

# Highland Valley Property



Ministry of Energy, Mines & Petroleum Resources  
Mining & Minerals Division  
BC Geological Survey

## BC Geological Survey Assessment Report 37643



Assessment Report  
Title Page and Summary

TYPE OF REPORT [type of survey(s)]: Technical (T)(C)(PR)

TOTAL COST: \$3250

AUTHOR(S): Christopher Delorme

SIGNATURE(S): [Signature]

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

YEAR OF WORK: 2018

STATEMENT OF WORK - CASH PAYMENTS EVENT NUMBER(S)/DATE(S): 5697040

PROPERTY NAME: HIGHLAND VALLEY PROPERTY

CLAIM NAME(S) (on which the work was done): HIGHLAND VALLEY PROPERTY

COMMODITIES SOUGHT: Copper

MINERAL INVENTORY MINFILE NUMBER(S), IF KNOWN: \_\_\_\_\_

MINING DIVISION: Kamloops Mining Div.

NTS/BCGS: 092110W/0921056

LATITUDE: \_\_\_\_\_ ° \_\_\_\_\_ ' \_\_\_\_\_ " LONGITUDE: \_\_\_\_\_ ° \_\_\_\_\_ ' \_\_\_\_\_ " (at centre of work)

OWNER(S):

1) Christopher Delorme  
Guy Delorme

2) \_\_\_\_\_

MAILING ADDRESS:

340A LOGAN LAKE AVE  
MERRIT B.C. V1K0B5

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

1) Christopher and Guy  
Delorme

2) \_\_\_\_\_

MAILING ADDRESS:

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

Late triassic-Middle Jurassic Guichen Creek batholith Deposit types  
Porphyry Cu, Terrane, diorite, quartz diorite and granodiorite  
Niobium Volcanics main minerals: chalco, pyrite minor moly

REFERENCES TO PREVIOUS ASSESSMENT WORK AND ASSESSMENT REPORT NUMBERS: 35711, 34795, 32290,

2114, ~~2114~~ Wikipedia

Next Page

# Highland Valley Property

TYPE OF WORK IN THIS REPORT	EXTENT OF WORK (IN METRIC UNITS)	ON WHICH CLAIMS	PROJECT COSTS APPORTIONED (incl. support)
<b>GEOLOGICAL (scale, area)</b>			
Ground, mapping			
Photo interpretation			
<b>GEOPHYSICAL (line-kilometres)</b>			
Ground			
Magnetic			
Electromagnetic			
Induced Polarization			
Radiometric			
Seismic			
Other			
Airborne			
<b>GEOCHEMICAL (number of samples analysed for...)</b>			
Soil			
Silt			
Rock	x 5	1060351	
Other			
<b>DRILLING (total metres; number of holes, size)</b>			
Core			
Non-core			
<b>RELATED TECHNICAL</b>			
Sampling/assaying			
Petrographic			
Mineralographic			
Metallurgic			
PROSPECTING (scale, area)	1/2 km x 300m	1060351	
<b>PREPARATORY / PHYSICAL</b>			
Line/grid (kilometres)			
Topographic/Photogrammetric (scale, area)			
Legal surveys (scale, area)			
Road, local access (kilometres)/trail			
Trench (metres)			
Underground dev. (metres)			
Other			
<b>TOTAL COST:</b>			\$3250 \$13746.09 (PAC)

Technical Report  
ON THE  
HIGHLAND VALLEY PROPERTY

KAMLOOPS MINING DIVISION  
EVENT NUMBER 5697040

CENTER OF WORK  
650 100E 559 8100N

WORK PERFORMED ON TENURE  
1060351

NTS MAP 091I10W  
BCGS MAP 092I056

OWNER

Christopher and Guy Delorme

OPERATOR

Christopher and Guy Delorme

AUTHOR

Christopher Delorme

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### 1.0 Summary

On May 13<sup>th</sup> 2018 Christopher and Guy Delorme conducted a prospecting and geochemical work program on tenure 1060351. The purpose of the work program was to delineate and discover new copper mineralization around previous worked areas near to the dansey and dab minfile. Several new areas of logging were encountered during the trip where the focus of the prospecting took place. New zones of mineralization were found in two different locations from new roads being exposed from logging. A Garmin E-trek magnetometer and orange flagging were used to identify location of samples taken. Five samples were sent to ALS Laboratory in Kamloops BC for an Ultra trace Aqua Regia ICP method of sampling. One sample came back above the 10,000ppm threshold for copper, ore grade analysis Aqua Regia was then used to determine the copper content in percentile.

### 2.0 Introduction

The Highland Valley Property is adjacent to the formerly producing Bethlehem mine and the producing Teck mine also known as Highland Valley. The **Highland Valley Copper mine** is the largest [open pit copper mine](#) in [Canada](#), located near [Logan Lake, British Columbia](#). It is an amalgamation of three historic mining operations: Bethlehem (later Valley Copper), Lornex and Highmont.

#### **Early Years**

The earliest roots of the Bethlehem mining operations began when the Jersey zone was staked and bonded to a French syndicate c. 1886 – c. 1887. This claim changed hands several times until finally in October 1954 when the Huestis-Reynolds-McLallen Syndicate sponsored a prospective examination covering 100 claims including Jersey and surrounding zones.

Copper was known to occur in the [Cascade Mountains](#) near [Princeton](#) as the productive mines of [Allenby](#) in 1914 had shown. On the strength of this, prospectors searched for other deposits in the region. These they found north of Merritt and east of Ashcroft at Logan Lake at the Jersey zone.

### 1950s-1960s

In February 1955 the Bethlehem Copper Corporation finalized the purchase of the 141 claims in the area and partnered with [ASARCO](#) to develop the property. The deposit was large, but of low grade copper ore (less than 1 percent). The mines sat waiting for the richer deposits to yield, and for technology to improve to process large amounts of ore.

In February 1960, Bethlehem Copper Corporation made an agreement with the Japanese group [Sumitomo](#) for \$5.5 million USD to bring the property into production. Construction began in July 1961. At the time, Jersey and East Jersey were identified as zones containing suitable ore for production, and an assessment was completed of the area between the two zones. It was found that this middle area did not have suitable deposits to favor commercial operation and the Jersey and East Jersey zones were mined separately.

Production of the East Jersey pit began on November 28, 1962, and continued until February 17, 1965, when a rock slide forced the Company to end the pit's life early. Production of the Jersey pit began quickly after.

### 1970s and 1980s

The Jersey pit was given an extension in 1977, extending its life another 5 years. Two minor additional pits were also operated for brief periods during this time: Huestis from 1970 to 1976 and Iona from 1976 to 1979.

On the south side of the valley the Lornex mine began mining in 1972.

