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Ministry of Energy, Mines & Petroleum Resources		Assassment Benort
BC Geological Survey		Title Page and Summary
TYPE OF REPORT [type of survey(s)]: Geological Geophysical	TOTAL COST:	\$ 11,572.00
AUTHOR(S): Laurence Sookochoff, PEng	SIGNATURE(S): Laurence S	ookochoff
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STATEMENT OF WORK - CASH PAYMENTS EVENT NUMBER(S)/DATE(S):	5533529 December 8, 2014	
PROPERTY NAME: Bertha		
CLAIM NAME(S) (on which the work was done): 580992		
COMMODITIES SOUGHT: Copper Gold MINERAL INVENTORY MINFILE NUMBER(S), IF KNOWN:		
MINING DIVISION: Kamloops	NTS/BCGS: 0921.046 0921.056 092	21.057
LATITUDE: <u>50</u> ° <u>30</u> <u>54</u> LONGITUDE: <u>120</u>	o 48 15 (at centre of work	s)
OWNER(S): 1) Guy Delorme	2) Christopher Delorme	
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Vancouver BC Canada V6C 1V5	Merritt BC Canada V1K 1P7	
OPERATOR(S) [who paid for the work]: 1) Guy Delorme	2) Christopher Delorme	
MAILING ADDRESS: 818 - 470 Granville Street	340 Logan Lake Avenue	
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PROPERTY GEOLOGY KEYWORDS (lithology, age, stratigraphy, structure, Upper Triassic, Nicola Volcanics, Western Volcanic Facies, Bas	alteration, mineralization, size and attitude): altic Volcanics, Central Volcanic Facies,	Andesitic Volcanics,
Undivided Volcanics. Late Triassic to Early Jurassic, Guichon Ba	atholith, Border Phase, Quartz Diorite. R	egional Fault.
On Tenure 580992 Northerly, northwesterly, westerly trending m	ajor structures, three cross-structures.	

REFERENCES TO PREVIOUS ASSESSMENT WORK AND ASSESSMENT REPORT NUMBERS: 02126, 29001, 34570, 34764, 35742

TYPE OF WORK IN THIS REPORT	EXTENT OF WORK (IN METRIC UNITS)	ON WHICH CLAIMS	PROJECT COSTS APPORTIONED (incl. support)
GEOLOGICAL (scale, area)			
Ground, mapping			
Photo interpretation	513 hectares	580992	\$ 7,500.00
GEOPHYSICAL (line-kilometres)			
Ground			( a=a aa
	3.6	580992	4,072.00
Electromagnetic		·	
Induced Polarization		·	
Radiometric			
Seismic			
Other			
Airborne			
GEOCHEMICAL (number of samples analysed for)			
Soll		·	
Silt		·	
Rock		·	
Other		-	
DRILLING (total metres; number of holes, size)			
Core			
Non-core			
RELATED TECHNICAL			
Sampling/assaying			
Petrographic			
Mineralographic			
Metallurgic			
PROSPECTING (scale, area)			
PREPARATORY / PHYSICAL			
Line/grid (kilometres)			
Topographic/Photogrammetric (scale, area)			
Legal surveys (scale, area)			
Road, local access (kilometres)/t	rail		
Trench (metres)			
Underground dev. (metres)			
Other			
		TOTAL COST:	\$ 11,572.00
			Print Form

Christopher & Guy Delorme

# **GUY & CHRISTOPHER DELORME**

(Owners & Operators)

# **GEOLOGICAL & GEOPHYSICAL ASSESSMENT REPORT**

(Event 5533529)

*on* **Tenure 580992** 

of the five claim Bertha 580992 Claim Group

**Kamloops Mining Divisions** 

BCGS Maps 092I.047/.056/.057

*work done from* **November 8, 2014 to November 13, 2015** 

*Centre of Work* **UTM Zone 10 (NAD 83) 5598186N, 655685E** 

> Author & Consultant Laurence Sookochoff, PEng Sookochoff Consultants Inc.

> > Submitted May 15, 2015

Amended October 5, 2015 & November 19, 2015

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# SUMMARY

The Bertha 580992 Claim Group is located in the Highland Valley of south central British Columbia within 14 kilometres of the Highland Valley Copper mine; one of the largest copper mining and concentrating operations in the world which, with the Lornex Mine, has measured and indicated ore reserves of 761 million tonnes of 0.408 per cent copper and 0.0072 molybdenum.

The Highland Valley copper/molybdenum deposit lies within the Guichon Creek batholith in the Bethsaida Phase of porphyritic quartz monzonite and granodiorite. The most prominent structural features are the north trending, west dipping Lornex fault and the east trending Highland Valley fault. The cross-structure and subsequent movement along the faults or other dynamic forces caused the fracture density and thus the mineral controls to the displaced mineral deposits. Fracture density was reported as apparently the most single factor in influencing ore grades of the Highland Valley mineral deposits

The five claim, 2568 hectare Bertha 580992 Claim Group predominantly covers a north-northwesterly trending band of upper Triassic Western Volcanic Facies of the Nicola Group (uTrNW). Along the eastern boundary, the Claim Group covers a portion of the Nicola Group Central Volcanic Facies (uTrNC) which is in a conformable contact with the Western Volcanic Facies. Along the western portion of the Claim Group, the Western Volcanic Facies is in a north-northwesterly fault contact with the Border Phase of the Guichon Batholith (LTrJGBo) and undivided volcanic rocks of the Nicola Group (uTrN).

Structural mineral controls related to structural preparedness to the deposition of mineral laden hydrothermal fluids is also a porphyritic geological feature at the periphery of an intrusive with fracture porphyry development in the intrusive and the host rock (Figure 8). Such was the case at the Copper Mountain deposit (*Minfile 092HSE001*) and at the Brenda past producer (*Minfile 092HNE047*) where the grade of the orebody was a function of fracture (vein) density and of the thickness and mineralogy of the filling material. Mineralization decreased outwardly from the most intensely fractured/mineralized rock and the centre of the main mineral zone

The magnetometer survey indicated a moderate 350 metre (east-west) by 150 metre (north-south) magnetic LO anomaly which is open to the south. The anomaly incorporates cross-structure "B" which is at the juncture of a northerly structure and a west-northwesterly structure. The two structures appear to enclose the anomaly to the east and the north with the maximum LO's generally correlating with the west-northwesterly structure.

