

REPORT ON
GEOLOGICAL, GEOPHYSICAL AND GEOCHEMICAL SURVEYS
ON THE
IDA CLAIMS - NANAIMO MINING DISTRICT

Comprising: GROUP A: IDA CLAIMS 411-428, 79-87, 90 & 93.
 GROUP B: IDA CLAIMS 69-78, 88, 89, 91, 92,
 94, 95, 396-408, Bob Fr. 874,
 Bob Fr. 875.

Located: 4 miles northwest of Coal Harbour, B.C.,
 Quatsino, East Map Sheet, Latitude $50^{\circ}-38'$,
 Longitude $127^{\circ}-42'$.

Work Done: September 29 to October 31, 1971.

For

GARNET EXPLORATION CORP. LTD.

By

M. R. Swanson, M.Sc.,

and

J. G. Simpson, Ph.D., P.Eng.

TABLE OF CONTENTS

	<u>PAGE</u>
SUMMARY	
INTRODUCTION	1
LOCATION AND ACCESS	1
CLAIMS	1
PREVIOUS WORK	2
WORK PROGRAM	2
GEOLOGY	2
GEOCHEMICAL SURVEY	3
Methods and Procedures	3
Results	4
MAGNETOMETER SURVEY	4
Methods and Procedures	4
Results	4
CONCLUSIONS AND RECOMMENDATIONS	5
APPENDICES	
(i) Petrographic Analysis	
(ii) Time and Cost Distribution	
(iii) Distribution of Assessment Work	
(iiii) Certification	

REPORT ON
GEOLOGICAL, GEOPHYSICAL AND GEOCHEMICAL SURVEYS
ON THE
IDA CLAIMS - NANAIMO MINING DISTRICT

Comprising: GROUP A: IDA CLAIMS 411-428, 79-87, 90 & 93.
 GROUP B: IDA CLAIMS 69-78, 88, 89, 91, 92,
 94, 95, 396-408, Bob Fr. 874,
 Bob Fr. 875.

Located: 4 miles northwest of Coal Harbour, B.C.,
 Quatsino, East Map Sheet, Latitude 50°-38',
 Longitude 127°-42'.

Work Done: September 29 to October 31, 1971.

For

GARNET EXPLORATION CORP. LTD.

By

M. R. Swanson, M.Sc.,

and

J. G. Simpson, Ph.D., P.Eng.

LIST OF ILLUSTRATIONS

IN BACK POCKET

		<u>SCALE</u>
Map 1	Ida Claims and Grid Location	1"=500'
Map 2	Ida Claims , Geology	1"=500'
Map 3	Ida Claims , Soil Geochemical Survey , Copper	1"=500'
Map 4	Ida Claims , Soil Geochemical Survey , Molybdenum	1"=500'
Map 5	Ida Claims , Magnetometer Survey	1"=500'

SUMMARY

Geological mapping and soil geochemical and ground magnetometer surveys were carried out in late 1971 on the Ida claims, situated four miles north of Apple Bay on Holberg Inlet, north Vancouver Island. A west-northwest trending fault zone associated with altered and pyritized andesites of the Bonanza Volcanics is partly coincident with a low magnetic background and on trend with the established Island Copper porphyry deposit to the southeast. The presence of a weak copper soil geochemical anomaly and a silicified breccia zone within the area of alteration, provide targets for further testing by diamond drilling.

INTRODUCTION

Between September 29 and October 31, 1971, detailed geochemical and magnetometer surveys and geological mapping were carried out on the IDA GROUP A and GROUP B claims under the supervision and direction of the authors.

A grid system with lines 400 feet apart was cut and chained. Geochemical samples and magnetometer readings were taken at 100 foot intervals along these lines. Available out-crops were examined and tied into the grid system.

The camp was set up in the centre of the property, and the crew was made up of two line cutters, two soil samplers, one magnetometer operator and one cook, under a project manager (M. R. Swanson, M.Sc.). Vancouver Island Helicopter serviced the camp.

LOCATION AND ACCESS

The Ida claims lie north of Apple Bay on the east end of Holberg Inlet at latitude 50°-38'N and longitude 127°-42'W in the Nanaimo Mining Division of north Vancouver Island, B.C. Access is by foot 4 miles north-west from Coal Harbour or by helicopter 10 miles south-west from Port Hardy.

The terrain slopes generally south into Holberg Inlet with an east-west striking ridge of 850 feet elevation running through the centre of the claims. The northern half of the claims support a hill and valley terrain with elevation differences of less than 1000 feet. The entire property is covered by a dense red cedar forest and salal underbrush.

CLAIMS

The Ida claims consisting of 58 whole claims and two fractional claims, under option to Garnet Exploration Corp. Ltd., are grouped as follows:

	<u>Claim</u>	<u>Record No.</u>	<u>Expiry Date</u>
GROUP A	IDA 411-428	31659-31676	April 16, 1972
	IDA 79-87	31629-31638	April 16, 1972
	IDA 90	31640	April 16, 1972
	IDA 93	31643	April 16, 1972
GROUP B	IDA 69-78	31619-31628	April 16, 1973
	IDA 88	31638	April 16, 1973
	IDA 89	31639	April 16, 1973
	IDA 91	31641	April 16, 1973

<u>Claim</u>	<u>Record No.</u>	<u>Expiry Date</u>
IDA 92	31642	April 16, 1973
IDA 94	31644	April 16, 1973
IDA 95	31645	April 16, 1973
IDA 396-408	31646-31658	April 16, 1973
Bob Fr. 874 & 875	33612-33613	March 22, 1972

PREVIOUS WORK

Previous exploration work on the property carried out in 1970 included reconnaissance soil sampling, ground magnetics and an I.P. resistivity survey. The results of this work are inconclusive due largely to inadequate coverage. However, the presence of altered and pyritized andesite combined with spotty copper soil geochemical highs was considered sufficiently promising to initiate further work.

WORK PROGRAM

An east-west base line was cut through the centre of the claims, between the east and western boundaries of the property, which is 6400 feet wide. At 400 foot intervals north-south lines were cut and chained. These north-south grid lines extended 5000 feet south of the base line and 2000 to 4000 feet north as indicated on the accompanying maps. A total of 24 line miles of line were cut and chained, on a daily contract basis, by SEMCO Ltd. of Vancouver.

GEOLOGY

The northern half of the claim block is underlain by a granitic intrusive approximating quartz-monzonite in composition and of Middle to Late Jurassic age. To the south, flows of Bonanza Volcanics of Lower Jurassic age form east-west ridges with steep cuestas facing north and a gentle to moderate dip slope to the south. At the contact, xenoliths of andesitic volcanics are caught up in the quartz-monzonite.

Three variants of the Bonanza sequence have been mapped, based on the appearance of fresh samples, and comprise a massive grey-green non-porphyrific andesite, feldspar porphyry andesite and mafic porphyry andesite. The latter described as hornblende porphyry in the field contains both pyroxene and hornblende phenocrysts. The andesites exhibit all stages of alteration from fresh rock to bleached and pyritized material resembling white firebrick. In general the alteration is most strongly developed in the vicinity of a west-northwest trending shear zone which extends across the property. However,

patchy developments of alteration occur to the south of this feature and in the extreme south-west. These zones may be more continuous than shown on the accompanying map which is based on relatively scarce outcrop. Heavy pyrite while mostly associated with alteration does occur in relatively fresh andesites, but is largely confined to the vicinity of the shear zone and areas to the south. It occurs mainly as disseminated grains replacing mafics, but in some sections also forms veins and patches with a total pyrite content of 5-10% of the rock.

