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ANALYTICA
Environmental Laboratories

5/12/2014

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

Work Order #: A1404515
Date: 5/12/2014
Work ID: KWF Baseline Monitoring 2014
Date Received: 4/29/2014
Proj #: None

**Sample Identification**

| Lab Sample Number | Client Description | Lab Sample Number | Client Description |
|---|---|---|---|
| A1404515-01 | RM 40 - Bing's Landing | A1404515-02 | RM 43 - Upstream of Dow Isl |
| A1404515-03 | RM 44 - Mouth of Kiley River | A1404515-04 | 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,

Claire Toon
Project Manager

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

# Case Narrative

*Analytica Group, LLC - Anchorage*

*Work Order: A1404515*

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 on 4/29/2014 6:20:00 PM, at a temperature of 3.6°C, at Analytica-Anchorage. The samples were received in good condition and in order per chain of custody.

The samples were transferred for metals and total phosphorus analysis to Analytica Environmental Laboratories (AEL), 12189 Pennsylvania St., Thornton, Colorado 80241, where they were received at a temperature of 2.7°C, in good condition and in order per chain of custody on 5/1/2014.

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. 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: 200.8 - Metals by ICP/MS - Total/TR - Aqueous

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

Test Method: SM4500-PE - Total Phos - Aqueous

Workorder (SDG): A1404515

**Project:** **KWF Baseline Monitoring 2014**

**Client:** **Kenai Watershed Forum**

**Client Project Number:** **None**

## Report Section: Client Sample Report

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

Matrix: Aqueous Collection Date: 4/29/2014 12:00:00PM

The following test was conducted by: Analytica - Anchorage

Lab Sample Number: A1404515-01A
Prep Date: 05-07-2014 10:05
Analytical Method ID: SM4500-NO3E - Nitrogen (Nitrate), Cadmium Reduction Method - N
Prep Method ID:
Prep Batch Number: A140508009
Report Basis: As Received
Sample prep wt./vol: 25.00 ml

Analysis Date: 5/7/2014 10:10:00AM
Instrument: Thermospectr
File Name:
Dilution Factor: 1
Analyst Initials: MC
Prep Extract Vol: 25.00 ml

| Analyte | CASNo | Result | Flags | Units | PQL | MDL | run #: |
|---|---|---|---|---|---|---|---|
| Nitrate-Nitrite as Nitrogen | | **0.172** | | mg/L | 0.10 | 0.015 | 1 |

The following test was conducted by: Analytica - Thornton

Lab Sample Number: A1404515-01B
Prep Date: 05-06-2014
Analytical Method ID: 200.8 - Metals by ICP/MS - Total/TR
Prep Method ID: 200.8
Prep Batch Number: T140506006
Report Basis: As Received
Sample prep wt./vol: 50.00 ml

Analysis Date: 5/6/2014 5:52:43PM
Instrument: AgilentICPMS
File Name: 050614A.csv
Dilution Factor: 1
Analyst Initials: RM
Prep Extract Vol: 50.00 ml

| Analyte | CASNo | Result | Flags | Units | PQL | MDL | run #: |
|---|---|---|---|---|---|---|---|
| Calcium | 7440-70-2 | **10.6** | | mg/L | 0.10 | 0.0030 | 2 |
| Magnesium | 7439-96-4 | **1.01** | | mg/L | 0.050 | 0.00020 | |

Lab Sample Number: A1404515-01B
Prep Date: 05-06-2014
Analytical Method ID: 200.8 - Metals by ICP/MS - Total/TR
Prep Method ID: 200.8
Prep Batch Number: T140506006
Report Basis: As Received
Sample prep wt./vol: 50.00 ml

Analysis Date: 5/7/2014 1:24:27PM
Instrument: AgilentICPMS
File Name: 050714A.csv
Dilution Factor: 1
Analyst Initials: RM
Prep Extract Vol: 50.00 ml

| Analyte | CASNo | Result | Flags | Units | PQL | MDL | run #: |
|---|---|---|---|---|---|---|---|
| Iron | 7439-89-6 | **0.292** | | mg/L | 0.010 | 0.00071 | 3 |

