

002484

REPORT OF
PRELIMINARY EXAMINATION
OF
L. H. M I N E
SILVERTON, B. C.

By Charles C. Starr,
September 1925.

LOCATION: The mine is situated $5\frac{1}{2}$ miles south of Silverton, at an elevation of 5400 feet, or 3700 feet above Slocan Lake. It is in the Slocan Mining Division. The mine is connected with town by a wagon road the latter part of which is quite steep.

WOOD: There is a fair amount of timber on the claims, largely balsam.

WATER: L. H. Creek passes close to the mine workings and camp. According to Government measurements made throughout one winter the minimum flow is 0.32 cu. ft. per second. Power could be developed from Eight-mile Creek or Ten-mile Creek, at a distance of three and seven miles respectively from the mine.

According to Government measurements the flow of Eight-mile Creek in February 1918 was 4.2 cu. ft. per second, and slightly greater in November. It is said that a fall of 735 feet could be obtained in a distance of 3000 feet. The flow of Ten-mile Creek on the same dates was 22 cu. ft. per second; a fall of 650 feet in a distance of three miles is reported.

TOPOGRAPHY: The mine workings are located on the southwest slope of a small basin. The average slope of the mountain above the #3 Tunnel is 50° , while below that tunnel the slopes are considerably flatter.

The average snowfall is said to be from six to eight feet.

CLAIMS: The group consists of the following claims:- L. H., Summit, Camden, Harlem, St. Joe, Basin Fr., C. B., and Baby Ruth, all of which are Crown Granted; They aggregate about 357 acres.

HISTORY: Part of the claims were purchased by the partners Finland and Brand, and part were located by them. In 1911 the British Columbia Copper Co. took a lease and bond and worked for two or three years in a small way. Considerable work was also done by the present owners.

EQUIPMENT: There is no equipment except sufficient hand mining tools for several men, and two camp buildings which will accommodate about a dozen men.

DEVELOPMENT: The principal development has been performed in three tunnels, and amounts to 2,100 feet. In #1 Tunnel there is 310 feet of drifting, 210 feet of crosscutting, and 40 feet of raising. In #2 Tunnel there is 650 feet of drifting, 425 feet of crosscutting, and 190 feet of raising. In #3 Tunnel there is 210 feet of crosscutting, and the orebody has not yet been reached, but should be close.

GEOLOGY: The principal rock in the vicinity of the mine is a dark, basic, igneous rock which is supposed to be of about

the same age as the Nelson Batholith. This is cut by numerous aplite and pegmatite-granite dikes; there are also several large bodies of granite in the vicinity.

The pegmatite dikes are apparently younger than the ore; the aplite dikes are younger than the granite, and possibly younger than the ore. It is not entirely clear whether the latter have any effect on the value of the ore or on its location.

The ore deposit appears to be of the contact-metamorphic type, and consists of rather glassy quartz and replacement quartz, with pyrite and arsenopyrite, replacing the country rock, and occasionally filling open channels. The locus of the ore was undoubtedly determined by fissuring and general crushing of the enclosing rocks, which, when un-altered were too impervious and tough to be penetrated by the mineralizing solutions.

There has been little or no post-mineral faulting and many of the joints of the rocks have been cemented by the silicification accompanying the ore.

OREBODIES: There is no definite vein, although locally some parts of the orebody have that appearance, but there is a widespread irregular silicification and mineralization along a definite zone. Occasionally there are walls to the ore for a short distance, but generally there is a gradual change from ore to waste.

The trend of the ore is N 75° E, which corresponds with the major jointing; the dip is to the north and somewhat variable, and the rake of the ore is not evident. Arsenopyrite occurs in irregular patches and disseminated grains in the solid quartz and in the more highly silicified parts of the rock.

On account of soil and underbrush it is difficult to trace the ore-zone on the surface, but it is very probably larger than appears. The principal showing is over #1 Tunnel and extends nearly to the portal of No. 2 Tunnel; it shows a width of about fifteen feet for a length of 200 feet or more. After crossing a barren zone 60 feet long, a second mineralized area outcrops to the westward, along the strike, nearly over the face of #3 Tunnel but quickly passes under soil and rock so that its size can not be estimated without further digging. Still further southwest along the strike, a third mineralized area is known, but mostly concealed by surface debris.

