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R E P O R T

on the

BLUE GROUSE PROPERTY,  
COWICHAN LAKE, VANCOUVER ISLAND  
BRITISH COLUMBIA

of

CORRIE COPPER LTD.

NTS. 92C/16

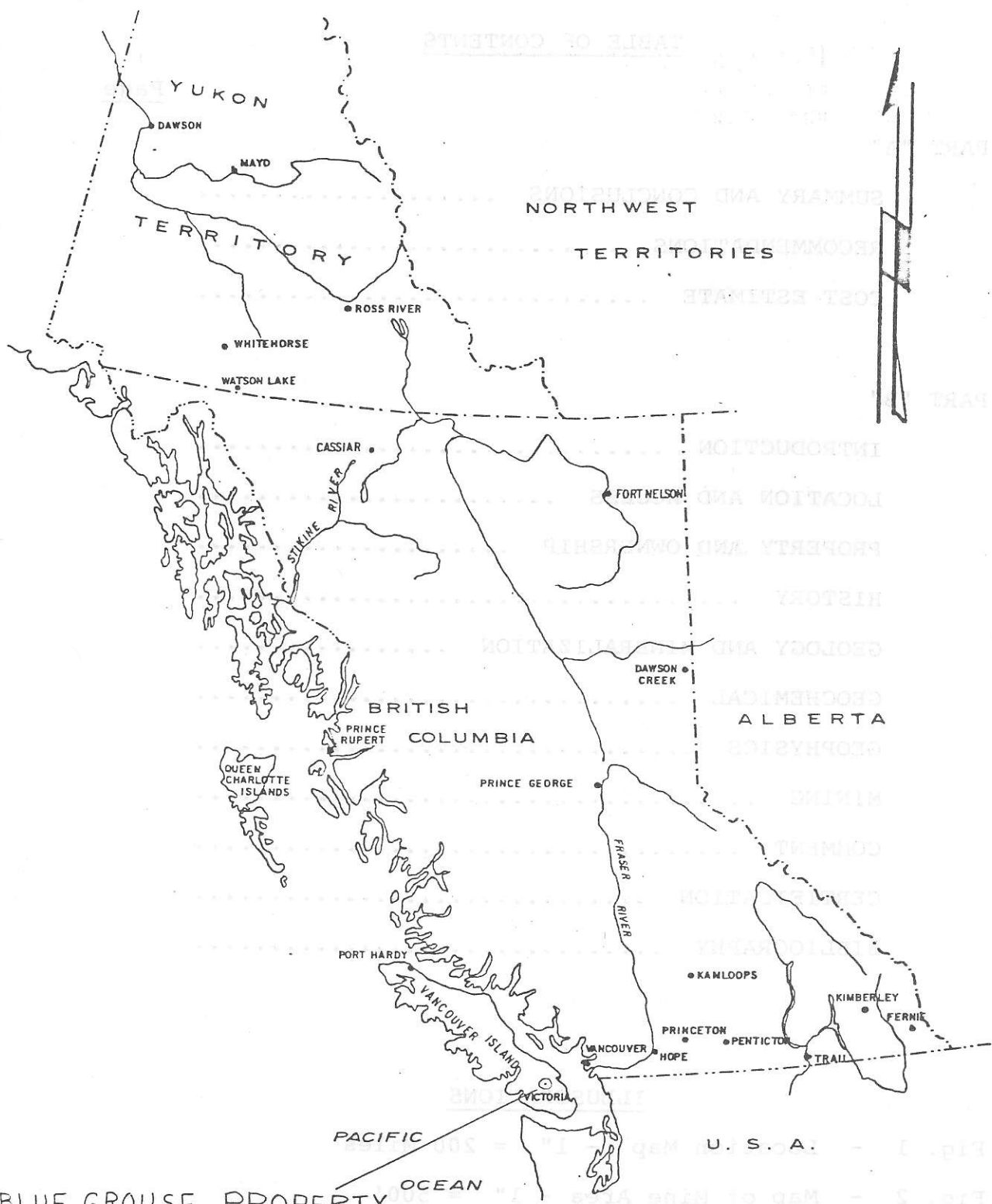
by

R.W. PHENDLER, P. ENG.

