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WHITEHORSE, YUKON TERRITORY

"LAND OF THE MIDNIGHT SUN"

GEOLOGICAL, GEOCHEMICAL AND GEOPHYSICAL REPORT
ON THEGREEN EAGLE 1-8 (Y59265-Y59272)
GREEN EAGLE 9-15 (Y39604-Y39611)
JAY 1-12 (Y60345-Y60356)
YUKON QUARTZ MINERAL CLAIMSKUSAWA LAKE AND DEVILHOLE CREEK AREA
YUKON TERRITORY

LATITUDE 60° 15'

LONGITUDE 136° 22'

N.T.S. DESIGNATION
SHEET 115-A-2
WHITEHORSE MINING DIVISION

-- JUNE 14th to JUNE 29th, 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 30th, 1971

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Scale: 1" = 200 ft.

Geochemistry Copper/Molybdenum Plan - Kusawa Project
Scale: 1" = 200 ft.

Geochemistry Lead/Zinc Plan - Kusawa Project
Scale: 1" = 200 ft.

Geochemistry Silver/Ph Plan - Kusawa Project
Scale: 1" = 200 ft.

Magnetics Plan - Kusawa Project
Scale: 1" = 200 ft.

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

Geochemistry/Geology Composite
Scale 1" = 200 ft.

INTRODUCTION

A property examination and evaluation was conducted on the Green Eagle 1-8 claims on October 12th, 1969. Mr. Barry O'Neil, the owner of the Green Eagle claims, accompanied R.G. Hilker on the property examination. A Trans North Turbo Air Jetranger helicopter was used for access to the property, which is located on the west side of Kusawa Lake. The helicopter placed the author and Mr. O'Neil at approximately the 5,200 foot level on the east side of the mountain near Devilhole Creek. A portion of the claim group from the 5,200 foot level to the 3,500 foot level was traversed during the property examination.

During the October 12th, 1969 property examination, Mr. Barry O'Neil staked an additional eight claims adjoining the Green Eagle 1-8 group. The new claims, the Green Eagle 9-16, were recorded in the Whitehorse Mining Recorder's Office on November 3rd, 1969.

In November of 1969, the Green Eagle 1-16 claim group was optioned to a group of Vancouver businessmen. The option agreement was not fulfilled and was permitted to expire on October 1st, 1970. The optionors did not do any exploration or physical work on the claim group and permitted the Green Eagle 1-8 claims to expire on September 17th, 1970. However, Mr. Barry O'Neil restaked the Green Eagle 1-8 claims on September 18th, 1970 and recorded the claims on October 7th, 1970.

On October 9th, 1970, Mr. Alan E. Hooper et al of Vancouver, B.C., purchased a 100 percent interest in the Green Eagle 1-16 claim group from Mr. Barry O'Neil of Whitehorse, Yukon Territory.

The Green Eagle 1-16 claim group were then transferred into Charta Mines Ltd. (N.P.L.).

On November 3rd, 1970, Charta Mines Ltd., paid \$200 in lieu of assessment work on the Green Eagle 9-16 claims and advanced the anniversary date of these claims to February 3rd, 1971.

On December 16th, 1970, R.G. Hilker and Dick Craft visited the claim group to blast trenches. The trenching was applied as assessment work on the Green Eagle 9-16 claims on December 30th, 1970. The property was snow-covered and no prospecting could be conducted on the claims. A few rock samples were collected from the area of the trenching. Access to the property was by Trans North Turbo Air Jetranger helicopter. The trenching assessment work was applied for one year, and Certificate of Work dated January 28th, 1971, was issued by B.R. Baxter - Whitehorse Mining Recorder on the Green Eagle 9-16 claims. On March 9th, 1971 the Joy 1-12 claims were staked by Mr. Alan Hooper et al and transferred to Charta Mines Ltd. (N.P.L.).

On June 14th, 1971 six men, camp gear and exploration equipment were mobilized to a campsite approximately 1½ miles east of the Green Eagle 1-8 claims. The exploration personnel from R.G. Hilker Limited was G.G. Carlson - geologist, Brian Slater - magnetometer technician, Alan Ashton and Glen Hillson - geochemistry samplers. Two linecutters of Eastern & Associates Reg'd accompanied the exploration crew, were Roger Voisine and Arthur Beauregarde. A baseline was established at a bearing of 150° and crosslines were picketed with lath, perpendicular to

the baseline at 200 feet and 400 feet intervals. A geological mapping, magnetics and geochemistry exploration survey was then conducted on the linegrid. Transportation for the camp was from Whitehorse by an Otter aircraft to the west shore of Kusawa Lake and by helicopter from the lakeshore to the campsite. The camp and personnel were demobilized in the same way, by fixed wing and rotor blade aircraft, on June 29th, 1971.

This report describes the field investigations carried out and interprets the data collected. It is submitted for the purpose of assessment work on the Green Eagle 1-16 claim group and the Joy 1-12 claim group in the Kusawa Lake area, Claim Sheet No. 115-A-8, Whitehorse Mining Division, Yukon Territory.

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

LOCATION AND ACCESS

The Green Eagle claim group is situated approximately halfway between Whitehorse, Y.T., and Desadeash Lake (Sketch #1). The property is located on the west side of Kusawa Lake and to the southeast of Frederick Lake. The property and showings are located on the east side of a granite stock that is isolated from other granite, by Devilhole Creek to the east and by Frederick Lake River to the west. The granite stocks located in this area are contained within the Boundary Ranges of mountains. The Green Eagle claims are located at approximately 60° 15' latitude and 136° 22' longitude. The property is located to the south of the westerly jog in Kusawa Lake and to the south of the extension of the Shakwak Valley. The property is contained on Topographic Sheet 115-A Desadeash, Y.T., scale 1" = 4 miles.

Access to the north end of Kusawa Lake is by a good gravel road 10 miles long, located south of Mile 958 on the Alaska Highway. The property is accessible by boat from the north end of Kusawa Lake. The property is approximately 26 miles by water from the road on the north end of Kusawa Lake. The terrain, on the west side of Kusawa Lake from the north and south to the claim group, is suitable for road building and would be a possible road route to the property.

A second possibility for a road would be through the Frederick Lake area to the old Dalton Trail, that is located on the east side of Desadeash Lake. The Dalton Trail route could be followed to Mile 120 of the Haines Road. The Frederick Lake

route would involve approximately 32 miles of road construction. The distance on the Haines Road is measured from Haines, Alaska to Haines Junction, Y.T., therefore by road route the property would be a distance of 152 miles to the tidewater port of Haines, Alaska. Presently, access to the area is by helicopter or fixed-wing aircraft from Whitehorse, or by boat from the north end of the lake.

The Green Eagle claims are located a total distance of 56 air miles south-westerly from Whitehorse. Access to the area for exploration purpose is best accomplished by aircraft, due to the quickness of moving crews and equipment. A fixed-wing aircraft was used for hauling supplies to Kusawa Lake, and a helicopter transported equipment and personnel from the lakeshore of Kusawa Lake up to the base of the mountain where the campsite was located.

BEAUFORT SEA

SKETCH No. 1

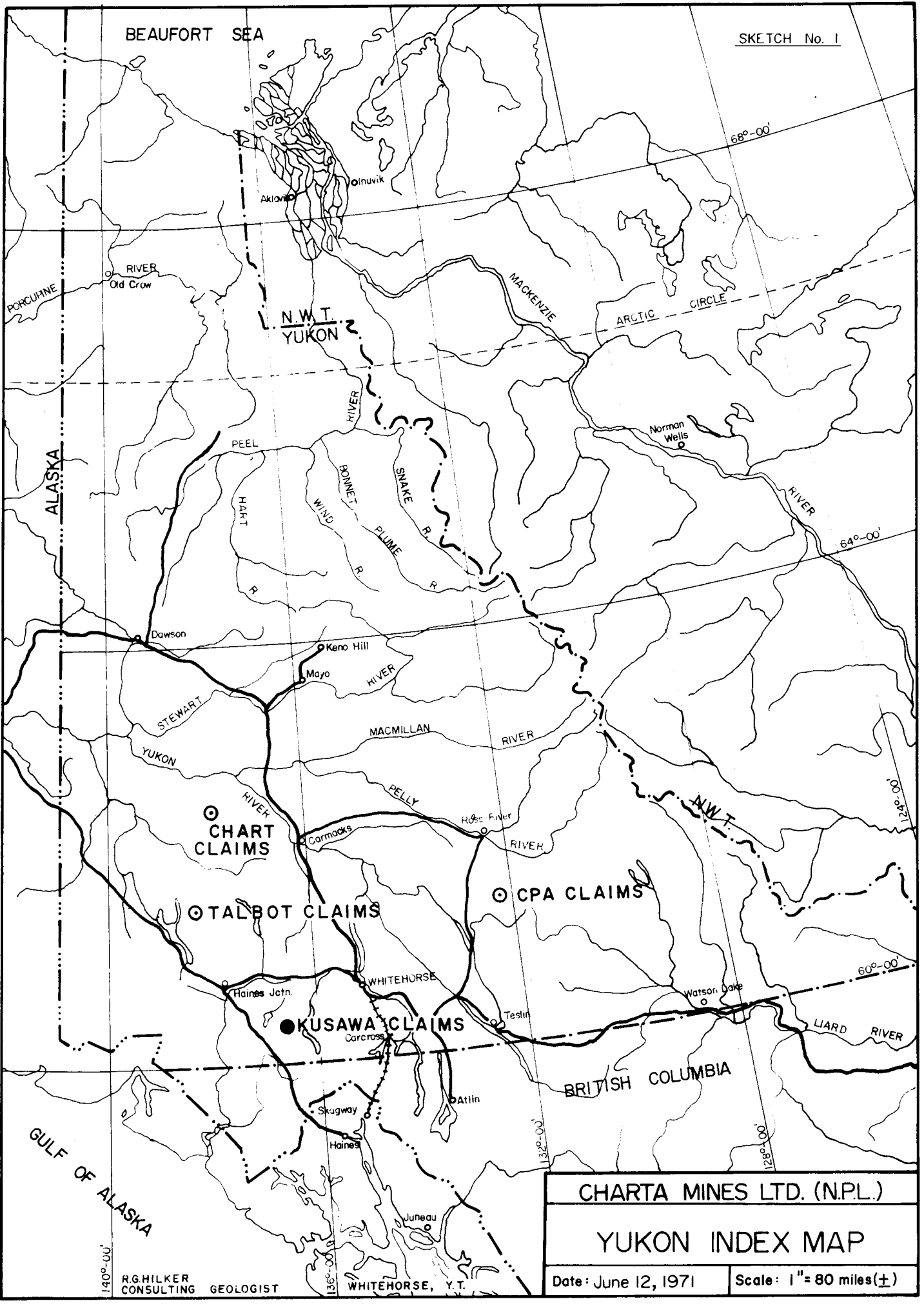


CHART CLAIMS

TALBOT CLAIMS

CPA CLAIMS

KUSAWA CLAIMS

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

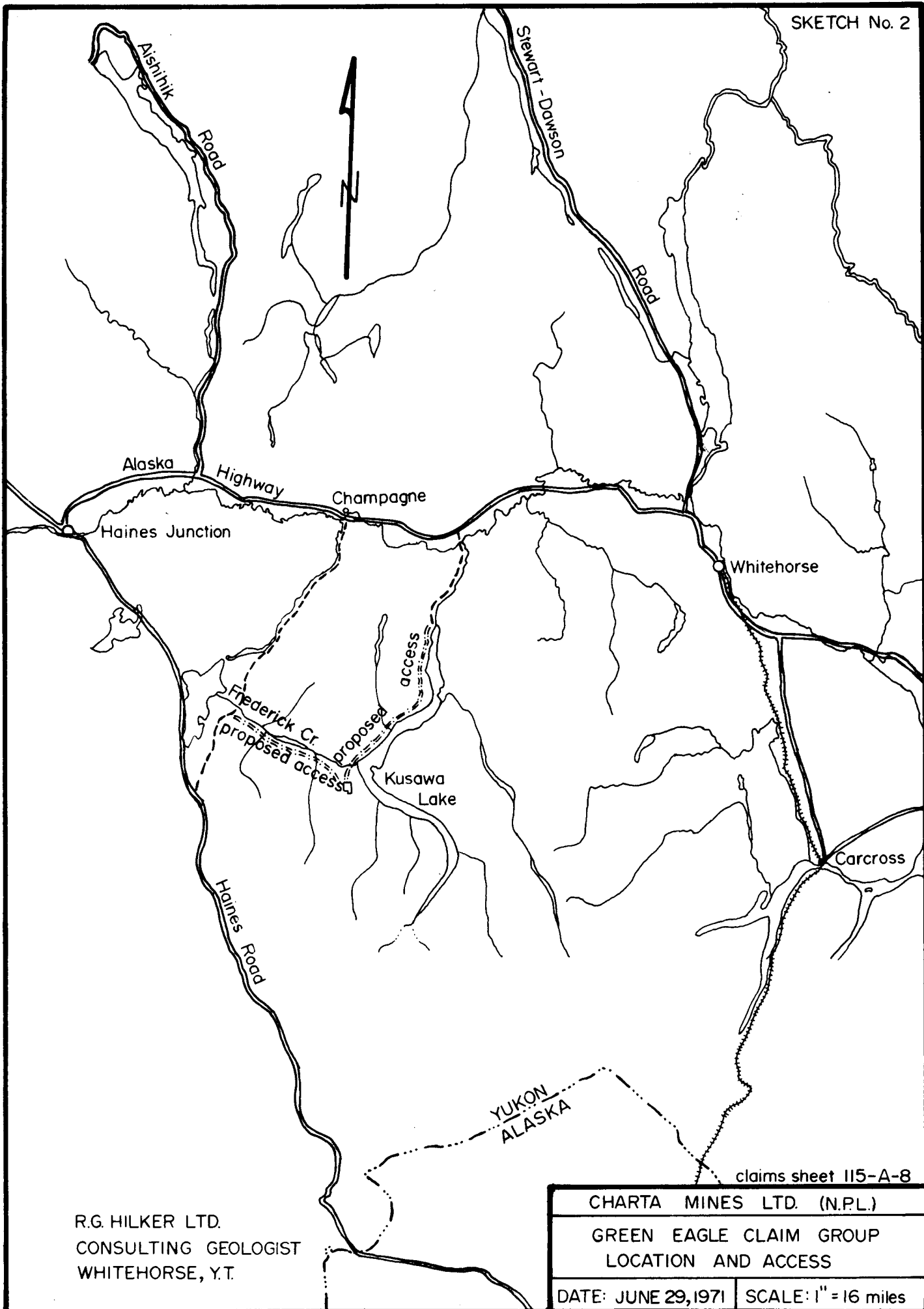
YUKON INDEX MAP

Date: June 12, 1971

Scale: 1" = 80 miles (±)

R.G.HILKER CONSULTING GEOLOGIST

WHITEHORSE, Y.T.



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

claims sheet I15-A-8	
CHARTA MINES LTD. (N.P.L.)	
GREEN EAGLE CLAIM GROUP	
LOCATION AND ACCESS	
DATE: JUNE 29, 1971	SCALE: 1" = 16 miles

CLAIMS

The following claim date was searched on July 27th, 1971, from the records in the Whitehorse Mining Recorder's Office.

<u>CLAIM NAME & NO.</u>	<u>GRANT NO.</u>	<u>ANNIVERSARY DATE</u>
Green Eagle 1 - 8	Y59265-Y59272	October 7, 1971
Green Eagle 9 - 16	Y39604-Y39611	February 3, 1972
Joy 1 - 12	Y60345-Y60356	March 10, 1972

Charta Mines Ltd. (N.P.L.) are the recorded Owners, with 100 percent interest in the Green Eagle 1 - 16 claim and the Joy 1-12 claims.

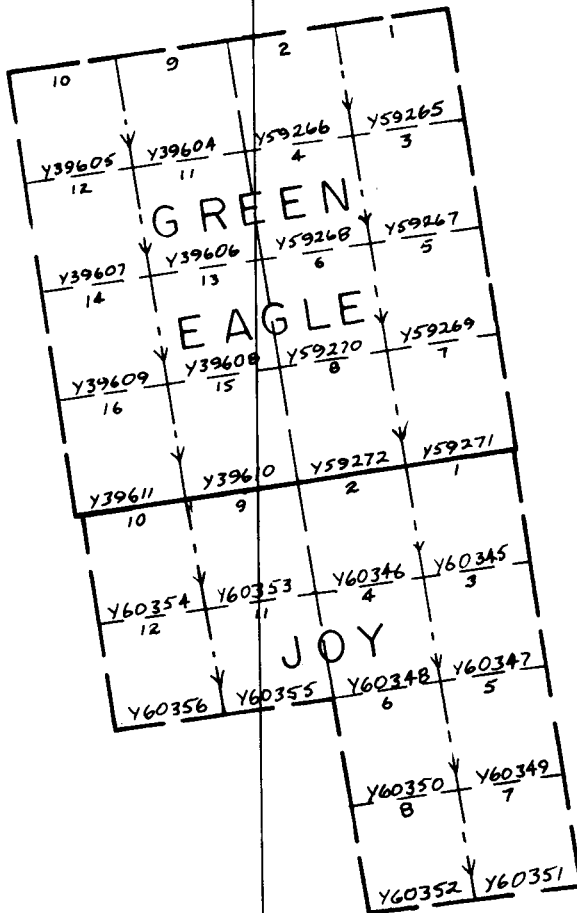
The claim group is located on the west side of Kusawa Lake on Sheet 115-A-8, Whitehorse Mining Division.



