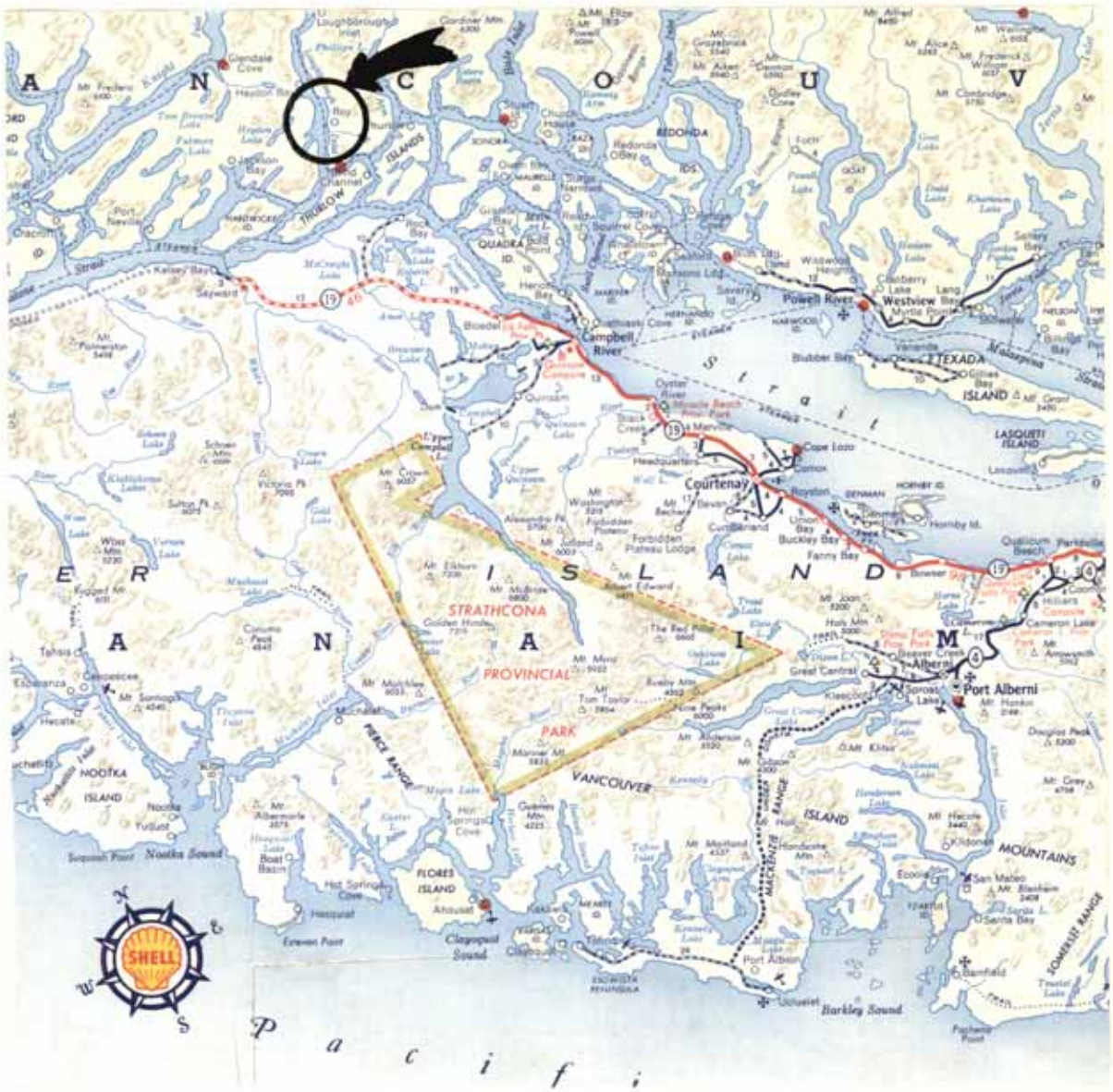

KEY MAP SHOWING LOUGHBOROUGH INLET AREA.

REPORT ON THE

LOUGHBOROUGH GOLD MINE

Roy, B.C.

To: Messrs. R.W.Liversidge
G. Shaw
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R.C.Clough Engineering Ltd.
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November, 1960

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DETAILS OF EXPENDITURES

October 15 - November 2, 1960

GEOLOGICAL REPORT:	H.S. 1-14 M.C. Record Nos. 7099 - 8099	
SURVEY AND SETTING STATIONS:	October 15 - 19	
D. Wilson J. Schutz P. Kellett H. Cohen		$ 420 00
MAPPING, DETAILING, SAMPLING:	October 19 - 22	
P. Kellett H. Cohen D. Wilson		280 00
RECONNAISSANCE AND LINE:		
H. Cohen D. Wilson		280 00
MAPPING AND REPORTS		420 00
FEES		
		$ 1,400 00

H. Cohen

ABSTRACT

The H.S. 1-14 mineral claims, situated on the east shore of Loughborough Inlet, are 140 air miles northwest of Vancouver, British Columbia, on the Vancouver mainland.

