GlencoreXstrata

Assessment Report

On the

2013 Diamond Drill Program

For

GlencoreXstrata's

Sturgeon Lake Property

Bell Lake, Six Mile Lake, Valora Lake and Penassi Lake Areas

Patricia Mining Division

NTS Sheet 52 G/14 and 15

Claim Holder:
Glencore Canada Corporation (Client # 130679)

November 2013

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1.0 Introduction

From January 16, 2013 to June 30, 2013 a diamond drill program consisting of 11 holes was completed on Glencore Canada Corporation's Sturgeon Lake Property (hereafter simply referred to as "the Property"). A total of 7, 683 metres were drilled with a total of 708 samples were taken and analyzed.

The objective of the exploration program was to evaluate the economic base metal potential of the area by drill testing previously identified areas of Zn-Cu mineralization as well as new geophysical and stratigraphic targets.

All work was carried out by Clark Exploration Consulting Inc. of Thunder Bay, Ontario and all samples and assays were sent to either ALS Minerals or Agat Laboratories for analysis. Drilling was completed by Major Drilling.

2.0 Property Description

The Property consists of 16 mining claims, 21 mining lease parcels and 4 patents (Tables 1 and 2). The Property covers a total of 18,147 hectares and is located in Bell Lake, Sixmile Lake, Valora Lake and Penassi Lake Area in the Patricia Mining Division of Ontario (Figures 1 and 2). The Property is host to the Sturgeon Lake VMS Camp. All claims are 100% owned by Xstrata Canada Corporation.

Please refer to Appendix A for a complete claim map of the property.

Figure 1: Property Location Map.

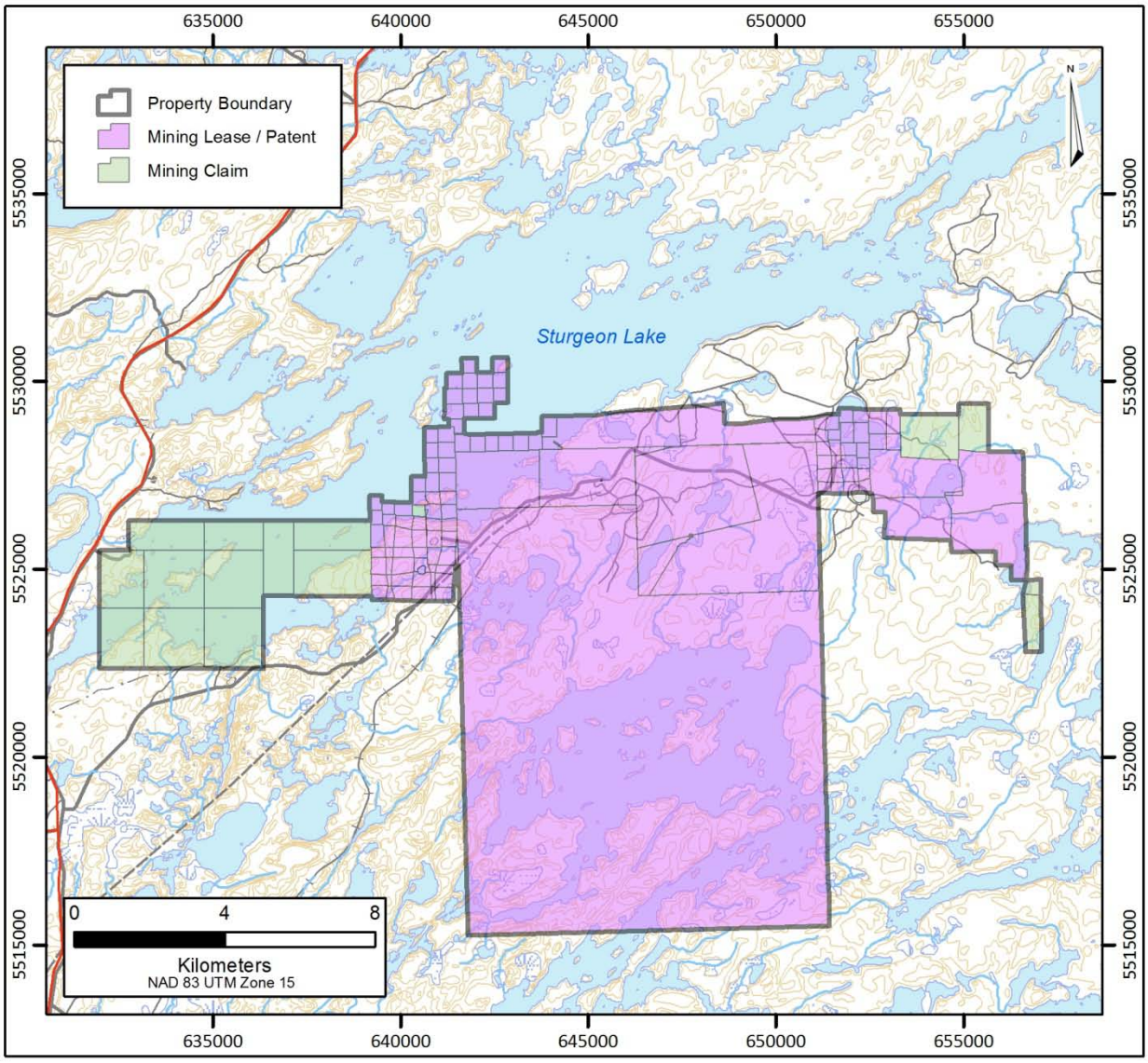

Figure 2: Property Claim Map .

Table 1: Claim Details.

Township/Area	Claim Number	Recording Date	Claim Due Date	Units	Work Required	Total Applied	Total Reserve
PENASSI LAKE AREA	1145072	1991-May-22	2015-May-22	1	$400	$8,800	$0
BELL LAKE AREA	1195743	1992-Jun-25	2013-Jun-25	4	$1,600	$30,400	$0
BELL LAKE AREA	1195858	1992-Aug-10	2013-Aug-10	1	$400	$7,600	$1,304
VALORA LAKE AREA (PAT)	4241547	2010-Jul-23	2014-Jul-23	15	$2,400	$15,600	$31,765
VALORA LAKE AREA (PAT)	4242860	2010-Jul-23	2013-Jul-23	10	$4,000	$4,000	$836
VALORA LAKE AREA (PAT)	4242923	2010-Jul-23	2013-Jul-23	10	$4,000	$4,000	$836
VALORA LAKE AREA (PAT)	4256551	2010-Sep-24	2013-Sep-24	8	$3,200	$3,200	$669
VALORA LAKE AREA (PAT)	4256552	2010-Sep-24	2013-Sep-24	16	$6,400	$6,400	$1,337
VALORA LAKE AREA (PAT)	4256553	2010-Sep-24	2013-Sep-24	16	$6,400	$6,400	$1,337
VALORA LAKE AREA (PAT)	4256554	2010-Sep-24	2013-Sep-24	16	$6,400	$6,400	$1,337
VALORA LAKE AREA (PAT)	4256555	2010-Sep-24	2013-Sep-24	16	$6,400	$6,400	$1,337
VALORA LAKE AREA (PAT)	4256556	2010-Sep-24	2013-Sep-24	10	$4,000	$4,000	$836
VALORA LAKE AREA (PAT)	4256557	2010-Sep-24	2013-Sep-24	12	$4,800	$4,800	$1,003
VALORA LAKE AREA (PAT)	4256558	2010-Sep-24	2013-Sep-24	12	$4,800	$4,800	$1,003
SIX MILE LAKE AREA	4258008	2010-Sep-24	2014-Sep-24	12	$2,400	$12,000	$65,906
SIX MILE LAKE AREA	4258009	2010-Sep-24	2013-Sep-24	6	$2,400	$2,400	$0

Table 2: Mining Lease / Parcel Details

Lease	Expiry Date	Disposition	Township
106677	28-02-2014	PA325230	Sixmile Lake
106678	28-02-2014	PA312563	Sixmile Lake
106679	30-04-2014	PA325409	Sixmile Lake
106680	30-04-2014	PA325236	Sixmile Lake
106682	31-10-2013	PA212610	Sixmile Lake
106682	31-10-2013	PA212611	Sixmile Lake
106682	31-10-2013	PA212612	Sixmile Lake
106682	31-10-2013	PA212613	Sixmile Lake
106682	31-10-2013	PA212614	Sixmile Lake
106682	31-10-2013	PA212615	Sixmile Lake
106682	31-10-2013	PA212616	Sixmile Lake
106682	31-10-2013	PA212617	Sixmile Lake
106682	31-10-2013	PA212735	Sixmile Lake
106682	31-10-2013	PA212736	Sixmile Lake
106683	31-10-2013	PA212741	Sixmile Lake
106683	31-10-2013	PA212742	Sixmile Lake
106958	30-09-2015	PA211905	Valora Lake
106958	30-09-2015	PA211906	Valora Lake
106958	30-09-2015	PA211907	Valora Lake
106958	30-09-2015	PA312564	Valora Lake
106958	30-09-2015	PA312565	Valora Lake
106958	30-09-2015	PA312566	Valora Lake
106958	30-09-2015	PA312567	Valora Lake
106958	30-09-2015	PA312568	Valora Lake
106958	30-09-2015	PA312569	Valora Lake
106994	30-11-2016	PA226440	Valora Lake
106994	30-11-2016	PA226441	Valora Lake
106994	30-11-2016	PA226444	Valora Lake
106994	30-11-2016	PA226445	Valora Lake
106994	30-11-2016	PA226446	Valora Lake
106994	30-11-2016	PA226447	Valora Lake
106994	30-11-2016	PA226448	Valora Lake
106994	31-03-2019	PA226490	Valora Lake
106994	30-11-2016	PA226491	Valora Lake
106994	30-11-2016	PA226496	Valora Lake
107160	31-03-2019	PA226437	Penassi Lake
107160	31-03-2019	PA226438	Penassi Lake
107160	31-03-2019	PA226439	Penassi Lake

Lease	Expiry Date	Disposition	Township
107160	31-03-2019	PA226442	Valora Lake
107161	31-03-2019	PA226443	Valora Lake
107161	31-03-2019	PA226449	Valora Lake
107161	31-03-2019	PA226450	Valora Lake
107161	31-03-2019	PA226451	Valora Lake
107161	31-03-2019	PA226452	Valora Lake
107161	31-03-2019	PA226453	Valora Lake
107161	31-03-2019	PA226454	Valora Lake
107161	31-03-2019	PA226455	Valora Lake
107161	31-03-2019	PA226456	Valora Lake
107161	31-03-2019	PA226457	Valora Lake
107161	30-11-2016	PA226497	Valora Lake
107161	31-03-2019	PA226498	Valora Lake
107161	31-03-2019	PA226499	Valora Lake
107161	31-03-2019	PA226500	Valora Lake
107161	31-03-2019	PA226501	Valora Lake
107161	31-03-2019	PA226502	Valora Lake
107161	31-03-2019	PA226503	Valora Lake
107161	31-03-2019	PA226504	Valora Lake
107161	31-03-2019	PA226505	Valora Lake
107332	30.04-2021	PA325203	Sixmile Lake
107332	30.04-2021	PA325204	Sixmile Lake
107332	30.04-2021	PA325205	Sixmile Lake
107332	30.04-2021	PA325206	Sixmile Lake
107332	30.04-2021	PA325207	Sixmile Lake
107333	30.04-2021	PA325202	Sixmile Lake
107333	30.04-2021	PA325208	Sixmile Lake
107333	30.04-2021	PA325209	Sixmile Lake
107333	30-04-2021	PA325232	Sixmile Lake
107333	30-04-2021	PA325233	Sixmile Lake
107333	30-04-2021	PA325234	Sixmile Lake
107333	30-04-2021	PA325235	Sixmile Lake
107405	31-05-2023	CLM 171	Sixmile Lake
107405	31-05-2023	CLM 171	Sixmile Lake
107406	31-05-2023	CLM 202	Bell Lake
107407	30-06-2023	CLM 201	Sixmile Lake / Bell Lake
107408	30-06-2023	CLM 170	Sixmile Lake
107453	30-09-2024	CLM 184	Bell Lake
107462	30-09-2024	CLM 185	Sixmile Lake
108283	31-08-2029	PA355939	Sixmile Lake

Lease	Expiry Date	Disposition	Township
108283	31-08-2029	PA355940	Penassi Lake / Sixmile Lake
108283	31-08-2029	PA355941	Penassi Lake
108283	31-08-2029	PA355942	Penassi Lake
108283	31-08-2029	PA355943	Penassi Lake
108283	31-08-2029	PA355955	Penassi Lake
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108284	31-08-2029	PA355959	Penassi Lake
108284	31-08-2029	PA355960	Penassi Lake
108284	31-08-2029	PA355961	Penassi Lake
108284	31-08-2029	PA355962	Penassi Lake
108284	31-08-2029	PA361473	Penassi Lake
108284	31-08-2029	PA361474	Penassi Lake
108284	31-08-2029	PA361475	Penassi Lake
108284	31-08-2029	PA361476	Valora Lake
108284	31-08-2029	PA361476	Penassi Lake
108284	31-08-2029	PA361478	Valora Lake / Penassi Lake
108284	31-08-2029	PA361479	Penassi Lake
108284	31-08-2029	PA361829	Penassi Lake
108284	31-08-2029	PA361830	Penassi Lake
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108284	31-08-2029	PA361840	Penassi Lake
108284	31-08-2029	PA361841	Penassi Lake
108284	31-08-2029	PA361842	Penassi Lake
108284	31-08-2029	PA436775	Penassi Lake
108284	31-08-2029	PA436776	Penassi Lake
108284	31-08-2029	PA436777	Penassi Lake
108284	31-08-2029	PA436778	Penassi Lake
108285	31-08-2029	PA361477	Valora Lake / Penassi Lake
108285	31-08-2029	PA361480	Penassi Lake
	Patent	CLS 115819	Sixmile Lake
	Patent	GTP BLOCK NO 7	Penassi Lake
	Patent	GTP NO 7	Bell Lake
	Patent	Mattabi Mine Patent	Sixmile Lake

2.1 Location and Access

The Sturgeon Lake Property is situated in the Patricia Mining Division of Ontario, with the claims being located on NTS sheets 52 G/14 and 15. The property is located approximately 65 kilometers north-northeast of the town of Ignace, Ontario, approximately 85 kilometers east-southeast of the town of Sioux Lookout, Ontario, and is within 4 kilometers of the past-producing Lyon Lake, Creek and Sturgeon Lake Deposits of the Sturgeon Lake VMS Camp. The city of Thunder Bay, Ontario has a population of 110,000 and provides support services, equipment and skilled labour for both the mineral exploration and mining industry. Rail, national highway, port and international airport services are also available out of Thunder Bay.

From Thunder Bay, the property can be reached by travelling west on Highway 11/17 and then 17 until the turnoff north to Highway 599 located as one enters the town of Ignace, Ontario approximately 242 kilometers away. Highway 599 is followed for 60 kilometers north to Silver Dollar. The Mattabi Mine Road is located roughly 500 meters past Silver Dollar on Highway 599. The Mattabi Mine Road is followed for approximately 15 kilometers to the gate on the west side of the Sturgeon Lake VMS camp. The Sturgeon Lake camp is currently held by GlencoreXstrata and access is restricted to the past-producing mine workings and the active water treatment facility located on the property. Once through the gates, a series of well maintained road networks and winter drill roads are used to access various points along the property.

2.2 Topography and Vegetation

The property covers gently rolling, heavily forested, swampy terrain. Overburden is extensive on the Property with outcrop exposure being limited to less than 1%. The overburden varies from sand-rich glacial outwash to boulder-rich glacial till. The limited outcrop exposures are typically small. Climate in the area is typical of north central Canada with temperature ranges from -40°C to 40°C. Snow covers the project area normally from November through to May. Surface mineral exploration can be conducted year round, but during the late Fall to early spring, drilling and geophysics are the most practical exploration methods.

3.0 Geological Setting

The Sturgeon Lake greenstone belt is located in the Wabigoon subprovince of Ontario's Superior province. The Sturgeon Lake caldera is a northward-younging pile of felsic to mafic volcanics rocks, with intermixed volcaniclastic and chemical sediments, locally intruded by syn- to post-volcanic plutons sills and dykes.

Laterally extensive mappable units within the submarine caldera are grouped into volcanic cycles comprised of, from base to top, mafic to intermediate volcanic flows, felsic pyroclastics, and a thin sedimentary layer. Within the 4500m thick package of caldera in-fill material, five major ash-flow tuff units are interpreted to represent five separate caldera-collapse events (Figure 3).

The pre-caldera mafic volcanic rocks at base of the caldera are intruded by the sill-like synvolcanic Beidelman Bay Intrusive Complex.

Please see figure 3 for a map showing the regional geology in the area.

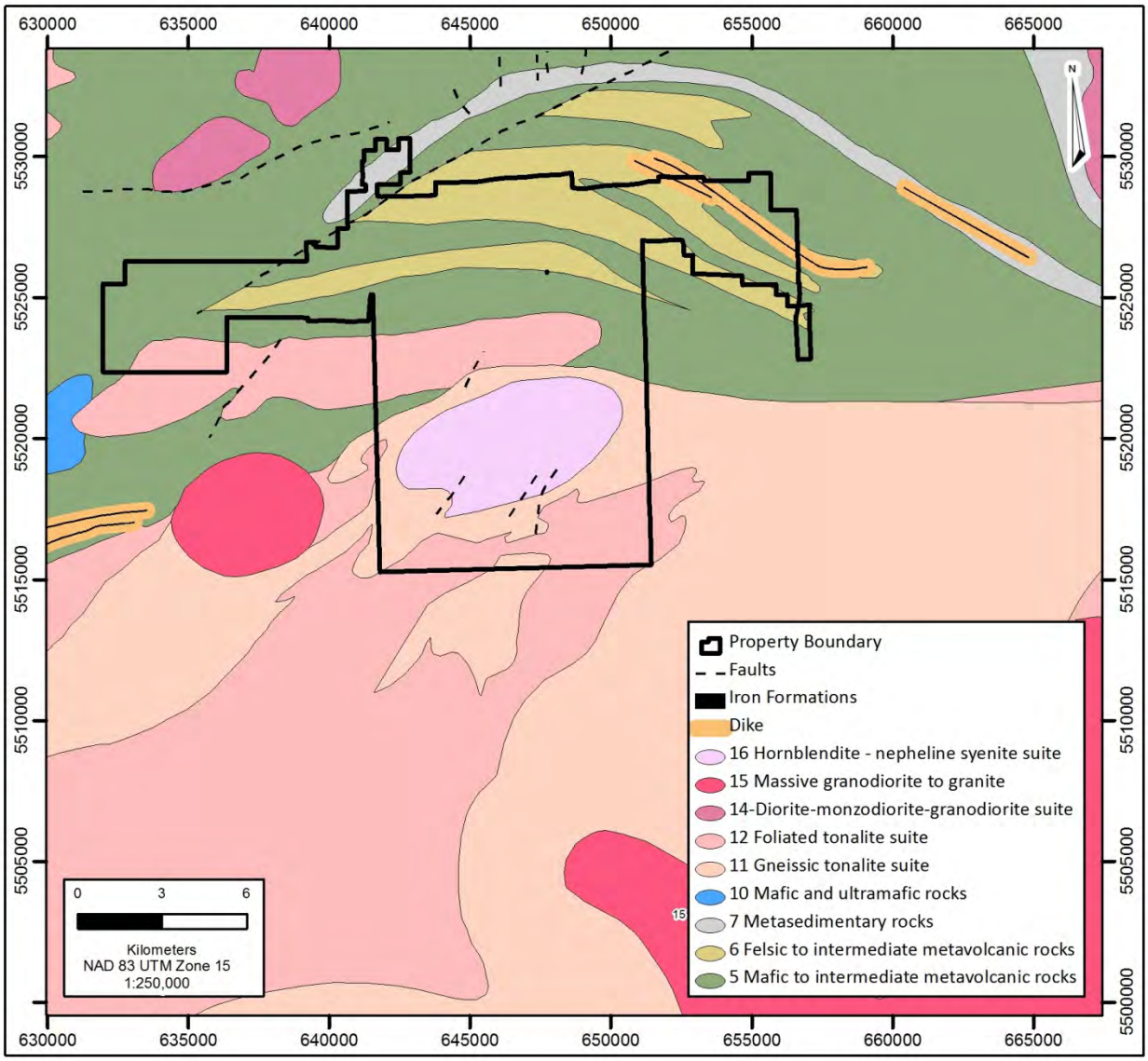


Figure 3: Regional Geology Map.

4.0 2013 Winter Drill Program

The objective of the drill program was to discover an economic volcanogenic massive sulphide (VMS) deposit in the Sturgeon Lake camp. Mineralization is likely to occur within felsic volcanic units, at the upper contact of the pyroclastic felsic units with the volcaniclastic sediments.

A total of 11 holes were drilled (Table 3) and drilling was completely by Major Drilling on the property between January 16, 2013 and June 30, 2013.

Drill holes were surveyed for changes in dip and direction using a reflex instrument. Readings were taken every 30 metres.

The on-site management of the drill program was carried out by professional geologists employed by Clark Exploration Consulting Inc. Procedures were provided and supervised by Glencore geologists and all analytical results were supplied directly to Glencore by ALS Minerals and Agat Laboratories.

Drill core logging and sampling was carried out on site and all drill core is also being stored on site. All samples were collected and prepared in accordance with Glencore procedures and shipped to ALS Chemex and Agat Laboratories at their facilities in Thunder Bay, Ontario and Mississauga, Ontario.

A total of 708 assays were submitted for analysis. Assay certificates can be found in Appendix E.

Please see Appendices B, C, and D for a drill hole plan map, drill logs, and drill hole sections.

Table 3: Drill Hole Details.

Hole ID	Easting	Northing	Azimuth	Dip	Depth	Elevation
15-108	641758	5526981	125	-80	962	410
15-109	641596	5526960	150	-65	828	410
F-143	640709	5526339	125	-80	854	410
F-149	641344	5526052	152	-50	302	422
F-150	641383	5526249	152	-78	611	422
F-151	641042	5526728	155	-55	324	408
F-152	641042	5526728	155	-60	829	408
F-153	641236	5526942	155	-72	948	412
F-154	641027	5526746	145	-70	336	408
F-154A	641027	5526746	145	-70	789	408
F-155	641188	5526863	155	-65	900	409

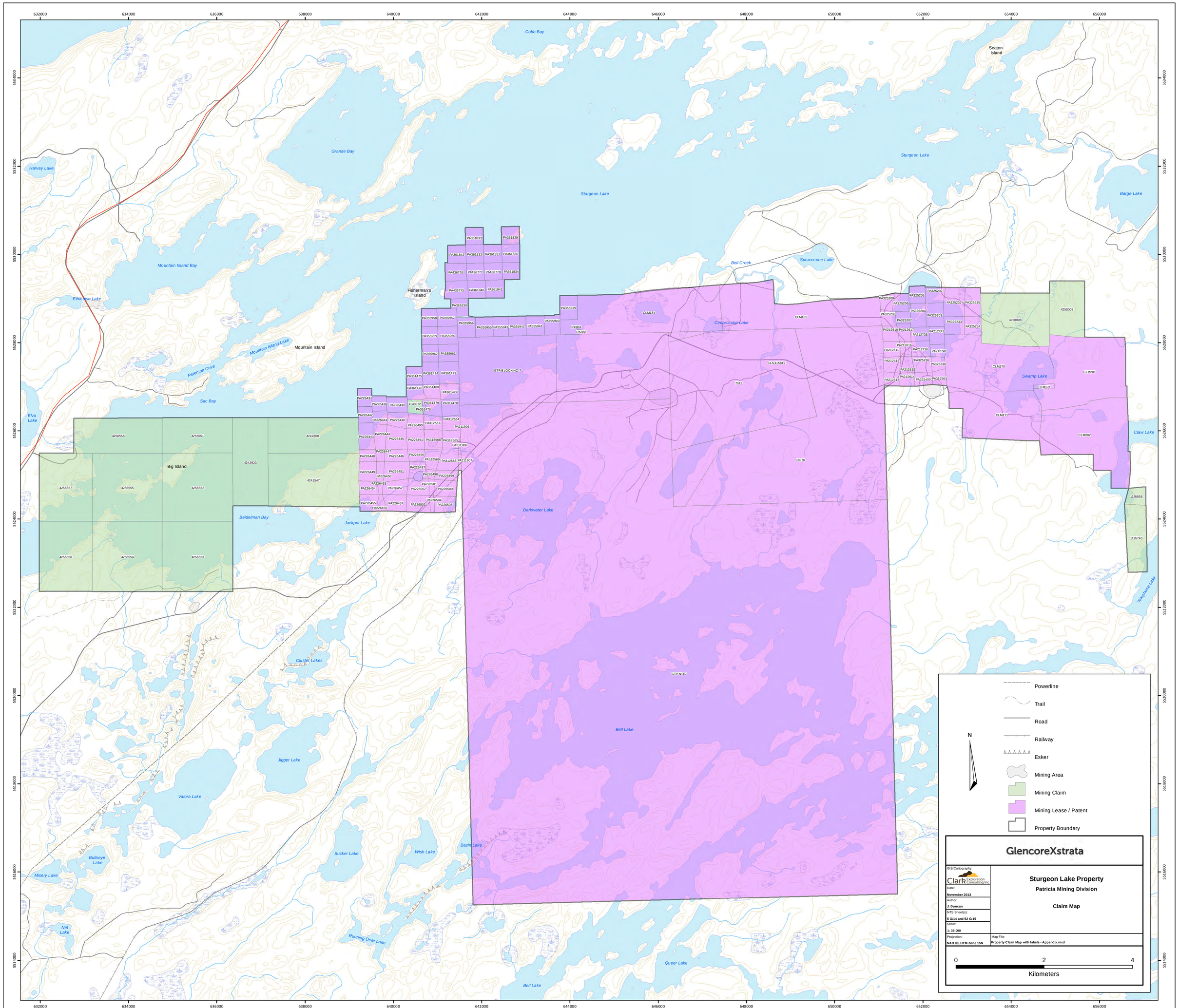
5.0 Conclusion and Recommendations

More drilling is warranted on the property.

Appendices

Appendix A

Claim Map


Cobb Bay
Seaton Island
Granite Bay
Harvey Lake
Sturgeon Lake
Barge Lake
Mountain Island Bay
Bell Creek
Sprucecone Lake
Fisherman's Island
Elmhouse Lake
Cedarclump Lake
Mountain Island Lake
Mountain Island
Peterson Cove
Sac Bay
Swamp Lake
Elva Lake
Claw Lake
Big Island
Darkwater Lake
Beidelman Bay
Jackpot Lake
Telephone Lake
Cluster Lakes
Jigger Lake
Valora Lake
Bullseye Lake
Misery Lake
Sucker Lake
Wish Lake
Basin Lake
Net Lake
Running Deer Lake
Queer Lake
Bell Lake
GTP.BLOCK NO.7
GTP.NO.7
CLM184
CLM185
CLS 115819
CLM170
CLM171
CLM201
CLM202
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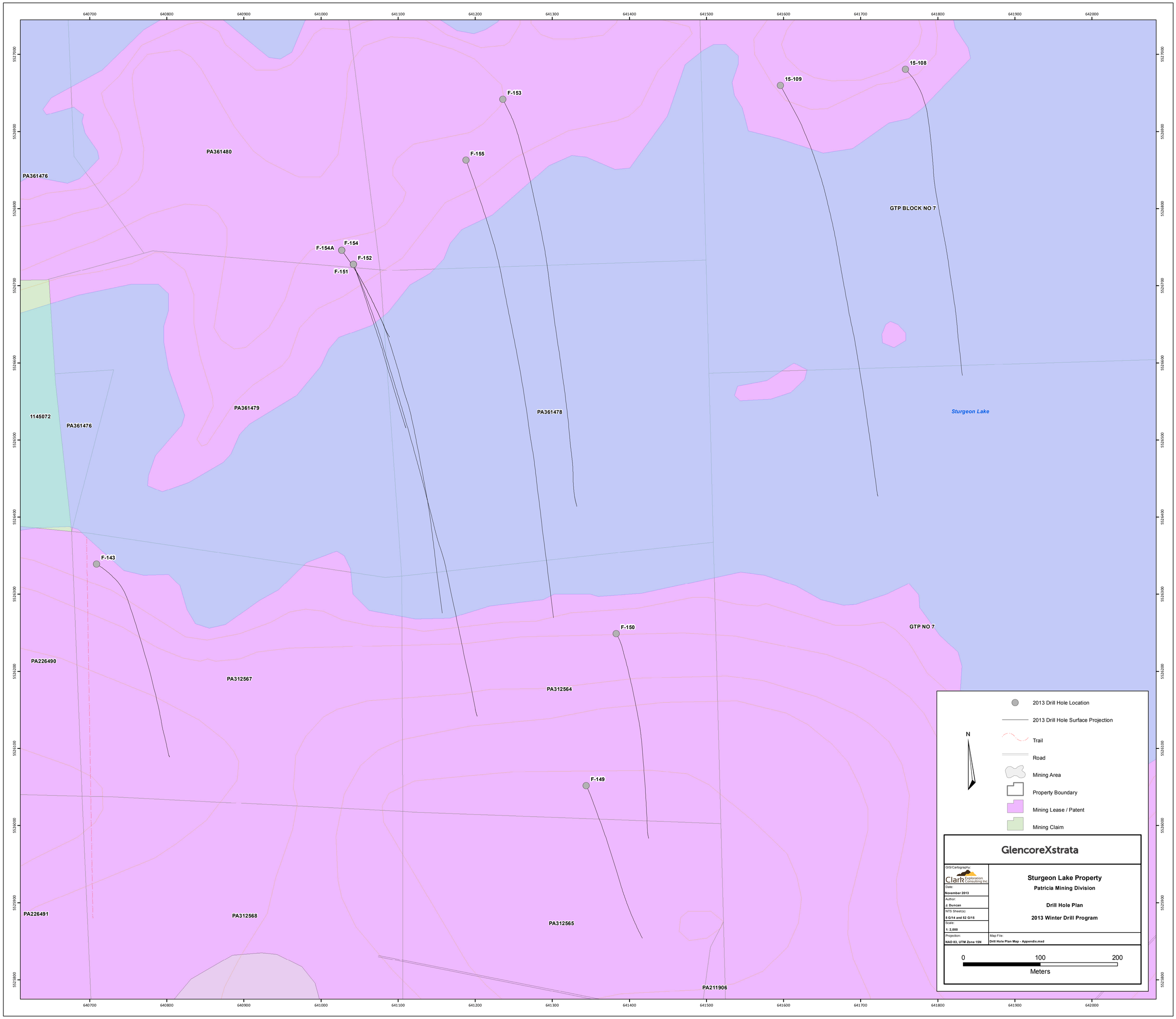
4256558
4256554
4256553
Powerline
Trail
Road
Railway
Esker
Mining Area
Mining Claim
Mining Lease / Patent
Property Boundary
N
GlencoreXstrata
GIS/Cartography:
Clark Exploration Consulting Inc.
Date:
November 2013
Author:
J. Duncan
NTS Sheet(s):
5 G/14 and 52 G/15
Scale:
1: 35,000
Projection:
NAD 83, UTM Zone 15N
Sturgeon Lake Property
Patricia Mining Division
Claim Map
Map File:
Property Claim Map with labels - Appendix.mxd
0
2
4
Kilometers

Appendix B

Drill Hole Plan Map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641200
641300
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5526100
5526000
5525900
5525800
F-153
15-108
15-109
F-155
PA361480
PA361476
GTP BLOCK NO 7
F-154A
F-154
F-152
F-151
PA361479
PA361478
1145072
PA361476
Sturgeon Lake
F-143
F-150
GTP NO 7
PA226490
PA312567
PA312564
F-149
PA226491
PA312568
PA312565
PA211906
2013 Drill Hole Location
2013 Drill Hole Surface Projection
N
Trail
Road
Mining Area
Property Boundary
Mining Lease / Patent
Mining Claim
GlencoreXstrata
GIS/Cartography:
Clark Exploration Consulting Inc.
Date:
November 2013
Author:
J. Duncan
NTS Sheet(s):
5 G/14 and 52 G/15
Scale:
1: 2,000
Projection:
NAD 83, UTM Zone 15N
Sturgeon Lake Property
Patricia Mining Division
Drill Hole Plan
2013 Winter Drill Program
Map File:
Drill Hole Plan Map - Appendix.mxd
0
100
200
Meters

Appendix C

Drill Logs

Xstrata Zinc Canada Exploration

DDH: **15-108**

Claims title:
Township:
Range:
Lot:

Section:
Level:
Work place:

Drilled by: Major Drilling
Described by: Des Cullen / Doug McKay

From: 2/28/2013
To: 3/10/2013

Description date: 3/10/2013

Collar

Azimuth: 125.00°
Dip: -80.00°
Length: 962.00 m

UTM (NAD83-15)

East	641,758.000
North	5,526,981.000
Elevation	410.000

Averages - Composites

Zone	From	To	Length	Hor. th.	Ver. th.	True th.	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)

Description

Core size: NQ
Cemented: No
Stored: Yes

Down hole survey

Type	Depth	Azimuth	Dip	Invalid
Reflex	71.00	138.90°	-80.50°	No
Reflex	101.00	145.40°	-80.50°	No
Reflex	110.00	146.90°	-80.10°	No
Reflex	140.00	151.50°	-80.00°	No
Reflex	170.00	151.30°	-79.40°	No
Reflex	200.00	155.00°	-79.10°	No
Reflex	230.00	159.60°	-79.20°	No
Reflex	260.00	163.40°	-79.10°	No
Reflex	290.00	160.40°	-78.60°	No
Reflex	320.00	165.10°	-77.30°	No
Reflex	350.00	171.20°	-74.80°	No
Reflex	380.00	171.80°	-73.30°	No
Reflex	410.00	172.30°	-72.90°	No
Reflex	440.00	173.60°	-71.90°	No
Reflex	584.00	176.00°	-64.40°	No
Reflex	614.00	172.30°	-59.20°	No
Reflex	644.00	169.70°	-53.00°	No
Reflex	674.00	169.40°	-49.90°	No
Reflex	704.00	169.60°	-48.00°	No
Reflex	734.00	169.30°	-46.50°	No
Reflex	764.00	171.50°	-44.00°	No
Reflex	794.00	171.90°	-43.40°	No
Reflex	824.00	171.10°	-40.30°	No
Reflex	854.00	172.20°	-38.80°	No
Reflex	884.00	175.50°	-37.70°	No
Reflex	914.00	173.20°	-37.40°	No
Reflex	944.00	174.10°	-36.30°	No
Reflex	962.00	173.50°	-35.60°	No

Type	Depth	Azimuth	Dip	Invalid

Description			Assay								
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
0.00	2.50	MO **Over Burden** Casing/overburden									
2.50	310.00	V3 **Mafic Flow** Massive mafic flow, dark greenish-grey to locally black, fine grained to finer medium grained, massive, composed of 5% tiny white crystals set in a very finer mafic groundmass, locally moderately to weakly magnetic, overall 3% erratic white quartz-carbonate stringers, veinlets and veins, locally up to 10% quartz-carbonate veinlets over 1 to 2 metres, lack of sulphide mineralization; locally foliated at 30 degrees to core axis; trace to locally 1% fine to medium grained disseminated pyrite; lower contact sharp and regular at 40-45 degrees to core axis, with about a 5cm quartz vein									
44.60	46.40	FLT **Fault Zone** Late fault zone, blocky-broken core with local clay gouge, locally shear-foliated @ 35 to core axis, subjective upper and lower contacts.									
51.50	55.20	FLT **Fault Zone** Late fault zone, blocky-broken core with local minor clay gouge, locally shear-foliated @ 30 to core axis, 5% erratic white carbonate and quartz-carbonate stringers and veinlets.									
56.00	57.00	QV **Quartz Vein** Quartz vein sub-parallels core axis, brecciated, moderate red hematite staining, vein orientation at 0 to 10 degrees to core axis, irregular upper and lower contacts, minor to weakly hematized quartz veinlets downhole 4 to 5 metres from main vein.									
63.80	65.70	QV **Quartz Vein** Intermittent epidotized quartz vein, hole appers to be edge of vein-in and out of 10-25cm wide vein over interval, vein is predominantly brecciated to locally sheared, may be related to earlier fault zone, contacts from 0 to 15 drgrees to core axis.									
119.70	120.30	FLT									

Description			Assay								
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		Fault Zone Fault zone; intensely fractured-blocky core; low angle fracturing; moderate to strong hematite-limonite staining on fracture surfaces									
149.60	151.10	I2J **Diorite** Diorite dyke; medium grained; weakly to moderately foliated at 45 degrees to core axis; composed of 70% <1mm to 3mm sub-rounded feldspar crystals set in a darker grey matrix; sharp upper contact at 40 degrees to core axis; assimilated lower contact at ~45 degrees to core axis									
161.60	163.00	V3 **Mafic Flow** Mafic flow/tuff; 20% foliation parallel to intensely deformed creamy white feldspathic veinlets									
163.20	164.90	I2J **Diorite** Intermediate dyke (Diorite - almost looks syenitic); grey; medium grained; massive; composed of 20% 1-3mm blck mafic crystals set in a medium grey feldspathic matrix, cut by a low angle 2cm wide quartz at upper contact containing 3% small red patches/infillings - hematite? minor Py and Cpy vein oriented at 10 degrees to core axis; contacts at 50 degrees to core axis									
310.00	320.60	V1B **Rhyolite** Light grey-beige to locally light green-grey; predominantly fine grained with ~1%, locally up to 2-3% quartz eyes, clear to grey, rounded to sub-angular, 1-2mm, locally up to ~4mm; Local moderate sericite and chlorite, often in seams; weak bedding at 40 degrees to core axis; also local feldspar phenocrysts2-3mm (amygdules? - appear zoned); lower contact gradational									
320.60	354.10	V1C **Rhyodacite** Quartz and feldspar-phric rhyodacite flow; medium grey-green; up to ~10% quartz eyes locally, 1-4mm in diameter, clear to grey, sub-rounded to sub-angular; up to 5-7% feldspar phenocrysts, up to 4-5mm, sub-angular, white to grey; weak to moderate chlorite throughout; local	353.10	354.10	K015618	1.00	NC	NC	NC	NC	NC

Description			Assay								
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		moderate sericite;trace pyrite; lower contact sharp and irregular at ~35-40 degrees									
354.10	369.75	V1C **Rhyodacite** Unit is similar to above but quartz eyes are absent to very rare (trace); feldspar phenocrysts have decreased to 2-3%; top 5-6m exhibit angular fragments/shards up to ~1cm, dark green - possibly flow breccia; local pyrite mineralization up to 20% over 20cm - 1-2% overall; lower contact sharp and regular at 45 degrees to core axis	354.10 355.60 357.10 358.80	355.60 357.10 358.80 390.80	K015619 K015620 K015621 K015622	1.50 1.50 1.70 32.00	NC NC NC NC	NC NC NC NC	NC NC NC NC	NC NC NC NC	NC NC NC NC
354.10	358.80	Py2-3% **Pyrite 2-3%** 2-3% stringer pyrite - possible sphalerite? darker brown-bronze coloured, very fine grained mineral with pyrite									
359.90	360.90	FLT **Fault Zone** Moderate to strong foliation/shgearing at 45 degrees to core axis; moderate to strong quartz flooding/veining with carbonate and feldspar; ~1cm of gouge/clay									
368.10	368.25	Py25% **Pyrite 25%** 25% pyrite stringers									
369.75	776.60	I2J **Diorite** Medium grey-green; fine to medium grained, with 1-2% quartz and feldspar phenocrysts/amygdules, clear to grey to white, rounded to sub-rounded, 2-10mm; below ~503m phenocrysts are absent to rare; weak to moderate foliation/bedding at 40-45 degrees to core axis, chaning to 45-55 downhole; occasional quartz-carbonate fractures and veinlets at variable core angles; local chloritic clots (altered amphiboles?) ~1mm wide by up to 3-4mm long, elongated parallel to foliation; trace/rare pyrite commonly in individual, medium-sized grains, and often associated with quartz-carb veins; towards the end of the unit it exhibits occasional intermediate dykes or possibly intercalated volcanics related to the unit below; loer contact is sharp and regular at 45 degrees to core axis, but as mentioned, somewhat arbitrary due to									

Description			Assay								
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		the dykes/intercalated volcanic units									
412.70	419.20	FLT **Fault Zone** Fault zone; moderately to strongly broken/blocky core with occasional irregular quartz-carbonate veining; moderate hematite staining; local vugs; locally bleached									
437.00	439.80	FLT **Fault Zone** Moderately broken core; local moderate breccia with quartz-carb cavity-filling; from 439.2 to 439.7 looks like a mylonite - white to pale green-grey; strongly foliated @ 45 degrees; strong sericite and moderate chlorite									
441.10	449.40	V1D; V2J **Dacite; Andesite** Flow breccia/flow top? Variably sheared/foliated at 40-45 degrees to core axis; locally exhibits angular top sub-angular clasts/fragments (breccia?); local quartz-carb veining/flooding up to 20cm; occasional pyrite stringers/blebs - trace to 0.5% overall									
484.10	486.10	I3 **Mafic Dike** Massive mafic dyke - fine grained; massive; equigranular; medium grey-green									
494.60	495.40	I2J **Diorite** Diorite dyke; medium to lighter green-grey, with common dark green (chlorite?) clots and wisps parallel to foliation at 45 degrees to core axis									
736.35	737.00	I2 **Intermediate Dyke 60°** Lighter grey-green; medium to fime grained; moderate foliation at 60 degrees, defined by chlorite (+biotite?); contacts sharp and regular at 60 degrees to core axis									
753.15	754.30	I2 **Intermediate Dyke**									

Description			Assay								
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		Intermediate porphyry dyke or intercalated volcanic related to unit below; medium to coarse grained with local feldspar phenocrysts up to 3-4mm									
763.10	765.80	V2J; I2 **Andesite; Intermediate Dyke** Looks like a porphyritic intermediate dyke - possibly an intercalated section of the volcanics below; medium to coarse grained; medium green-grey; moderate foliation at 55-60 degrees, primarily defined by chlorite; upper contact sharp/regular at 60 degrees, lower at 80 degrees									
776.60	820.40	V1B; V1C **Rhyolite; Rhyodacite** Darker grey to light tan-beige coloured rock. Unit appears to be intercalated zones of varitextured pyroclastic material with more generally massive felsic-intermediate flows with gradational contacts. Unit is gernerally aphanitic with short intervals of 5-10% chlorite/chloritoid that define a weak to moderate foliation in the rock at ~45 TCA as well as the odd 1-3mm bluish quartz eye associated with the more felisic/sericitized areas and some fine-medium grained subhedral fedspars in the darker more massive zones. Zones of chert-mudstone appear with the unit and display either folding or soft-sediment-deformation. Overall the unit is moderately silicified and sericitized. Unit is weakly mineralized with disseminated and stringer pyrite with local values approaching 25% over cm-scale intervals.									
776.60	820.40	Ser; Sil **Sericitisation; Silicification** Local intervals of strong sericite alteration (meter scale), overall unit appears to have moderate pervasive silicification.									
781.00	789.00	Py2-3%, Locally 25% **Pyrite 2-3%, Locally 25%** Overall about 2-3% disseminated and disseminated stringers of pyrite mineralization. Locally occur as mm-cm scale clusters of disseminated clots. Stringers reaching 25% disseminated pyrite are cm to sub-cm in scale at about 45 TCA	781.00	782.00	K015804	1.00	0.01	0.00	0.00	0.00	1.25
			782.00	783.00	K015805	1.00	0.01	0.00	0.01	0.01	1.25
			783.00	784.00	K015806	1.00	0.00	0.00	0.01	0.00	1.25
			784.00	785.00	K015807	1.00	0.01	0.00	0.00	0.00	1.25
			785.00	786.00	K015808	1.00	0.01	0.01	0.00	0.00	1.25
			786.00	787.00	K015810	1.00	0.00	0.00	0.00	0.00	1.25
			787.00	788.00	K015811	1.00	0.00	0.00	0.00	0.00	1.25
			788.00	789.00	K015812	1.00	0.00	0.00	0.00	0.00	1.25
820.40	867.30	V1B; Bed **Rhyolite; Bedded** Beige to grey green quartz-phyric pyroclastic flow and ash deposits.									

Description			Assay								
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		Bedding / foliation throughout the unit is roughly 50 TCA defined by deformed lapilli and chlorite seams. Unit is similar to above but due to the consistency of repeating deformed lapilli and ash deposits it was broken out as an individual unit. Upper contact is sharp at 50 TCA. Overall the unit consists of agglomerates of deformed pyroclastic material (lapilli) that vary in size but are roughly 1cm x 5cm in size on average and consist of sericitzed felsic material. These units are gradational in their amounts and size of lapilli and are usually separated by a 10-30cm crystal-ash tuff. Units contain varying amounts and types of quartz eyes. Upper units contain 1-5% 1-3mm bluish quartz eyes, while a couple of units near 857m contain 10-15% 0.5mm greyish quartz eyes. Unit is moderately sericitized and silicified and contains chlorite throughout usually as bedding parallel euhedral disseminate "streaks" of fine grained chlorite. Two sections of mineralization are present in the unit with overall pyrite 5-8% and containing localized disseminated pyrite stringers locally over 10's of cm's. Trace cpy noted in two spots as fine grained blebs, and trace-1% honey sphalerite appears over a roughly 3m section in the middle of the hole as disseminations intermingled with the pyrite.									
820.40	868.30	Ser; Sil	823.00	824.00	K015813	1.00	0.01	0.00	0.00	0.00	1.25
		Sericitisation; Silicification									
		Unit is moderately sericitized and silicified.									
824.00	830.30	Py3%	824.00	825.50	K015814	1.50	0.01	0.00	0.00	0.00	1.25
		Pyrite 3%	825.50	827.00	K015815	1.50	0.01	0.00	0.00	0.00	1.25
		Disseminated	827.00	828.50	K015816	1.50	0.01	0.00	0.00	0.00	1.25
			828.50	830.00	K015817	1.50	0.02	0.00	0.00	0.00	1.25
			830.00	831.50	K015818	1.50	0.24	0.00	0.01	0.01	1.25
830.30	831.30	Py10%									
		Pyrite 10%									
		Disseminated stringers ~1-3cm wide									
831.30	837.80	Py1-2%	831.50	833.00	K015819	1.50	0.17	0.00	0.04	0.01	2.80
		Pyrite 1-2%	833.00	834.00	K015820	1.00	0.29	0.00	0.01	0.00	1.25
		Disseminated	834.00	835.00	K015822	1.00	0.13	0.01	0.00	0.00	1.25
			835.00	836.00	K015823	1.00	0.05	0.00	0.00	0.00	1.25
			836.00	837.00	K015825	1.00	0.23	0.00	0.00	0.00	1.25
			837.00	838.00	K015826	1.00	0.08	0.00	0.00	0.00	1.25
			838.00	839.00	K015827	1.00	0.21	0.00	0.00	0.00	1.25
			853.00	854.00	K015828	1.00	0.01	0.00	0.00	0.00	1.25

Description			Assay							
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
854.00	854.80	Py12% **Pyrite 12%** Disseminated stringers 1-3cm wide	854.00	855.00	K015829	1.00	0.03	0.00	0.00	0.01	1.25
854.80	856.10	Py3-4%; CpTrace **Pyrite 3-4%; Chalcopyrite Trace** Disseminated pyrite, one lonely speck of chalco noted associated with pyrite	855.00	856.10	K015830	1.10	0.01	0.00	0.00	0.00	1.25
			856.10	857.50	K015831	1.40	0.01	0.00	0.00	0.00	1.25
			860.90	861.90	K015832	1.00	0.01	0.00	0.00	0.00	1.25
861.90	863.00	Py12 **Pyrite 12%** Disseminated stringers 1-3 cm wide	861.90	863.00	K015833	1.10	0.01	0.01	0.00	0.01	1.25
863.00	866.00	Py1-2% **Pyrite 1-2%** Trace pyrite with some local disseminations as stringers near middle of section, overall 1-2% in section	863.00	864.50	K015834	1.50	0.01	0.00	0.00	0.01	1.25
			864.50	866.00	K015835	1.50	0.00	0.00	0.00	0.00	1.25
			866.00	867.00	K015836	1.00	0.00	0.00	0.00	0.00	1.25
867.30	872.10	I2 **Intermediate Dyke** Dark grey-green in colour, sharp upper contact at 70 TCA with chill margin, lower also has chill margin but contact is brecciated with a 5cm barren quartz vein. Unit is aphanitic with vfg chl (retro amph?), non-foliated									
872.10	898.10	TU2 **Intermediate tuf** Intermediate ash tuffs? Grey-green in colour with strong bedding / foliation defined by tabular chld (meta after mafic portions of tuff?) having an angle of 50 TCA. Groundmass is aphanitic. Foliation as well as lighter / darker zones with sharp contacts and no flow-bx suggest a series of ash tuffs vs. intermediate volcanics. Zone from 886-891.5 shows an overprinting of 1-4mm white-pink porphroblasts that cross-cut foliation (garnet?). Small zones/patches of fg magnetite. Upper contact brecciated with quartz vein, lower contact sharp and roughly perpendicular TCA.	881.00	882.30	K015838	1.30	0.01	0.00	0.00	0.00	1.25
			882.70	884.00	K015839	1.30	0.01	0.01	0.00	0.00	1.25
			884.00	885.50	K015840	1.50	0.01	0.00	0.00	0.00	1.25
			885.50	887.00	K015841	1.50	0.01	0.00	0.00	0.00	1.25
886.00	891.50	OWeak **Other Weak** garnet? porphyroblasts 1-3mm in size	887.00	888.50	K015843	1.50	0.01	0.00	0.00	0.00	1.25
			888.50	890.00	K015844	1.50	0.01	0.00	0.00	0.00	1.25
			890.00	891.50	K015845	1.50	0.01	0.00	0.00	0.01	1.25
			891.50	893.00	K015846	1.50	0.01	0.01	0.00	0.00	1.25
			893.00	894.50	K015847	1.50	0.01	0.00	0.00	0.00	1.25
			894.50	896.00	K015849	1.50	0.01	0.00	0.00	0.00	1.25
			896.00	897.50	K015850	1.50	0.01	0.01	0.00	0.00	1.25

Description			Assay								
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
			897.50	898.10	K015851	0.60	0.01	0.01	0.00	0.00	1.25
898.10	921.80	V1B; TU1; TL1 **Rhyolite; Felsic tuf; Felsic lapilli tuf** Quartz-phyric lapilli-ash tuffs and breccias (flow tops?) - Rhyolite - Overall light-grey to beige in colour with shorter intervals of darker grey aphanitic material (ash?). Unit is foliated / beded at 50 TCA. Unit contains a consistent amount of 10-15% quartz eyes that are generally sub-rounded, 0.5 to 1.5mm in size, and are grey to grey-blue in colour. Quartz eye fragments are rare. Lapilli are generally flattened/welded 1x6cm cream coloured felsic (sericitic?) fragments with some larger fragments approaching 30cm. All fragmentals also contain quartz eyes. Larger fragments are pink-samlon coloured but are infrequent. "Mafic" lapilli fragments are also present though in lesser proportion. All brecciated zones are short intervals (5 cm) with very angular pieces surrounded by sericitic material (increased fluid flow?). Overall the unit contains 2-3% pyrite as disseminations and 1cm wide disseminated stringers and locally up to 5% pyrite over 10's of cm.									
898.10	921.80	SilModerate **Silicification Moderate** Moderately silicified									
898.10	921.80	Py2-3% **Pyrite 2-3%** 2-3% pyrite as disseminations and 1cm wide disseminated stringers and locally up to 5% pyrite over 10's of cm.	898.40	899.00	K015852	0.60	0.00	0.00	0.00	0.00	1.25
			899.00	900.50	K015853	1.50	0.01	0.00	0.00	0.00	1.25
			900.50	902.00	K015854	1.50	0.01	0.00	0.00	0.00	1.25
			902.00	903.50	K015855	1.50	0.01	0.00	0.00	0.00	1.25
			903.50	905.00	K015856	1.50	0.01	0.00	0.00	0.00	1.25
			905.00	906.50	K015858	1.50	0.01	0.00	0.00	0.01	1.25
			906.50	908.00	K015859	1.50	0.01	0.00	0.00	0.00	1.25
			908.00	909.50	K015860	1.50	0.01	0.00	0.00	0.00	1.25
			909.50	911.00	K015861	1.50	0.01	0.00	0.00	0.00	1.25
			911.00	912.50	K015862	1.50	0.01	0.00	0.00	0.00	1.25
			912.50	914.00	K015863	1.50	0.01	0.00	0.00	0.00	1.25
			914.00	915.50	K015865	1.50	0.01	0.00	0.00	0.00	1.25
			915.50	917.00	K015866	1.50	0.01	0.00	0.00	0.00	1.25
			917.00	918.50	K015867	1.50	0.01	0.00	0.00	0.00	1.25
			918.50	920.00	K015868	1.50	0.01	0.00	0.00	0.00	1.25
			920.00	921.00	K015869	1.00	0.01	0.00	0.00	0.00	1.25

Description			Assay								
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
			921.00	921.80	K015870	0.80	0.01	0.00	0.00	0.00	1.25
921.80	944.00	TU2; TU1; S10 **Intermediate tuf; Felsic tuf; Chert** Heterolithic intermediate-to-felsic lapilli-ash volcaniclastic seds? intercalated with brecciated chert horizons. Grey to light grey in colour, upper contact sharp and irregular at roughly 80 TCA marked by the appearance of whitish-grey jig-saw chert breccia. Unit consists of short intervals (5-30cm) of cherty jig-saw breccia (breccia clasts ~3-5cm in size) with darker inter-breccia glassy/mafic? infilling (hyaloclastite?), often zones are gradational but can also have sharp contacts with adjacent zones that it is intercalated with; adjacent to chert horizons are aphanitic units with varying amounts of rounded and angular lapilli sized fragments ranging in composition from chert to an aphanitic felsic material, to felsic material with fg suspended angular mafic fragments, to mafic (dark grey). Unit is weakly to moderately foliated at 50 TCA. Pyrite mineralization is continuous through contact with above unit and is the same style and intensitiy (overall2-3% pyrite as disseminations and 1cm wide disseminated stringers and locally up to 5% pyrite over 10's of cm). One cpy bleb ~1cm wide suspended in 2cm wide qv at 935.3.									
921.80	944.00	Py2-3%; Cptr **Pyrite 2-3%; Chalcopyrite tr** overall2-3% pyrite as disseminations and 1cm wide disseminated stringers and locally up to 5% pyrite over 10's of cm One cpy bleb ~1cm wide suspended in 2cm wide qv at 935.3.	921.80	923.00	K015871	1.20	0.01	0.01	0.00	0.01	1.25
			923.00	924.50	K015873	1.50	0.01	0.00	0.00	0.00	1.25
			924.50	925.70	K015874	1.20	0.01	0.00	0.00	0.00	1.25
			926.00	927.50	K015875	1.50	0.01	0.00	0.00	0.00	1.25
			927.50	929.00	K015876	1.50	0.01	0.00	0.00	0.00	1.25
			929.00	930.50	K015877	1.50	0.01	0.00	0.00	0.00	1.25
			930.50	932.00	K015878	1.50	0.01	0.00	0.00	0.00	1.25
			932.00	933.50	K015879	1.50	0.01	0.00	0.00	0.00	1.25
			933.50	935.00	K015880	1.50	0.02	0.00	0.00	0.02	1.25
			935.00	936.50	K015881	1.50	0.02	0.01	0.00	0.00	1.25
			936.50	938.00	K015883	1.50	0.02	0.00	0.00	0.00	1.25
			938.00	939.50	K015885	1.50	0.01	0.01	0.00	0.00	1.25
			939.50	941.00	K015886	1.50	0.01	0.00	0.00	0.00	1.25
			941.00	942.50	K015887	1.50	0.01	0.00	0.00	0.00	1.25
			942.50	944.00	K015888	1.50	0.01	0.00	0.00	0.00	1.25
944.00	962.00	TU1; V1B; TU2; S10 **Felsic tuf; Rhyolite; Intermediate tuf; Chert** Felsic Lapilli-ash +/- block tuff/agglomerate + short chert intervals. At									

Description			Assay								
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		944m unit begins a gradational change into a more chaotic looking / varitextured felsic (rhyolite) pyroclastic unit. ~5-10% larger blocks (15-30cm in size) consisting of a creamy beige coloured rhyolite that is qtz-phyric (1-3% 0.5-1.5mm rounded and angular (50:50) greyish coloured quartz eyes in an aphanitic groundmass). The contacts with these blocks is chaotic from perpindicular TCA to sub-parallel TCA. These are embedded in a multi-phase groundmass that varys from: weakly bedded/foliated sericitized qtz-phyric lapilli-ash tuff +/- short intervals of breccia, and contains 5-10% darker grey cm-sized fragments and lapilli along with rhyolite fragments and lapilli; to a moderately foliated (50 TCA) more uniform fg ash tuff that in places is qtz-feld phyric. Near EOH there are two short (5-10cm) zones of a less well defined chert-breccia as described in above unit. Overall unit is moderately silicified and weakly sericitized. Overall the unit contains ~2% pyrite with the top of zone weakly mineralized with trace to 1% fg pyrite and increasing down hole. Final ~7m contains about 3% pyrite present as disseminations and stringers of disseminated pyrite - locally up to 5% over 10's of cm.								
944.00	962.00	SilModerate **Silicification Moderate** Moderate silicification									
944.00	962.00	Py02 **Pyrite 2%** Overall the unit contains ~2% pyrite with the top of zone weakly mineralized with trace to 1% fg pyrite and increasing down hole. Final ~7m contains about 3% pyrite present as disseminations and stringers of disseminated pyrite - locally up to 5% over 10's of cm	944.00	945.50	K015889	1.50	0.01	0.00	0.00	0.00	1.25
			945.50	947.00	K015890	1.50	0.01	0.00	0.00	0.00	1.25
			947.30	948.50	K015891	1.20	0.01	0.00	0.00	0.02	1.25
			948.50	950.00	K015892	1.50	0.01	0.00	0.00	0.00	1.25
			950.00	951.50	K015893	1.50	0.01	0.00	0.00	0.00	1.25
			951.50	953.00	K015895	1.50	0.01	0.00	0.00	0.00	1.25
			953.00	954.50	K015896	1.50	0.01	0.00	0.00	0.01	1.25
			954.50	956.00	K015897	1.50	0.01	0.00	0.00	0.00	1.25
			956.00	957.50	K015898	1.50	0.01	0.00	0.00	0.00	1.25
			957.50	959.00	K015899	1.50	0.01	0.00	0.00	0.00	1.25
			959.00	960.50	K015900	1.50	0.01	0.00	0.00	0.00	1.25
			960.50	962.00	K015901	1.50	0.01	0.00	0.00	0.00	1.25
962.00		**End of DDH** **Number of samples: 91** **Number of QAQC samples: 12** **Total sampled length: 152.00**									

Xstrata Zinc Canada Exploration

DDH: **15-109**

Claims title:
Township:
Range:
Lot:
From: 4/25/2013
To:

Section:
Level:
Work place:
Description date:

Drilled by: Major Drilling
Described by: Des Cullen / Doug McKay

Collar

Azimuth: 150.00°
Dip: -65.00°
Length: 828.00 m

UTM (NAD83-15)

East	641,596.000
North	5,526,960.000
Elevation	410.000

Averages - Composites

Zone	From	To	Length	Hor. th.	Ver. th.	True th.	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)

Description

Core size: NQ
Cemented: No
Stored: Yes

Down hole survey

Type	Depth	Azimuth	Dip	Invalid
Reflex	99.00	151.70°	-61.90°	No
Reflex	129.00	157.90°	-59.90°	No
Reflex	159.00	157.00°	-58.40°	No
Reflex	189.00	159.30°	-57.30°	No
Reflex	219.00	161.70°	-55.80°	No
Reflex	252.00	162.50°	-54.70°	No
Reflex	279.00	164.70°	-53.80°	No
Reflex	309.00	166.90°	-52.80°	No
Reflex	339.00	166.50°	-50.70°	No
Reflex	369.00	167.90°	-49.60°	No
Reflex	399.00	169.80°	-48.30°	No
Reflex	429.00	170.00°	-46.80°	No
Reflex	459.00	169.90°	-44.30°	No
Reflex	492.00	169.10°	-42.80°	No
Reflex	519.00	169.90°	-42.00°	No
Reflex	549.00	167.40°	-40.70°	No
Reflex	579.00	170.00°	-39.50°	No
Reflex	609.00	170.70°	-38.10°	No
Reflex	639.00	171.10°	-37.10°	No
Reflex	669.00	171.50°	-36.60°	No
Reflex	699.00	172.30°	-35.90°	No
Reflex	729.00	171.10°	-35.10°	No
Reflex	759.00	172.90°	-34.40°	No
Reflex	789.00	172.00°	-32.50°	No
Reflex	822.00	172.80°	-30.80°	No

Type	Depth	Azimuth	Dip	Invalid

Description			Assay							
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
0.00	5.50	MO **Over Burden** Overburden. Of note, the interval from 5.0 to 5.5m comprises broken rounded pieces of andesite that may represent broken-up bedrock.									
5.50	162.45	V2J; FOL **Andesite; Foliated** Medium to dark greenish grey, fine- to locally medium-grained, relatively soft, weakly to locally moderately foliated (50 to 55 degrees t.c.a.), weakly to locally moderately fractured and blocky over narrow (<25cm) intervals, weakly to locally strongly calcium-carbonatized, weakly silicified with narrow (typically 1-3mm wide but locally up to 10cm), variably-oriented quartz-calcite+/- iron-carbonate veinlets, weakly to locally moderately magnetic. Typically contains trace amounts of pyrite as fine-grained disseminated anhedral grains and more rarely as medium-grained euhedra locallized along fractures and as isolated cyrstals up to 5mm across. Trace to minor amounts of fine-to medium-grained magnetite occur as disseminated grains usually in association with pyrite and more rarely as fine- to medium-grained anhedral crystals within narrow quartz-carbonate veinlets. Rare, subrounded, calcite-filled amygdules up to 5mm in diameter occur locally. Locally weakly hematitized along fractures and adjacent to quartz-carbonate veinlets. Locally plagioclase-phyric (white to buff, subhedral phenocrysts 1-2mm in size). Moderately epidotized over narrow (1 to 5mm) intervals adjacent to some of the quartz-carbonate veinlets. Rare fine-grained chalcopyrite occurs locally within narrow (1-2mm), late-stage fractures in asociation with fine-grained pyrite (eg: at 101.42, 102.25 & 142.35m). A narrow, strongly foliated, intercalated, intermediate to felsic, quartz crystal tuff occurs between 102.50 and 106.70m. The upper contact with the surrounding andesite is sharp and undulose. The lower contact is gradational over about 25cm. Another intermediate to felsic quartz crystal tuff unit begins at 162.45m. The contact with this unit is gradational over about 25cm. Of note, both units are markedly magnetic in the vicinity of the contact due to the presence of 3-5%, fine- to medium-grained disseminated magnetite.									
5.50	102.50	Pytr; Mttr **Pyrite tr; Magnetite tr** Fine- grained disseminated pyrite and more localized intervals of spotty magnetite occur throughout this unit. Rare pyrite euhedra									

Description			Assay							
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		up to 5mm occur locally.									
99.28	99.76	SerMod; SilMod; AnkWk **Sericitisation Mod; Silicification Mod; Ankeritisation Wk** Stongly deformed looking interval comprising 40% buff to light greyish-white disrupted quartz-carbonate veinlets and 30% contorted, light greenish-beige streaky patches of sericite.									
102.50	106.70	SilMod; SerStg **Silicification Mod; Sericitisation Stg** co-mingled streaks and mottled bands of light greenish-beige, fine-grained sericite and light gray-white patches and disrupted veinlets (?) of quartz									
102.50	106.70	Py1% **Pyrite 1%** Minor amounts of fg py as diss grains and locallized within poorly defined, irregular wisps									
106.70	161.54	Pytr; Mttr **Pyrite tr; Magnetite tr** Fine- grained disseminated pyrite and localized intervals of spotty magnetite occur throughout this unit. Rare pyrite euhedra up to 5mm occur locally.									
161.54	165.56	Mt3-5% **Magnetite 3-5%** markedly magnetic interval containing 3-5% disseminated grains of fine- to medium-grained magnetite straddling the andesite/intermediate to felsic crystal tuff boundary.									
162.45	333.30	TX1; TX2; TL2; Bed; FOL **Felsic cristal tuf; Intermediate cristal tuf; Intermediate lapilli tuf; Bedded; Foliated** Intercalated sequence of felsic to intermediate (i.e.: rhyodacitic to dacitic), dominantly quartz-plagioclase crystal tuffs +/- lapilli tuffs. Streaky to mottled in shades of slightly pinkish to purpleish light greenish-gray (where magnetite- rich), pale yellowish-green (where strongly sericitized) & medium to dark grayish-green (where relatively unaltered), locally thinly banded (bedded?) at 50 to 70 degrees tca, moderately foliated at 50 degrees tca, generally weakly fractured but occasional intervals of broken and blocky core occur locally as outlined below, moderately to locally strongly sericitized, weakly silicified and carbonatized with narrow (up to 3cm wide) variably-oriented, quartz-calcite +/- iron carbonate veinlets, locally weakly hematitized. Typically contain trace amounts of fine- to medium-grained pyrite as									

Description	Assay								
	From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
disseminated grains. Locally weakly to moderately magnetic due to the presence of minor amounts of fine- to medium-grained magnetite primarily as disseminated grains, but also localized in small (1-3mm in diameter) rounded "spots" in association with fine-grained pyrite. These rocks typically contain 2-3% poorly sorted, subangular to subrounded, light to medium gray, ocassionaly fractured quartz "eyes" (phenocrysts) 0.1 to 1mm in diameter set in a fine-grained sericitic matrix. Rare, flattened, felsic lapilli up to 3cm x 0.5cm occur locally and are aligned parallel to foliation. Within the less sericitized, darker grayish-green intervals, 3-5% subangular relict plagioclase phenocrysts (1-3mm) are evident. Of note, the upper 3m of this pyroclastic package is moderately to strongly magnetic and contains 3-5% fine-to medium-grained magnetite as disseminated grains. Narrow (1-2m wide) intervals containing 3-5%, buff to light gray, subrounded, quartz-filled amygdules (?) up to 0.5 x 1cm in diameter occur locally. Narrow (20 to 50cm wide), medium- to coarse-grained, moderately foliated, dioritic dikes comprising ~15% dark green phenocrysts (altered hornblende or pyroxene ?) set in a light greensih-gray matrix of altered plagioclase (?) occur locally (e.g.: from 231.82 to 232.02, 242.50 to 242.70, 264.08 to 264.60, & 329.40 to 329.75m) . These dikes have sharp contacts, fine-grained, chilled margins and a distinctive spotted appearance. Foliation parallel, narrow streaks and fracture coatings of pinkish- to reddish-brown hematite occur from 223.95 to 224.45m & 225.55 to 225.70m. A relatively wide interval of broken, blocky core occurs from 265.1 to 273m. Most of the broken surfaces are coated with hematite suggesting prolonged circulation of iron-bearing ground water. The tuffs are gradually becoming more massive, finer-grained, and darker greenish-gray (i.e.: dacitic-looking) with increasing depth, especially below about 300m. The interval between 300 and 323m contains 1-2% irregular to subrounded, quartz+/- carbonate-filled amygdules and markedly fewer quartz & plagioclase pyroclasts/phenocrysts than present higher in the volcanic sucession.									

