Geological Report

QUATSINO COPPER-GOLD MINES LIMITED
Alert Bay, B.C. 92L/6E

By: D.A. Bourne & S.M. Manning
December 31, 1952

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Mr. J. Cowan Adam
President
Quatsino Copper-Gold Mines Limited
572 Howe Street
Vancouver 1, B. C.

Dear Sir:-

We submit herewith the preliminary report and geological maps of the Low, High, Penny, Ante, Catherine and Stella Mineral Claims, Alert Bay, B. C.

Yours very truly,

HILL, LEGG & HEMSWORTH

H. L. Hill

HLH/er

on the east side of Elk River; its reported location is shown on Map 2. The mode of occurrence and mineralogy are similar to that of the Old Sport ore zone and it seems likely this showing proves the continuation of the Old Sport mineralized zone on the east side of Elk River.

In view of the prevailing high price of copper, it seems advisable to test thoroughly the limestone-greenstone contact by means of diamond drilling in hopes of picking up the continuation of the Old Sport ore zone on claims held by Quatsino Copper-Gold Mines Limited.

SUMMARY

Volcanic rocks and limestone of the Vancouver Group of Triassic and Jurassic age are exposed on the claims. These have been folded into a series of folds which strike northwest and are slightly overturned to the west. The claims apparently lie on the continuation of the Old Sport ore zone, a broad zone of contact metamorphic silicates and oxides mineralized with chalcopyrite and bornite which occurs along the limestone-greenstone contact. In view of the prevailing high price of copper, it seems advisable to diamond drill this contact thoroughly in the hope of picking up the continuation of this ore zone on the property on the east side of Elk River held by Quatsino Copper-Gold Mines Limited. This report and accompanying maps are to constitute the assessment work for these claims for 1952.

Respectfully submitted,

Per: Donald A. Bourne.
Donald A. Bourne.

S.M. Manning.

SMM/er
December 31, 1952

entirely in the greenstone but roughly parallel to the Old Sport. The mine has been developed by about 4 miles of underground workings for about 1200 feet down the dip and for probably more than a mile on strike; in addition, about 90,000 feet of diamond drilling has been done. Except along the Idaho Vein, drifting was done in the footwall and short diamond drill holes were drilled to determine the presence and width of the ore.

Mineralization consists of chalcopyrite and bornite in a broad zone of contact metamorphic minerals including garnet, diopside, calcite, epidote and magnetite; gold values are low. This zone trends northwesterly and dips about 40 degrees southwest. It varies in width from a few feet to over 100 feet, is generally separated into two zones by a sheet of volcanic wall rock, and the footwall section is the most continuous. Its continuity is interrupted by numerous northeast faults of small offset.

Chalcopyrite is the most important ore mineral and occurs as bodies following the strike of the mineralized zone, and as veinlets and disseminations in the silicates and magnetite. Bornite apparently increases with depth and occurs as veinlets and disseminations in magnetite. Pyrite and pyrrhotite are rare.

"Although the Old Sport is not as yet a producing mine, it is generally conceded that a sufficient tonnage of milling ore has been partially developed to assure a return, with reasonable interest, of the large sums which have been, and will be expended" (Gunning 1929b p. 1296).

Although the writer did not see it, there is reported to be a showing of chalcopyrite and magnetite on the Happy Jack claim (L.1495)

ECONOMIC GEOLOGY

No evidence of any large replacement bodies of magnetite in limestone (similar to the main iron ore showings of Quatsino Copper Gold Mines Limited) were observed on these seven claims; hence, no description of the showings on the Merry Widow group will be given in this report. However, the possibility that the main ore zone of the Old Sport mine of Coast Copper Company continues into these six claims merits serious consideration. The contact between the limestone and volcanic rocks definitely swings northeast through the Catherine, Stella and Low claims and thence southeast through the High mineral claim (see Map 1). The possibility that the above ore zone (which occurs along this limestone-greenstone contact on the Coast Copper Company's claims) continues into the property held by Quatsino Copper-Gold Mines Limited is evident.