The area is well located with regard to timber and water for mining purposes, and is situated within easy reach of water and air transportation facilities.

The ground was examined to determine its value and possibilities from a mining standpoint, and to gather information that would assist in forming a structural picture with a view to further exploration and development of areas of more favorable geology.

Results of the fieldwork indicate the exposed showings to consist of quartz veins - fissure filling - in a host rock of hornblende diorite. The mineralization consists of sulphides carrying gold, silver, minor copper and zinc with better values occurring in lenses and widths that are very irregular. The ore itself, although commercial in grade, would not stand direct shipping to the smelter without hand sorting.

The showings appear to contain a reasonable amount of valuable mineral and, with much of the ground obscured by overburden, it would be worthwhile investigating by trenching

or stripping of showings 3,000 feet north of the main workings (near Gray Creek) and diamond drilling to test the main vein at depth, the purpose of which would be to prove up a minimum tonnage for small scale production.

INTRODUCTION

LOCATION OF AREA:

The H.S. 1-14 Mineral Claims are located on the east side of Loughborough Inlet 140 air miles northwest of Vancouver, British Columbia, and 36 air miles north of Campbell River, British Columbia. The area is part of the western mainland coast, and the nearest settlement is Roy, P.O. approximately 1-1/2 miles south of the claims. A twice daily air service from Campbell River connects with Roy and is provided by B. C. Airlines. This service connects with the twice daily (except Sunday) service by Pacific Western Airlines to Vancouver, B. C.

SIZE OF AREA:

The total area of the H.S. 1-14 mineral claims consist of 700 acres. Development work has succeeded, by means of stopes, drifts, trenches, etc. in exposing approximately 2,000 square feet of workings. Natural exposures are few and are limited to creek beds and occasional rock bluffs. This would be somewhat less than 5%.

PURPOSE OF INVESTIGATION:

The workings and, in general, the physical and geological aspects were examined to evaluate the ground from a mining standpoint and determine the merits and possibilities

of the area with a view to -

1) direct shipping of mined ore

2) further exploration of areas of more favorable geology.

METHODS OF INVESTIGATION:

The full trip to Loughborough Inlet commenced October 15 and continued till October 20. A camp was established at tidewater near the site of the old camp some 500 feet in elevation below the workings. Access to the camp was gained by flying from Campbell River. The workings were reached by travelling the old cat road from the camp - a distance of approximately one mile.

Briefly the work included a general reconnaissance of the area and examination and sampling of the workings that could be entered.

ACKNOWLEDGMENTS:

The writer wishes to express his gratitude to Mr. R. W. Liversidge and Mr. G. Shaw.for the opportunity to investigate the Loughborough Gold Mine, and to Mr. I. Shulman who made available reports by Mr. W. S. Hamilton, M.E., and C. C. Starr.

HISTORY:

The property was first known as the Golden Gate group. It was located by a Mr. W. Willis during 1933 and was

later acquired by the Loughborough Gold Mines, Limited, a private company. In September of 1936 a public company was incorporated.

The construction of the wharf, cat road to the workings from the beach, and buildings took place during 1935-36, and a series of shipments of sacked ore was made during 1936. The total ore shipped was 110 tons averaging 0.9 oz. per ton gold and 3.5 oz. per ton silver.

The workings include two closely spaced upper levels and a shaft level, totalling 277 feet of drift, 143 feet of crosscuts, 57 feet of raises and a 70 ft. shaft. A series of open cuts and trenches served to expose the six known veins but at the present these are overgrown and could not be examined.

The property was acquired by location during 1960 by Mr. I. Shulman of Vancouver, B. C.

At the present time, the buildings, equipment, boat etc., are not usable, and the upper tunnels are not accessible. The main tunnel is accessible, but the shaft and wings are flooded.

SUMMARY AND CONCLUSIONS

The Loughborough property is classed as a fissure filling type of deposit in which the principal veins follow fractures or shear zones along or near the intrusive contact. The intrusive is acidic while the host rock is a hornblende diorite. Silicification and pyritization is a common observation and alteration of wallrock in the zone is also common. The mineralization consists of irregularly distributed blebs and grains of pyrite in a quartz gangue in silicified wallrock. Values of concern were chiefly in gold and silver - in association with the coarse pyrite and, often, minor copper, zinc mineralization was noted.

Geological observations are recorded in the next heading, but discussion of results are briefly thus:-

Of the six known veins, only one - the Loughborough - has been explored underground. The upper level (elevation 570 feet) has exposed a quartz vein for approximately 50 feet, revealing (on the north segment), sulphide mineralization carrying values in gold and silver. The south segment (some 4 feet apart) is apparently barren and is 6" - 18" wide compared to 2' of the north segment. The veins have been stoped on for some distance, and this could not be measured due to unsafe conditions. It is assumed that the ore shipments from

this property originated from this stope and its lower extremity. In any case, due to the close proximity of the surface above the tunnel, very little ore has been developed.

