

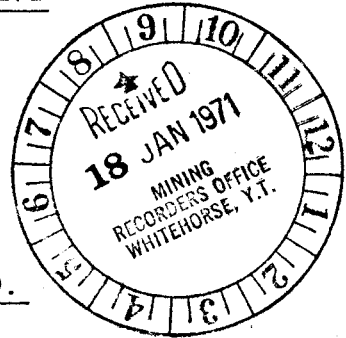
GEOLOGICAL AND GEOCHEMICAL REPORT

ON THE

HAYES CLAIM GROUP

OF

DELTA INTERNATIONAL MINERLAS LTD.



Coordinates 62°38'N 137°55'W

Claim Sheet 115 - I - 12

WHITEHORSE MINING DIVISION

YUKON TERRITORY

This report has been examined by the Geological Evaluation Unit and is recommended to the Commission to be considered as representation work for the amount of

\$ 8,024.01

D.B. Craig

Recorder in Charge

By: G. Gutrath, P. Eng.
November, 1970

Considered as representation work under Section 60 (4) Yukon Quartz Mining Act.

[Signature]
Commissioner of Yukon Territory

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HAYES CLAIM GROUP
DELTA INTERNATIONAL MINERALS LTD.
WHITEHORSE MINING DIVISION
YUKON TERRITORY

INTRODUCTION

A limited geochemical soil sampling program was completed in 1969 on the Hayes Creek Claim Group. The report on this work by E.D. Dodson, P. Eng. of December 1969 is on file at the Mining Recorder in Whitehorse. Mr. Dodson recommended additional line cutting, soil sampling, and geological mapping. This program was completed in September 1970 by J.R. Lerner, geochemical technician, and Howard Ball, line cutter, under the supervision of G. Gutrath, geologist.

SUMMARY

The Hayes Claim Group is located in the Dawson Range area, on the east side of Hayes Creek, 36 air miles to the east of Carmacks. Access to the property is by helicopter.

The claims are underlain by Yukon Group schist and gneiss, that have been intruded by granitic rocks, tentatively believed to be Tertiary and Jurassic age.

An extensive geochemical soil sampling program has been completed on the claim group. The results of this survey have indicated significant widespread lead-silver anomalies with coincident, but in most cases less significant, copper and molybdenum anomalies. The strongest copper-molybdenum anomaly is coincident with the highly altered porphyritic intrusive. There is no outcrop in the highly anomalous lead-silver zones to determine the cause of these anomalies. There is less than 2% outcrop exposed on the claim group.

From 1% to 2% finely disseminated pyrite occurs in both the intrusive rocks and the Yukon Group metamorphics. Small amounts of finely disseminated chalcopyrite and molybdenite have been found in the highly altered porphyritic intrusive that outcrops on the west side of Hayes Creek. This same intrusive has

SUMMARY (cont'd)

been located in residual outcrops on the Hayes Claims on the east side of the creek, but the intense leaching has completely removed the sulphide minerals.

CONCLUSION

The geochemical soil sampling survey on the Hayes Claim Group has outlined a number of large, highly anomalous, lead-silver areas associated with weaker copper and molybdenum values. This survey also located an intensely altered porphyritic intrusive typically associated with copper-molybdenum porphyry deposits. This intrusive is coincident with high geochemical values for lead, silver, molybdenum and copper. The majority of the anomalous areas are covered by overburden, making it impossible to determine the cause of the anomalies. However, the initial geochemical results have been so encouraging, that more work is definitely warranted.

RECOMMENDATIONS

The following program is recommended in order to extend the present anomalies, and to determine the cause of the anomalies:-

PHASE I

- (1) Extend the grid at 400-foot crossline intervals to the Hayes Creek flats.
- (2) The most significant lead-silver and copper-molybdenum anomalies can be trenched with a ripper-equipped bulldozer in order to expose bedrock. The anomalies on the south and southeast portion of the map area appear to be covered by thin overburden with discontinuous permafrost areas resulting in relatively easy trenching. However, the north portion of the map is covered by extensive areas of frozen overburden.

PHASE II

If the results of "Phase I" are encouraging, it will be necessary to drill the most favourable zones.

GEOGRAPHY

Location:

The Hayes Claim Group is located to the east of Hayes Creek, approximately ten miles from its confluence with the Selwyn River. From the Hayes Claim Group, Minto, on the Dawson-Whitehorse Highway, is 36 airmiles to the east; Carmacks, the nearest settlement of any consequence, is 70 airmiles to the southeast; and Whitehorse is 170 airmiles to the southeast.

