

ENVIRONMENTAL DYNAMICS INC.

ATTN: Meghan Marjanovic

2195 - 2nd Ave

Whitehorse YT Y1A 3T8

Date Received: 16-SEP-15

Report Date: 28-SEP-15 10:51 (MT)

Version: FINAL

Client Phone: 867-393-4882

Certificate of Analysis

Lab Work Order #: L1673982
Project P.O. #: NOT SUBMITTED

Job Reference: MOUNT NANSEN 15-Y-0146

C of C Numbers: 1

Legal Site Desc:

Can Dang Senior Account Manager

 $[This\ report\ shall\ not\ be\ reproduced\ except\ in\ full\ without\ the\ written\ authority\ of\ the\ Laboratory.]$

ADDRESS: 8081 Lougheed Hwy, Suite 100, Burnaby, BC V5A 1W9 Canada | Phone: +1 604 253 4188 | Fax: +1 604 253 6700 ALS CANADA LTD Part of the ALS Group A Campbell Brothers Limited Company



L1673982 CONTD....

Version:

PAGE 2 of 4 28-SEP-15 10:51 (MT)

FINAL

ALS ENVIRONMENTAL ANALYTICAL REPORT

L1673982-1 Sample ID Description 16-SEP-15 Sampled Date 08:40 Sampled Time WQ-PW Client ID Grouping Analyte **WATER** Colour, True (CU) **Physical Tests** <5.0 Conductivity (uS/cm) 350 Hardness (as CaCO3) (mg/L) 184 pH (pH) 8.18 Total Dissolved Solids (mg/L) 194 Turbidity (NTU) 0.10 Alkalinity, Total (as CaCO3) (mg/L) Anions and 161 **Nutrients** Chloride (CI) (mg/L) < 0.50 Fluoride (F) (mg/L) 0.097 Nitrate (as N) (mg/L) 0.133 Nitrite (as N) (mg/L) < 0.0010 Sulfate (SO4) (mg/L) 29.3 Anion Sum (meq/L) 3.84 Cation Sum (meq/L) 3.90 Cation - Anion Balance (%) 0.7 **Total Metals** Aluminum (Al)-Total (mg/L) < 0.010 Antimony (Sb)-Total (mg/L) < 0.00050 Arsenic (As)-Total (mg/L) 0.00039 Barium (Ba)-Total (mg/L) 0.082 Boron (B)-Total (mg/L) < 0.10 Cadmium (Cd)-Total (mg/L) < 0.00020 Calcium (Ca)-Total (mg/L) 42.7 Chromium (Cr)-Total (mg/L) < 0.0020 Copper (Cu)-Total (mg/L) < 0.0010 Iron (Fe)-Total (mg/L) < 0.030 Lead (Pb)-Total (mg/L) 0.00054 Magnesium (Mg)-Total (mg/L) 18.7 Manganese (Mn)-Total (mg/L) < 0.0020 Mercury (Hg)-Total (mg/L) < 0.00020 Potassium (K)-Total (mg/L) 0.90 Selenium (Se)-Total (mg/L) < 0.0010 Sodium (Na)-Total (mg/L) 4.7 Uranium (U)-Total (mg/L) 0.00157 Zinc (Zn)-Total (mg/L) < 0.050

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

L1673982 CONTD....

FINΔI

PAGE 3 of 4 28-SEP-15 10:51 (MT)

Version:

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Certified Reference Material	Conductivity	LCS-H	L1673982-1
Method Blank	Copper (Cu)-Total	MB-LOR	L1673982-1
Matrix Spike	Sulfate (SO4)	MS-B	L1673982-1

Qualifiers for Individual Parameters Listed:

Qualifier	Description
LCS-H	Lab Control Sample recovery was above ALS DQO. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.
MB-LOR	Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level.
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.

CL-IC-N-WR Water Chloride in Water by IC EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

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

Colour measurements can be highly pH dependent, and apply to the pH of the sample as received (at time of testing), without pH adjustment.

Concurrent measurement of sample pH is recommended.

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.

F-IC-N-WR Water Fluoride in Water by IC EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

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 Hg in Water by CVAFS LOR=50ppt EPA 1631E (mod)

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).

IONBALANCE-VA Water Ion Balance Calculation APHA 1030E

Cation Sum, Anion Sum, and Ion Balance (as % difference) are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Because all aqueous solutions are electrically neutral, the calculated ion balance (% difference of cations minus anions) should be near-zero.

Cation and Anion Sums are the total meq/L concentration of major cations and anions. Dissolved species are used where available. Minor ions are included where data is present. Ion Balance is calculated as:

Ion Balance (%) = [Cation Sum-Anion Sum] / [Cation Sum+Anion Sum]

MET-T-CCMS-VA Water Total Metals in Water by CRC ICPMS EPA 200.2/6020A (mod)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

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).

