

2716

REPORT ON THE  
PACKRAT, CALEDONIA, AND GOAT MT. GROUPS

GRAND FORKS M.D.

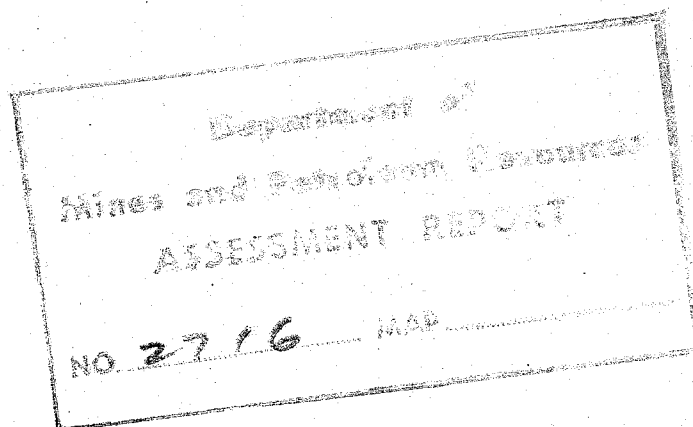
on behalf of

BAYLAND MINES LTD. (N.P.L.)

by

R. Wolfe, P. Eng.

Nov. 20, 1969



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## ABSTRACT

Bayland Mines Ltd. (N.P.L.) holds an option on a mining property in the Grand Forks Area. The property is situated in a favourable geological setting next to the old B.C. Mine.

The first phase of an intensive exploration program on the 68 claims will include Electromagnetic, Induced Polarization, and Magnetic surveys, geochemistry, geological mapping, some bulldozer trenching, and 5000' of diamonddrilling.

Three drilltargets are described: (1) An area containing a packsack drillhole assaying an average of 0.87% Copper and 0.4 oz/ton of silver between a depth of 125' and 150'. (2) A body of massive sulphides, the Packrat Mine, of which a representative specimen assayed 0.22% Copper, 0.1oz/ton silver, trace gold. (3) An Induced Polarization anomaly on the Goat Mt. 2A claim.

The cost of the first phase is estimated at \$145,000.

## INTRODUCTION

The property was examined on Nov. 7, 1969 with the owners, Messrs. Hoehn and Davis, and John Poloni, geologist for Bayland Mines Ltd. (N.P.L.).

The showings form part of the famous Boundary Camp, one of the earliest copper mining areas of B.C.

### LOCATION AND ACCESS

The property is located along the Grand Forks - Greenwood highway at the junction with the road to the Phoenix Copper Mine.

Several logging roads, trails, and old railroad grades provide excellent access to the various parts of the property.

### PROPERTY AND OWNERSHIP

The claims are owned by H. Hoehn, his wife, and C.F. Davis and his wife. Estey Agencies holds the title as trustee. The property is under option to Bayland Mines Ltd. (N.P.L.).

Due to the large number of claims and the doubtful standing of some of these claims, Mining Search Service (of 201 Sun Tower, Vancouver, B.C.) was engaged to research the status. Their report is quoted below together with a list of all claims forming part of the option agreement. The Tokyo #1 and 2 were examined by the author and found to be properly staked.

### HOEHN CLAIMS

#### Claim Names

#### Record Numbers

- |                     |            |
|---------------------|------------|
| 1. Ruth E 10A - 13A | 27310 -13  |
| 2. R.E.H. 1         | 19567      |
| 3. Ruth E 16 - 19   | 19561 - 64 |

4.	Ruth E 6 - 9, 14	27389 -93
5.	H & R 1, 2, 4	29378 - 80
6.	R.E.H. 2 - 69 to 8 - 69	29381 - 87
7.	Nickel Mt. A	25650
8.	Nickel 4A	25651
9.	Goat Mt. 1A, 2A	25648 - 49
10.	Goat Mt. 3, 4	24124 - 5
11.	4-Shur 1-69 to 6-69 (1969 restaking of claims 4-Shur 1A - 6A)	30255 - 60
12.	BG 1-69 to 6-69 (1969 restaking of BG 1A to 6A)	30261 - 66
13.	BG 1A -6A	26072 - 77
14.	4-Shur 1a - 6A	26066 - 71
15.	4-Shur 7A - 13A	26086 - 92
16.	Tokyo 1 - 2	26148 - 49
17.	Anna 5-69, 14-69	30317 - 26
18.	V & H	18852
19.	Pt Hardy 1 - 4	30006 - 9
<u>DAVIS CLAIMS</u>		
20.	BEE 1 - 6	27282-87
21.	BEE 7 - 8	27567 - 68
22.	BCC 11 - 13	25734 - 36
23.	BEE 14 - 15	30253 - 54
24.	CALEDONIA MINERAL LEASE M-142	Lot 973, Mar. 10/69

Summary of search re attached list. Client #3.

