



## ASSESSMENT REPORT TITLE PAGE AND SUMMARY

**TITLE OF REPORT:** Preliminary Mapping and Sampling Report with the Intention of Planning a Soil Sampling Program to Map Continuity of the Various Showings on the Toro property, Liard Mining Division, B.C.

**TOTAL COST:** \$ 12,950

**AUTHOR(S):** J. M. Kowalchuk, P. Geo.

**SIGNATURE(S):**

**NOTICE OF WORK PERMIT NUMBER(S)/DATE(S):**  
**STATEMENT OF WORK EVENT NUMBER(S)/DATE(S):**

**YEAR OF WORK:** 2017

**PROPERTY NAME:** Toro Property

**CLAIM NAME(S)** (on which work was done): Toro/Churchill (772742), Toro/Churchill 2 (772802), Idaho (1023665), John Ext (1024157), South Ext (1024158), Toro East (1026684), Toro SW (1026686), 854517, T/C2 (1019676)

**COMMODITIES SOUGHT:** Cu

**MINERAL INVENTORY MINFILE NUMBER(S), IF KNOWN:** 094K040, 094K057

**MINING DIVISION:** Liard

**NTS / BCGS:** 094K034-35

**LATITUDE:** 58 ° 21 ' 37.57 " N

**LONGITUDE:** 125 ° 11 ' 42.98 " (at centre of work) W

**UTM Zone:** 10 **EASTING:** 370746 **NORTHING:** 6470702

**OWNER(S):** A.R. Raven

**MAILING ADDRESS:**

P.O. Box 722

Smithers, B.C. V0J 2N0

**OPERATOR(S)** [who paid for the work]: A.R. Raven

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**REPORT KEYWORDS** (lithology, age, stratigraphy, structure, alteration, mineralization, size and attitude. **Do not use abbreviations or codes**)

Copper mineralization in diabase and quartz carbonate dyke(s) cutting Aida Formation calcareous mudstone, dolomitic slate, silty mudstone,

**REFERENCES TO PREVIOUS ASSESSMENT WORK AND ASSESSMENT REPORT NUMBERS:**

33336, 28281, 105090, 28736, 6471

TYPE OF WORK IN THIS REPORT	EXTENT OF WORK (in metric units)	ON WHICH CLAIMS	PROJECT COSTS APPORTIONED (incl. support)
GEOLOGICAL (scale, area)			
Ground, mapping			
Photo interpretation			
GEOPHYSICAL (line-kilometres)			
Ground			
Magnetic			
Electromagnetic			
Induced Polarization			
Radiometric			
Seismic			
Other			
Airborne			
GEOCHEMICAL (number of samples analysed for ...)			
Soil			
Silt			
Rock			
Other			
DRILLING (total metres, number of holes, size, storage location)			
Core			
Non-core			
RELATED TECHNICAL			
Sampling / Assaying			
Petrographic			
Mineralographic			
Metallurgic			
PROSPECTING (scale/area)	5,000 scale,	772742, 772802	\$ 6,475 \$ 6,475
PREPATORY / PHYSICAL			
Line/grid (km)			
Other			
		<b>TOTAL COST</b>	<b>\$12,950</b>

**PRELIMINARY MAPPING AND SAMPLING REPORT WITH THE INTENTION OF PLANNING A SOIL  
SAMPLING PROGRAM TO MAP CONTINUITY OF THE VARIOUS SHOWINGS ON THE  
TORO PROPERTY**

Tenure Numbers 772742, 772802, 1023665, 1024157, 1024158, 1026684, 1026686,  
854517, 1019676

located in the Liard Mining Division, B .C.

125°11'42.98" W, 58°21'37.57" N , NTS 094K/06E

owned by:

A.R. Raven  
P.O. Box 722  
Smithers, B.C. V0J 2N0

operated by:

A.R. Raven  
P.O. Box 722  
Smithers, B.C. V0J 2N0

by:

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February 16, 2018

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## 1.0 Introduction

At the request of Al Raven of Smithers, BC, the registered owner of the property, the author visited the Toro Property on September 23 and 24, 2017. The author intended to examine the Toro and Churchill showings on the property, however snow conditions at the sites prevented landing near the showings. The author then proceeded to fly to the nearest landing spot below the showings and proceeded to examine the talus and float samples coming off the showings and sampled them. The author took five samples of mineralized rock to if they contained sufficient copper mineralization to be of interest. The results, documented in the report support a further work program in the summer of 2018. The work program will consist of detailed mapping of the showings and their relationship to the mafic dykes (in particular the west dyke). The mapping program will consist of following the dykes checking for quartz veining around them. This mapping program will accompany a contour soil sampling program between the showing to ascertain whether the mineralize veins continue. The extensive amount of talus will cause problems.

### 1.1 Location and Access

The Toro mineral claims are situated about 155 km west of Fort Nelson, British Columbia (within N.T.S. map sheets 94K/06E). The claims are centered at approximately 125°11'42.98" W, 58°21'37.57" N, (Figure 1) and lie at an elevation between 1,120 and 2,560m asl.

Previously, access to the property was by the Churchill mine road, a gravel road extending 32 km in a southwesterly direction from the Alaska Highway (mile 401) to the Churchill mill site, followed by 22 km of exploration access trail to the Toro Property in the south. The Churchill Mill site is located at the confluence of Delano Creek and the Racing River northeast of the claims. Bridges have been removed along the route necessitating fording MacDonald Creek, Wokkpash Creek, and Delano Creek/Racing River. From the old mill site one branch road runs along Delano Creek to the northwest corner of the property, another branch road runs south along Churchill Creek to the south end of the property.

These access routes have since been decommissioned and the current access is by helicopter from the Toad River airstrip on the Alaska Highway to the north or from a staging area on the north side of MacDonald Creek near the Alaska Highway.