Therefore, for a true appraisal of the economic possibilities of these claims, it is important to understand the economic and structural geology of the Old Sport Mine. The writer was not able to examine any part of this mine except the small ore dump at the portal of the main haulage tunnel, reportedly from the Idaho Drift. The location of the main underground workings of Coast Copper Company are shown on Map 2 accompanying this report; these have been taken from a map drawn by Mr. A.J. Arland, P. Eng.

Coast Copper Company has encountered several copper-bearing veins. Apparently the two most important ones are the Old Sport, which occurs along the limestone-greenstone contact, and the Idaho which is

(b) LIMESTONE

The limestone (Figure 3) is fine-grained, massive, and white to almost black in colour, the latter colour probably indicating the presence of argillaceous material. Bedding is not common but where observed it strikes northwest and dips 40 degrees southwest. The limestone is fresh and unaltered but is occasionally cut by narrow seams 1/16 inch wide of white calcite. Also cutting the limestone are dykes and sills of fine-grained, dark green basic lava. These are generally narrow varying from 2 feet to 10 feet in width and probably represent feeders for the overlying lava flows. They are difficult to distinguish from the finer-grained phases of the overlying basaltic flows. Some of the dykes are sparsely mineralized with pyrite.

STRUCTURAL GEOLOGY

The main structural feature of the property is a series of anticlines and synclines which strike northwesterly and are slightly overturned to the southwest, the limestone occupying the synclinal folds, the basalt forming the anticlines. The limestone troughs plunge to the south but the angle of plunge is unknown. There is no field evidence to indicate this contact has been extensively faulted along Elk River although faults of small offset (as occur underground at Coast Copper Company) may be present.

No faults were seen on the property although some of the steep-sided draws may represent the topographical expression of faults. Jointing in the limestone is common.

flow out. The contacts between flows strike northwest and dip flatly to the southwest; there is no evidence of shearing or faulting along the contacts.

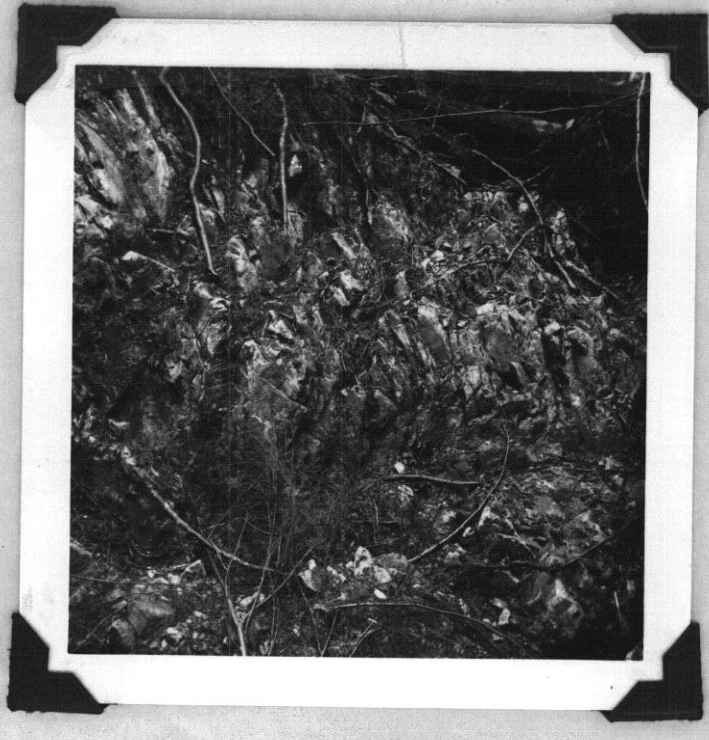


Figure 2.

Outcrop of basalt on High claim.

Figure 3.

Outcrop of limestone on Penny claim.

GEOLOGY OF THE CLAIMS

Geological mapping was done from pace and Brunton traverses at 500 foot intervals; where more detailed information was required, the traverses were run at 250 foot intervals. The geology was mapped by the writer under the supervision of Mr. S.M. Manning, P. Eng., resident engineer for Quatsino Copper-Gold Mines Limited.

