte	Spike Added (µg/L)	MSD Concentration (µg/L)	MSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Boron	161600	497000	86.8	6.43	70 - 130	20	EPA 200.8 Mod	AS

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FRONTIER
GLOBAL SCIENCES

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

LABORATORY CONTROL SAMPLE/ LABORATORY CONTROL SAMPLE DUPLICATE

RECOVERY AND RPD

Batch: F202131 **Sequence:** 2B18016

Preparation: Closed Vessel Nitric Oven Digestion **Lab Number:** F202131-BS/BSD1

LCS Source: Blank Spike

Analyte	Spike Added (µg/L)	LCS Concentration (µg/L)	LCS % Recovery	Recovery Limits	Method	Notes
Boron	75.000	76.23	102	85 - 115	EPA 200.8 Mod	
Vanadium	5.0000	4.57	91.4	85 - 115	EPA 200.8 Mod	
Cobalt	5.0000	5.06	101	85 - 115	EPA 200.8 Mod	

Analyte	Spike Added (µg/L)	LCSD Concentration (µg/L)	LCSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Boron	75.000	77.22	103	1.29	85 - 115	20	EPA 200.8 Mod	
Vanadium	5.0000	4.93	98.6	7.59	85 - 115	20	EPA 200.8 Mod	
Cobalt	5.0000	5.15	103	1.81	85 - 115	20	EPA 200.8 Mod	

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GLOBAL SCIENCES

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Seattle, WA 98109
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Fx: 206-622-6870

PREPARATION BLANKS

Instrument: ICPMS-6

Sequence: 2B18016

Preparation: Closed Vessel Nitric Oven Digestion

Lab Sample ID	Analyte	Found	MRL	Units	Batch	Method	Notes
F202131-BLK1	Boron	1.13	3.00	µg/L	F202131	EPA 200.8 Mod	U
F202131-BLK1	Vanadium	-0.06	0.10	µg/L	F202131	EPA 200.8 Mod	U
F202131-BLK1	Cobalt	0.0001	0.10	µg/L	F202131	EPA 200.8 Mod	U

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Notes and Definitions

U	Analyte included in the analysis, but not detected
QR-08	The RPD value for the MS/MSD was outside of acceptance limits. Batch QC acceptable based on matrix duplicate and/or LCS/LCSD RPD values within control limits.
QM-12	Initial or continuing calibration verification and/or blank spike/blank spike duplicate recoveries above upper control limits. All reported sample concentrations were below the reporting limit.
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-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.
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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CHAIN-OF-CUSTODY RECORD

107558

GZANH

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Sample IDs	Date/Time *Composites need start and stop dates/times*	Matrix	Parameters and Sample Notes	# of containers
Effluent Field Blank	2/9/12 08:52	aqueous Grab or Comp	AqTot/SWLLMetalsSub	1
☐ Sampler confirms ID and parameters are accurate			*Circle preservative/s:* HCL HNO$_3$ H$_2$SO$_4$ NaOH MEOH Na$_2$S$_2$O$_3$ ICE	Dissolved Sample Field Filtered ☐
Treat Tank Effluent	2/9/12 09:15	aqueous Grab or Comp	AqTot/SWLLMetalsSub/pH	4
☐ Sampler confirms ID and parameters are accurate			*Circle preservative/s:* HCL HNO$_3$ H$_2$SO$_4$ NaOH MEOH Na$_2$S$_2$O$_3$ ICE	Dissolved Sample Field Filtered ☐

Please ensure this auto COC is accurate, adheres to permit or sampling requirements for this sampling event, and modify as necessary.

EAI Project ID 3902

Project Name Wastewater Analysis - *Weekly*

State NH

Client (Pro Mgr) Paul Pepler

Customer GZA GeoEnvironmental, Inc. (NH)

Address 380 Harvey Road

City Manchester NH 03103

Phone 623-3600 Fax 624-9463 (37)

EmailAddress: paul.pepler@gza.com

Results Needed by: Preferred date _____

Notes about project: (i.e. Special Limits, Billing info if different...)

Subcontract ALL metals to Frontier Global Sciences. Metals include Total As,Cd,Cr,Cu,Pb,Hg,Mo,Ni,Se, Ag,Zn. Metals analyses require project-specific MS/MSD.

QC deliverables

☐ A ☐ A+ ☒ B ☐ B+ ☐ C ☐ PC

ReportingOptions

☒ HC
☒ EDD PDF
☒ EDD email
☒ PDF prelim, NO FAX
☐ e-mail Login Confirmation
☐ NO FAX

PONumber: 02259252

Quote No: 1009476

Temperature 20 °C

Ice present Yes ☒ No ☐

Samples Collected by: GT/PN

Relinquished by	Date/Time	Received by
[signature]	2/9/12 09:50	[signature]