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

CPA 1-12 (Y41569-Y41580)

YUKON QUARTZ MINERAL CLAIMS

WHITE CREEK AREA YUKON TERRITORY

LATITUDE 60° 27' N

LONGITUDE 132° 26' W

N.T.S. DESIGNATION 105-F-8

WATSON LAKE MINING DIVISION

--AUGUST 16th to AUGUST 30th, 1971--

FOR

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

VANCOUVER, B.C.

BY

R.G. HILKER, P. ENG.

G.G. CARLSON, GEOLOGIST

R.G. HILKER LIMITED

WHITEHORSE, YUKON TERRITORY

- SEPTEMBER 15, 1971 -

TABLE OF CONTENTS

INTRODUCTION	2
LOCATION AND ACCESS	3
Yukon Index Map - Sketch #1	
Location and Access - Sketch #2	
CLAIMS	6
Claims - Sketch #3	
PERSONNEL	7
LINE GRID	9
GEOLOGY	
GENERAL GEOLOGY	10
General Geology - Sketch #4	
TABLE OF FORMATIONS	13
REFERENCE TO PUBLISHED GEOLOGY	14
FIELD MAPPING METHODS	15
CLAIM GEOLOGY	16
CLAIM GEOLOGY - TABLE OF FORMATIONS	21
MACROSCOPIC DESCRIPTION OF ROCK SAMPLES	22
GEOCHEMICAL SURVEY	
INTRODUCTION	24
FIELD METHODS	25
SAMPLE HANDLING, ASSAY AND DATA TREATMENT	26
TOPOGRAPHY, VEGETATION AND SOILS	30

.../2

INTERPRETATION.. 32

Histograms: Cu - Sketch #5
Pb - Sketch #6

Log Probability Plots: Cu - Sketch #7
Pb - Sketch #8

MAGNETOMETER SURVEY

FIELD METHOD AND INSTRUMENTATION........................ 38

INTERPRETATION.. 42

CONCLUSIONS.. 44

RECOMMENDATIONS.. 46

CERTIFICATIONS.. 47

APPENDIX:

Expenditures of work performed
Magnetometer Specifications

POCKET:

Geology Plan - CPA Project
Scale 1" = 200 ft.

Geochemistry Copper/Ph Plan - CPA Project
Scale 1" = 200 ft.

Geochemistry Lead Plan - CPA Project
Scale 1" = 200 ft.

Magnetics Plan - CPA Project
Scale 1" = 200 ft.

Linegrid and Claim Location - CPA Project
Scale 1" = 400 ft.

.../2

INTRODUCTION:

The CPA 1-12 claim group was staked on September 26, 1969, by R.G. Hilker and Z. Lavoie. The Claims are in a geologically favorable area, with several known lead, silver and gold occurrences. A zone of three strong gossans is covered by the twelve claims.

During the staking, several samples were collected and some have been subsequently assayed. A second visit to the property was made by R.G. Hilker on July 12, 1970. During this examination, more rock samples were collected, as well as some random soil samples, and the gossan zones were located relative to the position of the claims.

Information gathered during these visits and a general description of the geology and mineral potential of the area were summarized in GEOLOGICAL REPORT ON THE CPA 1-12 MINERAL CLAIMS, November 12, 1970, by R.G. Hilker, P.Eng., and G.G. Carlson, Geologist.

Both trips to the property were by Trans North Turbo Air Bell 206 Jet Ranger. The staking flight originated from Whitehorse, while the second visit to the property was conducted from Swift Lake, approximately 60 miles southwest of the property.

On August 16, 1971, the present work was commenced by setting up a 5 man camp, including three linecutters of Eastern Associates Reg'd. and two employees of R.G. Hilker Limited, in the

White Creek valley just south of the claim group. These men include linecutters Roger Voisine, Leopold Laramee and Raymond Morin, magnetometer operator Brian Slater and soil sampler Allan Ashton. Work on the line grid was commenced immediately by establishing the baseline and turning off the crosslines. This work was continued through the week and the magnetics and soil samplings surveys were begun.

On August 21, 1971, the remaining three crew members of R.G. Hilker Ltd., Gerry Carlson, Glen Hillson and Darrell Lindstrom, arrived on the property to complete the surface exploration program. By August 26 the line grid and magnetometer survey were completed and the linecutters and magnetometer operator were demobilized from the property. On August 26 an additional 12 claims, CPA 13-24, were staked on the north and west sides of the original claim block.

On August 29, the soil sampling and geological mapping programs were completed and on August 30 the personnel and camp gear were returned to Whitehorse.

This report describes the field investigations carried out and interprets the data collected. It is submitted for the purpose of assessment work on the CPA 1-12 claim groups, White Creek area, Claim Sheet No. 105-F-8, Watson Lake Mining Division, Yukon Territory.

It is requested that information contained within this report remain CONFIDENTIAL.

.../3

LOCATION AND ACCESS

Physiographically, the CPA claim group is located on the southwest edge of the St. Cyr Range, within the northwesterly trending Pelly Mountains. This mountain range is bounded on the northeast side by the prominent and narrow Tintina Valley, on the west by the Lewes Plateau, and on the south by the Nisutlin Plateau. The claims are situated near a major divide, with the Nisutlin River draining to the south, the Big Salmon River to the west and the Pelly River to the north.

Elevation in the vicinity of the claims range from over 6,500 feet to less than 3,500 feet. The claims themselves cover elevations from 4,500 to 6,500 feet, with relatively steep slopes. This is above timberline and vegetation is almost non-existent except on the valley floor of White Creek and on lower slopes where low-growing willows and buckbrush are abundant.

The CPA 1-12 claim group is located on the Quiet Lake Map Sheet (105-F; 1:250,000) and on Claim Sheet 105-F-8, in the Watson Lake Mining Division, Yukon Territory. The centre of the claim group is located approximately one mile north of White Creek, three miles east of its confluence with McConnell River, at 60° 27' north latitude and 132° 26' west longitude.

At present, access to the property is by helicopter only. Whitehorse, which lies approximately 100 air miles southwest of the property, is the nearest permanent helicopter base.

.../4

The Canol Road, which runs between Johnson's Crossing at Mile 836 on the Alaska Highway, and Ross River, follows the Rose River Valley which parallels the McConnell River, 21 miles due west of the claim group.

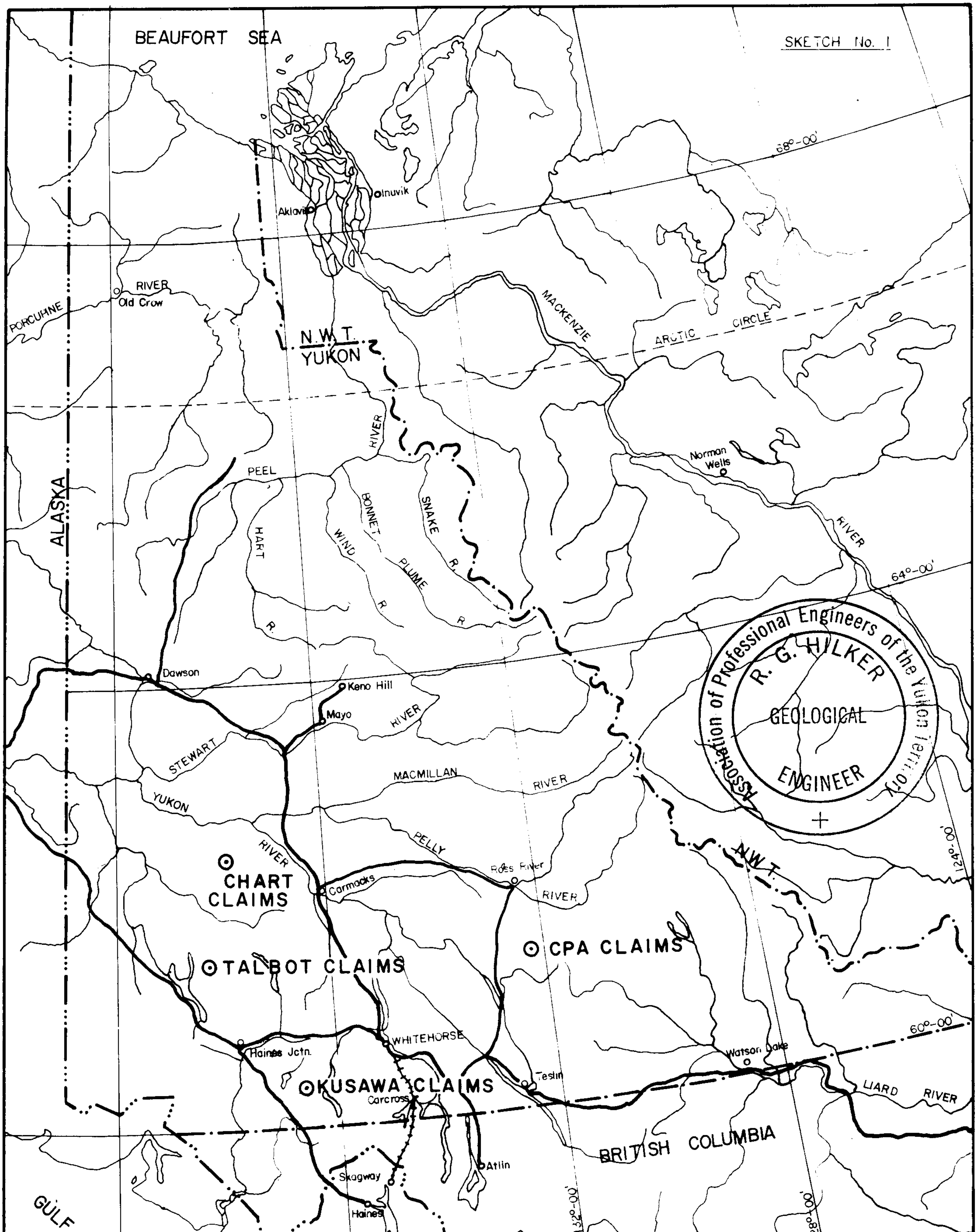
A tractor road leaves the Canol Road at approximately mile 71, follows the Groundhog Creek valley and continues over a low pass into the Seagull Creek valley to a silver-lead-zinc showing on the property of Canol Mines. This road was constructed during the summer of 1969. A continuation of this road from the point where it reaches the McConnell River would provide the most suitable access to the CPA claim group. The present route to the turnoff point is approximately 21 miles, while only 5.5 to 6.0 miles of new road construction would be required to reach the claim group. This would provide access to the top of the mountain ridge in the vicinity of the proposed future campsite areas, on CPA 6, 8, 19 and 20. The existing routes in the area, plus the new road requirements, have been located on the Location and Access Sketch (see Sketch #2).

Access for the present work is by truck to approximately mile 84.8 Rose Creek on the lower Canol Road, a distance of 167 road miles from Whitehorse, and by helicopter from mile 84.8 to the claim group. A Bell 81 helicopter, chartered from Trans North Turbo Air in Whitehorse, was used for the mobilization of all crews and camp and the demobilization of the linecutting crew and magnetometer operator.