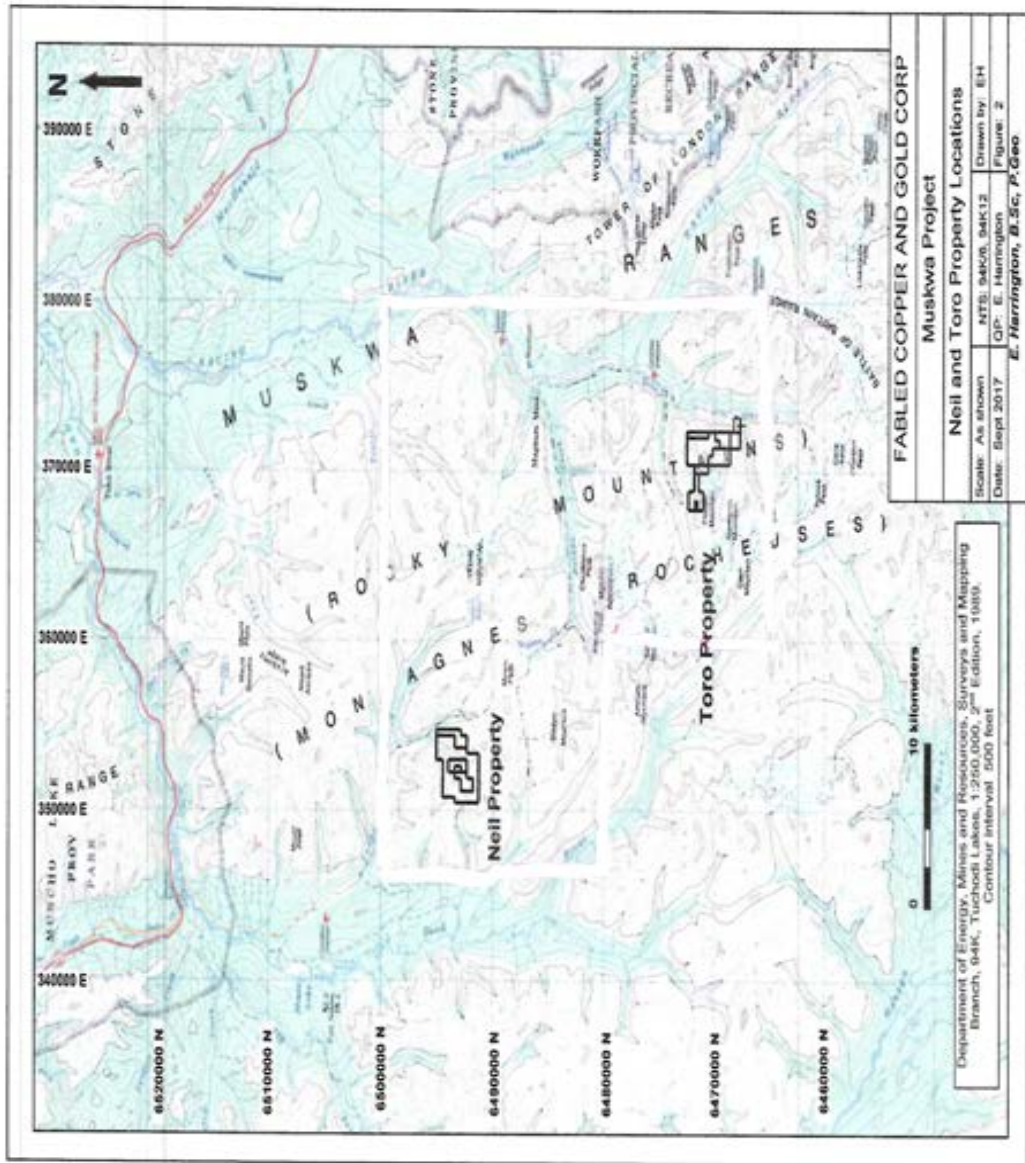


Figure 1 Toro/Churchill Location Map

## 1.2 Claim Status

Figure 2 is a map showing the locations of the nine mineral claims making up the Toro property. Details, as of October 4, 2017, are summarized in Table 1.

**Table 1. Description of Toro mineral claims.**

The total area of the Toro mineral claims is 916.8333 hectares.

Tenure No.	Claim Name	Owner (100%)	Issue Date	Good To Date	Area (Ha)
772742	TORO/CHURCHILL	RAVEN, A.R.	May 13, 2010	October 30, 2017	305.5589
772802	TORO/CHURCHILL 2	RAVEN, A.R.	May 13, 2010	October 30, 2017	84.9236
1023665	IDAHO	RAVEN, A.R.	November 7, 2013	October 30, 2017	33.9804
1024157	JOHN EXT	RAVEN, A.R.	December 2, 2013	October 30, 2017	135.779
1024158	SOUTH EXT	RAVEN, A.R.	December 2, 2013	October 30, 2017	67.9572
1026684	TORO EAST	RAVEN, A.R.	March 14, 2014	October 30, 2017	67.8936
1026686	TORO SW	RAVEN, A.R.	March 14, 2014	October 30, 2017	152.845
854517		RAVEN, A.R.	May 14, 2011	October 30, 2017	16.9724
1019676	T/C2	RAVEN, A.R.	May 21, 2013	October 30, 2017	50.9232

## 1.3 Physiography and Vegetation

The claims lie with the Muskwa Ranges of the northern Rocky Mountains, an area of great topographic relief, ranging from about 900 to 2600m above sea level. Castellated peaks, jagged ridges and wide U-shaped valleys occupied by braided rivers characterize the area (Holland, 1976). The lower slopes are covered by open scree which grades into moderate to dense growths of spruce trees on valley bottoms. The steep upper slopes are mainly devoid of vegetation and consist of exposed rock and open scree.

Tree line is at approximately 1400m. Local glaciation has produced numerous moraines and has deposited variable thicknesses of till up to an elevation of about 1500m. A number of glaciers still exist at high elevations particularly in north and east facing cirques. Creeks draining the property flow into the Gataga, Racing and Toad Rivers, which are all tributaries of the Liard River and ultimately drain into to Arctic Ocean via the Mackenzie River.

The area is contained within the Northern Canadian Rocky Mountain Ecoregion<sup>1</sup>, specifically in the eastern Muskwa Ecoregion. This area is protected from moist Pacific air moving over the mountains to the west, however low-pressure storms in Alberta pushing moisture eastward over the Alberta Plateaus to the east can result in extreme rain events. In the winter and early spring, dense, cold Arctic air can invade this area by coming down from the Interior Plains to the north. Spruce-Willow-Birch forests and shrublands grow in the interior valleys and lower slopes. Alpine areas are extensive and consist of rugged Boreal Altai Fescue Alpine but vegetation is generally sparse and barren rock is common with increased elevation. Several large glaciers remain on the highest summits.

