



ANALYTICAL REPORT

For:

OMI - Farmington - Animas River - Post Plume

ASL Report #: P2799

Project ID: 402544.A6.16.00.00

Attn: Monica Peterson

Authorized and Released By:

Laboratory Project Manager

Doug Hardy

(541) 758-0235 ext.23107

August 11, 2015

This data package meets standards requested by client and is not intended or implied to meet any other standard.

All analyses performed by CH2M HILL are clearly indicated. Any subcontracted analyses are included as appended reports as received from the subcontracted laboratory. The results included in this report only relate to the samples listed on the following Sample Cross-Reference page. This report shall not be reproduced except in full, without the written approval of the laboratory.

Any unusual difficulties encountered during the analysis of your samples are discussed in the attached case narratives.

ASL Report #: P2799

Sample Receipt Comments

We certify that the test results meet all standard ASL requirements.

Sample Cross-Reference

ASL Sample ID	Client Sample ID	Date/Time Collected	Date Received
P279901	APS#2 - 20150810-1	08/10/15 15:08	08/11/15
P279902	APS#2 - 20150810-2	08/10/15 15:10	08/11/15

CASE NARRATIVE METALS ANALYSIS

Lab Name: CH2M HILL ASL

ASL SDG#: P2799

Project: OMI - Farmington

Project #: 402544.A6.16.00.00

With the exceptions noted as flags, footnotes, or detailed in the section below; standard operating procedures were followed in the analysis of the samples and no problems were encountered or anomalies observed.

All laboratory quality control samples were within established control limits, with any exceptions noted below, or in the associated QC summary forms.

Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. For diluted samples, the reporting limits are adjusted for the dilution required.

Calculations are performed before rounding to minimize errors in calculated values.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the section below, or in the sample receipt documentation.

Method(s):

E200.7: E200.2

E200.8: E200.2

E245.1

Laboratory Control Sample(s):

E200.7: LCS recovery of Sodium(116%) in BS2W0811 did not meet acceptance criteria of 85-115%.

Matrix Spike/Matrix Spike Duplicate(s):

E200.7: Matrix spike/matrix spike duplicate recoveries for aluminum (167/157%) did not meet acceptance criteria (70-130%). Matrix spike recovery for iron (140%) did not meet acceptance criteria (70-130%).

CH2M HILL Applied Sciences Laboratory (ASL)

Client Information		Lab Information	
Client Sample ID: APS#2 - 20150810-1		Lab Sample ID: P279901	
Project Name: OMI - Farmington		Date Received: 08/11/15	
Sample Date: 08/10/15		Report Revision No: 0	
Sample Time: 15:08			
Type: Grab			
Matrix: Water			

Analyte	CAS#	Dilution Factor	RL	Sample Result	Qualifier	Units	Analysis Method	Date Analyzed
Metals								
Aluminum	7429-90-5	1	100	525		ug/L	E200.7	08/11/15
Antimony	7440-36-0	1	0.50	0.50	U	ug/L	E200.8	08/11/15
Arsenic	7440-38-2	1	0.50	1.17		ug/L	E200.8	08/11/15
Barium	7440-39-3	1	2.00	69.0		ug/L	E200.8	08/11/15
Beryllium	7440-41-7	1	4.00	4.00	U	ug/L	E200.7	08/11/15
Cadmium	7440-43-9	1	0.50	0.50	U	ug/L	E200.8	08/11/15
Calcium	7440-70-2	1	500	60400		ug/L	E200.7	08/11/15
Chromium	7440-47-3	1	1.00	1.00	U	ug/L	E200.8	08/11/15
Cobalt	7440-48-4	1	0.50	0.50	U	ug/L	E200.8	08/11/15
Copper	7440-50-8	1	2.00	4.46		ug/L	E200.8	08/11/15
Iron	7439-89-6	1	100	1250		ug/L	E200.7	08/11/15
Lead	7439-92-1	1	0.50	15.4		ug/L	E200.8	08/11/15
Magnesium	7439-95-4	1	500	8790		ug/L	E200.7	08/11/15
Manganese	7439-96-5	1	10.0	75.9		ug/L	E200.7	08/11/15
Mercury	7439-97-6	1	0.10	0.10	U	ug/L	E245.1	08/11/15
Molybdenum	7439-98-7	1	1.00	1.41		ug/L	E200.8	08/11/15
Nickel	7440-02-0	1	0.50	1.31		ug/L	E200.8	08/11/15
Potassium	7440-09-7	1	1000	2150		ug/L	E200.7	08/11/15
Selenium	7782-49-2	1	0.50	0.51		ug/L	E200.8	08/11/15
Silver	7440-22-4	1	0.50	0.50	U	ug/L	E200.8	08/11/15
Sodium	7440-23-5	1	1000	17400		ug/L	E200.7	08/11/15
Thallium	7440-28-0	1	0.20	0.20	U	ug/L	E200.8	08/11/15
Vanadium	7440-62-2	1	0.50	1.36		ug/L	E200.8	08/11/15
Zinc	7440-66-6	1	20.0	36.0		ug/L	E200.7	08/11/15

