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 #: A1604400
Date: 5/16/2016
Work ID: KWF Baseline Monitoring 2016
Date Received: 4/26/2016
Proj #: 2016

Sample Identification

Lab Sample Number	Client Description	Lab Sample Number	Client Description
A1604400-01	RM 40 - Bing's Landing	A1604400-02	Rm 43 - Upstream of Dow Isla
A1604400-03	Rm 44 - Mouth of Kiley River	A1604400-04	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,

Carissa Cumine
Project Manager

"The Science of Analysis, The Art of Service"

Case Narrative

ARS Aleut Analytical
Work Order: A1604400

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 12:08:00 PM at a temperature of 5.6°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 - Dissolved 200.8 Metals - Aqueous
Test Method: 200.8 - Metals by ICP/MS - Total - Aqueous

Workorder (SDG): A1604400

Project: **KWF Baseline Monitoring 2016**

Client: **Kenai Watershed Forum**

Client Project Number: **2016**

Report Section: Client Sample Report

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

Matrix: Aqueous Collection Date: 4/26/2016 9:45:00AM

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

Lab Sample Number: A1604400-01A Analysis Date: 5/7/2016 8:00:00AM
Prep Date: 5/7/2016 Instrument: Thermospectr
Analytical Method ID: SM4500-NO3E - Nitrogen (Nitrate), Cadmium Reduction Method - N
Prep Method ID: Dilution Factor: 1
Prep Batch Number: A160509001
Report Basis: As Received Analyst Initials: JR
Sample prep wt./vol: 25.00 ml Prep Extract Vol: 25.00 ml

Analyte	CASNo	Result	Flags	Units	PQL	MDL	run #:
Nitrate-Nitrite as Nitrogen		**0.170**		mg/L	0.10	0.015	1

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

Lab Sample Number: A1604400-01B Analysis Date: 5/5/2016 8:41:00PM
Prep Date: 5/2/2016 Instrument:
Analytical Method ID: 200.8 - Metals by ICP/MS - Total
Prep Method ID: Dilution Factor: 1
Prep Batch Number: R1605101223-5
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	**10,000**		ug/L	500	150	1
Iron	7439-89-6	**270**		ug/L	250	78	
Magnesium	7439-96-4	**1,100**		ug/L	50	15	

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

Lab Sample Number: A1604400-01C Analysis Date: 5/2/2016 8:40:00PM
Prep Date: 5/2/2016 Instrument: Spectrophoto
Analytical Method ID: SM4500-PE - Total Phos HACH 8190
Prep Method ID: 4500-PB Dilution Factor: 1
Prep Batch Number: F160504003
Report Basis: As Received Analyst Initials: MOC
Sample prep wt./vol: 5.00 ml Prep Extract Vol: 5.00 ml

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

Workorder (SDG): A1604400

Project: **KWF Baseline Monitoring 2016**

Client: **Kenai Watershed Forum**

Client Project Number: **2016**

Report Section: Client Sample Report

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

Matrix: Aqueous Collection Date: 4/26/2016 9:11:00AM

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

Lab Sample Number: A1604400-02A 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 - N
Prep Method ID: Dilution Factor: 1
Prep Batch Number: A160511015
Report Basis: As Received Analyst Initials: JR
Sample prep wt./vol: 25.00 ml Prep Extract Vol: 25.00 ml

Analyte	CASNo	Result	Flags	Units	PQL	MDL	run #:
Nitrate-Nitrite as Nitrogen		**0.196**		mg/L	0.10	0.015	1

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

Lab Sample Number: A1604400-02B Analysis Date: 5/5/2016 8:44:00PM
Prep Date: 5/2/2016 Instrument:
Analytical Method ID: 200.8 - Metals by ICP/MS - Total
Prep Method ID: Dilution Factor: 1
Prep Batch Number: R1605101223-5
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	**10,000**		ug/L	500	150	1
Iron	7439-89-6	**370**		ug/L	250	78	
Magnesium	7439-96-4	**1,100**		ug/L	50	15	

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

Lab Sample Number: A1604400-02C Analysis Date: 5/2/2016 8:40:00PM
Prep Date: 5/2/2016 Instrument: Spectrophoto
Analytical Method ID: SM4500-PE - Total Phos HACH 8190
Prep Method ID: 4500-PB Dilution Factor: 1
Prep Batch Number: F160504003
Report Basis: As Received Analyst Initials: MOC
Sample prep wt./vol: 5.00 ml Prep Extract Vol: 5.00 ml