No. 2 tunnel is 40 feet lower in elevation than the No. 1 tunnel. The vein was stoped, and the stoped area unsafe for entry and examination. However, the characteristics of the vein show widening with depth, but low in mineralization. The vein does exhibit splitting into stringers - a feature associated with the termination of a vein system. The shaft and raise were flooded and could not be examined, but the remainder of the 280 feet of workings were open.

The westward extension of the vein was not located on surface due to the swampy nature of the ground and overburden, however, quartz lenses were observed in the area adjacent to the beach camp, and quartz veins were observed in the area above the underground workings.

Taken as a whole, it can be expected that with a reasonable amount of exploratory work, the property may yield additional tons of gold bearing ore, which, if sorted and shipped directly to the smelter, would yield approximately 0.9 oz. per ton in gold or gross $31.50 per ton, (from past shipments). This would eliminate the possiblity of <u>immediate</u> mining and direct shipping of ore. Exploration must just prove up sufficient tonnage of sufficient grade to pay for

mining, trucking, shipping, smelting, handling and marketing, plus additional grade to yield returns on capital investment.

Without sorting, an average grade of vein material is estimated at 0.35 oz. per ton in gold. The cost of production and direct shipping of ore from this location is estimated at $25.00 per ton. Therefore, it would appear that any effort expended on this property should be confined to such a nature as to prove reserves by :

- locating new ore shoots on surface
- extensions to the present known veins

with a view to locating economic mining widths of gold bearing sulphides. It is common for this type of a deposit to exhibit such characteristics as:

1) lensy occurrences of quartz veins
2) grade variation, e.g. decreased grade with increased width
3) displaced vein system or echelon arrangement.

A careful exploration program designed to locate and delineate the quartz sulphide bodies would aid in a decision for a plant installation. This idea should be kept in mind due to the anticipated grade of ore.

RECOMMENDATIONS

1. Systematic prospecting and geological mapping on a scale of 1 inch to 200 feet. A gas operated drill may be employed to uncover fresh surfaces. Particular attention may be employed to uncover fresh surfaces. Particular attention may be given to the claims to the north - approximately 3,000 feet where a new logging road from Gray Creek camp has cut through quartz veins.

2. Diamond drilling is recommended for the main Loughborough vein to explore the characteristics of the vein at depth. This would avoid the necessity of dewatering and deepening the shaft. Drilling from a point, say 200 feet southwest of the lower tunnel, and drilling north-north easterly at 45° for 300 feet say, would intersect the lower regions of the main vein. Should the results prove encouraging, a series of holes (at least three) could be drilled to explore the vein along the strike. This work would be of a speculative nature, but the vein may prove to be reasonably persistent at depth.

3. No effort should, for the present, be made to pick up the faulted vein fissure on the east face of the lower tunnel by crosscutting. This information will be acquired by diamond drilling.

4. Should the surface exploratory work on the area toward Gray Creek prove up a minimum of 300 feet in length of the quartz fissure vein (at present it is 1 - 8 feet wide averaging 0.24 oz. per ton), diamond drilling is recommended. A pattern of holes drilled northerly to intersect the vein at 150 to 200 feet in depth should be followed.

5. Roadbuilding is not required at this time, and transportation can be supplied by boats from Campbell River. Arrangements can be made with B. C. Airlines at Campbell River to have a regular scheduled call at camp if desired.

6. Estimated costs for the program outlined above are as follows:

Camp and supplies	$ 1,500 00
Prospecting, traveling and mapping	1,500 00
Diamond drilling - main vein 1500 ft.	10,500 00
Gray Creek area prospecting,	
Diamond drilling - Gray Creek (not included in stage 1)	
Engineering and supervision	1,000 00
Transportation and miscellaneous	500 00
TOTAL	$15,000 00

This estimate does not include any management or office overhead.

GEOGRAPHY

RELIEF AND ELEVATION:

The H.S. 1-14 mineral claims occupy the lower reaches of a wooded hillside on the east shore of Loughborough Inlet approximately 140 air miles from Vancouver, B. C. The area is in the coast range mountains well within the western margin, and Loughborough Inlet is a deep narrow coastal inlet. The ground in general slopes irregularly to the inlet on the west in gentle to steep grades interrupted by benches. The main workings are located approximately 500 feet above sea level and 1-1/4 miles from the seashore.

The main timber growths are cedar, fir, hemlock and balsam, of commercial grade. Logging operations are presently being carried out at Gray Creek. The undergrowth is thick and consists of salmonberry, fern and blueberry brush.

A small creek to the south of the workings affords abundant water supply.

The nearest post office is at Roy, 1-1/2 miles south of the old Loughborough campsite. It is supplied by a daily air service to Campbell River where it connects with scheduled flights to Vancouver, B. C. by Pacific Western Airlines.

CLIMATE:

The climate in general is moderate and very similar to that of Vancouver. Zero weather is seldom experienced, and

the annual precipitation ranges from 35 to 95 inches.

