

Extract taken from Report of the Minister of Mines, 1916,  
Page K 312.

#### COWICHAN LAKE DEPOSITS

Blue Grouse. In a southerly direction from the narrows in Cowichan lake, and about six miles from the south end of the lake, an occurrence of copper ore occurs on the Blue Grouse group of mineral claims about one mile and a half from the westerly shore. The deposits belong to the contact-metamorphic type, and are developed under similar conditions to those prevailing on the Koksilah ridge. The Blue Grouse group was prospected to a considerable extent in 1915 and 1916, when underground development-work was done, consisting of a crosscut adit and drifts driven in an ore-body at right angles to the adit. The property is referred to in the Minister of Mines' Report for 1915, page 290.

During the winter of 1916-17 this property was leased by a Victoria syndicate, which perfected an arrangement with the Empire Lumber Company, owners of the Crown-granted surface rights, allowing the syndicate to mine and ship ore. Since then some shipments to the Ladysmith smelter are reported that yielded satisfactory returns.

The development-work has been extended, but, as the writer has not seen the property since April, 1916, no detailed description is given in this report.

The adit, when examined by the writer, crosscut an occurrence of chalcopryrite ore in garnetite gangue for about 30 feet at a depth of about 40 feet below the outcroppings in a ridge or bench of a mountain which rises to an elevation of about 1,500 feet within a comparatively short distance south-westerly from the workings, and roughly parallels the shore of Cowichan lake.

There are several other outcroppings of copper ore on the property which apparently represent isolated lenses, but, as some of these are in line along the strike of the ore-body exposed by the workings mentioned, further development may determine continuity between the outcroppings.

COPY

February 2nd, 1954.

Mr. Oswald MacDonald, President  
Cowichan Copper Company.

Dear Sir:-

GRAVITY DETERMINATIONS ON THE COWICHAN COPPER COMPANY ORE.

Specific gravity determinations were made by J. R. Williams & Son Ltd. on five samples selected from the list of samples taken in the northeast raise driven off of the sublevel during the period of January 8th and 21st.

The following table shows the sample numbers, the percentage of copper present, the specific gravity of the sample, the calculated number of pounds per cubic foot, the equivalent number of cubic feet of rock in place to weigh one ton, and the calculated percentages of weight of chalcopryrite, garnetite and pyrite present in the samples.

Sample No.	Percentage of copper in sample	Specific Gravity of sample	Calculated				
			Pounds per cubic foot.	Cubic Feet per ton.	Percent of Weight of Chalco-pyrite.	Percent of weight of Garnetite.	Percent of weight of Pyrite.
6227	3.05	3.633	226.3	8.83	8.97	64.	27.03
6283	6.30	3.825	238.3	8.39	18.80	49.20	32.0
6277	9.75	3.767	234.7	8.52	28.70	47.30	24.0
6278	11.80	3.756	234.0	8.54	34.70	44.60	20.7
6279	15.15	3.891	242.4	8.25	44.60	33.15	22.25
AVERAGE	9.21	3.774	234.9	8.51	27.10	47.75	25.15

Respectfully submitted,

(Sgd.) D. Nelson

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Extract taken from Report of the Minister of Mines, 1916,  
Page K 366.

## VICTORIA MINING DIVISION

### Lode-Mining

On the west side of Cowichan lake a local syndicate has for the past two years been developing the Blue Grouse mineral claim, and during 1916 three car-loads of ore were shipped. The main working is a tunnel 87 feet long, with drifts 28 feet to the south and 52 feet to the north. This development has shown up a nice body of copper ore which averages about 5 per cent copper. The first car of ore was hand-sorted and was shipped to Trail, giving returns of 11.10 per cent copper, 1.5 oz. silver, and 0.08 oz. gold to the ton. The other two cars were mine-run ore and shipped to Ladysmith; the returns gave 4.48 per cent copper and 0.84 oz. silver to the ton. Development of the property with occasional ore shipments is being proceeded with.