South of the shear-zone a belt of andesite breccia with a matrix of amorphous silica has been traced east-west for about 2000' centred on line 35+00E, and appears to be up to 300' wide. The andesite fragments show marginal reaction and alteration indicative of gaseous activity and the breccia may represent an explosive phase extrusion. This zone also contains highly silicified rock in which residual quartz eyes are similar to the quartz phenocrysts of the Island Copper porphyry. This point, however, remains to be confirmed. It is understood that silicification and quartz breccia formation is an important feature at the Island Copper deposit, but the lack of published material on this ore-body prevents close comparison.

Alteration in the andesite grades from a mild propylitic type to intense argillic alteration along the fault zone. The most continuously intense alteration occurs south of the fault and is associated with the breccia zone and heavy pyritization, although the breccia itself does not appear to carry sulphides. No chalcopyrite has been noted to date even in zones of heavy pyritization.

GEOCHEMICAL SURVEY

Methods and Procedures

An orientation survey was carried out by Barringer Research across a north-south topographical section of the property. Holes to four feet deep were dug with a shovel and samples were taken from each soil section. It was found that the "B₂" horizon provided the most consistent concentration of copper. This horizon was on the average about three feet below the surface.

A total of 1206 samples were taken from the "B₂" horizon using hand augers. The samples were placed in wet strength Kraft paper envelopes, then hung and partially air dried at room temperature, boxed in airtight steel containers and shipped to Barringer Research Ltd. Laboratory in Vancouver, B.C. There the samples were further dried in an air oven at 70°C, and sieved to minus 80 mesh on nylon screens. 0.2 gm. samples were digested in perchloric acid diluted to 10 mls, with the resultant solution being submitted to an Atomic Absorption unit and the values read and recorded for total copper and total molybdenum.

Results

The results were broken down into 10 p.p.m. groups and the frequencies counted. A cumulative frequency curve was plotted with the following results:

	<u>Cu p.p.m.</u>	<u>Mo p.p.m.</u>
Background	0-80	0-2
Threshold	80	3
Anomalous	> 80	6

Only one specific copper anomaly occurs on the property, and appears to be related to the west north-west striking fault zone in the south-west section of the property, but is east of the nearest area of alteration. The drainage suggests that the copper may have been dispersed from the central alteration zone north of the fault around coordinates 32+00E to 36+00E and 15+00S to 20+00S. Sporadic copper highs occur throughout the alteration zone, but are not contourable.

Sporadic Mo values occur in the vicinity of the copper anomaly. However, the only contourable Mo results occur in the northwest quadrant over the intrusive rocks. No mineralization was observed in the intrusives, and the cause of this Mo anomaly is not fully understood.

MAGNETOMETER SURVEY

Methods and Procedures

To assist in geologic mapping and in hopes of locating alteration zones believed to be outlined by magnetic lows a magnetometer survey was run over the cut grid.

A Sharp fluxgate Model MF-1 magnetometer was used throughout the survey. Base stations were established along the east-west base line at junctions with the north-south cut grid. Closed loop traverses were run over the north-south grid with all readings taken facing north. Readings were taken at 100 foot intervals on the lines 400 feet apart (see map in pocket). The station values were corrected for diurnal variation and instrument drift and plotted, the corrected results being contoured at 100 gamma intervals.

Results

The background value for the Bonanza Volcanics is lower than that of the intrusives and the contact between these two rock units can be determined from the magnetometer survey. This contact strikes east-west along 0+00N.

The significantly anomalous zone is a double lobed magnetic high in the south-west part of the property. This high straddles and is partially coincident with an altered zone. Generally, however, the alteration zones as a whole tend to coincide better with magnetic lows as was anticipated.

The high level airborne magnetometer survey sheet shows a small magnetic high in the vicinity of the Ida claims. The ground magnetic survey high described above is believed to be the eastern expression of this feature. Its significance lies in the general reversal of the magnetic field in post-Bonanza, pre-Island Copper Porphyry times, resulting in generally low background for the Bonanza sequence except where later intrusives cut or at least extend upwards into the volcanics.

CONCLUSIONS AND RECOMMENDATIONS

Between 10+00S and 40+00S and between 0+00E and 32+00E both a copper soil anomaly and a magnetic high, although not coincident, are situated in proximity to a geologically favourable alteration zone, which appears to be related to a line of major structural weakness. This area constitutes a primary target zone.

A second zone of interest lies south of 25+00S and between 24+00E and 56+00E, where intense alteration and pyritization are associated with a siliceous breccia phase of considerable lateral extent.

The inconsistent molybdenum soil values do not coincide with any significant geologically or geophysically anomalous feature and at present are not being emphasized as targets.

It is recommended that further investigation of the above two mentioned target areas be undertaken by a preliminary drilling program. Further geophysical work such as induced polarization or EM surveys are not recommended in that these surveys will only outline the already known fault and pyritic zones, and are unlikely to provide additional useful data.

APPENDIX (i)

PETROGRAPHIC ANALYSIS

Appendix (i)

PETROGRAPHIC ANALYSIS

Utah Rocks

G4
Hand Specimen

Ore zone Island Copper.

Grey andesite veined and fractured, with calcite and quartz veins. Sulphides in disseminated blebs of pyrite and chalcopyrite also concentrated along calcite veins. In part silicified.

T.S. Original texture largely destroyed, some remnant lathe-like phenocrysts of plagioclase, but generally the groundmass is a fine-grained mozaic of quartz and incipient plagioclase. Dominant features are quartz veins cut by numerous later calcite veins. Quartz shows wavy boundaries and internal shadows indicating a crystallization under some stress followed by later slight deformation. Sulphides occur in scattered blebs but tend to predominate along calcite veins and in association with clot of calcite, with some zoisite, etc.

Comments

Silicification and veining appear to be important features. Quartz veins are generally presulphides and earlier than calcite with which sulphides are generally associated. Alteration of phenocrysts where original texture is retained not outstanding; still recognizable plagioclase although cloudy, with sericite, etc. developing.

G5
Hand Specimen

Core - Ore zone Island Copper.

Similar to G4 but more fractured, and siliceous. Calcite veining not apparent, with sulphide tending to occur in blebs and disseminations.

T.S. Quartz rich rock, with large crystals and pools of fine-grained crystalline quartz; the latter showing fair three point intersections. Large quartz crystals appear to be remnant of earlier coarse vein

quartz that has undergone fracture and recrystallization. Ground-mass is a mozaic of fine grained quartz and sericite. No visable plagioclase phenocrysts retained.

Comments

Calcite not a feature, but again silicification and quartz veining important, followed by deformation and recrystallization. Ground-mass alteration more intense than G4, but apparently a much altered and silicified andesite.

G3)
G6) Medium grained intermediate igneous rock (dyke?).

Hand Specimen

Grey-buff medium-grained microdiorite.

T.S. Phenocrysts of zoned plagioclase (and/oli) and clino-pyroxene are set in a finer grained groundmass of plagioclase and quartz. Alteration is very slight with incipient sericitization of plagioclase, and breakdown of pyroxene. Specimen G6 contains a xenolithic fragment of andesite with a reaction rim picked out by epidote and quartz.