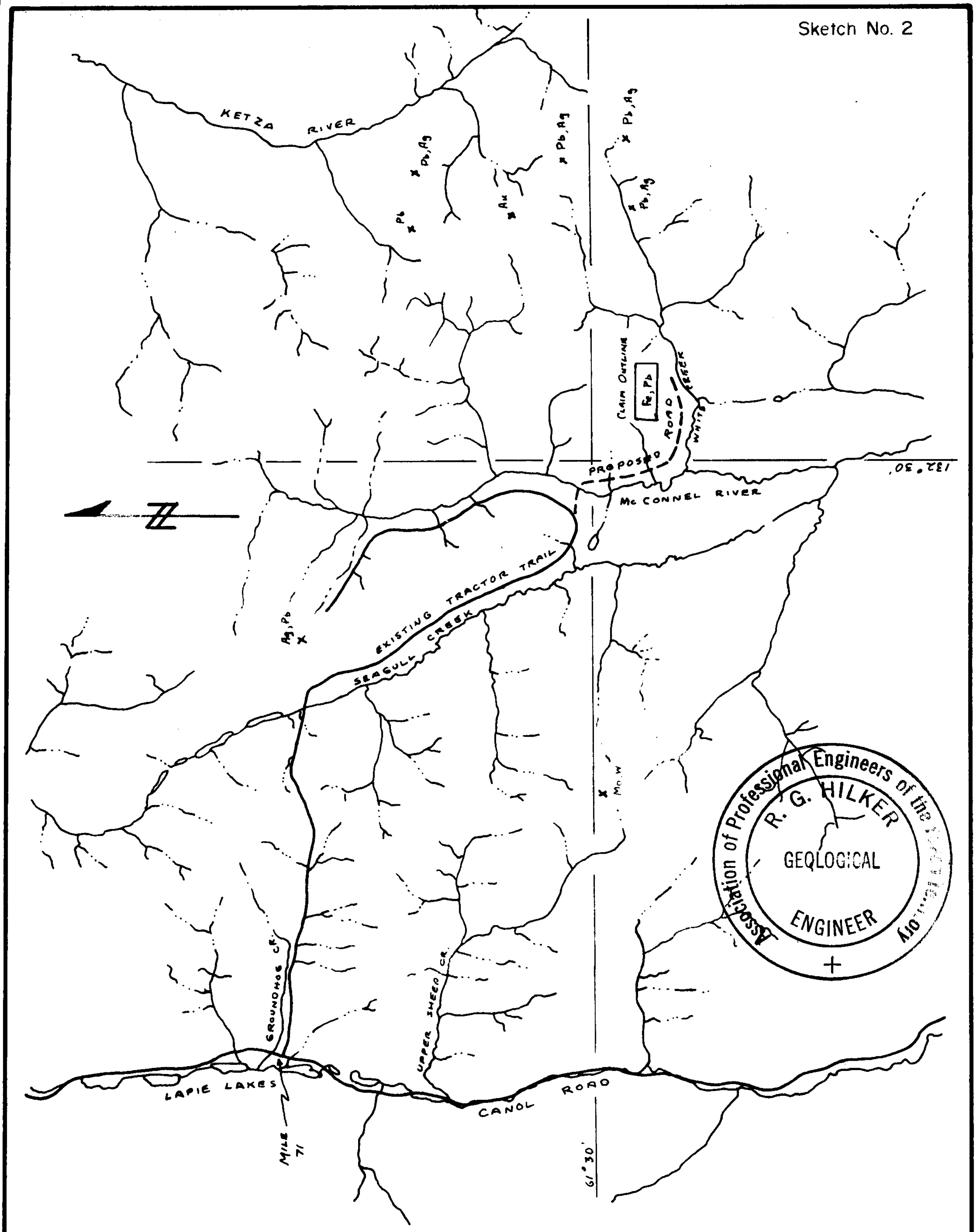
.../5

Demobilization of the remaining crew and camp was carried out by a Bell 206A Jet Ranger.

.../6



CHARTA MINES LTD. (N.P.L.)	
YUKON INDEX MAP	
Date: June 12, 1971	Scale: 1" = 80 miles (±)



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WHITEHORSE Y. T.

CHARTA MINES LTD (N.P.L.)	
CPA CLAIMS ACCESS	
Date: Oct. 20-70	Scale: 1" = 4 mi. approx.

CLAIMS

The following information was searched from the central files of the Mining Recorder's Office, Whitehorse, Y.T., on September 2nd, 1971 by G.G. Carlson:

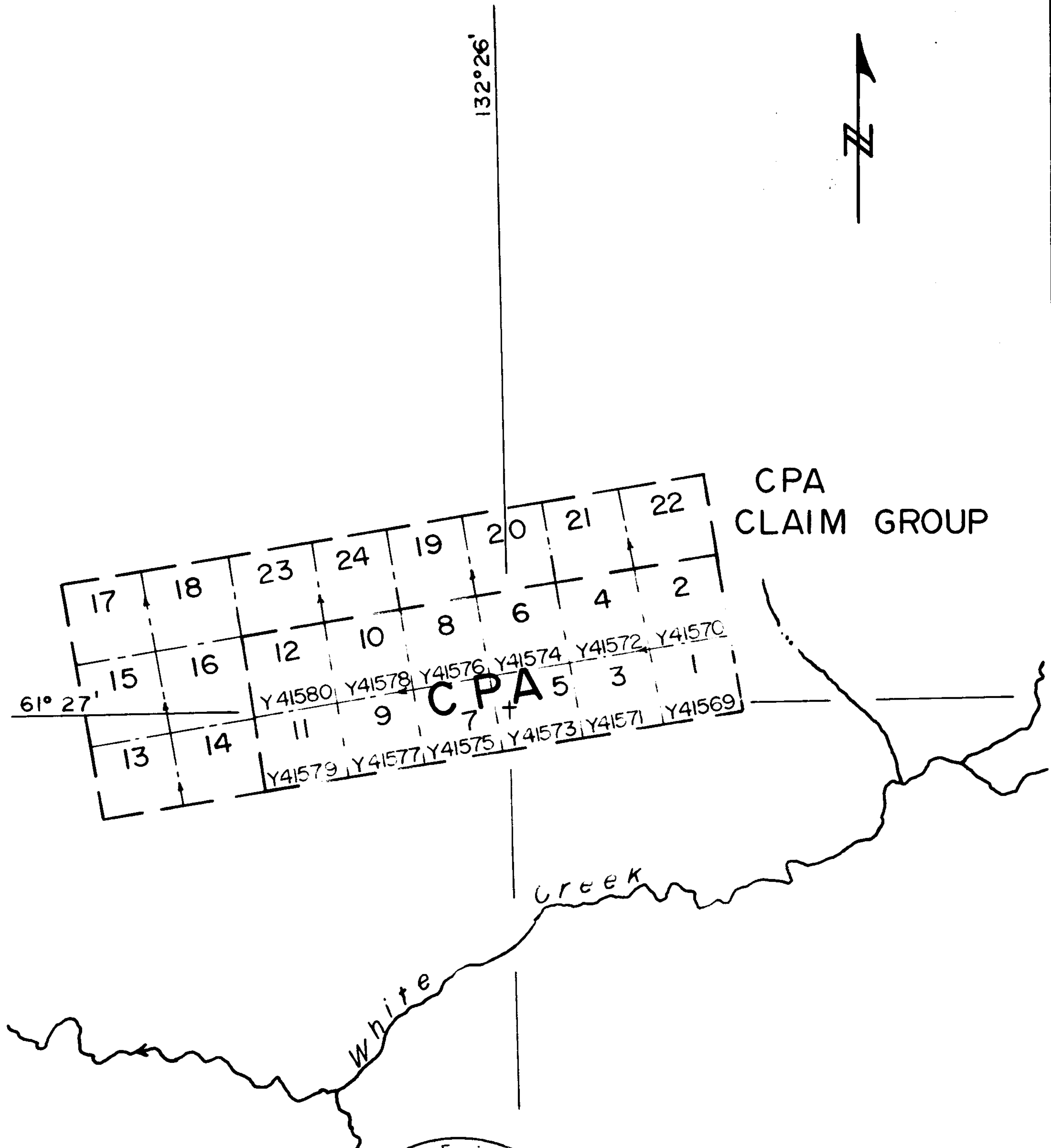
Claim Name	Grant No.s	Anniversary Date	Recorded Owner
CPA 1-12 (incl.)	Y41569-Y41580 (incl.)	Oct. 20,1971	Charta Mines Lt. (N.P.L.)

The following claims were staked during the present work and have not yet been recorded with the Watson Lake Mining Recorder:

Claim Name	Staking Date	Stakers Name
CPA 13-20	August 26, 1971	G. Carlson
CPA 21-24	August 26, 1971	R. Voisine

The claims were located on staking sheet 105-F-8, in the Watson Lake Mining District, Yukon Territory, as shown on the accompanying sketch (see Sketch #3).

SKETCH No. 3



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

NTS SHEET 105-F-8

CHARTA MINES LTD (N.P.L.)	
CPA CLAIMS	
DATE-OCT-20-70	SCALE-½" = 1 MI.

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

PERSONNEL

The following personnel of R.G. Hilker Limited were directly involved in the geological, geochemical and geophysical program on the CPA claim group between August 16th and August 30th, 1971:

NAME	ADDRESS	POSITION AND DATE
R.G. Hilker, P.Eng.	Box 1566 Whitehorse, Y.T.	Aug. 16 & 21 Supervision, report preparation. Aug. 16-30th. Sept. 1-10th.
G.G. Carlson	Box 1566 Whitehorse, Y.T.	Geologist, field supervisor, report preparation. Aug. 20-30th Sept. 1-10th
B. Slater	c/o Rundle Hall Univ. of Calgary Calgary, Alberta	Magnetomer Operator* Aug. 16-26th.
G. Hillson	St. Andrew's College Saskatoon, Sask.	Soil Sampler* Aug. 20-30th.
A. Ashton	Box 56 Parry, Sask.	Soil Sampler* Aug. 16-30th.
D. Lindstrom	Box 1116 Stettler, Alberta	Camp maintenance, Ph tester. Aug. 20-30th.

*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 experience in their respective jobs.

The following personnel of Eastern Associates Reg'd. were involved in setting up camp and cutting line on the CPA claim group between August 16th and August 26th, 1971.

NAME	ADDRESS	POSITION AND DATE
Roger Voisine	Eastern Assoc. Reg'd. Box 3245, Whse., Y.T.	Linecutter August 16-26th.
Leopold Laramee	Eastern Assoc. Reg'd. Box 3245, Whse., Y.T.	Linecutter August 16-26th.
Raymond Morin	Eastern Assoc. Reg'd. Box 3245, Whse., Y.T.	Linecutter August 16-26th.

LINE GRID

A total of 19.5 miles of linegrid were cut over the CPA claim group. The baseline, was located on a bearing of 262°, and commenced at Post 1, CPA 7 and 8, and aligned a total distance of 10,500 feet, extending from Post 1, CPA 1 and 2 (0+00) to 1500 feet beyond Post 2, CPA 11 and 12 (105+00W). Crosslines, with 400 feet separation, were cut between 0+00 and 88+00W. One additional crossline was cut at 105+00W. All crosslines were extended for 1500 feet south of the basline. Lines 0+00 to 44+00W, inclusive, and lines 72+00W, 76+00W and 105+00W were extended 3000 feet to the north, while lines 48+00W to 68+00W, inclusive, and lines 80+00W to 88+00W, inclusive, were extended to 1500 feet north. Lines 56+00W, 72+00W and 105+00W are not complete because of the impassable terrain encountered in these areas.

