GLENCORE

August 6th , 2013

Eva Paul
Water Resources Officer, Kitikmeot Region
Aboriginal Affairs and Northern Development Canada
Nunavut Regional Office
Building 918, PO Box 100
Iqaluit, NU
X0A 0H0

Re: 2BE-HAK0915 – Reporting Under Part H Item 4c, Follow-up on Unauthorized Discharge #13-240

Dear Ms. Paul,

The purpose of this letter is to fulfill the reporting requirement under Part H items 4c of water licence 2BE-HAK0915, regarding an unauthorized discharge of waste occurring at the Hackett River Exploration project.

Prior to commencing drilling on hole XPJ-1375, a sump location was identified at N7312852 616819E (65°54'54" latitude 108°26'2' longitude) to contain drill cuttings. The sump was located in a boulder field area 230 m upslope from Boot Lake. At that time, no surface water was observed or heard flowing between the boulders. Deposit of drill cuttings into the sump commenced on June 25, 2013.

On June 26, 2013, a routine inspection of drill sites by project personnel resulted in the discovery of a small plume of silt visible at the shore of Boot Lake, in the vicinity of N7312822 E616580 (65 °54'54" latitude 108 °26'21" longitude). This silt release was thought to be migrating out of a sump established for drill hole XPJ-1375. The observation was reported to the Project Geologist on site, and cuttings deposition in that sump ceased within 30 minutes of plume discovery. Cuttings deposition continued in an alternate sump location, and a recirculation system was installed on the drill.

During a subsequent field investigation on July 5, approximately 100 m downslope of the sump location, surface water was observed. Flow was observed intermittently downslope, towards Boot Lake. Silt deposition was observed in areas where surface

flow was present. At the shore of Boot Lake in the vicinity of the silt deposition, surface flow was absent; water likely enters the lake under vegetation and boulders; no channel was observed in the vicinity. Accordingly, no evidence of lakeshore erosion related to the silt release was observed.

However, silt was observed on the lake bottom in an area estimated at approximately 5 m x 5 m, to a thickness of a few millimeters; therefore, it can be estimated that <0.1 m^3 of silt was released into Boot Lake.

The silt release to Boot Lake was reported to the 24 hour spill reporting line on July 6, 2013 by Glencore personnel. The person who received the call at the spill reporting line on July 6 asked that the spill reporting form be filled out and emailed to spills@gov.nt.ca on the following day. Accordingly, the form was submitted on July 7 (see Attachment 1). Subsequent to initial reporting, photos were submitted to Marc Dionne (Environment Canada; see Attachment 2). Spill # 13-240 was assigned to this file.

Subsequently, water quality samples were collected and field parameters were measured in 3 locations, as summarized in Table 1. Samples were submitted to ALS Environmental Laboratories for analysis. Results can be found in Attachment 3.

Planned reclamation activities include, when feasible, removal of silt from depositional areas downslope from the sump to prevent further sedimentation in Boot Lake. Removal of silt in Boot Lake is not proposed at this time as the small estimated volume of silt is not thought to be posing an ongoing risk to the health of the aquatic environment of the lake. During periods of flow for the remainder of 2013 camp activities and throughout 2014, regular field monitoring of pH, temperature and conductivity are proposed at both the shore of Boot Lake and at a location about 100 m downslope of the sump.

GLENCORE

We trust that this letter provides the information required to satisfy reporting requirements.

If you have any questions regarding this request please call me at 514-745-9357.

Yours truly,

Robert Prairie
Glencore (formerly Xstrata Zinc Canada)

cc. M. Dionne, EC
P. Beaulieu, NWB
W. Kuliktana, KIA
P. Deveau, Glencore
P. Lessard, Glencore
S. Burgess, Glencore
D. Hamel, Glencore

Glencore 8801 Transcanada Highway St-Laurent Québec H4S 1Z6 Canada
Tel. (514) 745-9360 Fax (514) 745-9379