Comment

Mineralogically this rock is very similar to andesite - grain size suggests either a slow cooled centre of a flow or a dyke related to the andesitic extrusives. Definitely not related to quartz-porphry intrusive of Utah type.

G7)
G8) Porphyritic andesites.

H.S. Bleached buff to cream, fine grained slightly porphyritic andesites.

T.S. Typical andesitic texture with plagioclase lathes set in a ground-mass aggregate of plagioclase, quartz and micas. Alteration is incipient in feldspars with epidote and clinozoisite developed near sulphide pseudomorphs, presumably after pyroxene.

Comment

Although bleached in hand specimen extent of feldspar alteration not great.

G1 Bleached andesite.

H.S. As G7 and 8 but more altered.

T.S. Here alteration is pronounced, plagioclase phenocrysts are completely sericitized, a network of sericite surrounding a much altered aggregate of quartz, plagioclase, clay minerals epidote and clinozoisite. Sulphide grains largely replaced by limonite.

Comment

Surface alteration is matched by extensive sericitization, etc., as seen in section.

G2)
G10) Slightly bleached andesite strongly pyritized.

Typical andesitic texture with composition similar to G7 and 8, more or less sericitic alteration of feldspars. Notable features are presence of quartz veins in G2, and heavy pyritization of both G2 and G10. In G2 this takes the form of mafic replacement, but in G10 stringers and veins of sulphide (pyrite) also occur. Porphyritic texture discernable in G2 but largely obscured by alteration in G10.

G9 Highly altered andesite - breccia.

T.S. In section and hand specimen a crude brecciation is discernable. Rock is highly altered with much limonite, but porphyritic texture still evident in some segments.

Comment

Highly altered in appearance with leached and oxidized sulphides apparently after mafics.

Ida Sample Locations

G1: 16S-12W
G2: 16S-12W
G3: 27S-48E
G4: Utah Island Copper Orebody
G5: Utah Island Copper Orebody
G6: 27S-48E
G7: 32E-42S
G8: 52E-46S
G9: 45S-44E
G10: 44E-31S

APPENDIX (ii)

TIME AND COST DISTRIBUTION

TIME AND COST DISTRIBUTION

(1) SOIL GEOCHEMICAL AND MAGNETOMETER SURVEYS

Staff (Garnet Exploration Corp. Ltd.)

<u>Name</u>	<u>Position</u>	<u>Dates</u>	<u>Days</u>	<u>Rate</u>	<u>Total</u>
J. G. Simpson P. Eng.	Supervisor	Oct. 2 and 20/71	2	\$150.00	\$ 300.00
M. R. Swanson M.Sc.	Project Mgr. Geologist	Sept. 29 to Oct. 21/71	23	75.00	1725.00
Scott Wagenitz	Sampler	"	23	30.00	690.00
Jack Altenburg	Sampler	"	23	30.00	690.00
Doug Landry	Mag. Operator	"	23	30.00	690.00
Kevin Ryan	Cook	"	23	30.00	690.00
Camp operation and supplies: 115 man days at \$12.00					1380.00
Helicopter Services:					
Vancouver Island Helicopter, Port Hardy, B.C.					1462.50
Sample Preparation and Analysis:					
Barringer Research Ltd., Vancouver, B.C.					
1206 samples at \$1.50 each					<u>1890.00</u>
Sub Total					\$9517.50
Contract Linecutting:					
SEMCO Ltd., Vancouver, B.C., Contractor					
Two men for \$85.00 per day = 24 days, Sept. 28 to Oct. 22/71					\$2040.00
Camp operation and supplies for 46 man days @ \$12.00					<u>552.00</u>
Sub Total					\$2592.00

(2) OTHER COSTS

Drafting:

C. L. Cory Ltd. 25 hrs. at \$5.00 \$125.00

Preparation of Report:

M. R. Swanson, M.Sc., 1 day 75.00

J. G. Simpson, P.Eng., 1 day 150.00

Sub Total \$350.00

GRAND TOTAL \$12,459.50

COST BREAKDOWN

Geochemical 46% \$ 5,770.00

Geophysical 38% 4,688.50

Geological 16% 2,001.00

100% \$12,459.50

APPENDIX (iii)

DISTRIBUTION OF ASSESSMENT WORK

DISTRIBUTION OF ASSESSMENT WORK

The project costs itemized in Appendix (ii) are distributed on an equal basis to Claim Groups A and B.

SOIL AND MAGNETOMETER SURVEYS

Group A	50%	\$ 6,054.75
Group B	<u>50%</u>	<u>6,054.75</u>
	100%	\$12,109.50

OTHER COSTS

Group A	50%	\$175.00
Group B	<u>50%</u>	<u>175.00</u>
	100%	\$350.00

\$12,459.50

ASSESSMENT FILED

Group A; 30 claims:

$$50\% \times \$12,459.50 = \$6,229.00 \qquad \$6,229.00$$

$$\frac{\$6,229.00}{\$100.00 \text{ per claim year}} = 60 \text{ Claim Years}$$

Group B; 30 claims:

$$50\% \times \$12,459.50 = \$6,229.00 \qquad \$6,229.00$$

$$\frac{\$6,229.00}{\$100.00 \text{ per claim year}} = 60 \text{ Claim Years}$$

APPENDIX (iii)

