

Ministry of Energy, Mines & Petroleum Resources

Mining & Minerals Division BC Geological Survey

BC Geological Survey Assessment Report 38172



Assessment Report
Title Page and Summary

TYPE OF REPORT [type of survey(s)]: **TOTAL COST:** Geology and Geochemistry 95,709.67 Sassan Liaghat, Ph.D, David Blann P.Eng s.liaghat, d.blann AUTHOR(S): SIGNATURE(S): West Valley: MX-4-402, Approval # 14-1620810,-0502, May 2, 2014; YEAR OF WORK: 2018 NOTICE OF WORK PERMIT NUMBER(S)/DATE(S): Rateria: MX-4-402, Approval # 14-1620473-0507, May 7, 2014) 5728377 2019/ Jan 27 STATEMENT OF WORK - CASH PAYMENTS EVENT NUMBER(S)/DATE(S): PROPERTY NAME: Rateria, West Valley Rateria 511809, 513870, 522356, 528775, 528778, 529013, 563796, 571030, 571031, 954808, 954819 1043294,1051903, 1051904, 1054152, 1054153, 1054154, 1054155,1054156, ... CLAIM NAME(S) (on which the work was done): 1054158, 1054159, 1054160, 1058059, 1058855, 1058856, 1058857, 1058859 West Valley: 566312, 568146, 568149, 582066, 589580, 589723, 589897, 589900, 590952, 929369, 930037, 950872, 1051898, 1051899, 1051905 Copper, Molybdenum, Gold, Rhenium COMMODITIES SOUGHT: MINERAL INVENTORY MINFILE NUMBER(S), IF KNOWN: NTS/BCGS: 0921.036 MINING DIVISION: Kamloops 120 LONGITUDE: LATITUDE: (at centre of work) OWNER(S): Happy Creek Minerals Ltd. (FMC 203169) 2) **MAILING ADDRESS:** #460 - 789 West Pender St.; Vancouver, B.C.; V6C 1H2 OPERATOR(S) [who paid for the work]: 2) 1) Happy Creek Minerals Ltd. (FMC 203169) **MAILING ADDRESS:** #460 - 789 West Pender St.; Vancouver, B.C.; V6C 1H2

PROPERTY GEOLOGY KEYWORDS (lithology, age, stratigraphy, structure, alteration, mineralization, size and attitude):
the Rateria-West Valley property is underlain by granodiorite, quartz diorite, quartz monzonite, and crowded quartz feldspar porphyry dykes. These lithologies are tentatively assigned to the Bethsaida, Skeena and Chataway phases of the Upper Triassic - Lower Jurassic Guichon Creek batholith which hosts the Valley Copper, Lornex, Highmont, JA deposits to the northwest. The copper sulphide minerals are comprised predominantly of bornite, chalcocite and minor chalcopyrite, molybdenite with associated copper, molybdenum, gold, silver and rhenium values. It occurs within fracture controlled quartz-sericite and locally k-feldspar alteration. An overprint of argillic alteration also occurs. Pyrite is generally rare in all alteration assemblages, except in outer, more mafic border phases of the batholith.

REFERENCES TO PREVIOUS ASSESSMENT WORK AND ASSESSMENT REPORT NUMBERS:

34641, 33648, 31424, 33522, 32025, 31425, 1829, 1881, 3709, 9211, 10139, 26409, 27785, 28094, 28878, 30067, 30822, 37364

TYPE OF WORK IN THIS REPORT	EXTENT OF WORK (IN METRIC UNITS)	ON WHICH CLAIMS	PROJECT COSTS APPORTIONED (incl. support)		
GEOLOGICAL (scale, area)		Rateria 511809, 513870, 522356, 528775, 528778, 529013, 563796,			
Ground, mapping Personnel	(150 km2)	571030, 571031, 954808, 954819,1043294, 1051903, 1051904,	58,600.00		
Photo interpretation Office St	udies	1054152, 1054153, 1054154, 1054155, 1054156, 1054158,	13,000.00		
GEOPHYSICAL (line-kilometres)		1054159, 1054160, 1058059, 1058856, 1058856, 1058857, 1058859 West Valley: 566312, 568146, 568149, 582066,			
Ground		589580, 589723, 589897, 589900, 590952, 929369, 930037,			
Magnetic		950872, 1051898, 1051899, 1051905			
Electromagnetic					
Induced Polarization					
Radiometric					
Outerate					
Other					
Airborne					
GEOCHEMICAL (number of samples analysed for)					
Soil					
Silt					
Rock 28		954819,1051904,563796	980.00		
Other SGS Storage f	or 592 samples		2,666.50		
DRILLING (total metres; number of holes, size)					
Core					
RELATED TECHNICAL					
Sampling/assaying					
Petrographic					
Mineralographic					
Metallurgic					
PROSPECTING (scale, area)					
PREPARATORY / PHYSICAL					
Line/grid (kilometres)					
Topographic/Photogrammetric (scale, area)					
Logal curvoys (scalo, aroa)					
Road, local access (kilometres)/t					
Trench (metres)					
Underground dev. (metres)					
		ation, Transportation, Reclamation	20,463.17		
		TOTAL COST:	95,709.67		

GEOLOGICAL MAPPING AND GEOCHEMICAL REPORT

on the

RATERIA - WEST VALLEY PROPERTY

Permit Number: MX-4-402, MX-4-559

Event Number: 5728377

Work Start: 2018/June/1 - Work Stop:2018/Nov/9

Kamloops Mining Division British Columbia BCGS: 092I.036,

Map Sheet: 092I/036, 046

UTM East: 643000 UTM North: 5580000

UTM Zone 10N

Prepared for:

HAPPY CREEK MINERALS LTD. #460-789 W Pender St Vancouver, BC, V6C 1H2

By:

Sassan Liaghat, Ph.D

&

David Blann, P.Eng. March 30, 2019

Summary

The Highland Valley (Rateria and West Valley) Property is located approximately 30 kilometres northwest of Merritt, British Columbia, and 10 kilometres south of the Teck Resources Ltd's Highland Valley Copper Mine (HVC) concentrator.

The Rateria and West Valley area is underlain mainly by the Upper Triassic - Lower Jurassic Guichon Creek Batholith. The Guichon batholith is zoned inward from older Border phases of diorite composition to Highland Valley, Bethlehem, Skeena and Bethsaida phases that are progressively more felsic in composition. Major structures trend north-south and are cut by a variety of structures trending northwest to northeast and east-west in orientation. The largest known deposits occur in proximity to large scale structures and the younger phases of the batholith and include the Bethlehem, Valley, Lornex, Highmont and JA deposits.

Exploration on the Rateria and West Valley properties began in the late 1800's while more intensive work began in earnest during the development of the Craigmont and Bethlehem copper mines and with the discovery of Lornex then the Valley deposits generally between the late 1950's to 1973. Intermittent work was done through to today. Generally smaller-sized claim groups, thick glacial till and extensive forest cover limited historical exploration effectiveness. Between 2004 and 2017, Happy Creek Minerals Ltd assembled approximately 240 square kilometres of mineral claims called the Rateria & West Valley properties that cover portions of the younger intrusive phases to the south of the Highmont and Lornex mines, respectively. Work has focussed mainly on the Rateria property and includes modern 3D induced polarization and magnetic geophysical surveys, stream sediment, soil geochemical and geological surveys and diamond drilling. Between 2006 and 2008, drilling by the Company located two new copper zones on the Rateria property (Zone 1 and 2) beneath 3-20 metres of glacial till. These deposits have been defined by drilling for approximately 1.2 km in length, 50-200 metres in width and 350 metres in depth and contain drill results including 95.0 metres of 0.67% copper and 152.5 metres of 0.35% copper, respectively. The mineralized zones are open to further expansion.

During 2018, Happy Creek conducted geological mapping of the Rateria and West Valley properties for a wider-scale view of the project. This work was aided by extensive logging activities providing access throughout the property. Although the property remains more than 90% covered by glacial till, the improved access and much less forest cover allowed relatively rapid location of historical work and found new outcrops. Historical geological map outcrops were field checked as being confirmed or deemed to be

glacial till boulders and removed from the database. The geological work was performed mainly by Sassan Liaghat, PhD., and Graeme Evans, P.Geo. and in part by David Blann, P.Eng. between June 1st and November 8th, 2018.

The results of the 2018 program suggest that younger phases of the batholith can include magmatic phases that are gradational between the Highland Valley and Bethlehem phase. The larger structurally-controlled mineralized zones have porphyritic, phyric and aplite dikes with timing affiliated to the Bethlehem, Bethsaida or post-Bethsaida phase that are related to the copper centres in the Batholith. The younger intrusive phases, affiliated dikes with mineralized zones are more common beyond that shown on historical regional maps and are thought to improve the potential for porphyry systems to occur in a much larger area on the Rateria and West Valley property.

During 2018, the geological mapping in conjunction with drill core logs has attempted to identify alteration mineral patterns around known zones of copper mineralization. A preliminary map is included in this report and the work is still in progress. Mineralized copper zones are associated with fracture-controlled potassic, phyllic, intermediate argillic and propylitic alteration. Quartz, k-feldspar, chlorite, epidote, albite, sericite, muscovite minerals occurs predominantly as veins, veinlets and fracture envelopes, with generally weak selective rock matrix replacement. Iron oxide minerals occur in marked zones in proximity to higher temperature alteration. Phengitic muscovite occurs with sericite-muscovite at several prospects. Pyrite is rare in hand specimen within younger phases and more common to strong in the older, more mafic outer phases of the batholith. Bornite, chalcocite and lessor chalcopyrite and molybdenite are principle hypogene copper minerals, with malachite and azurite common in oxidized, near-surface environments. To date, molybdenite has been confirmed mainly around Zone 1 and 2 on the Rateria property but is noted at low levels in assays at several prospects and within stream sediments. Rhenium concentrations occur with molybdenite at significant levels within Zone 2 and at depth in Zone 1. Gold values are most significant in Zone 2.

Detailed rock sampling was performed around the historical Sho SE area. In this area, Chataway rocks are locally mixed with Bethlehem phase and fractures are filled with quartz, K-feldspar, chlorite, tourmaline and gouge zones contain strong sericite-clay alteration along with bornite-malachite and some chalcocite. Over a northwest-southeast trend of approximately 250 metres, three separate areas returned positive values up to 3.83% copper.

A previously un-documented copper showing was found 650 metres southeast of the Sho prospect. The Broome Creek showing is a west-trending, south dipping 0.50 - 1.0 metre-wide fault and fracture zone containing a thin anastomosing shear zone with semi-massive chalcocite-bornite lenses in quartz-sericite-carbonate alteration. Cross-cutting fractures in Chataway granodiorite up to 7 metres away contain thin veinlets of bornite-chalcocite and malachite and imparts a weak stockwork texture. An assay from a narrow high-grade shear returned 15.4% copper. This zone occurs near the major Skuhun Creek (east-west) fault and on strike of the Sho SE zones.

On the West Valley property, new outcrops were exposed along logging roads at the Abbott Trail zone. Here, Chataway rocks are cut by quartz feldspar phyric dikes with weak to moderate potassic alteration, hematite, carbonate, epidote and chlorite filled fractures and malachite, azurite and thin veinlets of bornite occur. Grab samples returned up to 7.94% copper.

Compilation of geology, structures and rock alteration and mineralization is ongoing however, work during 2018 has begun to identify larger-scale trends and associations that can be used to assist in locating new porphyry copper deposits. Further exploration of the property is recommended to include completing geophysical inversions of historical induced polarization data, additional geophysical surveys, geological mapping, soil and rock sampling and drilling in and around several prospects.

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1. Location and Access, Physiography

The Highland Valley (Rateria and West Valley) Property is located approximately 30 kilometres northwest of Merritt, British Columbia (Figure 1), and 10 kilometres south of the Teck Resources Ltd's Highland Valley Copper Mine (HVC) concentrator (Figure 2). The Rateria and West Valley properties adjoin the east and west sides, respectively, claims owned by HVC. They are centred on 50° 21" 17' North latitude, 120° 59" 23' West longitude on BCGS map sheet 092l036. Access to the Rateria property from Merritt, B.C., is west via Highway 8 to Lower Nicola, then north along the Aberdeen Road to Pimainus Lake Forest Service Road (FSR). From this all-weather logging road main, secondary logging road and clear-cut skid trails branch outward throughout the property. Near FSR kilometre 24 is the Rateria Zone 1 prospect. Continuing along this road to KM 34 crosses the Lornex Fault and reaches the north end of the West Valley property. Access to the southern side of the West Valley property and Abbott Lake area is via a westward turnoff at kilometer 16 of the Pimainus FSR onto the Tyner Forest Service Road. With proximity to the town of Merritt, HVC, and good access through the property, the infrastructure in the area is excellent.

The Rateria and West Valley Properties are situated within an upland plateau area of approximately 1,400 to 1,600 metres in elevation. The area is covered by glacial till of the Late Wisconsian period (Ploufee, Ferbey, 2018). It consists of till blanket, till veneer, hummocky till and locally kame terrace, esker formations. and gravel, lacustrine-like clay and boulders of variable thickness from less than 1.0 metre to over 130 metres. Small lakes, swamps and seasonal creeks occur throughout the property. Forested areas are dominantly lodge pole pine, spruce and locally fir, birch and poplar. Characterized by a dry interior climate, the area has burnt and re-grown several times. Temperatures vary from maximums of around –30 to +40 degrees Celsius during mid-winter and mid-summer, respectively, and 50-100 cm annual precipitation occurs primarily as rain and snow between the fall and spring. Water in suitable quantities for all stages of exploration, is generally available year-round from nearby creeks and lakes. Well trained professional and field personnel as well as heavy equipment and services are available in Kamloops and Merritt.

2. Claim Status

The Highland Valley Property comprises 62 contiguous mineral claims totaling 25,306.5 hectares (Table 1, Figure 3). The claims are in the Kamloops Mining Division. All claims are registered with BC Mineral Titles as 100% owned by Happy Creek Minerals Ltd.

3. History

By the early 1900's, two adits were driven on a copper vein just northwest of Chataway Lake and similar work with very small-scale production occurred at the Vimy and Aberdeen Mine area, located to the southeast of the Rateria property. Several adits, pits and trenches are noted on the West Valley property, however no historical reference to the workings are known.

Rateria Property

1958-1974

Between 1958 and 1974, the Highland Valley District was becoming known to host copper deposits with the Bethlehem, Lornex, Highland and Valley deposit discoveries to the north and the Craigmont copper mine to the south. The whole area was covered with mineral claims. The area which presently covers the Rateria property was partitioned into numerous, irregular-shaped mineral claims with different owners. Chataway Exploration Co. Ltd. who began staking claims fairly early in the rush had 462 claims by 1968 and which form a part of the current Rateria property.

The properties were subject to regional, property and prospect-scale stream sediment and soil geochemical surveys, geological mapping, induced polarization surveys, bulldozer trenching and road building. Chataway Exploration and Bralorne Pioneer Mines developed a small high-grade copper resource called Zone 4 to the southeast of the Rateria property. Widespread and shallow depth percussion holes were performed over a large area however many did not reach bedrock, and some which contained interesting copper or rock alteration were not followed up. Minor diamond drilling was performed at and around several known showings however generally poor core recovery and limited sampling of core limited interpretation. Induced polarization geophysical surveys performed were generally affected by low-power and resolution systems, depth of the glacial till and paucity of pyrite and gave uncertain results.

Between 1980-1985, Cominco performed reconnaissance induced polarization and magnetic geophysical surveys over certain claims in the north-central to eastern part of the Rateria property, however sizeable portions of the survey areas were either not completed or reported. No followup drilling was reported and the claims were allowed to lapse.

Between 1991-1993, Aucumo Resources acquired a substantial claim block around Chataway lake, and conducted geology mapping, stream sediment sampling, and an induced polarization geophysical survey with 400 metre line spacing. Diamond drilling tested portions of several larger induced polarization

anomalies and several of the holes contained multiple intervals of moderately fractured rocks with quartzsericite alteration and anomalous copper values.

The general area lay fairly dormant with notable work including drilling around the Aberdeen and Vimy prospects to the southeast of the Rateria property. By the year 2000-2001, copper prices reached \$0.60/ Ib and much of the Highland Valley district was quiet for exploration, and mineral tenures were allowed to lapse. Brian Malahoff staked the first Rateria claim to the south of Teck-Cominco's Roscoe claim (Yubet prospect). Teck-Comino optioned the property and conducted a reconnaissance style IP survey with widely-spaced lines, however the survey did not cover several prospective portions of the property. In 2004, Happy Creek Minerals Ltd. (a private company) conducted stream sediment and rock sampling and optioned the property in 2005. Between 2005 and 2017, Happy Creek increased its' mineral tenure holdings, and conducted 3D induced polarization, magnetic geophysical surveys, soil and stream sediment sampling over portions of the expanded Rateria property and in 2006-2008 drilling discovered Zone 1 and Zone 2 on the Rateria property with potentially economic grade copper values in drill core. By 2012, Zone 1 and 2 had enough drilling completed to define continuous positive grade copper-silver (Zone 1) and copper-molybdenum-gold-silver-rhenium (Zone 2) with dimensions of one km in length, 50-150 metres in width and over 350 metres in depth. Other drill holes tested different portions of the property which locally contained encouraging alteration and/ or copper values that have not been followed up. Between 2005 and 2012, the neighbouring Chataway property to the east of the Rateria property, was subject to an MMI soil survey and several drill holes that contained several intervals of encouraging fracturing, alteration and positive copper values, however the property lapsed and was acquired by Happy Creek in 2017.

West Valley property

On the West Valley property, historical work was largely intermittent and cursory with the main focus on conducting IP surveys along the southern extension of the Lornex Fault in the 1980's. Several copper prospects found in the 1950's- 1970's have seen soil sampling, trenching and drilling performed, however no information is available on results of the trenching or drilling.

In 2009, Happy Creek acquired a large mineral claim group covering the area from Pimainus Lakes south to the Abbot Lakes area, approximately 100 square km. The Company conducted stream sediment sampling, prospecting, and an airborne magnetic and radiometric survey. In the past decade, logging

activities has greatly improved road access and visibility of the surface in clear-cuts, increasing the opportunity to find new outcrops and perform exploration.

4. Regional Geology

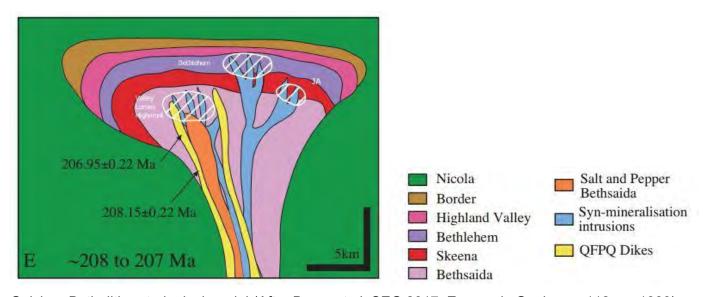
The Rateria and West Valley area (Figure 4) is underlain by the Upper Triassic - Lower Jurassic Guichon Creek Batholith. This multi-phase calc-alkaline intrusion is approximately 1,000 square kilometres in area and is elongated in an arc-parallel, north-northwesterly direction. Nearly concentric intrusive phases have contacts ranging from gradational to locally sharp or partially brecciated and are progressively younger and more felsic toward the central core of the batholith. The central core of the Guichon Creek Batholith is within a regional magnetic and gravity low. Textural and compositional criteria have been used to characterize the various intrusive phases after Northcote (1969), McMillan (1976) and Byrne (2017) and are described with some modification, below. Age dates and descriptions are after Byrne, 2017.

The oldest, outer phase of the Guichon Creek Batholith is the Border or Hybrid Phase which can contain zenoliths of wall rock volcanic basalt. Rock types within the Border facies include olivine leucogabbro, olivine leucomonzogabbro, diorite, quartz diorite, and quartz monzodiorite and all samples are equigranular with 30 to 45 modal % mafic minerals. Border phase is 211.02±0.17 Ma. The Highland Valley Phase consists of Guichon and Chataway Varieties. From Byrne, 2017: "The Highland Valley facies comprises two subfacies: (1) Guichon subfacies and (2) Chataway subfacies. Both subfacies are lithologically and geochemically similar, but with a number of key mineralogical and textural differences. Guichon subfacies is most prominent in the northeast and the Chataway subfacies in the southeast of the batholith and contacts between the two are gradational. Both subfacies are composed predominantly of equigranular granodiorite with minor quartz monzodiorite also in the Chataway subfacies. Mafic mineral contents vary from 20 to 25 and 13 to 15 modal % in the Guichon and Chataway subfacies, respectively". The Highland Valley phase is dated at approximately 211 to 210.4 Ma.

The inner, younger phase of the batholith consists of several, progressively more felsic phases emplaced between ~210 to 208.5 Ma. The Bethlehem Phase, a fine to medium grained granodiorite with approximately 6-9% mafic minerals, is characterized by fine grained granular quartz crystals and phenocrysts of several percent poikilitic amphibole crystals and zoned plagioclase. The Skeena phase is thought to have mineralogy, textures and age dates that suggest it is either a separate phase occurring between Bethsaida and Bethlehem phases or a result of mixing of several magmas and consists of seriate granodiorite with subordinate monzogranite, with amoeboid shaped quartz (Byrne, 2017). The youngest

main intrusive phase of the Guichon Creek Batholith is the Bethsaida, a weakly porphyritic granodiorite and monzogranite with 2 to 5 modal % mafic minerals. It contains coarse-grained subhedral biotite books and quartz phenocrysts that are amoeboid in shape but are coarser grained and more abundant than in the Skeena phase.

Porphyry dykes and stocks were emplaced during the Bethlehem phase through to post Bethsaida phase. Syn-mineral porphyry, "salt and pepper Bethsaida", and quartz-feldspar-phyric dikes are spatially associated with porphyry copper mineralization. The salt and pepper Bethsaida and quartz feldspar phyric dikes are the youngest phases at ~208 to 207 Ma.



Guichon Batholith petrological model (After Byrne et al, SEG 2017, Economic Geology, v 112, pg 1883)

Alkaline and felsic volcanic dykes, flow and tuff, Eocene to Miocene in age, cut the Guichon Creek Batholith rocks. Some areas of the Batholith are reported to have Tertiary sedimentary fill. During the last glacial period, portions of the Tertiary and older rocks and surficial sediments were eroded, and between one and greater than 150 metres of till, glaciofluvial and lacustrine cover was deposited towards a 165° azimuth.