GLENCORE

Table 1 Field sampling, Boot Lake, July 2013

Site ID	Date	Location	Field Parameters and Lab Results[1]								Sample ID
		Northing/Easting Latitude/Longitude	pH	Conductivity (µS/cm)	Temperature (°C)	TDS[2] (g/L)	DO[3] (%)	DO (mg/L)	ORP[4]	Salinity	
Boot Lake near inflow	8 Jul 2013	65°54′575″ Lat/ 108°25′792″Long	6.02 (6.45)	209 (190)	17.68	0.136 (0.187)	112.2	10.63	182.4	0.10	BOOT-IN-080713
Boot Lake near outflow	8 Jul 2013	616406N/7313207E	6.18 (6.47)	241 (234)	15.93	0.157 (0.236)	106.7	10.42	177.9	0.11	BOOT-OUT-080713
Boot Lake near release, BL-1	5 Jul 2013[5]	N7312822/E616580 65°54′54″ Lat/ 108°26′21″ Long	5.34 (6.09)	305 (244)	12.42	0.145 (0.234)	-	-	-		BOOT-XPJ1375-050713

[1] Field measurements presented. Corresponding lab results presented in parenthesis.
[2] TDS Total Dissolved Solids
[3] DO Dissolved Oxygen
[4] ORP Oxidation reduction Potential
[5] A different meter was used on July 5, hence the difference in field parameters measured.

Glencore 8801 Transcanada Highway St-Laurent Québec H4S 1Z6 Canada
Tel. (514) 745-9360 Fax (514) 745-9379

Attachment 1 Spill Reporting Form, Spill # 13-240

JUL-7-2013 20:40 FROM:ARCTIC ALARM STATION 8736924 TO:EC EDMONTON P:1/1

Northwest Territories | Nunavut | Canada

NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE
TEL: (867) 920-8130
FAX: (867) 873-6924
EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH - DAY - YEAR: JULY 07 - 2013	REPORT TIME: 14:45	☒ ORIGINAL SPILL REPORT, OR ☐ UPDATE # ..... TO THE ORIGINAL SPILL REPORT	REPORT NUMBER: 13-240
B	OCCURRENCE DATE: MONTH - DAY - YEAR: JUNE - 28 - 2013.	OCCURRENCE TIME		
C	LAND USE PERMIT NUMBER (IF APPLICABLE): N2012-C0015	WATER LICENCE NUMBER (IF APPLICABLE): 2BE-HAL0915		
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION: HACKETT RIVER CAMP - BOOT LAKE	REGION: ☐ NWT ☒ NUNAVUT ☐ ADJACENT JURISDICTION OR OCEAN		
E	LATITUDE: N 73 12 822 (DEGREES / MINUTES / SECONDS)	LONGITUDE: E 616580 NAD83 (DEGREES / MINUTES / SECONDS)		
F	RESPONSIBLE PARTY OR VESSEL NAME: XSTRATA ZINC CANADA	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION		
G	ANY CONTRACTOR INVOLVED: MAJOR DRILLING.	CONTRACTOR ADDRESS OR OFFICE LOCATION		
H	PRODUCT SPILLED: DRILL CUTTINGS	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES: 2 $1m^3$	U.N. NUMBER: -	
	SECOND PRODUCT SPILLED (IF APPLICABLE): -	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES	U.N. NUMBER	
I	SPILL SOURCE: SUMP	SPILL CAUSE: CUTTINGS MIGRATED TO LAKE VIA INTERMITTENT SURFACE FLOWS	AREA OF CONTAMINATION IN SQUARE METRES: 25 m^2	
J	FACTORS AFFECTING SPILL OR RECOVERY	DESCRIBE ANY ASSISTANCE REQUIRED	HAZARDS TO PERSONS, PROPERTY OR ENVIRONMENT: -	

K ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS

DRILL CUTTINGS DEPOSITED IN SUMP 240 m UPSLOPE FROM BOOT LAKE. NO SURFACE WATER OBSERVED IN IMMEDIATE VICINITY OF SUMP.

DRILL COTTINGS OBSERVED IN BOOT LAKE FOLLOWING DEPOSITION IN SUMP. IMMEDIATELY STOPPED DEPOSIT INTO SUMP.