CERTIFICATION

CERTIFICATE

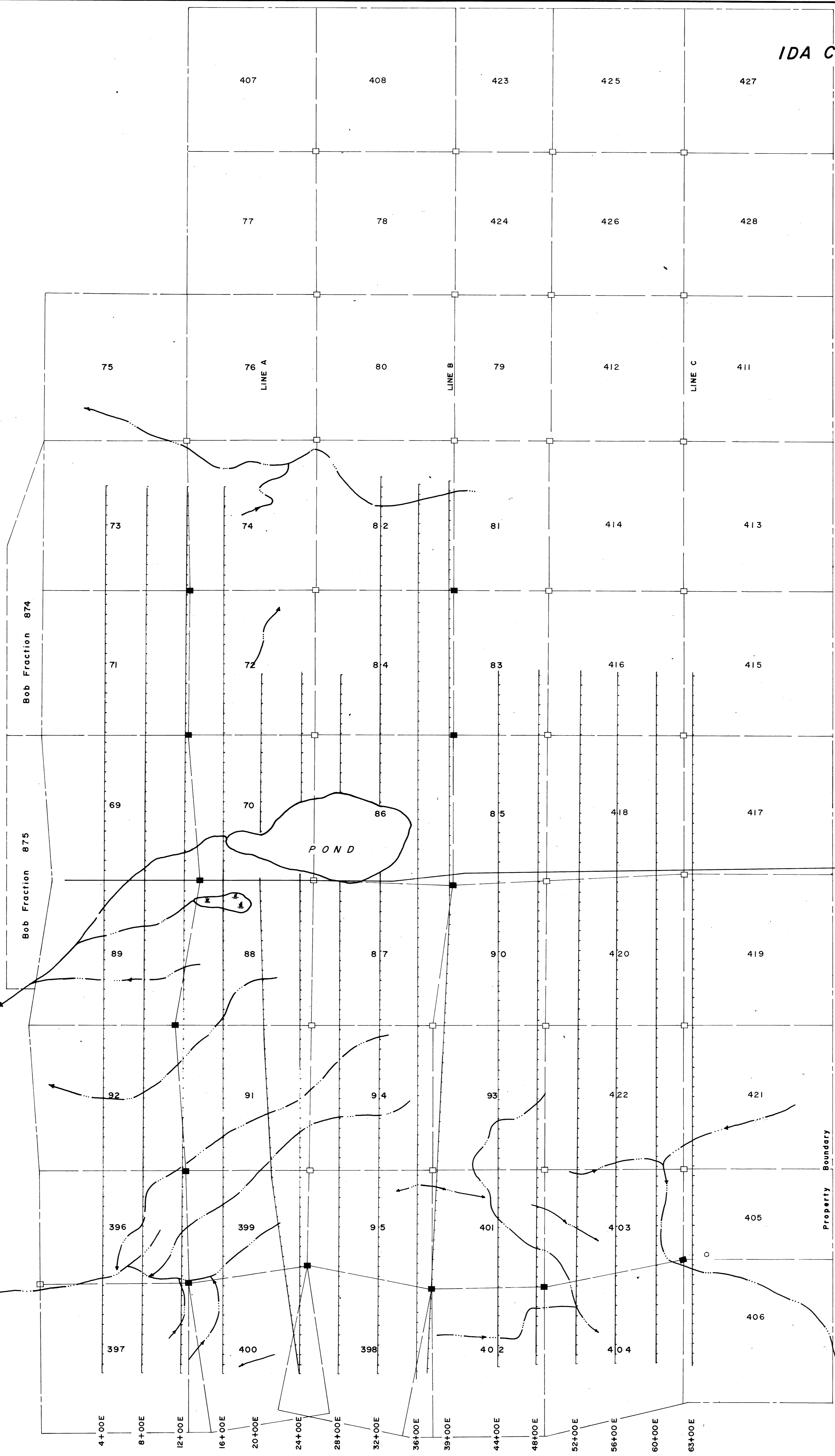
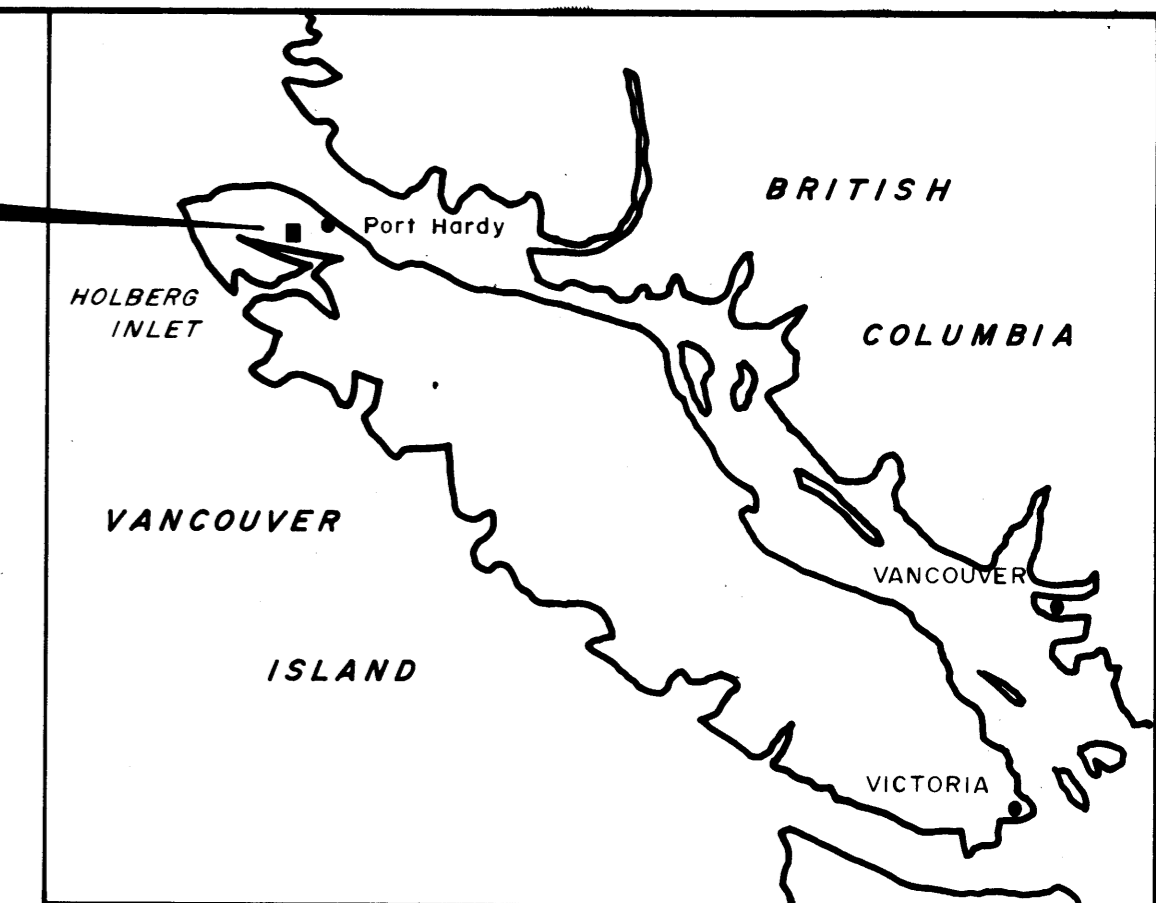
I, John Glenn Simpson, of 720 Anderson Crescent, West Vancouver, British Columbia, do certify that:

- (1) I graduated from King's College, London University, with a B.Sc. (Honors) Geology in 1958, and was awarded a Ph.D. (External) from London University in 1969.
- (2) I am a fellow of the Geological Association of Canada and a registered Professional Engineer in the Province of British Columbia and have practised my profession in Africa, Europe and Canada for the past 13 years.
- (3) As a salaried employee of Cyprus Exploration Corp. Ltd. I have no direct or indirect interest in the property or securities of Garnet Exploration Corp. Ltd.
- (4) The work described herein was carried out by M. R. Swanson, M.Sc., under my direction and supervision.

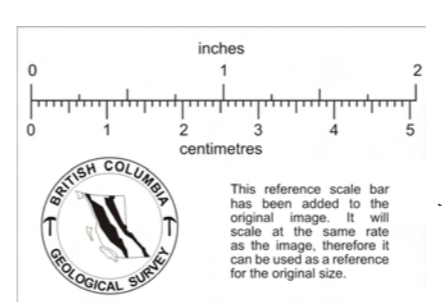
Dated at Vancouver, B. C.

