



**TYPE OF REPORT [type of survey(s)]:** Assessment Report on Geological and Geochemical work **TOTAL COST:** \$19,880.32

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**NOTICE OF WORK PERMIT NUMBER(S)/DATE(S):** \_\_\_\_\_

**YEAR OF WORK:** 2018

**STATEMENT OF WORK - CASH PAYMENTS EVENT NUMBER(S)/DATE(S):** SOW Event # 5721772, Recording Date Dec 4, 2018.

**PROPERTY NAME:** Andalusite Peak

**CLAIM NAME(S) (on which the work was done):** Andalusite Peak (1049497), Julep (1057768)

**COMMODITIES SOUGHT:** Au, Ag, Cu, Mo

**MINERAL INVENTORY MINFILE NUMBER(S), IF KNOWN:** 10083

**MINING DIVISION:** Liard Mining Division

**NTS/BCGS:** NTS 104I

**LATITUDE:** 58 ° 16 '33 "      **LONGITUDE:** 129 ° 28 '40 " (at centre of work)

**OWNER(S):**

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**OPERATOR(S) [who paid for the work]:**

1) Triumph Gold Corp.      2) \_\_\_\_\_

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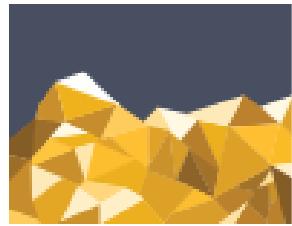
Vancouver, BC, Canada, V6E 3V6

**PROPERTY GEOLOGY KEYWORDS (lithology, age, stratigraphy, structure, alteration, mineralization, size and attitude):**

Horn Mountain Formation; Hazelton Group; Porphyry; Lithocap

**REFERENCES TO PREVIOUS ASSESSMENT WORK AND ASSESSMENT REPORT NUMBERS:** Barresi, T., 2009. Rock and Stream Sediment G Bickerton, L., Barresi, T., Hopkins, G., 2018. Assessment Report on Geological and Geochemical work conducted during August

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 7.5 Km2		Andalusite Peak & Jelup	\$7,677.62
Other			
DRILLING (total metres; number of holes, size)			
Core			
Non-core			
RELATED TECHNICAL			
Sampling/assaying			
Petrographic			
Mineralographic 7.5 Km2		Andalusite Peak & Jelup	\$6,796.35
Metallurgic			
PROSPECTING (scale, area) 7.5 Km2		Andalusite Peak & Jelup	\$5,416.35
PREPARATORY / PHYSICAL			
Line/grid (kilometres)			
Topographic/Photogrammetric (scale, area)			
Legal surveys (scale, area)			
Road, local access (kilometres)/trail			
Trench (metres)			
Underground dev. (metres)			
Other			
		TOTAL COST:	\$19,880.32



**TRIUMPH  
GOLD**

Assessment Report on Geological and Geochemical work  
conducted during July 2018 on the  
**Andalusite Peak Mineral Tenure**

Liard Mining Division  
British Columbia, Canada

Latitude / Longitude: 58° 16' 33" N, 129° 28' 40" W  
UTM, NAD 83 Zone 9N: 471895mE, 6459520mN  
1:250,000 NTS Map Sheet: 104I

Work Completed on Claims:  
1049497, 1057768  
Report Completed: February 21  
2019

Owner and Operator:  
Triumph Gold Corp.  
1100-1111 Melville St.  
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V6E 3V6

Contributions by:  
Tony Barresi, Graeme Hopkins, Luke Bickerton

## SUMMARY

The Andalusite Peak mineral tenure is located on the southeastern edge of the Stikine Plateau, approximately 36 km southeast of Dease Lake, British Columbia, and 21 km east of Highway 37 (Stewart-Cassiar). At the time of the assessment work the tenure comprised two claims that totaled an area of 987.31 hectares. This assessment report summarizes the work completed during a three day, 2018, exploration program conducted by Triumph Gold Corp. personnel.

The area containing the mineral tenure is relatively unexplored, with the only significant mineral exploration work in the region being completed on the Tanzilla property (Kaizen Discovery), 11 km to the northwest, and more recent reconnaissance exploration on the McBride property (Teck Resources), 12 km to the southeast.

The Andalusite Peak property is located along the northeastern margin of the Stikine terrane, a Triassic-Jurassic island arc complex that hosts several significant porphyry Cu-Au±Mo deposits (e.g., KSM, Galore Creek, Schaft Creek, Red Chris, Kemess) and many smaller, less developed occurrences. More local to the tenure, mineral occurrences are located along a trend of argillic alteration (~27 km) that extends from the Tanzilla property to the McBride property.

The 2018 exploration program consisted of prospecting, collecting samples for TerraSpec © hyperspectral analyses (45 samples taken), and geochemical rock sampling (61 samples taken), with an emphasis on the areas in the hangingwall (south of) the main argillic alteration zone. The purpose of the work was to follow up on high grade Au-Ag-Cu samples collected in 2018 at the newly discovered Julep and Gentleman showings (BC assessment report #37404). The strike length of the Gentleman/Julep Trend has been expanded from 140 metres defined in 2018, to at least 550 metres. This trend is now defined by seven samples with >0.5% Cu, and grades up to 3.3% Cu, 22.1 g/T Ag, and 2.8 g/T Au. In addition, a newly identified, 1,000 by 300 metre mineralized trend (the Tennessee Trend) has been delineated on a ridge 1.5 kilometres west of the Gentleman/Julep Trend. This trend is defined by fifteen new and historical samples with >0.5% Cu, including grades up to 67% Cu, 500 g/T Ag, and 2.8 g/T Au.

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## **1. INTRODUCTION**

The Andalusite Peak property is located on the Stikine Plateau, approximately 36 km southeast of Dease Lake, British Columbia (BC) and 410 km northwest of Smithers, BC (Figure 1). The property was acquired by staking in January 2017 and January 2018, and comprises two claims that covers a total area of 987.31 hectares (ha) (Figure 2).

This assessment report summarizes the work completed on the Andalusite Peak mineral tenure by Triumph Gold Corp. from July 6<sup>th</sup> to 8<sup>th</sup>, 2018. Assessment work totaling \$19,880.32 was applied to mineral claims 1049497 and 1057768, described in Table 1, under event number 5721772.

## **2. PROPERTY LOCATION AND DESCRIPTION**

### **2.1 Location**

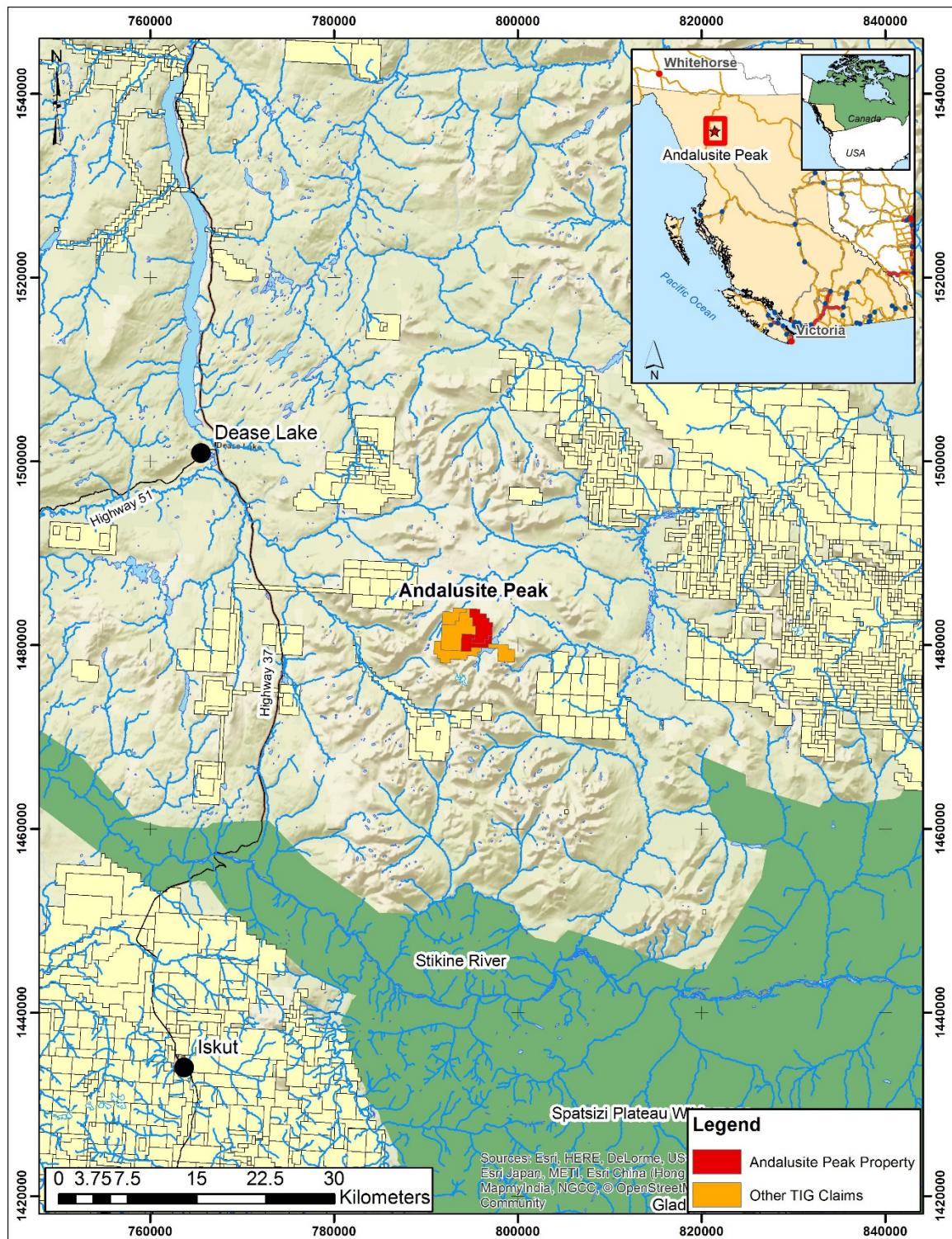
The Andalusite Peak property is located approximately 36 km southeast of Dease Lake, BC, and 410 km north-northwest of Smithers, BC, within the Stikine Plateau of the Liard Mining Division (Figure 1). At a larger scale, the property specifically lies northeast of Horn Mountain, abutting Glacial Lake to the east, at a latitude of 58° 16' 33" N and longitude of 129° 28' 40" W (UTM NAD83, Zone 9N) and on NTS 104 I/5, 6; BCGS 104I 023.

### **2.2 Description**

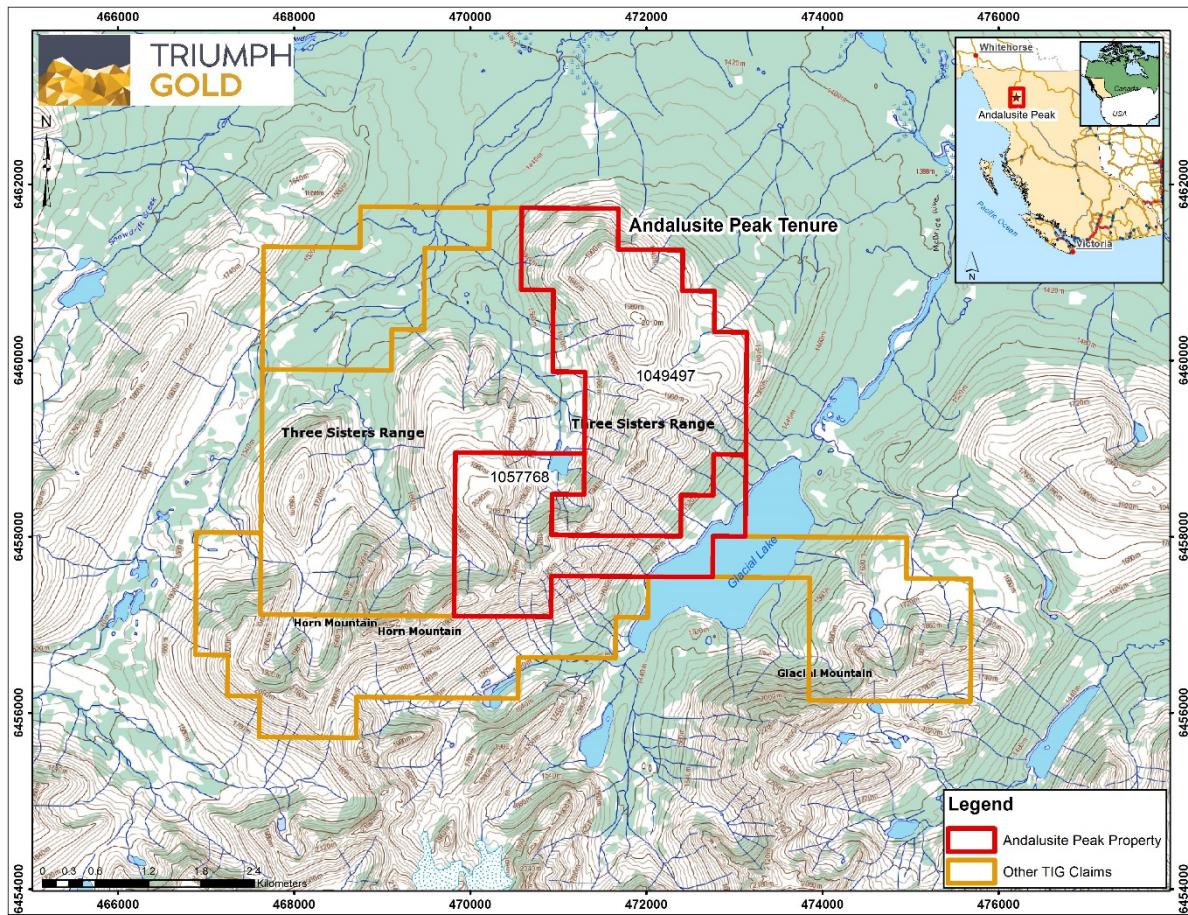
The Andalusite Peak mineral tenure consists of two mineral claim with a total area of 987.31 ha (Figure 2). Four additional Triumph Gold Corp. claims adjoin the two claims that constitute the Andalusite Peak Tenure. The details of the Andalusite Peak tenures (tenure number, expiry date, claim size) are contained in Table 1.

**Table 1. Andalusite Peak mineral claim**

Claim	Tenure Number	Owner	Issue Date	Area (ha)	Good-To-Date
<b>ANDALUSITE PEAK</b>	1049497	Tony Barresi	2017-01-25	629.73	2022-01-25
<b>JULEP</b>	1057768	Tony Barresi	2018-01-18	357.58	2022-01-18



**Figure 1. Regional scale geography with location of Andalusite Peak mineral tenure and surrounding claim boundaries.**



**Figure 2. Property scale geography with location of Andalusite Peak mineral tenure, vegetation line, and surrounding peaks.**

### 3. ACCESS, INFRASTRUCTURE and PHYSIOGRAPHY

#### 3.1 Access

The Andalusite Peak property is located approximately 36 km southeast of Dease Lake, BC, at latitude  $58^{\circ} 16' 33''$  N and longitude of  $129^{\circ} 28' 40''$  W in NTS map area 104I (Figure 1). The mineral tenure is accessible via helicopter from Dease Lake. Dease Lake is located along Highway 37 (Stewart-Cassiar), approximately 600 km drive north from Smithers, BC. Fixed wing service to a paved airstrip in Dease Lake during the summer months is normally available.

#### 3.2 Infrastructure and Local Resources

The primary access to the region is Highway 37, which runs north from Highway 16 near Smithers, BC, until it intersects Highway 1, the Alaska Highway, in southern Yukon. Dease

Lake is an approximate 600 km drive north from Smithers, BC, via Bell II (at 360 km N) and Iskut village (at 515 km N). Dease Lake, located on Highway 37, has a paved airstrip with a small airport and a helicopter base operated by Lakelse Air (formerly Pacific Western Helicopters).

Amenities in Dease Lake include a gas station, grocery and general store, hotel and B&B accommodation, a health clinic, and a RCMP detachment.

Power is supplied to the region via the BC Hydro Northwest Transmission Line (NTL) which extends a 287-kV transmission line from Skeena sub-station to the Bob Quinn Lake area, 190 km south of Dease Lake. This power project was completed in 2014 as part of an effort to facilitate development of potential mines in the region.

### **3.3 Climate and Physiography**

The Andalusite Peak property is in the Stikine region, situated northeast of the Three Sisters Range and west of the McBride River on the southeastern edge of the Stikine Plateau.

Topography in the area is variable from wide glacially smoothed valley floors to rugged, steep ridges and cirques. Elevation in the area ranges from 1300 m in the valley bottoms to >2300 m at ridge peaks. On the mineral tenure, elevation ranges from 1500 to 2000 m.

The tree line ranges from 1500 to 1600 m, below which is a mixed forest of primarily boreal character, typical of the northern interior Cordillera. Forests below treeline are composed of spruce, willow, birch, fir, pine, aspen and alder. Above the treeline there is juniper, dwarf willow ('buckbruch'), alpine grasses, mosses and lichens. Above 1650 to 1700 m, vegetation is sparse.

The climate in the area is typical of subalpine to alpine regions in the interior Cordillera plateaus of northern British Columbia. Winters are long and cold with thick snow accumulation from mid-November through to mid-March, and summers are short with long days and moderately warm temperatures, averaging in the mid-teens to -twenties ( $^{\circ}\text{C}$ ).

## **4. HISTORY**

### **4.1 Exploration History**

Historical exploration has taken place in the region during the 1970s and 1980s and more recently in 2008, summarized in assessment reports that are detailed in Table 2 and accessible

online via the B.C. Ministry of Energy, Mines and Petroleum Resources website:  
<http://www.empr.gov.bc.ca/mining/geoscience/aris>.

**Table 2. Historical exploration in the Andalusite Peak area.**

Report #	Year	Company	Work Completed
<b>Placer Dome File #:</b> <b>1967-28; 1968-37</b>	1967-1968	US Smelting, Refining and Mining Corp.	IP, trenching, diamond drilling
<b>4498</b>	1972	El Paso Mining	Mapping, soil sampling
<b>4644</b>	1973	Kennco	IP
<b>4645</b>	1973	Kennco	Soil Sampling
<b>4659</b>	1973	Kennco	Airborne Magnetics
<b>4660</b>	1973	Kennco	Ground Magnetics
<b>10356; 10923</b>	1982	Serrana Res / Noranda	Soil Sampling
<b>30590</b>	2009	Paget Moly Corp.	Rock and stream sediment geochemistry
<b>37404</b>	2017	Triumph Gold Corp.	Rock geochemistry & alteration mapping

The stream sediment and rock sampling program in 2008 identified consistent elevated Cu +/- Mo concentrations at three mineralization prospects, the Joyce, And Ginger, and Straight Up showings (see Figure 6), indicating the presence of a large, intrusion-related acid-leach alteration system (Barresi 2009). This is the only publicly documented historical work that has ever been conducted on the current tenure.

#### **4.2 Government Surveys**

Northwest of the Andalusite Peak claim, regional mapping was completed in the Dease Lake map area (104J; Gabrielse, 1980) and the western part of the Cry Lake map area (NTS 104I) as part of ‘Operation Stikine’ by the Geological Survey of Canada (GSC; Gabrielse, 1998). Further work in the area was conducted more recently as part of the QUEST-Northwest ‘Dease Lake Geoscience’ Mapping project by the British Columbia Geological Survey (BCGS) in the region (NTS 104I, J; Logan et al. 2012, and references therein).