Mineralization occurred late in the magmatic history of the Guichon Creek batholith in the Valley, Lornex and Highmont deposits, although an earlier mineralizing event is likely at the Bethlehem and J.A. deposits (Byrne. 2017).

Dominant ore controlling fracture sets at the Valley and Lornex deposits trend north-northwest to northeast and locally east-southeast. The regionally extensive, north trending Lornex Fault cuts the length of the Guichon Creek Batholith with a steep to locally moderate west dip and has a dextral sense slip of approximately 3.5 km which split the Lornex and Valley deposits. Sulphide mineralization is strongly associated with veins, fractures, faults and/or breccias.

In the Highland Valley deposits, potassic alteration is variably developed with hydrothermal biotite or k-feldspar as fracture-controlled flooding and veins. Phyllic alteration is typified by quartz and fine to coarse grained flakey pale green sericite to silver-grey muscovite occurring as fracture-filling or vein envelopes. Phyllic alteration cuts potassic alteration. In intermediate argillic zones, which often occur within and beyond the mineralized zones, feldspars and locally mafic minerals are altered to sericite and kaolinite +/- montmorillonite. Zones of sodic-calcic alteration occurs peripherally from some mineralized centres and is defined by chiefly epidote, albite, white mica veins (Byrne2016). Sericite, carbonate and clay alteration of feldspars, as well as chlorite-carbonate alteration of mafic minerals is characteristic of propylitic alteration. Calcite and zeolite occur primarily as late stage veins and fracture coatings.

The main hypogene copper sulphides include chalcopyrite, bornite and minor digenite. Sulphides are generally zoned from an inner bornite dominant to bornite-chalcopyrite and outer, usually very minor pyrite. Near surface oxide-supergene enriched zones may contain limonite, native copper, malachite, chalcocite and occasionally tenorite, copper "wad" or neoticite are described. Chalcocite variably replaces bornite locally to depths over 400 metres in the larger fault zones such as Zone 1. Pyrite occurs mainly in peripheral propylitic alteration in concentrations less than one percent. Mafic phases of the batholith such as the Border phases have a much greater frequency and concentration of pyrite. Distribution and concentration of molybdenite is highly variable throughout the Highland Valley deposits, with economically significant occurrences having similar distribution or a little outboard of the copper. Deeper-formed copper systems are reported to have less molybdenite. The relative abundance of molybdenum in the ore deposits increases from the Valley, Lornex to Highmont. Happy Creek's Zone 2 contains notable rhenium-enriched molybdenite and gold values.

- 5. Property Geology
- 5.1 Lithology, Alteration

The property is largely covered by 3 to 150 metres or more of glacial till that affected historical exploration. Rock outcrops comprise less than 5% of the Rateria Property and occur in limited exposures such as glacial meltwater channels, creek beds in part controlled by post-glacial structural uplift. Geological observations are largely derived from recent and historical drilling and from scattered outcrops.

The Rateria and West Valley areas are underlain by similar geology to the Highland Valley deposits currently in production to the north (Figure 4). The younger Bethsaida, Skeena, Bethlehem phases, respectively occur mainly on the western and eastern side of the Rateria and West Valley property, respectively. The Chataway, Guichon and Border phases occur to the east and west on the Rateria and West Valley properties, respectively. Syn to post-Bethlehem or Bethsaida related dykes consist of several types including fine to medium grained grey to pale green colored quartz feldspar phyric and orange-tan colored fine-grained k-feldspar rich aplite dykes from 5 cm to over 4 metres in thickness. Locally, dykes with a micro-feldspar porphyritic texture occur in proximity to or are cut by bornite-chalcocite veins.

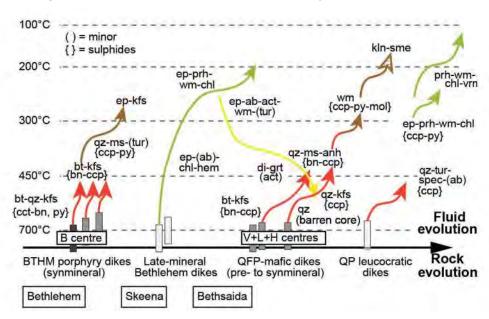
A 2014 geological study (Liaghat and Blann 2014) on the Rateria property provides a preliminary basis for an alteration pattern of this area. Mineralized zones on the property display structurally controlled alteration and mineralization. Propylitic (chlorite, epidote, carbonate) and potassic (k-feldspar, muscovite) and phyllic to intermediate argillic alteration (sericite, kaolinite/montmorillonite) occurs with variably intensity of quartz flooding, veinlets and veins. Sericite varies from soft, very fine-grained pale green (illite?) to hard medium grained grey-silver (muscovite), and locally very soft, medium grained silver-grey "talcose" (phengite?). At depths of over 350 metres in Zone 1, sericite decreases and potassic + propylitic (k-spar-chlorite-sericite/ muscovite) alteration increases and abundance of chalcocite decreases while bornite-chalcopyrite is more common.

Primary magnetite can be variably altered and martite, hematite, jarosite, goethite and specularite occurs. Due to the low-sulphur mineral system, and frequent association with chlorite, it is speculated that hematite could be a proxy for pyrite in exploration as it occurs in greater concentrations and frequency peripherally to the known copper zones.

On the West Valley Property, the younger phases of the Batholith outcrop along the east side in proximity to the Lornex fault, and appear as dikes that cut the Chataway, Guichon and Border Phase rocks further west. It is thought that the younger phases of the batholith occur beneath the older ones on the West Valley property. Based on the widespread presence of the younger felsic phase dykes, areas of propylitic to locally phyllic and argillic alteration with associated copper prospects, there is thought to be

potential for porphyry systems to occur within older phases of the Batholith. To the west and southwest of the property, the Guichon batholith is locally in contact with and in part overlain by Nicola Group volcanic rocks and the younger Spences Bridge Formation.

Proximity with geological contacts of the younger intrusive phases and dykes are spatially associated with hydrothermal alteration and copper mineralization. Regional to district scale fault zones cut the batholith in north, northwest and northeast to east-west orientations that also, in part, control emplacement of the various intrusive rocks associated with hydrothermal alteration and copper sulphides. Pre-mineral, syn-mineral and post-mineral faults occur. Displacement of mineralized zones by faults may be significant in the district and at the south end of Zone 1 an interpreted east-west oriented, south-dipping fault is thought to have displaced the zone. Faults may be strike-slip, normal or reverse in sense.



Paragenetic alteration in HV deposits- from Byrne, Summary of Activities 2016, Geoscience BC, Report 2017-1, p. 220

5.2 Mineralization on the Rateria Property

Zone 1 and Zone 2 were discovered by Happy Creek Minerals Ltd. and are thought to hold resource potential and remain open in extent. Numerous mineralized prospects occur with a few areas having more significant previous work as described below.

Zone 1 was discovered in 2006 and is located approximately 6.5 kilometres south-southeast of Teck's

Highmont mine. The zone extends to over 450 metres in depth, 1.2 kilometres in length and 50 to 200 metres in width. Zone 1 is located near the contact between the Bethsaida and Skeena Phase and dykes of aplite to feldspar porphyry composition occur. Bethlehem Phase rocks may occur but are not confirmed. Fractures are filled by quartz and sericite/muscovite forming veins, veinlets, stringers, and locally stockwork and breccia textures occur. Dominantly bornite, chalcocite and associated copper and silver values occur. Chalcocite in part replaces bornite that in part replaces chalcopyrite to over 350 metres depth in Zone 1. At depth and adjacent the bornite-chalcocite zone, relatively more chalcopyrite and molybdenite occurs.

In Zone 1, drilling results include 367.3 metres of 0.10% copper, 250.0 metres of 0.25% copper and 95 metres of 0.67% copper. West of Zone 1, and south of the Yubet prospect, drilling in 2011 returned 7.5 metres of 1.70% copper, 30.7 g/t silver and 7.5 metres of 1.35% copper, 12.4 g/t silver. Many of the recent and historical holes around Zone 1 were generally relatively shallow in depth. They ended in rock with hydrothermal alteration suggesting the underlying mineral system is widespread and larger than previously thought. One Km to the east of Zone 1 is the Three Creeks prospect and occurs near a contact between Chataway and Bethlehem/Skeena rocks. Iron oxide marks a strong fault and fracture zone containing sericite-muscovite, and quartz-carbonate veins with malachite and thin bornite veinlets

Zone 2 was discovered in 2008, about two kilometres northeast of Zone 1. Glacial till in Zone 2 is between 3 and 20 metres in thickness. Zone 2 occurs near the contact of Skeena, Bethlehem and Chataway Phases of the Batholith, and dikes of quartz feldspar porphyry and aplite occur. Major structures trend north, northeast and northwest and these faults and conjugate fractures are filled by quartzsericite/muscovite to form stockwork and breccia textures locally. K-feldspar occurs as wall rock matrix replacement and veins along with quartz-muscovite. Epidote, hematite occurs peripherally. Epidote and kfeldspar are locally replaced/overprinted by sericite-muscovite and kaolinite. The copper oxides malachite, azurite and native copper occur in minor amounts and generally very near the surface. However, very finegrained native copper averaging 0.02 to 0.09% copper occurs with weak sericite alteration to depths of at least 250 to 300 metres in several widely spaced drill holes to the east of Zone 2. Within Zone 2, bornite, minor chalcocite, chalcopyrite and locally molybdenite, with associated copper, molybdenum, gold, silver and rhenium values occur with potassic and phyllic style alteration. Significant rhenium enrichment in molybdenite is apparent. Zone 2. Copper values occur in drill core in an area approximately 1.5 kilometres by 1.0 kilometre in dimension. A better-defined zone is approximately 450 metres in length and between 75 and 125 metres in width and extends to at least 350 metres in depth. Drill results from Zone 2 include R08-05 with 126.0 metres of 0.46% copper, 0.008% molybdenum and 0.10 g/t gold. R11-36 returned 152.5

metres grading 0.26% copper, 0.008% molybdenum, 0.07 g/t gold and 0.67 g/t rhenium. This includes 42.5 metres of 0.37% copper, 0.17 g/t gold, 0.025% molybdenum, 1.82 g/t rhenium. R12-01 returned 92.8 metres of 0.30% copper, 0.15 g/t gold from bedrock surface and R12-02 contains 152.5 metres of 0.35% copper and 0.57 g/t rhenium. R17-02 returned 5.0metres of 4.41% copper, 20.0 g/t silver, 0.21 g/t gold, 0.031% molybdenum 6.86 g/t rhenium on the eastern side of the deposit and remains open. R17-05 includes 105.5 metres of 0.37% copper, 0.14 g/t gold and 0.63 g/t rhenium. Zone 2 remains undefined and open in extent.

Yubet prospect is comprised of a series of northerly trending, mineralized structures approximately 500-800 metres west of Zone 1. The prospect is exposed at surface approximately 200-700 metres north of the Rateria claim on Teck's Highland Valley copper property. Drilling by Happy Creek on the Rateria claim, located the southward extension to this zone by drilling and traced it for approximately 250 metres in width and over one kilometre southward. These zones consist of dominantly quartz veins containing bornite and locally chalcopyrite and are hosted within sericite -muscovite altered Bethsaida and Skeena phases of the Guichon Batholith. Drilling has returned 7.5 metres of 1.70% copper, 30.7 g/t silver in drill hole R11-16 that is approximately 125 metres beneath an intercept in R11-14 containing 7.5 metres of 1.35% copper, 12.4 g/t silver. Approximately 600 metres south of these holes, R11-34 intersected 7.5 metres of 0.60% copper, 3.5 g/t silver, as well as 12.5 metres of 0.13% copper. Several drill holes ended in moderate-strong kaolinite-sericite alteration with geochemically elevated molybdenum.

Sho Prospect. This historical prospect is located southeast of Zone 1 and south of Chataway Lake. The area is underlain by the Chataway and Bethlehem granodiorite. The area is covered extensively by glacial till with less than 10% outcrop exposure. Along the north side of the southeast draining, fault-controlled Broome creek, a steep cliff has exposed Chataway variety rocks.

The Sho prospect contains an area 15.0 metres by 4.1 metres in dimension that averages 1.49% copper, 8.4 g/t (grams per tonne) silver in 4 trenches. Approximately 400 metres to the south, several northwest trending mineralized shears and fractures occur in a zone over 250 metres in length and 50 to 100 metres in width. Geochemical rock samples returned from 0.20 to 2.84% copper and up to 12.8 g/t silver. Seven samples contain from 0.05 to 0.11 g/t gold.

Approximately 2 km southeast of the Sho prospect, an old cat road leads to trenches dating from around the late 1950's to 1970, has exposed in several different areas rocks with faults and fractures containing malachite, azurite and traces of bornite. This area is called the Sho southeast.

Tyner Lake Area is situated at the southern end of the Rateria property, south and west of the Sho and is approximately 75-90% covered by glacial till. Airborne magnetic surveys and historical work suggest several strong north, northwest and east-west (Shuhun Creek) trending structures occur within rocks including Bethsaida, Skeena to the west and Bethlehem and Chataway to the east.. Formerly named the Sku area, weak pyrite and an area of fracture-controlled malachite chalcopyrite, bornite mineralization was mapped prior to 1981. Drilling in 1981 returned propylitic, montmorillitic and weak argillic alteration in faulted and fractured granodiorite and porphyritic monzonite. One drill hole in Bethlehem phase granodiorite averaged 426 ppm Cu over 78 3 metres, including 0.18% copper over 10 metres. Historical induced polarization geophysical surveys to the west identified several sizable zones of interest that are open in extent eastward onto the Tyner area.

A prospecting report on the Tyner area in 2012 includes samples returning values of 0.16, 0.91 and 0.83% copper near Broome Creek where several outcrops occur. One sample located north of an historical adit returned 4.82 % copper, 0.19 g/t gold and 27.1 g/t silver is thought to reflect part of a large scale northwest trending structure.

5.3 Mineral prospects on the West Valley Property

The West Valley Property contains a number of widely spaced historical copper prospects. The Company has performed airborne magnetic and spectral geophysical and geochemical surveys, geology and prospecting that have identified potential for copper deposits to occur in several areas.

The West Valley Property is located in part on and to the west of the Lornex Fault, a major north-south trending structure that is thought to be an important control to mineralization at the Lornex and Valley copper deposits to the north. The Fir, Jay 2 and LL prospects occur near the intersection of the Lornex fault and the east-west trending Skuhun Creek fault. At the prospects, dykes of feldspar porphyry, quartz feldspar porphyry, aplite and mafic composition cut highland Valley and Border phase granodiorite.

NTP and Nord Showings. Located at the north end of the property, approximately 6 kilometres southwest of Teck's Lornex mine, the NTP prospect consists of two showings where grab samples approximately 65

metres apart returned 1.7 percent copper, 0.37 g/t gold and 1.4 percent copper, 0.27 g/t gold. Two reconnaissance drill holes in 2010 returned 74 m of 403 ppm copper and 52.5m of 428 ppm copper (AR 32025). Intervals of low-grade copper values occur in propylitic alteration and felsic dykes are thought to be consistent with the periphery of a porphyry system. Pyrite, bornite and chalcopyrite occur and locally, magnetite veins approximately 10 centimetres in thickness contain strong chalcopyrite mineralization. Drill hole WV10-1 returned 2.5 metres containing 1.20 g/t (grams per tonne) gold near the top of the hole. The presence of the positive gold values and magnetite is consistent with surface samples containing 0.27 and 0.37 g/t gold.

Fir, LL and Jay 2 Showings. The Fir area is comprised of a group of copper showings including the Jay 2 and LL prospects that cover an area approximately two kilometres by two kilometres in dimension. Cat trails and trenches, blast pits and an inclined shaft dating from around the 1950's or earlier are present. The Fir prospect is underlain by diorite that is cut by feldspar phyric and aplite dikes. Chalcopyrite-bearing quartz veinlets, veins and weakly developed breccia are accompanied by argillic, phyllic and propylitic alteration styles. Rock sampling at the Fir Prospect have returned values of 0.32% to 1.2% copper. The east side of the mineralized zone appears sharply cut off or overlain by massive fine-grained mafic rock. The Jay 2 showing is an inclined shaft approximately one-kilometre northeast of the Fir. Dump samples assayed up to 2.82% copper, 10.4 g/t silver and 0.12 g/t gold. An historical shallow drill hole near the shaft returned two mineralized zones adjacent to dykes. Two samples taken from the hole returned about 1.0 metre each of 1.87% copper and 1.29% copper, respectively. Approximately 1.5 km north of the Jay 2 is the LL prospect where chip samples returned 0.40% copper over 6.0 metres.

Abbot Lake Area. The Abbot Lake area is at the southern end of the West Valley property, south of Skuhun Creek. This area is underlain by rocks principally of quartz diorite and granodiorite composition and considered to be of the Guichon–Chataway variety of the Guichon Batholith. The few outcrops that occur in the area indicate the presence of Guichon Variety rocks; a medium to coarse grained, weakly foliated, biotite-hornblende granodiorite and locally quartz diorite. The rock contains approximately 20% mafic minerals with probably 2-5% magnetite. The mafics are medium grained, in small, evenly distributed clusters. Quartz is closed interstitial (wedgey), fine grained, and makes up about 10% of the rock. Plagioclase ranges from approximately 50 - 60%. Orthoclase makes up 0 - 8% of the rock, is poikilitic and interstitial to all other minerals. Weak sericite and hematite alteration is common throughout the observed samples. The amphibole tends to alter more to chlorite and epidote, along and in selvages of fractures. The

more mafic phase intrusive rocks display more dominant chlorite, epidote and hematite alteration, some of which is fairly intense.

Zones of chalcopyrite and malachite occur in part within younger phases of the Guichon Batholith, believed to be Bethlehem, Skeena or Bethsaida phase. The rocks appear to have variable propylitic, phyllic to argillic style alteration. This area also covers the southern extension of the Lornex fault, a key feature found at the Lornex and Valley mines to the north. 2013 samples returned geochemical values of 5070 ppm Cu from the Pole 383 Showing, 11400 ppm Cu from the Pole 346 Showing, and 5250 ppm Cu and 4.4 ppm Mo from the historical N-W Trenches area.

6. 2018 Exploration Activities

During 2018 the company added 6,849 hectares of mineral tenure to its 100% owned Rateria-West Valley copper property and the project now totals approximately 244 square kilometres. Historical work was fragmented by multiple owners of generally irregular-shaped, smaller-size claims and affected by extensive glacial till and thick forest cover. Happy Creek has assembled the current mineral property with greatly improved access and surface visibility due to on-going logging activities. The compilation of historical work along with the Company's own data has identified significant gaps in exploration and under-explored areas.

Between June and November 2018, the mapping program focused on the areas thought to have higher potential for mineralization, however time was also spent checking many areas of historical mapping. The Company has found in several instances that historical maps showed outcrop where with today's much better visibility or historical drill data, these outcrops appear more likely to be partially exposed, large glacial till boulders that could be many km from their source. As over 90% of the property is covered by glacial till, data from any visible bedrock is important. The geological focus was to identify the specific rock type, structure, alteration and mineralization present and merge this data with subsurface information from geophysics and historical drilling. This is an on-going process and is developing a larger-scale perspective for prioritizing exploration. At the Sho-South and Abbott areas, rock samples were collected from outcrops for geochemical analyses.

While hundreds of observations were made in the field, a total of 187 geological stations with rock samples were collected. Eight rock samples from the Abbott area and nineteen samples from the Sho Southeast were selected for geochemical analyses. Rock sample locations, descriptions and summary of

geochemical result are provided in Table 2 and 3 respectively and Table 4 lists the sample assays and descriptions.

The samples were analyzed by SGS Labs of Burnaby, B.C. Certificates of analyses are presented in Appendix 1. Geological mapping field stations are plotted in Figure 5 and labelled with a reference number. Figure 6 shows the locations of Sho and Abbott rock samples and labelled with copper assays. These samples are more clearly shown with reference numbers and copper assays in Figures 7 to 10.

7. Sampling and Analytical Procedures

28 rock samples were cleaned to avoid weathered surfaces or organic material to best represent the mineralization and/or alteration for that location. Sample types were recorded in a sample booklet and a field book. The extent of weathering was noted if fresh samples were unavailable. Rock sample size varied depending on whether a float or outcrop sample was taken. On average approximately 3 kilograms of rock was collected from each sample location. Sample bags were labeled with the corresponding sample ID numbers from the sample booklets. The sample ID tag was also inserted into the sample bag prior to sealing. The field sampling site was labeled with the sample ID number. Descriptions of each rock sample were recorded in the sample booklets.

The samples sent to SGS Laboratories Ltd. Samples were dried, crushed and pulverized by SGS Labs in Burnaby, B.C. Pulp samples were analysed by Aqua Regia Digest - Metals Package, ICP/ICP-MS was performed. The rock samples were crushed in their entirety to 80% passing -10 mesh (2 mm) and the crusher was cleaned with barren rock between samples. From the coarse rejects a sub-sample of 250 grams was pulverized to 85% passing -200 mesh (0.074 millimetres). The pulveriser was cleaned with silica sand between samples. Copper, (in addition to 50 other elements) was determined using an aqua regia solution to digest the sample, followed by ICP-MS analysis. SGS's quality system is compliant with the International Organization for Standardization's ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories' and the ISO 9000 series of Quality Management standards.

8. Geological and Geochemical Results

During 2018, geological mapping of the Rateria - West Valley property determined that in some cases, historically-mapped outcrops were in fact boulders within glacial till and corrected, and rock types changed

to be consistent with current mapping. These and new outcrops were located, and the rock type, alteration and structures determined. At the geological stations recorded, usually a number of outcrops in the general area were studied. Figure 5 shows location of the geological stations with descriptions provided in Table 2.

The mapping program has returned two main findings. More felsic, younger phases of the Guichon batholith extend much further east onto the Rateria property than historical regional maps indicate. Further, favorable geology and copper showings occur in several large-scale corridors that extend through the property. All new information has been used to update the geological-exploration map of the property (Figure 11).

8.1 Sho South Prospect

The Sho area contains several historical copper showings and trenches and represents an encouraging target for exploration activities (Liaghat and Blann, 2014, 2015, 2016, 2017). Approximately one km south, at the Sho South prospect, an excavator was utilized to clear approximately 500 metres of historical machine access trails dating from around 1970. Machine work was only enough to allow access by ATV. Three areas with shear, fault, fractures and copper mineralization align along a northwest trending strike length of around 200-250 metres and collectively approximately 40-60 metres in width. Rock samples collected from outcrop and trenches were studied for detailed lithology. Rocks are a medium to coarse grained granodiorite-diorite of Chataway and Bethlehem phase. Biotite and amphibole comprise 20% of the rock, quartz 10% and sub to euhedral plagioclase about 50 to 70%.