The following test was conducted by: Analytica - Thornton

Lab Sample Number: A1404515-01C
Prep Date: 05-08-2014 15:05
Analytical Method ID: SM4500-PE - Total Phos
Prep Method ID: 4500-PB
Prep Batch Number: T140509001
Report Basis: As Received
Sample prep wt./vol: 10.00 ml

Analysis Date: 5/8/2014 4:00:00PM
Instrument: Hach DR 3900
File Name:
Dilution Factor: 1
Analyst Initials: CRB
Prep Extract Vol: 10.00 ml

| Analyte | CASNo | Result | Flags | Units | PQL | MDL | run #: |
|---|---|---|---|---|---|---|---|
| Phosphorus, Total and Ortho | | **ND** | | mg/L | 0.051 | 0.026 | 1 |

Workorder (SDG): A1404515

**Project:** **KWF Baseline Monitoring 2014**

**Client:** **Kenai Watershed Forum**

**Client Project Number:** **None**

## Report Section: Client Sample Report

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

Matrix: Aqueous Collection Date: 4/29/2014 11:00:00AM

The following test was conducted by: Analytica - Anchorage

Lab Sample Number: A1404515-02A
Prep Date: 05-07-2014 10:05
Analytical Method ID: SM4500-NO3E - Nitrogen (Nitrate), Cadmium Reduction Method - N
Prep Method ID:
Prep Batch Number: A140508009
Report Basis: As Received
Sample prep wt./vol: 25.00 ml

Analysis Date: 5/7/2014 10:10:00AM
Instrument: Thermospectr
File Name:
Dilution Factor: 1
Analyst Initials: MC
Prep Extract Vol: 25.00 ml

| Analyte | CASNo | Result | Flags | Units | PQL | MDL | run #: |
|---|---|---|---|---|---|---|---|
| Nitrate-Nitrite as Nitrogen | | **0.182** | | mg/L | 0.10 | 0.015 | 1 |

The following test was conducted by: Analytica - Thornton

Lab Sample Number: A1404515-02B
Prep Date: 05-06-2014
Analytical Method ID: 200.8 - Metals by ICP/MS - Total/TR
Prep Method ID: 200.8
Prep Batch Number: T140506006
Report Basis: As Received
Sample prep wt./vol: 50.00 ml

Analysis Date: 5/6/2014 5:55:03PM
Instrument: AgilentICPMS
File Name: 050614A.csv
Dilution Factor: 1
Analyst Initials: RM
Prep Extract Vol: 50.00 ml

| Analyte | CASNo | Result | Flags | Units | PQL | MDL | run #: |
|---|---|---|---|---|---|---|---|
| Calcium | 7440-70-2 | **10.4** | | mg/L | 0.10 | 0.0030 | 2 |
| Magnesium | 7439-96-4 | **1.02** | | mg/L | 0.050 | 0.00020 | |

Lab Sample Number: A1404515-02B
Prep Date: 05-06-2014
Analytical Method ID: 200.8 - Metals by ICP/MS - Total/TR
Prep Method ID: 200.8
Prep Batch Number: T140506006
Report Basis: As Received
Sample prep wt./vol: 50.00 ml

Analysis Date: 5/7/2014 1:26:54PM
Instrument: AgilentICPMS
File Name: 050714A.csv
Dilution Factor: 1
Analyst Initials: RM
Prep Extract Vol: 50.00 ml

| Analyte | CASNo | Result | Flags | Units | PQL | MDL | run #: |
|---|---|---|---|---|---|---|---|
| Iron | 7439-89-6 | **0.318** | | mg/L | 0.010 | 0.00071 | 3 |

The following test was conducted by: Analytica - Thornton

Lab Sample Number: A1404515-02C
Prep Date: 05-08-2014 15:05
Analytical Method ID: SM4500-PE - Total Phos
Prep Method ID: 4500-PB
Prep Batch Number: T140509001
Report Basis: As Received
Sample prep wt./vol: 10.00 ml