One hundred foot stations have been marked on the baseline and all crosslines by fluorescent red painted pickets.

.../10

G E O L O G Y

GENERAL GEOLOGY

The geology of the Quiet Lake Map Sheet, NT.S. Sheet 105-F, has been mapped by J.O. Wheeler, L.H. Green and J.A. Roddick of the Geological Survey of Canada during the late 1950's. The information collected during this survey has been presented in preliminary form only, in G.S.C. Map 7-1960. The following general outline has been taken from this map and the accompanying descriptive note.

The CPA claim group lies in the east central part of the map sheet in a zone of relatively unmetamorphosed northwest trending sediments and volcanics. The oldest of these units mapped (Unit 1) has been dated as Lower Cambrian and consists of approximately 1000 feet of quartzites, overlain by phyllite and slate and finally limestone. These rocks outcrop both south and east of the claim group.

Overlying this sequence is a thick and extensive unit of Middle and Upper Cambrian phyllite (Unit 2) with minor intrusive and extrusive greenstone.

Unit 3, consisting of a narrow band of mainly black slate, has not been mapped in the vicinity of the claim group. Unit 4 is a relatively thick member of grey and buff weathered bedded dolomite with minor chert and sandstone and containing fossils of Silurian age. A discontinuous band of this unit occurs east and north of the claim group.

.../11

Disconformably overlying Units 2, 3 and 4 are Units 5 and 6, probably of Mississippian age. Clastic sedimentary rocks and bedded chert (Unit 5), occur as a thick band northeast of the claim group area, while a variety of volcanic rocks (Unit 6), ranging through greenstone, breccias, tuffs and flows, with minor slate, chert and greywacke, occur throughout the area of the claim group and over large areas mainly to the north. Unit 7 consists of heterogeneous and shattered hornblende syenite which occurs as plugs associated with Unit 6. One such plug occurs just north of the claim group.

Unit 8, consisting mainly of narrow beds of clastic limestone, has not been mapped in the immediate vicinity of the claim group.

Mesozoic plutonic rocks (Unit 9), possibly a part of the Coastal intrusives, consist mainly of medium-to coarse-grained biotite granodiorite and quartz monzonite. These rocks occur in a large batholithic structure to the west of the claim group. Minor plugs occur within the unmetamorphosed sediments to the east. Sediments within the area of the intrusives form a metamorphic assemblage of unknown age.

The structure of the area is quite complex. The CPA claim group is located in a northwest trending zone of highly folded and faulted sediments. Major faults, such as the Seagull, Tintina and the Porcupine, parallel the major trend, while minor faults parallel and bisect the trend. The sediments are in some

.../12

areas relatively flat, while elsewhere they are steeply folded and often overturned.

As a result of this extreme structural activity, the stratigraphic relations within this belt are rather difficult to interpret. On a major scale, regional folding has been disrupted by normal, reverse and thrust faulting. On a lesser scale, folding appears to be more intense, and associated faulting has produced numerous isolated blocks and klippes.

.../13

After: Wheeler, Green & Roddick; G.S.C.

Sketch No. 4

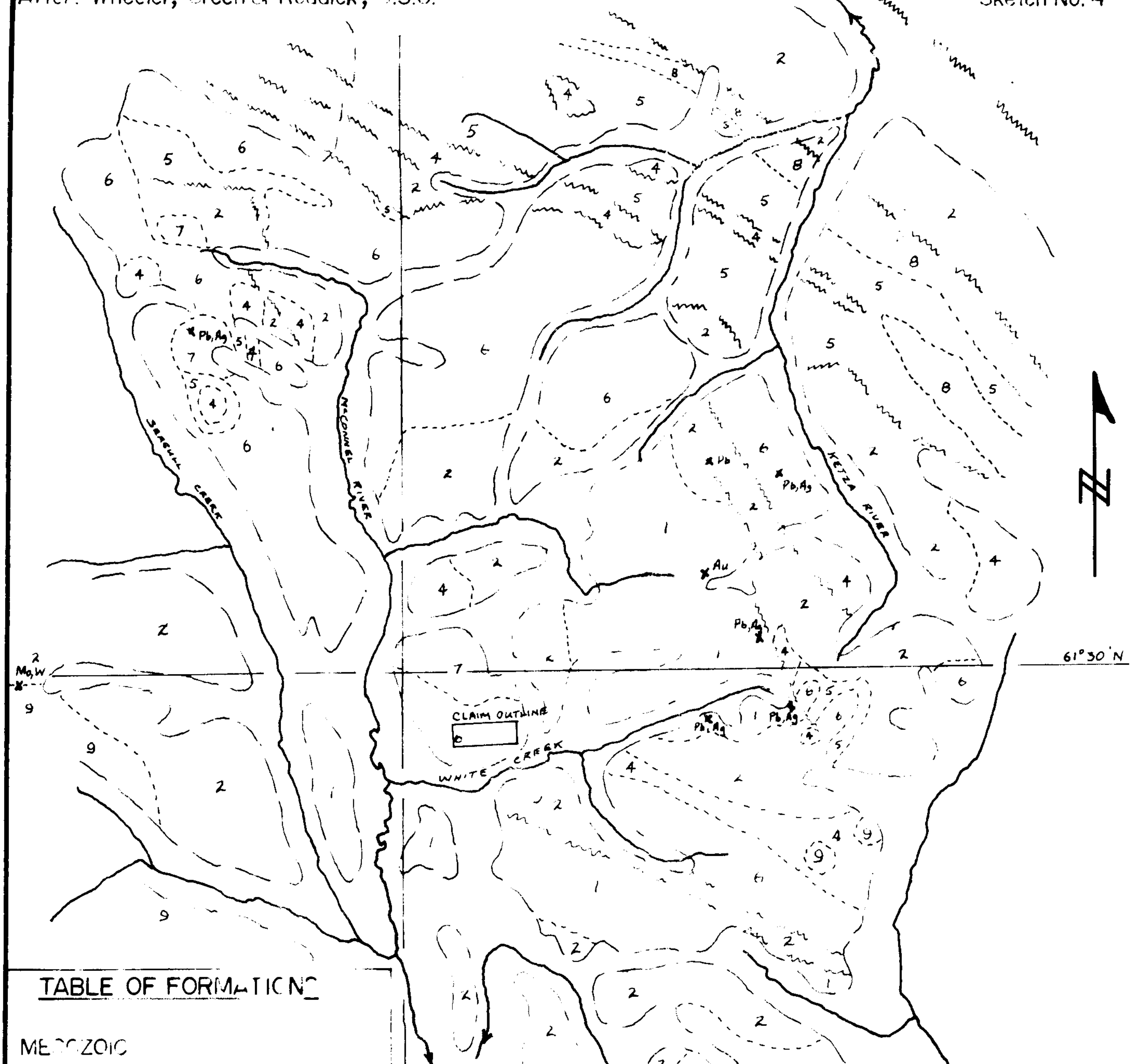


TABLE OF FORMATIONS

MESOZOIC

Jurassic and/or Cretaceous

- 9 Coast Intrusives

PALEOZOIC

Mississippian(?)

- 8 Limestone, argillite, dolomite

Mississippian(?) or Earlier

- 7 Hornblende syenite
- 6 Volcanics, minor limestone
- 5 Siliceous slate, shale, chert

Silurian and Devonian

- 4 Dolomite, minor quartzite

Ordovician and Silurian

- 3 Slate, limestone

Cambrian

- 2 Phyllite
- 1 Quartzite, limestone

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R. G. HILKER
GEOLOGICAL ENGINEER

R.G. Hilker Ltd.
Consulting Geologist
Whitehorse, Y.T.

LEGEND

- Geological contact
- Fault
- Outcrop zone boundary

CHARTA MINES LTD. (N.P.L.)	
General Geology CPA Claims	
Date: Oct. 2[illegible] - 7[illegible]	Scale: 1" = 4mi.

TABLE OF FORMATIONS

MESOZOIC

Jurassic and/or Cretaceous

| 9 | Medium to coarse-grained biotite granodiorite and quartz monzonite, part porphyritic; minor diorite, granite and gneiss. |

PALEOZOIC

Mississippian (?)

| 8 | Dark grey limestone; minor argillite and dolomite. |

Mississippian (?) or Earlier

| 7 | Heterogeneous, shattered hornblende syenite. |

| 6 | Green volcanic rocks; greenstone; breccias, tuffs and flows; minor meta-diorite, chert, slate, greywacke and limestone. |

| 5 | Siliceous slate and shale, chert, greywacke, minor chert pebble conglomerate. |

Silurian and Devonian

| 4 | Thick-bedded dolomite with local lenses of chert, minor quartzite. |

Ordovician and Silurian

| 3 | Black slate; platy black limestone; siltstone, minor volcanic breccia. |

Cambrian

| 2 | Lustrous phyllite, part limy and dolomitic; minor greenstone, limestone, chert, greywacke and phyllitic quartzite; minor greenstone breccia and tuff. |

| 1 | Massive quartzite; phyllite; limestone. |

After: Wheeler, Green, Roddick - G.S.C. Prelim. Map 7-1960.

.../14

REFERENCE TO PUBLISHED GEOLOGY

The Quiet Lake Map Sheet (Sheet 105F) was geologically mapped during the late 1950's by J.D. Wheeler, L.H. Green and J.A. Roddick of the Geological Survey of Canada. A final report has not yet been published, and the only information available is the preliminary geology map, Map 7-1960, with a short accompanying descriptive note. No previous or subsequent geology of the area has been published.

.../15

CLAIM GEOLOGY - FIELD METHODS

Geological mapping was carried out at a scale of 1" = 200 feet over the entire grid system, using the picketed lines for survey control. All rock outcrops and other geological features have been tied in to the grid, as shown on the CLAIM GEOLOGY plan. (see pocket)

Due to the broken nature of the rocks throughout the grid area, solid outcrops are difficult to distinguish. Thus, outlined areas on the CLAIM GEOLOGY plan represent mainly "outcrop zones", consisting of assumed outcrop plus broken boulders of the same rock type which appear to be very close to their original position.

Rocks over the claim group are a part of a relatively homogeneous volcanic series, with no strong marker horizons to help define stratigraphic relations. Thus, measurements of rock foliations and bedding planes were taken wherever possible and these have also been plotted on the CLAIM GEOLOGY plan. As the predominant planar strike is sub parallel to the slope direction, the downward shifting of assumed solid outcrops is not expected to alter the measured strike values significantly, although the measured dip values may well be affected due to small rotations of boulders.

.../16

CLAIM GEOLOGY

The rocks over the area of the CPA claim group are a part of a series of partly altered mainly pyroclastic volcanic rocks with a few associated meta-sedimentary rocks. The rocks have apparently undergone relatively severe structural deformation, including both faulting and folding.

The composition of the volcanic rocks is often quite variable over short distances. Because of this, the structural activity and the broken nature of rock exposures, a definition of stratigraphic relations was found to be difficult during the mapping program. A detailed description of typical hand specimens follows this section.

