CANADIAN INDUSTRIAL GAS & OIL LTD.

GEOLOGICAL REPORT

ON THE

HORN CLAIMS

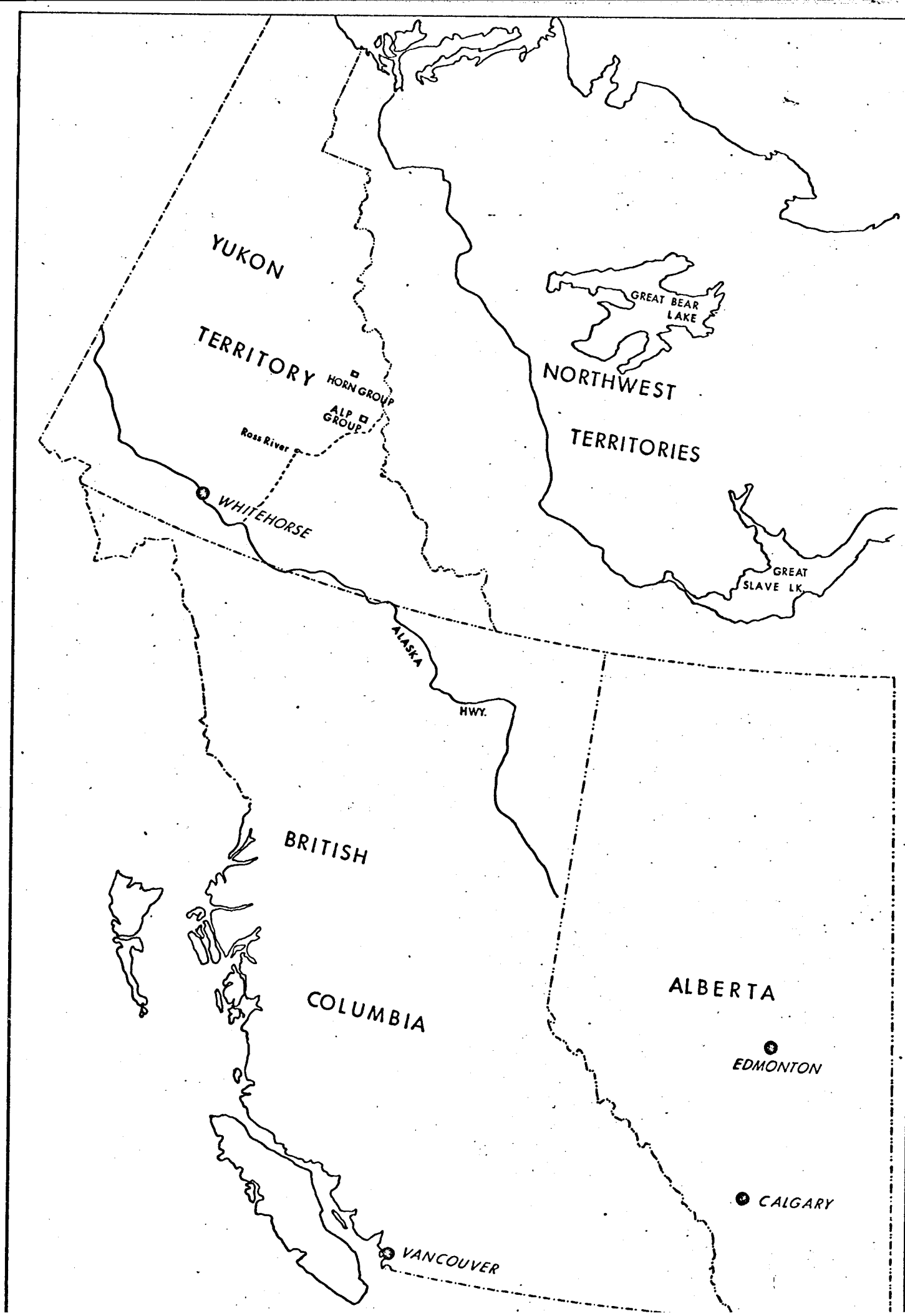
HESS MOUNTAIN AREA, YUKON

MAYO MINING DIVISION

by

P. G. MARSHALL

NOVEMBER 5, 1970


YUKON
TERRITORY
HORN GROUP
ALP GROUP
Ross River
WHITEHORSE
GREAT BEAR LAKE
NORTHWEST
TERRITORIES
GREAT SLAVE LK.
ALASKA
HWY.
BRITISH
COLUMBIA
ALBERTA
EDMONTON
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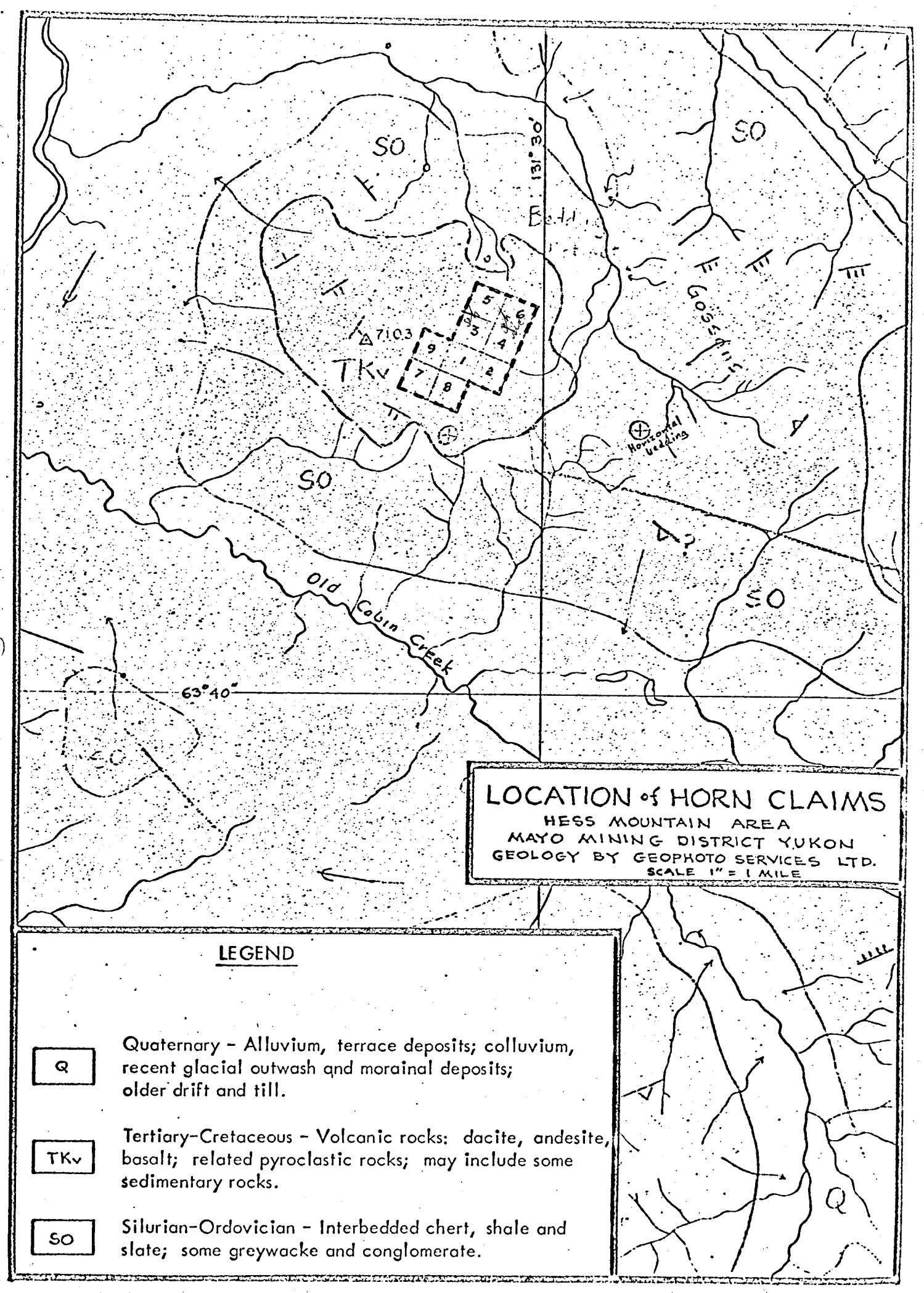
VANCOUVER



LOCATION of HORN CLAIMS

HESS MOUNTAIN AREA
MAYO MINING DISTRICT YUKON
GEOLOGY BY GEOPHOTO SERVICES LTD.
SCALE 1" = 1 MILE

LEGEND

Q	Quaternary - Alluvium, terrace deposits; colluvium, recent glacial outwash qnd morainal deposits; older drift and till.
TKv	Tertiary-Cretaceous - Volcanic rocks: dacite, andesite, basalt; related pyroclastic rocks; may include some sedimentary rocks.
SO	Silurian-Ordovician - Interbedded chert, shale and slate; some greywacke and conglomerate.

