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REPORT ON #3

COWICHAN COPPER COMPANY

By: Hill, Legg & Hemsworth
Consulting Mining Engineers

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R E P O R T

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COWICHAN COPPER COMPANY LTD.

(BLUE GROUSE MINE)

Vancouver Island, B. C.

By

R. E. Legg,
Consulting Mining Engineer.

Vancouver, B. C.
March 23, 1953.

Report on Cowichan Copper Company Ltd.

(Blue Grouse Mine), Vancouver Island, B. C.

The property of Cowichan Copper Company Ltd. consists of nineteen mineral claims situated on the south shore of Cowichan Lake, Vancouver Island, B. C. Three of these claims are Crown Granted and constitute what was formerly known as the Blue Grouse mine. The remaining sixteen claims were staked in 1952 and surround the three old Crown Grants.

The names and numbers of the claims are as follows.

Crown Granted Mineral Claims

Blue Grouse	Lot 31G
Blue Grouse No. 2	Lot 32G
Blue Grouse No. 3	Lot 33G

Claims Held by Location

Name	Record No.	Recorded Owner
SS No. 1	5662	Cowichan Copper Co. Ltd.
SS No. 2	5663	" " " "
SS No. 3	5664	" " " "
SS No. 4	5665	" " " "
SS No. 5	5666	" " " "
SS No. 6	5667	" " " "
SS No. 7	5668	" " " "
SS No. 8	5669	" " " "
TT No. 1	5670	" " " "
TT No. 2	5671	" " " "
TT No. 3	5672	" " " "
TT No. 4	5673	" " " "
TT No. 5	5674	" " " "
TT No. 6	5675	" " " "
TT No. 7	5676	" " " "
TT No. 8	5677	" " " "

HISTORY

The annual reports of the B. C. Minister of Mines indicate that the first serious work done on the Blue Grouse property was in the year 1915.

In that year a local syndicate started to develop the mine in a small way and began to ship ore to the smelter. In 1917 the Consolidated Mining & Smelting Company of Canada obtained a lease on the property and shipped ore to the Trail smelter for three consecutive years. As far as it can be ascertained, the following tonnages were shipped during the years 1915-1919 inclusive:

		Tons	Copper	Silver
1915	1 car sorted ore (estimated 40 tons)	40	11.1 %	1.5 oz.
1916	2 cars (estimated 80 tons)	80	4.48	
1917	C.M.&S. shipments sorted ore	1500	7.0	1.0
1918	" " " "	531	4.0	0.8
1919	" " " "	240		
Total		2391 tons		

The total tonnage of sorted ore shipped was 2391 tons averaging 6.0% copper and 1.0 oz. silver. The gold content was negligible. It is difficult to estimate what might have been the average grade of the ore mined before sorting, but I would estimate that it was close to 4.5% copper.

There is no mention made in these old Government reports on the profit made in shipping this ore, but it would appear certain that the high prices for copper during the war years made the operation possible. The average yearly prices for copper during the years 1912-1920 were as follows:

1912	16.3¢ per lb.	1917	27.18¢ per lb.
1913	15.3¢ " "	1918	24.6¢ " "
1914	13.6¢ " "	1919	18.69¢ " "
1915	17.2¢ " "	1920	17.4¢ " "
1916	27.2¢ " "		

The C.M.& S. Co. carried out a limited diamond drilling programme during the war years and some good ore intersections were cut. However, these results as a whole indicated that the ore picture for a

depth down to 200 feet below the main surface showing was similar to that exposed on the surface, namely disconnected short ore shoots. It is apparent that this condition combined with the falling price for copper caused the C.M.& S. to give up their lease. The property then lay idle until 1928 when Pacific Tidewater Mines acquired it and commenced in 1929 to drive a lower crosscut to intersect the ore zone cut by the deepest drill hole. This crosscut was driven only 83 feet when work was stopped, due probably to the financial crash of that year. Then followed a further period of idleness until the property was acquired in 1952 by the present owner Cowichan Copper Company Limited.