In 1981 [Cominco](#), who already owned the claim to the Valley Copper deposit located west of Bethlehem, purchased Bethlehem Copper to consolidate the nearby operations. Mining of the original Bethlehem Copper pits ceased in 1982. The Bethlehem concentrator continued to operate on ore from the Valley Copper deposit until June of 1989.

Production on the Valley Copper mine, now the largest mine and most noticeable feature, began in January 1983. For fifty years the ore was dug using shovels and [open pit](#) methods. A very large pit ensued--half a mile deep and two miles in diameter.

Highland Valley Copper was created in mid-1986 when the Highland Valley mining operations of Lornex Mining Corporation Ltd. and Cominco Ltd. were combined into a new single entity, structured as a partnership.

The Highmont mill on the south side of the valley was acquired in 1988 when Highmont Mining Company joined the partnership. This mill had been closed down in 1984 when the Highmont deposit became uneconomical.

### **Current operation**

The current mining operation is named Highland Valley Copper and operates one of the world's largest [open-pit mines](#). The Highland Valley Copper Mine consists of several large deep pits, dug to expose low-grade [copper](#) and [molybdenum](#) bearing ore deposits. Large electric shovels and explosives are used to carve out the rock and ore with diesel [haul trucks](#) carrying the material to crushing and milling facilities on the site.

A large tailing pond is maintained to support these operations (48.5 million tonnes of tailings pumped in 2003), with two containment embankments to retain the tailings from the environment. In April 2017 freezing pipes caused 850 cubic meters of process water to spill. The spill was contained on site and returned to the tailing pond. Trojan Pond, a previous tailing pool used in the operation, began to be reclaimed in 1990 and is now a self-sustaining ecosystem and used for sport fishing.

Copper and molybdenum mineral concentrates, which include trace amounts of silver and gold, are sent via truck to nearby rail facilities in [Ashcroft](#) where the ore is carried to the [Port of Vancouver](#) and to international destinations (primarily Japan and China for copper and steel production). The mine employed approximately 1300 persons in 2011.

## 3.0 Location

The Highland Valley property is situated in south central British Columbia. The property is situated near the community of Logan Lake. This community is situated approximately 48 km north of Merritt B.C. The property can be accessed by either Highway 97C from Merritt or Highway 5 South from Kamloops to exit 336 turning west onto Meadow Creek Road to Logan Lake.

Starting from the intersection of Meadow Creek road, highway 97C and Tunkwa Lake road in the Community of Logan Lake, the center of the Highland Valley Project can be accessed by traveling north on Tunkwa Lake road for approximately 4.3 km take a left onto a gravel road for 2.5km to the center of work area.

## 3.1 Location Map

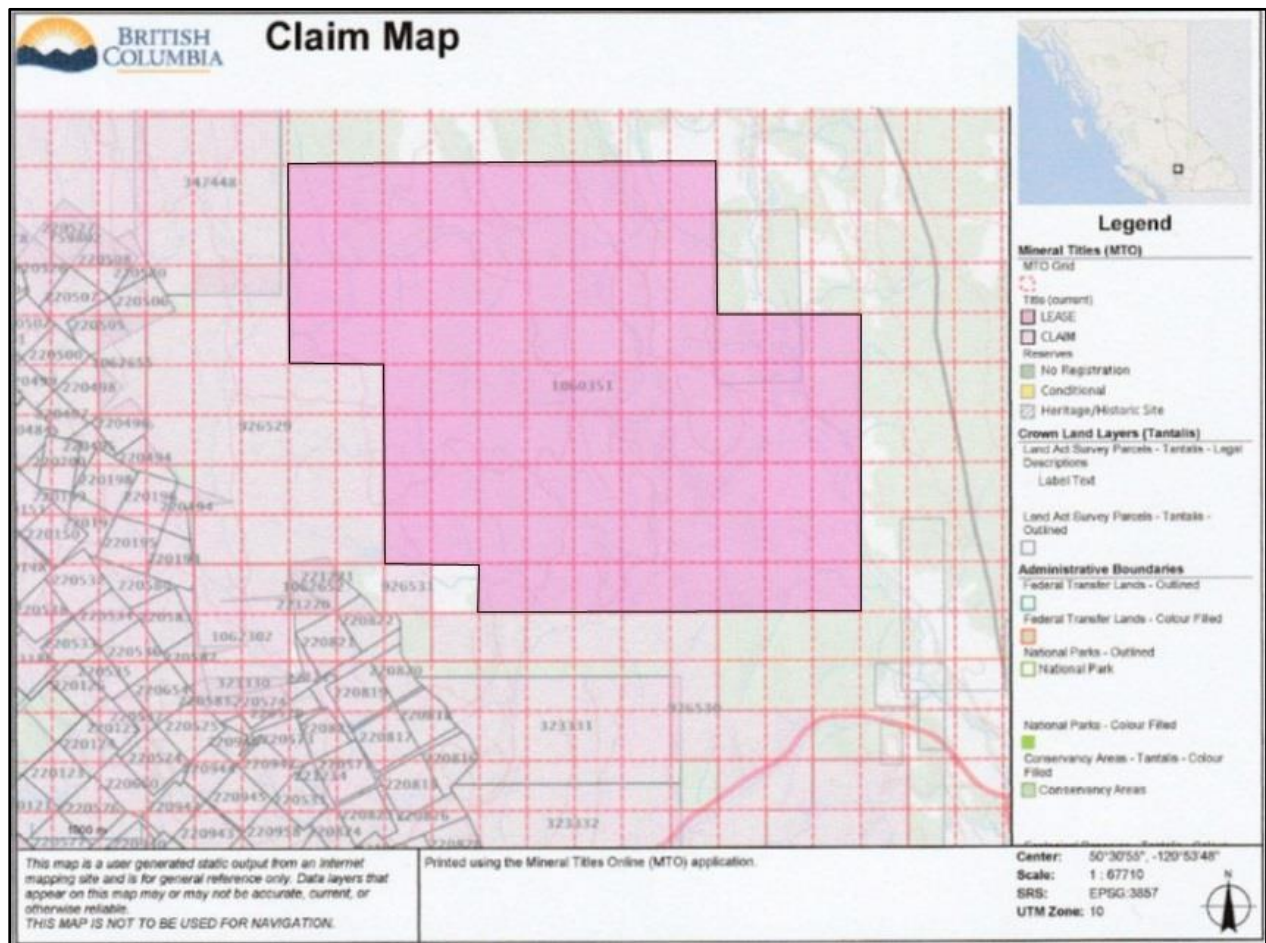




## 4.0 Claim Status

Tenure	Type	Claim Name	Good Until	Area Hectares
1060351	Mineral	Highland Valley Property	2018/Nov/21	1787.35

## 4.1 Claim Map



## 5.0 Physiography & Climate

The Property is located east of the Cascade Mountains in the Thompson Plateau physiographic region of British Columbia. The upper elevations are covered by spruce and Lodge pole pine stands, grading as one descends into ponderosa pine forest at around 900 metres ASL.