Analysis Date: 5/8/2014 4:00:00PM
Instrument: Hach DR 3900
File Name:
Dilution Factor: 1
Analyst Initials: CRB
Prep Extract Vol: 10.00 ml

| Analyte | CASNo | Result | Flags | Units | PQL | MDL | run #: |
|---|---|---|---|---|---|---|---|
| Phosphorus, Total and Ortho | | **ND** | | mg/L | 0.051 | 0.026 | 1 |

## Detailed Analytical Report

Analytica Group, LLC - Anchorage

Workorder (SDG): A1404515

**Project:** **KWF Baseline Monitoring 2014**

**Client:** **Kenai Watershed Forum**

**Client Project Number:** **None**

## Report Section: Client Sample Report

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

Matrix: Aqueous Collection Date: 4/29/2014 6:30:00AM

The following test was conducted by: Analytica - Anchorage

Lab Sample Number: A1404515-03A
Prep Date: 05-07-2014 10:05
Analytical Method ID: SM4500-NO3E - Nitrogen (Nitrate), Cadmium Reduction Method - N
Prep Method ID:
Prep Batch Number: A140508009
Report Basis: As Received
Sample prep wt./vol: 25.00 ml

Analysis Date: 5/7/2014 10:10:00AM
Instrument: Thermospectr
File Name:
Dilution Factor: 1
Analyst Initials: MC
Prep Extract Vol: 25.00 ml

| Analyte | CASNo | Result | Flags | Units | PQL | MDL | run #: |
|---|---|---|---|---|---|---|---|
| Nitrate-Nitrite as Nitrogen | | **0.231** | | mg/L | 0.10 | 0.015 | 1 |

The following test was conducted by: Analytica - Thornton

Lab Sample Number: A1404515-03B
Prep Date: 05-06-2014
Analytical Method ID: 200.8 - Metals by ICP/MS - Total/TR
Prep Method ID: 200.8
Prep Batch Number: T140506006
Report Basis: As Received
Sample prep wt./vol: 50.00 ml

Analysis Date: 5/6/2014 5:57:28PM
Instrument: AgilentICPMS
File Name: 050614A.csv
Dilution Factor: 1
Analyst Initials: RM
Prep Extract Vol: 50.00 ml

| Analyte | CASNo | Result | Flags | Units | PQL | MDL | run #: |
|---|---|---|---|---|---|---|---|
| Calcium | 7440-70-2 | **8.16** | | mg/L | 0.10 | 0.0030 | 2 |
| Magnesium | 7439-96-4 | **1.35** | | mg/L | 0.050 | 0.00020 | |

Lab Sample Number: A1404515-03B
Prep Date: 05-06-2014
Analytical Method ID: 200.8 - Metals by ICP/MS - Total/TR
Prep Method ID: 200.8
Prep Batch Number: T140506006
Report Basis: As Received
Sample prep wt./vol: 50.00 ml

Analysis Date: 5/7/2014 1:29:25PM
Instrument: AgilentICPMS
File Name: 050714A.csv
Dilution Factor: 1
Analyst Initials: RM
Prep Extract Vol: 50.00 ml

| Analyte | CASNo | Result | Flags | Units | PQL | MDL | run #: |
|---|---|---|---|---|---|---|---|
| Iron | 7439-89-6 | **0.558** | | mg/L | 0.010 | 0.00071 | 3 |

The following test was conducted by: Analytica - Thornton

Lab Sample Number: A1404515-03C
Prep Date: 05-08-2014 15:05
Analytical Method ID: SM4500-PE - Total Phos
Prep Method ID: 4500-PB
Prep Batch Number: T140509001
Report Basis: As Received
Sample prep wt./vol: 10.00 ml