-ADVISED AANDC INSPECTOR DURING SITE VISIT ON JULY 6 2013

L	REPORTED TO SPILL LINE BY: R. BOUCHER	POSITION: PROJECT GEOLOGIST	EMPLOYER: XSTRATA	LOCATION CALLING FROM: HACKETT CAMP	TELEPHONE: 778 372 3291
M	ANY ALTERNATE CONTACT: R. NAMOUR	POSITION: SAME	EMPLOYER: SAME	ALTERNATE CONTACT LOCATION: SAME	ALTERNATE TELEPHONE: SAME

REPORT LINE USE ONLY

N	RECEIVED AT SPILL LINE BY: K. Williams	POSITION: STATION OPERATOR	EMPLOYER: Arctic Alarm	LOCATION CALLED: YELLOWKNIFE, NT	REPORT LINE NUMBER: (867) 920-8130

LEAD AGENCY ☐ EC ☐ CCG ☐ GNWT ☐ GN ☐ ILA ☐ INAC ☐ NEB ☐ TC | SIGNIFICANCE ☐ MINOR ☐ MAJOR ☐ UNKNOWN | FILE STATUS ☐ OPEN ☐ CLOSED

AGENCY	CONTACT NAME	CONTACT TIME	REMARKS
LEAD AGENCY ~~AANDC~~ EC	E William	20:25	Faxed
FIRST SUPPORT AGENCY			
SECOND SUPPORT AGENCY			
THIRD SUPPORT AGENCY			