The climate is semi-arid which is typical of the southern interior of BC. Average annual precipitation is 322 mm, consisting of rain and snow. Summer temperatures average 30°C, with winter temperatures on average about -40°C. Extremes of temperatures are possible, with highs approaching +41°C in summer months and -42°C during the winter. The property is snow covered from November to May.

## 6.0 Topography

Relief on the Property ranges in elevation from 1060 metres to 1386 metres. In general the terrain can be described as rolling hills, slightly mountainous separated by creeks and swamps. The overburden is mainly thick glacial till.

## 7.0 History

The first recorded assessment work conducted in the area of the HVP Project was carried out in 1965. A large geochemical survey was conducted on behalf of New Indian Mines Ltd. ("Indian Mines") and Vananda Explorations Ltd. ("Vananda Explorations") on their Eden mineral claims which partly overlapped the southwest corner of the Dansey Project area. 1507 soil samples were collected at 300 by 200 meter intervals roughly half of which were located on ground currently held by Logan Copper. The samples were tested using the qualitative rubeanic acid method in a field laboratory. "Although the soil samples did not show a pattern of anomalous

values that could be contoured, the results were sufficiently encouraging to merit additional work in this area.” (ARIS 711)

In 1968 North Pacific Mines Ltd. (“North Pacific”) began its exploration program over its property, located adjacent to Alwin’s ground. North Pacific flew a large aeromagnetic survey which stretched across the center and beyond the northwest and southeast corners of the current Dansey Project tenures. The survey consisted of 40 lines averaging 3 miles and spaced at about 545 feet.

In late 1968 Alwin followed up their earlier aeromagnetic survey with geochemical work. 911 soil samples were collected and shipped to Technical Service Laboratories in Vancouver for analysis. The survey indicated a single, >100 ppm, 150 by 1100 foot anomaly trending and open to the northwest. The anomaly is located approximately 800m northeast of the Dab MINFILE. (ARIS 1787)

Following its aeromagnetic survey, North Pacific optioned out the property to Thermochem Industries Ltd. which had a working agreement with Noranda Exploration Company (“Noranda”). That year Noranda conducted a comprehensive geochemical survey covering nearly the entire North Pacific property group. Samples were taken from multiple soil horizons and analyzed for copper and molybdenum. Results are summarized in assessment reports 1934, 1935 and 2066. While molybdenum results were relatively muted the survey identified a large area of geochemical copper anomalies ranging from 100ppm to 1600ppm.

Concurrently, Comet-Krain Mining Corp. (“Comet Mining”) carried out its own geochemical survey southeast of North Pacific’s ground. This survey indicated low order but discreet geochemical copper anomalies. Results from this survey were similar in magnitude and position to anomalies surrounding Noranda’s Central Geochemical Anomaly, identified by Noranda the same year. (ARIS 2024)

In late 1969 large portions of the Dansey project area were subjected to induced polarization (“IP”) surveys. Indian Mines and Vananda Explorations commissioned an IP on its Eden property. North-south cut lines were located 300 feet apart with 200 foot and 400 foot electrode spacing.

An area of elevated chargeability was measured approximately 600m west of Logan Copper's "Midway Showing." Jon G. Baird P.Eng., the author of the subject surveys assessment report concluded:

*The present induced polarization survey has indicated one area at least 400' in width by 2000' in length which exhibits above normal chargeability responses. These responses are interpreted as being due to disseminations of from 1% to 2% by volume of metallicly conducting mineralization. In the present geological environment it appears that there is a real possibility that the chargeability increases may be due to concentrations of sulfide mineralization. (ARIS2114)*

Noranda also conducted IP surveys on three grids surrounding Noranda's Central Geochemical anomaly. A series of high order anomalies were identified on the eastern grid overlying a lowland swamp along Guichon Creek. The largest consistent anomaly in the area measures 550 feet by 1200 feet with a general anomalies trend running for over 2km north south. It appears that no IP survey was conducted or data was not disclosed on the Noranda's Central Geochemical Anomaly itself. (ARIS 2282)

In the spring of 1971 Comet Mining conducted a ground magnetometer survey on the same points as its earlier geochemical survey. Results were mostly inconclusive. Recommendations included further geophysical and geochemical investigations. (ARIS 3184)

In 1973 Indian Mines, which changed its name to Azure Resources Ltd. ("Azure") in 1972, also performed a ground magnetometer survey on their Eden and Ezra claim groups. The Ezra claim group was located south of the Eden claim block. No significant anomalies were encountered indicating no significant changes in bedrock geology or structure. (ARIS 4321)

Following 1975 little work was recorded in the area and much of the ground described above was dropped. In 1982 Cominco Ltd. ("Cominco") conducted approximately 29.4km of Reconnaissance scale multiseparation, induced polarization survey work on their Forge property. Cominco's work identified a 400m by 850m anomaly open to the north along its long axis and coincident with Indian Mines 1969 IP anomaly (ARIS 10783).

Between the years of 2008 and 2012 Logan Copper conducted several work programs over the years, including diamond drilling, geological mapping, MMI soil survey, over a portion of the DAB Minfile and the

Midway Showing. The claims were transferred to Guy Delorme and the Author in the year 2013.

Between the years 2013 and present the author contracted out Laurence Sookochoff to conduct several Structural analysis's photo interpretations over various portions of the property, follow-up magnetometer surveys were completed on some of the Structural Analysis work programs. The Author and Guy Delorme completed a prospecting and geochemical survey in 2017 delineating new zones of mineralization from existing IP anomalies.

### 8.0 Regional Geology

The HVP Copper property is located on the southern Intermontane Belt of British Columbia on the southern extent of the Quesnel Trench. The central geological features of this region are the Late Triassic island-arc volcanic rocks of the Nicola Group, and Late Triassic mudstone, siltstone and shale clastic sedimentary rocks located to the east, and intruded granodioritic rocks of the Late Triassic to early Jurassic. The Nicola Group is a succession of Late Triassic island-arc volcanic rocks. The Nicola Group volcanic rocks form part of a 30km to 60km wide northwest-trending belt extending from southern B.C. into the southern Yukon. This belt is enclosed by older rocks and intruded by batholiths and smaller intrusive rocks. Major batholiths in the area of the Logan Copper Property include the Guichon Creek Batholith to the west, the Wild Horse Batholith to the east, and the Iron Mask Batholith to the north northeast.