GEOLOGY

The rocks underlying this area are chiefly hornblende diorite, Jurassic in age, coarse-grained texture which are intruded by highly altered acid dykes. Alteration phases have produced chlorite, epidote, and apatite and sulphides of iron. The veins, which normally occur at the contact of the hornblende - diorite and intrusive reveals silicification, alteration, and appear to follow, in an irregular manner, the fractures and shears on an east-west strike. The dip is steep to the southeast. The veins themselves are quartz - massive, altered, and mineralized to a lesser degree with sulphides, chiefly pyrite which carrys values in gold and silver. Occasional areas were observed in which traces of chalcopyrite, and sphalerite were prominent. The general characteristics of the vein as observed in the main Loughborough workings is a system of parallel veins, which pinch and swell, and are probably a series of lenses connected by fine stringers (filled fractures).

Of the main workings, the Loughborough vein could be examined from the lower tunnel and from surface. The upper tunnel and the old stope were inaccessible. The surface for the most part was covered by overburden, but observations were made on the old trenches and cuts.

On the surface, above the upper tunnel, two narrow

quartz veins have been traced by a series of cuts in an easterly direction for over 300 feet. The quartz for the most part appears to be barren, but on the bluff above the portal, five quartz stringers carrying pyrite was assayed for gold content. The strong sulphide portions of the vein carried 1.72 oz. per ton in gold. This indicates the association of gold with coarse pyrite. The stringers were narrow - three stringers having a combined width of less than 3 inches. Where the vein was void of pyrite, assays showed only a trace of gold.

The upper tunnel was driven on the two quartz veins to explore them at depth. The north vein showed a width of 24 inches, while the south vein showed a width which varied from several inches to 18 inches. The veins are in a mass of hornblende-diorite and separated by 4 feet. It was on these veins that the stoping was done and from which shipments were made. The south vein (east face) shows gradual pinching while the north vein appeared to carry greater amounts of sulphide mineralization.

The lower tunnel (approximately 40 feet lower in elevation) exposes the north vein for approximately 110 feet. The characteristics of the vein show a gradually pinching from 4 feet to where it splits into a series of narrow, barren quartz stringers at the east face. Diorite shows strongly as

an irregular dyke - which carrys the vein or lens of quartz. The crosscut (165 feet from the portal) was evidently driven northerly in an endeavor to locate the north vein, but after 45 feet of heading, succeeded only in showing hornblende granite.

The shaft, (now full of water) was sunk on the vein to some 20 feet - a drift (37') and raise driven back up to the level. Old records indicate a widening of the vein at depth; a feature that may lead to possibilities of greater vein widths at lower horizons. A narrow vein to the south of the vein followed at shaft level joins to form 5 feet of quartz banded with fine pyrite, a sample of which assayed 0.3 oz. per ton Au across 4 feet.

The cross section taken through the shaft clearly shows the attitude and behavior of the gold bearing quartz stringers which strike east-west and dip 60° to the south. It shows the parallel structure, the irregular widths, and lensy characteristics of the quartz in the diorite. From a point in the lower drift just at the shaft, the two parallel veins average 2" in width, while in a distance of several feet, the two stringers become joined and form a vein 1' wide. At 27 feet from the shaft, the vein, combined with a 2' vein which enters from the south, form a width of 5'. It certainly appears from this behavior, that a possibility does exist for

stronger widths to occur beneath the present workings.

The surface cuts have succeeded in exposing several quartz veins, a few of which, in the writer's opinion, merit rating equal to that of the main Loughborough vein. One of these is located 3,000 feet north of the main Loughborough workings toward Gry Creek. The vein had been explored by an incline shaft which was filled with water at the time of examination, however, the dump revealed quartz containing coarse pyrite. A dump sample assayed 0.81 oz. per ton Au. The vein itself was uncovered at one point and measured at 3-1/2 feet in width. The host rock was diorite and hornblende diorite. A short tunnel was started just below the vein, but was not driven sufficiently to intersect the vein. This vein is of importance in view of the active logging operations in the immediate vicinity and the road building. A parallel vein system is exposed 350 feet northeast of this showing, but the quartz exposure was too irregular to make any definite determinations as to strike and dip. A sample of dump material assayed 0.28 oz. per ton Au.

A small showing below (towards the shoreline) revealed narrow quartz veins varying from 6" - 12" in width. At the exposure, very little sulphide mineralization was noticed and no samples taken. It is a distinct possibility that this vein is an extension of that mentioned above.

In summary, the area, at this time does not show quantities of shippable ore readily available for mining and consideration can only be given to possibilities that may be proven by exploration. Possibilities do exist for the main Loughborough vein at depth - this can be explored by a diamond drill - and also for the vein some 3,000 feet north of the main vein. This can be explored by trenching and, if warranted, followed by diamond drilling.