The south margin of the ore in the #1 Tunnel is indefinite and must be governed by assays; the north wall is much better defined on account of the effect of the aplite dike along it. The strongly mineralized area in this tunnel is 200 feet long by 20 feet wide, and neither end has been exposed.

In the No. 2 Tunnel there is a particularly strong mineralization on the south side of the ore near the west end over a width of 50 feet. One and possibly two zones of mineralization, much narrower, extend about 300 feet to the eastward, from the wide part.

SAMPLING & ORE DEVELOPED: The tunnels were sampled some years ago by the company which was developing the property; my samples did not cover the whole mine but were taken at intervals to check up the former sampling, and averaged slightly higher in value.

In #1 Tunnel an area of 2,360 sq. ft. averages 6.27 Oz. gold per ton.

In #2 Tunnel an area of 1,500 sq. ft. averages 0.87 Oz. gold per ton.

Allowing a twenty five foot extension of the orebody both above the #1 Tunnel and below the #2 Tunnel, there is partially developed and reasonably certain 16,000 tons of ore at \$7.50 per ton, or a gross value of \$120,000.

In addition to this ore there should be a considerable tonnage between the #1 Tunnel and the surface which has not been yet exposed.

The wide variation in the areas and values of the ore on the #1 and #2 Tunnel levels is noteworthy. In the #1 Tunnel the samples are quite uniform in value, showing low grade ore, while in #2 Tunnel the sample values are quite erratic and show a smaller area of good ore with the remainder of the vein matter below a paying grade.

ORE TREATMENT: A number of tests are reported to have been made for the B. C. Copper Co., using several different methods.

Data furnished me by the owner shows that an extraction of 90% of the value was obtained by cyanide. Combined amalgamation and flotation showed a saving between 75% and 80%.

It is probable that flotation recoveries would be higher now, since the process has been much improved in the last few years.

CONCLUSION: The ore is quite variable in value and size, but its average value, while quite low, is sufficient to make a good profit if enough ore can be developed to permit working on a large scale.

A limited amount of work in the #3 Tunnel should pick up the ore zone, and seems justified by the showings above. Since this tunnel is 250 feet lower than the #2 development of ore on this level would add rapidly to the ore reserves. However, before any definite recommendations are made a more thorough study of the mine should be undertaken.

Respectfully submitted,

Chas. C. Starr

NOTES

GEOLOGICAL SURVEY

SUMMARY REPORT 1917 PART B.

by

M. F. Bancroft

L. H. M I N E

The L. H. Mine is situated $5\frac{1}{2}$ miles from Silverton on a wagon road at an elevation of 5,250 feet; it was examined by R. C. McConnell in 1895. About 1700 feet of tunnels and raises driven since that time suffice to demonstrate the character of the deposits in their underground relations. The owners of the property, A. R. Fingland and Charles Brand, had done considerable development work prior to 1911, when the British Columbia Copper Co. took a bond on the property, allowing it to lapse in 1913.

GEOLOGY

The roof remnant on the headwaters of Eight-mile Creek embraces a complex of igneous rocks surrounded by granite. It extends three miles northeast-southwest and has a maximum width of one mile. The L. H. is located on the northwest margin of this elliptical shaped area.

It would have required more time than was at the writers disposal to establish the sequence of geological events recorded on the L. H. property. However, one thing was clear in point of time. Above the L. H. workings there is a considerable outcropping of breccia composed of angular fragments of granite included in basic igneous rock, such as forms the country rock of the L. H. ore deposits. Granite, aplitic, and micropegmatite dykes cutting through this basic member represent the acidic differentiation phase segregated and intruded into the roof rocks from the upper surface of the magma reservoir.

The country rock of the L. H. is plainly an early basic differentiate, consolidated, and later sheared through dynamic metamorphism. It is a hard massive porphyry similar in appearance to a sill rock found in No. 7 tunnel of the Standard Mine. This sill rock which is intrusive into the Slocan Series, has the composition of kersantite, with plagioclase feldspar and biotite as the chief minerals. The biotite being abundant, and of a yellowish color gives the rock its reddish to brownish-gray color. In composition the feldspar is andesine to labradorite. There is little quartz present and a lesser amount of orthoclase. Secondary calcite is associated with the biotite and there is a certain amount of pyrite developed in the rock.