Biotite often appears as selective fine-grained flaky replacement of amphibole. Some rocks show selective to moderately pervasive epidote-sericite-chlorite alteration, and some locations contain kaolinite. Minor K-spar and/or hematite alteration occurs in the selvage of epidote veins that are a few mm in widths. Quartz veinlets and veins from 0.5mm to 7 cm occur within structures usually hosted by pink coloured aplite/ feldspar phyric dikes. Thin, 0.5-1.0mm sheeted quartz veinlets occur locally. Rocks that are further from fractured areas are weakly mineralized.

In 2018, the observations and mapping of the Sho-South mineralized zone indicate it is predominantly controlled by 340 degree, steeply-dipping fault/fractures. Fractures contain quartz, K-feldspar, chlorite, tourmaline and locally strong sericite-clay alteration, along with bornite-malachite and some chalcocite. Rock sample locations and descriptions are provided in Table 4 and plotted in Figure 8.

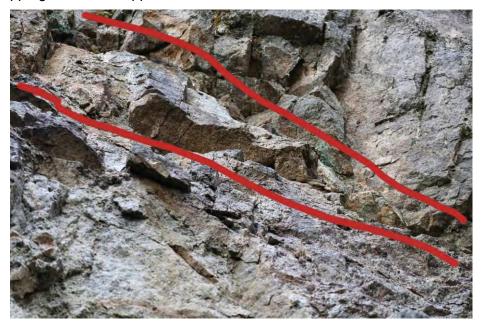
Nineteen mineralized chip an grab samples were collected from three zones (West, Middle East) at the Sho South prospect, with a cumulative sampled strike length of 82 metres. The distance between each zone is about 80 metres (Fig. 8). Five rock samples were collected from the West zone (Sho-S-W) and returned from 1.25%, to 3.83%, copper. Seven samples were collected from Middle zone (Sho-S-M) and returned from 0.66% to 3.59% copper. The East zone samples (Sho-S-E) contain a maximum assay of 1.28% copper.



Sho South

Mapping further southeast down Broome Creek, located a new copper showing near a sharp bend in the main creek and up a steep gully to the west. The showing is on a short, steep cliff beneath a cap of glacial till and consists of moderately fractured Chataway granodiorite. There is a prominent fault trending 280/70 south and other fractures trending 320/80 northeast. Stringers, veins and veinlets of bornite along with malachite/azurite occur mainly within the 0.5 meter-wide east-west trending fault, however wall rocks up to 5-7 metres away contain irregular millimetre thick bornite-chalcocite-malachite filled fractures in several directions, with a weakly brecciated or stockwork texture. Rocks are quartz sericite-carbonate-clay altered in the fault zone and pale green sericite chlorite-epidote altered in the wall rocks as shown in the photo below. Pinkish colored veins are k-feldspar/ aplite. The zone is fractured sufficiently in places to impart a coarse breccia texture. The zone is located 500 metres on strike to the southeast of the Sho South prospect, however the high-grade fault zone trends east-west and may be a part of the large Skuhun fault

that cuts across the batholith. A selected grab sample from part of the shear assayed 15.4% copper, 158 ppb gold and 33.7 ppm silver.



Broome Creek showing

8.2 Abbott Prospect- West Valley

Mapping during 2018 in the Abbott Lakes area located and sampled new copper showings (Abbott Trail) along recently constructed logging roads. The Abbott Trail area is 5 to 10 metres wide with a strike and dip of 030/90 and is about 200m long with fresh Chataway rocks on other side. Thin Quartz Feldspar Phyric (QFP) dikes were observed locally trending (360/90), (090/40s) as well as a 40 cm aplite dike trending 010/60. Copper mineralization is hosted in medium to coarse grained Chataway granodiorite rocks that display weak to moderate potassic alteration along with hematite, carbonate, epidote and chlorite filled fractures. Wide-spread, patchy occurrences of malachite selectively replace feldspar in the rock groundmass and with bornite in fractures locally.

A total of six outcrop rock grab samples were collected for assay that displayed alteration and or/mineralization. Results returned up to 7.94% copper, 175 ppb gold, 33.4 ppm silver and 2 ppm moly. This showing remains open in all directions.

The other area of interest on the Abbott property are historical showings and trenches. A series of trenches are located in the northwestern portion of the area with one of the trenches containing a 50-cm

wide fracture zone with porphyry-style alteration and copper mineralization. Rock fracturing, chlorite-epidote, albite and magnetite alteration occurs with chalcopyrite and iron oxide staining in and around the trenches and appear to be in part Nicola volcanic rocks as well as intrusive rocks. Rock samples from previous work in Abbott Lake area have returned positive copper values. Much of this area is covered by glacial till of variable thickness.

9 Conclusions

The Rateria and West Valley Property is situated in the south portion of the Guichon Creek Batholith and is underlain by granodiorite, quartz diorite, quartz monzonite and dykes and small plugs of crowded quartz feldspar porphyry, tan to pinkish colored quartz feldspar phyric and aplite occur. Lithology encountered in recent years by drilling and mapping is consistent with descriptions of the phases of the Guichon batholith including Bethsaida, Skeena, Bethlehem phases, and the older Highland Valley and Border Phases. The younger phases are the host rocks for the Valley, Lornex, and Highmont copper deposits, and Bethlehem and Guichon phases are host to the Bethlehem deposit. The geology, alteration and mineralization on the Rateria property are interpreted to be consistent with a deeper-seated porphyry copper system and share similarities with other deposits in the Highland Valley district. The eastern portion of the West Valley property lies in proximity to the Lornex Fault, Skuhun Fault and inner, younger phases of the batholith. These areas contain similar alteration and mineralization in prospects as the Rateria property. Towards the western side of the West Valley property, the intrusive rocks are somewhat more mafic in composition and occur in contact to the west with Nicola group volcanics or Spenses Bridge Formation. These areas contain a different style of alteration and mineralization, with magnetite, chlorite-epidote-albite and dominantly chalcopyrite present in several locations.

Dominant rock alteration style appears related to host-rock lithology (younger felsic vs older mafic phases) and is fracture-controlled. Quartz-sericite/muscovite with white clay (kaolinite etc) is associated with dominantly bornite and minor chalcocite-chalcopyrite in and around Zone 1. Quartz-sericite/muscovite and k-feldspar-epidote-chlorite occurs in and around Zone 2. Quartz-carbonate-ankerite/iron oxide and chlorite-sericite (illite, phengite?) alteration occurs around these zones and where observed elsewhere could lead to mineralized copper zones. The Moss 4 and 3 Creeks areas contain dominantly quartz-sericite-carbonate +/- muscovite with some ankerite /iron oxide and localized quartz- bornite veins and stringers. At the Sho, Sho-Southeast prospects, phengite, muscovite and quartz-sericite-k-feldspar occur with dominantly bornite and minor chalcopyrite veinlets and weak selective matrix replacement. The new

Broome Creek showing contains mainly quartz-sericite, k-feldspar, carbonate-clay alteration with bornite-chalcocite in a shear zone within a larger area of cross-cutting mineralized fractures.

On the West Valley property, at the Fir prospect, Guichon-Border phase rocks are cut by aplite dikes and quartz-biotite-k-feldspar alteration occurs with thin sheeted quartz veins and chalcopyrite. At the Abbott area, Guichon rocks and Quartz Feldspar Phyric dikes contain zones of k-feldspar, chlorite-epidote and malachite-bornite in the matrix and fractures, while some other areas display sericite-kaolinite alteration as well.

During 2018, several new zones of copper mineralization were located. This is of some significance after 50 years of copper mining and exploration in the district. The Broome Creek showing is situated where the projected east-west trending Skuhun Creek fault would occur, and on strike with the Sho South prospect. On the West Valley property, a new showing called the Abbott Trail was also located where younger phases of the batholith cut Chataway rocks and is thought to have potential for large scale mineralization.

Rock samples collected for assay in 2018 returned from trace to 15% copper, with significant zones at the Sho Southeast, Broome Creek, and Abbott Trail areas. Other areas of the property also contain trace to significant copper values with important geological information that can be utilized for porphyry copper exploration.

Geological work conducted in 2018 has improved reliability of historical outcrop locations, located new ones as well as collected consistent rock lithology information. In addition, rock alteration data collected from outcrop and drill core over a wide area is improving a larger-scale structure and alteration picture that can assist in locating porphyry systems.

10 Recommendations

Continued compilation of historical data on the property with an emphasis on rock type, structure and alteration is recommended as well as completing geophysical inversions of the 1993 CVS surveys over the Chataway portion of the property. This would be tied into magnetics and geology of the property and could generate new drill targets, expanding the scope of the following recommendations. Drilling of several

deep holes beneath Zone 1 and 2 are recommended as part of a program to expand these mineralized zones.

Other Recommendations for further work are discussed below, but not limited to:

Rateria property

The Roscoe adit area should be re-visited and mapped and sampled and tied in to the geophysical and geological data around Zone 2.

Sho prospect: diamond drilling of three holes to test beneath and to the west and east the known surface mineralization as well as several holes to the north and southward to the Sho SE area.

Broome Creek: Trenching to expose more of the new showing if possible, along with geology and chip sampling is recommended. Induced polarization geophysical surveys to the west and south of the zone would assist interpreting the orientation and extent of this zone prior to drilling.

West Valley property

Abbott Area: It is recommended to conduct detailed geochemical surveys where glacial till is thin, geological mapping and induced polarization geophysics. Areas of work include the Abbott Trail, Pole 383, N-W Trenches and the large magnetic low at the intersection of the East-West Skuhun and North-South Lornex Fault structures. This work would prioritize drilling of these areas.

Fir prospect: It is recommended to conduct induced polarization geophysics over and around the Fir prospect and to the north to near the Frank prospect. As access trails exist already, drill testing with three holes at the Fir prospect would provide a better picture of the extent and grade of mineralization at this showing.

Proposed Budget Summary

IP Inversions and compilation		\$ 25,000
Geology, Trench and sampling		\$ 60,000
IP 60 KM		\$ 180,000
28 DDH 6800m		\$ 986,000
		\$ 1,251,000
G&A 20%		\$ 250,200.0
	total	\$ 1,501,200

Respectfully Submitted,

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12 Statement of Costs

Highland Valley Copper Property 2018 Exploration Work Compl Geological mapping, rock and silt sampling	·				
Exploration Work type	Comment	Days			Totals
Exploration Work type	Comment	Days			Totals
Personnel / Position	Field Days	Days	Rate	Subtotal	
Sassan Liaghat, PhD, project manager	June 15- October 15		\$ 500.00	\$ 30,000.00	
Graeme Evans, P.Geo Consulting	June 15- October 15	30.0	\$650.00	\$ 19,500.00	
David Blann, P.Eng. Field Work/ supervision	June 5-7, july 4-5, july 20-21, aug 11-12, sept 19-21, Nov 8-9	14	\$650.00	\$ 9,100.00	
		104			
				\$ 58,600.00	\$58,600.0
Office Studies					
Historical compliation/ current field data entry/ map plotting	S Liaghat, PhD Geology, Arc-Gis/Target software	20.0	\$500.00	\$ 10,000.00	
Report preparation				\$ 3,000.00	
				\$ 13,000.00	\$13,000.00
Assaying/Geochemical	Number of Samples	No.	Rate	Subtotal	
SGS Labs	Sample prep,analysis,ICP+ Copper assay	28.0	\$35.00	\$ 980.00	
SGS Labs	Sample Storage of drill core rejects/pulps	5920.0		\$ 2,666.50	
				\$ 3,646.50	\$3,646.50
Transportation		No.	Rate	Subtotal	
Happy Creek Truck		60.0	125	\$ 7,500.00	
Standard Metals mob/demob and field truck	June 5-7, july 4-5, july 20-21, aug 11-12, sept 19-21, Nov 8-9	5329.00	\$0.50	\$ 2,664.50	
				\$ 2,664.50	\$2,664.50
Machine Rentals					
IKAN Industrial Supply. Mob/demob+ labour	Komatsu 235 Excavator historical access trail clearing Hours	53.36	150	\$ 8,004.00	
				\$ 8,004.00	\$8,004.00
Accommodation & Food					
motel and food accomodation. Total person-days	avg cost/day in field	104	\$76.87	\$ 7,994.67	
				\$ 7,994.67	\$7,994.6
Communications					
Various	cell phone, globalstar mobile satelite phone	14.00	25		
				\$ 350.00	\$350.00
Freight, rock samples					
	rock samples delivered to lab			\$ 125.00	
				\$ 125.00	\$125.00
Supplies					
	Deakin Industries, geological, safety supplies			\$ 1,325.00	
				\$ 1,325.00	\$1,325.0
TOTAL Expenditures	3				\$95,709.67

13 Statement of Qualifications

Sassan Liaghat, M Sc, PhD Coquitlam, British Columbia, do hereby certify that:

- I am a senior geologist, and project manager of the project.
- I graduated from the Universities of McGill and Ecole Polytechnique of Montreal in Master and Ph.D degrees in 1990 and 1994 respectively.
- That I have been actively engaged in the mineral exploration research and industry since 1990.
- I am the author or co-author of several scientific papers and reports, published in international and local journals.
- Since 2006, I have been involved in mineral exploration for base and precious metals in BC.
- -I conducted the work on the Rateria and West Valley property during 2018 as described in this report.

Dated at Vancouver, BC March 2019 "Sassan liaghat" (Signed)

Sassan Liaghat Ph.D

I, David E. Blann, P.Eng., of Squamish, British Columbia, do hereby certify:

- That I am a Professional Engineer registered in the Province of British Columbia since 1990.
- That I am a B.Sc. graduate in Geological Engineering from the Montana College of Mineral Science and Technology, Butte, Montana, 1987.
- That I am a graduate with a Diploma in Mining Engineering Technology from the B.C. Institute of Technology, 1984.
- That I have been actively engaged in the mining and mineral exploration industry since 1984.
- That I have worked directly on the Rateria and West Valley properties on an on-going basis since 2004 and performed in part, and reviewed the exploration activities described in this report.

Dated in Vancouver, B.C., March, 30, 2019

"David Blann" (Signed)

David E Blann, P.Eng.

Tables

	Table 1	Rateria and We	est Valley Min	eral Claim	ns					
No.	Title #	Claim Name	Owner	Title Type	Title Sub	Мар#	Issue Date	Good To Date	Status	Area (ha)
1	511809	NEW RATERIA	203169 (100%)	Mineral	Claim	0921	2005/APR/28	2025/DEC/31	GOOD	144.2650
2	513870		203169 (100%)	Mineral	Claim	0921	2005/JUN/03	2025/DEC/31	GOOD	1154.2060
3	522356	RATERIA NE	203169 (100%)	Mineral	Claim	0921	2005/NOV/17	2025/DEC/31	GOOD	494.4140
4	528775	MAL	203169 (100%)	Mineral	Claim	0921	2006/FEB/23	2025/DEC/31	GOOD	494.4150
5	528778	MAL 2	203169 (100%)	Mineral	Claim	0921	2006/FEB/23	2025/DEC/31	GOOD	514.8630
6	529011	RATERIA NORTH	203169 (100%)	Mineral	Claim	0921	2006/FEB/27	2025/DEC/31	GOOD	514.8020
7	529013	RATERIA NORTH-2	203169 (100%)	Mineral	Claim	0921	2006/FEB/27	2025/DEC/31	GOOD	515.1020
8	563796	SHO	203169 (100%)	Mineral	Claim	0921	2007/JUL/29	2025/DEC/31	GOOD	989.9270
9	571030		203169 (100%)	Mineral	Claim	0921	2007/NOV/30	2025/DEC/31	GOOD	20.5893
10	571031		203169 (100%)	Mineral	Claim	0921	2007/NOV/30	2025/DEC/31	GOOD	82.3569
11	954808		203169 (100%)	Mineral	Claim	0921	2012/MAR/02	2022/DEC/31	GOOD	144.4165
12	954819	SHO SOUTH	203169 (100%)	Mineral	Claim	0921	2012/MAR/02	2022/DEC/31	GOOD	165.0437
13	1021006	RATERIA NE 3	203169 (100%)	Mineral	Claim	0921	2013/JUL/15	2025/DEC/31	GOOD	61.7990
14	1043294	ABBY	203169 (100%)	Mineral	Claim	0921	2016/APR/06	2021/DEC/31	GOOD	454.1474
15	1051897	NICK	203169 (100%)	Mineral	Claim	0921	2017/MAY/10	2019/DEC/31	GOOD	206.5705
16	1051902	TY 1	203169 (100%)	Mineral	Claim	0921	2017/MAY/10	2019/DEC/31	GOOD	1817.1063
17	1051903		203169 (100%)	Mineral	Claim	0921	2017/MAY/10	2019/DEC/31	GOOD	557.1906
18	1051904	TY 3	203169 (100%)	Mineral	Claim	0921	2017/MAY/10	2019/DEC/31	GOOD	660.2564
19	1051906	TY 4	203169 (100%)	Mineral	Claim	0921	2017/MAY/10	2023/DEC/31	GOOD	350.7159
20	1054152	SHO SE	203169 (100%)	Mineral	Claim	0921	2017/AUG/20	2024/DEC/31	GOOD	247.4837
21	1054153		203169 (100%)	Mineral	Claim	0921	2017/AUG/20	2024/DEC/31	GOOD	226.7135
22	1054154	HI-RES SOUTH	203169 (100%)	Mineral	Claim	0921	2017/AUG/20	2024/DEC/31	GOOD	82.4201
23	1054155	HI RES SOUTH 2	203169 (100%)	Mineral	Claim	0921	2017/AUG/20	2024/DEC/31	GOOD	41.2102
24	1054156		203169 (100%)	Mineral	Claim	0921	2017/AUG/20	2024/DEC/31	GOOD	82.4308
25	1054158		203169 (100%)	Mineral	Claim	0921	2017/AUG/20	2024/DEC/31	GOOD	41.2223
26	1054159	HI RES SOUTH 3	203169 (100%)	Mineral	Claim	0921	2017/AUG/20	2024/DEC/31	GOOD	123.6411
27	1054160	CHATAWAY 1	203169 (100%)	Mineral	Claim	0921	2017/AUG/20	2024/DEC/31	GOOD	700.8845
28	1058059	GYPSUM	203169 (100%)	Mineral	Claim	0921	2018/JAN/30	2019/JAN/30	GOOD	762.7442
29	1058855		203169 (100%)	Mineral	Claim	0921	2018/FEB/26	2019/FEB/26	GOOD	185.6970
30	1058856		203169 (100%)	Mineral	Claim	0921	2018/FEB/26	2019/FEB/26	GOOD	144.4287
31	1058857	MOAG TECH N	203169 (100%)	Mineral	Claim	0921	2018/FEB/26	2019/FEB/26	GOOD	165.0270
32	1058859		203169 (100%)	Mineral	Claim	0921	2018/FEB/26	2019/FEB/26	GOOD	20.6293
								Rateria, 1	otal	12166.7189
1	544901	COPPER B	203169 (100%)	Mineral	Claim	0921	2006/NOV/05	2019/DEC/31	GOOD	20.5935
2	544902	COPPER C	203169 (100%)	Mineral	Claim	0921	2006/NOV/05	2019/DEC/31	GOOD	20.5937
3	544903	COPPER D	203169 (100%)	Mineral	Claim	0921	2006/NOV/05	2019/DEC/31	GOOD	20.5939
4	566312	COPPER 8	203169 (100%)	Mineral	Claim	0921	2007/SEP/20	2019/DEC/31	GOOD	535.9551
5	568146	NEW COPPER 1	203169 (100%)	Mineral	Claim	0921	2007/OCT/17	2019/DEC/31	GOOD	473.7434
6	568149	NEW COPPER 4	203169 (100%)	Mineral	Claim	0921	2007/OCT/17	2019/DEC/31	GOOD	1030.4537
7	582066	HIGHLAND VALLEY	203169 (100%)	Mineral	Claim	0921	2008/APR/20	2019/DEC/31	GOOD	433.2434
8	589580	COPPER IB	203169 (100%)	Mineral	Claim	0921	2008/AUG/06	2019/DEC/31	GOOD	412.7557
9	589581	COPPER IA	203169 (100%)	Mineral	Claim	0921	2008/AUG/06	2019/DEC/31	GOOD	392.0420
10	589723	COPPER GA	203169 (100%)	Mineral	Claim	0921	2008/AUG/09	2019/DEC/31	GOOD	495.1829
11	589897	COPPER H B	203169 (100%)	Mineral	Claim	0921	2008/AUG/14	2019/DEC/31	GOOD	330.2502
12	589900	COPPER H C	203169 (100%)	Mineral	Claim	0921	2008/AUG/14	2019/DEC/31	GOOD	144.4705
13	590952	COPPER 7B	203169 (100%)	Mineral	Claim	0921	2008/SEP/07	2019/DEC/31	GOOD	515.6008
14	664864	WV-SW	203169 (100%)	Mineral	Claim	0921	2009/NOV/04	2019/DEC/31	GOOD	515.5698
15	929369	NW TRENCHES	203169 (100%)	Mineral	Claim	0921	2011/NOV/16	2019/DEC/31	GOOD	41.2901
16	930037	COPPER TOP	203169 (100%)	Mineral	Claim	0921	2011/NOV/21	2019/DEC/31	GOOD	227.0854
17	930050	COPPER TOP 1	203169 (100%)	Mineral	Claim	0921	2011/NOV/21	2019/DEC/31	GOOD	433.6851