J. G. Simpson, B.Sc., Ph.D., P.Eng.

IDA CLAIMS



- Key to CLAIM POSTS
- Ida Located
 - Ida Assumed
 - Whiz Located
 - △ Expo



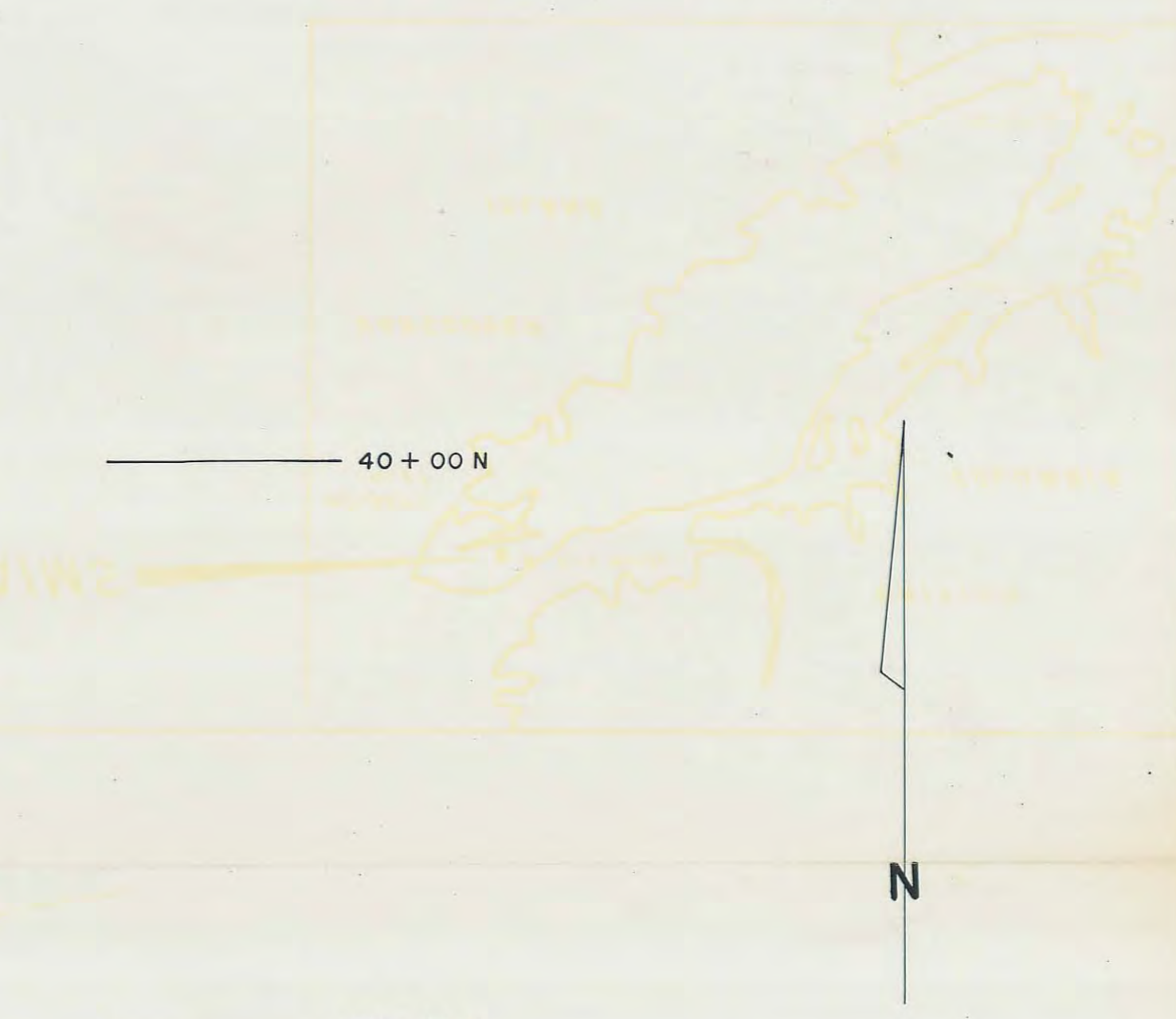
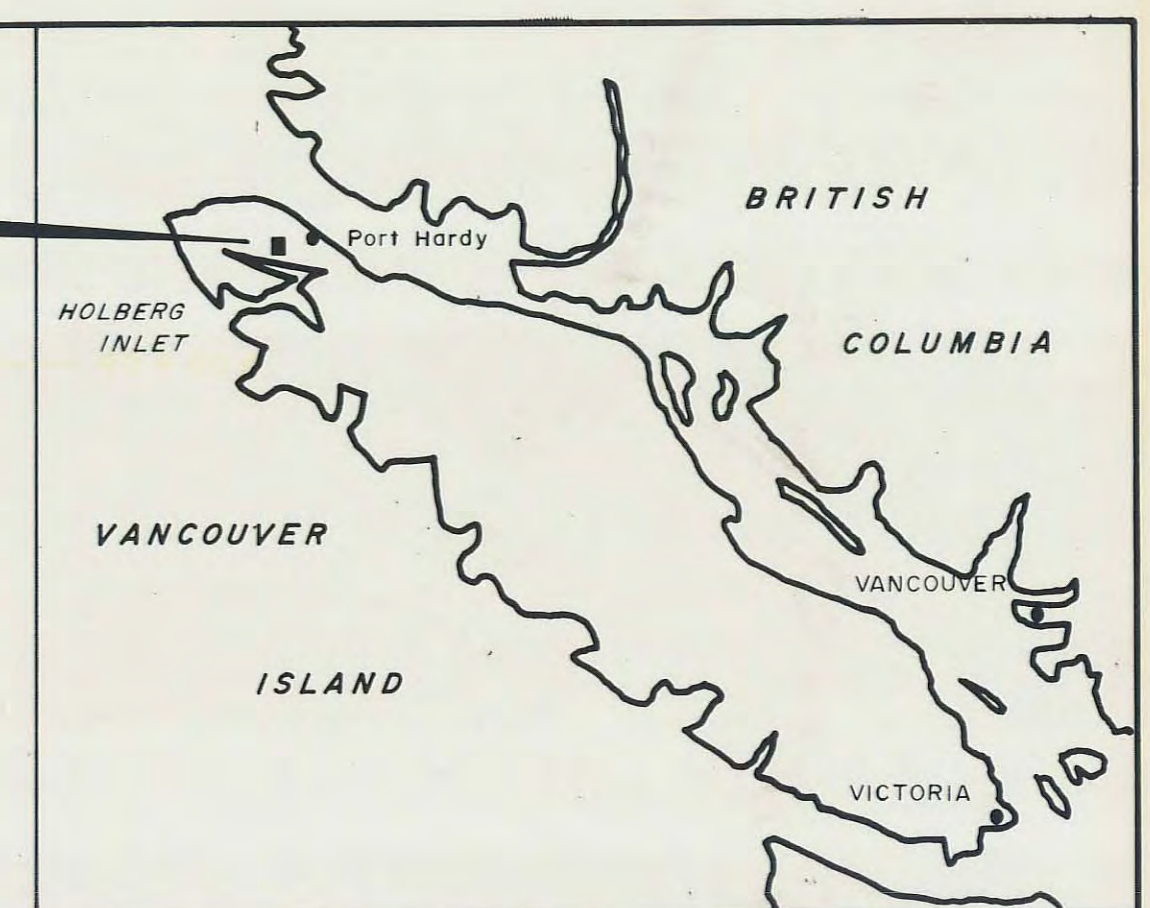
Garnet Exploration Corp. Ltd.

IDA CLAIMS AND GRID LOCATION

Port Hardy Dist. B.C.
Scale: 1" = 500' Date: November, 1971

To accompany Geological, Geochemical, Geophysical Report on the IDA claims by: M.R. Swanson M. Sc., and J. G. Simpson Ph. D., P. Eng. NOV. 1971

IDA CLAIMS



LEGEND

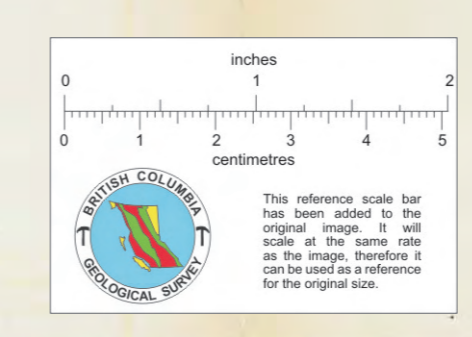
BONANZA VOLCANICS:	MASSIVE ANDESITE. Ia
	FELDSPAR ANDESITE PORPHYRY Ib
	HORNBLENDE ANDESITE PORPHYRY Ic
QTZ-FELDSPAR PORPHYRY	II
ORTHOCLASE GRANITE	III
OUTCROP LIMIT	(Symbol)
CONTACT	(Symbol)
FAULT	Mapped (Symbol)
	Inferred (Symbol)
BRECCIA ZONE	(Symbol)
FRACTURE PATTERN	(Symbol)
ALTERATION ZONE	(Symbol)
SULPHIDE MINERALIZATION: PYRITES	(Symbol)

Garnet Exploration Corp. Ltd.

