

ARS Aleut Analytical, LLC 4307 Arctic Boulevard Anchorage, AK 99503 Phone: 907-258-2155 Fax: 907-258-6634

8/6/2015

Kenai Watershed Forum 44129 Sterling Highway Soldotna, AK 99669 Attn: Branden Bornemann Work Order #: A1507370

Date: 8/6/2015

Work ID: KWF Baseline Monitoring 2015

Date Received: 7/21/2015

Proj #: none

Sample Identification

 Lab Sample Number
 Client Description
 Lab Sample Number
 Client Description

 A1507370-01
 RM 79.5-Juneau Creek

Enclosed are the analytical results for the submitted sample(s). Please review the CASE NARRATIVE for a discussion of any data and/or quality control issues. Listings of data qualifiers, analytical codes, key dates, and QC relationships are provided at the end of the report.

Sincerely,

Carissa Cumine Project Manager

Carina Camine

"The Science of Analysis, The Art of Service"

Case Narrative

ARS Aleut Analytical Work Order: A1507370

Samples were prepared and analyzed according to EPA or equivalent methods outlined in the following references:

Methods for the Determination of Metals in Environmental Samples, EPA/600/R-94/111, May 1994.

Standard Methods for the Examination of Water and Wastewater, 21st Edition, 2005.

SAMPLE RECEIPT:

One (1) sample was received on 7/21/2015 6:05:00 PM at a temperature of 3.2°C at AAA - Anchorage. The samples were received in good condition and in order per chain of custody.

REVIEW FOR COMPLIANCE WITH ARS Aleut Analytical QA PLAN A summary of our review is shown below.

All analytical results contained in this report have been reviewed under AAA's internal quality assurance and quality control program. Any deviations in quality control parameters for specific analyses are noted in the following text. A complete quality assurance report, including laboratory control, matrix spike, and sample duplicate recoveries, is kept on file in our office and is available upon request.

All method specifications were met for the following tests, unless otherwise noted:

Test Method: SM4500-NO3E - Nitrogen (Nitrate), Cadmium Reduction Method - Nitrate+Nitrite pres - Aqueous

Test Method: SM4500-PE - Total Phos HACH 8190 - Aqueous MS/MSD and DUP OUTLIERS:

The target was recovered outside the acceptance limits in the batch MS/MSD associated with this analysis. However, the sample spiked is not associated with this project.

The following was a subcontracted tests and has been represented to us as meeting criteria:

Test Method: 200.8 - Metals by ICP/MS - 200.8 Metals - Aqueous

ARS Aleut Analytical

Workorder (SDG): A1507370

Project: KWF Baseline Monitoring 2015 Client: Kenai Watershed Forum

Client Project Number: none

Report Section: Client Sample Report

Client Sample Name: RM 79.5-Juneau Creek

Matrix:	Aqı	ieous					C	Collection Date:	7/21/2015	9:30:00AM
The following test was	conducted	d by: ARS Ale	ut Analytical,	LLC						
Lab Sample Number: Prep Date:	A15073 7/24/20	15	ogan (Nitrata)	Codmi	um Dadu	uction Ma	thad	Analysis Date: Instrument:	7/24/202 Thermos	15 8:30:00AM spectr
Analytical Method ID:	SM4300	-NO3E - Nitro	gen (Nitrate),	Caumi	um Reau	iction Me	tnoa -		1	
Prep Method ID:	. 15050	4010						Dilution Factor:	1	
Prep Batch Number:	A15072								DÆ	
Report Basis:	As Recei							Analyst Initials:	RT	1
Sample prep wt./vol:	25.00	ml						Prep Extract Vol:	25.00	ml
Analyte Nitrate-Nitrite as Nitrogen		CASNo	<u>Result</u> ND	Flags	Units mg/L	PQL 0.10	MDL 0.015	5		<u>run #:</u> 1
The following test was	conducted	d by: SGS Env	rironmental Se	rvices I	nc.					
Lab Sample Number: Prep Date:	A15073 7/23/20	70-01B						Analysis Date: Instrument:	7/27/202	15 3:24:00PM
Analytical Method ID:	200.8 -	Metals by ICI	P/MS - 200.8 I	Metals				File Name:		
Prep Method ID:								Dilution Factor:	1	
Prep Batch Number:	R15072	91553-4								
Report Basis:	As Recei	ived						Analyst Initials:	EAB	
Sample prep wt./vol:								Prep Extract Vol:		ml
<u>Analyte</u> Calcium		<u>CASNo</u> 7440-70-2	Result 14,000	Flags	Units ug/L	<u>PQL</u> 500	MDL 150			<u>run #:</u> 1
Iron		7439-89-6	ND		ug/L	250	78			
Magnesium		7439-96-4	1,200		ug/L	50	15			
The following test was	conducted	d by: ARS Ale	ut Analytical,	LLC						
Lab Sample Number:	A15073	-	· ·					Analysis Date:	7/27/201	15 11:35:00AM
Prep Date:	7/27/20	15						Instrument:	Spectrop	ohoto
Analytical Method ID:	SM4500	-PE - Total Ph	os HACH 819	90				File Name:		
Prep Method ID:	4500-PI	3						Dilution Factor:	1	
Prep Batch Number:	F150728	8002								
Report Basis:	As Recei	ived						Analyst Initials:	MOC	
Sample prep wt./vol:	5.00	ml						Prep Extract Vol:	5.00	ml
Analyte Phosphorous, Total		CASNo	Result ND	Flags	Units mg/L	PQL 0.10	MDL 0.025	5		<u>run #:</u> 1

ARS Aleut Analytical

1

Workorder (SDG): A1507370

Project: KWF Baseline Monitoring 2015 Client: Kenai Watershed Forum

Client Project Number: none

Report Section: Method Blank Report

Client Sample Name: MB

Matrix: Aqueous Collection Date: 7/24/2015 8:30:00AM

The following test was conducted by: ARS Aleut Analytical,LLC

Lab Sample Number: A150724012-MB Analysis Date: 7/24/2015 8:30:00AM

Prep Date: 7/24/2015 Instrument: Thermospectr

Analytical Method ID: SM4500-NO3E - Nitrogen (Nitrate), Cadmium Reduction Method - Nie Name:

Prep Method ID: Dilution Factor: 1

Prep Batch Number: A150724012

Report Basis: As Received Analyst Initials: RT

Sample prep wt./vol: 25.00 ml Prep Extract Vol: 25.00 ml

The following test was conducted by: SGS Environmental Services Inc.

Lab Sample Number: 1278674 Analysis Date: 7/27/2015 2:53:00PM

Prep Date: 7/23/2015 Instrument: Analytical Method ID: 200.8 - Metals by ICP/MS - 200.8 Metals File Name:

Analysical Method ID. 200.0 - Metals by IC17MB - 200.0 Metals

Prep Method ID: Dilution Factor:

Prep Batch Number: R1507291553-4

Report Basis: As Received Analyst Initials: EAB

Sample prep wt./vol: Prep Extract Vol: ml

 Analyte
 CASNo
 Result
 Flags
 Units
 PQL
 MDL
 run #:

 Calcium
 7440-70-2
 ND
 ug/L
 500
 150
 1

 Iron
 7430-89.6
 ND
 ug/L
 250
 78

 Iron
 7439-89-6
 ND
 ug/L
 250
 78

 Magnesium
 7439-96-4
 ND
 ug/L
 50
 15

The following test was conducted by: ARS Aleut Analytical,LLC

Lab Sample Number: F150728002-MB Analysis Date: 7/27/2015 11:35:00AM

Prep Date: 7/27/2015 Instrument: Spectrophoto

Analytical Method ID: SM4500-PE - Total Phos HACH 8190 File Name:

Prep Method ID: 4500-PB Dilution Factor: 1

Prep Batch Number: F150728002

Report Basis: As Received Analyst Initials: MOC

Sample prep wt./vol: 5.00 ml Prep Extract Vol: 5.00 ml

<u>Analyte</u> <u>CASNo</u> <u>Result</u> <u>Flags</u> <u>Units</u> <u>PQL</u> <u>MDL</u> <u>run #:</u>

 Result
 Flag
 CMS / MD
 Flag
 CMS / MD<

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Workorder (SDG): A1507370

Project: KWF Baseline Monitoring 2015

Client: Kenai Watershed Forum

Client Project Number: none

Tests Run at: Analytica Environmental Laboratories - Anchorage, Alaska

Workorder (SDG): A1507370

Project: KWF Baseline Monitoring 2015

Project: Number: QUALITY CONTROL REPORT

Prep Batch: A150724012

LCS REPORT

Analysis: SM4500-NO3E - Nitrogen (Nitrate), Cadmium Reduction Method - MB: A150724012-MB

Prep Date: 7/24/2015

<u>Analyte Name</u> <u>SampResult</u> <u>LCSRes.</u> <u>SPLev</u> <u>Recov.</u> <u>Recov Lim</u> <u>RPDLim</u> <u>Flag</u>

Nitrate-Nitrite as Nitrogen ND 0.448 0.406 110 90 - 110

FOOTNOTES TO QC REPORT

Note 1: Results are shown to three significant figures to avoid rounding errors in calculations.

Note 2: If the sample concentration is greater than 4 times the spike level, a recovery is not meaningful, and the result should be used as a replicate. In such cases the spike is not as high as expected random measurement variability of the sample result itself.

Note 3: For sample duplicates, if the result is less than the PQL, the duplicate RPD is not applicable. If the sample and duplicate results are not five times the PQL or greater, then the RPD is not expected to fall within the window shown and the comparison should be made on the basis of the absolute difference. Analytica uses the criterion that the absolute difference should be less than the PQL for water or less than 2XPQL for other matrices.

Note 4: For serial dilutions, if the result is less than the PQL, the duplicate RPD is not applicable. If the sample result is not 50 times the MDL or greater, then the fact that the RPD does not meet the 10% criterion has little significance. Otherwise it indicates that a matrix bias may exist at the analytical step.

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Workorder (SDG): A1507370

Project: KWF Baseline Monitoring 2015

Client: Kenai Watershed Forum

Client Project Number: none

Tests Run at: SGS Environmental Services Inc.

Workorder (SDG): A1507370

Project: KWF Baseline Monitoring 2015

Project Number:

QUALITY CONTROL REPORT

Prep Batch: R1507291553-4

LCS REPORT

Analysis: 200.8 - Metals by ICP/MS - 200.8 Metals MB:

Prep Date: 7/23/2015

1278674

MB Anal. Date: 7/27/2015 2:53:00PM Units: ug/L

LCS Anal. Date: 7/27/2015 2:56:00PM

Matrix:

Analyte Name	<u>SampResult</u>	LCSRes.	<u>SPLev</u>	Recov.	Recov Lim RPDLim Flag
Calcium	ND	10,300	10,000	103	85 - 115
Iron	ND	5,220	5,000	104	85 - 115
Magnesium	ND	10,200	10,000	102	85 - 115

FOOTNOTES TO QC REPORT

Note 1: Results are shown to three significant figures to avoid rounding errors in calculations.