<sup>1</sup> <http://www.env.gov.bc.ca/ecology/ecoregions/>



### TORO/CHURCHILL CLAIMS

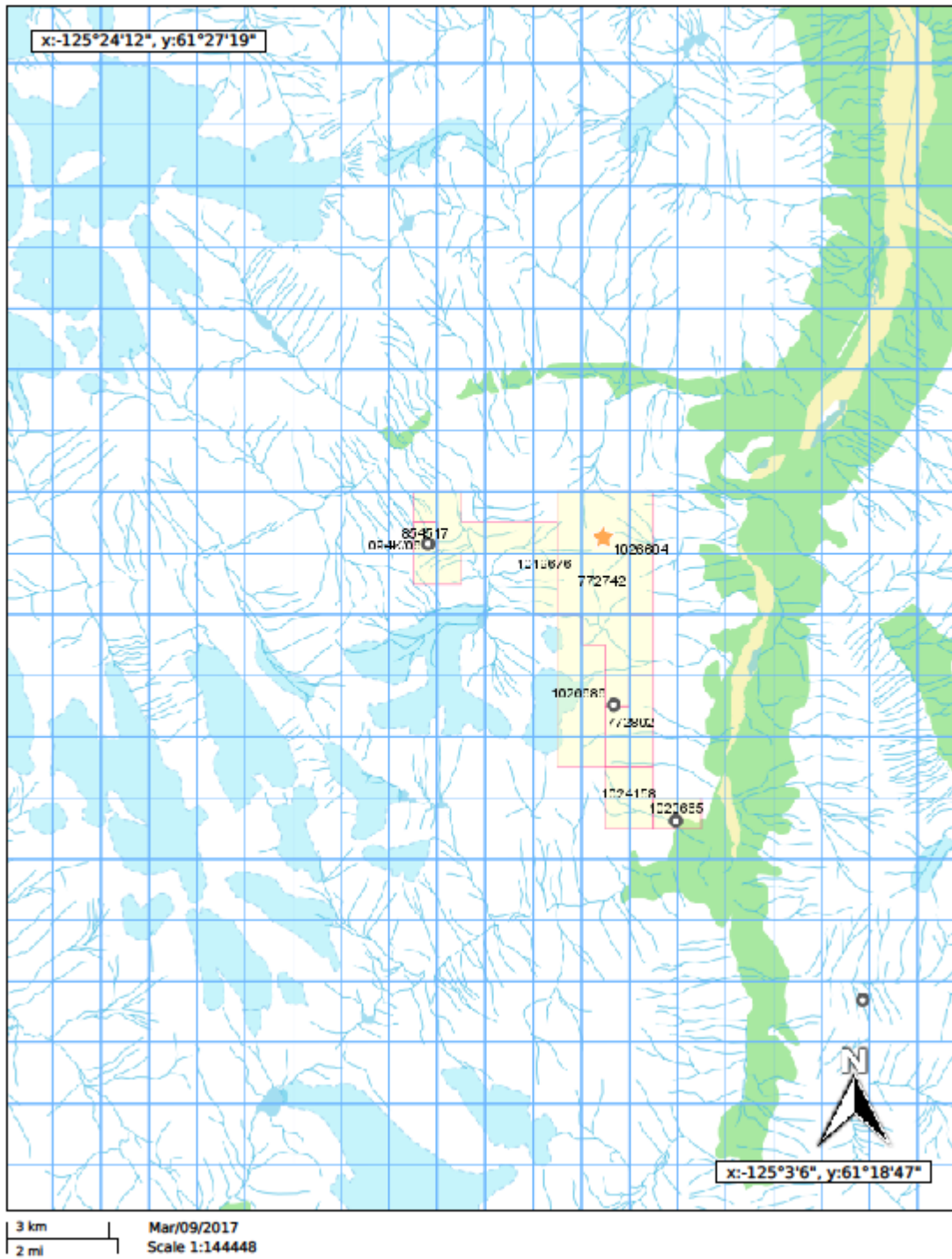


Figure 2 Toro/Churchill Mineral Claims



## 2.0 Regional Geology

The regional geology is shown in Figure 3. The claims are located in the Cordilleran Foreland Belt in the northern Rocky Mountains and are underlain by a broad belt of sedimentary rocks that have been deformed by moderate folds and a stack of northeast verging thrust or reactivated reverse faults. The structural trend throughout the Rocky Mountains is predominantly northwest. The main structural feature in the project area is the Muskwa Anticlinorium, a major north-northwest trending window that exposes rocks as old as Middle Proterozoic (Helikian). The pre-Paleozoic package is collectively referred to as the Muskwa Assemblage and consists of a 6400m thick succession of argillaceous to fine grained siliciclastic strata and carbonates. Seven formations of Proterozoic age are represented in the anticlinorium. From oldest to youngest, with approximately true thickness, they are the Chischa Formation (940m), Tetsa Formation (320 m), George Formation (360-530m), Henry Creek Formation (460m), Tuchodi Formation (1500m), Aida Formation and Gataga Formation (3000m together). Paleozoic units unconformably overlie the Proterozoic rocks along a Lower Cambrian erosional surface. Mapping in the area, (Carne, 2006) has identified various Paleozoic strata, units belonging to the three uppermost Proterozoic Formations, numerous gabbroic and diabase dykes, and perhaps most importantly, a few discordant hematite-rich breccia bodies.

The Tuchodi Formation is the oldest outcropping unit on the property. It comprises medium to thin bedded quartzite and quartz flooded dolomitic siltstone and argillite. Deposition in shallow water is inferred by mud cracks and stromatolitic dolomite. This Formation is relatively resistant to weathering and often forms an obvious bench on hill slopes where overlain by the more recessive weathering Aida Formation and Gataga Formation.

The Aida Formation, which underlies most of the Toro claims, lies conformably atop the Tuchodi Formation and is composed of buff weathered calcareous and dolomitic siltstone and mudstone with minor amounts of sandstone. Two generations of penetrative slaty cleavage are well developed in the rocks of this Formation. The Gataga Formation conformably overlies the Aida Formation and is characterized by black carbonaceous shales. Its rocks are well cleaved and dark weathered. Paleozoic stratigraphy on the claim block is Cambrian to Devonian in age. These strata unconformably overlie the Proterozoic Formations and are mainly composed of carbonaceous and siliceous units, including limestone, dolomite, quartzite and quartz pebble conglomerate.

The Proterozoic Formations are crosscut by a set of apparently Hadrynian aged gabbro and diabase dykes. The dykes range between 5 to 35m in width and follow the main north-northwest structural orientation of the area. The majority of the dykes are moderately to strongly magnetic. They form prominent linear features that resist weathering. The dykes are the only observed igneous rocks in the Muskwa Anticlinorium.

Low grade metamorphism, mainly sub-greenschist, is evident throughout the Proterozoic sedimentary package. Contact metamorphism along the periphery of the dykes is rare but, where present, consists of sericite and chlorite alteration.