Coordinates of the property are $62^{\circ}38'N$ and $137^{\circ}55'W$.

Access:

Access to the property is by helicopter. The nearest airstrip suitable for fixed-wing aircraft is on the International Mines Services property, six miles to the southeast of the Hayes Claim Group. The mouth of the Selwyn River, five miles to the north of the property, can be reached by boat by coming 50 miles downstream on the Yukon River from Minto. A 35-mile tote road, suitable for tracked vehicles, connects Yukon Revenue Creek at the end of the Discovery-Carmacks road with the Hayes Claim Group.

Topography:

Elevations from the claim group range from 1500 feet to 4500 feet. The topography is typical of the rolling, unglaciated hills that form the Dawson Range. The ridges and the tops of the hills are rounded and the major tributaries flow in steep-walled valleys.

Vegetation:

The bottom of the Hayes Creek Valley is heavily timbered with spruce and balsam. The northern slopes are covered with stunted balsam to the 3500 foot elevation, and the southern slopes are open with mixed stands of poplar and patches of balsam to the 4000 foot elevation.

GEOLOGY

General Geology:

The area has been mapped by the geological Survey of Canada Memoir 189, Carmacks District, Yukon, by H.S. Bostock.

The east flank of the Dawson Range, in the area of the Hayes Claim Group, is composed of Precambrian Yukon Group schists and gneisses that have been intruded by large masses of Jurassic and Tertiary granitic rocks. A large area of the Dawson Range to the southeast of the Hayes Group is covered by Tertiary volcanic rocks, composed of layered basalts, andesites and trachyte flows, breccias and tuffs.

Property Geology:

There is less than 2% exposed outcrop in the Hayes Claim Group. The property is in an unglaciated area and is covered by an extensive area of thin residual overburden mixed with soil. Outcrop is normally found only on the ridges or in the stream canyons. However, by taking careful note of the rock fragments, during the collection of the soil samples, it is possible to construct a fairly accurate map of the underlying geology.

Metamorphic Rocks (Yukon Group):

A large portion of the rocks underlying the Hayes Claim Group are Precambrian rocks, classified as the Yukon Group. These rocks are predominantly mica-quartz schists, chlorite schists, and quartz-mica gneiss. In the northeast corner of the claim group there is a northwest trending bank^{open} of limestone, believed to be part of the Yukon Group, that has been traced in float and outcrop for 2800 feet.

Intrusive Rocks:

A quartz-feldspar porphyry intrusive body, with an average width of 1000 feet has been traced for 6000 feet in a northwest direction across the central portion of the claim group. The intrusive is tentatively classified as Jurassic in age and appears to be of monzonite composition. Its crystal character varies from a quartz-feldspar latite porphyry to a medium-grained

GEOLOGY (cont'd)Intrusive Rocks: (cont'd)

monzonite with porphyritic phases. The massive, relatively fresh, intrusive rock is made up of 5% to 10% quartz, 80% plagioclase, with only minor orthoclase, and from 5% to 10% biotite.

A second intrusive has been found in the southwest portion of the claim group. It has been traced in the residual overburden for a distance of 2200 feet east of the Hayes Creek flats and it is believed to extend across Hayes Creek where similar intrusive rock outcrops on the west bank of the creek. The intrusive has a maximum width of 1000 feet at the edge of the creek flats, and going to the east it narrows to a width of 400 feet. The intrusive outcropping on the west bank of Hayes Creek can be traced for approximately 1000 feet along the creek and goes west up Klines Gulch a minimum of 800 feet. This intrusive does not outcrop on the east side of the creek on the Hayes Claim Group, but large areas of residual outcrop were found during the soil sampling survey. The intrusive appears to have been a quartz-feldspar porphyry, but the alteration has obliterated the original character of the rock. Pervasive argillic alteration and intense leaching has resulted in a "punky" textured, yellow, orange-coloured rock, cut by more resistant fine hair-like quartz veinlets. This intrusive may be an altered phase of the quartz feldspar monzonite porphyry that occurs to the northeast. However, the general appearance of the second highly-altered intrusive is typical of other intrusives located in the Dawson Range and classified as Tertiary in age.