Considering the claim and proximal geology, the magnetic LO anomaly could indicate a concealed mineralized zone hosted by volcanics and intrusives beneath a capping of typically lightly propylytically altered Nicola volcanics. The anomaly is indicated to broaden at the open southern limit of the magnetic survey which may suggest that the mineralized zone may ultimately extend south and west to a north-northwesterly structure approximately 700 metres west of the northerly trending structure "AB" (Figure 5).

Thus, in searching for surficial geological indicators of a potential concealed mineral resource, the three cross-structural locations on Tenure 580992 would be the most prospective areas for initial exploration with cross-structure "B" the priority. These geological indicators may be revealed as minerals and/or alteration products and would be subject to interpretation as potentially economic mineral indicators; the indicators in the area of cross-structure "B" should provide more definitive information.

# INTRODUCTION

Between November 2014 and November 2015, a structural analysis and a localized magnetometer survey were completed on Tenure 580992 of the five claim Bertha 580992 claim group (Property). The purpose of the program was to delineate potential structures which may be integral in geological controls to potentially economic mineral zones that may occur on Tenure 580992 or other claims of the Bertha property and to determine the effectiveness of the magnetic results in locating a potential mineral resource.

Information for this report was obtained from sources as cited under Selected References.



Figure 1. Location Map

# PROPERTY DESCRIPTION AND LOCATION

## Description

The Property is comprised of five contiguous claims covering an area of 2568.9421 hectares. Particulars are as follows:

				•
Tenure Number	<u>Type</u>	<u>Claim Name</u>	<u>Good Until</u>	<u>Area</u> (ha)
<u>580984</u>	Mineral	LOGAN	20150821	513.7014
<u>580992</u>	Mineral	LOGAN	20150821	513.7018
<u>580997</u>	Mineral	LOGAN	20150821	513.9286
<u>611543</u>	Mineral	LOGAN NORTH 10	20150821	513.7033
<u>611583</u>	Mineral	LOGAN 1	20150821	513.907

# *Table I.* Tenures of Bertha 580992 Claim Group

\*Upon the approval of the assessment work filing, Event Number 5533529.

#### Property Description and Location (cont'd)

#### Location

The Bertha 580992 Claim Group is located within BCGS Maps 092I.047/.056/.057 of the Kamloops Mining Division, 217 kilometres northeast of Vancouver, 45 kilometres north of Merritt, 38 kilometres southwest of Kamloops, and within 15 kilometres of the world-class producing Highland Valley Copper mine.

The centre of the work area on Tenure 580992 is at 5,598,182N, 653,503 (10) (NAD 83).

# ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

#### Access

From Logan Lake, the Bertha 580992 claim group can be accessed by traveling two kilometres east on Highway 97D (Meadow Creek Road) to the western boundary of Tenure 611583. Many secondary roads would provide access to most areas of the Property.

#### Climate

The local climate is typical of south central British Columbia. Annual temperatures range from  $35^{\circ}$ C to  $-40^{\circ}$ C. Negative temperatures can be typically expected between late October and late March. Annual precipitation ranges around an average of 30 cm.

#### Local Resources & Infrastructure

Merritt, or Kamloops, historic mining centres could be a source of experienced and reliable exploration and mining personnel and a supply for most mining related equipment. Kamloops is serviced daily by commercial airline and is a hub for road and rail transportation. Vancouver, a port city on the southwest corner of, and the largest city in the Province of British Columbia is four hours distant by road and less than one hour by air from Kamloops. Logan Lake, where many of the Highland Valley Copper Mine employees reside, has many facilities to accommodate any preliminary exploration crew.

## Physiography

The Property is located within the Thompson Plateau of Southern British Columbia. Topography is gentle to moderate, with elevations on Tenure 580992 ranging from 1,040m within a watercourse in the southwest to 1,232m along a northerly trending ridge in the north-central portion of the claim.

## WATER & POWER

There would be an ample water supply for the needs of any exploration program from the many lakes, rivers, or streams within the confines of the Property.

A high voltage power line trends southeasterly through the central portion of the Bertha 580992 Claim Group.

# HISTORY: BERTHA 580992 CLAIM GROUP AREA

The history on some of the more significant mineral MINFILE reported occurrences, prospects, and past producers peripheral to the Bertha 580992 Claim Group is reported as follows. The distance to the Minfile locations is relative to the Bertha 580992 Claim Group.

**BETHLEHEM** past producer (Porphyry Cu+/-Mo+-Au) MINFILE 092ISW001 Ten kilometres west

Production from 1963 to 1982 totalled 96,324,510 tonnes, yielding 99,826,893 grams silver, 1,279,833 grams gold, 398,112,545 kilograms copper and 851,048 kilograms molybdenum.

The Bethlehem concentrator milled Valley ore (092ISW012) until its closure in June of 1989.

*HIGHLAND VALLEY COPPER* producer (Porphyry Cu+/-Mo+-Au)

#### MINFILE 092ISW012

Fourteen kilometres west

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

On the south side of the valley was the Lornex mine which started mining in 1972. In 1981, the Lornex concentrator had been expanded to become one of the largest in the industry.

On the north side was Bethlehem Copper (092ISE001) which started mining in 1963. In 1981, this operation was absorbed by Cominco who already owned the Valley orebody (092ISW012) located west of the Lornex pit on the south side of the valley. Mining of the original Bethlehem Copper pits ceased in 1982.

Production from the Lornex mine (092ISW045) was combined with the Valley operations in 1987.

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 (092ISE013) became uneconomical.

Lornex Mining Corporation Ltd. was wound up at the end of 1988 with the result that Rio Algom Limited, Teck Corporation and Highmont Mining Company obtained direct participation in the cash flow from the partnership.

In 1995, with Explore B.C. Program support, Highland Valley Copper carried out 197 line kilometres of high-powered induced polarization surveys for very deep penetration, and drilled 1701 metres in 4 holes. This work was done on the Lornex SW Extension, Roscoe Lake and JA zones. No anomalies of merit were detected in Lornex SW Extension, and Roscoe Lake gave only limited encouragement. IP work on the JA zone detected an anomaly extending to the south, well beyond the limits of known mineralization, and another anomaly 2000 by 1500 metres in size at the east end of the grid. Both anomalies warrant drill testing (Explore B.C. Program 95/96 - M80).