Your list of claims purchased appear on a separate sheet herewith to which we have given numerical order for ease of explanation as to status of the claim groups.

Numbers 1,2 & 3 appear to be in good standing with no over-staking in evidence.

Number 4 is O.K. for record # 27389, 27390, 27391 & 27393 but #27392 of this group lapsed May 14/69 and could be open for staking.

Numbers 5,6,7,8,9, & 10 appear in good standing.

Numbers 11 & 12 are re-staking of 13 & 14.

Numbers 15 & 16 appear in good standing.

Number 17: record numbers 30322 to 30326 inc. are over-staking of claims held by Granby Mines which are in good standing.

Numbers 18 & 19 appear in good standing.

Number 20 appears in good standing.

Number 21 forfeited.

Numbers 22,23, & 24 appear in good standing.

(signed) Mining Search Service

DESCRIPTION OF THE PROPERTY

The property consists of 4 separate claim groups, which will be referred to as 1: The Packrat, 2: Caledonia, 3: Goat Mtn, and 4: Anna.

1. The Packrat

Apart from numerous old pits, some of which are mineralized, there are 2 showings which warrant special attention. One is called the Packrat "Mine"; it consists of an irregularly shaped body of massive pyrite containing pyrrhotite and chalcopyrite. No information is available on the underground workings, which are now caved and filled with water. The massive sulphides are in places up to 20 feet thick on the surface, but some detailed work will be required to determine the true width and direction of plunge of the body. A representative specimen assayed Cu: 0.22%, Ag: 0.1 oz, Au: Tr.

The other showing occurs on the Tokyo claims just to the east of the B.C. Mine. Although the surface showing only contains pyrite and some minor malachite, a diamonddrillhole in the immediate vicinity encountered some highgrade chalcopyrite. A full drill-log follows:

DDH: Depth: 239', Direction: vertical, core size :E

Depth

0-37' Greenstone breccia (fractured with epidote and pyrite)

37'-57' Felsite porphyry dyke

57'-74' Greenstone breccia  
 74'-107' Felsite porphyry dyke  
 107'-168' Greenstone breccia  
 168'-239' Limestone

Assays (by Coast Eldridge)

	<u>Au oz/ton</u>	<u>Ag oz/ton</u>	<u>Cu%</u>
125-130	0.01	0.26	0.47
130-135	0.005	0.70	1.52
135-140	Tr	0.02	0.08
140-145	0.01	0.32	0.95
145-150	0.01	0.72	1.37
150-155	Tr	0.04	0.01
155-160	Tr	Tr	0.02
160-165	Tr	Tr	0.03
165-170	Tr	Tr	0.01

Average: 125' - 150', Ag 0.4 oz/ton, Cu: 0.87% over apparent width of 25 feet.



2. The Caledonia

Two old shafts, presumably sunk on a mineralized quartz vein were found to be caved in and filled with water. Some chalcopyrite in quartz can be seen in the dump material, although no quartz was observed in place. One of several old prospect pits in the vicinity of the Caledonia workings contained pods of chalcopyrite-bearing skarn.

The hostrock, a conglomerate, was tentatively identified as belonging to the late Palaeozoic Brooklyn formation (see Seraphim).

3. The Goat Mountain and 4. The Anna

These claims were not examined. The Goat Mtn. is reported to have several old pits and some occurrences of chalcopyrite which have been "robbed" of high grade specimens. The Anna claims are overlapping on neighboring ground and are of low priority.

## HISTORY OF THE DISTRICT

Mining activity dates back to 1891. In 1919 the camp was abandoned. Production to that date was about 22,000,000 tons averaging 1.5% Cu, 0.02 oz Au. and 0.5 oz in Ag. Most of this ore came from the Knob Hill - Ironsides orebody, about 1½ miles west of the property. This orebody (Phoenix Mine) is now being mined by the Granby Mining Co., averaging 0.8% Cu to the ton.