Basically, the volcanic rocks consist of altered, often apparently partly migmatized, felsitic agglomerates and tuff with some fine grained massive or lightly banded flows. These rocks are quite heavy due probably to a high iron content and are generally a light cream color or a mottled purple-green. The weathering of iron minerals has produced a rusty patchwork, often displaying a rough alignment, of hematite-limonite stain. In addition, minor pyrite and hematite occur as fine crystals disseminated through the groundmass of many of these rocks, in quantities of approximately one per cent.

The meta - sediments consist of phyllite and pelitic schists, with a well developed schistosity and usually a strong crenulation. These rocks are a light grey color and, when they contain pyrite, bright orange and red rust stained.

Small zones of a fine grained and dense silicious rock, which may be either volcanic or sedimentary, and which generally is fairly rich in very finely disseminated pyrite, occurs adjacent to both the volcanic rocks and the phyllites.

Due to the assumed intensive faulting, these various rock types are not apparently continuous over strike length or across section, and correlation has not been possible.

The structural evidence of flow, metamorphism, folding and faulting consists of measured foliations and cleavage, banding and fragmental flow texture, lineation and small fold axes and distinct fracture sets.

The strongest feature is called foliation but, through the various rock types, it consists also of flow banding, rock cleavage, mineral schistosity and the suggested migmatic texture. The only primary structure is the flow banding and, while the others are assumed to at least sub-parallel original bedding planes, most of them are more or less metamorphic features. Some of the foliations and migmatic textures, especially in the fragmental rocks, with a more or less ordered rust patchwork, may indeed be very close to primary textures, subject only to mild or low grade metamorphism and regional pressures and subsequent oxidization of iron minerals. Many of these textures are very obscure and irregular, and exact definition is very difficult. The evidence that this "foliation" is at least in part secondary is that in the more massive and structurally competent rocks a fairly good rock cleavage is developed parallel to this trend. The average

.../18

trend is roughly 60° with a south dip, with ranges roughly through 20° to 100°.

Small, very asymmetrical folds, of the drag fold variety, were observed in some outcrops. The few fold axes measured showed a partial correlation with the faint lineation sometimes observed on the foliation plane, possibly its intersection with one of the fracture systems, and also the crenulation in the phyllites. This trend is roughly perpendicular to the foliation strike and pluges to the north or south, depending on the dip of the foliation. The variation, mainly in the dip, of the liniation and crenulations, suggests that at least two phases of structural activity have affected the rocks.

One dominant set of fracture or joint planes, at roughly 135° with a fairly steep easterly dip, was observed, with several weaker and irregular trends not so readily defined. Faulting, which was not directly observed, has been inferred sub-parallel to the major trend. This is also more or less parallel to the dominant northwest -southeast regional trend in this area.

The central area of the claim group is marked by a strong and very bright rust or gossan zone. This central zone, with a few smaller subsidiary zones, appears to strike roughly along the major foliation trend, although it is discontinuous along strike and has been cut off by the inferred fault. As previously mentioned, most of the rocks in the area contain minor pyrite, sometimes hematite and often a rusty patchwork of secondary iron oxides. This results in an overall deep orange-brown rust coloration of weathered rock fragments and grit soils.

.../19

The strong rust zone differs from the above as there is generally more pyrite present, often very finely disseminated with a content up to 10%, no hematite was observed, and the rocks are generally of the more siliceous variety, consisting mainly of either the massive, very fine grained and dense siliceous rocks and the light coloured phyllite or pelitic schist. No other metallic minerals were observed in this zone. The pyrite may be syngenetic or it may be associated with local faulting.

Quartz veins and veinlets, with associated crystalline hematite, occur throughout most of the area of the claims. They are generally narrow, somewhat irregular and discontinuous, often occurring in apparent tension gashes, at right angles to the main foliation, and are most abundant in the more highly fractured structurally competent rocks. Typical dimensions are ¼ inch by 5 to 10 inches. Locally, these may be quite closely spaced, although the typical occurrance is widely scattered. The hematite occurs as fairly well formed tetrahedrons, with growth either from the walls of the quartz vein inwards or in the central core of the vein.

Larger quartz veins, which are probably more continuous, were seldom observed in outcrop but were in evidence in three locations through large boulders in boulder trains. In one such boulder, from the vein at 59+00W; 16+00N, a small (1" x 2") bleb of massive galena was observed. As this was the only galena positively identified during the field work and galena would very rarely be leached from this environment, it is assumed that this type of mineralization is rare over this area.

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Finally, the G.S.C. mapping has indicated an association between the volcanics and small intrusive plugs of shattered hornblende syenite. One such plug of this rock type occurs just north and west of the CPA claims. These rocks were not observed during the present work, but are described on G.S.C. Map 7-1960 as "fine-grained, leucocratic syenite grading locally into pegmatitic syenite containing 1/2 inch hornblende crystals. The syenites are cut by slickensided joints, numerous shear zones and carbonated breccia zones and brown amygdaloidal felsite dykes. Fluorite is an abundant accessory mineral in the syenite body near peak 6541 ft. This is the same body as that associated with the present work. The strong rust zones on the claim group and continuing to the northwest occur within the volcanic rocks and adjacent to the syenite contact.

The association of the two rock types and the intense structural activity within both rock types may be closely associated with the rust zones, quartz veining and presently defined geochemical anomalies. It is interesting to note that fluorite, as an accessory mineral, is associated with the Adanac molybdenum property and the Talbot Arm molybdenum-copper prospect, both of which are porphyry-type occurrences.

.../21

CLAIM GEOLOGY
TABLE OF FORMATIONS

PALEOZOIC

Mississippian (?) or Earlier

6m	Massive felsite.
6f	Felsitic tuff, agglomerate, breccia.
6s	Fine grained, massive siliceous rock, rich in pyrite, strongly rusted.
6p	Phyllite, pelitic schist.
6r	Strongly rusted 6p, often pyrite rich.
qv	Quartz veins (greater than 1 ft. in width).

G.G. Carlson

.../22

MACROSCOPIC DESCRIPTION OF ROCK SAMPLES

L60+00W, 11+00S	Light coloured felsite tuff (?), with irregular, faintly banded orange rust patches comprising 30-40% of rock. Trace of finely disseminated metallic, probably pyrite and possibly also hematite. (Unit 6f).
L60+00W, 14+00S	As above, but some more massive, less rust. Light greenish cast to some. Less visible pyrite. (Unit 6f).
L64+00W, 13+00S	As above, but again more massive, less felsic. Light green-purple cast, possible trace of hematite. Light streaking or banding of rusty patches and fine grained black mineral (biotite?) Unit 6f).
L64+00W, 11+00S	Felsite with strong banding of rust patches. Bands orange to dark red-brown, to 4 mm. wide, discontinuous. (Unit 6f/6m?)
L64+00W, 5+00S	Relatively massive intermediate tuff (?), similar to 64W;13S. Roughly mottled purple-green with trace to 1% disseminated metallics (pyrite and (?) hematite.) Patches of rusty material are irregular. Minor white quartz injections (?) as elongated blebs. (Unit 6f).
L64+00W, 3+00S	Massive siliceous rock (rhyolite?) with 2-3% disseminated pyrite cubes, to 2 mm. and bright yellow-orange weathered surface. (Unit 6s).
L64+00W, 2+00N	Light grey coloured felsite tuff (?) Small, elongated rust patches parallel rough rock foliation. No visible metallics. (Unit 6f).
L64+00W, 3+00N	Dense, fine grained siliceous (quartzite or rhyolitic) rock with 2 to 3% finely disseminated pyrite cubes. Bright orange-red rusted surface. Hand speciment highly and irregularly fractured. (Unit 6s).
L64+00W, 5+00N	Weakly foliated rock, intermediate composition, to 20% fine grained biotite in feldspar-quartz with 5% rusty patches and trace pyrite cubes. (Unit 6m-6f?)

.../23

L64+00W, 6+00N	Felsitic tuff (?) with irregular rust patches. Trace disseminated pyrite. (Unit 6f).
L58+00W, 16+00N	Light grey-brown coloured tuff, approximately 90% fragments, some of which are feldspar (?) crystals. Rust is fairly abundant, minor quartz veinlets with associated hematite. (Unit 6f).
L32+00W, 4+00N	Dark silvery grey phyllite, rust on exposed surface but no visible metallics. Fairly strong crenulation is evident parallel to a small fold (warped hand speciment) axis. (Unit 6p).
L60+00W, 6+00S	Bright orange weathered lightly foliated siliceous rock. Minor visible pyrite cubes, weathered evidence of approximately 5% pyrite. (Unit 6s).
L80+00W, 4+00S	Agglomerate. Approximately 50% felsitic groundmass and 50% patchwork of secondary iron oxides. Rust patches show very rough alignment. No visible metallic minerals. (Unit 6f).
L80+00W, 4+00N	Mainly massive, fine grained light brown (rust) coloured felsite. Strong dark brown rust on fracture faces. (unit 6m).
L32+00W, 15+00N	Well foliated light grey coloured pelitic schist with fairly strong orange and red rust. No visible pyrite. Tight crenulation on foliation face. (Unit 6r).
L50+00W, 6+00S	Massive light grey coloured felsite with 3-5% finely, disseminated pyrite cubes and bright yellow-orange weathered surface. (Unit 6s).
L38+00W, 10+00N	Purple brown coloured tuff with obvious flow texture. Approximately 10-15% light coloured (felsite) fragments and 5-10% rusted fragments. No visible metallics. (Unit 6f).
L36+00W, 12+00N	Relatively dark coloured heavey and fairly massive volcanic. (fine fragmental ?) Rust is light, with trace of visible pyrite. (Unit 6m-6f?)
L71+00W, 8+00S	Massive or very faintly banded light brown-grey felsite. Rock is quite heavey, with very light coloured rust staining (?) over approximately 50% of the minerals. (Unit 6m).

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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 Cordilleran 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 Mines deposit, have been outlined by this technique. In the Yukon, soil sampling programs using both lead and silver as pathfinder elements have been particularly successful in locating lead-silver mineralized veins.

For the successful application of a soil sampling survey, however, a careful study of all factors which might affect 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.

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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 using a 2½ lb. grubhoe. In areas of little or no vegetation, with no soil development, a sample of surface fines, referred to as "grit", was gathered. 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 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.

.../26

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, molybdenum, lead, zinc and silver.

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 both elements on a Techtron AA-5 Digital atomic absorption unit. Results of the determinations of the elements were returned to Whitehorse by First Class mail.

Certificates of Analysis, for all soil samples tested, from Chemex Labs Limited, are on file at the office of R.G. Hilker Limited, #8 Northern Metalic Bldg., Whitehorse, Yukon Territory.

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

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

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

where: n = total number of values

Σppm = sum of values

$\bar{x}$ = arithmetic mean

Σppm^2 = sum of squares of values

s = standard deviation

For the present survey, extremely high values for lead have been reduced to a common maximum value (500 ppm) for the calculations. This is done to avoid the misleading influence these values have on the overall characteristics of the population.

The statistics, mean and standard deviation, 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).

The assumed lognormal distribution is monomodal. That is, there is ideally one set of values with its arithmetic mean substantially greater than its geometric mean (mode). However, field experience has shown that a true lognormal distribution

.../28

rarely occurs, and that most trace metal populations* are a combination of two or more distinct sets of values which reflect various bedrock and soil conditions.