Mineralization:

From 1% to 3% finely-disseminated pyrite occurs in the Yukon Group rocks and in the relatively fresh quartz-feldspar monzonite intrusive. The sulphide minerals in the highly-altered quartz-feldspar porphyry intrusive have been leached out leaving a coating of orange-red limonite and a mixture of yellow oxides. Mr. E.D. Dodson examined this same intrusive on the west side of Hayes Creek in 1969 and found it to be mineralized with disseminated pyrite, chalcopyrite, and some molybdenum.

GEOCHEMISTRYSurvey Performed:

A total of 79,400 feet of north-south crosslines and 6800 feet of baseline have been cut and tape-and-compass surveyed on the Hayes Claim Group. The majority of the crosslines are at 400-foot intervals with stations every 100 feet. A total of 375 soil samples were collected in 1969 and 627 soil samples were collected in 1970 for a grand total of 1,002 samples. The samples were taken from the "A" soil horizon with a stainless steel trowel. The first lot of 375 samples were analyzed for Mo, Cu, Pb and Ag. The second lot of samples were analyzed for Ag and Pb, and 150 of these samples were also analyzed for Mo and Cu.

Method of Analyses:	Instrumental-Atomic Absorption
Extraction:	HClO ₄ and HNO ₃
Detection:	Techtron AA4 and AA5
Analyzed by:	Vancouver Geochemical Laboratories Ltd.

Survey Results:(a) Lead:

Lead background is in the range of 25 to 50 ppm., weakly anomalous conditions range from 51 to 100 ppm., and over 100 ppm. is definitely anomalous.

There are four distinct lead anomalous areas:-

- (1) a strong lead anomaly up to 500 ppm. is coincident with the highly-altered intrusive in the southwest corner of the map area. The outline of the anomaly conforms remarkably close to the outline of the intrusive, but does indicate a possibly intrusive finger extending an additional 800 feet to the east,

GEOCHEMISTRY (cont'd)Survey Results: (cont'd)(a) Lead: (cont'd)

- (2) the second anomalous area trends in an east-west direction and cuts across the quartz-feldspar monzonite porphyry intrusive. The most continuous and strongest zone in this anomaly ranges as high as 4201 ppm. lead and can be traced for 2200 feet and is from 200 feet to 500 feet wide. The overall area is 4000 feet long and is made up of a number of discontinuous zones. There are a few small outcrops of quartz-feldspar monzonite porphyry along the southwestern edge of the anomaly, but no obvious mineralization to account for the anomaly. The remainder of the area is completely covered by overburden,
- (3) the third anomalous area trends in a northwest direction along the northeast side of the map area. The anomalous area can be traced for 7000 feet and is made up of a number of smaller anomalous zones that range as high as 860 ppm. lead. This anomalous area appears to be related in part to a strong northwest trending lineament. However, the anomaly also subparallels the northeast facing slope contour, possibly indicating that the anomalous lead values are being deposited by groundwater seeping out from under the permafrost. There is no outcrop in the anomalous area, and
- (4) the fourth anomalous area is in the southeast corner of the map area. The strongest anomalous zone occurs on line 32 east and can be traced along the line for 450 feet. The zone ranges as high as 2100 ppm. lead.

GEOCHEMISTRY (cont'd)

Survey Results: (cont'd)

(a) Lead: (cont'd)

- (4) However, it would appear that the anomaly reflects a very localized mineral occurrence since it was not evident on the lines 400 feet to the east and west.

There are a number of other smaller lead anomalous areas on the Hayes Group, but they are not as significant as the previously listed ones.

(b) Silver:

The silver background on the Hayes Claim Group is in the range of 1 to 2 ppm. From 2 to 4 ppm. is moderately anomalous, and over 4 ppm. is strongly anomalous.

The silver anomalies are coincident with the lead anomalies, and are listed in the same order:-

- (1) the silver anomaly coincident with the highly-altered intrusive has a strongly anomalous core from 7 to 11.5 ppm. The anomalous zone over 4 ppm. is 1400 feet long and 200 feet wide,
- (2) the second silver-lead anomalous area is made up of a number of small anomalous zones, ranging from 4 ppm. to 10 ppm. silver. The strongest zone trends in an east-west direction across line 16E and 20E at 15N. The zone ranges from 4 ppm. to 10 ppm. silver and can be traced for approximately 900 feet and over a width of 200 feet,
- (3) the third silver anomalous zone is not as distinct or as strong as the lead anomaly. The general trend is the same but the anomaly is not as continuous, and,

GEOCHEMISTRY (cont'd)Survey Results: (cont'd)(b) Silver: (cont'd)

- (4) the fourth silver-lead anomalous zone only has a small coincident silver anomaly of little significance.