Description			Assay							
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		Narrow (3mm wide), discontinuous, microfolded veilets of fine-grained magnetite +/- quartz & calcite occur at 328.55 & 330.18m and may be related to the intrusion of the underlying diorite? The contact with the underlying diorite is sharp, oriented at 70 degrees tca, and marked by a narrow (1cm wide) quartz-iron carbonate veinlet.									
165.56	229.80	PyTr; Mt<1% **Pyrite Tr; Magnetite <1%** Fine- grained disseminated pyrite and localized intervals of spotty magnetite occur throughout this unit.									
175.75	179.20	SerStg **Sericitisation Stg** Light greenish-gray, relatively hard, moderately foliated (50 degrees tca) interval containing 1-2%, poorly sorted, glassy, light gray, subangular to subrounded quartz eyes from <0.5 to 1.5mm in diameter. Contains rare amounts of fine-grained disseminated pyrite. May represent a rhyolitic, quartz crystal tuff intercalated with the surrounding dacitic rocks.									
223.95	224.45	HemMod **Hematisation Mod** Foliation parallel, narrow streaks and fracture coatings of pinkish- to reddish-brown hematite.									
225.55	225.70	HemMod **Hematisation Mod** Foliation parallel, narrow streaks and fracture coatings of pinkish- to reddish-brown hematite.									
229.80	231.82	Py1%; Mttr **Pyrite 1%; Magnetite tr** 1% fine-grained pyrite localized within narrow (1mm wide) fractures in association with quartz, along foliation planes and as disseminated grains.									
231.82	232.02	I2J; FOL **Diorite; Foliated** Medium- to coarse-grained, moderately foliated, dioritic dike comprising ~25% dark green phenocrysts (altered hornblende or pyroxene ?) set in a light greensih-gray matrix of altered plagioclase (?) giving rise to a distinctive spotted appearance. Has chilled, fine-grained margins. Contacts are sharp and parallel to the local foliation at 50 degrees tca.									

Description			Assay							
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
231.82	328.55	Mt<1%; Pytr **Magnetite <1%; Pyrite tr** Fine- grained disseminated pyrite and localized intervals of spotty magnetite occur throughout this unit									
242.50	242.70	I2J; FOL **Diorite; Foliated** Similar to dike at 231.82 to 232.02m.									
264.08	264.60	I2J; FOL **Diorite; Foliated** Similar to the 2 previously intersected dioritic dikes, but wider and with contacts at 70 degrees tca.									
328.55	328.58	Mt90% **Magnetite 90%** Discontinuous, microfolded veinlet of fine-grained magnetite +/- quartz and calcite.									
328.58	330.18	Mt<1%; PyTr **Magnetite <1%; Pyrite Tr** Fine-grained disseminated grains.									
329.40	329.75	I2J; FOL **Diorite; Foliated** Similar to the previously intersected dioritic dikes, upper & lower contacts sharp at 70 & 60 degrees tca, respectively.									
330.18	330.21	Mt90% **Magnetite 90%** Discontinuous, microfolded veinlet of fine-grained magnetite +/- quartz and calcite.									
330.21	355.35	Mt<1%; PyTr **Magnetite <1%; Pyrite Tr** Trace to minor amounts of fg to mg disseminated magnetite and trace amounts of fg diss py.									
333.30	494.50	I2J; FOL **Diorite; Foliated** Medium to dark grayish-green, medium- to coarse-grained, relatively soft, weakly fractured, weakly to moderately foliated (50 - 60 degrees tca), locally weakly silicified and carbonatized with 2-3%, widely spaced, variably-oriented, narrow (up to 10cm wide), quartz-iron carbonate veinlets that occasionally contain minor amounts of medium-grained pyrite and more rarely coarse-grained anhedral blebs of chalcopyrite (e.g. from 355.35 to 355.45m). This unit typically contains trace amounts of fine grained disseminated pyrite and is weakly to locally strongly									

Description			Assay							
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		magnetic due to presence of variable amounts of fine-grained disseminated magnetite. Locally this unit has a distinctive spotted appearance arising from the presence of 10 - 15% dark green flattened, foliation-parallel, chloritic wisps (altered amphiboles/pyroxenes?) up to 1x5mm set in a medium grayish-green matrix. A narrow interval of moderate sericitization with relict chloritic spots occurs from 347.20 to 349.48. Narrow (decimetre-scale) intervals containing up to 10% slightly flattened quartz-calcite-filled amygdules up to 1 x 0.5cm in diameter occur locally (e.g.: within the section from 402 - 409m). These may reflect the presence of some intercalated mafic flows (?) or perhaps resulted from intrusion of dioritic magma at relatively shallow depths within the volcanic pile. Narrow (decimetre-scale), non-magnetic, medium greenish-gray, medium-grained, plagioclase- +/- quartz- phyric, intermediate (quartz-diorite?) dikes intrude the diorite locally (e.g.: from 463.20 to 463.50m, 484.10 to 484.55m, & 485.70 to 485.83m). A narrow interval of broken, blocky core occurs from 461.65 to 462.00m. Lower contact with int-felsic tuffs is subtle and oriented at ~50 degrees tca.									
347.20	349.48	SerMod **Sericitisation Mod** Lighter greenish gray interval containing 10% relict chlorite spots suggesting it is altered diorite and not a separate unit.									
355.35	355.45	Py2-3% **Pyrite 2-3%** 10cm wide quartz-iron carbonate veinlet containing 2-3% anhedral blebs and patches of fine-grained py & cpy up to 2cm x 1cm									
355.45	463.20	Mt<1%; PyTr **Magnetite <1%; Pyrite Tr** Trace to minor amounts of fg to mg disseminated magnetite and trace amounts of fg diss py.									
453.90	459.70	HemWk									

Description			Assay								
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		Hematisation Wk 5% variably-oriented, narrow, hematite-stained fractures and quartz-carbaonate veinlets.									
463.20	463.50	I2; MED GRN **Intermediate Dyke; Medium Grained** Non-magnetic, medium greenish-gray, medium-grained, plagioclase- +/- quartz- phyric, intermediate (quartz-diorite?) dike. Upper contact lobate. Lower contact sharp at 70 degrees tca. Of note this dike and the surrounding diorite are both cross-cut by a narrow, later-stage quartz-carbonate veinlet.									
463.20	463.50	PyTr **Pyrite Tr** Trace amounts of fg diss py									
463.50	484.10	MtTr; PyTr **Magnetite Tr; Pyrite Tr** Trace amounts of fine grained disseminated py & mgnt									
484.10	484.55	I2; MED GRN **Intermediate Dyke; Medium Grained** Similar to dike above from 463.20 to 463.50m. Upper contact lobate and distinctly intrusive looking. Lower contact obscure.									
484.10	484.55	PyTr **Pyrite Tr** Trace amounts of fg diss py									
484.55	485.70	MtTr; PyTr **Magnetite Tr; Pyrite Tr** Trace amounts of fg diss py & mgnt									
485.70	485.83	I2; MED GRN **Intermediate Dyke; Medium Grained** Similar to dike above from 463.20 to 463.50m. Both contacts sharp at 70 degrees tca.									
485.70	494.50	PyTr **Pyrite Tr** Trace amounts of fg diss py									
494.50	633.99	TX2; TU2; TX1; TL1 **Intermediate cristal tuf; Intermediate tuf; Felsic cristal tuf; Felsic lapilli tuf** Intercalated sequence of locally thinly banded (bedded? at 60 degrees tca), medium to light greenish-gray to light gray, intermediate to felsic, dominantly quartz +/- plag crystal tuffs with occasional ash beds and localized felsic lapilli. These rocks are typically weakly to locally									

Description	Assay								
	From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
moderately foliated (60 degrees tca gradually steepening to 70 degrees tca as dip of hole shallows with increasing depth) and weakly to locally strongly fractured over narrow intervals. They are locally moderately chloritized (foliation parallel wisps and fracture fillings) and locally strongly and pervasively silicified and weakly sericitized especially in the vicinity of the semi massive sulphide mineralization described below. Narrow (up to 2cm wide), widely spaced, variably oriented, quartz-Fe-carbonate +/- calcite veinlets occur throughout. These rocks are typically non-magnetic except in vicinity of the semi-massive sulphide mineralization which contains 5-10% magnetic pyrrhotite. Hematite stained fractures and quartz-carb veins are locally abundant especially near the upper contact. Several narrow (<1m wide), variably spaced dioritic dikes occur within this pyroclastic package. The quartz-plag crystal tuffs typically comprise varying amounts (<1% to up to 3-5%) of poorly sorted, blue gray to gray, subangular to subrounded, sometimes fractured, quartz eyes (pyroclasts) from <0.5mm to 5mm in diameter and variable amounts (up to 30%) of buff to white, subangular, slightly flattened, relic plagioclase up to 2mm x 1mm set in a fine-grained locally siliceous matrix. The tuffs typically contain trace amounts of fine-grained pyrite as disseminated grains but several narrow (decimetre scale) intervals of semi-massive, stringer type pyrite +/- pyrrhotite occur locally within strongly silicified felsic quartz crystal tuff comprising 2-3% poorly sorted subangular to subrounded blue gray quartz eyes (<0.5mm 3mm in diameter) set in a vfg creamy light gray matrix. The mineralization includes: 535.97 to 539.96m: 10% fg py + po overall including: 537.40 to 537.52m: 35% fg -mg py & 5% vfg po 538.25 to 538.55m: 55% fg-mg py & 5% vfg po 538.80 to 539.51m: 30% fg-mg py & 10% vfg po 544.86 to 545.76m: 25% fg-mg py & 5% vfg po Rare amounts of fg cpy and sph were observed in a weakly mineralized interval from 535.97 to 536.13m containing 2-3% vfg po & 1% fg-mg py. The other sulphide mineralized sections listed above appear to be barren of cpy & sph.									

Description			Assay							
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		Weakly hematitized from 453.90 to 459.70m. A narrow interval of broken, blocky core occurs between 502 and 504m. Chloritoid spotting (typically 2-3% but locally up to 5% over narrow intervals) becomes more prevalent below 570m. Ocassional (1-2%), slightly flattened felsic lapilli up to 1.5 x 0.5cm occur from 593.75 to 597.17m Contact with underlying blue quartz eye crystal tuff is sharp at 70 degrees tca.									
498.33	498.40	I2J; FOL **Diorite; Foliated** Narrow dike similar to those present higher in the hole.									
498.95	498.99	I2J; FOL **Diorite; Foliated** Narrow dike similar to those present higher in the hole.									
509.34	509.42	I2J; FOL **Diorite; Foliated** Narrow dike similar to those present higher in the hole.									
509.60	509.85	I2J; FOL **Diorite; Foliated** Narrow dike similar to those present higher in the hole.	534.97	535.97	M829266	1.00					
535.97	536.13	Po2-3%; Py1%; CpTr; SpTr **Pyrrhotite 2-3%; Pyrite 1%; Chalcopyrite Tr; Sphalerite Tr** 2-3% vfg po, 1% fg-mg py, tr fg cpy, & very rare fg sph localized in discontinuous, narrow (2-3mm wide) foliation parallel stringers, wispy bands and fracture fillings.	535.97	536.47	M829267	0.50					
536.27	536.46	Py3-5%; Po3-5% **Pyrite 3-5%; Pyrrhotite 3-5%** Subequal amounts of fg-mg py and vfg po locallized in poorly	536.47	537.40	M829268	0.93					

Description			Assay							
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		defined foliation parallel wispy bands/ stringers									
537.40	537.42	Py20%; Po20%	537.40	538.40	M829269	1.00					
		Pyrite 20%; Pyrrhotite 20%									
		net-textured stringers of semi-massive vfg po & fg-mg py									
538.25	538.55	Py50%; Po5%	538.40	539.40	M829270	1.00					
		Pyrite 50%; Pyrrhotite 5%									
		net-textured stringers of semi-massive fg-mg py & vfg po									
		possible geopysical conductor									
538.80	539.51	Py30%	539.40	539.96	M829271	0.56					
		Pyrite 30%									
		net-textured stringers of semi-massive fg-mg py & vfg po									
539.77	539.96	Py15%	539.96	541.46	M829272	1.50					
		Pyrite 15%	541.46	543.00	M829273	1.54					
		stringers of semi-massive fg-mg py & vfg po	543.00	544.86	M829274	1.86					
			544.86	545.76	M829276	0.90					
			545.76	546.50	M829277	0.74					
546.01	546.11	Po5%; Py5%									
		Pyrrhotite 5%; Pyrite 5%									
		10% discontinuous, contorted seams & patches of subequal vfg po & fg-mg py									
546.50	547.22	I2J; FOL	546.50	547.22	M829278	0.72					
		Diorite; Foliated									
		Narrow dike similar to those present higher in the hole.									
547.22	547.34	Py2.5%; Po2.5%	547.22	548.72	M829279	1.50					
		Pyrite 2.5%; Pyrrhotite 2.5%									
		5% discontinuous, wispy, foliation parallel seams & patches of subequal vfg po & fg-mg py									
551.54	553.60	SilStg to Mod; SerWk									
		Silicification Stg to Mod; Sericitisation Wk									
		Creamy light grey pervasive to patchy silicification with local wk sericitization.									
554.73	555.04	I2J; FOL									
		Diorite; Foliated									
		Narrow dike similar to those present higher in the hole.									
555.29	555.34	I2J; FOL									
		Diorite; Foliated									
		Narrow dike similar to those present higher in the hole.									

Description			Assay								
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
555.88	556.94	I2J; FOL **Diorite; Foliated** Narrow dike similar to those present higher in the hole.									
563.38	566.30	I2J; FOL **Diorite; Foliated** Narrow dike similar to those present higher in the hole. Contains a xenolith of quartz crystal tuff from 565.80 to 565.96m.									
570.00	570.28	I2J; FOL **Diorite; Foliated** Narrow dike similar to those present higher in the hole.									
571.46	571.54	I2J; FOL **Diorite; Foliated** Narrow dike similar to those present higher in the hole.									
572.80	572.92	I2J; FOL **Diorite; Foliated** Narrow dike similar to those present higher in the hole.									
573.00	573.27	I2J; FOL **Diorite; Foliated** Narrow dike similar to those present higher in the hole.									
582.63	582.83	Bed; TU2 **Bedded; Intermediate tuf** Fine-grained, mottled gray ash bed. Contacts with surrounding int. crystal tuffs are sharp at 80 degrees tca.									
597.17	597.90	I2; CRS GRN **Intermediate Dyke; Coarse Grained** dark green, coarse-grained, massive, intermediate (quartz-dioritic?) dike, sharp intrusive contacts with chilled margins oriented at 45 degrees tca	624.00	625.01	M829280	1.01					
625.00	626.92	S6; Bed **Mudrock; Bedded** Banded (bedded? at 80 degrees tca) dark gray, very fine-grained, weakly fractured mudstone. 1-2% fg py & po locallized in thin (1-3mm wide) bands (beds?)									
625.00	626.92	Py1%; Po1% **Pyrite 1%; Pyrrhotite 1%** 1-2% fg py & po locallized in narrow (1-3mm wide) bands/beds within a mudstone unit	625.01 626.00 626.92 627.92 629.30	626.00 626.92 627.92 629.30 630.80	M829281 M829282 M829283 M829284 M829286	0.99 0.92 1.00 1.38 1.50					

Description			Assay							
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
			630.80	632.30	M829287	1.50					
632.30	636.50	SerStg **Sericitisation Stg** light greenish gray, patchy & streaky to pervasive sericitization	632.30	633.30	M829288	1.00					
632.40	632.45	Py1%; Po<1%; SpTr **Pyrite 1%; Pyrrhotite <1%; Sphalerite Tr** 1% fg-mg py & vfg po with trace vfg reddish brown sph locallized in streaky, foliation-parallel wisps and anhedral patches;	633.30	633.99	M829289	0.69					
633.42	633.55	Py1%; Po1%; SpTr **Pyrite 1%; Pyrrhotite 1%; Sphalerite Tr** 1-2% fg-mg py & vfg po with trace vfg reddish brown sph locallized in narrow (up to 1cm wide) poorly defined, contorted bands subparallel to foliation/bedding									
633.99	701.65	TX1; RUB; FOL **Felsic cristal tuf; Banded; Foliated** Banded to streaky in shades of light and medium gray (depending on degree of sericitization and/or silicification), moderately foliated (70 degrees tca), weakly fractured, moderately to locally strongly sericitized; typically contains 2-3% (locally 10% over narrow intervals), poorly sorted, angular to sub-rounded, often fractured, blue-gray quartz eyes from <0.5 to 4mm in diameter set in a fine-grained sericite-rich matrix. Dark green spots of chloritoid (1-2mm) are locally abundant. Narrow veinlets of chlorite occur locally. This unit typically contains minor amounts of vfg-mg py, but narrow, semi-massive and massive stringers/bands occur locally over decimetre- and centimetre-scale intervals,respectively, as outlined in the mineralization section. Trace amounts of fg reddish-brown sphalerite and very rare chalcopyrite and galena (a few specks of each) occur locally in association with some of the pyrite mineralization, but no base metal mineralization of significance is present (i.e.: no real "mineralized zones"). The semi-massive and massive stringers/bands of pyrite mineralization probably account for the off-hole geophysical conductors detected in nearby hole 15-108. Of note, a little (1%) pyrrhotite is associated with the pyrite in the top metre or so of this unit, but is conspicuously absent further down. Narrow dikes of foliated diorite occur locally. The contact with the underlying massive diorite is sharp at 80 degrees	633.99	634.99	M829291	1.00					
			634.99	635.99	M829292	1.00					
			635.99	637.03	M829293	1.04					
			637.03	637.54	M829294	0.51					
			637.54	639.00	M829295	1.46					
			639.00	640.80	M829296	1.80					
			640.80	642.30	M829297	1.50					
			642.30	643.80	M829298	1.50					

Description			Assay								
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		tca.									
633.99	634.92	Py2%; Po1%; SpTr **Pyrite 2%; Pyrrhotite 1%; Sphalerite Tr** 2-3% fg-mg py & vfg po with trace vfg reddish brown sph locallized in narrow (up to 1cm wide) poorly defined, contorted bands subparallel to foliation/bedding									
642.55	645.90	Py1%; SpTr; Cpvery rare **Pyrite 1%; Sphalerite Tr; Chalcopyrite very rare** 1% fg-mg py, trace fg reddish-brown sph & very rare fg blebby cpy; primarily as foliation-parallel wisps and narrow discontinuous bands/streaks, irregular flattened patches and diss grains	643.80 645.30 646.80	645.30 646.80 648.38	M829299 M829301 M829302	1.50 1.50 1.58					
648.38	648.83	I2J; FOL **Diorite; Foliated** Narrow foliated diorite dike similar to those present higher in the hole.	648.38	649.88	M829303	1.50					
648.93	649.06	I2J; FOL **Diorite; Foliated** Narrow foliated diorite dike similar to those present higher in the hole.									
649.74	652.79	FOL; I2J **Foliated; Diorite** Narrow foliated diorite dike similar to those present higher in the hole.	649.88 651.38	651.38 653.50	M829304 M829305	1.50 2.12					
652.79	653.18	I2J; FOL **Diorite; Foliated** Narrow foliated diorite dike similar to those present higher in the hole.									
653.50	654.60	Py3-5% **Pyrite 3-5%** 3-5% fg-mg py as foliation/bedding-parallel streaky discontinuous bands, irregular patches and narrow (up to 5cm wide) semi-massive (40%) bands	653.50 654.60 656.10	654.60 656.10 657.70	M829306 M829307 M829308	1.10 1.50 1.60					
657.70	658.20	QV **Quartz Vein** gray-white quartz-Fe carb vein with 20% tourmaline and 1-2% py	657.70	658.88	M829309	1.18					

Description			Assay							
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
658.88	660.60	Py2-3% **Pyrite 2-3%** 2-3% vfg-mg py primarily as foliation-parallel wisps diss grains and narrow (1-3mm wide), discontinuous seams, rare fg mgnt	658.88	660.60	M829311	1.72					
			660.60	661.98	M829312	1.38					
			661.98	663.38	M829313	1.40					
			663.38	664.88	M829314	1.50					
			664.88	666.38	M829316	1.50					
665.90	668.18	SerStr **Sericitisation Str** light greenish gray strongly sericitized interval with 1% relict blue-gray qtz eyes	666.38	667.88	M829317	1.50					
			667.88	669.09	M829318	1.21					
669.09	669.49	Py5%; GALvery rare; SpTr **Pyrite 5%; Galena very rare; Sphalerite Tr** 5% vfg-mg py localized in irregular patches and as diss grains, trace sph & very rare (2 specks) galena	669.09	669.59	M829319	0.50					
			669.59	669.98	M829320	0.39					
669.69	672.00	SerStg **Sericitisation Stg** light greenish grey interval of moderate to strong sericitization	670.28	671.78	M829321	1.50					
			671.78	673.28	M829322	1.50					
			673.28	674.67	M829323	1.39					
			674.67	675.17	M829324	0.50					
675.17	675.94	Py40%; Spvery rare **Pyrite 40%; Sphalerite very rare** interval of semi-massive (40% overall) fg-mg py mineralization including a narrow (11cm wide) band of massive (95%) pyrite from 675.27 to 675.38), very rare fg reddish to orangish-brown sph, 1-2% relict blue-gray quartz eyes probable geopysical conductor	675.17	675.94	M829326	0.77					
			675.94	676.44	M829327	0.50					
			676.44	677.94	M829328	1.50					
			677.94	679.44	M829329	1.50					
			679.44	680.94	M829330	1.50					
			680.94	681.86	M829331	0.92					
681.86	682.93	Py5-7% **Pyrite 5-7%** 5-7% fg-mg py overall with a narrow (6cm wide), foliation-parallel band of semi-massive (60%) py from 682.08 - 682.14m	681.86	682.93	M829332	1.07					
682.93	689.80	Py2-3% **Pyrite 2-3%** 2-3% fg-mg py as diss grains, small anhedral patches, foliation-parallel streaky wisps and narrow fracture fillings, mineralization is associated with locally strong silicification and brecciation defined by narrow fracture-fillings of chlorite	682.93	684.43	M829333	1.50					
			684.43	685.93	M829334	1.50					
			685.93	687.43	M829336	1.50					
			687.43	688.93	M829337	1.50					
			688.93	690.43	M829338	1.50					
			690.43	691.93	M829339	1.50					
			691.93	693.43	M829341	1.50					

Description			Assay							
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
692.35	693.65	Py1-2%	693.43	694.93	M829342	1.50					
		Pyrite 1-2%	694.93	696.43	M829343	1.50					
		1-2% vfg - mg py	696.43	697.60	M829344	1.17					
			697.90	699.40	M829345	1.50					
			699.40	700.29	M829346	0.89					
700.29	700.71	Py2-3%	700.29	700.71	M829347	0.42					
		Pyrite 2-3%	700.71	701.65	M829348	0.94					
		2-3% vfg-mg py									
701.65	766.19	I2J; MAS	701.65	703.15	M829349	1.50					
		Diorite; Massive rock									
		Medium greenish-gray, medium-grained, massive to locally weakly foliated (60 degrees tca), weakly fractured, relatively hard, typically weakly magnetic but a couple of narrow (1-2mm wide) veinlets of magnetite occur locally and cause local areas of strong magnetism, typically weakly silicified and carbonatized with narrow (up to 2cm wide), variably oriented quartz-Fe-carbonate veinlets,									
		Xenoliths(?) of foliated felsic quartz crystal tuff containing minor amounts of fg-mg py occur near the upper contact. Xenoliths of more intermediate tuff occur further down hole.									
		Lower contact sharp at 60 degress tca.									
702.35	702.97	TX1	703.15	704.65	M829351	1.50					
		Felsic cristal tuf									
		Xenolith in massive diorite									
707.23	709.38	TX1									
		Felsic cristal tuf									
		Xenolith in massive diorite									
754.28	754.76	TX2									
		Intermediate cristal tuf									
		Xenolith in massive diorite.									
756.42	756.77	TU2	764.69	766.19	M829352	1.50					
		Intermediate tuf									
		Xenolith (?) within massive diorite									
766.19	828.00	TL1; TX1	766.19	767.69	M829353	1.50					
		Felsic lapilli tuf; Felsic cristal tuf	767.69	769.19	M829354	1.50					
		Intercalated sequence of felsic to intermediate (rhyodacitic) lapilli and crystal tuffs. Mottled to banded in various shades of light and medium gray, moderately foliated at 70 degrees tca, locally banded (bedded?) at	769.19	770.69	M829355	1.50					
			770.69	772.34	M829356	1.65					

Description			Assay								
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		70 degrees tca, weakly to locally strongly sericitized and silicified. The lapilli tuffs locally contain up to 10% flattened, often quartz-phyric, felsic lapilli up to 4 x 1cm in size set in a sericitized matrix. The patchy nature of much of the sericitization present gives rise to many "psuedo"- lapilli that can be difficult to distinguish from real ones. Up to 2-3% sub-rounded, grayish-white quartz phenocrysts (pyroclasts?) 1-2mm in diameter occur locally. These are set in a fg sericitized siliceous matrix and are often difficult to discern. Towards the bottom of the hole, the lapilli decrease and the unit becomes more of an ash and crystal tuff. Chloritoid spots are common. Narrow (1-2mm wide), variably oriented veinlets of chlorite occur locally (e.g.: below 789.50m). Of note, very few blue-gray quartz eyes are evident. Several narrow (decimeter-scale) intervals of semi-massive (up to 40%) pyrite mineralization occur locally (see mineralization section for details) and may account for some of the off-hole geophysical conductors detected from nearby hole 15-108. No base metal mineralization of significance is present (i.e.: no real "mineralized zones"). The sulphide content is decreasing with increasing depth, and only trace amounts of fg diss py occurs below 785m.								
766.19	790.00	SerMod **Sericitisation Mod** Patchy moderate sericitization									
772.34	772.87	Py30% **Pyrite 30%** 30% vfg-fg py as diss grains and locallized in narrow (up to 7cm wide) bands/stringers and foliation-parallel streaky discontinuous patches	772.34 772.87	772.87 774.49	M829357 M829358	0.53 1.62					
774.24	774.49	I2J; FOL **Diorite; Foliated** Diorite dike.	774.49	775.93	M829359	1.44					
775.93	776.06	Py40 **Pyrite 40%** semi-massive band of vfg-fg pyrite	775.93	777.10	M829361	1.17					
776.39	777.10	Py10%									

Description			Assay								
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		Pyrite 10% 10% vfg-fg py as disseminated grains and locallized in narrow (up to 5cm wide) bands/stringers, and foliation-parallel streaky discontinuous patches									
777.10	778.70	Py2-3%	777.10	778.60	M829362	1.50					
		Pyrite 2-3%	778.60	780.10	M829363	1.50					
		2-3% f py as diss grains and locallized in foliation-parallel, discontinuous streaky bands and patches	780.10	781.60	M829364	1.50					
			781.60	783.10	M829366	1.50					
			783.10	785.00	M829367	1.90					
			785.00	786.50	M829368	1.50					
790.00	800.00	ChlMod; ChldWk; SerMod									
		Chloritisation Mod; chloritoid Wk; Sericitisation Mod									
		Variably oriented narrow (1-2mm wide) veinlets of chlorite and widespread spots of chloritoid (?)									
798.47	798.87	QV									
		Quartz Vein									
		gray-white quartz-Fe carb vein with 10% tourmaline(?) & patchy chlorite									
828.00		**End of DDH**									
		Number of samples: 91									
		Number of QAQC samples: 12									
		Total sampled length: 115.61									

Xstrata Zinc Canada Exploration

DDH: **F-143**

Claims title:
Township:
Range:
Lot:

Section:
Level:
Work place:

Drilled by: Major Drilling
Described by: Des Cullen / Doug McKay

From: 1/29/2013
To: 2/2/2013

Description date:

Collar

Azimuth: 125.00°
Dip: -80.00°
Length: 854.00 m

UTM (NAD83-15)

East	640,709.000
North	5,526,339.000
Elevation	410.000

Averages - Composites

Zone	From	To	Length	Hor. th.	Ver. th.	True th.	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)

Description

Core size: NQ
Cemented: No
Stored: No

Down hole survey

Type	Depth	Azimuth	Dip	Invalid
Reflex	20.00	122.80°	-79.80°	No
Reflex	50.00	125.80°	-79.30°	No
Reflex	80.00	128.10°	-78.70°	No
Reflex	110.00	130.80°	-78.20°	No
Reflex	140.00	135.40°	-78.30°	No
Reflex	170.00	136.00°	-78.00°	No
Reflex	200.00	143.10°	77.40°	No
Reflex	230.00	148.70°	-76.50°	No
Reflex	260.00	155.50°	-75.10°	No
Reflex	290.00	159.30°	-72.70°	No
Reflex	320.00	161.80°	-70.80°	No
Reflex	350.00	161.80°	-70.30°	No
Reflex	380.00	162.00°	-70.00°	No
Reflex	410.00	162.50°	-69.50°	No
Reflex	440.00	163.80°	-69.40°	No
Reflex	470.00	164.00°	-69.30°	No
Reflex	500.00	162.90°	-69.20°	No
Reflex	530.00	164.40°	-68.90°	No
Reflex	560.00	164.40°	-68.90°	No
Reflex	590.00	165.40°	-68.70°	No
Reflex	620.00	165.60°	-68.40°	No
Reflex	650.00	166.10°	-68.60°	No
Reflex	692.00	166.70°	-68.10°	No
Reflex	722.00	169.10°	-65.30°	No
Reflex	752.00	170.30°	-63.80°	No
Reflex	782.00	165.80°	-62.60°	No
Reflex	812.00	167.30°	-61.40°	No
Reflex	842.00	168.40°	-60.50°	No

Type	Depth	Azimuth	Dip	Invalid

Description				Assay								
				From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
0.00	5.00	MO **Over Burden** Casing to 6m, overburden to 5m										
5.00	33.70	V1B **Rhyolite** Rhyolite Tuff; Medium grey; fine grained; moderately fractured/foliated with irregular, wavy fractures/foliation and chloritic seams - commonly sub-parallel to core axis; siliceous - often cherty-looking; local weak to moderate chloritoid in grains ~1mm in size; occasional quartz-carb fractures and veinlets; trace fine grained pyrite - patchy and fracture-controlled; lower contact sharp and irregular										
5.00	33.70	Chlwk-mod **Chloritisation wk-mod** local weak to moderate chloritoid and pervasive weak to moderate chlorite										
33.70	130.60	I2J **Diorite** Diorite, Transitional; Medium grey; fine to medium grained (locally coarse grained); massive equigranular texture with local amygdular/porphyritic intervals over 10's of centimeters - amygdules are up to 0.5cm and locally strained/stretched; looks like the amydules (or phenocrysts) are quartz + plagioclase (+ possibly dolomite); local hematite fractures; local irregular quartz-carb veins - generally at low core angles, 1-2cm wide; trace fine gained pyite and chalcopyrite; lower contact sharp and somewhat regular at 30 degrees to core axis, with abundant quartz-carb veining for last 1 metre										
33.70	130.60	Hemwk **Hematisation wk** Weak fracture-controlled hematisation										
85.30	87.00	V1B **Rhyolite** Possible inclusion of rhyolite tuff; more siliceous and finer grained than surrounding diorite; moderate chlorite; moderate foliation sub-parallel to core axis; trace to 0.5% disseminated and stringer pyrite										
130.60	152.85	I2J; V2J; MAS **Diorite; Andesite; Massive rock** Diorite/Andesite, Transitional; fine grained; massive to weakly foliated at										

Description			Assay							
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
low core angles; light to medium grey; appears to be fine grained disseminated chloritoid(?) throughout - dark green-black, <0.5mm, 3-5%; rare quartz-carb veinlet; trace disseminated pyrite; lower contact sharp and regular at 45 degrees to c.a.											
152.85	508.10	I2J; RUB **Diorite; Banded** Diorite, Transitional; more mafic, darker grey to green-grey than previous units; fine to locally coarse grained, with some beds of fine material, others exhibiting coarse (up to 1cm) lapilli or lithic fragments - locally feldspar phenocrysts and/or amygdules 1-2mm; moderately bedded at 30 (to locally 40) degrees to core axis, becoming 45-50 degrees below ~275m; local massive beds - generally becoming more massive downhole, and it may be diorite intrusive(?) downhole - the contact is not obvious; occasional quartz-carb veins and patches - locally up to 1-1.5m; weak to moderate chlorite throughout; locally weakly to moderately magnetic; trace pyrite										
171.60	173.30	V2J; RUB **Andesite; Banded** Altered Zone? Or more felsic unit? Light grey - appears bleached, with somewhat diffuse contacts; common quartz-carb veins irregular to regular at 30 degrees to c.a., with chlorite pods and seams, commonly along vein walls (and possibly tourmaline?)									
171.60	173.30	Silmod; Carmod; Chlmod **Silicification mod; Carbonatisation mod; Chloritisation mod** possible pervasive moderate silicification; moderate fracture-controlled carbonate; moderate patchy and fracture-controlled chlorite									
191.20	191.80	V2J; RUB **Andesite; Banded** Large quartz-carb vein (or silicified/carbonatized zone) with local Fe-carb (reddish-brown); moderate chlorite									
191.20	191.80	Silmod; Carmod **Silicification mod; Carbonatisation mod** moderate fracture-controlled silicification/quartz veining; weak to moderate fracture-controlled dolomite and siderite									
193.60	195.20	V2J; RUB **Andesite; Banded**									

Description			Assay							
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		Zone as above with local moderate Fe-carb and/or hematite									
193.60	195.20	Silmod; Carmod **Silicification mod; Carbonatisation mod** moderate fracture-controlled silicification/quartz veining; weak to moderate fracture-controlled dolomite and siderite									
207.30	207.80	V2J; RUB **Andesite; Banded** Zone as above - contacts diffuse/gradational									
207.30	207.80	Silmod; Carwk-mod **Silicification mod; Carbonatisation wk-mod** moderate fracture-controlled silicification/quartz veining; weak to moderate fracture-controlled dolomite and siderite									
229.10	231.03	V2J; I2J; MAS **Andesite; Diorite; Massive rock** Possible diorite intrusive - sharp contacts, coarser grained, with ~20% grains (chloritic clots) up to 3-4mm; contacts @ 60 degrees to c.a.									
277.20	278.20	V2J; RUB **Andesite; Banded** Several quartz-carb (dolomite+siderite) veins, irregular and regular at 45 degrees to core axis									
277.20	278.20	Silmod; Carwk-mod **Silicification mod; Carbonatisation wk-mod** moderate fracture-controlled silicification/quartz veining; weak to moderate fracture-controlled dolomite and siderite									
278.20	280.30	V2J; RUB **Andesite; Banded** Occasional vugs, both in narrow quartz-carb veinlets (3-5mm wide) and disseminated as elongated vugs up to 1mm x 4mm - replacing carb amygdules?									
280.30	281.50	V2J; RUB **Andesite; Banded** Quartz-carb vein or strongly silicified zone with 3-5% reddish-brown siderite, locally strong chlorite (+chloritoid?) and									

Description			Assay								
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		local epidote									
280.30	281.50	Silstrong; Carmod **Silicification strong; Carbonatisation mod** quartz-carb vein or strongly silicified zone with 3-5% reddish-brown siderite, locally strong chlorite (chloritoid?) and local epidote									
283.70	283.90	V2J; RUB **Andesite; Banded** 5-7% siderite with weak to moderate dolomite									
283.70	283.90	Carwk-mod **Carbonatisation wk-mod** moderate fracture-controlled siderite and weak to moderate dolomite									
287.50	287.85	V2J; RUB **Andesite; Banded** Zone of moderate to strong quartz+epidote+chlorite+chloritoid+dolomite									
287.50	287.85	Silmod-str; Epimod; Chlmod-str **Silicification mod-str; Epidotisation mod; Chloritisation mod-str** zone of moderate to strong quartz+epidote+chlorite+chloritoid+dolomite									
297.00	508.10	V2J; I2J; MAS **Andesite; Diorite; Massive rock** Appears to be one large, massive andesite flow/tuff, with occasional quartz-carbonate veinlets/veins at variable core angles - generally less than 1cm; interval still exhibits occasional plagioclase amygdules/phenocrysts; bedding is absent or very weak through interval	507.10	508.10	K015115	1.00	NC	NC	NC	NC	NC
508.10	661.90	I2J; V2J; RUB **Diorite; Andesite; Banded** Diorite/Andesite, Transitional; medium green-grey; fine to medium grained; commonly massive to moderately foliated(bedded?) at 50-60 degrees to core axis; pervasive fine grained (<1mm) disseminated white to greenish grains (plagioclase?) - up to 5-10%; locally zones of bedded tuff with quartz-carb veining parallel to bedding/foliation and weak	508.10 509.00 510.00	509.00 510.00 511.10	K015116 K015117 K015118	0.90 1.00 1.10	NC NC NC	NC NC NC	NC NC NC	NC NC NC	NC NC NC

Description			Assay								
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		stringer and disseminated sulphides (mainly pyrite - trace overall); occasional quartz-carb veinlets and fractures throughout - both regular and irregular, at variable core angles; occasional narrow breccia zones associated with bedded tuff zones; lower contact is gradational/arbitrary - difficult to distinguish where the sediment below begins - picked the area where the sedimentary bedding appears and coincides roughly with increased magnetic susceptibilty; last few metres of this interval may be a volcaniclastic sediment									
508.10	511.10	V1D; RUB **Dacite; Banded** Moderate foliation/bedding at 50-60 degrees to core axis; moderate quartz-carb veining - often weakly brecciated and occasionally vuggy; moderate sericite; weak epidote; trace to 0.5% stringer pyrite and trace chalcopyrite									
508.10	511.10	Silmod; Carmod; Sermod; Epiwk **Silicification mod; Carbonatisation mod; Sericitisation mod; Epidotisation wk** moderate fracture-controlled quartz, dolomite and sericite; also weak epidote									
508.10	511.10	Pytrace-1% **Pyrite trace-1%** trace to 1% stringer pyrite									
511.10	514.50	V1D; MAS **Dacite; Massive rock** Massive dacite with trace to 0.5% disseminated medium grained pyrite									
511.10	514.50	Pytr-0.5% **Pyrite tr-0.5%** trace to 0.5% disseminated pyrite	511.10 512.50 513.50	512.50 513.50 514.50	K015119 K015120 K015121	1.40 1.00 1.00	NC NC NC	NC NC NC	NC NC NC	NC NC NC	NC NC NC
514.50	517.60	V1D; RUB **Dacite; Banded** Zone as from 508.10 to 511.10 with increased quartz-carb and moderate sericite and epidote; 1% disseminated and stringer pyrite									
514.50	517.60	Silmod; Carmod; Sermod; Epiwk **Silicification mod; Carbonatisation mod; Sericitisation**									

Description			Assay							
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		mod; Epidotisation wk									
		moderate fracture-controlled quartz, dolomite and sericite; also weak epidote									
514.50	517.60	Py1%	514.50	515.50	K015122	1.00	NC	NC	NC	NC	NC
		Pyrite 1%	515.50	516.50	K015123	1.00	NC	NC	NC	NC	NC
		1% disseminated and stringer pyrite	516.50	517.60	K015124	1.10	NC	NC	NC	NC	NC
517.60	532.30	V1D; MAS	517.60	518.60	K015126	1.00	NC	NC	NC	NC	NC
		Dacite; Massive rock	532.00	533.00	K015127	1.00	NC	NC	NC	NC	NC
		Trace to 0.5% fracture-controlled and disseminated chalcopyrite									
532.30	532.50	Cptr-0.5%	548.00	549.00	K015128	1.00	NC	NC	NC	NC	NC
		Chalcopyrite tr-0.5%	549.00	550.00	K015129	1.00	NC	NC	NC	NC	NC
		trace to 0.5% stringer pyrite									
549.04	552.50	V1D; RUB									
		Dacite; Banded									
		Zone with local quartz-carbonate veining/flooding (irregular); trace to 0.5% disseminated medium-coarse grained pyrite and trace chalcopyrite; possible trace to 0.5% sphalerite (very fine grained reddish-brown patches with quartz - may be iron-carbonate in the quartz)									
549.04	552.50	Silmod; Carmod; Chlmod									
		Silicification mod; Carbonatisation mod; Chloritisation mod									
		moderate fracture-controlled quartz, dolomite and chlorite									
549.04	552.50	Pytr-0.5%; Cptrace; Sptrace	550.00	551.00	K015130	1.00	NC	NC	NC	NC	NC
		Pyrite tr-0.5%; Chalcopyrite trace; Sphalerite trace	551.00	552.00	K015131	1.00	NC	NC	NC	NC	NC
		zone with local quartz-carb veining/flooding (irregular); trace to 0.5% disseminated medium to coarse grained pyrite with trace blebby chalcopyrite and possible trace sphalerite (very fine grained, reddish-brown patches with quartz - may be Fe-carb in quartz)	552.00	553.00	K015132	1.00	NC	NC	NC	NC	NC
			553.00	554.00	K015133	1.00	NC	NC	NC	NC	NC
581.50	582.50	V1D; RUB									
		Dacite; Banded									
		Moderately bedded/foliated zone with weak to moderate quartz-carb and local narrow breccia zone									
661.90	672.60	S9; S10; RUB; MAG	671.60	672.60	K015135	1.00	NC	NC	NC	NC	NC
		Iron formation; Chert; Banded; Magnetic									

Description			Assay								
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		Clastic and chemical sediment (iron formation?); medium grey; fine to very fine grained; commonly moderately bedded at 30-40 degrees to core axis; variably magnetic from weak to moderate, with disseminated and stringer magnetite, and occasional veinlets/seams of magnetite exhibiting small folds and cross-cutting bedding; occasional quartz-carb veinlets and fractures parallel to and cross-cutting bedding; lower contact sharp and regular at 30 degrees to core axis									
672.60	749.35	V1B; RUB **Rhyolite; Banded** Rhyolite, Transitional; medium to light grey; fine to medium grained; bedded at 45 degrees to core axis; beds locally exhibit quartz eyes - predominantly <1mm (occasionally up to 2mm), sub-angular, clear to grey, and up to 5% over several metres; local beds exhibit feldspar phenocrysts - up to 2-3mm, sub-rounded, and up to 5% over 1-2m; common patchy sericite, locally strong over 10's of centimetres, decreasing downhole, with occasional possible hematite (reddish-pink); trace pyrite overall - mainly as blebs/stringers, 2-3% from 672.60 to 673.50m; local lapilli-rich beds, increasing downhole, with lapilli 1-3cm and rarely up to 5cm, commonly strained parallel to foliation at 45 degrees; lower contact is somewhat gradational over ~30 cm with moderate quartz-carb-sericite - possible flow top									
672.60	749.35	Sermod-str	672.60	673.60	K015136	1.00	NC	NC	NC	NC	NC
		Sericitisation mod-str moderate to strong, patchy sericite; becoming weaker towards bottom of interval	673.60	674.60	K015137	1.00	NC	NC	NC	NC	NC
672.60	673.50	Py2-3% **Pyrite 2-3%** 2-3% blebs and stringers of pyrite									
677.65	680.05	V1B; V1D; RUB; TL2 **Rhyolite; Dacite; Banded; Intermediate lapilli tuf** Rhyodacite; zone of strong sericite, with ~5% quartz eyes, clear to grey, <1mm									
689.40	690.05	V1B; V1D; TL2; RUB **Rhyolite; Dacite; Intermediate lapilli tuf; Banded** Rhyodacite; zone of strong sericite and weak to moderate hematite, with ~1-2% quartz eyes, clear to grey, <1mm									
749.35	823.22	I2J; V2J									

Description			Assay								
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		Diorite; Andesite Medium green grey, similar to previous unit but more mafic in composition (darker green-grey); still exhibits local angular and subrounded clasts/lapilli generally from ~0.5 to 1cm, and occasionally up to 2-3cm; locally looks like a massive to moderately foliated intrusion (in the absence of clasts/lapilli), with foliation at 45 to 50 degrees to core axis; rare irregular quartz-carb veinlets and veins; trace fine-grained pyrite; lower contact gradational over ~10-20cm, marked mainly by sharp increase in clasts/lapilli - becomes a clast/lapilli-supported flow									
749.35	823.22	Chl **Chloritisation** Moderate to weak chlorite									
823.22	854.00	V1B; V1D **Rhyolite; Dacite** Rhyolite or rhyodacite? Possible debris flow or lapilli tuff; medium to light grey-green; generally fine to medium grained with common darker green (chloritic?) clasts or fragments, frequently angular and commonly strained/elongated parallel to foliation at 45 degrees to core axis; common lapilli/clasts from several mm up to several cm, rounded to angular and varying in colour from white to dark grey and green; the last 1-2m of the hole look more felsic, with lozenge-shaped light grey lapilli and severall pyrite stringers.									
854.00		**End of DDH** **Number of samples: 21** **Number of QAQC samples: 2** **Total sampled length: 21.50**									

Xstrata Zinc Canada Exploration

DDH: **F-149**

Claims title:
Township:
Range:
Lot:

Section:
Level:
Work place:

Drilled by: Major Drilling
Described by: D. McKay

From: 2/3/2013
To: 2/9/2013

Description date:

Collar

Azimuth: 152.00°
Dip: -50.00°
Length: 302.00 m

UTM (NAD83-15)

East	641,344.000
North	5,526,052.000
Elevation	422.000

Averages - Composites

Zone	From	To	Length	Hor. th.	Ver. th.	True th.	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)

Description

Core size: NQ
Cemented: No
Stored: No

Down hole survey

Type	Depth	Azimuth	Dip	Invalid
Reflex	11.00	155.90°	-49.30°	No
Reflex	41.00	160.30°	-43.60°	No
Reflex	71.00	159.50°	-43.00°	No
Reflex	101.00	160.70°	-42.80°	No
Reflex	131.00	162.40°	-42.60°	No
Reflex	161.00	163.10°	-42.40°	No
Reflex	191.00	163.30°	-42.20°	No

Type	Depth	Azimuth	Dip	Invalid

Description			Assay								
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
0.00	3.00	MO **Over Burden** Casing/Overburden									
3.00	129.43	I2J; MAS **Diorite; Massive rock** Diorite: medium greenish grey, medium grained, equigranular, massive to locally weakly fractured (50 degrees tca), locally moderately iron-stained (hematitized?) along fractures in top 20m of hole (from ground water circulation), weakly to locally strongly silicified and iron-carbonatized over narrow intervals (mm- to cm-scale veins up to 10cm in width oriented dominately at 45 to 60 degrees tca), trace amounts of fine to medium-grained magnetite as disseminated grains and narrow veinlets up to 5mm in width usually associated with quartz-carbonate veinlets, trace amonts of fine-grained disseminated pyrite. Lower contact sharp at 50 degrees tca.									
3.00	23.00	Hem; Sil; Car **Hematisation; Silicification; Carbonatisation** The entire diorite unit is weakly to locally moderately silicified and iron carbonatized with narrow (1mm to 10cm wide) quartz-carb veinlets dominantly oriented at 45 to 60 degrees tca. Of note, the top 20m of the hole is also weakly to moderately iron stained (hematitized?) along and adjacent to fractures from ground water circulation.									
3.00	129.43	Mt; Py **Magnetite; Pyrite** Trace amounts of fine to medium-grained magnetite occur as disseminated grains and locally as narrow veinlets up to 5mm in width usually in assocaitaion with the quartz-carbonate veinlets, trace amonts of fine-grained disseminated pyrite occur locally.									
23.00	129.43	Sil; SilWk to Mod; Carwk to mod **Silicification; Silicification Wk to Mod; Carbonatisation wk to mod** The entire diorite unit is weakly to locally moderately silicified and iron carbonatized with narrow (1mm to 10cm wide) quartz-carb veinlets dominantly oriented at 45 to 60 degrees tca.									
111.60	112.84	I3 **Mafic Dike** Mafic Dike(?), medium greenish-gray, medium- to locally coarse-grained, weakly foliated at 60 degrees tca, upper and lower contacts sharp at 70 and 65 degrees tca respectively,									

Description			Assay								
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		surrounding diorite is bleached (sericitized) for ~15cm on either side of the dike.									
119.64	120.68	V1B; RUB **Rhyolite; Banded** Felsic Crystal Tuff -possible xenolith(?), light greenish-grey with 20% narrow (2-3mm) salmon-pink bands/streaks (K-alteration?), typically medium-grained with rare felsic lapilli up to 1.0cm, relatively hard, moderately foliated (50 degrees tca), moderately sericitized, chloritized, and potassic-altered, weakly silicified and iron carbonatized with narrow (5mm) quartz-carbonate veinlets, trace amounts of fine-grained pyrite, contacts sharp at 60 degrees tca.									
126.80	127.67	V1B; RUB **Rhyolite; Banded** Felsic Crystal Tuff -possible xenolith, similar to unit from 119.64 to 120.68, upper contact gradational and breciated looking, lower contact sharp at 60 degrees tca. Locally moderately chloritized with narrow (<1mm wide), variably oriented veinlets of dark green chlorite.									
129.43	149.00	V1B **Rhyolite** Felsic Lapilli Tuff: medium to light greenish grey, fine- to locally medium-grained, realitively hard, locally contains up to 20% variably flattened light grey felsic lapilli up to 6cm by 2cm in size, moderately foliated (60 degrees tca), weakly to locally strongly sericitized and silicified (?). Unit becomes progressively more strongly sericitized with depth obscuring primary textures and making it difficult to determine the protolith. The unit appears to transition to a crystal tuff at around 149.00m but the contact is gradational over a meter or so. Typically contains trace amounts of fg-diss. py, but locally the pyrite comprises up to 25% over narrow intervals adjacent to the lower contact. Here the pyrite occurs in association with distinctive streaks of light salmon-pink alteration (potassic alteration?/ hematitization?).									
129.43	149.00	Ser; Sermod; Chl; Chlwk **Sericitisation; Sericitisation mod; Chloritisation; Chloritisation wk** Moderate fine-grained, patchy sericitization, weak chloritization (chloritoid?) comprising 2-3%, disseminated anhedral spots up to 2mm in size (possibly related to intrusion of diorite)	141.05 142.55	142.55 144.05	K015651 K015652	1.50 1.50	0.00 0.01	0.00 0.00	0.00 0.00	0.00 0.00	0.10 0.10
143.06	143.11	Py40; Py	144.05	145.55	K015653	1.50	0.00	0.00	0.00	0.00	0.10

Description			Assay							
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		Pyrite 40%; Pyrite	145.55	147.05	K015654	1.50	0.00	0.00	0.00	0.00	0.10
		fine- to medium-grained pyrite as disseminated grains and	147.05	148.55	K015655	1.50	0.01	0.00	0.00	0.00	0.20
		localized in foliation-parallel bands and patches									
148.55	149.00	Py10	148.55	150.05	K015656	1.50	0.00	0.00	0.00	0.00	0.60
		Pyrite 10%									
		fine- to medium-grained pyrite as disseminated grains and									
		localized in foliation-parallel bands and patches									
149.00	232.11	V1B	150.05	151.55	K015657	1.50	0.01	0.00	0.00	0.00	0.80
		Rhyolite									
		Felsic Crystal Tuff: mottled to banded in shades of greenish-grey to									
		greyish-green, typically fine-grained, relatively hard, locally banded on a									
		sub-cm scale, weakly to locally moderately foliated (50 - 60 degrees tca)									
		moderately to locally strongly sericitized, moderately silicified, weakly to									
		locally moderately chloritized (darker intervals), typically contains 2-3%									
		relict, subrounded greyish to bluish quartz eyes from 1 to 2mm across									
		set in a fine-grained sericitic matrix, typically contains minor amounts of									
		fine- to medium-grained pyrite as disseminated grains and									
		foliation-parallel streaks, but locally the pyrite occurs as semi-massive									
		(30%) bands/ stringers (?) up to 1.2m in width within the more strongly									
		sericitized, silicified (?) and potassic-altered intervals. Locally the									
		alteration creates patterns that define psuedo-lapilli. The alteration									
		diminishes markedly at 232.11m and here the rock is demonstrably an									
		intermediate qtz-feld xtal tuff. Some of the felsic xtal tuffs within this unit									
		may in fact be altered int. xtal tuffs (?). Lower contact sharp at 45									
		degrees tca									
149.00	170.65	Hemmod; Sermod; Chlwk									
		Hematisation mod; Sericitisation mod; Chloritisation wk									
		Streaks and patches of fine-grained, salmon-pink hematitization									
		(potassic alteration?) and sericitization.									
150.67	151.82	Py30	151.55	152.00	K015658	0.45	0.01	0.03	0.00	0.00	1.20
		Pyrite 30%	152.30	153.30	K015659	1.00	0.01	0.00	0.00	0.00	0.20
		fine- to medium-grained pyrite as disseminated grains and	153.30	154.18	K015660	0.88	0.02	0.00	0.00	0.00	0.50
		localized in foliation-parallel bands/stringers and patches									
154.18	154.30	Py20	154.18	155.18	K015661	1.00	0.03	0.01	0.00	0.00	1.10
		Pyrite 20%									
		fine- to medium-grained pyrite as disseminated grains and									
		localized in foliation-parallel bands /stringers and patches									
154.60	154.87	Py20	155.18	156.18	K015662	1.00	0.01	0.00	0.00	0.00	0.30
		Pyrite 20%	156.18	157.18	K015663	1.00	0.01	0.00	0.00	0.00	0.20
		fine- to medium-grained pyrite as disseminated grains and	157.18	158.18	K015664	1.00	0.01	0.00	0.00	0.00	0.20

Description			Assay								
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		localized in foliation-parallel bands/stringers and patches									
157.48	157.70	Py20	158.18	159.18	K015666	1.00	0.02	0.00	0.00	0.00	0.40
		Pyrite 20%	159.18	160.18	K015667	1.00	0.01	0.00	0.00	0.00	0.60
		fine- to medium-grained pyrite as disseminated grains and									
		localized in foliation-parallel bands/stringers and patches									
159.34	160.62	Py15	160.18	161.18	K015668	1.00	0.01	0.00	0.00	0.00	0.50
		Pyrite 15%	161.18	162.18	K015669	1.00	0.01	0.00	0.00	0.00	0.20
		fine- to medium-grained pyrite as disseminated grains and	162.18	163.18	K015671	1.00	0.02	0.00	0.00	0.00	0.50
		localized in foliation-parallel bands/stringers and patches	163.18	164.18	K015672	1.00	0.01	0.00	0.00	0.00	0.20
			164.18	165.18	K015673	1.00	0.01	0.00	0.00	0.00	0.50
			165.18	166.18	K015674	1.00	0.02	0.00	0.00	0.00	0.30
			166.18	167.18	K015675	1.00	0.01	0.00	0.00	0.00	0.40
			167.18	168.18	K015676	1.00	0.01	0.00	0.00	0.00	0.40
			168.18	169.18	K015677	1.00	0.01	0.00	0.00	0.00	1.20
168.90	169.80	Py20	169.18	170.18	K015678	1.00	0.01	0.00	0.00	0.01	0.80
		Pyrite 20%	170.18	171.18	K015679	1.00	0.01	0.00	0.00	0.00	0.30
		fine- to medium-grained pyrite as disseminated grains and									
		localized in foliation-parallel bandsstringers and patches									
170.65	222.60	Sermod; Silwk; Chlmod; Chlmod	171.18	172.68	K015680	1.50	0.01	0.00	0.00	0.00	0.20
		Sericitisation mod; Silicification wk; Chloritisation mod;	172.68	174.18	K015681	1.50	0.01	0.00	0.00	0.00	0.10
		Chloritisation mod	174.18	175.68	K015682	1.50	0.01	0.00	0.00	0.00	0.20
		Abundant mottled light grey, bleached patches of vfg sil & ser	175.68	177.18	K015683	1.50	0.01	0.00	0.00	0.00	1.25
		interspersed and cross-cut by narrow dark green fg chlorite. The	177.18	178.68	K015684	1.50	0.01	0.00	0.00	0.00	1.25
		alteration obscures the primary volcaniclastic textures - 1-2mm	178.68	180.18	K015686	1.50	0.02	0.01	0.00	0.00	7.50
		relic qtz eyes occur and suggest the unit was once a qtz +/- feld	180.18	181.68	K015687	1.50	0.01	0.00	0.00	0.00	1.25
		xtal tuff	181.68	183.18	K015688	1.50	0.01	0.00	0.00	0.00	1.25
181.75	183.10	Py05	183.18	184.70	K015689	1.52	0.01	0.00	0.00	0.00	1.25
		Pyrite 5%	185.00	186.50	K015691	1.50	0.00	0.00	0.00	0.00	1.25
		fine- to medium-grained pyrite as disseminated grains and	186.50	188.00	K015692	1.50	0.01	0.00	0.00	0.00	1.25
		localized in foliation-parallel bands and patches	188.00	189.50	K015693	1.50	0.01	0.00	0.00	0.00	1.25
			189.50	191.00	K015694	1.50	0.01	0.00	0.00	0.00	1.25
			191.00	192.50	K015696	1.50	0.02	0.00	0.00	0.01	1.25
			192.50	194.00	K015697	1.50	0.02	0.00	0.00	0.00	1.25
			194.00	195.50	K015698	1.50	0.04	0.00	0.01	0.02	4.60

Description			Assay								
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
194.96	195.38	Py15 **Pyrite 15%** fine- to medium-grained pyrite as disseminated grains and localized in foliation-parallel bands and patches	195.50	197.00	K015699	1.50	0.33	0.00	0.01	0.01	1.25
			197.00	198.50	K015700	1.50	0.57	0.01	0.01	0.05	7.00
			198.50	200.00	K015701	1.50	0.15	0.00	0.01	0.02	3.00
			200.00	201.50	K015702	1.50	0.19	0.00	0.01	0.01	2.80
			201.50	203.00	K015703	1.50	0.15	0.00	0.00	0.01	2.50
			203.00	204.50	K015704	1.50	0.02	0.00	0.00	0.00	1.25
			204.50	206.00	K015705	1.50	0.02	0.00	0.00	0.00	1.25
			206.00	207.50	K015706	1.50	0.02	0.00	0.00	0.00	1.25
			207.50	209.00	K015707	1.50	0.01	0.00	0.00	0.00	1.25
			209.00	210.50	K015708	1.50	0.01	0.00	0.00	0.00	1.25
			210.50	212.00	K015709	1.50	0.01	0.00	0.00	0.00	1.25
			212.00	213.50	K015711	1.50	0.01	0.00	0.00	0.00	1.25
			213.50	215.00	K015712	1.50	0.01	0.00	0.00	0.00	1.25
			215.30	216.50	K015713	1.20	0.01	0.00	0.00	0.01	1.25
			216.50	218.00	K015714	1.50	0.01	0.00	0.00	0.00	1.25
			218.00	219.50	K015716	1.50	0.00	0.00	0.00	0.00	1.25
			219.50	221.00	K015717	1.50	0.01	0.00	0.00	0.00	1.25
			221.00	222.50	K015718	1.50	0.01	0.00	0.00	0.00	1.25
			222.50	224.00	K015719	1.50	0.01	0.00	0.00	0.00	1.25
222.60	222.80	Silstg; Carwk **Silicification stg; Carbonatisation wk** 20cm wide, white quartz +/- Fe-carb vein oriented at low angle tca, tr fg py									
222.80	225.50	Sermod; Silwk **Sericitisation mod; Silicification wk** Abundant mottled light grey, bleached patches of vfg sil & ser interspersed and cross-cut by narrow dark green fg chlorite. The alteration obscures the primary volcaniclastic textures - 1-2mm relic qtz eyes occur and suggest the unit was once a qtz +/- feld xtal tuff	224.00	225.50	K015721	1.50	0.01	0.00	0.00	0.00	1.25
224.84	232.11	Py1-2 **Pyrite 1-2** 1-2% fg py as diss grains, irregular diffuse patches, and more rarely as foliation-parallel streaky bands and weakly developed net-textures	225.50	227.00	K015722	1.50	0.01	0.00	0.00	0.00	1.25
			227.00	228.50	K015723	1.50	0.01	0.00	0.00	0.00	1.25
227.50	227.98	Silstg; Carwk									

Description			Assay							
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		Silicification stg; Carbonatisation wk 48cm interval containing a narrow qtz-Fe-carb vein oriented sub-parallel tca, tr fg py									
227.98	232.11	Serstg; Silmod	228.50	230.00	K015724	1.50	0.01	0.00	0.00	0.00	1.25
		Sericitisation stg; Silicification mod	230.00	231.50	K015725	1.50	0.01	0.00	0.00	0.00	1.25
		Patchy light to medium grey sericitization and silicification within a medium greenish-grey matrix give rise to "psuedo lapilli"	231.50	232.11	K015726	0.61	0.01	0.01	0.00	0.00	1.25
232.11	268.53	V1C	232.11	233.61	K015727	1.50	0.01	0.00	0.00	0.00	1.25
		Rhyodacite Intermediate to Felsic Crystal Tuff: medium to dark greyish-green, fine- to medium-grained, weakly foliated (50 to 60 degrees tca), relatively soft, intermediate quartz-feldspar crystal tuff comprising 20 -40% buff, subangular to subrounded felspar crystals up to 2mm across, 5 - 10% grey, subrounded quartz crystals up to 3mm across, and occassional felsic lapilli up to 1cm in maximum dimension set in a finer-grained ash matrix. This unit (s) is typically moderately chloritized and weakly silicified and iron-carbonatized (narrow veinlets). It becomes bleached and more moderately sericitized/silicified from about 262.2 to268.53. The lower contact is gradational and over about 1m. The unit typically contains trace amounts of fg diss py, but locally the py comprises 5-7% over narrow intervals usually in association with narrow quartz-Fe-carbonate veins. Of note, some of the quartz-Fe-carbonate veins are pale bluishish white in colour.									
233.15	233.25	Silstg; Carmod	233.61	235.11	K015728	1.50	0.02	0.00	0.00	0.00	1.25
		Silicification stg; Carbonatisation mod 2cm wide pale bluish-white quartz-Fe-carb vein oriented at 40 degrees tca	235.11	236.11	K015729	1.00	0.01	0.04	0.00	0.00	1.25
235.50	235.93	Py5-7; Sp<1 **Pyrite 5-7; Sphalerite <1** 5-7% fg diss Py locallized around a 8cm wide qtz-Fe-carb vein, minor fg wispy light brown Sph??									
235.72	235.82	Silstg; Carmod **Silicification stg; Carbonatisation mod** 7cm wide pale bluish-white quartz-Fe-carb vein containing 1-2% fg pyrite and surrounded by a narrow alteration halo comprising 5-7% fg pyrite	236.11	237.61	K015730	1.50	0.02	0.01	0.00	0.00	1.25
245.57	245.59	Silstg; Carmod **Silicification stg; Carbonatisation mod** 2cm wide, white quartz-Fe-carb veinlet containing rare cpy as small (2-3mm) irregular patches associated with narrow chloritic	260.70	262.20	K015731	1.50	0.01	0.01	0.00	0.00	1.25