IDA CLAIMS GEOLOGY

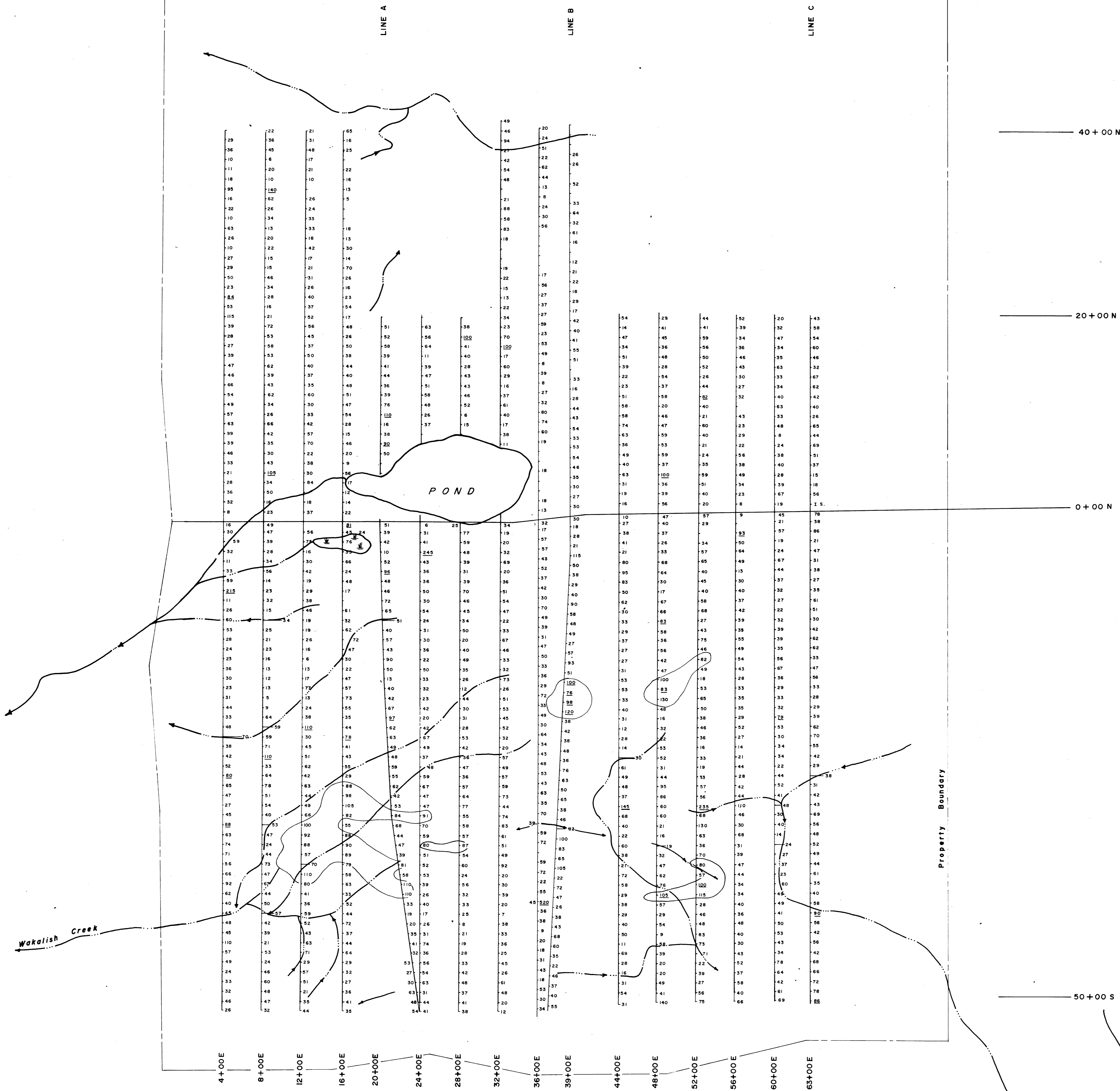
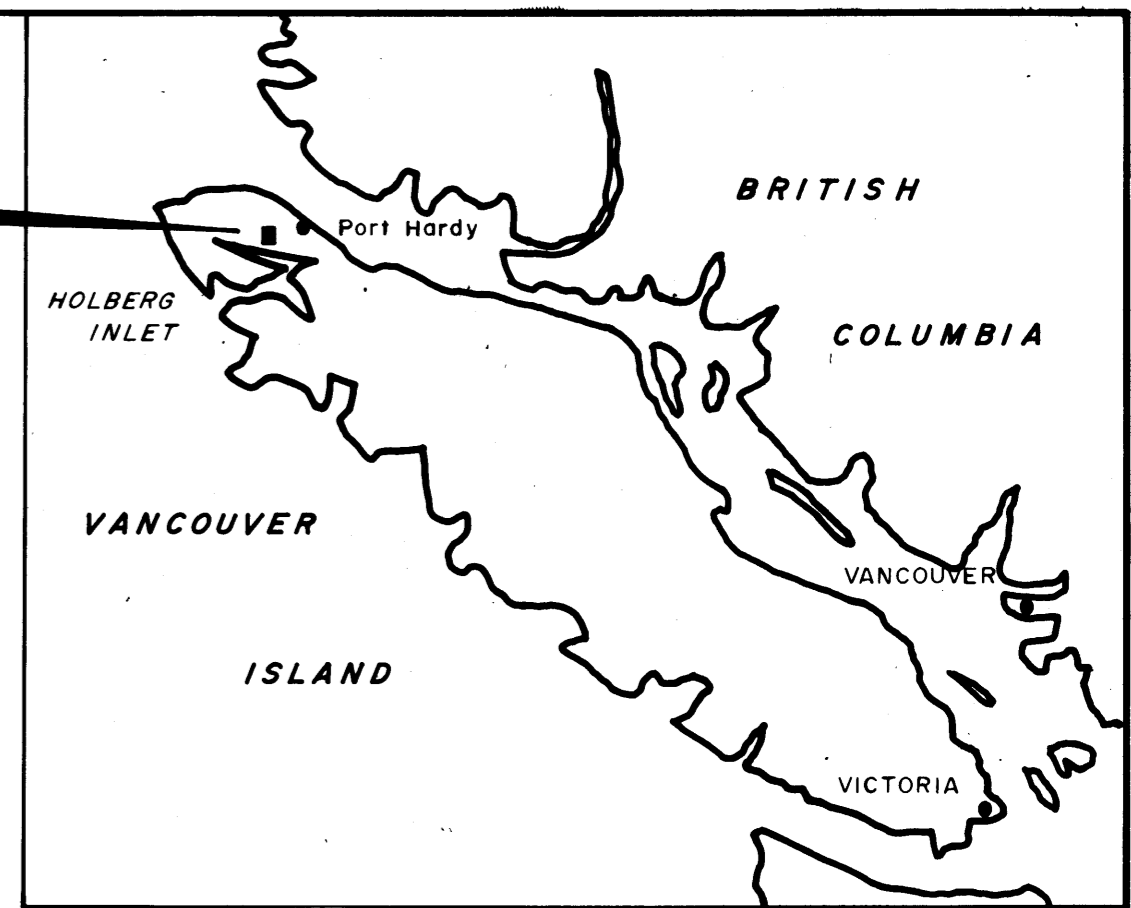
Port Hardy Dist. B.C.