COWICHAN COPPER CO., LTD.

BLUE GROUSE MINE

EN. 118

SUMMARY

In 1954 a mineral agreement was made with Canadian Pacific Oil and Gas on ground south of the mine area. Mapping, prospecting and geochemical work was started on this ground in the summer and the mine area was re-examined and tested geochemically. The geology is complicated and additional detailed geological work together with detailed prospecting of the favorable areas is necessary.

LOCATION

Latitude 48°50' Long. 124°20'. The area lies south of Cowichan Lake in the Victoria Mining Division and is reached by paved highway from Duncan and Honeycomb Bay.

PROPERTY

The permit covers 7087 acres in Lots, 12, 13, 22, 178, 303, 740, 832, 835, 838, 897, 898, 952, 969, 1071, 1144 and 1165.

GEOLOGY

The area is underlain by tightly folded Triassic limestones and volcanics cut by a series of overthrust faults and intruded by irregular bodies of feldspar porphyry. These rocks are overlain unconformably by patches of Cretaceous conglomerates and sandstones and are underlain by Permian volcanics and sediments.

(a) Topography

The land lots are bounded <sup>by</sup> valleys at Cowichan Lake, Sutton Creek and Gordon River at elevations of 500 to 1000 feet above sea level. They extend from these valleys over a series of steep sided logged-off ridges 2000 to 3000 feet in elevation. Main highways follow the valleys and steep logging roads switchback up the ridges.

(b) General Geology

The rocks are a series of interbedded sediments and volcanics as follows:

Upper Cretaceous sandstone and conglomerate.

Unconformity

- Triassic Porphyritic flows
- Argillites
- Sutton Limestone 100'
- Amygdalesid basalt 100-200'
- Red Beds 100-300'
- Amygdalesid basalt 100'
- Tuffs and agglomerate 100-300'
- Basalt and andesite 200'
- Tuffs and agglomerate 100'
- Basalt 200'

see History

PROPERTY FILE

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PROPERTY FILE

Permian limestones, cherty sediments and volcanics underlie the Triassic Rocks.

The following is a more detailed description of the rocks:

Amphibolitic flows:

These are a thick uniform series of dark brown or black vesicular rocks with square crystals of feldspar. They weather to an earthy brown color and are readily recognized in the field. They are over 500' in thickness.

Argillites:

These are finely bedded black and dark brown soft rocks generally crushed and they contain numerous fossil casts. At the base of the series they contain narrow continuous limestone bands, and grade into the Sutton limestones. At the Sunnyside road they contain volcanic bombs. It is difficult to measure the thickness of the beds as they are crumpled but they are believed to be about 500'.

Sutton Limestone:

These are grey crystalline limestones, argillaceous limestones, and in places a black limestone basaltic mixture. The beds were evidently deposited in a shallow sea and are continuous. In some areas on the claims up to 100 feet of fairly pure grey to white limestone exists. In others there are interbeds of argillite, tuff and basalt and in some sections the rock is black and is difficult to distinguish from basalt. Areas of this black limestone and limy basalts often contain interbedded volcanic bombs.

Generally, the horizon is about 100 feet in thickness.

Basalt:

Dark amygdaloidal flows underlie the Sutton horizon. The rocks are dense fine grained basalts with amygdules of feldspar, epidote or quartz. Feldspar fillings are most common and often they are grouped on rosettes or concentric circles. In some places these lavas are vesicular and in other sections they grade to a basaltic agglomerate. They sometimes contain hematite or chlorite filled vesicules. The flows vary from 150 to 350 feet in thickness.