The lamprophyre dikes of West Kootenay are considered to be the basic differentiates of the greater granite massifs, and mineralization is only another phase of this prolonged process of magmatic invasion, beginning with Jurassic. Fractures developed locally by dynamic metamorphism furnished the channels of access for silica and sulphides into these rocks above the invading granite. A pronounced and regular jointing along an east and west line has been developed in the rocks of the L. H. property. Besides, there are crushed zones, the material of which has been mashed in situ. Movements of displacement seem to be of slight and the underground workings show little positive evidence of faulting beyond a certain amount of sheared structure.

The sulphides are in a zone varying from 20 to 40 feet in width which follows the master jointing. This zone strikes 80 degrees (magnetic) and dips 55 degrees northeast. An abundance of quartz stringers prevails in the orebodies and furnishes a guide to the same.

The orebodies developed by the L. H. workings vary from 8 to 30 feet in length and the boundaries are not well defined. The jointed rock breaks in a very blocky manner outside the orebodies, whereas inside the orebodies the tunnel walls are much more even and the jointing has been more or less obliterated through replacement by silica and sulphides. The pitch of the oreshoots appears to be to the northeast. Surface indications point to other smaller zones paralleling the main one in which the underground development work has been done.

The ore consists of pyrrhotite, pyrite, arsenopyrite, and quartz and the gangue is country rock. It is reported that quartz stringers carrying visible native gold have been found on a nearby property cutting this set of rocks. Small stringers of native arsenic and calcite occur in the orebody near the mouth of tunnel No. 1. The native arsenic is tin white on fresh fracture and tarnishes to a dull gray. The gold values obtained in the different orebodies are not uniform.

DEVELOPMENT WORK

Tunnels have been driven at three different levels on the property, involving 1700 feet of underground development.

No. 1 tunnel is at an altitude of 5580 feet. The first crosscut shows a width of 16 feet of ore. At the face of the second crosscut is an aplite dike two feet wide, marking the supposed southern limit of the orebody on this level.

No. 2 tunnel is 80 feet below No. 1 and follows in on an aplite dike. Here and there in both No. 1 and No. 2 tunnels considerable ore has been encountered, but the difficulty of picking out ore from country rock can only be overcome by systematic sampling.

No. 3 tunnel is 330 feet below No. 1 and has been run through about 120 feet of talus, 30 feet of porphyry, and lacks only a few feet to break through into the ore zone, provided the shear zone followed in tunnels No. 1 and No. 2 dips at 67 degrees northeast. The present indications in this tunnel are good; quartz stringers and a fair degree of sulphide impregnation in the country rock are already evident.

Mineralization at depth in a contact metamorphism deposit is difficult to judge. Orebodies form and are localized where temperature and pressure conditions are favorable for a concentration of the minerals. The L. H. is a low grade gold deposit that will require the outlay of considerable capital to handle the ore in quantity. If workable orebodies are found on the level of No. 3 tunnel a fairly large tonnage might be assumed. A millsite has been chosen below the property on one of the branches of Eightmile Creek.

Property File
082FWW212

REPORT ON
THE L. H. MINE
SILVERTON, B. C.

By
Charles C. Starr,
July 11, 1930.

LOCATION: The L. H. Mine is situated $5\frac{1}{2}$ miles south of Silverton, B. C., at an elevation of 5400 feet, or 3700 feet above Slocan Lake. It is in the Slocan Mining Division. The mine is connected with town by a road (now needing some repairs), the latter part of which is quite steep.

CLAIMS: The group consists of the following claims:- L. H., Summit, Camden, Harlem, St. Joe, Basin Fr., C. B., and Baby Ruth. They are all Crown Granted and aggregate about 357 acres.

WOOD: There is a fair amount of timber on the claims, largely balsam and spruce.