No.	Title #	Claim Name	Owner	Title Type	Title Sub	Мар#	Issue Date	Good To Date	Status	Area (ha)
18	945669	ABBOTT	203169 (100%)	Mineral	Claim	0921	2012/FEB/02	2019/DEC/31	GOOD	516.3493
19	945670	ABBOTT 1	203169 (100%)	Mineral	Claim	0921	2012/FEB/02	2019/DEC/31	GOOD	495.5674
20	945672	ABBOTT 2	203169 (100%)	Mineral	Claim	0921	2012/FEB/02	2019/DEC/31	GOOD	392.2786
21	950869	VIKING	203169 (100%)	Mineral	Claim	0921	2012/FEB/20	2019/DEC/31	GOOD	247.7437
22	950872	FIN	203169 (100%)	Mineral	Claim	0921	2012/FEB/20	2019/DEC/31	GOOD	557.3399
23	1020414	WV SOUTH TRIM 2	203169 (100%)	Mineral	Claim	0921	2013/JUN/19	2019/DEC/31	GOOD	206.6539
24	1051898	WV 1	203169 (100%)	Mineral	Claim	0921	2017/MAY/10	2019/DEC/31	GOOD	474.1882
25	1051899	WV 2	203169 (100%)	Mineral	Claim	0921	2017/MAY/10	2019/DEC/31	GOOD	721.8365
26	1051900	WV 3	203169 (100%)	Mineral	Claim	0921	2017/MAY/10	2019/DEC/31	GOOD	804.6095
27	1051901	WV 4	203169 (100%)	Mineral	Claim	0921	2017/MAY/10	2019/DEC/31	GOOD	41.2820
28	1051905	WV 5	203169 (100%)	Mineral	Claim	0921	2017/MAY/10	2019/DEC/31	GOOD	1297.9358
29	1060391	DAISY	203169 (100%)	Mineral	Claim	0921	2018/MAY/02	2019/MAY/02	GOOD	433.4545
30	1061301	EYEYE	203169 (100%)	Mineral	Claim	0921	2018/JUN/19	2019/JUN/19	GOOD	907.4364
	West Valley Total						13139.7849			
									TOTAL	25306.5038

	Table 2	Geological St	ations,	Locatio	n and Ro	ck De	scriptio	n	
Map Ref	Station ID	Area	Date	Easting	Northing	Elev	Oc/ Sub/Fl	Rock	Rock Description
1	Yu-01	Yubet North	10-Jul	644059	5583679	1595		Bethsaida	Cg Bethsaida oc, K-spar mod w/ ser and tr mal. Ep-serin fracts. Fract 005/60, w/ crs gr aplite dike (105/70N) and QFP. Very good mal patchy locally.
2	Yu-02	Yubet North	10-Jul	643466	5583560	1578	OC	Bethsaida	Fresh crs gr Bethsaida, w/ aplite dike
3	Yu-03	Yubet North	10-Jul	643471	5582726	1600	OC	Bethsaida	Fresh crs gr Bethsaida, w/ aplite dike (025/90), rare ser frac. bio-hb-qtz FP
4	Yu-04	Yubet North	10-Jul	643702	5583815	1622	OC	Bethsaida	Fresh crs gr Bethsaida, w/ 20+% aplite dike (080/80S). Locally ep fract
5	Yu-05	Yubet North	10-Jul	644670	5582966	1593	OC	Bethsaida	Very fresh Bethsaida, qtz rich, no altn, farct 5+ (000/80W),
6	Yu-06	Yubet North	10-Jul	645029	5582465	1562	ОС	Bethsaida	Mass QP rich crs gr Bethsaida, w/ pervas ser altn. Frct 350/70W w/ K-spar on frac, some qtz vin cuts @ 300/80N)
7	Yu-07	Yubet North	10-Jul	644483	5583585	1534	ОС	Bethsaida	Mass QP rich crs gr Bethsaida, very fresh, fract 360/90
8	AB-01	Abbott, P383	11-Jul	641436	5572224	1449	ОС	Chatawayaway	Fresh Chataway, mainly bio med gr, fract 1-2, tr epi in 20% of oc.
9	AB-02	Abbott, P383	11-Jul	641683	5572314	1466	OC	Chatawayaway	Fresh bio-QF Chataway, med gr, 1-2 fract.
10	AB-03	Abbott, P383	11-Jul	641798	5572491	1482	OC	Chatawayaway	Med gr Chataway, bio rich +QFP, wk clay w/ minor epi vein and 1-3 cm k-spar vn, fract 040/90.
11	AB-04	Abbott, P381.5	11-Jul	642095	5572935	1496	ОС	Chatawayaway	Fresh bio-hb QFP Chataway, rare epi, K-spar, Aplite dike @ 310/90
12	AB-05	Abbott, P383	11-Jul	642273	5573171	1490	sub	Chatawayaway	Mainly Chataway, med gr, w/ patchy wk K alt, minor ser-mal alt, ser+chl fract. Minor mal in 1cm qtz vein w/ ser selvage.
13	AB-06	Abbott, Trail Cu	11-Jul	640944	5572399	1426	sub	Chatawayaway	Oc, med gr to crs gr, Chataway, bio-px QFP (360/90), (090/40s), wk -mod kspar alt pervasive + hem-carb w/epi+ chl fractures,10+/m, epi vein 2-3cm. Patchy but wide mal, Patchy but wide mal in groundmass, mal on fractures, rare bor. 40 cm aplite dike (010/60). This area probably part of 5 to 10m structural zone (@ 030/90 strike) about 200m long w/ fresh Chataway on other side. Pervasive FeCO3 +hem, occures qtz unit, wk ser. Weak mal on fracture, locally strong. 15+ frac/m (030/40E)
14	AB-07	Abbott, Trail Cu	11-Jul	641397	5571812	1423	ОС	Chatawayaway	Oc, Same as above, and 02R, more fresh Chataway unit, fracs (050/90), wt Fe carb fracs.
15	AB-08	Abbott, Trail Cu	11-Jul	641619	5571915	1446	OC	Chatawayaway	fracs (050/90), wt Fe carb fracs.
16	AB-09	Abbott, Trail Cu	11-Jul	641833	5572003	1469	ОС	Chatawayaway	same as above
17	AB-10	Abbott, Old rd	12-Jul	642550	5572374	1476	ОС	Chatawayaway	Fresh med gr Chataway, tr Fe carb, Fract 5/m, morte QV 330/70W
18	AB-11	Abbott, NW tr	12-Jul	639222	5571854	1392	ОС	Border phase	Border Phase, f gr, bio rich, limonite-ep fractures (360/90)
19	AB-12	Abbott, NW tr	12-Jul	638900	5571983	1407	ОС	Border phase	Border Phase, f gr, bio rich, felsic dk cut throuth, 10+ fract/m, epi on fract, rare qv
20	AB-13	Abbott, NW tr	12-Jul	638456	5572189	1402	sub	Border phase	Heavily oxide-limonite BP rubble , py? rare, no mal, occas QV.
21	AB-14	Abbott, NW tr-pit	12-Jul	638134	5572170	1387	sub	Border phase	Fresh med gr BP, bio rich, fract epi+limo wk, 20cm fg QFP dk w/ mal. Fract+dk 160/80W, Fract 10/m. 30cm tr Cu bearing fg dk, K-alt in selvage.
22	AB-01	Aberdeen mine	20-Jun	652256	5574423	1036	ОС	QFP	QFP dk, 130/70N, fract 20?m, stg spec hem , mal in shear, w/ wk mad k-spar ser halo, main zone 30-50cm.
23	AB-02	Aberdeen mine	20-Jun	651152	5573670	1284	ОС	Guichon	Fresh Guichon, cors gr. Frct 10/m, 020/90, in fract K+ Ank,
24	TL-01	Tyler Lk	21-Jun	649540	5576579		Core pile		TL-07-01, 94m, Guichon, cors gr, 5-7 fr/m. Wk k-spar, chl +carb
25	TL-02	Tyler Lk	21-Jun	649540	5576579		Core pile		TL-07-02, 81m, Guichon, cors gr, 10 fr/m, stg k-spar+carb
26	TL-03	Tyler Lk	21-Jun	649540	5576579	1413	Core pile	Guichon	TL-07-03,147m, Guichon, cors gr, 5 fr/m, wk k-hem fract.

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Map Ref	Station ID	Area	Date	Easting	Northing	Elev	Oc/ Sub/Fl	Rock	Rock Description
27	TL-04	Tyler Lk	21-Jun	649540	5576579	1413	Core pile	Guichon	TL-07-04, 64m, Guichon, cors gr, 10 fr/m, mod k-spar flooding +carb w/ chl , tr mal in box.
28	TL-05	Tyler Lk	21-Jun	649540	5576579	1413	Core pile	Guichon	TL-07-05, 15m, Guichon, mod gr, 10 fr/m, mod k-spar +carb, w/ chl minor epi.
29	Capar-01	Capar	22-Jun	650162	5575599	1444	OC	Guichon	Guichon, wk k-spar-ep minor mal, fract 110/90. Occas 20 cm QFP felsic dk (120/90)
30	Capar-02	Capar	22-Jun	649952	5575541	1440	OC	QFP+Guich	Guichon more felsic, 3-4fract /m, rare k-spar, ser in fract (350/70)
31	Capar-03	Capar	22-Jun	650685	5576481	1332	OC	Guichon	Guichon, corse gr, fresh, rare k-spar, chl, ser in fract (040/90)
32	Wiz-01	WIZ	26-Jun	652061	5577855	1379	sub	QFP/Beth	QFP + Beth, f gr, m gr, Subcrop, wk prevasive k-spar, locally stg ser alt + heavy 3+ % mal cc. Lim, bo. Blocky, very high grade cpy
33	Wiz-02	WIZ	26-Jun	652098	5577864	1379	OC	QFP	QFP , f gr, m gr, mixed plag +k-spar. Fract 290/90, 000/30, no mal
34	Wiz-03	WIZ	26-Jun	651642	5577315	1355	OC	Bethlehem	Beth, f gr, bio-feldspar, fract 10/m (340/50), k-spar prev, occas chl k-spar ep.
35	Wiz-04	WIZ	26-Jun	652126	557803		sub-OC	Bethlehem	Beth, f gr, bio-K-feldspar, fract 3/m, wk k-spar , 2nd bo on ep.
36	Wiz-05	WIZ	26-Jun	651642	5578919	1457	OC	Bethlehem	Beth, f gr, bio-K feldspar, fract 10/m (170/80), k-spar prev, frct chl k-spar ep and hem, tr mal fract.
37	Wiz-06	WIZ	26-Jun	651593	5578973	1462	OC	Guichon	Fresh Guichon, cors gr. Frct 2-3/m, 180/90, in fract K spar, no mal
38	Wiz-07	WIZ	26-Jun	651492	5578602	1437	OC	Bethlehem	Beth, f gr, bio-K-feldspar, fresh, fract 10+/m (060/90), wk k-spar
39	Gyp-01	Gypson	27-Jun	650579	5579661	1433	OC	Guichon	Guich, f gr, hb-mafic, fresh, fract 10+/m (060/90), wk ser
40	Gyp-02	Gypson	27-Jun	651165	5579653	1459	OC-sub	Guichon	Guich, f gr, Large Trench, oc + sub at crest, hb-mafic, fresh, fract 10+/m.
41	Gyp-03	Gypson	27-Jun	651317	5579769	1467	OC	QFP+Guich	Guich and QFP, large oc, corse gr, fresh, fract 1-2/m
42	Gyp-04	Gypson	27-Jun	651292	5581398	1442	ОС	Guichon	Guichon large oc, corse gr, fresh, fract 3/m (320/90), k-spar-ep in fract. Large xenoliths of mafic material.
43	Sho-01	Sho-main	28-Jun	648483	5578378	1343	ОС	Guichon	Guich or Beth, large oc in pit, c.g., bio-chl altd w/ prev wk k in fract 290/70, prev mod k-spar, bio, chl. High grade mal, cc and tourmaline. Strng shears and fract
44	Sho-02	Sho-main	28-Jun	648486	5578402	1348	OC	Bethlehem	Beth, large oc in pit, c.g., bio-chl altd w/ prev wk k in fract 290/50, prev mod k-spar, bio, chl. High grade mal, cc and tourmaline. Strng shears and fract
45	Sho-03	Sho-main	28-Jun	648422	5578105	1335	ОС	Bethlehem	Beth, m.g., +QFP, Fract 5/m (035/90), mod primary K in matrix, very fresh
46	Sho-04	Sho-main	28-Jun	648382	5578066	1336	OC	Bethlehem	Beth, m.g., Fresh, Px+QFP, less mafics Fract 5/m (110/70), occas fract w/ K-spar +ep, pink primary ortho
47	Sho-05	Sho-south	28-Jun	648737	5577410	1333	sub	Bethlehem	5-3 trecnch, Beth, m.g., epi -chl fract + ortho flooding , carb fract, silic/ser patches, mal common, tr bo
48	Sho-06	Sho-south	28-Jun	648808	5577374	1330	ОС	Bethlehem	Beth, m.g., mod k-flooding, silica, chl in fract, good tourmaline, w/ k-spar envelopes as veins, Fract 330/90, good mal-bo
49	Sho-07	Sho-south	28-Jun	648854	5577253	1334	OC-sub	Bethlehem	Beth, m.g., fresh, Pervasive K, some chl in fract, no mal.
50	Sho-08	Sho-south	28-Jun	648890	5577304	1334	sub-OC	Bethlehem	Beth, m.g., good alt, prervasive wk-mod K, veinlets of qtz +silica, epi-chl-k-spr-tour. Good diss and fract mal- bo. Some evidence of hydrothermal breccia.
51	Sho-09	Sho-south	28-Jun	648789	5577543	1334	sub	Bethlehem	Beth m.g, fresh, k-spar w/ epi in major fracture
52	Sku-01	SKU	29-Jun	646139	5575039	1343	ОС	Skeena	Skenna, c.g., fresh, fract 3-4/m, 010/90, k+chl in fract, Chl in core, K-spar 1-3 cm selvage

	Table 2	Geological S	Stations,	Locatio	n and Ro	ck Des	scriptio	n	
Map Ref	Station ID	Area	Date	Easting	Northing	Elev	Oc/ Sub/Fl	Rock	Rock Description
53	Sku-02	SKU	29-Jun	646016	5575079	1328		Skeena	Skenna, c.g., fresh, fract 6-7/m, 110/90, k+chl in fract, rare 10+cm aplite dk
54	Sku-03	SKU	29-Jun	646252	5575932	1252	OC	Skeena	Skenna, c.g., fresh, fract 6-7/m, 170/70, k+chl in fract, rare k-qtz peg vein, rare ep fract w/ k selvage
55	Sku-04	SKU	29-Jun	646070	5575483	1287	sub-OC	Skeena	Skenna, c.g., fresh, fract 6-7/m, 170/70, k+chl in fract, rare k-qtz peg vein, rare ep fract w/ k selvage
56	BL-01	Billy Lk	30-May	648688	5585907	1459	OC	Guichon	Guich, Qtz-dio, Fract 10/m (190/70), Tr K
57	BL-02	Billy Lk	30-May	648632	5585994	1459	ОС	Guichon	Guich, Qtz-dio, Fract 5-7/m (160/90), tr Perv K,
58	BL-03	Billy Lk	30-May	648244	5586203	1459	ОС	Guichon	Guich, Qtz-dio, Fract 6/m , tr mal
59	BL-04	Billy Lk	30-May	648650	5586043	1459	ОС	Guichon	Guich, Qtz-dio, Fract 5/m (160/80), tr K
60	BL-05	Billy Lk	30-May	648738	5585655	1454	OC	Guichon	Guich, Qtz-dio, Fract ?/m , tr epi, k
61	BL-06	Billy Lk	30-May	648673	5585291	1475	OC	Guichon	Guich, Qtz-dio, Fract 3/m , wk clay-k, rare ep, tr mal-cc
62	BL-07	Billy Lk	30-May	648632	5584823	1486	OC	Guichon	Guich, Qtz-dio, Fract 6-10/m (180/90), (148/70)
63	BL-08	Billy Lk	30-May	648469	5584825	1512	OC	Guichon	Guich, Qtz-dio, Fract 6-10/m, fract cont k-ep, silica, ep vein, lots of fract w/ mal in fract
64	BL-09	Billy Lk	30-May	648511	5584741	1502	ОС	Guichon	Guich, Qtz-dio, Fract 5/m (110/60), fresh, mal in fract
65	BL-10	Billy Lk	30-May	648629	5584728	1488	OC	Guichon	Guich, Qtz-dio, Fract 3/m (135/70), wk clay-k, tr mal
66	BL-11	Billy Lk	30-May	648679	5585012	1484	OC	Guichon	Guich, Qtz-dio, Fract2/m (190/70), k-epi in frac,
67	BL-12	Billy Lk	30-May	648716	5584279	1470	OC	Guichon	Guich, Qtz-dio, Fract 2/m (190/70), rare k in fract
68	BL-13	Billy Lk	30-May	648853	5584367	1479	OC	Guichon	Guich, Qtz-dio, Fract 10/m (155/70), occas k-spar in farc
69	BLE-01	Billy Lk - East	04-Jun	648802	5584936	1473	OC	Guichon	Guich, Qtz-dio, Fract K-spar, 20/m (015/90), 1mm kspr alt
70	BLE-02	Billy Lk - East	04-Jun	648715	5585143	1475	OC	Guichon	Guich, Qtz-dio, Fract K-spar, 5/m (170/90), 1mm kspr alt
71	BLE-03	Billy Lk - East	04-Jun	649247	5584749	1440	OC	Guichon	Guich, Qtz-dio, Fract K-spar, 5/m (045/90), 1mm kspr alt
72	BLE-04	Billy Lk - East	04-Jun	649271	5584609	1451	ОС	Guichon	Guich, Qtz-dio, Fract K-spar, 2/m (050/90) , 1cm kspr alt
73	BLE-05	Billy Lk - East	04-Jun	649444	5584586	1429	ОС	Guichon	Guich, Qtz-dio, Fract K-spar, 3-4/m, 1cm kspr alt
74	BLE-06	Billy Lk - East	04-Jun	649407	5584855	1433	ОС	Guichon	Guich, Qtz-dio, Fract K-spar, 3-4/m (190/80), 1cm kspr alt
75	BLE-07	Billy Lk - East	04-Jun	650938	5583457	1396	ОС	Guichon	Guich, Qtz-dio, Fract K-spar, 2-3/m, 1mm kspr alt
76	CH-01	Chataway	05-Jun	649270	5582768	1452	ОС	Guichon	Guich, Qtz-dio, large 200m EW Fract K-spar, 2-3/m, 025/90, 1cm kspr alt
77	CH-02	Chataway	05-Jun	648617	5581684	1449	ОС	Guichon	Guich, Qtz-dio, showing, Fract K-spar, 3-4/m, 130/90, rare k bleach fract.
78	CH-03	Chataway	05-Jun	648769	5581324	1461	ОС	Guichon	Guich, Qtz-dio, showing, Fract K-spar, 3/m,010/90, rare k bleach fract.
79	CH-04	Chataway	05-Jun	648186	5582472	1429	ОС	Guichon	Guich, Qtz-dio, Fract K-spar, 3/m, low ser, bio, mafics, more felds
80	CH-05	Roscue Adit	05-Jun	648191	5582429	1428	OC	Guichon	Guich, Qtz-dio, Roscoe Adit, Fract K-spar, =100/m, shear zone190/60, k vein patches to 20 cm, ore zone in float-strg ser/2nd bio w/ bo-mal
81	CH-06	Roscue Adit	05-Jun	648191	5582429	1428	OC	Felsic unit	F.g felsic unit, x-cut Chata Qtz-dio, Roscoe Adit, Fract K-spar, + chl alt and mafic.
82	ART-01	ART	06-Jun	647856	5583473	1480		Guichon	Guich, Qtz-dio, f.g., fract 10/m, 190/70, k-spar vn to 2cm wk and perv. Minor mal.
83	ART-02	ART	06-Jun	648080	5582954	1453		Guichon	Guich, Qtz-dio, large o/c +50, fract 20/m, 000/45, wk-perv k-spar vein
84	ART-03	ART	06-Jun	648061	5582860	1440		Guichon	Guich, Qtz-dio, f.g., fract 10/m, 140/80, occas k-sparfract.
85	ART-04	ART	06-Jun	648028		1450		Guichon	Guich, Qtz-dio, c.g., fract 10/m, 110/80, occas k-sparfract, wk ser-clay.

Map Ref	Station ID	Area	Date	Easting	Northing	Elev	Oc/ Sub/Fl	Rock	Rock Description
36	SAS-01	SAS	06-Jun	646631	5583050	1530	OC	Bethsaida	Baths, c.g., or late felsic QFP dyke, fract 10/m, multi fract set, wk perv cly, qtz, veins, k-spar, ep,chl. Some mal-bo in qtz vein.
37	SAS-02	SAS	06-Jun	646838	5583578	1534	ОС	Skeena	Skeena, > mafics Beths, rare k-spar vains, fract 1-2/m, tr mal in fract.
38	SAS-03	SAS	06-Jun	646896	5583430	1522	sub	Bethsaida	Guich, fresh, subcrop, perv wk k-par, tr mal.
39	Z2-01	Zone2	07-Jun	647359	5585208	1534	ОС	Guichon	Guich, fresh, fract 2/m, 175/70, rare k-spar fract
90	Z2-02	Zone2	07-Jun	647427	5585965	1540	OC	Guichon	Guich, fresh, fract 3/m, 160/70, rare k-spar fract + epi vein
91	Z2-03	Zone2	07-Jun	647456	5585979	1546	OC	Guichon	Guich, fresh, fract 3/m, ep @080/70, rare k-spar fract + epi vein
92	Z2-04	Zone2	07-Jun	647402	5585889	1545	OC	Guichon	Guich, fresh, fract 4/m, 170/90, k-spar fract
93	Z2-05	Zone2	07-Jun	647341	5585846	1547	ОС	Guichon	Guich, fresh, fract 7/m, 340/80, k-spar fract , tr ser-illite
94	Z2-06	Zone2	07-Jun	647712	5585675	1554	OC	Guichon	Guich, fresh, fract 3/m, 360/70, rare k-spar fract
95	Z2-07	Zone2	07-Jun	647363	5584905	1521	OC	Chatawayaway	Chata, f.g., more felsic, fract 3/m, 165/70, occas k-spar fract
96	Z2-08	Zone2	07-Jun	647102	5584095	1505	ОС	Chatawayaway	Chata, f.g., more felsic, fract 3/m, 040/40, occas k-spar fract, mafics destroyed
97	Z2-09	Zone2	07-Jun	647089	5584119	1510	OC	Chatawayaway	Guich, c.g., fract 3/m, 145/70, occas k-spar fract
98	Z2-10	Zone2	07-Jun	647050	5584193	1507	OC	Chatawayaway	Guich, c.g., fract 3/m, 135/50, occas k-spar fract
99	Z2-11	Zone2	07-Jun	647037	5584280	1512	OC	Chatawayaway	Guich, c.g., fract 2/m, 145/70, occas k-spar fract
100	Z2-12	Zone2	07-Jun	647351	5583670	1514	OC	Guich+QFP	Guich, large o/c, aplite, f.g. QFP, fract +10/m, frct 240/70, occas k-spar fract, fract 270/60
101	Z2-13	Zone2	07-Jun	647429	5583526	1519	ОС	Guichon	Guich, large o/c, stk wk, , k-par vein 3-4 cm, , fract +10/m, tr mal in k-par (020-090/000)
102	Z2-14	Zone2	07-Jun	646498	5584654	1538	OC	Bethsaida	Beth , rd cut, carb-clay, altd o/c, fract 3-4/m,tr mal in fract, hem-mal fract, 175/40, wk pervs hem fract, carb-clay,
103	Z2-15	Zone2	07-Jun	646495	5584975	1537	OC	Skeena	Skeena, rd cut, fresh o/c, fract 3-4/m, tr mal
104	Z2-16	Zone2	07-Jun	646488	5585115	1532		Skeena	Skeena, large, fresh o/c, fract 5-6/m, 010/40m, 290/70, 1cm k-spar fract
105	Z2-17	Zone2	07-Jun	646890	5585073	1528	OC	Guichon	Skeena, large, fresh o/c, fract 2/m, 280/70m
106	Z2-18	Zone2	07-Jun	646355	5584419	1554	OC	Skeena	Skeena, large, fresh o/c, fract 3/m, 150/70m
107	Z2-19	Zone2	07-Jun	646394	5584185	1569	OC	Skeena	Skeena, large o/c, wk perva ser, minor clay
108	Z2-20	Zone2	07-Jun	646830	5583872	1569	OC	Skeena	Skeena, fresh, fract 6-7/m, 000/80, wk ser fract
109	WV18-01	West valley	Sept	631946	5581619		silt/sand	Guichon	Silt-sand consistent rock Guich from 1m wide creek, dark green fine gr (about 1-2m), contain coarse grains of Guich-BP phases.
110	Abbott-2018	Abbott -2018	July	641726	5571995		ОС	Chatawayaway	Same as Abbott Trail Samples
111	AB18-01R	Abbott Trail	Sept	641680	5571990	1457	ОС	Chatawayaway	Oc, med gr to crs gr, Chataway, bio-px QFP (360/90), (090/40s), wk -mod kspar alt pervasive + hem-carb w epi+ chl fractures,10+/m, epi vein 2-3cm. Locally patchy K-spar w/chl-epi fractures Patchy but wide mal, Patchy but wide mal in groundmass, mal on fractures, rare bor. 40 cm aplite dike (010/60). This area probably part of 5 to 10m structural zone (@ 030/90 strike) about 200m long w/ fresh Chataway on other side.