The Guichon Batholith is a semi-concordant composite intrusive that is elliptical and elongated slightly west of north. A central, steeply plunging root or feeder zone is inferred under Highland Valley, and the major deposits lie around the projection of the feeder zone to the surface. The batholith has intruded and metamorphosed island-arc volcanic and associated sedimentary rocks of the Nicola Group, and a metamorphic halo up to 500 meters wide is developed adjacent to the contact. Rocks along the edge of the batholith are older and more mafic, and successive phases

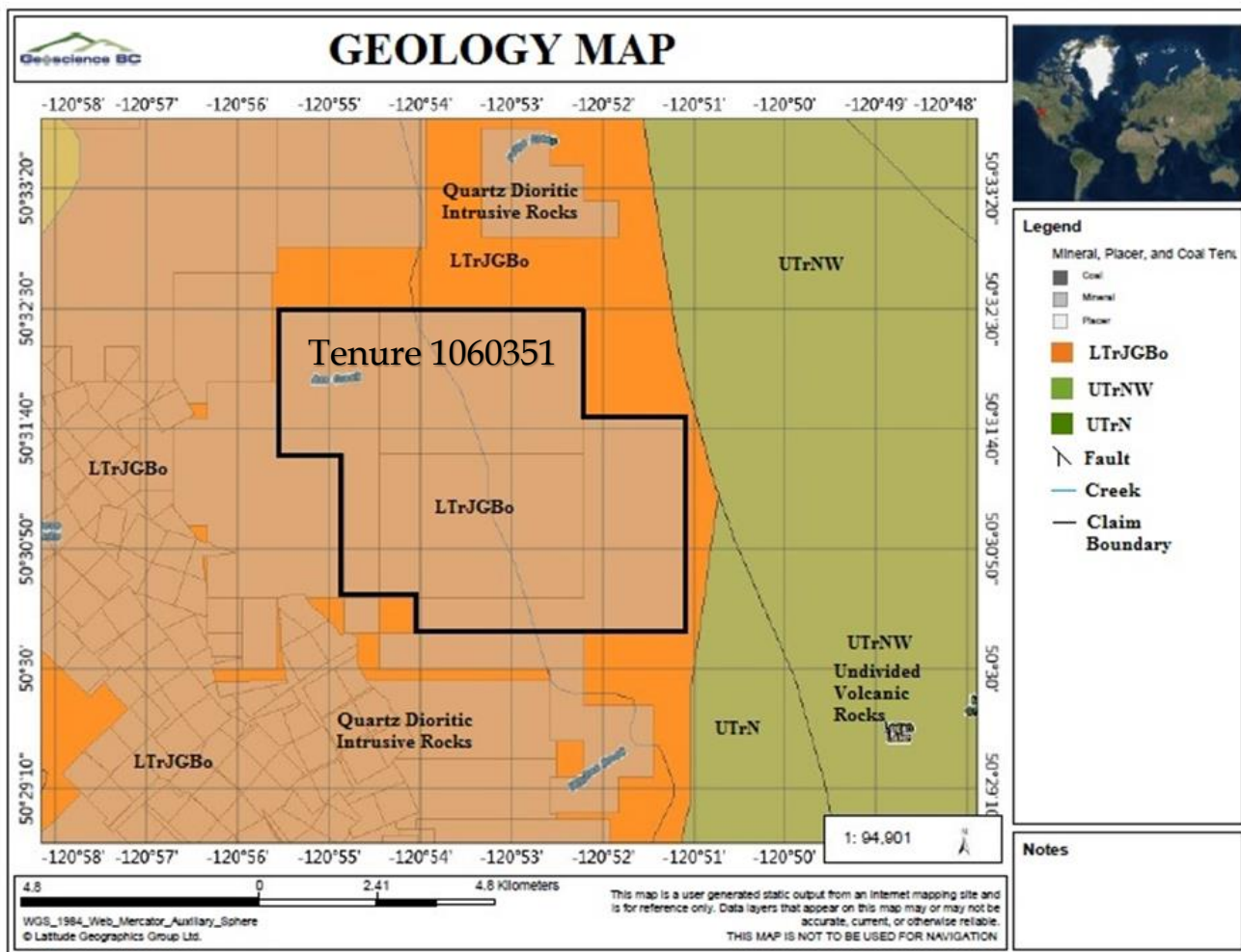
moving inward toward the core are younger and more felsic. Although contacts can be sharp, they are generally gradational and chilled contacts are not common. Variations in the batholith's geochemistry indicate local areas of assimilated country rock in the border zone and roof pendants in the intrusion. Outcrop areas have inclusions of amphibolite and "granitized" metamorphic rocks and compositional variations.

Two younger volcanic-dominated successions are important in the area. First, a northwest Trending belt of Cretaceous continental volcanic and sedimentary rocks of the Spences Bridge Group unconformably overlie both the Nicola Group country rock and intrusive rocks along the Southwest flank of the batholith. Distribution of the Spences Bridge Group rocks was locally controlled by reactivation of older faults that were important mineralization conduits in the Batholith, such as the Lornex fault. Second, continental volcanic and sedimentary rocks of the Tertiary Kamloops Group cover extensive areas of the batholith and also overlie Triassic and Jurassic rocks from north of Highland Valley to the Thompson River. These also form isolated Outliers and local intrusive centers south of the Highland Valley.

## 9.0 Property Geology

As indicated by the Geoscience geological maps, The HVP Claim Group is predominantly underlain by rocks of the Guichon Batholith with a predominance of granodioritic rocks of the Highland Valley Phase (LTrJGBo) and the quartz dioritic rocks of the Border phase. The rocks are in a north- northwesterly trending regional fault contact with the Western Volcanic Facies of the upper Triassic Nicola Group (uTrNW) in the north and in an intrusive contact in the south.