LIST OF ILLUSTRATIONS

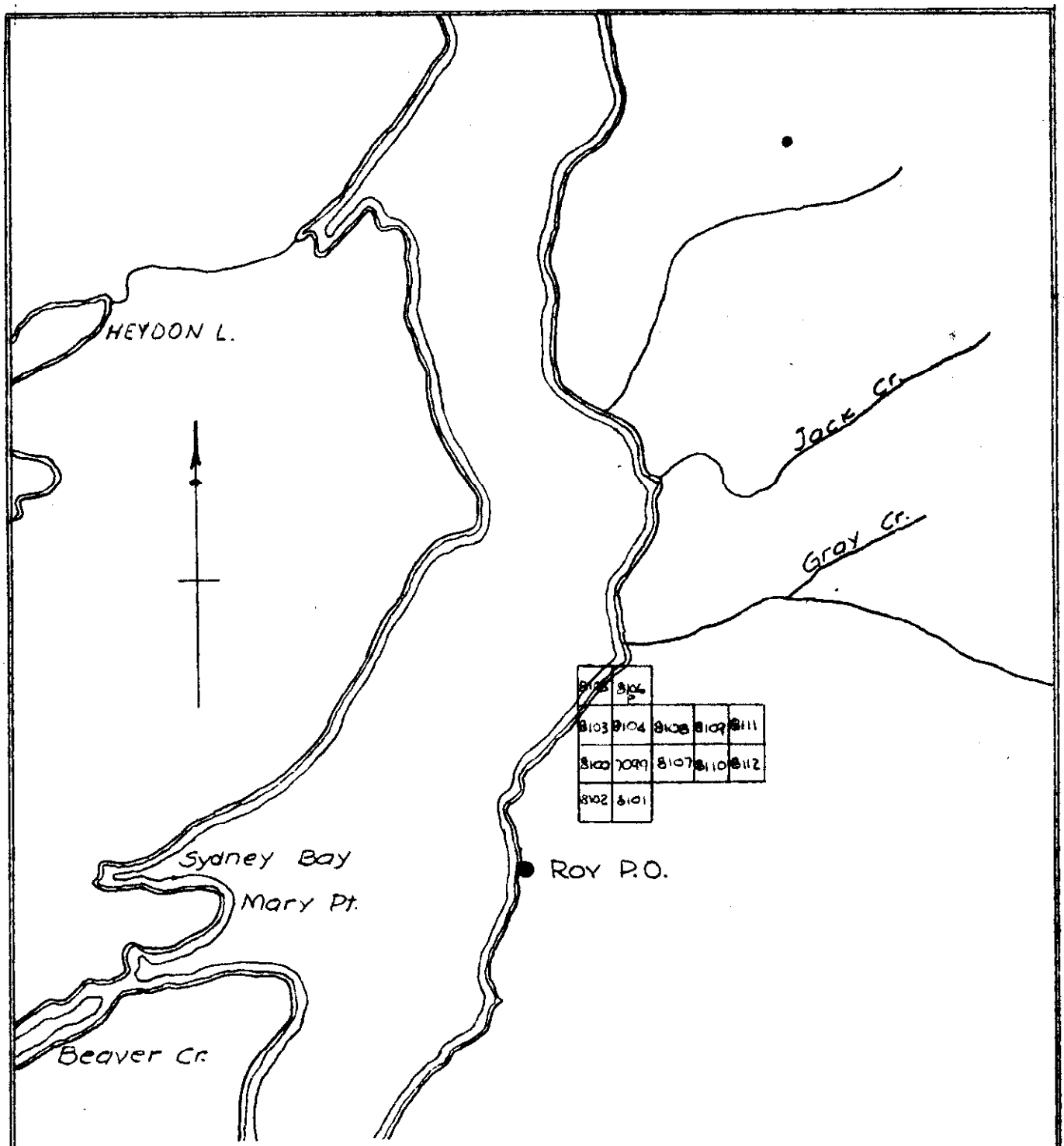
1. Map showing H.S. 1-14 Mineral Claim Loughborough Inlet, British Columbia.

