



ARS Aleut Analytical, LLC
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5/16/2016

Kenai Watershed Forum
44129 Sterling Highway
Soldotna, AK 99669
Attn: Branden Bornemann

Work Order #: A1604402
Date: 5/16/2016
Work ID: KWF Baseline Monitoring 2016
Date Received: 4/26/2016

Sample Identification

Lab Sample Number	Client Description	Lab Sample Number	Client Description
A1604402-01	RM 30-Funny River	A1604402-02	RM 30-Funny River Duplicate
A1604402-03	RM 31-Morgan's Landing	A1604402-04	RM 36-Moose River

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

"The Science of Analysis, The Art of Service"

Case Narrative

ARS Aleut Analytical, LLC

Work Order: A1604402

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, 22nd Edition, 2012.

SAMPLE RECEIPT:

There were four (4) samples received on 4/26/2016 12:35:00 PM at a temperature of 4.8°C at AAA - Anchorage. The samples were received in good condition and in order per chain of custody.

REVIEW FOR COMPLIANCE WITH AAA 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 were subcontracted tests and have been represented to us as meeting criteria:

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

Detailed Analytical Report

ARS Aleut Analytical, LLC

Workorder (SDG): A1604402

Project: KWF Baseline Monitoring 2016

Client: Kenai Watershed Forum

Client Project Number: 2016

Report Section: Client Sample Report

Client Sample Name: **RM 30-Funny River**

Matrix: Aqueous

Collection Date: 4/26/2016 8:55:00AM

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

Lab Sample Number: A1604402-01A

Prep Date: 5/11/2016

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

Prep Method ID: NO2NO3

Prep Batch Number: A160511015

Report Basis: As Received

Sample prep wt./vol: 25.00 ml

Analysis Date: 5/11/2016 2:45:00PM

Instrument: Thermospectr

File Name:

Dilution Factor: 1

Analyst Initials: JR

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>Rerun #:</u>
Nitrate-Nitrite as Nitrogen		<0.10		mg/L	0.10	0.015	1

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

Lab Sample Number: A1604402-01B

Prep Date: 5/2/2016

Analytical Method ID: 200.8 - Metals by ICP/MS - Total

Prep Method ID: 200.8

Prep Batch Number: R1605051900-35

Report Basis: As Received

Sample prep wt./vol:

Analysis Date: 5/3/2016 1:39:00PM

Instrument:

File Name:

Dilution Factor: 1

Analyst Initials: VDL

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>Rerun #:</u>
Calcium	7440-70-2	5,800		ug/L	500	150	1
Iron	7439-89-6	760		ug/L	250	78	
Magnesium	7439-96-4	2,200		ug/L	50	15	

Lab Sample Number: A1604402-01C

Prep Date: 5/2/2016

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

Prep Method ID: TotalPhos

Prep Batch Number: F160504003

Report Basis: As Received

Sample prep wt./vol: 5.00 ml

Analysis Date: 5/2/2016 8:40:00PM

Instrument: Spectrophoto

File Name:

Dilution Factor: 1

Analyst Initials: MOC

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>Rerun #:</u>
Phosphorous, Total		<0.10		mg/L	0.10	0.025	1

Detailed Analytical Report

ARS Aleut Analytical, LLC

Workorder (SDG): A1604402

Project: KWF Baseline Monitoring 2016

Client: Kenai Watershed Forum

Client Project Number: 2016

Report Section: Client Sample Report

Client Sample Name: **RM 30-Funny River Duplicate**

Matrix: Aqueous

Collection Date: 4/26/2016 8:55:00AM

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

Lab Sample Number: A1604402-02A

Prep Date: 5/11/2016

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

Prep Method ID: NO2NO3

Prep Batch Number: A160511015

Report Basis: As Received

Sample prep wt./vol: 25.00 ml

Analysis Date: 5/11/2016 2:45:00PM

Instrument: Thermospectr

File Name:

Dilution Factor: 1

Analyst Initials: JR

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>Rerun #:</u>
Nitrate-Nitrite as Nitrogen		<0.10		mg/L	0.10	0.015	1

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

Lab Sample Number: A1604402-02B

Prep Date: 5/2/2016

Analytical Method ID: 200.8 - Metals by ICP/MS - Total

Prep Method ID: 200.8

Prep Batch Number: R1605051900-35

Report Basis: As Received

Sample prep wt./vol:

Analysis Date: 5/3/2016 1:42:00PM

Instrument:

File Name:

Dilution Factor: 1

Analyst Initials: VDL

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>Rerun #:</u>
Calcium	7440-70-2	6,100		ug/L	500	150	1
Iron	7439-89-6	900		ug/L	250	78	
Magnesium	7439-96-4	2,300		ug/L	50	15	

Lab Sample Number: A1604402-02C

Prep Date: 5/2/2016

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

Prep Method ID: TotalPhos

Prep Batch Number: F160504003

Report Basis: As Received

Sample prep wt./vol: 5.00 ml

Analysis Date: 5/2/2016 8:40:00PM

Instrument: Spectrophoto

File Name:

Dilution Factor: 1

Analyst Initials: MOC

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>Rerun #:</u>
Phosphorous, Total		<0.10		mg/L	0.10	0.025	1

Detailed Analytical Report

ARS Aleut Analytical, LLC

Workorder (SDG): A1604402

Project: KWF Baseline Monitoring 2016

Client: Kenai Watershed Forum

Client Project Number: 2016

Report Section: Client Sample Report

Client Sample Name: **RM 31-Morgan's Landing**

Matrix: Aqueous

Collection Date: 4/26/2016 10:18:00AM

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

Lab Sample Number: A1604402-03A

Prep Date: 4/30/2016

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

Prep Method ID: NO2NO3

Prep Batch Number: A160502004

Report Basis: As Received

Sample prep wt./vol: 25.00 ml

Analysis Date: 4/30/2016 7:00:00AM

Instrument: Thermospectr

File Name:

Dilution Factor: 1

Analyst Initials: JR

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>Rerun #:</u>
Nitrate-Nitrite as Nitrogen		0.112		mg/L	0.10	0.015	1

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

Lab Sample Number: A1604402-03B

Prep Date: 5/2/2016

Analytical Method ID: 200.8 - Metals by ICP/MS - Total

Prep Method ID: 200.8

Prep Batch Number: R1605051900-35

Report Basis: As Received

Sample prep wt./vol:

Analysis Date: 5/3/2016 1:51:00PM

Instrument:

File Name:

Dilution Factor: 1

Analyst Initials: VDL

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>Rerun #:</u>
Calcium	7440-70-2	10,000		ug/L	500	150	1
Iron	7439-89-6	350		ug/L	250	78	
Magnesium	7439-96-4	1,200		ug/L	50	15	

Lab Sample Number: A1604402-03C

Prep Date: 5/2/2016

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

Prep Method ID: TotalPhos

Prep Batch Number: F160504004

Report Basis: As Received

Sample prep wt./vol: 5.00 ml

Analysis Date: 5/2/2016 11:50:00PM

Instrument: Spectrophoto

File Name:

Dilution Factor: 1

Analyst Initials: MOC

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>Rerun #:</u>
Phosphorous, Total		<0.10		mg/L	0.10	0.025	1

Detailed Analytical Report

ARS Aleut Analytical, LLC

Workorder (SDG): A1604402

Project: KWF Baseline Monitoring 2016

Client: Kenai Watershed Forum

Client Project Number: 2016

Report Section: Client Sample Report

Client Sample Name: RM 36-Moose River

Matrix: Aqueous

Collection Date: 4/26/2016 9:54:00AM

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

Lab Sample Number: A1604402-04A

Prep Date: 5/11/2016

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

Prep Method ID: NO2NO3

Prep Batch Number: A160511015

Report Basis: As Received

Sample prep wt./vol: 25.00 ml

Analysis Date: 5/11/2016 2:45:00PM

Instrument: Thermospectr

File Name:

Dilution Factor: 1

Analyst Initials: JR

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>Rerun #:</u>
Nitrate-Nitrite as Nitrogen		<0.10		mg/L	0.10	0.015	1

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

Lab Sample Number: A1604402-04B

Prep Date: 5/2/2016

Analytical Method ID: 200.8 - Metals by ICP/MS - Total

Prep Method ID: 200.8

Prep Batch Number: R1605051900-35

Report Basis: As Received

Sample prep wt./vol:

Analysis Date: 5/3/2016 1:54:00PM

Instrument:

File Name:

Dilution Factor: 1

Analyst Initials: VDL

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>Rerun #:</u>
Calcium	7440-70-2	16,000		ug/L	500	150	1
Iron	7439-89-6	990		ug/L	250	78	
Magnesium	7439-96-4	2,900		ug/L	50	15	