Vancouver, Canada

October 23, 1980

*report taken from  
VSE; Corrie Copper Ltd.*



BLUE GROUSE PROPERTY

LOCATION MAP		
VANCOUVER	BRITISH COLUMBIA	
<u>CORRIE COPPER LTD.</u>		
SCALE 1:12,672,000		
NTS.	DATE OCT. 1980	FIG. No. 1

1:12,672,000

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- Fig. 1 - Location Map - 1" = 200 Miles  
Fig. 2 - Map of Mine Area - 1" = 500'

PART "A"

SUMMARY AND CONCLUSIONS

Skarn deposits are high - temperature copper - magnetite replacements of limestone and are common throughout Vancouver Island. Unlike most skarn deposits, which are found within Quatsino (Sutton) limestone, the Blue Grouse deposit is related to limey tuffaceous beds within mixed volcanics of the Karmutsen (Franklin Creek) formation.

All are genetically related to plutonic rocks, either dykes, sills or irregular plutons. Among the better known copper deposits are Coast Copper, Ubell, Indian Chief, Hesquiat and the Blue Grouse.

The Blue Grouse property is located in south central Vancouver Island about 20 miles west of Duncan and has produced 274,000 tons averaging 2.95% Cu between 1957 and 1960. The mineralized skarn formation can be followed for at least 1,800 feet along strike by visual and geophysical methods and is open down dip and along strike to the northwest and southeast. However, the main ore zone is 200 to 500 feet long, 10' to 30' thick and extends 750 feet down the plunge from surface down to below the 1100 level. Dip is about 25° W.

During the period of mining, mill feed came from numerous mineral pods along the skarn formation, indicating that only a part was of commercial size and grade. This pattern can be expected to continue along strike in future exploration.

A number of mineral showings appear to be worthy of additional exploration. All are skarn type deposits, some in limey tuffs and some within the 100 foot thick Quatsino or Sutton limestone formation.

Recent geophysical work consisted of a vector pulse electromagnetic survey that is believed to be capable of testing to depths of 500 - 700 feet. Results showed that the Blue Grouse mineral zone is an excellent conductor and appears to extend along strike well beyond the limits of old mine workings. This is especially noticeable on the 1100 level, where no actual mining has taken place in the past. Top priority should be given to locating mineable material on the 1100 level by geological mapping, sampling and diamond drilling.

#### RECOMMENDATIONS

It is recommended that:

- 1) The diamond drill program presently under way be completed and the holes be electromagnetically probed.
- 2) The 1100 level be geologically mapped and sampled.
- 3) All accessible underground diamond drill holes be cleaned out and electromagnetically probed.
- 4) Underground diamond drilling be carried out on the 1100 level with the purpose of locating copper ore on or above that level.
- 5) Additional surface diamond drilling be carried out to investigate other known surface showings and electromagnetic conductors.
- 6) Additional surface EM work be carried out.

This program should be carried out in two phases.

COST ESTIMATE

Phase I

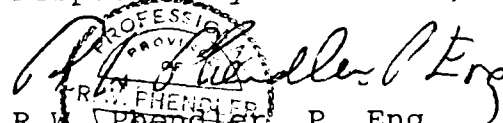

1) Additional Electromagnetic surveying	\$7,000
2) Geological mapping - 1100 level	3,000
3) Underground sampling and assaying	3,000
4) Underground diamond drilling - 1000' at \$20/ft.	20,000
5) Clean out underground drill holes	2,000
6) Assaying of core samples	500
7) Transportation and Accommodation	3,000
8) Engineering and Geology	<u>5,000</u>
Total -	\$43,400
15% Contingencies -	<u>6,525</u>
Grant Total Phase I -	\$50,025

Phase II

1) Surface diamond drilling - 2000' at \$22/foot -	44,000
2) Underground diamond drilling - 1500' at \$20/ft.-	30,000
3) Electromagnetic probing of holes -	3,000
4) Assaying -	1,000
5) Transportation and Accommodation -	3,000
6) Engineering and geology -	<u>6,000</u>
Total -	\$87,000
15% Contingencies -	<u>13,050</u>
Grand Total Phase II -	\$100,050

The sum of \$50,000 should be made available at this time to carry out Phase I of the above program.

Respectfully submitted,

  
R.W. Phendler, P. Eng.  


PART "B"

INTROUDUCTION

At the request of Mr. M. Filgas, President of Corrie Copper Ltd., the writer visited the Blue Grouse property on August 26 and October 22, 1980. He was guided by Mr. E. Stonehocker (August 26) and during the examinations surface diamond drill holes were spotted and later examined.

Prior to the examination the writer had the opportunity of studying the files of Placer Development Ltd. Invaluable information concerning the Blue Grouse property was made available and was used in the preparation of this report.

LOCATION AND ACCESS

The Blue Grouse property is located at an elevation of 800 to 1700 feet about fifty miles northwest of Victoria, Vancouver Island in southwest British Columbia. Access by car from Duncan, which is located halfway between Victoria and Nanaimo on the Island Highway (Route 1), is west on highway 18 through the towns of Lake Cowichan and Honeymoon Bay for 20 miles.