2. Plan of Lower Tunnel and Shaft and Level, H. S. Mineral Claims

3. Tunnel Location at Loughborough Inlet, British Columbia.

4. Geology of H.S. 5 mineral claim

5. Assay track workings



MAP SHOWING

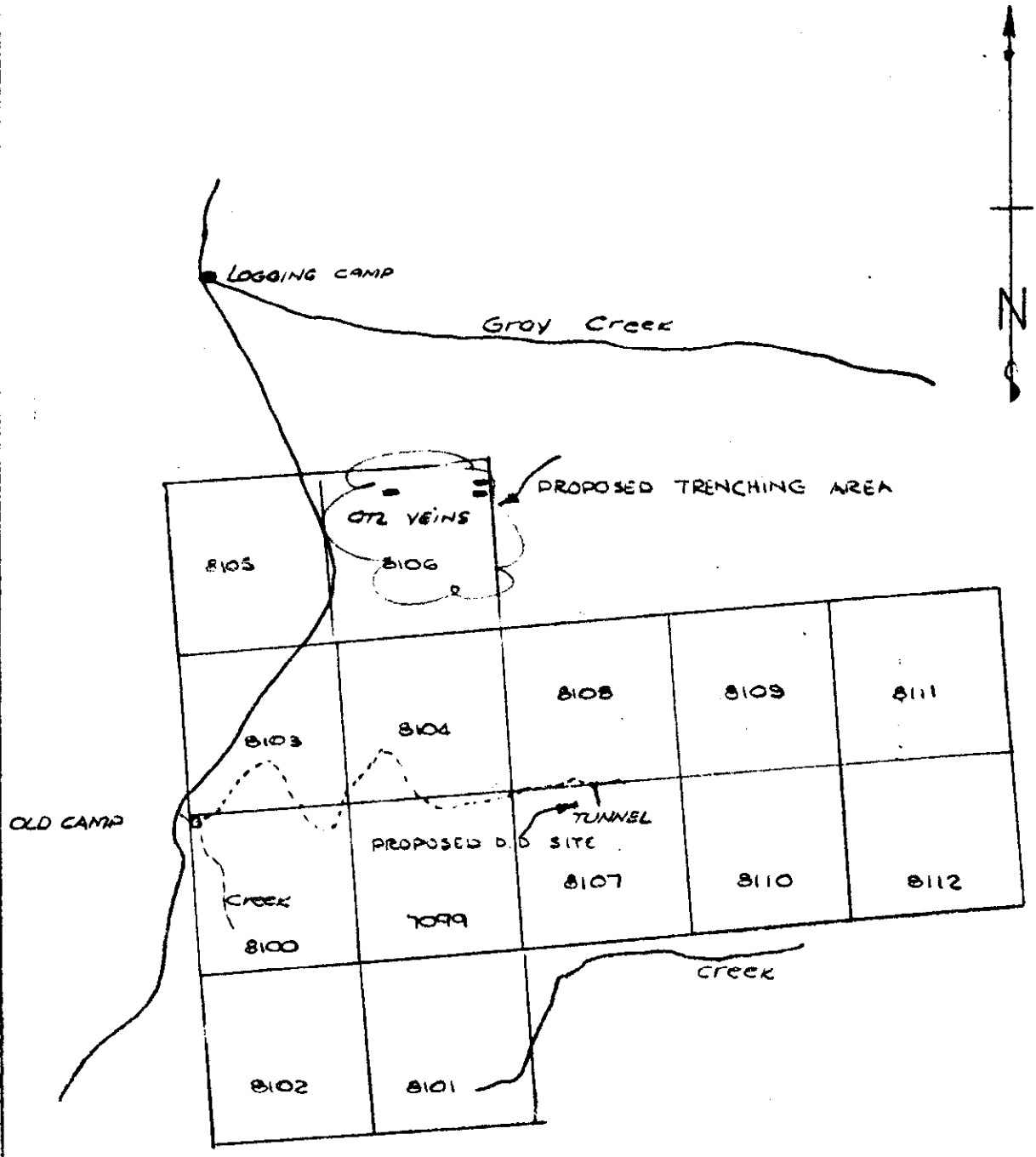
H.S. 1-14 M.C.

LOUGHBOROUGH INLET, B.C.