Lab Sample Number: A1604402-04C

Prep Date: 5/2/2016

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

Prep Method ID: TotalPhos

Prep Batch Number: F160504004

Report Basis: As Received

Sample prep wt./vol: 5.00 ml

Analysis Date: 5/2/2016 11:50:00PM

Instrument: Spectrophoto

File Name:

Dilution Factor: 1

Analyst Initials: MOC

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>Rerun #:</u>
Phosphorous, Total		<0.10		mg/L	0.10	0.025	1

Detailed Analytical Report

ARS Aleut Analytical, LLC

Workorder (SDG): A1604402

Project: KWF Baseline Monitoring 2016

Client: Kenai Watershed Forum

Client Project Number: 2016

Report Section: Method Blank Report

Client Sample Name:

MB

Matrix: Aqueous

Collection Date: 4/30/2016 7:00:00AM

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

Lab Sample Number: A160502004-MB Analysis Date: 4/30/2016 7:00:00AM
Prep Date: 4/30/2016 Instrument: Thermospectr
Analytical Method ID: SM4500-NO3E - Nitrogen (Nitrate), Cadmium Reduction Method - File Name:
Prep Method ID: NO2NO3 Dilution Factor: 1
Prep Batch Number: A160502004
Report Basis: Dry Weight Basis Analyst Initials: JR
Sample prep wt./vol: 25.00 ml Prep Extract Vol: 25.00 ml

Analyte	CASNo	Result	Flags	Units	PQL	MDL	Rerun #:
Nitrate-Nitrite as Nitrogen		<0.10		mg/L	0.10	0.015	1

Lab Sample Number: A160511015-MB Analysis Date: 5/11/2016 2:45:00PM
Prep Date: 5/11/2016 Instrument: Thermospectr
Analytical Method ID: SM4500-NO3E - Nitrogen (Nitrate), Cadmium Reduction Method - File Name:
Prep Method ID: NO2NO3 Dilution Factor: 1
Prep Batch Number: A160511015
Report Basis: Dry Weight Basis Analyst Initials: JR
Sample prep wt./vol: 25.00 ml Prep Extract Vol: 25.00 ml

Analyte	CASNo	Result	Flags	Units	PQL	MDL	Rerun #:
Nitrate-Nitrite as Nitrogen		<0.10		mg/L	0.10	0.015	1

Lab Sample Number: F160504003-MB Analysis Date: 5/2/2016 8:40:00PM
Prep Date: 5/2/2016 Instrument: Spectrophoto
Analytical Method ID: SM4500-PE - Total Phos HACH 8190 File Name:
Prep Method ID: TotalPhos Dilution Factor: 1
Prep Batch Number: F160504003
Report Basis: Dry Weight Basis Analyst Initials: MOC
Sample prep wt./vol: 5.00 ml Prep Extract Vol: 5.00 ml

Analyte	CASNo	Result	Flags	Units	PQL	MDL	Rerun #:
Phosphorous, Total		<0.10		mg/L	0.10	0.025	1

Lab Sample Number: F160504004-MB Analysis Date: 5/2/2016 11:50:00PM
Prep Date: 5/2/2016 Instrument: Spectrophoto
Analytical Method ID: SM4500-PE - Total Phos HACH 8190 File Name:
Prep Method ID: TotalPhos Dilution Factor: 1
Prep Batch Number: F160504004
Report Basis: Dry Weight Basis Analyst Initials: MOC
Sample prep wt./vol: 5.00 ml Prep Extract Vol: 5.00 ml

Analyte	CASNo	Result	Flags	Units	PQL	MDL	Rerun #:
Phosphorous, Total		<0.10		mg/L	0.10	0.025	1

Detailed Analytical Report

ARS Aleut Analytical, LLC

Workorder (SDG): A1604402

Project: KWF Baseline Monitoring 2016

Client: Kenai Watershed Forum

Client Project Number: 2016

Tests Run at: Analytica Environmental Laboratories - Anchorage, Alaska

Workorder (SDG): A1604402

Project: KWF Baseline Monitoring 2016

Project Number:

Prep Batch: A160502004

QUALITY CONTROL REPORT

SAMPLE DUPLICATE REPORT

Analysis: SM4500-NO3E - Nitrogen (Nitrate), Cadmium Reduction Method - Base Sample: A1604229-01A
Prep Date: 4/30/2016

Samp. Anal. Date: 4/30/2016 7:00:00AM

Units: mg/L

DUP Anal. Date: 4/30/2016 7:00:00AM

Matrix: Drinking Water

<u>Analyte Name</u>	<u>SampResult</u>	<u>DUPRes.</u>	<u>RPD</u>	<u>RPDLim</u>	<u>Flag</u>
Nitrate-Nitrite as Nitrogen	0.130	0.118	9.7	20	