136° 22'

KUSAWA

LAKE



60° 15'

SHEET 115-A-8

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

CLAIMS LOCATION SKETCH

DATE: MARIO-71

SCALE: 1" = 1/2 MI.

R. G. HILKER LTD.,
CONSULTING GEOLOGIST,
WHITEHORSE, YUKON

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.

<u>NAME</u>	<u>ADDRESS</u>	<u>POSITION & DATE</u>
Roger Voisine	Eastern Associates Reg'd Box 3245, Whitehorse, Y.T.	Linecutter June 14-29th
Arthur Beauregarde	Eastern Associates Reg'd Box 3245, Whitehorse, Y.T.	Linecutter June 14-29th

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:

<u>NAME</u>	<u>ADDRESS</u>	<u>POSITION & DATE</u>
R.G. Hilker, P.Eng.,	Box 566 Whitehorse, Y.T.	Supervision, report preparation June 14, 19 & 29th.
G.G. Carlson	Box 548 Whitehorse, Y.T.	Geologist, field supervisor, report preparation June 14-29th
B. Slater	c/o Rundle Hall Univ. of Calgary Calgary, Alberta	Magnetometer operator* June 14-29th
G. Hillson	St. Andrew's College Saskatoon, Sask.	Soil sampler* June 14-29th
A. Ashton	Box 56 Parry, Sask.	Soil sampler* June 14-29th

*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.

LINEGRID

In order to achieve adequate coverage of the claim group by the line grid, it was necessary to conform as closely as possible to the topography. The baseline was started near the top of a talus slope in the centre of the claim group at a point arbitrarily labelled 40+00S. A total of 7,200 feet of baseline was slashed and picketed at a bearing of 150°. Crosslines were turned off at 400 foot intervals between lines 12+00S and 72+00S and 200 foot spaced lines were turned off between lines 28+00S and 58+00S. These lines were cut only to the west of the baseline.

East of the baseline, all 400 foot lines were cut to 15+00E. On the west, lines were extended to 3000 feet wherever possible, although most were interrupted by impassable rock cliffs. One line was extended along acrosscutting valley from approximately 21+00W on line 42+00W. This line, called L40 SW, extends to the west a further 1600 feet at a slight angle to the other crosscutting lines.

The baseline and all crosslines have been chained and marked at 100 foot intervals by red painted lath pickets.

GEOLOGY

GENERAL GEOLOGY

The Dezadeash map sheet is divided into 3 major physiographic regions, including the St. Elias Mountains in the west and southwest, the Boundary Ranges of the Coast Mountains in the south and the Yukon Plateau in the north and east. The Shakwak Fault separates the St. Elias Mountains from the other regions while the Shakwak Valley, between Dezedeash Lake and Kusawa Lake, separates the Coast Mountains and the Yukon Plateau.

Cretaceous Coastal Intrusive granites and Precambrian Yukon Group rocks occur along the south-eastern end of the Ruby Range and to the Boundary Ranges in the area of Kusawa Lake and the Green Eagle claim group. These rock types are located in the north-south trending Ruby Range and the Boundary Ranges. The Shakwak Fault is located northwest of Dezadeash Lake and on the eastern side of the Kluane Range. The Shakwak Fault appears to trend southerly on the west side of Dezadeash Lake and roughly follows the location of the Haines Road south into British Columbia. The Shakwak Valley trends across the northern part of Dezadeash Lake and intersects the west jog in Kusawa Lake. Several stocks and laccoliths of Coastal Intrusive granites occur in this area and intrude the Yukon Group of rocks. There are approximately 75% granites and 25% metamorphic rock types in the previously described areas (Sketch #3). .../10

The Coastal Intrusions in this area consist mainly of acidic granite, porphyritic granite, granodiorite and diorites. The Yukon Group of rocks located in the Kusawa Lake area are mainly schists, gneiss, slate, quartzite, limestone and greenstone.

Coastal Intrusive granite rock types in the Ruby Range are similar to the igneous rocks in the Dawson and Nisling Ranges. Porphyry type copper-molybdenum occurrences have been discovered on Talbot Creek in the Ruby Range, Coffee Creek - Casino Mines and Hayes Creek in the Dawson Range.

Younger coarsely crystalline acidic granite, or alaskite, intrudes the granodiorite as small stocks both north and east of the claim group. It is apparent that porphyry copper-molybdenum type of occurrences, including the Casino Mines discovery in the Dawson Range and a recent discovery on Talbot Creek in the Ruby Range, are located within granitic rocks of this major intrusive phase and are closely associated with the younger acidic granite stocks.

The Yukon Group of metamorphic rocks occur mainly as irregular and isolated bodies or roof pendants within the main batholith. They consist mainly of quartz-mica schists, quartz-biotite-feldspar gneisses, crystalline limestone, slate and quartzite.

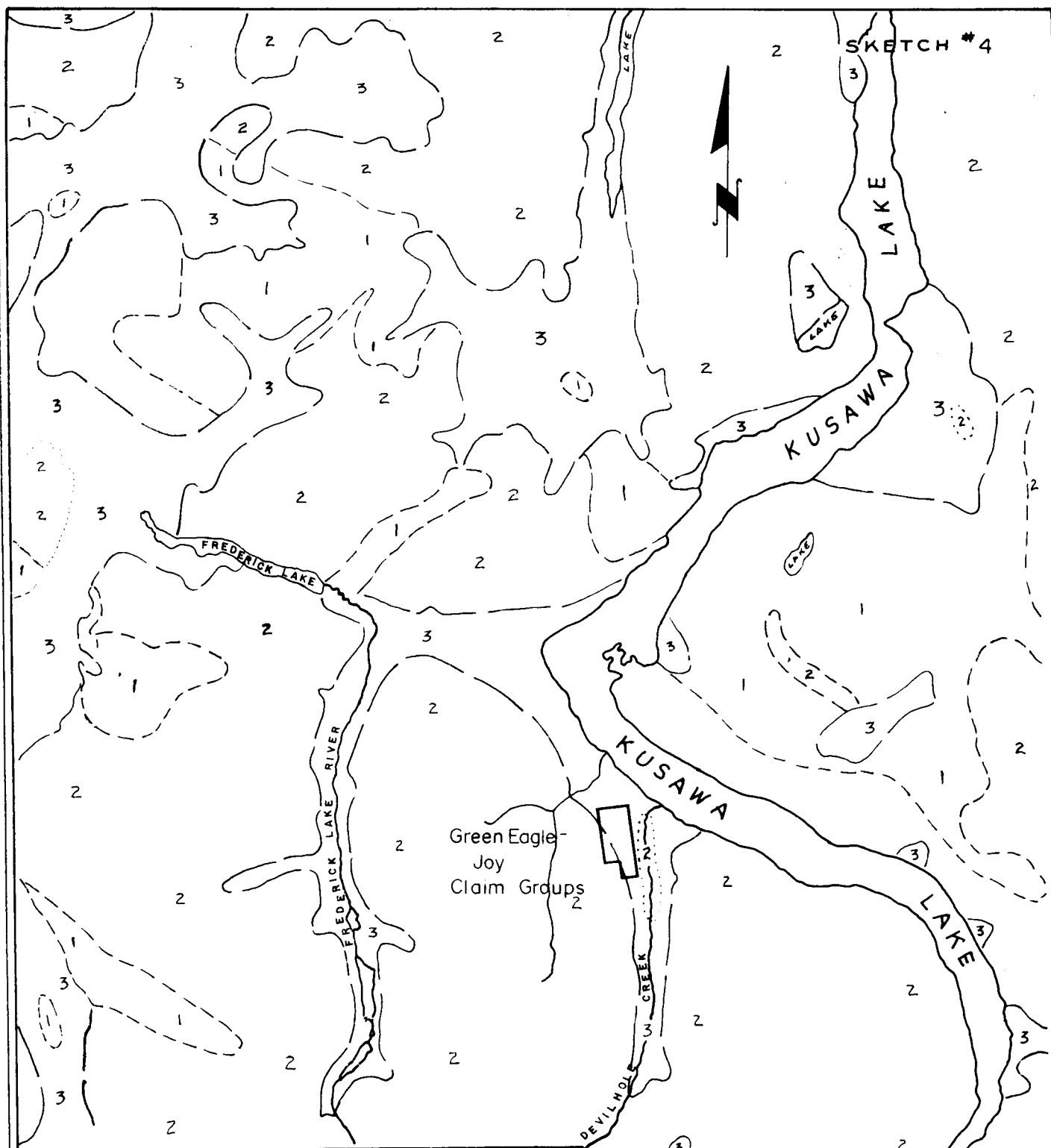


TABLE OF FORMATIONS

CENOZOIC

QUATERNARY

3 SILT, SAND, CLAY, GRAVEL,
BOULDER CLAY.

MESOZOIC

**CRETACEOUS
COAST INTRUSIONS**

2 ACIDIC GRANITE, PORPHYRIC GRANITE,
GRANODIORITE, DIORITE.

PRECAMBRIAN

YUKON GROUP

1 SCHISTS, GNEISS, SLATE, QUARTZITE,
LIMESTONE AND GREENSTONE.
(AFTER E.D. KINDLE - MEMOIR 268)

AFTER KINDLE MAP 1019 A

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

**GENERAL GEOLOGY
KUSAWA LAKE DISTRICT**

Date: Dec. 5th/1970

Scale: 1" = 4 miles

TABLE OF FORMATIONS

CENOZOIC

Quaternary

- 3 - Silt, sand, clay, gravel, boulder clay.

MESOZOIC

Cretaceous
Coast Intrusions

- 2 - Acidic granites, porphyritic granite, grano-diorite, diorite.

PRECAMBRIAN

Yukon Group

- 1 - Schists, gneiss, slate, quartzite, limestone and greenstone.

(After E.D. Kindle - Memoir 268)

REFERENCE TO PUBLISHED GEOLOGY & GEOPHYSICS

The main geological reference in the Kusawa Lake area is contained in Memoir 268 of the Geological Survey of Canada - Dezadeash Map area, Yukon Territory - by E.D. Kindle, 1953.

The airborne magnetics sheet that covers the claim group area is contained on Map 3341-G, Sandpipe Creek, Yukon Territory, scale 1" = 1 miles, and is Geophysics Paper 3341. This paper contains the airborne magnetics survey of June, 1964 to February, 1966.

FIELD MAPPING METHODS

Geological mapping was carried out at a scale of 1" = 100 feet over the entire grid system, using the picket lines for survey control. Mapping was also extended west of the linegrid to the top peaks of the mountain, upon which the Green Eagle and Jay claims are located. The geology map was reduced to 1" = 200 feet by photographic methods.

The map area is located on a steep eastern slope that varies between 20 - 30 degrees. In parts, the cliffs are steeper and not possible to map.

Excellent bedrock exposure occurs throughout the map area and a variety of rock types were mapped.

CLAIM GEOLOGY

In detail, the geology of the Green Eagle and Joy claim group consists of a complex association of igneous rocks, locally including remnants of earlier sedimentary rocks.

The oldest rocks in the area are the sedimentary rocks which probably belong to the Precambrian and/or Paleozoic aged Yukon Group. They occur, as small xenoliths and larger inclusions within the main intrusive rocks in both the north and south ends of the grid area and are mainly located east of the baseline. These rocks, Map unit 1, consist primarily of dark, fine to medium grained biotite schists, with minor amphibolite.

The next youngest rocks in the area are the Cretaceous aged Coast Intrusions. Within the area of the claims, these rocks are divided into two main varieties. They are as follows:

1) Coarse grained and often rusty hornblende granodiorite that occurs in the east half of the grid area. 2) A more lightly rusted medium-coarse grained biotite granite that occurs on the west part of the grid system. These are indicated on the geology map as, units 2a and 2b respectively. No distinct contact was observed between the two igneous rock types. The sedimentary inclusions are observed solely in the hornblende granodiorite, and this rock often exhibits a vague foliation of hornblende and biotite crystals. It is possible that the granodiorite rock was derived in part at the contact of the sedimentary rocks. The gossan rust occurs mainly on or near fracture planes and may be derived from weathering of the mafic minerals and possibly from

exterior sources, with transport and then deposition along fracture planes.

The biotite granite is relatively fresh, with minor rust, possibly from the weathering of biotite, and the rust decreases away from the contact with the granodiorite.

The next youngest rocks are also Cretaceous Intrusives and are probably quite closely associated with Unit 2. They consist of fine to medium grained granite (map unit 3a), quartz-orthoclase porphyry (map unit 3b) and altered rocks, at least in part derived from the above (map unit 3c). The granite is generally very mafic lean, often containing no visible ferromagnesian minerals. In this respect it may be called alaskite. The ground-mass is generally fine grained, with some coarser grained phases, and scattered phenocrysts, up to 6mm, of orthoclase. Pyrite is generally present, at least in trace amounts, along with traces of other dark opaque minerals which are unidentified but possibly secondary iron oxides. These rocks are generally very rusty on fracture faces, with a yellowish orange rust extending throughout some specimens, others are a fresh white. No structure, fracture or jointing control for this alteration pattern was observed.

The map unit 3 rocks are irregularly associated with unit 2a and in some areas near the centre of the grid unit 3a occurs, but away from this central core, there is an increased intermixing of 3a and 2a. Due to the broken and weathered nature of the outcrops, no exact relations between the two rock types are distinct. Although the texture and the mineralogy of map unit 3

suggest an intrusive origin, the close association with unit 2a, and a possibly faint textural banding observed in some specimens, suggests a possible association with the earlier sedimentary rocks. This banding feature could be studied further with microscopic thin section examination of the rock types.

Map unit 3b occurs as porphyry dikes which were observed cutting both units 2a and 2b and which may be associated with the secondary granite, as unit 3b is similar in composition. The groundmass of unit 3b - quartz orthoclase porphyry is very similar to the granite excepting that up to 5% biotite and chlorite may be present. Phenocrysts, consisting of roughly equal rounded quartz and euhedral orthoclase, average approximately 8 to 12 mm., with rare exceptions of orthoclase to 3mm. Although these rocks are generally fresher in appearance than any others, they contain generally more pyrite, often 3 to 5%. Galena was also observed in a dike of unit 3b rock type near the baseline at 64+00S. Finely disseminated galena may occur in other locations, but this is not definite. Galena and pyrite fracture filling was noted by R.G. Hilker on October 12, 1969, approximately in the area of the gully between L56+00S and L52+00S and 30+00W.

Unit 3c is possibly derived from the above rocks. It consists of highly brecciated and mylonitized rocks in which only quartz and sometimes pyrite or marcasite (a low temperature iron sulfide) are the only identifiable minerals in a light, chalky yellow, orange or white matrix. This rock is not observed over

extensive areas. The major occurrence, just west of the baseline between lines 44+00S and 46+00S is in the form of a small breccia plug which may extend to the north or east. Other occurrences of unit 3c are more linear, located over short distances and narrow widths along fault zones.

The youngest rocks, observed to be cutting all other rocks in the area, are the Tertiary (?) aged diabase and dacite dikes (map units 4a and 4b). The dikes are typically one to five feet in width, with some up to twenty feet in width, and are quite continuous. Most of the dikes have a strike bearing of 160° and dip 40° SW, but they were also observed to follow all the major structural trends in the drainage system in the area. The diabase is quite dark and fine to medium grained, with small plagioclase laths visible in the coarser grained varieties, and minor disseminated pyrite. The dacite is medium grey, dense and fine grained, with small visible laths of feldspar and hornblende and plates of biotite.

The dikes appear to post date all other rocks and structural activity and any secondary mineralizing solutions. The only association with other geological features in the area is that they are intruded along zones of previous weakness, either fractures or faults. Structural activity within the area of the claim group has been quite intense. All outcrops are highly fractured and broken, and several minor fault zones were observed. Numerous measurements of fault and fracture planes were recorded, and from the data three major directions are

defined. These are, in order of greatest to least intensity:

	<u>Bearing</u>	<u>Dip</u>
1.	10°	75°E
2.	95°	65°N
3	165°	40°W

Most of the smaller shear and fault zones observed had a bearing of 10°. The diabase and dacite dikes follow all three planes, but are most abundant along the 165° bearing direction. As previously mentioned, contacts were not well defined between rock units 2a and 3a, but minor evidence was observed to suggest that these contacts irregularly follow these fracture directions over very short distances.