NANAIMO MINING DIVISION

NOV 1960

1/4" = 1 MI

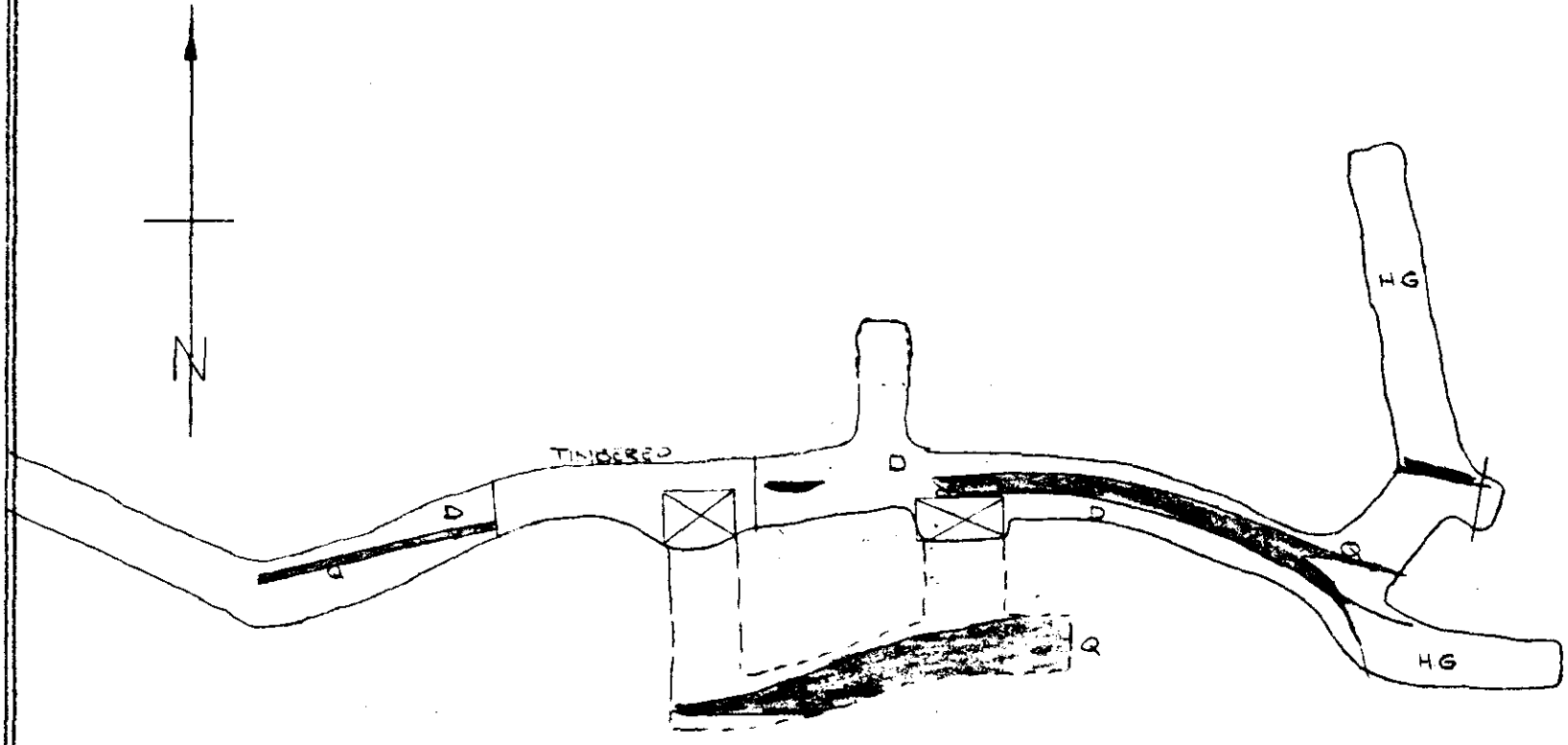


MAP SHOWING

TUNNEL LOCATION AT LOUGHBOROUGH INLET, B.C.

NOV 1960

1" = 1500'