PAGE 1 OF ____

Attachment 2 Photos

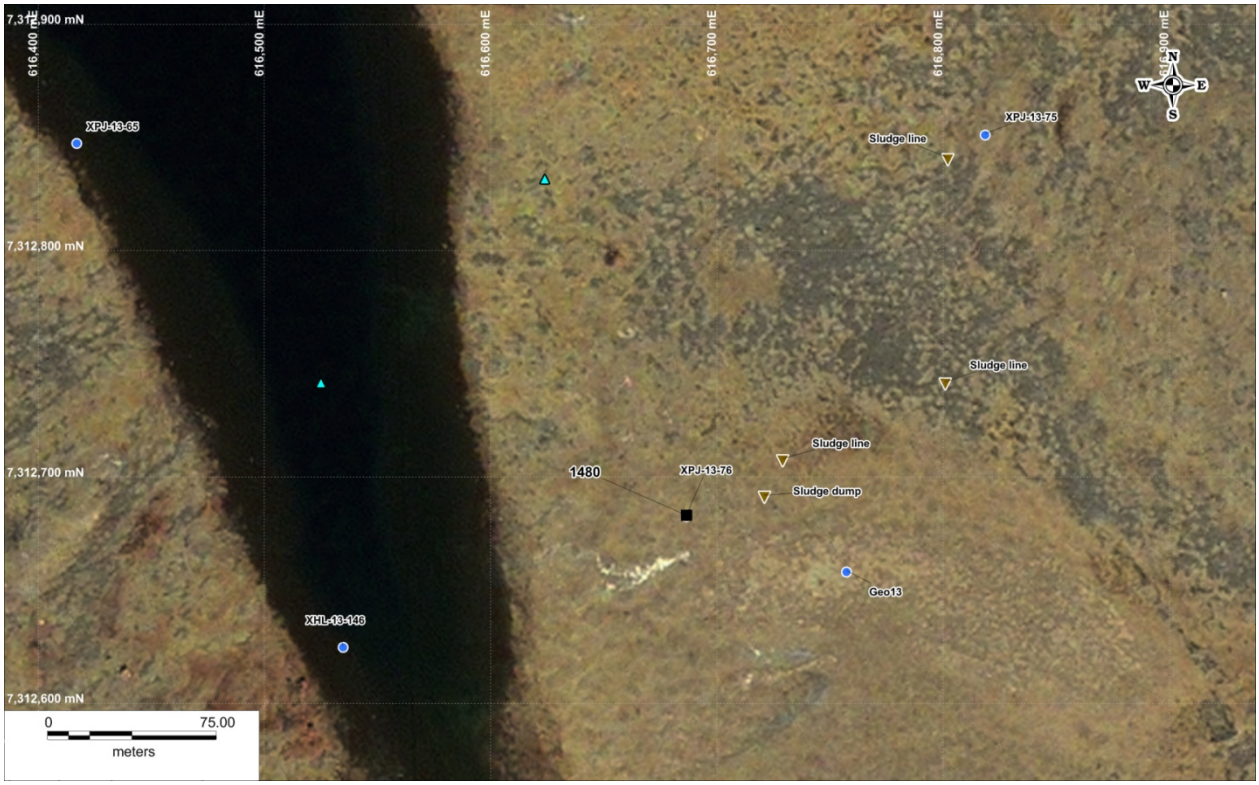

Photo 1 Area of interest, including sludge lines and drill locations

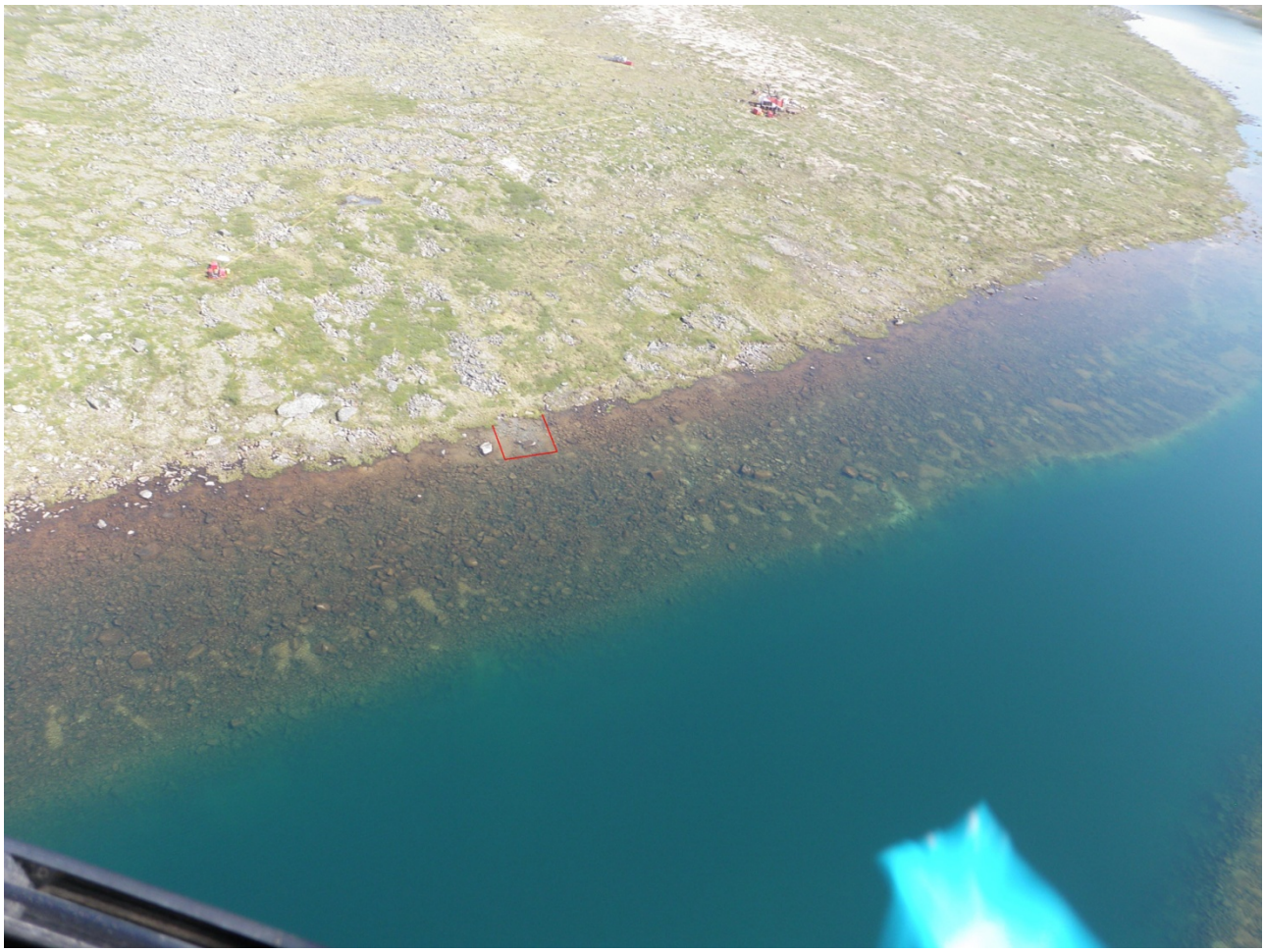

Photo 2 Boot Lake, BL1