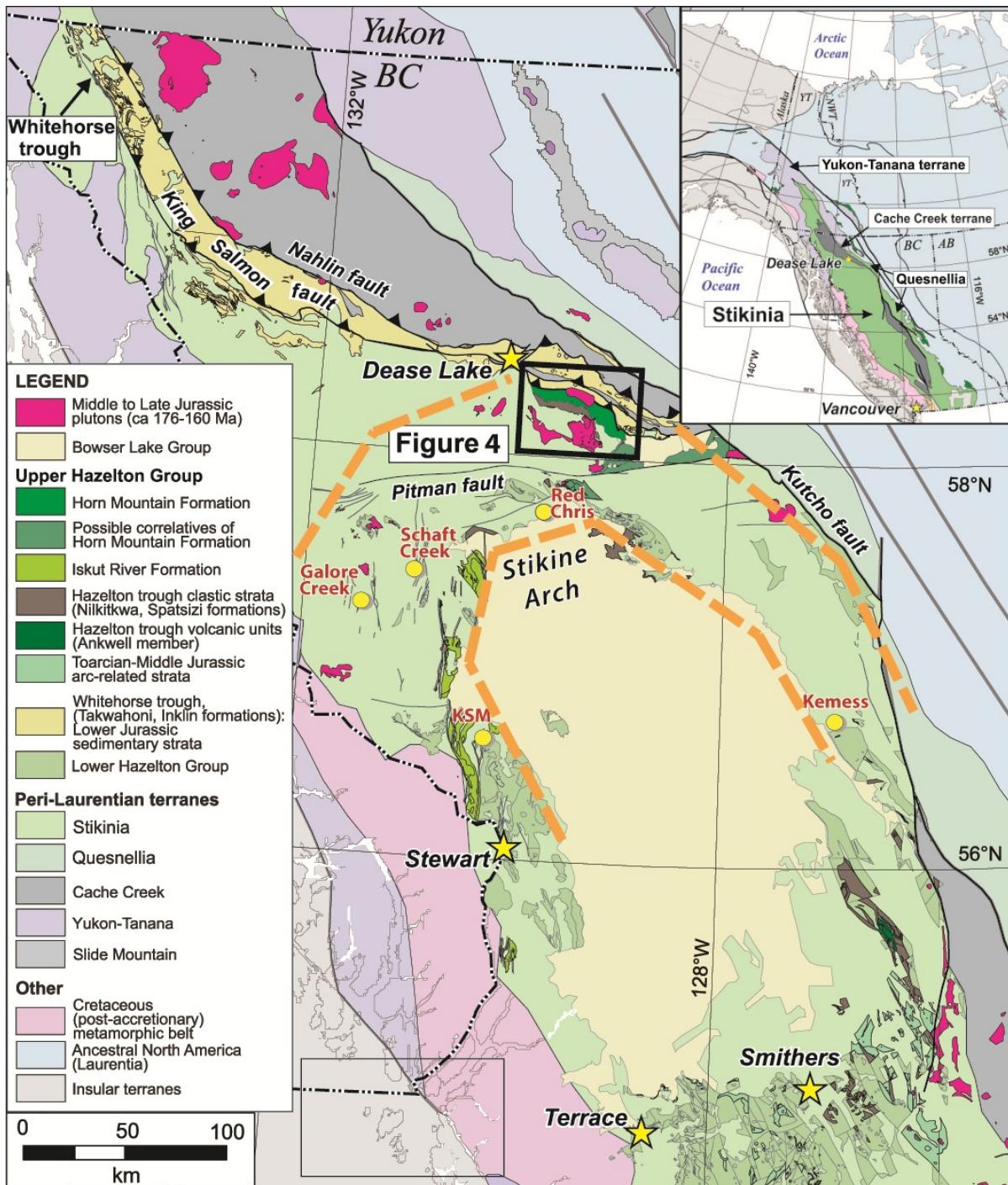
The area south of the mineral claim is the Stikine River Provincial Park and the Spatsizi Plateau Wilderness Provincial Park was part of a detailed study and mapping project titled ‘Geology of the Spatsizi River Area’ (Evenchick and Thorkelson 2005).

The most recent government mapping in the area was conducted by the BCGS in 2015 and 2016 north of the Hotailuh Batholith, and covers an area that includes the Tanzilla, Andalusite Peak, and McBride mineral tenures (van Straaten and Gibson 2016; van Straaten and Nelson 2016). This recent study summarizes the local lithostratigraphic and intrusive units into a regional context.

## 5. REGIONAL GEOLOGY

The Andalusite Peak property is located along the northeastern margin of the Stikine terrane (Stikinia; Fig. 3). Stikinia is an allochthonous Triassic-Jurassic island arc complex built upon para-autochthonous Devonian to Permian carbonate and metavolcanic units (Stikine Assemblage) outboard from the western Laurentian margin prior to accreting to ancestral North America (Mihalynuk et al. 1994; Nelson and Colpron 2007). The volcanic and related sedimentary rocks of the Late Triassic Stuhini Group and Lower Jurassic Hazelton Group are the dominant exposed Stikinia units in the northern part of the terrane (Currie and Parrish 1997). The Lower Cretaceous Bowser Lake Group and Upper Cretaceous Sustut Groups are post-accretionary clastic sedimentary units that overlie the Stikinia volcanic rocks (Evenchick and Thorkelson 2005).

The tenure is in the northern part of Stikinia, termed the ‘Stikine Arch’ in British Columbia, where plutonic suites are associated with large Cu-Au-Ag+-Mo porphyry-style mineral deposits (e.g., KSM, Galore Creek, Schaft Creek, Red Chris, Kemess; Figure 3). Intrusive suites that occur within Stikinia include the Forest-Kerr (Devono-Carboniferous), the Stikine and Copper Mountain (Late Triassic), the Texas Creek and Cone Mountain (Early Jurassic), and Three Sisters (Middle Jurassic; Anderson 1983, 1993; Brown et al. 1996; Logan et al. 2000). Plutonic rocks in the mineral tenure area include those of the mid- to Late Triassic Stikine suite (Cake Hill pluton, south-southwest of the tenure), the Middle Jurassic Three Sisters suite, and the early Late Jurassic Snowdrift Creek pluton (van Straaten and Gibson 2017).



**Figure 3.** Regional geology of northern British Columbia (modified after van Straaten and Nelson, 2016) featuring the 'Stikine Arch' and associated major porphyry Cu-Au+/-Mo mineral deposits. Inset shows tectonic terranes of the northern Cordillera and Figure 4 (tenure local geology) is outlined.

North of Andalusite Peak the terrane-bounding north- to northeast-dipping King Salmon fault separates Whitehorse trough and Stikinia rocks to the south, and rocks of the Cache Creek accretionary complex to the north (Figure 4).

## **5.1 Stratigraphy**

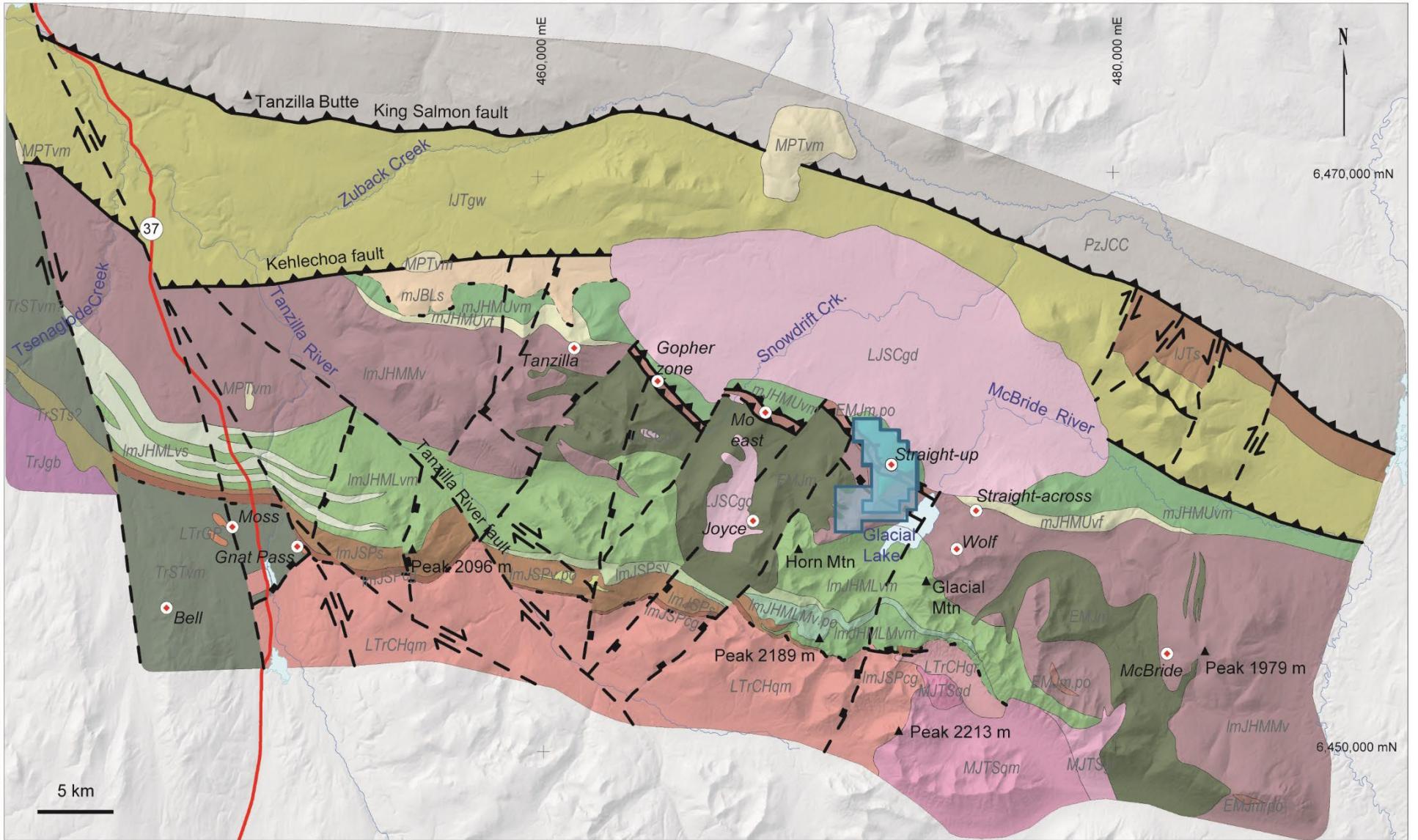
Lithostratigraphic units in the area comprise two main domains; siliciclastic sedimentary units of the Whitehorse trough, north of the Kehlechoa fault (hanging wall), and the mafic volcanic and volcanioclastic to siliciclastic sedimentary rocks of Stikinia, south of the Kehlechoa fault (footwall; Figure 4). The following stratigraphic groups have been recorded in the field area surrounding the Andalusite Peak mineral tenure:

### **5.1.1 Triassic Stuhini Group (Stikinia)**

The Stuhini Group is a thick succession of Late Triassic andesitic volcanic rocks and lesser sedimentary rocks. The dark green, massive augite- and lesser augite-plagioclase-phyric flows, volcanic breccia, tuffaceous conglomerate, volcaniclastic sandstone and siltstone are thought to have been deposited in a submarine environment (Anderson 1983; Gabrielse 1998; Logan et al. 2012b). The succession is cross-cut by Late Triassic porphyry dikes in the Gnat Pass area and is unconformably to conformably overlain by the Lower to Middle Jurassic Hazelton Group (Figure 5), and therefore likely represents Triassic arc construction in Stikinia (van Straaten et al. 2012; van Straaten and Gibson 2017).

### **5.1.2 Lower to Middle Jurassic upper Hazelton Group (Stikinia)**

The Lower to Middle Jurassic upper Hazelton Group forms a north-dipping ~10 km wide belt that trends northwest-southeast in the tenure area (Fig. 4). This Group is a volcano-sedimentary sequence that contains a lower sedimentary unit (Spatsizi Formation) and an upper volcanic unit (Horn Mountain Formation) that is newly defined in the region (van Straaten and Nelson 2016; van Straaten and Gibson 2017); it had previously been interpreted as Stuhini Group or undivided Triassic-Jurassic volcanic rocks.



**Figure 4. Local geology of the mineral tenure area, including the Tanzilla and McBride rivers, Horn Mtn. and Glacial Lake. Andalusite Peak mineral tenure outlined (after van Straaten and Gibson 2017), see continued figure for legend.**

## Stratified rocks

### Overlap assemblages

Miocene-Pleistocene, Tuya Formation

*MPTvm* Olivine basalt

### Stikinia

#### Middle Jurassic, Bowser Lake Group

*mJBLs* Sandstone and conglomerate

#### Lower to Middle Jurassic, upper Hazelton Group

Middle Jurassic, Horn Mountain Formation

*mJHMUvm* Upper mafic volcanic rocks

*mJHMUvf* Upper felsic volcanic rocks

#### Lower to Middle Jurassic, Horn Mountain Formation

*ImJHMMv* Middle maroon volcanic rocks

*ImJHMLvm* Lower mafic volcanic rocks

*ImJHMLvs* Volcaniclastic sandstone

*ImJHMLMv.po* Lowermost platy plagioclase-phyric volcanic rocks

*ImJHMLMvm* Lowermost mafic volcanic rocks

#### Lower to Middle Jurassic Spatsizi Formation

*ImJSPsv* Volcaniclastic sandstone

*ImJSPs* Argillite, siltstone and sandstone

*ImJSPv.po* Platy plagioclase-phyric volcanic rocks

*ImJSPcg* Basal sandstone and conglomerate

### Triassic, Stuhini Group

*TrSTvm* Mafic volcanic rocks

*TrSTS* Sandstone, volcaniclastic sandstone and argillite

### Whitehorse trough

#### Lower Jurassic, Laberge Group

Lower Jurassic, Takwahoni Formation

*IJT*s Siltstone

*IJTgw* Sandstone

### Cache Creek

Paleozoic to Jurassic

*PzJCC* Undivided

## Intrusive rocks

Late Jurassic, Snowdrift Creek pluton

*LJSCgd* Biotite-bearing hornblende granodiorite

Middle Jurassic, Three Sisters pluton

*MJTSgr* Biotite-bearing hornblende monzogranite

*MJTSqm* Biotite-bearing hornblende quartz monzodiorite

*MJTSqd* Hornblende-clinopyroxene diorite

Early to Middle Jurassic, Spatsizi/Horn Mountain intrusions

*EMJm.po* Platy plagioclase porphyry

*EMJm* Mafic intrusive complex

Triassic to Jurassic

*TrJgb* Clinopyroxene-rich diorite to gabbro

Late Triassic, Gnat Pass intrusion

*LTrGP* Plagioclase porphyry

Late Triassic, Cake Hill pluton

*LTrCHgr* Hornblende monzogranite

*LTrCHqm* Hornblende quartz monzodiorite

— Contact

- - - Unconformity

— Fault

—▲— Normal fault

—▲— Thrust fault

▲ Peak

● Minfile / mineral occurrence



Andalusite Peak & Julep  
mineral tenures

Figure 4 continued...

### **5.1.3 Middle Jurassic Bowser Lake Group (Stikinia)**

The Middle Jurassic to mid-Cretaceous Bowser Lake Group is a clastic overlap assemblage that defines a large sedimentary basin through much of interior northern British Columbia (Bowser Basin; Figure 3). The Group consists of thick sequences of shale, siltstone, sandstone and conglomerate that overlap the Stuhini and Hazelton groups. This Group is a prominent overlap assemblage south of the mineral tenure, bounded by parts of the Stikine terrane that have been uplifted during the Middle Jurassic relative to the rest of the terrane (i.e., the ‘Skeena Arch’ and ‘Stikine Arch’), contributing detritus to the basin until the mid-Cretaceous (Evenchick and Thorkelson 2005).

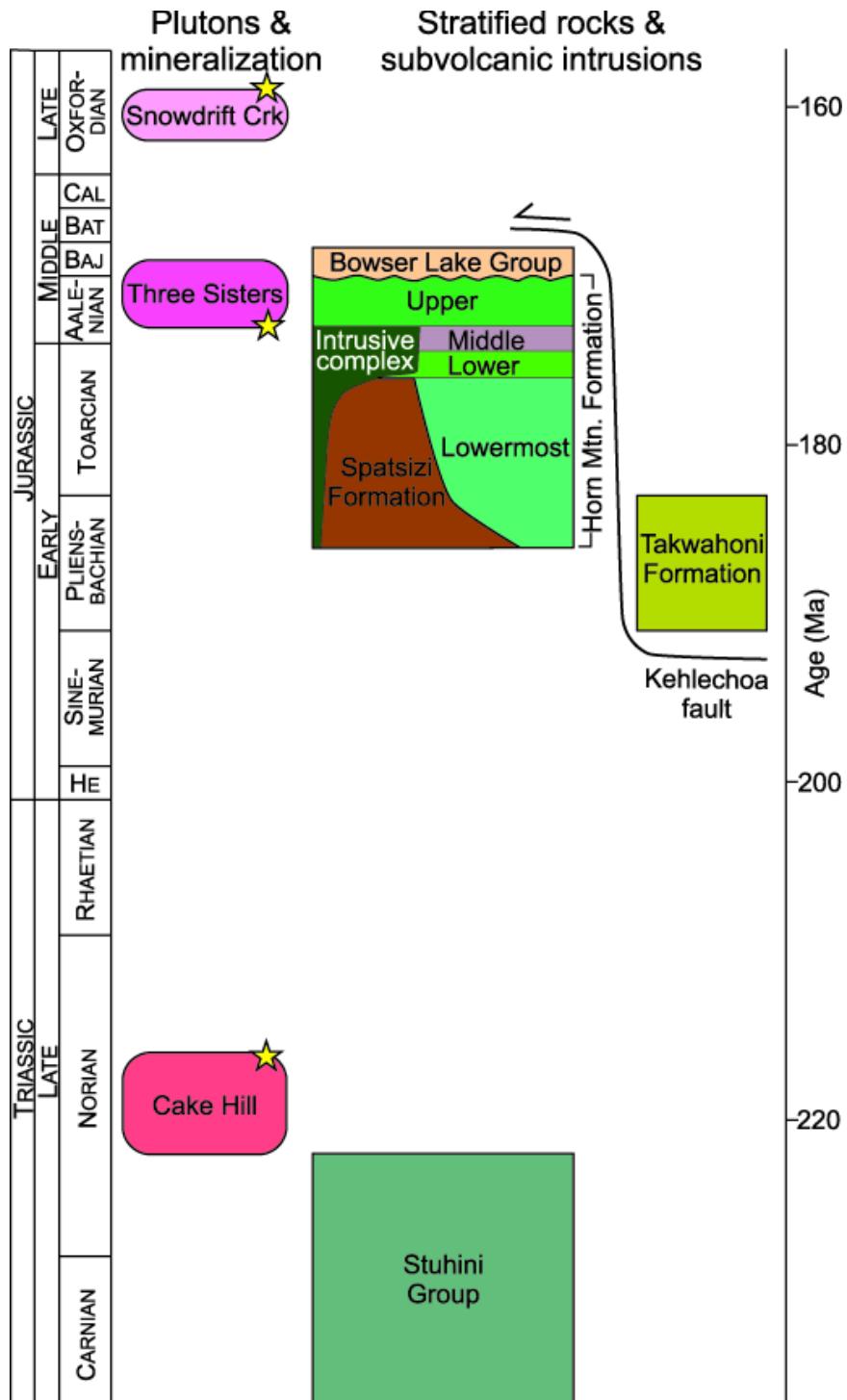
### **5.1.4 Lower Jurassic Laberge Group (Whitehorse trough)**

The Laberge Group is the primary unit within the Whitehorse trough, a forearc basin that became a syn-orogenic piggy-back basin by the Lower Jurassic, and overlaps both the Stikine and parts of Quesnel terrane as well as containing detritus from the Cache Creek terrane (Colpron et al. 2015). The Laberge Group is subdivided into the Takwahoni Formation and the Inklin Formation, but the Takwahoni is the more typical formation exposed in the region; it is comprised of conglomerate-rich clastic rocks (with Stikine terrane provenance) with interbedded siltstone, greywacke, feldspathic arenite, and rare calcareous sandstone (Schiarizza 2012).

## **5.2 Intrusive Rocks**

There are multiple intrusive units that occur in the region, they are various ages depending on the plutonic suite with which they are associated. There are also Early to Middle Jurassic hypabyssal to subvolcanic stocks, sills, and dikes that occur across the area as part of the volcanic rock dominated formations; although these units locally crosscut the stratigraphy, they are not described separately here as they can be considered part of the Stuhini Group and Hazelton Group volcanic pile.

South of the Andalusite Peak mineral tenure is the Hotailuh batholith, a composite intrusive complex that contains intrusions from multiple plutonic suites representing the Late Triassic (Stikine), the Early Jurassic (Cone Mountain), and the Middle Jurassic (Three Sisters).



**Figure 5. Schematic stratigraphic column of Mesozoic units in northern Stikinia and in the Andalusite Peak mineral tenure area (van Straaten and Gibson 2017). Yellow stars indicate main mineralization events in the region. Jurassic stage abbreviations: Hettanigian (He), Bajocian (Baj), Bathonian (Bat), Callovian (Cal).**

### **5.2.1 Late Triassic Cake Hill Pluton**

The Cake Hill Pluton, the largest and oldest component of the Hotailuh batholith, is composed of homogeneous, equigranular hornblende quartz-monzonodiorite to quartz monzonite and has been dated using U-Pb zircon at  $218.2 \pm 1.3$  Ma (Figure 5; van Straaten et al. 2012).

### **5.2.2 Middle Jurassic Three Sisters intrusions**

The Early to Middle Jurassic Three Sisters Suite comprises intrusions that range from hornblende-biotite quartz diorite to quartz monzonite and quartz monzonodiorite and can be broken up into four distinct phases: i) a fine grained mafic to intermediate phase, ii) a mafic phase, iii) a central felsic phase, and iv) a late crosscutting potassic phase (van Straaten et al. 2012).