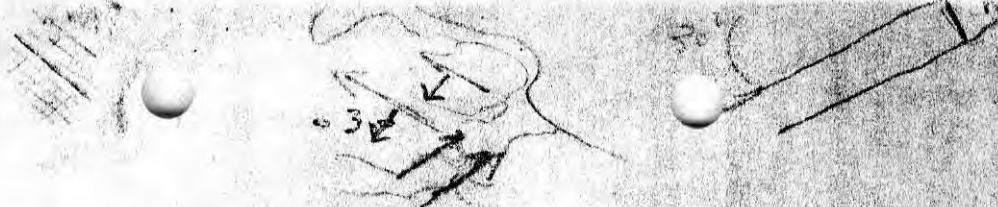
Hematitic Tuffs or Red Beds:

Limy hematitic tuffs underlie the black basalt horizon on the claims. These are variable and grade from brown ore with 50% to 70% hematite to limestone or to bedded tuffs. There is often a 30 to 40 foot impure limestone or limestone agglomerate at the base of the formation. The thickness of the red beds vary from 100 to over 300 feet.

Basalt:

A 100 foot thickness of black chloritic amygdaloidal basalt. This is often graphitic and is often quite soft. Sometimes it is agglomeratic.

7. Below the basalt or agglomerates a 100 to 150 foot thickness of limy tuff occurs. This has narrow beds of limestone in it at some horizons.



Thick beds of basalt or andesite pillow lavas underlie the tuffs and except for narrow beds of tuff and agglomerate extends to the base of the series with thicknesses of at least 500 feet.

Permian rocks with a cellular appearance and composition underlie these Triassic basins and irregular feldspar porphyry dikes, sills and plugs intrude all the rocks.

## STRUCTURAL GEOLOGY

The structural geology of the area is complex. The rocks are tightly folded into a series of overturned folds whose axes strike northwest, dip from 20 to 30 degrees to the southwest and plunge 20 to 40 degrees to the southeast. The changes in plunge are due to a second series of horizontal open folds with a northeast strike.

These rocks are cut by east striking thrust faults dipping 15 to 30 degrees to the south and having displacements of up to 1000 feet at a bearing of northeast the plane of the faults.

A second series of reverse faults strike northeast and dip southwest from 30 to 45 degrees. Movements are northeast of 100 to 150 feet.

Numerous northwest striking faults with steep dips and small displacements are adjustment faults associated with the overturned folds.

The results of these movements and the irregularity of the feldspar porphyry intrusions make the geology obscure but the Sutton limestone, the overlying porphyritic flows, the argillites and the red beds are excellent markers.

## ALTERATION

Generally, the rocks are not highly altered but locally, near the porphyry intrusives, they are extensively altered to siliceous epidote rocks and to magnetite garnet actinolite skarns. In areas where the faults follow the beds the rocks are mylonitized with large areas of chlorite and graphite.

## MINERALIZATION

The sulphide mineralization occurs in the limy rocks which have been altered and fractured. It is a high temperature replacement and varies in appearance. At the mine the main ore body occurs in the middle limy tuffs (see 7 above) at the crest and along the overturned limb of an anticline. The rocks are fractured and altered to epidote-actinolite skarn beneath irregular feldspar porphyry dikes. Chalcopyrite and pyrrhotite replace the limy silicates and the unaltered tuffaceous material. A second ore body occurs in the same horizon on the upper limb of the anticline. Here epidote rocks adjacent to porphyry dikes has been involved in the folding and bedded sulphides (pyrrhotite and chalcopyrite) replace the altered rocks. Other ore bodies occur as magnetite pyrrhotite-chalcopyrite-pyrite-sphalerite replacements in mylonitized red beds or in the tuff horizon. One deposit occurs in an actinolite skarn area at the nose of a fold in Sutton limestone near porphyry dikes.

MAIN GEOLOGY

Prospecting and reconnaissance geology was done over the area from Sutton Creek to Gordon River to Miller Creek to Cowichan Lake but at the time this work was done the geology was not understood in detail. Work was not concentrated on the favorable areas and additional detailed mapping is required.

The following is a description of the geology on the claims:

Lot 12:

This lot is below the Cayuse Road along Cowichan Lake and is underlain by Mesozoic formations.

