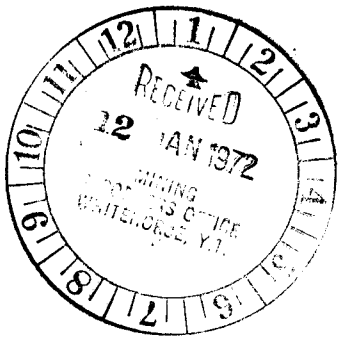

This report has been examined by the Geological Exploration Unit and is recommended to the Yukon Council to be considered as representing work in the amount of $12,500.00

D B Craig

or

Certificated as prospecting work under Section 38 (4) Yukon Quartz Mining Act.

Commissioner of Yukon Territory

12,500

PHONE: OFFICE 667-2819
RES. 668-2822
AREA CODE 403

R. G. HILKER
LIMITED
CONSULTING GEOLOGIST . . . PROFESSIONAL ENGINEER
P.O. Box 1566
WHITEHORSE, YUKON TERRITORY
"LAND OF THE MIDNIGHT SUN"

GEOLOGICAL, GEOCHEMICAL AND GEOPHYSICAL REPORT ON THE

CHART 1-48 (Y59861-Y59908)
YUKON QUARTZ MINERAL CLAIMS

KLAZA RIVER AND CINDY CREEK
DAWSON RANGE AREA
YUKON TERRITORY

LATITUDE 62° 15'

LONGITUDE 137° 45'

N.T.S. DESIGNATION
115-I-4
WHITEHORSE MINING DIVISION

-- MAY 20th to JUNE 11th, 1971 --

FOR

CHARTA MINES LTD (N.P.L.)
VANCOUVER, B.C.

BY

G.G. CARLSON - GEOLOGIST
R.G. HILKER LIMITED

AND

R.G. HILKER, P. ENG.
WHITEHORSE, YUKON TERRITORY

JULY 20th, 1971

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INTRODUCTION

In December, 1970, a group of 48 claims, the Chart Claim Group, was staked in the Klaza River - Cindy Creek area of the Dawson Range, Yukon Territory. H.S. Bostock, in his 1963 Geological Survey of Canada Report, mentions a mineral occurrence on the Klaza River below Magpie Creek. Little attention was paid to the area until the announcement, late in the summer of 1969, of a large tonnage Arizona-type porphyry copper-molybdenum deposit on the Casino Silver Mine porperty. In the ensuing staking rush, the present property was covered by a group of 120 claims. However, no assessment work was carried out over these claims, and they were allowed to lapse during the fall of 1970. The Chart claims were staked shortly after the original claims expired.

The present field work was commenced on May 20, 1971, when two employees of Eastern Associates Registered arrived on the property, set up camp and commenced cutting the linegrid. A third linecutter was mobilized to the property on May 22nd. G.G. Carlson-geologist and Glen Hillson soil sampler of R.G. Hilker Limited commenced surface work on the Chart claims May 29th. The linegrid was completed on June 1st and the linecutting crew departed from the property when Brian Slater - magnetometer operator and Alan Ashton soil sampler of R.G. Hilker Limited arrived at the campsite, June 2nd. The geological, geochemical and magnetics surveys were completed on June 10th and the camp was demobilized on June 11th. All mobilization, demobilization and expediting was carried out from Whitehorse. Access to the claim group was by truck between

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Whitehorse, Carmacks and the Minto Airstrip by a Bell 47G-3B-2 helicopter between Carmacks or the Minot Airstrip and the Chart claims on the Klaza River.

This report describes the field investigations carried out and interprets the data collected. (It is submitted for the purpose of assessment work on the Chart 1 - 48 claims group, in the Dawson Range. Claim Sheet No. 115-I-4, Whitehorse Mining Division, Yukon Territory).

It is requested that information contained in this report reamin CONFIDENTIAL.

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LOCATION AND ACCESS

The Dawson Range is located in the west-central portion of the Yukon Territory on the southwest side of the Yukon River between latitudes 62° 00' and 62° 45' and longitudes 137° 00' and 140° 00'. The Dawson Range strikes approximately north 45° west and is in the vicinity of 110 miles long and 20 miles wide. The Dawson Range is physiographically bounded by the Klondike Plateau to the northwest and by the Lewes Plateau to the southwest. The White River truncates the Dawson Range to the north-west and the Yukon River forms the south-eastern limit in the Carmacks area.

The Chart 1 - 48 claim group is located within the Dawson Range at latitude 62° 15' and longitude 137° 45' on Cindy Creek and the Klaza River about one mile west of Magpie Creek. The claims are located on the Carmacks Sheet 115-I (May 340-A; 1" = 4 miles) and on claim sheets 115-I-4 and 115-I-5 (1" = ½ miles) of the Whitehorse Mining Division.

An airstrip, suitable for aircraft up to and including a DC-3, has been constructed by Casino Mines at the head of Casino Creek, approximately 45 miles north-west of the Chart group. The Casino airstrip is approximately 194 air miles from Whitehorse where fixed wing aircraft are available. An airstrip, suitable for Beaver, Otter and smaller aircraft, has been constructed on the International Mines Services property on Hayes Creek, about 30 miles north of the Chart group. A third airstrip, 40 miles northeast of the claim group, is located at Minto, at mile 143 on

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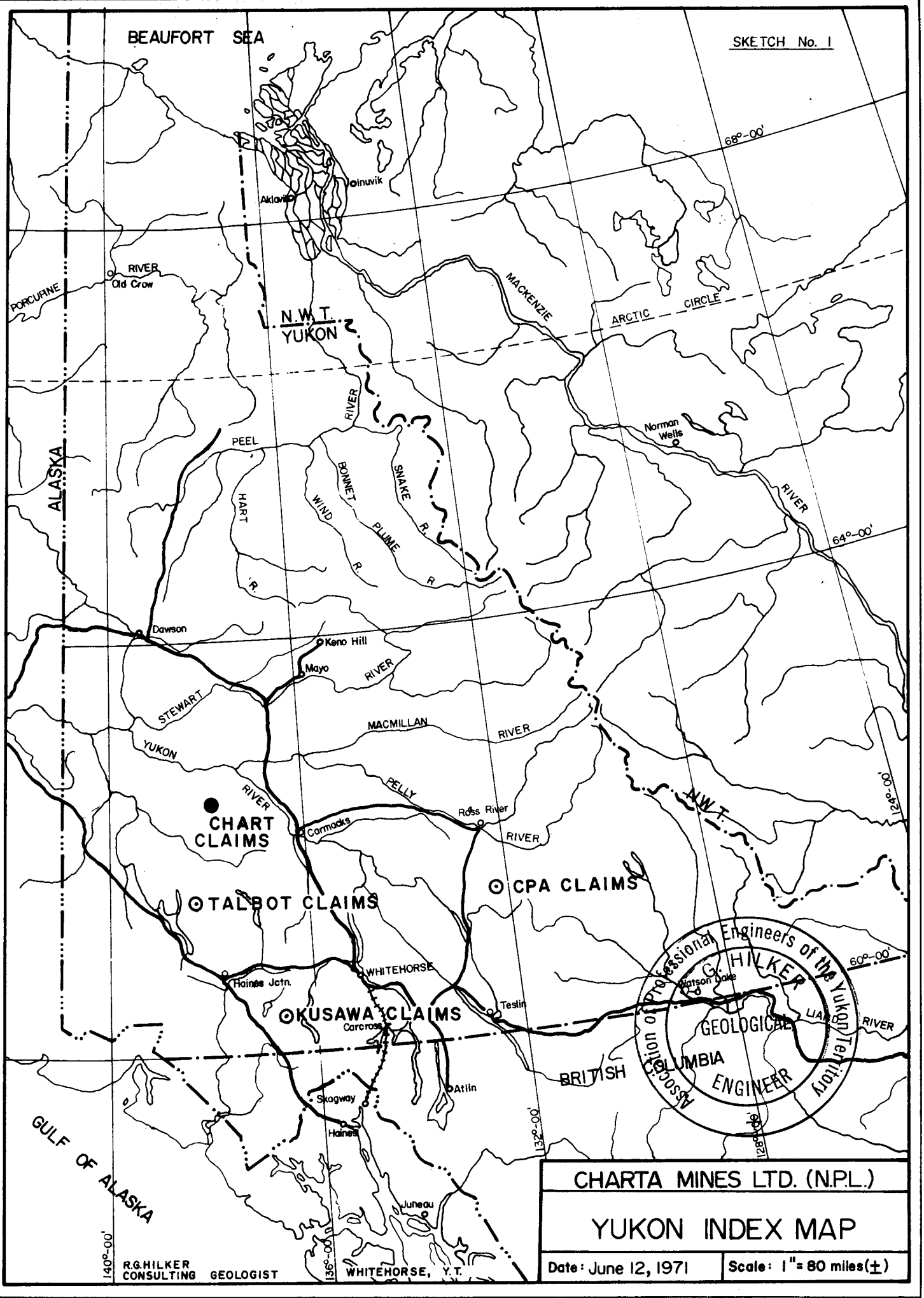
the Whitehorse-Mayo Road. Winter tractor roads have been constructed into various parts of the Dawson Range. Two such roads leave Carmacks at mile 103 on the Whitehorse-Mayo Road. One of these travels west to Mount Nansen, and the other northwest to Big Creek, to distances of 20 and 15 miles respectively from the Chart claims. These roads are not generally passable by truck after spring thaw unless they are repaired by a crawler tractor.

Best access, for the present stage of development to the property is by truck from Whitehorse to Carmacks or the Minto Airstrip a distance of 110 miles or 143 miles, and by helicopter from Carmacks or the Minto Airstrip to the claim group. A helicopter is being maintained in the Carmacks area during the 1971 summer months and is available on a casual charter basis.



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

YUKON INDEX MAP

Date: June 12, 1971 | Scale: 1" = 80 miles(±)

CLAIMS

The following information on the Chart claims was searched by R.G. Hilker on July 21st, 1971, in the Whitehorse Ming Recorder's Office. The claims were transferred from the stakers to Charta Mines Ltd. (N.P.L.) on January 13th, 1971. The Chart claims are located on Claim Sheet 115-I-4, Klaza River and Cindy Creek - Whitehorse Mining Division.

Claim Name & No.	Grant Number	Anniversary Date
CHART 1-8 (incl)	Y59861-Y59868	Jan. 4, 1972
CHART 9-16 (incl)	Y59869-Y59876	Jan. 4, 1972
CHART 17-24 (incl)	Y59877-Y59884	Jan. 4, 1972
CHART 25-32 (incl)	Y59885-Y59892	Jan. 4, 1972
CHART 33-40 (incl)	Y59893-Y59900	Jan. 4, 1972
CHART 41-48 (incl)	Y59901-Y59908	Jan. 4, 1972

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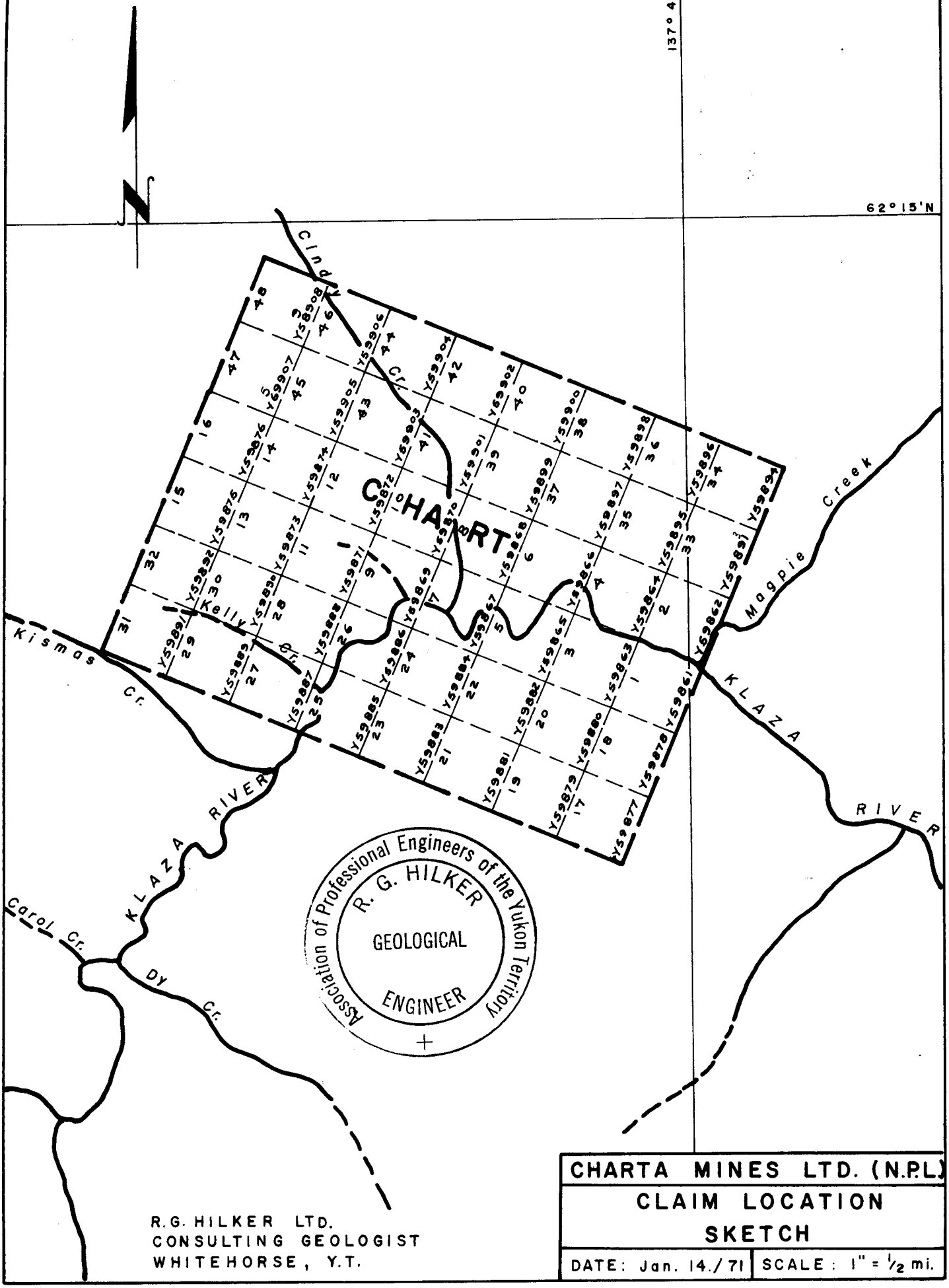
SKETCH No. 3

137° 45' W

62° 15' N



R.G. HILKER LTD.
CONSULTING GEOLOGIST
WHITEHORSE, Y.T.

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

CLAIM LOCATION SKETCH

DATE: Jan. 14./71 | SCALE: 1" = ½ mi.

PERSONNEL

The following personnel of Eastern Associates Reg'd were involved in setting up camp and cutting line on the Chart claim group between May 20th and June 11th, 1971.

Name	Address	Position & Date
Roger Voisine	c/o Eastern Associates Reg'd Box 3245, Whitehorse, Y.T.	Linecutter May 22-June 2
Arthur Beauregarde	c/o Eastern Associates Reg'd Box 3245, Whitehorse, Y.T.	Linecutter May 22-June 2
Dick Craft	Whitehorse, Y.T.	Linecutter May 22-June 2

The following personnel of R.G. Hilker Limited were directly involved in the geological, geochemical and geophysical program on the Chart claim group between May 29 and June 11, 1971:

Name	Address	Position & Date
R.G. Hilker, P.Eng.,	Box 566 Whitehorse, Y.T.	Supervision, report preparation May 29-June 2
B.G. Carlson	Box 548 Whitehorse, Y.T.	Geologist, field supervisor, report preparation May 29 - June 11
B. Slater	c/o Rundle Hall Univ. of Calgary Calgary, Alta.	Magnetometer operator* June 2-June 11
G. Hillson	St. Andrew's College Saskatoon, Sask.	Soil sampler* May 29-June 11
A. Ashton	Box 96 Perry, Sask.	Soil sampler* June 2-June 11

*NOTE: The soil samplers and magnetometer operator were fully trained by R.G. Hilker Limited prior to the present work and have had 2 years experince in their respective jobs.

