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To the Directors of

LONDON PRIDE SILVER MINES LTD. (N.P.L)

The accompanying Report and Geological Study of North Group, Granduc Area, Skeena Mining Division, 56° 130° S.E. by D. A. Davidson, was compiled under my personal supervision. His mapping and findings have been compiled in a most professional manner, and I fully agree with his findings.

Vancouver, B. C.,
September 1962.

G. H. Gamman

REPORT OF GEOLOGICAL STUDY

of the

NORTH GROUP, GRANDUC AREA

SKEENA MINING DIVISION

56° 130° S.E.

by

D. A. Davidson M.A.Sc.

Under the Supervision of H. D. Forman, P.Eng.

for

LONDON PRIDE SILVER MINES LTD.

Vancouver, B. C.
September 1962.

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REPORT OF GEOLOGICAL STUDY UP THE

NORTH GROUP, GRANDUC AREA, SKEENA MINING DIVISION, 56° 130° S.E.

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INTRODUCTION:

The property consists of 32 claims (Grace No. 1 to 16 and Sigrun No. 1 to 16) held by location 2½ miles north of the Granduc Mine (Map 1) near latitude 56°13' N. and longitude 130°22' W. The group covers the northern continuation of the Granduc Fault on the west flank of Mt. Pearson.

Access to the area is by airplane from Stewart, B.C. A dirt landing strip has been built by Granduc Mines at the head of the South Fork of the Unuk River. Snow covered glaciers form satisfactory landing strips in the winter and spring.

METHOD OF STUDY:

Field work was carried out from a base camp on the property during the latter part of August and early September. Equipment and supplies were flown into the area from Stewart, B. C.

The southern portion of the property was mapped using aerial photographs and a 1 inch = 800 feet base map. The northern part of the property was not mapped because of the dangerous condition of crevasses in the "Happy Valley" glacier; however, cliff walls above the ice were closely studied from a helicopter.

D. Davidson, M.A.Sc. and W. Dawson, B.Sc. were involved in the mapping program under the supervision of Mr. H. Foreman, P.Eng. Data was compiled in Vancouver, B. C.

REGIONAL GEOLOGY:

The Granduc area lies north and northeast of the eastern contact of the granitic complex that forms the backbone of the Coast Mountains.

Pre-batholithic rocks on the eastern flank of the Coast Mountains consist mostly of Mesozoic, sedimentary and volcanic rocks and their metamorphic equivalents. The sediments consist largely of greywacke, arkose, argillite and tuffaceous rocks, with numerous thin beds of limestone, sandstone and conglomerate. Interbedded andesitic and basaltic lavas and related pyroclastic rocks are abundant and widespread, although their distribution is irregular.

The granitic complex of the Coast Mountain system included rocks of widely variable composition that range in age from pre-Upper Aurassic to post-Lower Cretaceous. Hanson (1935) mapped granite, granodiorite, quartzdiorite and related phases as a unit in the Portland Canal area, whereas Buddington (1928) and Kerr (1948) emphasize the composite nature of the batholith. This granitic complex intrudes pre-Lower Cretaceous sedimentary and volcanic rocks, and is overlain unconformably by Tertiary volcanics and continental sediments.

The structure of the area is extremely complex. The Mesozoic rocks occur mostly in north to northwesterly trending folds on the flank of the granitic complex. In a few places remnants of pre-Mesozoic structure have been recognized, but for the most part older structures have been completely obliterated by those resulting from Mesozoic orogeny.

LOCAL GEOLOGY.

Introduction:

The oldest rocks in the area are a series of isoclinally folded metavolcanic and metasedimentary rocks that are believed to be correlative with the Hazelton group (Lower Mesozoic in age). These consist of a basal andesite complex which is overlain by a large thickness of metasediment rocks. The Hazelton group rocks have been regionally metamorphosed and synkinematically intruded by small subconcordant bodies of foliated diorite, leuco-diorite and/or syenite, and hornblende granodiorite. These intrusive rocks are satellitic to the main batholithic mass that is approximately 6 miles to the south.

ROCK TYPES:

METAVOLCANIC and VOLCANIC ROCKS:

Volcanic rocks outcrop both east and west of the map area. To the east, a large thickness of pillowed andesitic rocks occur on the east side of a north trending, steeply dipping major fault. A north trending band of andesite occurs about one mile west of the map area.