Lot 13:

The Sutton Limestone argillite contact outcrops on the Cowichan Lake on lot 13 in a deep syncline overturned to the west. The ground is heavily overburden covered and mostly underlain by argillites. No mineralization has been found on the claims.

Block 22:

*all in 11*

This is a very long block which starts at Cowichan Lake follows Miller Creek then Sutton Creek almost to Gordon River. It covers all the formations but the ground is heavily overburden covered and many of the valley bottoms were eroded the softer argillites which overlie the Sutton limestones. In most cases, the favorable horizons are deeply buried beneath overburden or argillites.

Blocks 292 and 303: *all in 11*

These are on the north slope of Miller Creek and cover the steep rocky ridge slides south of the valley. The rocks are faulted segments of the Sutton and beds beneath them are on the limb of anticline similar to that in the mine area.

Mineralization was found in the middle tuff beds and high grade float was found on the Miller Creek slope.

Detailed mapping and prospecting need to be done over the lot.

Block 295:

*all in 11*

Block 295 covers the south slope of Sutton Creek. The formations cross Sutton Creek and outcrop across the lot. It has good prospecting possibilities.

Lots 917, 802, 838, 1571, 877 and 808

*all in 11*

These lots cover the crest of the Sutton Creek anticline and are largely underlain by the middle tuff horizon (7) and by limy members. Several skarn areas are exposed and the blocks appear favorable. Further detailed mapping and prospecting is warranted.

Lots 891, 740, 856 and 765

*all in 11*

The lots lie on the slope to Gordon River and contain one limb of the Sutton limestones and the underlying argillaceous flows. Little work has been done as yet on the grounds.

Notes on the Blue Grouse Copper property Cowichan  
Lake B.C.

Location and access: see map.

Rock types: The top and northeast  
slope of Blue Grouse hill are underlain by  
andesitic and basaltic volcanic rocks.  
Near the Blue Grouse workings they are  
of uncertain origin, partly breccia, and  
partly massive dark green volcanics.  
Very irregular masses of dark grey, white-  
weathering feldspar porphyry intrude the  
volcanic rocks near the workings.

Workings: see sketch map.

mineralized zones: The principal  
working on the property is a big open-  
pit (Cut #1) near the top of a steep  
northeasterly-facing bluff. The ~~cut~~<sup>pit</sup> is  
about 60 feet long, 30 to 40 feet wide  
and 20 to 40 feet deep. The west, ~~or~~<sup>and</sup>  
highest wall of the pit is well defined  
by a shear zone that strikes north and  
dips about 45 degrees west. West of the  
shear zone the rocks are volcanics, while  
east of it they are massive sharn. Sharn  
forms a zone 30 to 40 feet thick and which  
not more than ~~about~~ 200 feet long ~~that~~<sup>which</sup>  
appears to lie parallel to the hanging wall  
shear zone. On the east, low wall of  
the pit, sharn grades into volcanics  
and to the north and south along the  
strike of the sharn zone no sharn has  
been ~~so~~ found more than a few tens  
of feet from the ends of the pit.

The sharn is a fine to medium  
grained aggregate of made up largely



of brown garnet. Locally it contains epidote and actinolite, and is cut by veinlets or contains disseminated grains of sulphides. <sup>Small amounts of pyrite, chalcocypite</sup> ~~Pyrite is the~~ <sup>are present</sup> ~~most abundant sulphide~~ in the walls of the pit, and although most copper ore is reported to have come from this pit, very little <sup>sulphide</sup> ~~chalcocypite~~ or copper stain can be seen. Most copper of the copper-bearing sharn thus appears to have been removed.

The short branching level workings below the big pit show that ~~the~~ sharn is present only immediately below the pit. Drilling carried on by Consolidated Mining and Smelting Co. in 1918 is reported to have intersected copper bearing zones as much as 200 feet down dip from the bottom of the pit but <sup>the</sup> holes ~~are~~ are almost vertically one above the other and give no indication of the strike length of the mineralized sharn. Present development is being carried on with the hope of mining the mineralized zones intersected in this early drilling.