Map 1 on a scale of 1" = 400' accompanying this report shows the distribution of the main rock types. Map 2 on a scale of 1" = 1000' shows the broader geological and structural features of the area and the main underground workings of Coast Copper Company and combines the geological mapping of Dr. H.C. Gunning and of the writer, but the latter accepts full responsibility for the structural interpretations.

Volcanic rocks and limestone of the Vancouver Group of Triassic and Jurassic age are exposed on all the claims. These strike northwesterly and dip to the southwest. They have been thrown into a series of anticlines and synclines which strike northwest and are overturned to the west.

(a) VOLCANIC ROCKS

Dark purple to dark green basalt (Figure 2) is the main volcanic rock type outcropping on the property. It is frequently amygdaloidal and in places coarsely porphyritic with phenocrysts of plagioclase feldspar up to ½ inch long. The border phases are generally light green in colour and much finer-grained. The lavas are much altered to epidote but no evidence could be obtained to indicate they are cupriferous. Three basalt flows were delineated but no attempt was made to trace each

limestones and tuffaceous argillites. Fossils collected by Dr. H.C. Gunning in 1929 on Nimpkish Lake indicate a Triassic age, while others from Quatsino Sound are probably Jurassic.

The Vancouver Group is cut by numerous stocks, dykes and sills of granitic rock which are believed to be associated with the Coast Range Batholith. They vary in composition from gabbro to granite, granodiorite being the most abundant phase. Many of the stock-like intrusives are well differentiated, grading from gabbro to granodiorite and occasionally to granite and syenite. Numerous acidic and basic dykes are associated with these intrusives.

Unconformably overlying the rocks of the Vancouver Group are several small remnants of Lower and Upper Cretaceous sediments. These include conglomerate, sandstone, and slate and occasionally contain small beds of coal.

The predominant strike of the Vancouver Group is northwest with dips to the southwest. Near intrusions of granite rocks, the sediments and volcanics have been tightly compressed into folds and it appears that the former have effected a domeing up of the intruded rocks around them.

Faults of small offset (up to one hundred feet or less) are present at different localities but very few major offsets have been determined. The area around Quatsino village and Quatsino Narrows probably contains the most important faulting in the district, and important faults may occur in the vicinity of Nimpkish Lake.

It is presumed that the rocks of the Vancouver Group are folded into a series of anticlines and synclines which are in most cases slightly overturned, so that the prevailing dip is towards the west.

BIBLIOGRAPHY

Listed below are the more important papers on this area which have been referred to in the preparation of this report.

Dolmage, V. (1918) Geological Survey of Canada Summary Report 1918, Part B. Quatsino Sound and certain Mineral Deposits of the West Coast of Vancouver Island, B.C.

Gunning, H.C.(1930 A) The Nimpkish Lake Copper Deposits. The Canadian Mining and Metallurgical Bulletin No. 222, October 1930 pp. 1270-1281.

Gunning, H.C.(1930B) Mineral Possibilities of Northern Vancouver Island. The Canadian Mining and Metallurgical Bulletin No. 222, October 1930 pp. 1382-1305.

In addition, the writer has had access to private reports by consulting engineers on Quatsino Copper-Gold Mines Limited and the Old Sport mine of Coast Copper Company.

REGIONAL GEOLOGY

Most of the northern part of Vancouver Island is underlain by rocks of the Vancouver Group of Triassic and Jurassic age. This group includes a great variety of lavas and fragmental volcanics interbedded with limestone, argillite and quartzite. The lavas are mainly andesitic to basaltic in composition and are frequently amygdaloidal. They are generally much altered to chlorite, epidote etc.

Limestone is the most abundant sedimentary rock. It occurs as white to dark grey beds varying in thickness from a few inches to about 2000 feet. Much of it is recrystallized to fine-grained marble. Black to grey argillites and quartzites occur interbedded with carbonaceous

received any attention; about this time the Merry Widow, Old Sport and other groups were staked. Later, the principal groups were bonded by a Spokane syndicate which did a considerable amount of work particularly on the Old Sport group. The Coast Copper Company was a development from the original Spokane syndicate. In 1916, the Consolidated Mining and Smelting Company of Canada Limited assumed control of the Coast Copper Company and carried on an active development program until 1932 when the property was closed down.

