

*Nelson*  
PROPERTY FILE

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REPORT OF THE EXAMINATION  
OF THE  
WISCONSIN MINE  
ON RIDGE CREEK, NELSON MINING  
DIVISION.

To:

Mr. F. R. Weekes, Manager,  
Porcupine Goldfields Development & Finance Co. Ltd.  
Montreal, Que.

By:

O. C. Starr.  
September 9, 1926.

## INTRODUCTION:

Five days were spent on the property by O. D. Frith and C. C. Starr. The sampling was done by Mr. Frith, but samples taken by Mr. R. H. McLoughlin on his preliminary examination are also included on the maps.

## LOCATION:

The property is situated on the south east side of the ridge between the south and west branches of Midge Creek, near the top. It is approximately 15 miles by trail from the west shore of Kootenay Lake. Nelson, Ymir and Proctor are about equally distant from the property in a air line, but the easiest way of reaching the property is along Midge Creek from the Lake.

## PROPERTY:

The property consists of Wisconsin and Lucky Strike claims, both of which are ~~Grown~~ Granted. The price asked for the property is \$77,000 of which \$12,000 is due September 1st, 1927, \$20,000 on March 1st, 1928, and \$45,000 December 1st, 1928.

Claims have been located in the immediate vicinity since McLoughlin's examination ~~are~~ as follows:- Iowa on the south and the Mary on the north by William Brannan of Spokane; the Morning Fraction on the north, the Leroy on the north east, the Tamarac and Lead Top on the west by James Branner and Associates of Ymir. The approximate location of these claims is shown on the map, and all of them should probably be included in any deal made on the Wisconsin property. No enquiries have been made as to the price and terms for these outside claims.

omit



#### TRANSPORTATION:

The property is best reached from Nelson by C. P. R. steamer on Kootenay Lake to Midge Creek, thence by a poor trail of fair, though undulating, grade for a distance of about 10 miles to the junction of the South and West Forks of Midge Creek, then approximately five miles up a continuous, though not heavy, grade to the mine. The trail is in bad condition and needs to be changed somewhat in location as well as cleaned out and rebuilt, which will entail considerable cost.

An old trail from Ymir extending north to the mine, is said to be the best route for summer work, but is nearly impassable in the winter time on account of snow, and at the present time this trail is so overgrown with brush that it is almost impassable. The distance from Ymir by this trail is said to be about 20 miles. ~~The~~ building of a road from the Lake to the mine will be rather expensive on account of almost continuous side hill cut being required.

#### ALTITUDE, TOPOGRAPHY, ETC:

The present mine workings are at an altitude of 6000 feet, by aneroid, or 4200 feet vertically above the Lake. In general the topography is steep but not rough; in the immediate vicinity of the mine the slopes are more gentle and there are no tunnel sites that do not require long crosscuts to reach the vein. There is evidence of deep snow during the winter, (probably well in excess of 6 feet) but there are no snowslides in the vicinity of the mine, and only three very small ones cross the trail from the Lake. The Ymir route would probably encounter much deeper snow and more snowslides than

the Lake route.

**TIMBER, WATER, & POWER:**

All claims are well timbered with medium <sup>sized</sup> pine and balsam which is suitable for mine use, and part of which is of sufficient size for sawing.

Water has been piped from a small spring about a quarter of a mile from the camp, but the quantity is very limited, and probably would only be sufficient for prospecting work. North west of the camp a distance of perhaps 2000 feet there is water in a gulch /on the Tamarac Claim which is undoubtedly sufficient for all domestic use and probably would also furnish water for diamond drilling. This water would, however, have to be pumped 500 feet, and over, vertically to make it available for camp use.

There appears to be ample water and fall in both the south branch and the west branch of Midge Creek to develop a number of hundred horse power. This power would be available probably within four miles of the mine and would be close to a good mill site.

**EQUIPMENT:**

There is no equipment on the property except a double cook and bunk-house which is in such a poor state of repair that it is almost worthless.