At the end of 1996, mine plans called for another 200 metres in depth in the Valley pit to the 2008. In addition, the partnership may consider mining the remaining 120 million tonnes grading 0.33 per cent copper estimated to exist in the Lornex pit (Information Circular 1997-1, page 8).

Highland Valley Copper suspended mining on May 15, 1999; they resumed August 30, 1999.

In September 2005, Highland Valley announced that mine life would be extended by five years to 2013. Very late in the year, Teck Cominco also announced that it is considering building a modern hydrometallurgical refinery on site.

# Figure 2. Claims Location

(Base Map from Google Earth)



# Figure 3. Claims Map (Base map from Google Earth)



# Highland Valley Copper producer (cont'd)

Most ore comes from the Valley pit, augmented by a small amount from the Lornex pit. Following a successful 300,000 tonne bulk sample test, the Highmont East pit, closed since the mid-1980s, was re-opened in the fall of 2005 to take advantage of higher molybdenum prices. In addition, exploration drilling was conducted nearby in the Highmont South area and results are being evaluated.

# **BERTHA - MOLLY** past producer (Stockwork)

MINFILE 092ISE012

Four kilometres southeast

In 1942, George Campbell did some surface-stripping on a copper showing, about 457 metres west of an old shaft. Production from this occurrence, known as the Lost group, was 31 tonnes, yielding 218 grams of silver and 626 kilograms of copper.

*RHYOLITE* showing (Porphyry Cu +/- Mo +/- Au)

MINFILE 092ISE021

Two kilometres southeast

*Trenches, 1.25 kilometres north-northwest of Homfray Lake, 8.5 kilometres south-southeast from Logan Lake (Assessment Report 18048).* 

*GETTY SOUTH* developed prospect (Porphyry Cu +/- Mo +/- Au)

MINFILE 09INW043

Eleven kilometres west

The showings were staked prior to 1903 as the Albatross group and were developed by trenches and two short adits. The claims were restaked in 1915 as the Canopus group but no exploration work was reported.

Trojan Exploration acquired the property in 1955 and became Trojan Consolidated Mines Ltd. in 1956. Work from 1955 to 1958 included geophysical surveys, a shaft to 49 metres with 268.5 metres of crosscutting and surface diamond drilling of 8934 metres in 44 holes. The property was under option to Newmont Mining Corporation in 1959 and 3 holes totalling 458 metres were completed. By August 1959, Rio Tinto Canadian Exploration Limited optioned the property and conducted an IP survey and diamond drilled one hole for 103.6 metres.

Trojan resumed operation in 1960 and from 1961 to 1962, diamond drilling was done underground in 14 holes totalling 598.3 metres and on surface 6 holes were completed totalling 580 metres. South Seas Mining Limited purchased 57 claims from Trojan in 1962 and excavated 408.4 metres of crosscuts and drifts in 1963. The Mitsui Mining and Smelting Company, Limited optioned the property in 1964 and 4033.8 metres of diamond drilling was done in 23 holes. South Seas extended the underground workings during 1966-67 by 787.9 metres.

Phelps Dodge Corporation optioned the property in 1968 and carried out 358.7 metres of underground development, 1242.9 metres of surface diamond drilling, 291.4 metres of underground diamond drilling and an IP survey. The option was dropped later in 1968. Pechiney Development Limited optioned the property and from 1969 to 1970 drilled 2945.4 metres in 18 diamond-drill holes and 588.2 metres in 8 percussion-drill holes.

Getty South developed prospect (cont'd)

Leemac Mines Ltd. optioned a 70 per cent interest from South Seas in 1972 and drilled 50 percussion-drill holes totalling 1708.3 metres. The option expired in 1974.

The property changed hands several more times in the 1970s and 1980s with the only work reported being a 1982 magnetometer survey conducted by TRV Minerals Corporation covering this zone and the Krain (Getty North) deposit (092INE038).

Getty Copper Corporation acquired the claims at some point prior to 1995 and resumed exploration on the Getty South in 1996. In 1996, Getty drilled 13 diamond-drill holes totalling 3236 metres. During 1997, the company conducted a 1500 metre bedrock trenching program which was reported to have encountered extensive oxidized mineralization of excellent grade, along with smaller exposures of fresh, high grade, copper sulphide mineralization.

More than 15,000 metres of diamond drilling and 1775 metres of underground development by previous operators has determined an initial deposit of 36 million tonnes of open-pittable oxide and sulphide mineralization grading 0.47 per cent copper.

Included in this deposit is 719,500 tonnes grading 1.41 per cent copper in three zones previously defined within the underground workings. The reserves were estimated by Gower, Thompson and Associates in 1992, and later confirmed by independent consultants Watts, Griffis and McOuat in 1996 (Northern Miner - March 10, 1997 (insert) and Getty Copper Corp. website, http://www.gettycopper.com/projects.html).

Please refer also to the Getty North deposit (092INE038), located 3 kilometres north, for further details and related bibliographic references.

## **GEOLOGY: REGIONAL**

The Bertha 580992 Claim Group 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 intrusive granodioritic rocks of the Late Triassic to early Jurassic. The Nicola Group is a succession of Late Triassic island-arc volcanic rock. 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 Creek batholith is a large, composite intrusion with a surface area of about 1,000 square kilometers. A cluster of nine major porphyry copper deposits lie within a 15 square kilometer zone in the center of the batholith. The Bertha 580992 Claim Group is situated partly on the eastern contact of the Guichon Creek Batholith and predominantly on the Nicola volcanics within 14 kilometres east of the Highland Valley Copper Mine.

The 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.

# Geology: Regional (cont'd)

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 batholiths 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.

# **GEOLOGY: BERTHA 580992 CLAIM GROUP AREA**

The geology of some of the more significant mineral MINFILE reported occurrences, prospects, and past producers peripheral to the Bertha 580992 Claim Group is reported as follows. The distance to the Minfile locations is relative to Tenure 580992 of the Bertha 580992 Claim Group.