The Quatsino Copper-Gold Company Limited was founded in 1928 and acquired about 50 claims south along the strike of the Old Sport ore zone. Development work consisting of open-cutting, minor underground tunnelling, and prospecting was carried on until 1931 when development work was stopped.

Beginning in the fall of 1950, development of the magnetite ore outcrops was initiated. Since then over 7500 feet of diamond drilling has been done. Geological and magnetometer dip needle surveys were run during the summer of 1952.

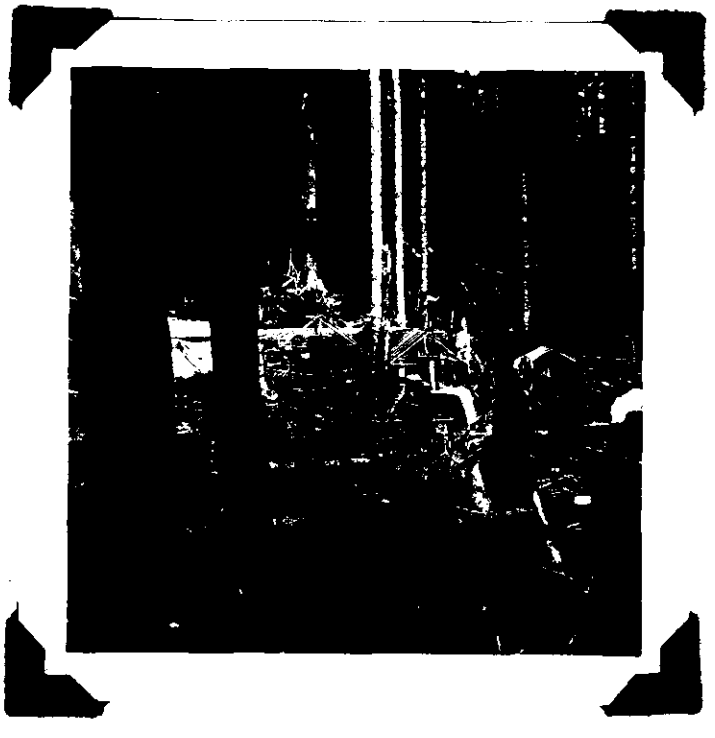


Figure 1.

Upper camp of Quatsino Copper-Gold Mines Limited.

The steep rock bluffs and areas of "windfall" make traversing difficult.

The climate in this area is decidedly mild. Prolonged periods of frosty weather are rare. Records kept by the management of the Coast Copper Company indicate a total annual precipitation of about 100 inches. While some snow does fall, it seldom remains long below an altitude of 500 to 1000 feet. Most of the rain falls between October and May.

PROPERTY AND OWNERSHIP

The property consists of six claims which are held by location by Quatsino Copper-Gold Mines Limited; they were staked in February 1951. Names and numbers of the claims are listed below. It should be noted that in this report the use of the word "property" refers to these six claims and not to the main showings of Quatsino Copper-Gold Mines Limited.

NAME	NUMBER
Ante	12368
Low	12369
Penny	12370
High	12371
Stella	12495
Catherine	12496

The relative location of these claims is shown on the base map which accompanies this report. (Map 1)

HISTORY OF THE AREA

Until recent development work by Quatsino Copper-Gold Mines Limited, the history of this area is largely that of Coast Copper Company. The first mineral showings were evidently made as early as 1897 but it was not until 1911 when copper was discovered near Elk Lake that the area

Air transportation can be arranged from Alert Bay, 20 miles to the northwest, to Alice or Kathleen Lakes but only the smaller types of aircraft such as Stinson or Beaver will land on the latter. A road broken by two stretches of water on Alice and Kathleen Lakes extends from Jeune Landing on Neroutsos Inlet of Quatsino Sound to the portal of the Old Sport Mine, a distance of 12 miles. From here a good trail leads southerly along the west bank of Elk River through the Stella and Catherine claims to the main magnetite showings of Quatsino Copper-Gold Mines Limited. There are no trails on the west side of the river servicing these claims.