Generally, fracturing appears to be most intense in the centre of the grid area, within rock unit 3a, and it decreases outwards to a well defined jointing pattern in the bordering biotite granites. Several fault zones have been interpreted, but the extent of displacement along each is not certain. Dikes which are not displaced may post-date faulting activity.

Rock unit 3c appears to be closely associated with structural activity due to its mylonitic and sometimes brecciated texture. The extent of these zones is quite uncertain as they are greatly weathered and eroded.

TABLE OF FORMATIONS

CENOZOIC

Tertiary

4 Minor Intrusives; 4a - diabase; 4b - dacite

MESOZOIC

Cretaceous

3 Secondary intrusives;
3a - Fine to medium grained granite
3b - Quartz-orthoclase porphyry
3c - Altered intrusives, breccia, mylonite

2 Coast Intrusions;
2a - Hornblende granodiorite
2b - Biotite granite

PRECAMBRIAN - PALEOZOIC

1 Yukon Group - biotite schist, amphibolite

KUSAWA LAKE

MEGASCOPIC DESCRIPTION OF ROCK SAMPLES

<u>Location</u>	<u>Description</u>
T (top of ridge, west of grid)	Biotite granite (2b) - Coarse grained, brownish grey, white orthoclase prominent due to relatively large crystal size, very light rust. quartz - 20% orthoclase - 50% Plagioclase - 20% biotite - 10%
T	Biotite granite (2b). As above but slightly stronger rust gives orange-brown. East.
L67S; 20W	Quartz-orthoclase porphyry (3b) - Mainly rounded quartz with few euhedral orthoclase phenocrysts, to 5 mm., comprise 20% of rock, less than 5% biotite/chlorite and 1 to 2% disseminated pyrite cubes, matrix is white and fine grained.
L68S; 27W	Biotite granite (2b) - Medium-coarse grained, orthoclase tinted light yellow-orange due to rust. quartz - 15% orthoclase - 40% plagioclase - 30% biotite - 15%
L64S; 4E	Diorite (2a). Medium grained, rust on fracture faces. Trace of disseminated pyrite. hornblende (biotite) - 60% plagioclase - 30% quartz + ? - 10%
L64S; 4E	Granodiorite (2a) - Coarse grained, rust on fracture faces. biotite - 30% hornblende - 10% plagioclase - 50% quartz - 10%
L65S; 1W	Granodiorite (2a) - As above but stronger rust, pyrite smeared on fracture faces, minor foliation of biotite.

- L12S; 5W Quartz-orthoclase porphyry (3b) - Typical (as above) Quartz phenocrysts predominant, to 10 mm., and only trace of mica. Pyrite over 1%, disseminated quite weathered.
- L12S; 5W Biotite granite (2b) - Medium grained, light orange rust colour throughout, quite typical of other 2b outcrops.
quartz - 20%
orthoclase - 50%
plagioclase - 20%
biotite - 10%
- L 65S; 1W Quartz-orthoclase porphyry (3b) - As above, but large phenocrysts (some orthoclase to 3cm.), pyrite 2 to 3% and trace of galena.
- L40Sw; 12W Quartz-orthoclase porphyry (3b) - Typical, but with extremely large phenocrysts. Some orthoclase to 5 cm. Only minor pyrite.
- L40Sw; 5W Biotite granite (2b) - Fresh, medium coarse grained.
quartz - 15%
orthoclase - 50%
plagioclase - 20%
biotite - 15%
- L36S; 8W Granite (3a) - Medium fine grained, white to light colors, rusty on and near fracture planes, largely quartz and feldspar (orthoclase) in roughly equal amounts with 2 or 3% biotite.
- L37S; 11W Dacite (3d) - Light grey, dense, fine grained with scattered crystals of biotite and hornblende and trace of pyrite.
- L37S; 12W Dacite (3d) - As above but also present are a few small phenocrysts of feldspar and quartz. Quite bright orange and yellow rust on some fracture planes.
- L37S; 13W Granite (2b/3a) - Medium grained, appears to be transition rock between 2b and 3a, quite fresh except for some rust on fracture planes.
quartz - 25%
orthoclase - 40%
plagioclase - 30%
biotite - 5%
- L44S; 3W Granite (3a) - White, very fine grained only very rare quartz and orthoclase phenocrysts.

- L32S; 20W Altered granite (3c) - Quartz (medium grained) is only identifiable mineral in chalky white - yellow orange matrix, rock has mylonitic texture.
- L29S; 22W Biotite granite (2b) - Medium grained, light rust throughout.
quartz - 20%
orthoclase - 40%
plagioclase - 30%
biotite - 10%
- L28S; 22W Quartz-orthoclase porphyry (3b) - As above, phenocrysts to 5 mm., pyrite not observed.
- L28S; 23W Biotite granite (2b). Fresh, medium grained.
quartz - 20%
orthoclase - 35%
plagioclase - 30%
biotite - 15%
- L44S; 10W Quartz-orthoclase porphyry (3b) - Phenocrysts to 5mm., matrix very fine grained, pyrite abundant (2 to 3%).
- L42S; 15W Biotite granite (2b/2a?) - Medium grained, orange rust throughout.
quartz - 20%
orthoclase - 35%
plagioclase - 25%
biotite - 20%
- L44S; 13W Granodiorite (2a/2b?) - Fresh, coarse grained, some hornblende with biotite.
quartz - 15%
orthoclase - 25%
plagioclase - 35%
biotite - 25%
- L39S; 24W Biotite granite (2b) - Medium grained orthoclase prominent.
quartz - 20%
orthoclase - 50%
plagioclase - 15%
biotite - 15%
- L44S; 7W Granite (3a) - Very fine grained quartz-feldspar groundmass with few scattered orthoclase phenocrysts. Orange brown rust on and near fracture planes and irregularly throughout rock, no mafics.

- L44S; 9W Granite (3a) - As above but no phenocrysts evident.
- L44S; 10W Quartz-orthoclase porphyry (3b) - Typical except quite rusty and to 5% biotite, phenocrysts 40 to 50% of rock, 2 to 5 mm, pyrite, in groundmass and on fracture planes, 2 to 3%, chalcopyrite - tr.? -
- L44S; 12W Quartz-orthoclase porphyry (3b) - Approximately 80% phenocrysts, almost 5% of this is biotite and hornblende, light rust, pyrite - 1%.
- L45S; 12W Granite (3a) - Medium fine grained, light orange rust irregularly throughout, dark minerals 1 to 2%.
- L45S; 15W (Biotite) granite (2b/3b) - medium to coarse grained, biotite nil to 10%, possibly fine grained matrix in mafic-lean specimens, also to 5% pyrite (disseminated) in mafic-lean, trace with biotite.
quartz - 20%
orthoclase - 40 to 50%
plagioclase - 10 to 30%
biotite - 0 to 10%

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.

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.

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. When soil material was not available for sampling, in areas of extensive outcrop or frost heaved and scree boulders which have obviously not been displaced too far downslope, a sample of three or four rock chips was collected. 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.

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 all five elements on a Techtron AA-5 Digital atomic absorption unit. Twenty five of the samples determined, for the five elements, contained enough rock chips to have fine dringing done on the sample to prepare them for analysis. 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 Metallic 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 all assay values, using the following formulae:

$$\bar{x} = \frac{\sum \text{ppm}}{n}$$

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

where: n = total number of values

$\sum \text{ppm}$ = sum of values

\bar{x} = arithmetic mean

$\sum \text{ppm}^2$ = sum of squares of values

s = standard deviation

For the present survey, extremely high values for some of the metals have been reduced to a common maximum value for the calculations. This is done to avoid the misleading influence these values have on the overall characteristics of the population. The figures used for each metal are shown in Table 2 (page) as well as the calculated statistical values.

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, and a value greater than $\bar{x} + 1s$ is statistically "possibly anomalous" and a value greater than $\bar{x} + 2s$ is "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

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 of the five elements are displayed in Table 1 and the histograms and logarithmic probability plots are shown in Sketches 5 through 14 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, M1, M2, M3... for molybdenum, etc... 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.

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.

TOPOGRAPHY, VEGETATION AND SOILS

The Green Eagle 1-16 and Joy 1-12 claim groups are located on the east facing side of a partially dissected mountain ridge. Slopes average 30° to 40° with many vertical and near vertical rock bluffs. Elevations range from approximately 3000 feet to over 5500 feet.

Due to the steepness of the slope and the elevation, vegetation is minimal except for moss and grass on the upper slopes and buck-brush and stunted spruce on the lower slopes. Willows are abundant in the vicinity of the numerous small creeks draining the slope and between the main slope and lakeshore of Kusawa Lake poplar and spruce become more abundant.

Geochemically, the area may be divided into two main zones. The primary zone is that on the upper slopes and it consists of outcrop and scree* cover. The secondary zone, on the lower slopes and in the crosscutting creek valley bottoms, consists of talus*, often with a thick, low growing vegetation cover.

Soils from the primary zone are almost truly residual. They consist largely of broken rock fragments, or grit, which has undergone some downslope movement but which is probably quite similar to the weathered parent bedrock. Thus, where no fine fraction was available for sampling at stations in this zone, a few rock chips either from scree boulders or from outcrop, were taken instead.

* For definition here, scree is loose rock material on side slopes, while talus is the boulder accumulation at the base of the slope.

Soils from the secondary talus areas are similar to the above soils except that they are derived from a much broader area and have undergone somewhat more chemical alteration and physical separation. Trace metal values from samples in this area are expected to reflect primarily the bedrock condition upslope rather than directly beneath the sample station.

The baseline roughly separates the primary and secondary environments. Exceptions to this are the dissecting creek floors and two areas of outcrop, between L14+00S and L20+00S and between L52+00S and L58+00S which extend below the baseline, both of which are indicated on the Geology Plan (see Pocket).

INTERPRETATION

Almost all of the trace metal concentrations measured from the soil within the Green Eagle and Joy claims grid area are higher than background values generally observed regionally throughout the Yukon. This is due to the fact that at least some of the bedrock in this area contains above average amounts of these metals and the actual soil samples collected are generally close to their parent source and have undergone less dilution than many of the soils sampled in lower areas.

When the present data is considered, a very complex pattern develops due to the large amount of information at hand. Thus, pH, copper-molybdenum, lead-zinc and silver will be considered in four separate sections, followed by a short summary.

The statistics calculated for all five elements are included in Table 2 on the following page, while the histograms and cumulative frequency plots, Sketchs 5 through 14, are distributed throughout the INTERPRETATION.

pH AND MOBILITY

The pH values, as determined on many of the samples taken from west of the baseline and plotted with the silver values on the Geochemistry Plan (see Pocket), are entirely acidic, ranging from less than 4 to almost neutral values of 6.8. Although the pattern is not strong, there is a fairly obvious correlation with the geology. The high pH values are generally associated with the major granitic intrusives (map units 2a and 2b) while the lower pH values, less than 6,

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Kusawa Project

Geochemistry Statistics

TABLE 2

Element	x	x ²	\bar{x}	s	$\bar{x}+1s$	$\bar{x}+2s$	$\bar{x}+3s$
Cu ¹	38,000	5,764,018	55	73	128	201	275
Mo ²	1,904	18,677	3(2.75)	4.5(4.41)	7.5	12	16.5
Pb ³	92,849	22,623,666	135	121	256	377	498
Zn ³	134,354	36,072,176	195	120	315	435	565
Ag ⁴	1,550.2	8,079.50	2(2.24)	2.5(2.58)	4.5	7.0	9.5

Note: - All values are in parts per million.

1. All copper values used in statistics calculations.
2. Any value greater than 30ppm - Mo was reduced to 30ppm for use in the calculations.
3. Any value greater than 500ppm - Pb/Zn was reduced to 500 ppm for use in the calculations.
4. Any value greater than 15ppm - Ag was reduced to 15 ppm for use in the calculations.

are associated with the secondary granitic and porphyritic intrusives (Map units 3a, 3b and 3c) which are mafic lean but which generally contain at least a trace of pyrite. The oxidation of this pyrite gives an end product of hydrous iron oxides which produce the rusty gossan zone and very dilute sulfuric acid, which depressed the pH.

The effect of this lower pH is to increase the solubility and thus the mobility of copper, lead and zinc, with increasing effect in that order. Silver is generally not mobile except by mechanical means. Molybdenum has a reduced chemical mobility in an acid environment.

All of the metals except silver will, to some extent, be co-precipitated with the hydrous iron oxides, and this would at least partly offset the increased mobility due to the low pH.

It is expected that the greatest dispersion of all metals in this environment is by mechanical means.

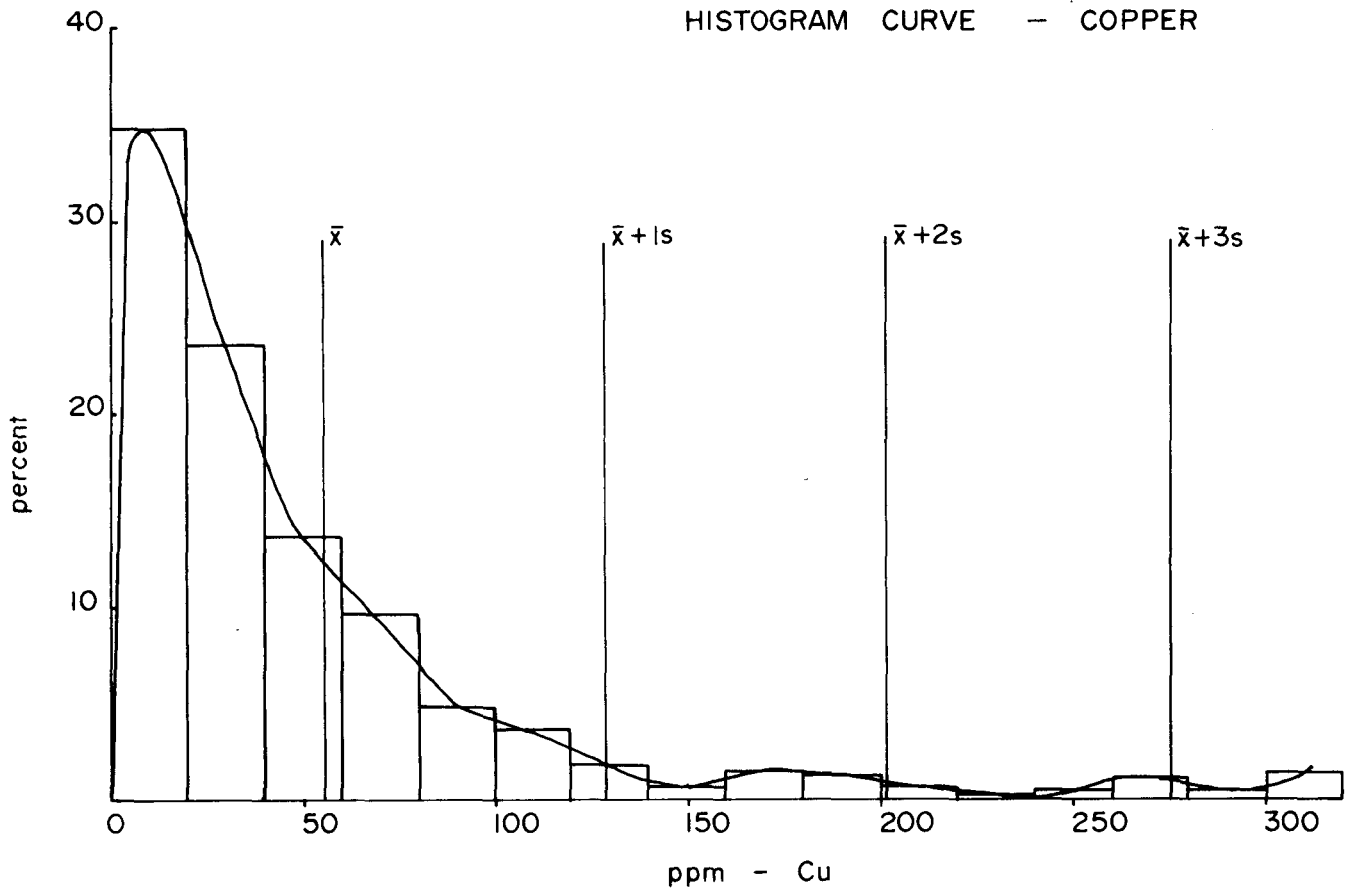
COPPER AND MOLYBDENUM

Both of these elements are generally closely associated especially in acidic intrusive complexes such as in the present situation. As will be seen from the contoured plan and from the histograms and log-probability graphs, this correlation is present at least in part. The two sets C1 and M1, with modal values of 15 to 20 and 0 to 1 respectively, represent background values within the grid area. This is the largest set for each element and values are mainly below the arithmetic mean for each element.