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LINE GRID

A total of 19.9 line miles of grid were cut over the Chart claims. The base line was started at Post 1, Chart 1 and 2 and slashed to a distance of 9,200 feet on a bearing of 292°. One offset was required to bypass a bend in the Klaza River, which could not be crossed due to the spring run-off conditions.

Crosslines were turned off at right angles to the base line every 400 feet and slashed as shown on the LINE GRID plan (see Pocket). A total of 93,000 feet of cross lines were cut. Stations, marked by pickets, are located every 100 feet on the base line and on the cross lines.

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G E O L O G Y

REGIONAL GEOLOGY - DAWSON RANGE

The Dawson Range occurs in the physiographic Yukon Plateau Province. It is a mountainous terrain, with peaks rising more than 2,000 feet from the level of the plateau, and elevations within the range varying from 3,000 feet to 6,600 feet. Almost all of the area has been left completely untouched by recent glaciation. Accordingly, the outcrops, which predominate on the mountain tops and ridges, are quite irregular. Exposed rocks are highly jointed, fractured and weathered due to frost action and wind erosion. Overburden may reach thicknesses greater than 50 feet in the lower areas, restricting outcrop occurrences to the steeper valley slopes.

The predominant rocks in the area consist of the Upper Cretaceous Coastal Intrusive granites which form a batholith intruding the Yukon Group of sediments, Precambrain/Paleozoic in age. These are also in contact with the Jurassic Mount Nansen group of volcanics and sediments. The Tertiary Carmacks volcanics overlie all of the earlier rocks in some areas.

The following is a general summary of the granitic rock types which occur in the coast range intrusive:

1. Granite Porphyry - composed of 40% orthoclase feldspar and 30% smokey quartz with biotite, augite and minor magnetite. Generally jointed and fractured and weathers a rusty brown color.

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2. Granodiorite Porphyry - composed of 50 to 60% orthoclase feldspar, 10 to 15% plagioclase feldspar, 15% clear quartz, augite, biotite and minor magnetite. Occurs in the Casino Creek area and is characterized by large phenocrysts.

3. Granodiorite - composed of 60% orthoclase feldspar and 20% plagioclase feldspar with augite and biotite. Fine to medium-grained texture.

4. Diorite - composed of plagioclase and orthoclase feldspar with approximately 30% augite and biotite.

5. Quartz Monzonite - composed of 50% plagioclase feldspar, 10 to 15 % orthoclase feldspar, 15% clear quartz, augite and fine to coarse crystalline biotite.

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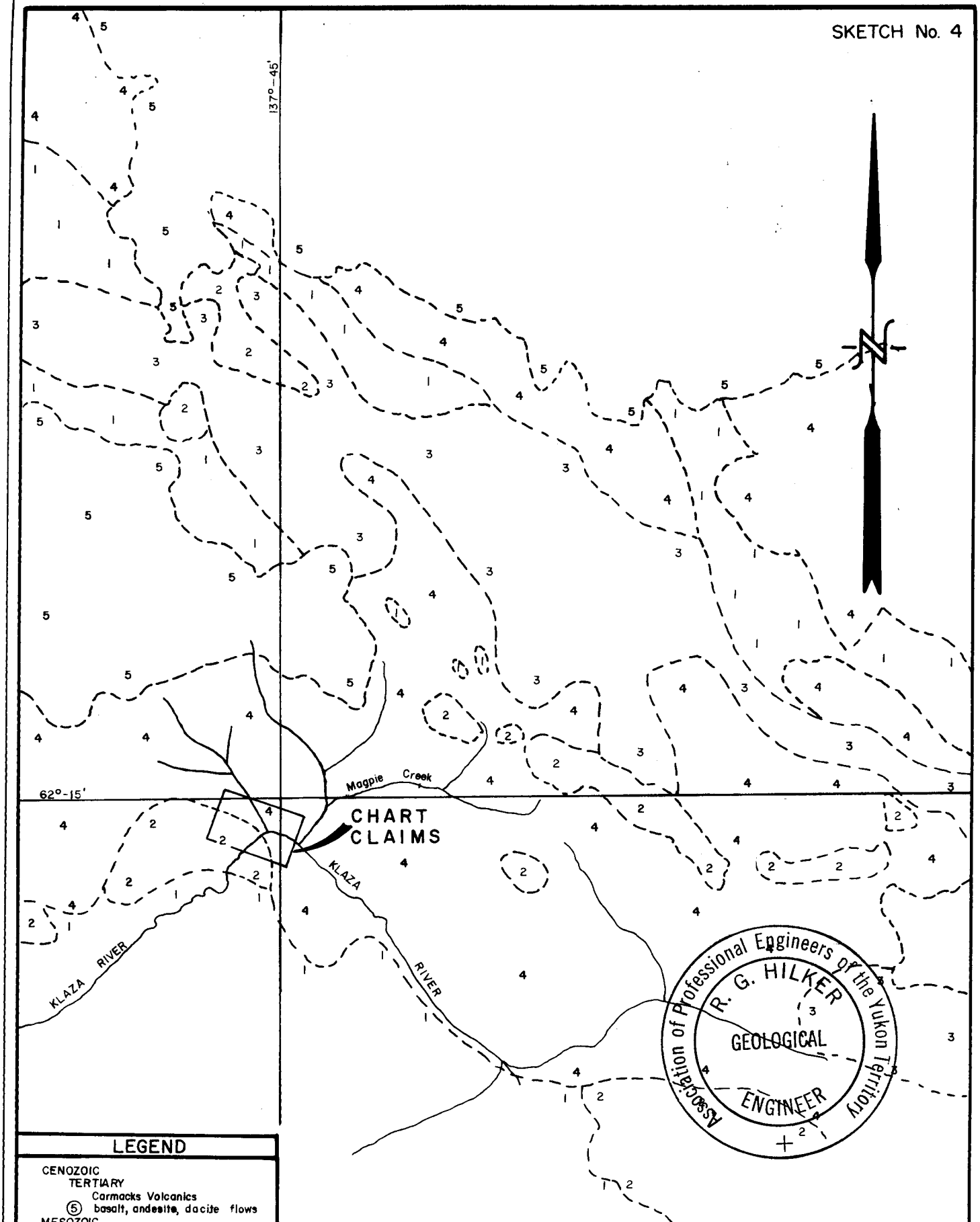
SKETCH No. 4



LEGEND

CENOZOIC
TERTIARY
Carmacks Volcanics
⑤ basalt, andesite, dacite flows
MESOZOIC
JURASSIC or LATER
④ granite
③ syenite
Mt. Nansen Volcanics
② basalt, andesite, dacite flows
PALAEOZOIC / PRECAMBRIAN
Yukon Group.
① schist, quartzite, limestone

R.G. HILKER LTD.
CONSULTING GEOLOGIST
WHITEHORSE, Y.T.

Sketch after G.S.C. Map 340-A

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

REGIONAL GEOLOGY

CHART CLAIM GROUP

Date: Jan. 14/71 | Scale: 1"= 4 miles

TABLE OF FORMATIONS

CENOZOIC

Quaternary

Q - Alluvium, volcanic ash, ground ice.

Tertiary

Carmacks Volcanics

9 - Thick flows, basalt, amygdaloidal flows, top of flows breccia, local brecciation and porphyritic flows.

MESOZOIC

Jurassic - Upper Cretaceous

Coastal Intrusives

8 - Granite, granodiorite, quartz-monzonite, porphyry and breccia, altered (ore host rock).

7 - Syenite and monzonite.

6 - Diorite and gabbro.

Mount Nansen Group

5 - Basalt, andesites and dacite flows, breccias and tuffs. Green-black color, contains sedimentary rocks consisting of sandstone, siltstone, pyritic arkose and argillites. Beds and bedding distinct.

Tantalus Formation

4 - Conglomerate, sandstone, shale and coal seams.

Jurassic

3 - Laberge Group

Triassic

2 - Granite, monzonite.

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PRECAMBRIAN & LATER

Yukon Group

[1] - Limestone, shale, mica-quartz schist, chlorite schist, quartzite.

After Bostock: G.S.C. Paper 44 - 34.

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REFERENCE TO PUBLISHED GEOLOGY

The following listed publications and geological maps contain geological information in select areas of the Dawson Range, and reference was made to the information in preparation of this report for Charta Mines Ltd. (N.P.L.).

1. D.D. Cairns 1916 - Klotassin Yukon Territory No. 1702, Geology Map, scale 1" = 2 mi. Canada Department of Mines Geological Survey, 1918.

2. H.S. Bostock 1944 - Paper 44-34 Preliminary Map, Selwyn River, Yukon - Canada Department of Mines and Technical Surveys.

3. H.S. Bostock 1936 - Memoir 189 - Carmacks District, Yukon - Geological Survey of Canada - Department of Mines and Technical Surveys.

4. J.R. Johnston 1937 - Memoir 214 - Geology and Mineral Deposits of Freegold Mountain, Carmacks District, Yukon - Geological Survey of Canada - Department of Mines and Technical Surveys.

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CLAIM GEOLOGY - FIELD METHODS

Geological mapping was carried out at a scale of 1" = 400 feet over the entire grid system, using the picketed lines for survey control. Bedrock exposures occupy only a small portion of the total area mapped. This region has not been affected by glaciation, and most boulders are frost-heaved vertically. The rock-frost-heaving is a common feature in the Yukon Territory and northern areas of extreme temperatures. These frost-heaved boulders have been mapped, both individually and as boulder trains. The resulting definition of geological boundaries will not be exceedingly accurate, but it should be adequate for the general purposes for which it is intended.

During the mapping program, all claim posts encountered were tied in to the grid, streams were mapped, and general vegetation noted.

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CLAIM GEOLOGY

The Chart 1 - 48 claim group was staked over a major contact between the Mount Nansen Group of volcanic and sedimentary rocks and the granitic rocks of the Dawson Range batholith. Rocks of these two groups dominate the claim geology and are described below.

The area within the claim group is notable for its lack of outcrop, with exposed bedrock comprising only 2 or 3 percent of total surface area. Because of this only the main volcanics - intrusive contact has been indicated on the map.

The Mount Nansen Group is Jurassic in age and predates the granitic intrusive rocks. These rocks (Map Unit 1) consist of mainly fine grained, dark grey to black andesite with basaltic and dacitic end members. Small feldspar phenocrysts with irregular outlines were observed in some specimens. Some of these show a light greenish, possibly epidote, alteration. Pyrite and epidote are relatively abundant as secondary minerals throughout this unit. Both are found on fracture planes and throughout the groundmass; the pyrite as small cubes and the epidote as small rounded blebs. Also included with this unit are some sedimentary rocks, including sandstone, siltstone, pyritic arkose and argillite. Beds and bedding planes are often distinct. Fine grained pyritic arkose was probably observed with some of the intermediate and siliceous volcanic rocks, although this was difficult to determine in hand specimen. Faint banding was observed in some locations.

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The gossan zone on the Klaza River occurs within Unit 1. In this area the rocks are light colored, dense, fine grained and often highly siliceous. They are also highly fractured resulting in highly broken outcrops. The rocks may be either the more intermediate to leucocratic end members of the volcanics or the arkosic sediments or both. The gossan is caused by the weathering of extensive pyrite which occurs as small cubes disseminated throughout most of the rocks present. The zone extends in all directions for unknown distances under overburden cover.

The Jurassic - Upper Cretaceous Coast Intrusives, although entirely included within one geological boundary, consist of two distinct intrusive phases. The earliest of these, the main intrusive body (Map Unit 2) consists of medium to coarse grained granitic rocks, ranging from the most typical hornblende granodiorite through to biotite granite. Average compositions are listed below:

ROCK TYPE	COMPOSITION
Hornblende Granodiorite	5 - 15% quartz 15% orthoclase 50% plagioclase 25 - 30% hornblende 0 - 5% biotite
Biotite Granite	20% quartz 50% orthoclase 10% plagioclase 10% biotite 5% hornblende

The biotite granite is typically medium grained and a light pinkish orange color due to the weathering of both the biotite

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and the potassic feldspar. The hornblende granodiorite is generally coarser grained with euhedral hornblende crystals up to 1/2 inch in length. Both varieties exhibit a very crumbly weathered outcrop surface due to the lack of glaciation in the area.

The secondary intrusive phases (Map Unit 3) are particularly abundant in this area and are probably associated with the main contact zone and also with the apparent local structural weakness. They consist of fine to medium grained, intermediate to leucocratic porphyritic rocks, with phenocrysts of quartz, orthoclase, plagioclase and hornblende. The phenocrysts comprise up to 50% of the total rock and are mainly feldspar and quartz. These rocks are generally a light brown to green color. Pyrite is observed in some specimens as small disseminated cubes, although it is more commonly smeared on fracture faces. Mafic minerals are generally less than 10% of the total rock, but occasional hornblende-rich varieties were noted. A few small aplite dikes and stringers were noted and these have also been included in this unit.

As previously mentioned, due to the lack of bedrock exposure, no attempt has been made to infer geological contacts between Units 2 and 3.

As previously mentioned, structurally the area appears to be a zone of relative weakness. Two major faults have been inferred, on the basis of measurements of fracture planes from outcrops within the grid area and by results of the magnetics

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survey and local topography. The attitude of fracture planes was measured wherever possible. Most of the measurements indicate a wide and almost random variation. This is largely the result of an error in measurement due to the broken nature of the outcrops. However, two trends, striking 70° and 160° and dipping 90° and 75° west respectively, are defined. The two fault zones are sub-parallel to these altitudes. Topographically, one fault (160°) follows Dindy Creek and the other (70°) follows the lower portion of the Klaza River. The magnetometer survey shows a strong lineation where the latter fault crosses the grid area. The two faults are roughly at right angles, and the 160° direction parallels the dominant structural and stratigraphic trend throughout the southern Yukon. In addition, two small fault zones were observed in outcrops along the edge of the Dindy Creek valley. Both of these are roughly parallel to the Klaza River fault.

It is apparent that the inferred major faulting post-dates the intrusion of the main granitic body. Minor and poorly defined leucocratic intrusives appeared to be associated with the two observed faults, and it is possible that the secondary intrusives (Unit 3) and the faulting are at least partially related.

Aside from a trace of malachite in one fault zone, mineralization observed during the geological mapping was restricted to pyrite which is disseminated throughout most of the Mount Nansen rocks, especially in the vicinity of the gossan, and through some of the secondary intrusives.

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CLAIM GEOLOGY

TABLE OF FORMATIONS

MESOZOIC

Jurassic -- Upper Cretaceous

Coastal Intrusives

3	Porphyries - medium grained quartz, felspar quartz - feldspar; aplite; minor dioritic phases.
2	Main granitic body; 2b - medium to coarse grained biotite granite; 2h - coarse grained hornblende granodiorite.

Mount Nansen Group

1	Basalt, andesite and dacite flows, breccias and tuffs; sandstone, siltstone, pyritic arkose and argillites.

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GEOCHEMICAL SURVEY

INTRODUCTION

The systematic sampling of soils and the subsequent analysis of these samples for trace amounts of copper and molybdenum has been successfully used throughout the Cordillera region in the search for porphyry-type copper-molybdenum mineralization. This success has been extended to the Dawson Range, where several mineralized zones including the Casino silver-lead deposit, have been outlined by this technique.