CONTENTS

Location and Access

The Horn Group of nine claims, staked by crews employed by Geophoto Services Ltd. on 12 August 1968, lies in a north facing cirque on the north face of a glacially modified mountain about four miles east of the junction of Old Cabin Creek with the Rogue River. This area, in the south-eastern portion of the Yukon Territory, in the northeast corner of N.T.S. quad 105-O-12, falls under the jurisdiction of the Mayo District Mines Recorder.

Access to the property was by helicopter from a base at Sheldon Lake, a distance of about 80 miles. Access to Sheldon Lake is by the newly re-opened Canol Road to Ross River, a distance of about 100 miles, and from there by road to either Whitehorse or Watson Lake.

Work Done

The writer was on the property for a total of nine days. A summary of this activity follows.

On 24 August, 1970 a helicopter reconnaissance flight was made to locate the area, a camp spot was picked, and a fuel cache set out.

From 1 September, 1970 until 7 September, 1970 the writer and an assistant camped on the property, during which time prospecting, geological mapping to a scale of 1" = 500' and channel sampling of a massive sulphide zone were undertaken.

On 10 September, 1970 helicopter support was utilized for several hours, prospecting the area immediately to the east of the claims.

Topography and Vegetation

The area of interest is on a relatively large, isolated mountain peak rising to an elevation of 7103' above a river valley system that lies at an elevation of approximately 3400' ASL.

The north, east and south faces of the mountain have been extensively sculptured by several post-Pleistocene mountain glaciers, giving rise to an extremely rugged and broken terrain. The west face has not been subjected to such glaciation and exhibits a much gentler topography.

The glaciation has produced a series of large cirque "amphitheaters" separated by long narrow, serrated arête ridges and isolated horn type peaks. These ridges are being rapidly weathered and broken down, especially by freeze-thaw phenomena, and large rock falls are a constant menace. As a consequence of this rapid breakdown, large active talus slopes, sometimes reaching almost to the crests of the ridges, are common; talus accumulation in the cirque bowls has led to the development of numerous large rock glaciers in excess of several hundred feet thick.

The claim area ranges in elevation from 5300' ASL to in excess of 6500' ASL, well above the tree line, which appears to be at an elevation of 4000' ASL. Because of the widespread talus and rock glacier material, typical alpine tundra vegetation of lichen, moss, heather and grass exists only in scattered protected locations.

Geology

The claims are underlain by a series of carbonate bearing shales, and banded cherts of Silurian-Ordovician age, capped unconformably by Tertiary volcanic material. Several shear zones and a possible faulted zone with brecciation were noted.

Shale:

A buff coloured, highly fissile shale, containing up to 5% carbonate by volume, outcrops at an elevation ranging from 5300' ASL to 5500' ASL on claims 3 and 5. This material strikes in a N. 10°-20° W. direction and dips from near vertical to steeply eastward, suggesting an upending of the shale beds.

Along the western border of these claims a long sinuous brecciated zone strikes in a generally northerly direction, and is possibly caused by faulting. Orange to white crystalline carbonate, in places vuggy, lined with platy crystals, has been deposited into this zone. Close examinations showed no sulphide minerals, indicating the carbonate material was possibly derived from the host shales.

Quartz veins ranging in width from hairline to several inches, cross-cutting the shale cleavage, are everywhere common. These veins have crystallized from the wall inwardly, and numerous veins show centres composed of quartz prisms. Graphite is common along the contacts and inclusions of a light brown acicular mineral are not unusual. Sulphide mineralization in these veins is very uncommon.

Chert:

An alternating buff and dark grey banded chert outcrops on claims

4 and 6 at elevations up to 6000' ASL. This material exhibits a sharp unconformable contact at this elevation to the overlying volcanic rocks. The chert strikes in a generally north-south direction and dips shallowly to the east, suggesting a non-conformable contact to the underlying shales but the actual contact is obscured by extensive talus deposits.