There are a number of smaller silver anomalies, but they do not appear to be related to mineralized structures of any significance.

(c) Copper:

Only a small portion of the soil samples have been analyzed for copper and molybdenum. The background for copper is in the range of 20 to 40 ppm. Samples over 40 ppm. are weakly anomalous, and over 80 ppm. are strongly anomalous.

The strongest and most significant copper anomaly is coincident with the lead-silver anomaly related to the highly-altered porphyry intrusive in the southwest corner of the map area. The anomaly is 1400 feet long, from 600 to 200 feet wide, and ranges from 40 to 410 ppm. copper.

From the limited amount of copper analyses, it would appear that weak copper anomalies in the 40 ppm. to 60 ppm. range are commonly associated with the lead-silver anomalies.

(d) Molybdenum:

The molybdenum background is in the range of 1 ppm. to 3 ppm.

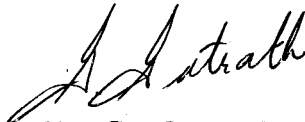
The most significant molybdenum anomaly is coincident with the highly-altered porphyry intrusive in the southwest corner of the map area. The anomaly is 1100 feet long, 100 to 200 feet wide, and ranges from 3 to 10 ppm. molybdenum. A small, strong molybdenum anomaly, ranging from 3 to 6 ppm. occurs 200 feet to the south of the first anomaly. It can be traced from the south end of 28W to 24W, a distance of 400 feet. The west end of the anomaly is a minimum of 300 feet wide. This anomaly would appear to

GEOCHEMISTRY (cont'd)Survey Results: (cont'd)(d) Molybdenum: (cont'd)

indicate that the intrusive is rapidly widening to the west towards Hayes Creek. On 28W the intrusive may be as wide as 800 feet.

There are a number of other small molybdenum anomalies in the Hayes Claim Group. The majority of these are associated with the lead-silver anomaly, but are not nearly as significant.

Respectfully submitted,



Gordon C. Gutrath,
P. Eng. Geologist.

NOVEMBER 1970

HAYES GROUP

o Dawson

o Mayo

o Carmacks

YUKON

o Whitehorse

N. W. T.

BRITISH COLUMBIA

o Prince Rupert

o Dawson Creek

o Prince George

ALBERTA

SASK.

o EDMONTON

o VANCOUVER

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SCALE 1" = ± 190 mi.