The volcanic rocks consist of porphyritic (pyroxene and/or feldspar) and non-porphyritic flows, with some pillowed and fragmental types. In hand specimen, these rocks are characteristically fine grained and green in colour. If present, phenocrysts of augite and/or feldspar up to 1.5 mm. in diameter are set in an aphanitic green matrix.

These rocks are gradational into greenstones, chloritic (±biotite) schists and phyllonites in zones of dislocation metamorphism.

ROCK TYPES:

METASEDIMENTARY ROCKS:

Metasedimentary rocks outcrop along the west side of the map area. The predominant rock types are quartz-biotite, and quartz-biotite-chlorite phyllonites and schists with minor interbanded limestone and graphitic schist. This assemblage is petrographically similar to metasediments that occur near the Granduc Mine.

The phyllonitic rocks are brown to brownish-green in colour and are extremely fine grained. Compositional layering is a common feature. These rocks are characteristically complexly folded. The limestone is medium grained and grey to greenish-grey in colour. It occurs in discontinuous, contorted layers up to 20 feet in width.

INTRUSIVE ROCKS:

The eastern contact of the Coast Range batholithic complex is approximately 5 miles south of the North Group. Smaller satellitic intrusions underlie much of the North Group. A large elongate subconcordant mass of foliated hornblende granodiorite occurs along the west side of the North Group. The southern portion of the North Group is underlain by a dioritic complex that is probably related to an irregular, highly sheared and closely folded dioritic zone that is present on Granduc Mountain.

(1) Hornblende Granodiorite: The hornblende granodiorite is a medium grained, leucocratic, porphyritic rock consisting essentially of phenocrysts of dark green hornblende and pale gray plagioclase up to 1.0 mm. in diameter set in a more fine grained groundmass of anhedral quartz and feldspar. A well developed foliation is produced by the common orientation of the hornblende. Irregularly shaped dioritic phases occur throughout the igneous mass, but are most abundant near contacts. The eastern contact is gradational

ROCK TYPES:

INTRUSIVE ROCKS (cont'd)

through 20 feet of mixed foliated diorite and quartz-feldspar-biotite schist into the rocks of the biotite rich metasedimentary map unit.

(2) Dioritic Complex: The dioritic complex includes rocks varying widely in time relationships and in composition. East of the Granduc fault, medium grained, greenish, slightly porphyritic diorite is the predominant rock type. This consists essentially of dark green phenocrysts of hornblende (?) and cloudy, greenish gray grains of plagioclase set in an altered fine-grained green matrix. Locally, this phase is well foliated. Where sheared, these rocks grade through greenstone, greenschist to very fine grained brown and green phyllonitic rocks.

A large irregular mass of light grey-green, slightly porphyritic leucodiorite or syenite occurs in the south central part of the North group, and on the east side of the Granduc fault. This is weakly foliated on the south slope of the mountain, but is unfoliated near the top of Mt. Pearson. Most of the contact of this leuco-phase with the predominant foliated green diorite was either obscured by snow cover, or occurred on inaccessible cliff faces. Contacts on the south slope of Mt. Pearson were sheared, but to the north the distribution suggests intrusive contact, (the leuco-phase appears to cross-cut the well developed foliation in the diorite).

(3) Dikes: Numerous small (up to 15 feet wide) dikes occur in the area. These vary in composition from granodiorite to diorite. Most are medium grained, slightly porphyritic and grey to greenish-gray in colour. The dikes cut the foliated and intrusive rocks, and as at the Granduc mine, are thought to be related to late batholithic activity.

ROCK TYPES:

UNDIFFERENTIATED PHYLLONITIC ROCKS:

An irregular zone of highly sheared chloritic schists, greenstone, chloritic phyllonites with minor amounts of biotite rich schists and limestone underlies much of North Group. These rocks occur between the metasedimentary map unit on the west and the dioritic complex on the east. Much detailed mapping and petrographic work would be required to ascertain the genesis of these rocks, but the presence of relict dioritic lenses in this zone suggest an igneous origin. Similar rock types have been formed from diorite on Granduc mountain.

STRUCTURAL GEOLOGY:

Foliations and contacts of most of the rock types trend northerly and dip steeply west. Complex isoclinal folding is characteristic of the foliated rocks. Fold axes trendparallel to the foliation, but plunges of fold axes vary markedly. The largest fold structure observed was in metasedimentary rocks to the west of the North Group. This structure indicated "tops" to the west.

The major structural elements are two major subparallel northerly trending, steeply dipping faults. One of these is the Granduc fault which cuts diagonally across the North group. The second major fault lies approximately 5000 feet east of the Granduc fault. Cross fracturing and "horsetail" shearing is a prominent feature in the block bounded by these two faults. Mineralisation is related to some of these structural breaks.