The next highest sets, C2 and M2, 70 and 6 ppm., respectively, appear to represent background values over the more sulfide-rich secondary granitic intrusives (unit 3a). Within these sets, and for higher sets, both a partial divergence of copper and molybdenum and complex association of sets occur.

Basically, while the higher copper sets are associated primarily with the central core of the secondary fine to medium grained granitic intrusive (unit 3a) the higher molybdenum values in addition to following the copper, also occur in zones isolated from high copper values. In the latter cases, the association appears to be with both primary and secondary intrusive zone. The two copper-molybdenum anomalous areas have been labelled ZONE A and ZONE B on the Composite Geochemical Contour Plan (see Pocket). The main peripheral molybdenum zone (with associated lead, zinc and silver) is labelled ZONE C.

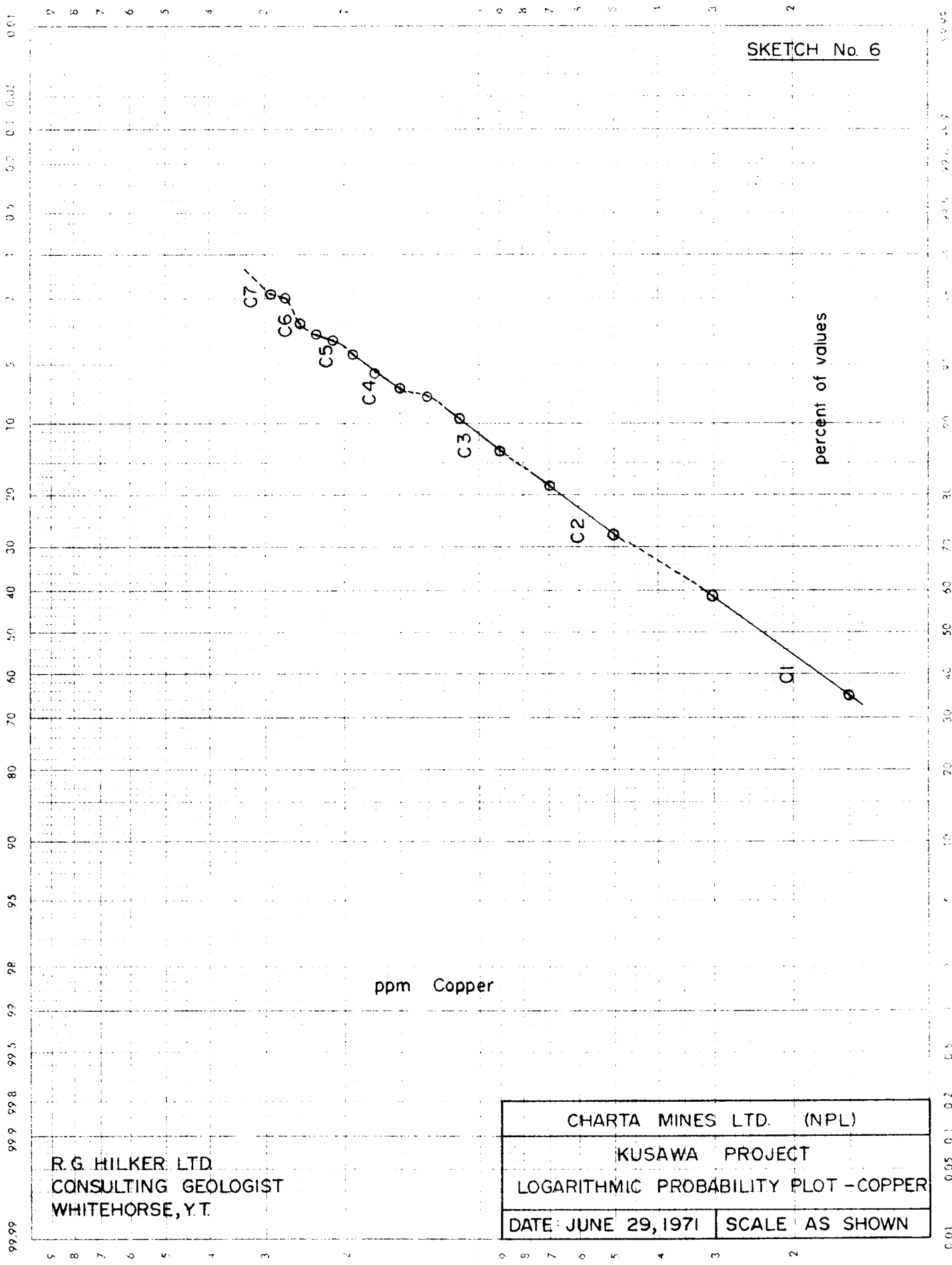
For copper, the statistically "probably anomalous" values, greater than 201 ppm Cu, are confined primarily within sets C5, C6 and C7. Most of these values occur within ZONES A and B. The molybdenum values greater than $\bar{x} + 2s$, or 12ppm, are contained in sets M4, M5 and M6. ZONE A and ZONE B, approximately 1000 feet by 300' and 600' by 300' respectively, are roughly on strike with each other but are separated by a 400 foot wide talus-snow zone between L38S and L42S and by one line (L38S) of relatively low background values. This may be due to the fact that, since L38S in the vicinity of ZONE B, is near the base of a scree slope and the anomalous zone may be



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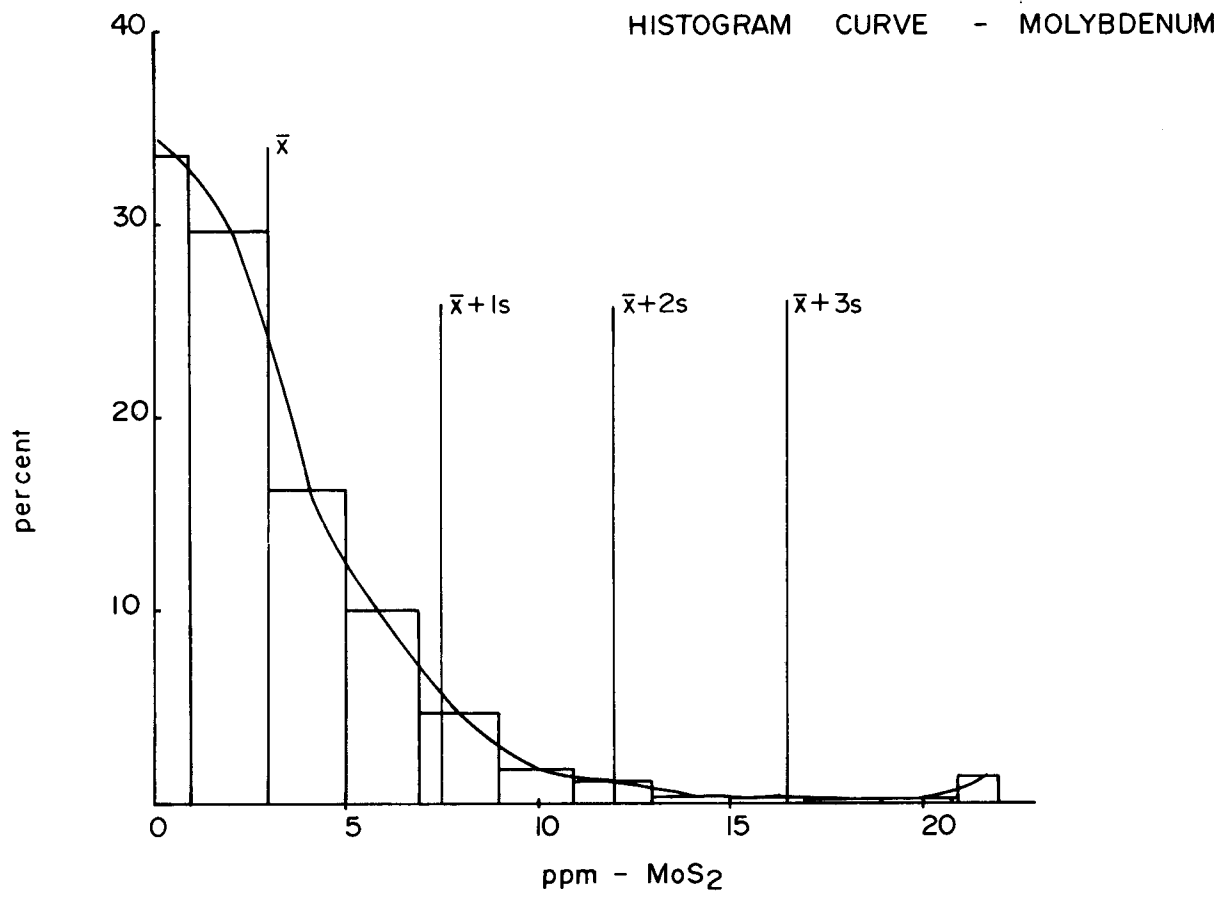
CHARTA MINES LTD (NPL)	
KUSAWA PROJECT HISTOGRAM - Cu	
DATE: JUNE 29, 1971	SCALE: as shown

SKETCH No. 6



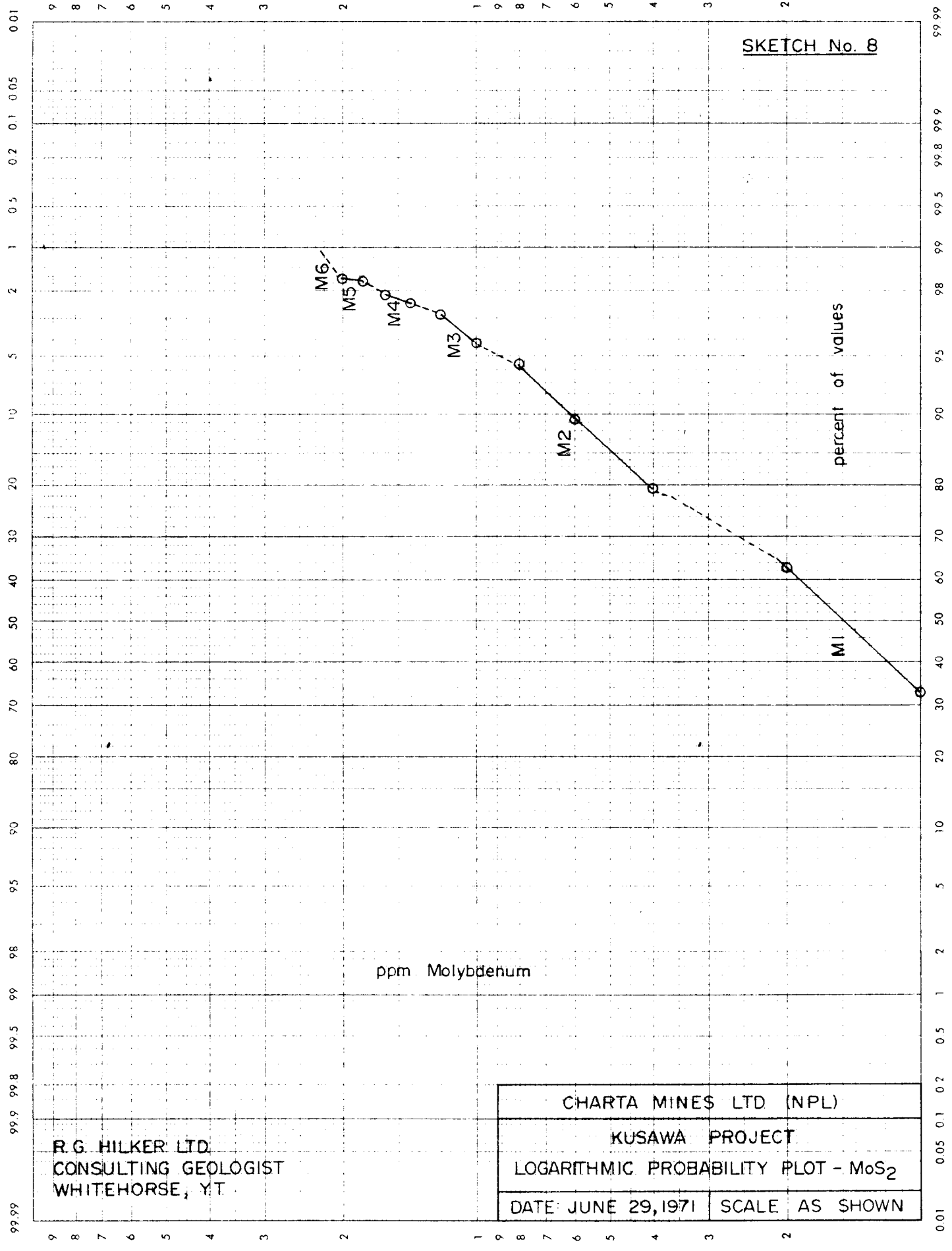
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LOGARITHMIC PROBABILITY PLOT - COPPER	
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masked by material from upslope. Any extension of either of these zones below the baseline could be quite effectively masked by the abundant talus.

ZONE D (copper, lead, silver), east of and downslope from ZONE A, is a fairly broad and weak anomalous zone in an area of extensive talus cover which may be a downslope expression of ZONE A or a reflection of bedrock conditions more directly beneath the anomaly. The latter interpretation is suggested since the ZONE B anomaly, which is comparable to ZONE A, shows no downslope reflection.

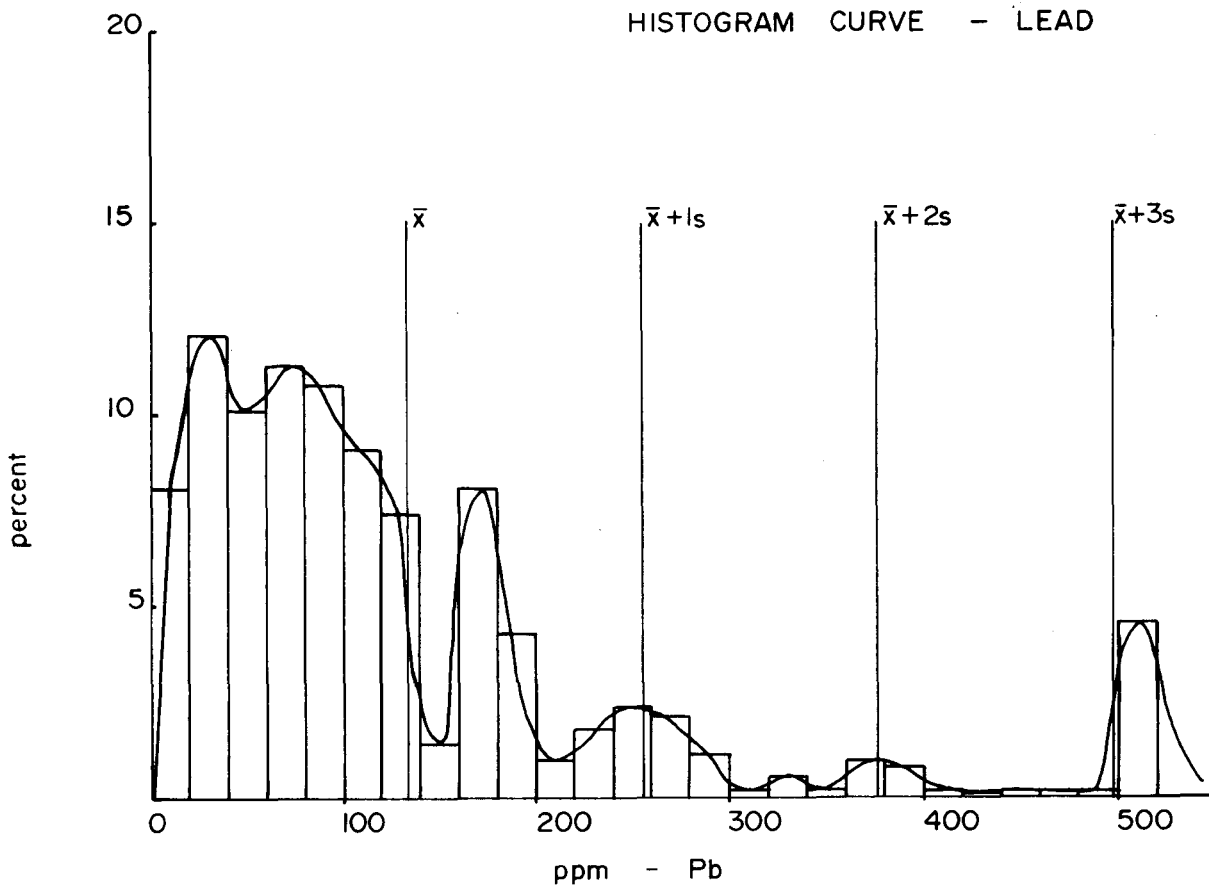
LEAD AND ZINC

These two elements behave in a much more complex fashion than copper and molybdenum. Both histograms show only a vague resemblance to a typical lognormal distribution. Eight different sets in the lead population and nine in the zinc have been interpreted. Many of these sets are approximately equal in size, rather than continually decreasing. Thus, the applicability of normal statistics to these values is probably lacking in accuracy compared with the other metals, but the figures are retained as a useful indicator. Three sets for each element are mainly below the respective mean values of 135 and 195 for lead and zinc, and these correlate with general background values. It is probable that the entire area of the grid, except for a relatively small number of values (sets P1 and Z1) is at least partially anomalous, and that all sets from P2 and Z2 upwards represent various degrees of the anomalous condition.