Description			Assay								
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		septa - the first cpy observed in this hole									
262.20	268.53	Silmod; Serwk	262.20	263.20	K015732	1.00	0.01	0.00	0.00	0.00	1.25
		Silicification mod; Sericitisation wk	263.20	264.03	K015733	0.83	0.01	0.00	0.00	0.00	1.25
		light- to medium-grey, bleached-looking,relatively hard interval	264.03	265.53	K015734	1.50	0.01	0.00	0.00	0.00	1.25
		containing several discrete, narrow, variably-oriented quartz	265.53	267.03	K015736	1.50	0.01	0.00	0.00	0.00	1.25
		Fe-carbonate veins interspersed among blotchy patches of	267.03	268.53	K015737	1.50	0.01	0.01	0.00	0.00	1.25
		fine-grained, more pervasive silicification +/- sericitization									
262.20	263.20	Py1-2									
		Pyrite 1-2									
		1-2% fg py as disseminated grains and fracture fillings in									
		association with narrow qtz-Fe-carb veinlets									
268.53	277.26	V1C									
		Rhyodacite									
		Intermediate to Felsic Lapilli Tuff: medium to dark greenish-grey, relatively soft, medium-grained, weakly foliated (50-60 degrees tca), locally brecciated-looking, intermediate lapilli tuff locally comprising up to 25% buff colored felsic lapilli up to 3cm x 1cm set in mg greyish green matrix, weakly silicified and Fe-carbonatized within narrow veinlets, typically contains trace amounts of fine-grained disseminated pyrite, lower contact with narrow dioritic unit sharp at 70 degrees tca. This unit may correspond to what has been previously logged/mapped elsewhere as an int. meso breccia.									
268.53	277.26	Silwk; Carwk									
		Silicification wk; Carbonatisation wk									
		occassional narrow (up to 2cm wide), variably oriented quartz-Fe-carbonate veinlets									
277.26	277.56	I2J									
		Diorite									
		Diorite: medium greyish-green, medium-grained, massive, dioritic dike with bleached, chilled margins, lower contact sharp at 90 degrees tca, intruded by a narrow (2cm) quartz-Fe-carb vein which in turn has been intruded and brecciated along its lower contact by a narrow (5mm) fg, vein of black tourmaline (?), unit contains tr fg diss py.									
277.56	278.35	V1C									
		Rhyodacite									
		Intermediate to Felsic Lapilli Tuff: continuation of unit encountered from 268.53 to 277.26m, contains several narrow (<1cm wide), contorted quartz-Fe-carb veinlets, lower contact with dioritic dike sharp at 70 degrees tca.									
277.56	278.35	Silmod; Carwk									

Description				Assay								
				From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
			Silicification mod; Carbonatisation wk interval contains several narrow (<1cm wide), variably-oriented, contorted (deformed), white quartz-Fe-carb veinlets									
278.35	279.80		I2J **Diorite** Diorite: medium to dark greyish-green, medium-grained, massive, dioritic dike, lower contact intrusive-looking and sharp at 80 degrees tca									
279.80	288.70		V1C **Rhyodacite** Intermediate to Felsic Lapilli Tuff: continuation of unit encountered from 277.56 to 278.35m, contains several distinctive, narrow (up to 10cm wide), brecciated sections that have been cemented with quartz, lower contact with dioritic dike sharp at 45 degrees tca.									
	279.80	288.70	Silmod; Carwk; Serwk **Silicification mod; Carbonatisation wk; Sericitisation wk** patchy, bleached, light grey sections of fg silicification and sericitization and narrow (<1cm wide) quartz-Fe-carb veinlets									
288.70	288.98		I2J **Diorite** Diorite: medium to dark greyish-green, medium-grained, massive, dioritic dike, lower contact intrusive-looking and sharp at 45 degrees tca									
288.98	298.70		V1C **Rhyodacite** Intermediate to Felsic Lapilli Tuff: continuation of unit encountered from 279.80 to 288.70m, contains several distinctive, narrow (up to 10cm wide), brecciated sections that have been cemented with quartz and several narrow (up to 2cm wide), variably-oriented, locally disrupted and contorted quartz-Fe-carb veinlets, lower contact with dioritic dike sharp at 60 degrees tca. Of note, the interval from 293.58 to 294.18 is bleached and strongly sericitized and silicified, typically contains only trace amounts of fg py.									
	288.98	293.58	Silwk; Carwk **Silicification wk; Carbonatisation wk** occassional narrow (1cm wide), contorted and disrupted quartz-Fe-carbonate veinlets									
	293.58	294.19	Silmod; Serstg **Silicification mod; Sericitisation stg** bleached, light greenish-gray interval of pervasive sericitization and silicification that truncates and hence post dates some of the narrow, contorted quartz-Fe-carb veins within this unit									

Description			Assay								
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
298.70	300.70	I2J **Diorite** Diorite: medium greyish-green, medium-grained, massive, dioritic dike with bleached, chilled margins, lower contact sharp at 80 degrees tca,									
300.70	301.02	V1C **Rhyodacite** Intermediate to Felsic Lapilli Tuff: continuation of unit encountered from 288.98 to 298.70m, mod sericitized and mod foliated at 50 degrees tca									
300.70	301.02	Sermod **Sericitisation mod** scattered irregular fg patches and streaks of sericitization									
301.25	301.55	I2J **Diorite** Diorite: medium greyish-green, medium-grained, massive, dioritic dike									
301.55	302.00	V1C **Rhyodacite** Intermediate Lapilli Tuff: continuation of unit encountered from 300.70 to 301.02m, locallized moderate patchy to streaky fg sericitization, contains one narrow (9cm wide) quartz-Fe-carbonate vein, tr fg diss py									
301.55	301.66	Sermod **Sericitisation mod** patchy fg sericite									
301.66	301.75	Silstg; Carmod **Silicification stg; Carbonatisation mod** 9cm wide white quartz-Fe-carbonate vein, no visible sulphides									
301.75	302.00	Sermod **Sericitisation mod** contorted streaks and patches of fg greenish-tan sericite									
302.00		**End of DDH** **Number of samples: 78** **Number of QAQC samples: 9** **Total sampled length: 103.49**									

Xstrata Zinc Canada Exploration

DDH: **F-150**

Claims title:
Township:
Range:
Lot:

Section:
Level:
Work place:

Drilled by: Major Drilling
Described by: D. McKay

From: 2/9/2013
To: 2/18/2013

Description date:

Collar

Azimuth: 152.00°
Dip: -78.00°
Length: 611.00 m

UTM (NAD83-15)

East	641,383.000
North	5,526,249.000
Elevation	422.000

Averages - Composites

Zone	From	To	Length	Hor. th.	Ver. th.	True th.	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)

Description

Core size: NQ
Cemented: No
Stored: No

Down hole survey

Type	Depth	Azimuth	Dip	Invalid
Reflex	20.00	152.30°	-76.60°	No
Reflex	50.00	158.30°	-75.40°	No
Reflex	80.00	164.90°	-73.40°	No
Reflex	110.00	164.90°	-71.60°	No
Reflex	140.00	165.00°	-70.30°	No
Reflex	170.00	166.90°	-69.20°	No
Reflex	200.00	166.50°	-67.90°	No
Reflex	230.00	167.40°	-66.70°	No
Reflex	260.00	168.30°	-66.10°	No
Reflex	290.00	168.80°	-65.40°	No
Reflex	320.00	169.10°	-63.90°	No
Reflex	350.00	170.40°	-61.20°	No
Reflex	380.00	174.20°	-56.70°	No
Reflex	410.00	175.20°	-56.10°	No
Reflex	440.00	175.50°	-55.40°	No
Reflex	470.00	175.50°	-54.40°	No
Reflex	500.00	176.40°	-53.80°	No
Reflex	530.00	176.90°	-52.80°	No
Reflex	560.00	177.20°	-51.90°	No
Reflex	590.00	177.30°	-50.80°	No
Reflex	611.00	177.80°	-50.30°	No

Type	Depth	Azimuth	Dip	Invalid

Description			Assay								
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
0.00	4.90	MO									
		Over Burden									
		Overburden: casing to 6m									
4.90	35.20	V1B									
		Rhyolite									
		Felsic Quartz-Feldspar Crystal Tuff: pale greenish-grey, fine-grained, comprises 5% medium-to light-grey, sub-rounded to sub-angular, occassionally fractured crystals of quartz from <1 to 5mm across and 15% buff to pale greenish (saussuritized), sub-angular to irregular crystals of plagioclase from 1 to 5mm across set in a very fine-grained, strongly and pervasively sericitized, weakly foliated (40-50 degrees tca) ash matrix, locally weakly to moderately chloritized, locally strongly hematitized along narrow fractures due to circulating ground water, typically contains trace amounts of fg py, lower contact is sharp at 40 degrees tca, locally there are hints of bedding at 50 degrees tca. A narrow diorite dike occurs from 27.04 to 27.37m									
5.00	25.27	Serstr									
		Sericitisation str									
		pale greenish-grey, relatively soft,pervasively sericitized interval									
25.27	25.72	Chlstg									
		Chloritisation stg									
		network veining of dark green chlorite giving rise to a "psuedo-brecciated" appearance									
25.72	29.60	Serstr									
		Sericitisation str									
		pale greenish-grey, relatively soft,pervasively sericitized interval									
27.04	27.37	I2J									
		Diorite									
		Diorite Dike: medium-greyish-green, mg, massive, subequal amounts of altered buff feldspar 1-2mm in size and dark green mafic minerals, contacts sharp at 75 degrees tca									
29.60	30.20	Serstg; Hemstg									
		Sericitisation stg; Hematisation stg									
		pale greenish-grey, relatively soft,pervasively sericitized interval streaked with reddish brown hematite locallized along fractures and foliation planes									
30.20	35.20	Serstr; Hemmod	33.70	35.20	K015738	1.50	0.10	0.00	0.00	0.00	1.25
		Sericitisation str; Hematisation mod									
		pale greenish-grey pervasively sericitized interval with conspicuous, narrow, foliation-parallel streaks and diffuse patches									

Description				Assay								
				From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
			of vfg salmon-pink hematitizaion (potassic-alteration?)									
35.20	37.20		V1B; S9	35.20	36.08	K015740	0.88	1.81	0.19	0.01	0.02	13.50
			Rhyolite; Iron formation									
			Interbedded Felsic Ash Tuff and Cherty, Sulphide-Facies Iron Formation (?): banded light to dark creamy grey, fine- to locally medium-grained, thinly bedded (mm-scale) at 35-40 degrees tca, locally very siliceous (cherty), typically contains 1-2% fg py locallized along bedding planes and as irregular, small streaky patches, the pyrite content increases markedly with increasing depth and comprises 85% of the unit over the bottom 40cm adjacent to the underlying felsic crystal tuff, the lower contact is sharp and distinct at 40 degrees tca, the pyrite-rich portions are very siliceous and likely represent cherty iron-formation									
	35.20	35.37	Py3-5%; Cptrace									
			Pyrite 3-5%; Chalcopyrite trace									
			3-5% fg pyrite as disseminated grains and irregular foliation/bedding-parallel streaks and patches, rare chalcopyrite as small (2-3mm) irregular blebs in association with pyrite									
	36.08	36.78	Py15-20%	36.08	37.20	K015741	1.12	0.07	0.01	0.00	0.02	4.30
			Pyrite 15-20%									
			thin (mm-scale) beds, disseminated grains and net-textured stringers of vfg to mg py									
	36.78	37.20	Py85									
			Pyrite 85%									
			Massive bed (?) of fg to mg py, no visible sph or cpy, possible sulphide-facies IF									
37.20	57.90		V1B	37.20	38.20	K015742	1.00	0.07	0.00	0.00	0.00	1.25
			Rhyolite	38.20	39.70	K015743	1.50	0.00	0.00	0.00	0.00	1.25
			Felsic Quartz Crystal Tuff: banded to mottled in shades of light greenish-grey to medium grey-white depending on degree and type of alteration, typically comprises 2-3% relict, light grey, subangular to subrounded, quartz crystals 1 to 3 mm in size set in a vfg variably sericitized and silicified ashy matrix, a few relict feldspar crystals are present but most have been obliterated by alteration, the unit is weakly to locally moderately foliated/bedded at 40 degrees tca, moderately to locally strongly silicified and sericitized and weakly to locally moderately chloritized especially in the more intermediate-looking sections, small (1-2mm) spots of dark green chloritoid (?) occur locally, this unit typically contains trace amounts of fg diss py, but concentrations of up to 25% occur locally over narrow intervals (<10cm wide) as outlined in the mineralization section, a few hematite-stained fractures occur locally,	39.70	40.70	K015744	1.00	0.01	0.00	0.00	0.00	1.25

Description			Assay								
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		lower contact gradational over about 1m and obscured by alteration									
37.20	39.77	Silstr; Serstr **Silicification str; Sericitisation str** hard, strongly sericitized and silicified, light greenish-grey bleached interval containing occassional, 1-2mm relict quartz eyes, hint of bedding at 40 degrees tca									
39.77	39.82	Silstr; Carmod **Silicification str; Carbonatisation mod** 5cm wide grey-white quartz-Fe-carb vein containing a 5mm cube of pyrite									
39.82	41.00	Silstr; Sermod **Silicification str; Sericitisation mod** hard, strongly sericitized and silicified, light greenish-grey bleached interval									
41.00	41.70	Chldmod **chloritoid mod** 10% scattered fg (<1mm) spots of dark-green chloritoid (?)	41.00	42.71	K015746	1.71	0.01	0.00	0.00	0.00	1.25
42.43	43.26	Serstr; Silmod **Sericitisation str; Silicification mod** pale greenish-grey, fg, hard, strongly sericitized and mod silicified, bleached interval	42.71	44.21	K015747	1.50	0.01	0.00	0.01	0.00	1.25
43.26	45.50	Chlwk -mod **Chloritisation wk -mod** spots and foliation-parallel streaks/seams of dark green chlorite, interval contains 2-3% pyrite locallized over narrow (<10cm wide)intervals as outlined in the mineralization section									
44.21	44.24	Py2 to 3% **Pyrite 2 to 3%** 2-3% fg py locallized in narrow foliation-parallel streaks and flattened patches	44.21	45.71	K015748	1.50	0.01	0.00	0.00	0.00	1.25
45.18	45.27	Py5-7% **Pyrite 5-7%** 5 to 7% fg py locallized in irregular discontinuous patches	45.71	47.21	K015749	1.50	0.01	0.00	0.00	0.00	1.25
46.87	47.30	Silstr; Sermod; Chlwk	47.21	48.71	K015750	1.50	0.01	0.01	0.00	0.00	1.25
		Silicification str; Sericitisation mod; Chloritisation wk bleached, light grey, hard, fg, silicified and sericitized interval containing occassional thin (<1mm wide) foliation-parallel seams of dark green chlorite	48.71	50.43	K015751	1.72	0.06	0.02	0.00	0.01	1.25
48.82	48.90	Py25 **Pyrite 25%**	50.43	51.43	K015752	1.00	0.01	0.00	0.01	0.01	1.25

Description				Assay								
				From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
			25% fg py as diss grains and irregular patches localized within an irregular zone of hydrothermal alteration rimmed by chlorite									
50.68	50.79		Py05 **Pyrite 5%** 5% vfg py locallized in irregular, poorly defined, streaky, foliation-parallel patches									
51.36	51.43		Py5-7% **Pyrite 5-7%** 5-7% vfg py locallized in irregular, poorly defined, streaky, foliation-parallel patches	51.43	52.93	K015753	1.50	0.01	0.00	0.01	0.00	1.25
53.92	54.22		Hemwk **Hematisation wk** interval containing several (6) hematite-stained fractures (ground water circulation)									
57.90	67.70		V1C **Rhyodacite** Felsic to Intermediate Lapilli Tuff: medium greenish-grey with scattered light greenish-grey, bleached (altered) intervals, contains up to 25% poorly sorted, pale greenish-grey, variably flattened, felsic lapilli up to 5cm by 2cm in size set in a darker greenish-grey ash matrix containing variable amounts of subangular to subrounded crystals of feldspar and quartz 1 to 3mm in maximum dimension, unit is moderately foliated at 40 to 50 degrees tca, weakly to locally strongly silicified and sericitized, weakly chloritized along fractures/foliation planes, and typically contains trace to minor amounts of fine-grained disseminated pyrite, locally the pyrite content rises to 15% over narrow (up to 35cm wide) intervals where it occurs in narrow, foliation-parallel streaks and poorly-defined net-textures in association with tourmaline, lower contact sharp at 45 degrees tca	62.70	64.20	K015754	1.50	0.01	0.00	0.01	0.00	1.25
63.00	64.20		ChldWk **chloritoid Wk** 1-2% dark green spots of chloritoid (?) 1mm in size	64.20	65.70	K015756	1.50	0.00	0.00	0.00	0.00	1.25
64.70	65.14		Py3-5% **Pyrite 3-5%** 3-5% very fine-grained pyrite as disseminated grains and locallized within narrow, foliation-parallel streaks	65.70	66.70	K015757	1.00	0.01	0.00	0.00	0.00	1.25
65.80	66.16		Py15-20%; Py15 **Pyrite 15-20%; Pyrite 15%** 15% very fine-grained pyrite as disseminated grains and locallized within foliation-parallel streaks and poorly-defined net-textured	66.70	67.70	K015758	1.00	0.01	0.00	0.00	0.02	1.25

Description				Assay								
				From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
			intervals in association with minor amounts of distinctive, black medium-grained tourmaline displaying triangular cross-sections									
67.24	67.70		Py10 **Pyrite 10%** 10% very fine-grained pyrite as disseminated grains and locallized within foliation-parallel streaks and poorly-defined net-textured intervals in association with minor amounts of distinctive, black medium-grained tourmaline displaying triangular cross-sections									
67.70	73.75		V1D **Dacite** Intermediate Polymict Breccia (Heterolithic Lapilli Tuff -possible meso-breccia?): markedly darker greenish-gray than preceeding unit, comprises up to 25% angular, flattened, foliation-parallel, fine-grained, dark green mafic lapilli of variable sizes up to 2cm by 1cm and 5% angular, light grey, siliceous, felsic lapilli up to 4cm by 2cm set in a fine-grained, sericitized matrix containing variable amounts of relict plagioclase and more rarely quartz crystals 1 to 2mm across, unit is moderately foliated (40 degrees tca), moderately sericitized and contains 1-2% fine-grained disseminated pyrite, 2-3% fine-grained magnetite occurs within a distinctive, light grey, patch of silicification between 73.10 and 73.38m, a narrow diorite dike intrudes from 69.30 to 70.28m, lower contact with more felsic-looking lapilli tuff is gradational over about 1m	67.70	69.30	K015759	1.60	0.01	0.00	0.00	0.00	1.25
67.70	73.10		Py1-2% **Pyrite 1-2%** 1-2% fine-grained disseminated pyrite									
69.30	70.28		I2J **Diorite** Diorite Dike: medium greyish-green, medium-grained, massive, similar to dike from 27.04 to 27.37m,	70.28 71.30 72.80	71.00 72.80 74.30	K015760 K015761 K015762	0.72 1.50 1.50	0.01 0.01 0.01	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	1.25 1.25 1.25
73.10	73.38		Mt2-3%; Mt **Magnetite 2-3%; Magnetite** 2-3% fine- to medium-grained magnetite locallized in an irregular patch of silicification									
73.38	73.75		Py1-2% **Pyrite 1-2%** 1-2% fine-grained disseminated pyrite									
73.75	93.00		V1C **Rhyodacite** Felsic to Intermediate Lapilli Tuff: similar to unit from 57.90 to 67.70m, but with rare felsic bombs up to 10cm by 6cm in size, moderately foliated at									

Description			Assay								
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		40 degrees tca, variably sericitized, typically contains minor (<1%) amounts of very fine-grained pyrite as disseminated grains and locallized in narrow (1-2mm wide) poorly-defined, foliation-parallel streaks, of note, no quartz-Fe-carb veins are present, lower contact with intermediate heterolithic lapilli tuff is gradational									
73.75	93.00	SerMod **Sericitisation Mod** entire unit is moderately sericitized, especially the felsic lapilli	74.30	75.80	K015763	1.50	0.00	0.00	0.00	0.00	1.25
93.00	97.07	V1D **Dacite** Intermediate Polymict Breccia (Heterolithic Lapilli Tuff - possible meso-breccia?): similar to unit from 67.70 to 73.75m but with fewer (10%), smaller (up to 1cm by 5mm) and less distinct mafic lapilli, relatively soft, weakly sericitized, moderately foliated at 40 degrees tca, typically contains minor (<1%) amounts of fine-grained disseminated pyrite, lower contact is gradational over 25cm, intruded by a narrow diorite dike from 93.60 to 95.27m									
93.00	93.60	SerWk **Sericitisation Wk** weakly sericitized unit									
93.60	95.27	I2J **Diorite** Diorite Dike: medium greyish-green, medium-grained, massive, similar to dike from 5.00 to 35.20m, chilled margins, intruded by several narrow (up to 2cm wide), variably oriented, quartz-Fe-carbonate veins one of which contains 10% cg euhedral pyrite									
97.07	120.62	V1C **Rhyodacite** Intermediate to Felsic Polymict Breccia (Heterolithic Lapilli Tuff - possible meso-breccia?): similar to units from 67.00 to 73.75 & 93.00 to 97.07 but lighter greenish-grey in color, comprises up to 20% dark green, fg, mafic lapilli up to 4 by 2cm in size and 5% quartz-phyric felsic lapilli also up to 4 by 2cm in size set in a variably sericitized, moderately foliated (40 degrees tca), fg matrix containing up to 10% buff, subangular relict plagioclase and rare rounded, grey quartz crystals both 1 to 2mm across, unit typically contains minor amounts of pyrite as fg disseminated grains, foliation-parallel streaks and concentrated within small (up to 2cm by 5mm), irregularly-shaped, mafic-rimmed clasts, chalcopyrite occurs locally as very rare blebs up to 1cm by 3mm in size									

Description			Assay							
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		in association with the fg pyrite (e.g. at 104.38m), narrow intercalated beds of intermediate crystal tuff occur from 104.95 to 105.52m (bedding at 40 degrees tca) and 108.47 to 112.96m (beds at 45 to 50 degrees tca), several narrow (up to 25cm wide), variably oriented grey-white quartz-Fe-carb veins containing minor amounts of mg py occur within the lower crystal tuff unit, the lower contact of this intermediate to felsic polymict breccia is sharp at 30 degrees tca and is intruded by a 20cm wide quartz-Fe-carb vein									
97.07	103.95	SerStr **Sericitisation Str** light greenish-grey, relatively soft, strongly sericitized interval									
104.95	105.52	V1D; Bed **Dacite; Bedded** Intermediate Ash and Crystal Tuff: greenish-grey, fine- to medium-grained, bedded at 40 degrees tca, beds appear to fine up-hole									
108.47	112.96	V1D; Bed **Dacite; Bedded** Intermediate Ash and Crystal Tuff: greenish-grey, fine- to medium-grained, bedded at 50 degrees tca, intruded by several narrow quartz-Fe-carbonate veins containing trace amounts of fg pyrite									
108.47	112.96	SilMod; CarWk **Silicification Mod; Carbonatisation Wk** several narrow (up to 25cm wide) quartz-Fe-carbonate veins occur within this interval									
120.42	120.62	SilStr; CarWk **Silicification Str; Carbonatisation Wk** 20cm wide quartz-Fe-carb vein , minor mg-cg py									
120.62	131.78	V1D **Dacite** Intermediate plagioclase-phyric crystal tuff; ~5% anhedral whitish feldspars 2-5mm in diameter; 1% pyrite in occasional bands and small patches, blebs and stringers; lower contact marked by the absence of feldspar crystals - somewhat gradational									
120.62	131.78	Py1% **Pyrite 1%** 1% occasional bands up to 1cm, blebs, patches and stringers of pyrite									

Description			Assay							
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
131.78	198.00	V1C **Rhyodacite** Felsic to intermediate lapilli to ash tuff; commonly bedded at 40 to 55 degrees to core axis; common sericitic beds, occasionally strongly sercicitic; locally quartz-phyric, with locally up to ~1% clear anhedral quartz eyes 1-2mm - quartz eyes seem to be more prominent below ~160m; locally semi-massive pyrite, with intervals of up to 70% pyrite over 20cm, and larger intervals of 10-15% over several metres; lower contact is altered and gradational over about 0.5m	140.00	141.50	K015764	1.50	0.00	0.00	0.00	0.01	1.25
131.78	140.60	Chlweak; Serweak **Chloritisation weak; Sericitisation weak** weak chlorite alteration and sericite stringers									
131.78	140.60	Py1% **Pyrite 1%** Fine grained disseminated and stringer pyrite									
140.60	166.00	Sermod-str; Chlweak **Sericitisation mod-str; Chloritisation weak** Moderate to locally strong, pervasive sericite; weak patchy chlorite	141.50	143.00	K015766	1.50	0.01	0.00	0.00	0.01	1.25
			143.00	144.50	K015767	1.50	0.01	0.00	0.00	0.01	1.25
			144.50	146.00	K015768	1.50	0.01	0.00	0.00	0.01	1.25
			146.00	147.50	K015769	1.50	0.01	0.01	0.00	0.01	1.25
			147.50	149.00	K015770	1.50	0.01	0.00	0.00	0.01	1.25
			149.00	150.50	K015771	1.50	0.01	0.00	0.00	0.01	1.25
			150.50	151.50	K015772	1.00	0.01	0.00	0.00	0.02	1.25
140.60	150.87	Py1-2% **Pyrite 1-2%** 1-2%, locally up to 2-3% disseminated, patchy and stringer pyrite									
150.87	161.50	Py5-7% **Pyrite 5-7%** 5-7% semi-massive, stringer and disseminated pyrite, locally up to 70% over 20cm	151.50	152.50	K015773	1.00	0.00	0.00	0.00	0.01	1.25
			152.50	153.50	K015774	1.00	0.01	0.00	0.00	0.04	1.25
			153.50	154.50	K015776	1.00	0.01	0.00	0.00	0.01	1.25
			154.50	155.50	K015777	1.00	0.01	0.00	0.00	0.01	1.25
			155.50	156.50	K015778	1.00	0.01	0.00	0.00	0.01	1.25
			156.50	157.50	K015779	1.00	0.02	0.00	0.00	0.00	1.25
			157.50	158.50	K015780	1.00	0.01	0.00	0.00	0.02	1.25
			158.50	159.50	K015781	1.00	0.01	0.00	0.00	0.05	1.25
			159.50	160.50	K015783	1.00	0.01	0.00	0.00	0.03	1.25
			160.50	161.50	K015784	1.00	0.01	0.00	0.00	0.04	1.25
161.50	173.50	Py1%	161.50	162.50	K015785	1.00	0.01	0.00	0.00	0.01	1.25

Description			Assay							
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		Pyrite 1% ~1% disseminated and stringer pyrite									
166.00	178.50	SerMod-weak; Chlweak **Sericitisation Mod-weak; Chloritisation weak** Decreasing sericite downhole, and continued weak chlorite									
178.50	198.00	Serweak-mod; Chlweak **Sericitisation weak-mod; Chloritisation weak** Weak sericite and chlorite									
198.00	357.05	I2J **Diorite** Medium to dark grey to green-grey; medium to fine grained; massive to weakly foliated at ~45 degrees to core axis; occasional quartz-carbonate veins both regular and irregular, at variable core angles, locally vuggy, pitted; trace fine grained pyrite usually associated with veins; lower contact sharp and regular at 45 degrees to core axis									
223.60	225.20	I3 **Mafic Dike 40°** Medium green; fine grained locally weakly porphyritic; contacts at 40 degrees									
232.35	236.50	I3 **Mafic Dike 40°** As above; lower contact irregular with quartz-carb vein; includes a 30cm interval of quartz-carb (tourmaline?) breccia vein from 235.35 to 235.65m									
312.80	313.40	Silmod-str; Carmod-str **Silicification mod-str; Carbonatisation mod-str** Contorted quartz-carb vein or altered zone - possible fault?									
314.45	314.87	Silmod; Carstrong **Silicification mod; Carbonatisation strong** As above - contorted quartz-carb vein or altered zone with moderately broken/blocky and chalky core - possible fault?									
327.00	327.85	Silmod; Carmod **Silicification mod; Carbonatisation mod** Contorted zone or vein of moderate silicification and carbonatization									
357.05	444.75	V1B; V1C **Rhyolite; Rhyodacite** Felsic to intermediate ash-crytal-lapilli tuff; colour varies from light to medium grey; locally appears to be brecciated or tuff breccia; locally sericitized and/or silicified; local intervals from several centimetres to									

Description			Assay								
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		several metres exhibiting quartz eyes, generally clear to grey, 1-2mm - quartz eyes becoming more pervasive (up to 2-3%) below ~389m to lower contact; trace to 1% stringer and disseminated pyrite throughout, with rare chalcopyrite blebs; lower contact gradational over ~0.3m, and marked by quartz veining/silicification									
371.14	384.05	SerMod; Silweak-mod **Sericitisation Mod; Silicification weak-mod** Moderate sericitization and possible silicification - unit is siliceous but it may be primary	372.00	373.00	K015786	1.00	0.01	0.00	0.00	0.00	1.25
372.14	384.05	V1B **Rhyolite** Appears to be a felsic tuff breccia, possibly a block tuff? exhibits clasts or fragments up to 20 cm but may just be sections of rock seperated by chloritic seams and more intermediate beds; moderately sericitic, and possibly silicified (siliceous); trace ro 1% pyrite through interval - up to 5-7% over 0.5m	373.00	374.00	K015787	1.00	0.01	0.00	0.00	0.00	1.25
373.20	373.75	Py5-7% **Pyrite 5-7%** 5-7% stringer and patches of medium grained pyrite	374.00	375.00	K015788	1.00	0.01	0.00	0.00	0.00	1.25
389.50	398.10	Py1-2% **Pyrite 1-2%** 1-2% stringer, patchy and disseminated pyrite, locally up to 3-5% over intervals of 0.5m	389.50	391.00	K015789	1.50	0.01	0.00	0.00	0.00	1.25
			391.00	392.50	K015791	1.50	0.01	0.00	0.00	0.00	1.25
			392.50	394.00	K015792	1.50	0.01	0.00	0.00	0.00	1.25
			394.00	395.50	K015793	1.50	0.02	0.01	0.00	0.00	1.25
			395.50	397.00	K015794	1.50	0.05	0.01	0.00	0.01	1.25
			397.00	398.50	K015795	1.50	0.02	0.01	0.00	0.00	1.25
398.10	444.75	Py1% **Pyrite 1%** 1% disseminated and occasionally stringer pyrite; trace chalcopyrite									
444.75	611.00	V1D **Dacite** Intermediate to mafic lapilli-crystal tuff; unit is generally a heterolithic lapilli-crystal tuff, with fragments/clasts from several millimetres to 1cm, with composition primarily feldspar (plagioclase?) and felsic to intermediate volcanic fragments/lapilli; weakly to moderately bedded/foliated at 50 degrees to core axis; trace pyrite overall - locally up to 1%; rare blebs and stringers of chalcopyrite downhole - trace overall									

Description			Assay								
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
482.08	483.56	I2J **Diorite** Diorite dyke; medium green-grey; fine grained equigranular; massive									
486.16	487.30	I2J **Diorite** Diorite dyke; medium green-grey; fine grained equigranular; massive									
520.90	522.42	I2J **Diorite** Diorite dyke; medium green-grey; fine grained equigranular									
558.05	559.50	I2J **Diorite** Diorite dyke; medium green-grey; fine grained equigranular									
560.00	563.10	Py1% **Pyrite 1%** 1% fine to medium grained stringer and irregular patchy pyrite	565.70	566.70	K015796	1.00	0.03	0.01	0.00	0.00	1.25
566.70	571.90	Pytrace to 0.5%; Cptrace **Pyrite trace to 0.5%; Chalcopyrite trace** Occasional blebs, stringers and patches of chalcopyrite, with pyrite stringers	566.70	567.70	K015797	1.00	0.30	0.49	0.00	0.03	3.20
			567.70	568.70	K015798	1.00	0.09	0.10	0.00	0.01	1.25
			568.70	569.70	K015799	1.00	0.04	0.28	0.00	0.01	1.25
			569.70	570.70	K015801	1.00					
			570.70	571.90	K015802	1.20					
			571.90	572.90	K015803	1.00					
611.00	**End of DDH** **Number of samples: 58** **Number of QAQC samples: 8** **Total sampled length: 72.45**										

Xstrata Zinc Canada Exploration

DDH: **F-151**

Claims title:
Township:
Range:
Lot:

Section:
Level:
Work place:

Drilled by: Major Drilling
Described by: Des Cullen / Doug McKay

From: 3/1/2013
To: 3/9/2013

Description date:

Collar

Azimuth: 155.00°
Dip: -55.00°
Length: 324.00 m

UTM (NAD83-15)

East	641,042.000
North	5,526,728.000
Elevation	408.000

Averages - Composites

Zone	From	To	Length	Hor. th.	Ver. th.	True th.	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)

Description

Core size: NQ
Cemented: No
Stored: Yes

Down hole survey

Type	Depth	Azimuth	Dip	Invalid
Reflex	48.00	160.20°	-53.20°	No
Reflex	78.00	162.60°	-50.80°	No
Reflex	108.00	161.30°	-49.40°	No
Reflex	138.00	161.40°	-48.30°	No
Reflex	168.00	161.60°	-47.20°	No
Reflex	198.00	164.90°	-44.70°	No
Reflex	228.00	162.80°	-42.90°	No
Reflex	258.00	163.40°	-40.70°	No
Reflex	288.00	163.20°	-38.40°	No
Reflex	318.00	162.60°	-32.40°	No
Reflex	324.00	162.60°	-32.30°	No

Type	Depth	Azimuth	Dip	Invalid

Description			Assay								
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
0.00	36.00	MO									
		Over Burden									
		Casing down to 39m, bedrock starts at about 36m.									
36.00	159.10	TU1; TU2									
		Felsic tuf; Intermediate tuf									
		Varies from dark grey to lighter grey in colour with small intervals of beige colouration. Appears to be intercalated zones of varitextured pyroclastic material (lapilli-crystal tuffs) with more generally "massive" volcaniclastic material (crystal tuffs displaying some weak graded bedding, broken crystals, etc.) with the odd interval of what appears to be an ash tuff or strongly slicificed/sericitized cherty metasediment horizon in the upper portion of the unit. Upper portion (42-48.6) of the unit does have some defined deformed felsic and more angular mafic? (darker) lapilli on the 1 to 3 cm-scale, about 5% quartz eyes (1-2 mm in size, sub angular, greyish in colour), and displays a strong foliation/bedding at about 50 TCA. Remainder of flows / clastic beds also display foliation at 50 TCA. Unit is gradational downwards into a more "massive" zone with what appear to be pseudo-clasts? defined by anatomozing darker chlorite bands (however there is the possibility of them being primary). This unit is broken up with short intervals (~0.5m) of of the ash tuff or strongly slicificed/sericitized cherty metasediment horizons as mentioned previously as well as a short interval of fairly massive diorite. Overall the unit is moderately silicified and sericitized. Short intervals of carbonate and potassic alteration are present. Upper portions of the unit is weakl to moderately mineralized with disseminated pyrite.									
42.00	48.60	V1B; Bed									
		Rhyolite; Bedded									
		Greyish-tan coloured unit containing some defined deformed felsic and more angular mafic? (darker) lapilli on the 1 to 3 cm-scale, about 5% quartz eyes (1-2 mm in size, sub angular, greyish in colour), and display a strong foliation/bedding at about 50 TCA.									
42.00	48.60	Py; Cp	42.00	43.50	M829001	1.50	0.01	0.01	0.00	0.02	1.25
		Pyrite; Chalcopyrite	43.50	45.00	M829002	1.50	0.02	0.01	0.00	0.01	1.25
		mm scale to sub-cm scale blebs of disseminated pyrite	45.00	46.50	M829003	1.50	0.02	0.01	0.00	0.01	1.25
		mineralization occur throughout the zone with trace chalcopyrite	46.50	48.00	M829004	1.50	0.01	0.02	0.00	0.01	1.25
		noted. Mineralization percentage increases to about 25% in the last 60cm of core.	48.00	48.60	M829005	0.60	0.02	0.15	0.00	0.03	2.90
48.60	51.10	V1B; Bed									
		Rhyolite; Bedded									

Description			Assay							
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		Beige coloured unit, weakly bedded, strong sericite / silica alteration, ash tuff?									
48.60	51.10	Ser; Sil **Sericitisation; Silicification** Strong sericite / silica alteration in what appears to be an ash tuff "cap"? Beige in colour.									
53.60	59.80	O; Hem **Other; Hematisation** Zone of moderate potassic colouration defined by a pervasive salmony colouration of the rock. In thin veinlets it appears as a darker red colour suggesting possibly hematite alteration?									
62.00	71.00	Py6% **Pyrite 6%** 5-6% disseminated pyrite uniformly throughout the section as clots and blebs. Zone of semi-massive pyrite at 67.1-67.3.	62.00	63.00	M829006	1.00	0.00	0.01	0.00	0.00	1.25
			63.00	64.50	M829007	1.50	0.00	0.01	0.00	0.02	1.25
			64.50	66.00	M829008	1.50	0.00	0.01	0.00	0.00	1.25
			66.00	67.50	M829010	1.50	0.01	0.01	0.00	0.01	1.25
			67.50	69.00	M829011	1.50	0.01	0.01	0.00	0.00	1.25
			69.00	70.00	M829012	1.00	0.08	0.02	0.00	0.01	1.25
			70.00	71.00	M829013	1.00	0.00	0.01	0.00	0.01	1.25
81.70	81.80	Py **Pyrite** Short interval of semi-massive pyrite, irregular upper and lower contacts roughly at ~50 TCA.									
82.50	86.40	V1B **Rhyolite** Strong sericite / silica alteration in what appears to be 3 or 4 intercalated ash tuff "caps"? Beige in colour.									
82.50	86.40	Ser; Sil **Sericitisation; Silicification** Strong sericite / silica alteration in what appears to be 3 or 4 intercalated ash tuff "caps"? Beige in colour.	87.50	90.00	M829014	2.50	0.01	0.03	0.00	0.00	1.25
107.40	111.40	QV **Quartz Vein** Zone of 5 or 6 decimeter scale irregular white barren quartz veins at varing angles TCA									
126.30	126.70	HemStrong **Hematisation Strong** Strong hematite alteration (annealed paleofault?); closely spaced micro-veinlets of hematite give the zone a fissile appearance,									

Description			Assay							
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		upper and lower contacts irregular and hematite veinlets bleed into "wallrock"									
159.10	172.35	V3 **Mafic Flow** Mafic flow, dark greenish-grey to locally black, fine grained to finer medium grained, massive, composed of 10-15% tiny white crystals set in a very fine mafic groundmass, locally moderately to weakly magnetic, odd sub-cm quartz-carbonate veinlet at varying angles TCA, lano visible sulfides; locally foliated at 30 degrees to core axis with what appears to be chlorite; upper contact sharp at 45 TCA and contains a 3cm quartz vein, lower contact irregular, brecciated? with quartz infilling.									
172.35	324.00	TU1; TU2; S10; S9 **Felsic tuf; Intermediate tuf; Chert; Iron formation** Similar to 36-159.1. Varies from dark grey to lighter green-grey in colour with small intervals of beige colouration. Appears to be intercalated zones of varitextured pyroclastic material (lapilli-crystal tuffs) with more generally "massive" volcaniclastic material (crystal tuffs displaying some weak graded bedding, broken crystals, etc.) Around 300m unit has some pyritized pumice? fragments / lapilli (distinct unit) and close to EOH contains short intervals of what appear to be sulfide-IF and cherty horizons. Overall consists primarily of foliated chlorite/chld laths in an aphanitic groundmass, odd eu-subhedral feldspar crystal and units display foliation at 50 TCA. Short intervals of a foliated intermediate dykes as well as a diorite (post caldera) dyke present. Short intervals of moderate to strong sericite alteration (one zone may be a felsic volcanic but protolith difficult to discern and contacts are gradational. Very minor trace disseminated pyrite over very small intervals present, approaches 1-3% for about 10m near EOH as disseminations.									
175.50	178.00	SerStrong **Sericitisation Strong** Strongly sericitized zone									
185.80	188.60	I2J **Diorite** Dark grey-green in colour, massive, odd mm-scale q-carb vein at varying TCA, contains submm to mm scale white feldspar laths, sharp upper and lower contacts at 70 TCA.									
200.40	200.45	FLT **Fault Zone 50°** Fissile zone with 0.5 cm of fault gouge									

Description			Assay								
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
210.90	216.40	SerStrong **Sericitisation Strong** Strongly sercitized zone, could be felsic volcanic protolith but contacts diffuse									
211.70	212.10	I2 **Intermediate Dyke** Grey green in colour, noticible chill margins, sharp upper and lower contacts at 50 TCA, weak to moderately foliated defined by fg-mafic (now chlorite) clasts.									
218.30	218.40	I2 **Intermediate Dyke** Grey green in colour, noticible chill margins, sharp upper and lower contacts at 50 TCA, weak to moderately foliated defined by fg-mafic (now chlorite) clasts.									
262.90	277.60	Serm-str **Sericitisation m-str** Intermittant narrow zones of fracture controlled seritization varying from sub-cm up to 8 cm wide, fractures consistent with core foliation/bedding at 50-60 TCA									
277.60	285.40	TL1 **Felsic lapilli tuf** Distinctive grey-beige coloured unit with a mottled texture. Distinctive mottling caused by ash-to-lapilli sized (sub-mm to 4mm) flattened and rounded clasts that appear to be accretionary lapilli. Unit that is gradationally just below this one has larger lapilli of what appear to be pumice that has been infilled with pyrite-quartz-feld?. The lapilli in this unit appear to be smaller versions of those with a mafic (chlorite?) rimming (hence accretionary lapilli?). Make up about 1% of the unit and locally get up to 5-10% in abuncance over shorter intervals (10-15cm). Groundmass to these lapilli is aphanitic. Sharp upper contact at 65TCA.									
285.40	294.20	TL1 **Felsic lapilli tuf** Similar to previous but with larger qtz-py-feld lapilli up to 2cm x core width. Some have a sub-rounded appearance whereas others are chaotic in shape.	305.70	306.70	M829015	1.00	0.01	0.01	0.00	0.00	1.25
306.70	306.80	S9 **Iron formation** 10 cm band of 30-40 percent disseminated f-mg pyrite with a									

Description			Assay								
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		cherty matrix and sharp upper and lower contacts at 60 TCA.									
306.70	306.80	Py35 **Pyrite 35%** Coincides with minor unit logged as iron formation.	306.70	307.70	M829016	1.00	0.02	0.02	0.00	0.02	1.25
306.80	318.10	Py1-2 **Pyrite 1-2** 1-2 % pyrite overall through section present as disseminations, disseminated blebs, and angular shaped clasts that appear similar in origin to IF logged in previous mineralized section. Locally up to 5%.	307.70	309.00	M829018	1.30	0.01	0.03	0.00	0.00	1.25
			309.00	310.50	M829019	1.50	0.02	0.01	0.00	0.00	1.25
			310.50	312.00	M829020	1.50	0.02	0.03	0.00	0.00	1.25
			312.00	313.50	M829021	1.50	0.02	0.03	0.00	0.01	1.25
			313.50	315.00	M829022	1.50	0.01	0.01	0.00	0.00	1.25
			315.00	316.50	M829024	1.50	0.01	0.02	0.00	0.00	1.25
			316.50	317.30	M829025	0.80	0.01	0.01	0.00	0.00	1.25
			317.30	318.10	M829026	0.80	0.02	0.02	0.00	0.00	1.25
			318.10	319.10	M829027	1.00	0.01	0.00	0.00	0.00	1.25
324.00		**End of DDH** **Number of samples: 24** **Number of QAQC samples: 3** **Total sampled length: 31.50**									

Xstrata Zinc Canada Exploration

DDH: **F-152**

Claims title:
Township:
Range:
Lot:

Section:
Level:
Work place:

Drilled by: Major Drilling
Described by: Des Cullen / Doug McKay

From: 3/9/2013
To: 3/29/2013

Description date:

Collar

Azimuth: 155.00°
Dip: -60.00°
Length: 829.00 m

UTM (NAD83-15)

East	641,042.000
North	5,526,728.000
Elevation	408.000

Averages - Composites

Zone	From	To	Length	Hor. th.	Ver. th.	True th.	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
AZ	574.32	592.30	17.98	11.67	25.03	10.58	2.45	0.33	0.21	0.08	35.26
AZ	609.00	621.50	12.50	8.00	17.15	7.25	3.31	0.51	1.11	0.37	131.04

Description

Core size: NQ
Cemented: No
Stored: No

Down hole survey

Type	Depth	Azimuth	Dip	Invalid
Reflex	42.00	158.20°	-60.20°	No
Reflex	69.00	158.80°	-59.20°	No
Reflex	99.00	159.60°	-57.20°	No
Reflex	126.00	160.10°	-56.00°	No
Reflex	156.00	160.80°	-55.50°	No
Reflex	186.00	162.60°	-52.90°	No
Reflex	216.00	164.10°	-51.80°	No
Reflex	246.00	162.50°	-50.40°	No
Reflex	276.00	163.10°	-49.50°	No
Reflex	306.00	162.80°	-47.50°	No
Reflex	336.00	163.60°	-46.00°	No
Reflex	366.00	163.60°	-43.30°	No
Reflex	396.00	164.40°	-41.80°	No
Reflex	426.00	164.70°	-39.90°	No
Reflex	456.00	164.60°	-37.70°	No
Reflex	486.00	165.80°	-35.40°	No
Reflex	516.00	165.10°	-33.00°	No
Reflex	546.00	166.40°	-30.70°	No
Reflex	576.00	160.90°	-28.60°	No
Reflex	606.00	168.00°	-28.00°	No
Reflex	636.00	168.50°	-28.20°	No
Reflex	666.00	167.80°	-28.00°	No
Reflex	696.00	168.40°	-27.90°	No
Reflex	726.00	168.30°	-27.00°	No
Reflex	756.00	167.40°	-26.80°	No
Reflex	786.00	168.40°	-26.60°	No
Reflex	816.00	170.00°	-26.20°	No

Type	Depth	Azimuth	Dip	Invalid

Description			Assay							
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
0.00	33.00	MO **Over Burden** OVB									
33.00	146.10	TU1; TU2; LAP **Felsic tuf; Intermediate tuf; Lapilli** Felsic to intermediate lapilli tuff. Groundmass is light grey coloured with heterolithic, dark grey (mafic) and light grey (felsic) pyroclasts ranging from from ash (<2mm) to bombs (>64mm), but are most often lapilli sized from roughly 3mm to 20mm. Sub-rounded quartz eyes less than 1mm up to 5mm in diameter are occasionally present over intervals of less than 50cm. Fracture controlled sericite alteration, appearing as creamy-green bands, is present throughout much of the unit. Sparse chlorite alteration is present over metre scale intervals. This unit is locally moderately silicified and has sparse fracture filling carbonate as well as (<1%) randomly oriented quartz-carbonate veins ~5mm to 10mm wide. Mineralization consists of pyrite which is generally found over short intervals of a less than 5 metres as patchy blebs up to 1cm, as irregular stringers, and finely disseminated throughout. A zone of semi-massive pyrite (40-50%) is found over a 30cm interval at 88 metres depth. A dioritic dike roughly 1 metre wide is present at 108 metres depth. This unit is weakly foliated at approximately 45 degrees TCA. The contact to the underlying unit is brecciated. Alteration 33.0 to 40.5 fracture controlled sericite alteration as mm scale bands, usually concordant to foliation. Weak pervasive quartz alteration. 46.0 to 57.0 fracture controlled sericite alteration as mm scale bands, usually concordant to foliation and weakly pervasive throughout 62.0 to 69.0 salmon coloured alteration as mm scale bands parallel to foliation. Possible hematite staining or potassic alteration? 78.5 to 85.0 salmon coloured alteration as mm scale bands parallel to foliation. Possible hematite staining or potassic alteration? 92.0 to 94.5 moderate silicification giving the rock an overall lighter colour. 97.5 to 105.0 Local strong, fracture controlled sericite alteration as mm scale bands, usually concordant to foliation. 112.5 to 114.0 Local strong, fracture controlled sericite alteration as mm scale bands, usually concordant to foliation and weak pervasive silicification. Sub Lithology	35.00	36.00	M829028	1.00	0.00	0.01	0.00	0.01	1.25

Description			Assay								
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		107.70 to 108.90 Medium grained, equigranular, dioritic dike. Mineralisation 36.0 to 39.0 2-4% pyrite as irregular stringers concordat to foliation, as patchy blebs up to 5mm in diameter, and finely disseminated throughout. Hematite blebs/nodules up to 5mm in diameter occur sparsely over this interval. 48.0 to 55.5 1-3% pyrite as irregular stringers concordat to foliation, as patchy blebs up to 5mm in diameter, and finely disseminated throughout. Frim 54.0 to 55.5 there is up to 5% pyrite. From 54.0 to 54.4 there is trace chalcopyrite as subhedral grains up to 5mm in diameter hosted within quartz-carbonate veins up to 2cm in thickness. At 54.30 there are two <1mm grains of a soft, silver sulphide mineral that is possibly galena. 87.75 to 88.05 40-50% fine grained, semi-massive pyrite 88.30 to 88.60 40-50% fine grained, semi-massive pyrite									
33.00	40.50	Ser; Sil **Sericitisation; Silicification** Fracture controlled sericite alteration as mm scale bands, usually concordant to foliation. Weak pervasive quartz alteration.									
36.00	39.00	Py2-4; Hm **Pyrite 2-4; Hematite** 2-4% pyrite as irregular stringers concordat to foliation, as patchy blebs up to 5mm in diameter, and finely disseminated throughout. Hematite blebs/nodules up to 5mm in diameter occur sparsely over this interval.	36.00	37.50	M829029	1.50	0.03	0.02	0.00	0.00	1.25
			37.50	39.00	M829030	1.50	0.02	0.03	0.00	0.01	1.25
			39.00	40.20	M829031	1.20	0.03	0.02	0.00	0.02	1.25
46.00	57.00	Ser **Sericitisation** Ffracture controlled sericite alteration as mm scale bands, usually concordant to foliation and weakly pervasive throughout	47.00	48.00	M829033	1.00	0.03	0.01	0.00	0.00	1.25
48.00	55.50	Py1-3; Cptrace; GALtrace? **Pyrite 1-3; Chalcopyrite trace; Galena trace?** 1-3% pyrite as irregular stringers concordat to foliation, as patchy blebs up to 5mm in diameter, and finely disseminated throughout. Frim 54.0 to 55.5 there is up to 5% pyrite. From 54.0 to 54.4 there is trace chalcopyrite as subhedral grains up to 5mm in diameter hosted within quartz-carbonate veins up to 2cm in thickness. At 54.30 there are two <1mm grains of a soft, silver sulphide mineral	48.00	49.50	M829034	1.50	0.03	0.01	0.00	0.01	1.25
			49.50	51.00	M829035	1.50	0.04	0.00	0.00	0.00	1.25
			51.00	52.50	M829036	1.50	0.03	0.00	0.00	0.00	1.25
			52.50	54.00	M829037	1.50	0.02	0.01	0.00	0.01	1.25
			54.00	55.50	M829038	1.50	0.03	0.04	0.00	0.01	1.25
			55.50	57.00	M829040	1.50	0.01	0.01	0.00	0.00	1.25

Description			Assay								
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		that is possibly galena.									
62.00	69.00	Hem?; POT? **Hematisation ?; Potassic ?** Salmon coloured alteration as mm scale bands parallel to foliation. Possible hematite staining or potassic alteration?									
78.50	85.00	POT?; Hem? **Potassic ?; Hematisation ?** salmon coloured alteration as mm scale bands parallel to foliation. Possible hematite staining or potassic alteration?	86.50	87.75	M829041	1.25	0.01	0.02	0.00	0.00	1.25
87.75	88.05	Py40-50 **Pyrite 40-50** 40-50% fine grained, semi-massive pyrite	87.75	88.60	M829042	0.85	0.01	0.06	0.00	0.02	1.25
88.30	88.60	Py40-50 **Pyrite 40-50** 40-50% fine grained, semi-massive pyrite	88.60	90.00	M829044	1.40	0.00	0.01	0.00	0.00	1.25
92.00	94.50	Sil **Silicification** moderate silicification giving the rock an overall lighter colour.									
97.50	105.00	Ser **Sericitisation** Local strong, fracture controlled sericite alteration as mm scale bands, usually concordant to foliation.									
107.70	108.90	I2J; MED GRN; EQGRN **Diorite; Medium Grained; Equigranular** Medium grained equigranular, dioritic dike.									
112.50	114.00	Ser; Sil **Sericitisation; Silicification** Local strong, fracture controlled sericite alteration as mm scale bands, usually concordant to foliation and weak pervasive silicification.									
140.40	141.10	FL TP; BRECC **Flow Top; Brecciated** Brecciated mafic material with occasional fracture filling silica and intermixed sediments. Possibly a flow top breccia or perhaps a									

Description			Assay								
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		debris flow between hiatus in volcanic activity?									
141.10	142.40	Sil **Silicification** Moderate silicification of flow, proximal to upper contact.									
146.10	239.95	VF2; AMYG; V2J **Intermediate Flow; Amygdaloidal; Andesite** Dark grey-green, fine grained, intermediate volcanic unit. The upper 70 cm of this unit is brecciated and may represent a flow top, but otherwise massive textures dominate. Amygdules are common in the upper portion of the flow and have a modal occurrence of up to 30%. In general amygdules are 1mm to 5mm in diameter and consist mainly of quartz+/-carbonate. Lapilli are itermittently present over decimetre scale intervals and coincide with more felsic zones. Randomly oriented quartz-carbonate veins are present throughout the unit and are generally from 5mm to 10mm wide. Carbonates occur as both calcite, and ankerite. Decimeter scale zones of brecciation with quartz flooding are found from 168 to 185 metres. Weak silicification occasionally occurs as well as localized minor sericitization from 169.5 to 189.50m. A cluster of equigranular, fine to medium grained, intermediate (dioritic?) dikes, ranging from 10cm to 120cm in diameter, occur from 193.2 to 197m. Hematite occurs along fractures from 234m to 239.55m. Late-stage chalcopyrite sparsely occurs within these veinlets and extremely sparse, fine grained, disseminated pyrite is also rarely present throughout. Mineralization Late chalcopyrite in quartz-carbonate veinlets and extremely sparse fine grained disseminated pyrite.									
158.20	158.70	FLT **Fault Zone** Fault zone? The rock within this interval is incompetent, highly fractured with fragments generally ranging from 0.5cm to 2.0cm in diameter.									
193.20	197.20	I2J; DK **Diorite; Dike** A cluster of equigranular, fine to medium grained, intermediate (dioritic?) dikes from 10cm to 120cm wide.									
234.00	240.00	Hem; Sil **Hematisation; Silicification**									

Description			Assay							
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		Hematite occurs along mm-scale fractures.									
239.95	490.75	TU1; TU2 **Felsic tuf; Intermediate tuf** Felsic to intermediate tuff. This unit varies from dark grey to lighter green-grey in colour with small intervals of beige colouration (sericite). Overall, there appears to be intercalated zones of vari-textured pyroclastic material (lapilli-crystal tuffs) with more generally "massive" volcaniclastic material (crystal tuffs displaying some weak graded bedding, broken crystals, etc.). Weakly to moderately foliated at 45-50 degrees TCA and occasionally crudely bedded. Local silica and sericite alteration. Randomly oriented quartz- carbonate veinlets from 5mm to 20mm occur throughout. . From 239.95 to 284.2 metres the rock is slightly lighter coloured (light grey coloured with greenish hue). Here, ~1-2mm flattened/elongated quartz clasts/eyes with a modal occurrence of 2-3% are found intermittently throughout and crude layering is present. From 284.2 to 294.95m, poorly sorted, sub-angular, heterolithic lapilli ranging from 5mm to 20mm in diameter occur. The lapilli are weakly elongated and are oriented along the foliation of 45 degrees TCA over this interval. Fracture controlled sericite alteration, appearing as creamy-green bands, is also present here as well as moderate silicification and occasional carbonate filling fractures. At 294.95m, a 10cm interval with 5% magnetite occurs. From 301.5 to 307.5m, 1% pyrite occurs as irregular stringers parallel to foliation and as fine grains disseminated throughout. From 305.1 to 305.65m, there is 20-40% semi-massive pyrite. From 340.6 to 341.8 the rock is light creamy greyish-green due to moderate silica and sericite alteration. From 400.90 to 402.40m, there is a distinct heterolithic lapilli unit, with elongated, sub-angular lapilli ranging from 5mm to 20mm in length. From 405.5 to 409.6m, there is distinct heterolithic lapilli unit, with elongated, sub-angular lapilli ranging from 5mm to 20mm in length and up to 1% pyrite as mm scale elongated blebs and stringers. Trace fine grained pyrite is disseminated throughout. From 429.4 to 432.0 there is a sub unit of highly brecciated pyroclastic material with clasts ranging from <1mm up to 15mm. This interval is moderately silica and sericite altered and contains 1-2% pyrite as mm scale stringers and elongated blebs. A milky white, bull quartz vein is present from 442.7 to 443.5. From 462.5 to 490.75, dioritic dikes of various orientations are present until the lower contact at 490.75m where diorite becomes the dominant ithology.									
240.00	244.80	Sil; Hem **Silicification; Hematisation** Moderate pervasive silicification giving the rock a medium to light									

Description			Assay								
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		grey colour. Hematite occurs along mm-scale fractures.									
252.40	252.50	FLT **Fault Zone** Possible minor fault zone (core is highly fractured over this interval).									
256.10	256.30	FLT **Fault Zone** Possible minor fault zone (core is highly fractured over this interval).									
257.30	257.70	Sil; Ser; Car **Silicification; Sericitisation; Carbonatisation** Moderate silicification, sericitization, and carbonatization alteration infilling a zone of brecciation.									
265.20	265.30	FLT **Fault Zone** Possible minor fault zone (core is highly fractured over this interval).									
276.60	276.70	FLT **Fault Zone** Possible minor fault zone (core is highly fractured over this interval).									
284.20	294.95	TL1 **Felsic lapilli tuf** Lapilli are heterolithic, poorly sorted, and generally range from 5mm to 20mm in length. Lapilli are elongated and oriented along foliation at 45 degrees TCA. Fracture controlled sericite alteration, appearing as creamy-green bands, is present throughout as well as moderate silicification and occasional iron carbonate alteration filling fractures.									
284.20	294.95	Ser; Sil **Sericitisation; Silicification** Fracture controlled sericite and carbonates, as well as pervasive silicification.									
294.95	295.05	Mt **Magnetite**	300.00	301.50	M829045	1.50	0.01	0.00	0.00	0.00	1.25

Description			Assay							
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		294.95 to 295.05 magnetite alteration as 1mm subhedral grains with a 5% modal occurrence									
301.50	307.50	Py01	301.50	303.00	M829046	1.50	0.01	0.00	0.00	0.00	1.25
		Pyrite 1%	303.00	304.50	M829047	1.50	0.01	0.00	0.00	0.00	1.25
		1% pyrite as irregular stringers parallel to foliation and fine grains disseminated throughout. From 305.1 to 305.65 there is a zone a semi-massive pyrite with a modal occurrence of 20-40%.	304.50	306.00	M829048	1.50	0.01	0.01	0.00	0.01	1.25
			306.00	307.50	M829049	1.50	0.01	0.00	0.00	0.00	1.25
307.50	312.65	TL1; TL2	307.50	309.00	M829050	1.50	0.01	0.00	0.00	0.00	1.25
		Felsic lapilli tuf; Intermediate lapilli tuf									
		Distinctive felsic to intermediate lapillii tuff. Weakly foliated at 50 degrees TCA. Lapilli are heterolithic as approximately 70% felsic and 30% mafic, poorly sorted elongated clasts ranging from 2mm to 15mm in diameter. The matrix is a medium grey colour with a greenish hue. Lapilli have a modal occurrence of roughly 40% and are angular.									
321.30	338.20	Sil									
		Silicification									
		Moderate pervasive silicification.									
340.60	341.80	Ser; Sil									
		Sericitisation; Silicification									
		Moderate sericite and silica alteration over a short interval.									
400.90	402.40	TL1; TL2									
		Felsic lapilli tuf; Intermediate lapilli tuf									
		Distinct heterolithic lapilli unit, with elongated, sub-angular lapilli ranging from 5mm to 20mm in length									
405.50	409.60	TL1; TL2									
		Felsic lapilli tuf; Intermediate lapilli tuf									
		Distinct heterolithic lapilli unit, with elongated, sub-angular lapilli ranging from 5mm to 20mm in length and up to 1% pyrite as mm scale elongated blebs and stringers.									
405.50	409.60	Py01	405.50	407.00	M829051	1.50	0.01	0.01	0.00	0.00	1.25
		Pyrite 1%	407.00	408.50	M829052	1.50	0.01	0.01	0.00	0.00	1.25
		Up to 1% pyrite as mm scale elongated blebs and stringers.	408.50	410.00	M829053	1.50	0.01	0.01	0.00	0.03	1.25
			428.00	429.40	M829054	1.40	0.01	0.01	0.00	0.00	1.25
429.40	432.00	PYRO									
		Pyroclastics									
		Sub unit of highly brecciated pyroclastic material with clasts ranging from <1mm up to 15mm. This interval is moderately silica and sericite altered and contains 1-2% pyrite as mm scale									

Description			Assay							
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		stringers and elongated blebs.									
429.40	432.00	Ser; Sil									
		Sericitisation; Silicification									
		This interval is moderately silica and sericite altered and contains									
		1-2% pyrite as mm scale stringers and elongated blebs.									
429.40	432.00	Py1-2	429.40	430.70	M829056	1.30	0.00	0.01	0.00	0.01	1.25
		Pyrite 1-2	430.70	432.00	M829057	1.30	0.01	0.00	0.00	0.00	1.25
		1-2% pyrite as mm scale irregular stringers and elongated blebs.	432.00	433.50	M829058	1.50	0.01	0.01	0.00	0.00	1.25
490.75	528.50	I2J	527.50	528.50	M829059	1.00	0.01	0.01	0.00	0.01	1.25
		Diorite									
		Medium to dark grey-green, fine to medium grained, equigranular diorite.									
		This unit is occasionally very weakly foliated at 45 degrees TCA. Sparse									
		irregular quartz-carb veinlets occur throughout. Occasionally silica and									
		sericite altered. Very sparse fine grained pyrite disseminated throughout.									
528.50	557.15	TX1	528.50	529.50	M829060	1.00	0.01	0.00	0.00	0.00	1.25
		Felsic cristal tuf	529.50	530.50	M829061	1.00	0.03	0.02	0.00	0.00	1.25
		Medium to light grey-beige, quartz-phyric felsic tuff. Variably sericitized	530.50	531.50	M829062	1.00	0.15	0.02	0.00	0.01	1.25
		and locally pyrite-mineralized with up to 5% sub-rounded clear-grey	531.50	532.50	M829064	1.00	0.11	0.02	0.00	0.01	1.25
		quartz eyes, 2-4mm in diameter. Sericite alteration as a pervasive zone	532.50	533.50	M829065	1.00	0.13	0.01	0.00	0.00	1.25
		form 537.2 to 540.8 and as wispy 5mm to 10mm bands from 540.8 to	533.50	534.50	M829066	1.00	0.09	0.01	0.00	0.01	1.25
		554.5m. Pyrite mineralization present from 528.50 to 535.90 as 2-3%	534.50	535.20	M829067	0.70	0.04	0.01	0.00	0.00	1.25
		irregular stringers and blebs up to 2mm in size. 5-6% pyrite in bands and	535.20	535.90	M829068	0.70	0.05	0.03	0.00	0.00	1.25
		stringers from 556.4 to 557.2m. Within this interval pyrite is at time semi	535.90	537.00	M829069	1.10	0.01	0.00	0.00	0.03	1.25
		massive over cm scale intervals, such as from 556.6 to 556.7m, where									
		20-30% semi massive pyrite occurs.									
528.50	535.90	Py2-3									
		Pyrite 2-3									
		2-3% pyrite as irregular stringers and lenses up to 2cm in size.									
537.20	540.80	Ser									
		Sericitisation									
		Pervasive sericite alteration									
540.80	554.20	Ser	555.40	556.40	M829070	1.00	0.04	0.00	0.00	0.02	1.25
		Sericitisation									
		wispy bands of sericite alteration 5-10mm in width with a 30-40%									
		modal occurrence.									
556.40	557.20	Py5-6	556.40	557.40	M829071	1.00	0.28	0.04	0.00	0.03	3.20
		Pyrite 5-6									
		5-6% pyrite in bands and stringers.									