The strongly developed northerly structural trend of the isoclinally folded and sheared rocks has been cross cut by a large irregular body of leuco-diorite or syenite. This in turn shows a fault contact (on the Granduc fault) with schistose and phyllonitic rocks. Small dioritic dikes also cut the main structural trend.

STRUCTURAL GEOLOGY:

These have also been cut (in a right handed sense) by late faulting that parallels the Granduc fault.

Movements on the main fault zones could not be ascertained in the small area mapped, due to lack of marker horizons and the obliteration of primary structural elements.

Field observations suggest that a second period of folding is involved in the deformational history of the area. This is represented by warping of the structural elements related to the isoclinal folding.

PETROGENESIS:

The foliated dioritic intrusions were intruded into the sedimentary and volcanic rocks of the Hazelton group before or during regional metamorphism, and were involved in complex isoclinal folding with the stratified rocks. The well developed foliation in the diorite favours synkinematic intrusion.

Although the relationship of the subconcordant foliated hornblende granodiorite with other intrusive rocks in the area is not known, it is considered to be closely related in time to the intrusion of the diorite. Studies by Kerr (1948) and Buddington (1928) indicate that the more basic phases of the Coast Range granitic complex are older than the more abundant acid types.

The metasediments are believed to have formed from greywackes, marls and sandstones that have been progressively metamorphosed to form schists that can be classified in the quartz-albite-epidote-biotite subfacies of the greenschist facies. (Davidson 1960). Identical mineral assemblages can be found in altered volcanic and intrusive rocks, and it is concluded that these initially high temperature assemblages have retrogressed during regional metamorphism to attain, or approach

PETROGRAPHY:

equilibrium in the same metamorphic facies.

Following development of the strong north trending structural fabric in the volcanic-sedimentary-igneous complex, a body of leucodiorite was intruded. Associated with this intrusion, and following it, strong differential movement was localised along major north trending, steeply dipping shear zones. Mineralization on the North Group appears to be related to this period of dislocation. Rocks associated with these movements have undergone retrogressive metamorphism, and have attained equilibrium in the quartz-albite-muscovite-chlorite subfacies of the greenschist facies. Intrusion of the main mass of granitic rocks of the Coast Range batholith and the second period of folding is thought to have taken place at, or slightly later than this time.

ECONOMIC GEOLOGY:

Mineralization consists essentially of small, widely separated lenses of magnetite and/or chalcopyrite that occur in cross fractures and "horsetail" shears in the block bounded by the two major faults. Deposits of this type show a well developed mineralogical layering that parallels the enclosing fracture. The largest lense observed was approximately 100 feet long and had a maximum width of 2½ feet.

Locally, irregular carbonatized zones in shears in the chlorite and biotite schists contain disseminated chalcopyrite, pyrite and magnetite. These are generally small, widely separated, and show no continuity.

Abundant finely disseminated pyrite occurs in schists and phyllonites along the Grenduc fault zone, but only sporadic specks of chalcopyrite were observed.

Mineralized float was found at the edge of the ice cap on Mt.

REGIONAL GEOLOGY:

Pearson from an area where the leucodiorite and chloritic schists were brought into contact by the Granduc fault. Here, slightly foliated leucodiorite contains streaks and disseminations of chalcopyrite. No great abundance of such float was observed. Dawson reports a wide zone of well mineralised material near the trace of the Granduc fault on the crest of the mountain overlooking "Happy Valley." This area was not mapped due to abnormal snow conditions.

SUMMARY:

On the North Group, rock types consist essentially of dioritic material and its dynamically metamorphosed equivalents (chloritic schists and phyllonites). Sediments of the type found at Granduc occur west of the southern portion of the Group, and are present in the northwest part of the Group.

The predominant structural features in the vicinity of the North Group are two major subparallel faults. One of these is the Granduc fault which cuts across the Group striking slightly east of north. The second major fault lies to the east of the Group. Numerous "horsetail shears" and cross fractures are present in the block bounded by the two major faults. Complex drag folding is exhibited in the schistose members, but no consistent pattern of plunge of fold axes was observed (drag folding is an important ore control at the Granduc mine).

Mineralization consists essentially of small lenses of magnetite and/or chalcopyrite in the "horsetail" shears and cross fractures. Locally, small areas with disseminated chalcopyrite in chloritic schists were observed. Some mineralized float was found at the base of the ice cap on the south side of Mt. Pearson. Here, slightly foliated leucodiorite contains streaks and disseminations of chalcopyrite.