Analysis Date: 5/8/2014 4:00:00PM
Instrument: Hach DR 3900
File Name:
Dilution Factor: 1
Analyst Initials: CRB
Prep Extract Vol: 10.00 ml

| Analyte | CASNo | Result | Flags | Units | PQL | MDL | run #: |
|---|---|---|---|---|---|---|---|
| Phosphorus, Total and Ortho | | **ND** | | mg/L | 0.051 | 0.026 | 1 |

Workorder (SDG): A1404515

**Project:** **KWF Baseline Monitoring 2014**

**Client:** **Kenai Watershed Forum**

**Client Project Number:** **None**

## Report Section: Client Sample Report

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

Matrix: Aqueous Collection Date: 4/29/2014 8:10:00AM

The following test was conducted by: Analytica - Anchorage

Lab Sample Number: A1404515-04A
Prep Date: 05-07-2014 10:05
Analytical Method ID: SM4500-NO3E - Nitrogen (Nitrate), Cadmium Reduction Method - N
Prep Method ID:
Prep Batch Number: A140508009
Report Basis: As Received
Sample prep wt./vol: 25.00 ml

Analysis Date: 5/7/2014 10:10:00AM
Instrument: Thermospectr
File Name:
Dilution Factor: 1
Analyst Initials: MC
Prep Extract Vol: 25.00 ml

| Analyte | CASNo | Result | Flags | Units | PQL | MDL | run #: |
|---|---|---|---|---|---|---|---|
| Nitrate-Nitrite as Nitrogen | | **0.193** | | mg/L | 0.10 | 0.015 | 1 |

The following test was conducted by: Analytica - Thornton

Lab Sample Number: A1404515-04B
Prep Date: 05-06-2014
Analytical Method ID: 200.8 - Metals by ICP/MS - Total/TR
Prep Method ID: 200.8
Prep Batch Number: T140506006
Report Basis: As Received
Sample prep wt./vol: 50.00 ml

Analysis Date: 5/6/2014 5:59:48PM
Instrument: AgilentICPMS
File Name: 050614A.csv
Dilution Factor: 1
Analyst Initials: RM
Prep Extract Vol: 50.00 ml

| Analyte | CASNo | Result | Flags | Units | PQL | MDL | run #: |
|---|---|---|---|---|---|---|---|
| Calcium | 7440-70-2 | **11.0** | | mg/L | 0.10 | 0.0030 | 2 |
| Magnesium | 7439-96-4 | **0.914** | | mg/L | 0.050 | 0.00020 | |

Lab Sample Number: A1404515-04B
Prep Date: 05-06-2014
Analytical Method ID: 200.8 - Metals by ICP/MS - Total/TR
Prep Method ID: 200.8
Prep Batch Number: T140506006
Report Basis: As Received
Sample prep wt./vol: 50.00 ml

Analysis Date: 5/7/2014 1:44:08PM
Instrument: AgilentICPMS
File Name: 050714A.csv
Dilution Factor: 1
Analyst Initials: RM
Prep Extract Vol: 50.00 ml

| Analyte | CASNo | Result | Flags | Units | PQL | MDL | run #: |
|---|---|---|---|---|---|---|---|
| Iron | 7439-89-6 | **0.236** | | mg/L | 0.010 | 0.00071 | 3 |

The following test was conducted by: Analytica - Thornton

Lab Sample Number: A1404515-04C
Prep Date: 05-08-2014 15:05
Analytical Method ID: SM4500-PE - Total Phos
Prep Method ID: 4500-PB
Prep Batch Number: T140509001
Report Basis: As Received
Sample prep wt./vol: 10.00 ml

Analysis Date: 5/8/2014 4:00:00PM
Instrument: Hach DR 3900
File Name:
Dilution Factor: 1
Analyst Initials: CRB
Prep Extract Vol: 10.00 ml

| Analyte | CASNo | Result | Flags | Units | PQL | MDL | run #: |
|---|---|---|---|---|---|---|---|
| Phosphorus, Total and Ortho | | **ND** | | mg/L | 0.051 | 0.026 | 1 |