A histogram on normal graph paper and a cumulative frequency plot on logarithmic probability paper have been constructed for each element. On the histogram, each separate set is indicated by a divergence from a typical lognormal curve. This is usually a hump in the curve which represents the approximate modal value of the set..

When the cumulative frequency is plotted versus the metal concentration on logarithmic probability paper, each lognormal set of values gives a straight line segment. A graph of this type will generally provide more detailed information about the overall population than the normal histogram.

The statistical values calculated for each element are displayed in Table 1 and the histograms and logarithmic probability plots are shown in Sketches 5 through 8 under the INTERPRETATION section of this report. Each set within a metal population, on both the histogram and the log-probability curve, has been labelled C1, C2, C3...for copper and L1, L2, L3... for lead in order of increasing metal concentration. The value represented by each symbol is the estimated mode for the particular set. It should be noted that these modal values

*NOTE: "Population" is used here to mean the set of all measured values for any one element within the grid area, while "set" means any sub-set within a population as defined above.

.../29

and the actual number of sets within each population is an interpretation of the information provided by the curves and not a concrete fact.

The large number of sets within each metal population, as indicated by the curves, is due to a combination of all factors influencing the chemistry of the sampled material, some of which affect results in very subtle ways. It is beyond the scope of the present interpretation to segregate all but the most influencing factors.

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TOPOGRAPHY VEGETATION AND SOILS

The CPA claim group lies mainly on the south facing side of a steep and deeply dissected mountain ridge. Elevations vary from 3500 feet at the base of the ridge to 6514 feet, the highest peak on the ridge. The baseline of the grid roughly parallels the main ridge direction, while the crosslines parallel the main slope direction.

The baseline traverses three main gullies, centered at 8+00W, 24+00W and 60+00W. The west end of the baseline, west of approximately 76+00W, is on the downward sloping west end of the ridge. Slopes over the grid area average 20° to 40°, with rock bluffs and steep cuts often over 60° and upper slopes 0° to 5°. The baseline runs roughly along the shoulder of the slope, although this feature is mainly destroyed by the cross cutting gullies.

Most of the grid area is either bare of vegetation or, on the gentler upper slopes, grass and moss covered. Portions of the southeast and southwest corners and the extreme south edge are thickly covered with buck brush, scrub black spruce and alpine creeping spruce. The spruce also occurs in isolated clumps on the upper slopes. A fairly high water table, due to slow melting of a large snow accumulation and fairly abundant rainfall, results in thick and lush vegetation on the lower slopes and in gully bottoms.

.../31

The soils are reflected by the vegetation. On steep slopes with no vegetation cover, the soils and rocks are in a state of continuous mechanical and chemical erosion and transport. Soils here are called rock grit and are believed to be very similar chemically to the weathered parent bedrock surface. Experience in this type of environment has shown this assumption to be essentially correct for trace base metal concentrations. Grass and moss covered upper slopes are more stable and soils here are somewhat more chemically developed. Some chemical leaching of metals from upper horizons is probable, but the sampled non-organic horizon is expected to represent fairly accurately the trace metal concentration of the parent weathered bedrock.

The soils in the vegetated lower slope areas are more complex and provide the most difficult sampling medium. Basically, a black humic layer covers a 2 to 6 inch thick volcanic ash horizon which in turn overlies talus boulders and a partially developed B horizon soil. This soil is often very difficult to locate within the boulders and, when found, is frequently contaminated by the volcanic ash layer and the surface humic layer.

While the source of metal ions in the non-vegetated areas is readily traced a short distance up slope, metals detected in soils from the lower vegetated areas may be derived from a bedrock source directly below or any distance upslope and are thus more difficult to interpret.

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INTERPRETATION

The copper and lead assay results from the soil samples collected over the CPA grid indicate a lower than average background concentration for both metals. Anomalous values for both metals occur, although they are neither as high, relatively, nor as abundant for copper as they are for lead.

The statistics as calculated for each element are shown in TABLE L (next page). These values were calculated from the first results received from the assay lab, a total of 741 samples representing over 2/3 of the total number of samples collected. The numbers of these samples are indicated in TABLE I. These samples appear to be statistically representative of the entire lot of samples.

For copper, both the mean ($\bar{x}$ = 16 ppm) and the standard deviation (s = 17 ppm) are low for this type of survey. Statistically "possibly anomalous" and "probably anomalous" values, $\bar{x}$ + 1s and $\bar{x}$ + 2s, are 33 ppm and 50 ppm respectively.

The mean, standard deviation, "possibly anomalous" and "probably anomalous" values for lead are 43 ppm, 51 ppm, 94 ppm and 145 ppm, respectively. These values again are low but are closer to the typical values expected than the copper values.

The histograms (sketches 5 and 6) show the behaviour of copper to be very close to an ideal lognormal distribution. A total of three sets are evident superimposed on the primary (background) set of values. All three of these sets are relatively insignificant with respect to the number of values in each.

.../33

Charta Mines Ltd. (N.P.L.)

CPA Project

Geochemistry Statistics

TABLE 1

Element	Cu	Pb*
n	741	741
x	11,851	31,977
x^2	395,908	3,305,450
$\bar{x}$	16(15.99)	43(43.15)
s	17(16.70)	51(50.98)
$\bar{x}$+1s	33	94
$\bar{x}$+2s	50	145
$\bar{x}$+3s	67	196
$\bar{x}$+4s	84	247
$\bar{x}$+5s	101	298

*Note: - All values are in parts per million.

Any value greater than 500 ppm Pb was reduced to 500 ppm Pb for use in the calculations.

The following is a list of the numbers of the samples used in calculating the above figures:

17901 - 18166 (incl.)
18168 - 18451 (incl.)
18454 - 18555 (incl.)
18601 - 18689 (incl.)

The lead curve is less charactaristic as the values are more spread out with a greater number of larger secondary sets of values.

The logarithmic probability curves (sketches 7 and 8) reflect the histograms fairly accurately. The four named copper sets, labelled C1, C2, C3 and C4, have approximate modal values of 8 ppm, 40 ppm, 70 ppm and 100 ppm (or greater). The two highest sets are both within the statistically "probably anomalous" range.

A total of seven sets have been identified on the lead curves. These are P1, P2, P3, P4, P5, P6 and P7 with approximate modal values of 20 ppm, 35 ppm, 50 ppm, 70 ppm, 105 ppm, 125 ppm and 145 ppm (or greater). Set P7 is the only set greater than $\bar{x}$ + 2s, while sets P5 and P6 are greater than $\bar{x}$ + 1s.

Due to the poor definition of stratigraphy in the area and to the suggested geological complexities, mainly structural, the correlation of the various sets for each element with observed geological features is not possible. For copper, set C3 is statistically anomalous and set C4 is statistically strongly anomalous, while in the case of lead, all statistically anomalous values are within set P7. No correlation between the two elements is evident on either the histograms or the logarithmic - probability plots.

As explained under the description of soils, most of the sample material is expected to be quite similar, chemically, to its weathered parent bedrock source. Therefore, the chemical dispersion of either metal, but mainly copper, will vary mainly with the redox potential,

.../35

pH and the presence of other secondary precipitates, all determined by the country rocks. Although lead is quite chemically immobile in most environments, copper could be highly affected by conditions within the CPA grid area. Oxidizing conditions, as indicated by the abundant rust from the oxidization of pyrite and hematite, and a low pH, measured over a large central area of the grid, namely in the strong, brightly coloured rust zones, both tend to increase the chemical mobility of copper, leaching it from surface rock and soil samples. Counteracting these forces is a tendency for copper to be co-precipitated with hydrous iron oxides.

Contouring of both elements was carried out using $\bar{x}$, $\bar{x}$ + 1s, $\bar{x}$ + 2s, etc. as contour values. The $\bar{x}$ + 2s value is used for anomaly definition, while the $\bar{x}$ + 4s is used to outline strongly anomalous zones. Five anomalous zones, labelled ZONES A, B, C, D and E, have been outlined. One of these, ZONE E, occurs off the grid to the north-west and was outlined by reconnaissance sampling in a cirque below a rust zone. (See inset geochemistry plan).

None of the outlined anomalous zones and in fact none of the smaller isolated anomalies lie over the well - defined bright red-orange rust zone. Although copper could be leached from these rocks, no downslope reflection was uncovered and it is suspected that this zone is a result of excessive concentrations of iron only.

ZONE A and ZONE B are the most extensive anomalies, both approximately 2000 feet by roughly 200 to 600 feet, and consisting of anomalous copper and lead values. Both zones roughly parallel the

.../36

major foliation trend, although, as previously mentioned, there is no obvious correlation with one or more of the rock types. Although there is general overlap of the two metals, minor divergences of anomalous values suggest a slight ringing of the high copper area by the high lead. Neutral to weakly acid pH values suggest a relatively low chemical mobility for copper and thus dispersion of both copper and lead by mechanical means.

ZONE C and ZONE D are not well defined and occur mainly on steep slopes. They appear to be similar to the first two zones, except that ZONE D has a weaker lead expression. A similar geological origin is expected.

The economic significance of these zones is difficult to predict. No copper mineralization was observed in the vicinity of these zones and the anomalous values are somewhat low. However, all of the rocks in these areas exhibit a strong degree of oxidization, and copper mineralization may be masked due to surface leaching. The small galena sample was noted upslope from the ZONE B anomaly. However, the large quartz vein from which this material was evidently derived is not extensive enough to be the cause of the entire ZONE B lead anomaly. The source of the anomalous metal values may be due to any of the three courses listed below:

1. Disseminated mineralization, either partially or totally leached from the observed weathered surface rocks, may occur within certain horizons of the volcanic rocks.

.../37

2. Copper and lead mineralization may be associated in trace amounts with the small quartz veinlets. However, these quartz veinlets, with associated hematite, occur throughout most of the grid area, and this is much more extensive than the outlined geochemical anomalies.

3. Anomalous copper and lead values may result from metal rich solutions associated with faulting and fracturing in zones parallel to the major foliation. The structural activity and metal rich solutions would, in this case, likely be associated with the intrusion and subsequent shattering and brecciation of the hornblende syenite plug to the north.

Definition of the true nature of the source would be aided by a close examination of the rocks across an anomalous zone and across the volcanics - syenite contact to the north. This would include both rock geochemistry and microscopic examination. Trenching may help to expose fresh rock surfaces, although the nature of the observed weathering suggests quite deep oxidization.