The B.C. Mine produced about ½ million tons of ore averaging 5% Copper. It is reported that mining became unprofitable at a depth of 400' due to an abundance of syenite dykes.

## PREVIOUS WORK ON THE PROPERTY

One of the owners, Mr. Hoehn, has drilled several pack-sack drillholes at various locations on the property for assessment-work purposes. The writer has examined the location of most of these holes and has found no geological (or other) reasons for drilling in those particular spots.

Scurry-Rainbow held an option on the property in 1965. The owner reports that the only work was an Induced Polarization survey (by Hunttec) on the Goat Mtn. 2A claim. Only 2 short lines (1000' long) were run in a North-South direction. There was no follow-up work although the geophysicist for Hunttec recommended more I.P. and diamonddrilling on what

appeared to be a very favourable anomaly.

On careful evaluation, these recommendations were found to be valid. (for full report by Huntco see Appendix 1). A soil sample program carried out by Penarroya adjacent to the north end of the Packrat group overlapped onto the Packrat group. This survey was purchased by the owners and applied for assessment work. No significant anomalies were noted.

No information has been found in the literature on the Packrat, Caledonia, or Goat Mtn. workings.

#### PHYSIOGRAPHY

The property consists of rolling hills, extensively covered with glacial overburden and medium growth timber. Underbrush is scarce. The surface is used for grazing range cattle.

REGIONAL GEOLOGY

Several versions of the regional geology are in existence. (Brock 1905, Leroy 1911, McNaughton 1945, Seraphim 1955). The most recent and comprehensive and accurate of these is by R. H. Seraphim, Ph.D., "Geology and Copper Deposits of the Boundary District, B.C.". McNaughton's report and map are largely an elaboration and extension of Leroy's work. Seraphim, who was assisted by Dr. Kidd, Dr. White, and Dr. Dahlstrom, differs markedly with Leroy on some of the important formations in the area. The writer had an opportunity to verify some of the observations of Seraphim's study in 1966 and will quote where appropriate.

Table of Formations\*

TERTIARY	Midway Volcanics and Hypabyssal Rocks	Dacitic to basaltic flows with associated dykes and sills of syenite (pulaskite in part) and augite porphyry.
	Kettle River Arkose, etc.	Arkose, with minor shales, and conglomerate, in places containing coal.
JURA-CRET- ACEOUS	Intrusives	Quartz diorite and diorite
LATE PALAEOZOIC	Attwood Series: Brooklyn Formation	Sharpstone conglomerate, limestone, greywacke and/or andesitic tuff, with minor shale and basalt.
	Rawhide Formation	Shale
EARLY PALAEOZOIC (?)	Knob Hill Formation	Chert and andesite, with minor limestone, shale and serpentine.

\*Seraphim, p. 2

The solution of the regional history is far from complete, but the main features are believed to be as follows:

The basement Knob Hill formation of chert and andesite, probably of marine deposition, were partially uplifted and severely folded before Brooklyn time. The uplift must have formed rugged mountains, which were devoid of vegetation, bordered by inlets and bays of the sea.

These bays and inlets were the site of the Brooklyn deposition. Erosion was predominantly mechanical, and very rapid. The conglomerates and minor greywackes and shales were roughly sorted during a short transport and were deposited in lenticular beds. The main band of limestone, with minor shale and siltstone, was deposited during a period of less rapid erosion, and in deeper water than the greywacke and fine conglomerate that were being deposited at the same time. Rapid erosion and deposition later formed the Upper Brooklyn conglomerates and greywacke. The upper limestone breccia bands may have formed from erosion of the Lower Brooklyn limestone or of larger bands of Knob Hill limestone than those now exposed.

Volcanic activity during Brooklyn time and continuing into post-Brooklyn is manifested by the thin flows of andesite and/or basalt intercalated with and lying conformably above the Brooklyn.

The Knob Hill and Brooklyn formations were intruded in Jura-Cretaceous time by diorite and quartz diorite. These intrusions were accompanied by mineralization. Many small precious-metal lodes were formed near the border of the Greenwood stock. The limestone at the Oro Denora and Emma mines was metasomatized to form economic orebodies containing chalcopyrite and magnetite with skarn minerals.....