Aside from low values over much of the east side of the baseline and the extreme south end of the grid, the major correlation between lead and zinc is that they both show a roughly inverse spatial relationship with respect to copper. That is, both lead and zinc have relatively low values over and in the vicinity of ZONE A and ZONE B, with an increase in values outwards. The lead and zinc form an effective halo around the central copper-molybdenum anomalies.

Lead values which are statistically "probably anomalous" (greater than 377 ppm - sets P7, P8 and P9) and zinc anomalies which are statistically "probably anomalous" (greater than 435 ppm sets Z7 and Z8) occur as scattered zones which at least partially coincide. These anomalies are ZONES C, D, E, F, G, H, I and J. No anomalous lead with ZONE F. The prime geological associations of both lead and zinc anomalies is: 1) with the quartz-orthoclase porphyry dikes (unit 3b), in which traces of visible galena were often visible, (ZONES C, I, J (in part)) and, 2) with the peripheral areas of the secondary granitic intrusive (Unit 3a).

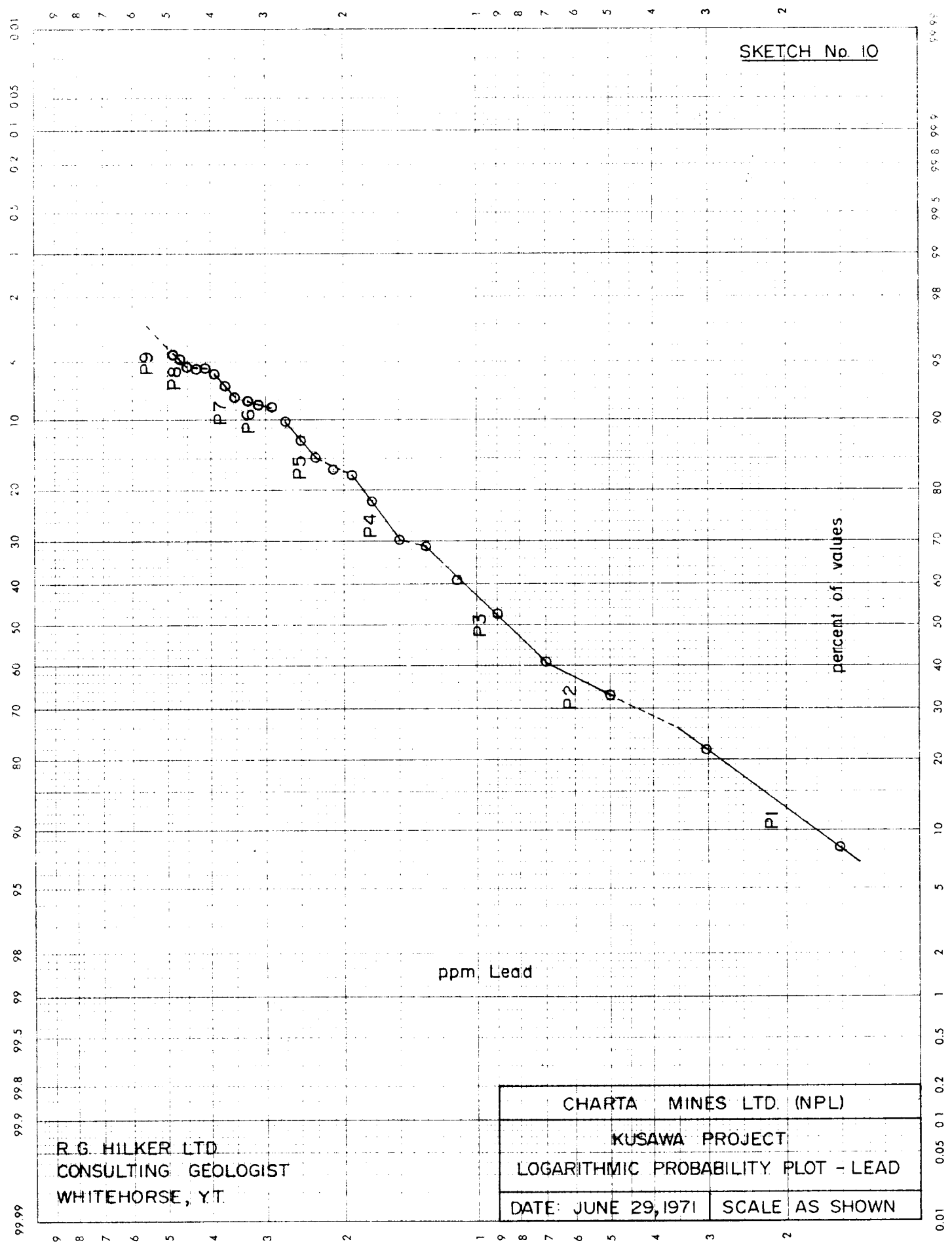
Two isolated anomalous lead values are associated with ZONE A and two broad lead anomalies are a part of ZONE D. As with the copper, the ZONE D lead may be either derived from a source in the vicinity of ZONE A or from more directly below ZONE D.



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SKETCH No. 10

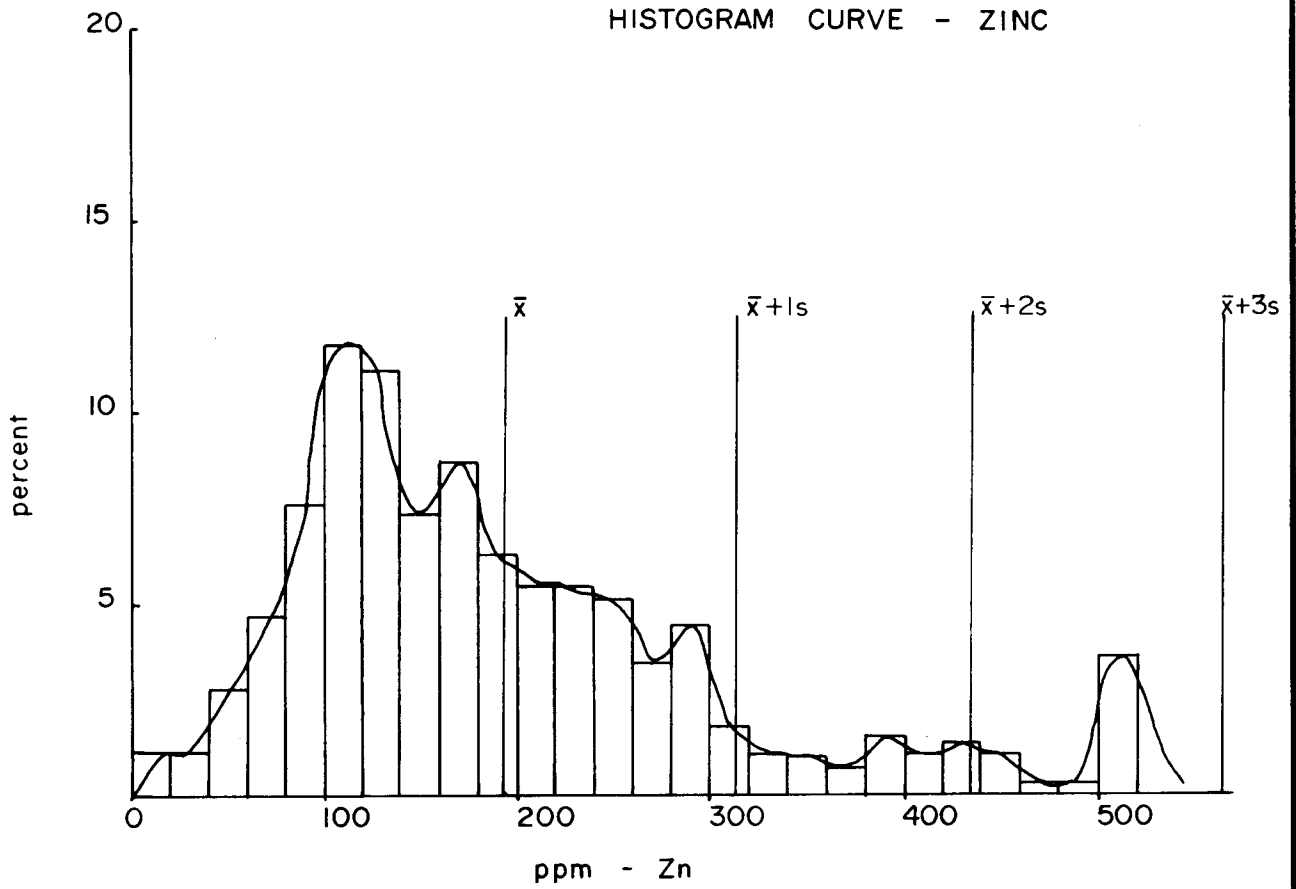


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LOGARITHMIC PROBABILITY PLOT - LEAD	
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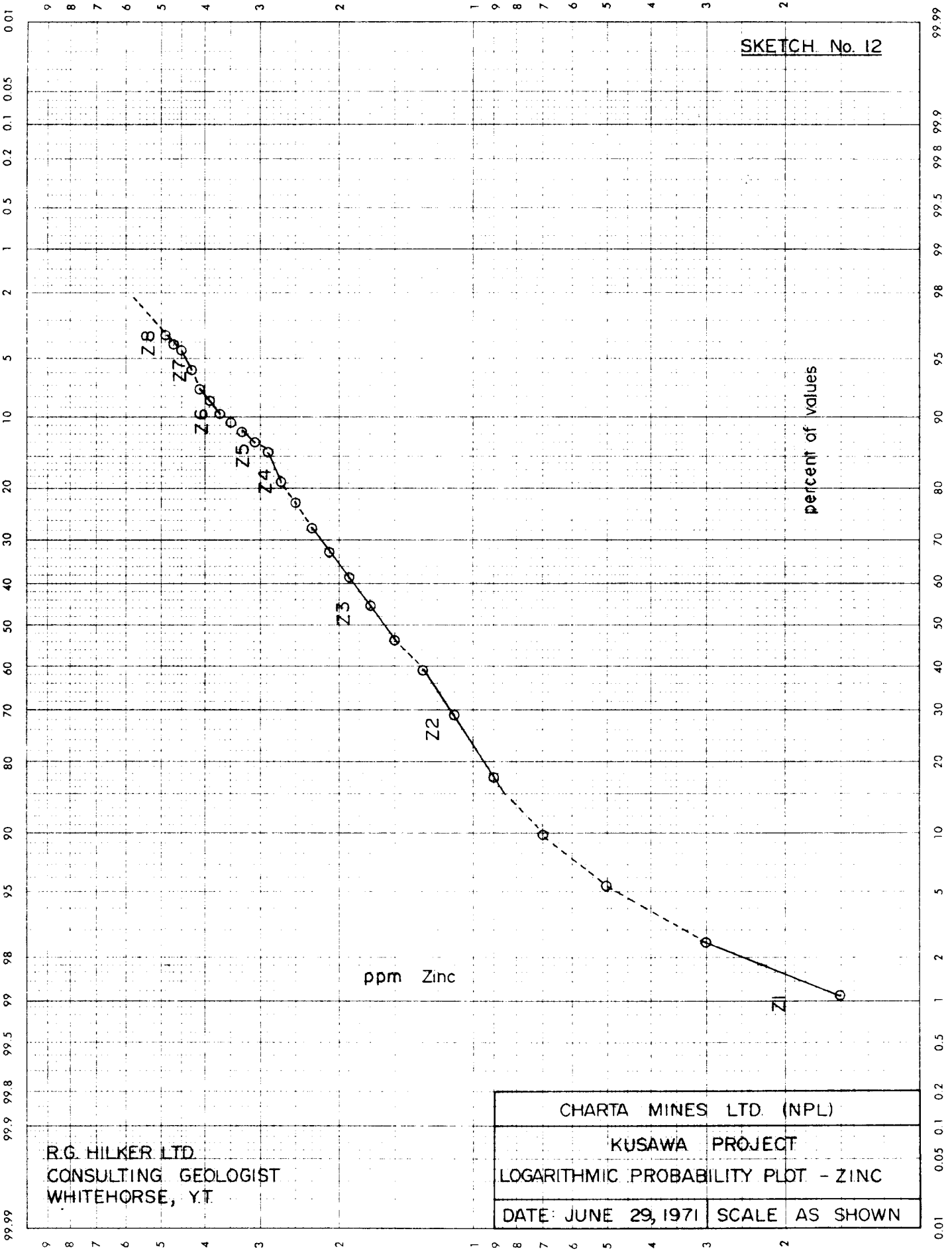
ppm Lead

percent of values



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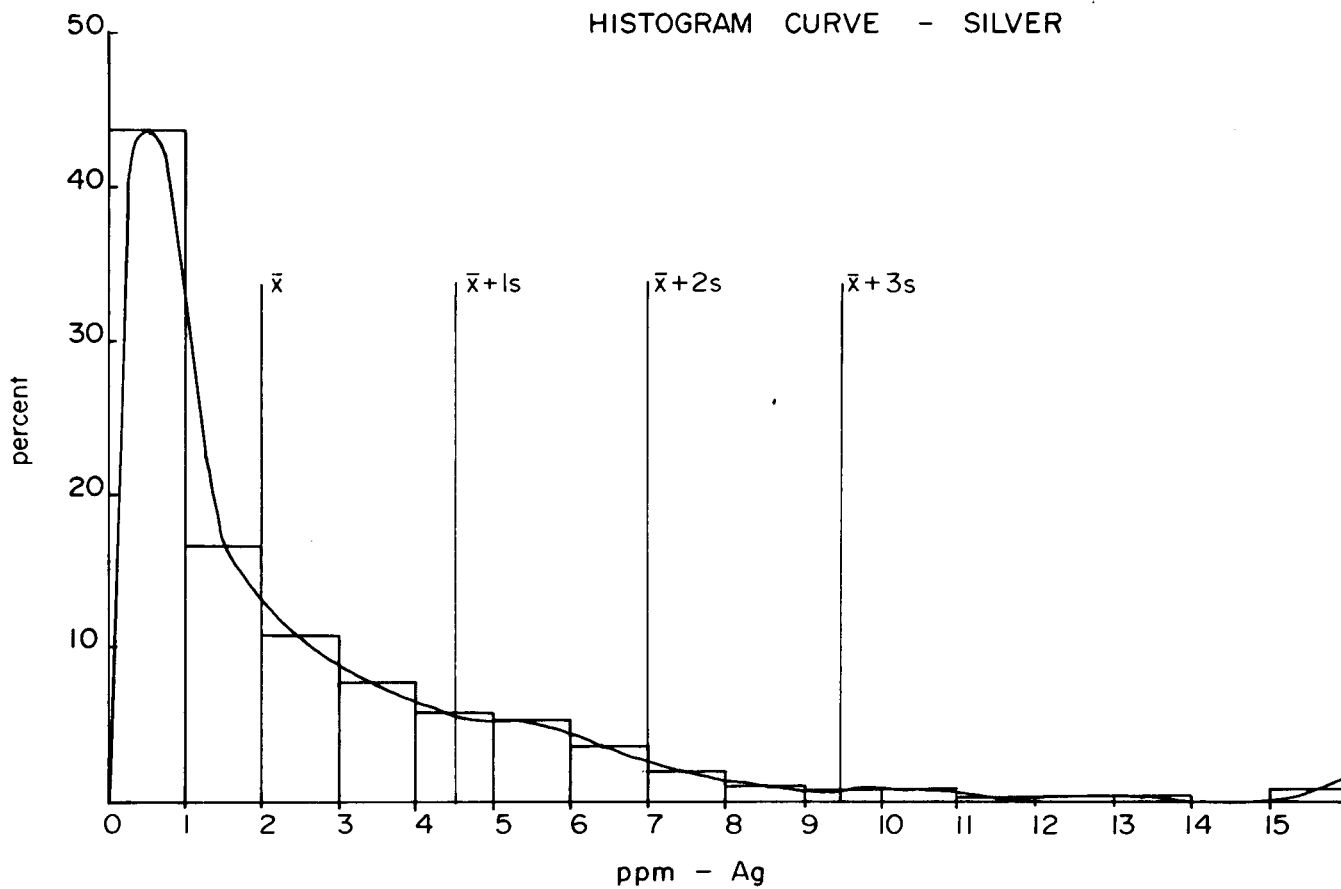
CHARTA MINES LTD. (NPL)			
KUSAWA PROJECT			
LOGARITHMIC PROBABILITY PLOT - ZINC			
DATE: JUNE 29, 1971	SCALE	AS SHOWN	

SILVER

Silver behaves in a less complex fashion than the other metals probably due to its relative chemical stability. The background, set A1, included values from 0 to the arithmetic mean, 2 ppm. Set A2, with a modal value of 5 ppm silver, appears to represent a higher background over the secondary granitic intrusive complex (unit 3a). Higher values (sets A3, A4 and A5) consist of values which are mainly statistically "probably anomalous" or greater than 7 ppm. Geologically, these anomalies are associated with both of rock units 3a and 3b. Anomalous values occur in ZONES A, C, D, E, G, H, I and J associated with lead and in ZONE A with copper. The closest association is with the lead, although the silver is often slightly more laterally extensive.