## BETHLEHEM past producer (Porphyry Cu+/-Mo+-Au)

MINFILE 092ISW001

Ten kilometres west

The Bethlehem property lies within the Early Jurassic-Late Triassic Guichon Creek batholith and straddles an intrusive contact where younger Bethlehem phase rocks form an irregular embayment in older Guichon variety rocks. The Bethlehem phase is medium-grained granodiorite to quartz diorite which ranges from equigranular to hornblende-biotite porphyry. The Guichon variety is medium-grained granodiorite. Igneous breccias are postulated to have been forcefully emplaced. Clasts up to 20 centimetres in diameter are subrounded and sit in a generally compact, but sometimes vuggy matrix. The granodiorites and breccias are intruded by north trending, steeply dipping dykes which are compositionally similar to the enclosing rocks; contacts are chilled. Most of the dykes are dacite porphyry and range in width from less than 1 metre to 60 metres.

The Bethlehem ore deposits (East Jersey (092ISE002), Huestis (092ISE004), Iona (092ISE006), and Snowstorm (092ISE005) are controlled by north trending faults and are localized in zones of closely-spaced fractures. Mineralization is concentrated in breccia bodies, faults and highly fractured areas. The Jersey fault cuts through the centre of the Jersey pit.

Hydrothermal alteration is restricted to the immediate area of the ore zones. The distribution of secondary biotite defines an inner potassic zone, sericite with kaolinite and montmorillonite define an intermediate phyllic zone, and epidote defines a peripheral propylitic zone. There is an outer halo of chloritized mafic minerals. Calcite, zeolite and quartz veining and vug-filling is common.

# Bethlehem past producer (cont'd)

Metallic mineral zoning is very similar to alteration patterns. Bornite and chalcopyrite occur in the hydrothermal biotite zone, specularite in the epidote zone and minor pyrite in the outer halo. Molybdenite, chalcocite and magnetite occur in minor amounts. Malachite, azurite, chrysocolla, cuprite, native copper, hematite, goethite and manganese oxides occur to shallow depths. An age date from a sample of a mixture of magmatic and hydrothermal biotite from the Iona ore zone (092ISE006) returned 199 Ma +/- 8 Ma (Canadian Institute of Mining and Metallurgy Special Volume 15).

BETHLEHEM COPPER-SPUD LAKE showing (Porphyry Cu+/-Mo+-Au)

MINFILE 092ISE008

## Three kilometres southwest

The property lies in the Lower Jurassic Guichon Creek batholith. The Spud Lake area is underlain primarily by medium-grained Guichon variety quartz diorite and granodiorite. This unit is cut by north trending dacite porphyry dykes up to 60 metres wide. To the west, at the Bethlehem mine (092ISE001), Guichon rocks have been intruded by Bethlehem phase granodiorite. Mineralization is controlled by intrusive contacts, north trending faults and closely spaced fractures.

Alteration is generally weak and consists of chlorite, epidote and sericite. Minor fault zones have sericite-kaolinite gouges. Quartz, calcite and zeolite (laumontite, heulandite) veining occurs sporadically. Oxidation consists of malachite and limonite.

**FORD** past producer (Porphyry Cu +/- Mo +/- Au) MINFILE 092ISE009 One hundred metres south

The Ford occurrence occupies the area north of Meadow Creek, which is underlain by dark grey to purplish red porphyritic amygdaloidal flows of the Upper Triassic Nicola Group. The lavas are typically amygdaloidal and vary in composition from olivine basalt to augite andesitic basalt. Alteration consists of albitization of plagioclase and propylitization of pyroxene to epidote, zoisite and calcite, with or without chlorite. The rock is locally shot through with sericite and epidote. Flows averaging 1.8 metres thick strike 050 degrees and dip 30 degrees northeast.

The original open cuts (pre-1915) expose copper carbonate ore with occasional flecks of bornite and chalcocite along fracture planes in amygdaloidal flows. The adit follows a mineralized shear zone striking 040 degrees and intersects an east trending set of faults.

## HIGHLAND VALLEY COPPER producer (Porphyry Cu+/-Mo+-Au)

# MINFILE 092ISW012

Fourteen kilometres west

The Valley deposit lies within the Late Triassic to Early Jurassic Guichon Creek batholith and is hosted by Bethsaida phase porphyritic quartz monzonite and granodiorite.

Feldspar porphyry and quartz feldspar porphyry dykes 0.6 to 35 metres wide dip steeply eastward in the western and central areas, and northward in the southern area of the deposit. These dykes are cut by mineralized fractures and quartz veinlets, and have been dated at 204 Ma +/- 4 Ma.



(Base Map from MapPlace)



# **GEOLOGY MAP LEGEND**

#### Mivb

Miocene-unnamed basaltic volcanic rocks

#### EKav

Eocene-Kamloops Group undivided volcanic rocks

#### EPrb

Eocene-Penticton Group andesitic volcanic rocks

#### Upper Triassic-Nicola Group uTrNW

#### Western Volcanic Facies undivided volcanic rocks uTrNC

Central Volcanic Facies undivided volcanic rocks

#### uTrNE

Eastern Volcanic Facies basaltic volcanic rocks uTrN undivided volcanic rocks Late Triassic to Early Jurassic LTrJGB

#### **GUICHON CREEK BATHOLITH**

LTrJGBe – Bethlehem Phase granodioritic intrusive rocks LTrJGB – Bethsaida Phase quartz monzonitic intrusive rocks LTrJGH – Highland Valley Phase granodioritic intrusive rocks LTrJGG – Gump Lake Phase granodioritic intrusive rocks LTrJGBo – Border Phase quartz dioritic intrusive rocks

# Highland Valley Copper producer (cont'd)

The Bethsaida granodiorite is also intruded by aplite dykes up to 30 centimetres wide, tan-coloured felsite dykes up to 4.5 metres wide, and three types of lamprophyre dykes (spessartite, hornblende vogesite, vogesite).

The most prominent structural features are the north trending, west dipping Lornex fault and the east trending Highland Valley fault. Faults and fractures in the deposit comprise four main sets. Quartz veinlets are subparallel to two of the earlier formed fault and fracture sets.

Silicic, potassic, phyllic, argillic and propylitic alteration are intimately associated. Stockworks of quartz veinlets 1 to 2 centimetres in width are common. Vuggy veinlets have envelopes of medium-grained sericite and/or potassic feldspar, and contain minor amounts of sericite, plagioclase, potassium feldspar, calcite, hematite, bornite, chalcopyrite, molybdenite, digenite and covellite.