Early Tertiary basins at Phoenix and on Fisherman creek, a few miles north of Phoenix, were filled or partially filled by arkose. The bedding and cross-bedding in the arkose shows that this sediment was derived from the west, and the composition indicates that it was formed from Jura-Cretaceous granitoid rocks. Late Tertiary flows were laid down on top of the arkose, and associated hypabyssal intrusives, feeders to the flows, cut the arkose and all underlying rocks. The location of the Tertiary basins shows that the topography has changed markedly since Tertiary time. The Tertiary basins are found on what are now ridges. Erosion from Tertiary to Recent time has cut valleys as much as 2,000 feet deep.

Post-Tertiary diastrophism is evident from the many faults found cutting the Tertiary rocks. \*

\* Seraphim, pp 10-11

ECCNOMIC GEOLOGY

The Brooklyn formation is host to all the major orebodies in the Boundary Camp. The copper orebodies are all replacements of limestone or impure limy rock at or near contacts with other rocks. The ore mineral is chalcopyrite in all the deposits. Other common minerals are pyrite, specular hematite, magnetite, epidote, carbonate amphibole, chlorite, quartz, garnet, pyroxene, and earthy hematite. Almost all the deposits, particularly those which are more flat-lying, have a hanging wall of skarn as much as 200 feet thick. Chalcopyrite is most abundant in the carbonate rich bands and in narrow carbonate veinlets traversing the banding. With one or two exceptions, no noticeable increase in chalcopyrite mineralization was found near faults. All the camps with exception to the Phoenix and B.C. mines are close to Jura-Cretaceous intrusives.

The mineralization in the drillhole on the Tokyo claims appears genetically related to the intrusion of the felsite dykes, with the contact of the greenstone and limestone providing the proper depositional environment.

The adjacent B.C. mine also occurs at the contact of greenstone and limestone.

CONCLUSION

The property is located in a favourable section of the famous Boundary Camp, close to the operating Phoenix Copper mine and adjacent to the old B.C. mine. The diamond drillhole on the Tokyo claims intersects encouraging copper mineralization from 125' to 150' assaying an average of 0.87% Cu and 0.4 oz of Ag to the ton over 25'.

About a mile north of this drillhole, a massive sulphide body of undetermined size, the Packrat "Mine" contains 0.22 % Cu. and 0.1 oz of Ag to the ton (representative surface specimen). A large number of old prospecting pits can be found over the rest of the property. Some of these pits contain chalcopyrite, usually in pods of skarn.

Extensive glacial overburden covers large areas which could contain mineralization missed by the old prospectors.

A limited Induced Polarization Survey indicated a strong anomaly on the Goat Mt 2A claim, which was never followed up. In general, the property shows a lot of copper indications and is well worth an intensive exploration program.

## RECOMMENDATIONS

The Packrat group has first priority, Goat Mt. second, Caledonia and Anna third and fourth.

### 1. Claims Survey

A chain and compass survey of the important claims should be instigated as soon as possible, to prevent work on overlapping claims of neighboring companies.

### 2. Linecutting

Lines are to be cut 400 feet apart to provide a control grid for geophysics, geochemistry, and geological mapping.

### 3. Geophysics

- a) An Electromagnetic survey is to be carried out over part of the property, namely the Packrat group. This type of survey is highly effective for shallow massive sulphide deposits.
- b) Induced Polarization is to be run over the largest part of the property to provide information down to 500 feet or deeper if feasible. In particular, the anomaly on the Goat Mt. 2A claim should be investigated in detail.
- c) Magnetometer readings will greatly assist in the interpretation of the E.M. and I.P. Surveys and geological projections.

### 4. Geochemistry

Soil samples are to be collected on all lines, 200 feet apart and analyzed for copper.



5. Geology

A geologist is to map all the outcrops and old pits and supervise the program.

6. Food and Accommodation

Since the property is just out of Grand Forks, it is suggested that personnel stay in the town and commute.

7. Transportation

2 Two-wheel drive trucks should handle all transportation requirements.

8. Bulldozer Trenching

A bulldozer will be necessary to prepare the drillsites and provide access to some parts of the property.

9. Diamonddrilling

Diamonddrilling can commence immediately in conjunction with the E.M. Survey. The first hole is to be drilled at the same location as the packsack drillhole, which encountered chalcopyrite on the Tokyo claims. This will have a dual purpose: 1) to check the validity of the owner's statements, 2) to obtain a higher quality intersection (ie, larger core) of the mineralized zone. This mineralized zone is then to be drilled to determine size and grade, using the results of the E.M. Survey and geological data. The second area, which warrants drilling as soon as the E.M. Survey is completed is the Packrat massive sulphide body. The third

target will be the Goat Mtn. area after completion of the I.P. Survey. 5,000. feet of drilling is to be divided between these 3 target areas.