D DIORITE

HG HORNBLENDE D

Q QTZ VEINS

PLAN OF

LOWER TUNNEL & SHAFT LEVEL

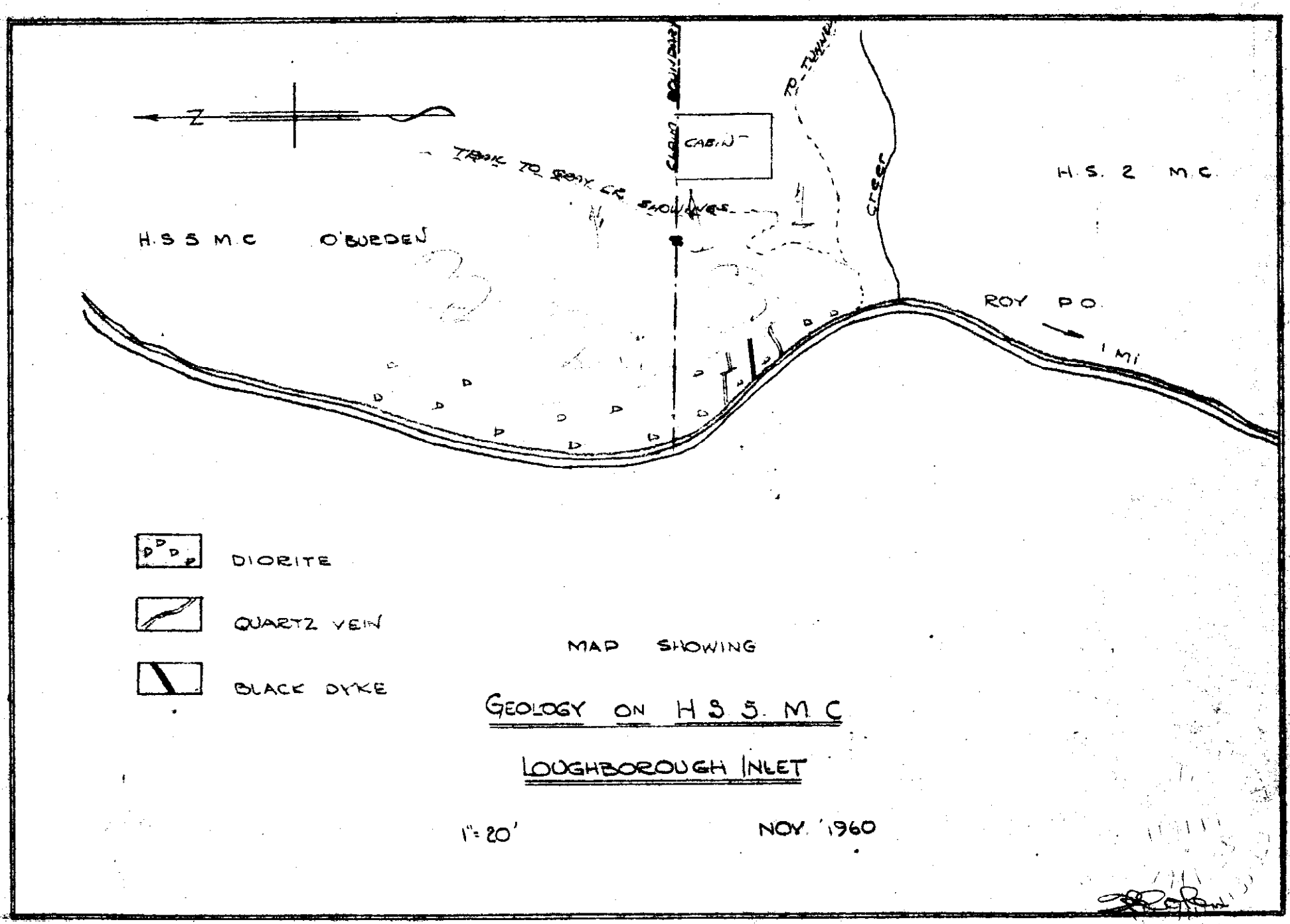
H.S MINERAL CLMS

LOUGHBOROUGH INLET B C

NOV 1960

1" = 20'

PART DATA FROM SURVEY OF C.C. STARR.



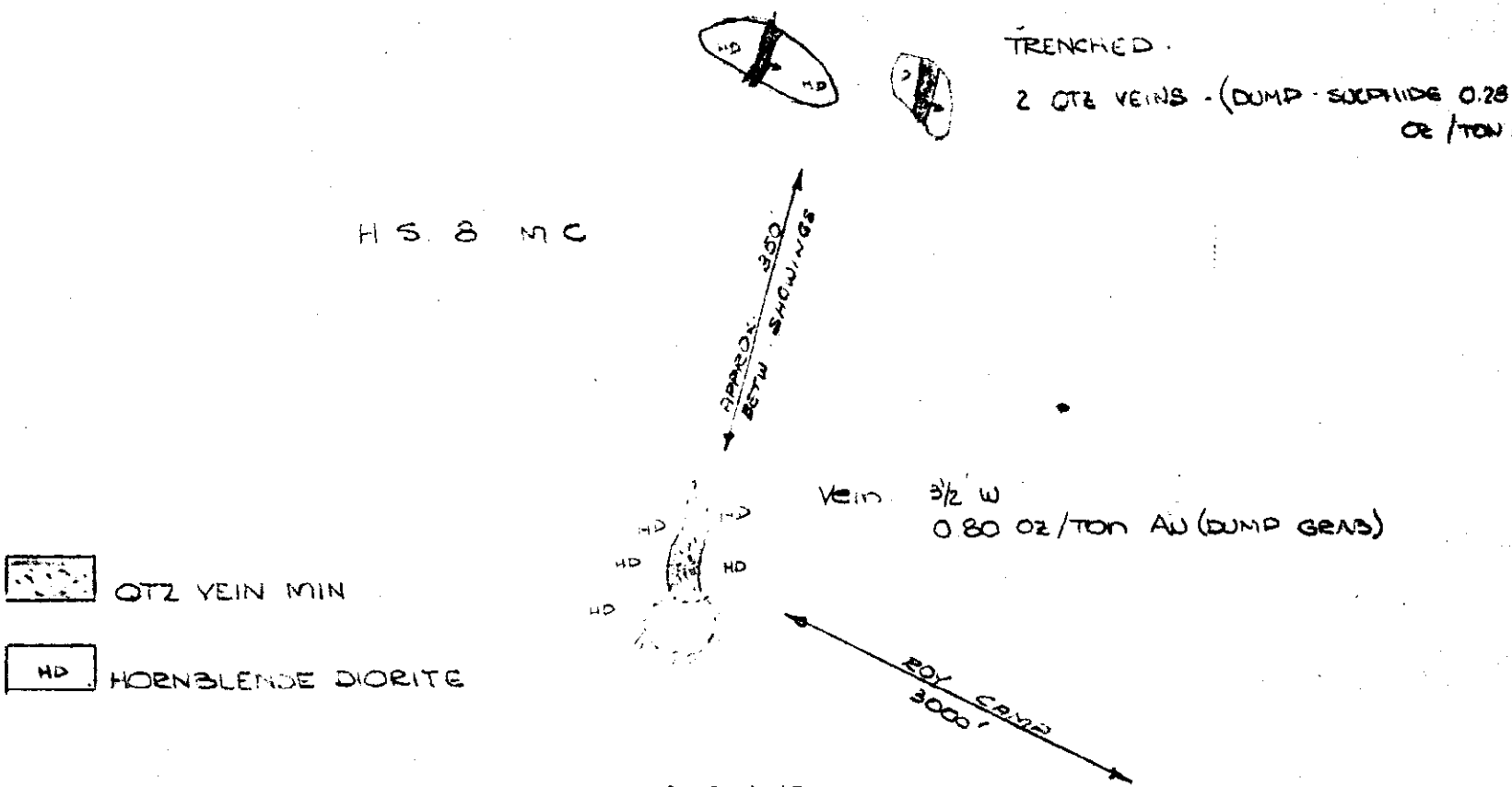
MAP SHOWING

GEOLOGY ON H S S. M C

LOUGHBOROUGH INLET

1" = 20'

NOV. 1960



SKETCH SHOWING

GRAY CREEK WORKINGS AT

LOUGHBOROUGH INLET, B.C.

1" = 20'

NOV 1960