Reference Information

L1673982 CONTD....

PAGE 4 of 4

28-SEP-15 10:51 (MT)

Version: FINAL

NO2-L-IC-N-WR Water Nitrite in Water by IC (Low Level) EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-L-IC-N-WR Water Nitrate in Water by IC (Low Level) EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

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.

SO4-IC-N-WR Water Sulfate in Water by IC EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

TDS-CALC-VA Water TDS (Calculated) APHA 1030E (20TH EDITION)

This analysis is carried out using procedures adapted from APHA 1030E "Checking Correctness of Analyses".

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:

1

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 wwt - 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.

S) Environmental www.alsolobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

COC Number: 14
Page 2 of 2

	www.aisglobal.com				<u> </u>							-								
Report To				Report Format	/ Distribution			Sele	ct Serv	ice Lev	el Belo	w (Rush	Turnerour	nd Time (TAT) is	not av	ailabie f	or all tes	sts)	
Company:	EDI		Select Report F	ormat: PDF	☑ EXCEL □	EDD (DIGITAL)	R	☑ Reg	ular (St	andard	TAT If re	ceived by	y 3 pm - b	ousiness	days)					
Contact:	Meghan Marjanovic	Quality Control (QC) Report with Report				s Γ·No	Р													
Address:	2195 - 2nd Avenue			Criteria on Report - provide details below if box checked				E												
	Whitehorse, YT Y1A 3T8			Select Distribution: EMAIL MAIL FAX				E2 Same day or weekend emergency - contact ALS to confirm TAT and surcharge												
Phone:	867-393-4882		Email 1 or Fax	mmarianovic@edy	namics.com		Specify Date Required for E2,E or P:													
			Email 2	Emilie.Hamm@gor	v.yk.ca															
		Email 3 <u>erik.pit@gov.yk.ca</u>									Ana	alysis R	eques	l						
Invoice To	Same as Report To	□ No	Invoice Distribution				Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below													
	Copy of Invoice with Report ✓ Yes	厂 No	Select Invoice Distribution:						P	P	F/P							_7		
Company:	ED1	•	Email 1 or Fax	mail 1 or Fax sienner@edynamics.com													Ĭ	$\neg \neg$		
Contact:	S Jenner		Email 2 mmarjanovic@edynamics.com																90	
	Project Information			Oll and Gas Required Fields (client use)													İ		Number of Containers	
ALS Quote #:	Q49312		Approver ID:		Cost Center:												İ		grafa	
Job #:	MOUNT NANSEN 15-Y-0146		GL Account:		Routing Code:]	.											Č	
PO / AFE:			Activity Code:]												ğ	
LSD:			Location:] ≨								l.				Ē	
							FULL-TOT-DW-WR	1											Z	
ALS Lab Wo	rk Order # ((lab use only)).		ALS Contact:	Sean Sluggett	Sampler:		[분					1								
ALS Sample #	Sample Identification	and/or Coordinates	.	Date	Time		1 Š		1											
(lab use only)	(This description will	appear on the report)		(dd-mmm-yy)	(hh:mm)	Sample Type	[[
	WO-PW			16 - Sept - 15	8:40	Water	R								П			一	3	
	W 3 1 - 5			-	2 .0															
			· · ·	!									+	+	Н			\dashv		
						,	1					-		+	╂┈╂			\dashv		
							-		\dashv					_	ļļ					
														┷	Ш					
									1						I. I			l		
() () () () ()																				
										_										
															 					
		·····	-	-	-	 	-	1				-	+	- 	 	┉┉				
							₩.													
							_									\Box				
Deinkins	Motor (DM) Samples (client use)	Special in	structions / Snec	ify Criteria to add o	report (client Us	:e)													a (Maria)	
			structions / Specify Criteria to add on report (client Use)				Froze	en 🧎					SIF Obs	ervatio	ns	Yes	، 🗖	No J		
Are samples taken from a Regulated DW System?							Frozen A SIF Observations Yes No No No No No No No No No No No No No													
Γ Yes N7 No																				
Are samples for human drinking water use?							SINIITIAL COOLER TEMPERATURES °C & SAME OF FINAL COOLER TEMPERATURES °C & COOLER TEMPERATURES °C													
r√Yes ⊏ No							Bara Bara Bara Market Bara Bara Bara													
				MITIAL SHIPMENT RECEPTION (lab use only)				FINAL SHIPMENT RECEPTION (lab use only)												
Released by:	DILLING Pate. SEPT	Time: Receive	NO EUR	% 0	Date Time			Received by Charge Sept 14 Time 14 35												
יישכן	1 000011- 110 741	1300h- 第章			162661	1 91~			\sim	····	7 CE	<u> </u>		\sim	11		12	رس		