Description			Assay								
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
557.15	561.04	FAT **Felsic Ash Tuff** Medium grey, fine grained, ash tuff. Beds of 0.5cm up to 20cm at 60 degrees TCA. Quartz eyes found in sprasely occurring 1-3cm intervals as 1-2mm subangular clasts. Trace fine grained pyrite occurs in sub-rounded 5mm blebs and disseminated throughout. Lower contact is gradational over 5-10cm.									
557.20	561.04	Pytrace **Pyrite trace** Trace fine grained pyrite occurs in sub-rounded 5mm blebs and as fine grains disseminated throughout	557.40	558.50	M829073	1.10	0.37	0.03	0.01	0.02	2.70
			558.50	560.00	M829074	1.50	0.28	0.04	0.01	0.01	3.40
			560.00	561.00	M829075	1.00	0.10	0.01	0.00	0.00	1.25
			561.00	562.00	M829076	1.00	0.05	0.01	0.00	0.00	1.25
561.04	572.04	FAT; TL1; TX1; GRPH SEDS **Felsic Ash Tuff; Felsic lapilli tuf; Felsic cristal tuf; Graphitic Sediments** Medium grey, locally dark grey crystal tuff with local ash, lapilli and intermixed graphitic sediments and intercalated narrow intervals of the above unit. 2-3% clear angular quartz eyes occurring locally throughout. Graphite occurs as irregular mm scale black bands. Locally semi massive, stringers, pods and blebs of pyrite with trace irregular stringers and blebs of sphalerite and chalcopyrite. Variably foliated/bedded at 60-80 degrees TCA. Lower contact is sharp at 90 degrees TCA.	562.00	563.00	M829077	1.00	0.03	0.01	0.01	0.03	3.50
			563.00	564.00	M829078	1.00	0.17	0.02	0.02	0.01	3.90
			564.00	565.00	M829079	1.00	2.73	0.16	0.06	0.03	20.20
			565.00	566.00	M829080	1.00	0.05	0.01	0.02	0.01	4.30
			566.00	567.00	M829081	1.00	0.08	0.00	0.01	0.00	1.25
561.04	566.44	Py7-10; Sptrace; Cptrace **Pyrite 7-10; Sphalerite trace; Chalcopyrite trace** 7-10% pyrite as semi massive zones up to 10cm wide, and in irregular stringers and blebs. Trace sphalerite and chalcopyrite occur in irregular stringers and as blebs associated with pyrite.									
566.44	568.88	Py01; Sptrace **Pyrite 1%; Sphalerite trace** 1% pyrite and trace sphalerite in irregular stringers and blebs	567.00	568.00	M829082	1.00	0.12	0.01	0.02	0.01	2.70
			568.00	569.00	M829083	1.00	0.24	0.01	0.04	0.02	7.40
568.88	572.04	Py15-20; Sptrace; Cptrace **Pyrite 15-20; Sphalerite trace; Chalcopyrite trace** 15-20% pyrite in semi massive zones up to 30cm wide, in stringers, as pods and blebs. Trace irregular stringers and blebs of sphalerite and chalcopyrite.	569.00	570.00	M829084	1.00	0.11	0.01	0.03	0.04	6.40
			570.00	571.00	M829085	1.00	0.06	0.00	0.02	0.02	7.80
			571.00	572.04	M829086	1.04	3.28	0.27	0.25	0.13	25.40
572.04	574.32	I2									

		Description	Assay								
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		Intermediate Dyke Miedium green-grey, fine to medium grained intermediate dike. Weakly sericitic. Lower contact sharp at 80 degrees TCA.									
572.04	574.32	Pytrace **Pyrite trace** trace fine grained disseminated pyrite	572.04 573.20	573.20 574.32	M829087 M829088	1.16 1.12	0.04 0.05	0.00 0.00	0.00 0.01	0.00 0.05	1.25 1.25
574.32	584.30	MINE ZONE **Mineralized Zone** Mineralized zone with up to 60% massive sulfides over intervals up to 1.16 metres wide. The first 1.38 metres of this zone (from 574.32 to 575.70m) consists of 25-30% pyrite as semi-massive zones up to 20cm wide, in bands up to 20cm and in stringers. Trace fracture-filling sphalerite, galena and chalcopyrite occur in a 5cm wide quartz vein at 575.65m. From 575.70 to 578.75m, 10% sphalerite as semi massive bands up to 10cm wide with small rock inclusions as well as associated galena (0.5%) and trace chalcopyrite. Also from 575.70 to 578.75m, there is 10-15% pyrite as semi-massive zones up to 20cm wide and in irregular stringers. 0.5% galena occurs as irregular stringers and net-texture within zones of semi-massive sphalerite. From 578.75 to 580.85m, 40% pyrite occurs in semi-massive zones and as irregular stringers. From 580.85 to 584.30m, 2-3% sphalerite, 1-2% pyrite, and 1% chalcopyrite occur in irregular stringers and blebs. Within this mineralized zone, the host rock appears to be a medium grey, locally dark grey crystal tuff with local ash, lapilli and intermixed graphitic sediments. 2-3% clear angular quartz eyes occur locally throughout. A light grey, cherty sedimentary? unit occurs from 576.76 to 577.82m and exclusively hosts sphalerite in veinlets and stringers with trace pyrite. The lower contact is sharp at 70 degrees TCA.	574.32	575.70	M829089	1.38	0.62	0.05	0.23	0.08	22.40
574.32	575.70	Py; Py25-30; Sptrace; GALtrace; Cptrace **Pyrite; Pyrite 25-30; Sphalerite trace; Galena trace; Chalcopyrite trace** 25-30% pyrite as semi-massive zones up to 20cm wide, in bands up to 20cm and in stringers. Trace fracture-filling sphalerite, galena and chalcopyrite occur in a 5cm wide quartz vein at 575.65m.									
575.70	578.75	Sp10; GAL00.5; Cptrace; Py10-15 **Sphalerite 10%; Galena 0.5%; Chalcopyrite trace; Pyrite 10-15** 10% sphalerite as semi massive bands up to 10cm wide with small	575.70 576.70 577.70	576.70 577.70 578.75	M829090 M829092 M829094	1.00 1.00 1.05	12.05 8.59 4.73	0.07 0.08 0.06	0.94 0.13 1.10	0.25 0.11 0.22	91.40 103.00 76.60

Description			Assay								
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		rock inclusions as well as associated galena (0.5%) and trace chalcopyrite. 10-15% pyrite as semi-massive zones up to 20cm wide and in irregular stringers. 0.5% galena occurs as irregular stringers and net-texture within zones of semi-massive sphalerite.									
578.75	580.85	Py40	578.75	579.75	M829096	1.00	0.40	0.02	0.11	0.06	9.20
		Pyrite 40%	579.75	580.85	M829097	1.10	0.34	0.04	0.27	0.10	23.50
		40% pyrite occurs in semi-massive zones and as irregular stringers.									
580.85	584.30	Sp2-3; Py1-2; Cp01	580.85	582.00	M829098	1.15	4.68	0.16	0.23	0.18	33.10
		Sphalerite 2-3; Pyrite 1-2; Chalcopyrite 1%	582.00	583.20	M829099	1.20	1.64	0.08	0.08	0.04	12.20
		2-3% sphalerite, 1-2% pyrite, and 1% chalcopyrite occur in irregular stringers and blebs.	583.20	584.30	M829100	1.10	0.11	0.21	0.03	0.03	11.10
584.30	588.30	FAT									
		Felsic Ash Tuff									
		Medium to light grey, fine grained, felsic crystal tuff with 1-2% clear, sub-angular quartz eyes with occasional bluish tint. Crudely bedded at 70 degrees TCA. Trace fine grained pyrite disseminated throughout. Lower contact gradational to underlying mineralized zone.									
584.30	588.30	Pytrace	584.30	585.30	M829101	1.00	0.06	0.01	0.01	0.00	1.30
		Pyrite trace	585.30	586.30	M829102	1.00	0.05	0.00	0.01	0.00	0.90
		trace fine grained disseminated pyrite.	586.30	587.30	M829103	1.00	0.03	0.00	0.00	0.00	0.30
			587.30	588.30	M829104	1.00	0.03	0.00	0.00	0.00	0.10
588.30	592.15	MINE ZONE	588.30	589.30	M829105	1.00	0.08	0.02	0.00	0.00	1.10
		Mineralized Zone	589.30	590.30	M829106	1.00	2.05	1.20	0.11	0.06	59.20
		Mineralized zone hosted within a light to medium grey, locally dark grey, ash tuff. From 588.3 to 591.3m, 7-10% pyrite occurs as subhedral rounded grains 3-4mm in diametre and as wispy blebs and stringers. 2-3% cpy and trace sphalerite occur in wispy blebs and stringers. From 591.3 to 592.15m, 1% sphalerite occurs in wispy stringers and blebs. The lower contact of this zone is gradational as sphalerite mineralization decreases and we get the introduction of quartz phenocrysts	590.30	591.30	M829107	1.00	5.38	3.57	0.35	0.20	157.00
588.30	591.30	Py7-10; Cp2-3; Sptrace									
		Pyrite 7-10; Chalcopyrite 2-3; Sphalerite trace									
		7-10% pyrite occurs as subhedral rounded grains 3-4mm in diametre and as wispy blebs and stringers. 2-3% cpy and trace sphalerite occur in wispy blebs and stringers.									
591.30	592.15	Sp01; Pytrace	591.30	592.30	M829109	1.00	1.72	0.31	0.01	0.01	8.40
		Sphalerite 1%; Pyrite trace									
		1% sphalerite occurs in wispy stringers and blebs. Trace									

Description				Assay								
				From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
			disseminated pyrite.									
592.15	610.06		TX1; V1B; V1C									
			Felsic cristal tuf; Rhyolite; Rhyodacite									
			Rhyolite to rhyodacite crystal tuff; light to medium grey; fine to coarse grained with fine grained matrix and 3-5% clear to grey, sub-rounded to sub-angular quartz eyes, from 1 to 5mm in size; unit also exhibits local mafic minerals, generally lath shaped, about 1mm by up to 1cm long (pyroxenes?) - 2-3% over several metres; unit is generally siliceous; weakly sericitic; trace fracture-controlled pyrite; lower contact sharp and somewhat regular at 70 degrees to core axis.									
	592.15	610.06	Serweak									
			Sericitisation weak									
			Weak pervasive sericite									
	592.15	610.06	Pytrace	592.30	593.30	M829111	1.00	0.06	0.00	0.01	0.00	0.10
			Pyrite trace	593.30	594.30	M829112	1.00	0.07	0.00	0.01	0.00	0.20
			Trace fracture-controlled pyrite	609.00	610.06	M829113	1.06	0.07	0.02	0.01	0.00	1.20
610.06	615.48		GRPH SEDS									
			Graphitic Sediments									
			Medium to light grey, generally very fine grained (aphanitic) to medium grained with occasional beds containing 1-2mm sub-angular grey quartz eyes; common anastamosing graphite seams; 25 to 30% semi-massive and stringer pyrite; lower contact sharp and regular at 70 degrees to core axis									
	610.06	615.48	Py25-30%	610.06	611.00	M829114	0.94	1.14	0.04	0.02	0.04	9.70
			Pyrite 25-30%	611.00	612.00	M829115	1.00	0.66	0.04	0.01	0.01	3.80
			25 to 30% semi-massive and stringer pyrite	612.00	613.00	M829116	1.00	0.18	0.01	0.01	0.01	1.90
				613.00	614.20	M829117	1.20	0.81	0.04	0.14	0.04	24.70
				614.20	615.50	M829118	1.30	0.85	0.08	0.46	0.10	45.70
615.48	621.30		MINE ZONE	615.50	616.50	M829119	1.00	0.00	0.19	4.69	0.67	413.00
			Mineralized Zone									
			Mineralized Zone - approximately 95% massive sulphide as described in the "mineralization" section. Minerals include pyrite, sphalerite, galena and chalcopyrite; sphalerite is locally massive with disseminated galena, and locally banded - appears to be exsolution lamellae; the graphitic sediments appear to end at about 620.70m									
	615.48	615.95	Py75%; Sp25%; GALtrace; Cptrace									
			Pyrite 75%; Sphalerite 25%; Galena trace; Chalcopyrite trace									

Description			Assay								
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		Massive sulphide, with about 75% massive pyrite and 25% sphalerite, with trace galena and chalcopyrite; sphalerite is generally banded - appears to be exsolution lamellae									
615.95	617.35	Sp90%; GAL3-5%; Py2-3% **Sphalerite 90%; Galena 3-5%; Pyrite 2-3%** Massive sulphide with 90% massive sphalerite with 3-5% disseminated galena throughout, and 2-3% pyrite patches; 2-3% rock fragments	616.50	617.50	M829121	1.00	0.00	0.42	2.47	1.11	465.00
617.35	619.90	Py75%; Sp10-15%; Cp2-3% **Pyrite 75%; Sphalerite 10-15%; Chalcopyrite 2-3%** 75% massive pyrite with 10-15% sphalerite bands (exsolution lamellae?), 2-3% chalcopyrite and 5% rock fragments	617.50	618.50	M829122	1.00	9.64	0.70	2.54	0.74	270.00
			618.50	619.50	M829123	1.00	15.50	0.59	2.30	1.10	173.00
			619.50	620.50	M829125	1.00	10.25	1.77	0.97	0.26	140.00
619.90	621.30	Py15-20%; Sp1-2%; Cp1-2% **Pyrite 15-20%; Sphalerite 1-2%; Chalcopyrite 1-2%** 15-20% semi-massive and stringer pyrite, 1-2% irregular stringers of sphalerite and 1-2% stringers and blebs of chalcopyrite	620.50	621.50	M829127	1.00	1.92	2.39	0.07	0.54	71.80
621.30	625.70	S1 **Volcaniclastic Sediment** Possibly an ash to lapilli tuff; medium grey; fine to coarse grained; massive to weakly foliated/bedded at 70 degrees to core axis; generally homogenous fine grained sediment (possible tuff) with occasional quartz phenocrysts/clasts, from several millimetres to 1 cm, lenticular to sub-rounded; occaional irregular quartz veins up to ~10cm; 0.5 to 1% fine grained disseminted pyrite, with trace chalcopyrite and sphalerite blebs and pods; lower contact sharp and regular at 70 degrees to core axis									
621.30	625.70	Py0.5-1%; Sptrace; Cptrace **Pyrite 0.5-1%; Sphalerite trace; Chalcopyrite trace** 0.5 to 1% fine grained disseminted pyrite, with trace chalcopyrite and sphalerite blebs and pods	621.50	622.50	M829128	1.00	0.06	0.03	0.01	0.00	1.80
			622.50	623.50	M829129	1.00	0.02	0.01	0.00	0.00	1.25
			623.50	624.50	M829130	1.00	0.03	0.08	0.00	0.01	1.25
			624.50	625.50	M829131	1.00	0.26	0.43	0.00	0.02	7.50
			625.50	626.50	M829132	1.00	0.02	0.07	0.00	0.00	1.25
625.70	774.02	TL2 **Intermediate lapilli tuf** Medium grey; fine to medium grained; massive to variably bedded at 45 to 70 degrees to core axis; trace local quartz eyes, sub-angular, clear to grey, 1-2mm in size; local ash tuff intervals; weakly sericitic throughout; local trace irregular chalcopyrite stringers; trace to 0.5% disseminated and stringer pyrite. Zone of incresed mineralization from 677.13 to 678.16m consisting of 10-15% pyrite and 1-2% chalcopyrite in irregular									

Description			Assay							
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		stringers and blebs. Locally, 5% possible chloritoid occurs as 1mm sub-rounded dark green-balck grains. Extremely sparse, randomly oriented quartz-carbonate veinlets are locally present. Below 730 metres, frequency of lapilli decrease and the rock begins to resemble more of a crystal tuff; lower contact is somewhat gradational/arbitrary due to intercalated narrow intervals of this unit and the breccia unit below around the contact zone									
625.70	774.20	SerWeak; Chldlocal **Sericitisation Weak; chloritoid local** Weak sericite throughout, and local possible chloritoid									
625.70	628.50	Py0.5-1% **Pyrite 0.5-1%** 0.5-1% disseminated and stringer pyrite									
639.15	640.95	TU2 **Intermediate tuf** Massive intermediate ash tuff (possible dyke?); medium grey; fine to medium grained; weak foliation/bedding at 70 degrees to core axis; contacts sharp and irregular									
643.63	644.04	TU2 **Intermediate tuf** As above									
645.17	645.50	TU2 **Intermediate tuf** As above	647.00	648.00	M829133	1.00	0.02	0.01	0.00	0.00	1.25
			648.00	649.00	M829134	1.00	0.08	0.75	0.00	0.03	5.50
648.30	650.18	Cp0.5-1% **Chalcopyrite 0.5-1%** Approximately 0.5-1% stringer and blebs of chalcopyrite with about 1% pyrite	649.00	650.00	M829135	1.00	0.04	0.09	0.00	0.01	1.25
			650.00	651.00	M829136	1.00	0.02	0.05	0.00	0.00	1.25
			656.00	657.00	M829137	1.00	0.02	0.02	0.00	0.00	1.25
657.00	657.50	Cp1-2%; Py1-2% **Chalcopyrite 1-2%; Pyrite 1-2%** 1-2% stringer and fracture-controlled chalcopyrite and 1-2% pyrite	657.00	658.00	M829138	1.00	0.02	0.57	0.00	0.02	3.60
			658.00	659.00	M829139	1.00	0.02	0.12	0.00	0.01	1.25
			659.00	660.00	M829140	1.00	0.02	0.04	0.00	0.00	1.25
660.00	660.30	Cp2-3% **Chalcopyrite 2-3%** 2-3% stringer chalcopyrite	660.00	661.00	M829141	1.00	0.02	0.48	0.00	0.01	2.60
			661.00	662.00	M829142	1.00	0.02	0.08	0.00	0.01	1.25
			676.13	677.13	M829143	1.00	0.02	0.02	0.00	0.00	1.25
677.13	678.16	Py10-15; Cp1-2 **Pyrite 10-15; Chalcopyrite 1-2** Mineralized zone consisting of 10-15% pyrite and 1-2% chalcopyrite in irregular stringers and blebs.	677.13	678.16	M829144	1.03	0.03	2.07	0.00	0.03	8.30
			678.16	679.00	M829146	0.84	5.74	0.02	0.11	0.00	9.40
			679.00	680.00	M829147	1.00	0.01	0.01	0.00	0.00	1.25

Description			Assay								
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
			680.00	681.00	M829148	1.00	0.01	0.02	0.00	0.00	1.25
			681.00	682.00	M829149	1.00	0.02	0.08	0.00	0.00	1.25
705.00	717.00	TU2	716.00	717.00	M829150	1.00	0.01	0.00	0.00	0.00	1.25
		Intermediate tuf									
		Increase in quartz eye content to 3-5%. Quartz eyes are clear to grey, sub-angular to sub-rounded and 1-3mm in size.									
716.22	722.92	Py2-3; Sptrace	717.00	718.50	M829151	1.50	0.17	0.00	0.00	0.00	1.25
		Pyrite 2-3; Sphalerite trace	718.50	720.00	M829152	1.50	0.07	0.01	0.00	0.00	1.25
		2-3% stringer and disseminated pyrite. From 722.35 to 722.45m a Quartz-carbonate vein hosts blebs of sphalerite up to 2cm in size	720.00	721.50	M829153	1.50	0.10	0.01	0.00	0.00	1.25
			721.50	722.30	M829154	0.80	0.34	0.01	0.00	0.00	1.25
			722.30	723.00	M829155	0.70	1.53	0.03	0.00	0.00	1.25
			723.00	724.00	M829181	1.00	1.07	0.08	0.00	0.00	1.25
			732.00	733.00	M829157	1.00	0.34	0.05	0.00	0.01	1.25
			733.00	733.50	M829158	0.50	1.65	0.03	0.00	0.00	1.25
733.02	733.45	Sp0.5-1; Cptrace; Pytrace									
		Sphalerite 0.5-1; Chalcopyrite trace; Pyrite trace									
		Stringers and patches of 0.5 to 1% sphalerite with trace chalcopyrite and pyrite.									
733.45	738.60	Cptrace-0.5	733.50	735.00	M829160	1.50	0.50	0.07	0.00	0.00	1.25
		Chalcopyrite trace-0.5	735.00	736.50	M829161	1.50	0.31	0.53	0.00	0.02	9.00
		Trace to 0.5% chalcopyrite in irregular stringers, blebs and fracture controlled. Trace pyrite and possible trace sphalerite as very fine disseminated grains associated with chalcopyrite.	736.50	738.00	M829163	1.50	0.12	0.63	0.00	0.02	12.70
			738.00	739.00	M829164	1.00	0.09	0.33	0.00	0.01	5.50
754.00	755.00	Cptrace-0.5%	762.70	763.70	M829165	1.00	0.18	0.01	0.00	0.00	1.25
		Chalcopyrite trace-0.5%									
		trace to 0.5% fracture-controlled and vein-hosted chalcopyrite									
763.70	768.70	Sptrace	763.70	764.70	M829166	1.00	0.78	0.05	0.00	0.01	1.25
		Sphalerite trace	764.70	765.70	M829167	1.00	1.43	0.02	0.00	0.00	1.25
		trace sphalerite stringers and blebs overall, locally up to 2-3% over 30cm	765.70	766.70	M829168	1.00	0.88	0.01	0.00	0.00	1.25
			766.70	767.70	M829169	1.00	0.22	0.00	0.00	0.02	1.25
			767.70	768.70	M829170	1.00	0.42	0.00	0.00	0.00	1.25
			768.70	769.70	M829171	1.00	0.06	0.00	0.00	0.01	1.25
774.02	800.10	V1D; BRECC									
		Dacite; Brecciated									
		Medium to dark grey, unit is generally chaotic in appearance due to abundant irregularly-shaped, angular clasts/fragments of variable composition; moderately to locally strongly chloritic; moderately sericitic;									

Description			Assay								
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		local moderate chloritoid, possible silicification. Chlorite is generallly interstitial between breccia fragments. Chloritoid generally consists of 1-2mm, sub-rounded to sub-angular, grains/clasts. Trace pyrite and chalcopyrite are found in stringers and disseminated throughout. The lower contact is gradational.									
774.20	800.10	Chl; Ser; Chld **Chloritisation; Sericitisation; chloritoid** Weak pervasive sericite and chlorite alteration and possible chloritoid.	786.40	787.40	M829172	1.00	0.51	0.03	0.00	0.01	2.50
787.40	788.20	Sp5-7%; Cp0.5-1.0; Pytrace **Sphalerite 5-7%; Chalcopyrite 0.5-1.0; Pyrite trace** Stringers and blebs of sphalerite associated with quartz carbonate flooding. 0.5 to 1.0% chalcopyrite and trace pyrite associated with sphalerite.	787.40	788.20	M829173	0.80	5.59	0.14	0.00	0.07	1.25
			788.20	789.20	M829174	1.00	0.49	0.02	0.00	0.01	1.25
789.20	789.40	Sp; Pytrace **Sphalerite; Pyrite trace** Trace to 0.5% sphalerite and trace pyrite.	789.20	790.20	M829175	1.00	0.88	0.02	0.00	0.02	1.25
			797.00	798.00	M829176	1.00	0.20	0.22	0.00	0.12	8.40
797.30	797.80	Py5-7; Cp1-2 **Pyrite 5-7; Chalcopyrite 1-2** 5-7% banded, semi-massive pyrite and 1-2% chalcopyrite.	798.00	799.00	M829177	1.00	0.58	0.46	0.00	0.40	33.40
798.80	799.00	Cp7-10; Sp **Chalcopyrite 7-10; Sphalerite** 7-10% chalcopyrite as a large (5cm pod) and hosted in a quartz carbonate vein. 1% "blackjack" sphalerite associated with chalcopyrite.	799.00	800.50	M829178	1.50	0.06	0.02	0.00	0.00	1.25
800.10	827.03	TL2 **Intermediate lapilli tuf** Medium grey; fine to medium grained; massive to variably bedded. Trace local quartz eyes, sub-angular, clear to grey, 1-2mm in size. Local ash tuff intervals; weakly sericitic throughout and moderately chlorititc; local trace irregular pyrite and chalcopyrite stringers. Similar to unit previously described from 625.70 to 774.02m, with narrow intervals of the breccia unit above. Lower contact sharp at 90 degrees TCA.									
800.10	827.03	Chl; Ser **Chloritisation; Sericitisation** Weak chlorite and sericite alteration.	800.50	801.50	M829179	1.00	0.04	0.27	0.02	0.06	92.20
801.20	801.40	Cp7-10; Py **Chalcopyrite 7-10; Pyrite** 7-10% chalcopyrite and pyrite in stringers.									

Description			Assay								
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
806.00	806.50	Cp2-3 **Chalcopyrite 2-3** 2-3% stringer chalcopyrite.	806.00	807.00	M829180	1.00	0.04	1.22	0.00	0.03	6.80
827.03	829.00	I2 **Intermediate Dyke** Fine grained, medium grey intermediate dike. Shearing adjacent to upper contact with bands of chlorite and silica flooding. The lower contact was not intersected in this hole (EOH 829m).									
829.00		**End of DDH** **Number of samples: 136** **Number of QAQC samples: 18** **Total sampled length: 150.77**									

Xstrata Zinc Canada Exploration

DDH: **F-153**

Claims title:
Township:
Range:
Lot:

Section:
Level:
Work place:

Drilled by: Major Drilling
Described by: Des Cullen / Doug McKay

From: 3/13/2013
To: 3/30/2013

Description date:

Collar

Azimuth: 155.00°
Dip: -72.00°
Length: 948.00 m

UTM (NAD83-15)

East	641,236.000
North	5,526,942.000
Elevation	412.000

Averages - Composites

Zone	From	To	Length	Hor. th.	Ver. th.	True th.	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)

Description

Core size: NQ
Cemented: No
Stored: No

Down hole survey

Type	Depth	Azimuth	Dip	Invalid
Reflex	81.00	154.30°	-72.70°	No
Reflex	111.00	159.80°	-70.90°	No
Reflex	141.00	161.40°	-68.60°	No
Reflex	171.00	164.70°	-67.50°	No
Reflex	201.00	165.30°	-67.10°	No
Reflex	231.00	163.90°	-66.60°	No
Reflex	261.00	165.10°	-66.40°	No
Reflex	291.00	166.10°	-66.30°	No
Reflex	321.00	166.20°	-65.10°	No
Reflex	351.00	168.70°	-64.00°	No
Reflex	381.00	167.30°	-60.60°	No
Reflex	411.00	167.70°	-59.30°	No
Reflex	441.00	168.70°	-57.90°	No
Reflex	471.00	168.60°	-56.30°	No
Reflex	501.00	170.50°	-54.70°	No
Reflex	531.00	171.80°	-52.90°	No
Reflex	561.00	173.00°	-47.60°	No
Reflex	591.00	172.40°	-45.00°	No
Reflex	621.00	172.20°	-43.30°	No
Reflex	651.00	172.00°	-41.70°	No
Reflex	681.00	170.80°	-40.20°	No
Reflex	711.00	172.20°	-39.10°	No
Reflex	741.00	171.90°	-37.90°	No
Reflex	771.00	173.20°	-36.90°	No
Reflex	801.00	173.60°	-35.80°	No
Reflex	831.00	175.30°	-35.20°	No
Reflex	861.00	172.50°	-34.00°	No
Reflex	891.00	179.70°	-33.40°	No
Reflex	921.00	172.90°	-33.10°	No
Reflex	948.00	172.10°	-32.50°	No

Type	Depth	Azimuth	Dip	Invalid

Description			Assay								
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
0.00	37.60	MO **Over Burden** Overburden.									
37.60	85.00	V2J **Andesite** Medium grayish-green, relatively soft, fine- to medium-grained, locally crudely bedded (45 degrees tca), weakly to locally moderately foliated (45 degrees tca), occasionally fractured, locally weakly magnetic, intermediate sub-volcanic unit. Occasional ash and lapilli sporadically present, but primarily massive. This unit is weakly silicified and carbonatized with numerous narrow (1-5mm wide), variably oriented quartz-calcite +/- iron-carbonate veinlets. Reddish-brown hematite coats many of the fractures. Two relatively hard, fine-grained, dark green, plagioclase-phyric, dioritic dikes occur from 69 to 74m and from 81 to 83m. Trace amounts of fine grained pyrite occur as disseminated grains throughout the unit. The lower contact is gradational over several metres to a similar, but coarser grained, underlying unit. Alteration 50.50 to 52.10 Moderate chlorite alteration as dark green flaky bands that define foliation. 60.50 to 60.90 moderate to intense silica flooding. Sub lithology 69.00 to 74.50 Relatively hard, fine-grained, dark green, plagioclase-phyric, dioritic dike 81.90 to 83.60 Relatively hard, fine-grained, dark green, plagioclase-phyric, dioritic dike Mineralization Trace disseminated pyrite.									
50.50	52.10	Chl **Chloritisation** Moderate chlorite alteration as dark green flaky bands that define foliation.									
60.50	60.90	Sil **Silicification** Moderate to intense silica flooding.									
69.00	74.50	I2J									

Description				Assay								
				From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
			Diorite Relatively hard, fine-grained, dark green, plagioclase-phyric, dioritic dike									
81.90	83.60		I2J **Diorite** Relatively hard, fine-grained, dark green, plagioclase-phyric, dioritic dike									
85.00	294.50		I2J; V2J **Diorite; Andesite** Medium to dark grey-green, fine to medium grained, equigranular andesite/diorite. This unit is occasionally very weakly foliated at 50 degrees TCA. Sparse irregular quartz-carb veinlets occur throughout. This unit may represent the center of an intermediate flow resulting in coarser grain sizes than those seen in the overlying unit. Occasionally silica and/or sericite altered. Very sparse fine grained pyrite disseminated throughout.									
125.60	126.30		Hem30 **Hematisation 30** 30% Hematite alteration as 1-3mm nodules.									
294.50	380.80		TU1; TU2 **Felsic tuf; Intermediate tuf** Light greyish-green, variably sericitized and silicified, weakly foliated (40 to 45 degrees tca), weakly fractured, poorly bedded, felsic to intermediate ash and crystal tuffs (with occasional felsic lapilli) that typically contain trace amounts of fine grained disseminated pyrite. Locally 1-2% pyrite over narrow (<2m wide) intervals. A few blebs of fine grained chalcopyrite occur along chloritc fractures within a 40cm quartz-carbonate vein at 309m. Randomly oriented quartz-carbonate veins are present throughout the unit and occasionally contain trace fine grained chalcopyrite. Sub-rounded quartz eyes from 1-4mm in diameter are found from 297.0 to 303.90m. A zone of andalusite? alteration is present from 379.5 to 380.8m as pink cm scale irregular, patchy bands. Wispy chlorite as mm scale bands parallel to foliation are occasionally present. From 369.2 to 380.80, decimeter to metre scale dioritic "finger" dikes sporadically occur.									

Description			Assay							
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
297.60	314.50	Ser **Sericitisation** Moderate sericite alteration as mm scale fracture filling creamy-green coloured bands.									
379.50	380.80	AND **Andalusite** A zone of andalusite? alteration is present from 379.5 to 380.8m as pink cm scale irregular, patchy bands.									
380.80	803.13	I2J **Diorite** Medium to dark grey-green, fine to medium grained, equigranular diorite (possibly an andesite). This unit is occasionally very weakly foliated at 45 degrees TCA from 380.80 to roughly 500 metres with randomly oriented quartz-carbonate veinlets, usually 2-10mm wide, throughout and occasional narrow (<10cm) intervals of sericite alteration. Below 500 metres, the foliation increases to 45 to 50 degrees TCA and carbonate fractures and veining becomes more prevasive to 540 metres. Very sparse fine grained pyrite disseminated throughout with rare chalcopyrite hosted in quartz-carbonate veins. From 505.05 to 505.90m, quartz flooding/silicaification with carbonate and trace chalcopyrite is present. From 518 to 523 a possible fault zone occurs with coincides with the increase in veining previously mentioned; quartz phenocrysts (amygdules?) 2-4mm, rounded; occur sparsely within this unit, sometimes up to 5-10% over short (decimeter scale) intervals. From 728.40 to 728.90m, there is a medium grained intermediate dike. Similar smaller (~10-20cm) dikes sparsely occur from 700 metres downwards. A medium grained intermediate dike with a sharp 70 degree TCA upper contact and a 90 degree TCA lower contact occurs from 738.9 to 740.6m. The lower contact is sharp at 60 degrees TCA.									
505.05	505.90	Sil; Car **Silicification; Carbonatisation** Quartz flooding/silicaification with carbonate and trace chalcopyrite.									
518.00	523.00	FLT **Fault Zone** Possible fault zone with increased fracturing and quartz-carb veining.									
728.40	728.90	I2 **Intermediate Dyke**									

Description			Assay								
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		Medium grained, equigranular, intermediate dike.									
738.90	740.60	I2 **Intermediate Dyke** Medium grained intermediate dike with a sharp 70 degree TCA upper contact and a 90 degree TCA lower contact. There is a 14cm chill margin at the lower contact.									
803.13	824.30	I2 **Intermediate Dyke** Grey-green intermediate dike with up to 10%, 2-5mm, sub-angular to sub-rounded, grey to pale green feldspar phenocrysts. Weakly to moderately chloritic. Occasional xenoliths of relatively unaltered diorite. Locally strongly sericitic. Lower contact is sharp at 45 degrees TCA.									
805.69	808.53	DK **Dike** Possible dike or sheared xenolith of the host diorite. Strongly foliated at 80 degrees. Moderately to strongly chloritic.									
805.69	808.53	Chl **Chloritisation** Moderately to strongly chlorite altered. Chlorite occurs as anastamozing mm scale bands.									
815.70	817.20	Ser **Sericitisation** Strongly sericitized (possible felsic dike).									
824.30	862.30	I2J **Diorite** Medium to dark grey-green, fine to medium grained, equigranular diorite. Same unit previously described from 380.80 to 803.13m. Lower contact is 60 degrees TCA.									
862.30	891.28	TX2; TL2 **Intermediate cristal tuf; Intermediate lapilli tuf** Medium grey, crystal tuff. Locally up to 5% quartz eyes, approximately 1mm in size, over decimeter scale intervals. Local chloritoid as 1mm sub-rounded dark green grains. This unit is predominantly a crystal tuff with local lapilli rich intervals. Trace sphalerite was observed over short intervals described in the mineralization tab. The lower contact is gradational.	863.00	864.00	K015902	1.00	0.13	0.00	0.00	0.00	1.25
			864.00	865.00	K015903	1.00	0.29	0.01	0.00	0.00	1.25
864.13	864.77	Sptrace **Sphalerite trace**	865.00	866.00	K015904	1.00	0.09	0.00	0.00	0.00	1.25

Description			Assay							
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		Trace sphalerite in mm scale blebs and stringers.	885.50	886.50	K015905	1.00	0.06	0.02	0.00	0.00	1.25
			886.50	887.20	K015906	0.70	0.51	0.02	0.00	0.00	2.50
886.61	887.08	Sp0.5-1.0	887.20	888.20	K015908	1.00	0.02	0.00	0.00	0.00	1.25
		Sphalerite 0.5-1.0									
		0.5 to 1.0% sphalerite as blebs and stringers associated with quartz-carbonate veins.									
891.28	948.00	V1D; BRECC									
		Dacite; Brecciated									
		Medium grey, brecciated dacitic unit. Generally somewhat chaotic in appearance due to abundant irregularly-shaped, angular clasts/fragments of variable composition; also exhibits abundant rounded clasts/lapilli. Moderately to locally strongly chloritic; moderately sericitic; local moderate chloritoid, possible silicification. Chlorite is generallly interstitial between breccia fragments. Chloritoid generally consists of 1-2mm, sub-rounded to sub-angular, grains/clasts. Trace pyrite and chalcopyrite are found in stringers and disseminated throughout. 2-3% clear to grey quartz eyes from 891.28 to 909.50m, 1-2mm in size. Weak to locally moderate Foliation at 60 degrees TCA. A bleb of sphalerite was observed in a quarz carbonate vein at 900.16m.									
891.28	948.00	Ser; Chl; Chld	899.00	900.00	K015909	1.00	0.12	0.09	0.00	0.00	11.50
		Sericitisation; Chloritisation; chloritoid	900.00	900.50	K015910	0.50	0.07	0.09	0.00	0.01	9.10
		Moderately to locally strongly chloritic; moderately sericitic; local moderate chloritoid, possible silicification. Chlorite is generallly interstitial between breccia fragments. Chloritoid generally consists of 1-2mm, sub-rounded to sub-angular, grains/clasts.									
900.16	900.17	Sptrace	900.50	901.50	K015912	1.00	0.04	0.04	0.00	0.00	3.00
		Sphalerite trace	928.00	929.00	K015913	1.00	0.02	0.01	0.00	0.00	1.25
		7mm bleb of spahlerite hosted within a quartz-carbonate vein.	929.00	929.70	K015914	0.70	0.04	0.36	0.00	0.18	3.50
929.20	929.50	Cp0.5-1	929.70	930.70	K015916	1.00	0.04	0.01	0.00	0.00	1.25
		Chalcopyrite 0.5-1									
		0.5 to 1.0% chalcopyrite in irregular blebs and stringers.									
948.00		**End of DDH**									
		Number of samples: 12									
		Number of QAQC samples: 3									
		Total sampled length: 10.90									

Xstrata Zinc Canada Exploration

DDH: **F-154**

Claims title:
Township:
Range:
Lot:

Section:
Level:
Work place:

Drilled by: Major Drilling
Described by: Des Cullen / Doug McKay

From: 3/30/2013
To: 4/6/2013

Description date:

Collar

Azimuth: 145.00°
Dip: -70.00°
Length: 336.00 m

UTM (NAD83-15)

East	641,027.000
North	5,526,746.000
Elevation	408.000

Averages - Composites

Zone	From	To	Length	Hor. th.	Ver. th.	True th.	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)

Description

Core size: NQ
Cemented: No
Stored: No

Down hole survey

Type	Depth	Azimuth	Dip	Invalid
Reflex	42.00	144.40°	-70.40°	No
Reflex	72.00	147.70°	-70.50°	No
Reflex	102.00	147.80°	-70.10°	No
Reflex	132.00	150.60°	-68.30°	No
Reflex	162.00	151.70°	-66.10°	No
Reflex	192.00	152.90°	-65.40°	No
Reflex	222.00	155.20°	-65.40°	No
Reflex	252.00	153.70°	-64.90°	No
Reflex	282.00	155.70°	-65.10°	No
Reflex	312.00	156.60°	-64.40°	No

Type	Depth	Azimuth	Dip	Invalid

Description				Assay								
				From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
0.00	27.40	MO										
		Over Burden										
		Overburden.										
27.40	45.51	S1										
		Volcaniclastic Sediment										
		Light grey, fine grained, volcaniclastic sedimentary unit. Locally bedded at variable core angles from sub-parallel to core axis. Locally contorted/folded/brecciated. From 33.30 to 34.90m, 3-5% pyrite is present as irregular stringers and patches. Moderate to strong pervasive sericite alteration from 41.17 to 43.07m. The lower contact is sharp at 30 degrees TCA.									
33.30	34.90	Py3-5		33.30	34.00	M829182	0.70	0.14	0.04	0.00	0.01	1.25
		Pyrite 3-5		34.00	35.00	M829183	1.00	0.24	0.07	0.00	0.01	1.25
		3-5% pyrite as irregular stringers and patches.										
41.17	43.07	Ser										
		Sericitisation										
		Moderate to strong pervasive sericite alteration.										
45.51	53.35	S6; GRPH SEDS										
		Mudrock; Graphitic Sediments										
		Medium to dark grey; very fine grained mudstone/graphitic sediment. Locally brecciated from 49.93 to 50.31m, with light grey breccia fragments (from unit above or below) 5mm to 30mm in size. Beds are generally thin (~1mm) with occasional quartz veining parallel to bedding. Trace pyrite and chalcopyrite in irregular stringers from 46 to 48m associated with the quartz veining. Wavy, irregular, lower contact at 60 degrees TCA.									
46.00	48.00	Pytrace; Cptrace		46.00	47.00	M829184	1.00	0.05	0.03	0.00	0.01	1.25
		Pyrite trace; Chalcopyrite trace		47.00	48.00	M829185	1.00	0.10	0.05	0.00	0.00	1.25
		Trace pyrite and chalcopyrite in irregular stringers from 46 to 48m										
53.35	69.25	S1										
		Volcaniclastic Sediment										
		Volcaniclastic sediment similar to previuously described unit from 27.4 to 45.0m. Trace pyrite, little or no breccias. Lower contact irregular at 30 degrees TCA.										
69.25	79.10	S6; GRPH SEDS		73.00	74.00	M829186	1.00	0.09	0.02	0.00	0.00	1.25
		Mudrock; Graphitic Sediments		74.00	75.00	M829187	1.00	0.15	0.01	0.00	0.00	1.25
		Mudstone/graphitic sediment similar to previously described unit from 45.0 to 53.35m. Trace pyrite in irregular stringers and disseminated throughout. From 74.60 to 74.80m, a low angle (~20 degrees TCA) pyrite-sphalerite veinlet/stringer is present. Due to the low angle of this										

Description			Assay								
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		veinlets, 0.5% pyrite and 0.5% sphalerite are present over this interval. The lower contact is irregular at roughly 30 degrees TCA.									
74.60	74.80	Py00.5; Sp00.5 **Pyrite 0.5%; Sphalerite 0.5%** 0.5% pyrite and 0.5% sphalerite in a low angle (~20 degrees TCA) veinlet/stringer.	75.00	76.00	M829188	1.00	0.09	0.02	0.00	0.00	1.25
79.10	188.95	S1; AGG **Volcaniclastic Sediment; Agglomerate** Volcaniclastic sediment/agglomerate. Occasional coarser clasts of variable composition – occasionally chert clasts, with some dark grey mudstone from the above unit. Clasts are genererally from 0.5 to 1.5cm, but are occasionally up to 10cm in size. This unit is moderately sericitic throughout and has a moderate foliation at ~30 degrees TCA. Locally there is up to 2-3% blebs and stringer pyrite over 2-3m intervals and occasional pyrrhotite associated with the pyrite. Local quartz eyes are present throughout the unit over 1-5 metre intervals. Quartz eyes are clear-grey, 1-3mm in size and sub-angular. The lower contact is sharp at 45 degrees TCA.									
82.38	101.49	Ser **Sericitisation** Pervasive moderate to Strong sericitization.									
92.13	99.11	Py01 **Pyrite 1%** 1% stringer and disseminated pyrite.	99.00	100.00	M829190	1.00	0.02	0.00	0.00	0.00	1.25
99.11	106.09	Py2-3 **Pyrite 2-3** 2-3% blebs, stingers and disseminated pyrite.	100.00	101.00	M829191	1.00	0.03	0.01	0.00	0.00	1.25
			101.00	102.00	M829192	1.00	0.04	0.01	0.00	0.01	1.25
101.49	188.95	Ser **Sericitisation** Moderate sericitization throughout.	125.00	126.00	M829193	1.00	0.00	0.00	0.00	0.00	1.25
			126.00	127.00	M829194	1.00	0.00	0.05	0.00	0.00	1.25
126.15	126.65	Py7-10; Po **Pyrite 7-10; Pyrrhotite** 7-10% pyrite and pyrrhotite in irregular blebs and stringers.	127.00	128.00	M829196	1.00	0.00	0.05	0.00	0.00	1.25
188.95	336.00	I2J **Diorite** Medium grey-green, fine to medium grained diorite. Occasional chlorite clots parallel to foliation. Quartz-carbonate veinlets parallel to foliation									

Description	Assay								
	From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
increasing in adundance with depth. Increasing intervals of blocky core downhole including 198m to 200m and 211.5m to 212m. At roughly 332m depth there are 1-3cm quartz-carbonate veins with 1mm specs of magnetite. At 327.5m a pronounce moderate foliation is presnet at 45 degrees TCA. T hole was terminated early at 336m because the rods got stuck while pulling the drill string to remove the stabilized core barrels. 18m of steel remains lodged in the hole between 294 & 312m (i.e.: an NQ bit, 18-inch reaming shell, two 3m stabilized core barrels & ~11.5m of NQ rods). A Bradley plug was installed at 294m, a wooden plug that was supposed to be installed on top of the Bradley got lodged in the hole at 272m at which point a second Bradley plug was installed followed by a second wooden plug and then a 22.5-ft long steel wedge was set in the hole. Hole F-13-154A was wedged off from hole -154 at this point which was calculated to be at 266m down the hole.									
336.00 **End of DDH** **Number of samples: 13** **Number of QAQC samples: 2** **Total sampled length: 12.70**									

Xstrata Zinc Canada Exploration

DDH: **F-154A**

Claims title:
Township:
Range:
Lot:

Section:
Level:
Work place:

Drilled by: Major Drilling
Described by: Des Cullen / Doug McKay

From: 4/7/2013
To: 4/20/2013

Description date:

Collar

Azimuth: 145.00°
Dip: -70.00°
Length: 789.00 m

UTM (NAD83-15)

East	641,027.000
North	5,526,746.000
Elevation	408.000

Averages - Composites

Zone	From	To	Length	Hor. th.	Ver. th.	True th.	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
AZ	625.50	632.00	6.50	3.86	8.28	3.50	2.76	0.01	0.52	0.06	25.80
AZ	636.00	644.60	8.60	5.15	11.04	4.67	3.62	0.04	0.10	0.06	11.45
AZ	656.00	663.00	7.00	4.22	9.05	3.83	3.33	0.06	0.02	0.04	5.76

Description

Core size: NQ
Cemented: No
Stored: No

Down hole survey

Type	Depth	Azimuth	Dip	Invalid
Reflex	312.00	161.30°	-59.90°	No
Reflex	342.00	162.20°	-57.30°	No
Reflex	369.00	162.70°	-52.40°	No
Reflex	402.00	163.50°	-49.70°	No
Reflex	429.00	165.90°	-47.60°	No
Reflex	459.00	161.30°	-39.80°	No
Reflex	489.00	167.40°	-36.50°	No
Reflex	492.00	167.60°	-36.50°	No
Reflex	522.00	168.90°	-35.30°	No
Reflex	552.00	169.10°	-33.80°	No
Reflex	582.00	169.30°	-32.10°	No
Reflex	612.00	170.00°	-31.10°	No
Reflex	642.00	171.70°	-29.80°	No
Reflex	672.00	172.70°	-29.10°	No
Reflex	702.00	173.40°	-27.80°	No
Reflex	732.00	172.60°	-26.70°	No

Type	Depth	Azimuth	Dip	Invalid

Description				Assay								
				From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
0.00	27.40	MO **Over Burden** Overburden.										
27.40	45.51	S1 **Volcaniclastic Sediment** Light grey, fine grained, volcaniclastic sedimentary unit. Locally bedded at variable core angles from sub-parallel to core axis. Locally contorted/folded/brecciated. From 33.30 to 34.90m, 3-5% pyrite is present as irregular stringers and patches. Moderate to strong pervasive sericite alteration from 41.17 to 43.07m. The lower contact is sharp at 30 degrees TCA.										
33.30	34.90	Py 3-5% **Pyrite 3-5%** 3-5% pyrite as irregular stringers and patches.										
41.17	43.07	Ser **Sericitisation** Moderate to strong pervasive sericite alteration										
45.51	53.35	S6; GRPH SEDS **Mudrock; Graphitic Sediments** Medium to dark grey; very fine grained mudstone/graphitic sediment. Locally brecciated from 49.93 to 50.31m, with light grey breccia fragments (from unit above or below) 5mm to 30mm in size. Beds are generally thin (~1mm) with occasional quartz veining parallel to bedding. Trace pyrite and chalcopyrite in irregular stringers from 46 to 48m associated with the quartz veining. Wavy, irregular, lower contact at 60 degrees TCA.										
46.00	48.00	Py tr; Cp tr **Pyrite tr; Chalcopyrite tr** Trace pyrite and chalcopyrite in irregular stringers from 46 to 48m										
53.35	69.25	S1 **Volcaniclastic Sediment** Volcaniclastic sediment similar to previuously described unit from 27.4 to 45.0m. Trace pyrite, little or no breccias. Lower contact irregular at 30 degrees TCA.										
69.25	79.10	S6; GRPH SEDS **Mudrock; Graphitic Sediments** Mudstone/graphitic sediment similar to previously described unit from 45.0 to 53.35m. Trace pyrite in irregular stringers and disseminated throughout. From 74.60 to 74.80m, a low angle (~20 degrees TCA) pyrite-sphalerite veinlet/stringer is present. Due to the low angle of this										

Description			Assay							
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
veinlets, 0.5% pyrite and 0.5% sphalerite are present over this interval. The lower contact is irregular at roughly 30 degrees TCA.											
74.60	74.80	Py 0.5%; Sp 0.5% **Pyrite 0.5%; Sphalerite 0.5%** 0.5% pyrite and 0.5% sphalerite in a low angle (~20 degrees TCA) veinlet/stringer.									
79.10	188.95	S1 **Volcaniclastic Sediment** Volcaniclastic sediment/agglomerate. Occasional coarser clasts of variable composition – occasionally chert clasts, with some dark grey mudstone from the above unit. Clasts are genererally from 0.5 to 1.5cm, but are occasionally up to 10cm in size. This unit is moderately sericitic throughout and has a moderate foliation at ~30 degrees TCA. Locally there is up to 2-3% blebs and stringer pyrite over 2-3m intervals and occasional pyrrhotite associated with the pyrite. Local quartz eyes are present throughout the unit over 1-5 metre intervals. Quartz eyes are clear-grey, 1-3mm in size and sub-angular. The lower contact is sharp at 45 degrees TCA.									
82.38	101.49	Ser **Sericitisation** Pervasive, moderate to strong sericite alteration									
92.13	99.11	Py 1% **Pyrite 1%** 1% stringer and disseminated pyrite.									
99.11	106.09	Py 2-3% **Pyrite 2-3%** 2-3% blebs, stingers and disseminated pyrite.									
101.49	188.95	Ser **Sericitisation** Moderate sericite alteration throughout									
126.15	126.65	Py 7-10 %; Po 7-10% **Pyrite 7-10 %; Pyrrhotite 7-10%** 7-10% pyrite and pyrrhotite in irregular blebs and stringers.									
188.95	266.00	I2J **Diorite** Medium grey-green, fine to medium grained diorite. Occasional chlorite clots parallel to foliation. Quartz-carbonate veinlets parallel to foliation increasing in adundance with depth. Increasing intervals of blocky core downhole including 198m to 200m and 211.5m to 212m. At roughly 332m									

Description			Assay							
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		depth there are 1-3cm quartz-carbonate veins with 1mm specs of magnetite. At 327.5m a pronounce moderate foliation is presnet at 45 degrees TCA. (Unit broken out at this depth because of wedging of new hole and no recovery of core over the next interval.)									
266.00	272.40	CNR **Core not recovered** Hole F-13-154A was wedged off from hole -154 at 266m depth. The interval from 266 to 272.4m was reamed with a bullnose bit and no core was recovered.									
272.40	326.60	I2J **Diorite** Medium grey-green, fine to medium grained diorite. Chlorite clots (up to 5 mm) are present throughout, elongated parallel to moderate foliation (45 degrees TCA). Feldspar phenocrysts (<1-2 mm) occur over 1-3 m intervals and are aligned parallel to foliation. Quartz-carbonate veins and clots crosscut foliation, range in size from 3-60mm and typically contain elgonated whispy grains of chlorite and sericite. Disseminated pyrite (1-3 mm; up to 3% locally) occurs within diotite and within quartz-carbonate veins & clots. Abundant hematite staining is present on core fracture planes as well as in association with qtz-carb veinlets. .Chlorite/sericite alteration occurs locally throughout but is limited to fracture planes. Core is moderately fractured at 40 degrees TCA (from 272.4-282m; may have been the cause of the rods getting stuck on F-13-154). The maximum magsus reading in this unit was 129.6.The lower contact is gradational over a span of 1 m.									
326.60	426.00	TU1; TU2; TL1; TL2 **Felsic tuf; Intermediate tuf; Felsic lapilli tuf; Intermediate lapilli tuf** Felsic to intermediate tuff. Unit is light to medium grey in colour. Local 1-2 metre intervals of lapilli with larger intervals of an ash tuff with elongated chlorite clots parallel to foliation. Lapilli are generally light grey, sub-angular and usually range in size from 1-5 mm. This unit is moderately foliated at 45 degrees TCA and moderately chloritic throughout. Zone of lapilli from 366.5-367m. Quartz-carbonate veins and clots are prolific throughout unit and range									

		Description	Assay								
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		in size from 0.5-2 cm veins and up to 4 cm wide clots. They contain mm-scale disseminated pyrite grains and stringers of magnetite. Quartz-carbonate amygdules occur from 396-400.8 m. They range in size from 1-5mm and are elongated parallel to foliation. Chlorite/sericite alteration & hematite staining occur in association with quartz-carbonate veins. Disseminated magnetite (1-2 mm) occurs throughout unit locally in abundances up to 4% (concentrated in what look almost like magnetite-rich ash beds?? make core a far more purplish-grey colour where concentrated). Disseminated magnetite also occurs in association with pyrite, aligned parallel to foliation. Disseminated pyrite mineralization from 365.5-366.5 m; 369-370.8 and 372-374 m (trace to 5%). Stringers and disseminations are aligned parallel to plane of foliation. Localized zones of ash bedding are present from 348-351 m and from 390-391.5 m. Lower contact is gradational.									
363.00	383.60	Chl; Ser; Hem **Chloritisation; Sericitisation; Hematisation** Moderate to intense chlorite & sericite alteration of felsic-intermediate tuff to lapilli tuff. Local hematite staining in present along fracture planes.									
405.00	409.40	Chl; Ser **Chloritisation; Sericitisation** Moderate to intense chlorite & sericite alteration of felsic-intermediate tuff to lapilli tuff. Local hematite staining in present along fracture planes.									
426.00	595.90	V2J **Andesite** Medium to dark greenish grey, fine-grained andesite. Chlorite clots occur in 1-3 m intervals that are elgonated parallel to the moderate									

Description			Assay							
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		foliation (45 degrees TCA). Unit is moderately chloritic throughout. Quartz-carbonate amygdules occur sporadically throughout unit and range in size from 2-6 mm. Feldspar phenocrysts (1-3mm) are present over 1-2 meter intervals. Majority of unit is fine-grained to almost aphanitic. Quartz-carbonate veining is pervasive throughout the unit, and veins range in size from 2-30 mm. Chlorite/sericite alteration and hematite staining are present locally and occur along fracture planes. Fine-grained disseminated pyrite (tr) occurs over decimeter-scale intervals, typically along planes of foliation. Trace amounts of cubic pyrite (1-2mm) occur throughout. Disseminated and clots of fine-grained magnetite occur throughout unit. Locally the magnetite is present in the form of veinlets and associated with disseminated pyrite. Fine-grained magnetite is concentrated locally in 1-4 cm bands within andesite. The highest magsus value taken from this unit was 102.9. Light to medium-grey, medium-grained diorite dykes present from 530.7-531.0 m; 539.2-539.9 m; 560.6-561.2 m; 586.1-586.3 m and 590.3-590.6 m. Zone of pervasive chlorite alteration and hematite staining from 549.0-550.5 m. Alteration and staining occurs along foliation planes (~40 degrees TCA). Trace stringers of pyrite are present in association with hematite staining. Zone of pervasive quartz-carbonate veining, chlorite alteration and hematite staining present from 563.5-565.5. Hematite staining occurs mainly adjacent to quartz-carbonate veins. Medium to light-grey, 1-2 mm, subangular to subrounded quartz eyes occur locally within zone of alteration (up to 2%). This unit has a gradational lower contact with the underlying intermediate ash tuff to lapilli tuff.									
549.00	550.50	Chl; Hem **Chloritisation; Hematisation** Zone of pervasive chlorite alteration and hematite staining. Alteration and staining occurs along foliation planes (~40 degrees									

Description			Assay							
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		TCA). Trace stringers of pyrite are present in association with hematite staining.									
563.50	565.50	Chl; Hem **Chloritisation; Hematisation** Zone of pervasive quartz-carbonate veining, chlorite alteration and hematite staining. Hematite staining occurs mainly adjacent to quartz-carbonate veins. Medium to light-grey, 1-2 mm, subangular to subrounded quartz eyes occur locally within zone of alteration (up to 2%).									
595.90	618.00	TU2; TL2 **Intermediate tuf; Intermediate lapilli tuf** Medium greenish-grey ash tuff to lapilli tuff. Predominantly massive to bedded ash tuff with local meter-scale intervals of intermediate, subangular, 2-6 mm lapilli. chlorite clots (1-2 mm) are pervasive throughout and are slightly elongated parallel to foliation (35-40 degrees TCA). Fine-grained disseminated and stringer magnetite occurs locally (trace to 2%) in the upper portion of the unit. Quartz-carbonate veins (1-20 mm) occur in moderate abundance throughout. Local quartz-carbonate amygdules (1-3 mm) are present, some of which containing trace amounts of disseminated pyrite. Chlorite/sericite alteration and silicificatoin is pervasive from 608.6-610.0 m. A large quartz vein is present from 617.2-617.4 m. It contains 4-40 mm euhedral to subhedral milky white-greyish grains that appear to be feldspar (??). Trace amounts of disseminated pyrite occur throughout (up to 2% locally).									
608.60	610.00	Chl; Ser; Sil **Chloritisation; Sericitisation; Silicification** Chlorite/sericite alteration and silicification pervasive within intermediate ash to lapilli tuff.									
618.00	644.50	MINE ZONE **Mineralized Zone** Mineralized zone within chlorite/sericite altered, silicified intermediate ash to lapilli tuff. Mineralized zone contains background amounts of fine-grained disseminated pyrite throughout (trace-3%). Chloritoid clots (1-3 mm) present in moderate abundance throughout mineralized zone. Mineralization zone is defined by the presence of stringer/disseminated									

Description			Assay							
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		to semi-massive bands of fine-grained sphalerite with local disseminated galena and trace amounts of chalcopyrite. Galena and chalcopyrite occur predominantly in association with semi-massive sphalerite bands. Stringers and bands of sulfide mineralization all parallel the host rock's foliation (~30 degrees TCA). From 618.0-624.0 m: trace-3% fine-grained disseminated pyrite; trace fine-grained disseminated sphalerite From 624.0-627.0 m:1-5% fine-grained disseminated pyrite; trace-2% stringer & disseminated sphalerite From 627.0-631.5 m: 5-10% sphalerite in semi-massive bands; trace-4% galena locally in association with sphalerite bands; 1-2% disseminated pyrite From 631.5-636.0 m: trace-3% sphalerite in stringers and semi-massive bands; trace-1% galena in association with sphalerite; 1-2% disseminated pyrite From 636.0-639.0 m: 5-10% sphalerite in semi-massive bands; trace-1% galena; trace-1% chalcopyrite (1% locally over decimeter-scale interval); 1-2% disseminated pyrite From 639.0-641.2 m:1-3% sphalerite in stringers to semi-massive bands; 1-3% disseminated pyrite; trace galena From 641.2-643.0 m: 5-10% sphalerite in matrix between lapilli; 3-5% disseminated pyrite; trace chalcopyrite; trace-1% galena From 643.0-644.0 m: 1-4% disseminated pyrite; trace-1% stringer sphalerite From 6440-644.5 m:5-10% sphalerite in semi-massive bands; 3-5% disseminated pyrite; trace-1% galena									
618.00	644.50	Chl; Ser; Sil	618.00	619.50	M829197	1.50	0.01	0.00	0.00	0.00	1.25
		Chloritisation; Sericitisation; Silicification	619.50	621.00	M829199	1.50	0.01	0.00	0.00	0.00	1.25
		Zone of pervasive chlorite/sericite alteration and silicification throughout zone of mineralization within intermediate ash to lapilli tuff.	621.00	622.50	M829200	1.50	0.01	0.00	0.00	0.00	1.25
			622.50	624.00	M829201	1.50	0.02	0.00	0.01	0.01	1.25
618.00	624.00	Py tr-3%; Sp tr									
		Pyrite tr-3%; Sphalerite tr									
		trace-3% fine-grained disseminated pyrite; trace fine-grained disseminated sphalerite									
624.00	627.00	Py 1-5%; Sp tr-2%	624.00	625.50	M829202	1.50	0.21	0.00	0.09	0.02	5.90
		Pyrite 1-5%; Sphalerite tr-2%	625.50	627.00	M829203	1.50	0.69	0.00	0.24	0.04	18.00
		1-5% fine-grained disseminated pyrite; trace-2% stringer &									

Description			Assay							
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		disseminated sphalerite									
627.00	631.50	Sp 5-10%; GAL tr-4%; Py 1-2%	627.00	628.00	M829204	1.00	5.56	0.02	0.10	0.04	10.20
		Sphalerite 5-10%; Galena tr-4%; Pyrite 1-2%	628.00	629.00	M829205	1.00	5.24	0.01	0.71	0.11	40.00
		5-10% sphalerite in semi-massive bands; trace-4% galena locally	629.00	630.00	M829207	1.00	1.55	0.00	0.60	0.10	27.00
		in association with sphalerite bands; 1-2% disseminated pyrite	630.00	631.00	M829208	1.00	3.80	0.01	1.32	0.06	48.10
			631.00	632.00	M829209	1.00	0.73	0.00	0.28	0.05	15.40
631.50	636.00	Sp tr-3%; GAL tr-1%; Py 1-2%	632.00	633.00	M829211	1.00	0.47	0.00	0.14	0.04	9.90
		Sphalerite tr-3%; Galena tr-1%; Pyrite 1-2%	633.00	634.00	M829212	1.00	0.23	0.00	0.11	0.01	7.90
		trace-3% sphalerite in stringers and semi-massive bands;	634.00	635.00	M829213	1.00	0.56	0.01	0.22	0.04	14.70
		trace-1% galena in association with sphalerite; 1-2% disseminated	635.00	636.00	M829214	1.00	0.47	0.00	0.22	0.03	13.20
		pyrite									
636.00	639.00	Sp 5-10%; GAL tr; Cp tr-1%; Py 1-2%	636.00	637.00	M829215	1.00	2.69	0.01	0.23	0.04	13.30
		Sphalerite 5-10%; Galena tr; Chalcopyrite tr-1%; Pyrite	637.00	638.00	M829216	1.00	3.90	0.04	0.01	0.05	5.30
		1-2%	638.00	639.00	M829217	1.00	5.80	0.05	0.01	0.08	6.00
		5-10% sphalerite in semi-massive bands; trace-1% galena;									
		trace-1% chalcopyrite (1% locally over decimeter-scale interval);									
		1-2% disseminated pyrite									
639.00	641.20	Sp 1-3%; Py 1-3%; GAL tr	639.00	640.00	M829218	1.00	3.00	0.05	0.01	0.05	4.50
		Sphalerite 1-3%; Pyrite 1-3%; Galena tr	640.00	641.00	M829219	1.00	2.61	0.05	0.01	0.04	4.80
		1-3% sphalerite in stringers to semi-massive bands; 1-3%	641.00	642.00	M829221	1.00	5.29	0.07	0.05	0.08	10.70
		disseminated pyrite; trace galena									
641.20	643.00	Sp 5-10%; Py 3-5%; Cp tr; GAL tr-1%	642.00	643.00	M829222	1.00	3.74	0.02	0.20	0.09	20.60
		Sphalerite 5-10%; Pyrite 3-5%; Chalcopyrite tr; Galena									
		tr-1%									
		5-10% sphalerite in matrix between lapilli; 3-5% disseminated									
		pyrite; trace chalcopyrite; trace-1% galena									
643.00	644.00	Py 1-4%; Sp tr-1%	643.00	644.00	M829223	1.00	0.34	0.00	0.09	0.02	8.40
		Pyrite 1-4%; Sphalerite tr-1%									
		1-4% disseminated pyrite; trace-1% stringer sphalerite									
644.00	645.00	Sp 5-10%; Py 3-5%; GAL tr-1%	644.00	644.60	M829224	0.60	6.22	0.07	0.48	0.08	41.40
		Sphalerite 5-10%; Pyrite 3-5%; Galena tr-1%									
		5-10% sphalerite in semi-massive bands; 3-5% disseminated									
		pyrite; trace-1% galena									
644.50	646.90	DK; I2J	644.60	646.90	M829225	2.30	0.04	0.00	0.00	0.01	1.25
		Dike; Diorite									
		Light to medium-grey, 1-3 mm felspar-phyric, foliated diorite dyke.									
		Foliation is 40 degrees TCA									
646.90	652.00	TL2; TU2	646.90	648.00	M829226	1.10	1.75	0.01	0.17	0.02	15.50
		Intermediate lapilli tuf; Intermediate tuf									

Description			Assay								
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		Medium greenish-grey intermediate lapilli to ash tuff. Predominantly lapilli tuff w/ local zones of ash bedding. Lapilli are light to medium-grey, 1-30 mm, subangular to subrounded and elongated parallel to foliation (30 degrees TCA). Unit is moderately chloritic throughout. Chlorite clots (1-2mm) occur throughout unit and are aligned parallel to foliaiton. Chlorite and sericite alteration are pervasive throughout and local silicification is present. Quartz-carbonate veins are present throughout unit and range in size from 3-30 mm. Trace to 2% disseminated pyrite occurs throughout. Semi-massive bands and stringers of sphalerite (1-3%) occur from 646.9-647.5 m. Disseminated pyrite (1-2%) occurs in association with sphalerite over this interval. Mineralization zone occurs within this unit, to be described as it's own interval.	648.00	649.50	M829227	1.50	0.08	0.00	0.03	0.02	3.90
			649.50	651.00	M829228	1.50	0.10	0.00	0.02	0.02	2.60
			651.00	652.00	M829229	1.00	0.01	0.00	0.02	0.03	2.70
646.90	647.50	Sp 1-3%; Py 1-2% **Sphalerite 1-3%; Pyrite 1-2%** Semi-massive bands and stringers of sphalerite (1-3%) occur from 646.9-647.5 m. Disseminated pyrite (1-2%) occurs in association with sphalerite over this interval.									
652.00	664.50	MINE ZONE **Mineralized Zone** Zone of mineralization within medium greenish-grey intermediate lapilli to ash tuff. Mineralization occurs as stockwork and stringer sphalerite (tr-5% locally), disseminated fine-grained pyrite (1-5% throughout) and disseminated fine-grained chalcopyrite (tr-1% locally). Stockwork sphalerite occurs within the matrix surrounding lapilli fragments. Stringer sphalerite is present along planes of foliation. From 652.0-653.0: 1-5% stockwork sphalerite in matrix between lapilli fragments; 2-4% fine-grained disseminated pyrite; tr-1% disseminated chalcopyrite From 653.0-656.0: trace stringer sphalerite; 2-5% disseminated pyrite; trace chalcopyrite From 656.0-659.0: 1-5% stockwork sphalerite in matrix between lapilli fragments; 2-4% fine-grained disseminated pyrite; tr-1% disseminated chalcopyrite	652.00	653.00	M829230	1.00	2.91	0.05	0.02	0.04	6.10

