



FIRST NATION HEALTH AUTHORITY
ATTN: Linda Pillsworth
Environmental Public Health Services
404 - 11138 Melville Street
Vancouver BC V6E 4S5

Date Received: 20-AUG-14
Report Date: 25-AUG-14 12:29 (MT)
Version: FINAL

Client Phone: 604-666-6943

Certificate of Analysis

Lab Work Order #: L1505289
Project P.O. #: PENDING
Job Reference: FNHA FISH SAMPLING PROJECT
C of C Numbers: 10-370107
Legal Site Desc:

Can Dang
Senior Account Manager

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ADDRESS: 8081 Lougheed Hwy, Suite 100, Burnaby, BC V5A 1W9 Canada | Phone: +1 604 253 4188 | Fax: +1 604 253 6700
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ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID				
	L1505289-1 WATER 18-AUG-14 10:50 FRASER RIVER WATER SAMPLE - SKYLINE RD				
Grouping	Analyte				
WATER					
Physical Tests	Colour, True (CU)	5.6			
	Conductivity (uS/cm)	115			
	Hardness (as CaCO3) (mg/L)	60.9			
	pH (pH)	7.97			
	Total Suspended Solids (mg/L)	59.8			
	Total Dissolved Solids (mg/L)	77			
	Turbidity (NTU)	33.1			
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	49.1			
	Chloride (Cl) (mg/L)	0.73			
	Fluoride (F) (mg/L)	0.039			
	Nitrate (as N) (mg/L)	0.0301			
	Nitrite (as N) (mg/L)	<0.0010			
	Phosphorus (P)-Total (mg/L)	0.0557			
	Sulfate (SO4) (mg/L)	8.80			
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)	3.05			
Total Metals	Aluminum (Al)-Total (mg/L)	1.48			
	Antimony (Sb)-Total (mg/L)	<0.00050			
	Arsenic (As)-Total (mg/L)	0.00084			
	Barium (Ba)-Total (mg/L)	0.027			
	Beryllium (Be)-Total (mg/L)	<0.0050			
	Bismuth (Bi)-Total (mg/L)	<0.20			
	Boron (B)-Total (mg/L)	<0.10			
	Cadmium (Cd)-Total (mg/L)	<0.00020			
	Calcium (Ca)-Total (mg/L)	17.4			
	Chromium (Cr)-Total (mg/L)	0.0026			
	Cobalt (Co)-Total (mg/L)	<0.010			
	Copper (Cu)-Total (mg/L)	0.0032			
	Iron (Fe)-Total (mg/L)	2.51			
	Lead (Pb)-Total (mg/L)	0.00112			
	Lithium (Li)-Total (mg/L)	<0.010			
	Magnesium (Mg)-Total (mg/L)	4.25			
	Manganese (Mn)-Total (mg/L)	0.0575			
	Mercury (Hg)-Total (mg/L)	<0.00020			
	Molybdenum (Mo)-Total (mg/L)	<0.030			
	Nickel (Ni)-Total (mg/L)	<0.050			
	Phosphorus (P)-Total (mg/L)	<0.30			

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

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	L1505289-1 WATER 18-AUG-14 10:50 FRASER RIVER WATER SAMPLE - SKYLINE RD				
Grouping	Analyte				
WATER					
Total Metals	Potassium (K)-Total (mg/L)	0.78			
	Selenium (Se)-Total (mg/L)	<0.0010			
	Silicon (Si)-Total (mg/L)	4.29			
	Silver (Ag)-Total (mg/L)	<0.010			
	Sodium (Na)-Total (mg/L)	2.3			
	Strontium (Sr)-Total (mg/L)	0.0864			
	Thallium (Tl)-Total (mg/L)	<0.20			
	Tin (Sn)-Total (mg/L)	<0.030			
	Titanium (Ti)-Total (mg/L)	0.063			
	Uranium (U)-Total (mg/L)	0.00031			
	Vanadium (V)-Total (mg/L)	<0.030			
	Zinc (Zn)-Total (mg/L)	0.0070			

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

Qualifiers for Sample Submission Listed:

Qualifier	Description
WSMT	Water sample(s) for total mercury analysis was not submitted in glass container with HCl preservative. Results may be biased low.