GEOLOGY

A geological study of the area has been made during the past two months by L. Gatenby, who produced the attached two geological maps, one of which covers the immediate area of the main surface showings (scale 1" to 100 ft.), while the other covers a reconnaissance of a larger portion of the claims (scale 1" to 500 ft.). These maps show that the copper mineralization in the form of chalcopyrite occurs in disconnected lenses in an altered volcanic formation which has been intruded by numerous irregularly-shaped tongues and dykes of an intrusive classified by Gatenby as a feldspar porphyry. The alteration of the volcanics is of varying degree, but where the copper mineralization is strongest there is also more evidence of the replacement mineral garnet. I believe that these maps represent the first detailed geological study of this immediate area, and in my opinion they give a picture of the ore conditions which would be revealed by an underground development programme.

SURFACE SHOWINGS

The main surface showing, which produced by far the greater part of the tonnage shipped, lies 350 feet west of the ore bin shown on Gatenby's map (1" to 100 ft.). Here there is a heavily garnetized zone roughly 120 feet in length with a maximum width of 35 feet. In this zone there were bands of ore on the footwall and hanging wall sides. Almost all of the shipping ore has been removed above the water level of the old workings. As the map shows, a good deal of surface trenching has been done in the immediate neighborhood which failed to disclose any northerly or southerly extensions of the ore shoot which appears to have had a maximum length of around 75 feet. To the west and south west of the main showing numerous surface trenches and open cuts have disclosed four isolated lenses showing copper mineralization. Some ore has been mined from these lenses. It would be necessary to clean out these old workings to determine if there was still ore in the bottoms of the cuts and to take samples to ascertain if the grade was commercial. In the condition in which they are now in they do not appear very encouraging, but I think that further work would improve the picture.

I believe that other ore lenses exist at the surface but which are covered with overburden. A detailed examination of the surface could reveal some evidence, such as rusty rock coutcrops, and work done in such places could prove up other ore shoots. In his reconnaissance survey Gatenby found an ore occurrence at survey station 145 which lies approximately 800 feet south of the ore bin at station 50. Here a rusty zone outcropped at the surface. As the overburden appeared light, the immediate area was stripped on March 17th and a lens of ore 20 feet long by 5 feet

wide was exposed. The zone was broken into and a sample of fresh sulphide ore was taken across a 5-foot width. This sample assayed 7.60% copper, 0.015 oz. gold and 0.40 oz. silver. Near survey station 76 and about 600 feet west of the 20-foot ore lens above described another ore lens had been found and which had a length of 25 feet and a width of 3 feet. Further work might show a greater length than 25 feet.

At several places on the claims pieces of float have been found, and as it is unlikely that this float has travelled far, such locations should be good prospecting ground.

Approximately 3000 feet south of the ore bin there are a number of old surface workings and short adits which were made on erratic showings of copper mineralization. Apparently these showings were opened up as long ago as 1906. The property was then known as the Sunnyside. The old pits and trenches have caved in and a proper examination of the extent of the mineralization is not possible. However, there does not appear to be any continuity of the various showings and they resemble in that respect those of the Blue Grouse further north. These Sunnyside showings are included in the claims owned by Cowichan Copper Company.

Various specimens from the Blue Grouse were examined for the mineral scheelite under the ultra violet light, but no traces of scheelite were noticed. These tests were made because scheelite often occurs in a scarn formation similar to that on the Blue Grouse property.

ORE RESERVES

As can be expected, there are no "blocked out" ore reserves at the Blue Grouse property. However, there are limited indicated ore reserves based on the diamond drilling results obtained by the C.M.& S. Company.

As any successful reopening of the Blue Grouse mine appears to be dependent on the accuracy of these diamond drill results, which were given to me by Mr. O.G. MacDonald, President of Cowichan Copper Co. Ltd., I requested proof of such results. Mr. MacDonald submitted for my inspection a photostatic copy of a letter dated November 22, 1951 from Mr. L. Telfer, Exploration Superintendent of the C.M.& S. Co. Ltd., to R.W. Wyllie who at that date owned the three Crown Grants. This letter gave the results of the C.M.& S. diamond drilling, and I consider it as satisfactory proof of the C.M.& S. results.

Attached hereto is a plan showing the results of the diamond drill holes put down under the main lens of ore which produced the bulk of the tonnage shipped. Holes No's 1,5,6,8 & 9 were drilled to cut the downward extension of this lens. Also attached is a Section looking north which is reported to have been copied from a blue print now in the hands of the B.C. Department of Mines.