	Table 2	Geological S	Stations,	Locatio	n and Ro	ck De	scriptio	n	
Map Ref	Station ID	Area	Date	Easting	Northing	Elev	Oc/ Sub/Fl	Rock	Rock Description
112	AB18-02R	Abbott Trail	Sept	641687	5571992	1457		Chatawayaway	Oc, Probably from the same oc as noted above, med gr to crs gr, Chataway, Pervasive FeCO3 +hem, occures qtz unit, wk ser. Weak mal on fracture, locally strong. 15+ frac/m (030/40E)
113	AB18-03R	Abbott Trail	Sept	641700	5571990	1457	ОС	Chatawayaway	Oc, Same as AB18-01R, and 02R, more fresh Chataway unit, fracs (050/90), wt Fe carb fracs.
114	AB18-04R	Abbott Trail	Sept	641726	5571995	1457	OC	Chatawayaway	Oc, Same as AB18-01R, and 02R.
115	AB18-05R	Abbott Trail	Sept	641730	5571997	1457		Chatawayaway	Oc, Same as AB18-01R, and 02R.
116	18-DB-1	Sho-south	ept 18 201	649335	5576908		OC		B-Hbl Gd, Fract density x/m = 30, Stike/dip= 100/70, Pervasive alt, Outcrop on short cliff near top of creek gully above main ravine. Shear zone E-W 0.5m wide with stringers of massive bornite strongly oxidized, within sericite-carbonate-clay gouge. Shatter to breccia caused by 320/50 fractures also containing Bo, up to 5-7m wide overall. Trace mal,
117	18-DB-ST-1	Sho-south	ept 18 201	649748	5578006				Silt. Sand, gravel, consistent rock type, boulders, creek 1.0 m wide flowing, red-orange stain, Qtz-ser veins X-cutting
118	WV-1	West valley	Sept	634781	5581103		ОС	Guichon	Oc, Guic, epi, weak alrd
119	WV-2	West valley	Sept	634691	5580861		ОС	Guichon	oc, Guic, epi, weak alrd, white, green
120	WV-3	West valley	Sept	633879	5581183		ОС	Guichon	oc, Guic, transition to Border phase
121	WV-4	West valley	Sept	633622	5581079		OC	Border Phase	oc, BP, epi-carb veins , fracture filling are common
122	WV-5	West valley	Sept	633707	5580223		OC	Border Phase	oc, BP, epi-carb veins , fracture filling
123	WV-6	West valley	Sept	633178	5580394		OC	Border Phase	oc, BP
124	WV-7	West valley	Sept	633542	558136		OC	Border Phase	oc, BP-Bethlehim, peg dike, along the road
125	WV-8	West valley	Sept	633149	5581150		OC		oc,
126	WV-9	West valley	Sept	633221	5581306		OC	Guichon	oc, Guic transition
127	WV-10	West valley	Sept	633607	5582881		OC	Border Phase	oc-BP, epi in frac
128	WV-11	West valley	Sept	633863	5583755		OC	Border Phase	oc-BP, epi in frac
129	WV-12	West valley	Sept	636996	5578661		OC	BP/Guich	oc-Guich oc-Guich
130	WV-13	West valley	Sept	636812	5578583		OC	BP/Guich	oc, Guich
131	BL-DB	Billy Lake	une 5 201	647815	5586788		OC	Beth-Chataway	B Qd, Fract density $x/m = 5$, Pervasive alt, abundant 2-5mm k-feld veinlets and mod ser altn, adjacent creek fault/shear
132	BL-DB	Billy Lake	une 5 201	648024	5586627		OC	Beth-Chataway	B Qd, Fract density x/m = 5, Selective alt, fresh , weak fractured sausserite-epidote northwest trending outcrop 30m
133	BL-DB	Billy Lake	une 5 201	648106	5586603		OC	Beth-Chataway	B Qd, Fract density x/m = 5, Selective alt, fresh , weak fractured sausserite-epidote northwest trending outcrop 30m
134	BL-DB	Billy Lake	une 5 201	648106	5586423		ОС	Beth-Chataway	B Qd, Fract density x/m = 5, Selective alt, Peg Qtz-K vein 10 cm 278/90, 2-5mm ser veins 110 + 020-040 stockwork

	Table 2	Geological S	Stations,	Locatio	on and Ro	ck De	scriptio	n	
Map Ref	Station ID	Area	Date	Easting	Northing	Elev	Oc/ Sub/Fl	Rock	Rock Description
135	BL-DB	Billy Lake	une 5 201	648135	5586350		ОС	Chataway	BGd, Fract density x/m = 5, Selective alt, weak pervasive ser with occasional k-feld/ep veins
136	BL-DB	Billy Lake	une 5 201	648184	5586225		ОС	Chataway	BGd, Fract density x/m = 5, Selective alt, on trend to SE from above. Ep-ser-k veinlets with trace mal/bo near edge of NW trending ravine.
137	BL-DB	Billy Lake	une 6 201	649261	5587129		ОС	Chataway	Hbl-B- Qd, Fract density x/m = 5, Selective alt, NE side of billy Lake. ridge top. Weak chl after Hbl
138	BL-DB	Billy Lake	une 6 201	649498	5587205		ОС	Chataway	Hbl-B- Qd, Fract density x/m =2, Selective alt, Massive MG Hbl-B Qd. Cut by 1 mm ser-ep veins with 0.5 cm pinkish k envelope 1-3/m 300 degrees
139	BL-DB	Billy Lake	une 6 201	649626	5587471		ОС	Chataway	Hbl-B- Qd, Fract density x/m = 2, Selective alt, Zenoliths of dark Biotite diorite in Gd.
140	BL-DB	Billy Lake	une 6 201	649321	5587088		ОС	Beth-Chataway	B Qd, Fract density x/m = 20, Stike/dip= 110, Pervasive alt, 1-2m wide shear zone musc-ser, ep with bornite/malachite.
141	BL-DB	Billy Lake	une 6 201	649348	5586883		ОС	Chataway	B Qd, Fract density x/m = 3, Pervasive alt, south end of outcrop ridges from above location. Genreally massive, weak frct, weak altn. Till to south and west of here.
142	BL-DB	Billy Lake	une 6 201	649261	5586757		ОС	Chataway	Hbl-B- Qd, Fract density x/m = 3, Stike/dip=110/80, Pervasive alt, 10 m long X 5m wide outcrop beside road. 110/80 + 020/90 fract 2-3/m cross-cutting, ser-musc-ep filled, with 1-2cm K envelope. Trace mal/ bo
143	LE-DB	Leroy	une 6 201	650077	5584564		OC	Chataway	Hbl-B- Qd, Fract density x/m = 2, Stike/dip= 110, Selective alt, East side of strong IP anomaly to south of creek fairly abundant outcrop for 60m west then thick till cover. No real explanation of strong IP.
144	M4-DB	Moss 4	uly 4 2018	646690	5580384		sub	B Gd	B Gd, Fract density x/m = 50, Pervasive alt, Pervasive alt, cat trench dump pile. Consistent orange-red oxide friable crumbly rock with qtz-ca veins 2-5mm bornite-mal.
145	M4-DB	Moss 4	uly 4 2018	646614	5580378		ОС	B Gd	B Gd, Fract density x/m = 30, Stike/dip= 300, Pervasive alt, side cut in logging road partially reclaimed/buried outcrop similar to above. Tourmaline
146	3K-DB	3 creek	uly 4 2018	646949	5582440		ОС	Gd I Bx	Bi Gd Intrusive Bx, Fract density $x/m = 5$, Stike/dip= 350, Selective alt, weak chl -ser altd mafics, felsic clast in chat rx.
147	Z2-DB	NW Zone 2	uly 4 2018	646294	5584472		ОС	Skeena	MG-CG B Gd, Fract density x/m = 25, Stike/dip= 020+310, Pervasive alt, old trench on claim boundary with TCK. Oxidized rusty rock like Moss 4 samples
148	Z1-DB	Zone 1	uly 4 2018	646263	5582242		FI	Skeena	MG-CG B Gd, Fract density x/m = x, Pervasive alt, "brown soil" area in road ditch- consistent crumbly fine pieces rusty orange-red, pebbles and cobbles some felsic dike

Map Ref	Station ID	Area	Date	Easting	Northing	Elev	Oc/ Sub/Fl	Rock	Rock Description
149	WV-DB	WV	uly 5 2018	636918	5579215	C	OC .	border	B-Hbl Gd, Fract density x/m = 5, Stike/dip= 310, Selective alt, K-rich peg/ bethsaida phase dike cuts border phase 310/25
150	WV-DB	WV	uly 5 2018	636915	5579068	C	DC .	border	B-Hbl Gd, Fract density x/m = 5, Stike/dip= 310, Selective alt, K-rich peg/ bethsaida phase dike and light colored felsic dikes cuts border phase 310/90
151	WV-DB	WV	uly 5 2018	636966	5578988	C	OC .	border	B-Hbl Gd, Fract density x/m = 5, Stike/dip= 310, Selective alt, K-rich peg/ bethsaida phase dikes and light colored felsic dikes cuts border phase 310/90
152	WV-DB	WV	uly 5 2018	636135	5581117	F	:1	Chataway-border	B-Hbl Gd, Fract density x/m = x, Selective alt, rusty brown soil in road ditch 100m. Ncu in several pieces of chl-ser altd Gd. Possibly surface water oxidation of Fe minerals
153	WV-DB	WV	uly 5 2018	634815	5581342	C	OC .	Chataway	B Qd, Fract density x/m = 10, Stike/dip= 040-090, Selective alt, weak sporadic veins of ser-ep +/- k. 200m west of old sample with copper (not visited)
154	FR-DB	Frank	uly 5 2018	636752	5581842	C	OC	Bethl-Sk?	B Qd, Fract density x/m = 30, Stike/dip= 350 +080, Pervasive alt, Road cut 75m. Well fractured with k-chl-ser veins 1-10mm, local bo/mal N-S cut by shear E-W. "warm" showing- on TCK property
155	FR-DB	Frank-Northeast	uly 5 2018	637369	5582081	F	=	Bethl-Sk?	B Qd, Fract density x/m = 15, Stike/dip= 310, Selective alt, large boulders beside road- probably outcrop nearby. Sheeted chl ser/musc veins
156	FR-DB	Frank-Northeast	uly 5 2018	637413	5582166	C	DC .	Bethl-Sk?	B Qd, Fract density x/m = 10, Stike/dip= 310, Selective alt, 5 cm aplite dike. Outcrop generally massive with occasional, weak thin ser veins
157	FR-DB	Frank-Northeast	uly 5 2018	637571	5582680	C	OC .	Bethl-Sk?	B Qd, Fract density x/m = 15, Stike/dip= 310 +020, Selective alt, road cut 30m moderately fractured with thin chl-ser filled fractures, mafics sel replaced by chl-ser-musc
158	FR-DB	Frank-Northeast	uly 5 2018	637404	5582801	S	Sub	Bethl-Sk?	B Qd, Fract density x/m = x, Selective alt, machine dug ditch dump pile at road junction/ culvert. Aplite dike in rusty crumbly material. Mal on chl-ser fracture about 100m north, west side of road (flagged).
159	SH-DB	Sho SE	ept 18 201	649020	5577394	C	OC	BethI/Chataway	B-Hbl Gd, Fract density x/m = 10, Selective alt, Fresh with 5-10 cm fracture alteration haloes around thin seams . 2B-ser, chl-ep-ca veinlets and selective replacement of mafics and plag cloudy. Trace mal replacing mafics,
160	SH-DB	S	ept 18 201	649175	5577252	C	OC .		B-Hbl Gd, Fract density x/m = 10, Pervasive alt, Moderate cloudy plag, chlorite-epidote veins, with pale green sericite in matrix. Fe-Ox replacing mafics- magnetite oxidized, weak fradctured, patcdhy alteration in shear zones.

Мар	Station ID	Area	Date	Easting	Northing	Elev	Oc/	Rock	Rock Description
Ref	CI DD			640007	5577044		Sub/Fl	= .1 /ol .	
161	SH-DB	2	Sept 18 201	649297	5577041		OC .	Beth/Chataway	B-Hbl Qd, Fract density x/m = 10, Selective alt, Grey biotite hornblende QD with dark fine grained well rounded mafic rich zenoliths. Trace bo-Fe-Ox subcrop
162	SH-DB	Ç	Sept 18 201	649462	5576957				, Fract density x/m = 10, Selective alt, Trace malachite in qtz-ser veinlets 1-2 mm
163	SH-DB	9	Sept 18 201	649684	5577016			Chataway	, Fract density x/m = 10, Selective alt, weak ser-chl altered Chataway
164	SH-DB	S	Sept 18 201	650032	5577207	S	ub	Chataway	Hbl-B- Gd, Fract density x/m = 10, Selective alt, boulders with weak-mod fractured ep-chl-ser vins 1-2 cm, pink rock altered- zeolite?
165	SH-DB	S	Sept 18 201	650052	5577346	C	OC .	Chataway	Hbl-B-Gd, Fract density x/m = 10, Selective alt, moderately fractured ser-ep-veinlets, weak Fe-OX. Traverse up gully to north, O/C shear zones 040, 340, weak perv alth cloudy plag, mafics-> ser, Feox, orange stain
166	SH-DB	9	Sept 18 201	649796	5577576				
167	SH-DB	Ş	Sept 18 201	648715	5578322	C)C	Chataway	Hbl-B-Gd, Fract density x/m = 50, Stike/dip= 300/90, Pervasive alt, 2X 3m OC in road cut. strongly fractured, 300 and 030 mainly, ser veins, veinlets
168	SH-DB	Ç	Sept 18 201	648516	5577964	C	OC .		Fract density x/m = 50, Pervasive alt, , Selective alt, 2X 3m outcrop in roadcut. intensely fractured with weak-mod ser-sausserite(?) clay fracture fill, red Ncu?,
169	Sho-S (E1) Sho-S-	Trench E	Sept 201	648905	5577292	1334 C	OC .	Bethl+Guich	Bethlehem (± Guichon), mal-azo-bo fracture control mineralization, 305°/-80-60°, 30cm thick, for 2m long. Strg k-spar-iron-oxide rusty, ser-chl± epi alteration in wallrocks, rare qtz vein +tourmaline. blocky, broken, 1 sample collected
170	Sho-S (E2) Sho-S		Sept 201	648901	5577297	1335 C	OC .	Bethl+Guich	Bethlehem (± Guichon), mal-azo-bo fracture control mineralization, 20°/-85°, for 3m long. Strg K-spar-iron-oxide rusty, ser-chl ± epi alteration in wallrock zone, strg ser-clay, blocky, broken, 1 sample collected
171	Sho-S (E3) Sho-S		Sept 201	648896	5577305	1336 C	OC	Bethl+Guich	Bethlehem (± Guichon), mal-azo-bo fracture control mineralization, 270°/-90°, strg K-spar-iron-oxide rusty, ser-chl ± epi alteration in wallrock, Fractures include K-ep-chl and tourmaline and rare qtz veinlets. Blocky, broken, 1 sample collected
172	Sho-S (E4-1) Sho-S		Sept 201	648886	5577319	1336 C	DC	Bethl+Guich	Bethlehem (± Guichon), 290°/-70°, fault, gougy broken, ser-clay rich zone, locally strongly gougy, with hydrothermal breccias. Along fault zone copper dissemination present in few cm to 2m zone for about 4m long. Four chip samples (1m interval) collected. 1m chip sample
173	Sho-S (E4-2) Sho-S		Sept 201	648889	5577319	1336 C	OC .	Bethl+Guich	 1m chip sample
174	Sho-S (E4-3) Sho-S		Sept 201	648893	5577318	1335 C		Bethl+Guich	1m chip sample
175	Sho-S (E4-4) Sho-S		Sept 201	648895	5577318	1335 C		Bethl+Guich	1m chip sample
176	Sho-S (M1) Sho-S-	Trench M1	Sept 201	648812	5577369	C	OC .	Bethl+Guich	Bethlehem (± Guichon), Pink-reddish coloured, 300°/-60°, 5cm wide gougy mal-azo-bo fracture/fault control mineralization, strg k-spar-iron-oxide rusty, ser-chl ±epi alteration in wallrock zone, blocky, broken,

	Table 2	Geological St	ations,	Locatio	n and Ro	ck De	scriptio	n	
Map Ref	Station ID	Area	Date	Easting	Northing	Elev	Oc/ Sub/Fl	Rock	Rock Description
177	Sho-S (M2-1)	Sho-S-Trench M2	Sept 201	648812	5577367		OC	Bethl+Guich	Bethlehem (± Guichon), 15 to 20 cm wide mal-azo-bo fracture/fault control mineralization, strg k-spar-iron-oxide rusty, ser-chl± epi alteration in wallrock zone, blocky, broken 280°/-80° SE. The zone continues for 12m, Six chip samples (2m interval) collected. 2m chip sample
178	Sho-S (M2-2)	Sho-S	Sept 201	648814	5577365		ОС	Bethl+Guich	2m chip sample
179	Sho-S (M2-3)	Sho-S	Sept 201	648816	5577364		ОС	Bethl+Guich	2m chip sample
180	Sho-S (M2-4)	Sho-S	Sept 201	648818	5577362		ОС	Bethl+Guich	2m chip sample
181	Sho-S (M2-5)	Sho-S	Sept 201	648819	5577361		OC	Bethl+Guich	2m chip sample
182	Sho-S (M2-6)	Sho-S	Sept 201	648820	5577360		OC	Bethl+Guich	2m chip sample
183	Sho-S (W1)	Sho-S-Trench W1	Sept 201	648722	5577378		ОС	Bethl+Guich	Bethlehem (± Guichon), 50 cm thick ,mal-azo-bo fracture/fault control feature, strg k-spar-iron-oxide rusty, ser-chl ±epi alteration in wallrock zone, blocky, broken, 290°/-80°W, 3m thickness, 1 sample collected.
184	Sho-S (W2-1)	Sho-S-Trench W2	Sept 201	648728	5577396		ОС	Bethl+Guich	Bethlehem (± Guichon), 50-200 cm fracture control copper zone(may be along fault zone) hosted in broken, k-spar, ser-chl altered rock, 300°/70-80°w, exposed 4m long, 4 chip samples collected (1m interval) 1m chip sample
185	Sho-S (W2-2)	Sho-S	Sept 201	648729	5577396		ОС	Bethl+Guich	1m chip sample
186	Sho-S (W2-3)	Sho-S	Sept 201	648730	5577395		ОС	Bethl+Guich	1m chip sample
187	Sho-S (W2-4)	Sho-S	Sept 201	648732	5577395		OC	Bethl+Guich	1m chip sample

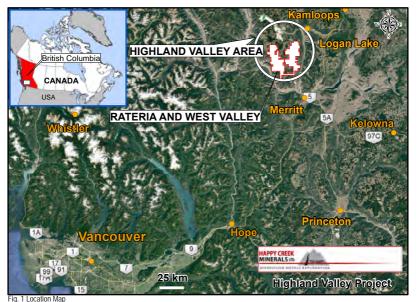
ID	Area	Easting	Northing	Oc/Sub/	Rock	Lab-ID	Ag-	Au-	Cu-	Mo-	Zn-	Cu-%	Pb-
טו	Area	Easting	Northing	Fl	ROCK	Lab-ID	ppm	ppb	ppm	ppm	ppm	Cu-%	ppm
WV18-01	West valley	631946	5581619	silt/sand	Guichon	D00009606	0.21	1	146	1.9	32	N.A.	1
Abbott-2018	Abbott Trail	641726	5571995	OC	Chataway	E00023870	50	175	>5000	2.03	15	7.94	6.4
AB18-01R	Abbott Trail	641680	5571990	ОС	Chataway	D00009601	0.03	<1	32	1.46	25	N.A.	1.46
AB18-02R	Abbott Trail	641687	5571992	OC	Chataway	D00009602	0.14	3	2140	0.97	18	N.A.	0.97
AB18-03R	Abbott Trail	641700	5571990	OC	Chataway	D00009603	28.55	119	>5000	1.69	25	4.74	1.69
AB18-04R	Abbott Trail	641726	5571995	OC	Chataway	D00009604	2.96	27	4070	1.57	28	N.A.	1.57
AB18-05R	Abbott Trail	641730	5571997	OC	Chataway	D00009605	4.01	68	>5000	1.35	47	1.05	1.35
18-DB-1	Sho-south	649335	5576908	OC	Bethlehem	D00009607	33.37	158	>5000	1.64	23	15.4	11.3
18-DB-ST-1	Sho-south	649748	5578006	o/c	Bethlehem	D00009608	0.07	1	136	1.41	20	N.A.	2