### **5.2.3 Late Jurassic Snowdrift Creek intrusions**

The Late Jurassic Snowdrift Creek intrusions are mostly recessive granodiorite and quartz diorite to tonalite, underlying an area of  $\sim 100$  km<sup>2</sup> north of the mineral tenure (Figure 4; van Straaten and Nelson 2016). The intrusions are interpreted to crosscut the Kehlechoa fault (thrust fault that brings basal units of the Whitehorse trough structurally above rocks of Stikinia and the Bowser Lake Group) and is dated by U-Pb zircon to be  $160.43 \pm 0.16$  Ma (van Straaten and Gibson 2017).

## **5.3 Structure**

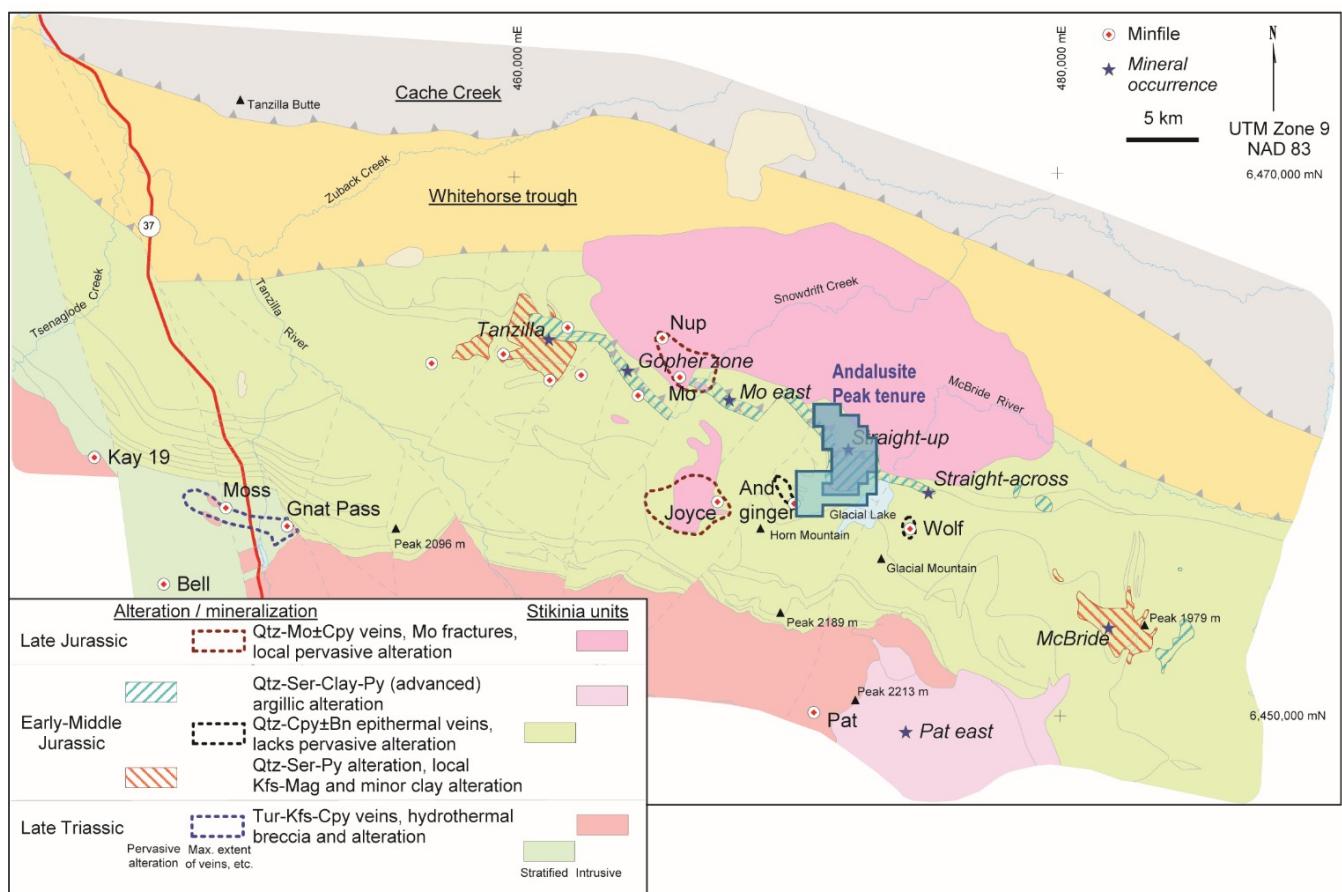
Regionally, in Stikinia, the oldest deformation is caused by the ‘Tahltanian Orogeny’ and is recorded in the Paleozoic Stikina assemblage by strong penetrative foliation and greenschist facies metamorphism and a disconformable contact with the above lying Stuhini Group (Logan et al. 2000). The Stuhini Group is unconformably overlain by the Hazelton Group, demarcating a deformation event that occurred by the Early Jurassic, as indicated by the lack of foliation in the Early Jurassic plutons in the region, relative to the older intrusive bodies (Gabrielse 1998).

Overprinting Stikinia is a deformation event related to the Early to Middle Jurassic accretion of the Cache Creek terrane to the Stikine margin, resulting in south-southwest vergent folds and north-northeast dipping faults as well as a penetrative schistosity and cleavage, particularly near these faults (Nelson and Colpron 2007; Logan et al. 2012). In the area containing the mineral tenure, the Hazelton Group forms a moderately north-northeast dipping homocline, cut by

northeast striking normal faults and northwest-striking transtensional faults with dextral displacement (Figure 4; van Straaten and Gibson 2017).

#### 5.4 Mineralization

Regionally, the ‘Stikine Arch’ is host to significant porphyry Cu-Au±Mo discoveries and many smaller, less developed occurrences. Several major deposits include Kerr-Sulphurets-Mitchell (KSM; Seabridge), Galore Creek (Antofagasta Mineral/Teck), Schaft Creek (Teck/Copper Fox), Red Chris (Imperial Metals), Saddle North (GT Gold), and Kemess (Centerra Gold). Smaller active properties include Spectrum-GJ (Skeena Resources), Castle and North Rok (Colorado Resources), Tanzilla (Kaizen Discovery) and Gnat Pass and McBride (Teck Resources).



**Figure 6. Mineralization occurrences, MINFILEs, and alteration trends in the tenure map area, Andalusite Peak outlined in blue (after van Straaten and Gibson 2017).**

Mineral occurrences in the tenure area include Late Triassic porphyry-style mineralization at Gnat Pass and nearby Moss, and extensive aerially visible gossans at Tanzilla and McBride showings. The trend of argillic alteration (~27 km) extends across the Horn Mountain Formation from the Tanzilla property to the McBride property, with the Andalusite Peak tenure located central to this trend (Figure 6; van Straaten and Gibson 2017).

## 6. 2018 EXPLORATION PROGRAM

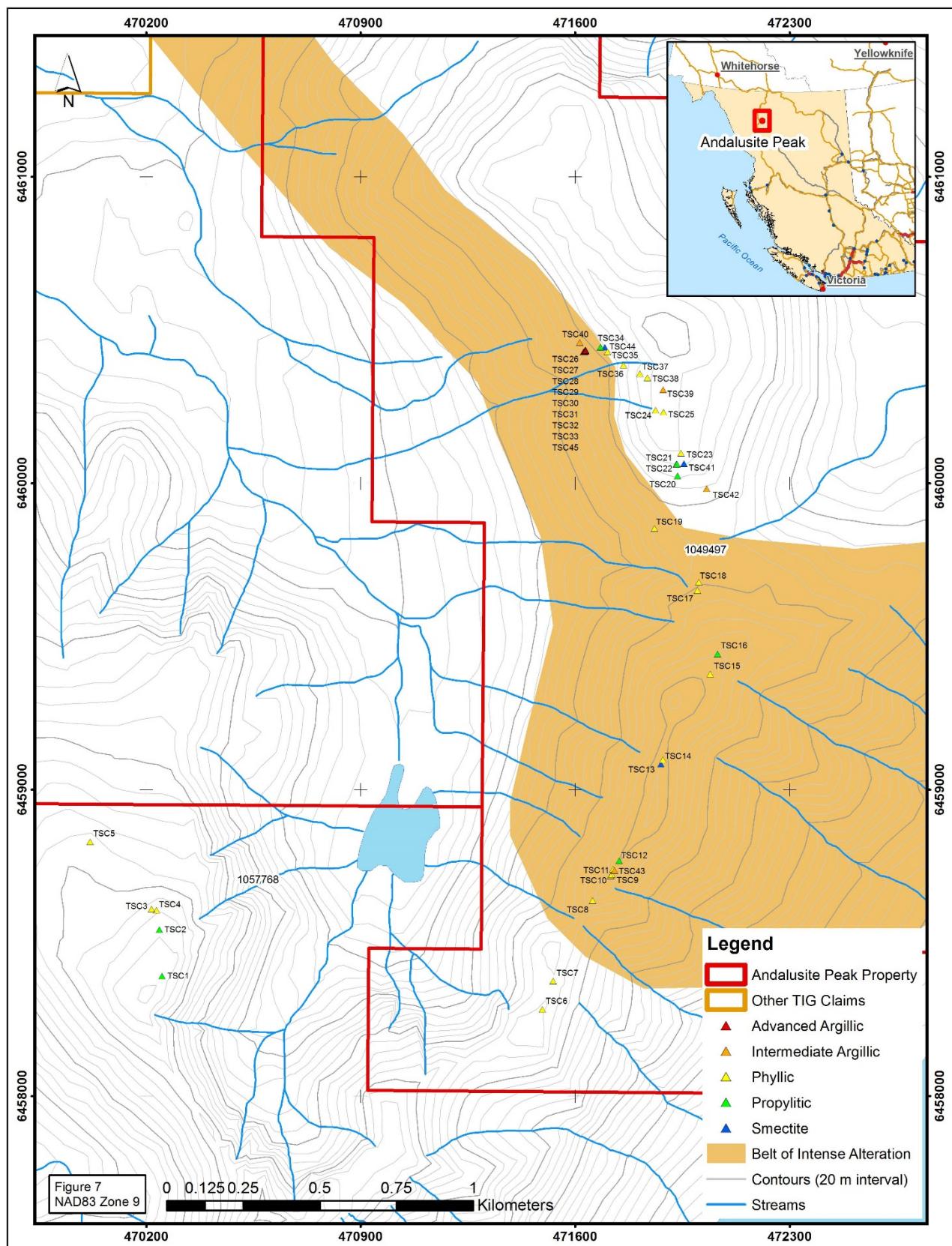
The 2018 exploration program took place over three days in August and consisted of collecting hyperspectral (TerraSpec ©) and geochemical samples to further understand the alteration and mineralization associated with gossanous and mineralized areas on the property.

### 6.1 TerraSpec© Sampling

TerraSpec © is an instrument that uses hyperspectral reflectance to identify normally difficult to distinguish minerals. The TerraSpec© survey was intended to map the distribution of alteration minerals (particularly phyllosilicates, but silicates and oxides were also noted) on the property. Understanding the alteration assemblage distribution will assist in vectoring towards zones of porphyry-style mineralization/alteration. Details on the TerraSpec© samples that were collected, the mineral assemblages interpreted from resultant spectra, and interpreted alteration facies are found in Table 3.

#### 6.1.1 TerraSpec© Sample Preparation and Analysis

A total of 45 samples were collected for hyperspectral reflectance analysis, typically from subcrop and outcrop on ridgelines, slopes and gullies on the Andalusite Peak property (Table 3, Figure 7). Multiple spectra were typically collected for each sample. Sample locations were recorded using a handheld GPS and samples were shipped from Whitehorse to Halifax where they were analyzed and photographed (wet and dry). The spectra were obtained using a TerraSpec 3© instrument and SpecWin software and were manually interpreted using comparison with reference spectra in the SpecMin ASD database.



**Figure 7. Location of TerraSpec© samples and intermediate to advanced argillic alteration on the Andalusite Peak mineral tenure.**

### 6.1.2 TerraSpec Sample Results©

The hyperspectral reflectance results from the Andalusite Peak property show several alteration mineral assemblages that indicate a distribution of smectite, propylitic, phylllic, and intermediate to advanced argillic alteration at Andalusite Peak. Minerals discovered using the TerraSpec© include chlorite (propylitic), muscovite (sericite; phylllic- commonly as sericite-chlorite-clay, or SCC), well crystalline illite and kaolinite (intermediate argillic), as well as andalusite and pyrophyllite (advanced argillic). Weathering and/or smectite facies alteration of some samples resulted in spectra that indicated poorly crystalline smectite kaolinite and illite.

**Table 3. Results of Terraspec sample spectra interpretation. (See Appendix VI for sample descriptions)**

ID	Easting	Northing	Minerals Present	Alteration Facies
TSC1	470252	6458391	epidote:70+carbonate:15+chlorite:15	Propylitic
TSC2	470243	6458543	water_silica:45+chlorite:40+amphibole:15	Propylitic
TSC3	470234	6458607	water_silica:55+carbonate:20+white mica:15+chlorite:10	Phylllic
TSC4	470217	6458611	epidote:40+chlorite:25+white mica:20+carbonate:15	Phylllic
TSC5	470017	6458830	white mica:90+carbonate:5+chlorite:5	Phylllic
TSC6	471493	6458283	white mica:85+carbonate:10+chlorite:5	Phylllic
TSC7	471528	6458375	white mica:80+carbonate:15+chlorite:5	Phylllic
TSC8	471657	6458638	white mica:50+carbonate:35+chlorite:15	Phylllic
TSC9	471716	6458719	white mica:85+jarosite:15	Phylllic
TSC10	471720	6458724	white mica:90+carbonate:10	Phylllic
TSC11	471723	6458740	white mica:90+carbonate:10	Phylllic
TSC12	471743	6458768	montmorillonite:55+chlorite:45	Propylitic
TSC13	471880	6459083	montmorillonite:65+biotite:15+white mica:10+chlorite:5+kaolinite:5	Smectite
TSC14	471886	6459098	montmorillonite:65+white mica:35	Phylllic
TSC15	472041	6459377	white mica:90+carbonate:5+chlorite:5	Phylllic
TSC16	472064	6459443	montmorillonite:55+chlorite:45	Propylitic
TSC17	471999	6459650	white mica:95+jarosite:5	Phylllic
TSC18	472003	6459677	white mica:95+jarosite:5	Phylllic
TSC19	471859	6459853	chlorite:55+white mica:40+carbonate:5	Phylllic
TSC20	471934	6460024	water_silica:70+amphibole:20+carbonate:5+chlorite:5	Propylitic
TSC21	471930	6460062	zeolite:40+montmorillonite:30+biotite:25+chlorite:5	Smectite
TSC22	471932	6460062	montmorillonite:50+amphibole:25+epidote:15+carbonate:5+chlorite:5	Propylitic
TSC23	471945	6460098	white mica:70+chlorite:25+carbonate:5	Phylllic
TSC24	471862	6460238	white mica:75+jarosite:25	Phylllic
TSC25	471888	6460232	white mica:90+carbonate:5+chlorite:5	Phylllic
TSC26	471631	6460429	water_silica:65+amphibole:15+chlorite:10+carbonate:5+white mica:5	Propylitic
TSC27	471627	6460429	pyrophyllite:35+jarosite:30+kaolinite:20+white mica:15	Advanced Argillic
TSC28	471630	6460430	pyrophyllite	Advanced Argillic

TSC29	471634	6460431	pyrophyllite:95+jarosite:5	Advanced Argillic
TSC30	471632	6460434	pyrophyllite:85+white mica:10+topaz:5	Advanced Argillic
TSC31	471634	6460433	pyrophyllite:80+topaz:15+white mica:5	Advanced Argillic
TSC32	471634	6460434	pyrophyllite	Advanced Argillic
TSC33	471632	6460434	pyrophyllite	Advanced Argillic
TSC34	471682	6460444	epidote:90+carbonate:10	Propylitic
TSC35	471705	6460429	white mica:95+chlorite:5	Phyllitic
TSC36	471758	6460385	epidote:55+white mica:20+kaolinite:15+carbonate:5+chlorite:5	Phyllitic
TSC37	471811	6460357	jarosite:50+white mica:50	Phyllitic
TSC38	471836	6460344	water_silica:70+jarosite:25+white mica:5	Phyllitic
TSC39	471887	6460305	Illite	Intermediate Argillic
TSC40	471615	6460459	Illite	Intermediate Argillic
TSC41	471955	6460064	Smectite	Smectite
TSC42	472029	6459982	Illite	Intermediate Argillic
TSC43	471728	6458736	Muscovite/illite	Intermediate Argillic
TSC44	471697	6460443	Jarosite&smectite	Smectite
TSC45	471634	6460435	Jarosite & kaolinite	Intermediate Argillic

## 6.2 Geochemical Sampling

Sampling in 2018 focused on the area south of the main argillic alteration zone and was conducted on two ridge-lines, the one that hosts the Julep and Gentleman showings, and another parallel ridge 1.5 kilometres to the west where historical grab samples graded up to 3.04% Cu, 68.9 g/T Ag and 0.23 g/T Au (B.C. Assessment Report # 30590). On the eastern ridge the Gentleman/Julep mineralized trend is now defined over a distance of 550 metres and remains unexplored along the ridge to the south or down-slope to the east and west. On the western ridge, the Tennessee mineralized trend extends at least one kilometre along the ridge, was sampled on both sides of a plateau where the ridge widens to 300 metres and is open in all directions. Geochemical sample locations and two mineralized trends, are shown in Figure 8.

Mineralization on both ridges comprises veins and volcanic-breccia-fill with quartz ± calcite ± epidote ± actinolite ± chlorite gangue and variable proportions of chalcopyrite, bornite, chalcocite, malachite and azurite. Copper bearing minerals also occur along fractures, filling vesicles, and disseminated in wall rock adjacent to veins. Triumph Gold geologists interpret the mineralization on both ridgelines to be part of a single very large mineralized zone greater than 1 by 1.5 kilometres in area.

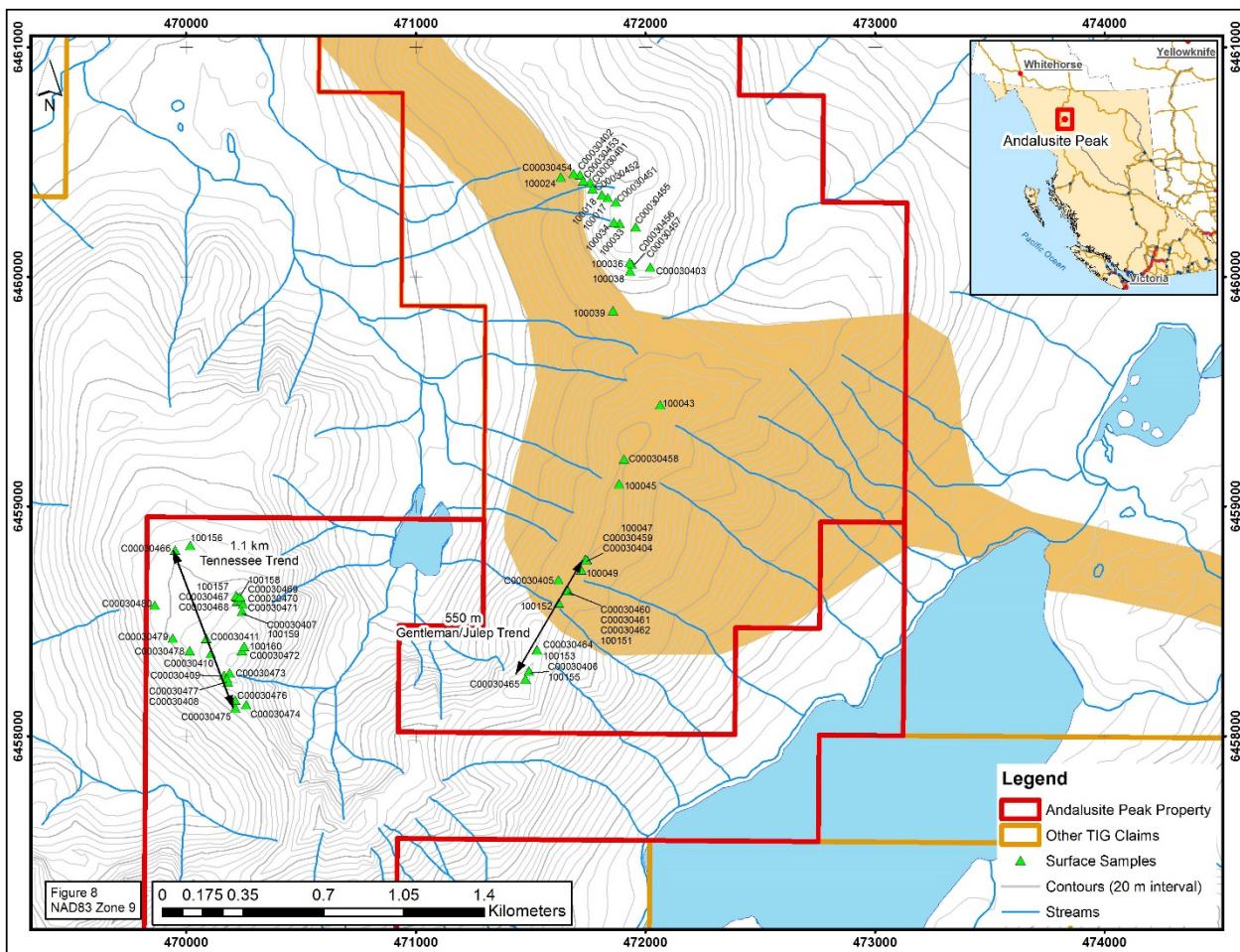
Assay data from the 61 rock samples collected are presented in Appendix IV, analytical certificates are provided in Appendix V and sample descriptions in Appendix VI.

