



ARS Aleut Analytical, LLC  
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5/17/2018

Kenai Watershed Forum  
44129 Sterling Highway  
Soldotna, AK 99669  
Attn: Jeff Sires

Work Order #: A1804328  
Date: 5/17/2018  
Work ID: AK DNR & AK DEC  
Date Received: 4/24/2018  
Proj #: AK DNR & AK DEC

#### Sample Identification

Lab Sample Number	Client Description	Lab Sample Number	Client Description
A1804328-01	RM 40 - Bing's Landing	A1804328-02	Rm 43 - Upstream of Dow Isla
A1804328-03	Rm 44 - Mouth of Kiley River	A1804328-04	RM 50 - Skilak Lake Outflow

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,

Jerry Baker  
Project Manager

*"The Science of Analysis, The Art of Service"*

## Case Narrative

*ARS Aleut Analytical, LLC*

*Work Order: A1804328*

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:

Four (4) samples were received 4/24/2017 12:34 PM at ARS Aleut Analytical - Anchorage. Samples were received in Anchorage at a temperature of 2.7°C. The samples were received in good condition and in order per chain of custody.

Samples requiring metals analyses were subcontracted to Test America - Denver and arrived 4/27/2018 9:10 AM and at a temperature of 16.7°C.

Samples requiring inorganic analyses were subcontracted to Test America - Houston and arrived 4/27/2018 9:10 AM and at a temperature of 0.6°C. Please see sample results for individual analysis locations.

### REVIEW FOR COMPLIANCE WITH ANALYTICA QA PLAN:

A summary of our review is shown below.

All analytical results contained in this report have been reviewed under Analytica's internal quality assurance and quality control program. Any deviations in quality control parameters for specific analyses are noted in the following text.

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

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

The following are subcontracted tests and have been represented to us as having met criteria:

Test Method: 200.7 - Metals by ICP - 200.7 metals - Aqueous

Test Method: SM4500-PE - Total Phos HACH 8190 - Aqueous

## Detailed Analytical Report

ARS Aleut Analytical, LLC

Workorder (SDG): A1804328

Project: AK DNR &amp; AK DEC

Client: Kenai Watershed Forum

Client Project Number: AK DNR &amp; AK DEC

### Report Section: Client Sample Report

Client Sample Name: **RM 40 - Bing's Landing**

Matrix: Aqueous

Collection Date: 4/24/2018 11:24:00AM

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

Lab Sample Number: A1804328-01A

Analysis Date: 5/8/2018 4:35:00PM

Prep Date: 05-08-2018 16:05

Instrument: Thermospectr

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

File Name:

Prep Method ID:

Dilution Factor: 1

Prep Batch Number: A180515002

Report Basis: As Received

Analyst Initials: AAS/CS

Sample prep wt./vol: 25.00 ml

Prep Extract Vol: 25.00 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>
Nitrate-Nitrite as Nitrogen		0.164		mg/L	0.10	0.028	1

The following test was conducted by: TestAmerica - Houston

Lab Sample Number: A1804328-01C

Analysis Date: 5/10/2018 2:25:00PM

Prep Date: 05-10-2018 05:05

Instrument:

Analytical Method ID: SM4500-PE - Phos

File Name:

Prep Method ID: 4500-PB

Dilution Factor: 1

Prep Batch Number: R1805150603-5

Report Basis: As Received

Analyst Initials: SC1

Sample prep wt./vol:

Prep Extract Vol: 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>
Phosphorous, Total		ND		mg/L	0.050	0.021	1

The following test was conducted by: TestAmerica - Denver

Lab Sample Number: A1804328-01B

Analysis Date: 5/3/2018 11:33:00PM

Prep Date: 05-03-2018 08:05

Instrument:

Analytical Method ID: 200.7 - Metals by ICP - 200.7 metals

File Name:

Prep Method ID:

Dilution Factor: 1

Prep Batch Number: R1805110916-10

Report Basis: As Received

Analyst Initials: SJS

Sample prep wt./vol:

Prep Extract Vol: 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>
Calcium	7440-70-2	9,400		ug/L	200	35	1
Magnesium	7439-96-4	1,100		ug/L	200	11	

Lab Sample Number: A1804328-01B

Analysis Date: 5/4/2018 2:48:00PM

Prep Date: 05-03-2018 08:05

Instrument:

Analytical Method ID: 200.7 - Metals by ICP - 200.7 metals

File Name:

Prep Method ID:

Dilution Factor: 1

Prep Batch Number: R1805110916-10

Report Basis: As Received

Analyst Initials: SJS

Sample prep wt./vol:

Prep Extract Vol: 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>
Iron	7439-89-6	480		ug/L	100	22	2

## Detailed Analytical Report

ARS Aleut Analytical, LLC

Workorder (SDG): A1804328

Project: AK DNR &amp; AK DEC

Client: Kenai Watershed Forum

Client Project Number: AK DNR &amp; AK DEC

### Report Section: Client Sample Report

Client Sample Name: **Rm 43 - Upstream of Dow Island**

Matrix: Aqueous

Collection Date: 4/24/2018 10:37:00AM

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

Lab Sample Number: A1804328-02A Analysis Date: 5/8/2018 4:35:00PM  
Prep Date: 05-08-2018 16:05 Instrument: Thermospectr  
Analytical Method ID: SM4500-NO3E - Nitrogen (Nitrate), Cadmium Reduction Method - File Name:  
Prep Method ID: Dilution Factor: 1  
Prep Batch Number: A180515002  
Report Basis: As Received Analyst Initials: AAS/CS  
Sample prep wt./vol: 25.00 ml Prep Extract Vol: 25.00 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>
Nitrate-Nitrite as Nitrogen		0.187		mg/L	0.10	0.028	1

The following test was conducted by: TestAmerica - Houston

Lab Sample Number: A1804328-02C Analysis Date: 5/10/2018 2:25:00PM  
Prep Date: 05-10-2018 05:05 Instrument:  
Analytical Method ID: SM4500-PE - Phos File Name:  
Prep Method ID: 4500-PB Dilution Factor: 1  
Prep Batch Number: R1805150603-5  
Report Basis: As Received Analyst Initials: SC1  
Sample prep wt./vol: Prep Extract Vol: 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>
Phosphorous, Total		ND		mg/L	0.050	0.021	1

The following test was conducted by: TestAmerica - Denver

Lab Sample Number: A1804328-02B Analysis Date: 5/3/2018 11:35:00PM  
Prep Date: 05-03-2018 08:05 Instrument:  
Analytical Method ID: 200.7 - Metals by ICP - 200.7 metals File Name:  
Prep Method ID: Dilution Factor: 1  
Prep Batch Number: R1805110916-10  
Report Basis: As Received Analyst Initials: SJS  
Sample prep wt./vol: Prep Extract Vol: 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>
Calcium	7440-70-2	9,300		ug/L	200	35	1
Magnesium	7439-96-4	1,100		ug/L	200	11	

Lab Sample Number: A1804328-02B Analysis Date: 5/4/2018 2:51:00PM  
Prep Date: 05-03-2018 08:05 Instrument:  
Analytical Method ID: 200.7 - Metals by ICP - 200.7 metals File Name:  
Prep Method ID: Dilution Factor: 1  
Prep Batch Number: R1805110916-10  
Report Basis: As Received Analyst Initials: SJS  
Sample prep wt./vol: Prep Extract Vol: 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>
Iron	7439-89-6	520		ug/L	100	22	2