LCS REPORT

Analysis: SM4500-NO3E - Nitrogen (Nitrate), Cadmium Reduction Method - MB: A160502004-MB

Prep Date: 4/30/2016

MB Anal. Date: 4/30/2016 7:00:00AM

Units: mg/L

LCS Anal. Date: 4/30/2016 7:00:00AM

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	0.523	0.527	99.2	90 - 110		

MS REPORT

Analysis: SM4500-NO3E - Nitrogen (Nitrate), Cadmium Reduction Method - Parent: A1604229-01A

Prep Date: 4/30/2016

Samp. Anal. Date: 4/30/2016 7:00:00AM

Units: mg/L

MS Anal. Date: 4/30/2016 7:00:00AM

Matrix: Drinking Water

<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	0.130	0.388	0.275	94.0	80 - 120	

Prep Batch: A160511015

SAMPLE DUPLICATE REPORT

Analysis: SM4500-NO3E - Nitrogen (Nitrate), Cadmium Reduction Method - Base Sample: A1604400-02A
Prep Date: 5/11/2016

Samp. Anal. Date: 5/11/2016 2:45:00PM

Units: mg/L

DUP Anal. Date: 5/11/2016 2:45:00PM

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	0.196	0.199	1.5	20	

Detailed Analytical Report

ARS Aleut Analytical, LLC

Workorder (SDG): A1604402

Project: KWF Baseline Monitoring 2016

Client: Kenai Watershed Forum

Client Project Number: 2016

Tests Run at: Analytica Environmental Laboratories - Anchorage, Alaska

Workorder (SDG): A1604402

Project: KWF Baseline Monitoring 2016

Project Number:

Prep Batch: A160511015

QUALITY CONTROL REPORT

LCS REPORT

Analysis: SM4500-NO3E - Nitrogen (Nitrate), Cadmium Reduction Method - MB: A160511015-MB

Prep Date: 5/11/2016

MB Anal. Date: 5/11/2016 2:45:00PM

Units: mg/L

LCS Anal. Date: 5/11/2016 2:45:00PM

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	0.525	0.527	99.6	90 - 110		

MS REPORT

Analysis: SM4500-NO3E - Nitrogen (Nitrate), Cadmium Reduction Method - Parent: A1604400-02A

Prep Date: 5/11/2016

Samp. Anal. Date: 5/11/2016 2:45:00PM

Units: mg/L

MS Anal. Date: 5/11/2016 2:45:00PM

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	0.196	0.483	0.275	104.5	80 - 120	

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): A1604402

Project: KWF Baseline Monitoring 2016

Client: Kenai Watershed Forum

Client Project Number: 2016

Tests Run at: Analytica Environmental Laboratories - Anchorage, Alaska

Workorder (SDG): A1604402

Project: KWF Baseline Monitoring 2016

Project Number:

Prep Batch: F160504003

QUALITY CONTROL REPORT

SAMPLE DUPLICATE REPORT

Analysis: SM4500-PE - Total Phos HACH 8190

Base Sample: A1604391-01D

Prep Date: 5/2/2016

Samp. Anal. Date: 5/2/2016 8:40:00PM

Units: mg/L

DUP Anal. Date: 5/2/2016 8:40:00PM

Matrix: Aqueous

Analyte Name	SampResult	DUPRes.	RPD	RPDLim	Flag
Phosphorous, Total	0.199	0.212	6.3	0	OUT

LCS REPORT

Analysis: SM4500-PE - Total Phos HACH 8190

MB: F160504003-MB

Prep Date: 5/2/2016

MB Anal. Date: 5/2/2016 8:40:00PM

Units: mg/L

LCS Anal. Date: 5/2/2016 8:40:00PM

Matrix: Aqueous

Analyte Name	SampResult	LCSRes.	SPLev	Recov.	Recov Lim	RPDLim	Flag
Phosphorous, Total	ND	0.359	0.333	107.9	90 - 110		

MS/MSD REPORT

Analysis: SM4500-PE - Total Phos HACH 8190

Parent: A1604391-01D

Prep Date: 5/2/2016

Samp. Anal. Date: 5/2/2016 8:40:00PM

Units: mg/L

MS Anal. Date: 5/2/2016 8:40:00PM MSD Anal. Date: 5/2/2016 8:40:00PM

Matrix: Aqueous

Analyte Name	SampResult	MSRes.	MSDRes	SPLev	SPDL Lev	Recov.	MSD Rec.	RPD	Recov Lim	RPDLim	Flag
Phosphorous, Total	0.199	0.225	0.287	0.0646	0.129	40.3	68.1	24.2	80 - 120	0	lowMS lowMSD RPD