For the successful application of a soil sampling survey, however, a careful study of all factors which might affect the geochemical characteristics of the soils, referred to here as the geochemical environment, must be undertaken. This environment is defined mainly by the characteristics of the soil, which are closely related to both topography and vegetation. A detailed description of these factors, along with the survey procedures and the interpretation of results follows.

.../20

FIELD METHODS

The soil sampling program was carried out using two samplers. Samples were taken along the baseline and all cross-lines at 100 foot intervals. Sample material was taken, wherever possible, from the upper sand or clay soil horizon, at least a few inches below the upper humus layer and, when it was present, directly below the light gray ash layer; using a 2½ lb. grubhoe. The sample material was collected in a pre-numbered Kraft paper sample bag, while notes on location, soil color and type, slope and grade direction, vegetation and any other pertinent data, were taken at each station. The samples were strung on wire, with approximately 30 samples per string, and hung at camp for partial drying.

In addition, the pH of every second sample on specific lines throughout the grid was tested using a LaMotte-Morgan Soil pH Testing Kit. Values are measured colorometrically to the nearest 0.2 pH unit, with an estimated accuracy of plus or minus 0.2 pH units. The values obtained are listed by line and station in the appendix.

Two test pits were dug within the grid area and sampled in duplicate through the upper soil horizons. The pH was determined on all samples, and an interpretation of results follows.

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SAMPLE HANDLING, ASSAYS AND TREATMENT OF DATA

After collection, samples were wired in strings of 30 to 40 samples, partially dried, and then packed in burlap sacks for shipment to Whitehorse. At Whitehorse, the samples were crated and sent via C.P. Air freight to Chemex Labs in North Vancouver, where they were analyzed for copper and molybdenum.

The analytical procedure at Chemex Labs consists of drying and sieving the samples, saving the -80 mesh fraction. One gram of this fraction is digested using perchlorate and is then dissolved in hot aqua regia. This solution is evaporated to dryness overnight. The residual is dissolved in hydrochloric acid and this solution is brought to volume for final analysis. The solution is run for copper and then molybdenum (using the Leeing method) on a Techtron AA-5 Digital atomic absorption unit. Results were returned to Whitehorse by First Class mail.

Certificates of Analysis, for all soil samples tested, from Chemex Labs Limited, are on file in the office of R.G. Hilker Limited, #2 Northern Metallic Bldg., Whitehorse, Yukon Territory.

The interpretation of geochemical data is often aided with the calculation of a few simple statistics. The arithmetic mean and standard deviation have been calculated for the copper assay values, using the following formulae:

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$$\bar{x} = \frac{\Sigma ppm}{n}$$

$$s = ((n \Sigma ppm^2 - (\Sigma ppm)^2)/(n(n-1)))^{1/2}$$

where: n = total number of values

Σppm = sum of values

$\bar{x}$ = arithmetic mean

Σppm^2 = sum of squares of values

s = standard deviation

These two statistics are useful in the definition of statistical anomalies which may or may not be relevant in the survey area. Experiment and field experience have indicated that, assuming a lognormal distribution of values, a value greater than $\bar{x} + 1s$ is statistically "possibly anomalous" and a value greater than $\bar{x} + 2s$ is statistically "probably anomalous". These values, as calculated for the present survey, have been used as guidelines in contouring the Geochemical Survey maps (see Pocket).

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TOPOGRAPHY, VEGETATION AND SOILS

The Chart 1 - 48 claim group is devided into three sections by narrow, relatively deep and flat bottomed valleys. The present grid system covers most of the two sections north of the Klaza River and on either side of Cindy Creek. Each section is marked by a sharp rise from the valley floor, gradually levelling off towards a ridge top. The slopes are only slightly dissected by small discontinuous tributary creeks.

Three distinct geochemical environments are present within the grid area and are defined by the topography. They consist of 'south-facing slopes', 'north-facing slopes' and 'valley floor'. Each of these is characterized by its own distinct vegetation and soils.

The 'south-facing slopes' are relatively steep due to increased erosional activity. The soils are immature, often consisting of little more than fresh rock fragments, and are well drained. Detailed soil profiles are discussed under "TEST PITS". Vegetation consists only of grass on the very steep slopes, with poplar and then spruce appearing as the slope lessens. The amount of vegetation varies inversely with the rate of surface and sub-surface run off, which is greatest on the steepest slopes.

.../24

This environment grades into that encountered on the north-facing slopes. Here the soils have undergone almost no development. They appear to be formed primarily of worn talus slopes which have been covered by a layer of humic material. They are poorly drained, frozen at a very shallow depth, and are characterized by thick moss and buck brush and scattered, stunted spruce.

The valley floors, along both Cindy Creek and Klaza River, are relatively flat. Surface soils are alluvial except for low swampy areas in which organic material has accumulated. The alluvial sediment consists largely of sand, which in places has formed natural levees from deposition during spring overflow. The stream beds consist largely of rounded boulders.

The area has not been glaciated, except for possibly small valley glaciers in the higher areas. No evidence of glaciation of any form was observed in the grid area.

A layer of unconsolidated volcanic ash, up to several inches in thickness, was deposited over much of southern Yukon. This ash layer is present at depths from one to ten inches over the survey area. It occurs usually quite close to surface and is fairly readily penetrated for the purpose of soil sampling.

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TEST PITS

Both Test Pits 1 and 2 are located on south-facing slopes at 57+95W and 17+85S (above the gossan zone) and at 34+22W and 3+00S respectively. The profiles, including soil color, composition, pH, and copper/molybdenum concentrations are quite similar, and are described together below. Individual profiles are described in Sketches #5 and #6.

The profiles exhibit characteristics which are typical throughout the Dawson Range area. The soils have not been affected by glacial action, and yet they are not truly residual because downslope movement has occurred. However, the soil will reflect fairly accurately bedrock material directly below. The soil is composed largely of sand and gravel size fragments, angular rock fragments and minor clay. The surface is covered by a thick humic and organic layer, followed by the previously mentioned volcanic ash layer, which varies from 2 to 10 inches in thickness. This layer is quite rich in calcium and calcareous precipitates have been deposited through most of the soil below this layer. As a result, all samples are basic, with pH varying from 7.5 to 8.5, generally increasing with depth.

Due to the basic pH, the copper will not be chemically mobile and its concentration in the soil will be generally decreased. This is the case in both profiles. Test pit 1 shows an exception to this at 31 inches depth. This is a gravel and rock fragment rich horizon overlying a sand-rich horizon and is quite possibly upslope material covering an

.../26

older soil surface. Thus the copper would be derived from a near bedrock source upslope and transported to its present position by mechanical means only. Test pit 2 shows a gradual increase in copper towards bedrock, with values exceeding the bedrock concentration just above the interface. This would be due to the rapid precipitation of copper leached from the bedrock as soon as solutions are in contact with the basic soils.

The pattern of the molybdenum occurrence is less readily explained, but it appears to increase with increasing copper. As the chemical mobility of molybdenum increases with increasing pH, the molybdenum in these soils would be expected to move both chemically and mechanically.

Both profiles indicate that, at the average sample depth of 6 to 12 inches, just beneath the ash layer, typical background levels of 20 to 40 ppm copper and 0 to 2 ppm molybdenum are expected. In fact, these ranges represent two distinct backgrounds as explained below under INTERPRETATION.

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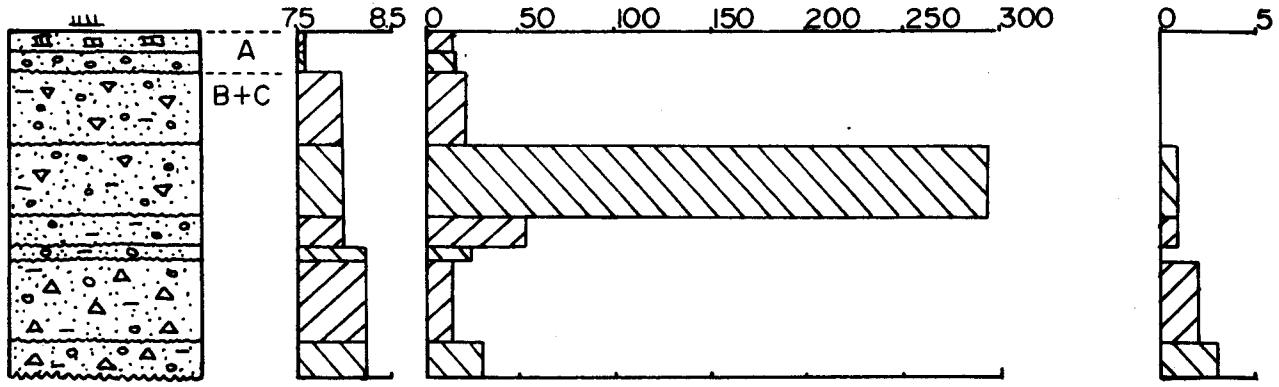
TEST PIT 1

LOCATION – 57+95W, 17+85S

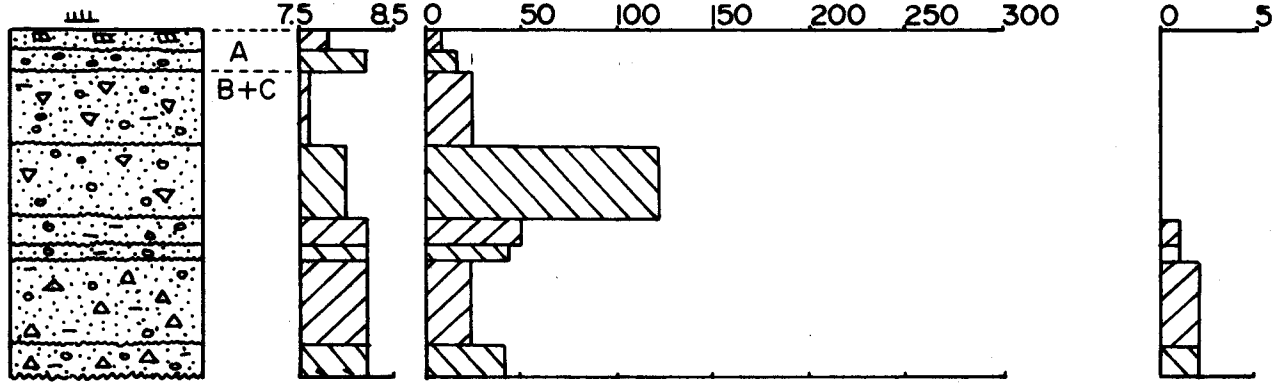
PROFILE #1

Sample number	Color	Sample depth (inches)
12288	1	2.5
12286	5	7
12284	3	17
12282	3	31
12280	2	42
12278	2	46.5
12276	3	58.5
12274	3	70.5



PROFILE # 2

Sample number	Color	Sample depth (inches)
12289	1	2.5
12287	5	7
12285	3	17
12283	3	31
12281	2	42
12279	2	46.5
12277	3	58.5
12275	3	70.5



LEGEND

Vegetation

grass

Miscellaneous

calc. – calcareous precipitate

Soil Composition

= clay
:: sand
gravel
△ rock fragments to 1"
▽ rock fragments 1" to 2"
humus

Soil Color

1 grey
2 light brown
3 medium brown
5 black brown

R.G. HILKER LTD.
CONSULTING GEOLOGIST
WHITEHORSE, Y.T.

CHARTA MINES LTD. (N.P.L.)
CHART CLAIMS
TEST PIT No. 1
DATE: JUNE 12,1971
SCALE AS SHOWN

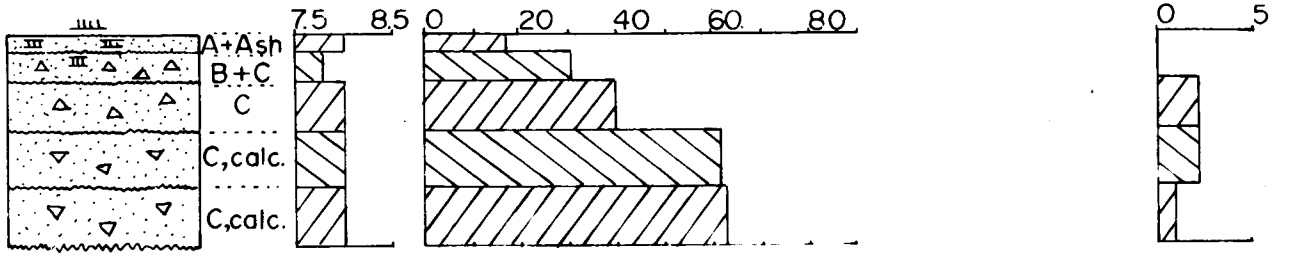
SKETCH No. 5

TEST PIT 2

LOCATION – 31+00W, 3+00S

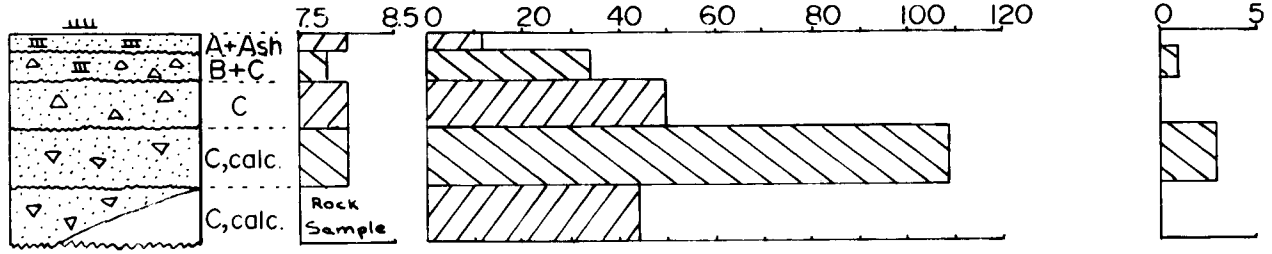
PROFILE # 1

Sample number	Color	Sample Depth (inches)	Horizon
12290	1	1	A+Ash
12292	4	3.5	B+C
12294	3	7.5	C
12296	3	13	C,calc.
12298	3	19	C,calc.



PROFILE # 2

12291	1	1	A+Ash
12293	4	3.5	B+C
12295	3	7.5	C
12297	3	13	C,calc.
12299	3	19	C,calc.



LEGEND

Vegetation

- grass

Miscellaneous

- calc. – calcareous precipitate

Soil Composition

- sand
- △ rock fragments to 1"
- ▽ rock fragments 1" to 2"
- humus

Soil Color

- 1 grey
- 3 medium brown
- 4 red brown – obvious (hydrous) iron oxides

R.G. HILKER LTD.
CONSULTING GEOLOGIST
WHITEHORSE, Y.T.

CHARTA MINES LTD. (N.P.L.)
CHART CLAIMS
TEST PIT No. 2
DATE: JUNE 12, 1971
SCALE AS SHOWN

SKETCH No. 6

INTERPRETATION

The statistics calculated for the copper values give a mean ($\bar{x}$) of 23 ppm Cu and a standard deviation (s) of 19 ppm Cu. Thus, values greater than $\bar{x} + s$, or 42 ppm Cu, are statistically "possibly anomalous" and values greater than $\bar{x} + 2s$, or 61 ppm Cu, are statistically "probably anomalous". Values of 23, 42, 61, 80 and 99 ppm Cu have been used as contour values for the Geochemical Survey Plan (see Pocket). These statistics have not been calculated for the molybdenum values as most values are zero and the distribution, with the given precision of measurement, is not lognormal.

A histogram, with a class interval of 10 and range from 0 to 100 ppm, has been calculated for copper. The results have been plotted on regular graph paper as frequency vs ppm Cu, cumulative frequency vs ppm Cu, and on logarithmic probability paper as ppm Cu versus cumulative frequency. All frequencies have been converted to percentages (see Sketches #7 + #8).