The property lies on the southwest shore of Cowichan Lake and is accessible by two roads - one which leaves Honeymoon Bay hugging the shore of the lake and leads to the old mill ruins and the adit portals and the Caycuse road, from which branches a road which leads to the higher levels.

PROPERTY AND OWNERSHIP

The Blue Grouse property consists of the following:

Crown Granted Claims - 11

Blue Grouse - Lot	31 G
Blue Grouse No. 2	Lot 32G
Blue Grouse No. 3	Lot 33G
S.S. No. 1	Lot 34G
S.S. No. 2	Lot 35G
S.S. No. 3	Lot 38G
S.S. No. 4	Lot 39G
S.S. No. 5	Lot 36G
S.S. No. 6	Lot 37G
S.S. No. 7	Lot 40G
S.S. No. 8	Lot 41G

These claims are covered by the Cindy, Joy and MAC claims comprising 42 units.

All are in good standing and are optioned or held by Corrie Copper Ltd.

HISTORY

The first recorded work on the Blue Grouse property took place in 1906 when Messrs. Douglas, Shelton and Prevost staked the Sunnyside and Here-it-is claims. A few trenches and a short adit were developed at this time and additional work was carried out in 1917 by J. Grayson.

The actual discovery of the Blue Grouse showing took place in 1915 and underground work was carried out in that year. In 1916 Ketchan and Miller leased the property and received permission from the holders of the surface rights (Empire Lumber Co.) to ship ore.

The Consolidated Mining and Smelting Co. acquired the property in 1917, carried out diamond drilling and underground



work and dropped the ground in 1918.

In 1928 and 1929 the Pacific Tidewater Company drove an 85 foot long crosscut along a diamond drill hole, but results were disappointing and no further work was done.

In 1957 the Cowichan Copper Co. Ltd. under the direction of Mr. O. MacDonald began exploration and development work, leading to the construction of a concentrator in 1957. Milling continued until 1960 when a total of 274,000 tons were treated averaging 2.95% Cu and 0.29 oz. Ag per ton.

In 1959 Mr. G.A. MacDonald conducted a self-potential geophysical survey over the ground north of the mine area and some anomalies were located.

In 1964 Cowichan Copper Co. carried out a geochemical survey over the central part of the property and results indicated the presence of anomalous areas that warranted additional exploration.

In 1976 Canex Placer Ltd. carried out a study of the mine area and this included a self potential survey, which indicated anomalous areas but was considered to have limited depth projection and the use of induced polarization over a few lines over the mine area.

Recently the key claims were acquired by Mr. G. MacDonald and Mr. G. Schell, who optioned them to Corrie Copper Ltd.

During 1979 Corrie Copper Ltd. rehabilitated the lower 1100' level on the recommendation of Mr. E. Chisholm, P. Eng. and in June and July, 1980 a Vector Pulse electromagnetic survey was carried out. Results showed the presence of conductors which warranted diamond drilling and a surface program was commenced in October, 1980.

## GEOLOGY AND MINERALIZATION

The area in which the Blue Grouse property is located is underlain by basalt and andesite flows of the Franklin Creek volcanic formations with minor interbedded limestone, argillite and tuffs, all of Triassic Age. These formations are folded and faulted and intruded by irregular bodies of feldspar porphyry. The Sutton limestone formation overlies the mixed volcanic formations.

Mineralization consists of chalcopyrite and pyrrhotite replacement of limey horizons forming a garnet - epidote - actinolite skarn. The principal zone is ten to thirty feet thick 200 to 500 feet in length and extends 750 feet down the plunge, which dips at about 25° W.

The skarn zone described above lies adjacent to an irregular feldspar - porphyry sill - like body and appears to lie within limey tuffaceous horizons within basalts and andesites. The Sutton Limestone formation, which is about 100 feet thick, does not appear to be associated with the principal skarn zone but the Sunnyside showing and the "New" showing lie on this band.

Crushed graphitic tuffs and argillites overlie the Sutton (or Quatsino) limestone and these formations contain fine grained disseminated pyrite, chalcopyrite and black sphalerite over large areas.

Within the Franklin Creek (or Karmutsen) volcanics are numerous limey tuff horizons that have undergone epidote - garnet - actinolite alteration that is referred to as skarn. Chalcopyrite, pyrite and magnetite mineralization is often associated with these skarn zones and although the exact process is not clear, it is

generally accepted that the presence of limestone or limey rocks, acidic intrusives and volcanic rocks are required. The source of the mineralization is believed to be the Karmutsen volcanics, which has an anomalous content of copper and iron.