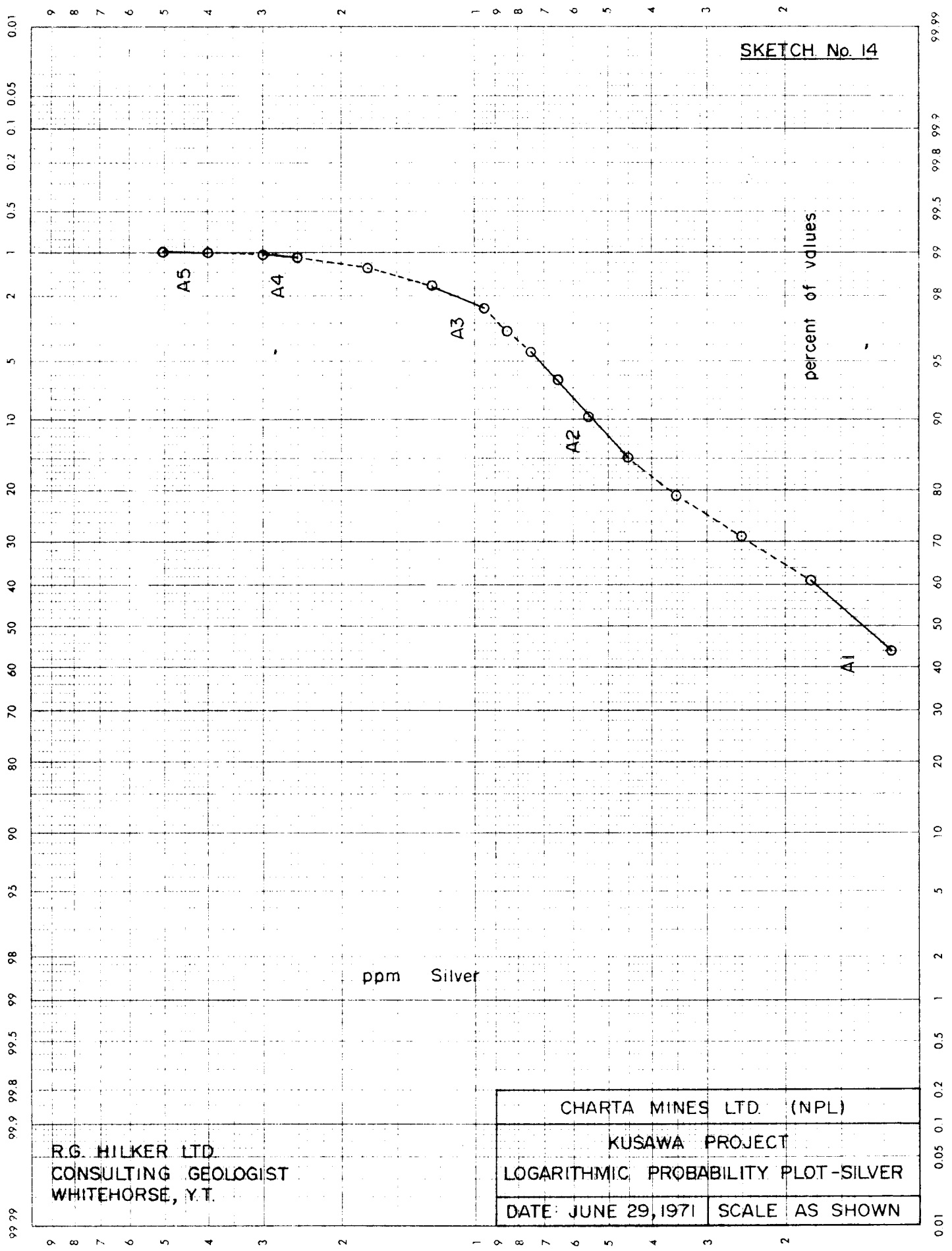
Jerome (1968) has suggested that both the physical and chemical changes within a porphyry copper deposit is attributed to alteration by the intrusive material. Jerome has generalized and speculated in his Figure 1 (reference #1) that geochemically zinc-lead and silver occurs as a halo effect on the edges of a mineralized granite intrusive. Also, high silver-gold-molybdenum and copper geochemical values may be expected to occur directly over the granitic intrusives. Therefore, it may be expected that silver, as an indicator element is extremely usefull. The Green Eagle survey has indicated a very similiar feature of silver occurring in unusually high values in conjunction with lead/zinc and copper/molybdenum. The usual background values of silver in the Yukon can be expected to be about < 0.5 P.P.M. Silver values range within the survey area of the Green

Eagle claims from 0.5 - 5 - 8 - 11 - 22 P.P.M. (see Silver Geo-chemical Plan), which silver values are above normal background. The silver values determined from the soil samples and rock fragments are therefore anomalous and are an excellent indication element.



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KUSAWA PROJECT	
LOGARITHMIC PROBABILITY PLOT-SILVER	
DATE: JUNE 29, 1971	SCALE AS SHOWN

SUMMARY

The trace concentrations of all five elements measured are, throughout most of the grid area, well above average trace metal concentrations in this type of rocks. Thus, most of grid represents an anomalous condition, and it is necessary for the present survey to define from this anomalous area any zones with significant economic potential.

The peripheral lead, zinc and silver anomalies halo or occur at the edge of the copper, molybdenum anomaly Zone A & B. Silver appears to have remained, after introduction into the host rocks in its original form. Lead, zinc and molybdenum, after possible solution by slightly acid groundwater, may have been rapidly co-precipitated with hydrous iron oxides, and copper, not so readily co-precipitated, is largely leached away.

Geochemically, Zones A and B, however, have entirely different character and outcrops are not particularly abundant through this area. Although some rocks in this area are not extremely altered, others show considerable chemical alteration and even brecciation. (unit 3c).

It appears that the core of the secondary granitic intrusive, which includes both ZONES A and B, is relatively rich in copper and molybdenum, while the peripheral zones of the secondary intrusive and the quartz-orthoclase porphyry dikes are richer in the other metals, especially lead, zinc and silver.

Thus, ZONES A and B are the main areas which appear to hold possible economic significance at this time. The true source of these anomalies is not certain, but it is believed to be directly below the surface expression. The degree of leaching, if any, of copper and molybdenum from oxidized surface samples is unknown. The lateral dimensions of the bedrock source zone are also unknown. It is possible that the masking effect of the talus cover splits the two anomalies and also leaves them open to the east. ZONE C, located at the west edge of grid, appears to be on the edge of a molybdenum high. A continuation, to the north-west and into the adjoining valley to the north of the Green Eagle claims, of the molybdenum is possible.

MAGNETICS SURVEY

INSTRUMENTATION

The field survey instrument used was a Scintrex Model MF-2 vertical field fluxgate magnetometer, 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 forms 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: \pm 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 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 .24 gamma on special order) over a range of -40° to $+40^{\circ}$ 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 June 11th to June 29th, 1971, inclusive, under the supervision of Mr. R.G. Hilker, Consulting Geologist and Professional Engineer, Whitehorse, Yukon Territory. Mr. Hilker supervised the data calculations mapping and contouring. The magnetics interpretation report was written by R.G. Hilker, the preparation work was done in Whitehorse between July 20th and July 28th, 1971.

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), was located at L40+00S and 0+00, 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:

<u>Station</u>	<u>Location</u>	<u>Gamma Value</u>
BCS	L40+00S - 0+00BL	2000
CS-1	L52+00S - 0+00BL	2025
CS-2	63+50S - 0+40W	2100
CS-3	L28+00S - 0+00BL	2075

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.

Magnetics Interpretation

The magnetics intensities recorded on the Green Eagle claim group is relatively flat and suggests a homogeneous rock mass. The gamma values vary between a low of 1625 to a high of 2100 gammas. The base control station (BCS) was established at the baseline and L40+00S with a value of 2000 gammas. All of the linegrid reading was based on the difference of the assumed value of the BSC. Most of the magnetic values vary between 1900 and 2000 gammas throughout the survey area.

Jerome (1968) has generalized that high magnetic intensities would occur on the fringe areas of a porphyry ore deposit and that relatively flat magnetics could be expected over a granitic intrusive. No magnetic data was recorded adjacent to the survey area, due to the steep mountainous terrain and the confining size of the linegrid. Therefore, the magnetics suggest the flat intensity of the interior portion of a porphyry mineralized igneous intrusive.

CONCLUSIONS

INTRODUCTION

Hydrothermal ore formation, or deposition, is usually by aqueous fluids in a continuous and discontinuous formation process. The regular order of deposition of ore, in a variable ore solution, depends on the solubility of the minerals present and the amount of metal concentration. Paragenesis is a term for the order of formation of associated minerals in a time succession one, after another. The paragenesis of the sequence of minerals present in a specific geological setting is a study to trace out in the host rock the succession in which the minerals have developed. The zonal theory of ore deposition is one that ores originate in a zone of differentiation in the lower part of the zone of crystallization where the siliceous-aqueous-metalliferous residues are formed. When the solution passes upward through faults and fractures deposition of ores occurs in successive zones, each of which is marked by its distinctive mineral association. Therefore, the depositional sequence in time (paragenesis) and space (zoning) depends on changes in solubility. The depositional sequence of sulfides show that the mobility of the ore metals in the transporting fluid follows a decreasing sequence of the following minerals: (Barnes & Czamanske - 1967).

Hg - Pb - Cu - Zn - Sn - Ni - Fe - Co

Mercury - Lead - Copper - Zinc - Tin - Nickel - Fe - Cobalt.

Smith (1962) suggests that in strong acidic solutions the solubility of metallic sulfides are as follows starting with the most soluble:

Mn - Fe - Ni - Co - Zn - Cd - Pb - Cu (ous) - Ag - Cu (ic) -
Bi - Hg

The forementioned sequence suggests the silver - Ag, could be deposited separate or with both lead - Pb or copper - Cu.

Geochemistry Results

The geochemistry survey has suggested a paragenesis and/or a zonal sequence of sulfide mineralization, within the linegrid area of the Green Eagle claim group. The concentration of the five elements; copper - molybdenum - silver - lead - zinc throughout the survey area, are well above average background values and indicate a distinctive halo effect or zonation of sulphide mineralization. The zonation of the sulphide sequence in the survey area appears to follow the anticipated order of a mineralization sequence of sulfides. The zonal sequence appears to be as follows:

Zn - Pb Zn - Pb - Ag Pb - Cu - Cu Ag - Mo - Cu Mo

The molybdenum - Mo sequence of desposition is uncertain and may be due to a separate mineralizing stage from the solutions that carried lead - zinc - copper and silver.

Zone A and B contains anomalous copper/molybdenum and is separated because of the lack of data collected due to snow and scree cover. If the presently delineated zones are continuous subsurface the copper - molybdenum anomaly could be expected to be approximately 2000 feet long and 400 feet wide. The lead - zinc and silver elements halo the copper - molybdenum zone, that is located in the centre of the geochemical survey area.

Anomalous molybdenum values in Zone C suggest the start of a

Fairly large concentration of molybdenum. The Zone C is located on the north-west edge of the grid system and should be traced further in the direction indicated. The anomaly is approximately 800 feet long and 100 - 300 feet wide.

Geology

The geological mapping on the linegrid of the Green Eagle claim group suggests the possibilities of the three geological features: one or more of the possible features may occur on the property.

1. Porphyry copper - molybdenum mineralized occurrence in a igneous "dike swarm"
and/or
2. Porphyry copper - molybdenum mineralization occurrence in a igneous "breccia pipe", that has subsided.
3. Porphyry copper - molybdenum mineralization occurrence in an igneous plug or small stock younger in age than the adjoining granite.

The possibility exists that a breccia pipe occurs that has been invaded by later igneous dikes. The geological mapping has indicated some breccia and altered igneous dike rock types in the survey area. Several factors besides breccia pipes may cause brecciation in rocks, such as; faults on eruptive material.

Breccia pipes are believed to be formed by subsidence caused by a net removal of rock inside the pipe. The removal of the rock within the pipe may be caused by corrosive action of early solutions, followed by a cycle of mineral deposition and replacement within the column of

rock fragments. Breccia pipes are approximately 1000 - 1500 feet in diameter in a lateral direction and several thousand feet along a vertical axis direction. Prophyry copper and/or molybdenum occurs within breccia pipes in the primary zone and massive sulphide develop in the secondary enriched zone.

The altered granites in Unit 3 within the geological mapped area may possibly be a younger plug or small stock within older Coastal Intrusive granites. The younger granitic intrusive may have been altered and mineralized by a later hydrothermal process. The geological mapping has indicated abundant pyrite, chlorite and altered feldspar with Map Unit 3, which are a few of the porphyry type of deposit alteration indicators. A thin section study of the rock types collected from the Green Eagle property would assist in the interpretation of the geological occurrence of the mineralization present.

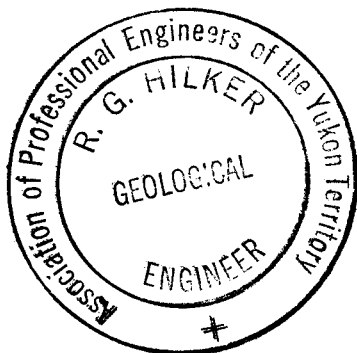
The survey area, covered by the linegrid, on the Green Eagle claims covers the gossan zone and altered rock types. Very little background data was collected from the area of granites that adjoin and enclose the mineralized and altered granites.

The magnetics survey has suggested a fairly homogeneous rock assemblage within the survey area, but little or no background data was collected because of the confined linegrid size. High magnetic values, due to magnetite may be expected on the outer edges of a porphyry copper/molybdenum igneous intrusive and a fairly normal magnetic background occurs over the intrusive.

RECOMMENDATIONS

The geological, geochemical and magnetics surveys on the Green Eagle - Joy claims group has indicated a possible porphyry copper/molybdenum type of mineralized occurrence. Further surface exploration work is warranted to confirm the concept of economic porphyry ore deposition. Therefore, the following programme is recommended:

Linegrid & Survey Control.....	\$3,000.00
Geological Mapping.....	1,800.00
Geochemical Surveying.....	1,800.00
Geochemical Determinations.....	2,500.00
Magnetics.....	1,200.00
Reconnaissance Geology.....	1,000.00
Reconnaissance Geochemical.....	2,500.00
Petrographic Study.....	700.00
Transportation To Property.....	3,000.00
Camp Costs & Radio.....	2,500.00
Report on Exploration & Drafting.....	1,500.00
Contingencies.....	<u>2,500.00</u>
TOTAL SURFACE PROGRAMME	<u>\$24,000.00</u>



A handwritten signature in black ink that reads "R. G. Hilker".

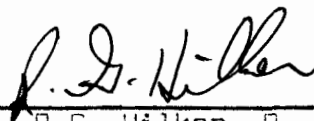
R.G. Hilker, P. Eng.,
Consultant Geologist
Whitehorse, Yukon Terr.
July 30th, 1971

CERTIFICATION

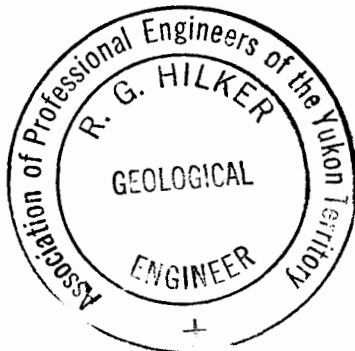
I, ROBERT G. HILKER of #5 Chalet Crescent, Hillcrest, in the City of Whitehorse, in the Yukon Territory, DO HEREBY CERTIFY:

1. THAT I am a Consulting Geologist, with an office located at #8 Northern Metallic 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 Green Eagle 1-16 and Jay 1-12 claim group, in the Whitehorse Mining Division of the Yukon Territory, from June 14th to June 29th, 1971 and was on the claim group during exploration on June 14, 19 and 29th, 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.
6. THAT I am a Director of Charta Mines Ltd (N.P.L.) and own securities of the company.