**DEVELOPMENT:**

Development on the property has been rather scattered and shallow. Number 1 tunnel is chiefly a drift on the vein and attains a depth at the face of about 100 feet. Number 2 tunnel crosses the vein at a depth of about 75 feet. Number 3 tunnel



apparently designed to cut the vein at about 200 feet depth, has not yet reached the vein as it appears to have been<sup>d</sup> averted on to stringers. It is now caved at the portal and inaccessible. There are also several other short caved tunnels, 15 or 20 open cuts, and a few trenches. Ten of the larger cuts are on the main vein in the vicinity of number 1 tunnel. Other cuts show mineralized material but no definite vein, and most of them are so badly caved that nothing can be seen in place.

The summary of development footage underground is as follows:-

	Drift	Crosscut	Winze
Tunnel 1	150	145	60*
" 2	-	150	-
" 3	245	800*	-
Misc Tunnel		125*	
	395	1220	60

\* approximate, -  
inaccessible.

#### GEOLOGY:

The West Kootenay map of the Dominion Geological survey shows the mine to be situated near the contact of the intrusive Nelson granite with the metamorphosed sediments of the Lower Selkirk series (Cambrian).

The surface in the vicinity of the mine is covered with soil to such an extent that outcrops are rare and it is not possible to outline the geology in detail.

Granite appears to be the principal rock, but limestone appears at several points in the underground workings, and limestone and schist float is found on the surface in considerable amount on the upper part of the Iowa claim, the southwest part of the Wisconsin, and on parts of the northern half of the

Lucky Strike. Probably the sedimentaries, which consist of marbleized limestone, mica schist, andalusite schist, quartzite, and argillite, lie with the bedding striking northerly and southerly and dipping fairly steeply to the westward. They are probably in the nature of "roof pendants" in the granite, and are of unknown extent.

Probably there are numerous pegmatite and quartz veins occurring in the granite, since quartz float is common, and boulders of white quartz weighing several hundred pounds are common in the slide rock on the Tamarack claim.

The ore-bearing veins are formed in the <sup>granite and</sup> sedimentaries near and along the contacts ~~with the granite~~, principally by replacement which has also somewhat mineralized the adjoining ~~granite~~ rocks. There is no definite evidence that the veins have formed along any persistent and definite lines of faulting, but rather that they have formed on and near minor fractures in especially friable and replaceable rock.

#### WISCONSIN VEIN:

The principal vein, which may be called the Wisconsin, strikes N 35° E and dips 58° west, as far as at present exposed, and has a width of 20 or 30 feet, although not all of this width is ore. It has a granite footwall which is fairly definite and regular, though accompanied by a rather small gouge. The hanging wall is not so well defined, or exposed, but appears to be an altered granite.

The ore follows the center or foot part of the vein and near the hanging wall the values are small. Outside of the vein proper there are areas of limestone that were evidently



once mineralized, but which have been so altered and leached that they now consist of honeycombed skeletons of quartz and difficultly replaceable residue heavily stained with limonite; they assay a dollar or two per ton in gold and silver.

The minerals in the ore-body consist of <sup>arsenopyrite</sup> arsenopyrite, pyrite, marcasite, pyrrhotite, *chalcopyrite*, *galena*, *Sphalerite*, and stibnite (?), about in the order named. *These are*

are associated with the residual parts of the replaced *rocks*, quartz, and siderite. Oxidation has been intense, though very erratic, and accompanied by leaching, so that few of the oxidation products are to be found in the vein except limonite. The sulphides, in the oxidized zone at least, occur as stringers, lenses, irregular spots, and disseminations, irregularly distributed through the vein; scattered among them are streaks, lenses, and pockets of honeycombed residue, heavily stained with limonite, and accompanied by seams and stringers of quartz.

A granite dike of probably pre-mineral age cuts through the vein parallel to, and a few feet from, the footwall.

A reference to the map shows that the vein outcrops with considerable regularity for 520 feet, above and beyond the ends of the No. 1 tunnel where it has been opened by Cuts Nos. 2 to 7. The hanging wall is not exposed in any of these cuts, and the footwall in only Nos. 2, 3, 4, and possibly in 7. It will be noted that the vein as exposed in Cut No. 1 and Tunnel No. 2 does not line up well with the central part of the vein, and a small fault between Cut No. 2 and Tunnel No. 2, or a second vein is indicated. Nothing is to be observed on the surface which throws any light on the question.