## Detailed Analytical Report

ARS Aleut Analytical, LLC

Workorder (SDG): A1804328

Project: AK DNR &amp; AK DEC

Client: Kenai Watershed Forum

Client Project Number: AK DNR &amp; AK DEC

### Report Section: Client Sample Report

Client Sample Name: **Rm 44 - Mouth of Kiley River**

Matrix: Aqueous

Collection Date: 4/24/2018 11:04:00AM

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

Lab Sample Number: A1804328-03A

Analysis Date: 5/8/2018 4:35:00PM

Prep Date: 05-08-2018 16:05

Instrument: Thermospectr

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

File Name:

Prep Method ID:

Dilution Factor: 1

Prep Batch Number: A180515002

Report Basis: As Received

Analyst Initials: AAS/CS

Sample prep wt./vol: 25.00 ml

Prep Extract Vol: 25.00 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>
Nitrate-Nitrite as Nitrogen		ND		mg/L	0.10	0.028	1

The following test was conducted by: TestAmerica - Houston

Lab Sample Number: A1804328-03C

Analysis Date: 5/10/2018 2:25:00PM

Prep Date: 05-10-2018 05:05

Instrument:

Analytical Method ID: SM4500-PE - Phos

File Name:

Prep Method ID: 4500-PB

Dilution Factor: 1

Prep Batch Number: R1805150603-5

Report Basis: As Received

Analyst Initials: SC1

Sample prep wt./vol:

Prep Extract Vol: 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>
Phosphorous, Total		0.085		mg/L	0.050	0.021	1

The following test was conducted by: TestAmerica - Denver

Lab Sample Number: A1804328-03B

Analysis Date: 5/3/2018 11:38:00PM

Prep Date: 05-03-2018 08:05

Instrument:

Analytical Method ID: 200.7 - Metals by ICP - 200.7 metals

File Name:

Prep Method ID:

Dilution Factor: 1

Prep Batch Number: R1805110916-10

Report Basis: As Received

Analyst Initials: SJS

Sample prep wt./vol:

Prep Extract Vol: 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>
Calcium	7440-70-2	6,700		ug/L	200	35	1
Magnesium	7439-96-4	1,500		ug/L	200	11	

Lab Sample Number: A1804328-03B

Analysis Date: 5/4/2018 2:53:00PM

Prep Date: 05-03-2018 08:05

Instrument:

Analytical Method ID: 200.7 - Metals by ICP - 200.7 metals

File Name:

Prep Method ID:

Dilution Factor: 1

Prep Batch Number: R1805110916-10

Report Basis: As Received

Analyst Initials: SJS

Sample prep wt./vol:

Prep Extract Vol: 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>
Iron	7439-89-6	950		ug/L	100	22	2

## Detailed Analytical Report

ARS Aleut Analytical, LLC

Workorder (SDG): A1804328

Project: AK DNR &amp; AK DEC

Client: Kenai Watershed Forum

Client Project Number: AK DNR &amp; AK DEC

### Report Section: Client Sample Report

Client Sample Name: **RM 50 - Skilak Lake Outflow**

Matrix: Aqueous

Collection Date: 4/24/2018 8:27:00AM

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

Lab Sample Number: A1804328-04A

Analysis Date: 5/8/2018 4:35:00PM

Prep Date: 05-08-2018 16:05

Instrument: Thermospectr

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

File Name:

Prep Method ID:

Dilution Factor: 1

Prep Batch Number: A180515002

Report Basis: As Received

Analyst Initials: AAS/CS

Sample prep wt./vol: 25.00 ml

Prep Extract Vol: 25.00 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>
Nitrate-Nitrite as Nitrogen		0.144		mg/L	0.10	0.028	1

The following test was conducted by: TestAmerica - Houston

Lab Sample Number: A1804328-04C

Analysis Date: 5/10/2018 2:25:00PM

Prep Date: 05-10-2018 05:05

Instrument:

Analytical Method ID: SM4500-PE - Phos

File Name:

Prep Method ID: 4500-PB

Dilution Factor: 1

Prep Batch Number: R1805150603-5

Report Basis: As Received

Analyst Initials: SC1

Sample prep wt./vol:

Prep Extract Vol: 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>
Phosphorous, Total		ND		mg/L	0.050	0.021	1

The following test was conducted by: TestAmerica - Denver

Lab Sample Number: A1804328-04B

Analysis Date: 5/3/2018 11:41:00PM

Prep Date: 05-03-2018 08:05

Instrument:

Analytical Method ID: 200.7 - Metals by ICP - 200.7 metals

File Name:

Prep Method ID:

Dilution Factor: 1

Prep Batch Number: R1805110916-10

Report Basis: As Received

Analyst Initials: SJS

Sample prep wt./vol:

Prep Extract Vol: 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>
Calcium	7440-70-2	9,200		ug/L	200	35	1
Magnesium	7439-96-4	830		ug/L	200	11	

Lab Sample Number: A1804328-04B

Analysis Date: 5/4/2018 2:56:00PM

Prep Date: 05-03-2018 08:05

Instrument:

Analytical Method ID: 200.7 - Metals by ICP - 200.7 metals

File Name:

Prep Method ID:

Dilution Factor: 1

Prep Batch Number: R1805110916-10

Report Basis: As Received

Analyst Initials: SJS

Sample prep wt./vol:

Prep Extract Vol: 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>
Iron	7439-89-6	160		ug/L	100	22	2

## Detailed Analytical Report

ARS Aleut Analytical, LLC

Workorder (SDG): A1804328

Project: AK DNR & AK DEC

Client: Kenai Watershed Forum

Client Project Number: AK DNR & AK DEC

Report Section: Method Blank Report

Client Sample Name: MB

Matrix: Aqueous

Collection Date: 5/8/2018 4:35:00PM

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

Lab Sample Number: A180515002-MB

Analysis Date: 5/8/2018 4:35:00PM

Prep Date: 05-08-2018 16:05

Instrument: Thermospectr

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

File Name:

Prep Method ID:

Dilution Factor: 1

Prep Batch Number: A180515002

Report Basis: As Received

Analyst Initials: AAS/CS

Sample prep wt./vol: 25.00 ml

Prep Extract Vol: 25.00 ml

pH on receipt: 0.00

<u>Analyte</u>	<u>CASNo</u>	<u>Result</u>	<u>Flags</u>	<u>Units</u>	<u>PQL</u>	<u>MDL</u>	<u>run #:</u>
Nitrate-Nitrite as Nitrogen		ND		mg/L	0.10	0.028	1

## Detailed Analytical Report

ARS Aleut Analytical, LLC

Workorder (SDG): A1804328

Project: AK DNR & AK DEC

Client: Kenai Watershed Forum

Client Project Number: AK DNR & AK DEC

Report Section: Method Blank Report

Client Sample Name: MB 600-238187/3-A

Matrix:

Collection Date: 5/10/2018 5:12:00AM

The following test was conducted by: TestAmerica - Houston

Lab Sample Number: MB 600-238187/3-A

Analysis Date: 5/10/2018 2:25:00PM

Prep Date: 05-10-2018 05:05

Instrument:

Analytical Method ID: SM4500-PE - Phos

File Name:

Prep Method ID: 4500-PB

Dilution Factor: 1

Prep Batch Number: R1805150603-5

Report Basis: As Received

Analyst Initials: SC1

Sample prep wt./vol:

Prep Extract Vol: 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>
Phosphorous, Total		ND		mg/L	0.050	0.021	1



## Detailed Analytical Report

ARS Aleut Analytical, LLC

Workorder (SDG): A1804328

Project: AK DNR & AK DEC

Client: Kenai Watershed Forum

Client Project Number: AK DNR & AK DEC

### Report Section: Method Blank Report

Client Sample Name: MB 280-413331/1-A

Matrix:

Collection Date: 5/3/2018 8:41:00AM

The following test was conducted by: TestAmerica - Denver

Lab Sample Number: MB 280-413331/1-A

Prep Date: 05-03-2018 08:05

Analytical Method ID: 200. 7 - Metals by ICP - 200.7 metals

Prep Method ID:

Prep Batch Number: R1805110916-10

Report Basis: As Received

Sample prep wt./vol:

Analysis Date: 5/3/2018 11:28:00PM

Instrument:

File Name:

Dilution Factor: 1

Analyst Initials: SJS

Prep Extract Vol: 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>
Calcium	7440-70-2	ND		ug/L	200	35	1
Magnesium	7439-96-4	ND		ug/L	200	11	

Lab Sample Number: MB 280-413331/1-A

Prep Date: 05-03-2018 08:05

Analytical Method ID: 200. 7 - Metals by ICP - 200.7 metals

Prep Method ID:

Prep Batch Number: R1805110916-10

Report Basis: As Received

Sample prep wt./vol:

Analysis Date: 5/4/2018 2:43:00PM

Instrument:

File Name:

Dilution Factor: 1

Analyst Initials: SJS

Prep Extract Vol: 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>
Iron	7439-89-6	ND		ug/L	100	22	2

## Detailed Analytical Report

ARS Aleut Analytical, LLC

Workorder (SDG): A1804328

Project: AK DNR & AK DEC

Client: Kenai Watershed Forum

Client Project Number: AK DNR & AK DEC

Tests Run at: Analytica Environmental Laboratories - Anchorage, Alaska

Workorder (SDG): A1804328

Project: AK DNR & AK DEC

Project Number:

Prep Batch: A180515002

### QUALITY CONTROL REPORT

#### SAMPLE DUPLICATE REPORT

Analysis: SM4500-NO3E - Nitrogen (Nitrate), Cadmium Reduction Method -Base Sample:A1804328-01A  
Prep Date: 5/8/2018

Samp. Anal. Date: 5/8/2018 4:35:00PM

Units: mg/L

DUP Anal. Date: 5/8/2018 4:35:00PM

Matrix: Aqueous

<u>Analyte Name</u>	<u>SampResult</u>	<u>DUPRes.</u>	<u>RPD</u>	<u>RPDLim</u>	<u>Flag</u>
Nitrate-Nitrite as Nitrogen	0.164	0.167	1.8	20	

#### LCS REPORT

Analysis: SM4500-NO3E - Nitrogen (Nitrate), Cadmium Reduction Method -MB: A180515002-MB  
Prep Date: 5/8/2018

MB Anal. Date: 5/8/2018 4:35:00PM

Units: mg/L

LCS Anal. Date: 5/8/2018 4:35:00PM

Matrix: Aqueous

<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	0.694	0.690	100.5	90 - 110		

#### MS REPORT

Analysis: SM4500-NO3E - Nitrogen (Nitrate), Cadmium Reduction Method -Parent: A1804328-01A  
Prep Date: 5/8/2018

Samp. Anal. Date: 5/8/2018 4:35:00PM

Units: mg/L

MS Anal. Date: 5/8/2018 4:35:00PM

Matrix: Aqueous

<u>Analyte Name</u>	<u>SampResult</u>	<u>MSRes.</u>	<u>SPLev</u>	<u>Recov.</u>	<u>Recov Lim</u>	<u>Flag</u>
Nitrate-Nitrite as Nitrogen	0.164	0.532	0.360	102.3	80 - 120	

## Detailed Analytical Report

ARS Aleut Analytical, LLC

Workorder (SDG): A1804328

**Project:** AK DNR & AK DEC

**Client:** Kenai Watershed Forum

**Client Project Number:** AK DNR & AK DEC

### 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.

## Detailed Analytical Report

ARS Aleut Analytical, LLC

Workorder (SDG): A1804328

Project: AK DNR &amp; AK DEC

Client: Kenai Watershed Forum

Client Project Number: AK DNR &amp; AK DEC

Tests Run at: TestAmerica - Denver

Workorder (SDG): A1804328

Project: AK DNR &amp; AK DEC

Project Number:

Prep Batch: R1805110916-10

### QUALITY CONTROL REPORT

#### LCS REPORT

Analysis: 200. 7 - Metals by ICP - 200.7 metals

MB: MB 280-413331/1-A

Prep Date: 5/3/2018

MB Anal. Date: 5/3/2018 11:28:00PM

Units: ug/L

LCS Anal. Date: 5/3/2018 11:31:00PM

Matrix:

Analyte Name	SampResult	LCSRes.	SPLev	Recov.	Recov Lim	RPDLim	Flag
Calcium	ND	46,600	50,000	93.2	90 - 111		
Iron	ND	1,000	1,000	100.0	89 - 115		
Magnesium	ND	50,600	50,000	101.2	90 - 113		

#### MS/MSD REPORT

Analysis: 200. 7 - Metals by ICP - 200.7 metals

Parent: A1804328-04B

Prep Date: 5/3/2018

Samp. Anal. Date: 5/3/2018 11:41:00PM

Units: ug/L

MS Anal. Date: 5/3/2018 11:46:00PM MSD Anal. Date: 5/3/2018 11:48:00PM

Matrix: Aqueous

Analyte Name	SampResult	MSRes.	MSDRes	SPLev	SPDLev	Recov.	MSD Rec.	RPD	Recov Lim	RPDLim	Flag
Calcium	9,200	56,000	55,700	49,800	50,000	94.0	93.0	0.5	70 - 130	0	RPD
Iron	160	1,130	1,130	1,000	1,000	97.0	97.0	0.0	70 - 130	0	
Magnesium	830	51,800	51,900	50,000	50,100	102.0	102.0	0.2	70 - 130	0	RPD

Prep Batch: R1805150603-5

#### LCS REPORT

Analysis: SM4500-PE - Phos

MB: MB 600-238187/3-A

Prep Date: 5/10/2018

MB Anal. Date: 5/10/2018 2:25:00PM

Units: mg/L

LCS Anal. Date: 5/10/2018 2:25:00PM

Matrix:

Analyte Name	SampResult	LCSRes.	SPLev	Recov.	Recov Lim	RPDLim	Flag
Phosphorous, Total	ND	0.477	0.500	95.4	90 - 110		

#### MS/MSD REPORT

## Detailed Analytical Report

ARS Aleut Analytical, LLC

Workorder (SDG): A1804328

Project: AK DNR & AK DEC

Client: Kenai Watershed Forum

Client Project Number: AK DNR & AK DEC

Tests Run at: TestAmerica - Houston

Workorder (SDG): A1804328

Project: AK DNR & AK DEC

Project Number:

Prep Batch: R1805150603-5

### QUALITY CONTROL REPORT

#### MS/MSD REPORT

Analysis: SM4500-PE - Phos

Parent: A1804328-04C

Prep Date: 5/10/2018

Samp. Anal. Date: 5/10/2018 2:25:00PM

Units: mg/L

MS Anal. Date: 5/10/2018 2:25:00PM MSD Anal. Date: 5/10/2018 2:25:00PM Matrix: Aqueous

Analyte Name	SampResult	MSRes.	MSDRes	SPLev	SPDLv	Recov.	MSD Rec.	RPD	Recov Lim	RPDLim	Flag
Phosphorous, Total	ND	0.495	0.530	0.499	0.499	99.2	106.2	6.8	75 - 125	0	RPD

#### 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.

## Detailed Analytical Report

ARS Aleut Analytical, LLC

Workorder (SDG): A1804328

Project: AK DNR & AK DEC

Client: Kenai Watershed Forum

Client Project Number: AK DNR & AK DEC

### QC BATCH ASSOCIATIONS - BY METHOD BLANK

Lab Project ID: 194,279 Lab Project Number: A1804328

Prep Date: 5/3/2018

Lab Method Blank Id: MB 280-413331/1-A

Prep Batch ID: R1805110916-10

Method: 200. 7 - Metals by ICP - 200.7 metals

This Method blank and sample preparation batch are associated with the following samples, spikes, and duplicates:

<u>SampleNum</u>	<u>ClientSampleName</u>	<u>DataFile</u>	<u>AnalysisDate</u>
A1804328-01B	RM 40 - Bing's Landing		5/3/2018 11:33:00PM
A1804328-01B	RM 40 - Bing's Landing		5/4/2018 2:48:00PM
A1804328-02B	Rm 43 - Upstream of Dow Island		5/3/2018 11:35:00PM
A1804328-02B	Rm 43 - Upstream of Dow Island		5/4/2018 2:51:00PM
A1804328-03B	Rm 44 - Mouth of Kiley River		5/3/2018 11:38:00PM
A1804328-03B	Rm 44 - Mouth of Kiley River		5/4/2018 2:53:00PM
A1804328-04B	RM 50 - Skilak Lake Outflow		5/3/2018 11:41:00PM
A1804328-04B	RM 50 - Skilak Lake Outflow		5/4/2018 2:56:00PM
LCS 280-413331/2-A	LCS 280-413331/2-A		5/3/2018 11:31:00PM
LCS 280-413331/2-A	LCS 280-413331/2-A		5/4/2018 2:46:00PM
280-109066-4	A1804328-04B		5/3/2018 11:46:00PM
280-109066-4	A1804328-04B		5/4/2018 3:01:00PM
280-109066-4	A1804328-04B		5/3/2018 11:48:00PM
280-109066-4	A1804328-04B		5/4/2018 3:03:00PM

Prep Date: 5/10/2018

Lab Method Blank Id: MB 600-238187/3-A

Prep Batch ID: R1805150603-5

Method: SM4500-PE - Phos

This Method blank and sample preparation batch are associated with the following samples, spikes, and duplicates:

<u>SampleNum</u>	<u>ClientSampleName</u>	<u>DataFile</u>	<u>AnalysisDate</u>
A1804328-01C	RM 40 - Bing's Landing		5/10/2018 2:25:00PM
A1804328-02C	Rm 43 - Upstream of Dow Island		5/10/2018 2:25:00PM
A1804328-03C	Rm 44 - Mouth of Kiley River		5/10/2018 2:25:00PM
A1804328-04C	RM 50 - Skilak Lake Outflow		5/10/2018 2:25:00PM
LCS 600-238187/4-A	LCS 600-238187/4-A		5/10/2018 2:25:00PM
280-109104-4	A1804328-04C		5/10/2018 2:25:00PM
280-109104-4	A1804328-04C		5/10/2018 2:25:00PM

## Detailed Analytical Report

ARS Aleut Analytical, LLC

Workorder (SDG): A1804328

Project: AK DNR & AK DEC

Client: Kenai Watershed Forum

Client Project Number: AK DNR & AK DEC

### QC BATCH ASSOCIATIONS - BY METHOD BLANK

Lab Project ID: 194,279 Lab Project Number: A1804328

Prep Date: 5/8/2018

Lab Method Blank Id: A180515002-MB

Prep Batch ID: A180515002

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

This Method blank and sample preparation batch are associated with the following samples, spikes, and duplicates:

<u>SampleNum</u>	<u>ClientSampleName</u>	<u>DataFile</u>	<u>AnalysisDate</u>
A1804328-01A	RM 40 - Bing's Landing		5/8/2018 4:35:00PM
A1804328-02A	Rm 43 - Upstream of Dow Island		5/8/2018 4:35:00PM
A1804328-03A	Rm 44 - Mouth of Kiley River		5/8/2018 4:35:00PM
A1804328-04A	RM 50 - Skilak Lake Outflow		5/8/2018 4:35:00PM
A180515002-LCS	LCS		5/8/2018 4:35:00PM
A1804328-01A-DUP	DUP		5/8/2018 4:35:00PM
A1804328-01A-MS	MS		5/8/2018 4:35:00PM