Drilling costs might be higher in the winter and there might be also a water shortage. The budget will be adjusted for this eventuality.

10. Consultants and Reports.

At the end of the first phase, a complete evaluation of all results will be necessary in order to plan the second phase of exploration.

COST ESTIMATE1. Claims Survey

4 men, 20 days, 80 mandays @ \$30 \$ 2,400.

2. Linecutting

64 miles @ \$150/linemile 9,600.

3. Geophysics

E.M. Survey 30 linemiles @ \$200/linemile 4,000.

I.P. Survey 50 linemiles @ \$400/linemile 20,000.

Magnetometer Survey 50 linemiles @ \$50/linemile 2,500.

4. Geochemistry

Collecting 1,600 soil samples

4 men, 30 days 120 mandays @ \$30/manday 3,600.

Analysis for Copper 1,600 samples @ \$1.50 2,400.

5. Geology

1 geologist, 5 mo @ \$1200/mo 6,000.

1 helper 5 mo @ \$600/mo 3,000.

Administration 20% 1,800.

6. Food and Accommodation

500 mandays @ \$15 7,500.

7. Transportation

2 trucks 5 mos @ \$400/mo \$ 4,000.

8. Bulldozer Trenching

60 hours @ \$35/hr 2,100.

9. Diamonddrilling

5000 feet @ \$12/ft 60,000.

10. Consultants and Reports

20 days @ \$150/day 3,000.

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\$ 131,900.

Contingencies  
10%

13,190.

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TOTAL

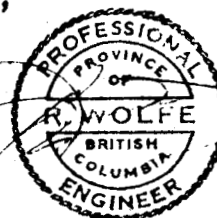
145,090.

Say

\$ 145,000.

Respectfully submitted,

R. Wolfe, P. Eng.



## APPENDIX I

From: A Geophysical Report on Induced Polarization Surveys  
in the Vicinity of Greenwood, B.C..

For Scurry Rainbow Oil, Ltd. by P. E. Lane, B.Sc. Geophysicist.

## GOAT MOUNTAIN

Two lines, G and G4, running north-south and crossing an andesite limestone contact, show anomalies which indicate a zone with a possible northeast-southwest trend.

The anomaly on Line G is possible slightly over twice background which is uncertain due to the shortness of the line and the variable chargeability. It extends from 4+00S to an unknown distance northward as the line ends before the anomaly is covered.

The resistivity increases with the chargeability and is of exceptionally high values, ranging from 5,000 to 20,000 ohm-meters. Mineralization in highly siliceous rock may explain this.

Line G4 has a main zone of interest from 2+00S to about 6+50S of probably three times background, but again the background value is being taken from a single reading and is therefore very uncertain.

Again the resistivity rises with chargeability to high values.

A sharp rise in chargeability at the southern end of G4 marks the start of another anomaly.

Detail across the anomaly nearest the baseline on G4 shows it to be complex. The 100-foot spacing suggests two separated bodies at shallow depth with locations around 2+00S and 7+00S. The strength of the anomaly on the 200-foot and 400-foot spacings at about 4+00S indicates a deeper mineralization at about 300 feet, and the fact that the 100-foot spacing at 4+00S is low points to no mineralization at around the 100-foot depth.

A diamond drill hole at 1+00S at  $-45^{\circ}$ S of 450-foot length will investigate the suspected shallow anomaly at 2+00S and the deeper target beneath 4+00S.

To the north the rapid rise of the 200-foot spacing and the relatively low 100-foot response suggests that deeper mineralization may exist in that direction.

At the other extremity of the line a high peak on the 400-foot spacing and lows on the 200-foot and 100-foot spacings suggests an even deeper target than 400 feet.

With such high responses at both ends of the line a north and south extension is necessary to cover the anomalies which

appear to be just beginning. Initially 1,500 feet north and south is necessary with possibilities of extending further should the anomalies be broad.

In order to trace the strike east and west, running north-south lines at 400 foot intervals need to be surveyed until the anomaly dies out.

APPENDIX IIBIBLIOGRAPHY

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Leroy, O.E., Phoenix B.C. G.S.C. Memoir 421, 1911

McNaughton, D.A., Greenwood - Phoenix Area, B.C., G.S.C.  
Paper 45-30, 1945.