These veinlets are moderately abundant within the 0.3 per cent copper isopleth. An area of welldeveloped barren quartz veinlets, generally 0.5 to 1.3 millimetres wide, without alteration envelopes, occurs in the southeastern part of the deposit.

In the west-central part of the deposit, potassium feldspar is associated with vein sericite in some replacement zones, as veinlet envelopes along fractures, and disseminated in quartz veinlets. Hydrothermal biotite occurs in small amounts. Flaky sericite and quartz, both as replacement zones and as envelopes around quartz veinlets, constitute the most common type of alteration associated with copper mineralization.

Strong phyllic alteration coincides with the 0.5 per cent copper isopleth. Phyllic alteration is closely associated with pervasive argillization, which is strongest where fractures are most closely-spaced. Feldspars are altered to sericite, kaolinite, quartz and calcite. The phyllic-argillic zone grades outward to a peripheral zone of weak to moderate propylitization, characterized by clay, sericite, epidote, clinozoisite and calcite replacing plagioclase, and chlorite and epidote replacing biotite. The age of hydrothermal alteration is approximately 191 Ma.

At the Valley deposit, gypsum is interpreted to be secondary and post-ore. It is commonly fibrous and white to orange but locally it forms large platy crystals or may be massive. Anhydrite, which is also present, provides indirect evidence for the secondary nature of the gypsum. It is apparently the same age as and associated with sericitic and potassic alteration. Quartz-gypsum veins and quartz-potash feldspar veins in which gypsum fills interstices provide more direct evidence for its secondary nature. Gypsum is believed to have formed at the expense of anhydrite which was deposited from the ore-forming fluids. Gypsum veins are common in the lower portion of the orebody (Open File 1991-15).

Sulphides occur chiefly as disseminations in quartz veinlets, and in phyllic (bornite) and potassic (chalcopyrite) alteration zones. Mineralization includes bornite and chalcopyrite, with minor digenite, covellite, pyrite, pyrrhotite, molybdenite, sphalerite and galena. The oxide zone averages 4.5 metres in thickness, and contains limonite, malachite, pyrolusite, digenite, native copper, and tenorite(?)

**BERTHA - MOLLY** past producer (Stockwork)

MINFILE 092ISE012 Four kilometres southeast

The Dupont Lake area is underlain mainly by Upper Triassic Nicola Group intermediate volcanics and derivatives.

Approximately 8 kilometres to the west, Nicola Group rocks are in contact with the Lower Jurassic Guichon Creek batholith. Quartz diorite outcrops southwest of Dupont Lake.

The Bertha-Molly showing is hosted by purplish amygdaloidal andesites with intercalated reddish tuffs. These rocks are strongly fractured and chloritized. The original shaft was sunk at a point where patches of cuprite occur in fractures. Small shipments were made.

*RHYOLITE* showing (Porphyry Cu +/- Mo +/- Au)

MINFILE 092ISE021

Two kilometres southeast

The area straddles a northwest trending contact between two volcanic sequences of the Upper Triassic Nicola Group. To the west are plagioclase, plagioclase-augite intermediate pyroclastic and epiclastic breccia, conglomerate, tuff, sandstone, local shale and augite porphyry bodies. The central portion to the east is underlain by aphanitic pillowed mafic flows. The contact between these two sequences hosts the Rhyolite occurrence.

The Rhyolite showing is underlain by grey, green or black amygdaloidal basalt of the Upper Triassic Nicola Group. Varicoloured calcite amygdules occur within an aphanitic groundmass. Several beds of maroon to green volcaniclastic breccia occur within the basalt and contain maroon, subrounded to subangular clasts ranging up to 30 by 15 centimetres. Two northwest trending, light grey-green, aphanitic, siliceous and pyritic felsic dykes, 3 to 4 metres wide, also occur.

*GETTY SOUTH* developed prospect (Porphyry Cu +/- Mo +/- Au)

# MINFILE 09INW043

# Eleven kilometres west

The Getty South deposit lies on the southern boundary of an extensive area of post-mineral cover consisting of continental volcanic and interbedded sedimentary rocks of the Eocene Kamloops Group which overlie plutonic rocks of the Late Triassic-Early Jurassic Guichon Creek batholith.

The deposit occurs within a broad northwest trending zone which is host to a number of mineralized porphyry systems including the Getty North deposit (092INE038), 3 kilometres to the north, and the Bethlehem mine (092ISE001, approximately 5 kilometres south). Typically, mineralization occurs within quartz diorites of the Highland Valley phase (Guichon variety) of the Guichon Creek batholith, and within younger anastomosing dikes and small stocks.

The dikes and stocks resemble quartz diorites of the Bethlehem phase of the batholith. The Kamloops Group rocks cover the northern half of the mineralized zone, and have protected an older oxidized cap as much as 100 metres thick.

*SA* showing (Stockwork, Disseminated) MINFILE 092ISE167 Three kilometres south

The property lies within the Upper Triassic Nicola Group approximately 3 kilometres east of the Lower Jurassic Guichon Creek batholith. Locally Tertiary volcanic flows and minor intrusives overlie the Triassic rocks. The area is underlain by a conformable succession of epiclastic rocks with subordinate interlayered lavas. The sedimentary sequence is best exposed at the main showing where the succession is about 90 metres thick. This unit is comprised of 50 to 100 metres of volcanic conglomerate composed of subangular to rounded red to green clasts of flow rocks cemented by a friable sandy matrix.

Weakly bedded, coarse-grained fossiliferous limestone overlies the conglomerate and is again overlain by at least 60 metres of conglomerate grading upward into massive volcanic breccia. An upper unit of poorly bedded, well sorted greywacke caps the succession. Amygdaloidal basalt and andesite outcrop to the east and south where they are interlayered with the epiclastic rocks. Vesicles are filled with carbonate, zeolite and chalcocite.

These rocks were subsequently intruded by Gump Lake phase granodiorite to quartz monzonite.

The eastern portion of the property is underlain by hornfels, hornfelsed schists and granitic gneisses which have a rough north trending foliation of variable dip. The metamorphosed rocks are intruded by leucocratic, fine to medium-grained granitic dykes which increase in abundance to the west until the hornfelsic units grade into granitic units. The southwestern part of the property is underlain by fine to medium-grained diorite or granodiorite and coarse grey granite.