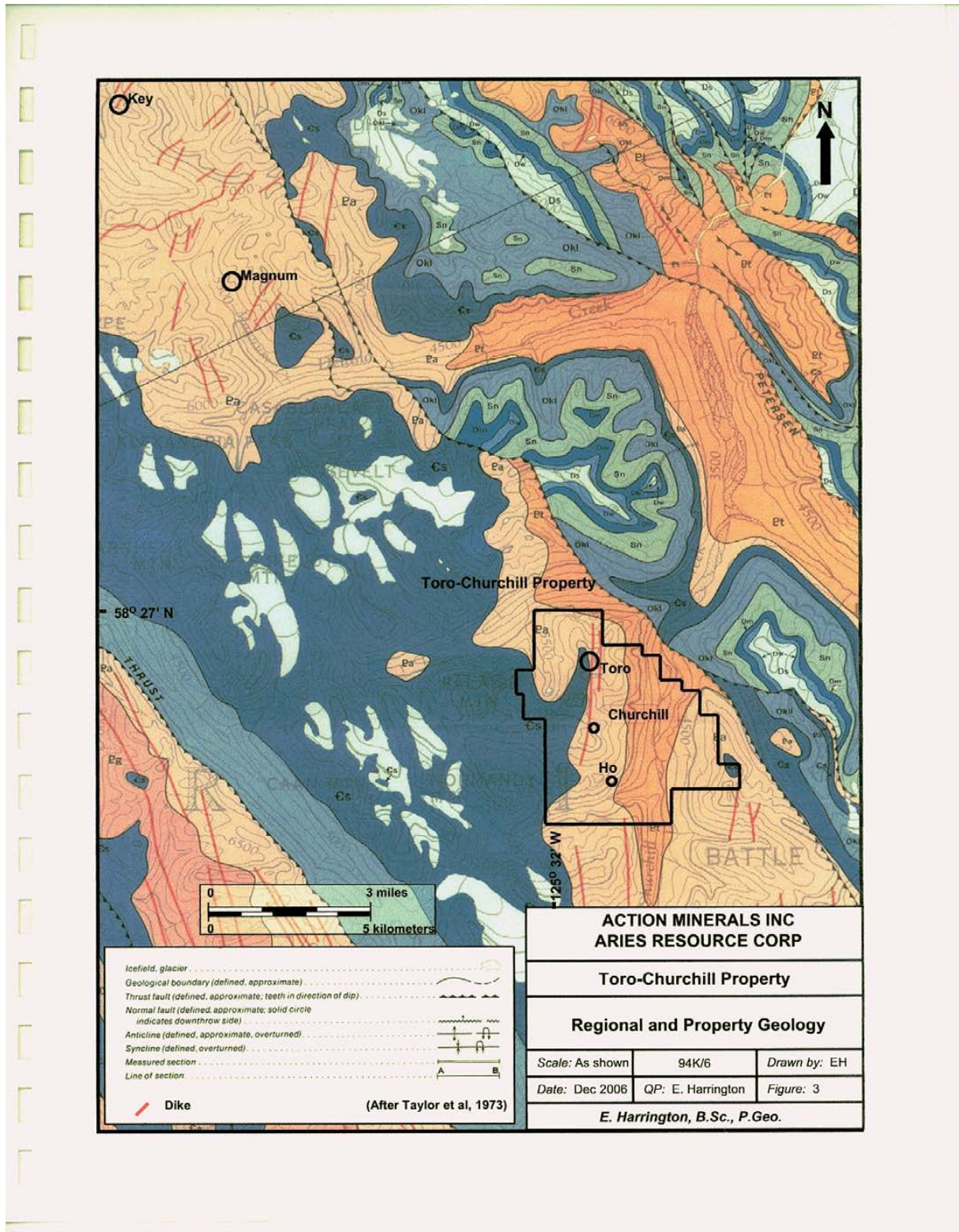


Figure 3: Regional Geology

### Figure 3b Regional Geology Legend

Table 1: Geology Legend

<b>Phanerozoic</b>	<b>Paleozoic</b>	
	<b>Carboniferous and Devonian</b>	
	Db	- Besa River Formation: dark pyritic siliceous shale
	<b>Devonian</b>	
	Dd	- Dunedin Formation: dark grey limestone
	<i>Local Disconformity</i>	
	Ds	- Stone Formation: light grey dolomite; dolomite breccia
	<i>Disconformity</i>	
	Dw	- Wokkpash Formation: sandstone, minor dolomite, shale
	Dm	- Muncho-McConnell Formation: dolomite
	<i>Disconformity</i>	
	<b>Silurian</b>	
	Sn	- Nonda Formation: dark grey dolomite, basal sandstones; minor limestone
	<i>Angular unconformity</i>	
<b>Ordovician - Ketchica Group</b>		
Ok	- argillaceous limestone	
Okg	- graptolitic shale	
Okt	- turbidites	
OkI	- limestone, minor sandstone	
<i>Angular unconformity</i>		
<b>Cambrian - Atan Group</b>		
Ca	- limestone, dolomite; minor sandstone and shale	
Cs	- conglomerate, sandstone, shale; minor limestone	
<i>Disconformity</i>		
<b>Proterozoic</b>	<b>Hadrynian</b>	
	Pv	- quartz-chlorite phylite, meta-sandstone, quartz-pebble conglomerate
	<i>Angular unconformity</i>	
	<b>Helikian</b>	
		- gabbroic dykes
	Pg	- Gataga Formation: mudstone, siltstone; minor sandstone
	Pa	- Aida Formation: mudstone, siltstone; minor chamositic and carbonaceous mudstone, dolomite, and limestone
	Pt	- Tuchodi Formation: quartzite, dolomite, siltstone; minor red shale
	Ph	- Henry Creek Formation: calcareous mudstone, siltstone; minor sandstone
	Pd	- George Formation: limestone, dolomite
Ps	- Tetsa Formation: dark grey mudstone, sandstone; minor quartzite	
<i>Disconformity</i>		
Pc	- Chisma Formation: dolomite, quartzite; minor siltstone	

Thrust faults, reverse faults and moderate folding characterize the structural history of the area. Late Helikian or early Hadrynian structures are represented by high angle fault zones that have been intruded by dyke swarms. These structural zones are considered to be deep-seated and have been observed to be up to 180m wide, hinting at an extensional tectonic environment. Their inferred strike lengths are in the order of tens of kilometers. Copper bearing quartz carbonate veins were emplaced along these same structures and are mainly found alongside the gabbroic dykes. Some workers report that the veins are older than the dykes but evidence is inconclusive. Shearing is common along the dyke contacts with the wall rocks and veins. Low angle, westerly dipping thrust faults have in some areas stacked Proterozoic basement rocks above the Paleozoic cover rocks. These faults are north-south trending and extend over hundreds of kilometers. Faults and folds developed during Jurassic to Tertiary times. Penetrative slaty cleavage occurs throughout the Proterozoic rocks and is especially visible in the argillaceous rocks of the Aida Formation and Gataga Formation.

### **3.0 Property Geology**

The following description of the property geology is from Harrington, 2015.

Precambrian sedimentary rocks in the vicinity of the Toro showings comprise interbedded Aida Formation dolomite and slate, strongly folded on axes, which plunge gently to the southeast. Bedding in these sedimentary rocks dips at various angles to the northeast and southwest. To the east, and a few hundred meters below the showings, Aida strata are conformably underlain by clastic sedimentary rocks of the Tuchodi Formation. The Precambrian sedimentary rocks are cut by at least three large, north-trending diabase dikes which, in the western area of the showings, are truncated and unconformably overlain by varicolored clastic Cambrian strata of the Sylvia Formation (Preto, 1971).

Taylor et al (1973) interpreted a major northwest-trending southwest-dipping thrust fault to be located approximately one kilometer northeast of the property. The thrust fault is due to northeast-southwest-trending compression, bringing deeper and older Proterozoic formations into contact with younger Phanerozoic rock formations higher in the stratigraphic succession.

Copper mineralization occurring in the quartz-carbonate veins appears to be highly variable and discontinuous. Preto suggested that the better mineralized veins are older than the dikes, occurring either as inclusions inside dikes or as panels along or near the sides of dikes. Barren veins appear to be younger than the dikes and can cause silicification of the dike rock.

The Toro/Churchill claims encompass four mineral occurrences summarized below with information from the B.C. Minfile.

#### **3.1 094K 009, Churchill**

The Churchill showing is in the Aida Formation of the Muskwa Assemblage, which here consists of interbedded dolostone and slate. The rocks are strongly folded about a northwesterly axis. Bedding strikes around 315° degrees and dips moderately southwest or locally northeast. The Aida Formation is intruded by a number of diabase dykes, clearly Proterozoic because they are truncated by the sub-Cambrian unconformity. The dykes strike just west of north and dip steeply. The mineralization is hosted in quartz-carbonate veins, most of which follow the margins of the dykes, and is probably a continuation of that at the Toro occurrence to the north, as suggested by malachite traceable in the intervening cliffs (Irwin, 1977). Chalcopyrite is reported to be present over a width of about 1.5 meters, and is locally massive over narrower widths. A channel sample taken over 1.5m from a trench on the Jed 1 claim was assayed at 3.91 per cent copper (Irwin, 1977).

There is some question as to exactly where this trench sample was acquired. Irwin's prospecting report describes the claims being located at 125°12'W, 58°24'N but this would indicate the claims lay to the north of Delano Creek, about 10km north of the Toro property.

### **3.2 094K 029, Ho**

According to its location, the area around the claims is underlain mainly by the Tuchodi Formation, consisting of sandstone, dolostone, dolomitic siltstone, and shale (Geological Survey of Canada Memoir 373). The rocks are cut by quartz-carbonate veins which contain disseminations, stringers and massive pods of chalcopyrite (Geology, Exploration and Mining in British Columbia, 1970).

### **3.3 094K 050, Toro**

This area is underlain by interbedded Aida Formation dolostone and slate which have been intruded by three large diabase dykes. Mineralization is hosted in quartz-carbonate veins, most of which follow the margins of two of the dykes, or locally lie within them. The veins are exposed intermittently for over 1830m along the dykes, and vary considerably in width and degree of mineralization. Chalcopyrite occurs mostly as lenses and stringers in the veins, but its intensity is erratic; some veins are essentially barren. The best vein is exposed for approximately 150m and is 2.5m wide on average, but ranges up to 9 meters in width. Surface samples of the vein averaged 2.95 per cent copper over 2.4 meters. To explore the vein further, two short adits having an aggregate length of 24m (80ft) were dug in 1966 and 5 holes were diamond drilled from them. Drill intersections in four of them averaged only 0.66% copper over 4.1 meters, indicating the variable and discontinuous grade of the mineralization (Geology, Exploration and Mining in British Columbia 1971). The exact location of the adits and drill holes is unknown, or at least unreported.

### **3.4 094K 076, John**

This occurrence is underlain by Aida Formation rocks which are gently folded about axes trending 015°. Around the mineralization, bedding dips 30° west. The rocks are cut by an irregular system of quartz-carbonate veins which are exposed intermittently for a length of about 45m. The system is made up of two parallel veins striking 315° and dipping vertically. The veins are about 3 meters apart, separated by dolostone at the southeast end and by argillites at the northwest end. Mineralization is in the form of disseminations, stringers and massive pods of chalcopyrite. (Geology, Exploration and Mining in British Columbia 1970).