### **6.2.1 Rock Sample Preparation and Analysis**

Two batches of samples were collected on the Andalusite Peak property, and they were analysed by two labs, but using roughly equivalent techniques: samples with ID format C00030XXX were analyzed by ALS Global in North Vancouver, British Columbia; samples with ID format 1000XX were analyzed by Bureau Veritas in Vancouver, British Columbia. Samples at the SGS lab were prepared for analysis according to SGS method PRP89: each sample was crushed to 75% passing 2mm and a 250g split was pulverized to better than 85% passing 75 micron mesh. Gold was tested by fire assay with atomic absorption finish on a 30g nominal sample (method GE FAA313). An additional 35 elements were tested by ICP-AES using a four-acid digestion (method GE ICP40B), over limit samples for copper were retested using the same technique but with ore grade four acid digestion and a higher range of detection (method GA AAS42S), and over limit samples by that technique were retested using X-ray florescence (method GO XRF77B). Samples submitted to the Bureau Veritas lab were prepared for analysis according to Bureau Veritas method PRP70-250: each sample was crushed, and a 250 g split was pulverized to passing a 200 mesh. Gold was tested by fire assay with an atomic emission spectroscopy finish on a 30g nominal sample (method FA330-Au). An additional 45 elements were tested by ICP-AES using a four-acid digestion (method MA200), over limit samples for copper were retested using the same technique but with ore grade four acid digestion and a higher range of detection (method MA370). Quality assurance and control (QAQC) at both labs are maintained through rigorous use of internal standards, blanks and duplicates.

### **6.2.2 Quality Control and Data Verification for Rock Samples**

The quality assurance and control are maintained in lab by SGS and ALS Canada Ltd. using internal standards, blanks and duplicates.



### **6.2.3 Rock Sample Results**

Sampling in 2018 defined two copper-gold-silver (Cu-Au-Ag) mineralized trends, with grades in grab samples up to 67% Cu, 500 g/T Ag (sample C00030474), and 2.8 g/T Au (sample C00030466).

The strike length of the Gentleman/Julep Trend has been expanded from 140 metres defined in 2017, to at least 550 metres. This trend is now defined by seven samples with >0.5% Cu, and grades up to 3.3% Cu, 22.1 g/T Ag, and 2.8 g/T Au.

A newly identified, 1,000 by 300 metre mineralized trend (the Tennessee Trend) has been delineated on a ridge 1.5 kilometres west of the Gentleman/Julep Trend. This trend is defined by fifteen new and historical samples with >0.5% Cu, including grades up to 67% Cu, 500 g/T Ag, and 2.8 g/T Au.

Significant assay results from 2018 samples are displayed in Table 4. A full table of results is in Appendix IV and the assay certificates are in Appendix V.

**Table 4a. Assay results of significant mineralized samples from the Tennessee Trend.**

<b>Sample ID</b>	<b>Easting*</b>	<b>Northing*</b>	<b>Cu (%)</b>	<b>Au (g/T)</b>	<b>Ag (g/T)</b>
C00030474	469862	6458571	67.0	0.569	500.0
C00030466	469941	6458426	2.420	2.770	17.0
C00030407	469952	6458810	1.870	0.427	27.0
C00030409	470015	6458372	1.830	0.038	25.0
C00030476	470017	6458830	1.430	0.040	9.0
C00030469	470086	6458425	1.300	0.179	5.0
100158	470108	6458360	1.239	0.158	4.5
100159	470165	6458265	1.154	0.235	12.1
C00030410	470178	6458250	1.040	0.009	2.0
C00030467	470181	6458237	1.000	0.092	6.0
C00030470	470189	6458276	0.627	0.078	<2.0
C00030411	470213	6458157	0.606	0.086	19.0
C00030479	470214	6458122	0.520	0.044	4.0
C00030408	470217	6458611	0.500	0.016	<2.0
C00030477	470221	6458587	0.493	0.005	<2.0
C00030468	470222	6458607	0.392	0.089	4.0
C00030471	470234	6458605	0.359	0.025	<2.0
C00030472	470234	6458607	0.349	0.032	<2.0
C00030475	470240	6458590	0.295	0.005	2.0
C00030473	470242	6458372	0.259	0.050	<2.0

100157	470243	6458543	0.251	0.100	3.5
100160	470243	6458543	0.248	0.034	1.9
C00030478	470247	6458574	0.234	0.015	5.0
100156	470252	6458391	0.036	0.008	0.9
C00030480	470261	6458137	0.002	0.186	<2.0

**Table 4b. Assay results of significant mineralized samples from the Gentleman/Julep Trend.**

Sample ID	Easting*	Northing*	Cu (%)	Au (g/T)	Ag (g/T)
100152	471622	6458580	3.329	2.845	22.1
C00030461	471664	6458632	0.657	0.147	11.0
C00030462	471656	6458631	0.610	0.085	8.0
100155	471493	6458283	0.582	0.082	3.7
C00030406	471493	6458284	0.381	0.057	<2.0
100153	471528	6458375	0.346	0.138	12.5
100047	471743	6458768	0.323	0.183	5.1
100151	471657	6458638	0.251	0.089	3.5
C00030464	471527	6458376	0.185	0.076	4.0
C00030460	471659	6458636	0.172	0.040	2.0
C00030459	471746	6458767	0.160	0.029	<2.0
C00030465	471477	6458249	0.036	0.000	<2.0
100049	471720	6458724	0.001	0.002	<0.1
C00030405	471621	6458681	0.001	<0.005	<2.0

## 7. CONCLUSIONS and RECOMMENDATIONS

Exploration of the Andalusite Peak property in 2018 included prospecting and alteration mapping that resulted in discovery of two mineralized trends in the footwall of a thick alteration blowout characterized by an intermediate to advanced argillic alteration assemblage. The mineral claim cover a zone of alteration that is the center of a 27-kilometer stretch of intermediate to advanced argillic alteration containing assemblages of quartz-sericite-clay-pyrite (van Straaten and Gibson 2017; Figure 6 and 9). This stretch of alteration is delimited on either side of the Andalusite Peak property by occurrences of porphyry-style mineralization and quartz-sericite-pyrite alteration with local K-feldspar-magnetite alteration assemblages, found on the Tanzilla property, 11 km to the northwest (Kaizen Discovery), and the McBride property, 12 km to the southeast (Teck Resources).

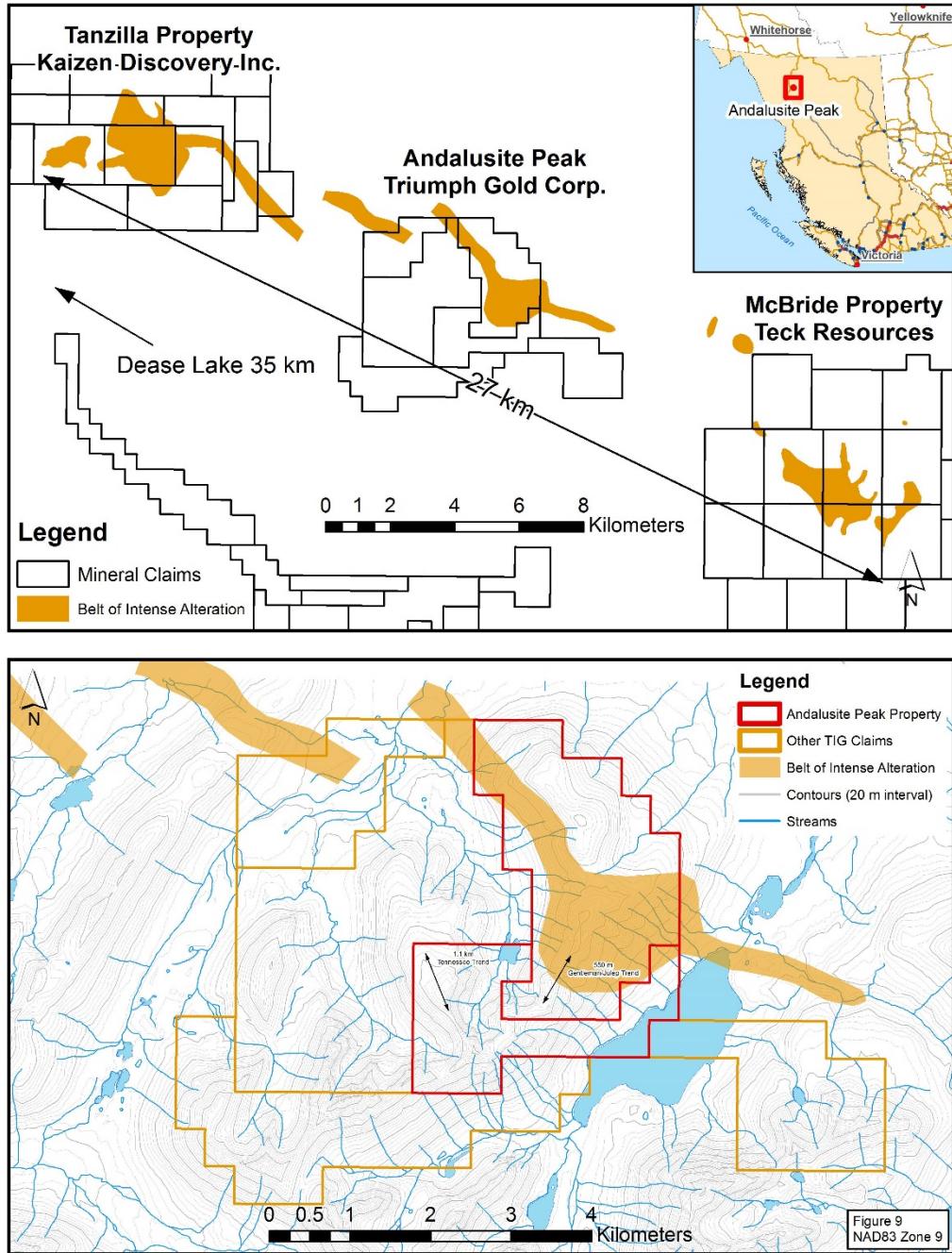
The two mineralized trends discovered in 2018 are not fully mapped or characterized and

therefore remain open for further study, however they represent the most extensive and high grade mineralized sampled to date anywhere in the belt, including the two adjacent properties, which have seen more advanced exploration.

Geological mapping by Triumph and regional mapping and geophysical surveys provide important evidence that the Andalusite Peak property is highly prospective for an underlying porphyry deposit:

1. The property is located in the centre of a regional scale, lithocap-style, belt of alteration, a geological environment typically associated with porphyry copper and high sulfidation Cu-Au systems.
2. Andalusite Peak contains the most extensive and highest grade Cu-Au-Ag mineralization documented to date in the belt.
3. The property is centred on one of three known alteration “blow-outs” in the belt. The other two have seen more advanced exploration that has identified porphyry-style alteration and Cu-Au-Mo mineralization below the lithocap.
4. The alteration mineral assemblage (quartz-andalusite-pyrophyllite) documented in the Andalusite Peak alteration zone represents the highest temperature advanced argillic alteration identified in the belt.
5. Quartz-magnetite veins mapped by Triumph within the alteration zone indicate possible proximity to a high temperature mineralized core zone/causative intrusion.
6. The property is underlain by a 10 kilometre long trend with high magnetic response, indicating potential for a buried oxidized (magnetite bearing) intrusive body.

To further define areas of interest on the Andalusite Peak property, detailed geologic mapping and identification of structural trends and alteration assemblages is required in tandem with geophysical surveys (magnetic and induced polarization) to target potential porphyry mineralization at depth.



**Figure 9. A) Belt of intermediate to advanced argillic alteration in the Andalusite Peak region; B) property overview with location of high-temperature alteration assemblages and mineralization showings.**

## **Appendix I**

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## **Appendix II**

### **Statement of Expenditures**

<b>Wages</b>	<b>Amount</b>	<b>Unit</b>	<b>Subtotals</b>
Tony	\$ 650.00	3.00	\$ 1,950.00
Luke	\$ 450.00	3.00	\$ 1,350.00
<b>Equipment Rental</b>			
Truck			\$ 1,102.74
TerraSepc			\$ 1,000.00
<b>Analytical</b>			
Geochemical			\$ 2,261.27
Hyperspectral			\$ 380.00
<b>Meals&amp;Accommodation</b>			\$ 1,938.75
<b>Helicopter</b>			\$ 3,613.00
<b>Travel</b>			
Wages			
Tony	\$ 650.00	3.00	\$ 1,950.00
Luke	\$ 450.00	3.00	\$ 1,350.00
Transport, Gas, Accom & food			\$ 1,209.56
<b>Report Writing</b>			
Tony	\$ 650.00	1.00	\$ 650.00
Luke	\$ 450.00	2.00	\$ 900.00
Graeme	\$ 450.00	0.50	\$ 225.00
	<b>Total</b>		\$ 19,880.32

## **Appendix III**

### **Statement of Qualification**

Statement of qualification:

I, Luke Bickerton, certify that:

1. I am currently a PhD Candidate in Precambrian Geology and Mineral Deposits at the Harquail School of Earth Sciences, Laurentian University, 935 Ramsey Lake Road, Sudbury, Ontario, Canada, P3E 2C6
2. I am a graduate of Saint Francis Xavier University having obtained the degree of Bachelor of Science – Honours, in Earth Sciences in 2011.
3. I am a graduate of Simon Fraser University having obtained the degree of Master of Science in Geology in 2014.
4. That since 2011, when not a student, I have been continuously employed as an exploration geologist at the greenfields and brownfields level in the mineral exploration industry with experience in copper and copper/gold porphyry deposits.
5. I participated in the 2017 and 2018 exploration program at Andalusite Peak and am therefore familiar with the geology of the property and the work conducted in 2018. I have co-prepared the background geology section of this report.
6. I am a seasonal project geologist with Triumph Gold Corp.

Signed and dated this 19th day of February, 2019.



Signature

Luke A. Bickerton, M.Sc.

## STATEMENT OF QUALIFICATIONS

I, Graeme Hopkins, B.Sc., certify that:

1. I am employed at Triumph Gold Corp as GIS/Database with a business address located at:  
1100 – 1111 Melville St.  
Vancouver, BC, Canada  
V6E3V6
2. I graduated from the University of Victoria in 1994 with a Bachelor of Science in Geography and from the BCIT Advanced Diploma Program in Geographical Information Systems in 2000.
3. I have been employed in the mineral sector since 2008 and in GIS since 2000 based in Vancouver, BC.
4. I have provided data services and mapping for this report on the Analusite Peak property in Northwestern BC.

Dated this 20<sup>th</sup> Day of February, 2019

A handwritten signature in blue ink, appearing to read "Graeme Hopkins".

Signature

Graeme Hopkins, B. Sc.

Statement of Qualification:

I, Tony Barresi certify that:

1. I am employed by Triumph Gold Corp. as VP of Exploration. 1100 - 1111 Melville St., Vancouver BC, V6E 3V6.
2. I graduated from Dalhousie University in 2015 with a Ph.D. in Earth Sciences.
3. I graduated from Saint Mary's University in 2004 with a B.Sc. in Geology.
4. I am a Professional Geoscientist registered with Geoscientists Nova Scotia since 2016.
5. Since 2004 I have been continuously employed in exploration for base and precious metals in North America.
6. I planned and participated in the 2018 exploration program at Andalusite Peak and am therefore personally familiar with the geology of the property and the work conducted in 2018. I have co-prepared all sections of this report.

Dated this 22<sup>nd</sup> day of February, 2019



Signature

Tony Barresi, P.Geo., Ph.D.

## **Appendix IV**

### **Geochemical Results**

SampleID	Easting	Northing	Au_ppb	Ag_ppm	Al_per	As_ppm	B_ppm	Ba_ppm	Be_ppm	Bi_ppm	Ca_per	Cd_ppm	Ce_ppm	Co_ppm	Cr_ppm	Cu_ppm	Fe_per	Ga_ppm
C00030401	471760.2	6460411.274	-5	-2	8.44	26		493	-0.5	-5	4.27	-1		19	12	44.1	5.45	
C00030402	471715.5	6460445.108	-5	-2	8.71	-3		930	2.2	-5	0.08	-1		42	-1	35.9	6.14	
C00030403	472021.1	6460041.878	-5	-2	8.3	21		267	1	-5	4.48	-1		15	5	94.3	4.87	
C00030404	471737.2	6458769.146	-5	-2	8.25	31		151	-0.5	-5	7.31	-1		15	25	21.2	6.23	
C00030405	471621.1	6458681.016	-5	-2	9.99	11		769	1.3	-5	2.94	-1		13	-1	11	6.01	
C00030406	471492.7	6458283.782	57	-2	5.33	33		225	-0.5	-5	6.34	-1		10	17	3810	2.66	
C00030407	470243.2	6458542.96	427	27	8.19	9		603	-0.5	-5	3.1	-1		42	12	18700	4.5	
C00030408	470180.8	6458236.571	16	-2	3.68	3		465	-0.5	-5	0.53	-1		15	15	5000	3.49	
C00030409	470164.9	6458265.195	38	25	5.39	4		1120	-0.5	-5	0.33	-1		20	30	18300	4.18	
C00030410	470107.7	6458359.711	9	2	5.74	9		667	-0.5	-5	1.42	-1		7	27	10400	3.83	
C00030411	470086.5	6458425.452	86	19	5.65	-3		347	-0.5	-5	1.95	-1		15	18	6060	3.45	
C00030451	471871.3	6460325.747	-5	-2	7.13	6		271	1.2	-5	0.59	-1		4	5	82.1	4.29	
C00030452	471769.2	6460384.038	-5	-2	8.99	9		956	1.8	-5	1.31	-1		7	-1	91.5	5.2	
C00030453	471729	6460417.506	9	-2	8.45	10		1030	1.7	-5	1.41	-1		8	1	137	4.32	
C00030454	471687.7	6460449.423	-5	-2	11.5	-3		238	0.6	-5	0.02	-1		-1	4	15	1.77	
C00030455	471958	6460217.351	-5	-2	6.41	4		736	1.5	-5	0.13	-1		8	-1	40.7	4.09	
C00030456	471941.5	6460053.907	-5	-2	7.9	13		86	0.7	-5	8.03	-1		4	8	13.9	5.73	
C00030457	471941.5	6460053.907	7	-2	9.3	19		824	0.9	-5	3.59	-1		18	4	82.9	5.9	
C00030458	471907.6	6459206.28	-5	-2	1.12	-3		113	-0.5	-5	0.13	-1		3	12	3.5	1.11	
C00030459	471745.8	6458766.965	29	-2	8.79	18		486	-0.5	6	5.09	2		30	24	1600	8.18	
C00030460	471658.9	6458635.536	40	2	1.69	-3		308	-0.5	-5	8.74	-1		2	16	1720	1.26	
C00030461	471664	6458631.825	147	11	8.8	8		1280	0.9	-5	3.16	-1		32	21	6570	6.78	
C00030462	471656	6458630.769	85	8	5.17	12		391	-0.5	-5	6.98	-1		16	17	6100	3.27	
C00030464	471526.9	6458375.611	76	4	5.47	24		956	0.5	-5	0.34	6		19	11	1850	3.42	
C00030465	471477.4	6458248.593	-5	-2	3.94	4		262	-0.5	-5	3.72	-1		18	94	362	4.09	
C00030466	469951.6	6458809.929	2770	17	0.07	-3		6	-0.5	-5	0.02	4		-1	24	24200	3.9	
C00030467	470221.3	6458587.43	92	6	5.32	5		370	-0.5	-5	4.64	-1		20	47	10000	5.42	
C00030468	470221.8	6458606.577	89	4	7.65	7		1430	-0.5	-5	5.08	-1		26	15	3920	6.4	
C00030469	470233.9	6458605.372	179	5	2.96	10		155	-0.5	-5	3.94	-1		12	19	13000	4.08	
C00030470	470240	6458589.627	78	-2	2.22	7		142	-0.5	-5	7.97	-1		7	15	6270	2.65	
C00030471	470246.6	6458573.989	25	-2	7.56	6		535	-0.5	-5	3.94	-1		43	17	3590	5.22	
C00030472	470242.1	6458372.16	32	-2	8.3	20		35	-0.5	-5	8.63	-1		7	16	3490	6.58	
C00030473	470188.7	6458275.584	50	-2	2.82	4		308	-0.5	-5	0.19	-1		21	16	2590	4.74	
C00030474	470261.4	6458136.638	569	500	0.42	-3		13	-0.5	-5	0.36	-1		-1	-1	670000	3.88	
C00030475	470214.1	6458121.517	5	2	5.94	7		184	-0.5	-5	10.9	-1		3	45	2950	4.72	
C00030476	470212.9	6458157.156	40	9	6.46	6		503	-0.5	-5	3.15	-1		18	15	14300	5.13	
C00030477	470177.7	6458250.28	5	-2	7.84	14		1170	0.8	-5	0.85	-1		21	16	4930	5.69	
C00030478	470014.7	6458371.986	15	5	5.81	12		390	-0.5	-5	1.7	-1		11	16	2340	3.55	
C00030479	469940.7	6458426.104	44	4	6.89	12		865	0.7	-5	1.56	-1		21	15	5200	5.36	
C00030480	469861.9	6458570.558	186	-2	7.82	40		351	0.9	7	0.28	-1		26	14	24.2	7.51	
100017	471836	6460344	3	0.6	7.01	4		72	-1	-0.1	0.24	-0.1		31	4.3	2	83	3.87
100018	471811	6460357	-2	0.2	7.36	4		83	2	0.8	0.26	-0.1		33	6.1	2	58.4	2.64
100024	471632	6460434	-2	-0.1	1.01	-1		153	-1	0.3	0.01	-0.1		10	0.3	4	3.3	0.68
100033	471888	6460232	-2	-0.1	7.41	4		67	2	0.6	0.69	-0.1		50	12.8	2	37.1	3.67
100034	471862	6460238	-2	-0.1	7.88	4		37	1	0.5	0.77	-0.1		27	17.3	2	40.5	4.38
100036	471932	6460062	-2	-0.1	7.43	2		576	-1	0.2	4.97	-0.1		31	12.5	3	75	3.72
100038	471934	6460024	-2	-0.1	7.97	2		566	1	-0.1	4.66	-0.1		19	29.9	5	13.1	6.09
100039	471859	6459853	2	-0.1	8.01	2		435	-1	-0.1	0.87	-0.1		15	11.2	3	29.9	9.67
100043	472064	6459443	4	0.1	8.01	2		480	1	-0.1	1.8	-0.1		27	4.8	23	165.7	6.87
100045	471886	6459098	4	0.1	7.11	2		728	-1	0.1	0.69	-0.1		56	11.1	5	74	5.01
100047	471743	6458768	183	5.1	7.99	8		288	-1	33.7	7.25	2.5		30	57.7	20	3232.7	8.6
100049	471720	6458724	2	-0.1	9.07	3		1193	3	0.3	0.05	-0.1		38	0.3	1	14.4	2.6
100151	471657	6458638	89	3.5	1.97	1		321	-1	0.4	8.14	-0.1		17	7.4	6	2510.5	1.41
100152	471622	6458580	2845	22.1	4.22	5		69	-1	4.5	2.78	5.9		9	29.8	10	33290	9.86