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ARS Aleut Analytical

Workorder (SDG): A1507370

Project: KWF Baseline Monitoring 2015

Client: Kenai Watershed Forum

Client Project Number: none

Tests Run at:

Workorder (SDG): A1507370

Project: KWF Baseline Monitoring 2015

Project Number:

QUALITY CONTROL REPORT

Prep Batch: F150728002

LCS REPORT

Analysis: SM4500-PE - Total Phos HACH 8190 MB: F150728002-MB

Prep Date: 7/27/2015

MB Anal. Date: 7/27/2015 11:35:00AM Units: mg/L LCS Anal. Date: 7/27/2015 11:35:00AM Matrix: Aqueous

Analyte Name SampResult LCSRes. SPLev Recov. Recov. Recov Lim RPDLim Flag

Phosphorous, Total ND 0.349 0.333 105 90 - 110

FOOTNOTES TO QC REPORT

Note 1: Results are shown to three significant figures to avoid rounding errors in calculations.

Note 2: If the sample concentration is greater than 4 times the spike level, a recovery is not meaningful, and the result should be used as a replicate. In such cases the spike is not as high as expected random measurement variability of the sample result itself.

Note 3: For sample duplicates, if the result is less than the PQL, the duplicate RPD is not applicable. If the sample and duplicate results are not five times the PQL or greater, then the RPD is not expected to fall within the window shown and the comparison should be made on the basis of the absolute difference. Analytica uses the criterion that the absolute difference should be less than the PQL for water or less than 2XPQL for other matrices.

Note 4: For serial dilutions, if the result is less than the PQL, the duplicate RPD is not applicable. If the sample result is not 50 times the MDL or greater, then the fact that the RPD does not meet the 10% criterion has little significance. Otherwise it indicates that a matrix bias may exist at the analytical step.

ARS Aleut Analytical

7/27/2015 3:31:00PM

Workorder (SDG): A1507370

Project: KWF Baseline Monitoring 2015 Client: Kenai Watershed Forum

Client Project Number: none

QC BATCH ASSOCIATIONS - BY METHOD BLANK

Lab Project ID:	172,480	Lab Project Number:	A1507370	
				Prep Date: 7/24/2015
Lab Method Blank Id:	A150724012-MB			
Prep Batch ID:	A150724012		D 1 2 36 4 1	
Method:		itrogen (Nitrate), Cadmium		
This Method blank and		are associated with the followi		duplicates:
<u>SampleNum</u>	ClientSampleName	<u>Data</u> F	<u>ïle</u>	<u>AnalysisDate</u>
A1507366-04A	Batch QC			7/24/2015 8:30:00AM
A1507370-01A	RM 79.5-Juneau Creek	C		7/24/2015 8:30:00AM
A150724012-LCS	LCS			7/24/2015 8:30:00AM
A1507366-04A-DUP	DUP			7/24/2015 8:30:00AM
A1507366-04A-MS	MS			7/24/2015 8:30:00AM
				Prep Date: 7/27/2015
Lab Method Blank Id:	F150728002-MB			
Prep Batch ID:	F150728002			
Method:	SM4500-PE - Total	Phos HACH 8190		
This Method blank and	sample preparation batch	are associated with the followi	ng samples, spikes, and	duplicates:
<u>SampleNum</u>	ClientSampleName	<u>Data</u> F	<u>ïle</u>	<u>AnalysisDate</u>
A1507369-03C	Batch QC			7/27/2015 11:35:00AM
A1507370-01C	RM 79.5-Juneau Creek	3		7/27/2015 11:35:00AM
F150728002-LCS	LCS			7/27/2015 11:35:00AM
A1507369-03C-DUP	DUP			7/27/2015 11:35:00AM
A1507369-03C-MS	MS			7/27/2015 11:35:00AM
A1507369-03C-MSD	MSD			7/27/2015 11:35:00AM
				Prep Date: 7/23/2015
Lab Method Blank Id:	1278674			
Prep Batch ID:	R1507291553-4			
Method:	200.8 - Metals by	ICP/MS - 200.8 Metals		
This Method blank and	sample preparation batch	are associated with the followi	ng samples, spikes, and	duplicates:
<u>SampleNum</u>	ClientSampleName	<u>Data</u> F	<u>ïle</u>	<u>AnalysisDate</u>
A1507370-01B	RM 79.5-Juneau Creek	ζ.		7/27/2015 3:24:00PM
1278675	LCS for HBN 1714415	5 [MXX/28911		7/27/2015 2:56:00PM
1278676	1278792 MS FOR [M2	XX28911]		7/27/2015 3:01:00PM