DATED this 30th day of July, A.D. 1971.



R.G. Hilker, P. Eng



APPENDIX

References

1. Jerome S.E. - Geology of The Porphyry Copper Deposits Southwestern North America - Titley & Hicks. 1968.
2. Lowell J.D. & Guilbert J.M. - Volume 65 June/July, 1970 - Number 4 Economic Geology - Lateral & Vertical Alteration - Mineralization Zoning in Porphyry Ore Deposits.
3. Barnes H.L. - Geochemistry of Hydrothermal Ore Deposits - Solubilities & Transportation of Ore Minerals. 1967.
4. Smith F.G. - Physical Geochemistry - 13-9 Effects of Compositional Variables on Solubility. 1962.
5. Perry V.D. - The Significance of Mineralized Breccia Pipes - Mining Engineer - April 1961.

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

Contract Costs - R.G. Hilker Limited

Invoice #2052 (copy attached).....	\$12,175.00
Invoice #2064 (copy attached).....	403.45
	<u>\$12,578.45</u>

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


L.R. Rasmuson

DATED this 19 day of ^{Nov}~~Jul~~, 1971
in the City of Whitehorse, Yukon Territory


Notary Public



R. G. HILKER
LIMITED

CONSULTING GEOLOGIST . . . PROFESSIONAL ENGINEER

P.O. Box 1566
WHITEHORSE, YUKON TERRITORY
"LAND OF THE MIDNIGHT SUN"

Chanta Mines Ltd. (NPL)
540 - 850 West Pender St.
VANCOUVER 1, B.C.

June 29, 1974

Re: Kusawa Lake Project

Invoice #2052

Contract Scope

R.G. Hilker Limited

Lithology.....	1,700.00
Ecology Mapping.....	1,500.00
Magnetics Survey.....	625.00
Geochemical Survey.....	1,500.00
Geochemical Determinations.....	1,750.00
Camp Rentals.....	500.00
Camp Supplies.....	1,000.00
Radio.....	300.00
Drifting Data Collected.....	500.00
Report on Property.....	500.00
Transportation.....	2,100.00
	<hr/>
TOTAL INVOICE	<u>\$12,475.00</u>
	<hr/>

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 - 690 West Pender St.
Vancouver 1, B.C.

July 30, 1971

Re: Kusawa Project
Adendum

INVOICE # 2064

TO:

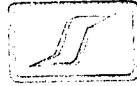
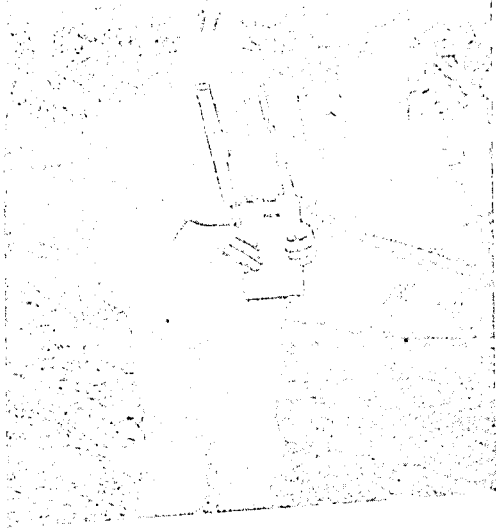
Geochemical determinations and handling
Re chemex labs \$315.00

Freight on Geochemical Sampling 22.50

Telephone

Long Distance	June 22, 1971	4.75	
	June 23, 1971	12.10	
	June 24, 1971	11.85	
	July 5, 1971	14.70	
	July 11, 1971	5.00	
	July 26, 1971	17.55	65.95

TOTAL INVOICE \$403.45



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 5 1/2 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 $+40^{\circ}$ centigrade.

The instrument has a built-in hemisphere polarity switch providing two overlapping ranges. For the Northern hemisphere the full range is $+60,000$ 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

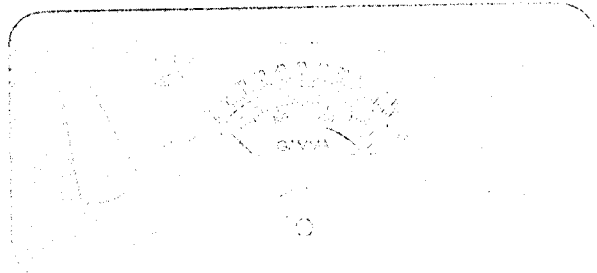
a) MF-2G

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 geo-probe 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

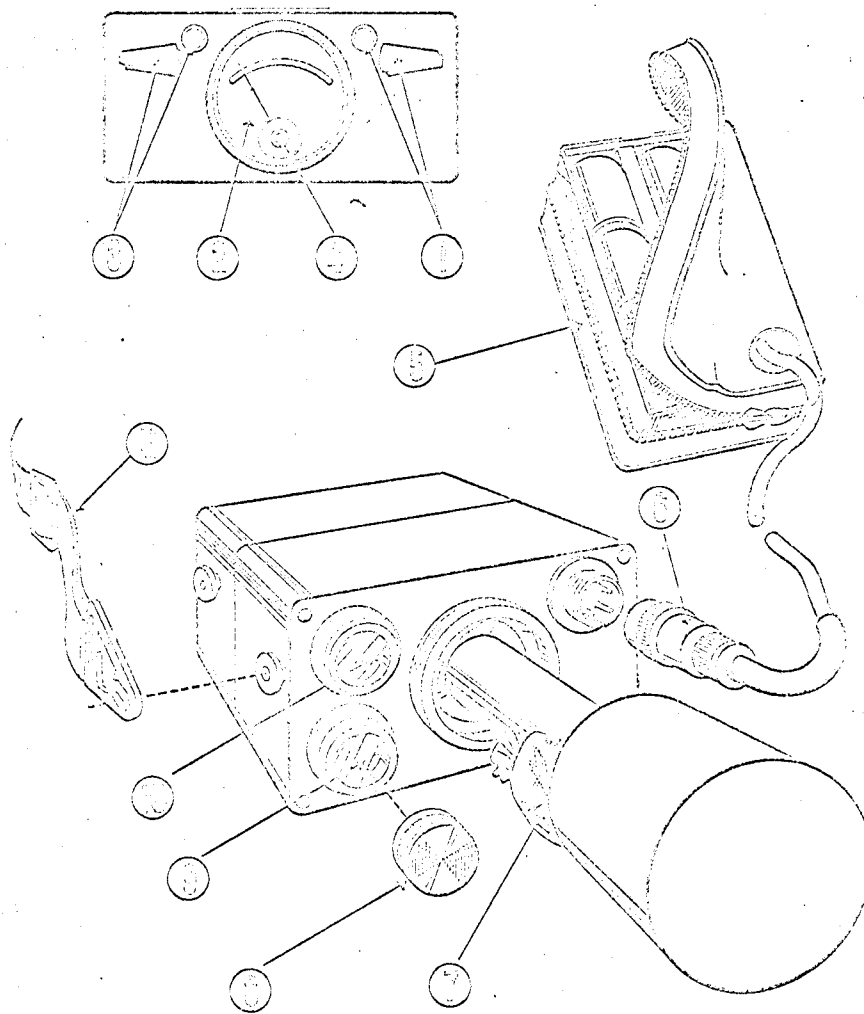
- 1.) Remove all magnetic objects from operator's person, e.g. keys, coins, buttons, etc. Zippers should be non-magnetic.
- 2.) Connect Battery Cable, Figure 6, to magnetometer receptacle on bottom of main housing. This connection must be secured by lock-ring.
- 3.) Attach battery pack (Fig. 5) either 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 $\pm 7,000$ 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 $\pm 7,000$ 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 re-calibrate 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.

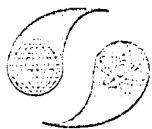
Field Procedure

- 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 1000-300 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 sure meter is turned off after use. Disconnect battery cable when meter not in use.



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

MODEL MF-1 FLUXGATE MAGNETOMETER



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



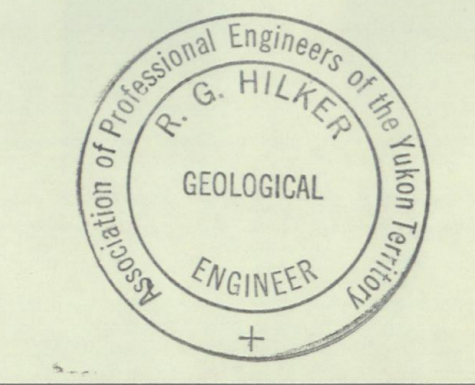
TABLE OF FORMATIONS

CENOZOIC	
TERTIARY	
1	Minor intrusives, 4a - diabase, 4b - dacite
MESOZOIC	
CRETACEOUS	
3	Secondary intrusives,
3a	Fine to medium grained granite
3b	Quartz-muscovite porphyry
3c	Altered intrusives, breccia, rhyolite
Coast intrusions,	
2	
2a	Hornblende granodiorite
2b	Biotite granite
PRECAMBRIAN - PALEOZOIC	
1	Yukon Group - biotite schist, amphibolite

Ⓜ HELICOPTER LANDING PAD

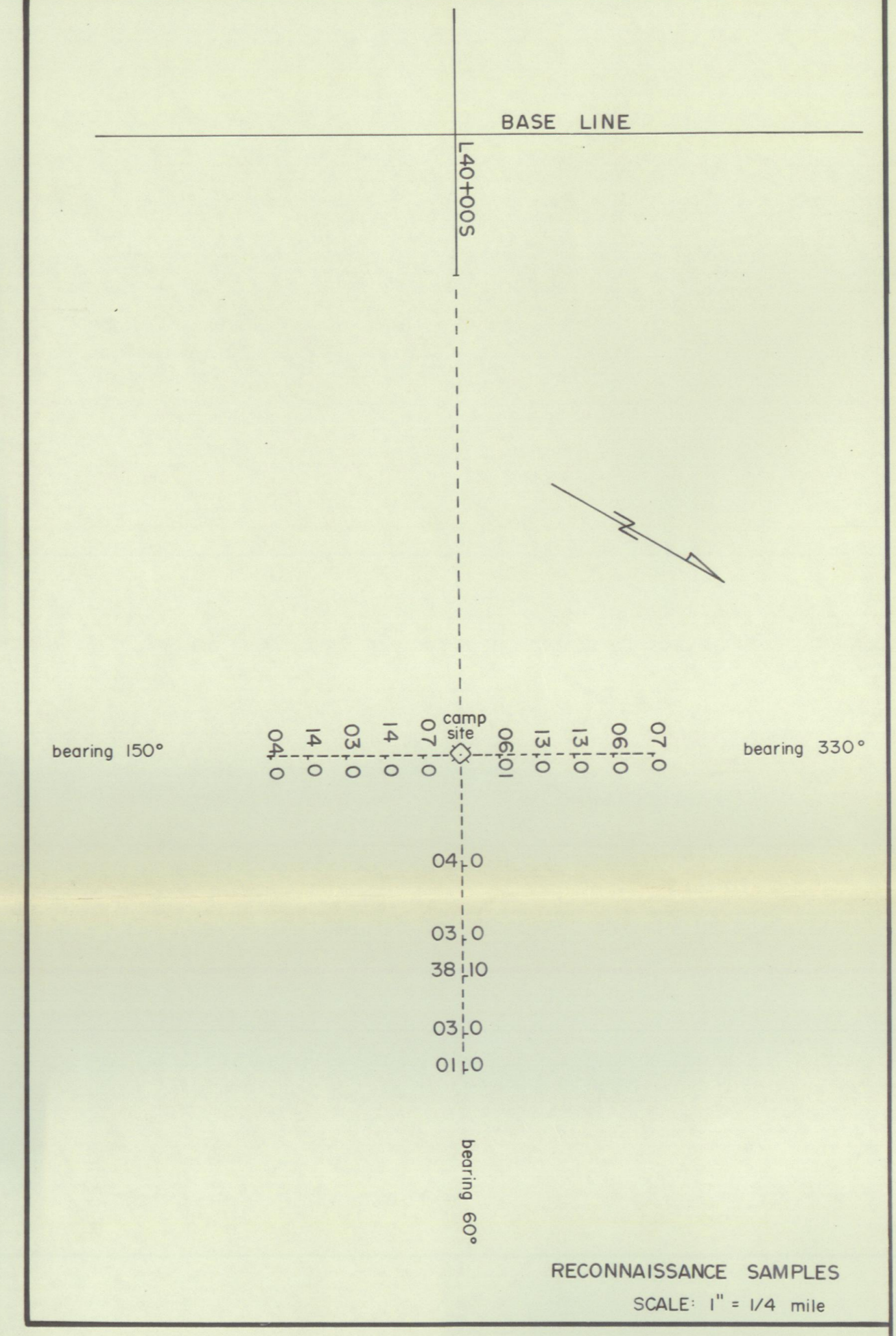
GEOLOGICAL LEGEND

- outcrop
- x small outcrop
- boulder train / ice
- creek
- - - inferred fault
- - - inferred geological boundary
- geological boundary



CHARTA MINES LTD (NPL)
 KUSAWA PROJECT
 GEOLOGY
 SHEET 115-A-8
 DATE: JUNE 25, 1971 SCALE: 1" = 200'

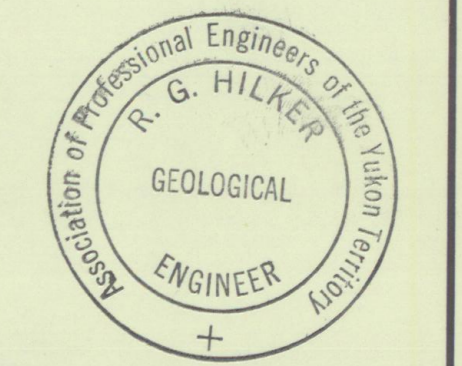
R. G. HILKER LTD
 CONSULTING GEOLOGIST
 WHITEHORSE, Y.T.