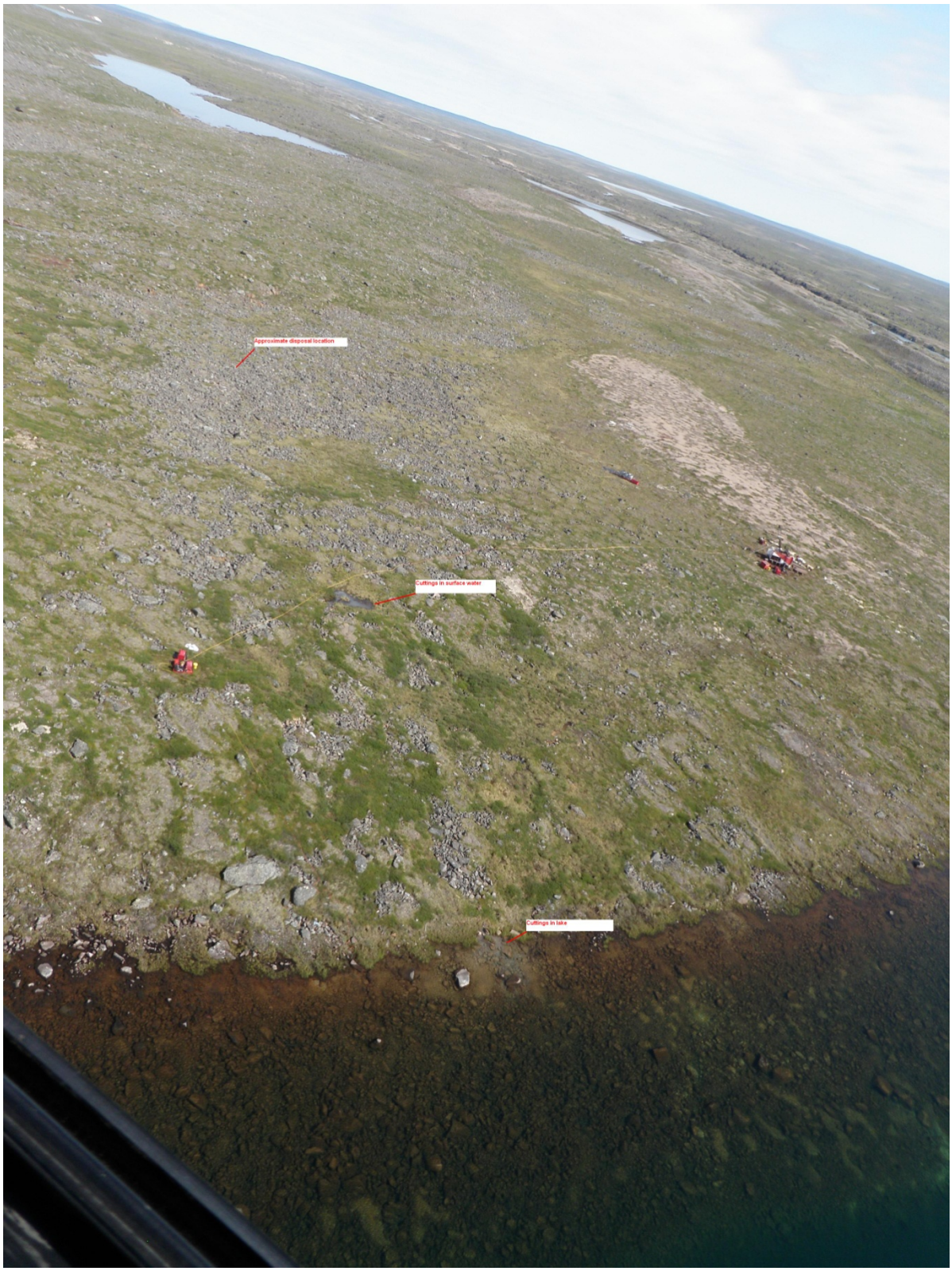

Photo 3 Sump location, BL1-US and BL1

Photo 4 Boot Lake Shore at BL1

Attachment 3 Certificate of Analysis

XSTRATA PLC.
ATTN: Robert Boucher
18 Yellowknife Airport
100 McMillan St.
Yellowknife NT X1A 3T2