Workorder (SDG): A1404515

**Project:** **KWF Baseline Monitoring 2014**

**Client:** **Kenai Watershed Forum**

**Client Project Number:** **None**

## Report Section: Method Blank Report

**Client Sample Name:** **MB**

Matrix: Aqueous Collection Date: 5/7/2014 10:10:00AM

The following test was conducted by: Analytica - Anchorage

Lab Sample Number: A140508009-MB
Prep Date: 05-07-2014 10:05
Analytical Method ID: SM4500-NO3E - Nitrogen (Nitrate), Cadmium Reduction Method - N
Prep Method ID:
Prep Batch Number: A140508009
Report Basis: As Received
Sample prep wt./vol: 25.00 ml

Analysis Date: 5/7/2014 10:10:00AM
Instrument: Thermospectr
File Name:
Dilution Factor: 1
Analyst Initials: MC
Prep Extract Vol: 25.00 ml

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

The following test was conducted by: Analytica - Thornton

Lab Sample Number: T140506006-MB
Prep Date: 05-06-2014
Analytical Method ID: 200.8 - Metals by ICP/MS - Total/TR
Prep Method ID: 200.8
Prep Batch Number: T140506006
Report Basis: As Received
Sample prep wt./vol: 50.00 ml

Analysis Date: 5/6/2014 1:04:50PM
Instrument: AgilentICPMS
File Name: 050614A.csv
Dilution Factor: 1
Analyst Initials: RM
Prep Extract Vol: 50.00 ml

| Analyte | CASNo | Result | Flags | Units | PQL | MDL | run #: |
|---|---|---|---|---|---|---|---|
| Calcium | 7440-70-2 | ND | | ug/L | 100 | 3.0 | 1 |
| Magnesium | 7439-96-4 | ND | | ug/L | 50 | 0.20 | |

Lab Sample Number: T140506006-MB
Prep Date: 05-06-2014
Analytical Method ID: 200.8 - Metals by ICP/MS - Total/TR
Prep Method ID: 200.8
Prep Batch Number: T140506006
Report Basis: As Received
Sample prep wt./vol: 50.00 ml

Analysis Date: 5/7/2014 11:58:33AM
Instrument: AgilentICPMS
File Name: 050714A.csv
Dilution Factor: 1
Analyst Initials: RM
Prep Extract Vol: 50.00 ml

| Analyte | CASNo | Result | Flags | Units | PQL | MDL | run #: |
|---|---|---|---|---|---|---|---|
| Iron | 7439-89-6 | ND | | ug/L | 10 | 0.71 | 3 |

The following test was conducted by: Analytica - Thornton

Lab Sample Number: T140509001-MB
Prep Date: 05-08-2014 15:05
Analytical Method ID: SM4500-PE - Total Phos
Prep Method ID: 4500-PB
Prep Batch Number: T140509001
Report Basis: As Received
Sample prep wt./vol: 10.00 ml

Analysis Date: 5/8/2014 4:00:00PM
Instrument: Hach DR 3900
File Name:
Dilution Factor: 1
Analyst Initials: CRB
Prep Extract Vol: 10.00 ml

| Analyte | CASNo | Result | Flags | Units | PQL | MDL | run #: |
|---|---|---|---|---|---|---|---|
| Phosphorus, Total and Ortho | | ND | | mg/L | 0.051 | 0.026 | 1 |

Workorder (SDG): A1404515

**Project:** **KWF Baseline Monitoring 2014**

**Client:** **Kenai Watershed Forum**

**Client Project Number:** **None**

Tests Run at: Analytica Environmental Laboratories - Anchorage, Alaska

Workorder (SDG): A1404515

Project: KWF Baseline Monitoring 2014

Project Number:

# QUALITY CONTROL REPORT

Prep Batch: **A140508009**

## LCS REPORT

Analysis: SM4500-NO3E - Nitrogen (Nitrate), Cadmium Reduction Method - MB: A140508009-MB

Prep Date: 5/7/2014

MB Anal. Date: 5/7/2014 10:10:00AM Units: mg/L

LCS Anal. Date: 5/7/2014 10:10:00AM Matrix: Aqueous

| Analyte Name | SampResult | LCSRes. | SPLev | Recov. | Recov Lim | RPDLim | Flag |
|---|---|---|---|---|---|---|---|
| Nitrate-Nitrite as Nitrogen | ND | 5.48 | 5.16 | 106.2 | 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 signifcance. Otherwise it indicates that a matrix bias may exist at the analytical step.