WATER: L. H. Creek passes close to the mine workings and camp. According to Government measurements made throughout one winter the minimum flow is 0.32 Cu. Ft. per second. Power could be developed from Eight-mile Creek or Ten-mile Creek at a distance of three and seven miles respectively from the mine. According to Government measurements the flow of the former in February 1918 was 4.2 Cu. Ft. per second, the flow of the latter creek was 22 Cu. Ft. per second. There is considerable fall in both creeks and it is said that a head of 350 feet can be obtained in about a mile.

TOPOGRAPHY: The mine workings are located on the east side of a narrow gulch, and the orebody strikes about at right-angles to it. The average slope of the mountain above No. 3 tunnel is 50° , while below that tunnel the slopes are somewhat flatter.

HISTORY: Part of the claims were located by the partners, Fingland and Brand, and part were purchased by them. In 1911 the British Columbia Copper Co. took a lease and bond and developed the property by hand work until 1914 when they were compelled to drop it. Since that time little work has been done in the upper tunnels, but No. 3 tunnel was started by the owners.

EQUIPMENT: There is no equipment except track, cars, etc. and hand tools for two or three men. There are two small log buildings at the camp which will accommodate about ten men.

DEVELOPMENT: (See Map) Development has been done on the principal showing chiefly in three tunnels and amounts to 2,130 feet.

In #1 Tunnel there is 310 feet of drifting, 210 feet of crosscutting, and 40 feet of raising.

In #2 Tunnel there is 650 feet of drifting, 495 feet of crosscutting, and 190 feet of raising.

In #3 Tunnel there is 210 feet of crosscutting.

A considerable part of the work in No. 1 and 2 tunnels is on the orebody, but it has not yet been cut in the #3 tunnel.

On a separate showing on the west bank of L. H. creek, a shallow tunnel has been driven containing about 115 feet of work.

GEOLOGY: The country rock at the mine is a dark igneous rock which is a basic differentiate from the granite magma.

It is a hard massive porphyry which has been sheared and crushed by dynamic metamorphism. It covers an area of several square miles, and is surrounded by granite.

It is cut by numerous aplite and granite dikes having an E-N-E strike and a steep southerly dip. Apparently both sets of dikes are younger than the ore and have no effect on its value. There is strong jointing along an E-N-E course, and weaker though still prominent series of joints nearly at right angles to this.

There has been little post-mineral faulting, but a very considerable crushing and mashing of the rocks with little movement. This is most pronounced along the E-N-E jointing and has determined the position of the orebodies.

The ore deposit is of the contact-metamorphic type, and consists of glassy quartz with pyrite, pyrrhotite, and arsenopyrite replacing country rock and occasionally filling open channels. Gold is the only valuable metal in appreciable quantity, and tends to follow mixed arsenopyrite and quartz, although good values occasionally occur in only partially silicified rock.

OREBODIES: There is no definite vein, although some parts of the orebody have that appearance locally, but there is a widespread irregular silicification and mineralization along a definite zone. Occasionally there are walls to the ore for a short distance, but usually there is a gradual change from ore to waste.

The trend of the mineralization is N 75° E and the dip steeply northward; both are rather variable. The rake of the ore is not evident. Sulphides occur in irregular patches and disseminated grains in the solid quartz and in the more highly silicified parts of the country rock.

On the surface, the principal showing extends from two hundred feet east of the portal of #1 tunnel westward to a point nearly over the face of #3 tunnel where it passes under slide-rock, a distance of nearly 400 feet. It varies considerably in intensity of mineralization, and in width from ten to fifty feet. An outcrop of similar, weakly mineralized material, occurs on the summit of the ridge some thousand feet further east.

The south margin of the orebody in No. 1 tunnel is indefinite and must be governed by assays; the north wall is much better defined and for some distance is bounded by an aplite dike. The strongly mineralized area in this tunnel is 175 feet, or more, in length by 25 feet in width.

No. 2 Tunnel was started on the supposition that the ore dipped southward, and considerable work was done before the orebody was picked up. West Drift No. 1 has followed the orebody for 230 feet, and the two south crosscuts at the east end show that weak mineralization extends at least fifty feet further. Throughout this drift there is a vein-like band of intense mineralization from 1½ to 6 feet in width, often containing high values in gold.