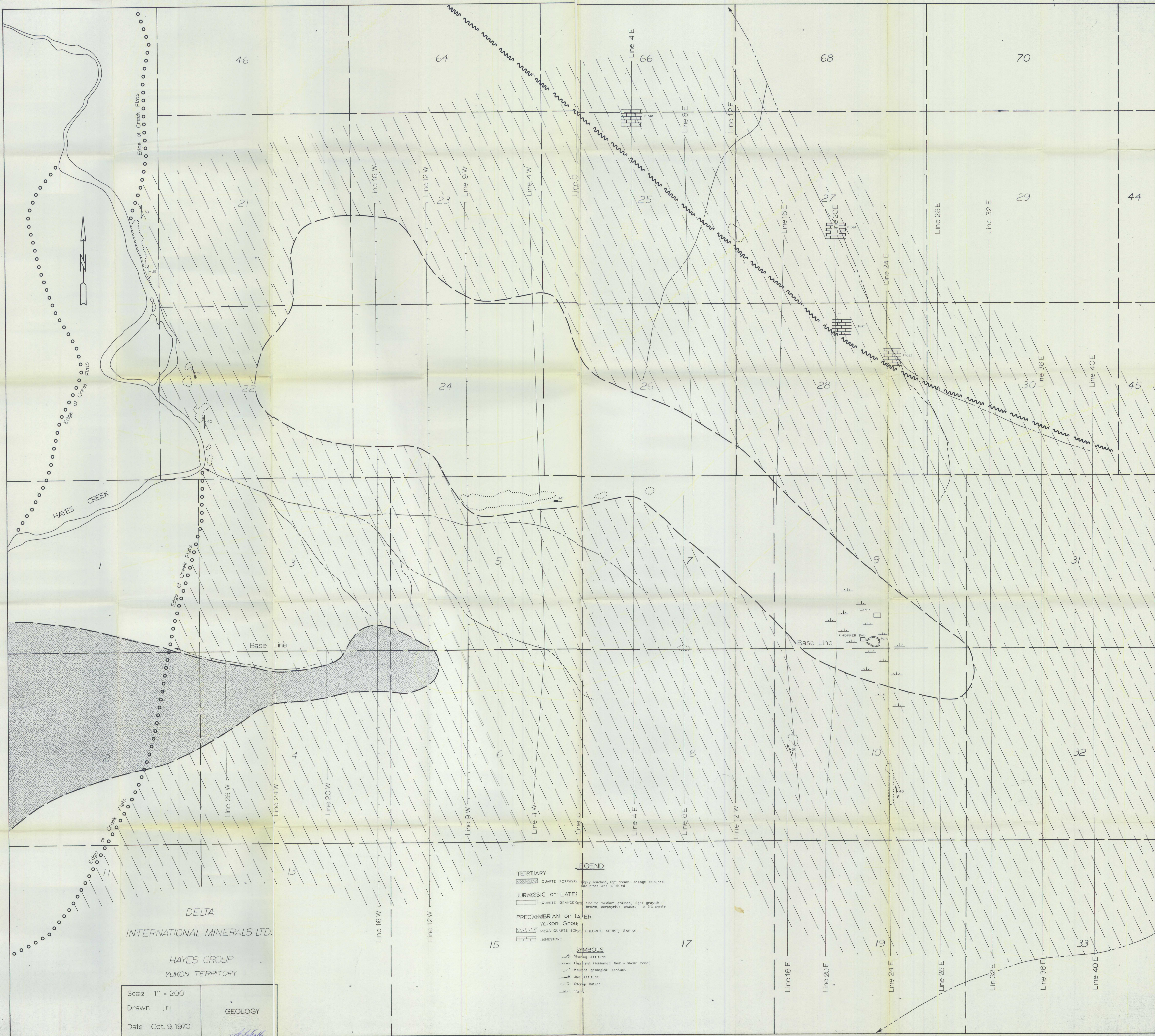
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NO. 279-1