Description			Assay								
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		From 659.0-660.0: 1-3% fine-grained disseminated pyrite From 660.0-663.0: 1-5% semi-massive bands and stringers of sphalerite; 2-5% disseminated pyrite From 663.0-664.5: 1-3% disseminated pyrite; trace chalcopyrite									
652.00	653.00	Sp 1-5%; Py 2-4%; Cp tr-1% **Sphalerite 1-5%; Pyrite 2-4%; Chalcopyrite tr-1%** 1-5% stockwork sphalerite in matrix between lapilli fragments; 2-4% fine-grained disseminated pyrite; tr-1% disseminated chalcopyrite									
653.00	656.00	Sp tr; Py 2-5%; Cp tr **Sphalerite tr; Pyrite 2-5%; Chalcopyrite tr** trace stringer sphalerite; 2-5% disseminated pyrite; trace chalcopyrite	653.00	654.00	M829232	1.00	0.61	0.01	0.01	0.02	2.60
			654.00	655.00	M829233	1.00	0.11	0.00	0.02	0.01	3.20
			655.00	656.00	M829234	1.00	0.37	0.02	0.04	0.03	5.10
656.00	659.00	Sp 1-5%; Py 2-4%; Cp tr-1% **Sphalerite 1-5%; Pyrite 2-4%; Chalcopyrite tr-1%** 1-5% stockwork sphalerite in matrix between lapilli fragments; 2-4% fine-grained disseminated pyrite; tr-1% disseminated chalcopyrite	656.00	657.00	M829235	1.00	5.02	0.10	0.03	0.06	9.70
			657.00	658.00	M829237	1.00	4.02	0.03	0.09	0.04	11.20
			658.00	659.00	M829238	1.00	2.76	0.05	0.01	0.03	4.10
659.00	660.00	Py 1-3% **Pyrite 1-3%** 1-3% fine-grained disseminated pyrite	659.00	660.00	M829239	1.00	0.21	0.06	0.01	0.02	3.90
660.00	663.00	Sp 1-5%; Py2-5% **Sphalerite 1-5%; Pyrite 2-5%** 1-5% semi-massive bands and stringers of sphalerite; 2-5% disseminated pyrite	660.00	661.00	M829240	1.00	3.16	0.06	0.01	0.03	4.50
			661.00	662.00	M829242	1.00	5.16	0.05	0.00	0.02	3.60
			662.00	663.00	M829243	1.00	2.95	0.05	0.00	0.08	3.30
663.00	664.50	Py 1-3%; Cp tr **Pyrite 1-3%; Chalcopyrite tr** 1-3% disseminated pyrite; trace chalcopyrite	663.00	664.50	M829244	1.50	0.05	0.01	0.00	0.01	1.25
664.50	689.00	TU2; TL2 **Intermediate tuf; Intermediate lapilli tuf** Medium greenish-grey intermediate tuff to lapilli tuff. Predominantly ash tuff with local zones of lapilli present over meter-scale intervals. Lapilli are light to medium-grey, 1-20 mm, subangular to subrounded and elongated parallel to foliation (40 degrees TCA). Unit is moderately chloritic throughout. Chlorite and sericite alteration are moderate throughout and local silicification is present. Chlorite clots (1-2mm) occur throughout unit and are aligned parallel to foliaiton. Quartz-carbonate veins are present throughout unit and range in size from 5-50 mm.; lower contact sharp and regular at ~45 degrees to core axis									

Description			Assay								
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		Trace to 2% disseminated pyrite occurs throughout. Trace stringers of sphalerite are present from 669.3-669.5 m. Trace chalcopyrite occurs locally in association with quartz-carbonate veining. Medium greenish-grey, fine-grained diorite dyke present from 678.5-679.3 m									
664.50	689.00	Chlmoderate; Sermod; Silweak **Chloritisation moderate; Sericitisation mod; Silicification weak** Pervasive variable chloritisation and sericitization, with local silicification									
689.00	694.60	TX1 **Felsic cristal tuf** Medium grey, fine to coarse grained with 3-5% subangular to subrounded clear to grey quartz eyes, 2-6 m in size - commonly 5-6mm; massive to weakly foliated at about 60 degrees to core axis; weakly chloritic and sericitic; lower contact gradational over 5cm; no sulphides observed									
689.00	694.60	Chlweak; Serweak **Chloritisation weak; Sericitisation weak** Weak chlorite and sericite alteration in seams parallel to foliation	693.60	694.60	M829245	1.00	0.03	0.00	0.00	0.01	1.25
694.60	771.10	TL2 **Intermediate lapilli tuf** Intermediate to felsic lapilli tuff; medium grey with darker, more mafic-looking intervals or beds mixed with lighter grey, more felsic material; lapilli are generally felsic to intermediate in composition, from less than a centimetre to 5-6 cm in size, usually lenticular in shape; local weak to moderate sericite and chlorite alteration, commonly in thin seams giving a weak to moderate foliation at 45-50 degrees to core axis; local chloritoid-rich intervals of up to tens of centimetres; rare irregular chalcopyrite stringers and blebs, with pyrite and possible sphalerite (see "mineralization" section); lower contact is somewhat gradational 715.2 - 716.8: Diorite dyke; medium to light grey; fine grained; massive; trace disseminated pyrite									
694.60	777.10	Chlweak-mod; Serweak-mod; Chldlocal **Chloritisation weak-mod; Sericitisation weak-mod; chloritoid local** Local weak to moderate sericite and chlorite alteration, commonly in thin seams giving a weak to moderate foliation at 45-50 degrees	694.60 695.60 696.60 697.60	695.60 696.60 697.60 698.60	M829246 M829247 M829248 M829249	1.00 1.00 1.00 1.00	0.02 0.02 0.02 0.05	0.01 0.00 0.00 0.10	0.00 0.00 0.00 0.00	0.03 0.00 0.06 0.02	1.25 1.25 1.25 3.20

Description			Assay							
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		to core axis; local chloritoid-rich intervals of up to tens of centimetres	698.60	699.60	M829250	1.00	0.35	0.08	0.01	0.05	14.00
694.60	698.70	Py2-3% **Pyrite 2-3%** 2-3% stringer and disseminated pyrite with occasional semi-massive band less than 10cm									
698.70	699.60	Py35-40%; Cp0.5-1%; Sptrace **Pyrite 35-40%; Chalcopyrite 0.5-1%; Sphalerite trace** 35 to 40% semi-massive to massive pyrite with 0.5 to 1% irregular blebs of chalcopyrite and trace sphalerite stringers and blebs									
699.60	702.20	Py2-3% **Pyrite 2-3%** 2 to 3% stringer and disseminated pyrite	699.60	700.60	M829252	1.00	0.04	0.00	0.00	0.01	2.80
			700.60	701.60	M829253	1.00	0.02	0.00	0.00	0.00	1.25
			701.60	702.60	M829254	1.00	0.02	0.02	0.00	0.00	1.25
702.20	705.50	Py0.5-1% **Pyrite 0.5-1%** 0.5 to 1% disseminated and stringer pyrite	702.60	703.60	M829255	1.00	0.01	0.02	0.00	0.01	1.25
			703.60	704.60	M829256	1.00	0.01	0.02	0.00	0.00	1.25
			704.60	705.60	M829257	1.00	0.01	0.03	0.00	0.00	1.25
715.20	716.80	I2J **Diorite** Diorite dyke; medium to light grey; fine grained; massive; trace disseminated pyrite									
757.20	758.75	Cptrace; Pytrace; Sptrace **Chalcopyrite trace; Pyrite trace; Sphalerite trace** Trace irregular blebs and stringers of chalcopyrite and pyrite, with possible sphalerite	757.20	758.70	M829258	1.50	0.88	0.10	0.00	0.01	1.25
			758.70	759.70	M829259	1.00	1.10	0.24	0.00	0.01	3.60
758.75	759.60	Cp1-2%; Py1%; Sp0.5-1% **Chalcopyrite 1-2%; Pyrite 1%; Sphalerite 0.5-1%** 1-2% irregular stringers of chalcopyrite (locally 5-7% over 10cm), with 0.5-1% sphalerite and 1% pyrite									
759.60	763.35	Cptrace; Pytrace **Chalcopyrite trace; Pyrite trace** Trace disseminated and blebs of pyrite and chalcopyrite, with possible sphalerite	759.70	760.70	M829260	1.00	0.13	0.02	0.00	0.00	1.25
			760.70	762.20	M829261	1.50	0.12	0.06	0.00	0.00	1.25
			762.20	763.20	M829262	1.00	0.30	0.03	0.00	0.00	3.40
			763.20	763.80	M829263	0.60	0.24	0.01	0.00	0.02	4.90
763.35	763.60	Sp0.5-1%; Pytrace; Cptrace **Sphalerite 0.5-1%; Pyrite trace; Chalcopyrite trace** 0.5 to 1% irregular blebs of sphalerite with trace chalcopyrite and pyrite									
763.60	765.20	Cptrace; Pytrace	763.80	765.20	M829264	1.40	0.06	0.01	0.00	0.01	1.25

Description			Assay								
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		Chalcopyrite trace; Pyrite trace									
		Trace pyrite and chalcopyrite (+ sphalerite?)									
771.10	783.56	V2; PYRO									
		Intermediate Volcanic; Pyroclastics									
		Heterolithic pyroclastic breccia; generally somewhat chaotic in appearance due to abundant 1-15mm, irregularly-shaped, angular to subrounded clasts/fragments of variable composition; also exhibits abundant rounded clasts/lapilli. Clasts/fragments & lapilli are moderately oriented and locally elongated parallel to weak foliation at ~60 degrees to core axis; trace disseminated and stringer pyrite; lower contact is sharp and regular at 60 degrees to core axis									
783.56	789.00	I2J									
		Diorite									
		Diorite dyke or massive ash bed? Generallly massive, fine grained, medium grey-green; local possible phenocrysts, or possibly assimilated portions of the breccia above; trace disseminated and stringer pyrite									
789.00		**End of DDH**									
		Number of samples: 60									
		Number of QAQC samples: 9									
		Total sampled length: 66.50									

Xstrata Zinc Canada Exploration

DDH: **F-155**

Claims title:
Township:
Range:
Lot:

Section:
Level:
Work place:

Drilled by: Major Drilling
Described by: Des Cullen / Doug McKay

From: 3/31/2013
To: 4/13/2013

Description date:

Collar

Azimuth: 155.00°
Dip: -65.00°
Length: 900.00 m

UTM (NAD83-15)

East	641,188.000
North	5,526,863.000
Elevation	409.000

Averages - Composites

Zone	From	To	Length	Hor. th.	Ver. th.	True th.	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)

Description

Core size: NQ
Cemented: No
Stored: No

Down hole survey

Type	Depth	Azimuth	Dip	Invalid
Reflex	50.00	160.00°	-63.10°	No
Reflex	80.00	161.10°	-62.50°	No
Reflex	113.00	161.50°	-62.20°	No
Reflex	143.00	161.50°	-61.50°	No
Reflex	173.00	162.20°	-60.60°	No
Reflex	203.00	162.90°	-59.00°	No
Reflex	233.00	163.30°	-59.30°	No
Reflex	263.00	165.80°	-57.50°	No
Reflex	293.00	167.40°	-55.70°	No
Reflex	323.00	169.30°	-49.90°	No
Reflex	353.00	168.90°	-48.10°	No
Reflex	383.00	168.40°	-47.20°	No
Reflex	413.00	168.70°	-46.20°	No
Reflex	443.00	168.80°	-45.10°	No
Reflex	473.00	169.10°	-44.10°	No
Reflex	503.00	170.20°	-43.20°	No
Reflex	533.00	170.10°	-41.90°	No
Reflex	563.00	171.40°	-42.30°	No
Reflex	590.00	42.70°	-39.60°	Yes
Reflex	593.00	172.30°	-42.90°	No
Reflex	620.00	353.30°	-43.10°	Yes
Reflex	626.00	170.30°	-37.00°	No
Reflex	653.00	171.90°	-35.80°	No
Reflex	683.00	173.80°	-34.30°	No
Reflex	713.00	172.70°	-33.80°	No
Reflex	746.00	173.30°	-33.20°	No
Reflex	776.00	172.70°	-32.80°	No
Reflex	806.00	172.60°	-32.40°	No
Reflex	836.00	173.20°	-32.00°	No
Reflex	866.00	173.00°	-31.80°	No

Type	Depth	Azimuth	Dip	Invalid

Description			Assay								
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
0.00	38.90	MO **Over Burden** Overburden.									
38.90	123.10	I2J **Diorite** Medium to dark grey-green, fine to medium grained, massive equigranular diorite. Randomly oriented quartz-carbonate veins generall 3-10mm in diameter present throughout. From 56m to 74m, there is a marked increase in the occurrence of these veins and hematite staining is present on fracture planes and the veins themselves are often pinkish in colour. Local intervals of trace disseminated pyrite. The lower contact is 40 degrees TCA, but is somewhat ambiguous as there is a zone where the two units mix.									
56.00	74.00	Hem **Hematisation** Hematite staining of quartz-carbonate veins and on fracture planes.									
123.10	170.25	TL2; TL1; TX1 **Intermediate lapilli tuf; Felsic lapilli tuf; Felsic cristal tuf** Light to medium gery-green felsic to intermediate lapilli-crystal tuff. Might be considered a volcaniclastic sediment. Clasts are heterolithic and and sometimes cocentrically zoned. Clasts are generally sub-angular and range from white to dark grey in colour and from 2-10mm and up to 30mm in size. Moderate sericite alteration throughout. From 128.20 to 128.70 there is a zone of hematite or potassic aleration. From 163.5 to 170.25m, there is a zone of intense sericite and minor epidote alteration. From 149.2 to 150.5 there is a fine to medium grained intermediate dike. Pyrrhotite, pyrite and possible sphalerite are present over metre scale intervals within this unit. Overall there is trace pyrite. From 141.0 to 157.0m there is trace to 0.5% pyrrhotite and pyrite. Possible 156.0 to 156.5, there is possible trace sphalerite. The lower contact is sharp at 45 degrees TCA.									
128.20	128.70	Hem; POT **Hematisation; Potassic** Small zone of hematite or possibley potassic aleration.									
141.00	156.00	Pytrace-0.5; Potrace-0.5 **Pyrite trace-0.5; Pyrrhotite trace-0.5** Trace to 0.5% pyrrhotite and pyrite as irregular stringers.									
149.20	150.50	I2 **Intermediate Dyke**	155.00	156.00	K015917	1.00	0.05	0.02	0.00	0.01	1.25

Description			Assay								
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		Fine to medium grained intermediate dike.									
156.00	156.50	Potrace-0.5; Sptrace	156.00	156.50	K015918	0.50	0.21	0.01	0.00	0.00	1.25
		Pyrrhotite trace-0.5; Sphalerite trace									
		Trace-0.5% pyrite and pyrrhotite in stringers and possible associated sphalerite.									
156.50	157.00	Pytrace-0.5%; Potrace-0.5%	156.50	157.50	K015919	1.00	0.01	0.01	0.00	0.00	1.25
		Pyrite trace-0.5%; Pyrrhotite trace-0.5%									
		Trace to 0.5% pyrrhotite and pyrite as irregular stringers.									
163.50	170.25	Ser; Epi									
		Sericitisation; Epidotisation									
		Zone of intense sericite and minor epidote alteration									
170.25	215.70	TU2	174.00	175.00	K015920	1.00	0.49	0.04	0.00	0.04	1.25
		Intermediate tuf									
		Medium grey fine to coarse grained, local feldspar crystals/phenocrysts 2-5mm in size and commonly elongated. Quartz eyes from 1-3mm, clear and sub-rounded to sub-angular, less than 1% overall. Locally weakly to moderately sericitic. Moderate foliation at 45 degrees TCA. Occasional local hematite/potassic alteration, generally in seams parallel to foliation. The upper portion appears to be more of a crystal tuff (possible volcaniclastic sediment). Overall, there is trace fine grained pyrite in local bands up to 2cm and possible very rare sphalerite. From 175.0 to 175.4 5-7% stringer and disseminated pyrite with possible 0.5% sphalerite (tan coloured, very fine grained). The lower contact is sharp at 30 degrees TCA, marked by brecciation.									
175.00	175.40	Py5-7; Sp00.5	175.00	175.50	K015921	0.50	1.22	0.20	0.00	0.24	10.70
		Pyrite 5-7; Sphalerite 0.5%	175.50	176.50	K015922	1.00	0.03	0.03	0.00	0.01	1.25
		Stringer and disseminated pyrite with possible 0.5% sphalerite (tan coloured, very fine grained).									
215.70	387.00	V2J									
		Andesite									
		Medium to dark grey-green, fine to coarse grained andesite with local (less than 1% overall) quartz-carbonate amygdules ranging in size from 2mm to 5mm and up to 10mm. Moderately foliated at 45 degrees TCA. Moderately chloritic. Common quartz carbonate in fractures, generally parallel to foliation. Local sericite and weak pervasive carbonate alteration. Local hematite on fracture planes associated with carbonate. The top of the unit from 215.7 to 228m, is brecciated (possible flow top) with clasts ranging from 2-10mm in size. Trace disseminated and stringer pyrite throughout with rare chalcopyrite generally associated with quartz-carbonate veining. Local narrow (~50cm) breccia zones									

Description			Assay							
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		space between 10-50 metres throughout (possible successive flow tops?). Occasional 1-2 metre wide zones with subhedral feldspar phenocrysts 1-2mm in size. Up to 5% magnetite is present in sparsely occurring quartz carbonate veins 1-5cm wide, from 245 to 255m depth. Mag sus readings over this interval were up to 304.4. The lower contact is gradational over one metre.									
215.70	228.00	FL TP **Flow Top** The top of the unit from 215.7 to 228m, is brecciated (possible flow top) with clasts ranging from 2-10mm in size.									
387.00	453.45	V1; TU1; TU2 **Felsic Volcanic; Felsic tuf; Intermediate tuf** Felsic to intermediate tuff. Local 3-5 metre intervals of lapilli with larger intervals of an ash tuff with elongated chlorite clots parallel to foliation. Lapilli are generally light grey, sub-angular and usually range in size from 4-30mm. This unit is moderately foliated at 45 degrees TCA and moderately chloritic throughout. From 393.2 to 394.2m, there are hematite veinlets parallel to foliation and in as fine specs. From 429 to 431m, threre are magnetite veinlets up to 7mm wide and magnetite stringers. From 437 to 438.2m there is trace disseminated and stringer magnetite. Short (~1m) intervals of feldspar phenocrysts are sporadically present. Trace pyrite and chalcopyrite is sparsely present as stringers and locally disseminated. Small zone of chlorite/sericite alteration with localized hematite staining from 444-447.5 m. Potentialy quartz eyes (??) present in association with the hematite staining of quartz-carbonate vein at 447.5 m, <1mm colourless to light-grey angular grains. Lower contact is gradational over an approximately 1m section of chlorite/sericite altered crystal tuff with ~5%, <1-1mm sized blue-grey to grey quartz eyes. Local hematite staining occurs along the plane of foliation. Magsus readings over this interval were up to 38.77.									
444.00	447.80	Ser; Chl; Hem **Sericitisation; Chloritisation; Hematisation** Chlorite/sericite alteration in felsic to intermediate tuff with localized hematite staining									
453.50	589.00	V2J **Andesite**									

Description	Assay								
	From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
Medium to dark grey-green, fine to coarse grained andesite with local (less than 1% overall) quartz-carbonate amygdules ranging in size from 2mm to 10mm and up to 20mm. Moderately foliated with foliation ranging from 45-55 degrees TCA. The upper contact is sharp, but a zone of intercalated felsic to intermediate tuff to crystal tuff is present from 456-458.6m. This tuffaceous unit contains blue-grey to grey <1-2mm, semiangular quartz eyes and is moderately foliated between 45-55 degrees TCA. It also shows chlorite/sericite alteration. Andesite is moderately chloritic. Chlorite clots are present locally, an are elongated parallel to foliation. Common quartz carbonate in fractures, generally parallel to foliation. Quartz-carbonate veins parallel foliation are up to 2cm wide. Carbonate veins containing calcite occur sporatically throughout and do not parallel foliatio. Local sericite and weak pervasive carbonate alteration. Medium to light-grey, medium to coarse-grained diorite dykes sharply crosscut andesite unit at 466.8-467.4m, 471.7-471.9m, 472-472.4m, 485.4 to 486m, 499.1-500.1m, 500.2-501.3m, 501.5-501.9m, 570.8-571.0m, and 578.2-578.5m. Quartz/carbonate and chlorite/sericite alteration is present locally within andesite above and below the contacts with the diorite dykes (could also be a zone of brecciation as chlorite defines what could be semi-angular fragments??). Subhedral-euhedral cubic pyrite (<1mm to 1cm) occurs in association with quartz/carbonate and chlorite/sericite alteration with local abundances up to 4%. Trace disseminated grains and stringers of pyrite are pervasive throughout unit in association with quartz/carbonate veining. Locally cubic pyrite up to 10mm occurs within andesite in unaltered zones. Hematite staining occurs locally in association with quart/carbonate veining, primarily along foliation planes. Occasional 1-2 metre wide zones with subhedral feldspar phenocrysts 1-2mm in size. Disseminated subhedral to anhedral magnetite is present locally, grain size varies from <1 to 3mm. Magsus readings in this interval are up to 42.97. Incompetant, broken core from 524 to 524.3m. A section of felsic to intermediate tuff to lapilli tuff is intercalated within the andesite from 579-580.4m. Lapilli are elongated, oriented parallel to foliation (~40 degrees TCA) and range in size from 1mm to 30mm. Lower contact is sharp, so this may represent another intercalated zone or a sharp contact with the underlying felsic to intermediate tuff-lapilli tuff (felsic-int tuff was in the last box).******									

Description			Assay							
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
456.00	458.60	TX1; TX2; TU1; TU2 **Felsic cristal tuf; Intermediate cristal tuf; Felsic tuf; Intermediate tuf** A zone of intercalated felsic to intermediate tuff to crystal tuff is present within the andesite from 456-458.6m. This tuffaceous unit contains blue-grey to grey <1-2mm, semiangular quartz eyes and is moderately foliated between 45-55 degrees TCA. It also shows chlorite/sericite alteration.									
466.80	467.40	I2J **Diorite** Light to medium-grey, medium to coarse-grained diorite dyke that sharply crosscuts andesite unit at approximately 30 degrees TCA.									
471.70	471.90	I2J **Diorite** Light to medium-grey, medium to coarse-grained diorite dyke that sharply crosscuts andesite unit at approximately 30 degrees TCA.									
472.00	472.40	I2J **Diorite** Light to medium-grey, medium to coarse-grained diorite dyke that sharply crosscuts andesite unit at approximately 30 degrees TCA.									
485.40	486.00	I2J **Diorite** Light to medium-grey, medium to coarse-grained diorite dyke that sharply crosscuts andesite unit at approximately 30 degrees TCA. Contain euhedral, cubic grains of pyrite (trace)									
499.90	500.10	I2J **Diorite** Light to medium-grey, medium to coarse-grained diorite dyke that sharply crosscuts andesite unit.									
500.20	501.30	I2J **Diorite** Light to medium-grey, medium to coarse-grained diorite dyke that sharply crosscuts andesite unit.									
501.50	501.90	I2J **Diorite** Light to medium-grey, medium to coarse-grained diorite dyke that sharply crosscuts andesite unit.									
512.60	513.40	Chl; Hem; Ser **Chloritisation; Hematisation; Sericitisation** Hematite staining, quartz-carbonate veining and local									

Description			Assay							
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		chlorite/sericite alteration in andesite									
516.00	516.20	Hem **Hematisation** Hematite staining in andesite in association with quartz-carbonate veining									
570.80	571.00	I2J **Diorite** Light to medium-grey, medium to coarse-grained diorite dyke that sharply crosscuts andesite unit.									
578.20	578.50	I2J **Diorite** Light to medium-grey, medium to coarse-grained diorite dyke that sharply crosscuts andesite unit.									
589.00	699.00	V1; V2; TU1; TL1; TU2 **Felsic Volcanic; Intermediate Volcanic; Felsic tuf; Felsic lapilli tuf; Intermediate tuf** Felsic to intermediate tuff to lapilli tuff. Lapilli are generally light-grey, subangular, range in size from 1-10mm and are moderately elongated parallel to foliation (~35-45 degrees TCA). Local 1-4 metre intervals of lapilli occur within larger intervals of an ash tuff with elongated chlorite clots parallel to foliation. Unit is moderately chloritic throughout. Ash beds are contorted from 611-612m (possibly from sediment loading??)Short (~1m) intervals of feldspar phenocrysts are sporadically present. Quartz-carbonate amygdules are present locally and range in size from 1 to 6mm. Quartz-carbonate veinlets occur throughout. They range in size from 1-3 cm and contain trace amounts of disseminated pyrite. From 590-593.3m and 594.9-595.4m large, predominantly quartz veins crosscut the felsic-intermediate tuff. The quartz veins contain stringers of tourmaline (??, black mineral, non-magnetic), chlorite, and sericite and shows local hematite staining. Subhedral to anhedral milky-white feldspar grains also occur within and on the margins of the quartz veins (at least they look like feldspar, milky white, not quartz, and show exolution lamellae). Magnetite occurs throughout the unit as subhedral to anhedral 1-2 mm grains and as very fine disseminated grains. Magnetite also occurs as stringers within quartz-carbonate veins and concentrated very fine-grains within ash beds. The unit is highly magnetic from 617-647m, likely indicating an increased abundance of magnetite (very fine grained									

Description	Assay								
	From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
magnetite). A small interval of intercalated andesite is present from 595.4-599m. It contains 1-3 mm chlorite clots and fine-grained disseminated magnetite, elongated parallel TCA (at 40 degrees). Medium greenish-grey, plagioclase-phyric (1-2mm) diorite dykes crosscut the felsic-intermediate tuff from 608.7-609.2m and 617.4-617.6m. A zone of disseminated and stringer pyrite mineralization within a moderately to highly silicified, chlorite/sericite altered interval of felsic to intermediate tuff to lapilli tuff. Fine-grained disseminated and stringer pyrite occur oriented along the plane of foliation (~40 degrees TCA) and range in abundance from 1-15 % with an average over the interval of 5%. Cubic pyrite grains (1-3mm) are present within the tuff/lapilli tuff on the margins of the mineralized zone. The increased abundance of pyrite mineralization within the zone correlates to increased alteration intensity. From 655.8-658.7 m, the felsic to intermediate tuff contains disseminated and stringer anhedral sphalerite (tr-3%) and sub-anhedral galena (trace). Trace to 5% disseminated pyrite occurs throughout mineralization zone, aligned parallel to plane of foliation (~40 degrees TCA). Mineralized zone shows chlorite and epidote alteration throughout. From 661.7-667.6 m, the felsic to intermediate tuff contains disseminated and veinlet sphalerite (up to 2% locally), disseminated and stringer galena (tr-1%) and disseminated pyrite throughout (1-10%; average of 5%).Mineralized zone shows chlorite and sericite alteration throughout. From 669.75-677.8 m, the felsic to intermediate tuff contains disseminated sphalerite (trace), disseminated galena (tr-1% in quartz veinlets) and disseminated pyrite throughout (tr-4%).Mineralized zone shows moderate sericite alteration throughout. From 689.9-695.3 m, the felsic to intermediate lapilli tuff to tuff contains disseminated and clots of sphalerite (fine grained disseminated, clots up to 1cm) that occur in association with pyrite. Stringers, bands and disseminations of fine-grained pyrite occur throughout. Locally, pyrite grains are euhedral to subhedral and range in size from 1-4 mm. Zone of mineralization is moderately silicified. Lapilli are white to light-grey, 3-20 mm in size and are elongated parallel to foliation (~40 degrees TCA).									

Description			Assay								
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		Local 1-3 mm beds of graphitic-rich sediments are present in association with the mineralized lapilli tuff. (Disseminated pyrite mineralization occurs between defined zones of mineralization, but percentages are not notable enough to block the entire interval as one large mineralzation zone) Light-grey to blue quartz eyes (1-2mm) occur from 651-657.2 m. They are poorly sorted and subangular-subrounded and range in abundance from 1-10%. Intervals of light to medium grey-green, angular to subangular brecciated fragements is present from 647-647.2 m and from 656.8-657.2 m. The matrix surrounding the fragements contains disseminated pyrite.									
645.80	651.70	Chl; Ser; Sil **Chloritisation; Sericitisation; Silicification** Moderately to highly silicified, chlorite/sericite altered interval of felsic to intermediate tuff to lapilli tuff. Zones of most intense alteration/silicification associated with higher abundance of pyrite mineralization. (potentially minor epidote alteration?? need to see next boxes of core..)									
645.80	651.70	Py 1-15% **Pyrite 1-15%** Zone of disseminated and stringer pyrite mineralization within a moderately to highly silicified, chlorite/sericite altered interval of felsic to intermediate tuff to lapilli tuff. Fine-grained disseminated and stringer pyrite occur oriented along the plane of foliation (~40 degrees TCA) and range in abundance from 1-15 % with an average over the interval of 5%. Cubic pyrite grains (1-3mm) are present within the tuff/lapilli tuff on the margins of the mineralized zone. The increased abundance of pyrite mineralization within the zone correlates to increased alteration intensity. Quartz eyes (1-2mm) occur from 651-651.7 m. They are poorly sorted and subangular. An interval of light to medium grey-green, angular to subangular brecciated fragments is present from 647-647.2 m. The matrix surrounding the fragments contains disseminated pyrite.	647.20	648.70	K015923	1.50	0.08	0.01	0.03	0.01	4.80
			648.70	650.20	K015924	1.50	0.29	0.00	0.07	0.02	25.10
			650.20	651.60	K015925	1.40	0.08	0.00	0.02	0.01	7.80
655.80	658.70	Chl; Epi **Chloritisation; Epidotisation** Zone of mineralization shows chlorite and epidote alteration.									

Description			Assay							
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
655.80	658.70	Sp tr-3%; GAL tr-3%; Py tr-5%	655.80	657.20	K015926	1.40	0.16	0.04	0.05	0.01	310.00
		Sphalerite tr-3%; Galena tr-3%; Pyrite tr-5%	657.20	658.70	K015927	1.50	0.15	0.00	0.06	0.02	49.90
		Felsic to intermediate tuff contains disseminated and stringer anhedral sphalerite (tr-3%) and sub-anhedral galena (trace). Trace to 5% disseminated pyrite occurs throughout mineralization zone, aligned parallel to plane of foliation (~40 degrees TCA). Mineralized zone shows chlorite and epidote alteration throughout.									
661.70	667.60	Chl; Ser									
		Chloritisation; Sericitisation									
		Mineralized zone shows moderate chlorite and sericite alteration along plane of foliation.									
661.70	667.60	Sp tr-2%; GAL tr-1%; Py 1-10% (av 5%)	661.70	663.20	K015928	1.50	0.16	0.00	0.06	0.00	10.90
		Sphalerite tr-2%; Galena tr-1%; Pyrite 1-10% (av 5%)	663.20	664.60	K015929	1.40	0.76	0.00	0.45	0.02	28.00
		Felsic to intermediate tuff contains disseminated and veinlet sphalerite (up to 2% locally), disseminated and stringer galena (tr-1%) and disseminated pyrite throughout (1-10%; average of 5%).Mineralized zone shows chlorite and sericite alteration throughout.	664.60	666.10	K015931	1.50	1.08	0.01	0.29	0.05	30.70
			666.10	667.60	K015932	1.50	0.61	0.01	0.39	0.15	36.40
			669.70	671.00	K015933	1.30	0.46	0.00	0.11	0.05	7.20
669.75	677.80	Ser									
		Sericitisation									
		Zone of dominated by moderate sericite alteration along plane of foliation.									
669.75	677.80	Sp tr; GAL tr-1%; Py tr-4%	671.00	672.50	K015934	1.50	0.17	0.00	0.11	0.03	5.40
		Sphalerite tr; Galena tr-1%; Pyrite tr-4%	672.50	674.00	K015935	1.50	0.03	0.00	0.02	0.01	1.25
		Felsic to intermediate tuff contains disseminated sphalerite (trace), disseminated galena (tr-1% in quartz veinlets) and disseminated pyrite throughout (tr-4%).Mineralized zone shows moderate sericite alteration throughout.	674.00	675.50	K015936	1.50	0.02	0.00	0.00	0.00	1.25
			675.50	676.87	K015937	1.37	0.04	0.00	0.03	0.00	1.25
			676.87	677.80	K015938	0.93	0.03	0.00	0.13	0.00	6.30
			677.80	679.30	K015939	1.50	0.02	0.00	0.01	0.00	1.25
			679.30	680.00	K015940	0.70	0.02	0.00	0.01	0.00	1.25
			680.00	681.50	K015941	1.50	0.02	0.00	0.01	0.00	1.25
			681.50	683.00	K015942	1.50	0.02	0.00	0.01	0.00	1.25
			683.00	684.50	K015943	1.50	0.03	0.00	0.01	0.00	1.25
			684.50	686.00	K015944	1.50	0.02	0.00	0.01	0.00	1.25
			686.00	687.50	K015945	1.50	0.02	0.00	0.00	0.00	1.25
			687.50	688.50	K015946	1.00	0.01	0.00	0.00	0.00	1.25
			688.50	690.00	K015948	1.50	0.01	0.00	0.00	0.00	1.25
689.90	695.30	Sil									

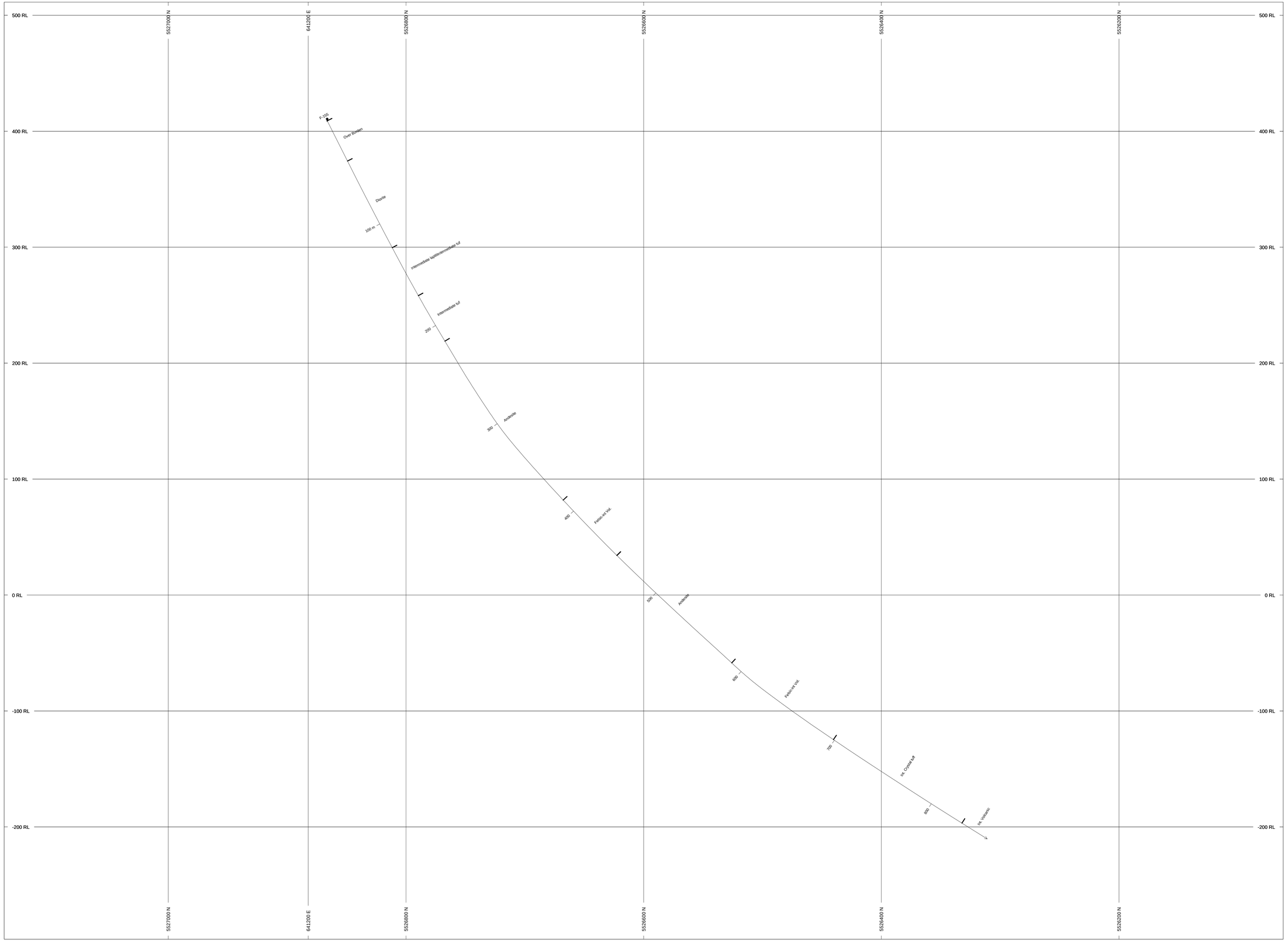
Description			Assay								
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		Silicification Moderately silicified zone of mineralization.									
689.90	695.30	Sp tr-1%; Py 1-4%	690.00	691.50	K015949	1.50	0.07	0.00	0.02	0.01	1.25
		Sphalerite tr-1%; Pyrite 1-4%	691.50	692.80	K015951	1.30	1.56	0.03	0.02	0.02	5.10
		Felsic to intermediate lapilli tuff to tuff contains disseminated and	692.80	694.20	K015952	1.40	0.18	0.03	0.01	0.01	4.20
		clots of sphalerite(tr-1%; fine grained disseminated, clots up to	694.20	695.70	K015953	1.50	0.02	0.00	0.01	0.01	2.70
		1cm) that occur in association with pyrite (1-4%). Stringers, bands	695.70	697.20	K015954	1.50	0.02	0.00	0.00	0.00	1.25
		and disseminations of fine-grained pyrite occur throughout.	697.20	698.70	K015955	1.50	0.04	0.00	0.00	0.00	1.25
		Locally, pyrite grains are euhedral to subhedral and range in size	698.70	700.20	K015956	1.50	0.02	0.01	0.00	0.00	1.25
		from 1-4 mm. Zone of mineralization is moderately silicified. Lapilli									
		are white to light-grey, 3-20 mm in size and are elongated parallel									
		to foliation (~40 degrees TCA).									
699.00	831.30	TX2; TU2; TL2	721.50	723.00	K015957	1.50	0.02	0.00	0.00	0.00	1.25
		Intermediate cristal tuf; Intermediate tuf; Intermediate lapilli tuf									
		Medium grey, crystal tuff to lapilli tuff. This unit is predominantly a crystal									
		tuff with local lapilli rich intervals as well as local intervals of ash bedding.									
		Pervasive sericite and chlorite alteration is present throughout unit and									
		occurs predominantly along foliation planes (45 degrees TCA). Lapilli are									
		present over 1-2 m intervals. They are medium-grey, subangular to									
		subrounded and are elongated parallel to foliation. Fine-grained ash									
		beds are present over 1-2 m intervals (from 773-775 m; 809.3-809.9 m).									
		Locally up to 5% quartz eyes, approximately 1mm in size, over									
		decimeter to half meter scale intervals. Local chloritoid as 1mm									
		sub-rounded dark green grains.									
		Quartz-carbonate (up to 4cm) veinlets occur sporadically in moderate									
		abundance throughout. Locally they contain whispy grains of chlorite									
		and sericite and euhedral, 5-40 mm feldspar (??) grains (milky white									
		mineral in association with quartz). From 782-800 m, the veins contain									
		local disseminated pyrite and chalcopyrite (tr-1%). A larger quartz vein									
		is present from 802.5-804 m.									
		Fine-grained, disseminated pyrite (tr-3%) occurs in localized zones.									
		Cubic, 1-2mm pyrite grains are disseminated throughout the unit.									
		A more pronouced zone of mineralization occurs from 723-729.2 m.									
		Disseminated, fine-grained pyrite (up to 10%) and chalcopyrite (tr-1%)									
		are present in cm-scale bands within the intermediate crystal-lapilli tuff.									
		Sulfide mineralization is typically oriented parallel to foliation (45 dgrees									
		TCA).									

Description			Assay								
			From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
		Disseminated, veinlet and stringer pyrite (tr-1%) and chalcopyrite (trace) occur from 827-828 m. Lower contact is gradational.									
699.00	717.10	Ser; Chl **Sericitisation; Chloritisation** Pervasive sericite to sericite/chlorite alteration throughout the unit of intermediate tuff/crystal tuff/lapilli tuff.									
723.00	729.20	Py tr-10%; Cp tr-1% **Pyrite tr-10%; Chalcopyrite tr-1%** A more pronouced zone of mineralization occurs from 723-729.2 m. Disseminated, fine-grained pyrite (up to 10%) and chalcopyrite (tr-1%) are present in cm-scale bands within the intermediate crystal-lapilli tuff. Sulfide mineralization is typically oriented parallel to foliation (45 dgrees TCA).	723.00 724.00	724.00 725.50	K015958 K015960	1.00 1.50	0.03 0.01	0.20 0.00	0.00 0.00	0.03 0.00	6.90 1.25
831.30	884.00	V2; BRECC **Intermediate Volcanic; Brecciated** Dacite/intermediate (potentially Rhyodacite??) tuff breccia. Medium grey overall with white to light-medium grey clasts/fragments and lapilli. Generally somewhat chaotic in appearance due to abundant 1-15mm, irregularly-shaped, angular to subrounded clasts/fragments of variable composition; also exhibits abundant rounded clasts/lapilli. Clasts/fragments & lapilli are moderately oriented and locally elongated parallel foliation. Weak to locally moderate Foliation at 30-45 degrees TCA. Local intervals of tuff/ash tuff occurs over 1-2 m intervals. Local intervals of lapilli tuff. Angular, milky white to light-grey cherty breccia fragments (4-50 mm) are abundant from 878.0-879.0 m. Unit is moderately to locally strongly chloritic; moderately sericitic; local moderate chlorite alteration, possible silicification. Chlorite is generallly interstitial between breccia fragments. Chloritoid generally consists of 1-2mm, sub-rounded to sub-angular, grains/clasts. Trace pyrite and is found in stringers and disseminated throughout. Colourless to light-grey quartz eyes (1-2 mm; 2-3% locally) occur in decimeter-scale intervals locally. Light to medium-greenish grey, fine to medium-grained diorite dykes occur toward the end of the hole; from 875.7-876.7 m and 881.3-882.1									

Description	Assay								
	From	To	Number	Length	ZN FINAL (%)	CU FINAL (%)	PB FINAL (%)	AU FINAL (g/t)	AG FINAL (g/t)
m.									
900.00 End of DDH Number of samples: 40 Number of QAQC samples: 4 Total sampled length: 52.70									

Appendix D

Drill Hole Sections



HOLES PLOTTED

TOTAL 1

F-155

COMMENTS L/R TEXT
Code R -------

SECTION SPECS:

REF. PT. E, N	641260 m	5526600 m
EXTENTS	1100 m	808.2 m
SECTION TOP, BOT	511.3 m	-296.9 m
TOLERANCE +/-	25 m	

SCALE

(m)

-20 0 20 40 60

*unknown

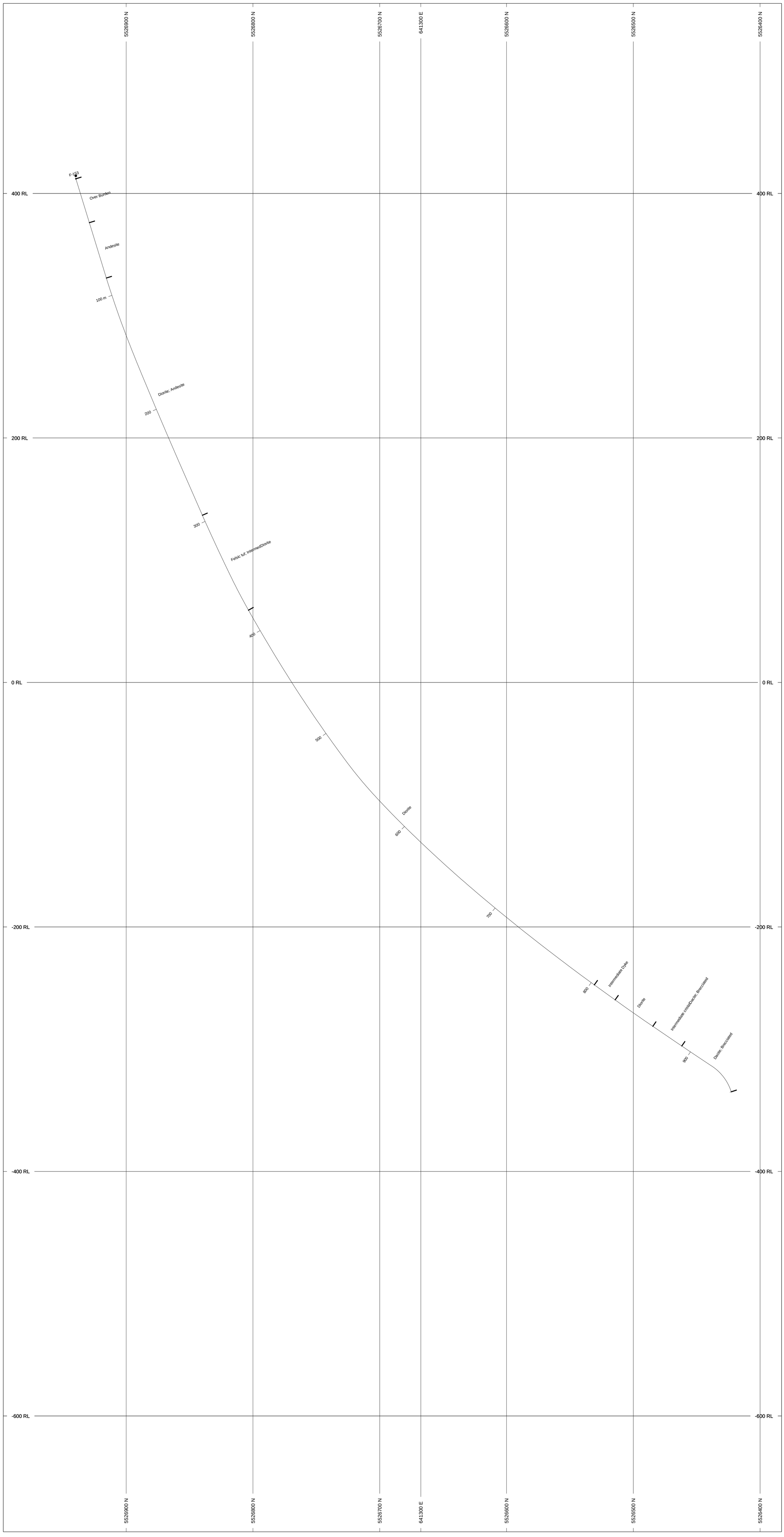
AZIMUTH = 168°

N E S W

GlencoreXstrata

Sturgeon Lake

641260E SECTION



HOLES PLOTTED

TOTAL 1

F-153

COMMENTS	L/R	TEXT
Code	R	-------

SECTION SPECS:

REF. PT. E, N	641294 m	5526690 m
EXTENTS	635.5 m	1250 m
SECTION TOP, BOT	555.5 m	-694.7 m
TOLERANCE +/-	40 m	

SCALE

(m)

-20 0 20 40 60

*unknown

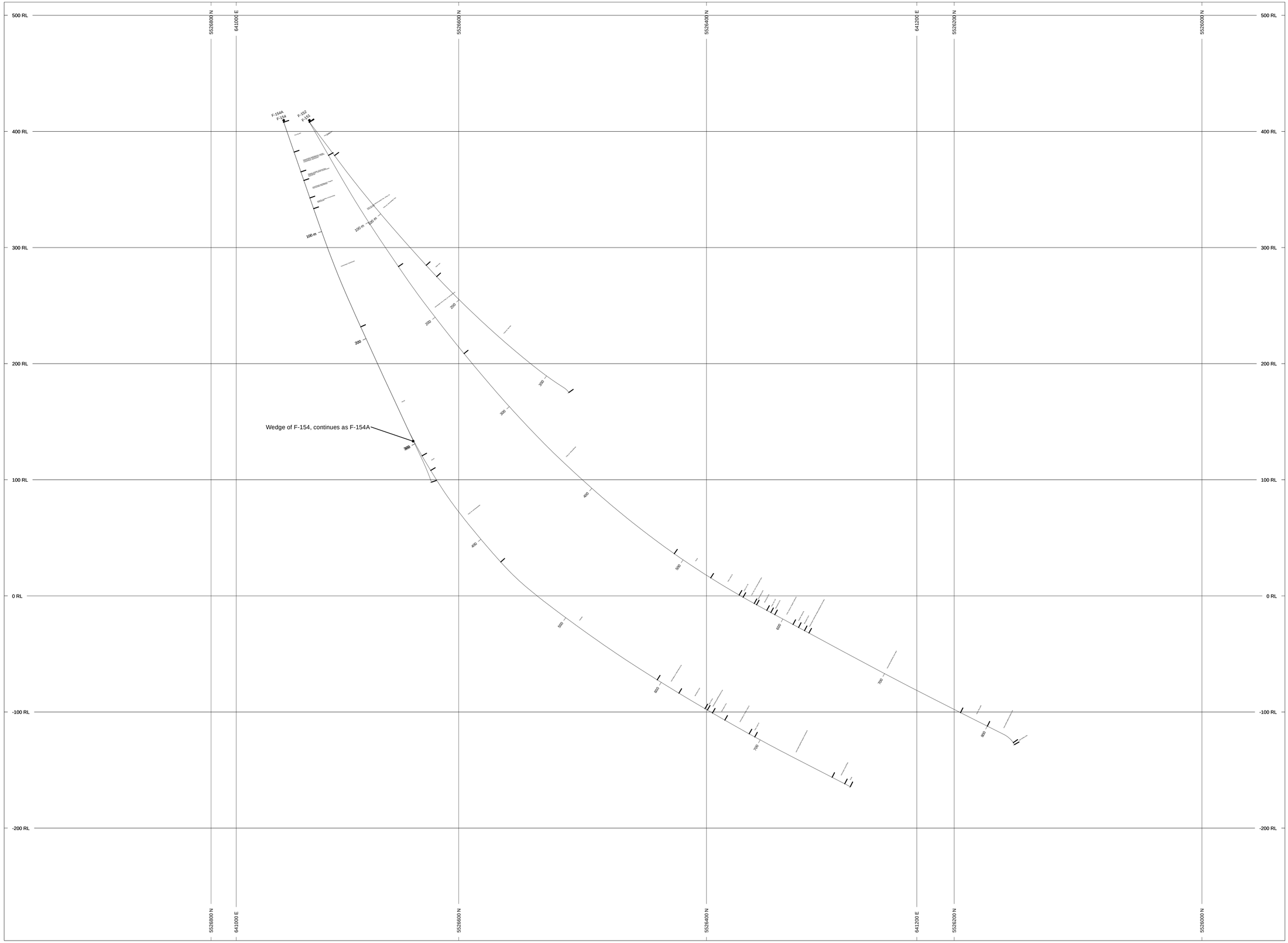
AZIMUTH = 165°

N W E S

GlencoreXstrata

Sturgeon Lake

641294E SECTION



HOLES PLOTTED

TOTAL 4

F-151 F-152 F-154 F-154A

COMMENTS L/R TEXT
Code R -------

SECTION SPECS:

REF. PT. E, N	641120 m	5526450 m
EXTENTS	1100 m	808.2 m
SECTION TOP, BOT	511.3 m	-296.9 m
TOLERANCE +/-	42.5 m	

SCALE

(m)

-20 0 20 40 60

*unknown

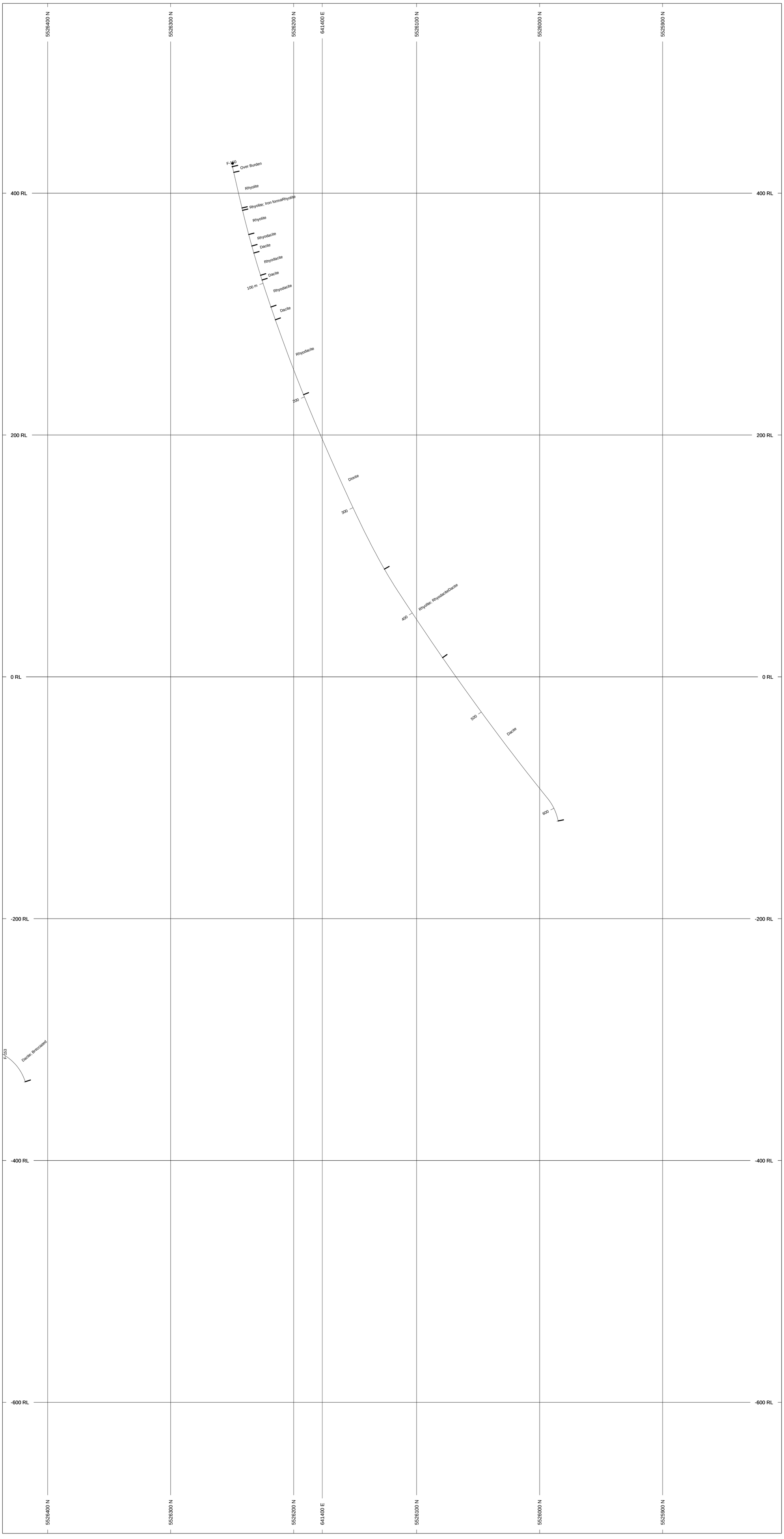
AZIMUTH = 160°

N W E S

GlencoreXstrata

Sturgeon Lake

641120E SECTION



HOLES PLOTTED

TOTAL 2

F-150 F-153

COMMENTS L/R TEXT
Code R -------

SECTION SPECS:

REF. PT. E, N	641410 m	5526120 m
EXTENTS	643.2 m	1265 m
SECTION TOP, BOT	557 m	-708.4 m
TOLERANCE +/-	30 m	

SCALE

(m)

-20 0 20 40 60

*unknown

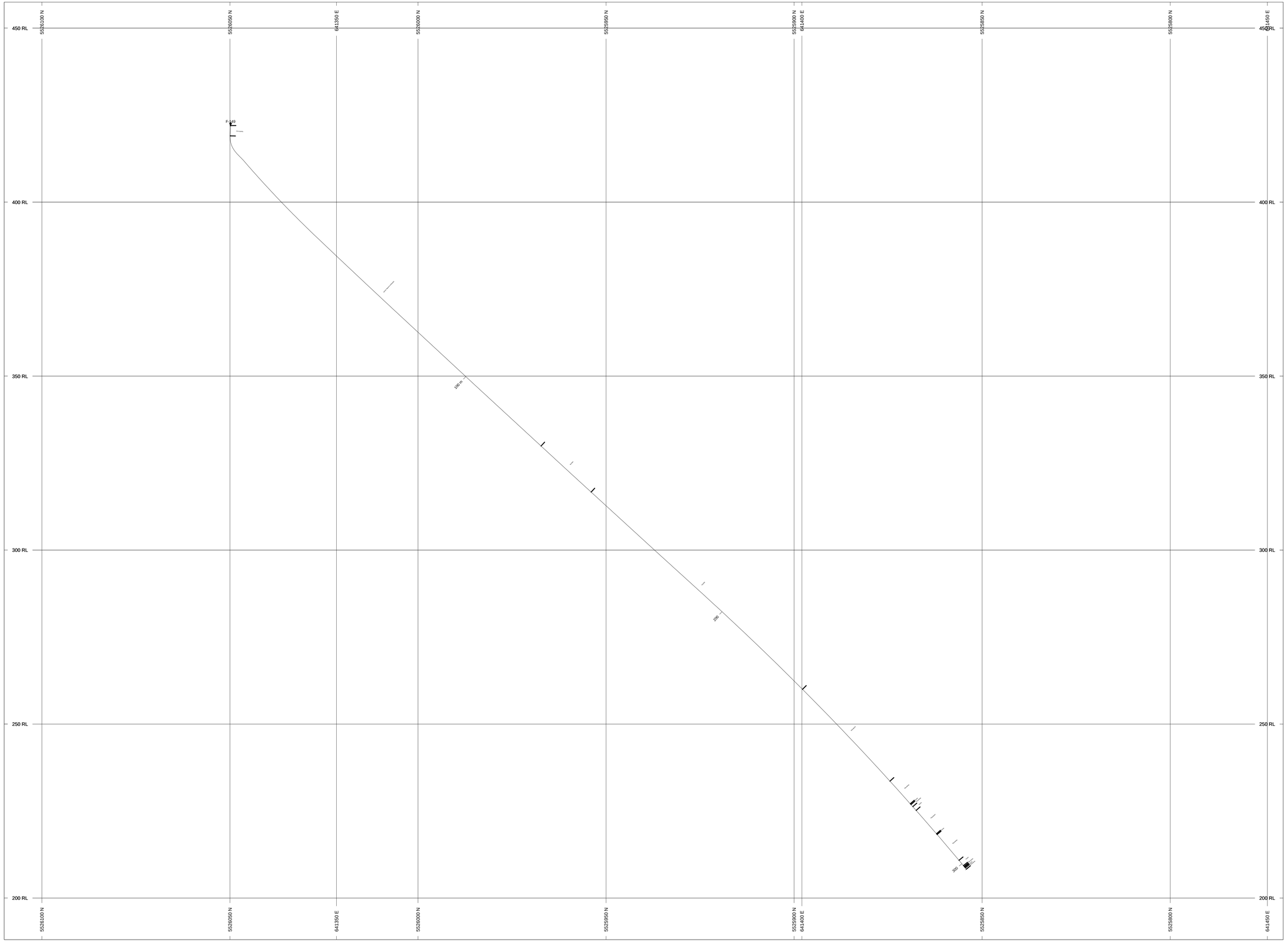
AZIMUTH = 170°

N W E S

GlencoreXstrata

Sturgeon Lake

641410E SECTION



HOLES PLOTTED

TOTAL 1

F-149

COMMENTS L/R TEXT
Code R -------

SECTION SPECS:

REF. PT. E, N	641383 m	5525940 m
EXTENTS	366.8 m	269.4 m
SECTION TOP, BOT	457.4 m	188 m
TOLERANCE +/-	20 m	

SCALE

(m)

-5 0 5 10 15 20

*unknown

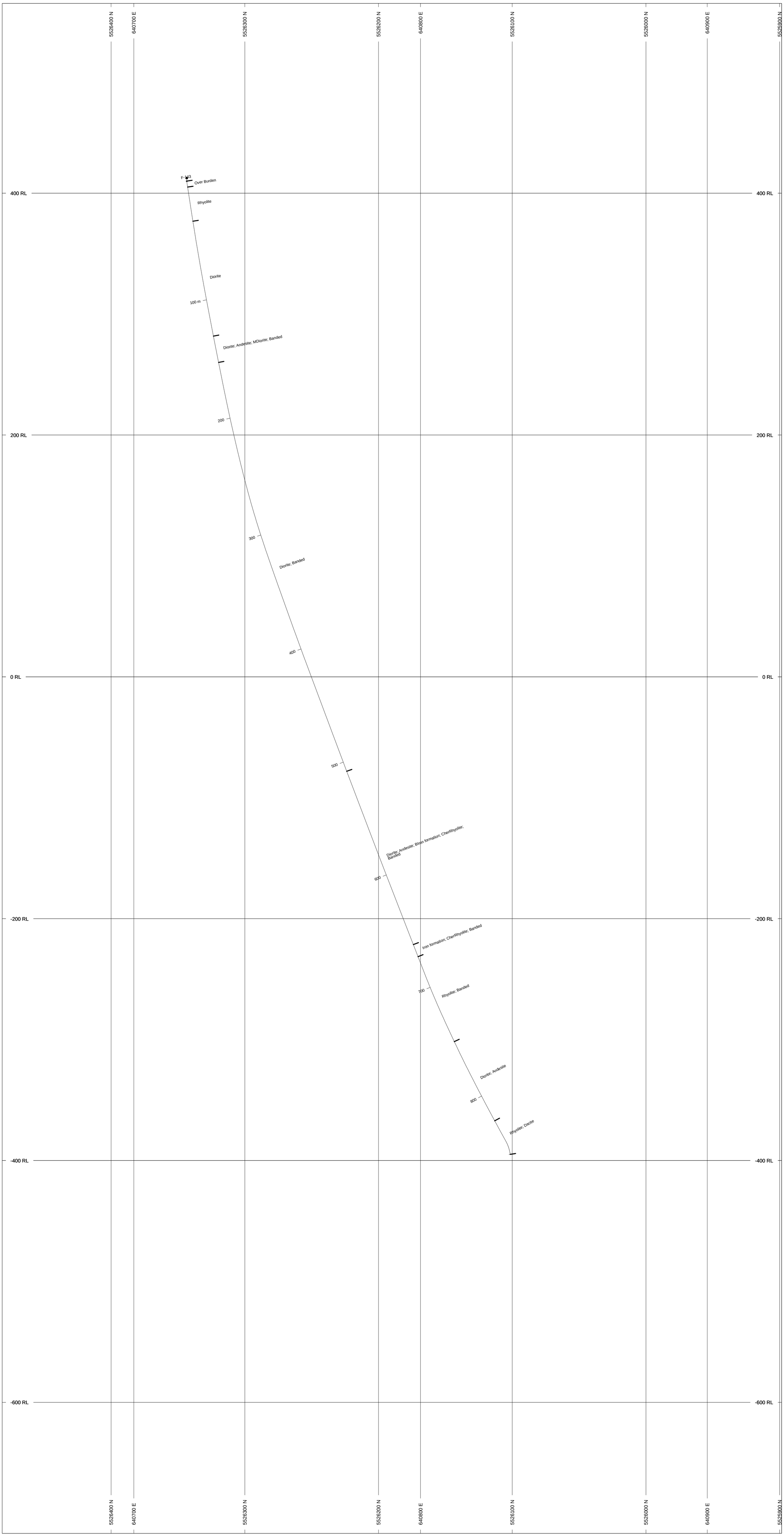
AZIMUTH = 158°

N W E S

GlencoreXstrata

Sturgeon Lake

641383E SECTION



HOLES PLOTTED

TOTAL 1

F-143

COMMENTS	L/R	TEXT
Code	R	-------

SECTION SPECS:

REF. PT. E, N	640790 m	5526190 m
EXTENTS	643.2 m	1265 m
SECTION TOP, BOT	557 m	-708.4 m
TOLERANCE +/-	45 m	

SCALE

(m)

-20 0 20 40 60

*unknown

AZIMUTH = 155°

N W E S

GlencoreXstrata

Sturgeon Lake

640790E SECTION

5527000 N | 641600 E | 5526900 N | 5526800 N | 5526700 N | 5526600 N | 641700 E | 5526500 N | 5526400 N

400 RL | 200 RL | 0 RL | -200 RL | -400 RL | -600 RL

15-109

Over Burden

Andesite; Foliated

100 m

200

Felsic cristal tuf; Diorite; Foliated

300

Diorite; Foliated

400

Intermediate cristalFelsic cristal tuf; Diorite; Massive rocFelsic lapilli tuf;

500

600

Felsic cristal tuf; Diorite; Massive rocFelsic lapilli tuf;

700

Diorite; Massive rocFelsic lapilli tuf;

800

Felsic lapilli tuf;

HOLES PLOTTED

TOTAL 1

15-109

COMMENTS		L/R	TEXT
Code		R	-------

SECTION SPECS:

REF. PT. E, N	641670 m	5526700 m
EXTENTS	635.1 m	1249 m
SECTION TOP, BOT	555.4 m	-694 m
TOLERANCE +/-	50 m	

SCALE

(m)

-20 0 20 40 60

*unknown

AZIMUTH = 165°

N W E S

GlencoreXstrata

Sturgeon Lake

641670E SECTION

5527200 N | 5527100 N | 5527000 N | 5526900 N | 5526800 N | 5526700 N | 5526600 N | 5526500 N | 5526400 N

400 RL | 200 RL | 0 RL | -200 RL | -400 RL | -600 RL | -800 RL | -1000 RL

15-108

Over Burden

100 m

Mafic Flow

200

300

Rhyolite

Rhyodacite

Rhyodacite

400

500

Diorite

600

700

Rhyolite; RhyodacteRhyolite; Bedded

800

Rhyolite; Bedded

Intermediate Dyke

Intermediate tuf

900

Rhyolite; Felsic tuf/pIntermediate tuf; FeFelsic tuf; RhyoliteYS Hatches

Intermediate tuf; FeFelsic tuf; RhyoliteYS Hatches

Felsic tuf; RhyoliteYS Hatches

5527200 N | 5527100 N | 5527000 N | 5526900 N | 5526800 N | 5526700 N | 5526600 N | 5526500 N | 5526400 N

HOLES PLOTTED

TOTAL 1

15-108

COMMENTS		L/R	TEXT
Code		R	-------

SECTION SPECS:

REF. PT. E, N	641802 m	5526790 m
EXTENTS	857.6 m	1687 m
SECTION TOP, BOT	599.2 m	-1088 m
TOLERANCE +/-	25.9 m	

SCALE

(m)

-20 0 20 40 60 80

*unknown

AZIMUTH = 167.3°

N W E S

GlencoreXstrata

Sturgeon Lake

641802E SECTION

Appendix E

Assay Certificates

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: 604 984 0221 Fax: 604 984 0218 www.alsglobal.com

To: XSTRATA ZINC CANADA
8801 TRANS CANADA HWY
SUITE 400
SAINT- LAURENT QC H4S 1Z6

Finalized Date: 26- FEB- 2013
Account: XSZNEX

CERTIFICATE TB13027906

Project: Sturgeon Lake

P.O. No.:

This report is for 32 Drill Core samples submitted to our lab in Thunder Bay, ON, Canada on 11- FEB- 2013.