1278677

1278793 MS FOR [MXX28911]

ARS Aleut Analytical

Workorder (SDG): A1507370

Project: KWF Baseline Monitoring 2015

Client: Kenai Watershed Forum

Client Project Number: none

DATA FLAGS AND DEFINITIONS

The PQL is the Method Quantitation Limit as defined by USACE.

Reporting Limit: Limit below which results are shown as "ND". This may be the PQL, MDL, or a value between. See the report conventions below.

Result Field:

ND = Not Detected at or above the Reporting Limit

NA = Analyte not applicable (see Case Narrative for discussion)

Qualifier Fields:

LOW = Recovery is below Lower Control Limit

HIGH = Recovery, RPD, or other parameter is above Upper Control Limit

E = Reported concentration is above the instrument calibration upper range

Organic Analysis Flags:

B = Analyte was detected in the laboratory method blank

J = Analyte was detected above MDL or Reporting Limit but below the Quant Limit (PQL)

Inorganic Analysis Flags:

J = Analyte was detected above the Reporting Limit but below the Quant Limit (PQL)

W = Post digestion spike did not meet criteria

S = Reported value determined by the Method of Standard Additions (MSA)

Several ways of defining the limit of detection and quantitation are prevalent in the laboratory industry and may appear in Analytica reports. These include the following:

MRL = "minimum reporting level", from the EPA Safe Drinking Water program (SDW)

PQL = "practical quantitation limit", from SW-846

EQL = "estimated quantitation limit", from SW-846

LOQ = "limit of quantitation", from a number of authoritative sources

In Analytica's work, all of these terms have the same meaning, equivalent to the EPA definition of the MRL. This reporting level is supported by a satisfactory calibration data point which is at that level or lower, and also is supported by a method detection limit (MDL) determined by the procedure in 40CFR. The MDL is lower than the MRL and represents an estimate of the level where positive detections have a 99% probability of being real, but where quantitation accuracy is unknown.

The MRL as defined by Analytica is the lowest demonstrated point of known quantitation accuracy.

The MRL should not be confused with the MCL, which is the EPA-defined "maximum contaminant level" allowed for certain regulated targets under specific regulations, such as the National Primary Drinking Water Regulations. Normally, the MRL is set at a level which is much lower than the MCL in order to ensure that levels are well below those limits. Not all target analytes have MCL levels established.

Other Flags may be applied. See Case Narrative for Description

ARS Aleut Analytical

Workorder (SDG): A1507370

Project: KWF Baseline Monitoring 2015 Client: Kenai Watershed Forum

Client Project Number: none

REPORTING CONVENTIONS FOR THIS REPORT

A1507370

<u>TestPkgName</u>	Basis	# Sig Figs	Reporting Limit
200.8 (Aqueous) - 200.8 Metals	As Received	2	Report to PQL
4500-NO3E (Aqueous) - Nitrate+Nitrite pres	As Received	3	Report to PQL
4500-PE/4500-PB (Aqueous) - Total Phos HACH 8190	As Received	2	Report to PQL
_			_



AAA Chain of Custody Form

4307 Arctic Blvd. Anchorage, AK 99503 (907) 258-2155 (907) 258-6634 fax

1325 W. 121st Avenue Westminster, CO 80234 303.469.8868 719.213.2478 fax

475 Hall Street Fairbanks, AK 99701 (907) 456-3116 (907) 456-3125 fax

701 W. Parks Hwy. #203 Wasilla, AK 99654 (907) 373-5440 (907) 258-6634 fax

Chain of Custody No:

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