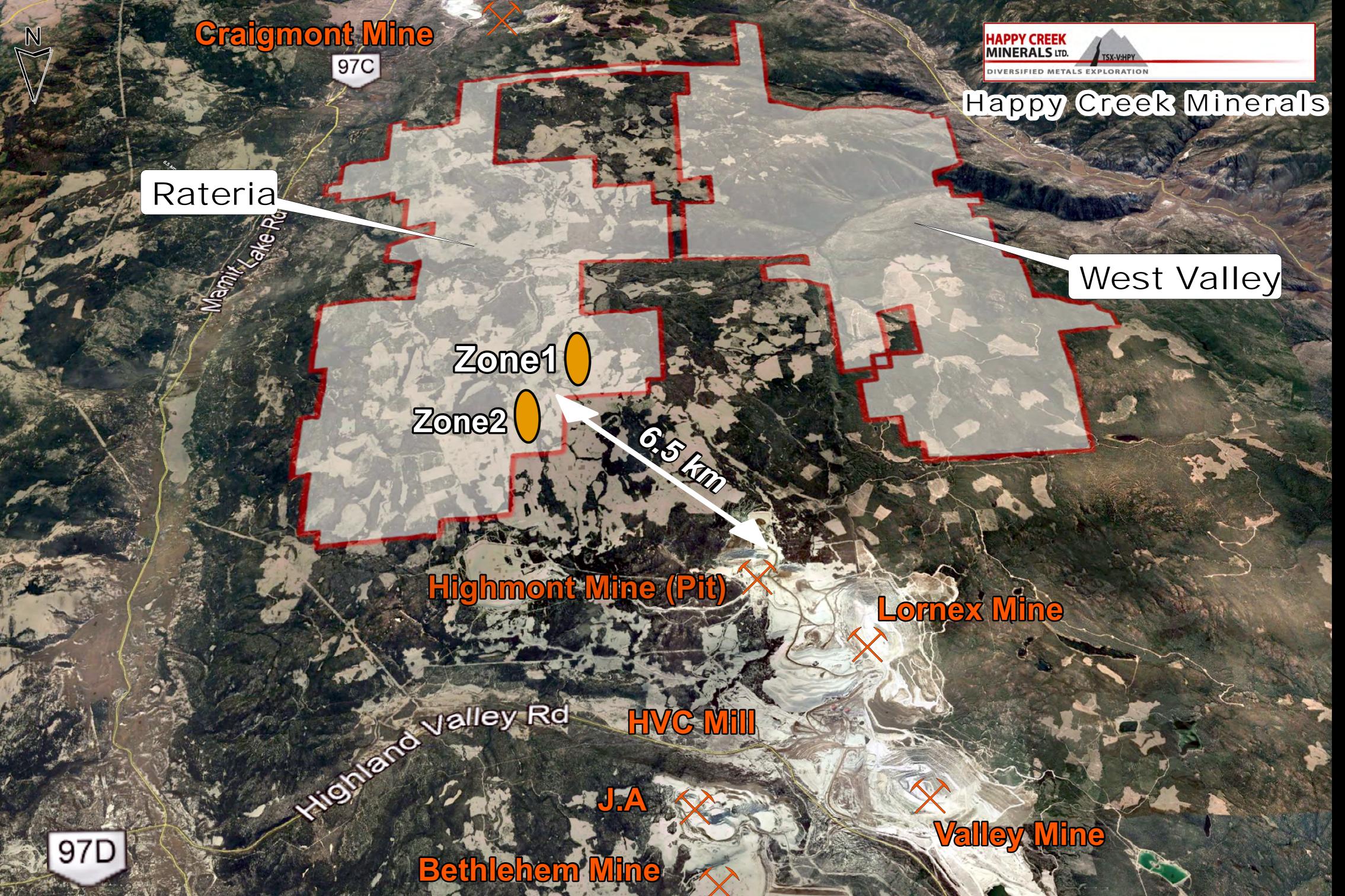
Sho-S	Easting	Northing	Elev	analyse	Ag	Au	Cu	Мо	Zn	Pb	Cu %	Copper Zone	Description
Samples Sho-S (E1)	648905	5577292	1334	E00023851	ppm 5.61	ppb 54	ppm >5000	ppm 1.06		ppm 2.5	1.28	Zone E: along existing trail, 50m long, 2-3m wide, 305° strike,	Bethlehem (± Guichon), mal-azo-bo fracture control mineralization, 305°/-80-60°, 30cm thick, for 2m long. Strg k-spar-iron-oxide rusty, ser chl± epi alteration in wallrocks, rare qtz vein +tourmaline. blocky, broken, 1 sample collected
Sho-S (E2)	648901	5577297	1335	E00023852	3.2	36	>5000	1.04	49	1.4	0.91		Bethlehem (± Guichon), mal-azo-bo fracture control mineralization, 20°/-85°, for 3m long. Strg K-spar-iron-oxide rusty, ser-chl ± epi alteration in wallrock zone, strg ser-clay, blocky, broken, 1 sample collected
Sho-S (E3)	648896	5577305	1336	E00023853	4.71	59	>5000	0.92	52	1.8	1.21		Bethlehem (± Guichon), mal-azo-bo fracture control mineralization, 270°/-90°, strg K-spar-iron-oxide rusty, ser-chl ± epi alteration in wallrock, Fractures include K-ep-chl and tourmaline and rare qtz veinlets. Blocky, broken, 1 sample collected
Sho-S (E4-1)	648886	5577319	1336	E00023854	2.4	26	>5000	0.94	55	1.9	0.74		Bethlehem (± Guichon), 290°/-70°, fault, gougy broken, ser-clay rich zone, locally strongly gougy, with hydrothermal breccias. Along fault zone copper dissemination present in few cm to 2m zone for about 4m long. Four chip samples (1m interval) collected. 1m chip sample
Sho-S (E4-2)	648889	5577319	1336	E00023855	2.45	32	>5000	0.94	51	2	0.71		1m chip sample
Sho-S (E4-3)	648893	5577318	1335	E00023856	2.79	49	>5000	0.99	52	2.5	1.02		1m chip sample
Sho-S (E4-4)	648895	5577318	1335	E00023857	1.99	26	>5000	1.09	45	2.4	0.51		1m chip sample
Sho-S (M1)	648812	5577369		E00023858	0.46	<1	660	43.6	44	9.5	N.A.	Zone M1: along trail, 2m long, 1m wide, 300° strike,	Bethlehem (± Guichon), Pink-reddish coloured, 300°/-60°, 5cm wide gougy mal-azo-bo fracture/fault control mineralization, strg k-spar-iron oxide rusty, ser-chl ±epi alteration in wallrock zone, blocky, broken, 1 sample collected.

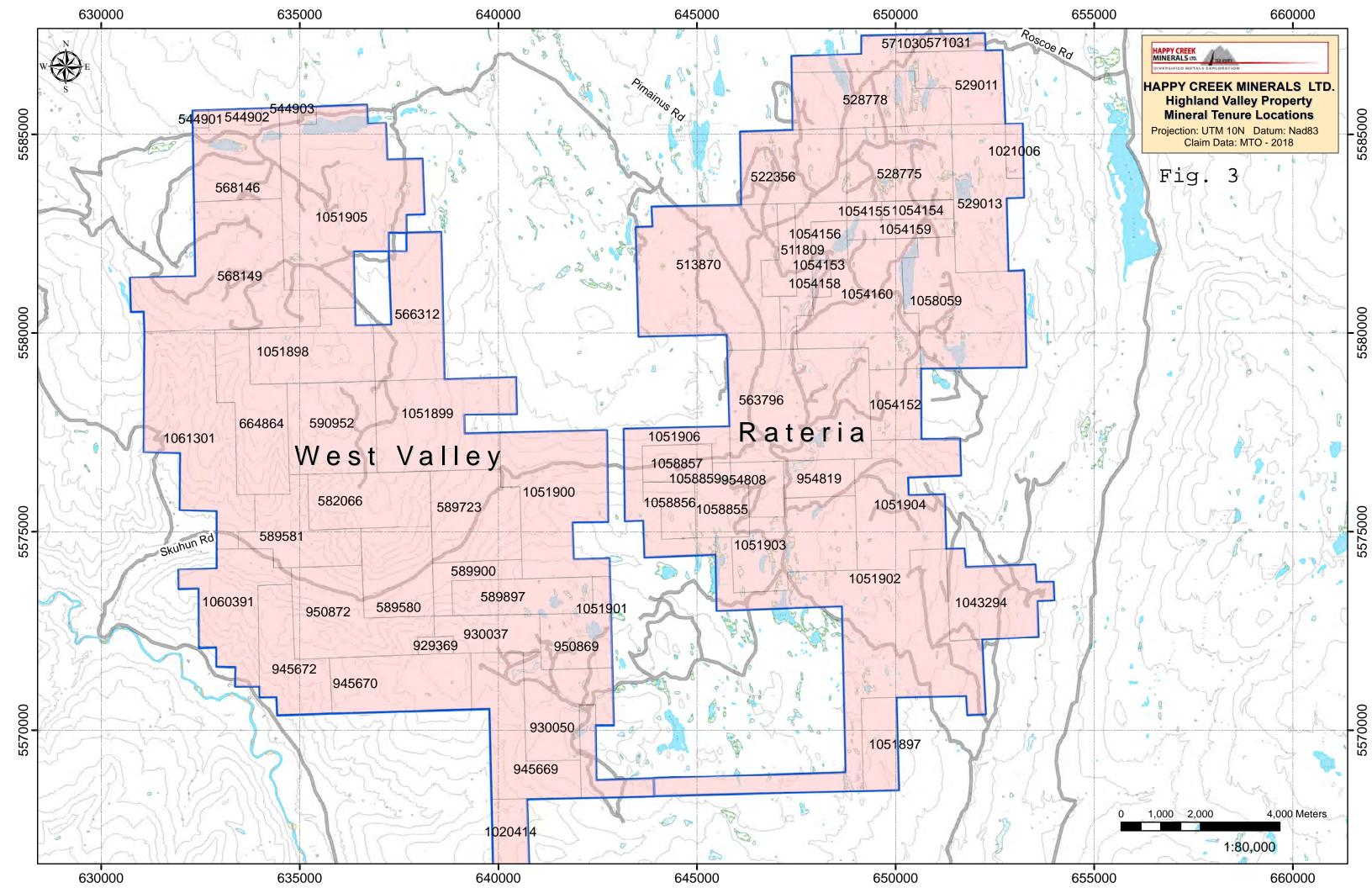
Table: 4 Rateria Property, 2018 Sho-South Copper Zones and Assay of Rock Samples	
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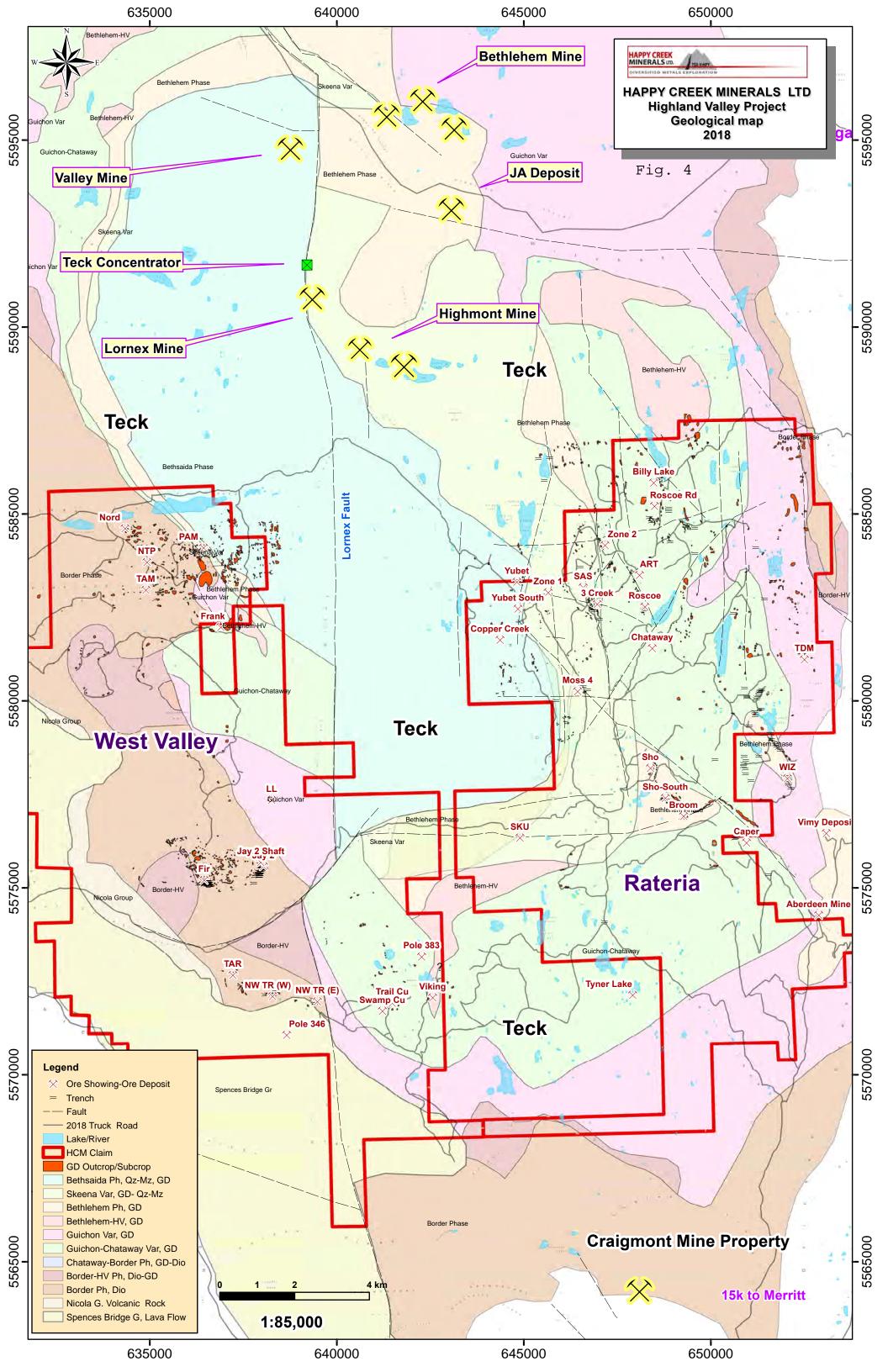
Sho-S Samples	Easting	J	Elev	analyse	Ag ppm		Cu ppm	Mo ppm		Pb ppm		Copper Zone	Description
Sho-S (M2-1)	648812	5577367		E00023859	4.81	151	>5000	1.24	53	3.1	1.7	Zone M2: along trail, 25m long, 2m wide, 300° strike,	Bethlehem (± Guichon), 15 to 20 cm wide mal-azo-bo fracture/fault control mineralization, strg k-spar-iron-oxide rusty, ser-chl± epi alteration in wallrock zone, blocky, broken 280°/-80° SE. The zone continues for 12m, Six chip samples (2m interval) collected. 2m chip sample
Sho-S (M2-2)	648814	5577365		E00023860	11.4	109	>5000	1.09	49	3.3	2.57		2m chip sample
Sho-S (M2-3)	648816	5577364		E00023861	11.9	287	>5000	1.42	36	4.5	3.59		2m chip sample
Sho-S (M2-4)	648818	5577362		E00023862	13.6	155	>5000	2.25	39	2.5	3.06		2m chip sample
Sho-S (M2-5)	648819	5577361		E00023863	13.1	172	>5000	1.23	52	2.2	2.2		2m chip sample
Sho-S (M2-6)	648820	5577360		E00023864	3.39	189	>5000	1.01	56	2.8	1.48		2m chip sample
Sho-S (W1)	648722	5577378		E00023865	10.8	161	>5000	1.38	49	2.8	2.29	Zone W1: 5m long, 3m wide, 2-3 m deep, 290° strike,	Bethlehem (± Guichon), 50 cm thick ,mal-azo-bo fracture/fault control feature, strg k-spar-iron-oxide rusty, ser-chl ±epi alteration in wallrock zone, blocky, broken, 290°/-80°W, 3m thickness, 1 sample collected.
Sho-S (W2-1)	648728	5577396		E00023866	6.33	100	>5000	11	65	2	2.06	Zone W2: 3m long, 2m wide, 2 m deep, 290° strike,	Bethlehem (± Guichon), 50-200 cm fracture control copper zone(may be along fault zone) hosted in broken, k-spar, ser-chl altered rock, 300°/70-80°w, exposed 4m long, 4 chip samples collected (1m interval) 1m chip sample
Sho-S (W2-2)	648729	5577396		E00023867	3.61	57	>5000	1.07	65	1.6	1.37		1m chip sample
Sho-S (W2-3)	648730	5577395		E00023868	5.34	66	>5000	1.38	53	1.9	1.25		1m chip sample
Sho-S (W2-4)	648732	5577395		E00023869	20.4	197	>5000	1.15	43	4.4	3.83		1m chip sample