Prep Batch: F160504004

SAMPLE DUPLICATE REPORT

Analysis: SM4500-PE - Total Phos HACH 8190

Base Sample: A1604406-03D

Prep Date: 5/2/2016

Samp. Anal. Date: 5/2/2016 11:50:00PM

Units: mg/L

DUP Anal. Date: 5/2/2016 11:50:00PM

Matrix: Aqueous

Analyte Name	SampResult	DUPRes.	RPD	RPDLim	Flag
Phosphorous, Total	0.153	0.157	2.6	0	OUT

LCS REPORT

Detailed Analytical Report

ARS Aleut Analytical, LLC

Workorder (SDG): A1604402

Project: KWF Baseline Monitoring 2016

Client: Kenai Watershed Forum

Client Project Number: 2016

Tests Run at:

Workorder (SDG): A1604402

Project: KWF Baseline Monitoring 2016

Project Number:

QUALITY CONTROL REPORT

Prep Batch: F160504004

LCS REPORT

Analysis: SM4500-PE - Total Phos HACH 8190

MB: F160504004-MB

Prep Date: 5/2/2016

MB Anal. Date: 5/2/2016 11:50:00PM

Units: mg/L

LCS Anal. Date: 5/2/2016 11:50:00PM

Matrix: Aqueous

Analyte Name	SampResult	LCSRes.	SPLev	Recov.	Recov Lim	RPDLim	Flag
Phosphorous, Total	ND	0.349	0.333	104.9	90 - 110		

MS/MSD REPORT

Analysis: SM4500-PE - Total Phos HACH 8190

Parent: A1604406-03D

Prep Date: 5/2/2016

Samp. Anal. Date: 5/2/2016 11:50:00PM

Units: mg/L

MS Anal. Date: 5/2/2016 11:50:00PM MSD Anal. Date: 5/2/2016 11:50:00PM

Matrix: Aqueous

Analyte Name	SampResult	MSRes.	MSDRes	SPLev	SPDLev	Recov.	MSD Rec.	RPD	Recov Lim	RPDLim	Flag
Phosphorous, Total	0.153	0.215	0.280	0.0646	0.129	96.0	98.3	26.3	80 - 120	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): A1604402

Project: KWF Baseline Monitoring 2016

Client: Kenai Watershed Forum

Client Project Number: 2016

Detailed Analytical Report

ARS Aleut Analytical, LLC

Workorder (SDG): A1604402

Project: KWF Baseline Monitoring 2016

Client: Kenai Watershed Forum

Client Project Number: 2016

QC BATCH ASSOCIATIONS - BY METHOD BLANK

Lab Project ID: 178,773 Lab Project Number: A1604402

Prep Date: 4/30/2016

Lab Method Blank Id: A160502004-MB

Prep Batch ID: A160502004

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>
A1604229-01A	Batch QC		4/30/2016 7:00:00AM
A1604402-03A	RM 31-Morgan's Landing		4/30/2016 7:00:00AM
A160502004-LCS	LCS		4/30/2016 7:00:00AM
A1604229-01A-DUP	DUP		4/30/2016 7:00:00AM
A1604229-01A-MS	MS		4/30/2016 7:00:00AM

Prep Date: 5/2/2016

Lab Method Blank Id: F160504003-MB

Prep Batch ID: F160504003

Method: SM4500-PE - Total Phos HACH 8190

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>
A1604391-01D	Batch QC		5/2/2016 8:40:00PM
A1604402-01C	RM 30-Funny River		5/2/2016 8:40:00PM
A1604402-02C	RM 30-Funny River Duplicate		5/2/2016 8:40:00PM
F160504003-LCS	LCS		5/2/2016 8:40:00PM
A1604391-01D-DUP	DUP		5/2/2016 8:40:00PM
A1604391-01D-MS	MS		5/2/2016 8:40:00PM
A1604391-01D-MSD	MSD		5/2/2016 8:40:00PM