The banding, probably derived from the original bedding, is generally "wavy" but in places exhibits tight small scale folding, and minor slump faulting.

Chlorite is present both as isolated green lenticular inclusions and as disseminations into some of the bands, giving them a green colour. Sulphide mineralization, mainly pyrite, is present as widely scattered pods, which are usually leached out at the surface.

Volcanic Complex:

A fine grained, dark grey-green, intensely jointed volcanic material outcrops above 6000' ASL, and on claims 4 and 6 the contact to the underlying cherts has been described. Upslope the contact is obscured by talus material, and above the 6000' level it is assumed to be continuous.

Sulphide mineralization in numerous forms is common: as disseminated pyrite cubes; pods and lenses of pyrrhotite and pyrite; and veins of pyrrhotite, pyrite, minor chalcopyrite and euhedral quartz associated with shearing.

The intense jointing pattern allows water easy access to the sulphide mineralization which is strongly leached, and a probable excess of sulphuric acid

has carried iron oxides downwards and has re-deposited the iron where the descending waters have re-emerged. Several examples of iron oxide cemented gossans of a "clinker-like" appearance were noted. Gossans containing secondary gypsum are a further indication of an excess of sulphuric acid in the water, which has reacted with the carbonate content in the host volcanics.

In addition to minor amounts of interstitial carbonates, crystalline calcite veins are common, and close examination of several failed to locate sulphides.

The jointing and surface weathering of this rock make it extremely difficult, and at times unsafe to traverse or climb.

Quartz Carbonate:

A light yellowish material containing about 40% quartz content, and displaying a cataclastic texture, outcrops at the 6100' level on claim 8. There is also a secondary quartz stockwork developed in this rock unit, which has minor amounts of specular hematite along the contacts.

Mineralization

The area of interest, a sulphide vein associated with shearing and cross fracturing, outcrops on claim 8 at the 6350' level.

The vein is exposed, along a strike of N 20° W, for a length of about 120', on a near vertical arete wall near the head of the cirque. At this point the vein has a true width of 15' and dips near vertically. On the other side of the arête, a distance estimated from 1200' to 1500', the outcrop is obscured by

talus material, but limonite staining indicates the vein may be continuous throughout this length.

At the 6350' level the vein exhibits a sharp horizontal contact (with several off-shoots) to the host volcanics. The vein extends downwards into ice, snow and talus, and is assumed to continue no further than the projected chert contact at the 6000' level, giving a total depth of 350'.

(Investigation of several similar but small sulphide bodies along the exposed portion of the volcanic-chert contact indicated that the sulphide mineralization in the volcanics did not pass through into the chert. Hence it can be assumed that the sulphide mineralization is associated with the volcanics, and is younger than the chert.)

The grade of mineralization throughout the visible portion of the vein was quite variable. The best portion showed about 40% magnetic pyrrhotite in grains or blebs, with lesser amounts of interstitial pyrite, and splashes of chalcopyrite, in a euhedral quartz gangue. Extensive weathering has produced limonitic gossans along much of the surface of the deposit, but erosion is constantly exposing reasonably fresh material.

Cubic crystals of pyrite up to 1/2" are common along the contact. Many of these have been altered to limonitic pseudomorphs.

A series of shear zones, striking N 50° W, cut across the vein, and mineralization appears concentrated along the shear surfaces.

Cross fractures, and associated aplitic quartz veins up to 6" wide are common between the shearing surfaces.

A second sulphide zone is exposed about 30' south from the first zone, and it appears to strike in a N 40° W direction and dips 30° SW. Only one small portion of this vein is uncovered, but it appears smaller than the previously described vein, and may even be an off-shoot from it.

Large amounts of the vein material have been eroded out by cirque development and have accumulated in a rock-glacier, up to 200' thick and extending downslope a distance of 2000'. Much of the central portion is covered by snow.

This large pile of sulphide material is probably responsible for high metal readings in the stream flowing out from this cirque.

Samples

The following samples were collected and sent to Loring Laboratories Ltd. of Calgary. A copy of the results is included with this report.