Cuts Nos. 8 and 9 do not show anything but granite, but Cut No. 10 shows ore and vein-matter over its entire length

but it is too limited to give any dependable data as to the dip and strike. According to the relative locations of these four cuts, the vein in No. 10 can hardly be the continuation of the main vein, and a fault or another vein is indicated; as the surface is covered with several feet of soil, nothing can be learned from it.

#### SAMPLING:

McLoughlin, during his preliminary examination of the mine, took 14 samples from the No. 1 tunnel and the cuts above it. During the present examination Frith took 26 samples from the No. 1 tunnel, two from the No. 2 tunnel, and three miscellaneous.

Average values (weighted) are as follows:-

<u>Place</u>	<u>Length</u>	<u>Width</u>	<u>Oz. Au.</u>	<u>Oz. Ag.</u>	<u>Val.</u>
No. 1 Tunnel, excluding low grade samples on hanging wall side	145	9.3 plus	0.35	3.4	\$9.00
Cuts Nos. 2 to 5	100	7.2 "	0.52	3.6	12.55
No. 1 Tunnel across full width of ore at winze, & both sides 2nd X-cuts.	60	17.6	0.43	3.9	10.95

To determine the relative values of the sulphide and oxidized parts of the orebody the following tabulation was made, based on the description of the samples in the mine:-

<u>Strong Sulphide</u>	<u>Mixed Oxide &amp; Sulphide</u>	<u>Strong Oxide</u>
Nos. 1245	1248	1246
1250	1249	1247
1251	1260	1252
1254	1263	1253
1255	1264	1259
1266	1265	1261
1269	1267	1262
1271	1268	1272
1277	1270	
	1273	
	1274	
	1275	



Strong Sulphide-3-  
Mixed Oxide & sulphideStrong Oxide

1276

Average 0.32 Oz. Au.  
3.0 Oz. Ag.0.32 Oz. Au.  
3.0 Oz. Ag.0.12 Oz. Au.  
3.1 Oz. Ag.

A composite of the following samples was made from the reject in quartering down; all of them show nearly solid sulphides: Nos. 1245, 1250, 1251, 1254, 1264, 1265, 1269

Oz. Gold	Oz. Silver	% Lead	% Zinc	% Copper	% Arsenic
Composite 0.48	4.1	0.6	0.65	1.42	13.25
Calculated 0.52	4.9	-	-	-	-

It should be noted that the average width exposed for sampling in No. 1 tunnel <sup>drift</sup> is about half the payable width as exposed on the North side of the winze and in the 2nd X-cut; there is, however, a slight indication that the payable ore is narrowing at the face of the drift. In the cuts, also, the full width of the ore is not exposed. In No. 2 tunnel there is 3½ feet of ore of about \$8.00 grade.

There is a rather noticeable similarity in the values obtained in the various sample cuts across the vein, indicating that the ore may be expected to be fairly uniform in value.

At the time of the examination, the water had receded about 25 feet in the winze, which is reported to be 60 feet deep. The winze has been sunk steeply for 25 feet and apparently has encountered the footwall and flattened to follow it at about the water level. There is no definite change in the appearance of the vein in the winze to the depth noted, and it is presumed that it contains about the same average values as sampled in the drift. No samples were taken in the winze, since staging would be required which there were no facilities for installing.

#### ORE DEVELOPED:

Between the No. 1 tunnel and the surface cuts there are approximately 7500 tons of ore sufficiently developed to be classed as "Probable ore", which have a gross value of about \$10.50 per ton, or a total of \$78,750.

If an extension of 25 feet below the tunnel level be allowed, there will be an additional amount of 3000 tons of "Possible Ore" of an average value of \$9.00, or a total gross value of \$27,000. This makes a total of 10,000 tons of ore of a gross value of \$105,000, which is partially developed.

This ore is, however, of no net value until a process is perfected and a plant built to treat it. The quantity is yet far too small to justify a treatment plant.