U=Not detected at specified reporting limit

E=Estimated value above calibration range

*=See case narrative

CH2M HILL Applied Sciences Laboratory (ASL)

Client Information				Lab Information			
Project Name: OMI - Farmington				Method Blank ID: WB1-0811			
Sample Date: N/A				Date Received: N/A			
Sample Time: N/A				Report Revision No: 0			
Type: QC							
Matrix: Water							

Analyte	CAS#	Dilution Factor	RL	Sample Result	Qualifier	Units	Analysis Method	Date Analyzed
Metals								
Mercury	7439-97-6	1	0.10	0.10	U	ug/L	E245.1	08/11/15

U=Not detected at specified reporting limit

E=Estimated value above calibration range

*=See case narrative

CH2M HILL Applied Sciences Laboratory (ASL)

Client Information	Lab Information
Project Name: OMI - Farmington Sample Date: N/A Sample Time: N/A Type: QC Matrix: Water	Method Blank ID: WB2-0811 Date Received: N/A Report Revision No: 0

Analyte	CAS#	Dilution Factor	RL	Sample Result	Qualifier	Units	Analysis Method	Date Analyzed
Metals								
Aluminum	7429-90-5	1	100	100	U	ug/L	E200.7	08/11/15
Antimony	7440-36-0	1	0.50	0.50	U	ug/L	E200.8	08/11/15
Arsenic	7440-38-2	1	0.50	0.50	U	ug/L	E200.8	08/11/15
Barium	7440-39-3	1	2.00	2.00	U	ug/L	E200.8	08/11/15
Beryllium	7440-41-7	1	4.00	4.00	U	ug/L	E200.7	08/11/15
Cadmium	7440-43-9	1	0.50	0.50	U	ug/L	E200.8	08/11/15
Calcium	7440-70-2	1	500	500	U	ug/L	E200.7	08/11/15
Chromium	7440-47-3	1	1.00	1.00	U	ug/L	E200.8	08/11/15
Cobalt	7440-48-4	1	0.50	0.50	U	ug/L	E200.8	08/11/15
Copper	7440-50-8	1	2.00	2.00	U	ug/L	E200.8	08/11/15
Iron	7439-89-6	1	100	100	U	ug/L	E200.7	08/11/15
Lead	7439-92-1	1	0.50	0.50	U	ug/L	E200.8	08/11/15
Magnesium	7439-95-4	1	500	500	U	ug/L	E200.7	08/11/15
Manganese	7439-96-5	1	10.0	10.0	U	ug/L	E200.7	08/11/15
Molybdenum	7439-98-7	1	1.00	1.00	U	ug/L	E200.8	08/11/15
Nickel	7440-02-0	1	0.50	0.50	U	ug/L	E200.8	08/11/15
Potassium	7440-09-7	1	1000	1000	U	ug/L	E200.7	08/11/15
Selenium	7782-49-2	1	0.50	0.50	U	ug/L	E200.8	08/11/15
Silver	7440-22-4	1	0.50	0.50	U	ug/L	E200.8	08/11/15
Sodium	7440-23-5	1	1000	1000	U	ug/L	E200.7	08/11/15
Thallium	7440-28-0	1	0.20	0.20	U	ug/L	E200.8	08/11/15
Vanadium	7440-62-2	1	0.50	0.50	U	ug/L	E200.8	08/11/15
Zinc	7440-66-6	1	20.0	20.0	U	ug/L	E200.7	08/11/15

U=Not detected at specified reporting limit

E=Estimated value above calibration range

*=See case narrative

CH2M HILL Applied Sciences Laboratory (ASL)

Client Information	Lab Information
Project Name: OMI - Farmington Type: QC Matrix: Water	Blank Spike ID: BS1W0811 Report Revision No: 0 Dilution Factor: 1

Analyte	Spike Amount	Result	Units	%Recovery	Analysis Method	Prep Method	Date Analyzed
Metals							
Mercury	1.00	1.04	ug/L	104	E245.1	METHOD	08/11/15

*=See case narrative

U=Not detected at specified reporting limit

E=Estimated value above calibration range

CH2M HILL Applied Sciences Laboratory (ASL)

Client Information				Lab Information			
Project Name: OMI - Farmington				Blank Spike ID: BS2W0811			
Type: QC				Report Revision No: 0			
Matrix: Water				Dilution Factor: 1			