Seraphim, R.H., Geology and Copper Deposits of the Boundary  
District, B.C., ClMM Transactions, Vol LIX, 1956



CERTIFICATE

I, Robert Wolfe of Halfmoon Bay, British Columbia, hereby certify that:

1. I am a geological engineer and reside at RR 1, Halfmoon Bay, B.C.
2. I am a graduate of the University of Alberta (B.Sc. 63) and studied geology for an extra year at the University of British Columbia in 1963-64.
3. I have been employed by the following companies:

United Keno Hill Mines, Ltd.	1959-60
Fort Reliance Minerals	1961
Frances River Syndicate	1962
Kerr Addison Gold Mines	1963
Kennco (Western) Explorations Ltd.	1964
Meridian Syndicate (Canex, Noranda, Homestake)	1965-66
Meridian Syndicate (Homestake, Home Oil, Asbestos Corp.)	1967
Orequest Syndicate (Home Oil, Granby Mining Co., Pechiney Dev. Co.)	1968

Self employed since 1968

4. I am a member of the Association of Professional Engineers of British Columbia.
5. I have no interest, direct or indirect in the property or securities of Bayland Mines or any affiliate nor do I expect to.

CERTIFICATE

I, Robert Wolfe of Halfmoon Bay, British Columbia, hereby certify that:

1. I am a geological engineer and reside at RR 1, Halfmoon Bay, B.C.
2. I am a graduate of the University of Alberta (B.Sc. 63) and studied geology for an extra year at the University of British Columbia in 1963-64.
3. I have been employed by the following companies:

United Keno Hill Mines, Ltd.	1959-60
Fort Reliance Minerals	1961
Frances River Syndicate	1962
Kerr Addison Gold Mines	1963
Kennco (Western) Explorations Ltd.	1964
Meridian Syndicate (Canex, Noranda, Homestake)	1965-66
Meridian Syndicate (Homestake, Home Oil, Asbestos Corp.)	1967
Orequest Syndicate (Home Oil, Granby Mining Co., Pechiney Dev. Co.)	1968

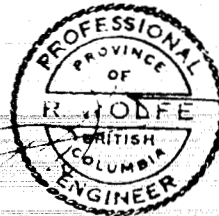
Self employed since 1968

4. I am a member of the Association of Professional Engineers of British Columbia.
5. I have no interest, direct or indirect in the property or securities of Bayland Mines or any affiliate nor do I expect to.

receive any such interest.

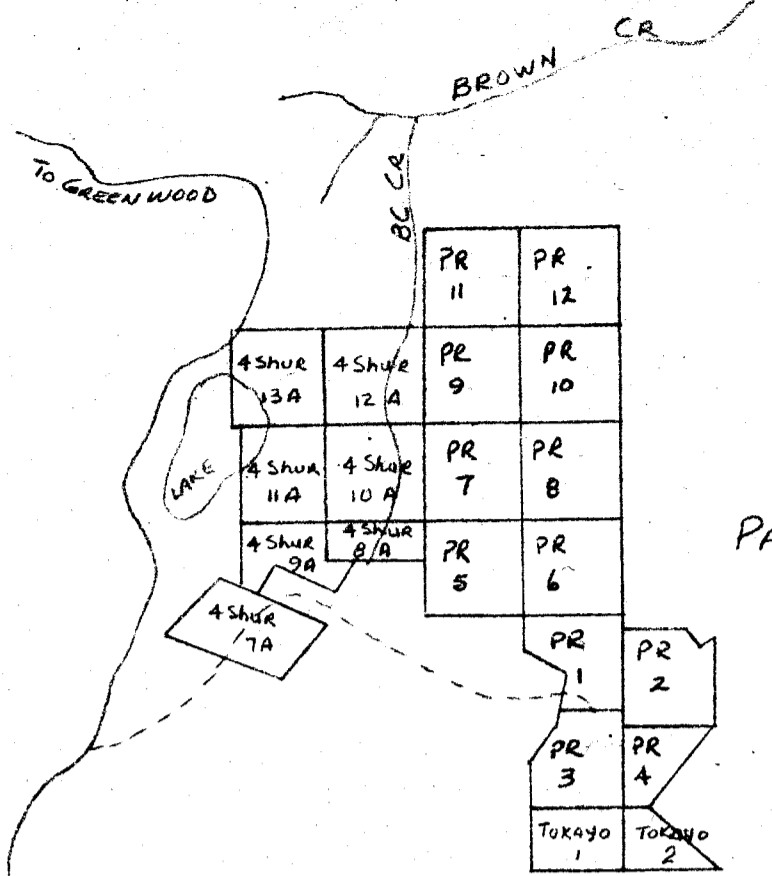
6. I have based this report on a personal visit to the property, personal experience in the general district, and on the available literature.