Workorder (SDG): A1404515

**Project:** **KWF Baseline Monitoring 2014**

**Client:** **Kenai Watershed Forum**

**Client Project Number:** **None**

Tests Run at: Analytica Environmental Laboratories - Thornton, Colorado

Workorder (SDG): A1404515

Project: KWF Baseline Monitoring 2014

Project Number:

# QUALITY CONTROL REPORT

Prep Batch: **T140506006**

## LCS REPORT

Analysis: 200.8 - Metals by ICP/MS - Total/TR

MB: T140506006-MB

Prep Date: 5/6/2014

MB Anal. Date: 5/6/2014 1:04:50PM

Units: ug/L

LCS Anal. Date: 5/6/2014 1:09:45PM

Matrix: Aqueous

| Analyte Name | SampResult | LCSRes. | SPLev | Recov. | Recov Lim | RPDLim | Flag |
|---|---|---|---|---|---|---|---|
| Calcium | ND | 5,050 | 5,000 | 101.0 | 85 - 115 | | |
| Magnesium | ND | 5,210 | 5,000 | 104.2 | 85 - 115 | | |
| Iron | ND | 4,730 | 5,000 | 94.6 | 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): A1404515

**Project:** **KWF Baseline Monitoring 2014**

**Client:** **Kenai Watershed Forum**

**Client Project Number:** **None**

Tests Run at: Analytica Environmental Laboratories - Thornton, Colorado

Workorder (SDG): A1404515

Project: KWF Baseline Monitoring 2014

Project Number:

# QUALITY CONTROL REPORT

Prep Batch: **T140509001**

## SAMPLE DUPLICATE REPORT

Analysis: SM4500-PE - Total Phos

Base Sample: A1404515-01C

Prep Date: 5/8/2014

Samp. Anal. Date: 5/8/2014 4:00:00PM

DUP Anal. Date: 5/8/2014 4:00:00PM

Units: mg/L

Matrix: Aqueous

| Analyte Name | SampResult | DUPRes. | RPD | RPDLim | Flag |
|---|---|---|---|---|---|
| Phosphorus, Total and Ortho | ND | ND | 0.0 | 20 | |

## LCS REPORT

Analysis: SM4500-PE - Total Phos

MB: T140509001-MB

Prep Date: 5/8/2014

MB Anal. Date: 5/8/2014 4:00:00PM

LCS Anal. Date: 5/8/2014 4:00:00PM

Units: mg/L

Matrix: Aqueous

| Analyte Name | SampResult | LCSRes. | SPLev | Recov. | Recov Lim | RPDLim | Flag |
|---|---|---|---|---|---|---|---|
| Phosphorus, Total and Ortho | ND | 0.510 | 0.500 | 102.0 | 80 - 120 | | |

## MS REPORT

Analysis: SM4500-PE - Total Phos

Parent: A1404515-01C

Prep Date: 5/8/2014

Samp. Anal. Date: 5/8/2014 4:00:00PM

MS Anal. Date: 5/8/2014 4:00:00PM

Units: mg/L

Matrix: Aqueous

| Analyte Name | SampResult | MSRes. | SPLev | Recov. | Recov Lim | Flag |
|---|---|---|---|---|---|---|
| Phosphorus, Total and Ortho | ND | 0.520 | 0.500 | 104.0 | 70 - 130 | |