Several small old open cuts ~~are reported to have been made to~~ the southwest <sup>and above</sup> ~~of~~ the big pit and a small amount of copper is reported to have been produced from two of them. These two cuts are along shear zones not parallel to, or inline with each other or with that in the big pit. Pods of sharn a few feet wide and a few tens of feet long containing sulphides, mainly pyrite, are exposed in these workings.

Production:

YEAR	TONS SHIPPED	GOLD oz/T	SILVER oz/T	COPPER lbs.	% CU CALCULATED
1917	1372	—	1228	191,970	7.
1918	501	—	399	44,022	4.4
1919	240	7	192	18,595	3.7
TOTAL	2113.	7	1819	254,587	6.

J. T. Fyler  
Feb 26/53.

# George Cross News Letter

"Reliable Reporting"

WESTERN CANADIAN INVESTMENTS

NO. 249(1956)

DEC. 28, 1956

COWICHAN COPPER CO. LTD.

## CLOSE SAMPLING ADDS FURTHER TO PROVEN GOOD GRADE ORE

As systematic sampling proceeds at Cowichan Copper Mine, Vancouver Island, the excellent grade of the developed ore is being established.

Maps previously published have shown in detail the dimensions and grade of the "H" or main orebody on the 1430 elevation level.

The accompanying assay plan shows dimensions and grade of the South Ore Block of this main orebody 90 feet vertically above the 1430 level on the 1340 ft. elevation.

At this horizon the sampling for 200 feet of length has shown a 31 foot average width at this elevation with average grade of 6.7%, says O.G. MacDonald, president.

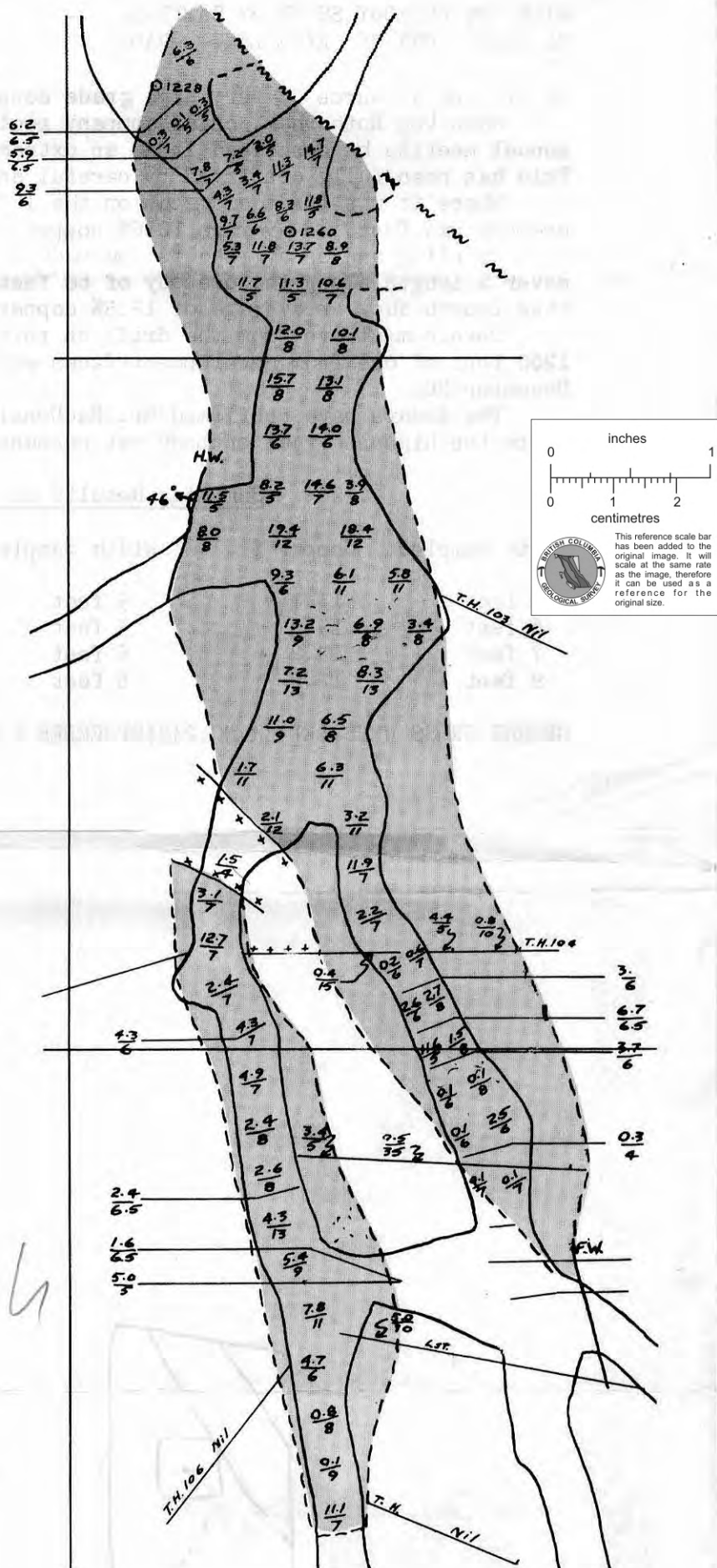
This forms part of a main orebody which has been opened to date on four levels through an indicated vertical range of about 430 feet or 600 feet on the slope of the structure. Greatest length so far has been opened on 1430 level where it is 560 feet long.