### **4.0 Recent Exploration (from Campbell, 2016)**

*The author has been unable to verify the information in this summary. The details of location, structure, mineralization and assay values are provided only for illustration purposes.*

A high level magnetometer survey of the area was flown by Sanders Geophysics Ltd. in 2005 for Archer Cathro Associates (Carne, 2006) and acquired by Action and Aries who then contracted McPhar Geosurveys Ltd. and Aeroquest Surveys in 2006 to acquire aeromagnetic and electromagnetic coverage over their project area which included the Toro property (Coetzee, 2007). Coetzee interpreted from this data that the mineralized veins in the area parallel the dyke trends and that quartz carbonate veins are nearly always associated with the dyke systems.

Carne (2006) reported on a geochemical silt sampling program undertaken for Twenty-Seven Capital Corp. on their Muskwa property which covered much of the Proterozoic assemblages making up the Muskwa anticlinorium. During this same program 233 soil samples were collected along the south side of Goat Ck. and from the Sheep Ck. valley crossing the western part of what are now the Toro claims. Anomalous copper values are indicated north of the Slide Ck. cirque, possibly derived from the dykes there, and on both sides of Sheep Ck. Those on the west side of Sheep Ck. are possibly associated with

the John mineral occurrence. Those on the east side of Sheep Ck. raise the possibility that there are as yet unmapped mineralized veins and or dykes there.

A total of 54 rock samples were also collected by Carne. Rock samples with more than 1% Cu are listed in Table 3. Three chip samples of quartz veins in black argillite from the Goat Ck. access road north of the current Toro claims also reported > 1 wt% Cu. The sampling notes in Carne's report attribute these to the John mineral occurrence whose mapped location lies ~ 1km to the south-southeast. Four quartz-carbonate vein samples with > 1 wt% Cu occur in the Slide Ck. cirque.

**Table 2: Copper >1 wt% in rock samples reported by Carne, 2006**

Sample	UTME NAD83	UTMN NAD83	Location	Type	Length (m)	Cu (%)
B374276	370147	6471738	0.4km NE Raven Lk.	select	-	1.35
B374277	370851	6471601	1.1km east Raven Lk.	select	-	6.40
B374279	370922	6471335	1.2km east Raven Lk.	chip	0.5	18.55
B374281	371707	6472171	east dyke complex	select	-	10.85
B374287	371778	6473065	east dyke complex	chip	2	5.27
B374289	371771	6473052	east dyke complex	chip	2	7.44
B374292	371610	6472815	west dyke complex	chip	1.09	3.20
B374296	371610	6472815	west dyke complex	chip	0.64	2.68
B374300	371563	6472714	west dyke complex	chip	0.66	7.62
B374321	368702	6473683	Goat Ck. access road	chip	1.15	12.75
B374324	368729	6473673	Goat Ck. access road	chip	1	10.70
B374328	368704	6473683	Goat Ck. access road	chip	1	1.99
B374336	371199	6473414	Slide Ck. vein system	chip	1	5.27
B374338	371213	6473643	Slide Ck. vein system	select	-	29.80
B374339	371213	6473643	Slide Ck. vein system	chip	1.5	8.23
B374340	371213	6473643	Slide Ck. vein system	chip	2	3.00
B374354	371776	6473158	east dyke complex	chip	0.68	2.91



In 2006, Harrington collected six rock samples to the north and south of the current Toro claims. A description of the samples is found in Table 4. Analyses including copper values are shown in Table 5.

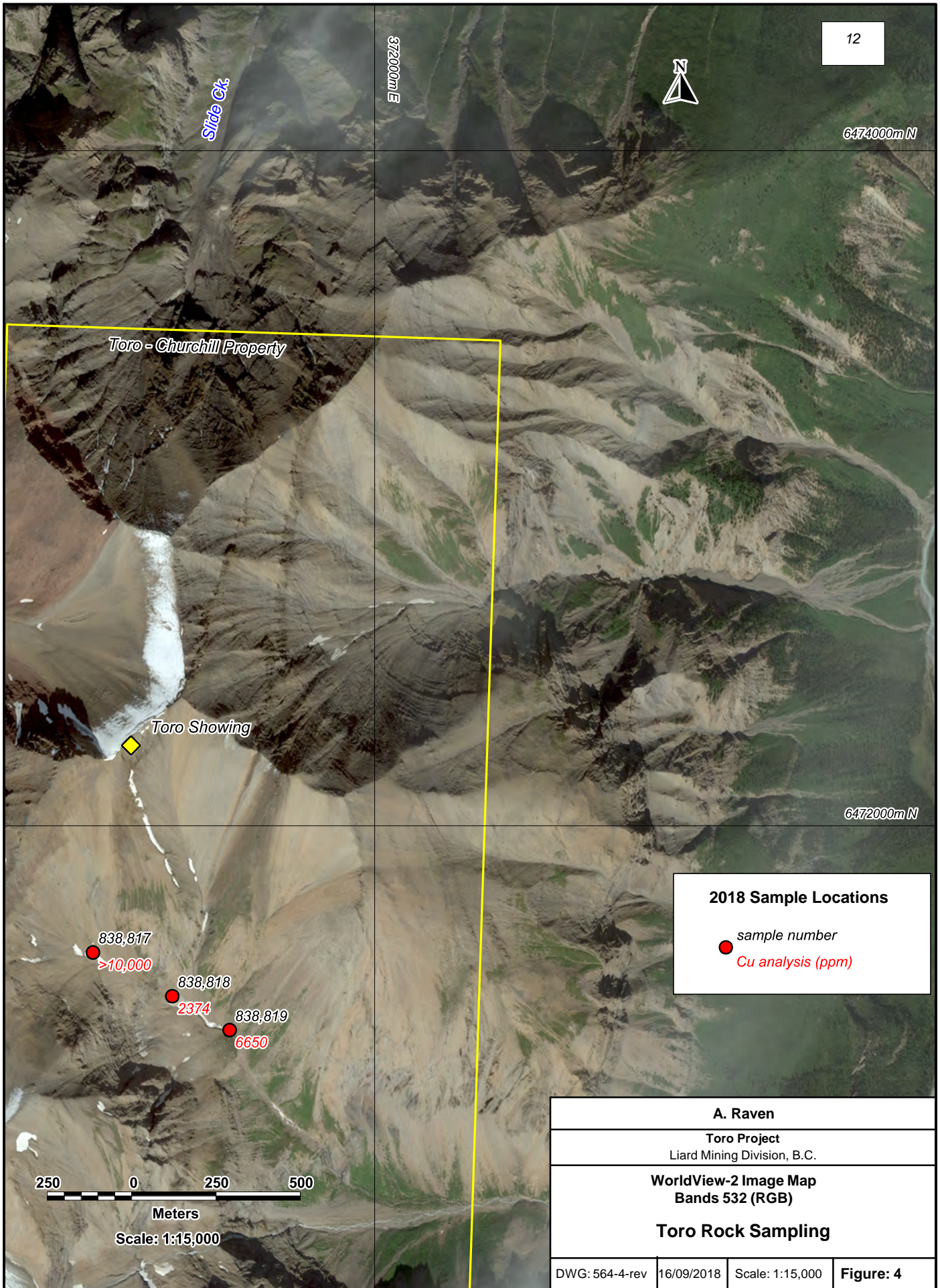
**Table 3: Description of rock samples collected by Harrington, 2006<sup>2</sup>.**

Sample	UTME (NAD27)	UTMN (NAD27)	UTME (NAD83)	UTMN (NAD83)	Type	Description
335801	372,272	6,467,824	372186	6468015	select	Float. Massive quartz-carbonate in black shale. Strong malachite crusts, < 2% pyrite and <1% chalcopyrite
335802	372,187	6,468,005	372101	6468196	chip	12 cm quartz-carbonate vein. <1% pyrite and <1% chalcopyrite, with weak to moderate malachite crusts. Angular fragments of black shale in vein.
335803	372,193	6,468,000	372107	6468191	select	Float. Massive white quartz with irregular blebs of <2% pyrite and <1% chalcopyrite. Weak copper staining.
335804	371,180	6,474,550	3710959	6474741	chip	White weakly banded quartz vein with trace pyrite
335805	371,175	6,474,500	371090	6474691	select	Diabase dike striking 360°/Vertical. Non-magnetic.
335806	371,218	6,474,606	371133	6474797	select	Composite sample of selected quartz and quartz-carbonate float from drainage. Varying amounts of copper staining and malachite crusts. Trace pyrite.

