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B.C. 8th. Aug. 1917.

REPORT ON THE KITSSELAS MOUNTAIN COPPER COMPANY.

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Introductory.

The Kitselas Mountain Copper Company is a company incorporated under B.C. regulations for the purpose of operating the Cordillera group of mineral claims, situate near Usk, B.C. J.D. Wells and James Darby, of Usk, are the original owners of the property, and they took 50 per cent of the stock in the Company in payment for the claims. The Company is capitalized at \$500,000 in shares of \$1.00 par value. Some of the stock has been bought locally, and a good deal in Portland, Oregon, the price being 25cts. a share.

With the money thus obtained from the sale of stock development of the property is now being proceeded with. Five men are at work.

The property is situated a mile from Usk Station, and the main working is only 200 feet above the railway track; the location is an ideal one with abundance of timber available for mining operations. The plan of development at present is the putting in of a crosscut tunnel to tap the main vein exposed on the property. This tunnel is now in 135 feet, and will require to be driven at least as much more to reach the vein. A road from Usk Station which runs through the property is now being built by the Public Works Dept; this road will form part of the trunk road along the Skeena River Valley at this point.

GEOLOGICAL FEATURES.

The rock formation exposed on this property cannot be definitely identified by an examination of hand specimens. There are a number of ~~kind~~ different rocks most of which are in a highly altered condition, and which are apparently referable to the

Kitseias formation. Four specimens taken from the tunnel by J. D. Wells, and sent to the geological survey at Ottawa for identification were named 1<sup>st</sup>-(1) "a sediment", (2) "a sediment" (3) "diorite" (4) "the weight of evidence indicates it to be a tuff".

It would seem that the rock formations in this locality consisted in the first place of interbedded sediments tuffaceous rocks and basic volcanics, all of which have been profoundly metamorphosed. The resulting rocks may be classed as quartzites, tuffaceous quartzites, argillites, tuffs, <sup>and</sup> chlorite, mica and greenstone schists. The rock labeled diorite by the Survey is a very doubtful diorite. Its contact relations with the other rocks render it certain that it is not a true plutonic intrusive rock, nor yet a dyke and hence the name diorite is inappropriate. It appears to be a rather coarsely crystalline and porphyritic volcanic rock, which might be called andesite porphyrite or diabase, intercalated with other flows and sediments. Faulting of the measures has brought it into contact with a pronounced schistose rock of a basic nature.

Cutting these rocks are several roughly parallel but irregular quartz veins. These veins are undoubtedly of the fissure - filled type, but in places the fracturing of the strata has formed a sheared or <sup>ee</sup> shated zone instead of an open fissure. In other places "horse" material has in part filled the fissure with quartz on the walls. Taken in all through the greater portions of the veins have been open fissures and the vein - filling is <sup>mainly</sup> quartz. Where the veins consist of sheeted zones, some replacement of the wall-rock has taken place. A faint banded and ribbon structure occurs in places.

Although it can not be entirely proved it would seem that the first mineralizing action consisted of the circulation of solutions from which quartz together with a little muscovite mica were deposited. Later secondary action has altered some of the muscovite to chlorite. After the quartz deposition the veins were subjected to a second fracturing which did not produce any large open fissures, but made small fissures in the quartz. Along these secondary fractures copper minerals have been deposited from a secondary period of circulating mineral-laden solutions. The copper minerals deposited consist of bornite,

chalcocite and tetrahedrite, the last being in very minute quantities. These copper minerals are intimately associated and would seem to be primary in their origin. They fill fractures in the quartz up to an inch in width, and also in places the quartz has been replaced by them outside the fractures. Oxidation by surface waters has in places formed the copper carbonates, malachite and azurite.