After sampling has been completed on the 1340 level, two deeper levels on the 1272 and 1150 ft. horizons will remain to be sampled. At present a sublevel is being opened just a little above 1200 feet. Surface elevation is slightly above 1500 feet.

### SUMMARY OF ASSAY RESULTS TO DATE

#### COWICHAN COPPER MAIN OREBODY

1430 Level	Length	Average Width	Average Grade
North Ore Block	200 ft.	40 ft.	4.00%
South Ore Block	200 ft.	40 ft.	4.65%
<b>1340 Level</b>			
South Ore Block	200 ft.	31 ft.	6.70%



COWICHAN COPPER CO. LTD.

1340 LEVEL ASSAY PLAN

"H" ORE BODY (Main Ore Body)  
South Ore Block

Scale - 20 FEET - 1 INCH

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PROPERTY FILE

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NO. 248(1956)

COWICHAN COPPER CO. LTD.

WIDE NEW OREBODY SHOWN BY SAMPLING  
TO CARRY ORE OF EXCELLENT GRADE

- Enough sampling has been done on the  
"J" or Hangingwall orebody at Cowichan  
Copper mine to prove effectively that

it will be a source of very high grade copper ore.

When Don Rotherham, chief company geologist, referred to this orebody at the annual meeting he described it as an extremely high grade zone carrying "lovely ore." This has been fully confirmed by careful and detailed sampling.

Where it was first crosscut on the 1272 elevation level of the mine this orebody was found to average 10.6% copper for an estimated true width of 43 feet.

Sampling and assay results now made available by O.G. MacDonald, president, cover a length along the orebody of 68 feet. The 82 feet of sampling done within this length show an average of 12.5% copper.

Development ore from the drift on this orebody contributed to a shipment of 1200 tons of ore from development-faces which went forward to Tacoma Smelter on December 20.

The assays have confirmed Mr. MacDonald's original view that this would prove to be the highest grade orebody yet encountered in the mine

Sampling Results on "J" Orebody 1272 Level

Width Sampled	Copper %	Width Sampled	Copper %	Width Sampled	Copper %
6 feet	13.7	5 feet	10.3	7 feet	12.1
6 feet	15.0	5 feet	9.3	6 feet	9.4
7 feet	17.2	6 feet	8.8	12 feet	23.1
8 feet	12.2	6 feet	13.3	8 feet	10.7

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