**Table 4: Analyses of rock samples collected by Harrington, 2006**

Sample	Au (ppm)	Ag (ppm)	As (ppm)	Co (ppm)	Cu (ppm)	Fe (%)	Ni (ppm)	Pb (ppm)	S (%)	Sb (ppm)	Cu (%)
335801	0.015	1.1	43.4	77.5	>10000	1.93	853	13.8	0.65	2.26	1.37
335802	0.008	0.18	22.4	44.7	4010	0.8	0.6	5.7	0.23	2.17	
335803	0.008	1.38	14.8	191.5	>10000	3.31	192.5	7.7	2	1.8	3.20
335804	0.001	0.03	61	4.7	267	0.72	7.2	32	0.03	0.58	
335805	0.001	0.01	3.5	55.9	51	7.52	85.2	1	<0.002	0.09	
335806	0.001	0.64	5.3	13.2	9910	2.25	12.3	23	0.88	0.68	

<sup>2</sup> No datum is provided in Harrington's report for the coordinates in the two NAD27 columns above but they best fit the drainage and road network on a topographic map (NTS 94K06) in that datum. No datum is provided on Harrington's sample location maps.



In 2011 Coetzee obtained a grab sample of semi massive chalcopyrite from the west dyke system , located in Figure 4 and summarized in Table 6.

**Table 5: Analyses of rock sample collected by Coetzee, 2012.**

Sample	UTME NAD83	UTMN NAD83	Cu (ppm)	Pb (ppm)	Ag (ppm)	Mn (ppm)	Fe (%)
59410	371674	6473098	43,872	44.7	4.4	517	9.69

## 5.0 2017 Exploration Program

In September 24 to 25, 2017 the author visited the Toro and Churchill property, attempting to map and sample the showings. Unfortunately, the showings were covered with heavy snow and so the author spent the two days prospecting the lower elevations along strike, primarily between the mafic dykes. In both cases, the author landed in a flat area below the snow and followed the talus train coming from the showings. No mineralized outcrop was seen during the program, however five mineralized float sample were taken from the talus slopes below the showings. Three samples were taken of float below the Toro workings. Two samples were taken below the Churchill workings. This program is intended to precede an expanded program of mapping, rock sampling and soil sampling during the summer of 2018. The author wished to determine the best locations for sampling which would test the strike continuity of the vein system. One day was spent prospecting below the Toro showing and one day was spent prospecting below the Churchill showing.

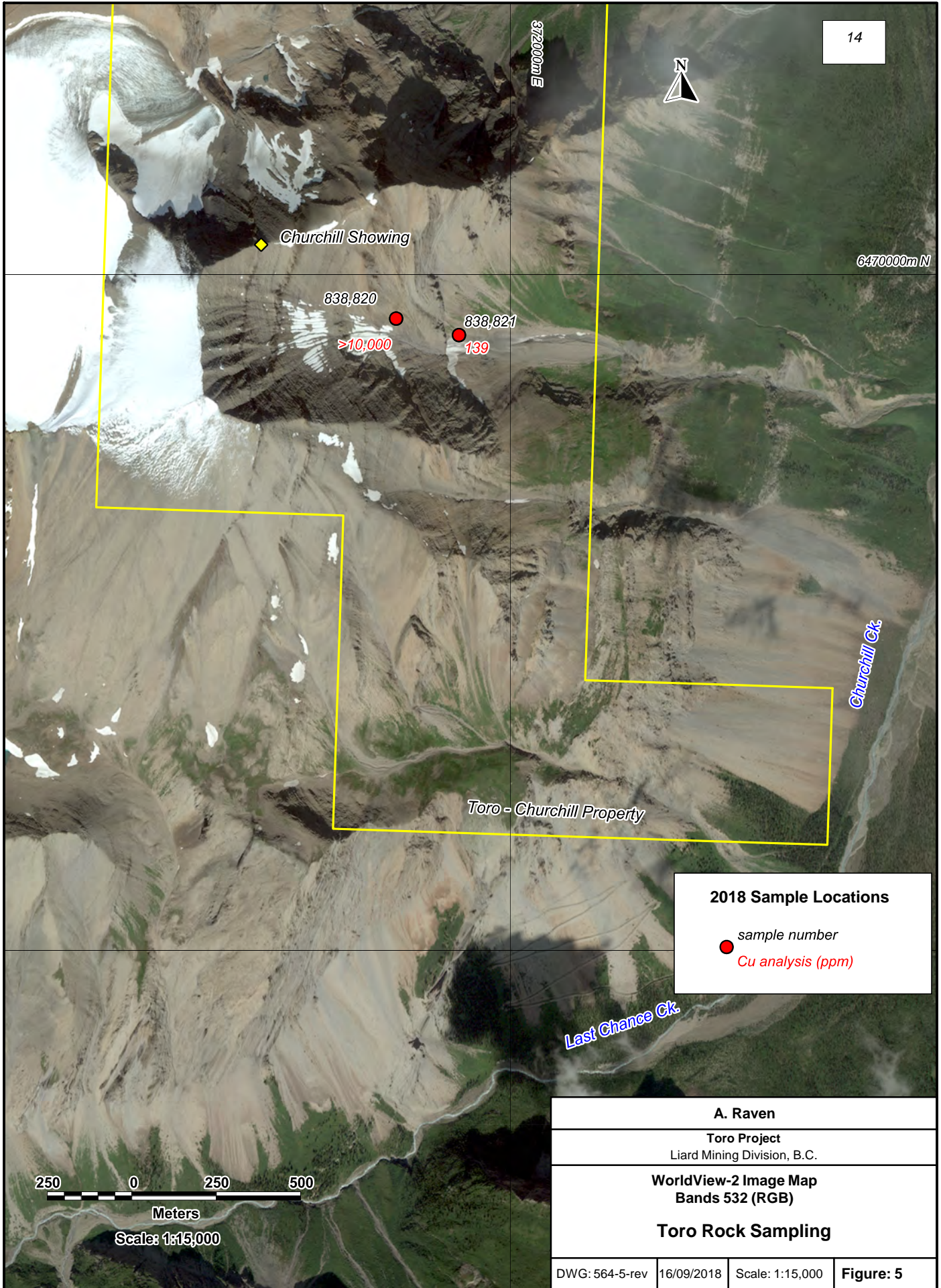
## 6.0 Results of the Sampling Program

The sampling program was successful in locating mineralized samples in the talus, downhill from the Toro and Churchill showings. A table of the sample locations, descriptions and analyses is included as Table 7. The results are similar in tenor to previous sampling of the mineralized showings. The sample locations are shown on Figure 4 and Figure 5.

## 7.0 Conclusions

The author was able to collect mineralized rock samples on the slopes below both the Toro and Churchill showings. Four of the samples were mineralized ranging from 0.24 to 7.43 percent copper. The ICP analysis sheets did not indicate any other anomalous metals in the rocks. The analysis sheets are located in Appendix A of this report. As reported in previous studies, the mineralized veins are intimately related to the presence of mafic dykes. The dykes appear to run through the country, so one can expect that the quartz veins will also be relatively continuous.