# **GEOLOGY: BERTHA 580992 CLAIM GROUP**

As indicated by the BC government supported MapPlace geological map, the Claim Group predominantly covers a north-northwesterly trending band of upper Triassic Western Volcanic Facies of the Nicola Group (uTrNW). Along the eastern boundary the Claim Group covers a portion of the Nicola Group Central Volcanic Facies (uTrNC) which is in a conformable contact with the Western Volcanic Facies. Along the western portion of the Claim Group, the Western Volcanic Facies is in a north-northwesterly fault contact with the Border Phase of the Guichon Batholith (LTrJGBo) and undivided volcanic rocks of the Nicola Group (uTrN).

## **MINERALIZATION: BERTHA 580992 CLAIM GROUP AREA**

The mineralization on some of the more significant mineral MINFILE reported occurrences, prospects, and past producers peripheral to the Bertha 580992 Claim Group is reported as follows. The distance to the Minfile locations is relative to the Bertha 580992 Claim Group.

**BETHLEHEM** past producer (Porphyry Cu+/-Mo+-Au) MINFILE 092ISW001

Ten kilometres west

The Jersey orebody hosts disseminated mineralization and occurs in an area of relatively evenly distributed and variously oriented pervasive fracturing. Irregular, discontinuous quartz veins also hosts mineralization. Production from the Jersey pit began in 1964 and from the Jersey pit extension in 1977.

# Bethlehem past producer (cont'd)

Reserves for the Jersey deposit are 22.9 million tonnes of 0.40 per cent copper. Total reserves for the Bethlehem deposits (Jersey, East Jersey and Iona) are 43.5 million tonnes (plus 6 million tonnes oxide) grading 0.40 per cent copper, minor molybdenum and 0.013 grams per tonne gold (CIM Special Volume 46, page 175).

# BETHLEHEM COPPER-SPUD LAKE showing (Porphyry Cu+/-Mo+-Au)

## MINFILE 092ISE008

Three kilometres southwest

Mineralization is spotty and consists of disseminations and veinlets of chalcopyrite, bornite and pyrite. Specularite and magnetite are also present in small amounts.

*FORD* past producer (Porphyry Cu +/- Mo +/- Au) MINFILE 092ISE009

One hundred metres south

The original open cuts (pre-1915) expose copper carbonate ore with occasional flecks of bornite and chalcocite along fracture planes in amygdaloidal flows. The adit follows a mineralized shear zone striking 040 degrees and intersects an east trending set of faults

Chalcocite(?), bornite and some malachite occur in amygdules and associated veins in flow tops. Gangue minerals include chlorite, sericite, clinozoisite, zeolite and calcite. Some mineralization also occurs in calcite veins, calcite-epidote-sericite veins, sericite-zoisite veins and chlorite veins. Carbonate-zeolite veins are barren.

Drill core assays range from 0.22 to 2.8 per cent copper over an interval of less than one metre (Minister of Mines Annual Report 1973)

# HIGHLAND VALLEY COPPER producer (Porphyry Cu+/-Mo+-Au)

MINFILE 092ISW012

Fourteen kilometres west

Highland Valley Copper operates two distinct mines, the Valley mine and the Lornex mine, and between the two has measured and indicated ore reserves of 761 million tonnes of 0.408 per cent copper and 0.0072 molybdenum. The ore reserves of each mine are: Valley mine - 627 million tonnes at 0.418 per cent copper and 0.0056 per cent molybdenum; Lornex mine - 135 million tonnes at 0.364 per cent copper and 0.0144 per cent molybdenum.

## **BERTHA - MOLLY** past producer (Stockwork)

MINFILE 092ISE012 Four kilometres southeast

Recent development has exposed malachite, azurite, chalcopyrite, cuprite and pyrite hosted by shears and fracture-fillings in vesicular volcanics and red tuffs. Mineralization is structurally controlled with an apparent north trend. A common alteration is calcite and epidote with silicification becoming stronger at depth.

**RHYOLITE** showing (Porphyry Cu +/- Mo +/- Au) MINFILE 092ISE021 Two kilometres southeast

# Mineralization: Bertha 611523 Claim Group Area (cont'd)

Rhyolite showing (cont'd)

Mineralization occurs in amygdaloidal basalt near the flow-volcaniclastic contact and is related to narrow quartz-carbonate veinlets within shears. Several old trenches indicate the shear zone strikes approximately 335 to 345 degrees and dips steeply west. Pyrite is present with minor chalcopyrite, azurite, malachite and sphalerite. Rock samples from this zone assayed up to 0.377 per cent copper, 0.218 per cent zinc and are weakly anomalous in gold and silver values.

*GETTY SOUTH* developed prospect (Porphyry Cu +/- Mo +/- Au)

#### MINFILE 09INW043 Eleven kilometres west

This mineralized zone is characterized by numerous subparallel northwest trending porphyry dikes, as well as by prominent fracture-related, but non-pervasive, chlorite-epidote-chalcopyrite +/- pyrite +/- bornite hydrothermal vein and fracture selvage assemblages. Smaller zones of pervasive chlorite-clay alteration, some containing strong chalcopyrite mineralization, occur frequently at the margins of porphyry dikes.

The Getty South deposit, previously known as the Trojan or South Seas deposit, occurs within a breccia zone just east of a major, north striking regional fault. The breccia-hosted deposit is elliptical in shape and measures 575 by 550 metres. The deposit is hosted in Guichon variety quartz diorite, intruded by dacite and quartz diorite porphyritic dikes, and is cut by widespread faulting. The breccia consists of fragments of quartz diorite and feldspar porphyry set in a matrix of finely broken rock, specular hematite, tourmaline, brown biotite, quartz and calcite. Chalcopyrite occurs as stringers and coarse blebs in the breccia matrix. Bornite, native copper, malachite, chrysocolla, azurite and tenorite have also been reported.

SA showing (Stockwork, Disseminated) MINFILE 092ISE167 Three kilometres south

On the SA showing, highly fractured, malachite stained, rusty weathering limestone(?) is exposed for 45.7 metres along the east side of an old logging access road. Stringers and disseminated grains of chalcocite, bornite and rarely chalcopyrite are visible on freshly broken surfaces. Much of the rock is strongly oxidized to a soft, rusty gossan locally rich in malachite.

