Location/Identification

MINFILE Number: 082ESE034
National Mineral Inventory Number: 082E2 Cu1
Name(s): **MOTHER LODE (L.704)**
MOTHER LODE MINE, CROWN SILVER (L.789), TEN BROCK (L.1221), PRIMROSE FRACTION (L.927), ST. LAWRENCE (L.1255), STANDARD (L.1463), DEADWOOD CAMP, SUNSET, WOODGREEN, GREYHOUND, MOTHERLODE

Status: Past Producer
Mining Division: Greenwood
Mining Method Underground, Open Pit
Electoral District: Boundary-Similkameen
Regions:
Resource District: Selkirk Natural Resource District
BCGS Map: 082E017
NTS Map: 082E02E
UTM Zone: 11 (NAD 83)
Latitude: 49 06 43 N
Northing: 5441322
Longitude: 118 43 05 W
Easting: 374622
Elevation: 1957 metres
Location Accuracy: Within 500M
Comments: Open pit, located 250 metres north of Deadwood Creek and 3.5 kilometres west-northwest of Greenwood (Property File - Fredericks, 1951). The Mother Lode pit is 600 metres northwest of the Sunset (L.788), (082ESE035) and 1700 metres northwest of the Greyhound (L.1014), (082ESE050).

Mineral Occurrence

Commodities: Copper, Gold, Silver

Minerals
Significant: Chalcopyrite, Magnetite, Pyrite
Associated: Garnet, Epidote, Actinolite, Magnetite, Calcite, Quartz, Specularite, Tremolite
Alteration: Hematite, Chlorite
Alteration Type: Skarn
Mineralization Age: Unknown

Deposit
Character: Disseminated, Podiform, Massive
Classification: Skarn
Type: K01: Cu skarn, K04: Au skarn, K03: Fe skarn
Shape: Irregular

Host Rock

Dominant Host Rock: Sedimentary

Stratigraphic Age	Group	Formation	Igneous/Metamorphic/Other
Triassic	Brooklyn	Unnamed/Unknown Formation	------
Upper Paleozoic	Knob Hill	Undefined Formation	------
Cretaceous	------	------	Wallace Creek Batholith

Isotopic Age	Dating Method	Material Dated
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Lithology: Sharpstone Conglomerate, Limestone, Chert, Greenstone, Calcareous Siltstone, Skarn, Granodiorite Dike, Feldspar Porphyry Dike, Pulaskite, Granodiorite
Comments: Host rocks are Brooklyn Group.

Geological Setting

Tectonic Belt: Omineca
Physiographic Area: Okanagan Highland

Terrane: Plutonic Rocks, Quesnel

Metamorphic Type: Regional

Grade: Greenschist

Inventory

Ore Zone: MOTHER LODE

Category: Combined

Quantity: 407,288 tonnes

Year: 1984

Report On: Y

NI 43-101: N

Commodity	Grade
Silver	4.4500 grams per tonne
Gold	0.5100 grams per tonne
Copper	0.6500 per cent

Comments: Proven and probable; includes the Greyhound deposit (082ESE050).

Reference: Royex Sturgex Mining Ltd., Information Circular 27/04/84.

Summary Production

		Metric		Imperial	
Mined:		4,245,875	tonnes	4,680,276	tons
Milled:		584,211	tonnes	643,982	tons
Recovery	Silver	21,405,520	grams	688,203	ounces
	Gold	5,390,837	grams	173,319	ounces
	Copper	34,915,323	kilograms	76,975,111	pounds

Capsule Geology

The property comprising the Mother Lode (Lot 704) and Sunset (Lot 788) (082ESE035) mines is centered four kilometres northwest of Greenwood at the elevation of 1050 metres. Access is by good gravel road which connects the property to the Mother Lode Creek road and Greenwood. The Greyhound (082ESE050) claim lies 1700 metres to the southeast.

Copper and iron-skarn mineralization occurs at several locations in the Greenwood mining camp. The skarn deposits are associated with the Upper Paleozoic Knob Hill Group and the unconformably overlying rocks of the Triassic Brooklyn Group. The Tertiary Penticton and Marron groups consisting of volcaniclastic and flow rocks unconformably overlie the Knob Hill and Brooklyn rocks.

The Knob Hill Group consists of massive chert, greenstone and amphibolite with minor pods and thin, widely scattered beds of limestone and argillite. The Brooklyn Group includes thick units of sharpstone conglomerate and limestone, as well as thinner beds of siltstone, sandstone and calcareous chert-pebble conglomerate. The sharpstone conglomerate contains angular fragments of chert and minor limestone, greenstone and jasper clasts set in a fine-grained chert, calcite and chlorite-rich matrix. The conglomerate is massive near its base and commonly bedded near its top, with numerous interbeds of sandstone, shale, siltstone and minor limestone. The conglomerate is overlain by the Brooklyn limestone which reaches 350 metres in thickness and comprises limestone and minor siltstone.

Regionally the Knob Hill Group trends east to southeast and dips moderately north, whereas the Brooklyn Group strikes north to northeast and dips steeply east. The rocks are broadly folded and have been affected by low grade regional metamorphism. They are truncated to the north by granodiorite of the Cretaceous Wallace Creek batholith, the southern margin of which has irregular apophyses and satellite intrusions that have thermally metamorphosed the country rocks. The major intrusive event is represented by the Cretaceous Greenwood stock and Wallace Creek batholith which are considered to be part of the Nelson Intrusions and genetically related to economic skarn development in the Greenwood camp (Paper 1989-3).