The histogram shows a typical lognormal distribution with a modal value of approximately 15 ppm Cu. (Labelled A - Sketch #7). This represents the average background value over both the Mount Nansen Group and also over the main granitic batholith. Two more modal values, suggesting two more distinct sets within the total population, are indicated at approximately 50 and 100 ppm Cu. (Labelled B and C, respectively - Sketch #7). When the contoured copper values are compared with the geology, it would appear that the lower of these sets represents soil derived from the secondary porphyritic intrusives, many of which

are known to be relatively copper and molybdenum normal throughout the Dawson Range area. The third and highest population represents anomalous values with undetermined cause.

When a population of geochemical values is plotted as a cumulative frequency curve on logarithmic probability paper, (Sketch #8) and if there are two or more lognormal sets within the population, each of these sets is ideally represented by a straight line. The copper data from the present survey shows three straight line segments which correspond with the three previously mentioned populations. These are again labelled A, B and C on the plot, to correspond with those on the histogram. The erratic joining of lines A/B and B/C, most likely represents the overlap of the sets.

The molybdenum values correlate roughly with the copper values. The overall background is zero, the background for secondary intrusives is 1 to 2 ppm Mo and the anomalous condition represents higher values. The molybdenum is more erratic than the copper, with more spot high values. Variances between the copper and molybdenum are the result of their varying mobilities with respect to pH and to other soil properties such as redox potential as well as variable concentrations in the parent material.

The majority of the pH values are slightly acid, with values ranging from 6 to 7, while a large number are basic, ranging from 7.5 to 8.3. There is no obvious correlation

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between pH and environment of pH and copper and molybdenum concentration. It is suspected that the higher values indicate a greater than average contamination of the sample by the volcanic ash layer.

Of the three geochemical environments, both copper and molybdenum show little variation between the north and south areas. However, the alluvial sands on the valley floor are definitely low in both copper and molybdenum.

Several small areas of moderately high copper and/or molybdenum values and a few erratic high values of each are attributed largely to the secondary intrusive. One anomalous zone, ZONE 'A', has been outlined in the northwest corner of the grid. This zone lies between L36+00W; 28+00N - L34+00W; 24+00N and L64+00W; 30+00N and L84+00W, 27+00N. This covers a length of over 3000 feet, with an average width of 400 to 800 feet, and it is open at both ends due to lack of grid coverage. It consists of both anomalous copper and anomalous molybdenum values, with partial overlap. Some of the copper values exceed 99 ppm, or $\bar{x} + 4\sigma$. This is highly anomalous for this particular grid area, although it is lower than many values from anomalous zones in other parts of the Dawson Range. However, when the basic soils and the resulting depression of copper ion mobility are considered, the significance of this anomaly is enhanced considerably.

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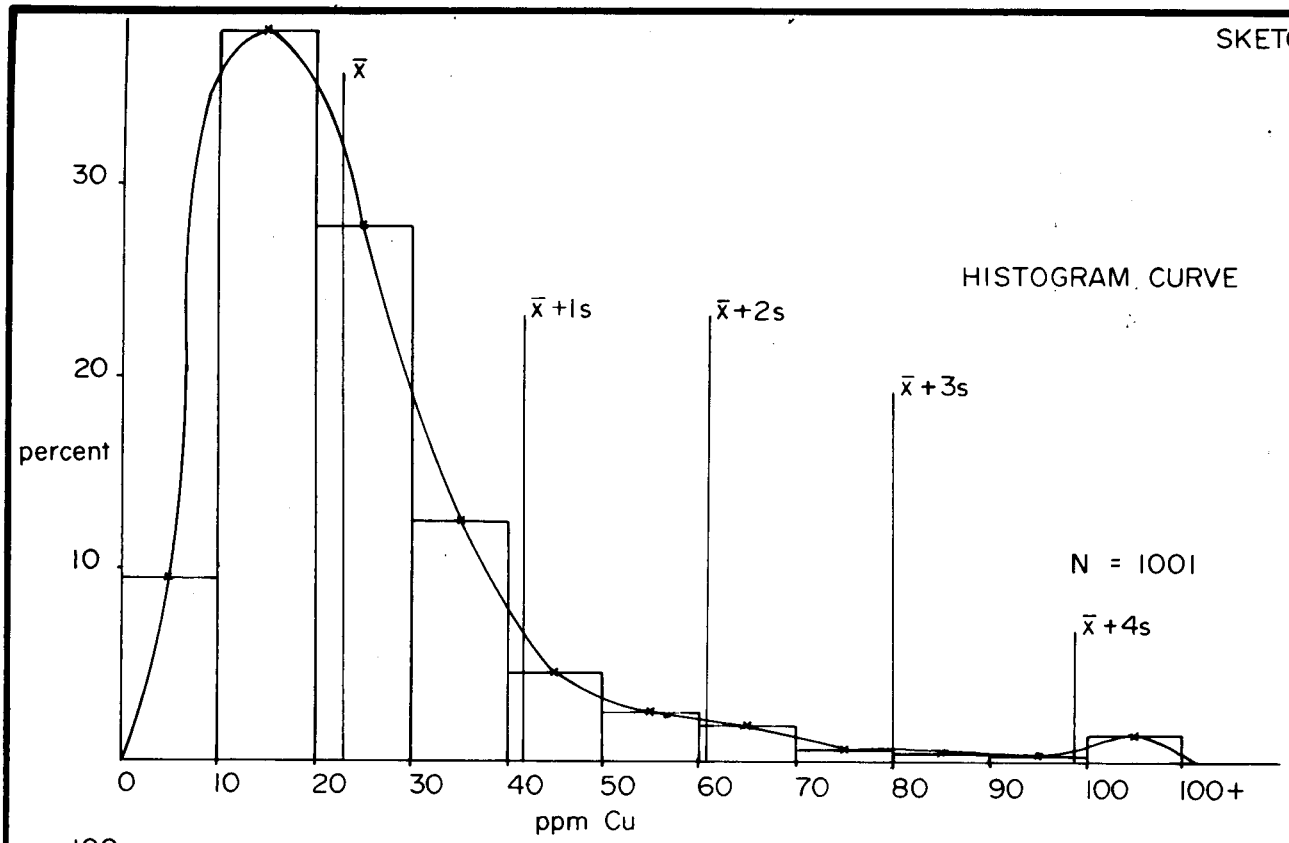
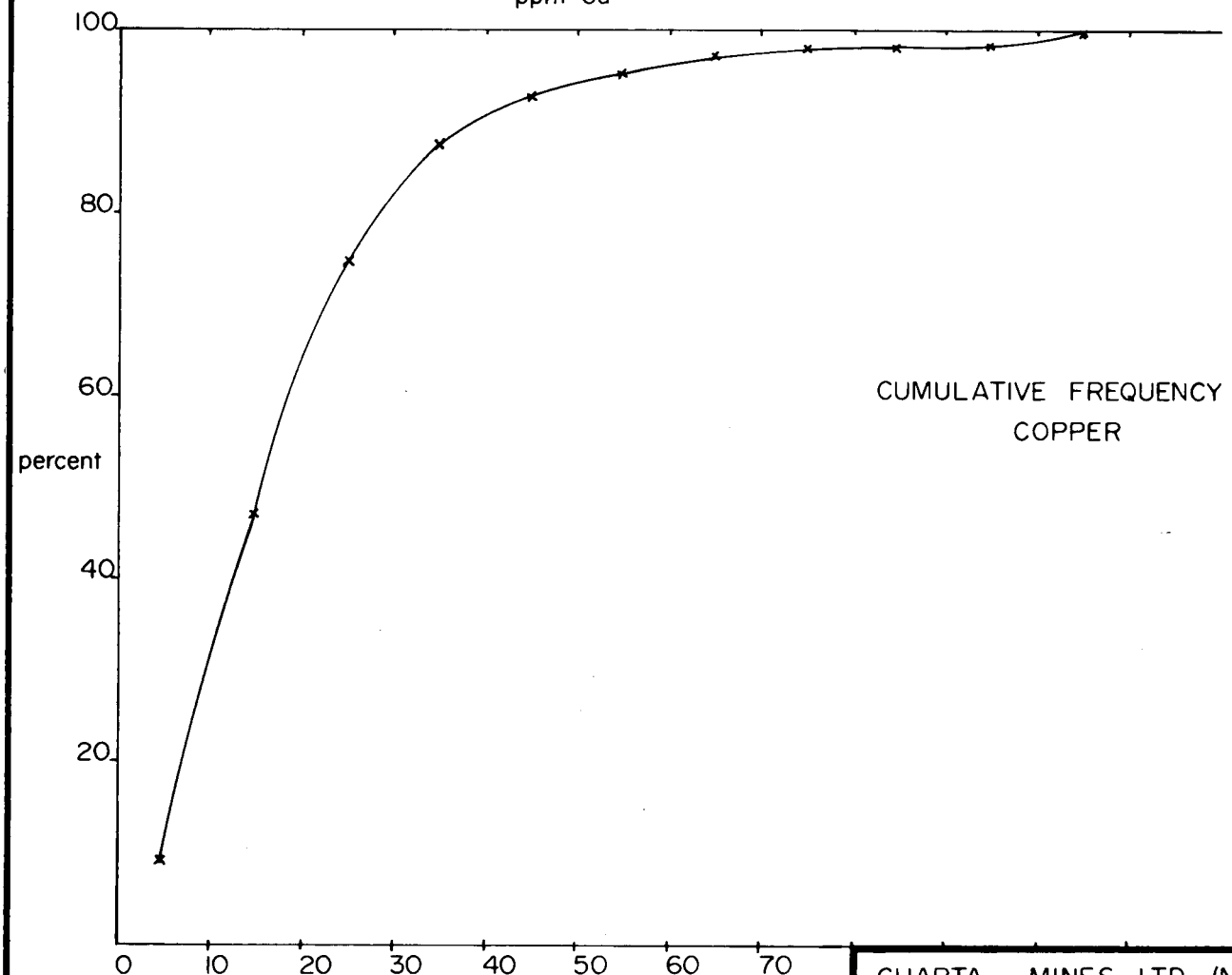
It is interesting to note that possibly only one sample (L52+00W; 19+00N) reflects this anomaly downstream. The reason for this is uncertain, but it is possibly due again to the low mobility of copper and the present lack of primary erosion by the creek through this area.

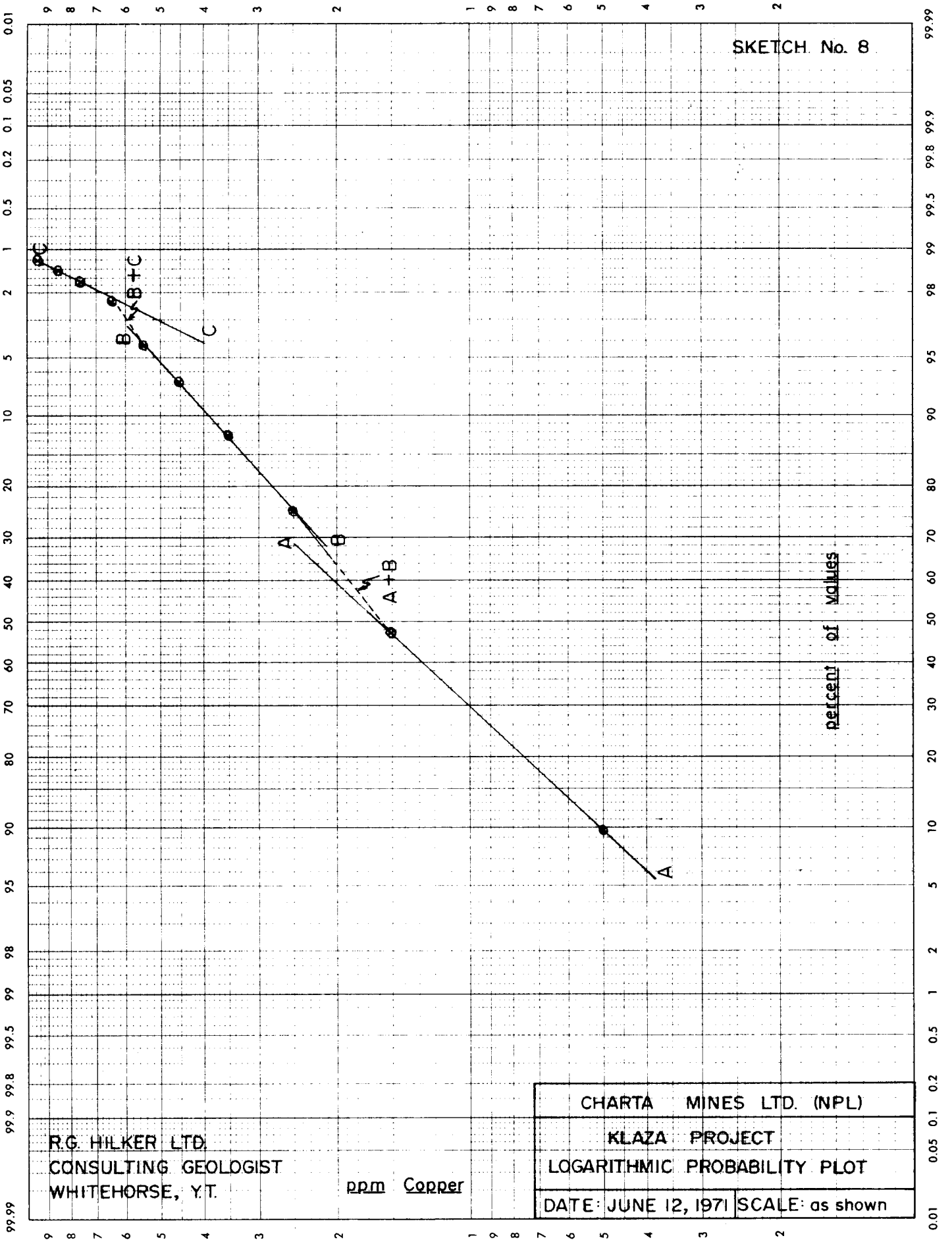
SKETCH No. 7





R.G. HILKER LTD.
CONSULTING GEOLOGIST
WHITEHORSE, Y.T.

CHARTA MINES LTD. (NPL)	
KLAZA PROJECT	
GEOCHEMICAL DATA	
DATE: JUNE 12,1971	SCALE: as shown



CONCLUSIONS

The cause of the Zone 'A' anomaly is uncertain. It roughly parallels magnetic trends and is in an area of a relative magnetic low. Outcrops are scarce in the area, and any rock type may be present. The apparent cause is then a higher than normal concentration of both copper and molybdenum, probably associated with a pendant of Mount Nansen Group rocks within the granitic intrusive or with secondary porphyry dike rocks intruded into the granitic intrusive.

A more detailed investigation of Anomaly "A" would include closer spaced sampling with extensions of the present grid to further define the extent of the anomaly, deeper sample holes, possibly with the aid of a mechanical auger, to obtain a sample from closer to bedrock, and trenching by blasting to expose boulders or bedrock.

With regard to the reconnaissance samples, one sample (2/72) along Magpie Creek may represent an anomalous condition and, if further work is carried out on the property, 200 feet spaced contour samples over 1000 feet and along three contour lines separated by 200 to 300 feet should be taken in this area.

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MAGNETICS SURVEY

INSTRUMENTATION

The field survey instrument used was a Scintrex Model MF-2 vertical field fluxgate magnetometer, Serial Number 00%132. This is a second generation transistorized, integrated circuit instrument which retains the sensitivity of the older MF11 units, but has greater temperature stability. A copy of the manufacturer's specification sheet forms Appendix A of this report.

For the field survey, the MF-2 magnetometer was set to read 1000 gamma full scale, or 50 gamma per scale division. Normal field practice is to read to 1/2 of a scale division, giving rise to a readability of 25 gamma. This precision was maintained throughout the survey.