Jeune Landing is a port of call of the Canadian Pacific west coast steamers. Coal Harbour, a town on Holberg Inlet of Quatsino Sound, is 18 miles distant by boat from Jeune Landing and 11 miles distant by good road from Port Hardy, a port on the northeast coast of Vancouver Island. Union Steamships make frequent calls to this port.

TOPOGRAPHY

The claims rise from Elk River at an elevation of 450 feet up the mountain slope to the east, the top of which is at an elevation of 1750 feet. Although the mountain slopes in this area are not high or rocky, they are very steep and precipitous on a small scale. Steep rock bluffs up to 150 feet high are common. Except in the valley of Elk River, rock outcrops are fairly abundant.

The claims are heavily wooded with fir, spruce, cedar, hemlock and balsam. At the lower elevations the underbrush, consisting of salmonberry, blueberry and huckleberry bushes, is very heavy; towards the top of the mountain slope, the country is more open and the underbush much lighter.

REPORT

on

QUATSINO COPPER-GOLD MINES LIMITED

Alert Bay, B.C.

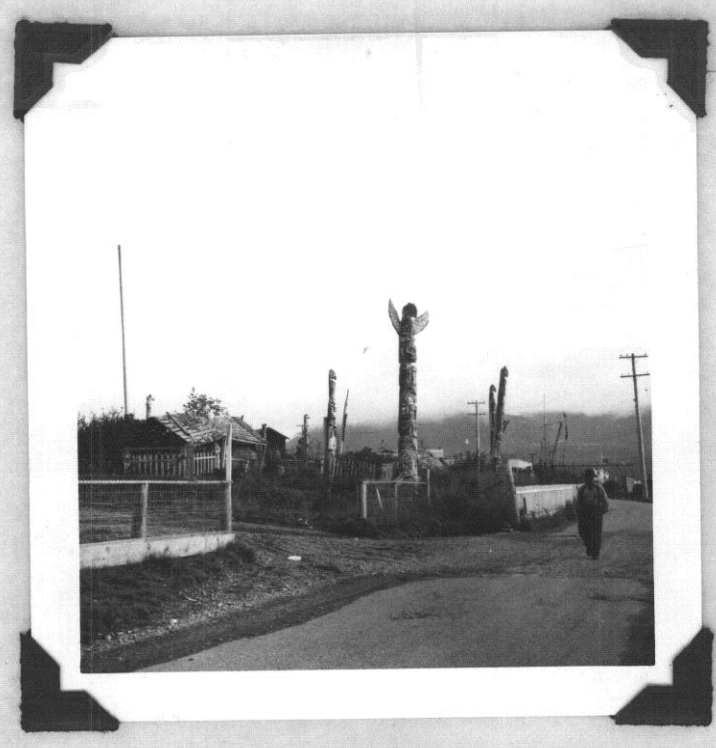
INTRODUCTION

On instructions from Mr. Henry Hill, Consulting Engineer for Quatsino Copper-Gold Mines Limited the writer, Donald Bourne, chief geologist for the Consulting Engineering firm of Hill, Legg & Hemsworth, was engaged to make a geological survey of six claims belonging to Quatsino Copper-Gold Mines Limited. This report and enclosed maps are to constitute the assessment work for these claims for 1952. From October 10th, 1952 to November 17th, 1952 was spent on the property, the geological work being conducted under the supervision of Mr. S.M. Manning, P. Eng., resident engineer for the company. Additional assistance was given by Fred Slee, Don Nelson and Pete Donahue. From December 12th to December 19th was spent in writing the report.

LOCATION AND ACCESSIBILITY

The claims are located on Vancouver Island in the Nanaimo Mining Division on the east side of Elk River about one quarter mile south of Elk Lake; two of the claims overlap onto the west side of the river. The Old Sport Mine of Coast Copper Company lies 2000 feet northwest and the main iron ore showings of Quatsino Copper-Gold Mines Limited lie 7000 feet southwest.

