Location/Identification

MINFILE Number: 082ESW011
National Mineral Inventory Number: 082E5 Au5
Name(s): **TWIN LAKES**
SUMMIT, B & E., JUNIPER, HUNTSMAN, MILL, ALICE, PEAK, B.E., PARVENU, GOLD STANDARD, EUREKA, MOUNTAIN LION, BLUE BIRD
Status: Past Producer
Mining Division: Osoyoos
Mining Method Underground
Electoral District: Yale-Lillooet
Regions: British Columbia
Resource District: Okanagan Shuswap Forest District
BCGS Map: 082E022
NTS Map: 082E05E
UTM Zone: 11 (NAD 83)
Latitude: 49 16 14 N
Northing: 5461011
Longitude: 119 41 19 W
Easting: 304426
Elevation: 1385 metres
Location Accuracy: Within 500M
Comments: The approximate location of the Summit shaft, near the centre of the Twin Lakes claims (Property File - Brenna Resources Ltd. (1987): Prospectus). See also Grandoro (082ESW010) and Orofino Mountain (082ESW113).

Mineral Occurrence

Commodities: Gold, Silver, Lead, Zinc

Minerals
Significant: Gold, Pyrite, Galena, Sphalerite
Significant Comments: Sphalerite is rare.
Associated: Quartz, Pyrolusite
Associated Comments: Manganese oxide found locally in the footwall of the Alice vein.
Alteration: Pyrite, Chlorite
Alteration Type: Pyrite, Oxidation, Chloritic
Mineralization Age: Unknown

Deposit
Character: Vein, Concordant, Disseminated, Massive
Classification: Epithermal, Epigenetic, Hydrothermal
Type: I05: Polymetallic veins Ag-Pb-Zn+/-Au, I01: Au-quartz veins
Shape: Irregular **Modifier:** Faulted, Folded
Dimension: 80x25x2 metres
Comments: The Summit vein has been developed over 80 metres strike length and 25 metres depth. Extensively warped and fractured veins range from 0.3 to 2.0 metres width.

Host Rock

Dominant Host Rock: Metavolcanic

Stratigraphic Age	Group	Formation	Igneous/Metamorphic/Other
Paleozoic-Mesozoic	Undefined Group	Old Tom	------
Paleozoic-Mesozoic	Undefined Group	Shoemaker	------

Isotopic Age	Dating Method	Material Dated
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Lithology: Greenstone, Diorite, Chert, Tuff
Comments: The Shoemaker and Old Tom formations are Carboniferous to Triassic age.

Geological Setting

Tectonic Belt: Intermontane
Physiographic Area: Thompson Plateau

Terrane: Okanagan

Metamorphic Type: Regional **Relationship:** Pre-mineralization

Grade: Greenschist

Inventory

Ore Zone: SHAFT **Year:** 1984

Category: Assay/analysis **Report On:** N

NI 43-101: N

Sample Type: Grab

Commodity	Grade
Silver	2.4000 grams per tonne
Gold	12.3000 grams per tonne

Comments: Grab sample from the Summit shaft.

Reference: Assessment Report 13219.

Ore Zone: ADIT **Year:** 1929

Category: Assay/analysis **Report On:** N

NI 43-101: N

Sample Type: Grab

Commodity	Grade
Silver	3.4300 grams per tonne
Gold	17.1400 grams per tonne

Comments: One of two grab samples taken from the crosscut adit driven by B.E. Mining Co. in 1929.

Reference: Minister of Mines Annual Report 1929, page 269.

Summary Production

		Metric		Imperial	
Mined:		7,265	tonnes	8,008	tons
Milled:		9,654	tonnes	10,641	tons
Recovery	Gold	151,471	grams	4,870	ounces
	Silver	36,608	grams	1,177	ounces

Capsule Geology

The Twin Lakes occurrence is located 2.25 kilometres north of the peak of Orofino Mountain, 14 kilometres northeast of Keremeos, British Columbia. It is one of three main occurrences forming the historic Orofino Mountain gold camp.