Workorder (SDG): A1404515

**Project:** **KWF Baseline Monitoring 2014**

**Client:** **Kenai Watershed Forum**

**Client Project Number:** **None**

**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): A1404515

**Project:** **KWF Baseline Monitoring 2014**

**Client:** **Kenai Watershed Forum**

**Client Project Number:** **None**

**QC BATCH ASSOCIATIONS - BY METHOD BLANK**

**Lab Project ID:** **159,719** **Lab Project Number:** **A1404515**

Prep Date: 5/6/2014

Lab Method Blank Id: T140506006-MB
Prep Batch ID: T140506006
Method: 200.8 - Metals by ICP/MS - Total/TR

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

| SampleNum | ClientSampleName | DataFile | AnalysisDate |
|---|---|---|---|
| A1404515-01B | RM 40 - Bing's Landing | 050614A.csv | 5/6/2014 5:52:43PM |
| A1404515-02B | RM 43 - Upstream of Dow Island | 050614A.csv | 5/6/2014 5:55:03PM |
| A1404515-03B | RM 44 - Mouth of Kiley River | 050614A.csv | 5/6/2014 5:57:28PM |
| A1404515-04B | RM 50 - Skilak Lake Outflow | 050614A.csv | 5/6/2014 5:59:48PM |
| F1404239-01C | Batch QC | 050614A.csv | 5/6/2014 6:09:18PM |
| T140506006-LCS | LCS | 050614A.csv | 5/6/2014 1:09:45PM |
| F1404239-01C-DUP | DUP | 050614A.csv | 5/6/2014 6:11:44PM |
| F1404239-01C-MS | MS | 050614A.csv | 5/6/2014 6:26:21PM |
| F1404239-01C-MSD | MSD | 050614A.csv | 5/6/2014 6:28:43PM |
| A1404515-01B | RM 40 - Bing's Landing | 050714A.csv | 5/7/2014 1:24:27PM |
| A1404515-02B | RM 43 - Upstream of Dow Island | 050714A.csv | 5/7/2014 1:26:54PM |
| A1404515-03B | RM 44 - Mouth of Kiley River | 050714A.csv | 5/7/2014 1:29:25PM |
| A1404515-04B | RM 50 - Skilak Lake Outflow | 050714A.csv | 5/7/2014 1:44:08PM |
| F1404239-01C | Batch QC | 050714A.csv | 5/7/2014 1:53:58PM |
| F1404239-01C-DUP | DUP | 050714A.csv | 5/7/2014 1:56:24PM |
| F1404239-01C-MS | MS | 050714A.csv | 5/7/2014 1:58:55PM |
| F1404239-01C-MSD | MSD | 050714A.csv | 5/7/2014 2:01:20PM |

Prep Date: 5/7/2014

Lab Method Blank Id: A140508009-MB
Prep Batch ID: A140508009
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 |
|---|---|---|---|
| A1404283-02A | Batch QC | | 5/7/2014 10:10:00AM |
| A1404512-01A | Batch QC | | 5/7/2014 10:10:00AM |
| A1404515-01A | RM 40 - Bing's Landing | | 5/7/2014 10:10:00AM |
| A1404515-02A | RM 43 - Upstream of Dow Island | | 5/7/2014 10:10:00AM |
| A1404515-03A | RM 44 - Mouth of Kiley River | | 5/7/2014 10:10:00AM |
| A1404515-04A | RM 50 - Skilak Lake Outflow | | 5/7/2014 10:10:00AM |
| A140508009-LCS | LCS | | 5/7/2014 10:10:00AM |
| A1404283-02A-DUP | DUP | | 5/7/2014 10:10:00AM |
| A1404512-01A-MS | MS | | 5/7/2014 10:10:00AM |