Frontispiece



Indian Cemetery, Alert Bay, B.C.

List of Illustrations

I N D E X

Geology of

QUATSINO COPPER - GOLD MINES LTD.

Alert Bay, B.C.

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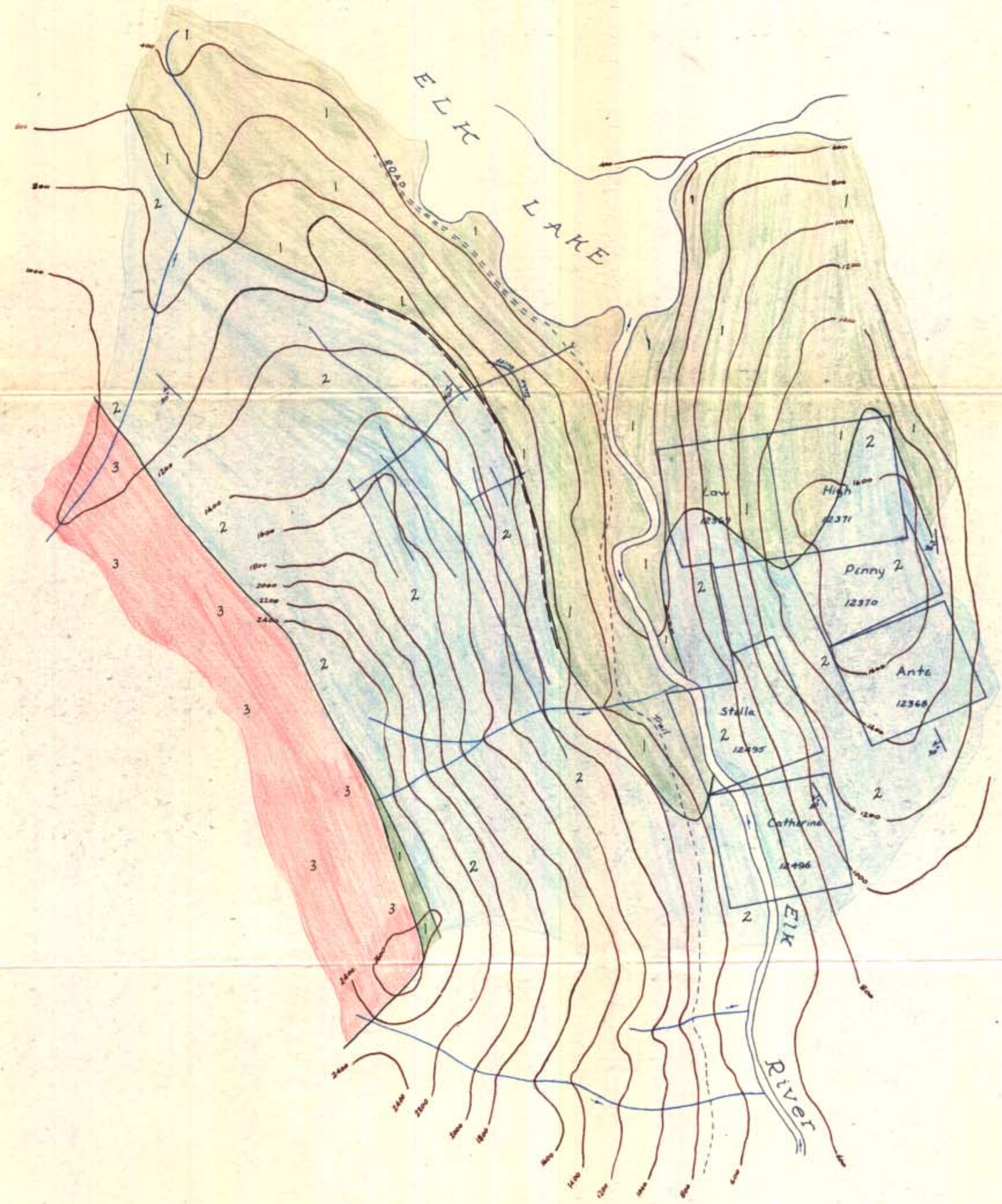
- Scale -
1" = 1000'