The following have access to data associated with this certificate:

LUCY POTTER		

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI- 21	Received Sample Weight
LOG- 22	Sample login - Rcd w/o BarCode
CRU- 32	Fine Crushing 90% < 2mm
SPL- 21	Split sample - riffle splitter
PUL- 31	Pulverize split to 85% < 75 um
CRU- QC	Crushing QC Test
PUL- QC	Pulverizing QC Test
LOG- 23	Pulp Login - Rcvd with Barcode

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	INSTRUMENT
Au- AA23	Au 30g FA- AA finish	AAS
Ag- AA45	Trace Ag - aqua regia/AAS	AAS
Cu- AA46	Ore grade Cu - aqua regia/AA	AAS
Pb- AA46	Ore grade Pb - aqua regia/AA	AAS
Zn- AA46	Ore grade Zn - aqua regia/AA	AAS
Cu- OG62	Ore Grade Cu - Four Acid	VARIABLE
ME- OG62	Ore Grade Elements - Four Acid	ICP- AES
Zn- OG62	Ore Grade Zn - Four Acid	VARIABLE

To: XSTRATA ZINC CANADA
ATTN: LUCY POTTER
8801 TRANS CANADA HWY
SUITE 400
SAINT- LAURENT QC H4S 1Z6

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

Signature:
Colin Ramshaw, Vancouver Laboratory Manager

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: 604 984 0221 Fax: 604 984 0218 www.alsglobal.com

To: XSTRATA ZINC CANADA
8801 TRANS CANADA HWY
SUITE 400
SAINT- LAURENT QC H4S 1Z6

Finalized Date: 26- FEB- 2013
Account: XSZNEX

Project: Sturgeon Lake

CERTIFICATE OF ANALYSIS TB13027906

Sample Description	Method Analyte Units LOR	WEI- 21 Recvd Wt. kg 0.02	Au- AA23 Au ppm 0.005	Ag- AA45 Ag ppm 0.2	Cu- AA46 Cu % 0.001	Pb- AA46 Pb % 0.001	Zn- AA46 Zn % 0.001	Cu- OC62 Cu % 0.001	Zn- OC62 Zn % 0.001
K015651		3.59	<0.005	<0.2	0.001	0.001	0.004		
K015652		3.70	<0.005	<0.2	0.004	0.002	0.006		
K015653		3.52	<0.005	<0.2	0.002	0.001	0.005		
K015654		3.67	<0.005	<0.2	0.002	0.001	0.004		
K015655		3.72	<0.005	0.2	0.002	0.001	0.006		
K015656		3.83	<0.005	0.6	0.004	0.001	0.005		
K015657		4.27	<0.005	0.8	0.004	0.002	0.009		
K015658		1.28	<0.005	1.2	0.028	0.003	0.009		
K015659		2.56	<0.005	0.2	0.005	<0.001	0.010		
K015660		2.34	<0.005	0.5	0.004	0.001	0.019		
K015661		2.69	<0.005	1.1	0.006	0.002	0.034		
K015662		2.45	<0.005	0.3	0.002	0.002	0.012		
K015663		2.52	<0.005	0.2	0.003	0.001	0.010		
K015664		1.21	<0.005	0.2	0.002	0.002	0.008		
K015665		1.33	<0.005	0.5	0.003	0.002	0.010		
K015666		2.58	<0.005	0.4	0.002	0.002	0.020		
K015667		2.54	<0.005	0.6	0.005	0.002	0.010		
K015668		2.39	<0.005	0.5	0.003	0.002	0.008		
K015669		2.43	<0.005	0.2	0.003	0.002	0.010		
K015670		<0.02	0.114	42.6	1.216	0.481	3.04	1.215	3.09
K015671		2.32	<0.005	0.5	0.004	0.002	0.018		
K015672		2.33	<0.005	0.2	0.003	0.002	0.011		
K015673		2.51	<0.005	0.5	0.001	0.002	0.012		
K015674		2.42	<0.005	0.3	0.002	0.001	0.015		
K015675		2.39	<0.005	0.4	0.003	0.002	0.012		
K015676		2.43	<0.005	0.4	0.002	0.001	0.010		
K015677		2.53	<0.005	1.2	0.002	0.002	0.010		
K015678		2.58	0.010	0.8	0.003	0.003	0.012		
K015679		2.36	<0.005	0.3	<0.001	0.001	0.011		
K015680		3.49	<0.005	0.2	<0.001	0.001	0.014		
K015681		3.66	<0.005	<0.2	<0.001	0.001	0.010		
K015682		3.55	<0.005	0.2	0.001	<0.001	0.009		

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: 604 984 0221 Fax: 604 984 0218 www.alsglobal.com

To: XSTRATA ZINC CANADA
8801 TRANS CANADA HWY
SUITE 400
SAINT- LAURENT QC H4S 1Z6

Finalized Date: 11- APR- 2013
Account: XSZNEX

CERTIFICATE TB13055529

Project: Sturgeon Lake

P.O. No.:

This report is for 40 Drill Core samples submitted to our lab in Thunder Bay, ON, Canada on 28- MAR- 2013.

The following have access to data associated with this certificate:

LUCY POTTER		

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI- 21	Received Sample Weight
LOG- 22	Sample login - Rcd w/o BarCode
CRU- 32	Fine Crushing 90% < 2mm
SPL- 21	Split sample - riffle splitter
PUL- 31	Pulverize split to 85% < 75 um
CRU- QC	Crushing QC Test
PUL- QC	Pulverizing QC Test
LOG- 23	Pulp Login - Rcvd with Barcode

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	INSTRUMENT
Au- AA23	Au 30g FA- AA finish	AAS
Ag- AA45	Trace Ag - aqua regia/AAS	AAS
Ag- AA46	Ore grade Ag - aqua regia/AA	AAS
Cu- AA46	Ore grade Cu - aqua regia/AA	AAS
Pb- AA46	Ore grade Pb - aqua regia/AA	AAS
Zn- AA46	Ore grade Zn - aqua regia/AA	AAS
Cu- OG62	Ore Grade Cu - Four Acid	VARIABLE
ME- OG62	Ore Grade Elements - Four Acid	ICP- AES
Pb- OG62	Ore Grade Pb - Four Acid	VARIABLE
Zn- OG62	Ore Grade Zn - Four Acid	VARIABLE

To: XSTRATA ZINC CANADA
ATTN: LUCY POTTER
8801 TRANS CANADA HWY
SUITE 400
SAINT- LAURENT QC H4S 1Z6

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

***** See Appendix Page for comments regarding this certificate *****

Signature:
Colin Ramshaw, Vancouver Laboratory Manager

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: 604 984 0221 Fax: 604 984 0218 www.alsglobal.com

To: XSTRATA ZINC CANADA
8801 TRANS CANADA HWY
SUITE 400
SAINT- LAURENT QC H4S 1Z6

Finalized Date: 11- APR- 2013
Account: XSZNEX

Project: Sturgeon Lake

CERTIFICATE OF ANALYSIS TB13055529

Sample Description	Method Analyte Units LOR	WEI- 21 Recvd Wt. kg 0.02	Au- AA23 Au ppm 0.005	Ag- AA45 Ag ppm 0.2	Ag- AA46 Ag ppm 1	Cu- AA46 Cu % 0.001	Pb- AA46 Pb % 0.001	Zn- AA46 Zn % 0.001	Cu- OG62 Cu % 0.001	Pb- OG62 Pb % 0.001	Zn- OG62 Zn % 0.001
M829089		3.92	0.075	22.4		0.048	0.226	0.622			
M829090		2.85	0.250	91.4		0.067	0.939	11.00			12.05
M829091		2.27	<0.005	0.2		0.004	0.003	0.028			
M829092		2.49	0.113	>100	103	0.081	0.130	7.48			8.59
M829093		<0.02	NSS	37.2		1.257	0.636	6.73	NSS		NSS
M829094		1.44	0.219	76.6		0.055	1.080	4.17		1.105	4.73
M829095		1.52	0.157	48.8		0.044	0.835	3.19			3.42
M829096		2.93	0.056	9.2		0.019	0.114	0.396			
M829097		3.03	0.101	23.5		0.043	0.274	0.342			
M829098		2.75	0.177	33.1		0.163	0.231	5.22			4.68
M829099		2.75	0.038	12.2		0.078	0.078	1.600			1.640
M829100		2.61	0.026	11.1		0.211	0.030	0.110			
M829101		1.57	<0.005	1.3		0.009	0.012	0.065			
M829102		2.23	<0.005	0.9		0.003	0.008	0.050			
M829103		2.23	<0.005	0.3		0.002	0.005	0.033			
M829104		2.13	<0.005	<0.2		0.001	0.002	0.028			
M829105		2.43	<0.005	1.1		0.023	0.004	0.083			
M829106		2.71	0.063	59.2		1.218	0.113	2.03	1.205		2.05
M829107		2.81	0.205	>100	157	3.184	0.353	4.78	3.57		5.38
M829108		2.16	<0.005	0.3		0.019	0.005	0.048			
M829109		2.33	0.014	8.4		0.314	0.011	1.715			1.715
M829110		<0.02	NSS	38.9		1.262	0.624	6.87	NSS		NSS
M829111		1.59	<0.005	<0.2		0.004	0.007	0.065			
M829112		2.31	<0.005	0.2		0.005	0.014	0.070			
M829113		1.82	<0.005	1.2		0.022	0.010	0.072			
M829114		2.63	0.041	9.7		0.043	0.025	1.080			1.145
M829115		2.50	0.014	3.8		0.038	0.011	0.657			
M829116		1.73	0.009	1.9		0.009	0.009	0.180			
M829117		3.98	0.041	24.7		0.039	0.137	0.811			
M829118		4.09	0.097	45.7		0.083	0.457	0.853			
M829119		3.56	0.670	>100	413	0.192	4.50	28.7		4.69	>30.0
M829120		2.21	<0.005	0.5		0.009	0.010	0.102			
M829121		3.47	1.110	>100	465	0.415	2.40	36.9		2.47	>30.0
M829122		4.03	0.741	>100	270	0.699	2.38	9.09		2.54	9.64
M829123		3.83	1.105	>100	173	0.591	2.15	14.60		2.30	15.50
M829124		<0.02	0.433	38.5		1.352	0.620	7.10	1.325		7.25
M829125		1.57	0.258	>100	140	1.744	0.966	10.10	1.770		10.25
M829126		1.65	0.303	>100	150	2.190	0.984	9.99	2.22		10.15
M829127		2.67	0.535	71.8		2.373	0.068	1.895	2.39		1.920
M829128		2.24	<0.005	1.8		0.027	0.010	0.065			

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: 604 984 0221 Fax: 604 984 0218 www.alsglobal.com

To: XSTRATA ZINC CANADA
8801 TRANS CANADA HWY
SUITE 400
SAINT- LAURENT QC H4S 1Z6

Finalized Date: 11- APR- 2013
Account: XSZNEX

Project: Sturgeon Lake

CERTIFICATE OF ANALYSIS TB13055529

Method	CERTIFICATE COMMENTS
ALL METHODS	NSS is non- sufficient sample.

AGAT Laboratories

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CANADA L4Z 1N9
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CLIENT NAME: XSTRATA ZINC STURGEON LAKE
8801 RTE TRANSCANADIENNE
MONTREAL, QC H4S1W8
(514) 745-9353

ATTENTION TO: Lucy Potter

PROJECT NO: Sturgeon Lake, ON

AGAT WORK ORDER: 13B708548

SOLID ANALYSIS REVIEWED BY: Ron Cardinall, Certified Assayer - Director - Technical Services (Mining)

DATE REPORTED: May 07, 2013

PAGES (INCLUDING COVER): 22

Should you require any information regarding this analysis please contact your client services representative at (905) 501-9998

*NOTES

All samples are stored at no charge for 90 days. Please contact the lab if you require additional sample storage time.

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Certificate of Analysis

AGAT WORK ORDER: 13B708548

PROJECT NO: Sturgeon Lake, ON

CLIENT NAME: XSTRATA ZINC STURGEON LAKE

ATTENTION TO: Lucy Potter

4 Acid Digest - Ore Grade Metals Package, ICP-OES finish (201270)

DATE SAMPLED: Apr 24, 2013 | DATE RECEIVED: Apr 22, 2013 | DATE REPORTED: May 07, 2013 | SAMPLE TYPE: Drill Core

Analyte:	Ag	Al	As	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr	Cu	Fe	Ga
Unit:	ppm	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm
Sample ID (AGAT ID) RDL:	2.5	0.25	5	5	2.5	5	0.05	2.5	5	2.5	2.5	2.5	0.05	25
M829001 (4287661)	<2.5	4.85	<5	683	<2.5	<5	1.46	<2.5	93	7.2	43.7	78.4	4.65	<25
M829002 (4287662)	<2.5	4.05	<5	456	<2.5	<5	1.63	<2.5	86	8.3	21.1	94.6	4.49	<25
M829003 (4287663)	<2.5	4.17	<5	378	<2.5	<5	1.13	<2.5	92	7.1	47.9	75.8	4.64	<25
M829004 (4287664)	<2.5	4.37	<5	536	<2.5	<5	0.98	<2.5	93	13.1	26.1	172	5.47	<25
M829005 (4287665)	2.9	4.09	<5	110	<2.5	8	1.21	<2.5	56	37.3	29.9	1480	9.90	<25
M829006 (4287666)	<2.5	5.07	<5	352	<2.5	<5	1.54	<2.5	27	11.6	20.8	62.9	2.88	<25
M829007 (4287667)	<2.5	3.85	<5	233	<2.5	<5	1.56	<2.5	40	22.1	31.4	121	7.22	<25
M829008 (4287668)	<2.5	2.97	<5	255	<2.5	<5	1.22	<2.5	45	11.3	18.8	80.7	3.72	<25
M829009 (4287669)	<2.5	6.95	<5	223	<2.5	<5	3.41	<2.5	27	23.9	222	78.8	4.87	<25
M829010 (4287670)	<2.5	2.87	<5	236	<2.5	<5	1.18	<2.5	35	13.1	18.1	94.6	9.21	<25
M829011 (4287671)	<2.5	3.12	<5	326	<2.5	<5	0.54	<2.5	41	22.8	35.3	110	2.94	<25
M829012 (4287672)	<2.5	3.00	<5	386	<2.5	<5	0.39	2.7	39	45.7	19.7	193	3.49	<25
M829013 (4287673)	<2.5	3.32	<5	316	<2.5	<5	0.54	<2.5	52	13.3	30.1	102	2.81	<25
M829014 (4287674)	<2.5	3.41	<5	183	<2.5	<5	0.71	<2.5	52	28.7	17.3	304	8.07	<25
M829015 (4287675)	<2.5	5.53	<5	300	<2.5	<5	1.75	<2.5	31	18.1	31.6	107	4.29	<25
M829016 (4287676)	<2.5	4.85	<5	252	<2.5	<5	1.43	<2.5	30	33.0	22.8	232	9.07	<25
M829017 (4287677)	<2.5	4.17	<5	242	<2.5	<5	1.73	<2.5	29	35.8	28.4	249	9.56	<25
M829018 (4287678)	<2.5	3.87	<5	246	<2.5	<5	2.08	<2.5	31	22.9	21.5	317	3.53	<25
M829019 (4287679)	<2.5	3.65	<5	227	<2.5	<5	0.86	<2.5	31	36.9	32.2	132	5.77	<25
M829020 (4287680)	<2.5	2.92	<5	111	<2.5	<5	0.61	<2.5	23	33.6	25.9	290	7.16	<25
M829021 (4287681)	<2.5	3.97	<5	132	<2.5	<5	1.04	<2.5	28	28.5	27.0	252	8.45	<25
M829022 (4287682)	<2.5	3.82	<5	156	<2.5	<5	0.79	<2.5	35	16.2	18.6	83.3	7.36	<25
M829023 (4287683)	42.0	2.61	<5	99	<2.5	98	0.62	89.9	60	162	23.4	12600	17.3	<25
M829024 (4287684)	<2.5	2.91	<5	173	<2.5	<5	0.71	<2.5	44	11.4	24.1	219	4.99	<25
M829025 (4287685)	<2.5	4.22	<5	219	<2.5	<5	1.11	<2.5	38	44.1	53.0	76.7	6.12	<25
M829026 (4287686)	<2.5	3.68	<5	137	<2.5	<5	1.27	<2.5	50	28.5	42.6	155	6.99	<25
M829027 (4287687)	<2.5	4.33	<5	214	<2.5	<5	2.45	<2.5	65	8.8	140	8.9	2.61	<25
M829028 (4287688)	<2.5	4.00	<5	438	<2.5	<5	1.58	<2.5	95	10.1	31.8	144	5.32	<25
M829029 (4287689)	<2.5	3.79	<5	427	<2.5	<5	0.98	<2.5	91	10.7	16.6	178	6.00	<25
M829030 (4287690)	<2.5	3.04	<5	415	<2.5	<5	0.69	<2.5	88	18.1	34.4	251	6.93	<25
M829031 (4287691)	<2.5	4.62	<5	334	<2.5	<5	2.76	<2.5	77	11.0	18.2	174	4.74	<25
M829032 (4287692)	41.5	2.40	10	90	<2.5	97	0.62	88.7	62	160	21.8	12000	16.5	<25

Certified By: Ron Cardinall

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Certificate of Analysis

AGAT WORK ORDER: 13B708548

PROJECT NO: Sturgeon Lake, ON

CLIENT NAME: XSTRATA ZINC STURGEON LAKE

ATTENTION TO: Lucy Potter

4 Acid Digest - Ore Grade Metals Package, ICP-OES finish (201270)

DATE SAMPLED: Apr 24, 2013 | DATE RECEIVED: Apr 22, 2013 | DATE REPORTED: May 07, 2013 | SAMPLE TYPE: Drill Core

Analyte:	Ag	Al	As	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr	Cu	Fe	Ga
Unit:	ppm	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm
Sample ID (AGAT ID) RDL:	2.5	0.25	5	5	2.5	5	0.05	2.5	5	2.5	2.5	2.5	0.05	25
M829033 (4287693)	<2.5	3.54	<5	661	<2.5	<5	1.44	<2.5	76	8.4	41.1	61.4	3.16	<25
M829034 (4287694)	<2.5	3.32	<5	599	<2.5	<5	1.23	<2.5	85	7.3	27.8	65.8	4.29	<25
M829035 (4287695)	<2.5	3.23	<5	515	<2.5	<5	0.95	<2.5	94	8.2	43.1	38.5	3.82	<25
M829036 (4287696)	<2.5	3.40	<5	466	<2.5	<5	1.13	<2.5	97	8.4	32.4	49.2	4.18	<25
M829037 (4287697)	<2.5	3.86	<5	424	<2.5	<5	1.13	<2.5	91	10.0	48.9	102	5.01	<25
M829038 (4287698)	<2.5	3.27	<5	289	<2.5	<5	1.09	<2.5	61	23.1	19.1	411	8.36	<25
M829039 (4287699)	<2.5	3.26	<5	275	<2.5	<5	1.39	<2.5	61	22.7	47.9	400	8.93	<25
M829040 (4287700)	<2.5	3.49	<5	499	<2.5	<5	1.33	<2.5	71	4.7	12.2	83.4	3.31	<25
M829041 (4287701)	<2.5	3.38	<5	316	<2.5	<5	0.75	<2.5	60	6.5	34.8	230	2.43	<25
M829042 (4287702)	<2.5	2.78	11	160	<2.5	<5	2.63	<2.5	34	19.3	16.6	575	18.1	<25
M829043 (4287703)	<2.5	7.71	<5	218	<2.5	<5	6.13	<2.5	27	30.8	197	105	5.37	<25
M829044 (4287704)	<2.5	3.50	<5	324	<2.5	<5	0.88	<2.5	62	3.0	16.4	56.1	2.36	<25
M829045 (4287705)	<2.5	4.23	<5	242	<2.5	<5	1.32	<2.5	72	3.2	19.4	3.5	2.56	<25
M829046 (4287706)	<2.5	4.43	<5	295	<2.5	<5	2.39	<2.5	50	13.7	37.8	8.8	3.88	<25
M829047 (4287707)	<2.5	4.26	<5	227	<2.5	<5	1.84	<2.5	72	6.2	22.5	4.0	3.38	<25
M829048 (4287708)	<2.5	4.19	<5	226	<2.5	<5	2.12	<2.5	43	26.3	16.4	71.0	8.24	<25
M829049 (4287709)	<2.5	5.24	<5	366	<2.5	<5	2.66	<2.5	29	30.6	28.2	43.7	4.72	<25
M829050 (4287710)	<2.5	5.34	<5	461	<2.5	<5	2.08	<2.5	39	15.7	21.3	13.3	3.59	<25
M829051 (4287711)	<2.5	5.52	<5	190	<2.5	<5	1.79	<2.5	36	20.3	24.2	64.3	5.21	<25
M829052 (4287712)	<2.5	4.62	<5	110	<2.5	<5	2.10	<2.5	30	24.5	15.2	67.4	7.81	<25
M829053 (4287713)	<2.5	3.75	<5	165	<2.5	<5	1.52	<2.5	31	32.2	37.2	53.6	5.35	<25
M829054 (4287714)	<2.5	6.39	<5	211	<2.5	<5	4.14	<2.5	31	29.3	65.9	57.4	5.33	<25
M829055 (4287715)	<2.5	6.82	<5	209	<2.5	<5	4.08	<2.5	30	30.9	65.5	52.9	5.22	<25
M829056 (4287716)	<2.5	4.35	<5	184	<2.5	<5	1.60	<2.5	40	25.5	37.2	62.2	2.92	<25
M829057 (4287717)	<2.5	3.12	<5	101	<2.5	<5	1.37	<2.5	52	18.1	25.5	42.3	5.15	<25
M829058 (4287718)	<2.5	6.19	<5	216	<2.5	<5	2.64	<2.5	29	24.6	28.3	50.8	6.30	<25
M829059 (4287719)	<2.5	4.86	<5	405	<2.5	<5	1.65	<2.5	34	17.7	64.9	57.2	3.63	<25
M829060 (4287720)	<2.5	5.90	<5	469	<2.5	<5	4.66	<2.5	53	44.9	195	44.4	4.81	<25
M829061 (4287721)	<2.5	5.44	<5	335	<2.5	<5	4.03	<2.5	57	39.3	236	210	7.41	<25
M829062 (4287722)	<2.5	3.53	<5	273	<2.5	<5	0.91	5.8	49	18.9	12.2	180	8.48	<25
M829063 (4287723)	40.3	2.72	<5	91	<2.5	95	0.60	83.8	54	153	22.1	11500	16.1	<25
M829064 (4287724)	<2.5	2.98	<5	212	<2.5	<5	0.98	4.4	46	20.2	20.5	155	10.2	<25

Certified By: Ron Cardinall

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Certificate of Analysis

AGAT WORK ORDER: 13B708548

PROJECT NO: Sturgeon Lake, ON

CLIENT NAME: XSTRATA ZINC STURGEON LAKE

ATTENTION TO: Lucy Potter

4 Acid Digest - Ore Grade Metals Package, ICP-OES finish (201270)

DATE SAMPLED: Apr 24, 2013 | DATE RECEIVED: Apr 22, 2013 | DATE REPORTED: May 07, 2013 | SAMPLE TYPE: Drill Core

Analyte:	Ag	Al	As	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr	Cu	Fe	Ga
Unit:	ppm	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm
Sample ID (AGAT ID) RDL:	2.5	0.25	5	5	2.5	5	0.05	2.5	5	2.5	2.5	2.5	0.05	25
M829065 (4287725)	<2.5	3.32	<5	236	<2.5	<5	0.77	5.1	42	17.1	17.1	134	8.84	<25
M829066 (4287726)	<2.5	3.30	<5	258	<2.5	<5	1.05	3.5	58	13.5	11.8	89.4	8.99	<25
M829067 (4287727)	<2.5	3.23	<5	249	<2.5	<5	0.87	<2.5	57	10.8	14.4	105	10.6	<25
M829068 (4287728)	<2.5	3.00	<5	143	<2.5	<5	0.71	<2.5	50	39.7	20.5	254	16.6	<25
M829069 (4287729)	<2.5	4.61	<5	414	<2.5	<5	1.93	<2.5	59	4.8	26.6	5.6	3.19	<25
M829070 (4287730)	<2.5	4.60	<5	311	<2.5	<5	1.09	<2.5	60	7.4	22.1	25.4	5.23	<25
M829071 (4287731)	3.2	3.32	5	270	<2.5	<5	1.39	7.9	41	32.4	18.2	404	12.3	<25
M829072 (4287732)	<2.5	7.25	<5	201	<2.5	<5	6.02	<2.5	25	27.3	176	70.2	4.97	<25
M829073 (4287733)	2.7	3.58	<5	345	<2.5	<5	1.09	9.1	56	20.0	10.3	296	4.75	<25
M829074 (4287734)	3.4	3.39	<5	338	<2.5	<5	0.74	6.7	62	16.8	18.6	370	3.17	<25
M829075 (4287735)	<2.5	3.16	<5	333	<2.5	<5	0.67	<2.5	61	8.3	10.0	100	2.54	<25
M829076 (4287736)	<2.5	5.50	<5	288	<2.5	<5	1.58	<2.5	41	5.4	20.2	129	4.30	<25
M829077 (4287737)	3.5	3.35	13	230	<2.5	<5	0.66	<2.5	37	6.7	9.7	52.8	10.0	<25
M829078 (4287738)	3.9	3.89	12	204	<2.5	<5	1.30	4.3	38	7.9	26.7	166	11.8	<25
M829079 (4287739)	20.2	3.93	33	185	<2.5	7	0.97	51.0	51	29.6	14.7	1610	8.78	<25
M829080 (4287740)	4.3	5.27	9	268	<2.5	<5	1.94	<2.5	59	13.2	117	61.5	6.60	<25
M829081 (4287741)	<2.5	4.17	6	271	<2.5	<5	0.92	<2.5	45	7.8	12.1	47.0	4.82	<25
M829082 (4287742)	2.7	3.94	<5	167	<2.5	<5	1.05	2.7	45	6.1	32.9	123	5.08	<25
M829083 (4287743)	7.4	3.64	5	195	<2.5	<5	0.54	5.1	51	13.6	23.5	106	3.94	<25
M829084 (4287744)	6.4	3.86	8	193	<2.5	<5	0.66	<2.5	53	4.3	31.5	56.0	4.80	<25
M829085 (4287745)	7.8	4.20	12	251	<2.5	<5	0.25	<2.5	60	4.8	11.8	45.4	6.93	<25
M829086 (4287746)	25.4	1.11	583	<5	<2.5	7	1.29	53.1	29	8.7	37.6	2690	23.7	<25
M829087 (4287747)	<2.5	5.47	<5	146	<2.5	<5	7.44	<2.5	40	39.0	654	5.5	5.60	<25
M829088 (4287748)	<2.5	5.52	<5	103	<2.5	<5	6.65	<2.5	39	54.9	759	4.1	5.78	<25

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TEL (905)501-9998
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Certificate of Analysis

AGAT WORK ORDER: 13B708548

PROJECT NO: Sturgeon Lake, ON

CLIENT NAME: XSTRATA ZINC STURGEON LAKE

ATTENTION TO: Lucy Potter

4 Acid Digest - Ore Grade Metals Package, ICP-OES finish (201270)

DATE SAMPLED: Apr 24, 2013 | DATE RECEIVED: Apr 22, 2013 | DATE REPORTED: May 07, 2013 | SAMPLE TYPE: Drill Core

Analyte:	In	K	La	Li	Mg	Mn	Mo	Na	Ni	P	Pb	Rb	S	Sb
Unit:	ppm	%	ppm	ppm	%	ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm
Sample ID (AGAT ID) RDL:	5	0.05	10	5	0.05	5	2.5	0.05	2.5	50	5	50	0.025	5
M829001 (4287661)	<5	2.13	38	<5	0.70	703	2.6	1.73	9.7	257	13	106	1.74	<5
M829002 (4287662)	<5	2.04	34	<5	0.74	674	<2.5	1.43	9.5	225	9	107	1.53	<5
M829003 (4287663)	<5	1.81	37	<5	0.60	583	3.4	1.95	8.2	190	9	93	1.98	<5
M829004 (4287664)	<5	1.95	37	<5	0.57	400	3.5	1.52	10.0	207	14	106	3.34	<5
M829005 (4287665)	<5	1.69	22	<5	0.62	464	3.2	1.36	25.2	210	25	96	8.02	<5
M829006 (4287666)	<5	1.99	13	<5	0.56	296	<2.5	1.39	12.8	352	14	125	1.44	<5
M829007 (4287667)	<5	1.39	17	7	0.69	351	<2.5	1.16	20.4	166	15	86	5.39	<5
M829008 (4287668)	<5	1.35	20	7	0.57	288	2.6	1.13	8.6	139	9	82	2.04	<5
M829009 (4287669)	<5	1.54	13	10	1.77	775	<2.5	2.27	110	556	6	76	<0.025	<5
M829010 (4287670)	<5	1.45	15	7	0.53	257	<2.5	0.96	17.6	218	16	89	8.76	<5
M829011 (4287671)	<5	1.78	18	9	0.41	120	2.6	0.76	20.4	286	19	118	1.86	<5
M829012 (4287672)	<5	2.24	18	10	0.34	74	2.9	0.87	61.4	416	25	150	3.00	<5
M829013 (4287673)	<5	1.78	22	10	0.46	99	<2.5	0.86	15.9	232	22	118	1.92	<5
M829014 (4287674)	<5	1.24	21	9	0.70	238	2.6	0.78	9.4	144	13	80	5.49	<5
M829015 (4287675)	<5	2.21	14	13	0.93	825	<2.5	0.79	62.1	701	10	111	0.256	<5
M829016 (4287676)	<5	2.07	14	15	1.16	1160	<2.5	0.67	93.6	719	12	91	4.02	<5
M829017 (4287677)	<5	1.97	13	14	1.18	1240	<2.5	0.65	98.5	699	8	79	4.91	<5
M829018 (4287678)	<5	1.82	14	10	0.99	760	<2.5	0.65	63.6	596	<5	83	0.376	<5
M829019 (4287679)	<5	1.82	14	16	1.04	548	<2.5	0.72	73.6	660	11	83	1.68	<5
M829020 (4287680)	<5	0.88	10	15	1.02	558	<2.5	0.44	46.5	377	7	<50	2.59	<5
M829021 (4287681)	<5	0.95	13	15	1.17	820	<2.5	0.51	35.5	388	9	<50	3.58	<5
M829022 (4287682)	<5	1.06	15	14	0.95	563	<2.5	0.56	29.5	364	12	<50	3.30	<5
M829023 (4287683)	10	1.67	26	28	1.19	884	18.4	0.50	15.1	158	4720	93	>10	29
M829024 (4287684)	<5	1.09	18	12	0.69	434	<2.5	0.62	22.2	252	6	<50	2.03	<5
M829025 (4287685)	<5	1.30	17	15	1.03	649	<2.5	0.71	75.3	435	11	59	1.67	<5
M829026 (4287686)	<5	0.75	20	16	1.26	695	<2.5	0.49	58.5	199	<5	<50	1.65	<5
M829027 (4287687)	<5	1.11	27	10	1.33	535	<2.5	0.59	57.9	468	<5	50	0.032	<5
M829028 (4287688)	<5	2.15	37	<5	0.90	493	2.6	1.09	10.9	179	11	103	2.30	<5
M829029 (4287689)	<5	1.98	35	<5	0.72	449	2.6	1.54	10.8	194	13	90	2.49	<5
M829030 (4287690)	<5	2.09	35	<5	0.89	490	3.1	0.92	12.7	197	10	95	3.01	<5
M829031 (4287691)	<5	1.93	32	<5	0.96	754	<2.5	1.42	9.2	182	<5	83	1.80	<5
M829032 (4287692)	10	1.58	26	26	1.19	823	16.3	0.49	14.8	156	4850	88	>10	29

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Certificate of Analysis

AGAT WORK ORDER: 13B708548

PROJECT NO: Sturgeon Lake, ON

CLIENT NAME: XSTRATA ZINC STURGEON LAKE

ATTENTION TO: Lucy Potter

4 Acid Digest - Ore Grade Metals Package, ICP-OES finish (201270)

DATE SAMPLED: Apr 24, 2013 | DATE RECEIVED: Apr 22, 2013 | DATE REPORTED: May 07, 2013 | SAMPLE TYPE: Drill Core

Analyte:	In	K	La	Li	Mg	Mn	Mo	Na	Ni	P	Pb	Rb	S	Sb
Unit:	ppm	%	ppm	ppm	%	ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm
Sample ID (AGAT ID) RDL:	5	0.05	10	5	0.05	5	2.5	0.05	2.5	50	5	50	0.025	5
M829033 (4287693)	<5	2.24	30	<5	0.62	500	2.8	0.91	12.0	259	7	103	0.891	<5
M829034 (4287694)	<5	2.09	34	<5	0.64	553	2.9	1.15	9.9	225	6	101	1.58	<5
M829035 (4287695)	<5	2.22	38	<5	0.58	458	3.4	1.12	10.2	232	7	108	1.69	<5
M829036 (4287696)	<5	1.97	39	<5	0.61	498	4.4	1.72	9.8	212	8	93	2.00	<5
M829037 (4287697)	<5	1.77	36	<5	0.62	473	2.7	1.81	9.4	196	11	84	2.97	<5
M829038 (4287698)	<5	1.37	25	5	0.72	477	2.6	0.88	14.2	202	16	67	5.65	<5
M829039 (4287699)	<5	1.24	24	5	0.79	566	3.2	0.89	17.9	198	13	60	6.06	<5
M829040 (4287700)	<5	2.57	29	<5	0.73	375	<2.5	0.70	6.6	171	11	144	1.32	<5
M829041 (4287701)	<5	1.66	24	11	0.68	203	<2.5	0.64	8.3	199	5	113	0.488	<5
M829042 (4287702)	<5	0.90	14	6	1.16	560	4.0	0.35	35.1	112	15	60	>10	5
M829043 (4287703)	<5	1.15	14	12	2.10	1180	<2.5	2.00	153	565	11	59	0.042	<5
M829044 (4287704)	<5	1.73	26	8	0.55	195	2.6	0.61	7.2	147	8	121	1.06	<5
M829045 (4287705)	<5	0.78	29	17	0.95	526	<2.5	1.07	14.6	99	10	<50	0.100	<5
M829046 (4287706)	<5	1.11	21	16	1.30	787	2.6	0.88	27.1	591	<5	59	0.647	<5
M829047 (4287707)	<5	0.84	29	16	1.21	641	<2.5	0.86	18.4	94	7	<50	0.140	<5
M829048 (4287708)	<5	0.90	18	13	1.16	1020	<2.5	0.92	58.7	242	6	<50	4.93	<5
M829049 (4287709)	<5	1.50	14	14	1.27	1160	<2.5	1.12	68.2	685	7	82	0.333	<5
M829050 (4287710)	<5	1.70	18	14	0.99	846	<2.5	1.28	51.3	503	10	92	0.149	<5
M829051 (4287711)	<5	0.95	17	25	1.06	994	<2.5	1.24	51.4	784	8	<50	0.143	<5
M829052 (4287712)	<5	0.53	14	28	1.26	1750	<2.5	0.84	65.1	691	<5	<50	0.393	<5
M829053 (4287713)	<5	0.76	14	21	0.70	831	<2.5	1.17	58.2	684	<5	<50	1.60	<5
M829054 (4287714)	<5	1.02	15	24	0.86	1050	<2.5	1.76	57.3	784	8	54	<0.025	<5
M829055 (4287715)	<5	1.01	14	24	0.83	1040	<2.5	1.74	53.8	765	9	<50	0.036	<5
M829056 (4287716)	<5	0.94	18	16	0.45	549	<2.5	1.09	53.7	546	6	<50	0.467	<5
M829057 (4287717)	<5	0.48	21	16	0.66	681	<2.5	0.61	50.4	118	<5	<50	1.11	<5
M829058 (4287718)	<5	0.99	14	28	1.00	1170	<2.5	1.23	69.7	736	11	<50	0.106	<5
M829059 (4287719)	<5	2.19	16	16	0.98	608	<2.5	0.62	94.7	812	22	112	0.026	<5
M829060 (4287720)	<5	1.71	23	23	2.69	1160	<2.5	0.46	69.8	1050	23	95	0.668	<5
M829061 (4287721)	<5	1.11	25	36	3.01	1260	<2.5	0.24	119	770	24	63	1.39	<5
M829062 (4287722)	<5	1.49	20	16	0.99	1690	<2.5	0.17	57.3	146	19	70	1.26	<5
M829063 (4287723)	16	1.56	23	26	1.13	814	18.2	0.46	14.5	143	4880	85	>10	28
M829064 (4287724)	6	1.38	19	16	1.17	2110	<2.5	0.14	64.4	144	19	68	1.38	<5

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AGAT WORK ORDER: 13B708548
PROJECT NO: Sturgeon Lake, ON

CLIENT NAME: XSTRATA ZINC STURGEON LAKE

ATTENTION TO: Lucy Potter

4 Acid Digest - Ore Grade Metals Package, ICP-OES finish (201270)

DATE SAMPLED: Apr 24, 2013 | DATE RECEIVED: Apr 22, 2013 | DATE REPORTED: May 07, 2013 | SAMPLE TYPE: Drill Core

Analyte:	In	K	La	Li	Mg	Mn	Mo	Na	Ni	P	Pb	Rb	S	Sb
Unit:	ppm	%	ppm	ppm	%	ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm
Sample ID (AGAT ID) RDL:	5	0.05	10	5	0.05	5	2.5	0.05	2.5	50	5	50	0.025	5
M829065 (4287725)	<5	1.56	17	11	0.95	1850	<2.5	0.15	53.1	134	17	76	1.40	<5
M829066 (4287726)	<5	1.73	24	11	0.92	1570	<2.5	0.18	47.8	154	16	80	2.69	<5
M829067 (4287727)	<5	1.36	24	10	1.12	2430	<2.5	0.13	50.9	125	18	66	1.43	<5
M829068 (4287728)	<5	0.70	21	14	1.29	2870	16.1	0.07	87.0	107	35	<50	4.06	<5
M829069 (4287729)	<5	2.26	25	10	1.06	706	<2.5	0.28	20.3	271	19	121	<0.025	<5
M829070 (4287730)	<5	1.42	24	5	0.90	1310	2.7	0.10	21.7	90	14	68	0.101	<5
M829071 (4287731)	<5	1.69	17	<5	0.79	671	6.2	0.16	57.0	231	39	79	>10	6
M829072 (4287732)	<5	1.00	13	14	2.58	1150	<2.5	1.71	141	543	5	51	<0.025	<5
M829073 (4287733)	<5	2.16	23	<5	0.62	414	5.5	0.23	36.9	271	54	118	3.79	7
M829074 (4287734)	<5	1.98	25	<5	0.62	393	<2.5	0.21	40.9	283	61	92	1.26	6
M829075 (4287735)	<5	1.92	25	<5	0.52	361	<2.5	0.21	21.1	276	44	97	0.735	<5
M829076 (4287736)	<5	1.78	18	<5	0.92	663	<2.5	0.21	13.0	225	41	87	1.96	7
M829077 (4287737)	<5	1.75	14	<5	0.43	314	<2.5	0.24	14.4	153	103	83	9.51	11
M829078 (4287738)	<5	1.40	14	6	0.70	472	<2.5	0.23	16.3	154	195	64	>10	14
M829079 (4287739)	<5	1.23	19	12	0.80	422	6.4	0.24	48.9	181	639	53	8.52	18
M829080 (4287740)	<5	1.59	24	12	1.25	635	3.7	0.27	46.0	399	250	80	5.09	10
M829081 (4287741)	<5	1.54	19	11	0.86	470	<2.5	0.28	23.5	209	127	71	3.08	6
M829082 (4287742)	<5	0.88	18	12	0.90	722	<2.5	0.23	31.9	234	224	<50	2.24	7
M829083 (4287743)	<5	1.12	20	28	0.68	344	<2.5	0.40	43.9	361	423	<50	2.21	15
M829084 (4287744)	<5	1.12	21	34	0.54	220	<2.5	0.48	14.3	177	264	55	4.21	11
M829085 (4287745)	<5	1.59	24	21	0.35	119	2.9	0.57	15.6	196	250	83	6.80	19
M829086 (4287746)	<5	<0.05	<10	<5	0.70	604	4.1	<0.05	40.5	<50	2530	<50	>10	28
M829087 (4287747)	<5	0.47	18	34	6.83	1490	<2.5	0.19	243	768	42	<50	0.206	<5
M829088 (4287748)	<5	0.23	17	51	8.04	1530	<2.5	0.08	316	810	137	<50	0.199	<5

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AGAT WORK ORDER: 13B708548

PROJECT NO: Sturgeon Lake, ON

CLIENT NAME: XSTRATA ZINC STURGEON LAKE

ATTENTION TO: Lucy Potter

4 Acid Digest - Ore Grade Metals Package, ICP-OES finish (201270)

DATE SAMPLED: Apr 24, 2013 | DATE RECEIVED: Apr 22, 2013 | DATE REPORTED: May 07, 2013 | SAMPLE TYPE: Drill Core

Analyte:	Sc	Se	Sn	Sr	Ta	Te	Th	Ti	Tl	U	V	W	Y	Zn
Unit:	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm
Sample ID (AGAT ID) RDL:	5	50	25	5	50	50	25	0.05	25	25	2.5	5	5	2.5
M829001 (4287661)	6	<50	<25	106	<50	<50	<25	0.08	<25	<25	37.4	<5	15	143
M829002 (4287662)	6	<50	<25	92	<50	<50	<25	0.07	<25	<25	29.4	<5	15	203
M829003 (4287663)	5	<50	<25	89	<50	<50	<25	0.06	<25	<25	24.8	<5	16	161
M829004 (4287664)	<5	<50	<25	78	<50	<50	<25	<0.05	<25	<25	26.2	<5	13	80.7
M829005 (4287665)	<5	<50	<25	78	<50	<50	<25	<0.05	<25	<25	17.9	<5	11	150
M829006 (4287666)	5	<50	<25	76	<50	<50	<25	<0.05	<25	<25	28.4	<5	8	31.7
M829007 (4287667)	5	<50	<25	60	<50	<50	<25	<0.05	<25	<25	13.2	<5	11	45.0
M829008 (4287668)	<5	<50	<25	59	<50	<50	<25	<0.05	<25	<25	7.0	<5	12	37.2
M829009 (4287669)	18	<50	<25	79	<50	<50	<25	0.10	<25	<25	135	<5	12	64.6
M829010 (4287670)	<5	<50	<25	65	<50	<50	<25	<0.05	<25	<25	17.4	<5	9	64.9
M829011 (4287671)	5	<50	<25	56	<50	<50	<25	<0.05	<25	<25	29.7	<5	8	87.2
M829012 (4287672)	<5	<50	<25	64	<50	<50	<25	<0.05	<25	<25	31.8	<5	6	752
M829013 (4287673)	<5	<50	<25	58	<50	<50	<25	<0.05	<25	<25	16.2	<5	9	39.1
M829014 (4287674)	<5	<50	<25	40	<50	<50	<25	<0.05	<25	<25	9.0	<5	13	90.8
M829015 (4287675)	15	<50	<25	89	<50	<50	<25	0.08	<25	<25	138	<5	9	104
M829016 (4287676)	13	<50	<25	74	<50	<50	<25	0.06	<25	<25	121	<5	8	174
M829017 (4287677)	12	<50	<25	76	<50	<50	<25	0.07	<25	<25	118	<5	7	133
M829018 (4287678)	10	<50	<25	71	<50	<50	<25	0.08	<25	<25	94.8	<5	7	67.4
M829019 (4287679)	10	<50	<25	61	<50	<50	<25	0.08	<25	<25	123	<5	7	157
M829020 (4287680)	6	<50	<25	48	<50	<50	<25	<0.05	<25	<25	77.5	<5	5	188
M829021 (4287681)	7	<50	<25	53	<50	<50	<25	<0.05	<25	<25	62.7	<5	7	163
M829022 (4287682)	7	<50	<25	61	<50	<50	<25	<0.05	<25	<25	55.4	<5	9	138
M829023 (4287683)	<5	<50	31	31	<50	<50	<25	0.06	<25	<25	10.7	15	11	33000
M829024 (4287684)	<5	<50	<25	52	<50	<50	<25	<0.05	<25	<25	26.7	<5	11	101
M829025 (4287685)	13	<50	<25	65	<50	<50	<25	0.05	<25	<25	102	<5	11	149
M829026 (4287686)	8	<50	<25	53	<50	<50	<25	<0.05	<25	<25	39.5	<5	12	172
M829027 (4287687)	10	<50	<25	70	<50	<50	<25	<0.05	<25	<25	47.2	<5	16	68.9
M829028 (4287688)	<5	<50	<25	75	<50	<50	<25	0.05	<25	<25	23.9	<5	12	46.7
M829029 (4287689)	<5	<50	<25	73	<50	<50	<25	<0.05	<25	<25	25.5	<5	12	266
M829030 (4287690)	<5	<50	<25	61	<50	<50	<25	0.05	<25	<25	29.3	<5	10	226
M829031 (4287691)	<5	<50	<25	109	<50	<50	<25	0.06	<25	<25	22.2	<5	14	259
M829032 (4287692)	<5	<50	32	38	<50	<50	<25	0.06	<25	<25	10.4	16	11	33500

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AGAT WORK ORDER: 13B708548

PROJECT NO: Sturgeon Lake, ON

CLIENT NAME: XSTRATA ZINC STURGEON LAKE

ATTENTION TO: Lucy Potter

4 Acid Digest - Ore Grade Metals Package, ICP-OES finish (201270)

DATE SAMPLED: Apr 24, 2013 | DATE RECEIVED: Apr 22, 2013 | DATE REPORTED: May 07, 2013 | SAMPLE TYPE: Drill Core

Analyte:	Sc	Se	Sn	Sr	Ta	Te	Th	Ti	Tl	U	V	W	Y	Zn
Unit:	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm
Sample ID (AGAT ID) RDL:	5	50	25	5	50	50	25	0.05	25	25	2.5	5	5	2.5
M829033 (4287693)	5	<50	<25	77	<50	<50	<25	0.10	<25	<25	33.6	<5	12	315
M829034 (4287694)	<5	<50	<25	81	<50	<50	<25	0.08	<25	<25	33.2	<5	13	254
M829035 (4287695)	<5	<50	<25	68	<50	<50	<25	0.08	<25	<25	28.8	<5	13	367
M829036 (4287696)	<5	<50	<25	79	<50	<50	<25	0.07	<25	<25	25.6	<5	14	283
M829037 (4287697)	<5	<50	<25	79	<50	<50	<25	0.06	<25	<25	26.9	<5	14	158
M829038 (4287698)	<5	<50	<25	66	<50	<50	<25	<0.05	<25	<25	25.8	<5	9	263
M829039 (4287699)	<5	<50	<25	72	<50	<50	<25	<0.05	<25	<25	24.8	<5	10	339
M829040 (4287700)	<5	<50	<25	71	<50	<50	<25	0.07	<25	<25	6.9	<5	14	61.2
M829041 (4287701)	<5	<50	<25	46	<50	<50	<25	0.06	<25	<25	8.1	<5	13	94.8
M829042 (4287702)	<5	<50	<25	63	<50	<50	<25	<0.05	<25	<25	10.9	<5	9	129
M829043 (4287703)	20	<50	<25	173	<50	<50	<25	0.14	<25	<25	136	<5	13	67.9
M829044 (4287704)	<5	<50	<25	53	<50	<50	<25	<0.05	<25	<25	5.6	<5	14	46.9
M829045 (4287705)	6	<50	<25	144	<50	<50	<25	<0.05	<25	<25	8.7	<5	20	81.3
M829046 (4287706)	8	<50	<25	134	<50	<50	<25	<0.05	<25	<25	52.5	<5	11	87.6
M829047 (4287707)	6	<50	<25	139	<50	<50	<25	<0.05	<25	<25	6.0	<5	16	93.8
M829048 (4287708)	10	<50	<25	119	<50	<50	<25	<0.05	<25	<25	45.5	<5	12	94.4
M829049 (4287709)	14	<50	<25	152	<50	<50	<25	0.09	<25	<25	113	<5	7	96.1
M829050 (4287710)	17	<50	<25	182	<50	<50	<25	0.13	<25	<25	142	<5	7	79.6
M829051 (4287711)	17	<50	<25	146	<50	<50	<25	0.07	<25	<25	137	<5	9	78.7
M829052 (4287712)	15	<50	<25	101	<50	<50	<25	0.06	<25	<25	116	<5	8	112
M829053 (4287713)	11	<50	<25	106	<50	<50	<25	0.07	<25	<25	119	<5	7	53.5
M829054 (4287714)	17	<50	<25	105	<50	<50	<25	0.08	<25	<25	136	<5	8	83.3
M829055 (4287715)	16	<50	<25	114	<50	<50	<25	<0.05	<25	<25	131	<5	7	84.4
M829056 (4287716)	15	<50	<25	86	<50	<50	<25	<0.05	<25	<25	149	<5	10	32.5
M829057 (4287717)	10	<50	<25	54	<50	<50	<25	<0.05	<25	<25	36.8	<5	15	94.1
M829058 (4287718)	19	<50	<25	107	<50	<50	<25	<0.05	<25	<25	154	<5	9	126
M829059 (4287719)	12	<50	<25	125	<50	<50	<25	0.09	<25	<25	126	<5	7	117
M829060 (4287720)	18	<50	<25	201	<50	<50	<25	0.08	<25	<25	136	<5	11	147
M829061 (4287721)	19	<50	<25	152	<50	<50	<25	0.06	<25	<25	104	<5	13	283
M829062 (4287722)	7	<50	<25	58	<50	<50	<25	<0.05	<25	<25	23.7	<5	14	1460
M829063 (4287723)	<5	<50	29	34	<50	<50	<25	0.06	<25	<25	10.9	15	11	30800
M829064 (4287724)	8	<50	<25	59	<50	<50	<25	<0.05	<25	<25	24.2	<5	15	1130

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Certificate of Analysis

AGAT WORK ORDER: 13B708548

PROJECT NO: Sturgeon Lake, ON

CLIENT NAME: XSTRATA ZINC STURGEON LAKE

ATTENTION TO: Lucy Potter

4 Acid Digest - Ore Grade Metals Package, ICP-OES finish (201270)

DATE SAMPLED: Apr 24, 2013 | DATE RECEIVED: Apr 22, 2013 | DATE REPORTED: May 07, 2013 | SAMPLE TYPE: Drill Core

Analyte:	Sc	Se	Sn	Sr	Ta	Te	Th	Ti	Tl	U	V	W	Y	Zn
Unit:	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm
Sample ID (AGAT ID) RDL:	5	50	25	5	50	50	25	0.05	25	25	2.5	5	5	2.5
M829065 (4287725)	7	<50	<25	56	<50	<50	<25	<0.05	<25	<25	16.7	<5	14	1270
M829066 (4287726)	6	<50	<25	63	<50	<50	<25	<0.05	<25	<25	16.5	<5	15	855
M829067 (4287727)	7	<50	<25	55	<50	<50	<25	<0.05	<25	<25	21.2	<5	16	426
M829068 (4287728)	14	<50	<25	36	<50	<50	<25	<0.05	<25	<25	39.0	<5	13	460
M829069 (4287729)	7	<50	<25	78	<50	<50	<25	0.06	<25	<25	46.0	<5	12	111
M829070 (4287730)	11	<50	<25	40	<50	<50	<25	<0.05	<25	<25	27.5	<5	16	418
M829071 (4287731)	7	<50	<25	55	<50	<50	<25	<0.05	<25	<25	28.1	<5	12	2830
M829072 (4287732)	19	<50	<25	142	<50	<50	<25	0.15	<25	<25	127	<5	12	70.1
M829073 (4287733)	6	<50	<25	59	<50	<50	<25	<0.05	<25	<25	31.6	<5	16	3690
M829074 (4287734)	6	<50	<25	43	<50	<50	<25	<0.05	<25	<25	29.6	<5	15	2770
M829075 (4287735)	7	<50	<25	43	<50	<50	<25	<0.05	<25	<25	26.1	<5	17	973
M829076 (4287736)	8	<50	<25	62	<50	<50	<25	<0.05	<25	<25	22.1	<5	19	477
M829077 (4287737)	<5	<50	<25	54	<50	<50	<25	<0.05	<25	<25	10.2	<5	14	262
M829078 (4287738)	5	<50	<25	72	<50	<50	<25	<0.05	<25	<25	11.0	<5	15	1680
M829079 (4287739)	6	<50	<25	70	<50	<50	<25	<0.05	<25	<25	17.2	<5	14	27300
M829080 (4287740)	10	<50	<25	92	<50	<50	<25	<0.05	<25	<25	40.1	<5	15	508
M829081 (4287741)	7	<50	<25	69	<50	<50	<25	<0.05	<25	<25	15.3	<5	15	791
M829082 (4287742)	8	<50	<25	53	<50	<50	<25	<0.05	<25	<25	19.6	<5	15	1210
M829083 (4287743)	6	<50	<25	82	<50	<50	<25	<0.05	<25	<25	27.7	<5	12	2360
M829084 (4287744)	<5	<50	<25	120	<50	<50	<25	<0.05	<25	<25	7.7	<5	14	1070
M829085 (4287745)	<5	<50	<25	134	<50	<50	<25	<0.05	<25	<25	6.4	<5	14	583
M829086 (4287746)	6	304	<25	26	<50	<50	<25	<0.05	<25	<25	10.5	<5	<5	32800
M829087 (4287747)	27	<50	<25	204	<50	<50	<25	<0.05	<25	<25	130	<5	<5	376
M829088 (4287748)	21	<50	<25	120	<50	<50	<25	<0.05	<25	<25	115	<5	<5	520

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AGAT WORK ORDER: 13B708548

PROJECT NO: Sturgeon Lake, ON

CLIENT NAME: XSTRATA ZINC STURGEON LAKE

ATTENTION TO: Lucy Potter

4 Acid Digest - Ore Grade Metals Package, ICP-OES finish (201270)

DATE SAMPLED: Apr 24, 2013 | DATE RECEIVED: Apr 22, 2013 | DATE REPORTED: May 07, 2013 | SAMPLE TYPE: Drill Core

Analyte:	Zr
Unit:	ppm
Sample ID (AGAT ID) RDL:	25
M829001 (4287661)	232
M829002 (4287662)	220
M829003 (4287663)	224
M829004 (4287664)	211
M829005 (4287665)	172
M829006 (4287666)	173
M829007 (4287667)	202
M829008 (4287668)	224
M829009 (4287669)	82
M829010 (4287670)	154
M829011 (4287671)	182
M829012 (4287672)	148
M829013 (4287673)	181
M829014 (4287674)	215
M829015 (4287675)	154
M829016 (4287676)	147
M829017 (4287677)	145
M829018 (4287678)	128
M829019 (4287679)	155
M829020 (4287680)	123
M829021 (4287681)	147
M829022 (4287682)	177
M829023 (4287683)	124
M829024 (4287684)	211
M829025 (4287685)	208
M829026 (4287686)	228
M829027 (4287687)	258
M829028 (4287688)	199
M829029 (4287689)	194
M829030 (4287690)	187
M829031 (4287691)	193
M829032 (4287692)	120

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AGAT WORK ORDER: 13B708548

PROJECT NO: Sturgeon Lake, ON

CLIENT NAME: XSTRATA ZINC STURGEON LAKE

ATTENTION TO: Lucy Potter

4 Acid Digest - Ore Grade Metals Package, ICP-OES finish (201270)

DATE SAMPLED: Apr 24, 2013 | DATE RECEIVED: Apr 22, 2013 | DATE REPORTED: May 07, 2013 | SAMPLE TYPE: Drill Core

Analyte:	Zr
Unit:	ppm
Sample ID (AGAT ID) RDL:	25
M829033 (4287693)	204
M829034 (4287694)	207
M829035 (4287695)	228
M829036 (4287696)	234
M829037 (4287697)	197
M829038 (4287698)	140
M829039 (4287699)	131
M829040 (4287700)	281
M829041 (4287701)	252
M829042 (4287702)	140
M829043 (4287703)	93
M829044 (4287704)	223
M829045 (4287705)	310
M829046 (4287706)	203
M829047 (4287707)	288
M829048 (4287708)	181
M829049 (4287709)	126
M829050 (4287710)	175
M829051 (4287711)	146
M829052 (4287712)	133
M829053 (4287713)	140
M829054 (4287714)	134
M829055 (4287715)	129
M829056 (4287716)	175
M829057 (4287717)	213
M829058 (4287718)	144
M829059 (4287719)	162
M829060 (4287720)	164
M829061 (4287721)	180
M829062 (4287722)	224
M829063 (4287723)	121
M829064 (4287724)	214

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AGAT WORK ORDER: 13B708548

PROJECT NO: Sturgeon Lake, ON

CLIENT NAME: XSTRATA ZINC STURGEON LAKE

ATTENTION TO: Lucy Potter

4 Acid Digest - Ore Grade Metals Package, ICP-OES finish (201270)

DATE SAMPLED: Apr 24, 2013 | DATE RECEIVED: Apr 22, 2013 | DATE REPORTED: May 07, 2013 | SAMPLE TYPE: Drill Core

Analyte:	Zr
Unit:	ppm
Sample ID (AGAT ID) RDL:	25
M829065 (4287725)	202
M829066 (4287726)	218
M829067 (4287727)	207
M829068 (4287728)	173
M829069 (4287729)	194
M829070 (4287730)	238
M829071 (4287731)	208
M829072 (4287732)	85
M829073 (4287733)	288
M829074 (4287734)	305
M829075 (4287735)	306
M829076 (4287736)	290
M829077 (4287737)	247
M829078 (4287738)	236
M829079 (4287739)	249
M829080 (4287740)	241
M829081 (4287741)	256
M829082 (4287742)	272
M829083 (4287743)	279
M829084 (4287744)	283
M829085 (4287745)	295
M829086 (4287746)	67
M829087 (4287747)	56
M829088 (4287748)	59

Comments: RDL - Reported Detection Limit

4287661-4287748 As, Sb values may be low due to digestion losses.