Respectfully submitted,

L. Davidson

Vancouver, B. C.
December, 1962.

COST OF PROJECT

The following are costs involved in the mapping program as compiled by the Company's accountant:

Assaying	$ 128.46
Maps	11.32
Travel	624.56
Wages	1,500.00
Supervision	600.00
Equipment Rental (including Helicopter)	629.80
Camp Expenses	21.37
Camp Supplies	133.60
Freight	95.96
Licences and Fees	14.60
Telephone	2.36
Fuel & Drill Supplies	97.76
Postage	2.75
	$ 4,062.54

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	Davidson, D.A.(1960):	Surface Geology at the Granduc Mine. Unpublished B.A.Sc. Thesis U.B.C.
1935	Hanson, G. (1935):	Portland Canal Area, B.C. G.S.C. Mem.175.
1948	Kerr, F.A.(1948):	Lower Stikine and Western Iskut River Areas, B.C. G.S.C. Mem.246.

DOMINION OF CANADA:

PROVINCE OF BRITISH COLUMBIA. } **In the Matter of** an AFFIDAVIT ON APPLICATION

TO WIT: } FOR CERTIFICATE OF WORK ON MINERAL CLAIMS

SIG No. 1 to 16 and GRACE No. 1 to 16

RECORD NOS. 20604 to 20635 incl.

I, H. D. FORMAN, #611, 850 West Hastings St., Vancouver 1, B. C. (Consultant for LONDON PRIDE SILVER MINES LTD. (NPL) (#611, 850 West Hastings Street, (Vancouver 1, B. C.

of

in the Province of British Columbia, do solemnly declare that Don Davidson, M.A.Sc., under the personal direction of H. D. Forman, P.Eng., compiled the attached Geological Report. The total cost of this survey was $4,076.34, as shown below:

Assaying	$ 128.46
Maps	11.32
Travel	624.56
Supervision (fee for Consultant)	600.00
Equipment Rental (including Helicopter)	829.80
Camp Expenses	21.37
Camp Supplies	133.60
Freight	95.96
Licences and Fees	14.60
Telephone	2.36
Fuel and Drill Supplies	97.76
Postage	2.75
Wages	1,513.80
	$ 4,076.34

WAGES:

Julian Berkosha (casual labour) Part Owner - Aug. 22nd to Sept. 9th, 1962 18 days @ $25/day	$ 450.00
Wendel Dawson (casual labour) Part Owner - Aug. 22nd to Sept. 9th, 1962 18 days @ $25/day	450.00
Don Davidson, M.A.Sc. (Geologist) Employee - August 22nd to September 9th, 1962 18 days @ $750/month	613.80
	$ 1,513.80

And I make this solemn declaration conscientiously believing it to be true, and knowing that it is of the same force and effect as if made under oath and by virtue of the "Canada Evidence Act."

Declared before me at the City of Vancouver in the Province of British Columbia, this 30 day of May, 1963, A.D.

H. D. Forman

A Commissioner for taking Affidavits within British Columbia or
A Notary Public in and for the Province of British Columbia.

★o

DOMINION OF CANADA:

PROVINCE OF BRITISH COLUMBIA.

TO WIT:

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Camp Expenses	21.37
Camp Supplies	133.60
Freight	95.96
Licences and Fees	14.60
Telephone	2.36
Fuel and Drill Supplies	97.76
Postage	2.75
Wages	1,513.80
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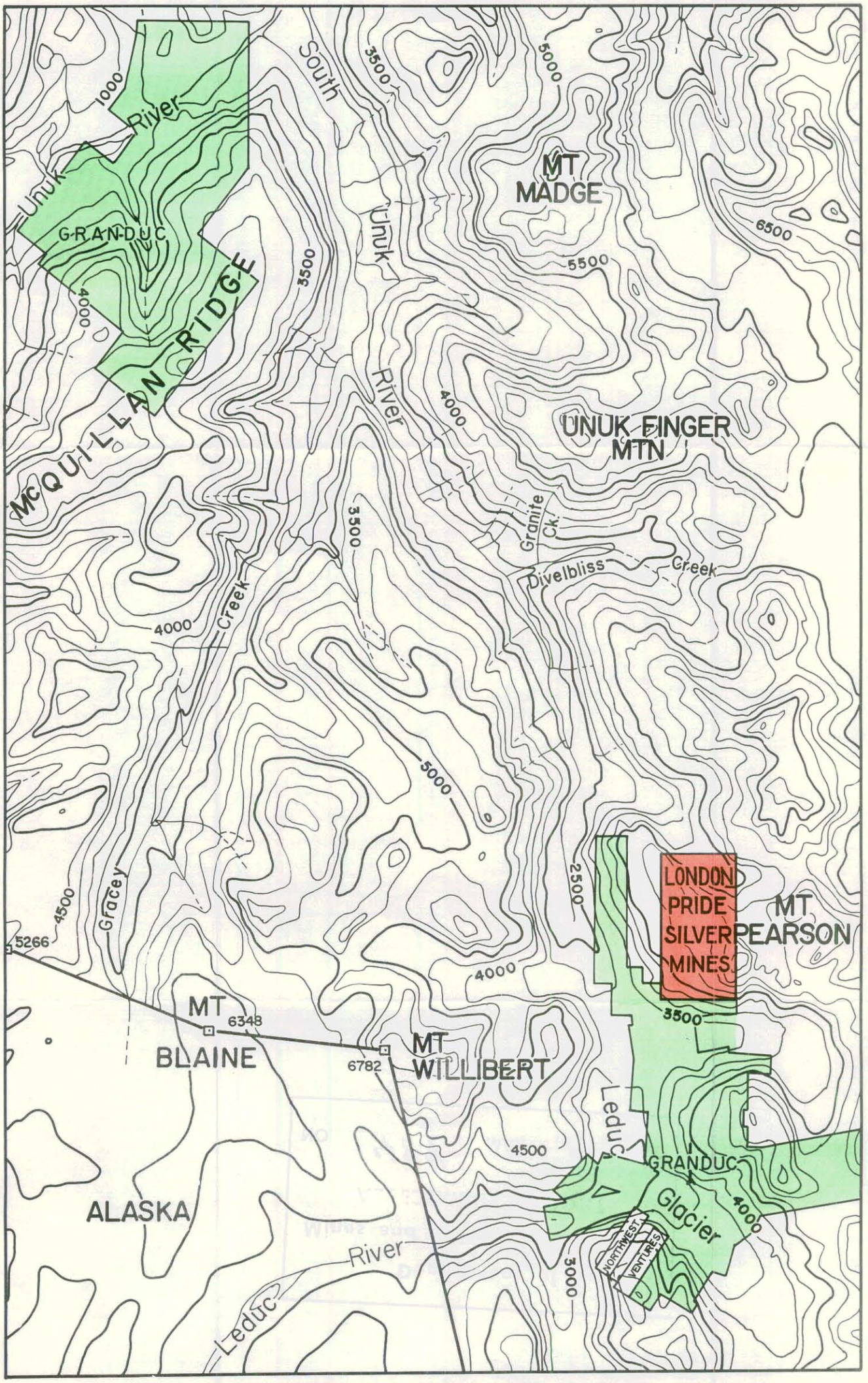
And I make this solemn declaration conscientiously believing it to be true, and knowing that it is of the same force and effect as if made under oath and by virtue of the "Canada Evidence Act."

Declared before me at the City of Vancouver, in the Province of British Columbia, this 30th day of May, 1963, A.D.

H. D. Forman

A Commissioner for taking Affidavits within British Columbia or
A Notary Public in and for the Province of British Columbia.



This map is prepared to serve as a guide only. Positions of claims are not guaranteed.

MAP SHOWING PROPERTIES IN THE UNUK-GRANDUC AREA

Distributed through courtesy of LONDON PRIDE SILVER MINES

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LEGEND

VOLCANIC ROCKS

1 — PORPHYRITIC AND NON-PORPHYRITIC ANDESITE. INCLUDES PILLOWED AND FRAGMENTAL TYPES.

METASEDIMENTARY ROCKS

2 — QUARTZ-BIOTITE(±CHLORITE) AND PLAGIOCLASE-BIOTITE(±QUARTZ, CHLORITE) SCHISTS AND PHYLLONITES. MINOR GRAPHITIC SCHIST AND CONTORTED LENSES OF LIMESTONE.

INTRUSIVE ROCKS

3 — DIORITIC COMPLEX. SHEARED FOLIATED DIORITE. LOCALLY CONVERTED TO CHLORITIC SCHISTS AND PHYLLONITES. MINOR CARBONATIZED ZONES.

3A — GREENSTONE, GREENSCHIST, CHLORITIC(±BIOTITE) SCHISTS AND PHYLLONITES DERIVED FROM 3. INCLUDES LENSES OF CARBONATITE.