#### GEOCHEMICAL

In 1964 a geochemical survey was carried out on lines spaced at 100 foot intervals. A qualitative method was used (rubeanic acid strips) and anomalous areas (relative to local conditions) were located. Some detailed testing was carried out but additional work is warranted, using up-to-date methods.

#### GEOPHYSICAL

A number of self potential surveys with limited depth penetration were carried out in the past and some conductors were discovered. This work was carried out by G.A. MacDonald for Cowichan Copper Co. Ltd. in 1959 and by Canex - Placer Ltd. in 1976. Canex Placer Ltd. also carried out a limited amount of VLF Crone Radem electromagnetic surveying but this, too, was felt to have a depth probe limitation of about 100 feet. Induced polarization work was carried out by G. White for Canex Placer over seven selected cross lines but results were negative.

Reconnaissance magnetometer surveying was also carried out in the past and this showed that magnetic anomalies occur over skarn deposits that contain magnetite and chalcopyrite.

In July, 1980 a vector pulse electromagnetic survey was conducted over the mine area with the purpose of seeing whether the sulphide mineralization was of sufficient conductivity to respond to this deep penetrating method. The survey grid was oriented in a N50°E direction parallel to the 1100 level crosscut.

Some 6 km of survey was done, as well as one line along the 1100 level crosscut (2000' long).

The principal mineral zone which is located 1500 feet southwest of the portal on the 1100 level, gave a strong multi-channel response close to where expected. Three zones are suggested with the strongest 50 meters southwest of the principal zone drift and the third 75 meters further west.

In general, the responses indicate that the mineral zone is an excellent conductor and could be traced to depth by probing diamond drill holes by the vector pulse electromagnetic method.

Strong responses were detected over a strike length of 600 meters with the anomalous zone open to the northeast and southwest and down dip.

#### MINING

Although detail mine maps are not available at present, it is known that the mine is developed on two levels, the main haulage or 1100 foot level and the upper or 1340 foot level. Two sub levels are also developed, the 1280 and the 1430 foot levels.

The "ore" mined came from the E, G, H, J and M bodies and from the No. 5 pit extending from above the 1430 level to the surface. Additional mill feed was obtained by slashing in the G north zone and the Sunnyside open pits. Efforts are presently under way to obtain more detail mine maps, etc.

#### COMMENT

Exploration by diamond drilling, VPEM surveying and underground development along strike from previously mined orebodies appears to be warranted. Old records show that no mining of the principal mineral zone took place below the 1220 level or 120 feet

above the lowest access level. As well, down holes show the presence of this zone below the 1100 level.

About 2,000 feet northwest of the main body of mineralization a surface trench showed interesting chalcopyrite mineralization over a strike length of 700 feet. An exploratory drive on the 1100 level beyond the present workings should be driven in the future.

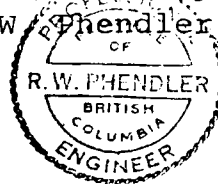
Mr. E. Chisholm in his report of August 10, 1979 states that sampling carried out by himself confirms the presence of unmined "ore" on the bottom level (1100').

Also that diamond drill holes put down by former owners show extensions of the ore below the 1100 level.

It is thought that detail exploratory work on the 1100 level may locate mineable pods of copper mineralization and this work should be undertaken.

Respectfully submitted,

  
R.W. Phendler, P. Eng.



CERTIFICATION

I, R.W. Phendler, of 7360 Decourcy Crescent, in the Municipality of Richmond, in the Province of British Columbia, hereby certify as follows:

- 1) THAT I am a registered member of the Association of Professional Engineers of British Columbia, No. 4421 - 1963.
- 2) THAT I am a graduate of McGill University, Montreal, with a Bachelor of Science Degree in Geology.
- 3) THAT I have practiced my profession continually for the past 27 years as Mine, Exploration and Consultant Geologist throughout North and South America.
- 4) THAT I have no interest, directly or indirectly, in the Blue Grouse property, nor do I own directly or indirectly, any shares of Corrie Copper Ltd., nor do I expect to.
- 5) THAT the information contained in this report was compiled as a result of my examination of the Blue Grouse property on August 26 and October 22, 1980 and my study of available reports.
- 6) THAT I hereby consent to the publication of this report in a prospectus or statement of material facts.

Respectfully submitted,

  
R.W. Phendler, P. Eng.