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

Workorder (SDG): A1604400

Project: **KWF Baseline Monitoring 2016**

Client: **Kenai Watershed Forum**

Client Project Number: **2016**

Report Section: Client Sample Report

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

Matrix: Aqueous Collection Date: 4/26/2016 8:41:00AM

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

Lab Sample Number: A1604400-03A 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 - N
Prep Method ID: Dilution Factor: 1
Prep Batch Number: A160511015
Report Basis: As Received Analyst Initials: JR
Sample prep wt./vol: 25.00 ml Prep Extract Vol: 25.00 ml

Analyte	CASNo	Result	Flags	Units	PQL	MDL	run #:
Nitrate-Nitrite as Nitrogen		**0.400**		mg/L	0.10	0.015	1

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

Lab Sample Number: A1604400-03B Analysis Date: 5/5/2016 8:47:00PM
Prep Date: 5/2/2016 Instrument:
Analytical Method ID: 200.8 - Metals by ICP/MS - Total
Prep Method ID: Dilution Factor: 1
Prep Batch Number: R1605101223-5
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	**8,600**		ug/L	500	150	1
Iron	7439-89-6	**520**		ug/L	250	78	
Magnesium	7439-96-4	**1,500**		ug/L	50	15	

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

Lab Sample Number: A1604400-03C Analysis Date: 5/2/2016 8:40:00PM
Prep Date: 5/2/2016 Instrument: Spectrophoto
Analytical Method ID: SM4500-PE - Total Phos HACH 8190
Prep Method ID: 4500-PB Dilution Factor: 1
Prep Batch Number: F160504003
Report Basis: As Received Analyst Initials: MOC
Sample prep wt./vol: 5.00 ml Prep Extract Vol: 5.00 ml

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

Workorder (SDG): A1604400

Project: **KWF Baseline Monitoring 2016**

Client: **Kenai Watershed Forum**

Client Project Number: **2016**

Report Section: Client Sample Report

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

Matrix: Aqueous Collection Date: 4/26/2016 6:55:00AM

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

Lab Sample Number: A1604400-04A 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 - N
Prep Method ID: Dilution Factor: 1
Prep Batch Number: A160511015
Report Basis: As Received Analyst Initials: JR
Sample prep wt./vol: 25.00 ml Prep Extract Vol: 25.00 ml

Analyte	CASNo	Result	Flags	Units	PQL	MDL	run #:
Nitrate-Nitrite as Nitrogen		**0.118**		mg/L	0.10	0.015	1

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

Lab Sample Number: A1604400-04B Analysis Date: 5/5/2016 8:50:00PM
Prep Date: 5/2/2016 Instrument:
Analytical Method ID: 200.8 - Metals by ICP/MS - Total
Prep Method ID: Dilution Factor: 1
Prep Batch Number: R1605101223-5
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	**10,000**		ug/L	500	150	1
Iron	7439-89-6	**<250**		ug/L	250	78	
Magnesium	7439-96-4	**950**		ug/L	50	15	

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

Lab Sample Number: A1604400-04C Analysis Date: 5/2/2016 8:40:00PM
Prep Date: 5/2/2016 Instrument: Spectrophoto
Analytical Method ID: SM4500-PE - Total Phos HACH 8190
Prep Method ID: 4500-PB Dilution Factor: 1
Prep Batch Number: F160504003
Report Basis: As Received Analyst Initials: MOC
Sample prep wt./vol: 5.00 ml Prep Extract Vol: 5.00 ml

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

Workorder (SDG): A1604400

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: 5/7/2016 8:00:00AM

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

Lab Sample Number: A160509001-MB
Prep Date: 5/7/2016
Analytical Method ID: SM4500-NO3E - Nitrogen (Nitrate), Cadmium Reduction Method - N
Prep Method ID:
Prep Batch Number: A160509001
Report Basis: As Received
Sample prep wt./vol: 25.00 ml

Analysis Date: 5/7/2016 8:00:00AM
Instrument: Thermospectr
Dilution Factor: 1
Analyst Initials: JR
Prep Extract Vol: 25.00 ml