## Detailed Analytical Report

ARS Aleut Analytical, LLC

Workorder (SDG): A1804328

**Project:** AK DNR & AK DEC

**Client:** Kenai Watershed Forum

**Client Project Number:** AK DNR & AK DEC

### 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



## Detailed Analytical Report

ARS Aleut Analytical, LLC

Workorder (SDG): A1804328

Project: AK DNR & AK DEC

Client: Kenai Watershed Forum

Client Project Number: AK DNR & AK DEC

### REPORTING CONVENTIONS FOR THIS REPORT

A1804328

<u>TestPkgName</u>	<u>Basis</u>	<u># Sig Figs</u>	<u>Reporting Limit</u>
200.7 (Aqueous) - 200.7 metals	As Received	2	Report to PQL
4500-NO3E (Aqueous) - Nitrate+Nitrite pres	As Received	3	Report to PQL
4500-PE/4500-PB (Aqueous) - Phos	As Received	2	Report to PQL



ARS Aleut Analytical

## AAA Chain of Custody

Custody form **MUST** be signed

Please provide as much information as possible

Anchorage Laboratory  
3710 Woodland Dr., Suite 900  
Anchorage, AK 99517  
907.258.2155  
907.258.6634 fax

Mat-Su Service Center  
701 East Parks Highway #206  
Wasilla, AK 99564  
907.373.5440

Fairbanks Laboratory  
475 Hall Street  
Fairbanks, AK 99701  
907.456.3116  
907.456.3125 fax  
ARS Corporate Office  
2608 North River Road  
Port Allen, LA 70767  
225.381.2991  
225.381.2996 fax

Sampling Event ID:

Client/Company Name & Address:

Kenal Watershed Forum

44129 Sterling HWY

Soldotna, AK 99669

Team ID: AK DNR & AK DEC

Project Name: KWF Baseline Monitoring April 2018

Quote Number:

LGN:

Turnaround Time (TAT) for Results

☐ Standard

☐ Expedited (prior authorization required for < 10 days)  
Please specify due date below; additional charges may apply

Account #:

Invoice Contact Name & Address & Phone:

Check

Credit

Phone No:

Fax No:

E-mail:

Special Instructions/Requirements:

Requested Date for Results:

Results to STATE: ☐ Yes ☐ No

☐ Routine ☐ Non-Routine

PO/Contract No.:

Requested Analysis/Method

Kit Preparation/Shipping Charge:

Client Sample Identification  
(Name, Designation, Location, etc.)

Date Sampled

Time Sampled

Matrix  
Aqueous  
DW-Drinking Water  
WW-Waste Water  
SOL-Solid Other

No. of Containers

Nitrate -SM4500 NO3E  
Preservative  
Lot#

200.7 Metals  
Preservative  
Lot#

Total Phos SM4500  
Preservative  
Lot#

Preservative  
Lot#

Preservative  
Lot#

Preservative  
Lot#

Field Preserved

Field Filtered

Use for MS/MSD

Comments

1 RM 40 -Bing's Landing

2 RM 43 -Upstream of Dow Island

3 RM 44 -Mouth of Kiley River

4 RM 50 -Skilak Lake Outflow

5

6

7

8

9

10

Relinquished by:

Date

Time

Received by:

Date

Time

Relinquished by:

Date

Time

Received by:

Date

Time

Relinquished by:

Date

Time

Received by:

Date

Time

Name of Sampler: (printed)

Jeanne Swartz

Section To Be Completed by AAA

Condition of Custody Seal:

Intact

Broken

Absent

Receiving location:

Temperature on arrival:

AKC

2.7 °C

Thermometer ID # 058

Measurement method: Temp Blank Other

Shipping method/Tracking number:

AKS