## BIBLIOGRAPHY

- 1) CHISHOLM, E.O., P. Eng. - "Geological Report on Blue Grouse Copper Property of CORRIE COPPER LTD., Cowichan Lake, Victoria, M.D., B.C." - August 10, 1979.
- 2) WHITE, G.E., P. Eng. - "Geophysical Report, Corrie Copper Ltd., Vector Pulse E.M. Survey" - September 30, 1980.
- 3) CARSON, D.J., et al - "Age of the Contact Metasomatic Copper and Iron Deposits, Vancouver and Texeda Islands, B.C." - G.S.C. - Paper 71 - 36.
- 4) MALCOLM, B.C., P. Eng. - "Blue Grouse Group, Geological Report" - March 8, 1965.
- 5) CARSON, D.J. - "Metallogenic Study of Vancouver Island with Emphasis on the Relationships of Mineral Deposits to Plutonic Rocks." - Ph.D. Thesis, Carleton University, Ottawa, Ontario" - May, 1968.

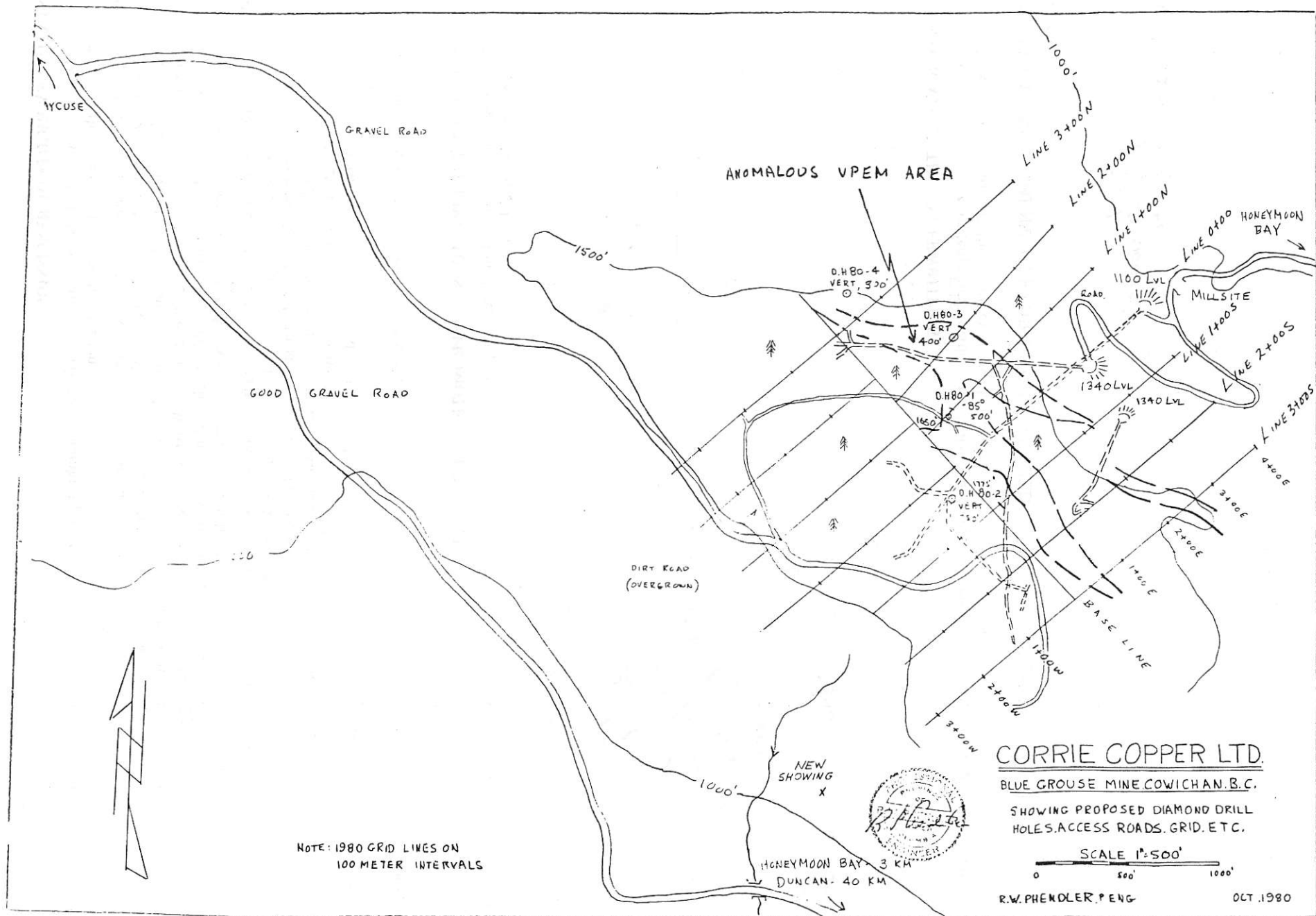


Fig 2