Analyte	Spike Amount	Result	Units	%Recovery	Analysis Method	Prep Method	Date Analyzed
Metals							
Aluminum	500	483	ug/L	97	E200.7	E200.2	08/11/15
Antimony	50.0	47.5	ug/L	95	E200.8	E200.2	08/11/15
Arsenic	50.0	49.9	ug/L	100	E200.8	E200.2	08/11/15
Barium	50.0	49.9	ug/L	100	E200.8	E200.2	08/11/15
Beryllium	500	499	ug/L	100	E200.7	E200.2	08/11/15
Cadmium	50.0	49.8	ug/L	100	E200.8	E200.2	08/11/15
Calcium	10000	10300	ug/L	103	E200.7	E200.2	08/11/15
Chromium	50.0	50.1	ug/L	100	E200.8	E200.2	08/11/15
Cobalt	50.0	50.4	ug/L	101	E200.8	E200.2	08/11/15
Copper	50.0	47.5	ug/L	95	E200.8	E200.2	08/11/15
Iron	500	525	ug/L	105	E200.7	E200.2	08/11/15
Lead	50.0	46.4	ug/L	93	E200.8	E200.2	08/11/15
Magnesium	10000	9730	ug/L	97	E200.7	E200.2	08/11/15
Manganese	500	457	ug/L	91	E200.7	E200.2	08/11/15
Molybdenum	50.0	48.2	ug/L	96	E200.8	E200.2	08/11/15
Nickel	50.0	48.8	ug/L	98	E200.8	E200.2	08/11/15
Potassium	5000	5750	ug/L	115	E200.7	E200.2	08/11/15
Selenium	50.0	48.9	ug/L	98	E200.8	E200.2	08/11/15
Silver	25.0	23.5	ug/L	94	E200.8	E200.2	08/11/15
Sodium	10000	11600	ug/L	116*	E200.7	E200.2	08/11/15
Thallium	50.0	50.7	ug/L	101	E200.8	E200.2	08/11/15
Vanadium	50.0	50.1	ug/L	100	E200.8	E200.2	08/11/15
Zinc	500	485	ug/L	97	E200.7	E200.2	08/11/15

*=See case narrative

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E=Estimated value above calibration range

CASE NARRATIVE GENERAL CHEMISTRY ANALYSIS

Lab Name: CH2M HILL ASL

ASL SDG#: P2799

Project: OMI - Farmington

Project #: 402544.A6.16.00.00

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Method(s):

E335.4

CH2M HILL Applied Sciences Laboratory (ASL)

Client Information			Lab Information			
Project Name: OMI - Farmington			Lab Batch ID: P2799			
Date Received: 08/11/15			Analysis Method: E335.4			
Type: See C.O.C.			Units: mg/L			
Matrix: Water			Report Revision No.: 0			

Client Sample ID	Lab Sample ID	Dilution Factor	RL	Cyanide, Total Result	Qualifier	Date Analyzed
General Chemistry						
APS#2 - 20150810-2	P279902	1	0.0050	0.0050	U	08/11/15
WB1-081115	WB1-081115	1	0.0050	0.0050	U	08/11/15

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*=See case narrative

CH2M HILL Applied Sciences Laboratory (ASL)

Client Information				Lab Information			
Project Name: OMI - Farmington				Lab Batch ID: P2799			
Type: QC				Report Revision No.: 0			
Matrix: Water							

LCS ID	Analyte	Spike Amount	Sample Result	Units	% Recovery	Analysis Method	Date Analyzed
General Chemistry							
BS1W0811	Cyanide, Total	0.10	0.097	mg/L	97	E335.4	08/11/15

*=See case narrative

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SDG ID: P2799

Date Received: 8/11/2015

Client/Project: OMI - Farmington

Received By: PC

Were custody seals intact and on the outside of the cooler?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Shipping Record:	<input type="checkbox"/> Hand Delivered	<input checked="" type="checkbox"/> On File	<input type="checkbox"/> COC
Radiological Screening for DoD	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A
Packing Material:	<input type="checkbox"/> Hand Delivered	<input checked="" type="checkbox"/> Ice	<input type="checkbox"/> Blue Ice <input type="checkbox"/> Box
Temp OK? (<6C) Therm ID: TH173 Exp.	5.9 °C	<input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> N/A
Was a Chain of Custody (CoC) Provided?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Was the CoC correctly filled out (If No, document below)	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Did sample labels agree with COC? (If No, document below)	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Did the CoC list a correct bottle count and the preservative types (No=Correct on CoC)	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Were the sample containers in good condition (broken or leaking)?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Was enough sample volume provided for analysis? (If No, document below)	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Containers supplied by ASL?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A
Any sample with < 1/2 holding time remaining? If so contact LPM	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A
Samples have multi-phase? If yes, document on SRER	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A
All water VOCs free of air bubbles? No, document on SRER	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A
pH of all samples met criteria on receipt? If "No", preserve and document below.	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Dissolved/Soluble metals filtered in the field?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A
Dissolved/Soluble metals have sediment in bottom of container? If so document below.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A

Preservation Adjustment

Sample ID	Reagent	Reagent Lot Number	Volume Added	Initials/Time	24 hour pH check Initials/Time

Did pH of all metals samples preserved upon receipt meet criteria 24 hours after preservation? Yes No

Sample Exception Report (The following exceptions were noted)

Client was notified on: _____ Client contact: _____
<u>Resolution to Exception:</u>