Hole No. 1 is reported to have cut 1.0 feet of ore averaging 3.92% copper. Hole No. 5 did not cut any ore which indicates that the lens does not continue to depth towards the north. On the surface directly above this hole there is no ore, but there was the possibility that the ore raked to the north. Hole No. 6 cut two good intersections of 10.2 and 19.7 feet of core which assayed 5.81% and 6.40% copper respectively. As this hole appears to have cut diagonally across the ore, the true widths of ore may be closer to 7 and 12 feet. Hole No. 8 cut 17 feet of core assaying 4.61% copper and I would judge that 12 feet would be the true width of ore at this point. Hole No. 1 is particularly disappointing in that it is shown to have penetrated the ground some 20

to 30 feet below the good ore intersection found by hole No. 8. However, I would not call this result too conclusive as hole No. 1 could readily have deviated sufficiently so as to cut the short ore lens where it was tapering out. While hole No. 9 was disappointing, yet I do not believe it is conclusive. A long hole such as No. 9 could easily have missed the ore. The hole could have deviated as much as 40 or 50 feet at the depth of 466 feet where it cut 2.0 feet of ore assaying 0.96% copper.

So while it is difficult to make an estimate of indicated ore reserves based on these few drill results, I believe it would be reasonably safe to conclude that there were 5000 tons of shipping ore available, which figure might quickly be increased after the crosscut tunnel, now being driven, had reached its objective and permitted a modest amount of drifting and raising to be carried out plus a limited diamond drilling programme. I do not feel that it is possible to give any definite opinion as to whether the ore lenses will carry down to depth. If a lens should taper out in depth, then possibly another one will take its place. This really is the gamble that is being taken by the present owners, and it is a worth while gamble since it does not involve more than 500 to 600 feet of tunnelling and raising with possibly a limited underground diamond drilling programme when the present tunnelling programme is completed.

ESTIMATED NET VALUE PER TON OF SHIPPING ORE

The following calculations show what would be the net value per ton of ore shipped to the Tacoma smelter. The smelter schedule of rates, deductions, etc., was discussed with Mr. Sigler of the Tacoma smelter. The smelter makes the following deductions and charges:

(1) A deduction of 1.3 Units is made from the average assay of a

shipment. For example, on a shipment averaging 6.0% copper, a deduction of 1.3% would be made, leaving 4.7% to be paid for or 94 lbs. per ton.

(2) The smelter pays the foreign price of copper less 2.75¢ per lb. Thus if the foreign price is 33¢ per lb., payment would be made at the rate of 30.25¢ per lb.

(3) The smelting charge depends on the analysis of the ore. If the ore ran very high in silica, then the smelting rate could be as low as $1.00 per ton. However, judging from the analysis of previous shipments from the Blue Grouse property, the silica content of the ore is not high. Based on samples submitted to the smelter by Mr. O.G. MacDonald in October of 1952, the smelter quoted a base smelting charge of $4.00 per ton for ore up to $25.00 per ton valuation plus 10% for any valuation in excess of $25.00. The smelting charge on 6% copper ore would thus be approximately $5.10 per ton.

(4) payment would be made for gold in excess of 0.03 oz. per ton and for silver in excess of 1.0 oz. As the average gold and silver values on 6.0% ore are less than 0.03 and 1.0 oz. respectively, no payment could be expected for gold and silver.

(5) Mr. Sigler felt that it would be wise to include an unloading charge of 50¢ per ton of ore.

Net Value Per Ton of 6% Copper Ore

6% copper ore less 1.3% = 4.7% or 94 lbs. per ton.

94 lbs. per ton at 30¢ less 2.75¢ = $25.85 per ton

Less	smelting charge	5.10	"	"
"	unloading charge at Tacoma	.50	"	"
"	barge freight Cowichan Bay to Tacoma	1.75	"	"
"	trucking cost mine to Cowichan Bay	2.00	"	"
"	marine insurance, customs, etc.	.15	"	"
				9.50
Net value per ton of 6.0% copper ore				$16.35

Applying the same method of calculation, the net value per ton of 5.0% copper ore would be $10.85.

The price of copper has been taken as 30¢ per lb. It is true that the foreign price of copper is now around 33¢ per lb., but the writer considers that it would be unwise to base any estimates on this higher figure. Well informed opinion is that the foreign price of copper will recede to around 30¢ within the next few months. Some authorities believe the price will go below 30¢ per lb.