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AGAT WORK ORDER: 13B708548

PROJECT NO: Sturgeon Lake, ON

CLIENT NAME: XSTRATA ZINC STURGEON LAKE

ATTENTION TO: Lucy Potter

Fire Assay - Trace Au, ICP-OES finish (202052)

DATE SAMPLED: Apr 24, 2013 | DATE RECEIVED: Apr 22, 2013 | DATE REPORTED: May 07, 2013 | SAMPLE TYPE: Drill Core

Analyte:	Sample Login Weight	Au
Unit:	kg	ppm
Sample ID (AGAT ID) RDL:	0.01	0.001
M829001 (4287661)	3.66	0.023
M829002 (4287662)	3.38	0.010
M829003 (4287663)	3.68	0.006
M829004 (4287664)	3.52	0.008
M829005 (4287665)	1.40	0.033
M829006 (4287666)	2.20	0.003
M829007 (4287667)	3.58	0.020
M829008 (4287668)	3.50	0.003
M829009 (4287669)	2.16	0.002
M829010 (4287670)	3.88	0.010
M829011 (4287671)	3.48	0.005
M829012 (4287672)	2.14	0.013
M829013 (4287673)	2.24	0.008
M829014 (4287674)	1.12	0.005
M829015 (4287675)	2.28	0.003
M829016 (4287676)	1.12	0.020
M829017 (4287677)	1.14	0.007
M829018 (4287678)	2.98	0.002
M829019 (4287679)	3.62	0.004
M829020 (4287680)	3.08	0.005
M829021 (4287681)	3.80	0.006
M829022 (4287682)	3.84	0.005
M829023 (4287683)	0.06	0.120
M829024 (4287684)	3.54	0.004
M829025 (4287685)	1.78	0.004
M829026 (4287686)	1.82	0.003
M829027 (4287687)	2.08	<0.001
M829028 (4287688)	2.26	0.009
M829029 (4287689)	3.32	0.004
M829030 (4287690)	3.94	0.007
M829031 (4287691)	2.90	0.018

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AGAT WORK ORDER: 13B708548

PROJECT NO: Sturgeon Lake, ON

CLIENT NAME: XSTRATA ZINC STURGEON LAKE

ATTENTION TO: Lucy Potter

Fire Assay - Trace Au, ICP-OES finish (202052)

DATE SAMPLED: Apr 24, 2013 | DATE RECEIVED: Apr 22, 2013 | DATE REPORTED: May 07, 2013 | SAMPLE TYPE: Drill Core

Analyte:	Sample Login Weight	Au
Unit:	kg	ppm
Sample ID (AGAT ID) RDL:	0.01	0.001
M829032 (4287692)	0.06	0.089
M829033 (4287693)	2.10	0.005
M829034 (4287694)	3.58	0.006
M829035 (4287695)	3.26	0.003
M829036 (4287696)	3.30	0.003
M829037 (4287697)	3.26	0.010
M829038 (4287698)	1.38	0.011
M829039 (4287699)	1.44	0.008
M829040 (4287700)	3.60	0.003
M829041 (4287701)	2.82	0.003
M829042 (4287702)	2.32	0.019
M829043 (4287703)	2.22	0.002
M829044 (4287704)	2.94	0.002
M829045 (4287705)	3.48	0.002
M829046 (4287706)	3.84	0.004
M829047 (4287707)	3.26	0.002
M829048 (4287708)	3.54	0.006
M829049 (4287709)	3.48	0.002
M829050 (4287710)	3.28	<0.001
M829051 (4287711)	3.42	0.004
M829052 (4287712)	3.36	0.003
M829053 (4287713)	3.78	0.026
M829054 (4287714)	1.42	0.001
M829055 (4287715)	1.52	0.001
M829056 (4287716)	2.96	0.007
M829057 (4287717)	3.04	0.005
M829058 (4287718)	3.58	0.002
M829059 (4287719)	2.26	0.008
M829060 (4287720)	2.28	0.004
M829061 (4287721)	2.42	0.005
M829062 (4287722)	2.66	0.006

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AGAT WORK ORDER: 13B708548

PROJECT NO: Sturgeon Lake, ON

CLIENT NAME: XSTRATA ZINC STURGEON LAKE

ATTENTION TO: Lucy Potter

Fire Assay - Trace Au, ICP-OES finish (202052)

DATE SAMPLED: Apr 24, 2013 | DATE RECEIVED: Apr 22, 2013 | DATE REPORTED: May 07, 2013 | SAMPLE TYPE: Drill Core

Analyte:	Sample Login Weight	Au
Unit:	kg	ppm
Sample ID (AGAT ID) RDL:	0.01	0.001
M829063 (4287723)	0.06	0.090
M829064 (4287724)	2.44	0.014
M829065 (4287725)	2.56	0.003
M829066 (4287726)	2.62	0.011
M829067 (4287727)	1.80	0.002
M829068 (4287728)	1.68	0.003
M829069 (4287729)	2.50	0.030
M829070 (4287730)	2.20	0.022
M829071 (4287731)	2.52	0.032
M829072 (4287732)	2.36	0.003
M829073 (4287733)	2.28	0.020
M829074 (4287734)	3.26	0.011
M829075 (4287735)	2.24	0.003
M829076 (4287736)	2.30	0.003
M829077 (4287737)	2.40	0.031
M829078 (4287738)	2.62	0.008
M829079 (4287739)	2.48	0.028
M829080 (4287740)	2.46	0.014
M829081 (4287741)	2.38	0.005
M829082 (4287742)	1.58	0.010
M829083 (4287743)	2.46	0.018
M829084 (4287744)	2.28	0.036
M829085 (4287745)	2.32	0.018
M829086 (4287746)	3.32	0.129
M829087 (4287747)	2.00	0.002
M829088 (4287748)	2.74	0.047

Comments: RDL - Reported Detection Limit

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Quality Assurance - Replicate

AGAT WORK ORDER: 13B708548

PROJECT NO: Sturgeon Lake, ON

CLIENT NAME: XSTRATA ZINC STURGEON LAKE

ATTENTION TO: Lucy Potter

4 Acid Digest - Ore Grade Metals Package, ICP-OES finish (201270)

	REPLICATE #1				REPLICATE #2				REPLICATE #3				REPLICATE #4			
Parameter	Sample ID	Original	Replicate	RPD	Sample ID	Original	Replicate	RPD	Sample ID	Original	Replicate	RPD	Sample ID	Original	Replicate	RPD
Ag	4287661	< 2.5	< 2.5	0.0%	4287678	< 2.5	< 2.5	0.0%	4287685	< 2.5	< 2.5	0.0%	4287703	< 2.5	< 2.5	0.0%
Al	4287661	4.85	4.45	8.6%	4287678	3.87	4.09	5.5%	4287685	4.22	3.21	27.2%	4287703	7.71	7.50	2.8%
As	4287661	< 5	< 5	0.0%	4287678	< 5	< 5	0.0%	4287685	< 5	< 5	0.0%	4287703	< 5	< 5	0.0%
Ba	4287661	683	425		4287678	246	269	8.9%	4287685	219	207	5.6%	4287703	218	213	2.3%
Be	4287661	< 2.5	< 2.5	0.0%	4287678	< 2.5	< 2.5	0.0%	4287685	< 2.5	< 2.5	0.0%	4287703	< 2.5	< 2.5	0.0%
Bi	4287661	< 5	< 5	0.0%	4287678	< 5	< 5	0.0%	4287685	< 5	< 5	0.0%	4287703	< 5	< 5	0.0%
Ca	4287661	1.46	1.40	4.2%	4287678	2.08	2.11	1.4%	4287685	1.11	0.96	14.5%	4287703	6.13	5.89	4.0%
Cd	4287661	< 2.5	< 2.5	0.0%	4287678	< 2.5	< 2.5	0.0%	4287685	< 2.5	< 2.5	0.0%	4287703	< 2.5	< 2.5	0.0%
Ce	4287661	93	88	5.5%	4287678	31	30	3.3%	4287685	38	37	2.7%	4287703	27	25	7.7%
Co	4287661	7.2	7.2	0.0%	4287678	22.9	22.9	0.0%	4287685	44.1	40.9	7.5%	4287703	30.8	30.3	1.6%
Cr	4287661	43.7	48.4	10.2%	4287678	21.5	21.9	1.8%	4287685	53.0	50.1	5.6%	4287703	197	190	3.6%
Cu	4287661	78.4	79.5	1.4%	4287678	317	308	2.9%	4287685	76.7	75.1	2.1%	4287703	105	89.6	15.8%
Fe	4287661	4.65	4.48	3.7%	4287678	3.53	3.54	0.3%	4287685	6.12	5.63	8.3%	4287703	5.37	5.21	3.0%
Ga	4287661	< 25	< 25	0.0%	4287678	< 25	< 25	0.0%	4287685	< 25	< 25	0.0%	4287703	< 25	< 25	0.0%
In	4287661	< 5	< 5	0.0%	4287678	< 5	< 5	0.0%	4287685	< 5	< 5	0.0%	4287703	< 5	< 5	0.0%
K	4287661	2.13	2.04	4.3%	4287678	1.82	2.05	11.9%	4287685	1.30	1.28	1.6%	4287703	1.15	1.10	4.4%
La	4287661	38	35	8.2%	4287678	14	14	0.0%	4287685	17	17	0.0%	4287703	14	13	7.4%
Li	4287661	< 5	< 5	0.0%	4287678	10	10	0.0%	4287685	15	15	0.0%	4287703	12	11	8.7%
Mg	4287661	0.70	0.68	2.9%	4287678	0.995	1.01	1.5%	4287685	1.03	0.96	7.0%	4287703	2.10	2.04	2.9%
Mn	4287661	703	674	4.2%	4287678	760	784	3.1%	4287685	649	593	9.0%	4287703	1180	1160	1.7%
Mo	4287661	2.62	2.75	4.8%	4287678	< 2.5	< 2.5	0.0%	4287685	< 2.5	< 2.5	0.0%	4287703	< 2.5	< 2.5	0.0%
Na	4287661	1.73	1.67	3.5%	4287678	0.65	0.66	1.5%	4287685	0.706	0.683	3.3%	4287703	2.00	1.93	3.6%
Ni	4287661	9.7	9.2	5.3%	4287678	63.6	65.3	2.6%	4287685	75.3	72.5	3.8%	4287703	153	146	4.7%
P	4287661	257	238	7.7%	4287678	596	630	5.5%	4287685	435	441	1.4%	4287703	565	570	0.9%
Pb	4287661	13	11	16.7%	4287678	< 5	< 5	0.0%	4287685	11	8		4287703	11	13	16.7%
Rb	4287661	106	101	4.8%	4287678	83	95	13.5%	4287685	59	51	14.5%	4287703	59	57	3.4%
S	4287661	1.74	1.65	5.3%	4287678	0.376	0.365	3.0%	4287685	1.67	1.59	4.9%	4287703	0.042	0.037	12.7%
Sb	4287661	< 5	< 5	0.0%	4287678	< 5	< 5	0.0%	4287685	< 5	< 5	0.0%	4287703	< 5	< 5	0.0%
Sc	4287661	6	6	0.0%	4287678	10	11	9.5%	4287685	13	10	26.1%	4287703	20	19	5.1%
Se	4287661	< 50	< 50	0.0%	4287678	< 50	< 50	0.0%	4287685	< 50	< 50	0.0%	4287703	< 50	< 50	0.0%
Sn	4287661	< 25	< 25	0.0%	4287678	< 25	< 25	0.0%	4287685	< 25	< 25	0.0%	4287703	< 25	< 25	0.0%

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CLIENT NAME: XSTRATA ZINC STURGEON LAKE

ATTENTION TO: Lucy Potter

Sr	4287661	106	94	12.0%	4287678	71	74	4.1%	4287685	65	51	24.1%	4287703	173	166	4.1%
Ta	4287661	< 50	< 50	0.0%	4287678	< 50	< 50	0.0%	4287685	< 50	< 50	0.0%	4287703	< 50	< 50	0.0%
Te	4287661	< 50	< 50	0.0%	4287678	< 50	< 50	0.0%	4287685	< 50	< 50	0.0%	4287703	< 50	< 50	0.0%
Th	4287661	< 25	< 25	0.0%	4287678	< 25	< 25	0.0%	4287685	< 25	< 25	0.0%	4287703	< 25	< 25	0.0%
Ti	4287661	0.08	0.08	0.0%	4287678	0.080	0.089	10.7%	4287685	0.05	0.05	0.0%	4287703	0.141	0.123	13.6%
Tl	4287661	< 25	< 25	0.0%	4287678	< 25	< 25	0.0%	4287685	< 25	< 25	0.0%	4287703	< 25	< 25	0.0%
U	4287661	< 25	< 25	0.0%	4287678	< 25	< 25	0.0%	4287685	< 25	< 25	0.0%	4287703	< 25	< 25	0.0%
V	4287661	37.4	35.0	6.6%	4287678	94.8	97.6	2.9%	4287685	102	98.6	3.4%	4287703	136	131	3.7%
W	4287661	< 5	< 5	0.0%	4287678	< 5	< 5	0.0%	4287685	< 5	< 5	0.0%	4287703	< 5	< 5	0.0%
Y	4287661	15	13	14.3%	4287678	7	7	0.0%	4287685	11	8		4287703	13	13	0.0%
Zn	4287661	143	140	2.1%	4287678	67.4	67.4	0.0%	4287685	149	127	15.9%	4287703	67.9	69.5	2.3%
Zr	4287661	232	209	10.4%	4287678	128	133	3.8%	4287685	208	191	8.5%	4287703	93	86	7.8%
	REPLICATE #5				REPLICATE #6				REPLICATE #7							
Parameter	Sample ID	Original	Replicate	RPD	Sample ID	Original	Replicate	RPD	Sample ID	Original	Replicate	RPD				
Ag	4287710	< 2.5	< 2.5	0.0%	4287729	< 2.5	< 2.5	0.0%	4287735	< 2.5	< 2.5	0.0%				
Al	4287710	5.34	5.69	6.3%	4287729	4.61	4.86	5.3%	4287735	3.16	4.27	29.9%				
As	4287710	< 5	< 5	0.0%	4287729	< 5	< 5	0.0%	4287735	< 5	< 5	0.0%				
Ba	4287710	461	438	5.1%	4287729	414	431	4.0%	4287735	333	339	1.8%				
Be	4287710	< 2.5	< 2.5	0.0%	4287729	< 2.5	< 2.5	0.0%	4287735	< 2.5	< 2.5	0.0%				
Bi	4287710	< 5	< 5	0.0%	4287729	< 5	< 5	0.0%	4287735	< 5	< 5	0.0%				
Ca	4287710	2.08	1.98	4.9%	4287729	1.93	1.91	1.0%	4287735	0.674	0.700	3.8%				
Cd	4287710	< 2.5	< 2.5	0.0%	4287729	< 2.5	< 2.5	0.0%	4287735	< 2.5	< 2.5	0.0%				
Ce	4287710	39	41	5.0%	4287729	59	57	3.4%	4287735	61	50	19.8%				
Co	4287710	15.7	15.7	0.0%	4287729	4.8	4.8	0.0%	4287735	8.3	8.5	2.4%				
Cr	4287710	21.3	21.3	0.0%	4287729	26.6	24.9	6.6%	4287735	9.96	9.03	9.8%				
Cu	4287710	13.3	13.6	2.2%	4287729	5.64	6.91	20.2%	4287735	100	110	9.5%				
Fe	4287710	3.59	3.56	0.8%	4287729	3.19	3.18	0.3%	4287735	2.54	2.75	7.9%				
Ga	4287710	< 25	< 25	0.0%	4287729	< 25	< 25	0.0%	4287735	< 25	< 25	0.0%				
In	4287710	< 5	< 5	0.0%	4287729	< 5	< 5	0.0%	4287735	< 5	< 5	0.0%				
K	4287710	1.70	1.62	4.8%	4287729	2.26	2.31	2.2%	4287735	1.92	1.99	3.6%				
La	4287710	18	19	5.4%	4287729	25	24	4.1%	4287735	25	21	17.4%				
Li	4287710	14	14	0.0%	4287729	10	10	0.0%	4287735	< 5	< 5	0.0%				
Mg	4287710	0.994	0.985	0.9%	4287729	1.06	1.04	1.9%	4287735	0.519	0.537	3.4%				
Mn	4287710	846	845	0.1%	4287729	706	702	0.6%	4287735	361	383	5.9%				

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Quality Assurance - Replicate

AGAT WORK ORDER: 13B708548

PROJECT NO: Sturgeon Lake, ON

CLIENT NAME: XSTRATA ZINC STURGEON LAKE

ATTENTION TO: Lucy Potter

Mo	4287710	< 2.5	< 2.5	0.0%	4287729	< 2.5	< 2.5	0.0%	4287735	< 2.5	< 2.5	0.0%				
Na	4287710	1.28	1.22	4.8%	4287729	0.279	0.270	3.3%	4287735	0.213	0.218	2.3%				
Ni	4287710	51.3	48.1	6.4%	4287729	20.3	19.7	3.0%	4287735	21.1	23.6	11.2%				
P	4287710	503	526	4.5%	4287729	271	270	0.4%	4287735	276	251	9.5%				
Pb	4287710	10	11	9.5%	4287729	19	18	5.4%	4287735	44	47	6.6%				
Rb	4287710	92	91	1.1%	4287729	121	122	0.8%	4287735	97	91	6.4%				
S	4287710	0.149	0.162	8.4%	4287729	< 0.025	< 0.025	0.0%	4287735	0.735	0.863	16.0%				
Sb	4287710	< 5	< 5	0.0%	4287729	< 5	< 5	0.0%	4287735	< 5	< 5	0.0%				
Sc	4287710	17	16	6.1%	4287729	7	7	0.0%	4287735	7	7	0.0%				
Se	4287710	< 50	< 50	0.0%	4287729	< 50	< 50	0.0%	4287735	< 50	< 50	0.0%				
Sn	4287710	< 25	< 25	0.0%	4287729	< 25	< 25	0.0%	4287735	< 25	< 25	0.0%				
Sr	4287710	182	170	6.8%	4287729	78	82	5.0%	4287735	43	50	15.1%				
Ta	4287710	< 50	< 50	0.0%	4287729	< 50	< 50	0.0%	4287735	< 50	< 50	0.0%				
Te	4287710	< 50	< 50	0.0%	4287729	< 50	< 50	0.0%	4287735	< 50	< 50	0.0%				
Th	4287710	< 25	< 25	0.0%	4287729	< 25	< 25	0.0%	4287735	< 25	< 25	0.0%				
Ti	4287710	0.13	0.22		4287729	0.06	0.06	0.0%	4287735	< 0.05	< 0.05	0.0%				
Tl	4287710	< 25	< 25	0.0%	4287729	< 25	< 25	0.0%	4287735	< 25	< 25	0.0%				
U	4287710	< 25	< 25	0.0%	4287729	< 25	< 25	0.0%	4287735	< 25	< 25	0.0%				
V	4287710	142	128	10.4%	4287729	46.0	44.4	3.5%	4287735	26.1	26.5	1.5%				
W	4287710	< 5	< 5	0.0%	4287729	< 5	< 5	0.0%	4287735	< 5	< 5	0.0%				
Y	4287710	7	7	0.0%	4287729	12	13	8.0%	4287735	17	16	6.1%				
Zn	4287710	79.6	79.3	0.4%	4287729	111	111	0.0%	4287735	973	939	3.6%				
Zr	4287710	175	176	0.6%	4287729	194	203	4.5%	4287735	306	294	4.0%				

Fire Assay - Trace Au, ICP-OES finish (202052)

	REPLICATE #1				REPLICATE #2				REPLICATE #3				REPLICATE #4			
Parameter	Sample ID	Original	Replicate	RPD	Sample ID	Original	Replicate	RPD	Sample ID	Original	Replicate	RPD	Sample ID	Original	Replicate	RPD
Au	4287661	0.023	0.010		4287674	0.005	0.012		4287685	0.0042	0.0048	13.3%	4287698	0.011	0.009	20.0%
	REPLICATE #5				REPLICATE #6				REPLICATE #7				REPLICATE #8			
Parameter	Sample ID	Original	Replicate	RPD	Sample ID	Original	Replicate	RPD	Sample ID	Original	Replicate	RPD	Sample ID	Original	Replicate	RPD
Au	4287710	< 0.001	< 0.001	0.0%	4287724	0.006	0.035		4287735	0.003	0.003	0.0%	4287748	0.047	0.028	

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Quality Assurance - Certified Reference materials

AGAT WORK ORDER: 13B708548

PROJECT NO: Sturgeon Lake, ON

CLIENT NAME: XSTRATA ZINC STURGEON LAKE

ATTENTION TO: Lucy Potter

4 Acid Digest - Ore Grade Metals Package, ICP-OES finish (201270)

	CRM #1 (CDN-ME-1101)				CRM #2				CRM #3 (CDN-ME-1101)				CRM #4 (CDN-ME-1206)			
Parameter	Expect	Actual	Recovery	Limits	Expect	Actual	Recovery	Limits	Expect	Actual	Recovery	Limits	Expect	Actual	Recovery	Limits
Ag	68.2	67.8	100%	90% - 110%					68.2	64.6	95%	90% - 110%	274	284	104%	90% - 110%
Al							100%	90% - 110%								
As							100%	90% - 110%								
Ba							100%	90% - 110%								
Be							100%	90% - 110%								
Bi							100%	90% - 110%								
Ca							100%	90% - 110%								
Cd							100%	90% - 110%								
Ce							100%	90% - 110%								
Co							100%	90% - 110%								
Cr							100%	90% - 110%								
Cu	6630	7282	100%	90% - 110%					6630	6705	101%	90% - 110%	7900	7908	100%	90% - 110%
Fe							100%	90% - 110%								
Ga							100%	90% - 110%								
In							100%	90% - 110%								
K							100%	90% - 110%								
La							100%	90% - 110%								
Li							100%	90% - 110%								
Mg							100%	90% - 110%								
Mn							100%	90% - 110%								
Mo							100%	90% - 110%								
Na							100%	90% - 110%								
Ni							100%	90% - 110%								
P							100%	90% - 110%								
Pb	4590	4614	100%	90% - 110%					4590	4192	91%	90% - 110%	8010	7690	96%	90% - 110%
Rb							100%	90% - 110%								
S							100%	90% - 110%								
Sb							100%	90% - 110%								
Sc							100%	90% - 110%								
Se							100%	90% - 110%								
Sn							100%	90% - 110%								

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AGAT WORK ORDER: 13B708548

PROJECT NO: Sturgeon Lake, ON

CLIENT NAME: XSTRATA ZINC STURGEON LAKE

ATTENTION TO: Lucy Potter

Sr							100%	90% - 110%								
Ta							100%	90% - 110%								
Te							100%	90% - 110%								
Th							100%	90% - 110%								
Ti							100%	90% - 110%								
Tl							100%	90% - 110%								
U							100%	90% - 110%								
V							100%	90% - 110%								
W							100%	90% - 110%								
Y							100%	90% - 110%								
Zn							100%	90% - 110%					23800	23696	100%	90% - 110%
Zr							100%	90% - 110%								
	CRM #5 (CDN-ME-1101)															
Parameter	Expect	Actual	Recovery	Limits												
Ag	68.2	68.1	100%	90% - 110%												
Cu	6630	7041	106%	90% - 110%												
Pb	4590	4292	93%	90% - 110%												

Fire Assay - Trace Au, ICP-OES finish (202052)

	CRM #1 (CM14)				CRM #2 (1P5F)				CRM #3 (GS7E)				CRM #4 (CM14)			
Parameter	Expect	Actual	Recovery	Limits	Expect	Actual	Recovery	Limits	Expect	Actual	Recovery	Limits	Expect	Actual	Recovery	Limits
Au	0.792	0.749	95%	90% - 110%	1.40	1.4	100%	90% - 110%	7.4	7.4	100%	90% - 110%	0.792	0.8	101%	90% - 110%
	CRM #5 (1P5F)															
Parameter	Expect	Actual	Recovery	Limits												
Au	1.40	1.4	100%	90% - 110%												

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Method Summary

CLIENT NAME: XSTRATA ZINC STURGEON LAKE

AGAT WORK ORDER: 13B708548

PROJECT NO: Sturgeon Lake, ON

ATTENTION TO: Lucy Potter

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Solid Analysis			
Ag	MIN-200-12002/12020		ICP/OES
Al	MIN-200-12002/12020		ICP/OES
As	MIN-200-12002/12020		ICP/OES
Ba	MIN-200-12002/12020		ICP/OES
Be	MIN-200-12002/12020		ICP/OES
Bi	MIN-200-12002/12020		ICP/OES
Ca	MIN-200-12002/12020		ICP/OES
Cd	MIN-200-12002/12020		ICP/OES
Ce	MIN-200-12002/12020		ICP/OES
Co	MIN-200-12002/12020		ICP/OES
Cr	MIN-200-12002/12020		ICP/OES
Cu	MIN-200-12002/12020		ICP/OES
Fe	MIN-200-12002/12020		ICP/OES
Ga	MIN-200-12002/12020		ICP/OES
In	MIN-200-12002/12020		ICP/OES
K	MIN-200-12002/12020		ICP/OES
La	MIN-200-12002/12020		ICP/OES
Li	MIN-200-12002/12020		ICP/OES
Mg	MIN-200-12002/12020		ICP/OES
Mn	MIN-200-12002/12020		ICP/OES
Mo	MIN-200-12002/12020		ICP/OES
Na	MIN-200-12002/12020		ICP/OES
Ni	MIN-200-12002/12020		ICP/OES
P	MIN-200-12002/12020		ICP/OES
Pb	MIN-200-12002/12020		ICP/OES
Rb	MIN-200-12002/12020		ICP/OES
S	MIN-200-12002/12020		ICP/OES
Sb	MIN-200-12002/12020		ICP/OES
Sc	MIN-200-12002/12020		ICP/OES
Se	MIN-200-12002/12020		ICP/OES
Sn	MIN-200-12002/12020		ICP/OES
Sr	MIN-200-12002/12020		ICP/OES
Ta	MIN-200-12002/12020		ICP/OES
Te	MIN-200-12002/12020		ICP/OES
Th	MIN-200-12002/12020		ICP/OES
Ti	MIN-200-12002/12020		ICP/OES
Tl	MIN-200-12002/12020		ICP/OES
U	MIN-200-12002/12020		ICP/OES
V	MIN-200-12002/12020		ICP/OES
W	MIN-200-12002/12020		ICP/OES
Y	MIN-200-12002/12020		ICP/OES
Zn	MIN-200-12002/12020		ICP/OES
Zr	MIN-200-12002/12020		ICP/OES
Sample Login Weight	MIN-12009		BALANCE
Au	MIN-200-12006	BUGBEE, E: A Textbook of Fire Assaying	ICP-OES

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INVOICE NO. 13L05056M

Date: 10/May/13

GST #: R100073238 **QST #: 1212241632**

Customer No	WorkOrder No	Branch	Customer P.O.	Division ID	AFE	Acct Code	District	Product
4223703	13B710097	B	4500049906	10				0

Product ID	Product Description	Quantity	Unit Price	Extended Price
	RE:			
201-270	Metals Package (4Acid) - ICP (Concentrates)	6.00	$7.75	$46.50
202-052	Trace Au at 0.001-10 ppm by Fire Assay / ICP Finish	6.00	$8.50	$51.00
221-101	Dry <5kg, crush to 95% 2mm (10mesh), split to 250g, pulverize to 95% 0.105mm (140mesh).	6.00	$6.50	$39.00
	**********		**Subtotal:**	$136.50
	* **Should you require any information regarding this analysis, please contact your Client Project Manager @ (905) 501-9998** *		**GST:**	$6.83
	* **We appreciate and welcome your feedback which can be provided by submitting a Client Review at http://www.agatlabs.com/resources/client-forms.cfm** *		**QST:**	13.62
	**********			
	TERMS: NET 30 DAYS . INTEREST CHARGED ON OVERDUE ACCOUNTS AT THE RATE OF 2% PER MONTH (24% PER ANNUM).		**Total:**	**$156.95**

Corporate Office:

XSTRATA ZINC
8801 RTE TRANSCANADIENNE
MONTREAL QC H4S1W8

Invoice To:

XSTRATA ZINC STURGEON LAKE
8801 RTE TRANSCANADIENNE
MONTREAL QC H4S1W8

Attn To: Lucy Potter

AGAT Laboratories

5623 McAdam Road
Mississauga, Ontario
L4Z 1N9

Tel:(905) 501-9998
Fax:(905) 501-0589

INVOICE NO. 13L05098M

Date: 10/May/13

GST #: R100073238 **QST #: 1212241632**

Customer No	WorkOrder No	Branch	Customer P.O.	Division ID	AFE	Acct Code	District	Product
4223703	13T708558	T	4500049906	10				0

Product ID	Product Description	Quantity	Unit Price	Extended Price
	RE:			
201-078	Lithogeochemical Analysis by ICP/ICPMS Finish	272.00	$18.00	$4,896.00
201-676	XRF Whole Rock Analysis	272.00	$20.00	$5,440.00
202-066	Ore Grade Ag by Fire Assay / Gravimetric Finish	1.00	$8.50	$8.50
221-101	Dry <5kg, crush to 95% 2mm (10mesh), split to 250g, pulverize to 95% 0.105mm (140mesh).	272.00	$6.50	$1,768.00
			Subtotal:	$12,112.50
	Should you require any information regarding this analysis, please contact your Client Project Manager @ (905) 501-9998		**GST:**	$605.63
	We appreciate and welcome your feedback which can be provided by submitting a Client Review at http://www.agatlabs.com/resources/client-forms.cfm		**QST:**	1208.22
	TERMS: NET 30 DAYS . INTEREST CHARGED ON OVERDUE ACCOUNTS AT THE RATE OF 2% PER MONTH (24% PER ANNUM).		**Total:**	**$13,926.35**

Corporate Office:

XSTRATA ZINC
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Attn To: Lucy Potter

AGAT Laboratories

5623 McAdam Road
Mississauga, Ontario
L4Z 1N9

Tel:(905) 501-9998
Fax:(905) 501-0589

INVOICE NO. 13L05677M

Date: 14/May/13

GST #: R100073238 **QST #: 1212241632**

Customer No	WorkOrder No	Branch	Customer P.O.	Division ID	AFE	Acct Code	District	Product
4223703	13B710275	B	4500049906	10				0

Product ID	Product Description	Quantity	Unit Price	Extended Price
	RE:			
201-270	Metals Package (4Acid) - ICP (Concentrates)	137.00	$7.75	$1,061.75
202-052	Trace Au at 0.001-10 ppm by Fire Assay / ICP Finish	137.00	$8.50	$1,164.50
221-101	Dry <5kg, crush to 95% 2mm (10mesh), split to 250g, pulverize to 95% 0.105mm (140mesh).	137.00	$6.50	$890.50
			Subtotal:	$3,116.75
	Should you require any information regarding this analysis, please contact your Client Project Manager @ (905) 501-9998		**GST:**	$155.84
	We appreciate and welcome your feedback which can be provided by submitting a Client Review at http://www.agatlabs.com/resources/client-forms.cfm		**QST:**	310.9
	TERMS: NET 30 DAYS . INTEREST CHARGED ON OVERDUE ACCOUNTS AT THE RATE OF 2% PER MONTH (24% PER ANNUM).		**Total:**	**$3,583.49**

Corporate Office:

XSTRATA ZINC
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Invoice To:

XSTRATA ZINC STURGEON LAKE
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MONTREAL QC H4S1W8

Attn To: Lucy Potter

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MISSISSAUGA, ONTARIO
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TEL (905)501-9998
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http://www.agatlabs.com

CLIENT NAME: XSTRATA ZINC STURGEON LAKE
8801 RTE TRANSCANADIENNE
MONTREAL, QC H4S1W8
(514) 745-9353

ATTENTION TO: Lucy Potter

PROJECT NO: Sturgeon Lake

AGAT WORK ORDER: 13B728595

SOLID ANALYSIS REVIEWED BY: Ron Cardinall, Certified Assayer - Director - Technical Services (Mining)

DATE REPORTED: Jul 09, 2013

PAGES (INCLUDING COVER): 12

Should you require any information regarding this analysis please contact your client services representative at (905) 501-9998

*NOTES

All samples are stored at no charge for 90 days. Please contact the lab if you require additional sample storage time.

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 13B728595

PROJECT NO: Sturgeon Lake

CLIENT NAME: XSTRATA ZINC STURGEON LAKE

ATTENTION TO: Lucy Potter

Lithium Borate Fusion - Summation of Oxides, XRF finish (201676)

DATE SAMPLED: Jun 21, 2013 | DATE RECEIVED: Jun 21, 2013 | DATE REPORTED: Jul 09, 2013 | SAMPLE TYPE: Drill Core

Analyte:	Al2O3	BaO	CaO	Cr2O3	Fe2O3	K2O	MgO	MnO	Na2O	P2O5	SiO2	TiO2	SrO	V2O5
Unit:	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Sample ID (AGAT ID) RDL:	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
J529871 (4479190)	10.9	0.06	0.19	<0.01	3.62	1.95	2.35	0.04	0.30	0.02	77.4	0.20	<0.01	<0.01
J529872 (4479191)	13.9	0.03	5.30	0.01	8.73	1.45	5.74	0.17	1.00	0.13	50.1	0.67	0.01	0.02
J529873 (4479192)	15.1	0.06	0.60	<0.01	12.1	1.56	9.45	0.32	0.17	0.20	50.9	0.98	<0.01	0.03
J529874 (4479193)	14.4	0.01	8.53	<0.01	12.6	0.15	6.62	0.19	2.30	0.08	51.2	0.85	0.02	0.05
J529875 (4479194)	13.6	0.01	11.1	<0.01	11.8	0.58	6.70	0.19	0.57	0.07	48.0	0.75	0.03	0.04
J529876 (4479195)	15.2	0.03	8.51	0.02	9.07	1.40	5.43	0.14	1.55	0.13	44.7	0.69	0.01	0.02
J529877 (4479196)	13.2	<0.01	10.5	0.01	9.92	0.22	5.93	0.18	2.75	0.05	44.9	0.65	<0.01	0.04
J529878 (4479197)	12.4	0.01	8.90	<0.01	9.10	0.54	7.76	0.16	1.35	0.04	42.6	0.46	0.02	0.03
J529879 (4479198)	16.2	0.07	5.08	0.01	5.48	2.49	1.40	0.10	2.87	0.18	57.1	0.94	0.01	0.03
J529880 (4479199)	15.5	0.04	6.97	0.01	6.84	1.33	1.34	0.12	3.05	0.16	53.0	0.86	0.02	0.03
J529881 (4479200)	14.3	0.03	6.68	0.01	8.87	0.92	2.33	0.13	2.78	0.15	51.2	0.78	0.02	0.03
J529882 (4479201)	15.4	0.02	5.02	<0.01	6.53	1.12	2.00	0.13	3.14	0.17	56.6	0.85	0.02	0.03
J529883 (4479202)	15.3	0.02	6.26	0.01	8.22	0.92	1.66	0.12	3.09	0.19	54.0	0.90	0.01	0.02
J529884 (4479203)	14.2	0.03	7.44	0.03	8.59	1.03	2.97	0.15	1.89	0.13	50.9	0.67	0.02	0.03
J529885 (4479204)	15.1	0.01	6.07	0.02	8.41	0.89	3.17	0.10	2.70	0.13	51.9	0.72	0.01	0.03
J529886 (4479205)	15.6	0.02	7.36	0.02	7.38	0.97	1.77	0.13	2.87	0.14	54.4	0.71	0.02	0.03
J529887 (4479206)	14.4	0.01	7.57	0.01	7.13	0.74	2.92	0.12	2.56	0.13	52.5	0.67	0.02	0.03
J529888 (4479207)	14.9	0.02	7.39	0.02	8.04	0.93	2.86	0.14	2.77	0.14	52.0	0.68	0.02	0.03
J529889 (4479208)	13.7	0.02	9.47	0.02	7.64	0.84	3.46	0.14	2.14	0.12	48.7	0.64	0.03	0.02
J529890 (4479209)	14.8	0.03	7.42	0.03	7.79	1.02	2.65	0.14	2.69	0.14	50.6	0.69	0.03	0.02
J529891 (4479210)	9.37	0.03	2.76	<0.01	2.38	1.36	1.42	0.04	1.00	0.03	75.9	0.23	0.01	<0.01
J529892 (4479211)	16.3	0.02	4.59	0.01	7.54	1.23	1.69	0.11	2.34	0.17	56.4	0.91	0.01	0.03
J529893 (4479212)	16.8	0.02	6.01	<0.01	7.96	1.36	1.90	0.12	2.23	0.19	52.3	0.90	0.02	0.03
J529894 (4479213)	11.0	0.07	2.54	<0.01	2.83	2.47	0.83	0.05	0.63	0.04	73.9	0.27	0.01	<0.01
J529895 (4479214)	10.6	0.03	1.00	<0.01	2.95	1.59	0.82	0.05	0.46	0.03	78.8	0.22	<0.01	<0.01
J529896 (4479215)	8.65	0.01	0.37	0.01	2.31	0.51	0.12	<0.01	0.60	0.02	83.8	0.18	<0.01	<0.01
J529897 (4479216)	15.8	0.03	4.27	0.01	8.82	1.81	3.00	0.11	0.97	0.16	55.6	0.86	0.01	0.02
J529898 (4479217)	16.6	0.02	6.05	0.01	9.80	0.43	4.67	0.14	0.68	0.18	50.6	0.90	<0.01	0.03
J529899 (4479218)	12.9	0.02	1.08	<0.01	4.38	0.45	2.20	0.06	0.23	0.02	74.4	0.25	<0.01	<0.01
N566351 (4479219)	10.1	<0.01	5.18	<0.01	3.99	0.10	3.80	0.11	0.22	0.03	68.9	0.21	<0.01	<0.01

Certified By: Ron Cardinall

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Certificate of Analysis

AGAT WORK ORDER: 13B728595

PROJECT NO: Sturgeon Lake

CLIENT NAME: XSTRATA ZINC STURGEON LAKE

ATTENTION TO: Lucy Potter

Lithium Borate Fusion - Summation of Oxides, XRF finish (201676)

DATE SAMPLED: Jun 21, 2013 | DATE RECEIVED: Jun 21, 2013 | DATE REPORTED: Jul 09, 2013 | SAMPLE TYPE: Drill Core

Analyte:	LOI	Total
Unit:	%	%
Sample ID (AGAT ID) RDL:	0.01	0.01
J529871 (4479190)	3.06	100
J529872 (4479191)	12.6	99.8
J529873 (4479192)	9.42	101
J529874 (4479193)	3.75	101
J529875 (4479194)	6.55	100
J529876 (4479195)	13.3	100
J529877 (4479196)	11.9	100
J529878 (4479197)	16.4	99.7
J529879 (4479198)	8.84	101
J529880 (4479199)	10.5	99.7
J529881 (4479200)	11.0	99.2
J529882 (4479201)	9.12	100
J529883 (4479202)	9.03	99.7
J529884 (4479203)	12.6	101
J529885 (4479204)	11.1	100
J529886 (4479205)	8.70	100
J529887 (4479206)	11.1	99.9
J529888 (4479207)	10.6	101
J529889 (4479208)	13.7	101
J529890 (4479209)	12.6	101
J529891 (4479210)	5.42	100
J529892 (4479211)	8.63	100
J529893 (4479212)	10.4	100
J529894 (4479213)	5.20	99.8
J529895 (4479214)	2.98	99.5
J529896 (4479215)	2.29	98.9
J529897 (4479216)	8.73	100
J529898 (4479217)	10.6	101
J529899 (4479218)	2.68	98.7
N566351 (4479219)	7.39	100

Comments: RDL - Reported Detection Limit

Certified By: Ron Cardinall

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Certificate of Analysis

AGAT WORK ORDER: 13B728595

PROJECT NO: Sturgeon Lake

CLIENT NAME: XSTRATA ZINC STURGEON LAKE

ATTENTION TO: Lucy Potter

Xstrata Zinc - Lithium Borate Fusion, ICP-MS finish (201078)

DATE SAMPLED: Jun 21, 2013 | DATE RECEIVED: Jun 21, 2013 | DATE REPORTED: Jul 09, 2013 | SAMPLE TYPE: Drill Core

Analyte:	Sample Login Weight	Ag	As	Ba	Cd	Ce	Co	Cr	Cs	Cu	Dy	Er	Eu	Ga
Unit:	kg	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Sample ID (AGAT ID) RDL:	0.01	1	0.5	0.5	0.05	0.5	0.5	10	0.01	1	0.05	0.03	0.03	0.01
J529871 (4479190)	1.48	<1	0.6	390	<0.05	89.0	1.6	46	0.45	5	8.70	5.41	1.45	15.8
J529872 (4479191)	1.42	<1	2.2	299	0.18	43.7	21.9	98	0.63	29	3.81	2.32	1.04	14.5
J529873 (4479192)	1.48	<1	3.3	458	0.31	41.3	17.0	26	0.34	24	3.96	2.32	1.20	16.1
J529874 (4479193)	1.62	<1	3.3	52.8	0.06	13.1	46.2	41	0.50	79	2.80	1.85	0.77	14.9
J529875 (4479194)	1.66	<1	2.7	82.7	0.28	13.2	45.4	36	2.67	81	2.91	1.85	0.68	13.5
J529876 (4479195)	1.56	<1	1.6	229	0.09	31.6	29.6	144	0.83	33	2.46	1.49	0.90	14.8
J529877 (4479196)	1.50	<1	1.1	113	0.12	9.7	39.0	42	0.38	93	2.20	1.44	0.63	12.2
J529878 (4479197)	1.50	<1	0.5	92.6	0.11	6.8	50.8	48	0.59	10	1.62	1.06	0.44	10.7
J529879 (4479198)	1.78	<1	2.0	513	0.07	31.7	19.9	76	1.60	30	3.36	1.93	1.13	15.3
J529880 (4479199)	1.60	<1	1.0	253	0.07	27.1	20.4	87	1.30	99	2.95	1.84	1.00	15.1
J529881 (4479200)	1.62	<1	1.5	219	0.08	29.6	27.1	54	1.03	87	3.00	1.84	1.03	14.4
J529882 (4479201)	1.68	<1	1.2	188	0.05	32.5	27.8	36	1.11	121	3.30	2.02	1.11	15.2
J529883 (4479202)	1.46	<1	1.2	155	<0.05	36.5	20.2	79	0.94	57	3.57	2.16	1.20	15.5
J529884 (4479203)	1.62	<1	0.7	235	0.07	27.3	29.4	222	1.11	31	2.67	1.67	0.89	13.6
J529885 (4479204)	1.44	<1	0.7	135	0.08	26.9	22.7	172	0.84	11	2.73	1.73	0.87	13.7
J529886 (4479205)	1.54	<1	1.2	176	<0.05	30.6	19.6	166	0.90	52	2.70	1.62	0.98	14.6
J529887 (4479206)	1.56	<1	1.1	136	0.06	29.6	22.6	143	0.65	47	2.59	1.54	0.96	13.4
J529888 (4479207)	1.40	<1	1.0	185	0.06	28.4	24.4	172	0.73	19	2.66	1.64	0.91	14.1
J529889 (4479208)	1.60	<1	1.2	128	0.08	27.6	26.1	172	0.68	46	2.50	1.55	0.93	12.9
J529890 (4479209)	1.40	<1	8.3	174	0.08	28.9	19.5	206	0.84	41	2.76	1.64	0.95	14.3
J529891 (4479210)	1.46	<1	6.2	221	0.56	67.6	10.2	40	0.85	64	7.09	3.99	1.46	12.0
J529892 (4479211)	1.60	<1	1.7	183	0.06	35.8	22.5	76	1.01	80	3.62	2.20	1.22	16.0
J529893 (4479212)	1.38	<1	12.9	161	0.08	36.0	26.5	39	0.95	9	3.74	2.26	1.18	17.0
J529894 (4479213)	1.36	<1	3.1	505	0.17	70.0	3.8	40	0.98	37	6.77	4.11	1.33	14.2
J529895 (4479214)	1.50	<1	2.3	195	<0.05	83.3	2.0	23	0.64	4	8.72	5.32	1.63	15.0
J529896 (4479215)	1.42	<1	9.2	77.5	<0.05	70.0	4.4	47	0.49	15	8.58	5.25	1.32	11.8
J529897 (4479216)	1.50	<1	1.8	172	0.06	31.8	26.0	69	1.15	58	3.28	2.01	1.10	16.2
J529898 (4479217)	1.66	<1	3.7	63.4	0.08	34.6	24.3	90	0.62	9	4.01	2.45	1.26	16.7
J529899 (4479218)	1.46	1	2.1	82.9	<0.05	104	2.0	19	0.41	201	10.0	6.22	1.59	19.2
N566351 (4479219)	1.52	<1	1.2	17.4	0.09	77.4	1.1	36	0.32	9	8.29	4.91	1.66	14.7

Certified By: Ron Cardinall

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Certificate of Analysis

AGAT WORK ORDER: 13B728595

PROJECT NO: Sturgeon Lake

CLIENT NAME: XSTRATA ZINC STURGEON LAKE

ATTENTION TO: Lucy Potter

Xstrata Zinc - Lithium Borate Fusion, ICP-MS finish (201078)

DATE SAMPLED: Jun 21, 2013 | DATE RECEIVED: Jun 21, 2013 | DATE REPORTED: Jul 09, 2013 | SAMPLE TYPE: Drill Core

Analyte:	Gd	Hf	Ho	La	Lu	Mo	Nb	Nd	Ni	Pb	Pr	Rb	Sc	Sm
Unit:	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Sample ID (AGAT ID) RDL:	0.05	0.2	0.01	0.5	0.01	2	0.2	0.1	1	1	0.03	0.2	0.05	0.03
J529871 (4479190)	10.2	8.9	1.83	42.5	0.77	4	21.6	46.9	7	5	12.4	39.9	40.3	9.45
J529872 (4479191)	4.76	4.0	0.80	21.1	0.33	<2	9.2	22.9	90	5	5.90	39.1	38.3	4.49
J529873 (4479192)	4.88	3.8	0.81	18.9	0.33	2	9.4	22.1	35	3	5.69	31.0	41.0	4.39
J529874 (4479193)	2.78	1.6	0.61	6.3	0.27	<2	2.8	8.1	38	5	1.85	3.6	62.2	2.12
J529875 (4479194)	2.78	1.4	0.63	6.4	0.27	<2	2.5	8.0	59	9	1.82	20.3	56.5	2.07
J529876 (4479195)	3.03	2.5	0.49	15.9	0.21	<2	5.9	15.2	140	6	3.96	45.5	38.3	2.85
J529877 (4479196)	2.15	1.1	0.48	4.6	0.20	<2	2.0	6.2	51	4	1.37	6.5	54.1	1.65
J529878 (4479197)	1.49	0.8	0.35	3.3	0.16	<2	1.3	4.1	123	3	0.95	15.3	47.9	1.11
J529879 (4479198)	4.02	3.1	0.67	14.7	0.26	<2	6.9	17.2	44	5	4.34	76.5	47.1	3.64
J529880 (4479199)	3.49	2.7	0.62	12.8	0.26	<2	6.3	14.6	49	5	3.64	44.1	44.2	3.10
J529881 (4479200)	3.73	2.7	0.62	14.3	0.26	<2	6.1	16.3	65	5	4.07	28.9	42.8	3.43
J529882 (4479201)	3.96	3.1	0.69	15.4	0.27	<2	7.1	17.4	44	4	4.50	35.3	44.0	3.59
J529883 (4479202)	4.29	3.4	0.75	17.5	0.29	<2	7.4	19.5	52	5	5.02	27.6	43.1	3.97
J529884 (4479203)	3.09	2.3	0.56	13.5	0.21	<2	5.2	14.5	137	5	3.76	27.6	44.4	2.84
J529885 (4479204)	3.13	2.4	0.59	13.1	0.24	<2	5.3	14.5	81	6	3.67	22.0	47.0	2.90
J529886 (4479205)	3.22	2.6	0.55	14.9	0.23	<2	5.9	15.5	83	4	4.07	27.1	46.3	2.99
J529887 (4479206)	3.22	2.7	0.53	14.7	0.22	<2	5.7	15.6	102	4	4.09	18.3	42.3	3.02
J529888 (4479207)	3.15	2.5	0.55	13.7	0.22	<2	5.4	15.1	104	3	3.96	26.5	44.7	2.93
J529889 (4479208)	3.19	2.3	0.52	13.5	0.21	<2	4.8	14.7	127	5	3.78	20.6	41.8	3.01
J529890 (4479209)	3.26	2.7	0.57	13.9	0.22	<2	5.7	15.5	84	7	3.96	27.1	42.8	2.99
J529891 (4479210)	8.68	6.0	1.41	31.8	0.54	3	13.9	38.2	24	11	9.74	33.7	42.4	8.13
J529892 (4479211)	4.39	3.3	0.76	17.5	0.30	<2	7.3	19.7	53	10	4.96	28.4	46.1	4.02
J529893 (4479212)	4.38	3.4	0.80	17.2	0.32	<2	7.5	19.4	47	13	5.03	33.3	44.9	4.01
J529894 (4479213)	7.82	7.1	1.42	33.4	0.59	2	16.6	37.9	11	34	9.83	72.8	40.1	7.53
J529895 (4479214)	10.2	9.6	1.84	38.7	0.78	<2	20.3	49.4	25	13	12.5	44.2	45.5	10.3
J529896 (4479215)	9.01	8.1	1.84	32.6	0.71	5	16.5	40.0	11	11	10.3	13.9	46.7	8.38
J529897 (4479216)	3.97	3.2	0.69	15.3	0.29	<2	7.0	17.4	60	20	4.43	48.1	46.3	3.67
J529898 (4479217)	4.60	3.2	0.84	16.5	0.33	<2	7.1	19.3	62	10	4.77	11.5	46.2	4.10
J529899 (4479218)	12.5	10.4	2.07	51.4	0.92	3	25.8	62.2	6	10	16.0	12.4	44.2	12.7
N566351 (4479219)	9.42	8.1	1.72	35.9	0.70	2	19.9	42.2	8	6	11.0	2.3	41.2	9.00

Certified By: Ron Cardinall

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Certificate of Analysis

AGAT WORK ORDER: 13B728595

PROJECT NO: Sturgeon Lake

CLIENT NAME: XSTRATA ZINC STURGEON LAKE

ATTENTION TO: Lucy Potter

Xstrata Zinc - Lithium Borate Fusion, ICP-MS finish (201078)

DATE SAMPLED: Jun 21, 2013 | DATE RECEIVED: Jun 21, 2013 | DATE REPORTED: Jul 09, 2013 | SAMPLE TYPE: Drill Core

Analyte:	Sn	Sr	Ta	Tb	Th	Tl	Tm	U	V	W	Y	Yb	Zn	Zr
Unit:	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Sample ID (AGAT ID) RDL:	1	0.1	0.1	0.01	0.05	0.5	0.01	0.05	1	1	0.5	0.03	1	2
J529871 (4479190)	3	37.5	1.4	1.60	7.62	<0.5	0.79	6.30	7	4	47.2	5.19	94	351
J529872 (4479191)	1	114	0.6	0.69	3.34	<0.5	0.34	2.23	116	1	20.6	2.18	395	162
J529873 (4479192)	1	24.8	0.6	0.71	3.57	<0.5	0.34	2.34	137	2	21.2	2.19	372	156
J529874 (4479193)	<1	162	0.2	0.46	1.40	<0.5	0.27	0.79	264	1	15.9	1.81	90	67
J529875 (4479194)	<1	255	0.2	0.47	1.26	<0.5	0.26	0.70	226	<1	16.9	1.80	87	61
J529876 (4479195)	<1	178	0.4	0.44	2.10	<0.5	0.22	1.09	141	<1	13.7	1.44	139	123
J529877 (4479196)	<1	101	0.1	0.35	0.96	<0.5	0.22	0.61	207	<1	12.6	1.40	71	45
J529878 (4479197)	<1	151	<0.1	0.26	0.61	<0.5	0.16	0.41	164	1	9.3	1.02	94	58
J529879 (4479198)	1	107	0.5	0.60	2.69	<0.5	0.27	1.40	155	<1	17.4	1.81	54	134
J529880 (4479199)	1	163	0.4	0.52	2.30	<0.5	0.27	1.41	140	2	16.1	1.71	62	121
J529881 (4479200)	<1	136	0.4	0.55	2.49	<0.5	0.26	1.27	145	3	16.4	1.73	80	121
J529882 (4479201)	1	168	0.5	0.60	2.83	<0.5	0.29	1.54	136	<1	17.2	1.84	51	131
J529883 (4479202)	1	139	0.5	0.65	3.07	<0.5	0.31	1.50	149	1	19.2	2.01	72	146
J529884 (4479203)	<1	135	0.3	0.47	1.82	<0.5	0.23	0.87	140	<1	14.4	1.49	61	103
J529885 (4479204)	<1	120	0.3	0.48	1.90	<0.5	0.25	0.82	159	2	14.6	1.66	58	107
J529886 (4479205)	<1	162	0.4	0.49	2.00	<0.5	0.24	0.71	147	1	14.3	1.56	65	120
J529887 (4479206)	<1	183	0.4	0.48	2.00	<0.5	0.23	0.74	135	<1	13.5	1.47	63	114
J529888 (4479207)	<1	177	0.4	0.47	1.96	<0.5	0.24	0.73	146	1	14.0	1.52	62	110
J529889 (4479208)	<1	208	0.3	0.46	1.71	<0.5	0.22	0.73	135	<1	12.9	1.44	71	104
J529890 (4479209)	<1	168	0.4	0.50	1.96	<0.5	0.24	0.93	150	1	14.7	1.49	68	124
J529891 (4479210)	2	133	1.0	1.33	5.92	0.6	0.57	3.73	33	1	34.3	3.67	169	230
J529892 (4479211)	1	122	0.5	0.65	2.98	<0.5	0.31	1.53	149	1	19.0	2.02	80	153
J529893 (4479212)	1	144	0.5	0.67	3.05	<0.5	0.32	0.84	147	<1	19.4	2.18	76	148
J529894 (4479213)	2	129	1.1	1.21	7.21	1.7	0.61	1.89	11	1	36.6	3.92	87	261
J529895 (4479214)	3	72.1	1.4	1.55	7.93	1.4	0.80	1.68	11	3	45.1	5.21	43	357
J529896 (4479215)	2	51.2	1.2	1.46	6.34	<0.5	0.75	1.50	6	2	46.5	4.84	11	311
J529897 (4479216)	1	89.5	0.5	0.59	2.78	<0.5	0.29	0.53	147	1	17.8	1.97	98	139
J529898 (4479217)	1	54.9	0.5	0.69	2.69	<0.5	0.35	0.57	145	1	21.3	2.25	112	138
J529899 (4479218)	3	26.5	1.7	1.82	9.41	<0.5	0.92	2.20	7	1	51.8	6.13	124	371
N566351 (4479219)	2	22.8	1.3	1.48	6.99	<0.5	0.72	1.86	9	2	44.1	4.65	80	288

Comments: RDL - Reported Detection Limit

Certified By: Ron Cardinall

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Quality Assurance - Replicate

AGAT WORK ORDER: 13B728595

PROJECT NO: Sturgeon Lake

CLIENT NAME: XSTRATA ZINC STURGEON LAKE

ATTENTION TO: Lucy Potter

Lithium Borate Fusion - Summation of Oxides, XRF finish (201676)

	REPLICATE #1															
Parameter	Sample ID	Original	Replicate	RPD												
Al2O3	4479190	10.9	10.9	0.0%												
BaO	4479190	0.06	0.06	0.0%												
CaO	4479190	0.19	0.20	5.1%												
Cr2O3	4479190	< 0.01	< 0.01	0.0%												
Fe2O3	4479190	3.62	3.69	1.9%												
K2O	4479190	1.95	1.92	1.6%												
MgO	4479190	2.35	2.48	5.4%												
MnO	4479190	0.04	0.05	22.2%												
Na2O	4479190	0.30	0.41	31.0%												
P2O5	4479190	0.02	0.03													
SiO2	4479190	77.4	76.6	1.0%												
TiO2	4479190	0.20	0.21	4.9%												
SrO	4479190	< 0.01	< 0.01	0.0%												
V2O5	4479190	< 0.01	< 0.01	0.0%												

Xstrata Zinc - Lithium Borate Fusion, ICP-MS finish (201078)

	REPLICATE #1				REPLICATE #2											
Parameter	Sample ID	Original	Replicate	RPD	Sample ID	Original	Replicate	RPD								
Ag	4479190	< 1	< 1	0.0%	4479210	< 1	< 1	0.0%								
As	4479190	0.64	0.67	4.6%	4479210	6.2	6.2	0.0%								
Ba	4479190	390	384	1.6%	4479210	221	220	0.5%								
Cd	4479190	< 0.05	< 0.05	0.0%	4479210	0.56	0.58	3.5%								
Ce	4479190	89.0	85.2	4.4%	4479210	67.6	75.7	11.3%								
Co	4479190	1.58	1.33	17.2%	4479210	10.2	10.1	1.0%								
Cr	4479190	46	45	2.2%	4479210	40	42	4.9%								
Cs	4479190	0.447	0.441	1.4%	4479210	0.853	0.844	1.1%								
Cu	4479190	5	5	0.0%	4479210	64	65	1.6%								
Dy	4479190	8.70	8.70	0.0%	4479210	7.09	7.13	0.6%								
Er	4479190	5.41	5.33	1.5%	4479210	3.99	3.97	0.5%								
Eu	4479190	1.45	1.42	2.1%	4479210	1.46	1.56	6.6%								
Ga	4479190	15.8	15.6	1.3%	4479210	12.0	12.1	0.8%								
Gd	4479190	10.2	10.1	1.0%	4479210	8.68	9.02	3.8%								

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AGAT WORK ORDER: 13B728595

PROJECT NO: Sturgeon Lake

CLIENT NAME: XSTRATA ZINC STURGEON LAKE

ATTENTION TO: Lucy Potter

Hf	4479190	8.9	8.9	0.0%	4479210	6.0	6.1	1.7%								
Ho	4479190	1.83	1.85	1.1%	4479210	1.41	1.40	0.7%								
La	4479190	42.5	42.0	1.2%	4479210	31.8	35.6	11.3%								
Lu	4479190	0.773	0.763	1.3%	4479210	0.543	0.566	4.1%								
Mo	4479190	4	4	0.0%	4479210	3	3	0.0%								
Nb	4479190	21.6	21.7	0.5%	4479210	13.9	13.5	2.9%								
Nd	4479190	46.9	47.1	0.4%	4479210	38.2	43.1	12.1%								
Ni	4479190	7	6	15.4%	4479210	24	24	0.0%								
Pb	4479190	5	5	0.0%	4479210	11	10	9.5%								
Pr	4479190	12.4	12.3	0.8%	4479210	9.74	10.9	11.2%								
Rb	4479190	39.9	39.1	2.0%	4479210	33.7	33.3	1.2%								
Sc	4479190	40.3	40.5	0.5%	4479210	42.4	42.9	1.2%								
Sm	4479190	9.45	9.42	0.3%	4479210	8.13	8.83	8.3%								
Sn	4479190	3	3	0.0%	4479210	2	2	0.0%								
Sr	4479190	37.5	36.8	1.9%	4479210	133	133	0.0%								
Ta	4479190	1.4	1.4	0.0%	4479210	1.0	1.0	0.0%								
Tb	4479190	1.60	1.56	2.5%	4479210	1.33	1.35	1.5%								
Th	4479190	7.62	7.73	1.4%	4479210	5.92	6.56	10.3%								
Tl	4479190	< 0.5	< 0.5	0.0%	4479210	0.6	0.6	0.0%								
Tm	4479190	0.79	0.79	0.0%	4479210	0.572	0.577	0.9%								
U	4479190	6.30	6.40	1.6%	4479210	3.73	3.46	7.5%								
V	4479190	7	7	0.0%	4479210	33	33	0.0%								
W	4479190	4	2		4479210	1	2									
Y	4479190	47.2	47.6	0.8%	4479210	34.3	34.2	0.3%								
Yb	4479190	5.19	5.16	0.6%	4479210	3.67	3.83	4.3%								
Zn	4479190	94	92	2.2%	4479210	169	174	2.9%								
Zr	4479190	351	350	0.3%	4479210	230	230	0.0%								

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Quality Assurance - Certified Reference materials

AGAT WORK ORDER: 13B728595

PROJECT NO: Sturgeon Lake

CLIENT NAME: XSTRATA ZINC STURGEON LAKE

ATTENTION TO: Lucy Potter

Lithium Borate Fusion - Summation of Oxides, XRF finish (201676)

	CRM #1				CRM #2 (SY-4)											
Parameter	Expect	Actual	Recovery	Limits	Expect	Actual	Recovery	Limits								
Al2O3	20.69	20.63	99%	90% - 110%												
BaO	0.04	0.04	100%	90% - 110%												
CaO	8.05	7.96	98%	90% - 110%												
Fe2O3	6.21	6.28	101%	90% - 110%												
K2O	1.66	1.63	98%	90% - 110%												
MgO	0.54	0.52	96%	90% - 110%												
MnO	0.108	0.110	101%	90% - 110%												
Na2O	7.10	7.11	100%	90% - 110%												
P2O5	0.131	0.130	99%	90% - 110%												
SiO2	49.9	49.5	99%	90% - 110%												
TiO2	0.287	0.290	101%	90% - 110%												
SrO	0.14	0.14	100%	90% - 110%												

Xstrata Zinc - Lithium Borate Fusion, ICP-MS finish (201078)

	CRM #1 (SY-4)				CRM #2 (SY-4)											
Parameter	Expect	Actual	Recovery	Limits	Expect	Actual	Recovery	Limits								
Ba	340	312	91%	90% - 110%	340	324	95%	90% - 110%								
Ce	122	114	94%	90% - 110%	122	114	93%	90% - 110%								
Co	2.8	2.6	92%	90% - 110%	2.8	2.5	88%	90% - 110%								
Cu	7	7	103%	90% - 110%	7	7	107%	90% - 110%								
Dy	18.2	18.6	102%	90% - 110%	18.2	19.6	108%	90% - 110%								
Er	14.2	14.5	102%	90% - 110%	14.2	15.6	110%	90% - 110%								
Eu	2	2	105%	90% - 110%	2	2	100%	90% - 110%								
Ga	35	32	91%	90% - 110%	35	32	91%	90% - 110%								
Gd	14	16	114%	90% - 110%	14	15.4	110%	90% - 110%								
Hf	10.6	9.9	93%	90% - 110%	10.6	9.8	92%	90% - 110%								
Ho	4.3	4.4	102%	90% - 110%	4.3	4.7	110%	90% - 110%								
La	58	59	101%	90% - 110%	58	59	102%	90% - 110%								
Lu	2.1	2	96%	90% - 110%	2.1	2.1	101%	90% - 110%								
Nb	13	14	111%	90% - 110%	13	14	107%	90% - 110%								
Nd	57	62	108%	90% - 110%	57	67	118%	90% - 110%								
Pb	10	9	90%	90% - 110%	10	9	92%	90% - 110%								

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CLIENT NAME: XSTRATA ZINC STURGEON LAKE

ATTENTION TO: Lucy Potter

Pr	15	16	109%	90% - 110%	15	16.5	110%	90% - 110%								
Rb	55	53	97%	90% - 110%	55	53	96%	90% - 110%								
Sm	12.9	13.4	104%	90% - 110%	12.9	14.3	111%	90% - 110%								
Sr	1191	1126	95%	90% - 110%	1191	1122	94%	90% - 110%								
Ta	0.9	0.8	87%	90% - 110%	0.9	0.8	93%	90% - 110%								
Tb	2.6	2.8	109%	90% - 110%	2.6	3	116%	90% - 110%								
Th	1.4	1.3	94%	90% - 110%	1.4	1.6	111%	90% - 110%								
Tm	2.3	2.3	98%	90% - 110%	2.3	2.4	105%	90% - 110%								
Yb	14.8	14.8	100%	90% - 110%	14.8	15.7	106%	90% - 110%								
Zn	93	84	91%	90% - 110%	93	84	91%	90% - 110%								
Zr	517	511	99%	90% - 110%	517	472	91%	90% - 110%								

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Method Summary

CLIENT NAME: XSTRATA ZINC STURGEON LAKE

AGAT WORK ORDER: 13B728595

PROJECT NO: Sturgeon Lake

ATTENTION TO: Lucy Potter

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Solid Analysis			
Al2O3	MIN-200-12027		XRF
BaO	MIN-200-12027		XRF
CaO	MIN-200-12027		XRF
Cr2O3	MIN-200-12027		XRF
Fe2O3	MIN-200-12027		XRF
K2O	MIN-200-12027		XRF
MgO	MIN-200-12027		XRF
MnO	MIN-200-12027		XRF
Na2O	MIN-200-12027		XRF
P2O5	MIN-200-12027		XRF
SiO2	MIN-200-12027		XRF
TiO2	MIN-200-12027		XRF
SrO	MIN-200-12027		XRF
V2O5	MIN-200-12027		XRF
LOI	MIN-200-12021		GRAVIMETRIC
Total	MIN-200-12027		CALCULATION
Sample Login Weight	MIN-12009		BALANCE
Ag	MIN-200-12016		ICP-MS
As	MIN-200-12016		ICP-MS
Ba	MIN-200-12016		ICP-MS
Cd	MIN-200-12016		ICP-MS
Ce	MIN-200-12016		ICP-MS
Co	MIN-200-12016		ICP-MS
Cr	MIN-200-12016		ICP-MS
Cs	MIN-200-12016		ICP-MS
Cu	MIN-200-12016		ICP-MS
Dy	MIN-200-12016		ICP-MS
Er	MIN-200-12016		ICP-MS
Eu	MIN-200-12016		ICP-MS
Ga	MIN-200-12016		ICP-MS
Gd	MIN-200-12016		ICP-MS
Hf	MIN-200-12016		ICP-MS
Ho	MIN-200-12016		ICP-MS
La	MIN-200-12016		ICP-MS
Lu	MIN-200-12016		ICP-MS
Mo	MIN-200-12016		ICP-MS
Nb	MIN-200-12016		ICP-MS
Nd	MIN-200-12016		ICP-MS
Ni	MIN-200-12016		ICP-MS
Pb	MIN-200-12016		ICP-MS
Pr	MIN-200-12016		ICP-MS
Rb	MIN-200-12016		ICP-MS
Sc	MIN-200-12016		ICP-MS
Sm	MIN-200-12016		ICP-MS
Sn	MIN-200-12016		ICP-MS
Sr	MIN-200-12016		ICP-MS
Ta	MIN-200-12016		ICP-MS
Tb	MIN-200-12016		ICP-MS
Th	MIN-200-12016		ICP-MS

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Method Summary

CLIENT NAME: XSTRATA ZINC STURGEON LAKE

AGAT WORK ORDER: 13B728595

PROJECT NO: Sturgeon Lake

ATTENTION TO: Lucy Potter

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Tl	MIN-200-12016		ICP-MS
Tm	MIN-200-12016		ICP-MS
U	MIN-200-12016		ICP-MS
V	MIN-200-12016		ICP-MS
W	MIN-200-12016		ICP-MS
Y	MIN-200-12016		ICP-MS
Yb	MIN-200-12016		ICP-MS
Zn	MIN-200-12016		ICP-MS
Zr	MIN-200-12016		ICP-MS

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CLIENT NAME: XSTRATA ZINC STURGEON LAKE
8801 RTE TRANSCANADIENNE
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ATTENTION TO: Lucy Potter

PROJECT NO: Sturgeon Lake

AGAT WORK ORDER: 13B728569

SOLID ANALYSIS REVIEWED BY: Ron Cardinall, Certified Assayer - Director - Technical Services (Mining)

DATE REPORTED: Jul 12, 2013

PAGES (INCLUDING COVER): 21

Should you require any information regarding this analysis please contact your client services representative at (905) 501-9998

*NOTES

All samples are stored at no charge for 90 days. Please contact the lab if you require additional sample storage time.