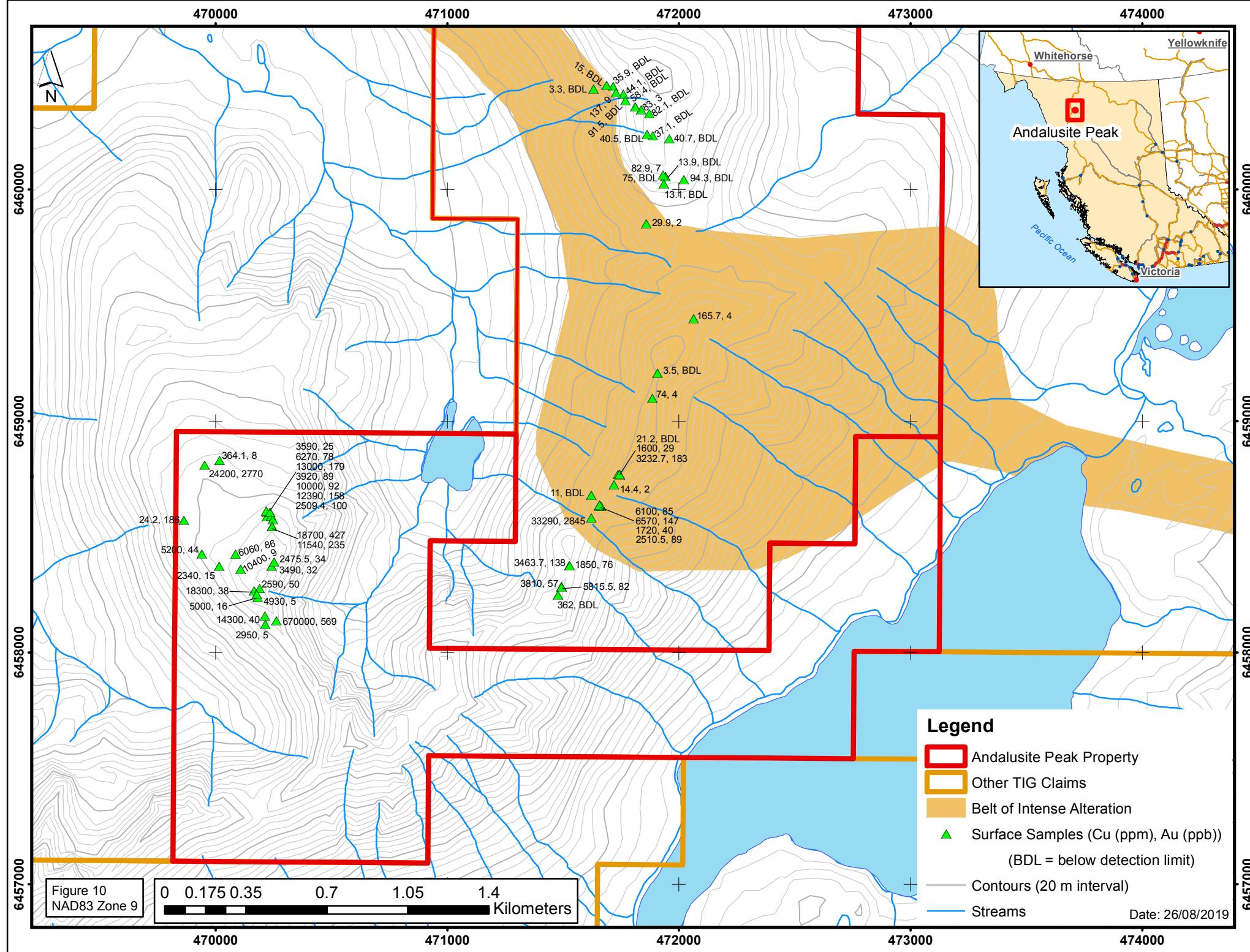
SampleID	Easting	Northing	Au_ppb	Ag_ppm	Al_per	As_ppm	B_ppm	Ba_ppm	Be_ppm	Bi_ppm	Ca_per	Cd_ppm	Ce_ppm	Co_ppm	Cr_ppm	Cu_ppm	Fe_per	Ga_ppm
100153	471528	6458375	138	12.5	2.17	4		314	-1	1.5	0.1	8.1	12	7.1	2	3463.7	1.74	
100155	471493	6458283	82	3.7	6.2	14		381	-1	0.1	1.09	1.1	16	10.7	12	5815.5	2.34	
100156	470017	6458830	8	0.9	6.54	3		737	2	-0.1	0.55	-0.1	41	2.5	1	364.1	1.5	
100157	470217	6458611	100	3.5	7.86	5		1534	1	-0.1	3.77	-0.1	30	27.3	22	2509.4	7.02	
100158	470234	6458607	158	4.5	2.97	2		201	-1	0.1	4.07	0.4	50	13.4	9	12390	3.74	
100159	470243	6458543	235	12.1	7.48	3		628	-1	-0.1	4.19	0.5	33	42.5	16	11540	4.36	
100160	470252	6458391	34	1.9	7.27	9		27	-1	-0.1	13.2	-0.1	26	4.6	15	2475.5	5.53	

SampleID	Easting	Northing	Hg_ppm	K_per	La_ppm	Li_ppm	Mg_per	Mn_ppm	Mo_ppm	Na_per	Nb_ppm	Ni_ppm	P_per	Pb_ppm	S_per	Sb_ppm	Sc_ppm	Sn_ppm
C00030401	471760.2	6460411.274		1.22	13.7	11	1.54	1360	-1	2.36		8	0.09	8	-0.01	15	23.5	-10
C00030402	471715.5	6460445.108		3.83	23.9	4	0.3	88	-1	0.26		3	0.08	6	-0.01	14	15.6	-10
C00030403	472021.1	6460041.878		1.91	21.3	4	0.56	1040	19	1.34		3	0.12	15	4.16	12	18.2	-10
C00030404	471737.2	6458769.146		0.43	16.8	3	1.63	1850	-1	2.86		13	0.16	22	-0.01	14	30.6	-10
C00030405	471621.1	6458681.016		2.05	14.1	21	1.57	1020	-1	4.15		10	0.21	7	-0.01	15	18	-10
C00030406	471492.7	6458283.782		2.76	10.8	10	0.31	1710	-1	0.07		10	0.1	16	0.04	8	14.4	-10
C00030407	470243.2	6458542.96		0.67	15	25	3.83	1480	-1	3.84		52	0.18	19	0.44	14	24.8	-10
C00030408	470180.8	6458236.571		1.3	16.4	20	1.02	1240	-1	0.27		14	0.16	14	-0.01	5	10.9	-10
C00030409	470164.9	6458265.195		1.99	11.6	22	1.35	800	1	0.72		38	0.1	36	0.09	11	15.8	-10
C00030410	470107.7	6458359.711		2.39	7.6	18	0.64	486	7	1.5		11	0.11	15	0.34	13	17.5	-10
C00030411	470086.5	6458425.452		1.45	8.6	19	1.19	1140	-1	1.24		17	0.09	11	0.06	12	16.4	-10
C00030451	471871.3	6460325.747		6.07	28.5	6	0.13	89	4	1.23		2	0.03	50	3.14	16	8.9	-10
C00030452	471769.2	6460384.038		4.22	24.7	6	0.14	181	-1	3.42		3	0.12	17	-0.01	16	11.8	-10
C00030453	471729	6460417.506		4.12	29.2	29	0.96	548	-1	2.46		3	0.12	22	-0.01	13	15.9	-10
C00030454	471687.7	6460449.423		0.61	9.8	4	0.03	72	-1	0.08		1	0.04	-2	0.06	18	16.7	-10
C00030455	471958	6460217.351		4.34	16.6	19	0.39	63	6	0.41		2	0.01	22	3.61	9	6.5	-10
C00030456	471941.5	6460053.907		0.23	26.1	6	0.39	1510	-1	1.21		2	0.17	14	-0.01	13	12.3	-10
C00030457	471941.5	6460053.907		3	32.4	18	2.94	2860	-1	0.8		7	0.12	7	1.07	10	22.7	-10
C00030458	471907.6	6459206.28		0.26	2.7	3	0.17	252	-1	0.46		1	0.02	-2	-0.01	-5	1.2	-10
C00030459	471745.8	6458766.965		1.23	17.7	14	2.1	2170	-1	2.4		15	0.18	22	-0.01	12	33.5	-10
C00030460	471658.9	6458635.536		0.71	9.9	5	0.26	2190	2	0.16		3	0.02	-2	0.03	-5	6.1	-10
C00030461	471664	6458631.825		3.01	14.8	33	3.1	1470	-1	2.37		20	0.16	13	0.14	11	35.9	-10
C00030462	471656	6458630.769		1.45	11.6	15	1	2000	-1	0.74		10	0.09	6	0.13	9	19	-10
C00030464	471526.9	6458375.611		2.89	8.2	12	0.7	639	5	0.53		5	0.05	498	0.03	8	5.7	-10
C00030465	471477.4	6458248.593		0.84	9.3	17	1.73	1090	-1	0.87		34	0.08	2	-0.01	-5	13.6	-10
C00030466	469951.6	6458809.929	-0.01	-0.5	2	0.02	75	8	0.02		2	0.04	30	0.02	-5	-0.5	-10	
C00030467	470221.3	6458587.43		1.69	43.1	19	1.5	1690	-1	0.72		22	0.11	17	1.29	9	18.1	-10
C00030468	470221.8	6458606.577		2.47	13.6	28	2.27	1720	-1	2.81		26	0.14	12	0.05	14	24.3	-10
C00030469	470233.9	6458605.372		0.97	36.8	15	0.91	1420	-1	0.29		13	0.05	91	1.07	9	9.5	-10
C00030470	470240	6458589.627		0.84	23.2	13	0.8	1690	-1	0.19		9	0.04	20	0.6	9	8	-10
C00030471	470246.6	6458573.989		2.73	15.1	32	1.88	1910	-1	1.36		32	0.16	5	0.55	9	22.1	-10
C00030472	470242.1	6458372.16		0.11	15.5	10	0.95	1920	-1	1.31		14	0.16	23	0.02	20	22.6	-10
C00030473	470188.7	6458275.584		0.97	6.4	15	2.3	2030	-1	0.06		17	0.06	7	-0.01	10	9.4	-10
C00030474	470261.4	6458136.638		0.03	9.9	-1	0.04	91	-1	0.07		1	0.03	299	5	16	4.7	-10
C00030475	470214.1	6458121.517		0.41	8.6	12	0.75	1580	-1	0.35		10	0.08	1320	0.05	15	12.6	-10
C00030476	470212.9	6458157.156		1.7	13	24	1.55	1260	-1	2.35		24	0.1	673	0.33	11	17.7	-10
C00030477	470177.7	6458250.28		3	7.6	30	1.81	997	-1	2.06		28	0.18	17	-0.01	11	23.1	-10
C00030478	470014.7	6458371.986		2.28	7.5	12	0.79	700	-1	1.59		15	0.1	10	0.03	9	16.6	-10
C00030479	469940.7	6458426.104		3.33	7.5	19	1.61	1370	-1	1.43		27	0.11	14	0.38	11	23.5	-10
C00030480	469861.9	6458570.558		1.28	16.5	13	1.08	382	-1	4.12		12	0.21	15	2.04	15	22.5	-10
100017	471836	6460344	7.08	11.8	6.4	0.1	27	5.8	0.801	1.4	0.6	0.03	44.5	1.9	0.8	10	1.6	
100018	471811	6460357	7.14	12.8	9.8	0.19	50	16.9	0.802	2.1	1.2	0.019	53.7	1.9	0.6	10	1.6	
100024	471632	6460434	0.39	6	0.3	-0.01	24	2	0.028	1	0.6	0.021	1.7	0.3	0.6	9	0.4	
100033	471888	6460232	4.4	22.2	9.1	0.45	116	3.6	1.088	1	2	0.051	41.8	2.5	0.4	16	1.3	
100034	471862	6460238	4.59	10.4	8.2	0.44	148	24.9	1.855	1.2	2.1	0.031	32.7	3.4	0.5	14	3.6	
100036	471932	6460062	1.39	15.4	4.8	1.52	1992	0.4	0.348	2.2	5.6	0.065	5.2	0.6	1.4	20	0.9	
100038	471934	6460024	1.39	8.8	8.6	2.73	2134	0.3	2.408	3.4	9.8	0.125	5.6	-0.1	0.7	19	1	
100039	471859	6459853	1.15	5.9	12.3	2.74	1478	2.1	1.315	0.4	6.8	0.02	4.6	0.3	-0.1	21	0.7	
100043	472064	6459443	0.93	12.8	6.8	1.59	734	0.4	2.933	3.2	9.3	0.099	9	0.6	0.1	26	1.6	
100045	471886	6459098	3.75	27.4	13.8	1.34	1173	-0.1	0.116	4.8	3.1	0.292	3.8	-0.1	0.5	18	2.6	
100047	471743	6458768	0.5	14	8.2	1.53	2447	1.1	1.46	3.2	13.9	0.159	33.5	-0.1	5	26	1.4	
100049	471720	6458724	4.44	20.7	6.5	0.22	24	1.9	0.245	4.9	0.1	0.068	4.7	-0.1	1.8	9	2.1	
100151	471657	6458638	0.78	8.8	6.7	0.45	2047	1.3	0.233	0.6	4.3	0.032	3.1	-0.1	1.6	7	0.4	
100152	471622	6458580	0.87	3.9	13.5	0.88	1807	48.5	0.064	1.3	7.1	0.056	31.5	3	2.7	10	0.5	

SampleID	Easting	Northing	Hg_ppm	K_per	La_ppm	Li_ppm	Mg_per	Mn_ppm	Mo_ppm	Na_per	Nb_ppm	Ni_ppm	P_per	Pb_ppm	S_per	Sb_ppm	Sc_ppm	Sn_ppm
100153	471528	6458375		1.05	6.9	7	0.32	290	7.6	0.083	0.9	1.2	0.022	1322	-0.1	0.9	3	0.3
100155	471493	6458283		3.53	7.5	9.3	0.3	605	0.4	0.07	2.3	6.6	0.109	11.7	-0.1	1.6	15	0.6
100156	470017	6458830		2.19	22.5	8.1	0.32	609	5.4	2.759	4.6	1.6	0.016	14.9	-0.1	0.5	-1	0.6
100157	470217	6458611		2.3	15.9	27.9	2.65	1399	0.2	2.903	2.2	25.8	0.151	9.6	-0.1	1.2	25	0.9
100158	470234	6458607		1	34.5	15.2	0.99	1279	0.2	0.352	0.9	15.1	0.065	78.3	0.8	1.8	10	0.6
100159	470243	6458543		0.62	15.9	24.7	3.74	1724	0.2	3.193	2.1	42.7	0.168	6.5	0.2	0.8	22	0.8
100160	470252	6458391		0.05	13.2	3.6	0.11	1349	0.2	0.064	1.8	2.5	0.129	40.8	-0.1	2	18	0.7