Date Received: 09-JUL-13
Report Date: 23-JUL-13 16:53 (MT)
Version: FINAL

Client Phone: 778-372-3293

Certificate of Analysis

Lab Work Order #: L1329403
Project P.O. #: 0914113-0009
Job Reference: HACKETT RIVER XSTRATA WATER
C of C Numbers: 23
Legal Site Desc:

Amber Springer
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1329403-1	L1329403-2	L1329403-3		
	Description	Water	Water	Water		
	Sampled Date	05-JUL-13	08-JUL-13	08-JUL-13		
	Sampled Time	12:00	12:00	12:00		
	Client ID	BOOT-XPJ1375-050713	BOOT-IN-080713	BOOT-OUT-080713		
Grouping	**Analyte**					
WATER						
Physical Tests	Conductivity (uS/cm)	244	190	234		
	Hardness (as CaCO3) (mg/L)	88.3	72.6	91.5		
	pH (pH)	6.09	6.45	6.47		
	Total Suspended Solids (mg/L)	5.2	<3.0	<3.0		
	Total Dissolved Solids (mg/L)	234	187	236		
	Turbidity (NTU)	5.83	0.44	0.39		
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	3.9	1.9	2.6		
	Bromide (Br) (mg/L)	0.278	0.306	0.433		
	Chloride (Cl) (mg/L)	54.9	41.2	56.0		
	Fluoride (F) (mg/L)	0.049	0.025	0.030		
	Nitrate (as N) (mg/L)	0.0342	0.0111	0.0125		
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010		
	Sulfate (SO4) (mg/L)	27.1	20.6	18.7		
Total Metals	Aluminum (Al)-Total (mg/L)	0.321	0.0341	0.0126		
	Antimony (Sb)-Total (mg/L)	<0.000050	<0.000050	<0.000050		
	Arsenic (As)-Total (mg/L)	0.000118	0.000096	0.000072		
	Barium (Ba)-Total (mg/L)	0.0707	0.0269	0.0312		
	Beryllium (Be)-Total (mg/L)	<0.00020	<0.00020	<0.00020		
	Bismuth (Bi)-Total (mg/L)	<0.00050	<0.00050	<0.00050		
	Boron (B)-Total (mg/L)	0.0084	0.0113	0.0111		
	Cadmium (Cd)-Total (mg/L)	0.00139	0.000140	0.000225		
	Calcium (Ca)-Total (mg/L)	29.4	22.9	29.2		
	Chromium (Cr)-Total (mg/L)	0.00051	0.00016	0.00013		
	Cobalt (Co)-Total (mg/L)	0.00809	0.00044	<0.00010		
	Copper (Cu)-Total (mg/L)	0.00841	0.00159	0.00097		
	Iron (Fe)-Total (mg/L)	0.208	0.047	0.026		
	Lead (Pb)-Total (mg/L)	0.00326	<0.000050	<0.000050		
	Lithium (Li)-Total (mg/L)	0.0080	0.0054	0.0093		
	Magnesium (Mg)-Total (mg/L)	4.32	3.87	3.81		
	Manganese (Mn)-Total (mg/L)	0.256	0.0111	0.00607		
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010		
	Molybdenum (Mo)-Total (mg/L)	<0.000050	<0.000050	<0.000050		
	Nickel (Ni)-Total (mg/L)	0.0177	0.00844	0.00789		
	Phosphorus (P)-Total (mg/L)	<0.30	<0.30	<0.30		
	Potassium (K)-Total (mg/L)	1.91	1.33	1.61		
	Selenium (Se)-Total (mg/L)	<0.00010	<0.00010	<0.00010		
	Silicon (Si)-Total (mg/L)	1.77	0.840	0.762		