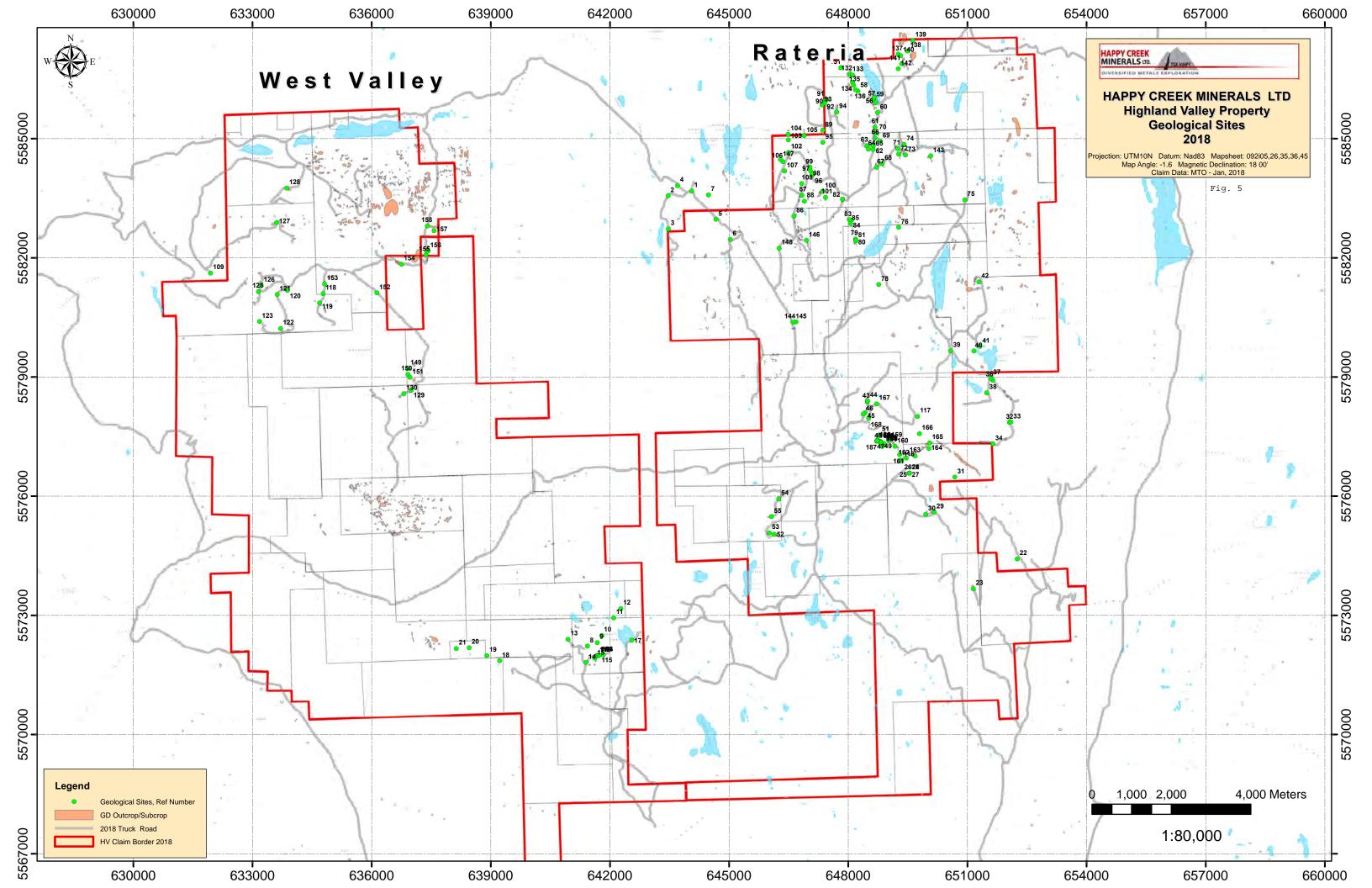
Figures

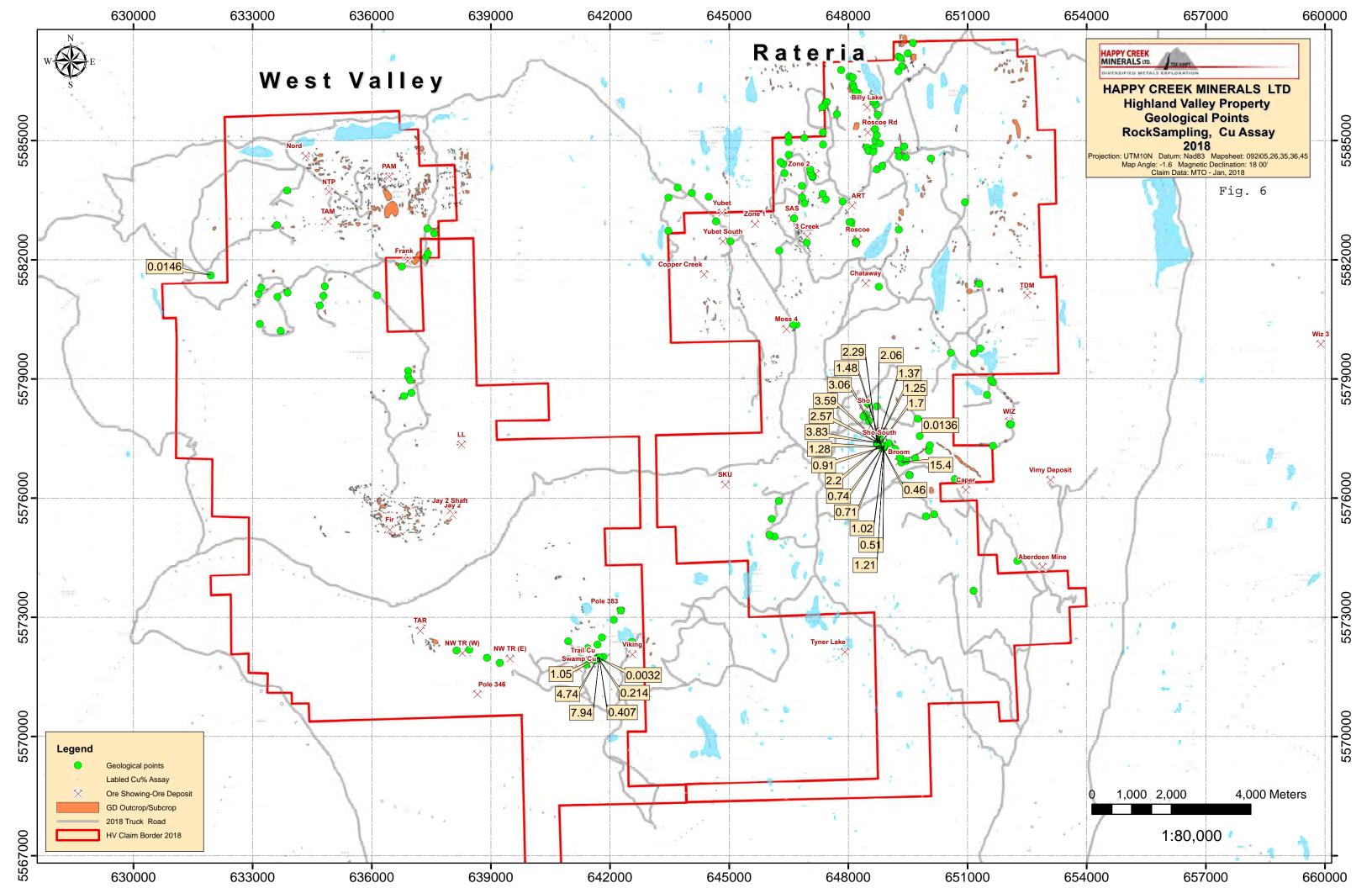


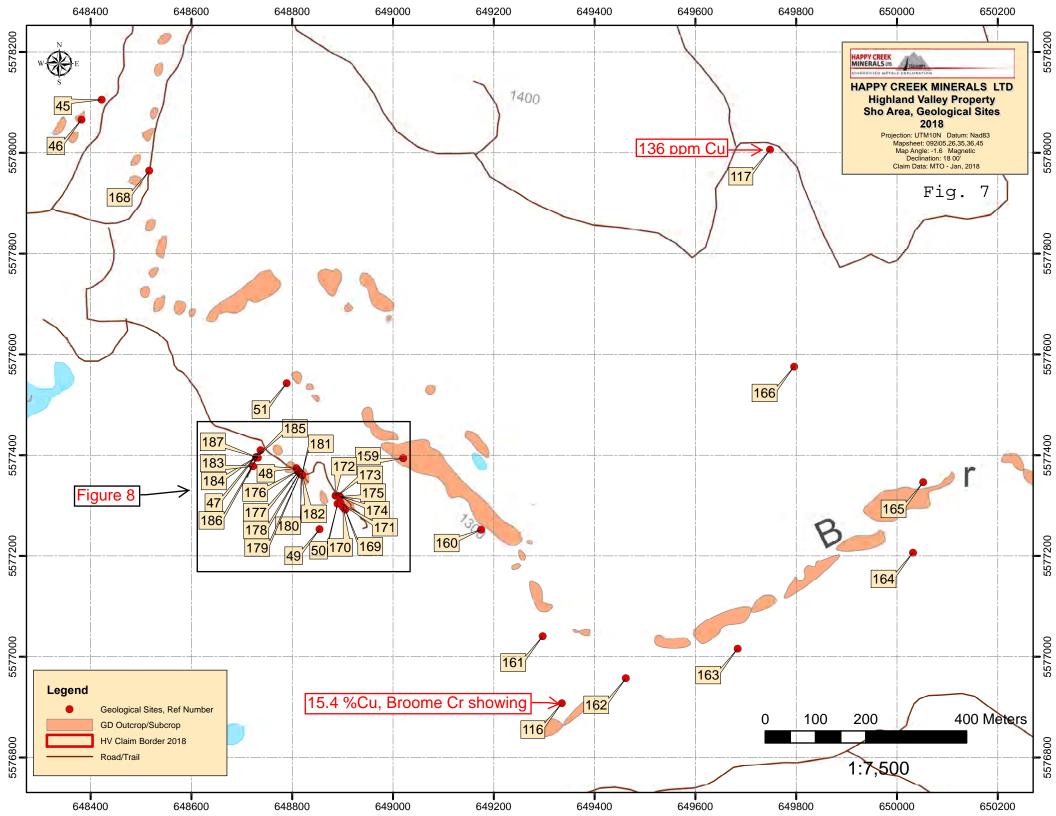


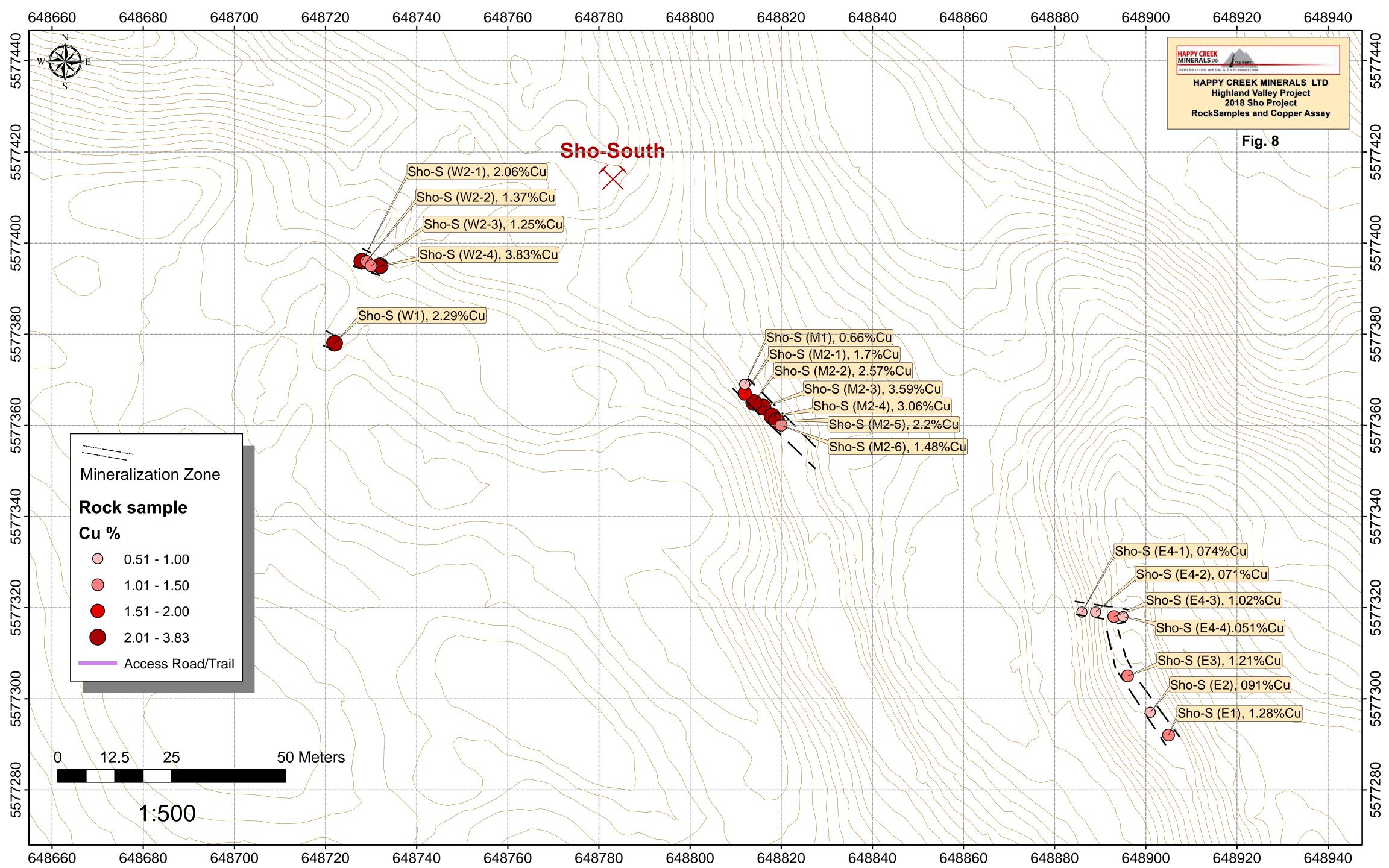


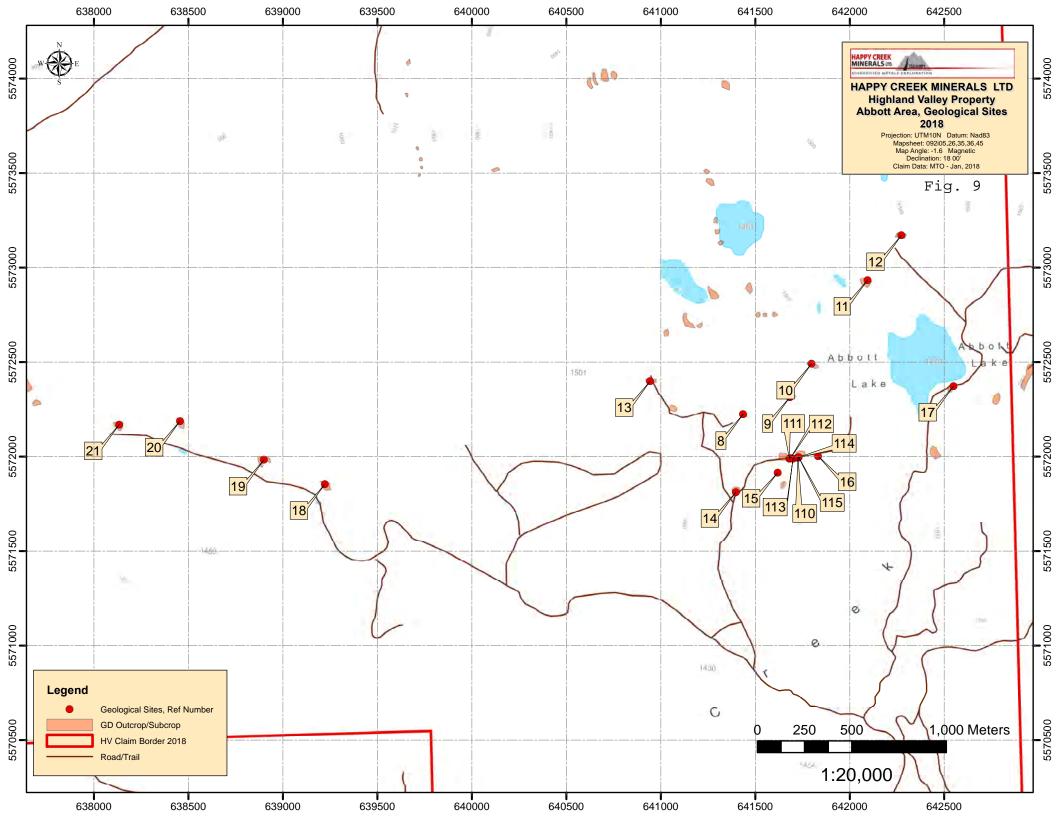


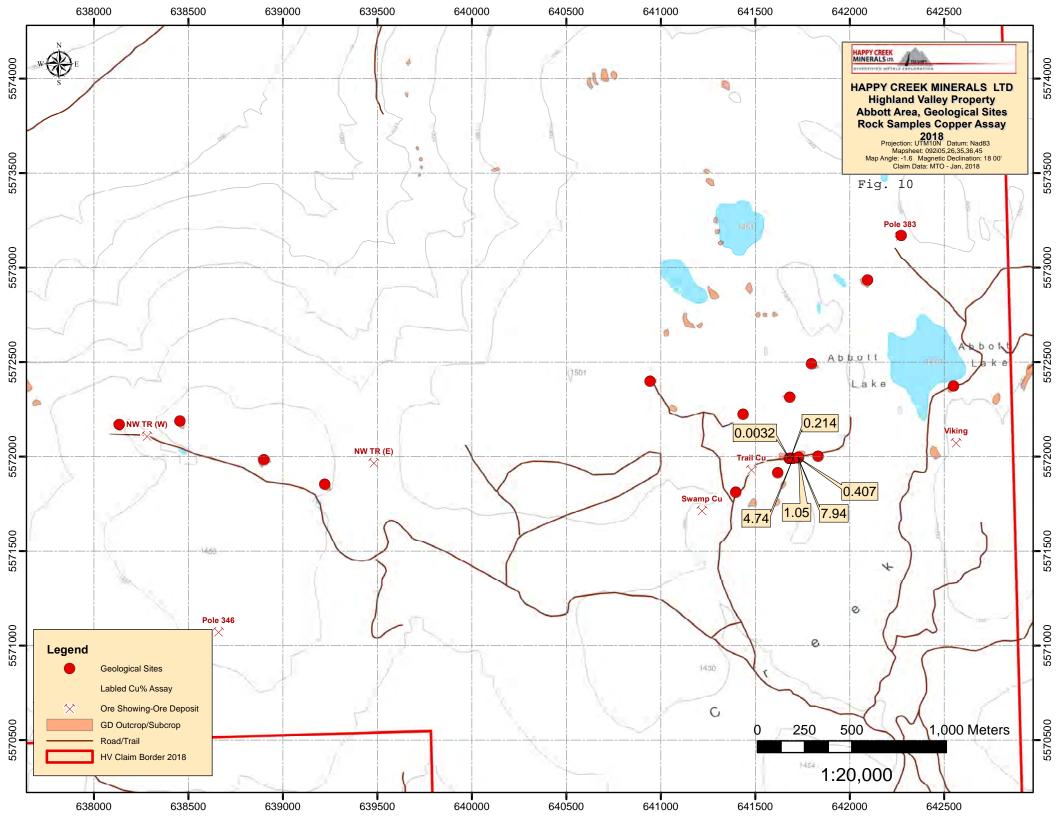















Appendix 1



Certificate of Analysis

Work Order: VC182895

[Report File No.: 0000034659]

Date: March 25, 2019

To: DAVID BLANN

HAPPY CREEK MINERALS LTD 789 PENDER STREET W SUITE 460

VANCOUVER BC V6C 1H2

P.O. No.: RATERIA / TEST: 20 Rock Samples

Project No.: -Samples: 20

Received: Aug 17, 2018
Pages: Page 1 to 8

(Inclusive of Cover Sheet)

Methods Summary

ivo. Or Samp	<u>ivietnoa Code</u>	<u>Description</u>
20	G_LOG02	Pre-preparation processing, sorting, logging, boxing
20	G_WGH79	Weighing of samples and reporting of weights
20	G_PRP90	Weigh, dry, (<3.0 kg), crush to 90% passing 2 mm, split 250 g, pulverize to
20	G_PUL45	Pulverize 250g, Cr Steel, 85% passing 75 microns
20	GE_ARM133_VA	Aqua Regia Digest 25g-300ml, ICPMS (Vancouver)
19	GO_ICP13B	Ore Grade, Aqua Regia Diges/ICP-AES

Storage: Pulp & Reject

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

Comments:

Upon Client's request, this Certificate/Report has been issued in more than one original. Only the first original is a legally binding document and may be used for any legal purpose, including payment.

Certified By

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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Report File No.: 0000034659

	Element	WtKg	Ag	As	Au	Ва	Ве	Bi	Cd
	Method	G_WGH79	GE_ARM133						
	Det.Lim.	0.01	0.02	0.5	1	0.5	0.02	0.01	0.02
	Units	kg	ppm	ppm	ppb	ppm	ppm	ppm	ppm
E00023851		2.475	5.61	0.6	54	245	0.29	6.70	0.05
E00023852		1.330	3.20	0.5	36	155	0.23	5.23	0.05
E00023853		1.570	4.71	<0.5	59	182	0.21	6.24	0.06
E00023854		5.615	2.40	0.5	26	112	0.27	2.93	0.04
E00023855		4.545	2.45	0.5	32	109	0.25	3.76	0.04
E00023856		3.780	2.79	<0.5	49	126	0.26	4.39	0.07
E00023857		5.010	1.99	1.0	26	73.9	0.40	3.65	0.05
E00023858		2.500	0.46	4.1	<1	86.7	0.23	0.09	0.30
E00023859		5.400	4.81	0.6	151	217	0.25	8.75	0.13
E00023860		1.795	11.40	<0.5	109	304	0.18	12.84	0.18
E00023861		0.920	11.87	0.7	287	288	0.22	16.54	0.26
E00023862		1.920	13.60	0.7	155	230	0.20	17.29	0.23
E00023863		1.220	13.06	<0.5	172	146	0.20	10.59	0.13
E00023864		3.095	3.39	<0.5	189	174	0.30	6.68	0.14
E00023865		3.720	10.78	8.0	161	348	0.23	10.05	0.20
E00023866		3.370	6.33	0.5	100	270	0.27	8.77	0.13
E00023867		3.360	3.61	<0.5	57	139	0.24	5.85	0.10
E00023868		3.635	5.34	<0.5	66	240	0.19	7.03	0.06
E00023869		3.335	20.43	0.6	197	395	0.21	14.98	0.22
E00023870		0.580	40.05	2.9	175	38.8	0.14	48.06	<0.02
*Rep E00023869			21.14	0.6	180	403	0.21	15.72	0.23
*BIk BLANK			<0.02	<0.5	<1	<0.5	<0.02	0.01	<0.02
*Std OREAS905			0.55	30.0	413	262	0.98	5.59	0.36

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Report File No.: 0000034659

	Element	Ce	Co	Cs	Cu	Dy	Er	Eu	Ga
	Method	GE_ARM133							
	Det.Lim.	0.05	0.1	0.01	1	0.01	0.01	0.01	0.05
	Units	ppm							
E00023851		17.56	12.7	0.23	>5000	1.40	0.89	0.51	6.17
E00023852		18.56	12.7	0.25	>5000	1.35	0.87	0.53	6.02
E00023853		18.10	11.1	0.30	>5000	1.54	0.96	0.55	5.12
E00023854		18.10	12.5	0.29	>5000	1.53	0.95	0.53	6.24
E00023855		18.64	12.1	0.27	>5000	1.49	0.92	0.56	6.39
E00023856		20.42	11.6	0.42	>5000	1.73	1.07	0.62	5.80
E00023857		20.84	13.6	0.23	>5000	1.65	0.99	0.61	7.68
E00023858		16.37	7.5	5.18	660	1.17	0.69	0.55	2.19
E00023859		20.28	14.0	0.29	>5000	1.74	1.08	0.67	7.21
E00023860		17.50	11.6	0.25	>5000	1.70	1.04	0.67	5.08
E00023861		18.13	8.7	0.26	>5000	1.96	1.20	0.67	5.70
E00023862		17.29	10.7	0.26	>5000	1.47	0.89	0.53	5.66
E00023863		17.34	11.9	0.24	>5000	1.50	0.94	0.56	5.85
E00023864		21.72	14.3	0.27	>5000	1.86	1.14	0.71	7.37
E00023865		18.64	11.4	0.24	>5000	1.70	1.03	0.63	5.88
E00023866		19.14	13.3	0.30	>5000	1.83	1.10	0.69	6.91
E00023867		20.85	14.3	0.34	>5000	1.78	1.10	0.73	7.24
E00023868		17.74	11.1	0.24	>5000	1.54	0.95	0.57	5.26
E00023869		18.64	9.6	0.26	>5000	1.69	1.05	0.68	5.71
E00023870		17.42	3.6	1.08	>5000	1.38	0.80	0.56	1.50
*Rep E00023869		18.06	9.8	0.25	>5000	1.64	1.02	0.65	5.77
*BIk BLANK		<0.05	<0.1	<0.01	<1	<0.01	<0.01	<0.01	<0.05
*Std OREAS905		84.09	13.0	1.45	1610	2.03	0.60	1.01	6.33

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Report File No.: 0000034659

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E	lement	Gd	Hf	Hg	Но	In	La	Li	Lu
N	Method	GE_ARM133							
D	et.Lim.	0.01	0.01	0.02	0.01	0.01	0.05	0.01	0.02
	Units	ppm							
E00023851		1.53	0.18	0.04	0.27	0.02	8.17	7.62	0.13
E00023852		1.58	0.19	0.02	0.26	0.02	8.74	9.16	0.12
E00023853		1.60	0.12	0.04	0.29	0.02	8.18	8.57	0.14
E00023854		1.65	0.18	<0.02	0.29	0.02	8.44	10.38	0.13
E00023855		1.68	0.14	<0.02	0.28	0.02	8.38	8.95	0.13
E00023856		1.87	0.12	0.02	0.32	0.03	9.29	9.06	0.15
E00023857		1.91	0.28	<0.02	0.31	0.02	10.25	12.07	0.14
E00023858		1.40	0.04	<0.02	0.22	0.02	8.43	2.74	0.10
E00023859		1.92	0.18	<0.02	0.33	0.02	10.61	11.85	0.15
E00023860		1.81	0.12	<0.02	0.32	0.02	7.94	10.19	0.15
E00023861		2.10	0.13	<0.02	0.37	0.02	8.17	7.07	0.16
E00023862		1.59	0.17	<0.02	0.28	0.02	8.06	8.43	0.12
E00023863		1.66	0.09	<0.02	0.29	0.02	7.34	11.37	0.13
E00023864		2.01	0.15	<0.02	0.36	0.02	10.84	11.91	0.15
E00023865		1.80	0.17	<0.02	0.33	0.03	8.71	9.84	0.14
E00023866		2.00	0.09	<0.02	0.33	0.03	9.00	12.98	0.16
E00023867		2.21	0.06	<0.02	0.35	0.03	10.49	12.91	0.15
E00023868		1.66	0.08	0.04	0.29	0.03	8.39	8.25	0.14
E00023869		1.85	0.13	<0.02	0.32	0.02	8.48	7.92	0.15
E00023870		1.71	0.06	0.08	0.26	0.01	9.21	1.85	0.11
*Rep E00023869		1.76	0.13	<0.02	0.32	0.02	8.21	7.87	0.14
*BIk BLANK		<0.01	<0.01	<0.02	<0.01	<0.01	<0.05	0.01	<0.02
*Std OREAS905		4.05	1.33	<0.02	0.26	0.57	40.45	4.86	0.04

