



FIRST NATION HEALTH AUTHORITY

ATTN: [REDACTED]

[REDACTED]
Vancouver BC V6E 4S5

Date Received: 14-AUG-14

Report Date: 02-SEP-14 14:18 (MT)

Version: DRAFT

Client Phone: [REDACTED]

Certificate of Analysis

Lab Work Order #: L1502442
Project P.O. #: NOT SUBMITTED
Job Reference:
C of C Numbers: 10-385197
Legal Site Desc:

DRAFT

[REDACTED]
Senior Account Manager

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ALS CANADA LTD Part of the ALS Group A Campbell Brothers Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID	L1502442-1 fish 08-AUG-14 SAMPLE 1 - SOCKEYE (R/JFC) NSTQ (MUSCLE+SKIN)	L1502442-2 fish 08-AUG-14 SAMPLE 2 - SOCKEYE (R/JFC) NSTQ (MUSCLE+SKIN)	L1502442-3 fish 08-AUG-14 SAMPLE 3 SOCKEYE (R/J) NSTQ (MUSCLE+SKIN)	L1502442-4 fish 08-AUG-14 SAMPLE 4 - SOCKEYE (R/J) NSTQ (MUSCLE+SKIN)	L1502442-5 fish 04-AUG-14 SAMPLE 5 - SOCKEYE (ESKETEMC) NSTQ (MUSCLE+SKIN)
Grouping	Analyte						
TISSUE							
Metals	Aluminum (Al)-Total (mg/kg wwt)	<0.40	<0.40	3.03	1.57	0.46	
	Antimony (Sb)-Total (mg/kg wwt)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	
	Arsenic (As)-Total (mg/kg wwt)	0.467	0.357	0.474	0.531	0.371	
	Barium (Ba)-Total (mg/kg wwt)	0.011	0.013	0.029	0.052	0.036	
	Beryllium (Be)-Total (mg/kg wwt)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	
	Bismuth (Bi)-Total (mg/kg wwt)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	
	Boron (B)-Total (mg/kg wwt)	<0.20	<0.20	<0.20	<0.20	<0.20	
	Cadmium (Cd)-Total (mg/kg wwt)	0.0090	0.0054	0.0053	0.0056	0.0046	
	Calcium (Ca)-Total (mg/kg wwt)	288	335	515	508	528	
	Cesium (Cs)-Total (mg/kg wwt)	0.0203	0.0216	0.0199	0.0204	0.0169	
	Chromium (Cr)-Total (mg/kg wwt)	0.223	0.170	0.963	0.012	0.012	
	Cobalt (Co)-Total (mg/kg wwt)	0.0069	0.0062	0.0202	0.0065	0.0077	
	Copper (Cu)-Total (mg/kg wwt)	0.629	0.694	0.871	0.641	0.850	
	Iron (Fe)-Total (mg/kg wwt)	4.92	4.33	10.5	7.11	7.16	
	Lead (Pb)-Total (mg/kg wwt)	<0.0040	<0.0040	<0.0040	<0.0040	0.0044	
	Lithium (Li)-Total (mg/kg wwt)	<0.10	<0.10	<0.10	<0.10	<0.10	
	Magnesium (Mg)-Total (mg/kg wwt)	256	263	294	288	265	
	Manganese (Mn)-Total (mg/kg wwt)	0.095	0.098	0.224	0.169	0.167	
	Mercury (Hg)-Total (mg/kg wwt)	0.0335	0.0296	0.0511	0.0479	0.0548	
	Molybdenum (Mo)-Total (mg/kg wwt)	0.0284	0.0236	0.130	<0.0040	0.0053	
	Nickel (Ni)-Total (mg/kg wwt)	0.151	0.115	0.619	<0.040	<0.040	
	Phosphorus (P)-Total (mg/kg wwt)	2540	2780	3100	3110	2820	
	Potassium (K)-Total (mg/kg wwt)	3660	3880	4100	4200	3410	
	Rubidium (Rb)-Total (mg/kg wwt)	0.897	0.948	1.03	0.928	0.830	
	Selenium (Se)-Total (mg/kg wwt)	0.250	0.278	0.324	0.291	0.314	
	Sodium (Na)-Total (mg/kg wwt)	451	467	320	364	1150	
	Strontium (Sr)-Total (mg/kg wwt)	1.24	1.57	2.43	2.27	2.25	
	Tellurium (Te)-Total (mg/kg wwt)	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	
	Thallium (Tl)-Total (mg/kg wwt)	0.00068	0.00067	0.00094	0.00105	0.00110	
	Tin (Sn)-Total (mg/kg wwt)	<0.020	<0.020	<0.020	<0.020	<0.020	
	Uranium (U)-Total (mg/kg wwt)	<0.00040	<0.00040	<0.00040	<0.00040	0.00071	
	Vanadium (V)-Total (mg/kg wwt)	<0.020	<0.020	0.988	0.043	0.035	
	Zinc (Zn)-Total (mg/kg wwt)	4.80	5.74	6.12	7.67	7.83	
	Zirconium (Zr)-Total (mg/kg wwt)	<0.040	<0.040	<0.040	<0.040	<0.040	