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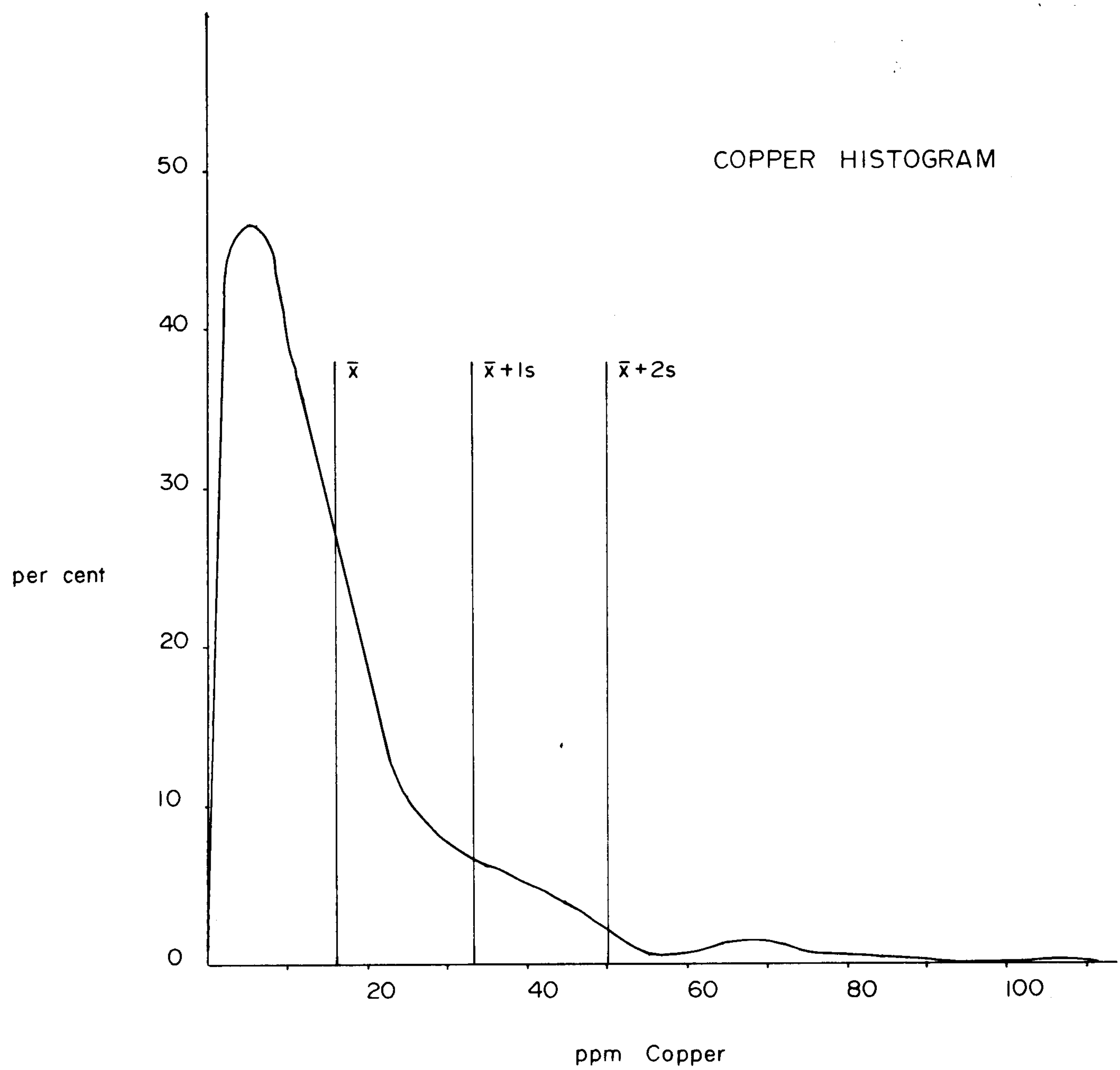

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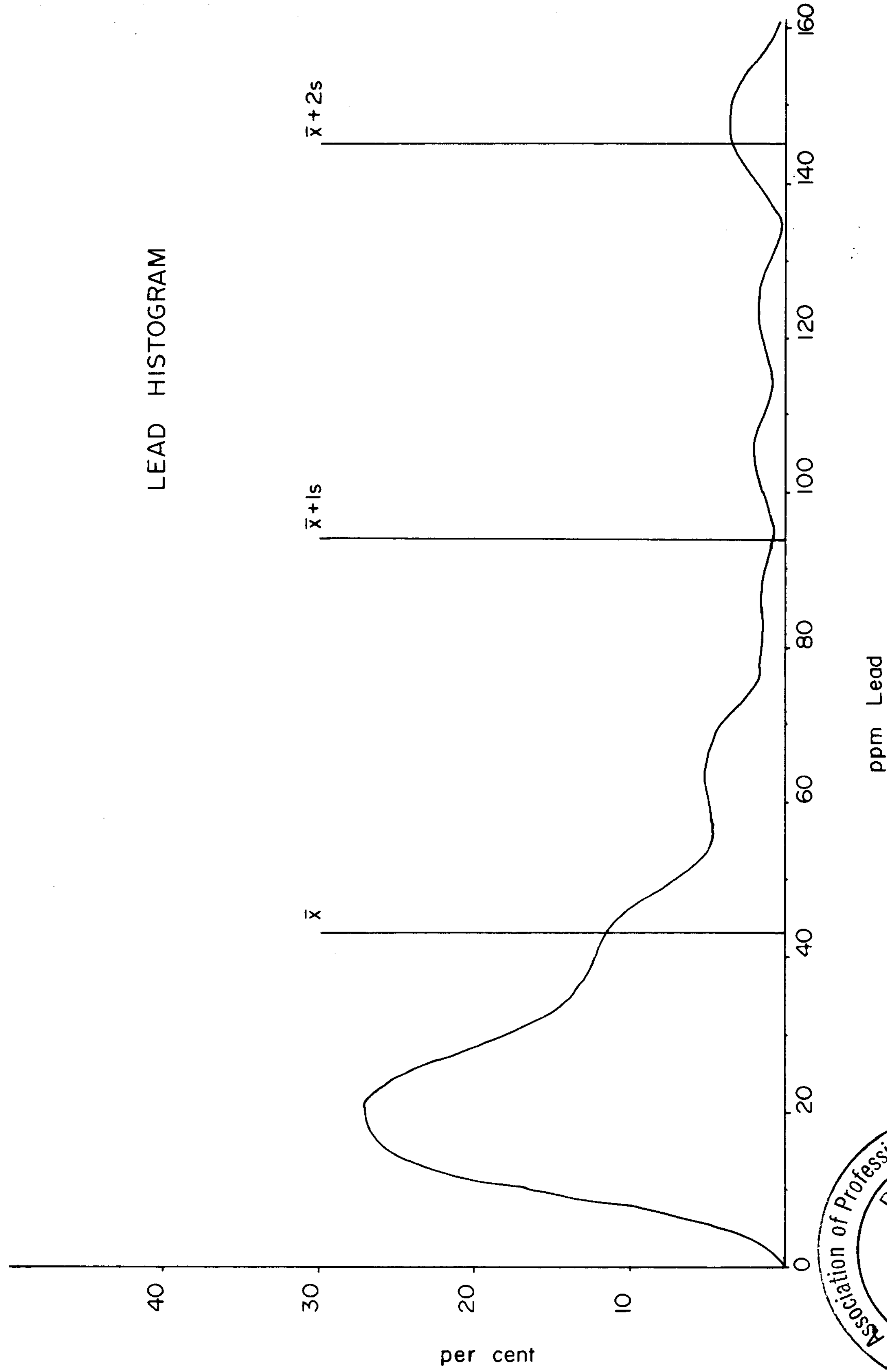
GEOLOGICAL
ENGINEER

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

CHARTA MINES LTD. (NPL)	
CPA CLAIM GROUP COPPER HISTOGRAM	
DATE: SEPT. 15/71	SCALE: as shown

Sketch no. 6



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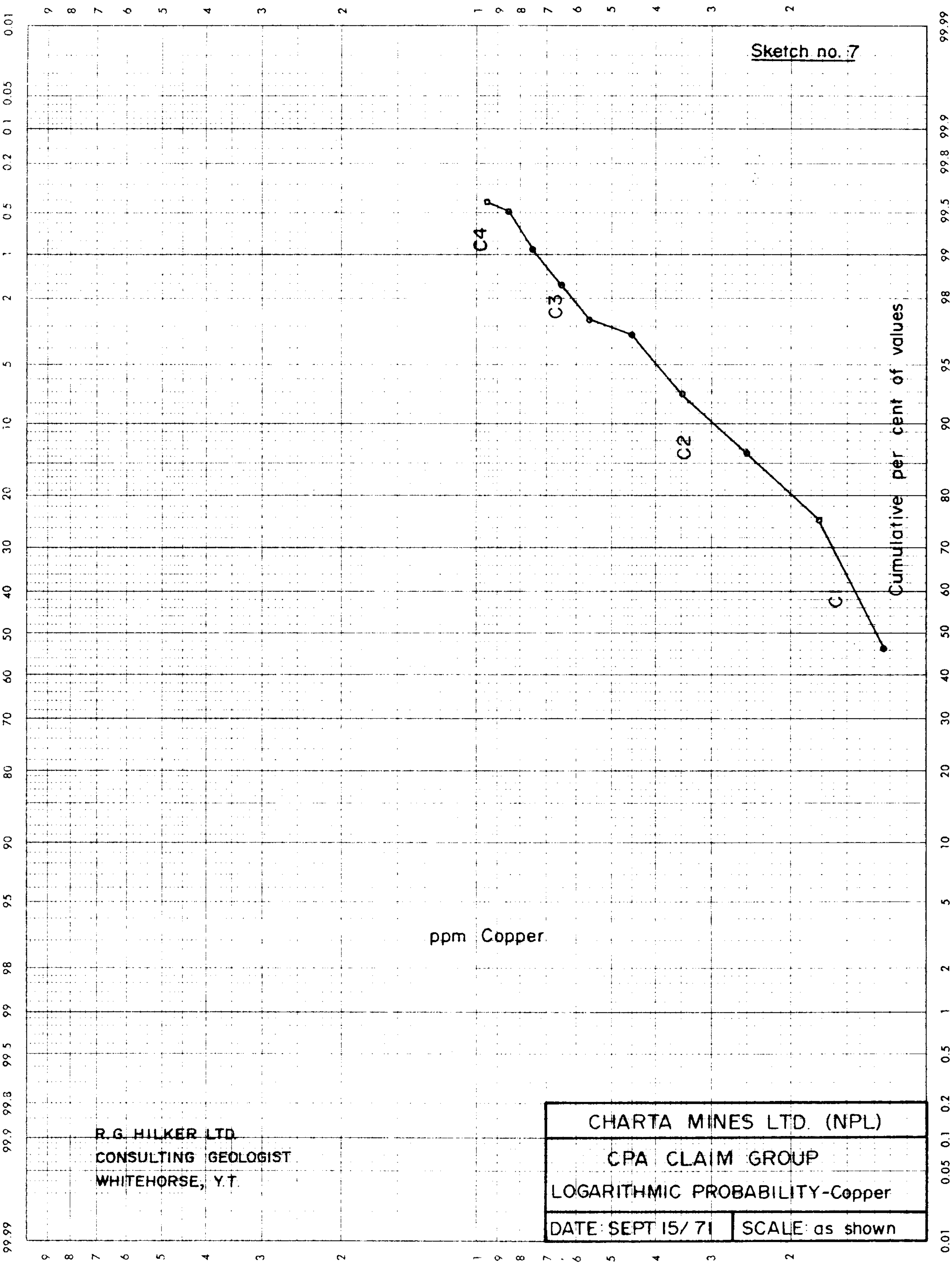
WHITEHORSE, Y. T.