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Report File No.: 0000034659

	Element	Mn	Mo	Nb	Nd	Ni	Pb	Pr	Rb
	Method	GE_ARM133							
	Det.Lim.	0.5	0.02	0.02	0.05	0.5	0.2	0.01	0.05
	Units	ppm							
E00023851		496	1.06	0.04	8.60	9.2	2.5	2.05	7.47
E00023852		554	1.04	0.07	9.59	10.1	1.4	2.24	7.60
E00023853		498	0.92	0.05	9.03	9.7	1.8	2.16	10.21
E00023854		540	0.94	0.06	9.36	10.5	1.9	2.21	9.03
E00023855		548	0.94	0.02	9.23	10.8	2.0	2.13	8.10
E00023856		561	0.99	<0.02	10.62	10.1	2.5	2.46	11.23
E00023857		527	1.09	0.09	10.89	12.2	2.4	2.57	6.12
E00023858		474	43.57	<0.02	8.01	7.7	9.5	1.85	5.65
E00023859		522	1.24	0.06	10.62	12.2	3.1	2.55	8.38
E00023860		478	1.09	0.07	9.46	9.8	3.3	2.17	9.27
E00023861		426	1.42	0.07	10.17	7.5	4.5	2.32	9.48
E00023862		443	2.25	0.10	8.78	8.7	2.5	2.04	7.54
E00023863		503	1.23	0.04	9.03	9.9	2.2	2.09	8.50
E00023864		596	1.01	0.04	11.43	11.5	2.8	2.74	9.29
E00023865		500	1.38	0.05	10.03	9.7	2.8	2.37	10.56
E00023866		552	10.99	<0.02	11.05	10.8	2.0	2.55	10.02
E00023867		605	1.07	<0.02	12.24	12.1	1.6	2.82	10.12
E00023868		537	1.38	<0.02	9.77	9.9	1.9	2.29	8.72
E00023869		426	1.15	0.04	9.79	8.1	4.4	2.22	9.70
E00023870		198	2.03	0.03	9.55	3.4	6.4	2.27	4.04
*Rep E00023869		434	1.23	0.04	9.34	8.5	4.0	2.13	8.70
*BIk BLANK		<0.5	<0.02	<0.02	<0.05	<0.5	<0.2	<0.01	<0.05
*Std OREAS905		358	3.14	0.44	30.91	8.2	17.8	8.81	19.33

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Report File No.: 0000034659

E	Element	Re	Sb	Sc	Se	Sm	Sn	Sr	Та
	Method	GE_ARM133							
	Det.Lim.	0.01	0.02	0.1	0.5	0.02	0.05	0.1	0.01
	Units	ppm							
E00023851		<0.01	0.10	4.1	<0.5	1.68	0.20	62.5	<0.01
E00023852		<0.01	0.09	4.1	<0.5	1.78	0.21	56.2	<0.01
E00023853		<0.01	0.10	2.9	<0.5	1.80	0.19	37.0	<0.01
E00023854		<0.01	0.17	4.2	<0.5	1.81	0.20	56.6	<0.01
E00023855		<0.01	0.10	4.2	<0.5	1.89	0.18	72.4	<0.01
E00023856		<0.01	0.08	3.7	<0.5	2.12	0.18	50.5	<0.01
E00023857		<0.01	0.19	6.2	<0.5	2.14	0.34	48.9	<0.01
E00023858		<0.01	1.18	4.4	<0.5	1.58	0.12	31.4	<0.01
E00023859		<0.01	0.15	5.2	<0.5	2.08	0.32	60.1	<0.01
E00023860		<0.01	0.16	4.1	<0.5	2.02	0.10	43.9	<0.01
E00023861		<0.01	0.24	3.6	<0.5	2.30	0.11	52.7	<0.01
E00023862		<0.01	0.21	3.8	<0.5	1.82	0.18	64.6	<0.01
E00023863		<0.01	0.14	3.1	<0.5	1.93	0.08	32.7	<0.01
E00023864		<0.01	0.15	5.0	<0.5	2.26	0.14	50.2	<0.01
E00023865		<0.01	0.21	4.2	<0.5	2.06	0.25	74.0	<0.01
E00023866		0.04	0.15	4.0	<0.5	2.24	0.11	46.8	<0.01
E00023867		<0.01	0.07	3.8	<0.5	2.44	0.09	31.2	<0.01
E00023868		<0.01	0.05	3.7	<0.5	1.87	0.12	57.4	<0.01
E00023869		<0.01	0.20	3.7	<0.5	2.03	0.12	83.7	<0.01
E00023870		<0.01	0.04	2.1	0.9	1.93	0.05	9.2	<0.01
*Rep E00023869		<0.01	0.20	3.5	<0.5	1.99	0.11	81.7	<0.01
*BIK BLANK		<0.01	<0.02	<0.1	<0.5	<0.02	<0.05	<0.1	<0.01
*Std OREAS905		<0.01	1.30	1.7	2.1	5.20	1.30	11.6	<0.01

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Report File No.: 0000034659

1								
ement	Tb	Te	Th	TI	U	W	Y	Yb
lethod	GE_ARM133	GE_ARM133	GE_ARM133	GE_ARM133	GE_ARM133	GE_ARM133	GE_ARM133	GE_ARM133
et.Lim.	0.005	0.05	0.01	0.01	0.01	1	0.02	0.01
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	0.243	0.33	4.74	0.15	2.22	<1	6.98	0.82
	0.244	0.08	4.55	0.13	1.79	<1	6.88	0.78
	0.267	<0.05	4.54	0.10	1.91	<1	7.22	0.88
	0.264	<0.05	4.00	0.07	2.04	<1	7.85	0.86
	0.271	<0.05	4.01	0.04	1.87	<1	7.36	0.84
	0.299	<0.05	4.28	0.04	2.28	<1	8.47	0.99
	0.293	<0.05	4.91	0.01	2.32	<1	8.19	0.91
	0.209	<0.05	4.09	0.03	1.03	95	5.92	0.63
	0.303	<0.05	4.81	0.01	3.19	2	8.51	1.00
	0.289	<0.05	5.00	0.02	1.99	<1	7.21	0.95
	0.344	<0.05	5.37	0.01	3.31	<1	8.00	1.11
	0.256	<0.05	4.19	<0.01	2.02	<1	6.07	0.84
	0.269	<0.05	4.45	0.01	1.57	<1	6.58	0.84
	0.329	<0.05	5.23	<0.01	3.24	<1	9.01	1.06
	0.294	<0.05	4.75	<0.01	2.10	<1	7.55	0.94
	0.324	<0.05	5.05	<0.01	1.78	<1	8.05	0.98
	0.336	<0.05	4.81	<0.01	1.71	<1	9.01	0.98
	0.267	<0.05	4.46	<0.01	1.98	<1	7.20	0.89
	0.293	<0.05	5.06	<0.01	2.74	<1	7.09	0.97
	0.258	0.20	3.54	<0.01	5.63	<1	4.23	0.75
	0.291	<0.05	5.22	<0.01	2.81	<1	6.92	0.96
	<0.005	<0.05	<0.01	<0.01	<0.01	<1	<0.02	<0.01
	0.436	0.05	9.08	<0.01	2.34	3	7.00	0.28
	ement lethod et.Lim.	ement Tb dethod GE_ARM133 at.Lim. 0.005 Units ppm 0.243 0.244 0.267 0.264 0.271 0.299 0.293 0.209 0.303 0.289 0.266 0.266 0.269 0.329 0.294 0.324 0.324 0.324 0.324 0.324 0.326 0.267 0.293 0.293 0.294 0.294 0.324 0.324 0.326 0.267 0.293 0.258 0.291 <0.005	ement lethod Tb Te lethod GE_ARM133 GE_ARM133 det.Lim. 0.005 0.05 Units ppm ppm 0.243 0.33 0.244 0.08 0.267 <0.05 0.264 <0.05 0.271 <0.05 0.299 <0.05 0.293 <0.05 0.209 <0.05 0.303 <0.05 0.289 <0.05 0.289 <0.05 0.256 <0.05 0.269 <0.05 0.294 <0.05 0.324 <0.05 0.294 <0.05 0.267 <0.05 0.293 <0.05 0.293 <0.05 0.293 <0.05 0.293 <0.05 0.293 <0.05 0.293 <0.05 0.293 <0.05 0.293 <0.05 0.294 <0.05 </td <td>ement ethod Tb Te Th lethod GE_ARM133 GE_ARM133 GE_ARM133 lethod 0.005 0.05 0.01 lethod 0.005 0.05 0.01 lethod 0.005 0.05 0.01 lethod 0.243 0.33 4.74 lethod 0.244 0.08 4.55 lethod 0.267 <0.05</td> 4.54 lethod 0.264 <0.05	ement ethod Tb Te Th lethod GE_ARM133 GE_ARM133 GE_ARM133 lethod 0.005 0.05 0.01 lethod 0.005 0.05 0.01 lethod 0.005 0.05 0.01 lethod 0.243 0.33 4.74 lethod 0.244 0.08 4.55 lethod 0.267 <0.05	ement lethod Tb Te Th Tl lethod GE_ARM133 GE_ARM133 GE_ARM133 GE_ARM133 lethod 0.005 0.05 0.01 0.01 lethod 0.005 0.05 0.01 0.01 lethod 0.005 0.05 0.01 0.01 lethod 0.243 0.33 4.74 0.15 lethod 0.244 0.08 4.55 0.13 lethod 0.267 <0.05	ement lethod Tb Te lethod Th TI U Lethod GE_ARM133 GE_ARM133 GE_ARM133 GE_ARM133 GE_ARM133 st.Lim. 0.005 0.05 0.01 0.01 0.01 Units ppm ppm ppm ppm ppm 0.243 0.33 4.74 0.15 2.22 0.244 0.08 4.55 0.13 1.79 0.267 <0.05	ement ethod Tb Te Th Th T U W ethod GE_ARM133 GE_ARM	ement ethod Tb Te Th TI TI U W Y ethod GE_ARM133 GE_ARM133

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Final: VC182895 Order: RATERIA / TEST: 20 Rock Samples

Report File No.: 0000034659

	Element	Zn	Zr	Cu
	Method	GE_ARM133	GE_ARM133	GO_ICP13B
	Det.Lim.	1	0.1	0.01
	Units	ppm	ppm	%
E00023851		51	3.5	1.28
E00023852		49	2.8	0.91
E00023853		52	1.8	1.21
E00023854		55	2.5	0.74
E00023855		51	2.2	0.71
E00023856		52	1.9	1.02
E00023857		45	4.1	0.51
E00023858		44	1.1	N.A.
E00023859		53	2.5	1.70
E00023860		49	1.8	2.57
E00023861		36	1.9	3.59
E00023862		39	2.2	3.06
E00023863		52	1.5	2.20
E00023864		56	2.3	1.48
E00023865		49	2.7	2.29
E00023866		65	1.7	2.06
E00023867		65	1.3	1.37
E00023868		53	1.4	1.25
E00023869		43	1.8	3.83
E00023870		15	1.6	7.94
*Rep E00023869		42	1.7	
*BIk BLANK		<1	<0.1	
*Rep E00023856				0.96
*BIk BLANK				<0.01
*Std OREAS905		71	45.7	
*Std OREAS932				6.25

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Certificate of Analysis

Work Order : VC183838 [Report File No.: 0000034663]

Date: March 25, 2019

To: DAVID BLANN

HAPPY CREEK MINERALS LTD 789 PENDER STREET W SUITE 460

VANCOUVER BC V6C 1H2

P.O. No.: RATERIA / TEST: 8 Rock Samples

Project No.: - Samples: 8

Received: Oct 11, 2018
Pages: Page 1 to 8

(Inclusive of Cover Sheet)

Methods Summary

No. Of Samples	<u>ivietnoa Code</u>	<u>Description</u>
8	G_LOG02	Pre-preparation processing, sorting, logging, boxing
8	G_WGH79	Weighing of samples and reporting of weights
8	G_PRP90	Weigh, dry, (<3.0 kg), crush to 90% passing 2 mm, split 250 g, pulverize to
8	G_PUL45	Pulverize 250g, Cr Steel, 85% passing 75 microns
8	GE_ARM133_VA	Aqua Regia Digest 25g-300ml, ICPMS (Vancouver)
3	GO_ICP13B	Ore Grade, Aqua Regia Diges/ICP-AES

Storage: Pulp & Reject

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

Comments:

Upon Client's request, this Certificate/Report has been issued in more than one original. Only the first original is a legally binding document and may be used for any legal purpose, including payment.

Certified By:

Gerald Chik
Operations Manager/Chief 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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*Std OREAS905

Final: VC183838 Order: RATERIA / TEST: 8 Rock Samples

Report File No.: 0000034663

	Element	WtKg	Ag	As	Au	Ва	Ве	Bi	Cd
	Method	G_WGH79	GE_ARM133						
	Det.Lim.	0.01	0.02	0.5	1	0.5	0.02	0.01	0.02
	Units	kg	ppm	ppm	ppb	ppm	ppm	ppm	ppm
D00009601		1.180	0.03	2.3	<1	65.0	0.14	<0.01	0.02
D00009602		2.875	0.14	<0.5	3	67.7	0.16	0.04	0.04
D00009603		1.960	28.55	4.6	119	49.0	0.18	32.93	0.02
D00009604		2.125	2.96	1.2	27	95.3	0.17	4.23	0.05
D00009605		2.340	4.01	1.0	68	89.3	0.29	7.62	0.10
D00009606		1.195	0.21	2.0	1	77.3	0.22	0.08	0.04
D00009607		0.875	33.37	2.4	158	407	0.49	26.05	0.60
D00009608		0.640	0.07	2.3	1	63.6	0.26	0.08	<0.02
*Rep D00009604			3.39	1.3	29	106	0.20	4.81	0.05
*BIk BLANK			<0.02	<0.5	<1	<0.5	<0.02	<0.01	<0.02

29.0

418

252

0.90

5.67

0.47

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0.35

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*Std OREAS905

Final: VC183838 Order: RATERIA / TEST: 8 Rock Samples

79.35

Report File No.: 0000034663

	Element	Ce	Co	Cs	Cu	Dy	Er	Eu	Ga
	Method	GE_ARM133							
	Det.Lim.	0.05	0.1	0.01	1	0.01	0.01	0.01	0.05
	Units	ppm							
D00009601		6.40	3.6	1.76	32	0.20	0.11	0.33	1.26
D00009602		25.30	4.8	1.11	2140	1.16	0.66	0.45	1.51
D00009603		18.51	5.1	1.16	>5000	1.36	0.69	0.53	2.88
D00009604		15.31	6.5	0.84	4070	0.88	0.48	0.38	2.63
D00009605		18.97	13.2	0.45	>5000	1.20	0.65	0.49	7.40
D00009606		15.69	9.5	0.42	146	1.15	0.58	0.35	5.05
D00009607		14.17	5.4	0.46	>5000	0.78	0.48	0.45	10.21
D00009608		18.76	5.0	0.31	136	1.04	0.54	0.40	4.12
*Rep D00009604		13.59	7.5	0.97	4350	1.01	0.56	0.43	2.85
*BIk BLANK		<0.05	<0.1	<0.01	<1	<0.01	<0.01	<0.01	<0.05

1.39

13.4

1580

1.99

0.58

0.96

6.13

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SGS Canada Inc. Minerals Suite E - 3260 Production Way Burnaby BC t(604) 638-2349 f(604) 444-5486 www.ca.sgs.com

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Report File No.: 0000034663

Report lie No.: 0000034003									
	Element	Gd	Hf	Hg	Ho	In	La	Li	Lu
	Method	GE_ARM133							
	Det.Lim.	0.01	0.01	0.02	0.01	0.01	0.05	0.01	0.02
	Units	ppm							
D00009601		0.29	0.04	<0.02	0.04	<0.01	4.42	1.72	<0.02
D00009602		1.54	0.04	<0.02	0.24	<0.01	13.69	1.79	0.12
D00009603		1.58	0.09	0.08	0.27	0.01	9.38	3.53	0.11
D00009604		1.05	0.08	0.05	0.18	<0.01	7.46	3.58	0.08
D00009605		1.46	0.23	<0.02	0.25	0.02	8.87	11.73	0.10
D00009606		1.40	0.08	<0.02	0.23	0.01	6.94	5.89	0.08
D00009607		0.97	0.06	0.46	0.16	0.03	7.74	4.86	0.07
D00009608		1.34	0.26	<0.02	0.21	<0.01	9.15	5.63	0.08
*Rep D00009604		1.20	0.10	0.07	0.21	<0.01	8.52	4.07	0.09
*BIk BLANK		<0.01	<0.01	<0.02	<0.01	<0.01	<0.05	<0.01	<0.02
*Std OREAS905		3.74	1.25	<0.02	0.25	0.54	39.99	4.57	0.03

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1		_							
	Element	Mn	Мо	Nb	Nd	Ni	Pb	Pr	Rb
	Method	GE_ARM133							
	Det.Lim.	0.5	0.02	0.02	0.05	0.5	0.2	0.01	0.05
	Units	ppm							
D00009601		271	1.46	<0.02	2.45	5.0	2.5	0.71	5.21
D00009602		349	0.97	<0.02	11.16	7.8	2.2	3.03	9.13
D00009603		267	1.69	0.07	9.16	5.0	5.7	2.43	5.68
D00009604		336	1.57	0.07	6.64	7.3	2.5	1.85	4.06
D00009605		498	1.35	0.04	8.85	11.5	4.3	2.31	6.16
D00009606		642	1.90	0.52	7.75	12.9	2.6	2.00	4.93
D00009607		172	1.64	<0.02	6.70	5.3	11.3	1.77	5.30
D00009608		218	1.41	0.26	9.23	8.6	2.0	2.43	5.08
*Rep D00009604		349	1.62	0.09	7.53	8.7	2.8	2.09	4.27
*BIk BLANK		<0.5	<0.02	<0.02	<0.05	<0.5	0.3	<0.01	<0.05
*Std OREAS905		337	3.13	0.47	32.36	7.8	16.8	7.98	18.69

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	Element	Re	Sb	Sc	Se	Sm	Sn	Sr	Ta
	Method	GE_ARM133							
	Det.Lim.	0.01	0.02	0.1	0.5	0.02	0.05	0.1	0.01
	Units	ppm							
D00009601		<0.01	0.10	0.4	<0.5	0.36	<0.05	31.2	<0.01
D00009602		<0.01	0.15	2.0	<0.5	1.99	<0.05	44.1	<0.01
D00009603		<0.01	0.11	3.1	0.9	1.90	0.10	11.3	<0.01
D00009604		<0.01	0.13	2.1	<0.5	1.24	0.11	24.0	<0.01
D00009605		<0.01	0.14	5.5	<0.5	1.67	0.21	47.2	<0.01
D00009606		<0.01	0.15	3.3	<0.5	1.55	0.29	48.9	<0.01
D00009607		<0.01	0.60	2.2	1.0	1.28	0.17	93.0	<0.01
D00009608		<0.01	0.12	2.1	<0.5	1.64	0.25	46.3	<0.01
*Rep D00009604		<0.01	0.14	2.4	<0.5	1.41	0.13	26.5	<0.01
*BIk BLANK		<0.01	<0.02	<0.1	<0.5	<0.02	<0.05	<0.1	<0.01
*Std OREAS905		<0.01	1.31	1.5	2.2	5.54	1.35	11.7	<0.01

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Elem	ent Tb	Te	Th	TI	U	W	Y	Yb
Meth	od GE_ARM133	GE_ARM133	GE_ARM133	GE_ARM133	GE_ARM133	GE_ARM133	GE_ARM133	GE_ARM133
Det.L	m. 0.005	0.05	0.01	0.01	0.01	1	0.02	0.01
Ur	its ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
D00009601	0.037	0.19	2.81	0.03	0.65	<1	1.28	0.11
D00009602	0.206	0.10	4.70	0.04	2.21	<1	6.68	0.75
D00009603	0.237	0.18	4.73	0.04	3.65	<1	5.31	0.72
D00009604	0.153	<0.05	1.54	0.02	0.69	<1	5.09	0.53
D00009605	0.208	<0.05	3.45	0.02	2.57	<1	6.27	0.66
D00009606	0.199	<0.05	1.85	0.04	0.96	<1	6.08	0.53
D00009607	0.151	0.38	1.70	<0.01	12.69	<1	3.97	0.43
D00009608	0.183	<0.05	3.08	0.03	1.48	<1	5.52	0.54
*Rep D00009604	0.174	<0.05	1.33	0.02	0.80	<1	5.79	0.59
*BIk BLANK	<0.005	<0.05	<0.01	<0.01	<0.01	<1	<0.02	<0.01
*Std OREAS905	0.425	<0.05	8.67	<0.01	2.45	<1	6.97	0.27

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	F14	Zn	Zr	Cu
	Element			
	Method	GE_ARM133	GE_ARM133	GO_ICP13B
	Det.Lim.	1	0.1	0.01
	Units	ppm	ppm	%
D00009601		25	1.8	N.A.
D00009602		18	0.9	N.A.
D00009603		25	2.1	4.74
D00009604		28	1.6	N.A.
D00009605		47	2.8	1.05
D00009606		32	3.5	N.A.
D00009607		23	1.4	15.4
D00009608		20	5.6	N.A.
*Rep D00009604		31	1.7	
*BIk BLANK		<1	<0.1	
*Rep D00009603				4.81
*BIk BLANK				<0.01
*Std OREAS905		67	47.1	
*Std OREAS934				9.60

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