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID	L1502442-6 fish 08-AUG-14 SAMPLE 3 - SOCKEYE (RJ) NSTQ (LIVER)	L1502442-7 fish 08-AUG-14 SAMPLE 3 - SOCKEYE (RJ) NSTQ (GONADS)	L1502442-8 fish 08-AUG-14 SAMPLE 4 - SOCKEYE (RJ) NSTQ (LIVER)		
Grouping	Analyte						
TISSUE							
Metals	Aluminum (Al)-Total (mg/kg wwt)	0.80	<0.40	0.43			
	Antimony (Sb)-Total (mg/kg wwt)	<0.0020	<0.0020	<0.0020			
	Arsenic (As)-Total (mg/kg wwt)	0.659	0.297	0.494			
	Barium (Ba)-Total (mg/kg wwt)	0.013	0.077	<0.010			
	Beryllium (Be)-Total (mg/kg wwt)	<0.0020	<0.0020	<0.0020			
	Bismuth (Bi)-Total (mg/kg wwt)	<0.0020	<0.0020	<0.0020			
	Boron (B)-Total (mg/kg wwt)	<0.20	<0.20	<0.20			
	Cadmium (Cd)-Total (mg/kg wwt)	1.21	0.0322	0.629			
	Calcium (Ca)-Total (mg/kg wwt)	76.3	428	83.6			
	Cesium (Cs)-Total (mg/kg wwt)	0.0070	0.0070	0.0072			
	Chromium (Cr)-Total (mg/kg wwt)	0.019	<0.010	0.032			
	Cobalt (Co)-Total (mg/kg wwt)	0.0347	0.0461	0.0291			
	Copper (Cu)-Total (mg/kg wwt)	110	81.4	170			
	Iron (Fe)-Total (mg/kg wwt)	137	34.7	268			
	Lead (Pb)-Total (mg/kg wwt)	0.0045	<0.0040	0.0054			
	Lithium (Li)-Total (mg/kg wwt)	<0.10	<0.10	<0.10			
	Magnesium (Mg)-Total (mg/kg wwt)	156	623	129			
	Manganese (Mn)-Total (mg/kg wwt)	1.30	1.36	1.09			
	Mercury (Hg)-Total (mg/kg wwt)	0.0970	0.0068	0.0999			
	Molybdenum (Mo)-Total (mg/kg wwt)	0.186	0.0108	0.126			
	Nickel (Ni)-Total (mg/kg wwt)	<0.040	<0.040	<0.040			
	Phosphorus (P)-Total (mg/kg wwt)	3170	3740	2630			
	Potassium (K)-Total (mg/kg wwt)	3460	1710	2910			
	Rubidium (Rb)-Total (mg/kg wwt)	0.973	0.451	0.730			
	Selenium (Se)-Total (mg/kg wwt)	12.8	3.87	8.05			
	Sodium (Na)-Total (mg/kg wwt)	1050	711	1170			
	Strontium (Sr)-Total (mg/kg wwt)	0.284	3.75	0.284			
	Tellurium (Te)-Total (mg/kg wwt)	<0.0040	<0.0040	<0.0040			
	Thallium (Tl)-Total (mg/kg wwt)	0.00499	0.00067	0.00291			
	Tin (Sn)-Total (mg/kg wwt)	0.034	<0.020	0.036			
	Uranium (U)-Total (mg/kg wwt)	0.00128	0.00118	0.00052			
	Vanadium (V)-Total (mg/kg wwt)	0.381	0.084	0.044			
	Zinc (Zn)-Total (mg/kg wwt)	45.2	55.1	41.0			
	Zirconium (Zr)-Total (mg/kg wwt)	<0.040	<0.040	<0.040			

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

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	Calcium (Ca)-Total	DUP-H	L1502442-1, -2, -3, -4, -5, -6, -7, -8
Duplicate	Strontium (Sr)-Total	DUP-H	L1502442-1, -2, -3, -4, -5, -6, -7, -8

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DUP-H	Duplicate results outside ALS DQO, due to sample heterogeneity.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
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HG-WET-CVAFS-VA	Tissue	Mercury in Tissue by CVAFS (WET)	EPA 200.3, EPA 245.7
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This method is adapted from US EPA Method 200.3 "Sample Procedures for Spectrochemical Determination of Total Recoverable Elements in Biological Tissues" (1996). Tissue samples are homogenized and sub-sampled prior to hotblock digestion with nitric and hydrochloric acids, in combination with repeated additions of hydrogen peroxide. Analysis is by atomic fluorescence spectrophotometry or atomic absorption spectrophotometry, adapted from US EPA Method 245.7. This digestion procedure was implemented on October 5, 2009.

MET-WET-CCMS-VA	Tissue	Metals in Tissue by CRC ICPMS (WET)	EPA 200.3/6020A
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This method is adapted from US EPA Method 200.3 "Sample Procedures for Spectrochemical Determination of Total Recoverable Elements in Biological Tissues" (1996). Tissue samples are homogenized and sub-sampled prior to hotblock digestion with nitric and hydrochloric acids, in combination with repeated additions of hydrogen peroxide. Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).

Method Limitation: This method employs a strong acid/peroxide digestion, and is intended to provide a conservative estimate of bio-available metals. Near complete recoveries are achieved for most toxicologically important metals, but elements associated with recalcitrant minerals may be only partially recovered.

** 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:

10-385197

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.