372000m E

6470000m N

Churchill Showing

838,820

>10,000

838,821

139

Toro - Churchill Property

Churchill Ck.

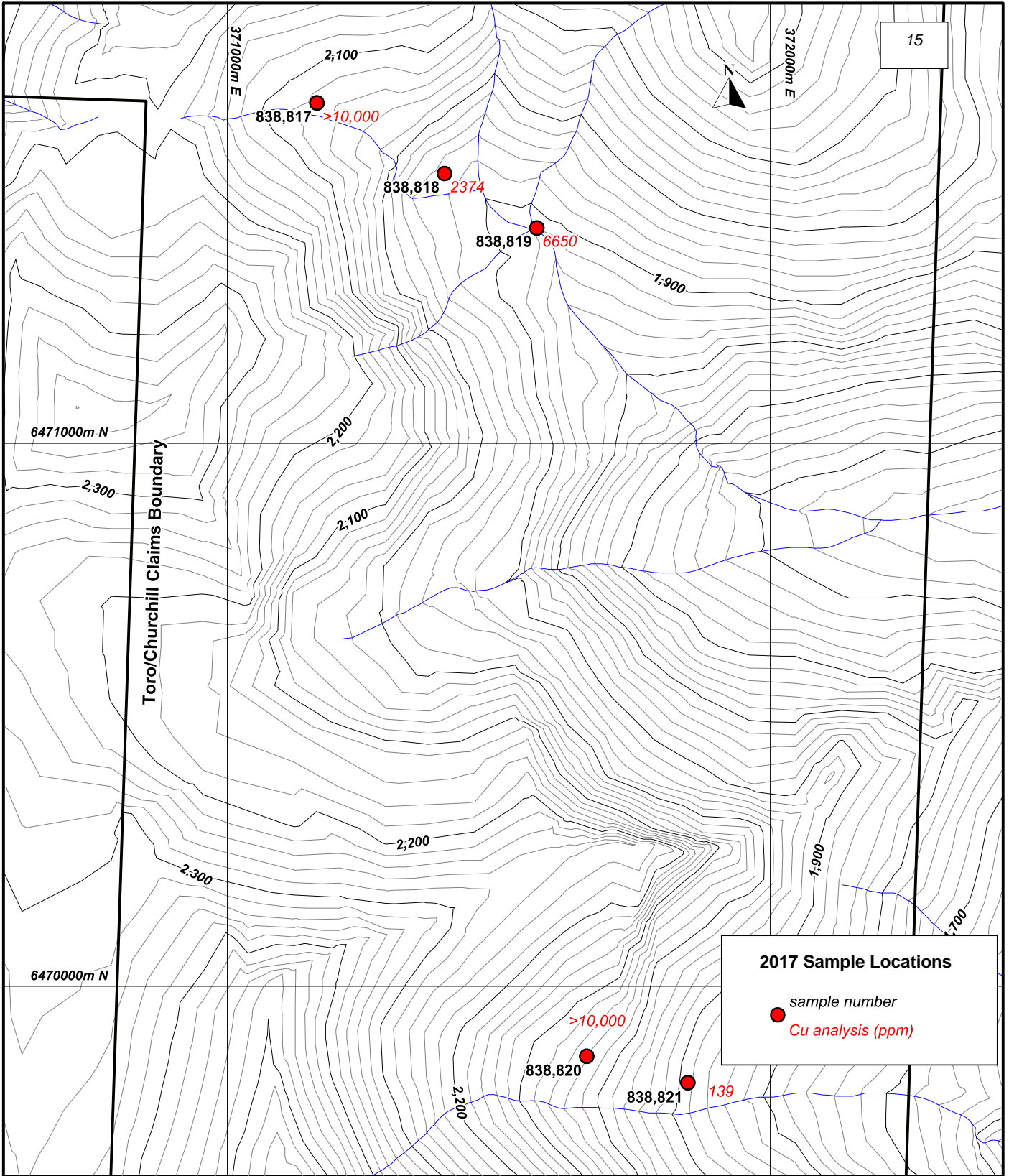
Last Chance Ck.

**2018 Sample Locations**

- sample number
- Cu analysis (ppm)

250 0 250 500  
Meters  
Scale: 1:15,000

A. Raven			
Toro Project			
Liard Mining Division, B.C.			
WorldView-2 Image Map Bands 532 (RGB)			
Toro Rock Sampling			
DWG: 564-5-rev	16/09/2018	Scale: 1:15,000	Figure: 5



15

**2017 Sample Locations**

- sample number
- Cu analysis (ppm)

200      0      200      400      600

Meters

Scale: 1:10,000

**A. Raven**

Toro Project  
Liard Mining Division, B.C.

**2017 Toro Rock Sampling**

DWG: 564-15	16/09/2018	Scale: 1:10,000	<b>Figure: 6</b>
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**Table 6 Table of 2017 Float Samples**

Sample #	Easting	Northing	Description	Showing Name	Cu (ppm)	Cu %
838817	371165	6471630	Quartz breccia with stringers of chalcopyrite	Toro	>10,000	1.32
838818	371400	6471500	Buff coloured dolomite and shale breccia cemented by quartz contains fragments of chalcopyrite	Toro	2374	0.24
838819	371570	6471400	Brecciated quartz vein with malachite, chalcocite and chalcopyrite in fractures	Toro	6650	0.67
838820	371662	6469875	Quartz vein in limestone containing bands of chalcopyrite and malachite	Churchill	>10,000	7.43
838821	371848	6469826	Banded Quartz vein in sandstone	Churchill	139	

### 8.0 Recommendations

In both the Toro and Churchill showings, the mineralized quartz carbonate veins appear to be intimately related to the west dyke. Between these showing the bedrock is covered in talus and this disrupts the possibility of the veins being as continuous as the mafic dykes. Detailed mapping (1:5000 scale) of the west dyke and east dyke and adjacent mineralization should be completed, checking for float to possibly confirm the continuation of the veins. A contour soil sampling program between the showings on 100 metre contours will also help to determine the continuation of mineralization. Care will need to be taken to confirm soil anomalies are related to subcrop and not just talus float from the showings above.

### 9.0 Statement of Expenditures

John Kowalchuk (Geologist) from September 23 to September 26, 2017

2 days travel @\$600/day	\$1,200.00
2 days sampling @ \$600/day	1,200.00
Helicopter 4 hours@ \$1500/hour	6,000.00
Accommodations	576.94
Transportations	373.12
Report 6 days @ 600/day	3,600.00
<b>Total expenses</b>	<b>\$12,950.00</b>



## 12.0 References

Campbell, K.V., 2012; Remote sensing study, Northern IOCG project, unpublished report for High Range Exploration Ltd., in Coetzee, G., 2012; Geophysical data interpretation, remote sensing satellite interpretation and infrastructure and logistics surveys at the Northern IOCG project; B.C. Mineral Resources Assessment Report 33336; 134pp.

Campbell, K.V., 2017; Preparatory Surveys, Structural Study and Geological Remote Sensing Investigation of the Toro Property, report for A.R. Raven of Smithers BC.

Carne, R.C., 2006; Assessment report describing geological mapping, prospecting, soil sampling, airborne magnetic surveys and diamond drilling at the Muskwa property; unpublished report prepared for Twenty-seven Capital Corp., B.C. Mineral Resources Assessment Report 28281; 376pp.

Coetzee, G., 2012; Geophysical data interpretation, remote sensing satellite interpretation and infrastructure and logistics surveys at the Northern IOCG project; B.C. Mineral Resources Assessment Report 33336; 134pp.

Geology, Exploration and Mining in British Columbia, 1970; British Columbia Department of Mines and Petroleum Resources.