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Certificate of Analysis

AGAT WORK ORDER: 13B728569

PROJECT NO: Sturgeon Lake

CLIENT NAME: XSTRATA ZINC STURGEON LAKE

ATTENTION TO: Lucy Potter

Xstrata Zinc - Sturgeon Lake

DATE SAMPLED: Jun 21, 2013 | DATE RECEIVED: Jun 20, 2013 | DATE REPORTED: Jul 12, 2013 | SAMPLE TYPE: Drill Core

Analyte:	Sample Login Weight	Au	Ag	Al	As	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr	Cu
Unit:	kg	ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm
Sample ID (AGAT ID) RDL:	0.01	0.001	2.5	0.25	5	5	2.5	5	0.05	2.5	5	2.5	2.5	2.5
M829266 (4478545)	3.62	<0.001	<2.5	7.52	<5	239	<2.5	<5	2.51	<2.5	38	23.2	76.4	30.6
M829267 (4478546)	1.30	0.003	<2.5	4.27	<5	142	<2.5	<5	3.08	<2.5	28	12.7	27.5	105
M829268 (4478547)	2.22	<0.001	<2.5	7.27	<5	292	<2.5	<5	1.17	<2.5	40	2.9	48.1	32.4
M829269 (4478548)	2.72	0.010	<2.5	3.67	<5	155	<2.5	<5	1.12	<2.5	31	31.5	36.3	168
M829270 (4478549)	2.98	0.024	<2.5	2.38	<5	100	<2.5	<5	1.37	<2.5	20	71.6	71.7	168
M829271 (4478550)	1.60	<0.001	<2.5	4.53	<5	192	<2.5	<5	1.51	<2.5	43	28.1	38.7	152
M829272 (4478551)	3.48	<0.001	<2.5	7.27	<5	278	<2.5	<5	2.47	<2.5	27	21.5	50.7	25.4
M829273 (4478552)	3.62	<0.001	<2.5	8.27	<5	333	<2.5	<5	3.07	<2.5	33	76.6	32.4	44.4
M829274 (4478553)	4.10	<0.001	<2.5	8.68	5	271	<2.5	<5	3.13	<2.5	36	49.1	39.5	37.9
M829275 (4478554)	2.12	<0.001	<2.5	7.63	<5	190	<2.5	<5	5.71	<2.5	30	32.1	165	52.5
M829276 (4478555)	2.64	0.025	<2.5	2.19	<5	43	<2.5	<5	0.80	<2.5	21	83.7	43.7	195
M829277 (4478556)	1.78	0.002	<2.5	6.76	<5	362	<2.5	<5	1.09	<2.5	78	9.2	27.4	60.0
M829278 (4478557)	1.70	<0.001	<2.5	5.64	<5	180	<2.5	<5	7.99	<2.5	91	36.7	587	<2.5
M829279 (4478558)	3.46	<0.001	<2.5	5.52	<5	343	<2.5	<5	2.07	<2.5	84	14.0	21.6	152
M829280 (4478559)	2.46	<0.001	<2.5	8.04	<5	254	<2.5	<5	2.99	<2.5	38	27.3	55.1	65.6
M829281 (4478560)	2.60	0.009	<2.5	7.28	<5	231	<2.5	<5	1.16	<2.5	43	43.4	72.1	220
M829282 (4478561)	2.22	0.004	<2.5	6.98	<5	257	<2.5	<5	1.64	<2.5	47	60.0	61.6	120
M829283 (4478562)	2.34	<0.001	<2.5	7.08	<5	381	<2.5	<5	2.75	<2.5	47	13.3	15.6	66.5
M829284 (4478563)	1.56	<0.001	<2.5	7.16	<5	454	<2.5	<5	4.67	<2.5	55	30.3	52.8	96.3
M829285 (4478564)	1.50	<0.001	<2.5	7.09	<5	439	<2.5	<5	4.66	<2.5	51	25.6	35.6	106
M829286 (4478565)	3.94	<0.001	<2.5	5.73	6	177	<2.5	<5	9.32	<2.5	38	48.5	991	20.8
M829287 (4478566)	3.54	<0.001	<2.5	4.88	<5	47	<2.5	<5	8.15	<2.5	33	47.4	896	4.2
M829288 (4478567)	2.38	0.005	<2.5	7.30	<5	590	<2.5	<5	1.84	<2.5	59	16.8	122	156
M829289 (4478568)	1.58	0.004	<2.5	7.29	<5	511	<2.5	<5	0.48	4.9	56	20.7	36.3	301
M829290 (4478569)	0.06	0.083	42.4	4.13	10	114	<2.5	110	0.79	87.5	66	175	23.1	11800
M829291 (4478570)	2.36	0.002	<2.5	5.65	<5	717	<2.5	<5	3.62	<2.5	56	33.9	125	95.0
M829292 (4478571)	2.58	<0.001	<2.5	5.90	<5	806	<2.5	<5	4.52	<2.5	62	21.8	289	29.9
M829293 (4478572)	2.34	0.002	<2.5	5.56	<5	663	<2.5	<5	2.26	<2.5	67	6.4	48.4	83.2
M829294 (4478573)	1.32	<0.001	<2.5	5.76	<5	670	<2.5	<5	7.43	<2.5	54	33.2	449	3.7
M829295 (4478574)	3.34	<0.001	<2.5	6.18	<5	688	<2.5	<5	1.37	<2.5	75	2.7	45.6	26.7
M829296 (4478575)	3.52	<0.001	<2.5	5.67	<5	597	<2.5	<5	1.31	<2.5	66	6.6	19.2	59.7

Certified By: Ron Cardinall

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Certificate of Analysis

AGAT WORK ORDER: 13B728569

PROJECT NO: Sturgeon Lake

CLIENT NAME: XSTRATA ZINC STURGEON LAKE

ATTENTION TO: Lucy Potter

Xstrata Zinc - Sturgeon Lake

DATE SAMPLED: Jun 21, 2013 | DATE RECEIVED: Jun 20, 2013 | DATE REPORTED: Jul 12, 2013 | SAMPLE TYPE: Drill Core

Analyte:	Sample Login Weight	Au	Ag	Al	As	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr	Cu
Unit:	kg	ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm
Sample ID (AGAT ID) RDL:	0.01	0.001	2.5	0.25	5	5	2.5	5	0.05	2.5	5	2.5	2.5	2.5
M829297 (4478576)	3.38	0.003	<2.5	6.16	<5	631	<2.5	<5	1.39	3.1	75	11.0	53.2	175
M829298 (4478577)	3.48	0.004	<2.5	5.72	<5	552	<2.5	<5	1.47	3.9	64	12.2	51.0	190
M829299 (4478578)	3.54	0.004	<2.5	5.80	<5	459	<2.5	<5	1.76	<2.5	67	12.4	22.5	116
M829300 (4478579)	2.30	0.003	<2.5	7.37	<5	159	<2.5	<5	6.51	<2.5	28	30.9	173	67.6
M829301 (4478580)	3.40	<0.001	<2.5	5.64	<5	503	<2.5	<5	1.72	<2.5	64	7.3	34.3	38.1
M829302 (4478581)	3.70	<0.001	<2.5	6.02	<5	595	<2.5	<5	0.65	<2.5	78	<2.5	31.4	30.2
M829303 (4478582)	3.52	<0.001	<2.5	6.37	<5	499	<2.5	<5	4.06	<2.5	68	19.8	188	13.6
M829304 (4478583)	3.64	<0.001	<2.5	5.90	<5	499	<2.5	<5	1.15	<2.5	78	2.7	40.2	2.8
M829305 (4478584)	4.76	0.001	<2.5	4.94	<5	342	<2.5	<5	2.05	<2.5	54	15.8	69.1	121
M829306 (4478585)	2.66	<0.001	<2.5	5.07	<5	303	<2.5	<5	0.98	5.9	61	22.1	17.3	401
M829307 (4478586)	3.48	0.001	<2.5	8.13	<5	397	<2.5	<5	1.38	<2.5	36	28.9	66.5	62.1
M829308 (4478587)	3.68	0.001	<2.5	8.47	<5	375	<2.5	<5	1.16	<2.5	35	24.7	62.4	53.4
M829309 (4478588)	1.20	0.002	<2.5	6.69	<5	290	<2.5	<5	0.26	<2.5	23	44.7	110	108
M829310 (4478589)	1.26	0.028	<2.5	6.72	<5	280	<2.5	<5	0.40	<2.5	26	26.2	66.2	78.8
M829311 (4478590)	4.40	0.008	<2.5	3.95	<5	133	<2.5	<5	0.99	<2.5	50	27.1	38.9	44.3
M829312 (4478591)	3.48	<0.001	<2.5	8.57	<5	470	<2.5	<5	1.20	<2.5	34	16.8	49.1	22.9
M829313 (4478592)	3.32	<0.001	<2.5	8.01	<5	445	<2.5	<5	1.36	<2.5	59	20.6	111	33.1
M829314 (4478593)	3.56	<0.001	<2.5	5.50	<5	284	<2.5	<5	1.01	<2.5	48	15.5	16.4	43.4
M829315 (4478594)	0.06	0.109	41.4	4.29	11	117	<2.5	114	0.83	91.5	66	182	23.7	12200
M829316 (4478595)	3.68	<0.001	<2.5	5.52	<5	203	<2.5	<5	1.21	<2.5	62	15.3	52.8	87.6
M829317 (4478596)	3.54	<0.001	<2.5	5.56	<5	284	<2.5	<5	2.34	<2.5	65	3.8	9.3	<2.5
M829318 (4478597)	2.66	<0.001	<2.5	5.39	<5	158	<2.5	<5	2.63	<2.5	62	8.5	43.2	36.2
M829319 (4478598)	1.22	0.002	<2.5	4.25	<5	44	<2.5	<5	3.20	5.8	40	24.3	16.0	343
M829320 (4478599)	1.06	<0.001	<2.5	6.62	<5	287	<2.5	<5	0.70	<2.5	91	<2.5	52.1	<2.5
M829321 (4478600)	3.18	<0.001	<2.5	5.50	<5	229	<2.5	<5	1.49	<2.5	81	2.6	9.2	<2.5
M829322 (4478601)	3.38	<0.001	<2.5	6.00	<5	185	<2.5	<5	1.48	<2.5	86	6.0	30.1	7.9
M829323 (4478602)	3.18	<0.001	<2.5	6.02	<5	193	<2.5	<5	0.91	<2.5	78	6.0	11.9	8.2
M829324 (4478603)	1.14	<0.001	<2.5	6.14	<5	117	<2.5	<5	1.15	<2.5	82	3.4	29.2	<2.5
M829325 (4478604)	2.18	0.002	<2.5	7.19	<5	229	<2.5	<5	6.39	<2.5	27	31.1	164	24.5
M829326 (4478605)	2.20	0.010	<2.5	3.35	18	111	<2.5	8	0.54	<2.5	31	15.7	50.6	18.6
M829327 (4478606)	1.24	<0.001	<2.5	4.43	10	93	<2.5	<5	1.92	<2.5	49	2.8	14.6	<2.5

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AGAT WORK ORDER: 13B728569

PROJECT NO: Sturgeon Lake

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ATTENTION TO: Lucy Potter

Xstrata Zinc - Sturgeon Lake

DATE SAMPLED: Jun 21, 2013 | DATE RECEIVED: Jun 20, 2013 | DATE REPORTED: Jul 12, 2013 | SAMPLE TYPE: Drill Core

Analyte:	Sample Login Weight	Au	Ag	Al	As	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr	Cu
Unit:	kg	ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm
Sample ID (AGAT ID) RDL:	0.01	0.001	2.5	0.25	5	5	2.5	5	0.05	2.5	5	2.5	2.5	2.5
M829328 (4478607)	3.60	<0.001	<2.5	4.33	<5	129	<2.5	<5	1.71	<2.5	47	3.6	48.1	<2.5
M829329 (4478608)	3.66	<0.001	<2.5	4.02	<5	150	<2.5	<5	0.83	<2.5	45	3.5	20.7	11.4
M829330 (4478609)	3.12	<0.001	<2.5	3.28	<5	48	<2.5	<5	3.11	<2.5	42	<2.5	52.3	10.3
M829331 (4478610)	1.90	<0.001	<2.5	7.05	<5	183	<2.5	<5	1.03	<2.5	93	2.8	10.4	<2.5
M829332 (4478611)	2.74	0.009	<2.5	5.11	<5	121	<2.5	<5	1.43	<2.5	72	4.2	53.9	38.8
M829333 (4478612)	3.54	0.003	<2.5	3.24	<5	68	<2.5	<5	0.11	<2.5	59	2.9	49.0	2.7
M829334 (4478613)	1.64	0.027	<2.5	3.80	<5	67	<2.5	<5	0.16	<2.5	50	2.8	107	6.7
M829335 (4478614)	1.66	0.001	<2.5	3.55	<5	73	<2.5	<5	0.16	<2.5	45	3.5	54.1	48.8
M829336 (4478615)	3.48	0.003	<2.5	3.01	<5	69	<2.5	<5	0.18	<2.5	49	4.5	81.9	5.7
M829337 (4478616)	3.92	0.006	<2.5	5.08	<5	130	<2.5	<5	0.21	<2.5	96	5.2	19.8	14.7
M829338 (4478617)	3.36	0.004	<2.5	4.48	<5	122	<2.5	<5	0.38	<2.5	57	4.3	59.0	14.1
M829339 (4478618)	3.32	<0.001	<2.5	2.70	<5	85	<2.5	<5	0.23	<2.5	44	<2.5	18.4	11.5
M829340 (4478619)	0.06	0.080	42.6	4.10	8	112	<2.5	101	0.79	93.3	75	184	23.6	11800
M829341 (4478620)	3.26	0.003	<2.5	2.40	<5	57	<2.5	<5	0.05	<2.5	40	6.9	170	32.3
M829342 (4478621)	3.50	<0.001	<2.5	2.91	<5	56	<2.5	<5	0.15	<2.5	47	5.0	160	38.7
M829343 (4478622)	3.50	0.003	<2.5	5.57	<5	82	<2.5	<5	0.27	<2.5	81	8.0	109	44.3
M829344 (4478623)	2.78	0.002	<2.5	5.00	<5	66	<2.5	<5	0.33	<2.5	79	6.0	118	33.2
M829345 (4478624)	3.64	<0.001	<2.5	3.10	<5	64	<2.5	<5	0.63	<2.5	38	6.7	96.9	49.0
M829346 (4478625)	1.88	<0.001	<2.5	3.67	<5	148	<2.5	<5	0.28	<2.5	59	9.4	109	9.1
M829347 (4478626)	1.10	0.005	<2.5	3.26	<5	134	<2.5	<5	0.26	<2.5	41	16.0	95.6	9.5
M829348 (4478627)	2.28	0.005	2.8	6.35	<5	178	<2.5	<5	3.18	<2.5	209	33.3	191	271
M829349 (4478628)	3.64	<0.001	<2.5	7.44	<5	232	<2.5	<5	1.13	<2.5	23	18.6	142	9.0
M829350 (4478629)	2.18	<0.001	<2.5	7.37	<5	243	<2.5	<5	5.82	<2.5	27	31.0	180	40.5
M829351 (4478630)	3.80	0.002	<2.5	8.41	<5	53	<2.5	<5	0.97	<2.5	45	37.3	127	81.5
M829352 (4478631)	3.76	<0.001	<2.5	7.81	<5	178	<2.5	<5	5.21	<2.5	26	32.6	94.4	126
M829353 (4478632)	3.74	0.008	<2.5	6.05	<5	126	<2.5	<5	1.62	<2.5	77	6.6	71.0	24.3
M829354 (4478633)	3.60	<0.001	<2.5	5.60	<5	81	<2.5	<5	2.18	<2.5	70	5.1	57.1	<2.5
M829355 (4478634)	3.56	<0.001	<2.5	5.24	<5	73	<2.5	<5	2.07	<2.5	69	3.0	54.3	4.3
M829356 (4478635)	3.90	<0.001	<2.5	5.28	<5	91	<2.5	<5	2.58	<2.5	64	<2.5	56.5	<2.5
M829357 (4478636)	1.50	0.019	<2.5	1.90	23	11	<2.5	<5	5.20	<2.5	26	21.3	61.8	75.4
M829358 (4478637)	3.54	<0.001	<2.5	5.29	<5	161	<2.5	<5	3.63	<2.5	79	<2.5	73.8	34.6

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Certificate of Analysis

AGAT WORK ORDER: 13B728569

PROJECT NO: Sturgeon Lake

CLIENT NAME: XSTRATA ZINC STURGEON LAKE

ATTENTION TO: Lucy Potter

Xstrata Zinc - Sturgeon Lake

DATE SAMPLED: Jun 21, 2013 | DATE RECEIVED: Jun 20, 2013 | DATE REPORTED: Jul 12, 2013 | SAMPLE TYPE: Drill Core

Analyte:	Sample Login Weight	Au	Ag	Al	As	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr	Cu
Unit:	kg	ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm
Sample ID (AGAT ID) RDL:	0.01	0.001	2.5	0.25	5	5	2.5	5	0.05	2.5	5	2.5	2.5	2.5
M829359 (4478638)	1.64	<0.001	<2.5	5.18	<5	278	<2.5	<5	2.19	<2.5	75	<2.5	71.0	<2.5
M829360 (4478639)	1.72	<0.001	<2.5	4.83	<5	290	<2.5	<5	1.91	<2.5	65	<2.5	52.8	<2.5
M829361 (4478640)	3.30	0.005	<2.5	2.72	14	36	<2.5	<5	5.92	<2.5	45	5.9	65.7	11.0
M829362 (4478641)	3.68	0.004	<2.5	5.40	<5	370	<2.5	<5	1.80	<2.5	84	<2.5	97.3	6.6
M829363 (4478642)	3.58	<0.001	<2.5	4.99	<5	490	<2.5	<5	1.55	<2.5	84	<2.5	87.7	6.6
M829364 (4478643)	3.60	<0.001	<2.5	4.64	<5	469	<2.5	<5	1.85	<2.5	76	<2.5	91.0	13.3
M829365 (4478644)	0.06	0.104	43.5	3.74	22	113	<2.5	112	0.79	91.1	67	183	25.0	12400
M829366 (4478645)	3.76	<0.001	<2.5	5.34	<5	596	<2.5	<5	1.94	<2.5	82	<2.5	82.9	11.6
M829367 (4478646)	4.38	<0.001	<2.5	5.34	<5	645	<2.5	<5	1.42	<2.5	88	<2.5	90.2	<2.5
M829368 (4478647)	3.36	0.004	<2.5	4.83	<5	135	<2.5	<5	4.21	<2.5	77	<2.5	29.4	<2.5

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AGAT WORK ORDER: 13B728569

PROJECT NO: Sturgeon Lake

CLIENT NAME: XSTRATA ZINC STURGEON LAKE

ATTENTION TO: Lucy Potter

Xstrata Zinc - Sturgeon Lake

DATE SAMPLED: Jun 21, 2013 | DATE RECEIVED: Jun 20, 2013 | DATE REPORTED: Jul 12, 2013 | SAMPLE TYPE: Drill Core

Analyte:	Fe	Ga	In	K	La	Li	Mg	Mn	Mo	Na	Ni	P	Pb	Rb
Unit:	%	ppm	ppm	%	ppm	ppm	%	ppm	ppm	%	ppm	ppm	ppm	ppm
Sample ID (AGAT ID) RDL:	0.05	25	5	0.05	10	5	0.05	5	2.5	0.05	2.5	50	5	50
M829266 (4478545)	3.70	<25	<5	1.02	16	24	1.14	765	<2.5	1.29	36.0	458	23	<50
M829267 (4478546)	8.31	<25	<5	0.63	11	12	0.99	916	<2.5	0.81	40.3	211	13	<50
M829268 (4478547)	2.15	<25	<5	1.45	18	13	0.41	304	<2.5	1.15	11.5	727	24	64
M829269 (4478548)	13.9	<25	<5	0.81	11	9	0.60	498	2.7	0.47	46.1	290	16	<50
M829270 (4478549)	22.1	<25	<5	0.54	<10	7	0.65	617	3.6	0.23	65.1	239	18	<50
M829271 (4478550)	12.8	<25	<5	1.04	18	10	0.65	547	<2.5	0.59	52.0	273	14	<50
M829272 (4478551)	2.66	<25	<5	1.39	12	14	0.71	591	<2.5	1.32	36.5	462	21	63
M829273 (4478552)	3.43	<25	<5	1.93	15	13	0.97	763	<2.5	1.21	108	846	20	97
M829274 (4478553)	4.82	<25	<5	1.75	16	14	1.31	1140	<2.5	2.02	80.7	835	20	89
M829275 (4478554)	5.75	<25	<5	0.47	13	20	2.27	901	<2.5	2.09	138	551	5	<50
M829276 (4478555)	27.3	<25	<5	0.19	<10	38	1.04	2540	<2.5	0.78	95.0	91	19	<50
M829277 (4478556)	4.71	<25	<5	1.51	32	14	0.85	386	<2.5	1.29	22.4	224	29	75
M829278 (4478557)	5.66	<25	<5	0.68	38	33	5.64	1310	<2.5	1.11	210	1580	9	<50
M829279 (4478558)	3.15	<25	<5	1.28	34	13	0.91	350	<2.5	0.77	30.2	158	16	65
M829280 (4478559)	6.12	<25	<5	1.37	17	15	1.00	1210	<2.5	0.80	60.8	749	31	69
M829281 (4478560)	9.51	<25	<5	1.11	19	22	0.95	903	<2.5	0.80	123	454	36	56
M829282 (4478561)	9.33	<25	<5	1.20	19	23	1.25	925	<2.5	0.86	92.2	673	34	60
M829283 (4478562)	4.14	<25	<5	1.63	18	13	1.17	1260	<2.5	0.71	29.8	686	23	86
M829284 (4478563)	4.10	<25	<5	1.64	23	17	2.17	788	<2.5	0.81	42.5	995	25	97
M829285 (4478564)	5.19	<25	<5	1.63	21	17	2.15	799	<2.5	0.81	43.3	869	23	91
M829286 (4478565)	5.09	<25	<5	0.70	18	35	6.64	1190	<2.5	0.54	217	816	17	<50
M829287 (4478566)	5.57	<25	<5	0.19	15	51	8.79	1110	<2.5	0.05	362	660	5	<50
M829288 (4478567)	2.22	<25	<5	2.58	27	11	1.45	384	<2.5	0.40	59.6	640	56	156
M829289 (4478568)	4.20	<25	<5	2.28	23	10	0.78	166	<2.5	0.92	74.5	378	178	144
M829290 (4478569)	18.1	<25	6	1.52	28	29	1.30	870	18.1	0.49	13.5	154	4840	86
M829291 (4478570)	4.82	<25	<5	1.77	23	9	1.83	683	4.4	0.78	48.1	383	247	117
M829292 (4478571)	4.45	<25	<5	1.58	24	20	2.93	802	<2.5	0.64	83.3	799	46	107
M829293 (4478572)	2.05	<25	<5	2.08	27	5	0.93	371	<2.5	0.38	12.3	274	25	135
M829294 (4478573)	6.54	<25	<5	1.39	22	33	4.72	1100	<2.5	0.19	141	1250	17	97
M829295 (4478574)	1.58	<25	<5	2.16	30	<5	0.43	226	<2.5	0.40	3.9	138	34	129
M829296 (4478575)	1.63	<25	<5	1.89	26	<5	0.34	255	<2.5	0.41	4.5	160	49	108
M829297 (4478576)	2.11	<25	<5	2.03	30	6	0.38	265	<2.5	0.47	14.4	137	74	116

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Certificate of Analysis

AGAT WORK ORDER: 13B728569

PROJECT NO: Sturgeon Lake

CLIENT NAME: XSTRATA ZINC STURGEON LAKE

ATTENTION TO: Lucy Potter

Xstrata Zinc - Sturgeon Lake

DATE SAMPLED: Jun 21, 2013 | DATE RECEIVED: Jun 20, 2013 | DATE REPORTED: Jul 12, 2013 | SAMPLE TYPE: Drill Core

Analyte:	Fe	Ga	In	K	La	Li	Mg	Mn	Mo	Na	Ni	P	Pb	Rb
Unit:	%	ppm	ppm	%	ppm	ppm	%	ppm	ppm	%	ppm	ppm	ppm	ppm
Sample ID (AGAT ID) RDL:	0.05	25	5	0.05	10	5	0.05	5	2.5	0.05	2.5	50	5	50
M829298 (4478577)	3.87	<25	<5	1.82	25	5	0.48	467	<2.5	0.35	20.1	118	61	104
M829299 (4478578)	6.37	<25	7	1.40	26	9	0.81	1090	<2.5	0.22	25.3	209	45	81
M829300 (4478579)	5.57	<25	<5	0.38	13	21	2.51	978	<2.5	2.02	132	560	11	<50
M829301 (4478580)	4.39	<25	<5	1.50	26	8	0.76	989	<2.5	0.27	17.1	166	44	91
M829302 (4478581)	1.46	<25	<5	1.93	31	8	0.51	151	<2.5	0.42	6.4	88	49	116
M829303 (4478582)	3.30	<25	<5	1.82	27	17	2.41	561	<2.5	0.40	79.7	475	31	109
M829304 (4478583)	1.52	<25	<5	1.66	31	<5	0.47	243	<2.5	0.39	3.3	<50	34	102
M829305 (4478584)	6.62	<25	<5	1.40	22	10	1.16	1440	<2.5	0.20	40.7	128	35	75
M829306 (4478585)	9.93	<25	<5	1.66	24	7	0.65	884	<2.5	0.21	50.9	210	35	93
M829307 (4478586)	5.02	<25	<5	2.40	16	10	0.77	1050	<2.5	0.37	69.1	748	34	140
M829308 (4478587)	4.62	<25	<5	2.40	15	11	0.68	758	<2.5	0.43	91.1	693	36	138
M829309 (4478588)	3.61	<25	<5	1.86	11	8	0.36	321	2.8	0.36	61.8	258	39	105
M829310 (4478589)	3.75	<25	<5	1.80	12	11	0.46	371	<2.5	0.35	63.2	282	34	101
M829311 (4478590)	10.6	<25	<5	0.73	20	11	1.13	1620	<2.5	0.14	59.1	221	23	<50
M829312 (4478591)	4.24	<25	<5	2.47	15	13	0.82	605	<2.5	0.49	64.5	588	33	142
M829313 (4478592)	4.70	<25	<5	2.27	25	17	1.27	637	<2.5	0.39	113	381	28	129
M829314 (4478593)	8.49	<25	<5	1.29	20	9	1.22	2060	<2.5	0.19	50.6	230	21	71
M829315 (4478594)	18.8	<25	5	1.58	28	30	1.34	894	18.6	0.51	14.1	172	4990	89
M829316 (4478595)	8.18	<25	<5	0.90	24	11	1.25	1340	<2.5	0.19	44.1	72	20	<50
M829317 (4478596)	1.98	<25	<5	1.43	25	<5	0.92	540	<2.5	0.45	5.3	103	23	80
M829318 (4478597)	4.82	<25	<5	0.89	24	9	1.34	844	<2.5	0.34	14.2	57	29	<50
M829319 (4478598)	11.2	<25	<5	0.23	16	8	1.97	1570	<2.5	0.06	63.4	64	397	<50
M829320 (4478599)	2.42	<25	<5	1.41	38	<5	0.48	406	<2.5	0.37	6.2	156	26	72
M829321 (4478600)	2.15	<25	<5	1.20	33	7	0.78	449	<2.5	0.36	7.6	104	25	63
M829322 (4478601)	3.60	<25	<5	0.95	33	17	0.96	706	<2.5	0.43	12.9	151	24	51
M829323 (4478602)	2.74	<25	<5	0.84	30	18	0.55	354	<2.5	0.42	9.7	91	24	<50
M829324 (4478603)	2.45	<25	<5	0.43	32	41	0.65	185	<2.5	0.47	8.1	53	23	<50
M829325 (4478604)	5.56	<25	<5	0.47	11	22	2.80	921	<2.5	1.87	138	557	9	<50
M829326 (4478605)	20.6	<25	<5	0.26	10	18	0.33	178	11.8	0.26	49.7	<50	55	<50
M829327 (4478606)	2.63	<25	<5	0.27	22	32	0.89	425	<2.5	0.33	4.4	<50	17	<50
M829328 (4478607)	4.23	<25	<5	0.39	18	23	0.74	450	<2.5	0.31	4.5	<50	40	<50
M829329 (4478608)	3.51	<25	<5	0.41	17	13	0.59	450	<2.5	0.18	7.4	70	16	<50

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Certificate of Analysis

AGAT WORK ORDER: 13B728569

PROJECT NO: Sturgeon Lake

CLIENT NAME: XSTRATA ZINC STURGEON LAKE

ATTENTION TO: Lucy Potter

Xstrata Zinc - Sturgeon Lake

DATE SAMPLED: Jun 21, 2013 | DATE RECEIVED: Jun 20, 2013 | DATE REPORTED: Jul 12, 2013 | SAMPLE TYPE: Drill Core

Analyte:	Fe	Ga	In	K	La	Li	Mg	Mn	Mo	Na	Ni	P	Pb	Rb
Unit:	%	ppm	ppm	%	ppm	ppm	%	ppm	ppm	%	ppm	ppm	ppm	ppm
Sample ID (AGAT ID) RDL:	0.05	25	5	0.05	10	5	0.05	5	2.5	0.05	2.5	50	5	50
M829330 (4478609)	2.21	<25	<5	0.09	16	28	1.21	528	<2.5	0.22	3.2	<50	<5	<50
M829331 (4478610)	1.68	<25	<5	0.49	35	45	0.34	74	<2.5	0.63	5.1	109	26	<50
M829332 (4478611)	7.13	<25	<5	0.37	28	28	0.80	289	7.7	0.47	9.0	93	19	<50
M829333 (4478612)	1.74	<25	<5	0.24	23	8	<0.05	<5	2.8	0.25	3.9	72	16	<50
M829334 (4478613)	2.42	<25	<5	0.26	19	13	0.19	31	3.7	0.36	3.9	87	19	<50
M829335 (4478614)	2.23	<25	<5	0.26	16	13	0.14	10	3.0	0.35	3.6	107	34	<50
M829336 (4478615)	2.46	<25	<5	0.26	18	12	0.10	11	2.9	0.30	4.4	56	17	<50
M829337 (4478616)	3.84	<25	<5	0.50	35	17	0.05	<5	9.5	0.50	6.2	136	24	<50
M829338 (4478617)	3.17	<25	<5	0.39	21	21	0.22	27	3.5	0.49	4.3	89	19	<50
M829339 (4478618)	1.18	<25	<5	0.32	18	11	0.13	26	3.3	0.32	<2.5	<50	17	<50
M829340 (4478619)	18.2	<25	<5	1.51	32	28	1.29	848	17.7	0.49	12.8	201	5040	90
M829341 (4478620)	2.74	<25	<5	0.26	16	5	<0.05	22	3.9	0.26	9.3	<50	22	<50
M829342 (4478621)	2.12	<25	<5	0.26	17	9	0.14	41	8.0	0.31	7.4	<50	18	<50
M829343 (4478622)	3.14	<25	<5	0.40	31	14	0.18	156	3.8	0.47	12.3	77	24	<50
M829344 (4478623)	2.59	<25	<5	0.33	29	17	0.20	73	<2.5	0.46	11.2	101	25	<50
M829345 (4478624)	3.65	<25	<5	0.29	14	28	0.40	65	9.7	0.47	10.1	51	23	<50
M829346 (4478625)	2.47	<25	<5	0.74	23	14	0.10	36	5.6	0.59	14.6	98	29	<50
M829347 (4478626)	4.63	<25	<5	0.59	16	14	0.15	139	3.5	0.53	22.5	<50	31	<50
M829348 (4478627)	5.73	<25	<5	0.74	88	18	1.82	1500	7.5	0.56	50.9	509	32	<50
M829349 (4478628)	4.39	<25	<5	1.04	<10	14	1.09	818	<2.5	0.64	57.0	385	35	<50
M829350 (4478629)	5.42	<25	<5	0.47	13	23	2.71	907	<2.5	1.83	142	558	9	<50
M829351 (4478630)	7.40	<25	<5	0.26	20	14	1.85	1250	<2.5	0.17	85.0	826	25	<50
M829352 (4478631)	6.51	<25	<5	0.96	12	5	2.54	1290	<2.5	0.32	51.4	545	20	<50
M829353 (4478632)	3.43	<25	<5	0.64	30	17	1.15	535	<2.5	0.43	15.3	107	23	<50
M829354 (4478633)	2.71	<25	<5	0.32	27	39	1.24	434	<2.5	0.48	7.7	97	16	<50
M829355 (4478634)	3.13	<25	<5	0.23	27	34	1.26	479	<2.5	0.36	7.3	103	14	<50
M829356 (4478635)	2.76	<25	<5	0.27	24	34	1.30	552	<2.5	0.38	4.6	55	15	<50
M829357 (4478636)	18.6	<25	<5	<0.05	<10	10	2.27	1250	3.1	0.10	31.8	<50	<5	<50
M829358 (4478637)	3.22	<25	<5	0.41	32	27	1.87	867	<2.5	0.34	16.2	120	14	<50
M829359 (4478638)	2.32	<25	<5	0.64	29	28	1.08	521	<2.5	0.43	5.8	<50	24	<50
M829360 (4478639)	2.17	<25	<5	0.68	29	28	0.99	462	3.5	0.44	4.0	<50	17	<50
M829361 (4478640)	15.8	<25	<5	0.08	18	6	3.03	2280	<2.5	<0.05	17.1	<50	<5	<50

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Certificate of Analysis

AGAT WORK ORDER: 13B728569

PROJECT NO: Sturgeon Lake

CLIENT NAME: XSTRATA ZINC STURGEON LAKE

ATTENTION TO: Lucy Potter

Xstrata Zinc - Sturgeon Lake

DATE SAMPLED: Jun 21, 2013 | DATE RECEIVED: Jun 20, 2013 | DATE REPORTED: Jul 12, 2013 | SAMPLE TYPE: Drill Core

Analyte:	Fe	Ga	In	K	La	Li	Mg	Mn	Mo	Na	Ni	P	Pb	Rb
Unit:	%	ppm	ppm	%	ppm	ppm	%	ppm	ppm	%	ppm	ppm	ppm	ppm
Sample ID (AGAT ID) RDL:	0.05	25	5	0.05	10	5	0.05	5	2.5	0.05	2.5	50	5	50
M829362 (4478641)	5.17	<25	<5	0.66	35	12	1.24	971	3.3	0.27	5.2	55	23	<50
M829363 (4478642)	4.34	<25	<5	0.70	35	8	1.14	910	2.8	0.20	<2.5	<50	15	<50
M829364 (4478643)	4.06	<25	<5	0.53	31	10	1.31	875	<2.5	0.14	5.2	<50	13	<50
M829365 (4478644)	18.3	<25	<5	1.58	28	30	1.27	888	18.3	0.52	15.7	204	4950	86
M829366 (4478645)	3.32	<25	<5	0.66	34	12	1.12	795	2.9	0.17	<2.5	74	17	<50
M829367 (4478646)	3.92	<25	<5	0.91	36	14	1.17	737	<2.5	0.16	7.3	98	17	<50
M829368 (4478647)	2.32	<25	<5	0.27	32	32	1.91	896	<2.5	0.18	<2.5	<50	8	<50

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DATE SAMPLED: Jun 21, 2013 | DATE RECEIVED: Jun 20, 2013 | DATE REPORTED: Jul 12, 2013 | SAMPLE TYPE: Drill Core

Analyte:	Sulfur	Sb	Sc	Se	Sn	Sr	Ta	Te	Th	Ti	Tl	U	V	W
Unit:	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
Sample ID (AGAT ID) RDL:	0.025	5	5	50	25	5	50	50	25	0.05	25	25	2.5	5
M829266 (4478545)	0.699	<5	13	<50	<25	100	<50	<50	<25	0.08	<25	<25	70.3	<5
M829267 (4478546)	4.09	<5	11	<50	<25	72	<50	<50	<25	0.06	<25	<25	56.3	<5
M829268 (4478547)	0.663	<5	14	<50	<25	113	<50	<50	<25	0.10	<25	<25	114	<5
M829269 (4478548)	10.4	<5	15	<50	<25	41	<50	<50	27	0.06	<25	<25	55.9	<5
M829270 (4478549)	18.5	<5	12	<50	<25	36	<50	<50	33	<0.05	<25	<25	37.9	<5
M829271 (4478550)	8.69	<5	12	<50	<25	67	<50	<50	26	<0.05	<25	<25	50.3	<5
M829272 (4478551)	0.535	<5	11	<50	<25	149	<50	<50	<25	0.08	<25	<25	63.8	<5
M829273 (4478552)	0.724	<5	22	<50	<25	158	<50	<50	<25	0.13	<25	<25	141	<5
M829274 (4478553)	0.548	<5	21	<50	<25	149	<50	<50	<25	0.16	<25	<25	131	<5
M829275 (4478554)	0.037	<5	20	<50	<25	182	<50	<50	<25	0.15	<25	<25	113	<5
M829276 (4478555)	18.4	<5	15	<50	<25	50	<50	<50	43	<0.05	<25	<25	33.3	<5
M829277 (4478556)	2.67	<5	9	<50	<25	151	<50	<50	<25	0.09	<25	<25	12.2	<5
M829278 (4478557)	0.096	<5	26	<50	<25	154	<50	<50	<25	0.14	<25	<25	135	<5
M829279 (4478558)	1.19	<5	9	<50	<25	146	<50	<50	<25	0.06	<25	<25	24.8	<5
M829280 (4478559)	0.494	<5	22	<50	<25	81	<50	<50	<25	0.18	<25	<25	130	<5
M829281 (4478560)	3.38	<5	20	<50	<25	121	<50	<50	<25	0.11	<25	<25	115	<5
M829282 (4478561)	3.72	<5	21	<50	<25	142	<50	<50	<25	0.17	<25	<25	112	<5
M829283 (4478562)	0.791	<5	10	<50	<25	170	<50	<50	<25	0.19	<25	<25	44.8	<5
M829284 (4478563)	0.688	<5	15	<50	<25	286	<50	<50	<25	0.14	<25	<25	79.0	<5
M829285 (4478564)	1.91	<5	14	<50	<25	279	<50	<50	<25	0.13	<25	<25	73.3	<5
M829286 (4478565)	0.103	<5	30	<50	<25	351	<50	<50	<25	<0.05	<25	<25	102	<5
M829287 (4478566)	0.034	<5	25	<50	<25	184	<50	<50	<25	<0.05	<25	<25	88.1	<5
M829288 (4478567)	0.456	<5	9	<50	<25	149	<50	<50	<25	0.13	<25	<25	39.3	<5
M829289 (4478568)	1.42	<5	13	<50	<25	164	<50	<50	<25	0.09	<25	<25	66.2	<5
M829290 (4478569)	15.9	26	<5	<50	34	25	<50	<50	35	0.06	<25	<25	<2.5	<5
M829291 (4478570)	2.11	<5	13	<50	<25	256	<50	<50	<25	0.07	<25	<25	39.7	<5
M829292 (4478571)	0.565	<5	17	<50	<25	288	<50	<50	<25	0.08	<25	<25	74.3	<5
M829293 (4478572)	0.120	<5	6	<50	<25	176	<50	<50	<25	0.07	<25	<25	6.4	<5
M829294 (4478573)	0.290	<5	23	<50	<25	242	<50	<50	<25	0.09	<25	<25	144	<5
M829295 (4478574)	0.096	<5	<5	<50	<25	152	<50	<50	<25	0.08	<25	<25	<2.5	<5
M829296 (4478575)	0.111	<5	<5	<50	<25	126	<50	<50	<25	0.07	<25	<25	<2.5	<5
M829297 (4478576)	0.631	<5	5	<50	<25	139	<50	<50	<25	0.07	<25	<25	3.5	<5

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Certificate of Analysis

AGAT WORK ORDER: 13B728569

PROJECT NO: Sturgeon Lake

CLIENT NAME: XSTRATA ZINC STURGEON LAKE

ATTENTION TO: Lucy Potter

Xstrata Zinc - Sturgeon Lake

DATE SAMPLED: Jun 21, 2013 | DATE RECEIVED: Jun 20, 2013 | DATE REPORTED: Jul 12, 2013 | SAMPLE TYPE: Drill Core

Analyte:	Sulfur	Sb	Sc	Se	Sn	Sr	Ta	Te	Th	Ti	Tl	U	V	W
Unit:	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
Sample ID (AGAT ID) RDL:	0.025	5	5	50	25	5	50	50	25	0.05	25	25	2.5	5
M829298 (4478577)	1.71	<5	<5	<50	<25	130	<50	<50	<25	0.06	<25	<25	<2.5	<5
M829299 (4478578)	1.59	<5	6	<50	<25	86	<50	<50	<25	0.06	<25	<25	<2.5	<5
M829300 (4478579)	0.038	<5	20	<50	<25	223	<50	<50	<25	0.10	<25	<25	102	<5
M829301 (4478580)	0.601	<5	6	<50	<25	97	<50	<50	<25	0.05	<25	<25	3.7	<5
M829302 (4478581)	0.047	<5	<5	<50	<25	139	<50	<50	<25	<0.05	<25	<25	<2.5	<5
M829303 (4478582)	0.026	<5	11	<50	<25	153	<50	<50	<25	0.06	<25	<25	36.6	<5
M829304 (4478583)	<0.025	<5	<5	<50	<25	115	<50	<50	<25	<0.05	<25	<25	<2.5	<5
M829305 (4478584)	0.777	<5	9	<50	<25	87	<50	<50	<25	<0.05	<25	<25	6.6	<5
M829306 (4478585)	6.75	<5	12	<50	<25	85	<50	<50	27	0.05	<25	<25	16.5	<5
M829307 (4478586)	0.233	<5	22	<50	<25	130	<50	<50	<25	0.10	<25	<25	147	<5
M829308 (4478587)	0.130	<5	24	<50	<25	159	<50	<50	<25	0.09	<25	<25	169	<5
M829309 (4478588)	0.631	<5	19	<50	<25	123	<50	<50	<25	0.08	<25	<25	141	<5
M829310 (4478589)	0.311	<5	20	<50	<25	118	<50	<50	<25	0.07	<25	<25	132	<5
M829311 (4478590)	2.69	<5	18	<50	<25	53	<50	<50	<25	<0.05	<25	<25	31.4	<5
M829312 (4478591)	0.115	<5	19	<50	<25	179	<50	<50	<25	0.07	<25	<25	153	<5
M829313 (4478592)	0.229	<5	17	<50	<25	140	<50	<50	<25	0.07	<25	<25	86.2	<5
M829314 (4478593)	0.493	<5	13	<50	<25	78	<50	<50	<25	<0.05	<25	<25	26.2	<5
M829315 (4478594)	16.5	31	<5	<50	36	32	<50	<50	36	0.06	<25	<25	<2.5	<5
M829316 (4478595)	0.742	<5	10	<50	<25	63	<50	<50	<25	<0.05	<25	<25	<2.5	<5
M829317 (4478596)	0.252	<5	6	<50	<25	116	<50	<50	<25	<0.05	<25	<25	<2.5	<5
M829318 (4478597)	0.686	<5	8	<50	<25	93	<50	<50	<25	<0.05	<25	<25	<2.5	<5
M829319 (4478598)	4.07	13	9	<50	<25	26	<50	<50	<25	<0.05	<25	<25	<2.5	<5
M829320 (4478599)	<0.025	<5	8	<50	<25	78	<50	<50	<25	0.05	<25	<25	<2.5	<5
M829321 (4478600)	0.195	<5	8	<50	<25	82	<50	<50	<25	<0.05	<25	<25	<2.5	<5
M829322 (4478601)	0.392	<5	9	<50	<25	77	<50	<50	<25	<0.05	<25	<25	<2.5	<5
M829323 (4478602)	0.689	<5	8	<50	<25	66	<50	<50	<25	0.05	<25	<25	<2.5	<5
M829324 (4478603)	0.979	<5	8	<50	<25	69	<50	<50	<25	0.05	<25	<25	<2.5	<5
M829325 (4478604)	0.032	<5	20	<50	<25	192	<50	<50	<25	0.14	<25	<25	102	<5
M829326 (4478605)	>10	<5	7	<50	<25	52	<50	<50	36	<0.05	<25	<25	<2.5	<5
M829327 (4478606)	1.23	<5	9	<50	<25	71	<50	<50	<25	<0.05	<25	<25	<2.5	<5
M829328 (4478607)	2.79	<5	6	<50	<25	48	<50	<50	<25	<0.05	<25	<25	<2.5	<5
M829329 (4478608)	1.03	<5	7	<50	<25	13	<50	<50	<25	<0.05	<25	<25	<2.5	<5

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Certificate of Analysis

AGAT WORK ORDER: 13B728569

PROJECT NO: Sturgeon Lake

CLIENT NAME: XSTRATA ZINC STURGEON LAKE

ATTENTION TO: Lucy Potter

Xstrata Zinc - Sturgeon Lake

DATE SAMPLED: Jun 21, 2013 | DATE RECEIVED: Jun 20, 2013 | DATE REPORTED: Jul 12, 2013 | SAMPLE TYPE: Drill Core

Analyte:	Sulfur	Sb	Sc	Se	Sn	Sr	Ta	Te	Th	Ti	Tl	U	V	W
Unit:	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
Sample ID (AGAT ID) RDL:	0.025	5	5	50	25	5	50	50	25	0.05	25	25	2.5	5
M829330 (4478609)	0.673	<5	<5	<50	<25	30	<50	<50	<25	<0.05	<25	<25	<2.5	<5
M829331 (4478610)	0.667	<5	11	<50	<25	75	<50	<50	<25	0.05	<25	<25	<2.5	<5
M829332 (4478611)	6.53	<5	8	<50	<25	57	<50	<50	<25	<0.05	<25	<25	<2.5	<5
M829333 (4478612)	1.59	<5	6	<50	<25	14	<50	<50	<25	<0.05	<25	<25	<2.5	<5
M829334 (4478613)	2.15	<5	7	<50	<25	49	<50	<50	<25	<0.05	<25	<25	<2.5	<5
M829335 (4478614)	2.04	<5	6	<50	<25	31	<50	<50	<25	<0.05	<25	<25	<2.5	13
M829336 (4478615)	2.32	<5	6	<50	<25	30	<50	<50	<25	<0.05	<25	<25	<2.5	<5
M829337 (4478616)	3.95	<5	10	<50	<25	45	<50	<50	<25	<0.05	<25	<25	<2.5	<5
M829338 (4478617)	2.97	<5	7	<50	<25	62	<50	<50	<25	<0.05	<25	<25	<2.5	<5
M829339 (4478618)	0.874	<5	<5	<50	<25	30	<50	<50	<25	<0.05	<25	<25	<2.5	<5
M829340 (4478619)	15.9	29	<5	<50	39	31	<50	<50	40	0.06	<25	<25	<2.5	<5
M829341 (4478620)	2.56	<5	<5	<50	<25	26	<50	<50	<25	<0.05	<25	<25	<2.5	<5
M829342 (4478621)	1.78	<5	<5	<50	<25	29	<50	<50	<25	<0.05	<25	<25	<2.5	<5
M829343 (4478622)	2.31	<5	8	<50	<25	50	<50	<50	<25	0.05	<25	<25	<2.5	<5
M829344 (4478623)	2.05	<5	8	<50	<25	50	<50	<50	<25	0.06	<25	<25	<2.5	<5
M829345 (4478624)	3.21	<5	5	<50	<25	44	<50	<50	<25	<0.05	<25	<25	<2.5	<5
M829346 (4478625)	2.19	<5	6	<50	<25	54	<50	<50	<25	<0.05	<25	<25	7.2	<5
M829347 (4478626)	3.99	<5	9	<50	<25	62	<50	<50	<25	<0.05	<25	<25	23.6	<5
M829348 (4478627)	1.43	<5	20	<50	<25	79	<50	<50	26	0.06	<25	<25	41.2	<5
M829349 (4478628)	0.500	<5	16	<50	<25	86	<50	<50	<25	0.09	<25	<25	87.1	<5
M829350 (4478629)	0.033	<5	20	<50	<25	207	<50	<50	<25	0.08	<25	<25	105	<5
M829351 (4478630)	0.042	<5	26	<50	<25	23	<50	<50	<25	0.12	<25	<25	149	<5
M829352 (4478631)	0.151	<5	20	<50	<25	44	<50	<50	<25	0.10	<25	<25	102	<5
M829353 (4478632)	0.134	<5	9	<50	<25	36	<50	<50	<25	<0.05	<25	<25	<2.5	<5
M829354 (4478633)	0.442	<5	8	<50	<25	42	<50	<50	<25	<0.05	<25	<25	<2.5	<5
M829355 (4478634)	0.793	<5	7	<50	<25	25	<50	<50	<25	<0.05	<25	<25	<2.5	<5
M829356 (4478635)	0.561	<5	7	<50	<25	42	<50	<50	<25	<0.05	<25	<25	<2.5	<5
M829357 (4478636)	18.1	<5	6	<50	<25	12	<50	<50	<25	<0.05	<25	<25	<2.5	<5
M829358 (4478637)	0.329	<5	8	<50	<25	25	<50	<50	<25	<0.05	<25	<25	<2.5	<5
M829359 (4478638)	0.159	<5	7	<50	<25	53	<50	<50	<25	<0.05	<25	<25	<2.5	<5
M829360 (4478639)	0.068	<5	6	<50	<25	31	<50	<50	<25	<0.05	<25	<25	<2.5	<5
M829361 (4478640)	11.6	<5	7	<50	<25	<5	<50	<50	30	<0.05	<25	<25	<2.5	<5

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Certificate of Analysis

AGAT WORK ORDER: 13B728569

PROJECT NO: Sturgeon Lake

CLIENT NAME: XSTRATA ZINC STURGEON LAKE

ATTENTION TO: Lucy Potter

Xstrata Zinc - Sturgeon Lake

DATE SAMPLED: Jun 21, 2013 | DATE RECEIVED: Jun 20, 2013 | DATE REPORTED: Jul 12, 2013 | SAMPLE TYPE: Drill Core

Analyte:	Sulfur	Sb	Sc	Se	Sn	Sr	Ta	Te	Th	Ti	Tl	U	V	W
Unit:	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
Sample ID (AGAT ID) RDL:	0.025	5	5	50	25	5	50	50	25	0.05	25	25	2.5	5
M829362 (4478641)	1.73	<5	9	<50	<25	35	<50	<50	<25	<0.05	<25	<25	<2.5	<5
M829363 (4478642)	0.789	<5	7	<50	<25	28	<50	<50	<25	<0.05	<25	<25	<2.5	<5
M829364 (4478643)	0.669	<5	7	<50	<25	12	<50	<50	<25	<0.05	<25	<25	<2.5	<5
M829365 (4478644)	16.0	30	<5	<50	35	9	<50	<50	36	0.06	<25	<25	<2.5	7
M829366 (4478645)	0.383	<5	7	<50	<25	21	<50	<50	<25	<0.05	<25	<25	<2.5	<5
M829367 (4478646)	0.420	<5	8	<50	<25	13	<50	<50	<25	<0.05	<25	<25	<2.5	<5
M829368 (4478647)	0.044	<5	6	<50	<25	20	<50	<50	<25	<0.05	<25	<25	<2.5	<5

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DATE SAMPLED: Jun 21, 2013 | DATE RECEIVED: Jun 20, 2013 | DATE REPORTED: Jul 12, 2013 | SAMPLE TYPE: Drill Core

Analyte:	Y	Zn	Zr
Unit:	ppm	ppm	ppm
Sample ID (AGAT ID) RDL:	5	2.5	25
M829266 (4478545)	9	380	146
M829267 (4478546)	8	254	105
M829268 (4478547)	8	36.6	126
M829269 (4478548)	7	136	116
M829270 (4478549)	6	94.4	86
M829271 (4478550)	9	344	137
M829272 (4478551)	7	14.7	116
M829273 (4478552)	8	27.3	148
M829274 (4478553)	9	164	149
M829275 (4478554)	7	78.6	102
M829276 (4478555)	6	491	65
M829277 (4478556)	16	473	269
M829278 (4478557)	12	277	73
M829279 (4478558)	18	525	241
M829280 (4478559)	10	150	145
M829281 (4478560)	8	1150	160
M829282 (4478561)	10	536	187
M829283 (4478562)	12	97.6	184
M829284 (4478563)	9	100	153
M829285 (4478564)	9	86.1	152
M829286 (4478565)	<5	198	45
M829287 (4478566)	<5	329	38
M829288 (4478567)	14	825	203
M829289 (4478568)	14	1870	248
M829290 (4478569)	14	31400	119
M829291 (4478570)	13	818	189
M829292 (4478571)	13	370	176
M829293 (4478572)	20	56.7	253
M829294 (4478573)	11	313	60
M829295 (4478574)	21	31.3	253
M829296 (4478575)	22	656	247
M829297 (4478576)	21	1590	273

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Analyte:	Y	Zn	Zr
Unit:	ppm	ppm	ppm
Sample ID (AGAT ID) RDL:	5	2.5	25
M829298 (4478577)	20	2030	245
M829299 (4478578)	21	920	225
M829300 (4478579)	7	90.9	80
M829301 (4478580)	21	258	228
M829302 (4478581)	20	201	263
M829303 (4478582)	14	164	186
M829304 (4478583)	21	40.5	238
M829305 (4478584)	17	664	222
M829306 (4478585)	22	2580	219
M829307 (4478586)	10	225	165
M829308 (4478587)	9	210	178
M829309 (4478588)	8	120	173
M829310 (4478589)	9	137	196
M829311 (4478590)	19	242	237
M829312 (4478591)	11	133	171
M829313 (4478592)	11	152	226
M829314 (4478593)	23	183	261
M829315 (4478594)	14	33000	122
M829316 (4478595)	30	198	334
M829317 (4478596)	30	31.9	314
M829318 (4478597)	28	145	273
M829319 (4478598)	26	3740	245
M829320 (4478599)	33	69.0	392
M829321 (4478600)	27	103	313
M829322 (4478601)	26	80.1	347
M829323 (4478602)	25	87.4	357
M829324 (4478603)	21	81.8	367
M829325 (4478604)	9	76.4	96
M829326 (4478605)	11	248	182
M829327 (4478606)	19	45.1	267
M829328 (4478607)	20	68.4	275
M829329 (4478608)	21	90.5	258

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Analyte:	Y	Zn	Zr
Unit:	ppm	ppm	ppm
Sample ID (AGAT ID) RDL:	5	2.5	25
M829330 (4478609)	15	53.1	188
M829331 (4478610)	29	45.1	462
M829332 (4478611)	19	99.9	279
M829333 (4478612)	20	71.4	256
M829334 (4478613)	20	55.4	280
M829335 (4478614)	19	161	264
M829336 (4478615)	19	13.6	258
M829337 (4478616)	23	52.2	347
M829338 (4478617)	23	24.0	279
M829339 (4478618)	21	16.7	210
M829340 (4478619)	15	31700	129
M829341 (4478620)	21	86.5	182
M829342 (4478621)	22	27.1	195
M829343 (4478622)	25	39.7	347
M829344 (4478623)	29	32.8	380
M829345 (4478624)	18	132	260
M829346 (4478625)	18	24.5	318
M829347 (4478626)	17	36.5	326
M829348 (4478627)	38	127	486
M829349 (4478628)	14	112	238
M829350 (4478629)	9	68.3	95
M829351 (4478630)	11	183	146
M829352 (4478631)	10	103	116
M829353 (4478632)	23	87.8	331
M829354 (4478633)	22	80.5	365
M829355 (4478634)	21	80.1	304
M829356 (4478635)	21	76.9	311
M829357 (4478636)	21	60.6	290
M829358 (4478637)	25	102	342
M829359 (4478638)	27	103	332
M829360 (4478639)	20	70.5	294
M829361 (4478640)	20	142	211

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DATE SAMPLED: Jun 21, 2013 | DATE RECEIVED: Jun 20, 2013 | DATE REPORTED: Jul 12, 2013 | SAMPLE TYPE: Drill Core

Analyte:	Y	Zn	Zr
Unit:	ppm	ppm	ppm
Sample ID (AGAT ID) RDL:	5	2.5	25
M829362 (4478641)	35	136	423
M829363 (4478642)	27	122	348
M829364 (4478643)	25	119	278
M829365 (4478644)	15	31700	132
M829366 (4478645)	30	113	361
M829367 (4478646)	28	135	370
M829368 (4478647)	29	98.4	290

Comments: RDL - Reported Detection Limit

Certified By: Ron Cardinall

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Quality Assurance - Replicate

AGAT WORK ORDER: 13B728569

PROJECT NO: Sturgeon Lake

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ATTENTION TO: Lucy Potter

Xstrata Zinc - Sturgeon Lake

	REPLICATE #1				REPLICATE #2				REPLICATE #3				REPLICATE #4			
Parameter	Sample ID	Original	Replicate	RPD	Sample ID	Original	Replicate	RPD	Sample ID	Original	Replicate	RPD	Sample ID	Original	Replicate	RPD
Au	4478545	< 0.001	< 0.001	0.0%	4478557	< 0.001	< 0.001	0.0%	4478607	< 0.001	< 0.001	0.0%	4478582	< 0.001	< 0.001	0.0%
Ag	4478624	< 2.5	< 2.5	0.0%	4478645	< 2.5	< 2.5	0.0%	4478589	< 2.5	< 2.5	0.0%	4478607	< 2.5	< 2.5	0.0%
Al	4478624	3.10	2.53	20.2%	4478645	5.34	5.46	2.2%	4478589	6.72	6.79	1.0%	4478607	4.33	4.28	1.2%
As	4478624	< 5	< 5	0.0%	4478645	< 5	< 5	0.0%	4478589	< 5	< 5	0.0%	4478607	< 5	< 5	0.0%
Ba	4478624	64	56	13.3%	4478645	596	608	2.0%	4478589	280	284	1.4%	4478607	129	120	7.2%
Be	4478624	< 2.5	< 2.5	0.0%	4478645	< 2.5	< 2.5	0.0%	4478589	< 2.5	< 2.5	0.0%	4478607	< 2.5	< 2.5	0.0%
Bi	4478624	< 5	< 5	0.0%	4478645	< 5	< 5	0.0%	4478589	< 5	< 5	0.0%	4478607	< 5	< 5	0.0%
Ca	4478624	0.625	0.546	13.5%	4478645	1.94	1.95	0.5%	4478589	0.403	0.410	1.7%	4478607	1.71	1.65	3.6%
Cd	4478624	< 2.5	< 2.5	0.0%	4478645	< 2.5	< 2.5	0.0%	4478589	< 2.5	< 2.5	0.0%	4478607	< 2.5	< 2.5	0.0%
Ce	4478624	38	37	2.7%	4478645	82	74	10.3%	4478589	26	22	16.7%	4478607	47	49	4.2%
Co	4478624	6.7	6.1	9.4%	4478645	< 2.5	< 2.5	0.0%	4478589	26.2	25.4	3.1%	4478607	3.60	3.31	8.4%
Cr	4478624	96.9	92.2	5.0%	4478645	82.9	83.1	0.2%	4478589	66.2	59.4	10.8%	4478607	48.1	44.8	7.1%
Cu	4478551	25.4	26.4	3.9%	4478645	11.6	10.0	14.8%	4478589	78.8	83.4	5.7%	4478607	< 2.5	< 2.5	0.0%
Fe	4478624	3.65	3.28	10.7%	4478645	3.32	3.33	0.3%	4478589	3.75	3.77	0.5%	4478607	4.23	4.20	0.7%
Ga	4478624	< 25	< 25	0.0%	4478645	< 25	< 25	0.0%	4478589	< 25	< 25	0.0%	4478607	< 25	< 25	0.0%
In	4478624	< 5	< 5	0.0%	4478645	< 5	< 5	0.0%	4478589	< 5	< 5	0.0%	4478607	< 5	< 5	0.0%
K	4478624	0.287	0.254	12.2%	4478645	0.66	0.66	0.0%	4478589	1.80	1.73	4.0%	4478607	0.39	0.38	2.6%
La	4478624	14	15	6.9%	4478645	34	30	12.5%	4478589	12	10	18.2%	4478607	18	19	5.4%
Li	4478624	28	25	11.3%	4478645	12	13	8.0%	4478589	11	10	9.5%	4478607	23	22	4.4%
Mg	4478624	0.398	0.352	12.3%	4478645	1.12	1.14	1.8%	4478589	0.462	0.471	1.9%	4478607	0.741	0.724	2.3%
Mn	4478551	591	624	5.4%	4478645	795	801	0.8%	4478589	371	397	6.8%	4478607	450	428	5.0%
Mo	4478624	9.7	10.1	4.0%	4478645	2.9	2.3	23.1%	4478589	< 2.5	< 2.5	0.0%	4478607	< 2.5	< 2.5	0.0%
Na	4478624	0.47	0.43	8.9%	4478645	0.166	0.164	1.2%	4478589	0.354	0.357	0.8%	4478607	0.31	0.30	3.3%
Ni	4478624	10.1	7.6	28.2%	4478645	2.4	2.6	8.0%	4478589	63.2	61.5	2.7%	4478607	4.5	4.0	11.8%
P	4478551	462	497	7.3%	4478570	383	423	9.9%	4478589	282	261	7.7%	4478607	< 50	54	
Pb	4478551	21	21	0.0%	4478645	17	16	6.1%	4478589	34	35	2.9%	4478607	40	38	5.1%
Rb	4478624	< 50	< 50	0.0%	4478645	< 50	< 50	0.0%	4478589	101	95	6.1%	4478607	< 50	< 50	0.0%
Sulfur	4478605	21.7	22.3	2.7%	4478570	2.11	2.19	3.7%	4478589	0.311	0.315	1.3%	4478607	2.79	2.76	1.1%
Sb	4478624	< 5	< 5	0.0%	4478645	< 5	< 5	0.0%	4478589	< 5	< 5	0.0%	4478607	< 5	< 5	0.0%
Sc	4478624	5	5	0.0%	4478645	7	7	0.0%	4478589	20	19	5.1%	4478607	6	6	0.0%
Se	4478624	< 50	< 50	0.0%	4478645	< 50	< 50	0.0%	4478589	< 50	< 50	0.0%	4478607	< 50	< 50	0.0%

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Quality Assurance - Replicate

AGAT WORK ORDER: 13B728569

PROJECT NO: Sturgeon Lake

CLIENT NAME: XSTRATA ZINC STURGEON LAKE

ATTENTION TO: Lucy Potter

Sn	4478624	< 25	< 25	0.0%	4478645	< 25	< 25	0.0%	4478589	< 25	< 25	0.0%	4478607	< 25	< 25	0.0%
Sr	4478624	44	33	28.6%	4478570	256	251	2.0%	4478589	118	116	1.7%	4478607	48	50	4.1%
Ta	4478624	< 50	< 50	0.0%	4478645	< 50	< 50	0.0%	4478589	< 50	< 50	0.0%	4478607	< 50	< 50	0.0%
Te	4478624	< 50	< 50	0.0%	4478645	< 50	< 50	0.0%	4478589	< 50	< 50	0.0%	4478607	< 50	< 50	0.0%
Th	4478624	< 25	< 25	0.0%	4478645	< 25	< 25	0.0%	4478589	< 25	< 25	0.0%	4478607	< 25	< 25	0.0%
Ti	4478624	< 0.05	< 0.05	0.0%	4478645	< 0.05	< 0.05	0.0%	4478589	0.07	0.07	0.0%	4478607	< 0.05	< 0.05	0.0%
Tl	4478624	< 25	< 25	0.0%	4478645	< 25	< 25	0.0%	4478589	< 25	< 25	0.0%	4478607	< 25	< 25	0.0%
U	4478624	< 25	< 25	0.0%	4478645	< 25	< 25	0.0%	4478589	< 25	< 25	0.0%	4478607	< 25	< 25	0.0%
V	4478624	< 2.5	< 2.5	0.0%	4478645	< 2.5	< 2.5	0.0%	4478589	132	136	3.0%	4478607	< 2.5	< 2.5	0.0%
W	4478624	< 5	< 5	0.0%	4478645	< 5	< 5	0.0%	4478589	< 5	< 5	0.0%	4478607	< 5	< 5	0.0%
Y	4478551	7	7	0.0%	4478570	13	15	14.3%	4478589	9	9	0.0%	4478607	20	20	0.0%
Zn	4478551	14.7	16.7	12.7%	4478645	113	102	10.2%	4478589	137	140	2.2%	4478607	68.4	60.2	12.8%
Zr	4478624	260	244	6.3%	4478645	361	363	0.6%	4478589	196	182	7.4%	4478607	275	273	0.7%
	REPLICATE #5				REPLICATE #6				REPLICATE #7							
Parameter	Sample ID	Original	Replicate	RPD	Sample ID	Original	Replicate	RPD	Sample ID	Original	Replicate	RPD				
Au	4478620	0.003	< 0.001		4478632	0.008	< 0.001		4478645	< 0.001	< 0.001	0.0%				

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Quality Assurance - Certified Reference materials

AGAT WORK ORDER: 13B728569

PROJECT NO: Sturgeon Lake

CLIENT NAME: XSTRATA ZINC STURGEON LAKE

ATTENTION TO: Lucy Potter

Xstrata Zinc - Sturgeon Lake

	CRM #1 (1P5F)				CRM #2 (CDN-ME-1101)				CRM #3 (CM14)				CRM #4 (GS7E)			
Parameter	Expect	Actual	Recovery	Limits	Expect	Actual	Recovery	Limits	Expect	Actual	Recovery	Limits	Expect	Actual	Recovery	Limits
Au	1.40	1.38	99%	90% - 110%					0.792	0.758	96%	90% - 110%	7.4	7	94%	90% - 110%
Ag					68.2	67.3	99%	90% - 110%								
Cu					6630	6974	105%	90% - 110%								
Pb					4590	4630	101%	90% - 110%								
	CRM #5 (1P5F)				CRM #6 (CM14)											
Parameter	Expect	Actual	Recovery	Limits	Expect	Actual	Recovery	Limits								
Au	1.40	1.46	104%	90% - 110%	0.792	0.753	95%	90% - 110%								

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Method Summary

CLIENT NAME: XSTRATA ZINC STURGEON LAKE

AGAT WORK ORDER: 13B728569

PROJECT NO: Sturgeon Lake

ATTENTION TO: Lucy Potter

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Solid Analysis			
Sample Login Weight	MIN-12009		BALANCE
Au	MIN-200-1206		ICP/OES
Ag	MIN-200-12002/12020		ICP/OES
Al	MIN-200-12002/12020		ICP/OES
As	MIN-200-12002/12020		ICP/OES
Ba	MIN-200-12002/12020		ICP/OES
Be	MIN-200-12002/12020		ICP/OES
Bi	MIN-200-12002/12020		ICP/OES
Ca	MIN-200-12002/12020		ICP/OES
Cd	MIN-200-12002/12020		ICP/OES
Ce	MIN-200-12002/12020		ICP/OES
Co	MIN-200-12002/12020		ICP/OES
Cr	MIN-200-12002/12020		ICP/OES
Cu	MIN-200-12002/12020		ICP/OES
Fe	MIN-200-12002/12020		ICP/OES
Ga	MIN-200-12002/12020		ICP/OES
In	MIN-200-12002/12020		ICP/OES
K	MIN-200-12002/12020		ICP/OES
La	MIN-200-12002/12020		ICP/OES
Li	MIN-200-12002/12020		ICP/OES
Mg	MIN-200-12002/12020		ICP/OES
Mn	MIN-200-12002/12020		ICP/OES
Mo	MIN-200-12002/12020		ICP/OES
Na	MIN-200-12002/12020		ICP/OES
Ni	MIN-200-12002/12020		ICP/OES
P	MIN-200-12002/12020		ICP/OES
Pb	MIN-200-12002/12020		ICP/OES
Rb	MIN-200-12002/12020		ICP/OES
Sulfur	MIN-200-12002/12020		ICP/OES
Sb	MIN-200-12002/12020		ICP/OES
Sc	MIN-200-12002/12020		ICP/OES
Se	MIN-200-12002/12020		ICP/OES
Sn	MIN-200-12002/12020		ICP/OES
Sr	MIN-200-12002/12020		ICP/OES
Ta	MIN-200-12002/12020		ICP/OES
Te	MIN-200-12002/12020		ICP/OES
Th	MIN-200-12002/12020		ICP/OES
Ti	MIN-200-12002/12020		ICP/OES
Tl	MIN-200-12002/12020		ICP/OES
U	MIN-200-12002/12020		ICP/OES
V	MIN-200-12002/12020		ICP/OES
W	MIN-200-12002/12020		ICP/OES
Y	MIN-200-12002/12020		ICP/OES
Zn	MIN-200-12002/12020		ICP/OES
Zr	MIN-200-12002/12020		ICP/OES