Workorder (SDG): A1404515

**Project:** **KWF Baseline Monitoring 2014**

**Client:** **Kenai Watershed Forum**

**Client Project Number:** **None**

**QC BATCH ASSOCIATIONS - BY METHOD BLANK**

**Lab Project ID:** **159,719** **Lab Project Number:** **A1404515**

Prep Date: 5/8/2014

Lab Method Blank Id: T140509001-MB

Prep Batch ID: T140509001

Method: SM4500-PE - Total Phos

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

| SampleNum | ClientSampleName | DataFile | AnalysisDate |
|---|---|---|---|
| A1404515-01C | RM 40 - Bing's Landing | | 5/8/2014 4:00:00PM |
| A1404515-02C | RM 43 - Upstream of Dow Island | | 5/8/2014 4:00:00PM |
| A1404515-03C | RM 44 - Mouth of Kiley River | | 5/8/2014 4:00:00PM |
| A1404515-04C | RM 50 - Skilak Lake Outflow | | 5/8/2014 4:00:00PM |
| T140509001-LCS | LCS | | 5/8/2014 4:00:00PM |
| A1404515-01C-DUP | DUP | | 5/8/2014 4:00:00PM |
| A1404515-01C-MS | MS | | 5/8/2014 4:00:00PM |

Workorder (SDG): A1404515

**Project:** **KWF Baseline Monitoring 2014**

**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

Workorder (SDG): A1404515

**Project:** **KWF Baseline Monitoring 2014**

**Client:** **Kenai Watershed Forum**

**Client Project Number:** **None**

**REPORTING CONVENTIONS FOR THIS REPORT**

A1404515

| TestPkgName | Basis | # Sig Figs | Reporting Limit |
|---|---|---|---|
| 200.8/200.8 (Aqueous) - Total/TR | As Received | 3 | Report to PQL |
| 4500-NO3E (Aqueous) - Nitrate+Nitrite pres | As Received | 3 | Report to PQL |
| 4500-PE/4500-PB (Aqueous) - Total Phos | As Received | 2 | Report to PQL |

# Analytica Chain of Custody Form

ANALYTICA GROUP®

121889 Pennsylvania St. Thornton, CO 80241 (303) 469-8868
4307 Arctic Blvd. Anchorage, AK 99503 (907) 258-2155 (907) 258-6634 fax
475 Hall Street. Fairbanks, AK 99701 (907) 456-3116 (907) 456-3125 fax
1203 W. Parks Highway Wasilla, Alaska 99654 (907) 373-5440



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**

**TEAM ID: DNR and KWF**
**Project Name: Kenai River Baseline Project - April 2014**

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:

Special Instructions/Comments:
pH on all samples

**Section To be Completed by Analytica**
Quote ID No: A14040019
LGN: A1404515
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 #: Pres: H2SO4 | 200.7 Metals by ICP-Total TR Lot #: Pres: HNO3 | Total Phos SM4500 Lot #: Pres: H2SO4 | Lot #: Pres: | Lot #: Pres: | Lot #: Pres: | Lot #: Pres: | Lot #: Pres: | Field Preserved | Field Filtered | MS/MSD ? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RM 40- Bing's Landing | 4/29/14 | 12:00 PM | Aq | 4 | X | X | X | | | | | | | | |
| RM 43- Upstream of Dow Island | 4/29/14 | 11:00AM | Aq | 4 | X | X | X | | | | | | | | |
| RM 44- Mouth of Kiley River | 4/29/14 | 6:30AM | Aq | 4 | X | X | X | | | | | | | | |
| RM 50- Skilak Lake Outflow | 4/29/14 | 8:10AM | Aq | 4 | X | X | X | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |

| Collected/Relinquished by: | Date | Time | Received by: | Date | Time |
|---|---|---|---|---|---|
| | 4/29/14 | 2:30pm | | 4/29/14 | 14:34 |
| Relinquished by: | Date | Time | Received by: | Date | Time |
| | 4/29/14 | 15:04 | | 4/29/14 | 15:04 |
| Relinquished by: | Date | Time | Received by: | Date | Time |
| | 4/29/14 | 5:20P | | 4/29/14 | 6:20 |
| **Name of Sampler: (printed)** | USA Beranek | | | | |

**To be Completed by Analytica**

| | THO | ANC | JUN | FBKS |
|---|---|---|---|---|
| Chain-of-Custody Seal?: | | AJS | | |
| Initialed By: | | — | | |
| Temp/Loc: | | 3.6 | | |
| Thermo ID#: | | 83135 | | |
| Shipping Via: | | Analytica | | |