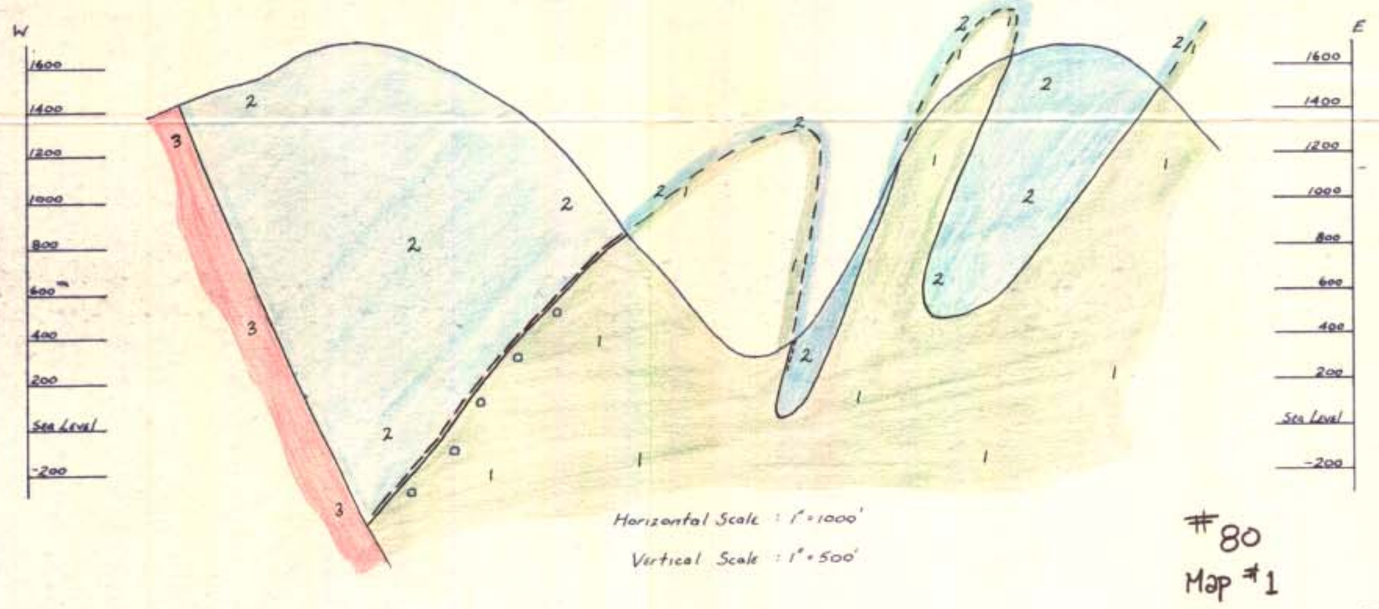
~ LEGEND ~

- 3 — Granite
- 2 — Limestone
- 1 — Volcanics
- Geological Contacts
- Strike & Dip
- Underground Workings
- Rivers & Creeks
- Contours
- Old Sport ore zone
- Happy Jack showing

Geology of west side of ELK River by Dr. H.C. Gunning (1929); geology of east side of ELK River by D.A. Bourne (1952).

To accompany report by D.A. Bourne, December 1952.

Map 2



Horizontal Scale : 1" = 1000'
Vertical Scale : 1" = 500'

#80
Map #1

D.A. BOURNE 1952

Geology of

QUATSINO COPPER - GOLD MINES LTD.

Alert Bay, B.C.

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- Scale -
1" = 400'

~ LEGEND ~

- 3 — Basalt & Andesite
- 2 — Limestone
- 1 — Diabase (?) Dyks
- Geological Contacts
- Strike & Dip
- Outcrop Areas
- Rivers & Creeks
- Trail
- Claim Posts

To accompany report by D. A. Bourne, December 1952.

Map 1

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Map #2

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