Scale: 1" = 500' Date: November, 1971



To accompany Geological, Geochemical, Geophysical Report on the IDA claims by: M.R. Swanson, M. Sc., and J.G. Simpson Ph.D., P. Eng. NOV. 1971

IDA CLAIMS

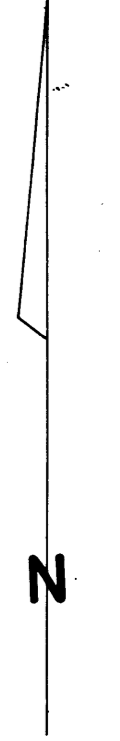


40+00 N

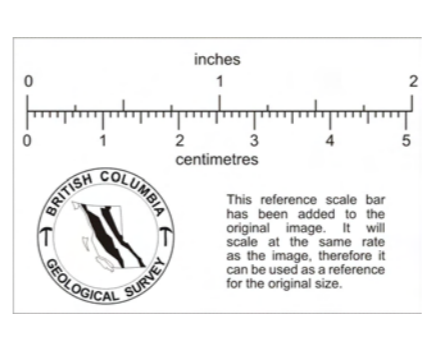
20+00 N

0+00 N

50+00 S



40 Cu ppm
96 Cu ppm
80 > 80 ppm Cu



Garnet Exploration Corp. Ltd.

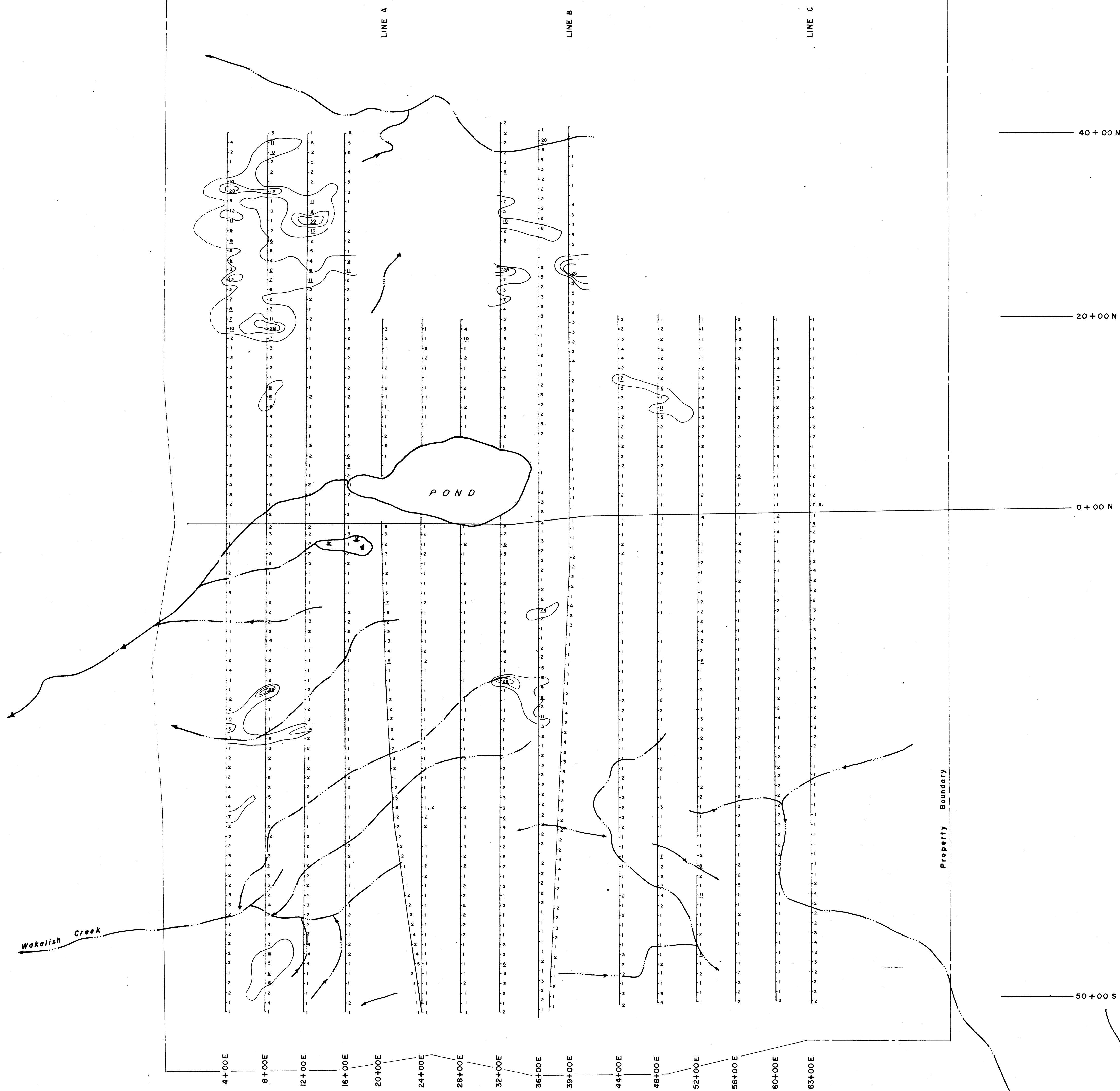
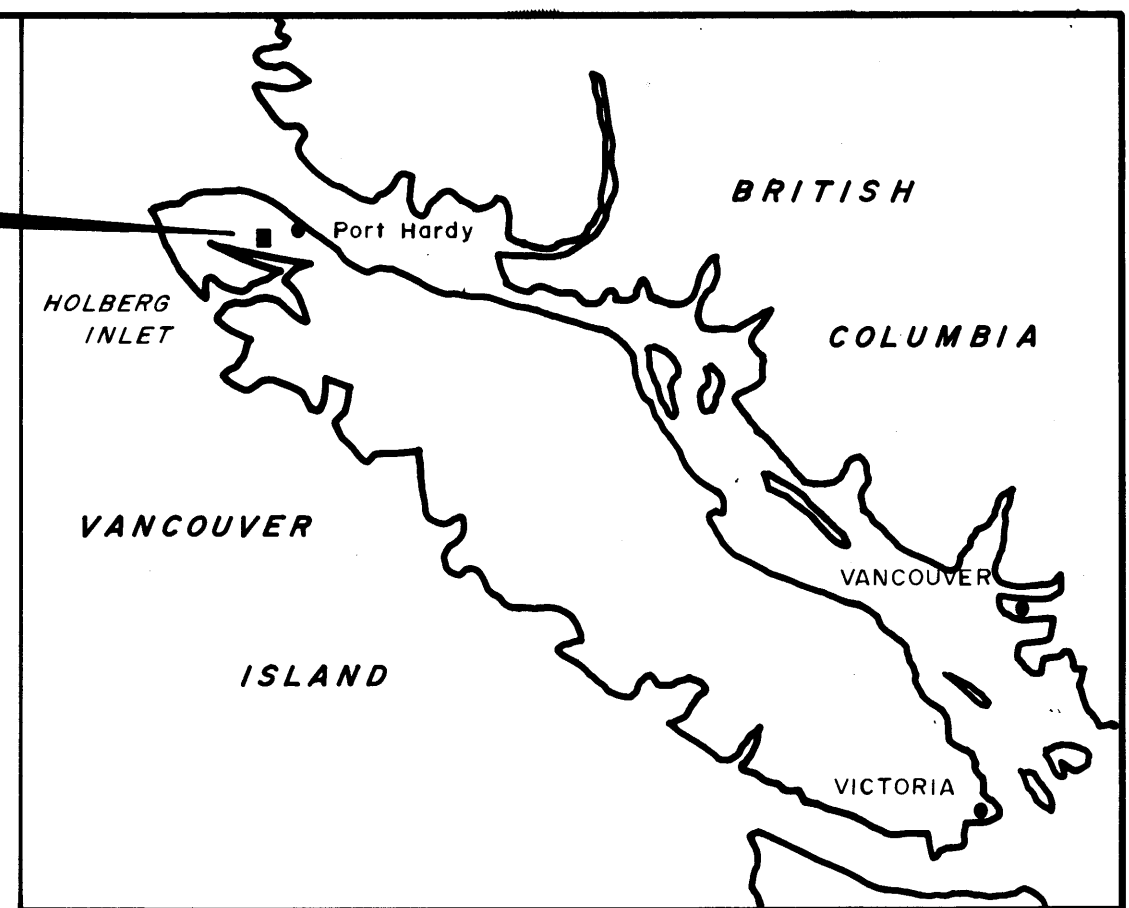
IDA CLAIMS
SOIL GEOCHEMICAL SURVEY
Copper