The Scintrex MF-2 vertical field fluxgate Magnetometer used to conduct the magnetic survey over the grid system has the following instrument manufacturer's specifications:

Maximum sensitivity: 20 gammas per scale division on 1000 gamma range
50 gammas per scale division on 3000 gamma range

Readability: 10 gamma or 1/2 scale division on 1000 gamma range and 25 gammas or 1/2 scale division on 3000 gamma range.

Ranges: 1,000 - 3,000 - 10,000 - 30,000 - 100,000 gammas

Maximum Range: ± 100,000 gammas

Latitude Adjustment Ranges: 10,000 to 75,000 gammas; Northern Hemisphere

Power Source: 12 "C" cell flashlight batteries

The fluxgate magnetometer as defined by M.B. Dobrin in the text book "Introduction to Geophysical Prospecting," is

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as follows:

"The fluxgate magnetometer, also known as the saturable reactor, makes use of a ferromagnetic element of such high permeability that the earth's field can induce a magnetization that is a substantial proportion of the saturation value. If this field is superimposed upon a cyclic field induced by a sufficiently large alternating current in a coil around the magnet, the resultant field will saturate the core. The phase of each energizing cycle at which saturation is reached gives a measure of the earth's ambient field."

The MF-2 Fluxgate Magnetometer measures the vertical component of total magnetic field. The instrument does not require a tripod and only needs to be oriented in the general north magnetic pole direction. The sensitivity of the instrument cannot be changed except by rough handling of the instrument. The MF-1 magnetometer reads directly in gammas.

The following is quoted from the Scintrex Data Sheet:

"The MF-2 is a completely new concept in vertical force fluxgate magnetometers. These instruments which are designed for fast and accurate mineral ground surveys, are orientation independent, self levelling and require no tripod.

The MF-2 combines in one compact 5½ lb. package electronics, sensor and rechargeable batteries. With the latest I.C. and F.E.T. circuitry and high precision components, a temperature stability better than 1 gamma per degree is standard (with .2% gamma on special order) over a range of -40° to +40°

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centigrade.

The instrument has a built-in hemisphere polarity switch providing two overlapping ranges. For the Northern hemisphere the full range is +80,000 to -20,000 gammas, and reversible for the Southern hemisphere.

A calibrated feedback system can be provided which makes it possible to determine the total vertical component strength.

Measuring accuracy, on the 100 gamma scale is 0.5 gamma, and on the 1000 gamma scale 5 gammas. The Scintrex MF series of magnetometers have been in use for many years in varied applications, e.g. ground reconnaissance, base station recording and monitoring, study of magnetic properties of rocks, observatory monitoring and recording of both vertical and horizontal components.

PERSONNEL

The field work was conducted by Mr. B. Slater, during the period June 2 to June 14, 1971, inclusive, under the supervision of Mr. R.G. Hilker, Consulting Geologist and Professional Engineer, Whitehorse, Yukon Territory. Mr. Hilker supervised the data calculations and mapping. Data contouring, at 100 gamma intervals was done by Mr. G.S. Carlson of R.G. Hilker Limited. The magnetics interpretation report was written by R.G. Hilker, the presentation work was done in Whitehorse between June 25 and July 17, 1971.

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MAGNETICS FIELD METHOD

The magnetics survey was carried out by taking a magnetometer reading at each 100 foot station over the entire 19.9 miles of line grid.

A Base Control Station (BCS), near the camp was located at 33+15W and 5+00S and was given an arbitrary value of 2000 gammas. From this BCS station, secondary Control stations (CS1, CS2, etc) were carefully established from the BCS along the base line as follows:

Station	Location	Gamma Value
BCS	33+15W - 5+00S	2000
CS-1	12+00W - BL	2450
CS-2	44+45W - BL	2100
CS-3	56+00W - BL	2500
CS-4	88+00W - BL	2650

The gamma value at a CS was determined by taking an instrument reading at the BCS, then at the CS, and a return check instrument reading at the BCS in the minimum length of time to walk between the two points. The difference was averaged and the procedure repeated several times to ensure an accurate difference in gamma value was established between the arbitrary 2000 gamma value at the BCS and the CS that was being determined.

During the actual survey, a check reading was taken at the BCS or CS every hour or two in order that the magnetic diurnal variations in the magnetic field could be determined and calculated, plus or minus for the correct value of each 100 feet spaced station on the linegrid.

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INTERPRETATION

The magnetic survey was conducted on the 400' foot spaced linegrid with station intensities determined at each 100 foot interval on the crosslines. The majority of the magnetic values are between 2175 gammas and 2700 gammas, but one value as low as 1675 gammas and one value as high as 3400 gammas were recorded.

The surface magnetic trends, as outlined by the contours on the magnetics plan, suggest a magnetic difference between the Mount Nansen Group of volcanics/metamorphic rocks and the Coastal Intrusive altered granite rocks. The break in the magnetic trend suggests faulting along the drainage system on Cindy Creek and the north-east extension of the Klaza River.

The Mount Nansen Group of rocks are generally outlined magnetically between lines 48+00W and 84+00W on the south side of the baseline. The group of rocks are magnetic flat and vary between 2100 gammas and 2275 gammas with little variation above or below that magnetic intensity. Geological mapping confirms the presence of the Mount Nansen Group in the south-west corner of the grid system. The geological contact between the Mount Nansen Group and Coastal Intrusive has been inferred to occur at the edge of flat magnetic trend and the more variable magnetic highs. The regional mapping by H.S. Bostock on Geology Map 340-A contained in the G.S.C. Carmacks Memoir 189 indicates the presence of the Mount Nansen Group of rocks south-west of Cindy Creek and the Klaza River.

The remainder of the linegrid system, adjacent to and north of the previously described area of the Mount Nansen Group

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rocks, contains variable magnetic intensities between the ranges of 1675 gammas and 3400 gammas. The variable magnetic intensities suggests a heterogeneous granitic mass, that has been altered by intrusives and extrusives (refer to the section in claim geology).

Two inferred faults were prognosticated along the drainage systems of Cindy Creek and the north-east extension of the Klaza River. The inferred faults were based on a break in the general trend of the variable magnetic intensities that indicates the heterogeneous granite mass of rocks.

Outcrops of Mount Nansen Group of rocks occur north of Cindy Creek near 130°00W and 60°00N at about 2½°30N on a magnetic high, that differ from the magnetic flat area on the south-western edge of the grid system. It is probable that the higher magnetics are indicating the presence of intrusive granites and the Mount Nansen rocks are small remanent roof pendants remaining after intrusion by the Coastal Intrusive granites.

Aeromagnetics of the Klaza River area is contained on the Geophysics Paper 3296- Tritop Peak Sheet - Yukon Terr. - Sheet 115-I-4. - Scale 1" = 1 mile. The Mount Nansen Group of rocks are magnetically flat in the area south-west of Cindy Creek and the Klaza River. Magnetic highs are located north, west and south of Cindy Creek and roughly correspond to the occurrence of the Coastal Intrusive granite.

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CONCLUSIONS

The area contained within the 19.9 kilometres of grid system on the Chart 1-48 claim group, Klaza River and Dindy Creek, was explored by geological mapping, geochemistry using copper/ molybdenum elements and by geophysical magnetics.

Geological mapping indicates the presence of the Jurassic - Upper Cretaceous aged Mount Nansen Group and Coastal Intrusive granites. The Mount Nansen Group (map unit 1) are the older rocks and have been intruded by the Coastal Intrusive granites. The gossan zone located on L56+00S and 17+50S is highly pyritic and occurs in the Mount Nansen Group of rocks. The Coast Intrusives (map unit 2 and 3) appears to include two intrusive phases, and have been mapped as hornblende-granodiorite and biotite-granite. In places both of the rock types contained in the two phases of intrusion contain pyrite. The Coastal Intrusive granite is favorable for the deposition of porphyry copper/ molybdenite mineralized occurrences at the Casino Mines orebody 52 miles north-west of the Chart claim group. Recent announcements by the Dawson Range Syndicate have reported copper occurrences on Williams and Merrice Creeks 35 miles east of the Chart claim group.

The geochemical survey conducted on a portion of the Chart claim group has indicated the presence of a molybdenum/ copper anomaly - Zone 'A' - that is approximately 3000 feet long in an east-west direction and varies in width between 150 feet

.../35

and 500 feet. The anomaly is located near the north end of lines L84+00W, L80+00W, L76+00W, L72+00W, L68+00W, L64+00W, L60+00W and L56+00W adjacent to Cindy Creek. The west end of the Zone 'A' anomaly, is open for further exploration. A second molybdenum anomaly occurs on the south end of lines L84+00W, L80+00W and L76+00W and is open to the west. Both anomalies are of greater than normal background for molybdenum and in parts copper and require further surface exploration.

The magnetics survey on the linegrid over a part of the Chart claim group has indicated relatively flat magnetics over the Mount Nansen Group of rocks and variable magnetic intensities over the Coastal Intrusive granites. A variance in the magnetic trend has suggested a lineation that is considered to be faulting occurs along Cindy Creek and the north-east extension of the Klaza River.

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RECOMMENDATIONS

It is recommended that the linegrid on the Chart Claim group be extended further west and crosslines be cut both north and south. Any of the present lines from line 48+00W, and any new crosslines west of line 84+00W should be extended to 48+00 feet north of the baseline. The extended grid system will enable further geochemical exploration of the Zone 'A' anomaly and the anomaly on the south-west end of the present gridsystem. Two hundred foot space crosslines should be sloped over the entire length of the present Zone A anomaly and detailed geochemical sampling conducted on all additional linegrid. Deeper soil sampling should be obtained by use of a mechanical auger on the Zone 'A' anomaly.

Geological mapping and a magnetics survey, using the established base control station gamma value, should be conducted in conjunction with the geochemical soil sampling programme on an extended and detailed grid system.

Further reconnaissance soil sampling is recommended east of Magpie Creek and the east side of the Chart claim group - If encouraging copper/molybdenum values occur, then more quartz mineral claims should be staked east of Chart claim group.

The following expenditures are recommended for the extended and detailed exploration programme on the Chart 1-48 claim group:

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Linecutting - 15 linemiles @ $100/mile	$ 1,500.00
Geological Mapping - 15 linemiles @ $100/mile	1,500.00
Magnetics Survey - 15 linemiles @ $75/mile	1,125.00
Geochemical Sampling - 15 linemiles @ $100/mile	1,500.00
Geochemical Determinations - 780 samples @ $1.60	1,250.00
Transportation for Crews - helicopter & trucks	2,000.00
Camp Costs	1,200.00
Radio	300.00
Report on Exploration and Drafting	1,500.00
Contingencies	1,125.00
TOTAL PROGRAMME	$13,500.00

R. G. Hilker

R.G. Hilker, P. Eng.,
Consultant Geologist
Whitehorse, Yukon Terr.
July 20th, 1971

Association of Professional Engineers of the Yukon Territory
R. G. HILKER
GEOLOGICAL
ENGINEER

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CERTIFICATION

I, ROBERT G. HILKER of #6 Chalet Crescent, Hillcrest, in the City of Whitehorse, in the Yukon Territory, DO HEREBY CERTIFY:

1. THAT I am a Consulting Geologist, with an office located at #3 Northern Metalic Building, and postal address P.O. Box 568, in the City of Whitehorse, in the Yukon Territory.

2. THAT I am a graduate of the Michigan Technological University located in Houghton, Michigan, U.S.A., where I obtained a Bachelor of Science degree in Geological Engineering (Exploration Option) in 1962.

3. THAT I am a registered member in good standing of The Association of Professional Engineers of the Yukon Territory.

4. THAT I have practised my profession as an engineer and geologist for the past eight years.

5. THAT I have personally supervised the geological-geochemical and magnetics evaluation conducted by G.G. Carlson, geologist, on the Chert 1-48 claim group in the Whitehorse Mining Division of the Yukon Territory, from May 29th to June 11th, 1971 and was on the Chert claim group during exploration on May 29th and 31st and June 2nd, 1971. Report preparation and field work is acknowledged by G.G. Carlson, a graduate geologist having membership in the Geological Association of Canada, and who is in my employee.

6. THAT I am a Director of Charta Minas Ltd (N.P.L.) and own securities of the company.

DATED this 20th day of July, A.D. 1971.

R. G. Hilker

R.G. Hilker, P. Eng.

Association of Professional Engineers of the Yukon Territory
R. G. HILKER
GEOLOGICAL
ENGINEER

APPENDIX

Certificate of Expenditure - For Assessment Work Purposes, for the period May 20th through June 11th, 1971 on the Chart 1-48 claim group Aleza River and Dinky Creek, Yukon Territory.

Contract Costs - R.G. Hiker Limited

Invoice #2591 (copy attached).....$12,500.00

Affidavit I, L.R. RASMUSON, Registered Industrial Accountant - Society of Industrial and Cost Accounts of Alberta - Calgary Chapter, with an office located at 103 Lambert Bureau in the City of Whitehorse, Yukon Territory, do hereby declare the above to be true and correct.

Certified Correct

L.R. Rasmuson

DATED this 11th day of ~~DEC~~ JAN., 1971
in the City of Whitehorse, Yukon Territory

M. Heath
Notary Public

PHONE: OFFICE 667-2819
RES. 668-2822
AREA CODE 403

R. G. HILKER
LIMITED
CONSULTING GEOLOGIST . . . PROFESSIONAL ENGINEER
P.O. Box 1566
WHITEHORSE, YUKON TERRITORY
"LAND OF THE MIDNIGHT SUN"

Charta Mines Ltd. (NPL)
510 - 890 West Pender St.
VANCOUVER 1, B.C.

June 29, 1971

Re: Klaza River Project

Invoice #2051

Contract Costs

R.G. Hilker Limited

Linegrid - 20 line miles	$2000.00
Geology Mapping	1500.00
Magnetics Survey	1000.00
Geochemical Survey	1500.00
Geochemical Determinations	1664.00
Camp Rental	500.00
Radio	300.00
Drafting Data Collected	500.00
Report on Property	500.00
Transportation	2036.00
Camp Supplies	1000.00
TOTAL INVOICE	$12,500.00

APPENDIX

pH VALUES

Line - 0+00W		Line - 24+00W		Line - 36+00W	
Station	pH Value	Station	pH Value	Station	pH Value
0+00	6.2	6+00S	6.4	2+00N	6.0
2+00N	5.8	2+00S	6.8	4+00N	6.2
4+00N	6.8	0+00	8.2	6+00N	6.4
6+00N	7.2	2+00N	6.8	9+00S	6.0
8+00N	6.6	4+00N	7.0	11+00S	6.2
10+00N	6.8	6+00N	7.0	13+00S	6.2
12+00N	6.8	11+00N	6.4	15+00S	6.0
14+00N	6.2	13+00N	6.6	17+00S	6.2
16+00N	5.8	16+00N	6.6	21+00S	6.2
18+00N	6.6	18+00N	6.6	23+00S	5.8
20+00N	5.8	20+00N	6.4	25+00N	6.0
22+00N	6.2	22+00N	6.6	27+00N	6.0
24+00N	6.4	25+00N	6.4	30+00N	6.0
26+00N	6.6	27+00N	6.8		
28+00N	6.8	29+00N	5.6		
30+00N	6.6				

pH Value Continued

Line - BL

Station	pH Value
92+00W	5.2
90+00W	6.0
88+00W	5.8
86+00W	5.8
84+00W	5.6
82+00W	5.8
80+00W	5.8
78+00W	5.8
76+00W	6.6
74+00W	5.6
72+00W	6.0
70+00W	6.2
68+00W	6.0
66+00W	6.2
64+00W	6.2
62+00W	6.0
60+00W	5.8
58+00W	6.2

Line - 52+00W

Station	pH Value
30+00N	6.6
28+00N	6.8
26+00N	5.8
24+00N	5.6
22+00N	6.0
20+00N	6.0
18+00N	6.2
16+00N	5.6
12+00N	5.8
10+00N	6.2
8+00N	6.6
6+00N	6.2
3+00N	6.2
1+00N	6.2

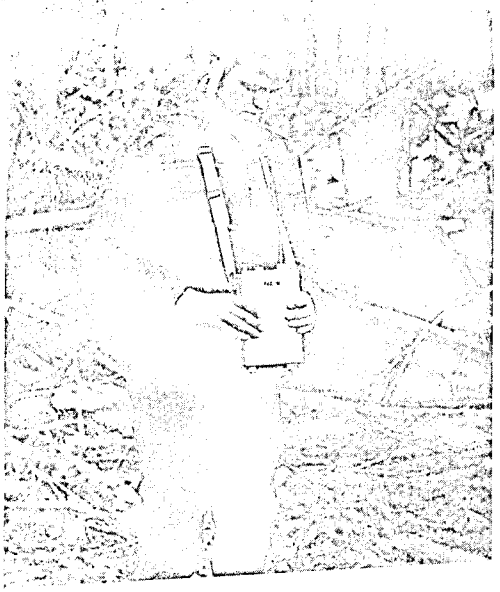
Line - 72+00W

Station	pH Value
30+00N	6.8
25+00N	6.6
23+00N	6.6
21+00N	6.4
18+00N	6.6
13+00N	6.6
11+00N	6.6
9+00N	6.8
7+00N	6.4
5+00N	6.4
3+00N	6.8
1+00N	6.8

pH Value Continued

Line - 72+00S

Station	pH Value
1+00S	6.2
3+00S	6.2
6+00S	6.2
11+00S	5.6
15+00S	5.8
17+00S	6.2
19+00S	6.2
21+00S	6.2
23+00S	6.6
25+00S	6.8
27+00S	6.8
29+00S	6.8



SCINTREX

FLUXGATE MAGNETOMETER

The MF-2 is a completely new concept in vertical force fluxgate magnetometers. These instruments, which are designed for fast and accurate mineral ground surveys, are orientation independent, self levelling and require no tripod.