HAYES GROUP

LOCATION
MAP



DELTA
 INTERNATIONAL MINERALS LTD.
 HAYES GROUP
 YUKON TERRITORY

Scale 1" = 200'
 Drawn jrl
 Date Oct. 9, 1970

GEOLOGY

LEGEND

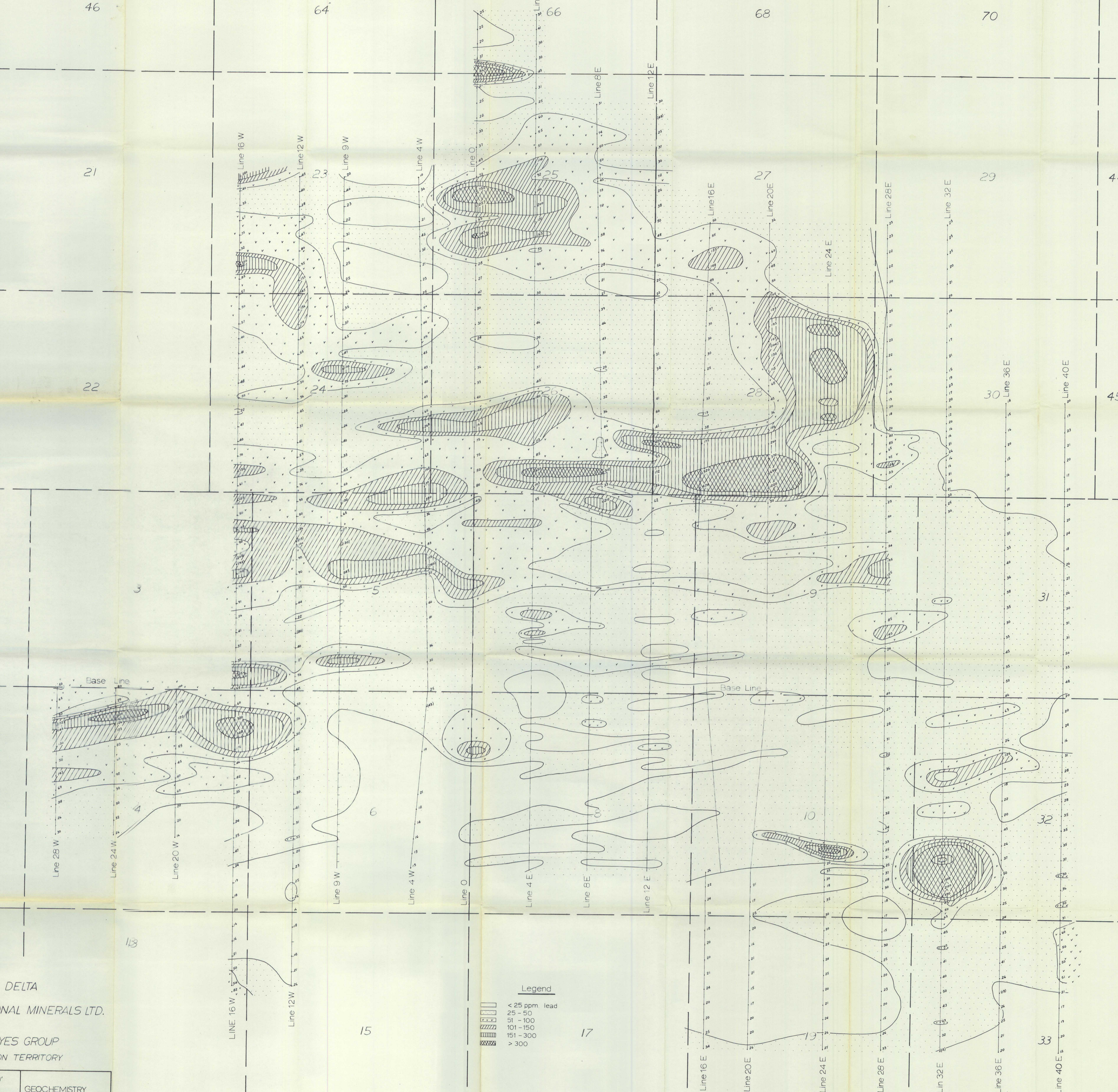
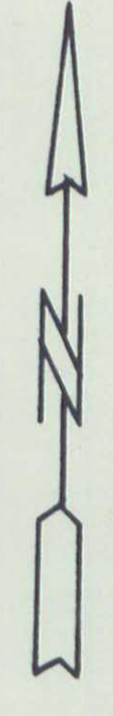
TERTIARY
 QUARTZ PORPHYRY (highly leached, light cream - orange coloured, kaolinized and silicified)

JURASSIC or LATE?
 QUARTZ GRANODIORITE (fine to medium grained, light grayish - brown, porphyritic phases, < 2% zircon)

PRECAMBRIAN or LATER
 Yukon Group
 MICHA QUARTZ SCHIST, CHLORITE SCHIST, GNEISS
 LIMESTONE

SYMBOLS
 Sharp altitude
 Assumed geological contact
 Jot altitude
 Otopro outline
 Sams