# 9.1 Geology Map



## 10.0 Photo's Work Program



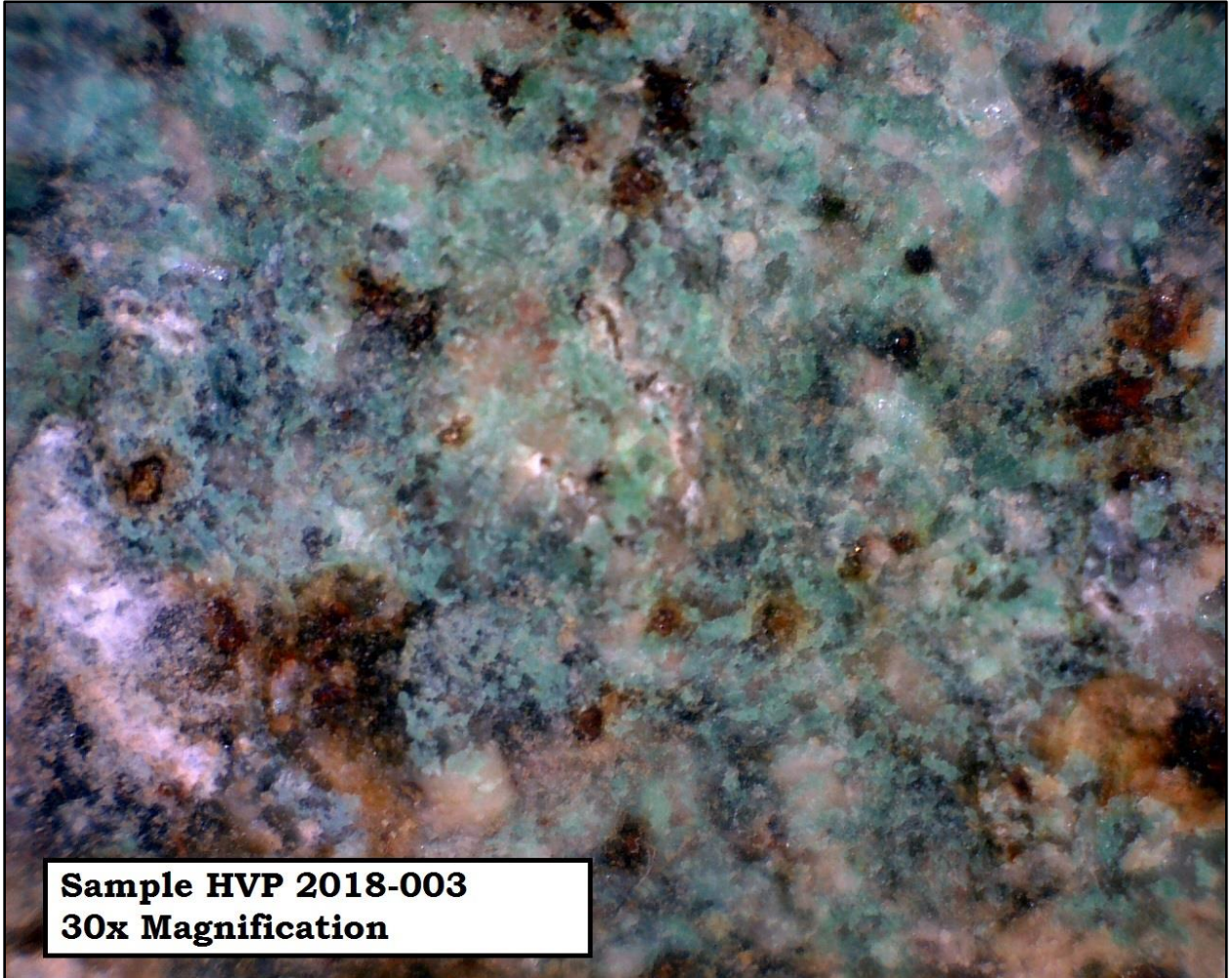


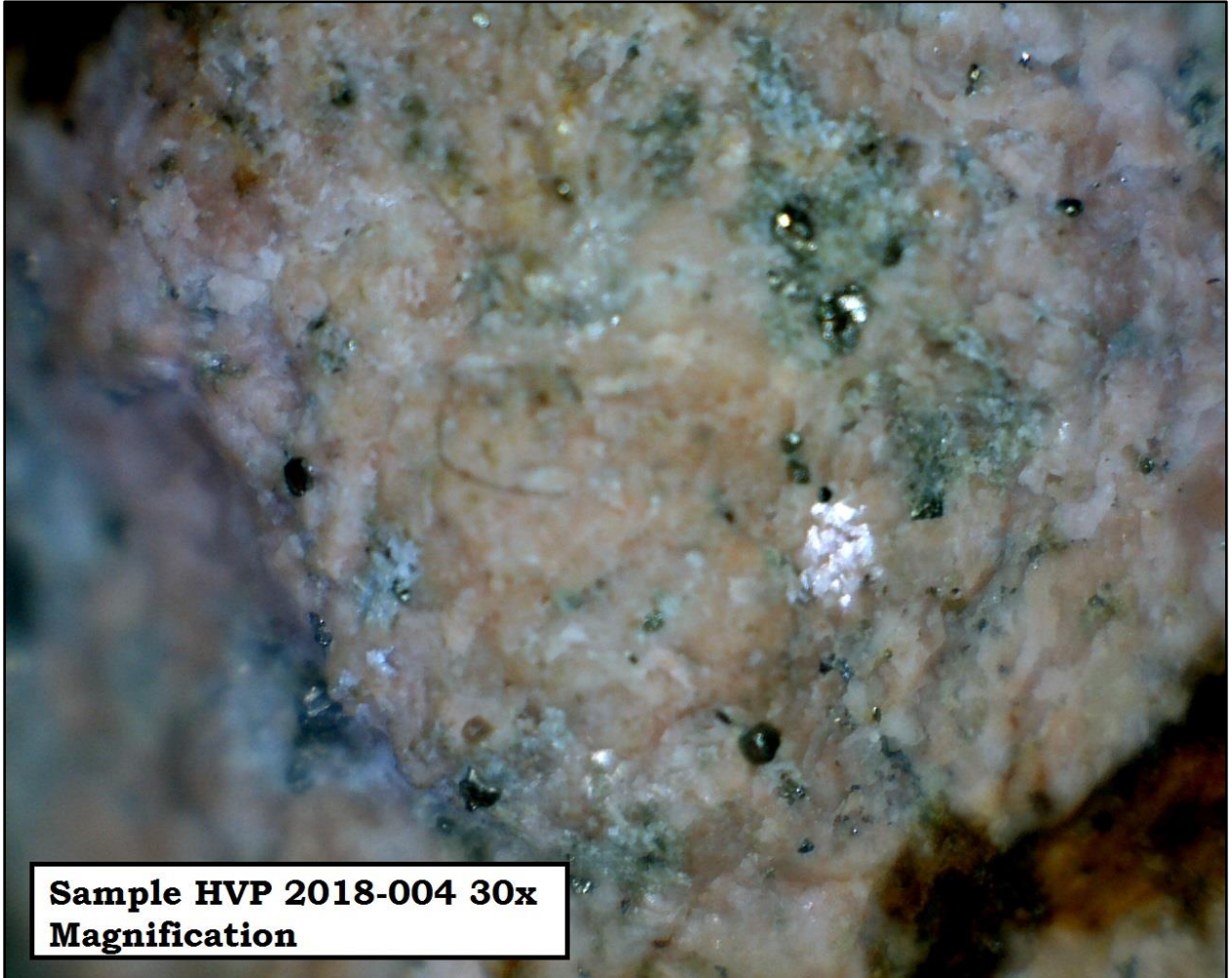


PHOTO LOOKING NORTH  
BY SAMPLE HVP-2018-  
001 SHOWING AREA OF  
NEW LOGGING

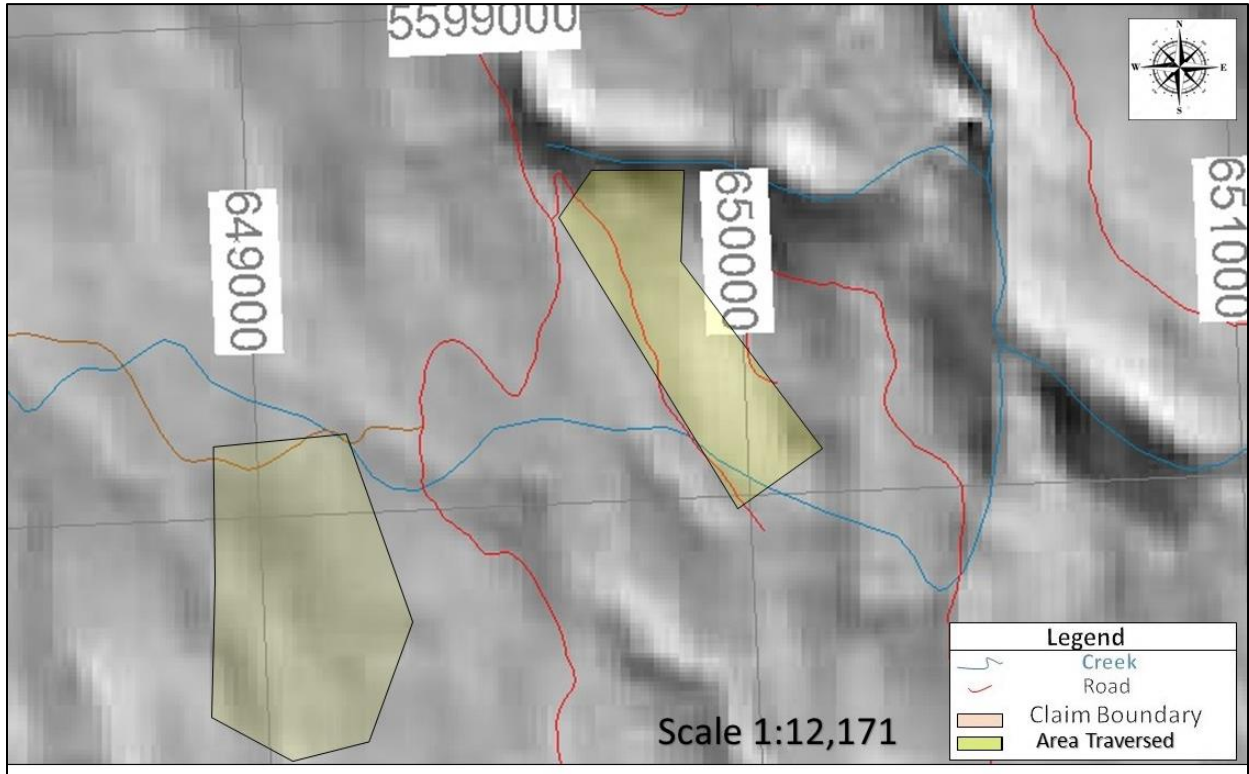


## 11.0 Microscopic Photo's



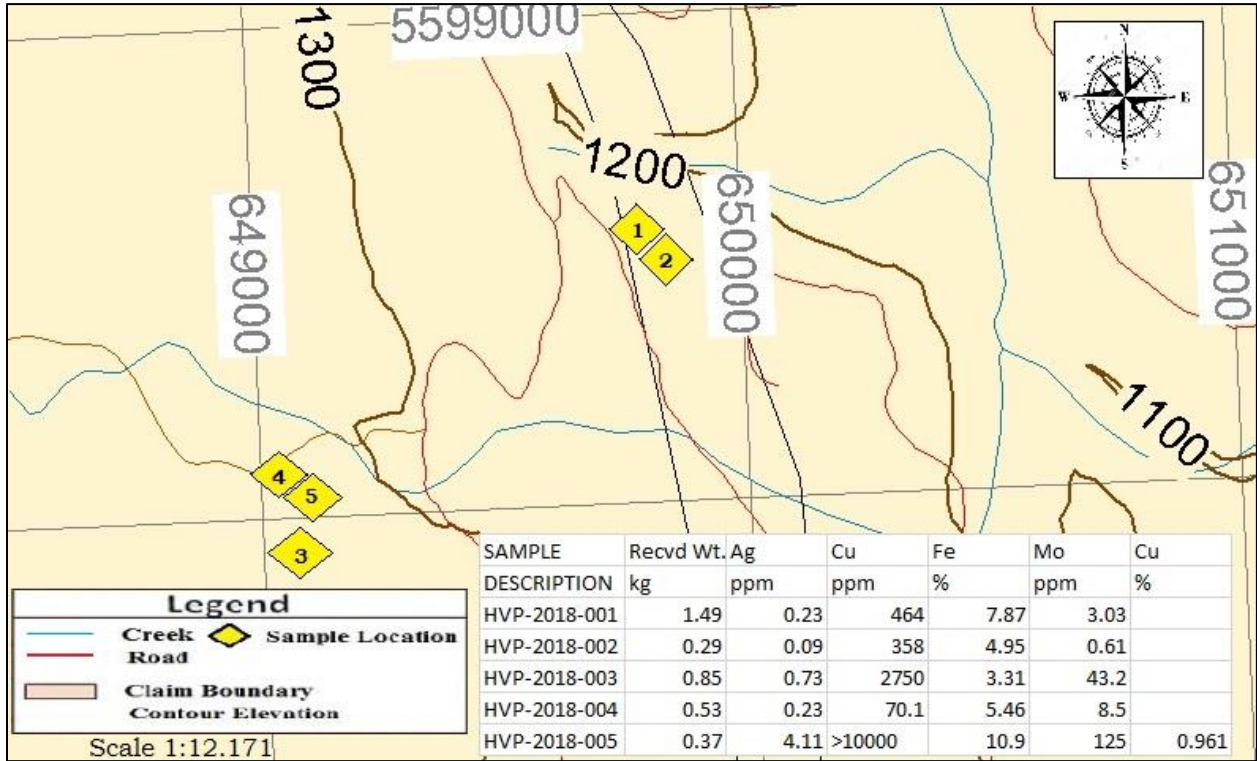


## 12.0 Traverse Map



### 13.0 Sample Location Map with Results

## Highland Valley Property



### 13.0 Sample Description

SAMPLE	DESCRIPTION	GPS NORTH	GPS EAST	Rock Description (Lithology/Mineralization)	Sample Type	Showing Type
HVP-2018-001		5598577	649697	Granodiorite (mn malachite on fractures)	Grab	New
HVP-2018-002		5598440	649746	Granodiorite (mn malachite on fractures)	Grab	New
HVP-2018-003		5597973	649075	Weathered Granodiorite (Kspar Pyrite Iron Oxide Minor Chal)	Grab	New
HVP-2018-004		5598000	649054	Weathered Granodiorite (Kspar Pyrite Iron Oxide Minor Chal)	Grab	New
HVP-2018-005		5598000	649054	Weathered Granodiorite (Kspar Pyrite Iron Oxide Minor Chal)	Grab	New