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

Lab Sample Number: A160511015-MB
Prep Date: 5/11/2016
Analytical Method ID: SM4500-NO3E - Nitrogen (Nitrate), Cadmium Reduction Method - N
Prep Method ID:
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
Dilution Factor: 1
Analyst Initials: JR
Prep Extract Vol: 25.00 ml

Analyte	CASNo	Result	Flags	Units	PQL	MDL	run #:
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: 1322233
Prep Date: 5/2/2016
Analytical Method ID: 200.8 - Metals by ICP/MS - Total
Prep Method ID:
Prep Batch Number: R1605101223-5
Report Basis: As Received
Sample prep wt./vol:

Analysis Date: 5/5/2016 7:47:00PM
Instrument:
Dilution Factor: 1
Analyst Initials: EAB
Prep Extract Vol: ml

Analyte	CASNo	Result	Flags	Units	PQL	MDL	run #:
Calcium	7440-70-2	**<500**		ug/L	500	150	1
Iron	7439-89-6	**<250**		ug/L	250	78	
Magnesium	7439-96-4	**<50**		ug/L	50	15	

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

Lab Sample Number: F160504003-MB
Prep Date: 5/2/2016
Analytical Method ID: SM4500-PE - Total Phos HACH 8190
Prep Method ID: 4500-PB
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
Dilution Factor: 1
Analyst Initials: MOC
Prep Extract Vol: 5.00 ml

Analyte	CASNo	Result	Flags	Units	PQL	MDL	run #:

Detailed Analytical Report

ARS Aleut Analytical

Workorder (SDG): A1604400

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

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

Prep Method ID: 4500-PB

Dilution Factor: 1

Prep Batch Number: F160504003

Report Basis: As Received

Analyst Initials: MOC

Sample prep wt./vol: 5.00 ml

Prep Extract Vol: 5.00 ml

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

Tests Run at: Analytica Environmental Laboratories - Anchorage, Alaska

Workorder (SDG): A1604400

Project: KWF Baseline Monitoring 2016

Project Number:

QUALITY CONTROL REPORT

Prep Batch: **A160509001**

SAMPLE DUPLICATE REPORT

Analysis: SM4500-NO3E - Nitrogen (Nitrate), Cadmium Reduction Method - Base Sample: W1605014-01A
Prep Date: 5/7/2016

Samp. Anal. Date: 5/7/2016 8:00:00AM Units: mg/L

DUP Anal. Date: 5/7/2016 8:00:00AM Matrix: Drinking Water

Analyte Name	SampResult	DUPRes.	RPD	RPDLim	Flag
Nitrate-Nitrite as Nitrogen	0.418	0.419	0.2	20	

LCS REPORT

Analysis: SM4500-NO3E - Nitrogen (Nitrate), Cadmium Reduction Method - MB: A160509001-MB
Prep Date: 5/7/2016

MB Anal. Date: 5/7/2016 8:00:00AM Units: mg/L

LCS Anal. Date: 5/7/2016 8:00:00AM Matrix: Aqueous

Analyte Name	SampResult	LCSRes.	SPLev	Recov.	Recov Lim	RPDLim	Flag
Nitrate-Nitrite as Nitrogen	ND	0.555			90 - 110		

MS REPORT

Analysis: SM4500-NO3E - Nitrogen (Nitrate), Cadmium Reduction Method - Parent: W1605014-01A
Prep Date: 5/7/2016

Samp. Anal. Date: 5/7/2016 8:00:00AM Units: mg/L

MS Anal. Date: 5/7/2016 8:00:00AM Matrix: Drinking Water

Analyte Name	SampResult	MSRes.	SPLev	Recov.	Recov Lim	Flag
Nitrate-Nitrite as Nitrogen	0.418	0.681			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

Analyte Name	SampResult	DUPRes.	RPD	RPDLim	Flag
Nitrate-Nitrite as Nitrogen	0.196	0.199	1.5	20	

Workorder (SDG): A1604400

Project: **KWF Baseline Monitoring 2016**

Client: **Kenai Watershed Forum**

Client Project Number: **2016**

Tests Run at: Analytica Environmental Laboratories - Anchorage, Alaska

Workorder (SDG): A1604400

Project: KWF Baseline Monitoring 2016

Project Number:

QUALITY CONTROL REPORT

Prep Batch: **A160511015**

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

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

Analyte Name	SampResult	MSRes.	SPLev	Recov.	Recov Lim	Flag
Nitrate-Nitrite as Nitrogen	0.196	0.483	0.275	105	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 signifcance. Otherwise it indicates that a matrix bias may exist at the analytical step.