# EXPLORATION PROGRAM

# **Structural Analysis**

The structural analysis was performed on a DEM image Hillshade map of Tenure 580992 by viewing of the map and marking the lineaments as indicated structures thereon. A total of 60 lineaments were marked (*Figure 5*), compiled into a 10 degree class interval, and plotted as a rose diagram as indicated on *Figure 6*.



Figure 5. Indicated lineaments & cross-structures on Tenure 580992

Figure 6. Rose Diagram from lineaments of Tenure 580992 (Figure 5)



Event 5533529

#### Structural Analysis (cont'd)

# **STATISTICS**

(for Figure 6)

Axial (non-polar) data No. of Data = 60 Sector angle = 8° Scale: tick interval = 3% [1.8 data] Maximum = 18.3% [11 data] Mean Resultant dir'n = 148-328 [Approx. 95% Confidence interval = ±22.3°] (valid only for unimodal data)

Mean Resultant dir'n = 147.8 - 327.8Circ.Median = 147.0 - 327.0Circ.Mean Dev.about median =  $29.7^{\circ}$ Circ. Variance = 0.20Circular Std.Dev. =  $38.23^{\circ}$ Circ. Dispersion = 2.24Circ.Std Error = 0.1934Circ.Skewness = 2.66 Circ.Kurtosis = -8.94 kappa = 0.90 (von Mises concentration param. estimate)

Resultant length = 24.63 Mean Resultant length = 0.4106 'Mean' Moments: Cbar = 0.1773; Sbar = -0.3703 'Full' trig. sums: SumCos = 10.6386; Sbar = -22.2186

Mean resultant of doubled angles = 0.2431 Mean direction of doubled angles = 154 (Usage references: Mardia & Jupp, 'Directional Statistics', 1999, Wiley; Fisher, 'Statistical Analysis of Circular Data', 1993, Cambridge University Press) Note: The 95% confidence calculation uses Fisher's (1993) 'large-sample method'

*Figure 7.* Cross structural locations (*Figure 5*) on Google Earth (*Base Map: Google Earth*)



#### Structural Analysis (cont'd)

# Table II. Approximate UTM locations of cross-structures

Location	UTM East	UTM North	Elevation
Α	656,086	5,599,035	1,310
В	656,146	5,597,281	1,204
С	655,201	5,597,604	1,214

UTM Zone 10U (NAD 83)

# Exploration Program (cont'd)

# Magnetometer Survey

#### a) Instrumentation

During November 2015 a localized survey was completed on Tenure 580992 by Christopher and Guy Delorme. Although the survey was limited in scope, two persons were required in the field for safety reasons as requirements by the Workers Compensation Board.

A Fluxgate MF 2 Model magnetometer was used for the survey. Diurnal variation was corrected by taking repeated readings at a base point throughout the day. Magnetometer values reported are total intensity and relative.

The field readings were forwarded to the author for the creation of maps, interpretation, and reporting.

#### b) Theory

Only two commonly occurring minerals are strongly magnetic, magnetite and pyrrhotite; magnetic surveys are therefore used to detect the presence of these minerals in varying concentrations. Magnetics is also useful is a reconnaissance tool for mapping geologic lithology and structure since different rock types have different background amounts of magnetite and/or pyrrhotite.

#### c) Survey Procedure

A base line was established from 655,800E 5,597,200N northward for two more main grid stations at 5,597,300N. and 5,597,400N. From each of three main stations, magnetometer readings were taken along eastern grid lines at 25 metre intervals to 656,600E. The grid line stations were located by a GPS instrument. Kilometres of survey completed was 3.6 The field data is reported in Appendix I.

Table III. Magnetometer Survey Grid Line Da
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UTM 10 (NAD 83)

North	East (from)	East (to)	Line kilometres
5,597.400	655,800	656,600	0.8
5,597.300	655,800	656,600	0.8
5,597,200	655,800	656,600	0.8

# Magnetometer Survey (cont'd)

# *Figure 8.* Conceptual model showing potential for a deep-seated porphyry Cu-Au resource



(Map from Corbett, 2007)

Figure 9. Magnetometer Grid Index Map (Base from MapPlace)



#### Magnetometer Survey (cont'd)



# Figure 9. Magnetometer Survey Grid & Raw Data





## Magnetometer Survey (cont'd)



# Figure 11. Magnetometer Survey Colour Contour Map

#### d) Data Reduction

The field results were initially input to an Exel spreadsheet whereupon a Surfer 31 program was utilized to create maps from the data results. The field results are included within as Appendix I.

#### e) Results

A moderate magnetometer LO with dimensions of 300 metres east-west and 150 metres north south and open and broadening to the south.

# **INTERPRETATION and CONCLUSIONS**

Three cross-structures, as indicated from primary west-northwesterly and northerly trending primary structures, were delineated from the structural analysis of Tenure 580992. The two directional trends correspond to the structural trends at the Highland Valley Copper and the Lornex mineral deposits hosted by the Guichon batholith, where the cross-structure and subsequent movement along the faults or other dynamic forces caused the fracture density and thus the mineral controls to the displaced mineral deposits. Fracture density was reported as apparently the most single factor in influencing ore grades of the Highland Valley mineral deposits.

The breccia hosting the Getty South (*Minfile 092INW043*) deposit which occurs within a breccia zone of the Guichon batholith just east of a major, north striking regional fault could be a mineral controlling breccia zone created by a cross-structure with the near surface mineralization indicative of a larger zone of porphyritic mineralization at depth.

#### Interpretation and Conclusions (cont'd)

The fracture density as structural preparedness to mineral controls is also a porphyritic geological feature at the periphery of an intrusive with porphyry development in the intrusive and the host rock *(Figure 8).* Such was the case at the Brenda past producer where the grade of the orebody was a function of fracture (vein) density and of the thickness and mineralogy of the filling material. Mineralization decreased outwardly from the most intensely fractured/mineralized rock and the centre of the main mineral zone (*Minfile 092HNE047*).

Thus the surficial exposure of a cross- structure related to a potential porphyritic mineral resource at depth may reveal geological indications to the resource.