### 14.0 Assay Results



ALS Canada Ltd.  
 2103 Dollarton Hwy  
 North Vancouver BC V7H 0A7  
 Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218  
 www.alsglobal.com/geochemistry

To: **CHRISTOPHER DELORME**  
**340 LOGAN LANE AVE.**  
**MERRITT BC V1K 1C8**

**INVOICE NUMBER 4322438**

BILLING INFORMATION	
Certificate:	<b>KL18137435</b>
Sample Type:	<b>Rock</b>
Account:	<b>DELOCH</b>
Date:	<b>24-JUN-2018</b>
Project:	Highland Valley Project
P.O. No.:	
Quote:	
Terms:	<b>Due on Receipt</b> C2
Comments:	

QUANTITY	CODE	ANALYSED FOR	UNIT PRICE	TOTAL
		DESCRIPTION		
1	BAT-01	Administration Fee	33.10	33.10
5	PREP-31	Crush, Split, Pulverize	8.10	40.50
3.53	PREP-31	Weight Charge (kg) - Crush, Split, Pulverize	0.80	2.82
5	ME-MS41	Ultra Trace Aqua Regia ICP-MS	25.55	127.75
1	ME-OG46	Ore Grade Elements - AquaRegia	9.40	9.40
1	Cu-OG46	Ore Grade Cu - Aqua Regia	2.70	2.70

SUBTOTAL (CAD) \$ 216.27

R100938885 GST \$ 10.81

**TOTAL PAYABLE (CAD) \$ 227.08**

To: **CHRISTOPHER DELORME**  
 ATTN: CHRISTOPHER DELORME  
 340 LOGAN LANE AVE.  
 MERRITT BC V1K 1C8

Payment may be made by: Cheque or Bank Transfer

Beneficiary Name: ALS Canada Ltd.  
 Bank: Royal Bank of Canada  
 SWIFT: ROYCCAT2  
 Address: Vancouver, BC, CAN  
 Account: 003-00010-1001098  
 Please send payment info to accounting.canusa@alsglobal.com

Please Remit Payments To :  
**ALS Canada Ltd.**  
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 North Vancouver BC V7H 0A7



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To: CHRISTOPHER DELORME  
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Page: 1  
Total # Pages: 2 (A - D)  
Plus Appendix Pages  
Finalized Date: 24 - JUN - 2018  
This copy reported on  
25 - JUN - 2018  
Account: DELOCH

**CERTIFICATE KL18137435**

Project: Highland Valley Project  
  
This report is for 5 Rock samples submitted to our lab in Kamloops, BC, Canada on 11-JUN-2018.  
  
The following have access to data associated with this certificate:  
CHRISTOPHER DELORME

SAMPLE PREPARATION	
ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
CRU-QC	Crushing QC Test
PUL-QC	Pulverizing QC Test
LOG-22	Sample login - Rcd w/o BarCode
CRU-31	Fine crushing - 70% <2mm
SPL-21	Split sample - riffle splitter
PUL-31	Pulverize split to 85% <75 um

ANALYTICAL PROCEDURES		
ALS CODE	DESCRIPTION	INSTRUMENT
ME-OG46	Ore Grade Elements - AquaRegia	ICP-AES
Cu-OG46	Ore Grade Cu - Aqua Regia	ICP-AES
ME-MS41	Ultra Trace Aqua Regia ICP-MS	

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

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

Signature:   
Colin Ramshaw, Vancouver Laboratory Manager





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 North Vancouver BC V7H 0A7  
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Page: 2 - A  
 Total # Pages: 2 (A - D)  
 Plus Appendix Pages  
 Finalized Date: 24-JUN-2018  
 Account: DELOCH

Project: Highland Valley Project

**CERTIFICATE OF ANALYSIS KL18137435**

Sample Description	Method Analyte Units LOD	WEI-21	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41
		Recvd Wt. kg	Ag ppm	Al %	As ppm	Au ppm	B ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Ce ppm	Co ppm	Cr ppm	Cs ppm
		0.02	0.01	0.01	0.1	0.02	10	10	0.05	0.01	0.01	0.01	0.01	0.01	0.05	
HVP-2018-001		1.49	0.23	3.09	3.5	<0.02	<10	60	0.14	0.31	0.27	0.33	24.5	48.7	34	0.48
HVP-2018-002		0.29	0.09	1.95	1.2	<0.02	<10	60	0.23	0.05	0.92	0.06	13.05	24.2	21	0.51
HVP-2018-003		0.85	0.73	1.47	4.2	<0.02	<10	40	0.12	0.09	0.35	0.03	10.20	23.3	21	0.63
HVP-2018-004		0.53	0.23	0.90	14.0	<0.02	<10	80	0.13	0.19	0.35	0.02	12.00	49.1	17	0.20
HVP-2018-005		0.37	4.11	1.07	12.0	0.02	<10	30	0.12	0.31	0.34	0.04	9.35	8.4	18	0.77

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



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Page: 2 - B  
 Total # Pages: 2 (A - D)  
 Plus Appendix Pages  
 Finalized Date: 24-JUN-2018  
 Account: DELOCH

Project: Highland Valley Project

**CERTIFICATE OF ANALYSIS KL18137435**

Sample Description	Method Analyte Units LOD	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	
		Cu ppm	Fe %	Ga ppm	Ge ppm	Hf ppm	Hg ppm	In ppm	K %	La ppm	Li ppm	Mg %	Mn ppm	Mo ppm	Na %	Nb ppm
		0.2	0.01	0.05	0.05	0.02	0.01	0.005	0.01	0.2	0.1	0.01	5	0.05	0.01	0.05
HVP-2018-001		464	7.87	10.10	0.11	0.05	<0.01	0.052	0.32	7.3	15.0	1.73	1280	3.03	0.01	0.06
HVP-2018-002		358	4.95	7.39	0.12	0.07	<0.01	0.025	0.17	5.7	9.9	1.21	1580	0.61	0.05	0.08
HVP-2018-003		2750	3.31	6.35	0.11	0.10	0.01	0.148	0.11	4.6	7.1	1.15	524	43.2	0.04	0.10
HVP-2018-004		70.1	5.46	8.20	0.17	0.13	0.02	0.024	0.17	5.9	4.3	0.49	243	8.50	0.03	0.21
HVP-2018-005		>10000	10.90	8.40	0.16	0.11	0.03	2.63	0.22	5.2	3.4	0.60	258	125.0	0.04	0.20