SampleID	Easting	Northing	Sr_ppm	Th_ppm	Ti_per	Tl_ppm	U_ppm	V_ppm	W_ppm	Y_ppm	Zn_ppm	Zr_ppm	Ta_ppm	Rb_ppm	Hf_ppm	In_ppm	Re_ppm	Se_ppm	Te_ppm
C00030401	471760.2	6460411.274	484		0.45			205	-10	23	93	50.8							
C00030402	471715.5	6460445.108	90.5		0.2			160	-10	9.9	19	177							
C00030403	472021.1	6460041.878	286		0.4			172	-10	26.5	29	160							
C00030404	471737.2	6458769.146	949		0.57			270	-10	20.3	46	34.7							
C00030405	471621.1	6458681.016	470		0.45			229	-10	23.3	66	119							
C00030406	471492.7	6458283.782	55.3		0.3			128	-10	11.1	87	40.5							
C00030407	470243.2	6458542.96	368		0.49			208	-10	16.6	114	20.3							
C00030408	470180.8	6458236.571	39.5		0.17			128	-10	7.1	81	12.7							
C00030409	470164.9	6458265.195	65.9		0.26			152	-10	8.1	110	24.7							
C00030410	470107.7	6458359.711	147		0.31			167	-10	9.6	40	19.6							
C00030411	470086.5	6458425.452	177		0.27			171	-10	9.9	74	15							
C00030451	471871.3	6460325.747	261		0.11			69	-10	9.8	-1	183							
C00030452	471769.2	6460384.038	544		0.27			123	-10	22.5	22	212							
C00030453	471729	6460417.506	648		0.28			101	-10	22.8	93	209							
C00030454	471687.7	6460449.423	72.1		0.14			240	-10	3.7	-1	51.9							
C00030455	471958	6460217.351	98.1		0.28			106	-10	6.9	3	189							
C00030456	471941.5	6460053.907	1520		0.42			199	-10	24	17	61.1							
C00030457	471941.5	6460053.907	189		0.48			206	-10	23.1	164	145							
C00030458	471907.6	6459206.28	59.5		0.04			18	-10	2.1	13	7							
C00030459	471745.8	6458766.965	1010		0.66			308	-10	22.6	150	44							
C00030460	471658.9	6458635.536	84.1		0.08			63	-10	6.8	13	9.8							
C00030461	471664	6458631.825	332		0.66			301	-10	22.4	149	67.9							
C00030462	471656	6458630.769	168		0.27			186	-10	14.5	55	38.5							
C00030464	471526.9	6458375.611	45.4		0.15			78	-10	10.7	986	75.9							
C00030465	471477.4	6458248.593	351		0.22			173	-10	7	62	18							
C00030466	469951.6	6458809.929	2.6		-0.01			14	-10	1.9	80	1.5							
C00030467	470221.3	6458587.43	194		0.3			198	-10	11.7	136	21.6							
C00030468	470221.8	6458606.577	772		0.44			211	-10	15.2	91	24							
C00030469	470233.9	6458605.372	104		0.17			115	-10	7.8	101	13.4							
C00030470	470240	6458589.627	126		0.14			83	-10	7.9	62	8.9							
C00030471	470246.6	6458573.989	193		0.46			249	-10	16.6	125	38.9							
C00030472	470242.1	6458372.16	1280		0.42			338	-10	18.2	25	24.3							
C00030473	470188.7	6458275.584	16.4		0.14			99	-10	4.5	52	8.7							
C00030474	470261.4	6458136.638	149		0.02			76	-10	1.8	-1	2.4							
C00030475	470214.1	6458121.517	1950		0.22			190	-10	8.8	22	18.7							
C00030476	470212.9	6458157.156	243		0.34			166	-10	13.4	108	30							
C00030477	470177.7	6458250.28	139		0.5			248	-10	13.6	147	31.3							
C00030478	470014.7	6458371.986	118		0.32			182	-10	10.5	54	26.3							
C00030479	469940.7	6458426.104	199		0.39			226	-10	12.1	130	38.1							
C00030480	469861.9	6458570.558	296		0.34			174	-10	7.1	83	33.2							
100017	471836	6460344	176	8.4	0.128	0.7	3.4	71	0.5	8.9	4	192.2	-0.1	219.8	5.1	-0.05	-0.005	2	-0.5
100018	471811	6460357	263	9	0.197	0.7	4.1	76	1.1	9.4	5	190.1	0.1	230.1	4.9	-0.05	0.005	3	-0.5
100024	471632	6460434	79	2.2	0.105	-0.5	0.8	89	1.8	2.5	-1	28.3	-0.1	6.3	0.7	-0.05	-0.005	2	-0.5
100033	471888	6460232	252	7.1	0.224	0.9	4.8	182	1.1	11.5	13	156.2	-0.1	164.5	4.3	-0.05	-0.005	-1	0.5
100034	471862	6460238	204	5.4	0.229	0.6	3.7	176	0.8	6.4	15	143.4	-0.1	136.7	3.7	-0.05	-0.005	-1	-0.5
100036	471932	6460062	115	2.3	0.415	-0.5	1	147	0.7	17.9	103	54	0.1	64.9	1.7	0.09	-0.005	-1	1.4
100038	471934	6460024	525	2.9	0.478	-0.5	1.2	327	0.3	15.7	190	70.6	0.2	20.5	2	0.17	-0.005	-1	1.7
100039	471859	6459853	217	1.3	0.248	-0.5	0.6	287	-0.1	2.7	178	44.1	-0.1	21.5	1.1	-0.05	-0.005	-1	-0.5
100043	472064	6459443	565	3.7	0.48	-0.5	1.8	311	0.3	9.8	104	87.9	0.2	30.7	2.3	0.07	-0.005	-1	-0.5
100045	471886	6459098	43	4.8	0.472	-0.5	1.7	125	0.8	20.7	50	92	0.3	110.8	2.4	0.28	-0.005	-1	0.6
100047	471743	6458768	1048	2.4	0.512	-0.5	1.2	322	1.1	19.3	114	29.5	0.2	10.7	1.1	0.45	-0.005	3	14.1
100049	471720	6458724	132	11	0.188	-0.5	3.4	9	0.5	19.7	5	265.8	0.3	132.5	6.3	0.06	-0.005	1	0.6
100151	471657	6458638	93	0.5	0.111	-0.5	0.2	66	0.2	7.5	28	17.1	-0.1	25.5	0.3	-0.05	-0.005	1	2.1
100152	471622	6458580	43	0.8	0.185	-0.5	0.3	164	1	8	389	21.2	-0.1	34.7	0.6	0.35	0.02	2	-0.5

SampleID	Easting	Northing	Sr_ppm	Th_ppm	Ti_per	Tl_ppm	U_ppm	V_ppm	W_ppm	Y_ppm	Zn_ppm	Zr_ppm	Ta_ppm	Rb_ppm	Hf_ppm	In_ppm	Re_ppm	Se_ppm	Te_ppm
100153	471528	6458375	16	1.5	0.058	-0.5	0.8	40	0.7	4.5	3968	28.4	-0.1	35.3	0.8	0.12	-0.005	2	0.7
100155	471493	6458283	24	1.3	0.386	-0.5	0.8	179	2.5	10.1	160	47	0.1	77.5	1.2	0.09	-0.005	-1	-0.5
100156	470017	6458830	176	3.1	0.102	-0.5	1.2	16	0.5	11.8	41	109.6	0.2	53.2	2.5	-0.05	0.005	-1	-0.5
100157	470217	6458611	791	1	0.481	-0.5	0.5	288	0.8	15	105	13.6	0.1	45.6	0.6	0.08	-0.005	-1	1.2
100158	470234	6458607	107	0.5	0.194	-0.5	0.2	115	0.7	7.9	126	16.6	-0.1	36.1	0.3	0.13	-0.005	-1	1.3
100159	470243	6458543	421	1.4	0.442	-0.5	0.3	194	0.2	15.2	123	20.8	0.1	9.6	0.7	0.06	-0.005	3	4.5
100160	470252	6458391	4335	1.3	0.376	-0.5	0.4	259	-0.1	12.3	7	27.7	-0.1	1.1	1.1	0.08	-0.005	-1	1



## **Appendix V**

### **Analytical Certificates**



BUREAU  
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Bureau Veritas Commodities Canada Ltd.  
9050 Shaughnessy St Vancouver British Columbia V6P 6E5 Canada  
PHONE (604) 253-3158

Client:

[REDACTED]

Submitted By: [REDACTED]  
Receiving Lab: Canada-Vancouver  
Received: July 24, 2018  
Report Date: September 08, 2018  
Page: 1 of 3

## CERTIFICATE OF ANALYSIS

VAN18001858.2

### CLIENT JOB INFORMATION

Project: None Given

Shipment ID:

P.O. Number

Number of Samples: 31

### SAMPLE DISPOSAL

DISP-PLP Dispose of Pulp After 90 days

DISP-RJT Dispose of Reject After 60 days

### SAMPLE PREPARATION AND ANALYTICAL PROCEDURES

Procedure Code	Number of Samples	Code Description	Test Wgt (g)	Report Status	Lab
PRP70-250	31	Crush, split and pulverize 250 g rock to 200 mesh			VAN
FA330-Au	31	Fire assay fusion Au by ICP-ES	30	Completed	VAN
EN002	31	Environmental disposal charge-Fire assay lead waste			VAN
MA200	31	4 Acid digestion ICP-MS analysis	0.25	Completed	VAN
MA370	3	4-Acid Digestion ICP-ES Finish	0.5	Completed	VAN

### ADDITIONAL COMMENTS

Version 2 : MA370-Cu included.

Bureau Veritas does not accept responsibility for samples left at the laboratory after 90 days without prior written instructions for sample storage or return.

Invoice To:

[REDACTED]  
[REDACTED]  
[REDACTED]  
Canada

CC:

[REDACTED]

*Jeffrey Cannon*  
JEFFREY CANNON  
Geochemistry Department Supervisor

This report supersedes all previous preliminary and final reports with this file number dated prior to the date on this certificate. Signature indicates final approval; preliminary reports are unsigned and should be used for reference only. All results are considered the confidential property of the client. Bureau Veritas assumes the liabilities for actual cost of analysis only. Results apply to samples as submitted.  
\*\* asterisk indicates that an analytical result could not be provided due to unusually high levels of interference from other elements.



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## **Client:**

Page 1 of 1

Bureau Veritas Commodities Canada Ltd.

9050 Shaughnessy St Vancouver British Columbia V6P 6E5 Canada

PHONE (604) 253-3158

Project: None Given  
Report Date: September 08, 2018

Page: 2 of 3

Part: 1 of 3

## CERTIFICATE OF ANALYSIS

VAN18001858.2

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## **Client:**

**ANSWER**

Bureau Veritas Commodities Canada Ltd.

9050 Shaughnessy St Vancouver British Columbia V6P 6E5 Canada

**PHONE (604) 253-3158**

Project: None Given  
Report Date: September 08, 2018

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Part: 2 of 3

## CERTIFICATE OF ANALYSIS

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Bureau Veritas Commodities Canada Ltd.

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Client:

[REDACTED]

Project: None Given  
Report Date: September 08, 2018

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Part: 3 of 3

## CERTIFICATE OF ANALYSIS

VAN18001858.2

Analyte	Method	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA370
		Rb	Hf	In	Re	Se	Te	Tl	Cu
		ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
		0.1	0.1	0.05	0.005	1	0.5	0.5	0.001
100006	Rock	17.6	0.5	<0.05	<0.005	<1	1.4	<0.5	
100007	Rock	90.9	1.4	<0.05	<0.005	<1	<0.5	1.3	
100008	Rock	52.7	2.1	<0.05	<0.005	<1	2.0	<0.5	
100009	Rock	9.1	0.4	0.05	<0.005	<1	1.2	<0.5	
100010	Rock	31.2	0.2	0.12	<0.005	1	0.7	<0.5	
100011	Rock	29.0	0.8	0.27	<0.005	2	<0.5	<0.5	
100012	Rock	70.0	0.4	0.18	0.036	2	0.8	0.9	
100013	Rock	82.4	0.9	<0.05	<0.005	<1	<0.5	0.6	
100014	Rock	121.3	0.8	<0.05	0.006	<1	<0.5	1.0	
100015	Rock	85.9	0.7	<0.05	<0.005	<1	<0.5	0.7	
100017A	Rock	219.8	5.1	<0.05	<0.005	2	<0.5	0.7	
100018A	Rock	230.1	4.9	<0.05	0.005	3	<0.5	0.7	
100024A	Rock	6.3	0.7	<0.05	<0.005	2	<0.5	<0.5	
100033A	Rock	164.5	4.3	<0.05	<0.005	<1	0.5	0.9	
100034	Rock	136.7	3.7	<0.05	<0.005	<1	<0.5	0.6	
100036A	Rock	64.9	1.7	0.09	<0.005	<1	1.4	<0.5	
100038A	Rock	20.5	2.0	0.17	<0.005	<1	1.7	<0.5	
100039A	Rock	21.5	1.1	<0.05	<0.005	<1	<0.5	<0.5	
100043A	Rock	30.7	2.3	0.07	<0.005	<1	<0.5	<0.5	
100045	Rock	110.8	2.4	0.28	<0.005	<1	0.6	<0.5	
100047	Rock	10.7	1.1	0.45	<0.005	3	14.1	<0.5	
100049A	Rock	132.5	6.3	0.06	<0.005	1	0.6	<0.5	
100151	Rock	25.5	0.3	<0.05	<0.005	1	2.1	<0.5	
100152	Rock	34.7	0.6	0.35	0.020	2	<0.5	<0.5	3.329
100153	Rock	35.3	0.8	0.12	<0.005	2	0.7	<0.5	
100155	Rock	77.5	1.2	0.09	<0.005	<1	<0.5	<0.5	
100156A	Rock	53.2	2.5	<0.05	0.005	<1	<0.5	<0.5	
100157	Rock	45.6	0.6	0.08	<0.005	<1	1.2	<0.5	
100158	Rock	36.1	0.3	0.13	<0.005	<1	1.3	<0.5	1.239
100159	Rock	9.6	0.7	0.06	<0.005	3	4.5	<0.5	1.154



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Bureau Veritas Commodities Canada Ltd.

9050 Shaughnessy St Vancouver British Columbia V6P 6E5 Canada  
PHONE (604) 253-3158

## **Client:**

Digitized by srujanika@gmail.com

Project: None Given  
Report Date: September 08, 2018

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Part: 1 of 3

## CERTIFICATE OF ANALYSIS

VAN18001858.2



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Project: None Given  
Report Date: September 08, 2018

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## CERTIFICATE OF ANALYSIS

VAN18001858.2

Method	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	
	Analyte	P	La	Cr	Mg	Ba	Ti	Al	Na	K	W	Zr	Ce	Sn	Y	Nb	Ta	Be	Sc	Li	S
	Unit	%	ppm	ppm	%	ppm	%	%	%	%	ppm	%									
	MDL	0.001	0.1	1	0.01	1	0.001	0.01	0.001	0.01	0.1	0.1	1	0.1	0.1	0.1	0.1	1	1	0.1	
100160	Rock	0.129	13.2	15	0.11	27	0.376	7.27	0.064	0.05	<0.1	27.7	26	0.7	12.3	1.8	<0.1	<1	18	3.6	<0.1



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## CERTIFICATE OF ANALYSIS

VAN18001858.2

Method	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA370
Analyte	Rb	Hf	In	Re	Se	Te	Tl	Cu
Unit	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
MDL	0.1	0.1	0.05	0.005	1	0.5	0.5	0.001
100160	Rock	1.1	1.1	0.08	<0.005	<1	1.0	<0.5



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## QUALITY CONTROL REPORT

VAN18001858.2



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# QUALITY CONTROL REPORT

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Report Date: September 08, 2018

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## QUALITY CONTROL REPORT

VAN18001858.2

	Method	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA370
Analyte	Rb	Hf	In	Re	Se	Te	Tl	Cu	
Unit	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	
MDL	0.1	0.1	0.05	0.005	1	0.5	0.5	0.001	
<b>Pulp Duplicates</b>									
100013	Rock	82.4	0.9	<0.05	<0.005	<1	<0.5	0.6	
REP 100013	QC	79.4	0.8	<0.05	<0.005	<1	<0.5	0.5	
100160	Rock	1.1	1.1	0.08	<0.005	<1	1.0	<0.5	
REP 100160	QC								
<b>Core Reject Duplicates</b>									
100015	Rock	85.9	0.7	<0.05	<0.005	<1	<0.5	0.7	
DUP 100015	QC	90.3	0.8	<0.05	<0.005	<1	<0.5	0.6	
<b>Reference Materials</b>									
STD CDN-ME-14	Standard								1.203
STD CDN-ME-9	Standard								0.644
STD OREAS25A-4A	Standard	55.2	3.5	0.12	<0.005	<1	<0.5	<0.5	
STD OREAS45E	Standard	21.4	2.6	0.09	<0.005	2	<0.5	<0.5	
STD OXC145	Standard								
STD OXH139	Standard								
STD OXC145 Expected									
STD OXH139 Expected									
STD OREAS25A-4A Expected		61	4.28	0.09		2.5		0.35	
STD OREAS45E Expected		21.2	3.11	0.099		2.97	0.1	0.15	
STD CDN-ME-14 Expected									1.221
STD CDN-ME-9 Expected									0.654
BLK	Blank								
BLK	Blank								
BLK	Blank	0.1	<0.1	<0.05	<0.005	<1	<0.5	<0.5	
BLK	Blank								<0.001
<b>Prep Wash</b>									
ROCK-VAN	Prep Blank	30.8	1.8	<0.05	<0.005	<1	<0.5	<0.5	
ROCK-VAN	Prep Blank	33.0	1.8	<0.05	<0.005	<1	<0.5	<0.5	

**Certificate of Analysis**  
**Work Order : WH180049**  
**[Report File No.: 0000030401]**

Date: July 27, 2018

To: Tony Barresi  
TRIUMPH GOLD CORPORATION  
1100-1111 MELVILLE ST  
VANCOUVER BC V6E 3V6

P.O. No.: Andalusite Peak  
Project No.: ANDALUSITE PEAK  
Samples: 41  
Received: Jul 10, 2018  
Pages: Page 1 to 11  
(Inclusive of Cover Sheet)

**Methods Summary**

No. Of Samples	Method Code	Description
41	G_LOG02	Pre-preparation processing, sorting, logging, boxing
41	G_WGH79	Weighing of samples and reporting of weights
41	G_PRP89	Weigh, dry,(up to 3.0 kg) crush to 75% passing 2 mm, split 250 g, pulverize to
41	GE_FAA313	@Au, FAS, AAS, 30g-5ml(Final Mode)
41	GE_ICP40B	Multi-acid (4-acid) digestion/ICP-AES package
8	GO_ICP41Q	Ore-Grade, 4-Acid Digest/ICP-AES
1	GO_XRF77B	Pyrosulphate fusion, XRF Base Metal package (0.2g)

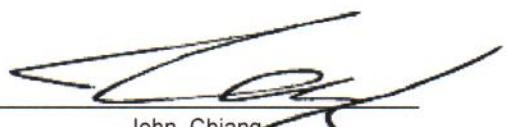
**Storage: Pulp & Reject**

REJECT STORAGE : DISPOSE AFTER 30 DAYS  
PULP STORAGE : PAID STORE AFTER 90 DAYS

**Comments:**

Analytical interferences might be in effect for some elements.

Certified By :

  
John Chiang  
QC Chemist

SGS Minerals Services Geochemistry Vancouver conforms to the requirements of ISO/IEC 17025 for specific tests as listed on their scope of accreditation which can be found at <http://www.scc.ca/en/search/palcan/sgs>

Report Footer:

L.N.R. = Listed not received                            I.S. = Insufficient Sample  
n.a. = Not applicable                                    -- = No result

\*INF = Composition of this sample makes detection impossible by this method

M after a result denotes ppb to ppm conversion, % denotes ppm to % conversion

Methods marked with an asterisk (e.g. \*NAA08V) were subcontracted

Elements marked with the @ symbol (e.g. @Cu) denote assays performed using accredited test methods

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Element Method Det.Lim. Units	WtKg G_WGH79	@Au GE_FA313	@Ag GE_ICP40B	@Al GE_ICP40B	@As GE_ICP40B	@Ba GE_ICP40B	@Be GE_ICP40B	@Bi GE_ICP40B
	0.01 kg	5 ppb	2 ppm	0.01 %	3 ppm	1 ppm	0.5 ppm	5 ppm
C00030401	0.940	<5	<2	8.44	26	493	<0.5	<5
C00030402	0.920	<5	<2	8.71	<3	930	2.2	<5
C00030403	1.140	<5	<2	8.30	21	267	1.0	<5
C00030404	1.120	<5	<2	8.25	31	151	<0.5	<5
C00030405	1.000	<5	<2	9.99	11	769	1.3	<5
C00030406	2.100	57	<2	5.33	33	225	<0.5	<5
C00030407	1.300	427	27	8.19	9	603	<0.5	<5
C00030408	0.640	16	<2	3.68	3	465	<0.5	<5
C00030409	0.920	38	25	5.39	4	1120	<0.5	<5
C00030410	1.120	9	2	5.74	9	667	<0.5	<5
C00030411	0.800	86	19	5.65	<3	347	<0.5	<5
C00030451	1.160	<5	<2	7.13	6	271	1.2	<5
C00030452	0.980	<5	<2	8.99	9	956	1.8	<5
C00030453	1.740	9	<2	8.45	10	1030	1.7	<5
*Dup C00030453	N.A.	9	<2	8.31	<3	1040	1.7	<5
C00030454	1.180	<5	<2	11.5	<3	238	0.6	<5
C00030455	1.180	<5	<2	6.41	4	736	1.5	<5
C00030456	0.660	<5	<2	7.90	13	86	0.7	<5
C00030457	1.440	7	<2	9.30	19	824	0.9	<5
C00030458	1.120	<5	<2	1.12	<3	113	<0.5	<5
C00030459	0.720	29	<2	8.79	18	486	<0.5	6
C00030460	1.440	40	2	1.69	<3	308	<0.5	<5
C00030461	1.060	147	11	8.80	8	1280	0.9	<5
C00030462	1.220	85	8	5.17	12	391	<0.5	<5
C00030463	1.180	11	2	2.68	16	466	<0.5	<5
C00030464	1.760	76	4	5.47	24	956	0.5	<5
C00030465	1.680	<5	<2	3.94	4	282	<0.5	<5
C00030466	1.240	2770	17	0.07	<3	6	<0.5	<5
C00030467	1.460	92	6	5.32	5	370	<0.5	<5
C00030468	1.160	89	4	7.65	7	1430	<0.5	<5
C00030469	1.260	179	5	2.96	10	155	<0.5	<5
C00030470	1.100	78	<2	2.22	7	142	<0.5	<5
C00030471	1.660	25	<2	7.56	6	535	<0.5	<5
C00030472	1.020	32	<2	8.30	20	35	<0.5	<5
C00030473	1.920	50	<2	2.82	4	308	<0.5	<5
C00030474	1.460	569	>100	0.42	<3	13	<0.5	<5
C00030475	1.700	5	2	5.94	7	184	<0.5	<5
C00030476	1.360	40	9	6.46	6	503	<0.5	<5
C00030477	0.960	5	<2	7.84	14	1170	0.8	<5
C00030478	1.200	15	5	5.81	12	390	<0.5	<5