The MF-2 combines in one compact 5½ lb. package electronics, sensor and rechargeable batteries. With the latest I.C. and F.E.T. circuitry and high precision components, a temperature stability better than 1 gamma per degree is standard (with .25 gamma on special order) over a range of —40° to +40° centigrade.

The instrument has a built-in hemisphere polarity switch providing two overlapping ranges. For the Northern hemisphere the full range is +80,000 to —20,000 gammas, and reversible for the Southern hemisphere.

A calibrated feedback system can be provided which makes it possible to determine the total vertical component strength.

Measuring accuracy, on the 100 gamma scale is 0.5 gamma, and on the 1000 gamma scale 5 gammas.

The Scintrex MF series of magnetometers have been in use for many years in varied applications, e.g. ground reconnaissance, base station recording and monitoring, study of magnetic properties of rocks, observatory monitoring and recording of both vertical and horizontal components.

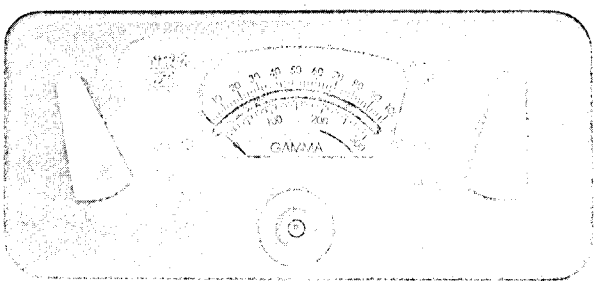
OPTIONAL

a) MF-2G

The MF-2G Fluxgate Magnetometer has the same electronics and specifications as the MF-2, but the sensor is detached and enclosed in a small cylindrical tube which permits it to be oriented and tilted in any desired direction. A 25 foot cable connects the sensor to the instrument housing. This version is particularly suitable for the study of the magnetic properties of rocks, and the measurement of magnetic field components of any orientation, etc.

b) MF-2GS

The MF-2GS Magnetometer again has the same electronics and specifications as the MF-2 but has two sensors, the enclosed self-levelling sensor of the MF-2 as well as the detached geoprobe of the MF-2G, either one of which can be employed at any one time. Thus, this instrument can be employed as the standard MF-2 as well as for vertical gradient measurements, and for the determination of the magnetic properties of rocks, etc.



MODEL MF-1 FLUXGATE MAGNETOMETER

Operation of the Meter

1.) Remove all magnetic objects from operator's person, e.g. keys, coins, buttons, etc. Zippers should be non-magnetic.

2.) Connect Battery Cable, Figure 6, to magnetometer receptacle on bottom of main housing. This connection must be secured by lock-ring.

3.) Attach battery pack (Fig. 5) either in back pocket or on belt behind operator.

4.) Switch on Main Switch (Fig. 3) to first position, which is the battery check. Indicating meter needle should rest within red arc. Replace batteries if reading below red arc.

5.) Latitude Adjustment - To adjust the latitude setting to read 0 gammas is a simple operation.

   a. After indicating meter needle (fig.2) shows voltage okay, switch Main Switch (Fig.3) to next position which is the positive reading with the Range Switch (Fig. 1) set at the 100K step. (100,000 gamma range)

   b. If needle goes full arc to left past 0, switch main switch (Fig. 3) to last position which is the negative reading range.

   c. Figures 10 and 9 indicate the latitude adjustment controls - Coarse control is Fig. 10 and Fine control is Fig. 9. If scale reading is more than ± 7,000 gammas rotate coarse control (Fig. 10) in steps of 7,000 and switch range down to more sensitive range until scale is reading less than ± 7,000 gammas. Remove protection cap on fine control (Fig. 8) by pulling straight off. Then rotate fine control switch (Fig. 9) until scale reading is 0 gammas. Check reading by switching main switch from positive to negative (or vice versa) to ensure 0 reading both polarities. Replace fine control protection cap.

6.) Calibration - This meter is calibrated at the factory prior to delivery. Field tests show that only by severe misuse (i.e. constant dropping, rough handling, improper shipping) can the calibration of this instrument be effected. It is therefore not necessary to recalibrate in the field and if through misuse calibration becomes necessary, the meter should be returned to the factory. *All parts are guaranteed against defect for a period of one year and will be replaced free of charge.

* This guarantee does not apply to batteries or the connecting cable.

7.) Trouble Shooting - Under normal conditions the only field problem will be batteries or the connecting cable. If after completion of step (4) under "Operation of the Meter" the meter still does not indicate voltage, check cable for faulty connection or broken cable. If after this procedure, meter still does not indicate current, return unit immediately to your supplier or directly to the factory.

Regional Latitude Settings

Normally each unit is pre-set at the factory for the Northern Hemisphere. However, if the unit is required for Equatorial or Southern Hemispheric regions, the unit will be pre-set at the factory for these areas. If a unit is going from one of the above regions to another, reset instructions will be supplied on request.

Field Procedure

1.) Select Base Control station. This station should be selected in relation to one or both of two things.
   1. General magnetic background (i.e. not anomalous) if possible.
   2. Accessibility in relation to area being surveyed.

2.) Set magnetometer to read between 0 and 200 gammas. (For contouring and to avoid small negative readings, an arbitrary value of 1000-800 gammas should be added to all readings.

3.) For effective diurnal control, control stations should be permanently marked and readings should be taken at the same height and location each time; a simple method is to have the control stations' pickets hammered into the ground with the top about waist height. Rest the probe end of the magnetometer on the top of the picket. In barren country, a mound or large piece of rock or some other material should be used.

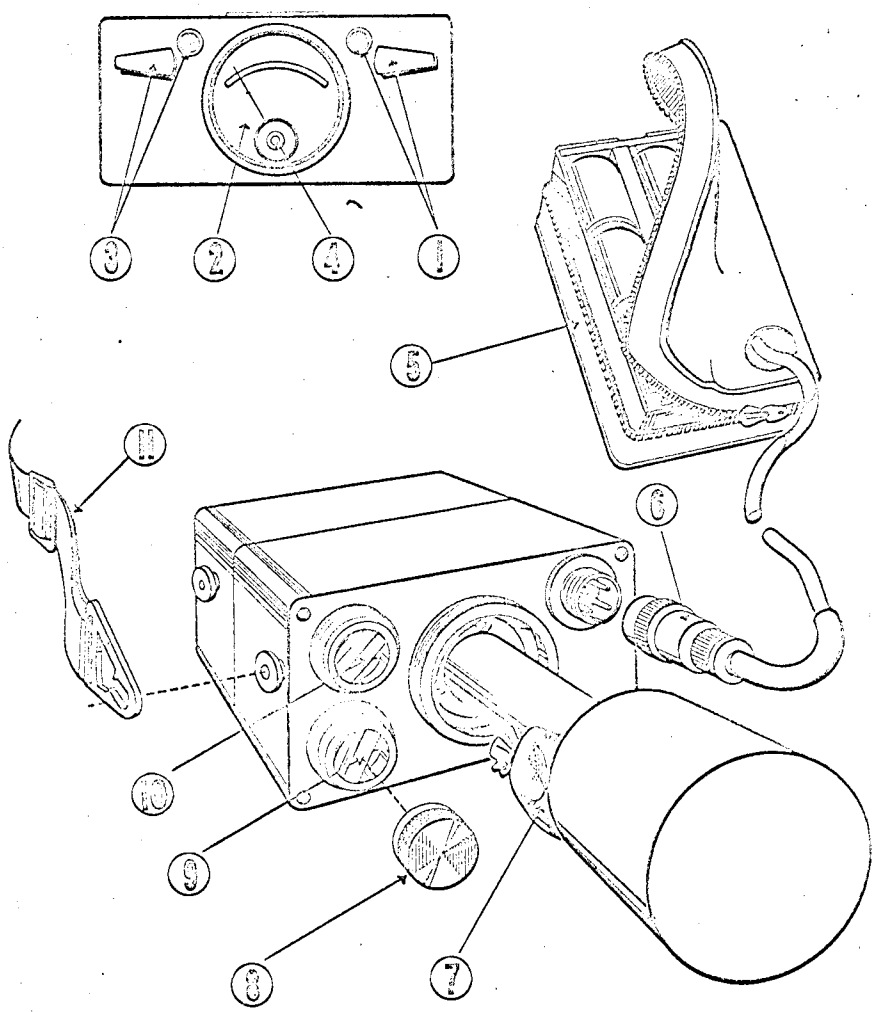
4.) Continue survey the same as any other method of magnetic surveying.

5.) Remove and replace Silica-Gel (Fig.7) when deteriorated. The silica gel is located in the removable probe housing.
   The Silica bag should not be placed on the bottom of the probe housing.

6.) Do not pass powerful magnet closer than 1 foot to instrument.

7.) During winter operation, batteries should be kept in pocket or under parka.

***Warning: - Do not leave batteries in battery case when unit is being stored. Always be be sure meter is turned off after use. Disconnect battery cable when meter not in use.



1. Range Switch
2. Meter
3. Main Switch
4. Level
5. Battery Pack
6. Battery Connector
7. Silica Gel
8. Protection Cap
9. Latitude Adjustment Control Fine
10. Latitude Adjustment Control Coarse
11. Carrying Strap

MODEL MF-1 FLUXGATE MAGNETOMETER

E. J. SHARPE INSTRUMENTS OF CANADA LIMITED
P.O. Box 279, Willowdale, Ontario

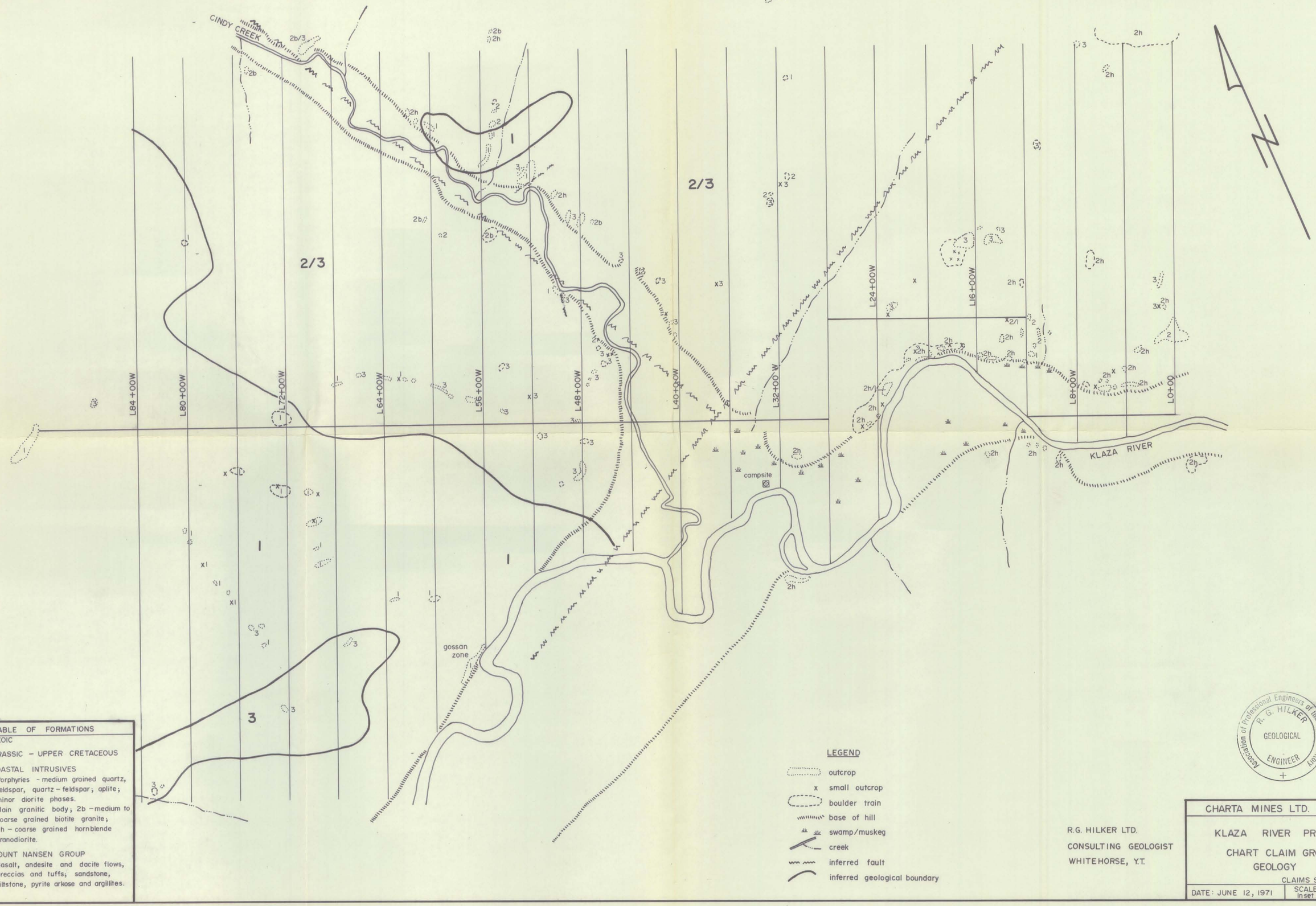


TABLE OF FORMATIONS

MESOZOIC

JURASSIC – UPPER CRETACEOUS

COASTAL INTRUSIVES

[3] Porphyries – medium grained quartz, feldspar, quartz – feldspar; aplite; minor diorite phases.

[2] Main granitic body; 2b – medium to coarse grained biotite granite; 2h – coarse grained hornblende granodiorite.

MOUNT NANSEN GROUP

[1] Basalt, andesite and dacite flows, breccias and tuffs; sandstone, siltstone, pyrite arkose and argillites.

LEGEND

- outcrop
- x small outcrop
- boulder train
- base of hill
- swamp/muskeg
- creek
- inferred fault
- inferred geological boundary

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WHITEHORSE, Y.T.