#### ORE TREATMENT:

Some preliminary treatment tests are reported by the owners, which show that gravity concentration and amalgamation are useless. A cyanide test gave a 92½% recovery of the gold (silver not mentioned) with a consumption of 29 lbs. of lime and 7 lbs. of cyanide per ton.

In the writers opinion, it will be found impossible to treat the mixed oxide and sulphide ores from near the surface, except at a high cost, but it is probable that a method can be worked out to handle the deeper straight sulphide ores at a reasonable, though perhaps never low, cost.

#### GENERAL REMARKS:

On the tunnel level the more solid sulphide parts of the orebody are the best, and the question arises as to whether these are primary sulphides or a secondary sulphide enrichment. There is no doubt that a part of the sulphides are primary, but



there are some untrustworthy indications that there has been secondary precipitation of marcasite and pyrite in places. It hardly appears reasonable from a theoretical point of view that sulphide enrichment should be of much importance in a zone of intense oxidation, such as that on the tunnel level, and this is also indicated by the scarcity of observed sulphides of possible secondary origin. It is to be doubted if any important zone of secondary enrichment will be encountered at greater depth. The whole future of the mine apparently depends on the values and size of the primary sulphide ores which may be expected at a comparatively shallow depth.

Whether the mine turns out to be a large one or a small one seems likely to depend on the extent of the replaceable limestone beds, and little idea can be obtained of this from the surface, on account of the soil. As opposed to the possibility that the limestone is of limited quantity, there is the possibility that the ore may make <sup>in</sup> large lenses ~~of ore~~ away from the vein proper, which is itself of good size, as suggested by the south part of the 2nd crosscut of No. 1 tunnel, where completely leached limestone shows about a dollar per ton in the precious metals, if the limestone is of sufficient extent.

It seems quite certain that several times the present amount of ore can be developed; beyond that the chances are good, and there are interesting possibilities of developing a big mine. In order to be a paying proposition, the ore will have to be treated in a nearby plant, and to justify this the development of several hundred thousand tons of ore will be

required. Any salvage of ore developed can hardly be expected unless the quantity developed is large enough to justify a treatment plant.

There are no good tunnel sites for the development of the property except that on the north west part of the Tamarack claim, where a crosscut tunnel of 1400 feet length would cut the vein at a depth of 750 feet (figures approximate only).

The costs of preparation for, and the performing of, the preliminary development will be high, on account of the location, but fair working costs after the property is once well equipped should be obtained. From the base metals present, little income can be expected. The copper, and under exceptional price conditions the arsenic, might be of some value but not of much consequence unless the copper content should increase with depth.

#### RECOMMENDATIONS:

I would outline the following procedure as justified by the present condition of the property:-

1. Take up the option on the Wisconsin and Lucky Strike, at the same time endeavouring to have the dates of payment extended.
2. Take a long time option on the Iowa, Mary, Morning, Tamarack, and Lead Top claims, if possible to obtain them reasonably.
3. Locate one claim to the southeast of the Lucky Strike, and one to the northeast of the Tamarack.
4. Repair the trail to Kootenay Lake, and equip the camp sufficiently to serve for a winters work.
5. Trench on the surface in the vicinity of Cuts Nos. 1, 2, 7, and 10, to determine whether they are on one or more veins.
- 6.-- Prospect the vein at a depth of about 300 feet by diamond



drilling from the surface on the hanging wall side of the vein. This will require about 400 foot holes, and will necessitate the pumping of water from the gulch on the Tamarack claim.

CONCLUSION:

The property has an attractive showing of fair grade gold ore with minor values in silver and copper, and has a reasonable chance of developing into a large mine. The factors of most importance at present are the extent of the ore-body and the value of the unaltered sulphide ore, together with its amenability to cheap treatment. This can be most quickly determined by diamond drilling, which is recommended. The proposition would be more attractive if the dates of payments are extended, since a very considerable amount of work is needed before it can be proven that the property is of value, as sufficient ore must be developed to justify a treatment plant before any returns can be expected.

omit

Respectfully submitted,

*Chas. C. Starr*