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Element Method Det.Lim. Units	WtKg G_WGH79	@Au GE_FAAC13	@Ag GE_ICP40B	@Al GE_ICP40B	@As GE_ICP40B	@Ba GE_ICP40B	@Be GE_ICP40B	@Bi GE_ICP40B
	0.01 kg	5 ppb	2 ppm	0.01 %	3 ppm	1 ppm	0.5 ppm	5 ppm
C00030479	1.380	44	4	6.89	12	865	0.7	<5
C00030480	0.780	186	<2	7.82	40	351	0.9	7
*Rep C00030452		5						
*Std OREAS222		1260						
*Std SN75		8590						
*Blk BLANK		9						
*Rep C00030479			4	7.07	12	837	0.7	<5
*Std OREAS601			51	6.41	313	1110	2.0	20
*Std OREAS601			48	6.12	303	1920	2.1	18
*Blk BLANK			<2	0.01	<3	<1	<0.5	<5

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Element Method Det.Lim. Units	@Ca GE_ICP40B 0.01 %	@Cd GE_ICP40B 1 ppm	@Co GE_ICP40B 1 ppm	@Cr GE_ICP40B 1 ppm	@Cu GE_ICP40B 0.5 ppm	@Fe GE_ICP40B 0.01 %	@K GE_ICP40B 0.01 %	@La GE_ICP40B 0.5 ppm
C00030401	4.27	<1	19	12	44.1	5.45	1.22	13.7
C00030402	0.08	<1	42	<1	35.9	6.14	3.83	23.9
C00030403	4.48	<1	15	5	94.3	4.87	1.91	21.3
C00030404	7.31	<1	15	25	21.2	6.23	0.43	16.8
C00030405	2.94	<1	13	<1	11.0	6.01	2.05	14.1
C00030406	6.34	<1	10	17	3810	2.66	2.76	10.8
C00030407	3.10	<1	42	12	>10000	4.50	0.67	15.0
C00030408	0.53	<1	15	15	5000	3.49	1.30	16.4
C00030409	0.33	<1	20	30	>10000	4.18	1.99	11.6
C00030410	1.42	<1	7	27	>10000	3.83	2.39	7.6
C00030411	1.95	<1	15	18	6060	3.45	1.45	8.6
C00030451	0.59	<1	4	5	82.1	4.29	6.07	28.5
C00030452	1.31	<1	7	<1	91.5	5.20	4.22	24.7
C00030453	1.41	<1	8	1	137	4.32	4.12	29.2
*Dup C00030453	1.42	<1	8	1	126	4.41	4.08	28.4
C00030454	0.02	<1	<1	4	15.0	1.77	0.61	9.8
C00030455	0.13	<1	8	<1	40.7	4.09	4.34	16.6
C00030456	8.03	<1	4	8	13.9	5.73	0.23	26.1
C00030457	3.59	<1	18	4	82.9	5.90	3.00	32.4
C00030458	0.13	<1	3	12	3.5	1.11	0.26	2.7
C00030459	5.09	2	30	24	1600	8.18	1.23	17.7
C00030460	8.74	<1	2	16	1720	1.26	0.71	9.9
C00030461	3.16	<1	32	21	6570	6.78	3.01	14.8
C00030462	6.98	<1	16	17	6100	3.27	1.45	11.6
C00030463	8.64	<1	9	16	2060	2.20	1.18	8.8
C00030464	0.34	6	19	11	1850	3.42	2.89	8.2
C00030465	3.72	<1	18	94	362	4.09	0.84	9.3
C00030466	0.02	4	<1	24	>10000	3.90	<0.01	<0.5
C00030467	4.64	<1	20	47	>10000	5.42	1.69	43.1
C00030468	5.08	<1	26	15	3920	6.40	2.47	13.6
C00030469	3.94	<1	12	19	>10000	4.08	0.97	36.8
C00030470	7.97	<1	7	15	6270	2.65	0.84	23.2
C00030471	3.94	<1	43	17	3590	5.22	2.73	15.1
C00030472	8.63	<1	7	16	3490	6.58	0.11	15.5
C00030473	0.19	<1	21	16	2590	4.74	0.97	6.4
C00030474	0.36	<1	<1	<1	>10000	3.88	0.03	9.9
C00030475	10.9	<1	3	45	2950	4.72	0.41	8.6
C00030476	3.15	<1	18	15	>10000	5.13	1.70	13.0
C00030477	0.85	<1	21	16	4930	5.69	3.00	7.6
C00030478	1.70	<1	11	16	2340	3.55	2.28	7.5

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Element Method Det.Lim. Units	@Ca GE_ICP40B 0.01 %	@Cd GE_ICP40B 1 ppm	@Co GE_ICP40B 1 ppm	@Cr GE_ICP40B 1 ppm	@Cu GE_ICP40B 0.5 ppm	@Fe GE_ICP40B 0.01 %	@K GE_ICP40B 0.01 %	@La GE_ICP40B 0.5 ppm
C00030479	1.56	<1	21	15	5200	5.36	3.33	7.5
C00030480	0.28	<1	26	14	24.2	7.51	1.28	16.5
*Rep C00030479	1.57	<1	23	18	5370	5.38	3.44	7.6
*Std OREAS601	1.23	8	3	30	1030	2.40	2.22	34.6
*Std OREAS601	1.16	8	3	30	987	2.49	2.08	32.8
*Blk BLANK	<0.01	<1	<1	<1	<0.5	<0.01	<0.01	<0.5

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Element Method Det.Lim. Units	@Li GE_ICP40B 1 ppm	@Mg GE_ICP40B 0.01 %	@Mn GE_ICP40B 2 ppm	@Mo GE_ICP40B 1 ppm	@Na GE_ICP40B 0.01 %	@Ni GE_ICP40B 1 ppm	@P GE_ICP40B 0.01 %	@Pb GE_ICP40B 2 ppm
C00030401	11	1.54	1360	<1	2.36	8	0.09	8
C00030402	4	0.30	88	<1	0.26	3	0.08	6
C00030403	4	0.56	1040	19	1.34	3	0.12	15
C00030404	3	1.63	1850	<1	2.86	13	0.16	22
C00030405	21	1.57	1020	<1	4.15	10	0.21	7
C00030406	10	0.31	1710	<1	0.07	10	0.10	16
C00030407	25	3.83	1480	<1	3.84	52	0.18	19
C00030408	20	1.02	1240	<1	0.27	14	0.16	14
C00030409	22	1.35	800	1	0.72	38	0.10	36
C00030410	18	0.64	486	7	1.50	11	0.11	15
C00030411	19	1.19	1140	<1	1.24	17	0.09	11
C00030451	6	0.13	89	4	1.23	2	0.03	50
C00030452	6	0.14	181	<1	3.42	3	0.12	17
C00030453	29	0.96	548	<1	2.46	3	0.12	22
*Dup C00030453	29	0.97	567	<1	2.43	1	0.12	23
C00030454	4	0.03	72	<1	0.08	1	0.04	<2
C00030455	19	0.39	63	6	0.41	2	0.01	22
C00030456	6	0.39	1510	<1	1.21	2	0.17	14
C00030457	18	2.94	2860	<1	0.80	7	0.12	7
C00030458	3	0.17	252	<1	0.46	1	0.02	<2
C00030459	14	2.10	2170	<1	2.40	15	0.18	22
C00030460	5	0.26	2190	2	0.16	3	0.02	<2
C00030461	33	3.10	1470	<1	2.37	20	0.16	13
C00030462	15	1.00	2000	<1	0.74	10	0.09	6
C00030463	10	0.70	2340	<1	0.23	7	0.04	<2
C00030464	12	0.70	639	5	0.53	5	0.05	498
C00030465	17	1.73	1090	<1	0.87	34	0.08	2
C00030466	2	0.02	75	8	0.02	2	0.04	30
C00030467	19	1.50	1690	<1	0.72	22	0.11	17
C00030468	28	2.27	1720	<1	2.81	26	0.14	12
C00030469	15	0.91	1420	<1	0.29	13	0.05	91
C00030470	13	0.80	1690	<1	0.19	9	0.04	20
C00030471	32	1.88	1910	<1	1.36	32	0.16	5
C00030472	10	0.95	1920	<1	1.31	14	0.16	23
C00030473	15	2.30	2030	<1	0.06	17	0.06	7
C00030474	<1	0.04	91	<1	0.07	1	0.03	299
C00030475	12	0.75	1580	<1	0.35	10	0.08	1320
C00030476	24	1.55	1260	<1	2.35	24	0.10	673
C00030477	30	1.81	997	<1	2.06	28	0.18	17
C00030478	12	0.79	700	<1	1.59	15	0.10	10

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Element Method Det.Lim. Units	@Li GE_ICP40B	@Mg GE_ICP40B	@Mn GE_ICP40B	@Mo GE_ICP40B	@Na GE_ICP40B	@Ni GE_ICP40B	@P GE_ICP40B	@Pb GE_ICP40B
	ppm	%	ppm	ppm	%	ppm	%	ppm
C00030479	19	1.61	1370	<1	1.43	27	0.11	14
C00030480	13	1.08	382	<1	4.12	12	0.21	15
*Rep C00030479	20	1.65	1400	<1	1.50	29	0.11	13
*Std OREAS601	22	0.36	472	2	1.57	24	0.05	343
*Std OREAS601	22	0.37	462	2	1.44	27	0.05	341
*Blk BLANK	<1	<0.01	<2	<1	0.01	<1	<0.01	<2

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Element Method Det.Lim. Units	@S GE_ICP40B 0.01 %	@Sb GE_ICP40B 5 ppm	@Sc GE_ICP40B 0.5 ppm	@Sn GE_ICP40B 10 ppm	@Sr GE_ICP40B 0.5 ppm	@Ti GE_ICP40B 0.01 %	@V GE_ICP40B 2 ppm	@W GE_ICP40B 10 ppm
C00030401	<0.01	15	23.5	<10	484	0.45	205	<10
C00030402	<0.01	14	15.6	<10	90.5	0.20	160	<10
C00030403	4.16	12	18.2	<10	286	0.40	172	<10
C00030404	<0.01	14	30.6	<10	949	0.57	270	<10
C00030405	<0.01	15	18.0	<10	470	0.45	229	<10
C00030406	0.04	8	14.4	<10	55.3	0.30	128	<10
C00030407	0.44	14	24.8	<10	368	0.49	208	<10
C00030408	<0.01	5	10.9	<10	39.5	0.17	128	<10
C00030409	0.09	11	15.8	<10	65.9	0.26	152	<10
C00030410	0.34	13	17.5	<10	147	0.31	167	<10
C00030411	0.06	12	16.4	<10	177	0.27	171	<10
C00030451	3.14	16	8.9	<10	261	0.11	69	<10
C00030452	<0.01	16	11.8	<10	544	0.27	123	<10
C00030453	<0.01	13	15.9	<10	648	0.28	101	<10
*Dup C00030453	<0.01	13	15.6	<10	646	0.28	100	<10
C00030454	0.06	18	16.7	<10	72.1	0.14	240	<10
C00030455	3.61	9	6.5	<10	98.1	0.28	106	<10
C00030456	<0.01	13	12.3	<10	1520	0.42	199	<10
C00030457	1.07	10	22.7	<10	189	0.48	206	<10
C00030458	<0.01	<5	1.2	<10	59.5	0.04	18	<10
C00030459	<0.01	12	33.5	<10	1010	0.66	308	<10
C00030460	0.03	<5	6.1	<10	84.1	0.08	63	<10
C00030461	0.14	11	35.9	<10	332	0.66	301	<10
C00030462	0.13	9	19.0	<10	168	0.27	186	<10
C00030463	0.03	5	9.5	<10	92.5	0.14	93	<10
C00030464	0.03	8	5.7	<10	45.4	0.15	78	<10
C00030465	<0.01	<5	13.6	<10	351	0.22	173	<10
C00030466	0.02	<5	<0.5	<10	2.6	<0.01	14	<10
C00030467	1.29	9	18.1	<10	194	0.30	198	<10
C00030468	0.05	14	24.3	<10	772	0.44	211	<10
C00030469	1.07	9	9.5	<10	104	0.17	115	<10
C00030470	0.60	9	8.0	<10	126	0.14	83	<10
C00030471	0.55	9	22.1	<10	193	0.46	249	<10
C00030472	0.02	20	22.6	<10	1280	0.42	338	<10
C00030473	<0.01	10	9.4	<10	16.4	0.14	99	<10
C00030474	>5.00	16	4.7	<10	149	0.02	76	<10
C00030475	0.05	15	12.6	<10	1950	0.22	190	<10
C00030476	0.33	11	17.7	<10	243	0.34	166	<10
C00030477	<0.01	11	23.1	<10	139	0.50	248	<10
C00030478	0.03	9	16.6	<10	118	0.32	182	<10

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Element Method Det.Lim. Units	@S GE_ICP40B 0.01 %	@Sb GE_ICP40B 5 ppm	@Sc GE_ICP40B 0.5 ppm	@Sn GE_ICP40B 10 ppm	@Sr GE_ICP40B 0.5 ppm	@Ti GE_ICP40B 0.01 %	@V GE_ICP40B 2 ppm	@W GE_ICP40B 10 ppm
C00030479	0.38	11	23.5	<10	199	0.39	226	<10
C00030480	2.04	15	22.5	<10	296	0.34	174	<10
*Rep C00030479	0.39	15	24.4	<10	206	0.41	229	<10
*Std OREAS601	1.09	42	4.9	<10	230	0.19	27	<10
*Std OREAS601	1.11	39	4.7	<10	228	0.19	26	<10
*Blk BLANK	<0.01	<5	<0.5	<10	<0.5	<0.01	<2	<10

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Element Method Det.Lim. Units	@Y GE_ICP40B 0.5 ppm	@Zn GE_ICP40B 1 ppm	@Zr GE_ICP40B 0.5 ppm	Ag GO_ICP41Q 0.01 %	Cu GO_ICP41Q 0.01 %	Cu GO_XRF77B 0.01 %
C00030401	23.0	93	50.8	N.A.	N.A.	N.A.
C00030402	9.9	19	177	N.A.	N.A.	N.A.
C00030403	26.5	29	160	N.A.	N.A.	N.A.
C00030404	20.3	46	34.7	N.A.	N.A.	N.A.
C00030405	23.3	66	119	N.A.	N.A.	N.A.
C00030406	11.1	87	40.5	N.A.	N.A.	N.A.
C00030407	16.6	114	20.3	N.A.	1.87	N.A.
C00030408	7.1	81	12.7	N.A.	N.A.	N.A.
C00030409	8.1	110	24.7	N.A.	1.83	N.A.
C00030410	9.6	40	19.6	N.A.	1.04	N.A.
C00030411	9.9	74	15.0	N.A.	N.A.	N.A.
C00030451	9.8	<1	183	N.A.	N.A.	N.A.
C00030452	22.5	22	212	N.A.	N.A.	N.A.
C00030453	22.8	93	209	N.A.	N.A.	N.A.
*Dup C00030453	22.7	91	204	N.A.	N.A.	N.A.
C00030454	3.7	<1	51.9	N.A.	N.A.	N.A.
C00030455	6.9	3	189	N.A.	N.A.	N.A.
C00030456	24.0	17	61.1	N.A.	N.A.	N.A.
C00030457	23.1	164	145	N.A.	N.A.	N.A.
C00030458	2.1	13	7.0	N.A.	N.A.	N.A.
C00030459	22.6	150	44.0	N.A.	N.A.	N.A.
C00030460	6.8	13	9.8	N.A.	N.A.	N.A.
C00030461	22.4	149	67.9	N.A.	N.A.	N.A.
C00030462	14.5	55	38.5	N.A.	N.A.	N.A.
C00030463	10.6	35	17.4	N.A.	N.A.	N.A.
C00030464	10.7	986	75.9	N.A.	N.A.	N.A.
C00030465	7.0	62	18.0	N.A.	N.A.	N.A.
C00030466	1.9	80	1.5	N.A.	2.42	N.A.
C00030467	11.7	136	21.6	N.A.	1.00	N.A.
C00030468	15.2	91	24.0	N.A.	N.A.	N.A.
C00030469	7.8	101	13.4	N.A.	1.30	N.A.
C00030470	7.9	62	8.9	N.A.	N.A.	N.A.
C00030471	16.6	125	38.9	N.A.	N.A.	N.A.
C00030472	18.2	25	24.3	N.A.	N.A.	N.A.
C00030473	4.5	52	8.7	N.A.	N.A.	N.A.
C00030474	1.8	<1	2.4	0.05	>30.0	67.0
C00030475	8.8	22	18.7	N.A.	N.A.	N.A.
C00030476	13.4	108	30.0	N.A.	1.43	N.A.
C00030477	13.6	147	31.3	N.A.	N.A.	N.A.
C00030478	10.5	54	26.3	N.A.	N.A.	N.A.

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Element Method Det.Lim. Units	@Y GE_ICP40B 0.5 ppm	@Zn GE_ICP40B 1 ppm	@Zr GE_ICP40B 0.5 ppm	Ag GO_ICP41Q 0.01 %	Cu GO_ICP41Q 0.01 %	Cu GO_XRF77B 0.01 %
C00030479	12.1	130	38.1	N.A.	N.A.	N.A.
C00030480	7.1	83	33.2	N.A.	N.A.	N.A.
*Rep C00030479	12.3	130	39.1			
*Std OREAS601	12.2	1410	162			
*Std OREAS601	11.6	1370	155			
*Blk BLANK	<0.5	1	<0.5			
*Std CCU1D				0.01	23.7	
*Blk BLANK				<0.01	<0.01	
*Rep C00030474						67.2
*Std AMIS0409						34.0
*Blk BLANK						0.01
*Rep C00030409				N.A.	1.82	