Port Hardy Dist. B.C.

Scale: 1" = 500' Date: November, 1971

To accompany Geological, Geochemical, Geophysical Report on the IDA claims by: M. R. Swanson M. Sc., and J. G. Simpson Ph.D., P. Eng. NOV. 1971

IDA CLAIMS



40+00 N

20+00 N

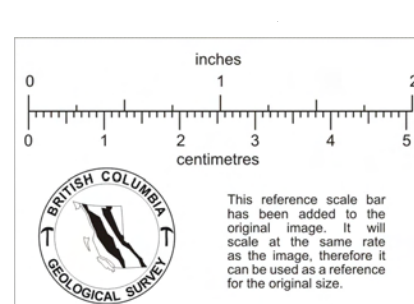
0+00 N

50+00 S



EXPLANATION

- 2 Mo ppm
- 8 Anomalous values Mo ppm
- Contour interval >6, 12 and 24 ppm Mo



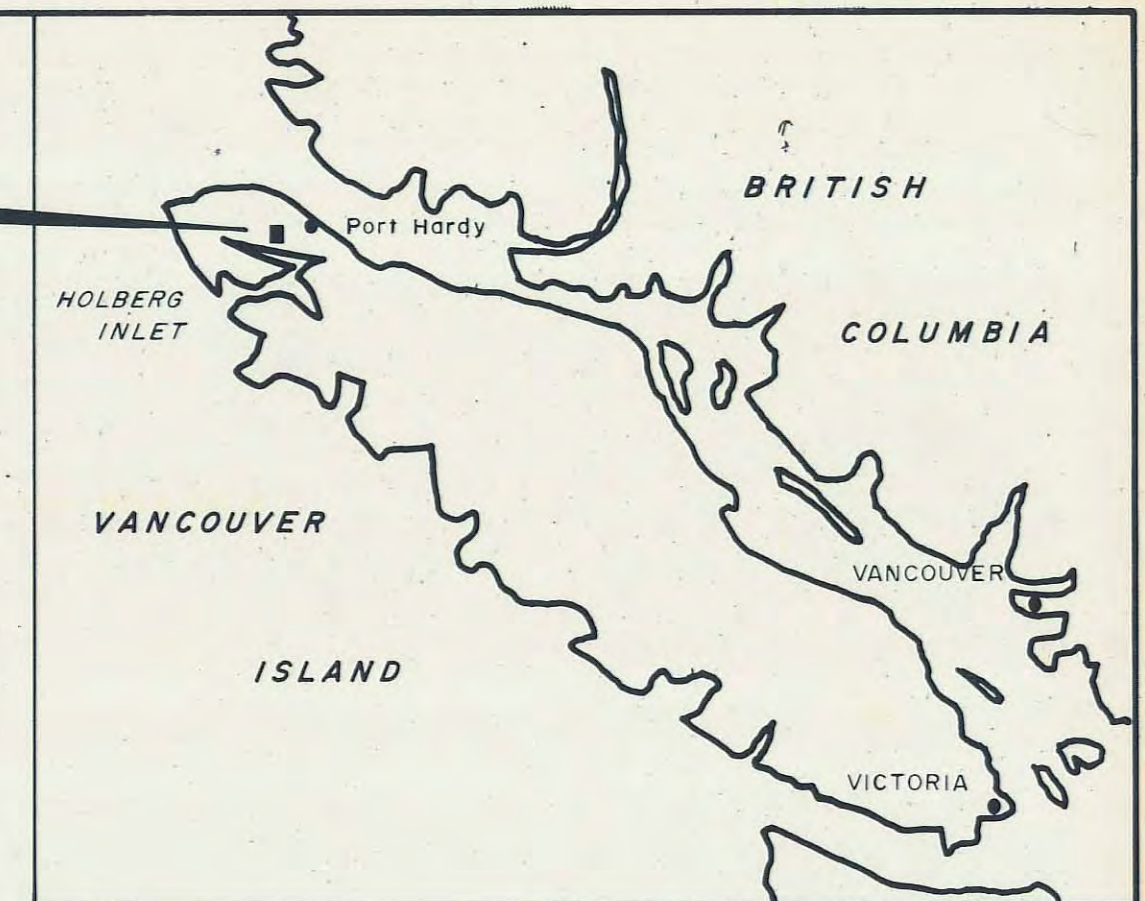
Garnet Exploration Corp. Ltd.

IDA CLAIMS
SOIL GEOCHEMICAL SURVEY
MOLYBDENUM

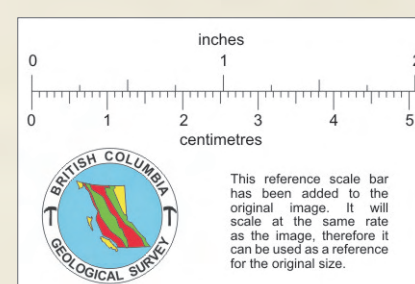
Port Hardy Dist. B.C.
Scale: 1" = 500' Date: November, 1971

To accompany Geological, Geochemical, Geophysical Report on the IDA claims by: M.R. Swanson M. Sc., and J.G. Simpson Ph.D., P.Eng. NOV. 1971

IDA CLAIMS



Contour interval 100 gammas



Garnet Exploration Corp. Ltd.

IDA CLAIMS
Magnetometer Survey

Port Hardy Dist. B.C.

Scale: 1" = 500'

Date: November, 1971