CAMP
 CHOPPER PAD
 POLY



DELTA
INTERNATIONAL MINERALS LTD.
HAYES GROUP
YUKON TERRITORY

Scale 1" = 200'
Drawn jrl
Date Oct. 9, 1970

GEOCHEMISTRY
Lead
Atchuk

Legend
 < 25 ppm lead
 25 - 50
 51 - 100
 101 - 150
 151 - 300
 > 300



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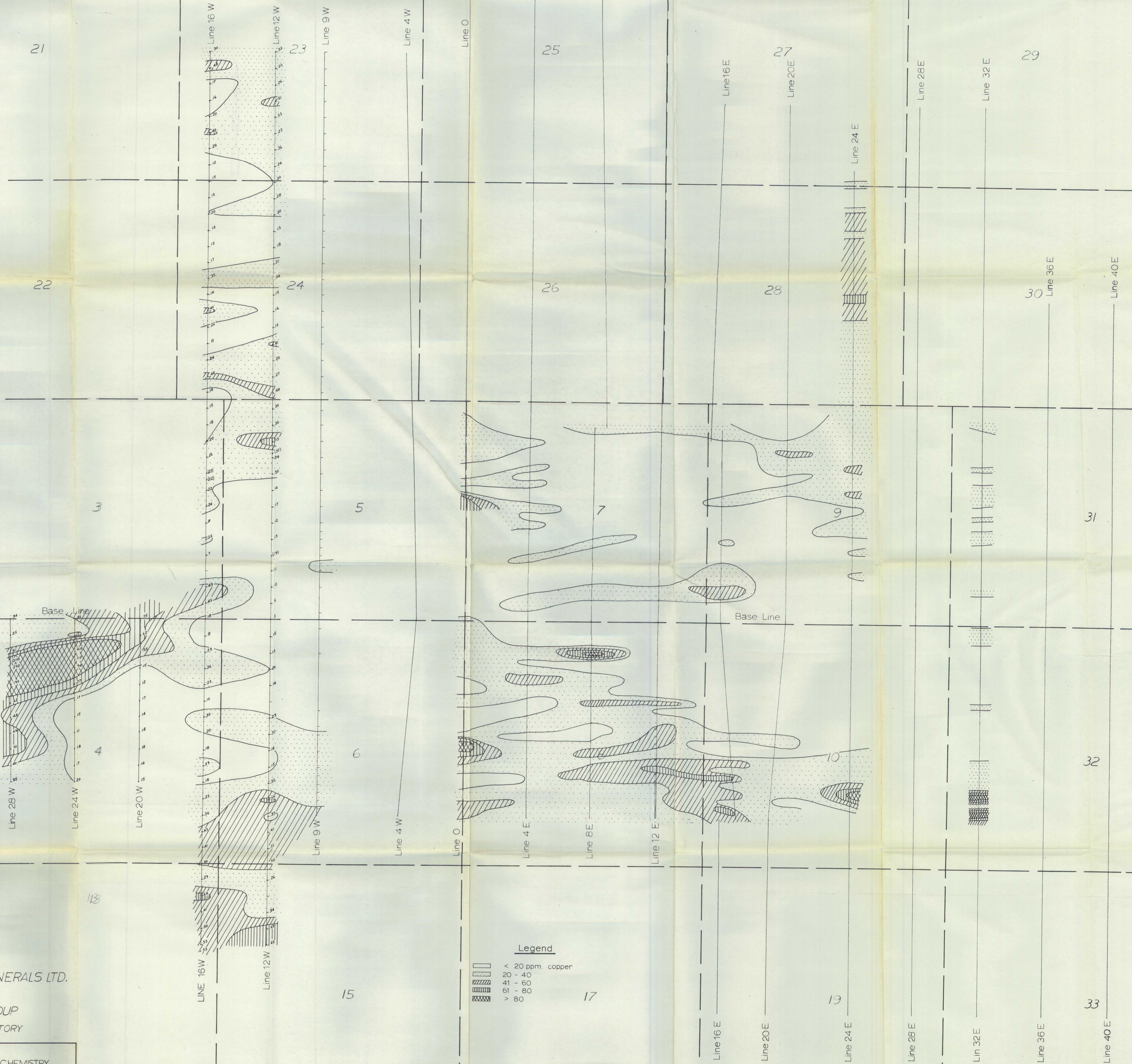
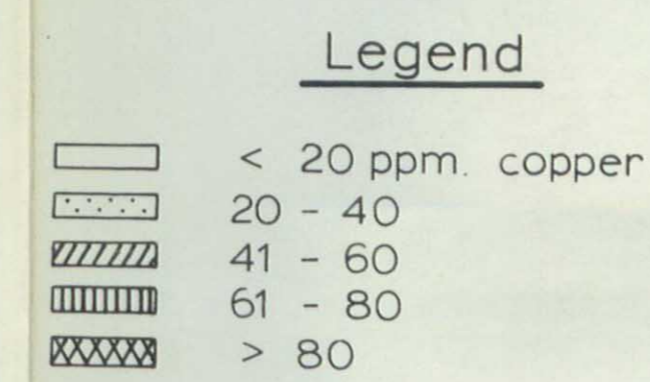
HAYES GROUP
YUKON TERRITORY

Scale 1" = 200'
Drawn jrl
Date Oct. 9, 1970

GEOCHEMISTRY
Copper

Base Line

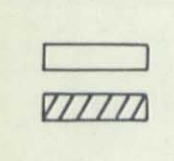

Base Line





DELTA
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HAYES GROUP
YUKON TERRITORY

Scale 1" = 200'
Drawn jrl
Date Oct. 9, 1970
GEOCHEMISTRY
Molybdenum

Legend
 < 3 ppm. molybdenum
 > 3