Earlier intrusive activity comprise small diorite, microdiorite, quartz feldspar porphyry and gabbro bodies that show varying degrees of alteration, but are not apparently associated with economic skarn mineralization. Tertiary intrusions include many dykes, sills and irregular bodies of monzodiorite and other alkalic rocks.

The formation of skarn in the district appears to be preferentially controlled by the contact between Brooklyn limestone and underlying sharpstone and siltstone beds. The largest and most productive precious metal enriched (PME) copper skarns are in the lower part of the Brooklyn Formation,

either in the transition zone between the lower sharpstone and the Brooklyn limestone, or within the Brooklyn limestone itself.

The copper skarn mineralization at the Mother Lode pit occurs in the same member of the Brooklyn Formation as the skarns at the Phoenix mine (082ESE020). The protolith is believed to be mainly sharpstone conglomerate, calcareous siltstone and limestone. The formation, which strikes northwards and dips steeply east, also includes a lower sharpstone conglomerate overlain by skarn-altered siltstone and lenses of Brooklyn limestone and an overlying fine-grained sharpstone. These stratified rocks are cut by slightly skarn-altered granodiorite and feldspar porphyry (quartz syenite) dykes from several centimetres to 30 metres wide. These dykes are found at all levels of the mine from surface down to the 152 metre level.

Skarn alteration of limestone and sharpstone conglomerate is fairly extensive. The limestone is mostly altered to garnet skarn, but banded garnet-epidote-actinolite skarn is also common. In the sharpstone conglomerate, the original chert pebbles are replaced by recrystallized strained quartz, while the volcanic fragments are partially replaced by epidote, garnet, magnetite and minor sulphides.

The ore at the Mother Lode mine consists of many lenses, pods and irregular zones of chalcopyrite, pyrite and magnetite as grains, aggregates and thread-like streaks and lenses, distributed in a gangue composed of varying proportions of actinolite, garnet, epidote, calcite and quartz. Chalcopyrite also occurs in larger and purer masses. Magnetite occurs in irregular masses and lenses of considerable size.

The Mother Lode orebody is flanked by limestone on the northwest and by a northerly trending normal fault on the southeast. The ore has a warped configuration trending northeast and then east at the north end of the body and steepening in inclination from 45 degrees southeast to nearly vertical at depth.

The main mineralized zone is semi-circular and outcropped for a length of 365 metres with a width of approximately 60 metres. It has been explored by underground workings to a depth of 152 metres, but most of the mining was above the 121 metre level. The general strike of the zone is 030 degrees with 45 to 70 degree southeast dips.

The Mother Lode claim was staked in 1891 and Crown granted in 1899. Exploration began with an adit crosscut in 1896 followed by an expanded program of shaft sinking and completion of a smelter at Greenwood in 1901. Underground development to 1902 totalled 2360 metres of tunnelling. In 1908 the shaft was deepened to 150 metres forming the basis for mining on four levels. Operations continued until 1918 when the mine and smelter closed. The Sunset claim was at first developed separately from Mother Lode. The Mother Lode was renewed by Woodgreen Copper Mines Limited in 1956 as an open pit mine supported by a 900-tonne per day mill. Production continued in 1959 at a reduced rate of 450 tonnes per day. This was augmented somewhat in 1960 with ore from the Sunset mine. Operations closed in 1962 and the concentrator was removed from the mine site.

Ore reserves at the Mother Lode mine are based on estimated tonnage remaining in pillars and sills in the old underground workings and unmined mineralization between the 120-metre level and chert basement. Estimated ore reserves for the Mother Lode are 300,000 tonnes, grading 0.5 gram per tonne gold, 4.5 grams per tonne silver and 0.65 per cent copper.

Combined (proven and probable) reserves at the Mother Lode and Greyhound are 407,288 tonnes grading 0.65 per cent copper, 0.51 gram per tonne gold and 4.44 grams per tonne silver (Royex Sturgex Mining Ltd., Information Circular 27/04/84).

A grab sample assayed 2.6 per cent copper, 3.6 grams per tonne gold, and 18 grams per tonne silver (EMPR Bulletin 101, Appendix 4B).

In 1996, YGC Resources drilled 7 holes, totalling 814 metres on the property.

During 2008 through 2012, Grizzly Discoveries Inc. completed programs of rock and soil sampling, geological mapping, ground geophysical surveys and diamond drilling on the area as the Motherlode portion of the Greenwood property. In 2009, a sample (09RHP063) from a gossanous skarn boulder located immediately north of the Motherlode pit assayed 6.65 grams per tonne gold, 21.7 grams per tonne silver and 0.361 per cent copper (Dufresne, M. (2013-11-25): Technical Report for the Greenwood Gold Project).

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Date Coded:	1985/07/24	**Coded By:**	BC Geological Survey (BCGS)	**Field Check:**	N
Date Revised:	2020/07/22	**Revised By:**	Karl A. Flower (KAF)	**Field Check:**	N