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GEOLOGICAL
ENGINEER

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

KLAZA RIVER PROJECT

CHART CLAIM GROUP
GEOLOGY

CLAIMS SHEET 115-I-4

DATE: JUNE 12, 1971 | SCALE: 1" = 400' Inset as shown

ZONE 'A'

CINDY CREEK

L84+00W

L80+00W

L72+00W

L64+00W

L56+00W

L48+00W

L40+00W

L32+00W

L24+00W

L16+00W

L8+00W

L0+00

KLAZA RIVER

MAGPIE CREEK

Test Pit 2

campsite

Test Pit 1

INSET #1

L56+00W

15+00S

GOSSAN SAMPLES
SCALE: 1" = 200'

INSET #2

x1/22

x2/70

x0/34

x0/33

x0/24

x0/20

x0/10

x0/6

x0/10

x0/22

x0/13

RECONNAISSANCE SAMPLES
KLAZA RIVER - MAGPIE CREEK
SCALE: 1" = 1000'

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LEGEND

$\bar{x}$ = 23 ppm Cu - arithmetic mean
s = 19 ppm Cu - standard deviation
molybdenum contours
copper contours
creeks, rivers

CONTOUR VALUES

23 ppm Cu - mean (not shown)
42 ppm Cu - mean plus one standard deviation
61 ppm Cu - mean plus two standard deviations
80 ppm Cu - mean plus three standard deviations
99 ppm Cu - mean plus four standard deviations

NOTE: Copper p.p.m. are to the right, and molybdenum p.p.m. are to the left at each sample station.
'NS' means no sample was taken.

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KLAZA RIVER PROJECT
CHART CLAIM GROUP
GEOCHEMICAL SURVEY - $Cu\text{-}MoS_2$
CLAIMS SHEET 115-I-4

DATE: JUNE 12, 1971
SCALE: 1" = 400'
Insets as shown

N

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KLAZA RIVER PROJECT

CHART CLAIM GROUP
MAGNETOMETER SURVEY

CLAIMS SHEET 115-I-4

DATE: JUNE 12, 1971 | SCALE: 1" = 400'

LEGEND

- ⊡ claimposts located
- ⊙ claimposts not located
- claimline

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KLAZA RIVER PROJECT
CHART CLAIM GROUP

LINECUTTING GRID
WITH LOCATED CLAIMS

CLAIMS SHEET 115-I-4

DATE: JUNE 12, 1971 | SCALE: 1" = 800'

PHONE: OFFICE 667-2819
RES. 668-2822
AREA CODE 403

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"LAND OF THE MIDNIGHT SUN"

GEOLOGICAL EXAMINATION AND EVALUATION REPORT

CHART 1-48 CLAIM GROUP

KLAZA RIVER AND MAGPIE CREEK

SHEET 115-I-4

DAWSON RANGE, YUKON TERRITORY

FOR

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

BY

R.G. HILKER, P.ENG.

WHITEHORSE, YUKON TERRITORY

JANUARY 14, 1971

TABLE OF CONTENTS

* * * * *

INTRODUCTION

A property examination and evaluation was conducted in the vicinity of Cindy Creek and the Klaza River in the Dawson Range - Yukon Territory, by R.G. Hilker, on December 15th, 1970. The examination was conducted during the period the Chart 1-48 claim group was being staked. The property examination and staking of the claim group was done on behalf of Charta Mines Ltd. (N.P.L.) of Vancouver, B.C.

Access to the property was provided by truck to Carmacks, Y.T., and by a Bell Jetranger helicopter from Whitehorse to the claim group.

Due to the snow cover in the area, tree cover and overburden, very little of the claim group was exposed to observation. Two isolated outcrops above timberline were swept clean of snow by wind action, and were noted. The gossan zone on the southwest side of Cindy Creek, and to the north of the Klaza River, was located. The gossan zone is located on a fairly steep side-hill and was not sampled, because of frozen ground conditions.

The Chart claim group is located in the Dawson Range of the Central Yukon Territory. Interest in this area has been spurred by the discovery of a large tonnage, low-grade, copper-molybdenum deposit by Casino Mines Ltd. A news release in the Vancouver Province dated December 1st, 1970, by Brameda

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Resources Ltd., stated that the Casino property has an inferred reserve of 179 million tons of copper-molybdenum ore grading 0.45 percent copper equivalent. The Casino deposit has been compared as similar in size to that of Brenda, Lornex and Gibraltar Mines.

The Casino property is a porphyry-type copper-molybdenum deposit comparable in size, scope and potential to that of the Highland Valley in British Columbia. Mineralization at the Casino property is contained in quartz-monzonite, granodiorite, quartz-porphyry, feldspar-porphyry, and diorite. Portions of these rock types are brecciated, highly altered, and contain appreciable secondary biotite and plagioclase feldspar. Age determinations on the granites of this area have yielded an approximate age of 78 million years which geologically corresponds to Upper Cretaceous in age. The intrusive rock types have been grouped together under the general heading of Coastal Intrusives, and are contained in a large batholith which constitutes a major portion of the Dawson Range. The extensive occurrences of the Coastal Intrusives in the area, coupled with the known mineralization at the Casino property, indicates that the intrusive regions of the Dawson Range are highly favorable areas for economically significant copper-molybdenum mineralization. Accordingly, any claim group located over the favorable host rock warrants an examination consisting of a geochemical survey at the very minimum.

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LOCATION AND ACCESS

The Dawson Range is located in the west-central portion of the Yukon Territory on the southwest side of the Yukon River between latitudes 62° 00' and 62° 45' and longitudes 137° 00' and 140° 00'. The Dawson Range strikes approximately north 45° west and is about 110 miles long and 20 miles wide. The Dawson Range is physiographically bounded by the Klondike Plateau to the northwest and by the Lewes Plateau to the southeast. The White River truncates the Dawson Range to the northwest and the Yukon River forms the southeastern limited in the Carmacks area.

The Chart 1-48 claim group is located within the Dawson Range at latitude 62° 15' and longitude 137° 45' on Cindy Creek and the Klaza River about one mile west of Magpie Creek. The claims are located on the Carmacks Sheet 115-I (Map 340-A; 1" = 4 miles) and on Claim Sheet 115-I-4 (1" = ½ mile) in the Whitehorse Mining Division.

An airstrip, suitable for aircraft up to and including a DC-3, has been constructed by Casino Mines at the head of Casino Creek, approximately 45 miles northwest of the Chart group. The Casino airstrip is approximately 94 air miles from Whitehorse, where fixed-wing aircraft are available. An airstrip, suitable for Beaver, Otter and smaller aircraft, has been constructed by International Mines on Hayes Creek, about 20 miles north of the Chart group. The claims are located

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about 48 air miles northwest of Carmacks, Y.T., which is 110 road miles north of Whitehorse.

A winter access road has been constructed to the Casino property from Mile 1097 on the Alaska Highway, and is a total distance of 130 miles long. Helicopters are occasionally based at Carmacks at Mile 103 of the Whitehorse-Mayo road. Road access is also possible from Carmacks to Mount Nansen which is located 20 air miles southeast of the Klaza River and Magpie Creek.

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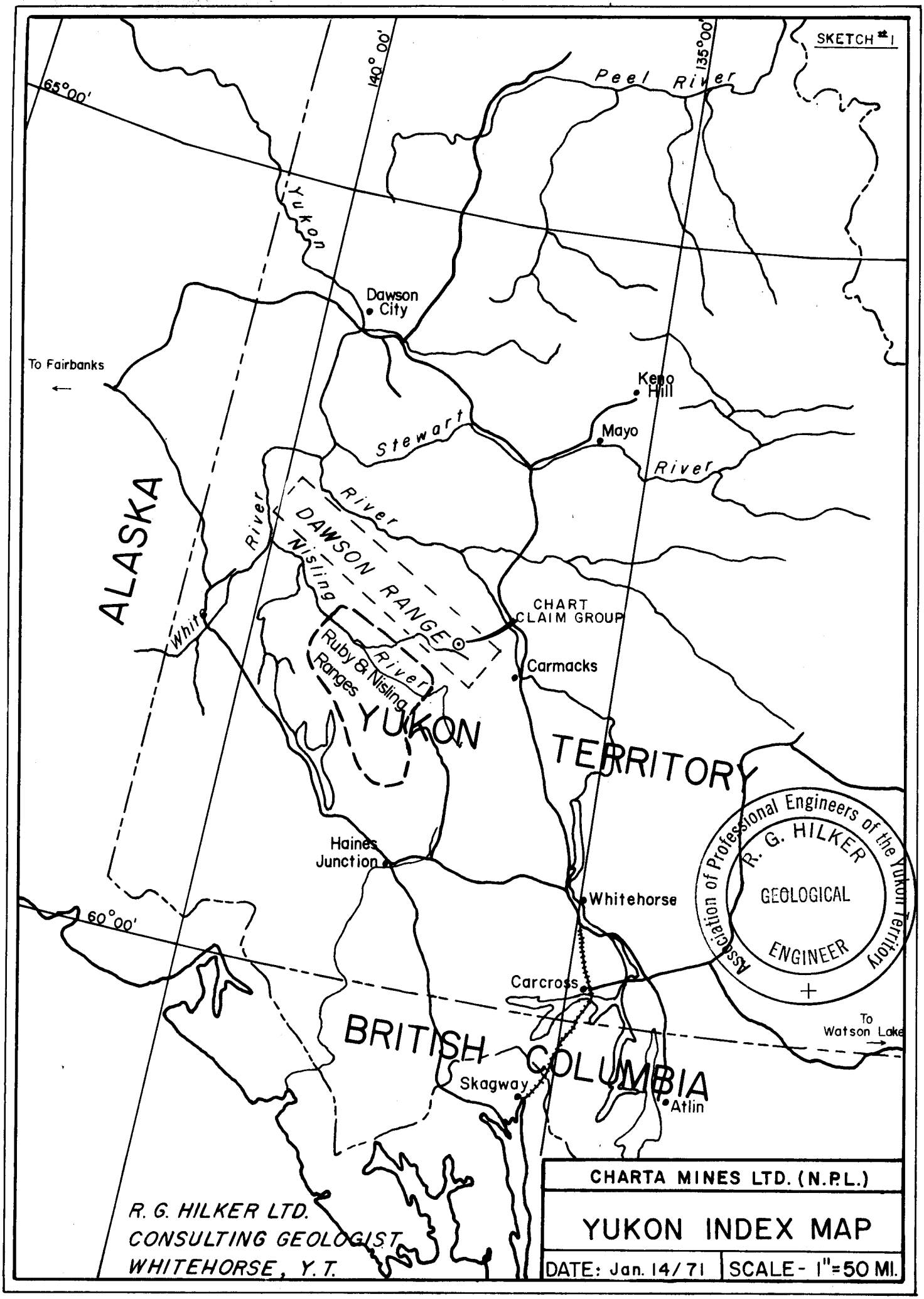
SKETCH # 1
65°00'
140° 00'
135°00'
Peel River
Yukon
Dawson City
To Fairbanks
Keno Hill
Mayo
Stewart River
River
River
DAWSON RANGE
Nisling
ALASKA
White
CHART CLAIM GROUP
Ruby & Nisling Ranges
River
Carmacks
YUKON TERRITORY
Haines Junction
Whitehorse
60°00'
Carcross
To Watson Lake
BRITISH COLUMBIA
Skagway
Atlin
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WHITEHORSE, Y.T.
CHARTA MINES LTD. (N.P.L.)
YUKON INDEX MAP
DATE: Jan. 14/71
SCALE - 1"=50 MI.

CLAIMS

The following information on the Chart claims was searched by the writer on January 14th, 1971, in the Whitehorse Mining Recorder's Office. The claims were transferred from the stakers to Charta Mines Ltd. (N.P.L.) on January 13th, 1971. The Chart claims are located on Claim Sheet 115-I-4, Klaza River and Magpie Creek.

Claim Name & No.	Grant Number	Anniversary Date
CHART 1-8 (incl)	Y59861-Y59868	Jan. 4, 1972
CHART 9-16 (incl)	Y59869-Y59876	Jan. 4, 1972
CHART 17-24 (incl)	Y59877-Y59884	Jan. 4, 1972
CHART 25-32 (incl)	Y59885-Y59892	Jan. 4, 1972
CHART 33-40 (incl)	Y59893-Y59900	Jan. 4, 1972
CHART 41-48 (incl)	Y59901-Y59908	Jan. 4, 1972

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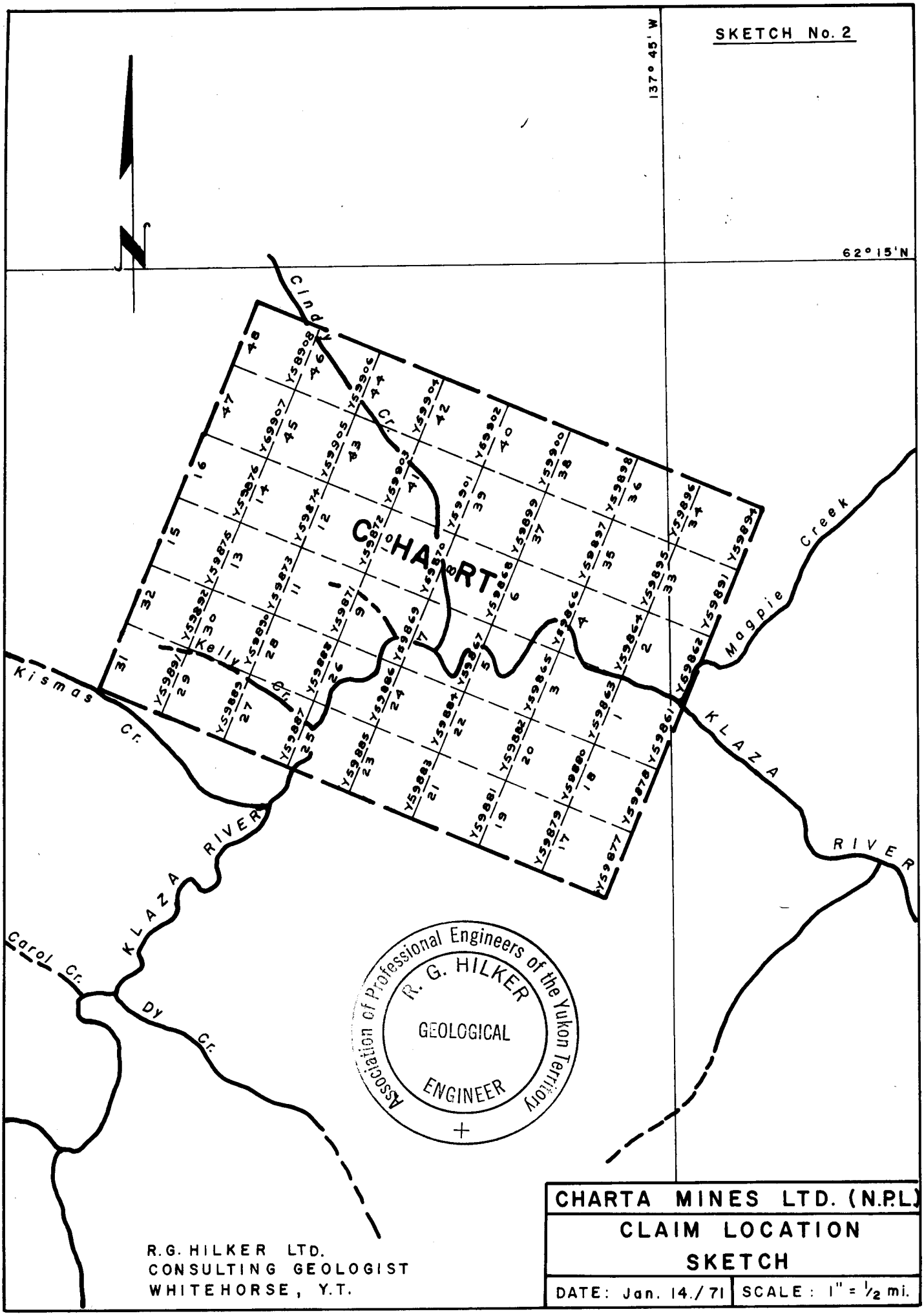
SKETCH No. 2



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WHITEHORSE, Y.T.