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1329403-1	L1329403-2	L1329403-3		
	Description	Water	Water	Water		
	Sampled Date	05-JUL-13	08-JUL-13	08-JUL-13		
	Sampled Time	12:00	12:00	12:00		
	Client ID	BOOT-XPJ1375-050713	BOOT-IN-080713	BOOT-OUT-080713		
Grouping	Analyte					
WATER						
Total Metals	Silver (Ag)-Total (mg/L)	0.000066	<0.000010	<0.000010		
	Sodium (Na)-Total (mg/L)	2.22	1.35	1.46		
	Strontium (Sr)-Total (mg/L)	0.209	0.182	0.253		
	Thallium (Tl)-Total (mg/L)	<0.000050	<0.000050	<0.000050		
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.00010		
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010		
	Uranium (U)-Total (mg/L)	0.000074	0.000010	<0.000010		
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010		
	Zinc (Zn)-Total (mg/L)	0.345	0.0271	0.0563		
Dissolved Metals	Dissolved Metals Filtration Location	LAB	LAB	LAB		
	Aluminum (Al)-Dissolved (mg/L)	0.101	0.0131	0.0048		
	Antimony (Sb)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050		
	Arsenic (As)-Dissolved (mg/L)	0.000090	0.000069	0.000048		
	Barium (Ba)-Dissolved (mg/L)	0.0737	0.0267	0.0316		
	Beryllium (Be)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020		
	Bismuth (Bi)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050		
	Boron (B)-Dissolved (mg/L)	0.0066	0.0105	0.0111		
	Cadmium (Cd)-Dissolved (mg/L)	0.00166	0.000140	0.000237		
	Calcium (Ca)-Dissolved (mg/L)	28.5	22.7	30.2		
	Chromium (Cr)-Dissolved (mg/L)	<0.00010	0.00022	0.00026		
	Cobalt (Co)-Dissolved (mg/L)	0.00961	0.00044	<0.00010		
	Copper (Cu)-Dissolved (mg/L)	0.00858	0.00127	0.00084		
	Iron (Fe)-Dissolved (mg/L)	0.032	<0.010	<0.010		
	Lead (Pb)-Dissolved (mg/L)	0.00251	<0.000050	<0.000050		
	Lithium (Li)-Dissolved (mg/L)	0.0070	0.0052	0.0096		
	Magnesium (Mg)-Dissolved (mg/L)	4.15	3.86	3.93		
	Manganese (Mn)-Dissolved (mg/L)	0.304	0.0109	0.00532		
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010		
	Molybdenum (Mo)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050		
	Nickel (Ni)-Dissolved (mg/L)	0.0180	0.00833	0.00773		
	Phosphorus (P)-Dissolved (mg/L)	<0.30	<0.30	<0.30		
	Potassium (K)-Dissolved (mg/L)	1.66	1.33	1.60		
	Selenium (Se)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010		
	Silicon (Si)-Dissolved (mg/L)	1.72	0.821	0.752		
	Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010		
	Sodium (Na)-Dissolved (mg/L)	2.15	1.39	1.49		
	Strontium (Sr)-Dissolved (mg/L)	0.181	0.179	0.260		

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1329403-1	L1329403-2	L1329403-3		
	Description	Water	Water	Water		
	Sampled Date	05-JUL-13	08-JUL-13	08-JUL-13		
	Sampled Time	12:00	12:00	12:00		
	Client ID	BOOT-XPJ1375-050713	BOOT-IN-080713	BOOT-OUT-080713		
Grouping	Analyte					
WATER						
Dissolved Metals	Thallium (Tl)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050		
	Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010		
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010		
	Uranium (U)-Dissolved (mg/L)	0.000056	<0.000010	<0.000010		
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010		
	Zinc (Zn)-Dissolved (mg/L)	0.385	0.0270	0.0558		