PM-H-1 A 10' vertical channel sample taken across the portion of the vein exposed by glaciation, at a point about 50' from the contact to the host rock. Sample contained pyrrhotite and pyrite, with surface development of limonite.

PM-H-2 A 10' horizontal channel sample, starting at the mid point of the previous sample, along the strike of N 20° W. A shear zone striking N 55° W, dipping 30° SW, crosses this area. Sample contained pyrrhotite and pyrite.

PM-H-3 A 30' horizontal sample taken along the exposed "nose" of the vein, the true vein width here is 45'. Shearing striking N 50° W, dipping 20° SW, crosses this zone. Sample contained mainly pyrrhotite and pyrite with minor amounts of chalcopyrite.

PM-H-4 A 5' vertical sample taken on the second vein, about 30' to the south of the first. This sample was taken from the top contact, to the point where it is obscured by talus. Material contained mainly pyrrhotite and pyrite, with blebs of chalcopyrite.

Conclusions

The vein is exposed near the head of a cirque, crossing an arête wall possibly into another cirque, limiting the possible maximum length to 1500'. The mineralization is assumed to be confined to the volcanics, and probably terminates at the volcanic-chert contact giving a total estimated depth of 350'. Where exposed the true width ranges from 15 to 20'.

The small outcrop of similar material may in effect be a parallel vein, or possibly an off-shoot of the main vein. Assuming it to be parallel the width may increase to 50'.

Estimate for volume in the first case is slightly under 500,000 cubic yards, and slightly over 1,000,000 cubic yards in the second case. Assuming 2.5 tons per yard this gives tonnages of 1,250,000 and 2,500,000.

The best grade was sample PM-H-4 which returned 0.49% Cu, and the largest sample, PM-H-3, gave a grade of 0.21% over 30'. Both of these grades

are very low, especially so in relation to the tonnage.

As a point of interest, two vein type deposits currently being developed have the following tonnages and ore grades:

1.	Churchill Copper	1,034,600 tons at 4.01% Cu.
2.	Davis Keays	1,634,790 tons at slightly better than 5.5% Cu.[1]

Also to be considered is the remoteness of the site, over 80 air miles from the Canol Road, and from there over 300 miles to the railhead at Whitehorse.

Recommendations

In view of the above conclusions the writer feels that any more work or money spent on the property is unwarranted, and that the claims should be allowed to lapse.

P. G. MARSHALL

[1] Northern Miner, 11 December 1969

CERTIFICATE

I, HUGH MOGENSEN, of the City of Calgary, in the Province of Alberta, HEREBY CERTIFY:

1. THAT I am a registered Professional Geologist in the Province of Alberta.

2. THAT I am a graduate of the University of Alberta with a degree of Bachelor of Science (1956).

3. THAT I am Minerals and Foreign Exploration Manager with Canadian Industrial Gas & Oil Ltd. of 640 - Eighth Avenue S.W., Calgary 2, Alberta.

4. THAT I have visited the property discussed in this report.

5. THAT I have practiced as a geologist for more than 13 years, examining and reporting on properties in North America and Europe.

6. THAT the work described in this report was carried out under my supervision.

DATED at Calgary, this twenty-first day of December, 1970.

Hugh Mogensen

Hugh Mogensen, P. Geol.

LEGEND

TERTIARY ①	QUARTZ-CARBONATE	A light yellow colored, cataclastic textured, carbonate matrix with up to 40% quartz.
TERTIARY ②	VOLCANIC COMPLEX	A fine grained, dark grey-green, jointed material, contains pods of pyrrhotite.
SILURIAN - ORDOVICIAN ③	CHERT	A fine grained, alternately buff and grey, banded material
SILURIAN - ORDOVICIAN ④	SHALE	A fissile, buff colored carbonate bearing shale with abundant quartz veining.

Strike and dip beds.

Quartz veins (QV)

Jointing

Major fracture

Shear zone

Talus and rock glacier material.

CANADIAN INDUSTRIAL GAS & OIL LTD.

GEOLOGY OF THE HORN CLAIM GROUP HESS MOUNTAIN AREA MAYO MINING DISTRICT YUKON TERRITORY

NTS QUAD 105-O-12
SCALE : 1"=500'

TO ACCOMPANY GEOLOGICAL REPORT BY P.G.MARSHALL
NOV. 5, 1970