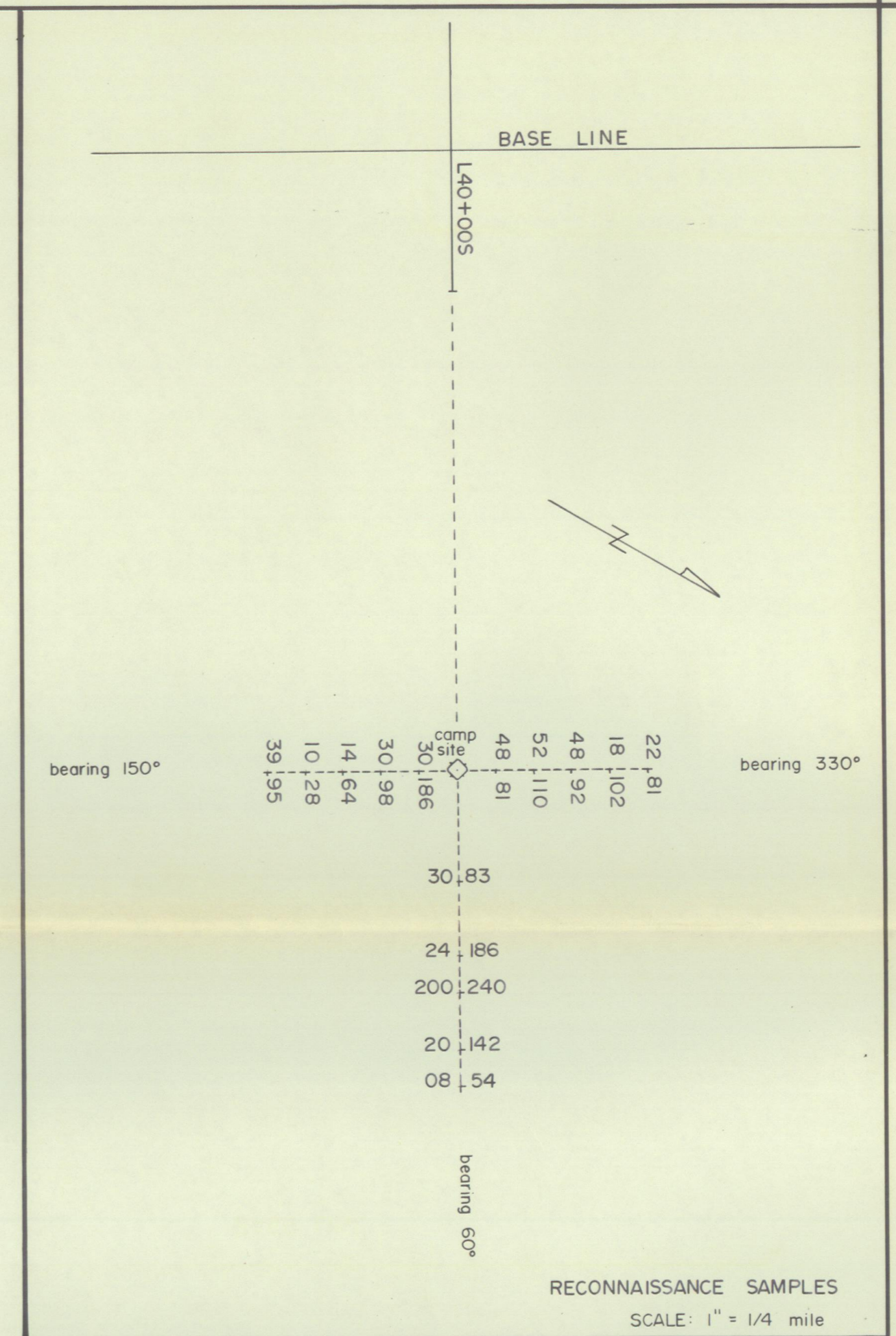
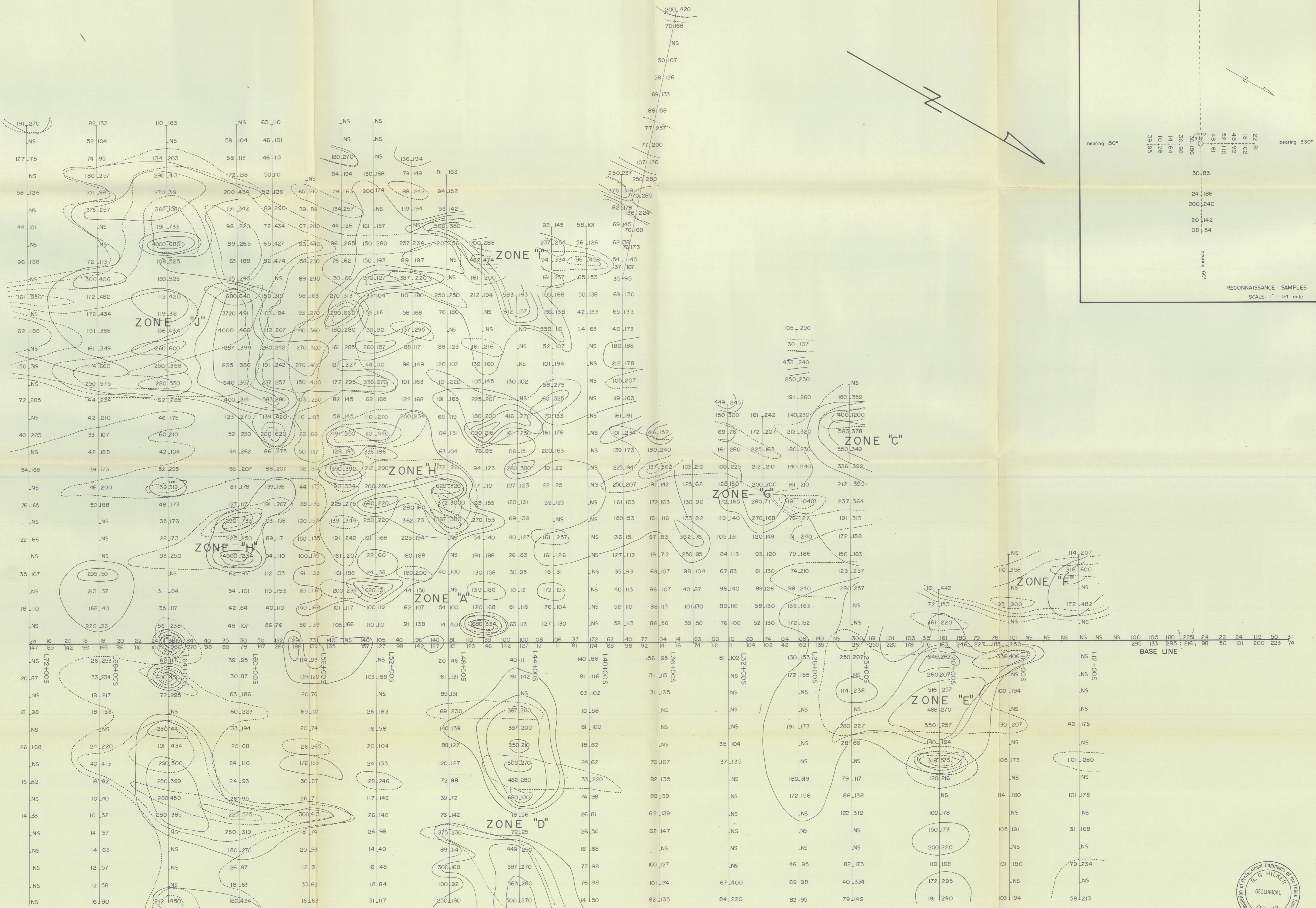
LEGEND		CONTOUR VALUES	
COPPER	MOLYBDENUM	COPPER	MOLYBDENUM
\bar{x} = 55 ppm Cu = arithmetic mean	\bar{x} = 3 ppm MoS ₂ = arithmetic mean	55ppm Cu - mean	3ppm MoS ₂ - mean
s = 73 ppm Cu = standard deviation	s = 4.5 ppm MoS ₂ = standard deviation	128ppm Cu - mean plus one standard deviation	75ppm MoS ₂ - mean plus one standard deviation
copper contours	molybdenum contours	201ppm Cu - mean plus two standard deviations	12 ppm MoS ₂ - mean plus two standard deviations
		275ppm Cu - mean plus three standard deviations	165ppm MoS ₂ - mean plus three standard deviations

NOTE
 Cu = Copper
 MoS₂ = Molybdenum
 NS = No sample
 Cu PPM. are shown to the south of each sample station, and to the west on the baseline.
 MoS₂ PPM. are to the north of each sample station, and to the east on the baseline.

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



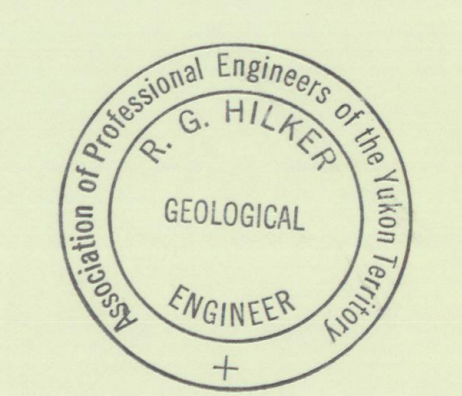
CHARTA MINES LTD. (N.P.L.)
 GREEN EAGLE - JOY CLAIMS
 GEOCHEMISTRY SURVEY-Cu/MoS₂
 NTS sheet 115-A-8
 DATE: JUNE 29, 1971 SCALE: 1" = 200'

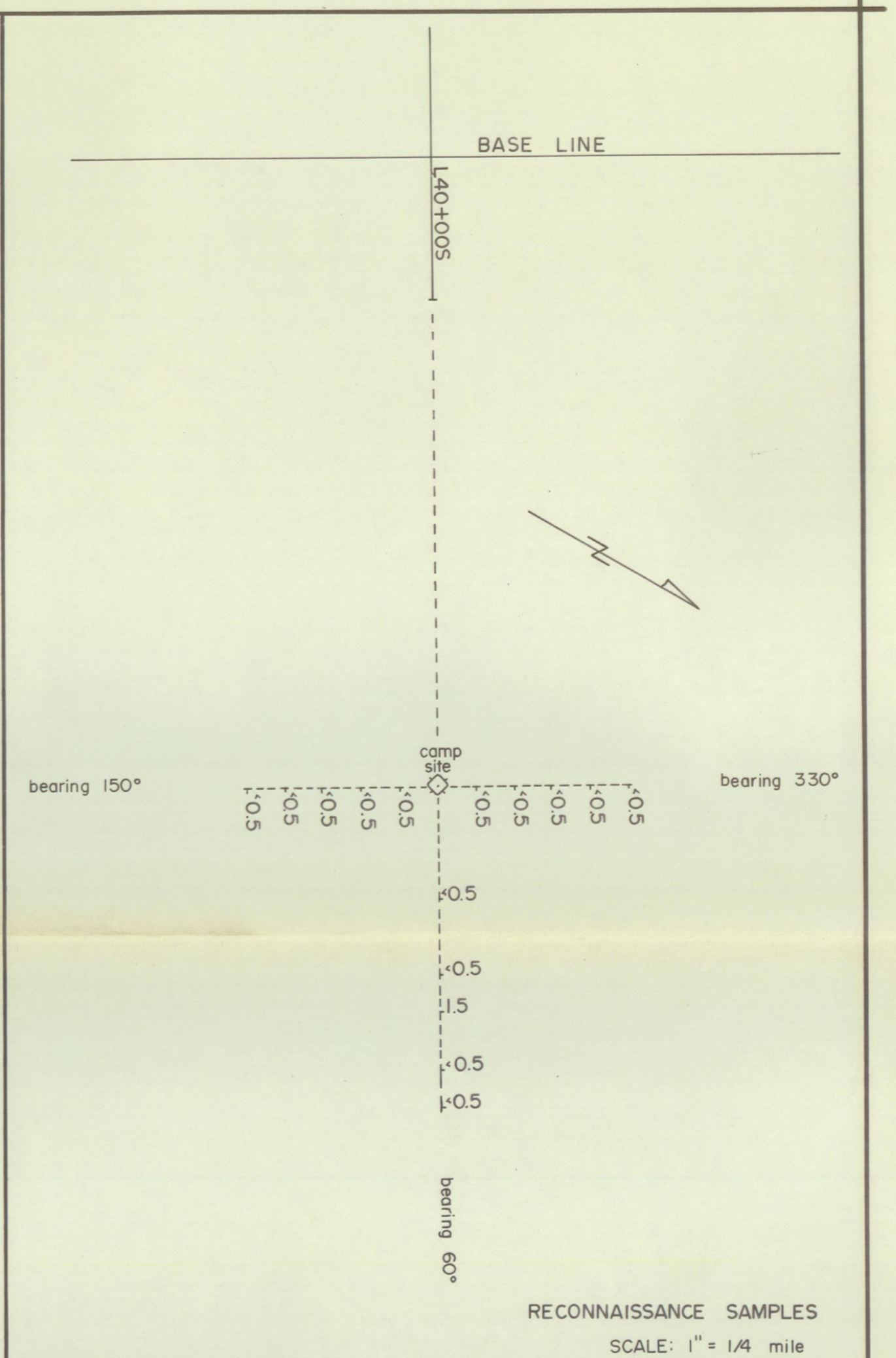


LEAD		ZINC	
\bar{x} = 135 ppm Pb = arithmetic mean	\bar{x} = 195 ppm Zn = arithmetic mean	\bar{x} = 135 ppm Pb = \bar{x}	\bar{x} = 195 ppm Zn = \bar{x}
s = 121 ppm Pb = standard deviation	s = 120 ppm Zn = standard deviation	\bar{x} + 1s	\bar{x} + 1s
lead contours	zinc contours	\bar{x} + 2s	\bar{x} + 2s
		\bar{x} + 3s	\bar{x} + 3s

NOTE
 Pb PPM. are shown to the south of each sample station, and to the west on the baseline.
 Zn PPM are to the north of each sample station, and to the east on the baseline.

R.G. HILKER LTD.
 CONSULTING GEOLOGIST
 WHITEHORSE, Y.T.
 CHARTA MINES LTD. (N.P.L.)
 GREEN EAGLE - JOY CLAIMS
 GEOCHEMISTRY SURVEY: Pb/Zn
 NTS sheet 115-A-8
 DATE: JUNE 29, 1971 SCALE: 1" = 200'





LEGEND
SILVER
 \bar{x} = 2 ppm Ag = arithmetic mean
 s = 25 ppm Ag = standard deviation
 silver contours

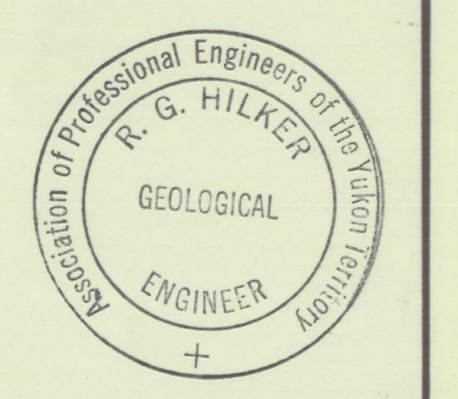
CONTOUR VALUES
SILVER
 2 ppm Ag - \bar{x}
 4.5 ppm Ag - $\bar{x} + 1s$
 7.0 ppm Ag - $\bar{x} + 2s$
 9.5 ppm Ag - $\bar{x} + 3s$

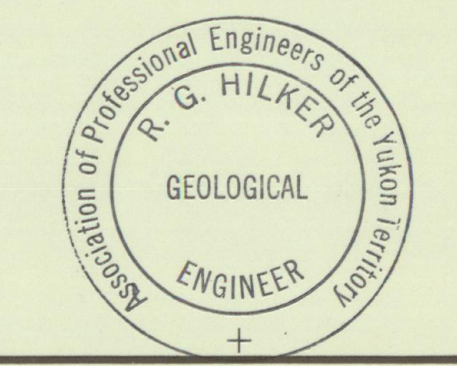
Ag = Silver
 NS = No sample

NOTE
 pH values are shown to the south of each sample station, and to the west on the baseline.
 Ag PPM are to the north of each sample station, and to the east on the baseline.

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

CHARTA MINES LTD. (N.P.L.)
 GREEN EAGLE - JOY CLAIMS
 GEOCHEMISTRY SURVEY: pH/Ag
 NTS sheet 115-A-8
 DATE: JUNE 29, 1971 SCALE: 1" = 200'



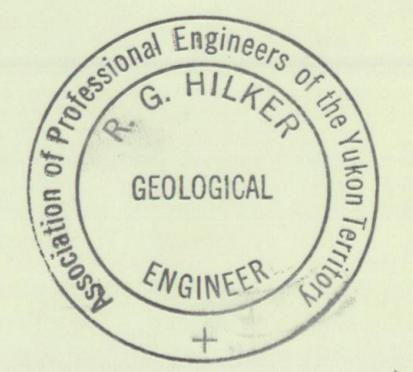


R.G. HILKER LTD.
CONSULTING GEOLOGIST
WHITEHORSE, Y.T.

CHARTA MINES LTD (N.P.L.)
GREEN EAGLE - JOY CLAIMS
MAGNETOMETER SURVEY
NTS sheet 115-A-B
DATE: JUNE 29, 1971 SCALE: 1" = 200'



LEGEND
 □ claimposts located
 ○ claimposts not located
 - - - - - claimline
 ———— cut line



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CHARTA MINES LTD. (NPL)
 CLAIMS LOCATION
 AND LINE GRID
 SHEET 115-A-8
 DATE: JUNE 29, 1971 SCALE: 1" = 400'



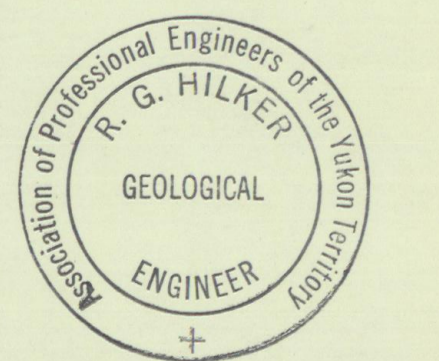
TABLE OF FORMATIONS

CENOZOIC
TERTIARY
4 Minor intrusives, 4a - diabase, 4b - dacite
MESOZOIC
CRETACEOUS
3 Secondary intrusives
3a - Fine to medium grained granite
3b - Quartz orthoclase porphyry
3c - Altered intrusives, breccia, mylonite
2 Coast intrusions
2a - Hornblende granodiorite
2b - Biotite granite
PRECAMBRIAN - PALEOZOIC
1 Yukon Group - biotite schist, amphibolite

Ⓜ HELICOPTER LANDING PAD

- GEOLOGICAL LEGEND**
- outcrop
 - small outcrop
 - boulder train / ice
 - creek
 - inferred fault
 - inferred geological boundary
 - geological boundary

- GEOCHEMICAL LEGEND**
- Copper
 - Molybdenum
 - Lead
 - Zinc
 - Silver



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