At the most westerly north-crosscut from this drift this swells out to a width of 50 feet of low grade ore. West drift No. 2 also shows a vein-like band of strong mineralization with low values which is apparently along the hanging wall of the main orebody; this band also shows weakly in the other two north crosscuts.

No. 3 Tunnel is caved near the portal (presumably one or two sets only). It is said that it has not yet reached the orebody. An \$86 assay is reported from an isolated bunch of ore 2 feet in diameter on the south side of the tunnel 40 feet back from the face, and specimen assays from at and near the face are said to show up to \$10.

It seems probable that the main orebody lies very closely south of the present face.

Some five hundred feet southwest of the main showing, and along the west bank of the creek, there is a similar mineralized outcrop. Several open cuts and a short tunnel tend to show that the strike is north and south. Except for specimens, the values reported from this work are below the grade of ore.

SAMPLING: The samples by Mr. Frederick Keffer (see Map) are stated to be composites of daily face samples, channel samples, and in some cases samples of a ton or more blasted from the side of the workings. They are presumably accurate.

Thirteen samples were taken by me to check Keffer's samples, and are shown in detail on the map. The comparison of my samples with those of Mr. Keffer in the same area is as follows:-

Keffer	13	cuts	in	#2	W	X-C	covering	40	ft.	.24	Oz.	gold
Starr	9	"	"	do.	"	"	"	45	"	.18	"	"
Keffer	7	"	"	W. Dr. #1	"	"	"	40	"	.34	"	"
Starr	4	"	"	"	"	"	"	40	"	.84	"	"

For the #2 W. X-C the average of both sets of samples is .21 Oz. gold, which can hardly be classed as ore.

In the W Dr. #1 Keffer obtains a value of .385 Oz. gold for a length of 50 feet, the width not given but probably about five feet. Further north in the same drift he shows a length of 80 feet of ore of unknown width, probably around two feet, assaying 1.37 Oz. gold.

ORE DEVELOPED: In #1 Tunnel an area of 2,360 Sq. Ft. averages .27 Oz. gold by Keffer's assays.

In #2 Tunnel an area of 500 Sq. Ft. averages .87 Oz. gold; - this covers the better part of the drift and omits the low grade material in the crosscut.

The average of the No. 1 and No. 2 tunnels is 1430 Sq. Ft. at .375 Ozs. giving 10,000 tons of \$7.50 ore (\$13.12) between the two levels.

If an extension of the ore 25 feet above No. 1 level be assumed it will add 5,000 tons of ore of a value of \$5.40^(#3.75) per ton, or a total above the No. 2 level of 15,000 tons of \$6.80^(#11.90) ore.

This may be classed as positive ore, with considerable more ore probable.

Mr. Keffer estimated 33,000 tons of \$5.25^(#4.10) ore between the No. 1 and No. 2 levels, and 18,300 tons of probable ore 25 feet above the No.1 and 25 feet below the No. 2.

ORE TREATMENT: A number of treatment tests were made on the ore some years ago, using several different methods. Treatment by cyanide with fine grinding is reported to have shown an extraction of 90% and a consumption of 2.3 pounds of cyanide per ton of ore. Combined amalgamation and flotation showed a saving of 75% to 80%. It is to be expected that up to date methods might show better recoveries.

CONCLUSION: Irregularity in size and value is to be expected in a contact metamorphic deposit, such as this, but the present development and the surface indications of mineralizations are sufficiently extensive to warrant considerable further development. The mineralized zone is covered and has not been found west of the point where it passes under slide-rock over No. 3 tunnel; where it disappears it is strong and suggests a considerable westerly extension. The average value of the ore, while low, is enough to allow a good profit if sufficient ore can be developed to permit working on a large scale. The ground breaks well and stands well, so that it should be possible to obtain low mining costs. A very limited amount of work in No. 3 tunnel should pick up the orebody, and, as this is 250 feet lower than No. 2, favorable development there would add to the ore reserves rapidly. As the property now stands I consider it worthy of extensive development, especially on the No. 3 tunnel level, and believe it contains possibilities for making a large mine.

Respectfully submitted,

Chas. C. Starr

Blue - at #3525