Geology, Exploration and Mining in British Columbia, 1971; British Columbia Department of Mines and Petroleum Resources.

Halferdahl, L.B., 1983; Geochemical and geological assessment report; B.C. Mineral Resources Assessment Report 105090; 40pp.

Harrington, E., 2006; Assessment report on the Toro-Churchill property, Liard Mining Division; unpublished report for Aries Resource Corp. and Action Minerals, Inc.; B.C. Mineral Resources Assessment Report 28736; 35pp.

Harrington, E., 2015; Technical report on the Toro property; unpublished report for Aida Minerals Corp., dated October 23, 2014; 46pp.

Holland, S.S., 1976; Landforms of British Columbia; British Columbia Department of Mines and Petroleum Resources; Bulletin 48; 138pp.

Irwin, J.E., 1977; Prospecting report JED #1, 2 and 3 mineral claims; B.C. Mineral Resources Assessment Report 6471; 8pp.

Massey, N.W.D, MacIntyre, D.G., Desjardins, P.J. and Cooney, R.T., 2005; Digital geology map of British Columbia; B.C. Ministry of Energy and Mines, Geological Survey Branch, Open File 2005-2.

Minister of Mines Annual Report; 1966; Racing River, p.18.

Preto, V.A., 1971; Lode Copper Deposits of the Racing River-Gataga River Area; Geology, Exploration, and

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Mining in British Columbia, 1971; British Columbia Department of Mines and Petroleum Resources, pp. 75-104.

Taylor, G.C., and Stott, D.F., 1973; Tuchodi Lakes Map-Area, British Columbia, Geological Survey of Canada, Memoir 373.

**Certificate of Work**

I, John Michael Kowalchuk, resident of Richmond, BC do hereby certify as follows:

- 1 I am a Professional Geologist, principal of JMK Geological Services, #16-7491 No 1 Road Richmond, British Columbia.
- 2 I graduated with a degree of Bachelor of Science, Honours Geology, from the McMaster University in Hamilton, Ontario in 1970.
- 3 I have practiced my profession for 48 years. I have been a member of the Association of Professional Engineers and Geoscientists of British Columbia since February 1, 1999.
- 4 I visited the Toro property between the dates, September 23, 2017 and September 26, 2017.
5. This report, dated February 16, 2018 is based worked performed during the visit to the property in order to map and sample the mineral showings over the Toro and Churchill showings on the Toro Property mineral claims, Liard Mining Division, BC.

Dated at Richmond, Province of British Columbia

This 16<sup>th</sup> day of February, 2018

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John Kowalchuk, P. Geo

Geologist

Appendix 1

MS Analytical Laboratories, Analysis Sheets



**MS Analytical** Unit 1, 20120 102nd Avenue  
 Langley, BC V1M 4B4 Canada  
 Phone: +1-604-888-0875

An A2 Global Company

Suite 2300 - 1066 West Hastings St.  
 Vancouver, British Columbia, V6C 3X2  
 Canada

**SAMPLE RECEIPT CONFIRMATION**

<b>COMMENTS:</b>
For overlimit on copper ICA-6Cu.
Samples may not have been examined at this time; you will be contacted if insufficient sample was received for the methods requested or if sample integrity issues are present. Please refer to MS Analytical's Schedule of Services and Fees for our complete Terms and Conditions.

<b>JOB NUMBER</b>	<b>YVR1711044</b>
<b>Project Name:</b>	TORO Claims
<b>Submission Date:</b>	2017-12-11
<b>Turnaround Time Requested:</b>	Standard
<b>Estimated Completion Date:</b>	2018-01-05

**SAMPLE PREPARATION**

Sequence	Sample Type	Quantity	Prep Code	Description
838817 to 838821	Rock	5	DIS-100	Reject disposition/sample
838817 to 838821	Rock	5	DIS-200	Pulp disposition/sample
838817 to 838821	Rock	5	PRP-910	Dry, crush 1kg to 2mm, split 250g & pulverize to 85% -75µm

**ANALYTICAL METHODS**

Sequence	Sample Type	Quantity	Analytical Package	Description
838817 to 838821	Rock	5	ICA-6xx (Overlimit)	ICP-140 individual element, xx denotes element code
838817 to 838821	Rock	5	ICP-130	0.5g true aqua regia, ICP-ES finish (basic)

Sample ID	Sample Type	PWE-100 Rec. Wt. kg	Method Analyte Units	ICA-6Cu Cu %	ICP-130 Ag ppm	ICP-130 Al %	ICP-130 As ppm	ICP-130 B ppm	ICP-130 Ba ppm	ICP-130 Be ppm	ICP-130 Bi ppm	ICP-130 Ca %	ICP-130 Cd ppm	
838817	Rock	0.27	LOR	1.318	2.4	0.08	3	<10	<10	<0.5	<2	1.2	<0.5	
838818	Rock	0.2			0.4	0.47	8	13	24	<0.5	<2	4.77	<0.5	
838819	Rock	0.24			0.9	0.04	<2	<10	<10	<0.5	<2	0.06	<0.5	
838820	Rock	0.48		7.433	2.5	0.05	<2	13	<10	<0.5	<2	0.68	<0.5	
838821	Rock	0.21			0.5	0.95	<2	<10	<10	<0.5	<2	9.24	<0.5	
STD BLANK					<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	
STD BLANK				<0.001										
STD OREAS 601					51	0.84	319	<10	139	0.6	21	1.07	8.2	
Sample ID		ICP-130 Co ppm	ICP-130 Cr ppm	ICP-130 Cu ppm	ICP-130 Fe %	ICP-130 Ga ppm	ICP-130 Hg ppm	ICP-130 K %	ICP-130 La ppm	ICP-130 Mg %	ICP-130 Mn ppm	ICP-130 Mo ppm	ICP-130 Na %	ICP-130 Ni ppm
838817		8	173	>10000	1.74	<10	<1	0.05	<10	0.61	200	2	<0.01	9
838818		11	85	2374	3.29	<10	<1	0.2	<10	4.07	413	<1	0.01	15
838819		3	275	6650	0.89	<10	<1	0.03	<10	0.02	67	2	<0.01	10
838820		4	172	>10000	6.86	<10	<1	0.03	<10	0.16	51	2	0.01	7
838821		6	100	139	2.45	<10	<1	0.01	<10	1	1232	<1	<0.01	8
STD BLANK		<1	<1	<1	<0.01	<10	<1	<0.01	<10	<0.01	<5	<1	<0.01	<1
STD OREAS 601		5	42	1019	2.21	<10	<1	0.26	13	0.19	404	4	0.08	23
Sample ID		ICP-130 P ppm	ICP-130 Pb ppm	ICP-130 S %	ICP-130 Sb ppm	ICP-130 Sc ppm	ICP-130 Sr ppm	ICP-130 Th ppm	ICP-130 Ti %	ICP-130 Tl ppm	ICP-130 V ppm	ICP-130 W ppm	ICP-130 Zn ppm	ICP-130 Zr ppm
838817		148	6	1.37	<2	<2	7	<8	<0.01	<10	2	<10	20	<5
838818		341	10	0.24	<2	5	40	<8	<0.01	<10	7	<10	6	6
838819		140	9	0.29	<2	<2	3	<8	<0.01	<10	1	<10	19	<5
838820		1705	11	4.23	3	<2	6	10	<0.01	<10	3	<10	14	<5
838821		125	7	0.02	<2	12	276	<8	<0.01	<10	75	<10	20	<5
STD BLANK		<10	<2	<0.01	<2	<2	<1	<8	<0.01	<10	<1	<10	<1	<5
STD OREAS 601		374	294	1.03	17	<2	38	<8	0.01	<10	10	<10	1332	26