CHARTA MINES LTD. (NPL)	
CPA CLAIM GROUP LEAD HISTOGRAM	
DATE: SEPT. 15/71	SCALE: as shown



CHARTA MINES LTD. (NPL)

CPA CLAIM GROUP

LOGARITHMIC PROBABILITY-Copper

DATE: SEPT 15/ 71 | SCALE: as shown

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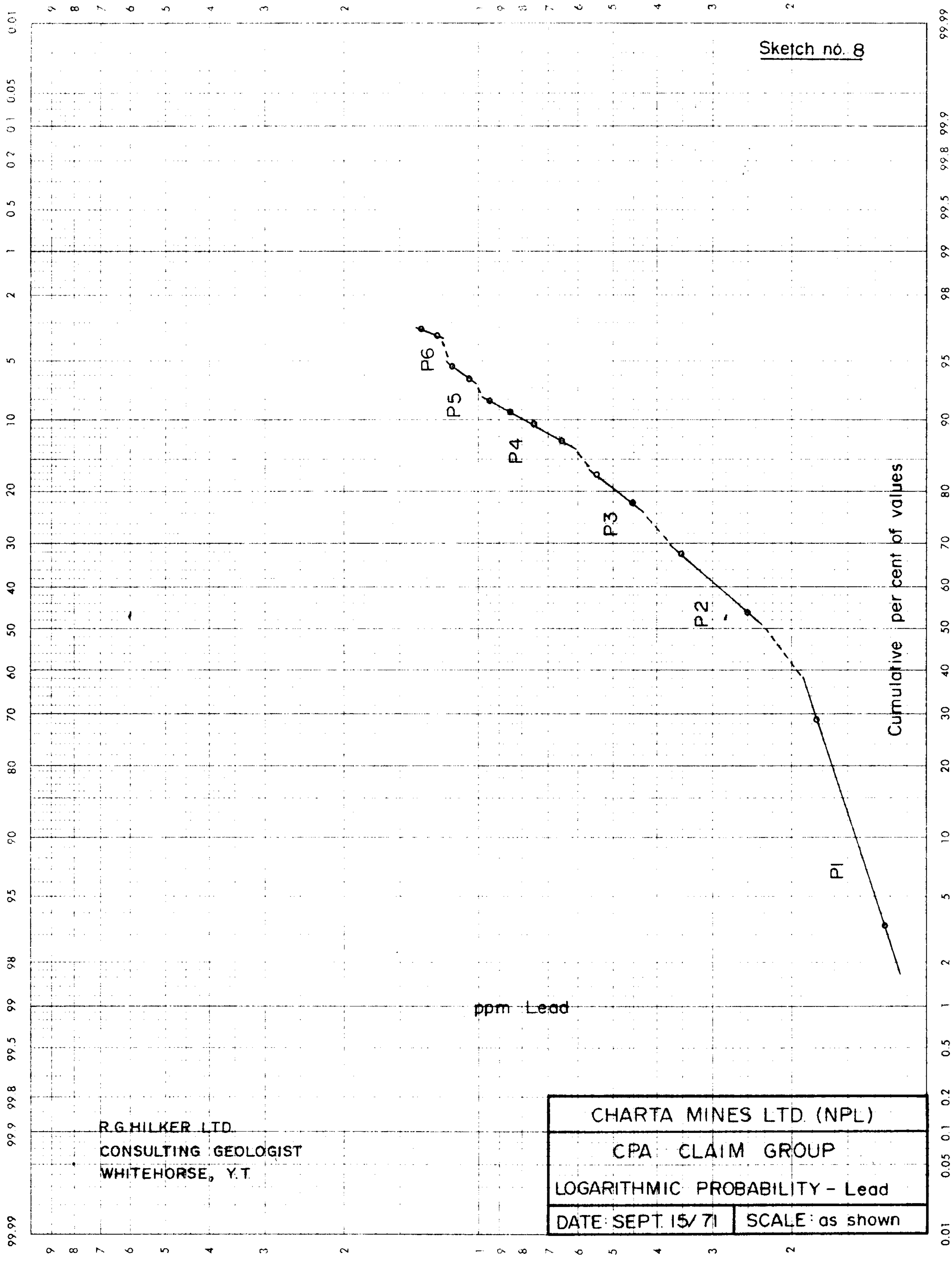

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WHITEHORSE, Y.T.

CHARTA MINES LTD. (NPL)

CPA CLAIM GROUP

LOGARITHMIC PROBABILITY - Lead

DATE: SEPT. 15/71 | SCALE: as shown

MAGNETICS SURVEY

INSTRUMENTATION

The field survey instrument used was a Scintrex Model MF-2 vertical field fluxgate magnetomer, Serial Number 002132. This is a second generation transistorized, integrated circuit instrument which retains the sensitivity of the older MF-1 units, but has greater temperature stability. A copy of the manufacturer's specification sheet from Appendix A of this report.

For the field survey, the MF-2 magnetometer was set to read 1600 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

.../39

The fluxgate magnetometer as defined by M.B. Dobrin in the text book "Introduction to Geophysical Prospecting," is 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 5 1/2 lb. package electronics, sensor and rechargeable batteries. With the latest I.C. and F.E.T.

.../40

circuitry and high precision components, a temperature stability better than 1 gamma per degree is standard (with .24 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 Scintres 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 August 16th to August 26th, 1971, inclusive, under the supervision of Mr. R.G. Hilker, Consulting Geologist and Professional Engineer, Whitehorse, Yukon Territory. Mr. Hilker supervised the date calculations mapping and contouring. The magnetics interpretation report was written by R.G. Hilker, the preparation work was done in Whitehorse between September 1st and 15th, 1971.

.../41

MAGNETICS FIELD METHOD

The magnetics survey was carried out by taking a magnetometer reading at each 100 foot station over the entire 19.5 miles of line grid.

A Base Control Station (BCS), was located at camp 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	Camp	2000
CS-1	B.L. - 48+00W	1900
CS-2	B.L. - 60+00W	1850
CS-3	B.L. - 72+00W	1850
CS-4	B.L. - 36+00W	1950
CS-5	B.L. - 24+00W	2100
CS-6	B.L. - 12+00W	2900

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 arbitary 2000 gamma value at the BCS and the CS that was being determined.

.../42

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.

INTERPRETATION

The magnetic values measured on the CPA claim group grid system vary between a high of 5000 gammas and a low of 1600 gammas. The magnetics are based on an assumed 2000 gamma base control station value, for measuring the magnetic differences throughout the survey area.

The CPA claim group magnetic intensities may be roughly divided into two areas; from line 36+00W to Line 0+00 the magnetic intensities vary in the range of 2000 gammas to 3000 gammas with a high of 5000 gammas, and from line 36+00W to line 105+00W the magnetic variations range from 2000 gammas to 1800 gammas with a low of 1600 gammas. The higher magnetic values occur roughly in the area of the main gossan zone north of the baseline between line 36+00W and line 20+00W. Two infered faults have been plotted adjacent to L36+00W - L32+00W and L20+00W - L16+00W, the faults are based on geological and mapping lineations.

The greater than background magnetics located on the east side of the grid, suggests a near surface basement rock that may be

.../43

igneous in composition and capped by the highly altered volcanic assemblage, as outlined by the geological mapping. Possibly, the basement rock has been block faulted upward and the igneous assemblage is a part of the hornblende syenite that occurs north and west of the CPA linegrid. The change in the magnetics, to the east of L36+00W suggests a change in rock types, that may be associated with the intrusive syenite plug located north of the grid system.

.../44

CONCLUSIONS

The CPA claim group contains a cluster of copper and lead probable to strongly, anomalies north and south of the baseline between line 84+00W and line 40+00W and labeled Zone A & B. Both of these zones roughly parallel a major foliation trend. Zone A & B occurs to the west of the north-south trending magnetic high that occurs near L36+00W and the area east of the picket line. The magnetic lineation adjacent to L36+00W may be a fault contact between an intrusive igneous syenite and the altered volcanics. Strong copper/lead anomalies occur in a gossan on L105+00W and in a cirque north of the claim group and are labeled Zone C and E. The lead values are particularly high in Zone C, although the L105+00W is only a reconnaissance line. The reconnaissance geochemical traverse, in the cirque north of the claim group, has indicated strongly anomalous copper and lead values over a gossan zone. The gossan zones occur near the contact with a shattered hornblende syenite (geology map 7-1960) and altered volcanic rocks.

The magnetics suggest that the eastern portion of the CPA grid contains a rock type that is more magnetic in composition than the surface volcanic rocks on the west part of the grid. The surface ock types are similiar in composition throughout the CPA grid system. t is postulated that the east part of the CPA grid contains a volcanic ock type cap over a more magnetic igneous intrusive basement rock. deep orange red gossan occurs on the north-east side of the grid,

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within the magnetic high and may be caused by hematite.

The area to the west, of L36+00W and the high magnetics, contains the copper and lead anomalous zones. This area may be described as being a favorable structural zone if an igneous intrusive is present on the eastern part of the grid system. The areas north and west of the CPA grid are favorable geological areas that are close to the volcanic and syenite contact.

The completed surface exploration programme on the CPA claim group has indicated interesting geological, magnetic and geochemical results within the claim group and to adjoining areas to the north and west. Further exploration is warranted on the claim group and adjacent areas, to attempt to delineate economic mineralization.

.../46

RECOMMENDATIONS

The surface exploration programme, consisting of geological, geochemical and magnetics, on the CPA 1-12 claim group has outlined areas of above background copper and lead anomalies. The copper and lead anomalies occur to the west of a magnetic high area. Further surface exploration is recommended on the existing linegrid and reconnaissance geology, magnetics and geochemistry to the north and west of the present claim group.

Reconnaissance Linegrid	$ 2,000.00
Geological Mapping	1,200.00
Geological Trenching	2,000.00
Geochemical Surveying	1,200.00
Geochemical Determinations	1,500.00
Magnetics	1,000.00
Transportation to Property	3,500.00
Camp Costs & Radio	2,000.00
Report On Exploration & Drafting	1,500.00
Contingencies	1,100.00
TOTAL SURFACE PROGRAMME	$17,000.00

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

R. G. Hilker

R.G. Hilker, P.Eng.,
Consultant Geologist
Whitehorse, Yukon Terr.
September 15, 1971

.../47

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 #8 Northern Metalic Building, and postal address P.O. Box 566, 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 CPA 1-12 claim group, located in the Watson Lake Mining Division of the Yukon Territory, from August 16th to August 30th, 1971 and was on the claim group during exploration on August 16th and 21st, 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 employ. Report preparation was by G.G. Carlson, M.L. Smith - drafting and R.G. Hilker between the period September 1st and September 15th, 1971.

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

DATED this 15th day of September A.D. 1971.

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

R.G. Hilker, P. Eng.

APPENDIX

Certificate of Expenditure - for Assessment Work Purposes, for the period August 16th through August 30th, 1971 on the CPA 1-12 claim group White Creek area, Yukon Territory.

Contract Costs - R.G. Hilker Limited

Invoice #2075 (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 106 Lambert Street in the City of Whitehorse, Yukon Territory, do hereby declare the above to be true and correct.

Certified Correct

[signature]

L.R. Rasmuson

DATED this ~~15th~~ 19th day of ~~September~~ NOVEMBER, 1971
in the City of Whitehorse, Yukon Territory

[signature]

Notary Public

PHONE: OFFICE 667-2819
RES. 668-2022
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 Limited (N.P.L.)
510 - 890 West Pender Street
Vancouver 1, B.C.