Dated at Vancouver, B.C., this 20th day of November, 1969.



R. Wolfe, P. Eng.

RR 1, Halfmoon Bay, B.C.



PACKRAT

Department of  
Mines and Petroleum Resources  
ASSESSMENT REPORT  
NO. 2716  
MAP # 1

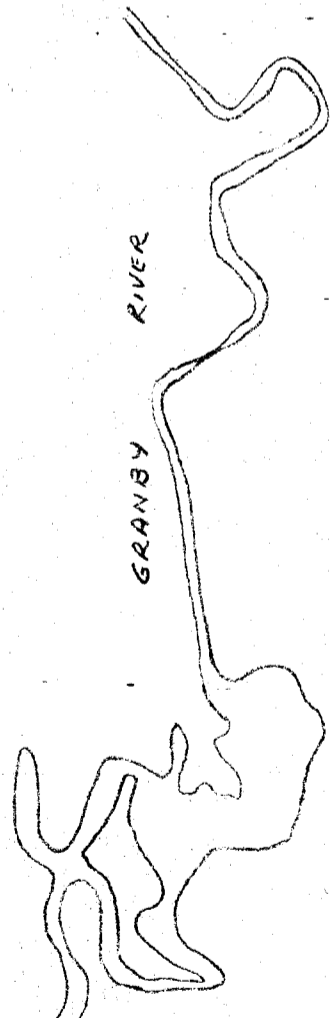
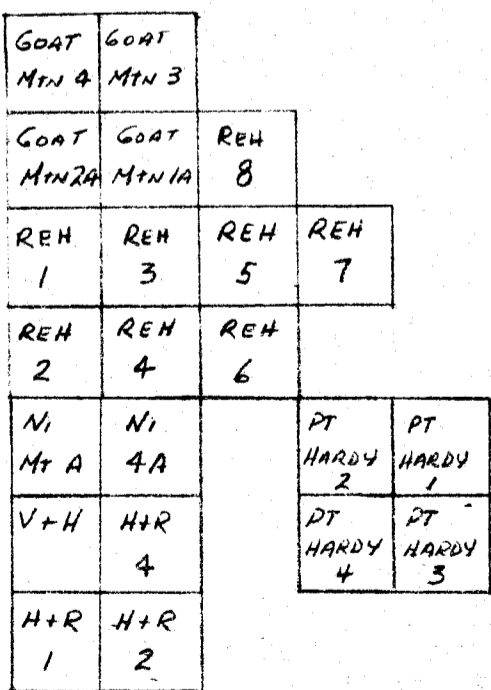
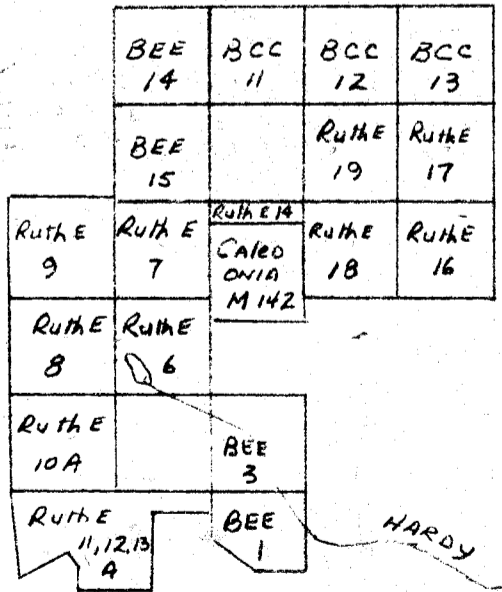


ANNA



GOAT MT

CALEDONIA



2716 M-1

BAYLAND MINES LIMITED

GRAND FORKS  
LOCATION + CLAIMS MAP  
SCALE 1" = 1/2 MI

MAP 82E/1W(M)

MAP 82E 2E(M)

ROAD TO GRAND FORKS 6 MI

TO GREEN WOOD

BC CR

BROWN CR

NEFF CR

HARDY CR

GRANBY RIVER

LAKE