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



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 Account: DELOCH

Project: Highland Valley Project

**CERTIFICATE OF ANALYSIS KL18137435**

Sample Description	Method Analyte Units LOD	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41
		Ni ppm	P ppm	Pb ppm	Rb ppm	Re ppm	S %	Sb ppm	Sc ppm	Se ppm	Sn ppm	Sr ppm	Ta ppm	Te ppm	Th ppm	Ti %
		0.2	10	0.2	0.1	0.001	0.01	0.05	0.1	0.2	0.2	0.2	0.01	0.01	0.2	0.005
HVP-2018-001		24.3	970	7.6	16.5	0.001	0.06	0.17	6.7	0.4	<0.2	5.4	<0.01	0.13	6.2	0.005
HVP-2018-002		20.5	920	3.3	7.0	<0.001	0.02	0.31	6.4	<0.2	0.2	23.0	<0.01	<0.01	4.2	0.041
HVP-2018-003		20.2	660	2.0	6.3	0.010	0.66	2.26	3.6	0.5	0.4	45.4	<0.01	0.23	4.8	0.045
HVP-2018-004		8.2	830	2.2	4.0	0.001	1.44	1.32	3.2	<0.2	0.8	26.7	<0.01	0.53	6.2	0.070
HVP-2018-005		16.7	580	6.5	5.6	0.017	1.79	9.71	4.0	3.8	0.8	164.0	<0.01	1.05	4.1	0.053

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



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Project: Highland Valley Project

**CERTIFICATE OF ANALYSIS KL18137435**

Sample Description	Method Analyte Units LOD	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	Cu-OG46
		Tl	U	V	W	Y	Zn	Zr	Cu
		ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
		0.02	0.05	1	0.05	0.05	2	0.5	0.001
HVP-2018-001		0.05	1.07	99	0.07	6.84	156	1.6	
HVP-2018-002		0.04	0.95	107	0.06	6.19	133	1.4	
HVP-2018-003		0.03	4.30	61	0.05	3.24	69	1.9	
HVP-2018-004		0.02	3.34	64	1.23	4.86	32	2.8	
HVP-2018-005		0.03	1.88	76	0.09	1.69	41	1.8	0.961

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



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**CERTIFICATE OF ANALYSIS KL18137435**

	<b>CERTIFICATE COMMENTS</b>								
Applies to Method:	<p style="text-align: center;"><b>ANALYTICAL COMMENTS</b></p> <p>Gold determinations by this method are semi-quantitative due to the small sample weight used (0.5g).                      ME-MS41</p>								
Applies to Method:	<p style="text-align: center;"><b>LABORATORY ADDRESSES</b></p> <p>Processed at ALS Kamloops located at 2953 Shuswap Drive, Kamloops, BC, Canada.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 33%;">CRU-31</td> <td style="width: 33%;">CRU-QC</td> <td style="width: 33%;">LOG-22</td> <td style="width: 15%;"></td> </tr> <tr> <td>PUL-QC</td> <td>SPL-21</td> <td>WEI-21</td> <td>PUL-31</td> </tr> </table>	CRU-31	CRU-QC	LOG-22		PUL-QC	SPL-21	WEI-21	PUL-31
CRU-31	CRU-QC	LOG-22							
PUL-QC	SPL-21	WEI-21	PUL-31						
Applies to Method:	<p>Processed at ALS Vancouver located at 2103 Dollarton Hwy, North Vancouver, BC, Canada.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 33%;">Cu-OG46</td> <td style="width: 33%;">ME-MS41</td> <td style="width: 33%;">ME-OG46</td> <td style="width: 15%;"></td> </tr> </table>	Cu-OG46	ME-MS41	ME-OG46					
Cu-OG46	ME-MS41	ME-OG46							

## 15.0 Conclusions and Recommendation's

The Program was successful in identifying new areas of mineralization during the prospecting program. New logging has been helpful in finding mineralization in the area. Samples 3/4/5 were close to the western edge of the forge IP anomaly a historic anomaly that has never been drilled. The amount of pyrite within the area sampled (3-5) may be due to the halo effect of the outer rim of IP anomalies since the author has not observed a substantial amount of pyrite in the host rocks in the general area of the DAB and Dansey minfiles. Sample 5 was the most weathered and unidentifiable sample of the rocks submitted. Almost 1% Cu content along with 4 grams of silver was obtained which was surprising to the author it is possible that chalcocite may be the cause of enriched copper value from this rock sample. The mineralization is disseminated in Samples (3, 4, and 5) Sample's 1 and 2 show minimal signs of apparent width and grade, the mineralization is fracture controlled. Further prospecting in the Vicinity the Forge Anomaly is recommended and follow up prospecting on any new logged areas.

## 16.0 Authors Qualification's

The author has spent over 20 years in the exploration industry. Work related experience has been over the past 20 years or more, staking mineral claims in the USA and Canada, conducting or working on the crew of geophysics with methods of VLF, Magnetometer, Induced Polarization and Self-Potential Survey's. Conducted numerous soil sampling surveys and also line cutting. I have also worked on over 15 different types of diamond drills, have experience in roadbuilding and heavy equipment operation, completed reclamation requirements on mineral properties, researching mineral properties, evaluating data, prospecting and report writing and preparation as well as permitting and first nation consultation. The Author has also worked on an operating mine from weighing in the trucks of ore to

final stages of shipping the ore.

## 17.0 References

- Sookochoff, Laurence, 33 pages, 2015, Geological Photo, 472.0 ha, Geophysical, Magnetic Ground 3.0km ARIS 35711, Structural Analysis.
  
- Sookochoff, Laurence, 28 pages, 2014, Geological 492.9ha, Structural Analysis, ARIS 34975.
  
- Garrow , Terry D , 80 pages , 2011 , Drilling Diamond Surface , 1 Hole NQ 284.6m , Geochemical , 287 Samples Multielement ,ARIS 32290
  
- Wikipedia , Highland Valley Copper Mine .
  
- Crosby, R.O.; Baird, Shannon James, 20 Pages, Report on Induced Polarization Survey on some CL Claims - Highland Valley Area 1969 ARIS 2114

## 18.0 Cost Statement

Report Maps			\$1,500
Prospecting	C+G Delorme \$400 per day	May 13th	\$800
Drop Off Samples	Kamloops Lab ALS	June 11th	\$125
Samples	ALS Laboratory NORTH VAN		\$227
Truck @.65km	300km		\$195
Microscopic Photo	x2 @\$20 per photo		\$40
Food Lodging			\$300
Misc Supplies	Batteries,Flagging,Bags		\$63
		Total	<b>\$3,250</b>