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	Nitrite (as N)	DLM	L1505289-1
Duplicate	Nitrate (as N)	DLM	L1505289-1
Matrix Spike	Phosphorus (P)-Total	MS-B	L1505289-1
Matrix Spike	Silicon (Si)-Total	MS-B	L1505289-1
Matrix Spike	Total Organic Carbon	MS-B	L1505289-1

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLM	Detection Limit Adjusted due to sample matrix effects.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-COL-VA	Water	Alkalinity by Colourimetric (Automated)	EPA 310.2
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.			
ANIONS-CL-IC-VA	Water	Chloride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-F-IC-VA	Water	Fluoride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-NO2-IC-VA	Water	Nitrite in Water by Ion Chromatography	EPA 300.0
This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrite is detected by UV absorbance.			
ANIONS-NO3-IC-VA	Water	Nitrate in Water by Ion Chromatography	EPA 300.0
This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrate is detected by UV absorbance.			
ANIONS-SO4-IC-VA	Water	Sulfate by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
CARBONS-TOC-VA	Water	Total organic carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".			
COLOUR-TRUE-VA	Water	Colour (True) by Spectrometer	BCMOE Colour Single Wavelength
This analysis is carried out using procedures adapted from British Columbia Environmental Manual "Colour- Single Wavelength." Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method. Apparent Colour is determined without prior sample filtration. Colour is pH dependent. Unless otherwise indicated, reported colour results pertain to the pH of the sample as received, to within +/- 1 pH unit.			
EC-PCT-VA	Water	Conductivity (Automated)	APHA 2510 Auto. Conduc.
This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.			
HARDNESS-CALC-VA	Water	Hardness	APHA 2340B
Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.			
HG-TOT-CVAFS-VA	Water	Total Mercury in Water by CVAFS	EPA 245.7
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).			

Reference Information

MET-TOT-ICP-VA	Water	Total Metals in Water by ICPOES	EPA SW-846 3005A/6010B
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).			
MET-TOT-LOW-MS-VA	Water	Total Metals in Water by ICPMS(Low)	EPA SW-846 3005A/6020A
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).			
P-T-PRES-COL-VA	Water	Total P in Water by Colour	APHA 4500-P Phosphorus
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.			
PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H "pH Value"
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode			
It is recommended that this analysis be conducted in the field.			
PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H pH Value
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode			
It is recommended that this analysis be conducted in the field.			
TDS-VA	Water	Total Dissolved Solids by Gravimetric	APHA 2540 C - GRAVIMETRIC
This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.			
TSS-VA	Water	Total Suspended Solids by Gravimetric	APHA 2540 D - GRAVIMETRIC
This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.			
TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 "Turbidity"
This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.			
TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 Turbidity
This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.			

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

10-370107

Reference Information

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

mg/kg - milligrams per kilogram based on dry weight of sample.

mg/kg ww - milligrams per kilogram based on wet weight of sample.

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.

mg/L - milligrams per litre.

< - Less than.

D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Report To		Report Format / Distribution		Service Request: (Rush subject to availability - Contact ALS to confirm TAT)	
Company: <u>First Nations Health Authority</u>		Standard: _____ Other (specify): _____		Regular (Standard Turnaround Times - Business Days)	
Contact: <u>Linda Pillsworth / Blake Blok</u>		Select <input checked="" type="checkbox"/> PDF <input type="checkbox"/> Excel <input type="checkbox"/> Digital <input type="checkbox"/> Fax		Priority(2-4 Business Days)-50% surcharge - Contact ALS to confirm TAT	
Address: <u>404-1138 Melville St.</u>		Email 1: <u>linda.pillsworth@fnha.ca</u>		Emergency (1-2 Business Days)-100% Surcharge - Contact ALS to confirm TAT	
<u>Vancouver, BC, V6E 4S3</u>		Email 2: <u>blake.blok@fnha.ca</u>		Same Day or Weekend Emergency - Contact ALS to confirm TAT	
Phone: <u>604-693-6962</u> Fax: <u>604-666-3356</u>		Analysis Request			

Invoice To		Client / Project Information		(Indicate Filtered or Preserved, F/P)																																													
Same as Report? (circle Yes or No (if No, provide details))		Job #: <u>FNHA Fish Sampling Project</u>		<table border="1" style="width: 100%; height: 100%;"> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>																																													
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Lab Work Order # (lab use only)		ALS Contact: <u>Cam Dang</u>		Sampler: <u>B. Blok</u>		<u>Physical / Anion / Metals / TDC - See Attached</u>						Number of Containers <u>3</u>
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Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Physical / Anion	Metals	TDC	Short Holding Time Rush Processing						Number of Containers
1	Fraser River Water Sample - Skyline Rd	18-08-14	10:50	Water	✓									3
2	"	"	10:50	"	✓									
3	"	"	10:20	"			✓							



Special Instructions / Regulation with water or land use (CCME- Freshwater Aquatic Life/BC CSR-Commercial/AB Tier 1-Natural/ETC) / Hazardous Details
Please Return Cooler to # 220-177 Victoria St., Prince George, BC, V2L5S1

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date:	Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations:
<u>B. Blok</u>	<u>Aug 19/14</u>	<u>8:00 AM</u>	<u>Chris</u>	<u>Aug 20/14</u>	<u>10:00 am</u>	<u>8 °C</u>				Yes / No ? If Yes add SIF