CHARTA MINES LTD. (N.P.L.)	
CLAIM LOCATION SKETCH	
DATE: Jan. 14./71	SCALE: 1" = ½ mi.

REGIONAL GEOLOGY

The Dawson Range lies within the Yukon Plateau physiographic province which consists of a gently rolling upland surface. The plateau is cut by a series of deep valleys, providing a relief of 2,000 feet or more. The Dawson Range rises some 2,000 feet above the plateau and has elevations between 3,000 and 6,600 feet. The Dawson Range has not been glaciated, except in the southeastern part, which has produced debris-covered slopes with occasional outcrops on the summits. The outcrops are jointed, fractured, and highly weathered due to exposure to frost action and wind erosion.

The rocks of the area include a basement of Palaeozoic or Precambrian metamorphic rocks (Yukon Group) and minor early intrusive. The basement is overlain by areas of Mesozoic volcanics (Mount Nansen Volcanics) which have been intruded by Cretaceous rocks of generally granitic composition (Coast Intrusions). Large areas of the aforementioned rock types were later covered by Tertiary volcanics (Carmacks Volcanics).

The Mesozoic and older rocks exhibit a general northwest-southeast trend which has been disrupted by the intrusive bodies and partially obscured by the flat-lying Carmacks Volcanics.

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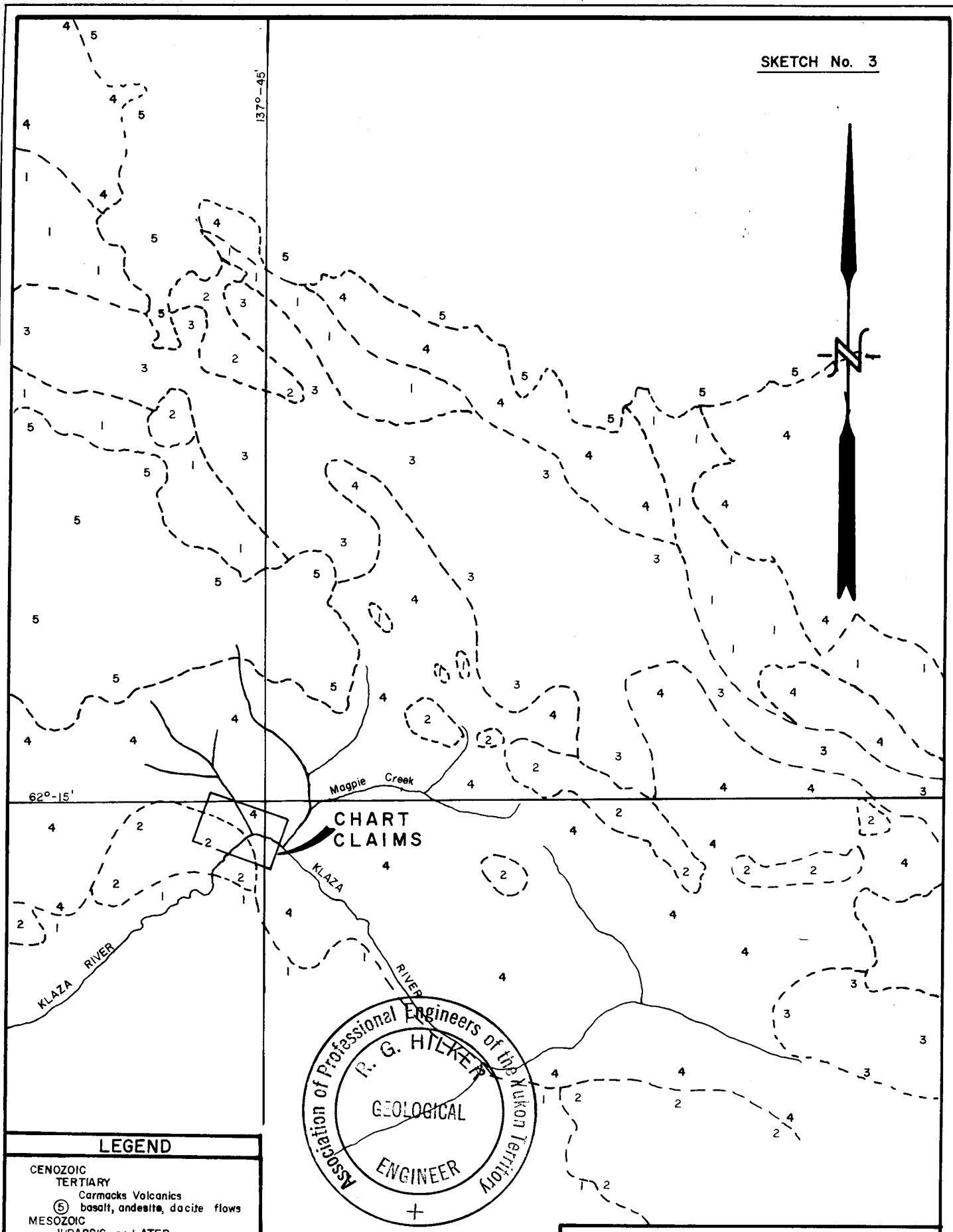
SKETCH No. 3



LEGEND

CENOZOIC
TERTIARY
Carmacks Volcanics
(5) basalt, andesite, dacite flows
MESOZOIC
JURASSIC or LATER
(4) granite
(3) syenite
Mt. Nansen Volcanics
(2) basalt, andesite, dacite flows
PALAEOZOIC / PRECAMBRIAN
Yukon Group.
(1) schist, quartzite, limestone

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Sketch after G.S.C. Map 340-A

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

REGIONAL GEOLOGY

CHART CLAIM GROUP

Date: Jan. 14/71 | Scale: 1" = 4 miles

REFERENCE TO PUBLISHED GEOLOGY

The following publications contain geological information pertaining to the Dawson Range and reference was made to the information in the preparation of this report for Charta Mines Ltd. (N.P.L.):

1. G.S.C. Publication No. 1702; Klotassin, Yukon Territory; Geological Map (Scale 1" = 2 miles); D.D. Cairns, 1916.
2. G.S.C. Paper 44-32; Preliminary Map, Selwyn River, Yukon; H.S. Bostock, 1944.
3. G.S.C. Memoir 189; Carmacks District, Yukon; H.S. Bostock, 1936.
4. G.S.C. Memoir 214; Geology and Mineral Deposits of Freegold Mountain Carmacks District, Yukon: J.R. Johnston, 1937.

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TABLE OF FORMATIONS

CENOZOIC

Quaternary

Q - Alluvium, volcanic ash, ground ice.

Tertiary

Carmacks Volcanics

9 - Thick flows, basalt, amygdaloidal flows, top of flows breccia, local brecciation and porphyritic flows.

MESOZOIC

Jurassic - Upper Cretaceous

Coastal Intrusives

8 - Granite, granodiorite, quartz monzonite, porphyry and breccia, altered (ore host rock).

7 - Syenite and monzonite.

6 - Diorite and gabbro.

Mount Nansen Group

5 - Basalt, andesites, and dacite flows, breccias and tuffs. Green-black color, contains sedimentary rocks consisting of sandstone, siltstone, pyritic arkose and argillites. Bands and bedding distinct.

Tantalus Formation

4 - Conglomerate, sandstone, shale and coal seams.

Jurassic

3 - Labarge Group

Triassic

2 - Granite, monzonite.

PRECAMBRIAN & LATER

Yukon Group

1 - Limestone, shale, mica-quartz schist, chlorite schist, quartzite.

.../9

CLAIM GEOLOGY

The CHART 1-48 claim group covers a gossan zone that is located on the west side of Cindy Creek and the Klaza River. Bostock, in Memoir 189, mentions that mineralization occurs in this area as follows:

> "Mineral was noted along Klaza River below Magpie Creek. As the locality is near the contact of the granitic intrusives and the older rocks, it is believed to be very promising, but its inaccessibility would probably render any but very rich deposits worthless."

The gossan zone occurs near the contact of the Mount Nansen volcanics and the Coastal Intrusive granite. A granit outcrop was noted on the south side of the Klaza River and an andesite porphyry outcrop north of the gossan zone. The following is a brief rock description:

Coastal Intrusives

1. Altered granite due to contact with Mount Nansen Group volcanics.
2. Granite - coarse grained, biotite and augite.
3. Granodiorite.

Mount Nansen Group Volcanics

1. Andesite Porphyry - located near contact with granite.

No mineralization was observed near the gossan zone, as snow cover, frozen ground conditions and terrain prevented a good examination of the gossan. The CHART 1-48 claim group

.../10

is considered to be a good exploration target. The gossan is located in granite-granodiorite in the Dawson Range where porphyry-copper-molybdenum types of economic deposits have been discovered. The property requires a detailed geological and geochemical examination to prove or disprove mineralization and economic potential. If mineralization occurs on the property several geological factors should be considered.

1. Mineralization due to contact between volcanics and granite.

2. Mineralization due to structure control, e.g., Cindy Creek appears to be a fault or shear zone and a cross structure may occur in the valley of the Klaza River.

3. Alteration of the granite due to younger igneous intrustions within earlier granite stocks or a possible porphyry copper type of deposit.

For the above reasons, the property should be given a thorough examination.

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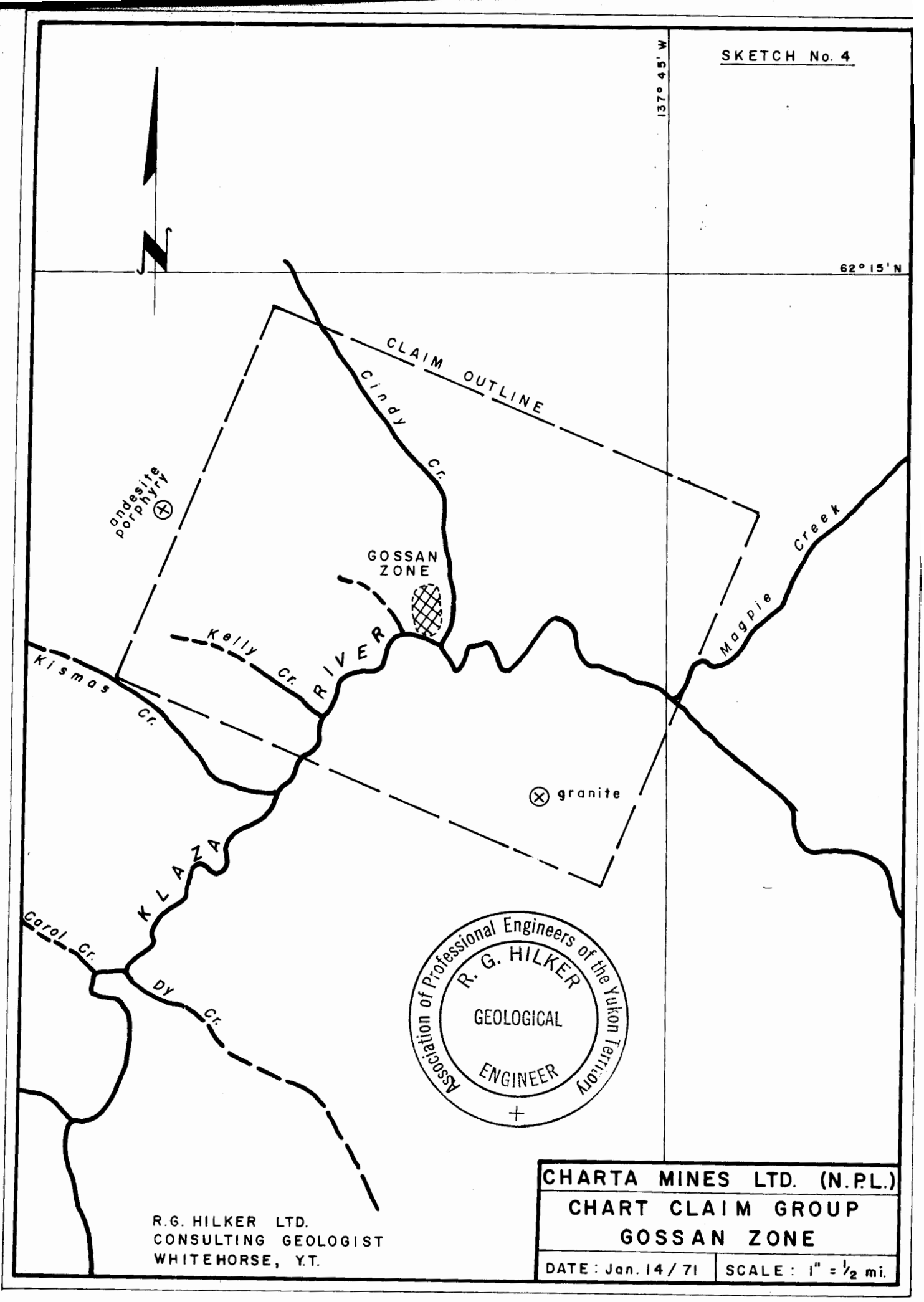
SKETCH No. 4



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

CHART CLAIM GROUP

GOSSAN ZONE

DATE: Jan. 14/71 | SCALE: 1" = ½ mi.

CONCLUSIONS

The granites within the Dawson Range have been proven to be a favorable host-rock for copper-molybdenum mineralization, at the Casino Mines discovery on Casino Creek, and on Hayes Creek by International Mines. Cuprite mineralization, occurring in a schist host-rock in the Yukon Group, has been discovered on Merrice and Williams Creeks.

There is reported mineralization in the vicinity of the CHART claims, and a geological and geochemical survey is recommended to prove mineralization and to outline areas of interest. The geochemical program should be made in conjunction with geological mapping, and if warranted a magnetics survey should be made to delineate overburden-covered contacts between volcanics and granite.

A grid system should be established over the claim group, with 400-foot line spacings. The geochemical sampling done at 100-foot intervals on the grid lines, should be followed or accompanied by geological mapping and a magnetics survey.

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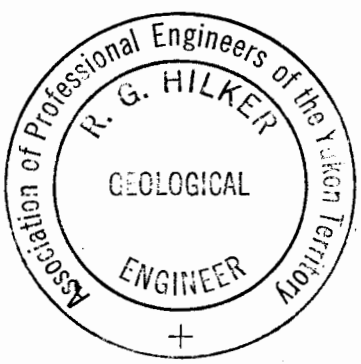
RECOMMENDATIONS

The following expenditures on the CHART 1-48 claims located in the Dawson Range - Yukon Territory, are recommended to fully evaluate the potential of the claim group:

Linecutting - 20 linemiles @ $100/mile	$ 2,000
Geological Mapping - 20 linemiles @ $100/mile	2,000
Magnetics Survey - 20 linemiles @ $75/mile	1,500
Geochemical Sampling - 20 linemiles @ $100/mile	2,000
Geochemical Determinations - 1040 samples @ $1.60	1,664
Transportation for Crews - helicopter & truck	2,036
Camp Rental	500
Camp Supplies	1,000
Radio	300
Drafting Data	500
Report on Property	1,000
Contingencies	1,300
TOTAL PROGRAM	$ 15,800

The initial camp is to be established by two linecutters on the CHART claim group. Upon completion of the linegrid the two linecutters would move out of the camp when the four-man exploration crew is mobilized to the property.



R. G. Hilker

R.G. Hilker, P.Eng.
Consulting Geologist
January 14th, 1971