PROFIT POSSIBILITIES

The profit possibilities from shipping ore to the Tacoma smelter depend chiefly on the grade of ore shipped. Every effort should be made to hold the grade at 6% copper, and in order to achieve this, it is considered that sorting at the mine is essential. Sorting could be carried out at the portal of the crosscut tunnel now being driven. A sorting platform and a waste chute are required and these could be built in three or four days time. Effective sorting largely depends on the nature of the ore. If the values are evenly disseminated then sorting will be difficult. However, as it was possible to sort the ore from the surface working to give a shipping grade of around 6%, it is hoped that this will also apply to the ore at depth.

It has already been shown that the net value per ton of 6% ore shipped is $16.35, taking copper at 30¢ per lb. From this figure must be deducted the cost per ton for mining, development, sorting and general overhead. I believe this should be done for $7.00 per ton shipped, which would leave an operating profit of $9.35 per ton.

If the shipping ore averages 5% copper, then the operating profit

per ton would be reduced to $3.85, while if the grade dropped to 4% copper, then there would be no profit. These figures show how essential it is to maintain the grade of ore shipped at 6% copper and thus avoid paying freight and smelting charges on too large a proportion of waste material.

The estimated mine operating cost of $7.00 per ton should permit a limited amount of development to be carried out in ore in addition to taking care of mining, sorting and overhead charges.

Assuming the 5000 tons of indicated ore to average 4.5% copper, then this tonnage after sorting could produce around 3500 tons of 6% shipping ore. The total operating profit on 3500 tons at $9.35 per ton would be $32,725.00. Further profit would depend upon the tonnage and grade of ore found by the underground exploration programme, and it would indeed be disappointing if further ore was not found.

CAPITAL EXPENDITURES

An excellent feature of this property is the small amount of capital required to bring it into production as a shipper of sorted ore to the Tacoma smelter. Apart from property payments, the sum of $55,000.00 should be ample to take care of pre-production expense. A rough breakdown of this expenditure is as follows:

600 feet of underground development (400 feet of crosscutting, 100 feet of drifting and 100 feet of raising) @ $40.00 per foot.	$18,000.00
Ore bin, sorting plarform, ore chute	4,000.00
Mine equipment to produce 40 tons in 2 shifts	10,000.00
Diamond drilling underground 1500 feet @ $3.00	4,500.00
Roads	3,500.00
General expense	11,000.00
Capital expense at Cowichan Bay	4,000.00
	$55,000.00

This estimate of $55,000.00 includes the espenditures which have been made to date for equipment, bin, road, geological survey, company organization expenses etc., but not including any property payments.

Property payments total $24,500.00 of which $9,500.00 has already been paid, and the remaining $15,000.00 has to be paid in yearly installments of $5000.00, the next payment coming due on September 31st, of this year. These $5000.00 installments are not a firm commitment of the company.

CONCLUSION

While I consider this venture an attractive speculation, provided that initially the efforts of the company are confined to shipping ore, I would suggest that the capital structure of the company is out of line with its potentialities as an ore shipper. The authorized capital is $1,500,000.00 divided into 3,000,000 shares of 50¢ par value. The sale of a total of 500,000 shares to net the treasury $60,000.00 would appear to provide sufficient capital to bring the mine into production. However, it is noticed in the Prospectus of Cowichan Copper Company Limited that the vendor, O.G. MacDonald is to receive 750,000 shares to be escrowed under the directions of the Superintendent of Brokers. I would recommend for a speculatiye venture of this type that the vendor's equity should not exceed 25% of the shares issued and should not be 25% of the shares authorized.

Provided that the price of copper remains at or above 30¢ per pound, the shareholders have a good chance of getting half their investment back from the indicated ore in sight. Should the ore bodies continue to depth - and there is no known geological reason why they should not - then the profit could greatly exceed that on the small tonnage of indicated ore.

If such a condition applies to the one lens on the property which has to date been fairly well explored by surface work and drilling, then it could also apply to the other known lenses on which little or no work has been done.

It is stressed that this is a venture in which there is no room for waste or unnecessary overhead expenses. All expenditures should apply on the property to the direct task of producing ore of the necessary shipping grade.

It is doubtful to the writer if the Blue Grouse property will produce sufficient tonnage to warrant mill construction. If this opinion is proved to be incorrect by underground exploration, then the raising of the necessary capital could be arranged by sale of the shares remaining in the treasury.

Yours very truly,

HILL, LEGG & HEMSWORTH

R.E. Legg

R.E. Legg.

REL/er
March 24, 1953