An interesting and commercially important occurrence in this ore is the presence of free gold in particles up to the size of a grain of wheat. This gold can be seen both in the quartz and on the bornite. It is not evident whether this gold came in with the quartz or later with the copper ore, but I am inclined to believe that it will prove to have been introduced either with the copper minerals or still later. This point is important commercially as if the whole quartz filling carries appreciable gold values the prospective value of the property is much greater than if only the quartz adjacent to the copper minerals carried gold. Apparently no sampling has been undertaken which is of any value in determining this point. I took some samples which when assayed will I expect shed light on the matter.

The proportion of copper minerals to the quartz in the vein is quite variable and is always quite low. Where the main vein is a clean cut fissure it is from four to six feet wide, but in places it consists of smaller bands of quartz irregularly scattered over a width of twenty to thirty feet. The copper minerals never form more than 5 to 10 per cent of the vein-filling and as a rule are so disseminated through the quartz, as to make hand sorting difficult.

Two small dykes are exposed which are cut by the main vein which narrows where cutting through the dyke. These dykes consist of rocks of medium acidity with well developed needle-shaped phenocrysts of hornblende, which give a porphyrite structure to the rock. This dyke rock may be classified as being of an andesitic type.

#### DESCRIPTION OF VEINS AND WORKINGS.

The main vein is the only one on which development work to any extent has been done. This vein is exposed in a number of open

cuts and by stripping along the hillside, for a distance of 300 to 400 feet <sup>striking</sup> N. 15° E and dipping at from 30° to 45° into the hill. This development shows the vein to have a width of at least four feet and often considerably more. In places it is irregular and consists of several bands of quartz about six to twelve inches spaced across a width of twenty feet. While the average dip of the vein may prove to be about 45°, in places it is almost flat. Some trouble may be expected in exploring this vein, on account of faults. No faulting of the vein is in evidence yet, but the topography of the country at least suggests that there has been some faulting in this locality.

An incline shaft has been sunk on this vein which has an average dip of 33 degrees but near the bottom straightens up to about 45 degrees. The vein here is from four to six feet wide and the filling is roughly about 75 per cent quartz. Mineralization with copper minerals is continuous throughout the quartz, but somewhat irregular. The bottom of the incline could not be examined owing to water, but conditions are said to be identical with the rest of the working.

The crosscut tunnel has been started about 150 feet below the collar of the incline shaft. It is now in 135 feet and will require from, depending on the dip of the vein, 100 to 300 feet further driving to reach the vein. At a point 121 feet in the tunnel a small stringer of quartz was cut, the outcropping of which on the surface has not been discovered. This was drifted on for 22 feet to the South, and a <sup>winze</sup> ~~wing~~ was being sunk at that point, which at the time of examination was only down six feet. In the winze the stringer had widened out to a vein about 3 feet wide, consisting of roughly 1/3 quartz and 2/3 schistose rock matter. Bornite and chalcocite occur in sparing quantities and specimens showing free gold are plentiful. This vein occurs in schistose rock but is cut off on the upper part of the tunnel where the rock which has been called diorite comes in. There is apparently a fault contact between the schist and diorite (?) and the vein is cut by the fault.

Work is being continued in the winze and also in driving ahead the tunnel to strike the main vein.

No. 2 Vein is exposed in an open cut at an elevation of

725 feet. This vein is a clear out quartz vein about three feet wide but is only mineralized very slightly with copper minerals.

No. 3 vein which is exposed still higher up the hill consists of several stringers of quartz which unite in places to form a three foot vein. Mineralization with copper minerals is very slight.

The No. 4 vein which has been referred to as a "Dyke" is a fracture zone in blue quartzite, which is irregular, but in places has quite a development of quartz. Copper minerals only occur in traces.

These veins (2, 3 & 4) have not been developed and are not of importance at present. If the main vein should prove to be economically valuable then these other veins would be worth prospecting to some extent. They can all be out by a 700 to 1000 foot tunnel.

VALUES.