Workorder (SDG): A1604400

Project: **KWF Baseline Monitoring 2016**

Client: **Kenai Watershed Forum**

Client Project Number: **2016**

Tests Run at: SGS Environmental Services Inc.

Workorder (SDG): A1604400

Project: KWF Baseline Monitoring 2016

Project Number:

QUALITY CONTROL REPORT

Prep Batch: **R1605101223-5**

LCS REPORT

Analysis: 200.8 - Metals by ICP/MS - Total

MB: 1322233

Prep Date: 5/2/2016

MB Anal. Date: 5/5/2016 7:47:00PM

Units: ug/L

LCS Anal. Date: 5/5/2016 7:50:00PM

Matrix:

Analyte Name	SampResult	LCSRes.	SPLev	Recov.	Recov Lim	RPDLim	Flag
Calcium	ND	10,500	10,000	105	85 - 115		
Iron	ND	5,050	5,000	101	85 - 115		
Magnesium	ND	10,600	10,000	106	85 - 115		

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 signifcance. Otherwise it indicates that a matrix bias may exist at the analytical step.

Workorder (SDG): A1604400

Project: **KWF Baseline Monitoring 2016**

Client: **Kenai Watershed Forum**

Client Project Number: **2016**

Tests Run at: Analytica Environmental Laboratories - Anchorage, Alaska

Workorder (SDG): A1604400

Project: KWF Baseline Monitoring 2016

Project Number:

QUALITY CONTROL REPORT

Prep Batch: **F160504003**

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

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

Units: mg/L

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

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

Units: mg/L

Matrix: Aqueous

Analyte Name	SampResult	LCSRes.	SPLev	Recov.	Recov Lim	RPDLim	Flag
Phosphorous, Total	ND	0.359	0.333	108	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

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

Units: mg/L

Matrix: Aqueous

Analyte Name	SampResult	MSRes.	MSDRes	SPLev	SPDLev	Recov.	MSD Rec.	RPD	Recov Lim	RPDLim	Flag
Phosphorous, Total	0.199	0.225	0.287	0.0646	0.129	38.7	67.4	24.2	80 - 120	20	

Workorder (SDG): A1604400

Project: **KWF Baseline Monitoring 2016**

Client: **Kenai Watershed Forum**

Client Project Number: **2016**

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 signifcance. Otherwise it indicates that a matrix bias may exist at the analytical step.

Workorder (SDG): A1604400

Project: **KWF Baseline Monitoring 2016**

Client: **Kenai Watershed Forum**

Client Project Number: **2016**

QC BATCH ASSOCIATIONS - BY METHOD BLANK

Lab Project ID: **178,766** **Lab Project Number:** **A1604400**

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:

SampleNum	ClientSampleName	DataFile	AnalysisDate
A1604391-01D	Batch QC		5/2/2016 8:40:00PM
A1604400-01C	RM 40 - Bing's Landing		5/2/2016 8:40:00PM
A1604400-02C	Rm 43 - Upstream of Dow Island		5/2/2016 8:40:00PM
A1604400-03C	Rm 44 - Mouth of Kiley River		5/2/2016 8:40:00PM
A1604400-04C	Rm 50 - Skilak Lake Outflow		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: 5/7/2016

Lab Method Blank Id: A160509001-MB
Prep Batch ID: A160509001
Method: SM4500-NO3E - Nitrogen (Nitrate), Cadmium Reduction Method -

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

SampleNum	ClientSampleName	DataFile	AnalysisDate
A1604400-01A	RM 40 - Bing's Landing		5/7/2016 8:00:00AM
W1605014-01A	Batch QC		5/7/2016 8:00:00AM
A160509001-LCS	LCS		5/7/2016 8:00:00AM
W1605014-01A-DUP	DUP		5/7/2016 8:00:00AM
W1605014-01A-MS	MS		5/7/2016 8:00:00AM

Workorder (SDG): A1604400

Project: **KWF Baseline Monitoring 2016**

Client: **Kenai Watershed Forum**

Client Project Number: **2016**

QC BATCH ASSOCIATIONS - BY METHOD BLANK

Lab Project ID: **178,766** **Lab Project Number:** **A1604400**

Prep Date: 5/2/2016

Lab Method Blank Id: 1322233
Prep Batch ID: R1605101223-5
Method: 200.8 - Metals by ICP/MS - Total