August 31, 1971 Re - C.P.A. Project

INVOICE # 2075

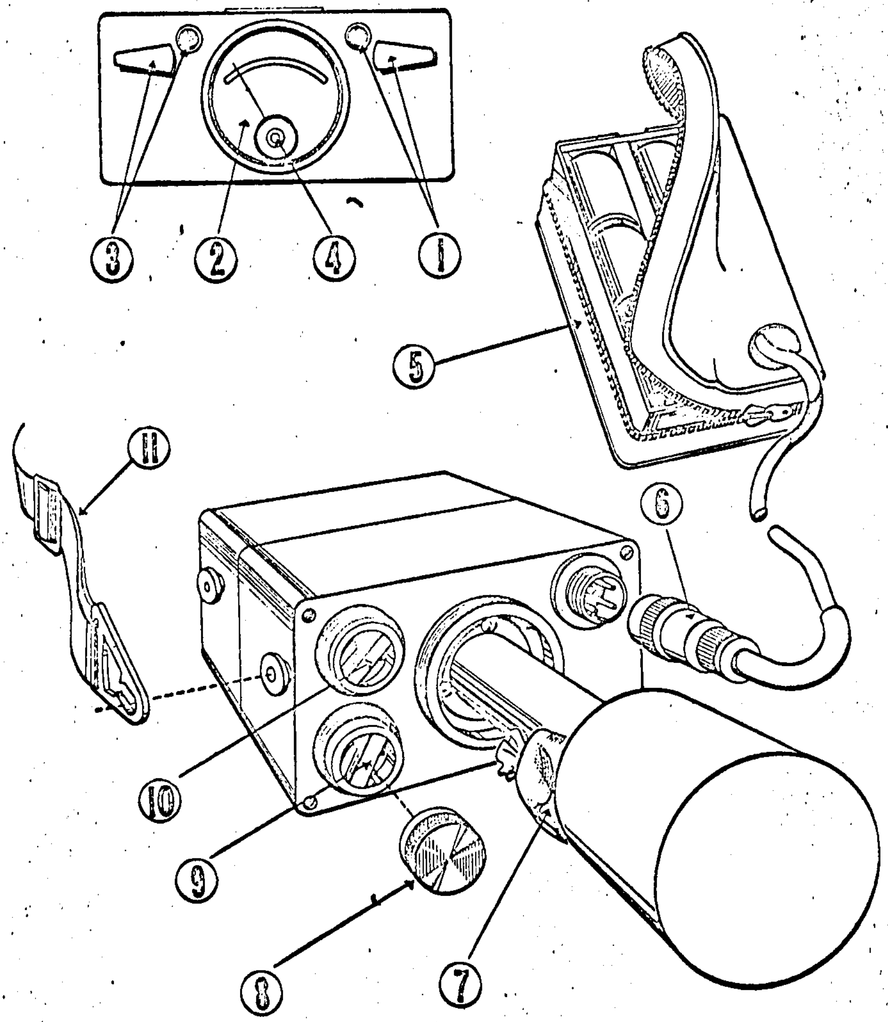
TO:

Contract cost for mineral exploration on the
CPA 1-12 Claim Group - White Creek Area Yukon Territory.

Contract Costs

R.G. Hilker Limited

Linegrid - 20 line miles	$ 2,000.00
Geology Mapping	1,500.00
Magnetics Survey	1,000.00
Geochemical Survey	1,500.00
Geochemical Determinations	1,664.00
Camp Rental	500.00
Radio	300.00
Drafting Data Collected	500.00
Report on Property	500.00
Transportation	2,036.00
Camp Supplies	1,000.00
TOTAL INVOICE	$12,500.00



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

SPECIFICATIONS OF FLUXGATE MAGNETOMETER MODEL MF-2

	RANGES	SENSITIVITY
Standard:	Plus or minus	
	1,000 gammas f.sc.	20 gammas/div.
	3,000 gammas f.sc.	50 gammas/div.
	10,000 gammas f.sc.	200 gammas/div.
	30,000 gammas f.sc.	500 gammas/div.
	100,000 gammas f.sc.	2000 gammas/div.
Optional:	100 gammas f.sc.	2 gammas/div.
	300 gammas f.sc.	5 gammas/div.

Meter: Taut-band suspension
100 gamma scale 2.1" long — 50 div.
300 gamma scale 1.9" long — 60 div.

Accuracy: 1000 to 10,000 gamma ranges ±0.5% of full scale.

Operating Temperature: —40°C to +40°C
—40°F to +100°F

Temperature Coefficient: Less than 1 gamma per °C (½ gamma/°F)

Noise Level: Less than 1 gamma P-P

Bucking Adjustments: (Latitude) —20,000 to +80,000 gammas
9 steps of 10,000 gammas plus fine control of 0 - 10,000 gammas by ten turn potentiometer. Reversible for southern hemisphere.

Recording Output: Optional.

Electrical Response: D.C. to 0.3 cps (3db down) on 1000 gamma range with meter in circuit. D.C. to 20 cps with meter network shorted for recording purposes.

Connector: Cannon KO2-16-10SN
for plug Cannon KO3-16-10-PN and cover KO6-16-⅜.

Batteries: Internal 3 x 6V-1 amp/hr. Sealed Lead Acid rechargeable Centralab GC 6101; recharge time 8 Hrs.

Consumption: 60 milliamperes — GC6101 batteries are rated for 16 hours continuous use.

Dimensions: 6¼"x 2¾"x 10" Instrument.
161 mm x 71 mm x 254 mm

Weights: 5 lb. 8 oz. — 2.5 kg.

Battery Charger: 6"x 2½"x 2½"
155 mm x 64 mm x 64 mm
110V - 220V 50/60 Hz supply or 28 - 42V D.C. supply
Automatic charge rate and cutoff preset for Centralab GC6101 batteries.

SCINTREX LIMITED
79 Martin Ross Avenue, Downsview, Ontario, Canada


CIRQUE
CIRQUE
FUTURE CAMPSITE
q.v.
6f
6f/6m
6s
6m
6p
6r
6s/6r
6f/6m
L100+00W
L88+00W
L84+00W
L80+00W
L76+00W
L72+00W
L68+00W
L64+00W
L60+00W
L56+00W
L52+00W
L48+00W
L44+00W
L40+00W
L36+00W
L32+00W
L28+00W
L24+00W
L20+00W
L16+00W
L12+00W
L8+00W
L4+00W
L0+00
TABLE OF FORMATIONS
PALEOZOIC
Mississippian (?) or Earlier
6m Massive felsite
6f Felsite tuff, agglomerate, breccia
6s Fine grained, massive siliceous rock, rich in pyrite, strongly rusted
6p Phyllite, pelitic schist
6r Strongly rusted 6p, often pyrite rich
qv. quartz vein (greater than 1 foot in width)
LEGEND
m massive
g fragmental
b banded
s felsitic (siliceous)
i intermediate (dacite – andesite)
c basic (andesite – basalt)
f foliated (rock foliation)
p phyllite or phyllitic
R1 dark red-brown hematitic (?) rust
R2 bright orange-red-yellow rust after Fe2S
l light
( ) minor (weak) feature
py pyrite
hm hematite (or magnetite ?) - not with quartz veins
rock foliation
fracture
lineation (fold axis)
outcrop
gossan
direction of scree slope
fault
creek
R.G. HILKER LTD.
CONSULTING GEOLOGIST
WHITEHORSE, Y.T.
GEOLOGICAL
ENGINEER
NTS SHEET 105-F-8
CHARTA MINES LTD. (NPL)
CPA CLAIM GROUP
GEOLOGY
DATE: SEPT. 15, 1971
SCALE: 1" = 200'


ZONE E
RECONNAISSANCE SAMPLING
SCALE 1" = 1/4 mile
CPA CLAIMS
ZONE 'C'
ZONE 'D'
ZONE 'B'
ZONE 'A'
INFERRED FAULT
INFERRED FAULT
LEGEND - CONTOUR VALUES
x̄ = 16 ppm Copper = arithmetic mean
s = 17 ppm Copper = standard deviation
x̄ + 1s = 33 ppm Copper
x̄ + 2s = 50 ppm Copper
x̄ + 3s = 67 ppm Copper
x̄ + 4s = 84 ppm Copper
x̄ + 5s = 101 ppm Copper
NOTE:
- All values are in parts per million (p.p.m.) copper
- Copper values are shown to the east of each sample station; along the baseline copper values are to the south.
- pH readings are to the west of each sample station, and to the north along the baseline.
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CONSULTING GEOLOGIST
WHITEHORSE, Y.T.
NTS SHEET 105-F-8
CHARTA MINES LTD. (NPL)
CPA CLAIM GROUP
GEOCHEMISTRY - COPPER with pH
DATE: SEPT. 15, 1971
SCALE: 1" = 200'
GEOLOGICAL ENGINEER

ZONE 'E'
RECONNAISSANCE SAMPLING
SCALE: 1" = 1/4 mile
CPA CLAIMS
ZONE 'C'
ZONE 'D'
ZONE 'B'
ZONE 'A'
INFERRED FAULT
INFERRED FAULT
LEGEND - CONTOUR VALUES
x̄ = 43 ppm Lead = arithmetic mean
s = 51 ppm Lead = standard deviation
x̄ + 1s = 94 ppm Lead
x̄ + 2s = 145 ppm Lead
x̄ + 3s = 196 ppm Lead
x̄ + 4s = 247 ppm Lead
x̄ + 5s = 298 ppm Lead
NOTE:
All values are in parts per million (p.p.m.)
Association of Professional Engineers of the Yukon Territory
R. G. HILKER
GEOLOGICAL ENGINEER
R.G. HILKER LTD.
CONSULTING GEOLOGIST
WHITEHORSE, Y.T.
NTS SHEET 105-F-8
CHARTA MINES LTD. (NPL)
CPA CLAIM GROUP
GEOCHEMISTRY - LEAD
DATE: SEPT. 15, 1971
SCALE: 1" = 200'


L105+00W
L88+00W
L84+00W
L80+00W
L76+00W
L72+00W
L68+00W
L64+00W
L60+00W
L56+00W
L52+00W
L48+00W
L44+00W
L40+00W
L36+00W
L32+00W
L28+00W
L24+00W
L20+00W
L16+00W
L12+00W
L8+00W
L4+00W
L0+00
INFERRED FAULT
INFERRED FAULT
CONTOUR INTERVALS
1800 γ
2000 γ
2500 γ
3000 γ
3500 γ
4000 γ
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ENGINEER
R.G. HILKER LTD.
CONSULTING GEOLOGIST
WHITEHORSE, Y.T.
NTS SHEET 105-F-8
CHARTA MINES LTD. (NPL)
CPA CLAIM GROUP
MAGNETOMETER SURVEY
DATE: SEPT. 15, 1971
SCALE: 1" = 200'

LEGEND

- located claimposts
- claimposts not located
- claim outline
- cut line (linegrid)

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ENGINEER

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CONSULTING GEOLOGIST
WHITEHORSE, Y.T.

NTS SHEET 105-F-8

CHARTA MINES LTD. (NPL)	
CPA CLAIM GROUP	
LINEGRID AND CLAIM LOCATION	
DATE: SEPT. 15, 1971	SCALE: 1" = 400'