The ground was held from 1923 or earlier as the Juniper, Juniper No. 2 and Huntsman claims, by F.G. Watkin and J. Davis. Three quartz veins were explored by trenches and shallow shafts. Cominco Ltd. optioned the property in 1925 as a source of silica flux for the Trail smelter. An unknown amount of diamond drilling was conducted and the option allowed to lapse. In 1925 or 1926, the ground was restaked as the Summit, Blue Bird, Eureka and Mountain Lion claims by Al Piper and Associates. Small amounts of sorted ore were shipped from a 33.5-metre crosscut adit. An option was given to B.E. Mining Co. in 1929 and a 13.6-tonne per day mill was installed. Operations ceased in 1930 because of the failure to find sufficient ore. The Property was then optioned to Parvenu Mines Ltd. in 1932. Two inclined shafts were sunk on the Summit claim and a small amount of ore was recovered. In 1933, Twin Lakes Gold Mining Co. Ltd. acquired the property, now consisting of 20 claims. A new 274-metre crosscut adit was developed 91 metres southwest of the millsite and 122 metres lower than the Main Summit shaft. Drifts were also extended 30 metres northeast and 49 metres southwest. About 304.8 metres of underground drilling were done. Ore was stoped mainly from above the southwest drift and milled in 1934 in a newly erected 36.3 tonne per day mill. Development work was continued on the Alice claims, 183 metres to the south. Operations ceased after a shipment of gold and gold-bearing concentrates in 1934. Grandoro Mines Ltd., also owner of the neighbouring Grandoro past producer (082ESW010), leased the property in 1935. The mill was used to process ore from the Grandoro past producer. Then in 1936, Gold Standard Fairview Mining Co. Ltd. leased both properties and processed more Grandoro ore. In 1956, A. Topp restaked the Twin Lakes claims and ownership transferred to A. Davidoff in 1979. An option was granted to Boundary Exploration Ltd. 1968 but allowed to lapse. J. Stitt optioned the property in

1980 but also allowed it to lapse. In 1984, property exploration was conducted by I. Monteith. A. Davidoff is the current owner.

The Twin Lakes property is underlain primarily by west and northwest trending sequences of chert and greenstone of the Carboniferous to Triassic Old Tom and Shoemaker formations. The Old Tom rocks include basaltic and andesitic (greenstone) flows dipping steeply to the north, and minor related diorite. The Shoemaker Formation consists of chert, with small amounts of tuff, greenstone and limestone. To the south these rocks are intruded by Jurassic to Cretaceous gabbroic to granitic rocks of the Nelson and Oliver plutonic complexes. To the north, Eocene Marron Formation basalts are faulted against the older rocks by the easterly trending McCaig Creek fault.

The initial three discovery veins of the Twin Lakes occurrence varied from 0.05 to 1.22 metres width. The Summit shaft and various nearby workings exposed high grade quartz veins in the deformed Carboniferous to Triassic rocks. Veins generally parallel the schistosity of the country rock and thus are extensively warped and fractured, with widths varying from 0.3 to 2.0 metres. Inclusions of country rock are common and veins may be oxidized with black films. Major structural controls include a normal fault dipping 63 degrees to the northwest which offsets the veins about 11 metres vertically, and a series of crossfaults with related lateral displacement.

Mineralization consists mainly of pyrite, both in the vein and disseminated in the wallrock. High grade pockets of galena, free gold and minor sphalerite are also present. Rare tourmaline was observed.

Fluid inclusion and stable isotope studies at the Grandoro occurrence indicate mesothermal fluids were responsible for mineralization events. The fluids are characterized by a high carbon dioxide content, temperatures of 280 to 330 degrees Celsius, salinities of 4 to 6 weight per cent NaCl and oxygen del 18 values of 4 to 6 per mil (relative to standard mean ocean water). The mineralization occurred at depths of 3 to 4 kilometres.

The Summit shaft developed the vein for a length of 80 metres and the veins have a depth of at least 25 metres. Extensions along strike are unknown and down-dip are possibly 35 to 60 metres, based on old records.