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

SampleNum	ClientSampleName	DataFile	AnalysisDate
A1604400-01B	RM 40 - Bing's Landing		5/5/2016 8:41:00PM
A1604400-02B	Rm 43 - Upstream of Dow Island		5/5/2016 8:44:00PM
A1604400-03B	Rm 44 - Mouth of Kiley River		5/5/2016 8:47:00PM
A1604400-04B	Rm 50 - Skilak Lake Outflow		5/5/2016 8:50:00PM
1322234	LCS for HBN 1732757 [MXX/29695		5/5/2016 7:50:00PM
1322238	1322237 MS FOR [MXX29695]		5/5/2016 8:32:00PM

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:

SampleNum	ClientSampleName	DataFile	AnalysisDate
A1604400-02A	Rm 43 - Upstream of Dow Island		5/11/2016 2:45:00PM
A1604400-03A	Rm 44 - Mouth of Kiley River		5/11/2016 2:45:00PM
A1604400-04A	Rm 50 - Skilak Lake Outflow		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

Workorder (SDG): A1604400

Project: **KWF Baseline Monitoring 2016**

Client: **Kenai Watershed Forum**

Client Project Number: **2016**

DATA FLAGS AND DEFINITIONS

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

Result Field:

< = Not Detected at or above the Reporting Limit shown
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 ARS 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. When results are provided from a subcontract laboratory, ARS reflects their data flags.

Workorder (SDG): A1604400

Project: **KWF Baseline Monitoring 2016**

Client: **Kenai Watershed Forum**

Client Project Number: **2016**

REPORTING CONVENTIONS FOR THIS REPORT

A1604400

TestPkgName	Basis	# Sig Figs	Reporting Limit
200.8 (Aqueous) - Total	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

ARS Aleut Analytical

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

Mat-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
225.381.2991
225.381.2996 fax

Page____ of ____

Chain of Custody No:

Client Name & Address:
Kenai Watershed Forum
44129 Sterling Hwy
Soldotna, AK 99669

Contact Person: **Branden Bornemann**
Phone No: **(907) 260-5449**
Fax No: (907) 260-5412
E-mail: **branden@kenaiwatershed.org**
Special Instructions/Comments:

TEAM ID: AK DNR and AK DEC
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'tl charges may apply)*
Results Due Date:

Section To be Completed by AAA
Quote ID No: A16030019
LGN: A1604400
Account #: Cash: Credit Card:
Invoice to Name & Address:
P.O. or Contract

Requested Analysis/Method

Lab Bottle Order No: / Client Sample Identification / Location	Date Sampled	Time Sampled	Matrix (S-DW-WW-Other)	No. of Containers	Nitrate SM4500-NO3E Lot#: 49057602 Pres: H2SO4	200.8 Metals by ICP-Total TR Lot#: 45124981 Pres: HNO3	Total Phos SM4500 Lot#: A1050402 Pres: H2SO4	Lot#: Pres:	Lot#: Pres:	Lot#: Pres:	Lot#: Pres:	Lot#: Pres:	Field Preserved	Field Filtered	MS/MSD ?
RM 40- Bing's Landing	4/26/16	945	Aqu	3	X	X	X								
RM 43- Upstream of Dow island	4/26/16	911	Aqu	3	X	X	X								
RM 44- Mouth of Kiley River	4/26/16	841	Aqu	3	X	X	X								
RM 50- Skilak Lake Outflow	4/26/16	655	Aqu	3	X	X	X								
							pH 2?								

Collected/Relinquished by:	Date	Time	Received by:	Date	Time
Jack Sinclair	4/26/16	1208	Shelley Anker	4/26/16	12:08
Relinquished by:	Date	Time	Received by:	Date	Time
Relinquished by:	Date	Time	Received by:	Date	Time
Name of Sampler: (printed)	Jack Sinclair				

To be Completed by AAA

	ANC	WAS	FBKS
Chain-of-Custody Seal?:	Absent		
Initialed By:	NA		
Temp/Loc:	5.6		NA
Thermo ID#:	150187221		
Shipping Via:	Client		

updated April 6, 2006