Tenure 580992 covers Nicola volcanics some two kilometres east of the Guichon batholith. Stocks or other related intrusive, occur within the volcanics with some exposed at the surface and others indicated in the intrusive related variable alteration of the volcanics. Surficial mineralization, presumably derived from an underlying source is perhaps the strongest indicator of potential porphyry related mineralization.

Some of the Minfile reported locations of mineralization and mineral controls in the volcanics such as at the Minfile:

- Bertha-Molly where mineralization is controlled by northerly trending structures
- Rhyolite where mineralization is hosted and controlled in northerly trending structures.

The approximate UTM locations of the three intersections are shown in Table II.

The magnetometer survey indicated a moderate 350 metre (east-west) by 150 metre (north-south) magnetic LO anomaly which is open to the south. The anomaly incorporates cross-structure "B" which is at the juncture of the "AB" northerly structure and the "BC" west-northwesterly structure (aforementioned easterly structure). The two structures appear to enclose the anomaly to the east and the north with the maximum LO's generally correlating with the "BC" structure.

There could be differing interpretations to the cause of the anomaly, however, considering the claim and proximal geology, the magnetic LO anomaly could indicate a concealed mineralized zone hosted by volcanics and intrusives beneath a capping of typically lightly propylytically altered Nicola volcanics. The anomaly is indicated to broaden at the open southern limit of the magnetic survey which may suggest that the mineralized zone may ultimately extend south and west to a northnorthwesterly structure approximately 700 metres west of structure "AB" (Figure 5).

Thus, in searching for surficial geological indicators of a potential concealed mineral resource, the three cross-structural locations on Tenure 580992 would be the most prospective areas for initial exploration with cross-structure "B" the priority. These geological indicators may be revealed as minerals and/or alteration products and would be subject to interpretation as potentially economic mineral indicators; the indicators in the area of cross-structure "B" should provide more definitive information.

Respectfully submitted Sookochoff Consultants Inc.



Laurence Sookochoff, PEng

#### SELECTED REFERENCES

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Corbett, G., 2007. Controls to low-sulphidation epithermal Au-Ag mineralization. Unpublished paper,

**Garrow, T.** – 2010 Diamond Drilling Assessment Report on the Dansey Project for Highland North Inc. January 20, 2012. AR 32,980.

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Marshak, S., Mitra, G. – Basic Methods of Structural Geology. pp 258-259, 264\*. Prentice-Hall Inc. 1988

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092ISW001 – BETHLEHEM 092ISW008 – BETHLEHEM COPPER-SPUD LAKE . 092ISE009 – FORD 092ISW011 – RHYOLITE 092ISE012 – BERTHA-MOLLY 092INW043 – GETTY SOUTH 092INE167 – SA

**Sookochoff, L.** – Geological Assessment Report for Guy and Christopher Delorme on Tenure 581003 of the Bertha 581003 Claim Group. April 24, 2014.

**Sookochoff, L.** – Geological Assessment Report for Guy and Christopher Delorme on Tenure 580989 of the Bertha 580989 Claim Group. October 2, 2013.

# STATEMENT OF COSTS

The geological and geophysical work on Tenure 580992 was done from November 8, 2014 to November 13, 2015 to the value as follows:

# **Structural Analysis:**

Laurence Sookochoff, P Eng. 4 days @ \$ 1,000.00/day	\$ 4,000.00
Magnetometer Survey	
Christopher Delorme & Guy Delorme	
November 12-13, 2015	
Four man days @ \$300.00 per day	1,200.00
Truck rental, kilometre charge, fuel, room & board,	
mag rental	1,122.00
Maps	750.00
Report	4,500.00
	\$ 11,572.00

# CERTIFICATE

I, Laurence Sookochoff, of the City of Vancouver, in the Province of British Columbia, do hereby certify:

That I am a Consulting Geologist and principal of Sookochoff Consultants Inc. with an address at 120 125A-1030 Denman Street, Vancouver, BC V6G 2M6.

I, Laurence Sookochoff, further certify that:

1) I am a graduate of the University of British Columbia (1966) and hold a B.Sc. degree in Geology.

2) I have been practicing my profession for the past forty-nine years.

3) I am registered and in good standing with the Association of Professional Engineers and Geoscientists of British Columbia.

4) The information for this report is based on information as itemized in the Selected Reference section of this report and from work the author has performed in the Bertha Property area.

5) I have no interest in the Bertha 580992 Claim Group as described herein.



Laurence Sookochoff, P. Eng.

Appendix I

# Magnetometer Data

April 19, 2015

Bertha 580992 Claim Group

Christopher & Guy Delorme

Event 5533529

		Line		Line	
Line 5597400	Reading	5597300	Reading	5597200	Reading
Station					
656600E	620	656600E	600	656600E	620
656575E	620	656575E	600	656575E	620
656550E	620	656550E	620	656550E	600
656525E	600	656525E	620	656525E	600
656500E	620	656500E	600	656500E	600
656475E	600	656475E	580	656475E	620
656450E	620	656450E	580	656450E	600
656425E	600	656425E	580	656425E	640
656400E	580	656400E	580	656400E	620
656375E	580	656375E	560	656375E	620
656350E	580	656350E	580	656350E	600
656325E	600	656325E	580	656325E	580
656300E	600	656300E	600	656300E	580
656275E	600	656275E	580	656275E	580
656250E	580	656250E	580	656250E	560
656225E	580	656225E	580	656225E	580
656200E	580	656200E	560	656200E	580
656175E	580	656175E	560	656175E	560
656150E	600	656150E	540	656150E	580
656125E	600	656125E	560	656125E	580
656100E	600	656100E	560	656100E	560
656075E	580	656075E	540	656075E	540
656050E	580	656050E	560	656050E	540
656025E	580	656025E	560	656025E	560
656000E	580	656000E	540	656000E	560
655975E	580	655975E	540	655975E	560
655950E	560	655950E	560	655950E	560
655925E	580	655925E	580	655925E	560
655900E	580	655900E	560	655900E	560
655875E	600	655875E	560	655875E	580
655850E	580	655850E	580	655850E	580
655825E	600	655825E	580	655825E	560
655800E	600	655800E	580	655800E	580

#### Bertha 580992 Claim Group

Christopher & Guy Delorme

Battery 90 percent 60 kilo gamma 10 k setting Fluxgate Mf-2 model tenure 580992 total lines 3.6km Snow covered