The Peak adits are 50 metres higher than the Summit shaft area and 200 metres to the west. In this zone, quartz veins have been exposed intermittently over a strike length of 150 metres and 50 metres width. The veins in the Summit shaft and Peak zones are flat lying.

The Alice adit has exposed a 1.5-metre thick quartz vein dipping 30 to 45 degrees into the slope of the hill along a strike length of 10 metres. At the Alice adit portal, two smaller quartz veins occur in the hangingwall. The footwall is highly altered and oxidized diorite with manganese alteration.

The veins in the 'East' workings strike southwest and dip gently to the north. The vein system has been traced for 200 metres.

In 1933, a sample from the Juniper No. 2 dump, from a long opencut, yielded 30.17 grams per tonne gold (Minister of Mines Annual Report 1924, page 169). Other samples from the Huntsman claim yielded from trace gold and silver to 109.71 grams per tonne gold and 34.28 grams per tonne silver (Minister of Mines Annual Report 1924, page 169). Two samples taken by B.E. Mining Co. in 1929 from the newly driven crosscut adit, yielded 23.31 grams per tonne gold and 4.11 grams per tonne silver, and 17.14 grams per tonne gold and 3.43 grams per tonne silver, respectively (Minister of Mines Annual Report 1929, page 269). The two samples were chip samples taken across 33 centimetres. Sampling from the 'Eastern' inclined shaft on the Summit claim in 1932 yielded some high-grade gold and silver values. Sample No. 3, the lowest, yielded 2.74 grams per tonne gold and 0.68 gram per tonne silver (Minister of Mines Annual Report 1932, page 137). Sample No. 6, the highest, yielded 143.99 grams per tonne gold and 27.43 grams per tonne silver (Minister of Mines Annual Report 1932, page 137). Sampling from the Twin Lakes crosscut adit in 1933 yielded 171.42 grams per tonne gold across 2.1 metres (Minister of Mines Annual Report 1933, page 169). In 1984, grab sample 14903 from the Summit shaft assayed 12.3 grams per tonne gold and 2.4 grams per tonne silver (Assessment Report 13219). Eighteen samples of various veins were taken in 1987. The results indicate gold values ranging from 0.07 to 394.63 grams per tonne gold and 0.34 to 38.39 grams per tonne silver (Property File - Brenna Resources (1987): Prospectus).

Total recorded production from the Twin Lakes occurrence is 7265 tonnes mined and 9654 tonnes milled intermittently between 1926 and 1942. Recovery included 151,471 grams of silver and 36,608 grams of gold.

Bibliography

EMPR AR 1924-169; 1928-260; *1929-269; 1930-218; 1931-134; *1932-25, 136; *1933-169; 1934-A25,A29,D16; 1935-D13; 1936-A34,D54; 1937-A37; 1938-A35,D35; 1939-A37; 1940-A24; 1941-A25

EMPR INDEX 3-215-216

EMPR ASS RPT 4604, 8585, *13219

EMPR BC METAL MM0366

EMPR BULL 20, Part III, p. 19

EMPR EXPL 1980-32; 1984-19

EMPR OF 1989-2; 1989-5

EMPR PF (Sookochoff, L. (1973-10-05): Geological Report on the Twin Lakes Property of Cripple Creek Resources Ltd.; *Brenna Resources (1989-10-05): Prospectus Report on the Twin Lakes Property)

GSC MAP 341A; 538A; 539A; 541A; *15-1961; 1736A; 2389
GSC MEM 38; 179
GSC OF 481; 637; 1505A; 1565; 1969
GSC P 37-21
GCNL #232(Dec.4), 1989

EMPR PFD 1471, 1472, 903742, 889166, 824918, 672527, 895236, 895237, 680071

Date Coded:	1985/07/24	**Coded By:**	BC Geological Survey (BCGS)	**Field Check:**	N
Date Revised:	2008/02/21	**Revised By:**	Karl A. Flower (KAF)	**Field Check:**	N