The question of the value of the property, and its chance of becoming a paying mine, practically hinges upon the average values of the whole mass of the main vein. To arrive at this the only satisfactory method is to thoroughly sample the vein and prepare an Assay Plan, which of course would not be undertaken by a Government Engineer for obvious reasons. Mr. Wells and Mr. Thomson, Manager, say that the vein will average \$15.00 throughout, but it is evident that their method of arriving at the average has not been based on sufficient sampling. If the vein will hold up to this average it will pay nicely.

In any case selective mining may enable the property to produce a small tonnage of shipping ore. The proposition will never however pay much unless development shows that the whole vein is sufficiently mineralized to mine and treat by mechanical concentration at a profit.

The following samples were taken by the writer which give some indication of the values:-

Description.	Gold oz.	Silver oz.	Copper %.
Across 4 feet at point 30 feet down incline	Trace	Trace	Trace
Grab sample off Dump representing about 10% of vein-filling.	0.25	2.8	4.5

Description	Gold oz.	Silver oz.	Copper %
White quartz selected from places where there were no copper minerals	Trace	Trace	Trace
Selected solid copper ore	0.30	20.5	65.16

Conclusion.

This property can be classed as a prospect in the development stage. It undoubtedly has possibilities and may prove to be a profitable mining proposition. Its location so close to the railway line, plentiful supply of timber and water-power and generally ideal conditions for cheap and efficient working, are factors which make it a reasonable speculation to continue the development at least until the main vein has been explored on the crosscut tunnel level.

Respectfully submitted,

Resident Engineer.



B. C. 6th. Aug. 1917.

Memo for the Hon. The Minister of Mines.

Re application of J. D. Wells, et al, for a wagon-road up Kelanzo Creek.

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Sir:-

I beg to submit herewith a brief report on the request for a wagon -road up Kelanzo (Gold) Creek, which was made by J. D. Wells, backed by a petition signed by many.

I examined all the principal groups of claims situate at the head of Kelanzo Creek, South fork, and on the Copper River Slope, which would be served by the proposed road. There is no necessity at the present time for submitting detail reports on these claims, the writing of which would take time, which can be better spent in the field; later on of course these reports will be written up.

The proposed road is from a point across the Skeena from Usk Station to Kleanza Lake, a distance of 21 miles, of which three miles is built. To build a good road the required 18 miles would cost at least \$50,000 and possibly more. I cannot see, any justification for such an expenditure at the present time, and so would recommend that the request for a road be refused.

The present trail is in good condition, to the 11 - Mile post, 14 miles from Usk; the last seven miles is however in bad shape. I think in a case like this where a number of prospectors and claim-

holders wish to continue development of their property that they are entitled to a good pack trail. This cost of such repair work however, might be expected to come from the Public Works funds, and as I understand there is a considerable surplus available in the Skeena District appropriation (where Kleenza Creek is situated) it might be possible to get the work done through Mr. Carruthers. This aspect of where the money shall come from is, of course, a matter to be settled at Victoria. \* (See Foot-note)

The ~~first~~<sup>last</sup> seven miles of the trail was poorly laid out and there is not much use spending more money on it. A new route has been cruised out by J. D. Wells, which would be a much better one. Whether the old trail should be repaired or seven miles of new trail be built is a question that should be examined into, and one of the Public Works Engineers should be sent in to look over the situation if it is decided that anything is to be done this year. The cost of the seven miles of new trail should not exceed \$2500.

I wish to refer to another matter which is strictly speaking entirely Mr. Carruthers' business, viz:- the ferry at Dek, which was carried out during the high water ~~at Dek~~<sup>last Spring</sup>. For the benefit of the prospectors on Kleenza Creek and a few settlers the ferry is a decided advantage. As it is now a boat is used for crossing but horses have to be taken eight miles to Copper City to cross on the ferry there.

I think the ferry should be put in again as soon as possible and thought it well to direct your attention to the matter. The towers, most of the cable etc., are still in good condition and so the cost would not be great.

Respectfully submitted,

Resident Engineer.

\* Unless the Skeena District appropriation would take care of this work I would not care to recommend the expenditure, to come out of the "Mines Development Fund". In that case it would be better to wait until next year.