Prep Date: 5/2/2016

Lab Method Blank Id: F160504004-MB

Prep Batch ID: F160504004

Method: SM4500-PE - Total Phos HACH 8190

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>
A1604402-03C	RM 31-Morgan's Landing		5/2/2016 11:50:00PM
A1604402-04C	RM 36-Moose River		5/2/2016 11:50:00PM
A1604406-03D	Batch QC		5/2/2016 11:50:00PM
F160504004-LCS	LCS		5/2/2016 11:50:00PM
A1604406-03D-DUP	DUP		5/2/2016 11:50:00PM
A1604406-03D-MS	MS		5/2/2016 11:50:00PM
A1604406-03D-MSD	MSD		5/2/2016 11:50:00PM

Detailed Analytical Report

ARS Aleut Analytical, LLC

Workorder (SDG): A1604402

Project: KWF Baseline Monitoring 2016

Client: Kenai Watershed Forum

Client Project Number: 2016

QC BATCH ASSOCIATIONS - BY METHOD BLANK

Lab Project ID: 178,773 Lab Project Number: A1604402

Prep Date: 5/11/2016

Lab Method Blank Id: A160511015-MB

Prep Batch ID: A160511015

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>
A1604400-02A	Batch QC		5/11/2016 2:45:00PM
A1604402-01A	RM 30-Funny River		5/11/2016 2:45:00PM
A1604402-02A	RM 30-Funny River Duplicate		5/11/2016 2:45:00PM
A1604402-04A	RM 36-Moose River		5/11/2016 2:45:00PM
A160511015-LCS	LCS		5/11/2016 2:45:00PM
A1604400-02A-DUP	DUP		5/11/2016 2:45:00PM
A1604400-02A-MS	MS		5/11/2016 2:45:00PM

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)

Other Flags may be applied. See Case Narrative for Description

PLEASE NOTE THAT THE MDL AND PQL SHOWN FOR WAD CYANIDE IN THIS REPORT ARE SITE-SPECIFIC AS REQUESTED BY THE CLIENT AND ARE ONLY APPROPRIATE FOR THE POGO MINE SITE.

Detailed Analytical Report

ARS Aleut Analytical, LLC

Workorder (SDG): A1604402

Project: KWF Baseline Monitoring 2016

Client: Kenai Watershed Forum

Client Project Number: 2016

REPORTING CONVENTIONS FOR THIS REPORT

A1604402

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



ARS Aleut Analytical

AAA Chain of Custody

Page ____ of ____

Anchorage Laboratory
4307 Arctic Blvd
Anchorage, AK 99503
907.258.2155
907.258.6634 fax

Met-Su Service Center
701 East Parks Highway #203
Wasilla, AK 99654
907.373.5440

Fairbanks Laboratory
475 Hall Street
Fairbanks, AK 99701
907.456.3116
907.456.3125 fax

ARS Corporate Office
2609 North River Road
Port Allen, LA 70767
225.381.2891
225.361.2996 fax

Chain of Custody No:

Client Name & Address:

Kenai Watershed Forum

44129 Sterling Hwy

Soldotna, AK 99669

Contact Person: Brandon Bornemann

Phone No: (907) 260-5449

Fax No: (907) 260-5412

E-mail: branden@kenaiwatershed.org

Special Instructions/Comments:

TEAM ID: Cook Inlet Aquaculture

Project Name: KWF Baseline Monitoring - April 2016

Turnaround Time for Results (TAT)

Standard

Expedited

(< 10 days, prior authorization required)
(please specify due date below; add'l charges may apply)

Results Due Date:

P.O. or Contract

Section To be Completed by AAA

Quote ID No: A16030019

LGN:

A16044002

Account #:

Cast:

Credit Card:

Invoice to Name & Address:

Lab Bottle Order No:

Client Sample Identification / Location

RM 30- Funny River

RM 30- Funny River Duplicate

RM 31- Morgan's Landing

RM 36 -Moose River

Date Sampled

Time Sampled

Matrix (S-DW-WW-Other)

No. of Containers

Nitrate SM4500-NO3E

Lot #: 4405A102
Pres: H2SO4

200.8 Metals by ICP-
Total TR

Lot #: 4512981
Pres: HNO3

Total Phos SM4500

Lot #: 4405A102
Pres: H2SO4

Lot #:
Pres:

Lot #:
Pres:

Lot #:
Pres:

Lot #:
Pres:

Field Preserved

Field Filtered

MS/MSD ?

Collected/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)

Rodney Tobay

Chain-of-Custody Seal:

Temp/Loc:

Thermo ID#:

Shipping Via:

ANC WAS FBKS

Initiated By:

4X

150187221

Client

To be Completed by AAA