4 — HORNBLENDE GRANODIORITE

5 — LEUCODIORITE AND/OR SYENITE

FOLIATION

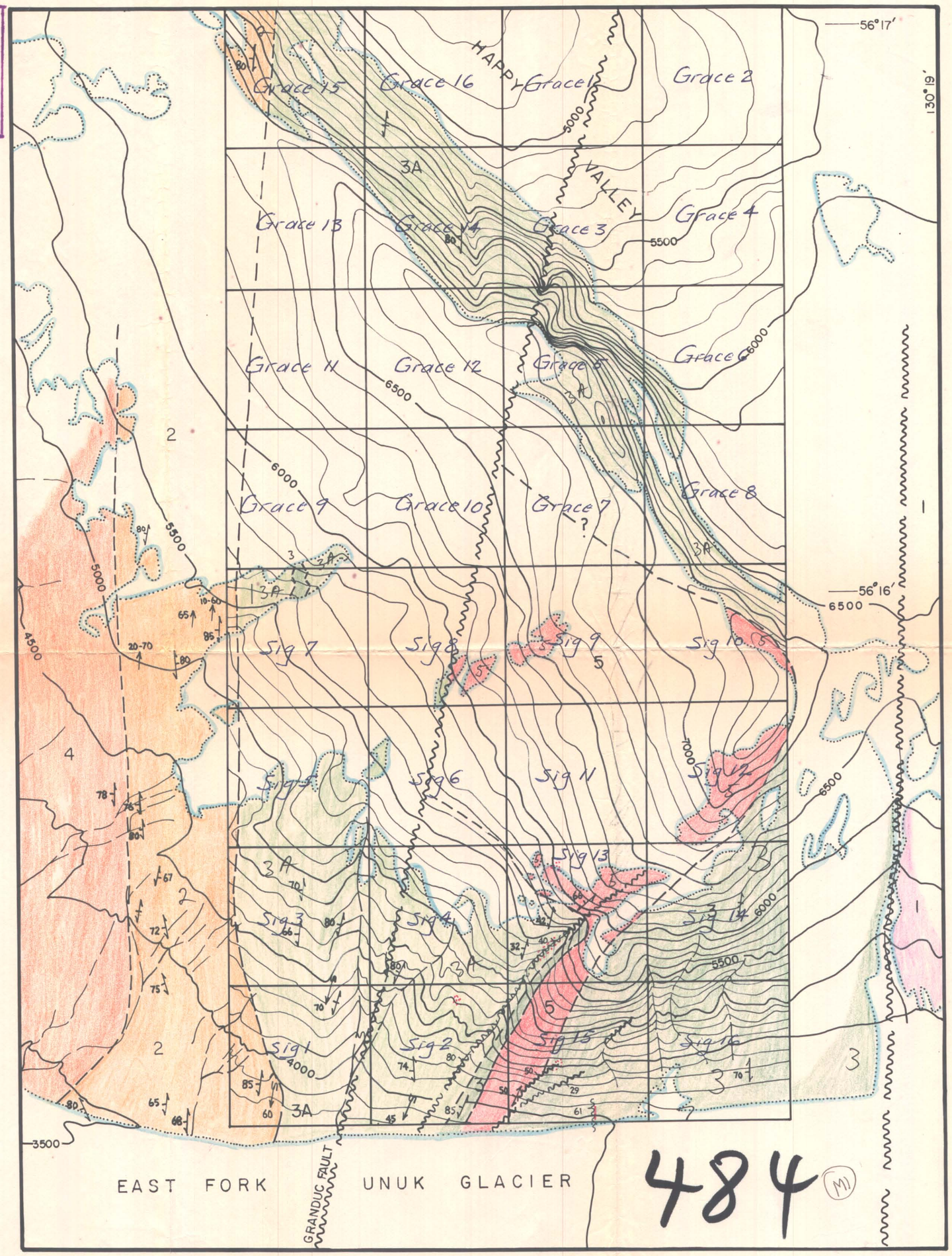
FOLD AXIS

FAULT

SNOW, ICE

COPPER MINERALIZATION

SCALE 1"= 800'



Accompanying report on claims Grace 1-16
Sig 1-16
by D A Davidson for London Pride Silver Mines Ltd
supervised by H.D. Forman P.Eng.
Aug. 22 - Sept 9 '62

GEOLOGY OF THE NORTH GROUP, GRANDUC AREA