* 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	Fluoride (F)	DLM	L1329403-1, -2, -3
Duplicate	Nitrite (as N)	DLM	L1329403-1, -2, -3
Method Blank	Boron (B)-Total	MB-LOR	L1329403-1, -2, -3
Method Blank	Sodium (Na)-Total	MB-LOR	L1329403-1, -2, -3
Matrix Spike	Barium (Ba)-Total	MS-B	L1329403-1, -2, -3
Matrix Spike	Calcium (Ca)-Total	MS-B	L1329403-1, -2, -3
Matrix Spike	Magnesium (Mg)-Total	MS-B	L1329403-1, -2, -3
Matrix Spike	Strontium (Sr)-Total	MS-B	L1329403-1, -2, -3
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L1329403-1, -2, -3
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L1329403-1, -2, -3
Matrix Spike	Magnesium (Mg)-Dissolved	MS-B	L1329403-1, -2, -3

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLM	Detection Limit Adjusted For Sample Matrix Effects
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-PCT-VA	Water	Alkalinity by Auto. Titration	APHA 2320 "Alkalinity"

This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

ALK-PCT-VA	Water	Alkalinity by Auto. Titration	APHA 2320 Alkalinity

This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

ANIONS-BR-IC-VA	Water	Bromide 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-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".

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.

FE-DIS-LOW-ICP-VA	Water	Dissolved Fe 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 procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

FE-TOT-LOW-ICP-VA	Water	Total Fe 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

Reference Information

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).

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-DIS-LOW-CVAFS-VA Water Dissolved Mercury in Water by CVAFS(Low) EPA SW-846 3005A & 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 procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and 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).

HG-TOT-LOW-CVAFS-VA Water Total Mercury in Water by CVAFS(Low) 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).

MET-D-CCMS-VA Water Dissolved Metals in Water by CRC ICPMS APHA 3030 B&E / EPA SW-846 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 hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).

MET-DIS-ICP-VA Water Dissolved 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 procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-DIS-ULTRA-MS-VA Water Diss. Metals in Water by ICPMS (Ultra) 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 involves preliminary sample treatment by filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-T-CCMS-VA Water Total Metals in Water by CRC ICPMS APHA 3030 B&E / EPA SW-846 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 hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).

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-ULTRA-MS-VA Water Total Metals in Water by ICPMS (Ultra) 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).

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.

Reference Information

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:

23

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.

ALS Environmental

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

COC # 23

Page 1 of 1

Report To				Report Format / Distribution				Service Requested (Rush for routine analysis subject to availability)
Company:	Xstrata Zinc-Hackett			☑ Standard ☐ Other				◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Robert Boucher			☑ PDF ☑ Excel ☐ Digital ☐ Fax				○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	Xstrata Zinc Canada-Hackett River-BBE			Email 1: rboucher@xstratazinc.ca				○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
	#18 Yellowknife Airport 100 Mc Millan St Yellowknife NT X1A 1			Email 2: rprairie@xstratazinc.ca				○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	778-372-3291	Fax:		Email 3: achateauvert@rescan.com				Analysis Request
Invoice To	Same as Report ? ☐ Yes ☑ No			Client / Project Information				Please indicate below Filtered, Preserved or both (F, P, F/P)
Hardcopy of Invoice with Report?	☑ Yes ☐ No			Job #: Hackett River Xstrata Water				P F/P
Company:	Rescan			PO / AFE: 0914113-0009				
Contact:	Adam Chateauvert			LSD:				
Address:	908-5201 50 Th Ave Yellowknife NT							
Phone:	867-9202090	Fax:		Quote #:				
Lab Work Order # (lab use only)	L1329403			ALS Contact: Bruce Stuart	Sampler: S. Hamm			

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Total Metals Ultra Low Level	Routine	Dissolved MetalsUltraLowLevel	Dissolved MetalsUltraLowLevel	Number of Containers
	BOOT-XPJ1375-050713	05-Jul-13		water	x	x	x		3
	BOOT-IN-080713	08-Jul-13		water	x	x		x	3
	BOOT-OUT-080713	08-Jul-13		water	x	x		x	3
									3

L1329403-COFC

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

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 provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Sharleen Hamm	9-Jul-13	0:00		July 9/13	1:30	max 17.4 avg 15.0 °C				

GENF 20.00 Front