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## **Appendix VI**

### **Sample Descriptions**

Site_ID	SampleID	Terraspec_ID	Easting	Northing	Description
18L. Bickerton-AND-01		TSC39	471887.4	6460305.5	subcrop of heavily foliated aug-phyric mafic volcanic with localized outcrop of undeformed but green-grey altered plagiophytic andesite; plagioclase is 1-5mm and subhedral, some with zonation (plagioclase rim and sauss core?). Sampled for Rep/Thin(?) to investigate if mag is primary or secondary?. To the west is coarse aug-phyric mafic volcanics
18L. Bickerton-AND-02	C00030401		471760.2	6460411.3	subcrop of fine-grained to coarse-grained augite-phyric andesite with localized flow-banding and cannibalized(?) clast content --> volcaniclastic? Minor epidote and chlorite (thin stringers throughout) alteration is found here and some qtz-calcite-pyrite +/-pitch limonite(after cpy?). Sampled for assay (401).
18L. Bickerton-AND-03	C00030402		471715.5	6460445.1	multiple float of white-beige heavily-foliated and phyllitically altered volcanic with pyr-hematite +/-tourmaline. Sampled for thin(?) and assay (402) of part with oxidized sulfide-bearing vein (qtz-pyr-FeOx) that is deformed and offset by foliation.
18L. Bickerton-02		TSC40	471615	6460459	musc-rich +/- qtz and rusty pyr deformed volcanic - now a powdery white-beige. Muscovite is medium- to coarse-grained and appears secondary (potential for AND??)
18L. Bickerton-AND-04	18L. Bickerton-AND-04		471855.3	6460218.4	just East of a fault (red-orange foliated mafic volcanic) is an outcrop of aug-phyric andesite and intermingled plagiophytic (bladed feldspar) porphyritic mafic volcanic. Mag replacing mafic sites? Sampled for Thin(?) and rep. Weakly epi-chl altered and epi rims plagioclase... magnetite+pyr is disseminated
18L. Bickerton03		TSC41	471955	6460064	Foliated mafic volcanic with coarse muscovite (parallel to foliation) and disseminated qtz-pyr proximal to 10-30m^2 subcrop of fine- to medium-grained silicified gabbro/diorite. Plagioclase is abundant (> 60%) and mafic sites are mostly replaced/silicified; some bio remains +/- chl-epi (altn?)
18L. Bickerton-AND-05	C00030403		472021.1	6460041.9	Small E-W trending gully of gossanous mafic volcanic to plagiophytic intrusive --> heavily qtz-ser-pyr altered, Fe-staining from weathering of pyr? Sampled for assay (403) and TS (04).
18L. Bickerton05		TSC42	472029	6459982	Strongly foliated sub- to outcrop with C-S schistose fabric in the sericitized mafic volcanic rock. Minor pyr+qtz. Rock is silvery-white to beige.
18L. Bickerton-AND-06	18L. Bickerton-AND-06		472032.1	6459431.2	aug-plagiophytic (1-5mm) mafic volcanic (Horn Bluff) with chl-mag alteration(?) and planar 0.5cm veins of mag-epi+/-qtz-pyr-act. Sampled for rep. Upon reaching ridge, volcanic/volcaniclastic has abundant chl-mag(>-hem)-epidote alteration.
18L. Bickerton-AND-07	18L. Bickerton-AND-07		471913.6	6459275.5	Outcrop of bladed feldspar-porphyry. Fsp are rounded (4-8 mm), coarse-grained in weakly magnetic andesitic matrix. Sampled for slab/thin(?) . Weakly foliated with no magmatic alignment. Just to the S is andesite, veined with qtz-chl-act-pyr+/-mag. Tenuously sampled.... This grades to less altered andesite, locally with extensive qtz-epi veins (+bleached haloes --> al. Bickertonite??).
18L. Bickerton-AND-08	18L. Bickerton-AND-08		471871	6459079.4	From previous station... these volcanics go back into bladed feldspar-porphyry -- much less altered, photo'd.
18L. Bickerton-AND-09	C00030404		471737.2	6458769.1	boulder/blocky outcrop of mafic volcanic with sparse veining of qtz-epi-chl-pyr(+ tr. Cpy! Now mal...); these vein assemblages can be cored by act with epi-al. Bickerton haloes. One such sample has been collected for assay (404).
18L. Bickerton06		TSC43	471728	6458736	
18L. Bickerton-AND-10	C00030405		471621.1	6458681	Outcrop of plagiophytic porphyry on western flank of ridge. Thick 1-cm qtz-epi-chl-act+/-pyr, cpy veins with 1-2 cm haloes with al. Bickerton alteration (~4/m density). Sampled rep lith with vein (405)
18L. Bickerton-AND-11	C00030406		471492.7	6458283.8	mafic volcanic with vein of qtz-carbonate-mal-qtz. Veins are 1-3 cm thick, open-space/vuggy. Some contain cpy (>-brn/tetrahedrite?). Sampled (406).
18L. Bickerton-AND-12	18L. Bickerton-AND-12		469988.3	6458862.8	Somewhat of an alteration contact area between weakly altered mafic volcanic (flow top brx? Amygdaloidal and massive, basaltic andesite) to the South and a strongly silicified version of the volcanic (not a felsic dyke??) trending approx. NE-SW, outcrop is 10-15 m in thickness. Radial to silicified zone is thick (1-3cm) qtz veins that expose foliation in the mafic volcanics.
18L. Bickerton-AND-13	18L. Bickerton-AND-13		470062.9	6458780.4	NE-SW trend of increased sulfide pyr>>cpy in the semi-massive to flow-brx volcanic. CO <sub>3</sub> content also increases here. Between here and previous station, CO <sub>3</sub> -qtz-epi (in haloes) veins are abundant.
18L. Bickerton-AND-14	18L. Bickerton-AND-14		470206.4	6458572.9	Volcanics slightly coarser-grained on this hill. Plagioclase phenocrysts throughout and magnetite-epidote is pervasive. Some malachite found directly East. Sampled for Thin...
18L. Bickerton-AND-15	C00030407		470243.2	6458543	Outcrop of grey plagiophytic mafic volcanics, slightly more coarse-grained and magnetic with fractures coated in mal-azurite and minor veining with disseminated sulfides (pyr>cpy, lesser tet??). Sampled (407)
18L. Bickerton-AND-16	18L. Bickerton-AND-16		470317.2	6458028.7	Weakly silicified and act-epi-qtz-carbonate veined mafic volcanic. At this station, malachite-azurite occurs as minor vein-fill and fracture staining.
18L. Bickerton-AND-17	18L. Bickerton-AND-17		470225.9	6458136.4	Thick (~2 m) epi alteration channel with dense qtz+/-chl-epi veining (wavy, 1-10cm, 3/m) in mafic volcanic rock with bladed plagioclase phenocrysts (~30%, 1-3mm).
18L. Bickerton-AND-18	C00030408		470180.8	6458236.6	mafic volcanic brecciated by hydrothermal fluid with infill/cement dominantly of qtz+carbonate (vuggy). Volcanic proximal to veins and breccia have increased silicification and sulfide content (pyr>cpy) with minor malachite (replacing cpy?). Sampled (408).
18L. Bickerton-AND-19	C00030409		470164.9	6458265.2	Subcrop (float?) of mafic volcanic with extensional veins of qtz-pyr-cpy and haloes of sulfide disseminated and pervasive Malachite (sampled, 409).
18L. Bickerton-AND-20	C00030410		470107.7	6458359.7	Fine-grained mafic volcanics, weakly silicified with thin stringers of qtz-pyr-epi-cpy(>brn, mal) and mal-cpy-pyr in haloes to veins. Sampled (410)
18L. Bickerton-AND-21	C00030411		470086.5	6458425.5	Fine-grained mafic volcanic, near in situ boulder of volcanic with abundant qtz-CO <sub>3</sub> veining and alteration (heavily silicified with disseminated and fine veins of pyr-cpy. Some cpy to mal? Lesser tetrahedrite;brn?). Sampled (411).
18L. Bickerton-AND-22	18L. Bickerton-AND-22		469914.9	6458529.7	Frost boil?? Subcrop of medium-grained and qtz-biotite porphyritic monzonodiorite. Some fragments are moderately altered (ser-pyr-qtz) and others weakly altered, Euclidian coarse qtz and biotite in a matrix of fine- to medium-grained feldspar(plag)>>qtz, Ksp, biotite. Much different than mafic volcanics --intrusion at depth here? Sampled as rep...

1564	C00030451	TSC45	471871.3	6460325.7	110 degree oriented saddle with, in place, vuggy boxwork in quartz-sericite-pyrite altered rock, and in other areas intensely silica altered rock with up to 15% disseminated pyrite and trace chalcopyrite
1565	C00030452		471769.2	6460384	Talus of mafic plagioclase porphyritic intrusive rock. Weakly foliated. Contains 1 cm thick quartz magnetite vein.
1566	C00030453		471729	6460417.5	Multiple talus rocks of mafic plagioclase porphyry intrusive with quartz magnetite veins.
1567		TSC44	471697.2	6460442.9	Talus with likely andalusite. Located higher up the slope than the andalusite outcrop.
1568	C00030454		471687.7	6460449.4	Talus train with abundant coarse white mica and susscrosic vuggy quartz and quartz veins. Probably quartz-sericite-pyrite altered mafic intrusive. Contains trace pyrite.
1569			471634.4	6460435.1	1-2 cm diameter porphyroblasts in strongly altered rock adjacent to the andalusite outcrop.
1570	C00030455		471958	6460217.4	280 oriented corridor of intense quartz-sericite-pyrite alteration in less altered plagioclase porphyritic rock. 15% disseminated pyrite.
1571			471943	6460075.6	Coxcomb quartz chlorite veins in vesicular volcanic rock.
1572	C00030456		471941.5	6460053.9	56: Talus of epidote altered feldspar porphyritic rock with quartz veins that contain a silver coloured sulfide. 57: Talus of biotite altered volcanic wrick with 10% disseminated pyrite.
1572	C00030457		471941.5	6460053.9	56: Talus of epidote altered feldspar porphyritic rock with quartz veins that contain a silver coloured sulfide. 57: Talus of biotite altered volcanic wrick with 10% disseminated pyrite.
1573			471944	6460003	Outcrop of K-feldspar porphyritic monzonite.
1574			471954.2	6459708.3	Strongly magnetic biotite, magnetite, pyrite recrystallized rock.
1575			472103.6	6459473.3	Plagioclase porphyritic intrusive diorite with abundant carbonate-quartz-epidote-chlorite-actinolite veins with trace pyrite and wallrock alteration.
1576			472094.2	6459464.3	Approximately 300 degree oriented saddle of phyllitic altered rock in otherwise propylitic altered domain.
1577			472046	6459411.1	142 Oriented phyllitic altered saddle
1578	C00030458		471907.6	6459206.3	Fine grained intermediate to felsic volcanic rock with abundant 1 cm quartz chlorite veins and larger bull quartz veins (sample).
1579			471789.5	6458822.5	Outcrop with evidence that bladed feldspar porphyry is a least partly volcanic. Here it is bedded with fine tuff.
1580	C00030459		471745.8	6458767	Quartz epidote vein in mafic volcanic rock with chalcopyrite and malachite.
1581			471718.2	6458722.3	Saddle of bleached and altered volcanic rock. Fine rusty fractures.
1582			471706.7	6458651.9	Strongly clay altered bladed feldspar porphyry with preserved texture.
1583	C00030460		471658.9	6458635.5	3-4 cm thick quartz carbonate vein in vesicular volcanic rock with blebs of bornite and tetrahedrite + malachite
1584	C00030461		471664	6458631.8	Quartz carbonate stringers in mafic volcanic rock with blebs of bornite and tetrahedrite + malachite on fractures.
1585	C00030462		471656	6458630.8	Bornite in quartz-carbonate talus
1586			471651.9	6458627.7	More talus here with malachite
1587			471547.4	6458452.6	Strongly copper mineralized sample take here by third party.
1588	C00030464		471526.9	6458375.6	Quartz veins in silicified volcanic rock with malachite and trace bornite?
1589			471493.2	6458283.7	Abundant calcite-quartz veins with malachite chalcopyrite and tetrahedrite in vesicular volcanic rock
1590	C00030465		471477.4	6458248.6	4 cm wide quartz vein with blebby chalcopyrite and malachite
1591	C00030466		469951.6	6458809.9	Strongly oxidized boxwork on margin of coarse coxcomb quartz veins in felsenmeier of mixed intermediate to felsic + mafic volcanic rock.
1592	C00030467		470221.3	6458587.4	Autobrecciated vesicular basalt with Quartz>calcite veins + breccia fill and quartz + chalcopyrite stringers with malachite on fracture surfaces. Limited extent of mineralization. Also here coarse 3-5 cm thick quartz calcite veins.
1593	C00030468		470221.8	6458606.6	Fine grained mafic volcanic rock with malachite on fractures.
1594			470232.3	6458604.2	
1595	C00030469		470233.9	6458605.4	Basalt breccia with abundant quartz-chalcopyrite-malachite infill.
1596	C00030470		470240	6458589.6	felsenmeier of basalt breccia with quartz calcite chalcopyrite matrix.
1597	C00030471		470246.6	6458574	Random quartz veins in mafic volcanic rock with chalcopyrite in the veins and disseminated in the basalt. Historical sample from near this location contain chalcopyrite, tetrahedrite and malachite from a quartz-carbonate-epidote vein.
1598	C00030472		470242.1	6458372.2	Along strike of historical sample noted above. Abundant regolith of quartz-carbonate veining with bornite, tetrahedrite, malachite and azurite.
1599	C00030473		470188.7	6458275.6	Talus just down from ridge top. Abundant malachite and azurite in association with coarse quartz-carbonate veins with clots of malachite, azurite, trace chalcopyrite and a highly reflective silver mineral. The azurite appears to be intergrown with coarse biotite?
1600			470239.8	6458184.5	Malachite on fractures in basalt
1601			470259.1	6458137.9	Historical sample site: beautiful quartz-tetrahedrite epidote veins with malachite and azurite
1602	C00030474		470261.4	6458136.6	Near previous sample site, but they missed the best stuff! This knob is well mineralized top to bottom. The sample is of a copper blowout at intersecting epidote quartz veins. Massive up to 10 cm thick bornite + tetrahedrite. Trace coarse hematite on margin.
1603			470240.4	6458083.5	Minor malachite in talus on vesicular basalt.
1604	C00030475		470214.1	6458121.5	Coarse quartz epidote veins with trace malachite + trace oxidized sulfide in large boulder/talus train of similar material that goes directly up slope
1605	C00030476		470212.9	6458157.2	Regolith of vesicular basalt with malachite filled vesicles and quartz+bornite+tetrahedrite stringers.
1606	C00030477		470177.7	6458250.3	Float of silicified and bleached mafic vesicular volcanic rock with fine quartz veins and coarse chrysocolla on fractures.
1607	C00030478		470014.7	6458372	Quartz calcite + minor epidote vein in mafic volcanic felsenmeier. Contain disseminated and vein chalcopyrite and malachite staining.
1608			469973.3	6458393	Coarse, nearly flat lying banded quartz carbonate chlorite vein, insitu

1609	C00030479		469940.7	6458426.1	Fine grained mafic volcanic rock cut by quartz carbonate chalcopyrite veins + malachite. felsenmeer
1610			469911.9	6458433.1	Heading north, beginning to pick up little enclaves of red oxidized basalt, still mostly green though.
1611			469885.8	6458458.5	A few blocks of syenites here? With hornblende phenocrysts. Dyke?
1612	C00030480		469861.9	6458570.6	Abundant in Float; just down off the edge of the plateau. Oxidized strongly clay altered syenite with 5-12% disseminated pyrite.
100016	100016		471902	6460341	2 samples for TSP-1 with clay? & 1 with FeOx; REF 2 samples- ref - 1 Horn Mt volc and 1 Snowdrift Pluton granite; main sample: yellow, jarosite(?) weak goe on fractures; fine-grained xtnl; weak-moderate clay
100017	100017	TSC38	471836	6460344	highly oxidized sample; strong hematite; red; fine-grained volcanics (?); rare fine pyrite; highly quartz-altered
100018	100018	TCS37	471811	6460357	yellow-brown; strong quartz alt; strong jarosite-goethite, fine pyrite @ 2-3% dissemination; weak clay
100019	100019		471767	6460378	highly quartz-musc altered rock (portion of medium-grained porphyritic feldspar porphyry), light gray, fine-grained, mod fine-grained muscovite; sheared
100020	100020		471767	6460379	feldspar porphyry; fine-medium grained porphyritic, gray; very fine mt diss-weak-moderate; weak-moderate ill/musc, cut by sheeted, planar 1-4mm wide gray quartz vein with filling in centerline of milky white quartz; mt diss ~3-5% very fine diss
100021	100021	TCS36	471758	6460385	int volcanic (IA?), gray, fine-grained; weakly magnetic; very fine mt diss; fine-grained ch clots; quartz-epidote in fractures; weak ill/musc patches
100022	100022	TCS35	471705	6460429	quartz-muscovite vein-sheared?; weak goethite
100023	100023	TCS34	471682	6460444	pink-green, int volcanics?; fine-grained; strong epidote±act in fractures, moderate actinolite patches act in micro-fractures; weakly magnetic, weak hem dust staining (?)
100024	100024	TCS33	471632	6460434	yellowish-gray, jarosite quartz vein; very fine py diss @ 2%, weak-moderate mica fine-grained; weak goethite
100025	100025		471633	6460434	mica schist with porphyroblast texture & andalusite (?); weak ch
100026	100026	TCS32	471634	6460434	highly quartz-altered rock with musc(?); saccharoidal texture; fine-grained mica
100027	100027	TCS31	471634	6460433	light gray, highly quartz-altered rock; weak-moderate clay in fractures; destructive alt to orig texture of protolith
100028	100028	TCS30	471632	6460434	highly quartz-altered granular rock, light gray; local blue & green dumortierite(?) clots & andalusite(?); saccharoidal
100029	100029	TCS29	471634	6460431	highly quartz-altered rock, yellowish-gray, fine-grained; ffine-grained mica; deep blue & green dumortierite(?) clots; weak-moderate jarosite
100030	100030	TCS28	471630	6460430	highly quartz-altered rock, light gray to white; fine-grained saccharoidal; fine mica; rare bluish dumortierite(?); weak oxeation
100031	100031	TCS27	471627	6460429	highly quartz-altered rock; light gray, andalusite(?) clusters - light green tinge common on sample, local deep blue dumortierite(?) clots, fine-grained mica; weak jarosite(?)
100032	100032	TCS26	471631	6460429	dark gray; fine-grained; int volcanics(?) strong epidote in fractures; common actinolite clots in epidote patches, epidote veining (3-4mm) with aL. Bickertonite(?) selvage
100033	100033	TCS25	471888	6460232	int volcnics(?) - highly oxidized; brownish-red, gray inside; highly quartz-altered with ~3-5% fine pyrite disseminations; strong hematite-goethite, weak jarosite-local
100034	100034	TCS24	471862	6460238	yellowish-red gray inside, highly qz-altered with very fine pyrite diss@5% strong hem-jarosite; texture-dest alteration
100035	100035	TCS23	471945	6460098	monzonite or monzodiorite(?) - boulder floats; dike?; weak-mod ch; 1" bt? weakly oxidized
100036	100036	TCS22	471932	6460062	int volcanics; gray; aph; weak h alt; py @ <1% blebs; cut by qz-ch±act±ep vein with aL. Bickertonite(?) selvage; recrystallized volcanics?; ep±act vein vut along vein by milky white quartz vein; vein is oxidized locally; for WR; pyrite in act vein, vein is 3-4mm wide
100037	100037	TCS21	471930	6460062	int volcanics; fine-grained; fine elongate tourmaline crystals, dark gray; strong tourmaline locally in fracture
100038	100038	TCS20	471934	6460024	gray, fine-grained; int volcanics(?); common <1mm, slightly wavy @ 1mm wide mt veinlets, with aL. Bickertonite(?) selvage & actinolite also?
100039	100039	TCS19	471859	6459853	gray; highly qz-altered; moderate mt, fine mt diss; weak dine ch or act(?) clots; strong hem on fractures; fine pyrite diss @ 1-2% aL. Bickertonite(?) patches
100040	100040	TCS18	472003	6459677	white; sheared or foliated qz; fine mica(?)
100041	100041	TCS17	471999	6459650	white; completely qz-mica replaced rock; sheared
100042	100042		472033	6459549	yellowish & dark gray; yellowish portion is clay? Dark gray portion is matted with fine tourmaline needle-like crystals
100043	100043	TCS16	472064	6459443	gray, int volcanics(?), strong hematite in fractures; fine-grained, moderate magnetic, common very fine mt diss., very weak ill?
100044	100044	TCS15	472041	6459377	white, qz-mica - sheared
100045	100045	TCS14	471886	6459098	highly oxidized - Horn mt volcanics - reddish-gray, fine-grained/aphanitic some samples have carb-ep-spec hem veining; weak-moderate magnetic reddish-black
100046	100046	TCS13	471880	6459083	bladed feldspar porphyry; porphyritic medium-grained feldspars euhedral; weak-moderate magnetic; fine mt diss on groundmass; very weak illite at on feldspars
100047	100047	TCS12	471743	6458768	malachite in qz vein cutting dark gray int volcanics?, fine-grained!; vein is <1mm weakly magnetic; weak hem in fracture
100048	100048	TCS11	471723	6458740	reddish-white; sheared qz±mica vein?/replacement?, weak-moderate hematite
100049	100049	TCS10	471720	6458724	reddish; highly oxidized, sheared quartz replacement? Rare fine pyrite
100050	100050	TCS9	471716	6458719	yellowish-white; quartz replacement, moderate jarosite, weak goethite
100151	100151	TCS8	471657	6458638	white; quartz vein with mt as lenses in vein or @ selvage; malachite patches in some fractures in vein , fresh, reddish/copper red bornite(?) in vein, common vugs in vein (open space textures)
100152	100152		471622	6458580	highly oxidized, strong magnetic, highly vuggy int volcanic rock(?); with infill carbonate/calcite crystals and strong malachite stains all over - rock maybe most likely originally a breccia that was leached & later infilled with calcite, magnetite & copper??

100153	100153	TCS7	471528	6458375	highly quartz altered fine grained rock - volcanic? With <1mm transparent quartz veining with malachite in vein & malachite clots in fractures; gray, fine-grained int volcanic(?) protolith
100154	100154		471525	6458371	white, quartz±clay, complete replacement
100155	100155	TCS6	471493	6458283	int volcanic(?), fine-grained, dark gray, cut by ~1cm qz±carb vein with dogtooth crystals & common malachite stains; common open space textures in vein (epithermal) - very very late in system??
100156	100156	TSC5	470017	6458830	mafic volcanics - basaltic andesite with ~1cm qz vein, highly vuggy with weak chalcocite clots; weak goethite; fresh (?) unaltered
100157	100157	TSC4	470217	6458611	malachite in fracture face of mafic volcanic - basaltic andesite; very weak ch alt
100158	100158	TSC3	470234	6458607	bxtd qz±carb vein milky white vein in fine-grained, bladed feldspar porphyry to fine-grained basaltic andesite (?) - local facies Change; pyrite-chalcopyrite diss; py@2%, cp @ ~1% with moderate malachite stains
100159	100159	TSC2	470243	6458543	mafic volcanics - basaltic andesite dark gray; moderate-strong hem; moderate-strong malachite stains with weak azurite clots relict fine chalcopyrite; CU mineralization in fractures & not associated with veining; moderate qz-altered
100160	100160	TSC1	470252	6458391	gray bladed feldspar porphyry, euhedral plag, fine-grained; fresh to weakly alt; ~2cm wide carb vein with moderate-strong malachite clots & assoc strong epidote (carb-ep vein)

