GEOPHYSICAL REPORT

on the

AIRBORNE MAGNETIC AND VLF-EM SURVEY

on the

MAC, OTTO AND MAD CLAIMS
COBALT CREEK, BONNET PLUME AREA
MAYO MINING DISTRICT, YUKON TERRITORY.

LOCATION:	64° 57'N, 133° 23'W 11.5 miles S85E of the south end of Fairchild Lake and 300 miles N10E of Whitehorse
CLAIM SHEET:	106 - C - 14
SURVEY DATE:	May, 1974
REPORT BY:	David G. Mark Geophysicist GEOTRONICS SURVEYS LTD. 302-475 Howe Street, Vancouver, B.C.
for:	MENIKA MINING LTD 2245 West 13th Avenue, Vancouver, B.C.
dated:	April 16, 1975

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

$ 2200.00

D. B. Craig

Resident Geologist or
Resident Mining Engineer

Considered as representation work under Section 53 (4) Yukon Quartz Mining Act.

Commissioner of Yukon Territory

Department of Indian Affairs & Northern Development
Northern Natural Resources and Environment Branch
MAY 6 1975
Mayo Mining District
Mining Recorder and Land Agent

Office Of The Supervising Mining Recorder
MAY 12 1975
WHITEHORSE
Yukon Territory

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SUMMARY

A combined airborne magnetic and VLF-EM survey was carried out over the Mac, Otto and Mad claims located on Cobalt Creek about 11.5 miles S85E of the south end of Fairchild Lake in the Mayo Mining District, Yukon. Access to the property is only by helicopter. The terrain is steep and rugged, many creeks cross the claims, and no timber exists. The object of the survey was to locate potential areas for sulphide deposits.

The property, according to G.S.C. Open File 205, is mainly underlain by argillite, limestone and minor calc-silicate hornfels. The sediments are cut by numerous intrusive plugs, stocks and dykes. Many copper sulphide occurrences are found in the area.

For the survey, the instruments used were on Elsec nuclear free precession magnetometer and a Sabre VLF-EM instrument connected to analog recorders. The surveys were flown from a helicopter at a terrain clearance of 400 feet, and a line spacing of about 700 feet. Values were taken off of the profiles, plotted on maps, and contoured.

The magnetic survey showed a gradual increase in field strength from the east to the west and also revealed three possible anomalies. The VLF-EM survey experienced severe noise that

RECOMMENDATIONS

1. The property should be thoroughly prospected and the geology mapped. This will assist in interpretting geophysics or geochemistry as well as help to assess the mineral potential of the property.

2. A grid should be established on the property, the dimensions and direction of which will depend on the geological mapping.

3. A ground VLF-EM survey is recommended with readings taken every 100 feet.

4. The property, if enough soil exists, should be soil sampled and the samples tested for copper.

5. Depending on the above results, an induced polarization survey is recommended.

6. Only after the above work has been carried out should diamond drilling ~~then~~ be undertaken.

Respectfully submitted,
GEOTRONICS SURVEYS LTD.,

David G. Mark,
Geophysicist

April 16, 1975

GEOPHYSICAL REPORT

on an

AIRBORNE MAGNETIC AND VLF-EM SURVEY

on the

MAC, OTTO AND MAD CLAIMS

COBALT CREEK, BONNET PLUME AREA

MAYO M.D., YUKON TERRITORY

INTRODUCTION AND GENERAL REMARKS

This report discusses the procedure, compilation and interpretation of a combined airborne magnetometer and very low frequency electromagnetic (VLF-EM) survey carried out over the MAC, OTTO and MAD claims during the latter part of May, 1974.

The field work was carried out by Stanley Mauer, instrument operator, and Charles Boitard, navigator. The total number of survey miles flown was five.

The object of the survey was to search for economic sulphide mineralization. The purpose of the magnetometer was to search for mineral bodies associated with magnetic and/or pyrrhotite. That of the VLF-EM instrument was to search for sulphides in massive form. A secondary object of both

instruments was to obtain information on the structural geology of the property.

FIELD PERSONNEL

Name	Capacity	Address
Stanley Mauer	Instrument Operator and Field Supervisor	4245 E Hastings St Burnaby, B.C.
Charles Boitard	Navigator	2245 W 13th Ave Vancouver, B.C.

Mr. Stanley Mauer is an electronics engineer who specializes in the designing of geophysical instruments. He is the proprietor of Sabre Electronic Instruments Ltd at 4245 East Hastings Street, Burnaby, British Columbia. He designed and built the airborne VLF-EM instrument of this survey and put together the components of the airborne system. He has carried out numerous airborne surveys throughout Western Canada.

LOCATION AND ACCESS

The property is located on Cobalt Creek which is a tributary of a creek or small river that flows into the Bonnet Plume River. It is found 11.5 miles S85E of the south end of Fairchild Lake in the Mayo Mining District of the Yukon

Territory. It is also located 93 miles N44E of Keno Hill and 300 miles N10E of Whitehorse.

Its geographical coordinates are 64° 57'N latitude and 133° 23'W longitude.

Access is only by helicopter for which there is a base at Mayo 120 miles southwest of the property.

PROPERTY AND OWNERSHIP

The property is comprised of 24 contiguous mineral claims described below and shown on Figure 1.

Claim Name	Record No.	Expiry Date
MAC 1-8))	Y69059-74	April 5, 1975
OTTO 1-8)		
MAD 1-8	Y88678-85	May 30, 1975

The above expiry dates do not take into account the assessment credits that may be gained from the airborne magnetic and VLF-EM survey. One year on each claim has been applied for and if it is accepted then the expiry dates will be April 5, 1976 and May 30, 1976 respectively.

The property is wholly owned by Menika Mining Ltd of Vancouver, British Columbia.

PHYSIOGRAPHY

The property is located within the centre of the Bonnet Plume Range which is part of the physiographic division known as the Selwyn Mountains. The Bonnet Plume Range is fairly rugged with steep slopes and elevations ranging from 2000 to 8000 feet a.s.l.

The property varies in elevation from 3900 feet a.s.l. at the bottom of Cobalt Creek to 6500 feet on the valley sides for a maximum relief of 2600 feet. The valley sides are rugged and steep.

Cobalt Creek flows easterly through the centre of the property. Four or five of its tributaries are also found on the property.

No timber exists on or near the claims.

HISTORY OF PREVIOUS WORK

No work known to the writer has previously been done on the claims.

GEOLOGY

The following has been quoted from Mr. Sookochoff's engineering report on the property:

"The geology as shown on the Open File Map 205, published by the Geological Survey of Canada in June 1974, shows the property to be underlain by grey-weathering interbedded dark argillite and limestone with minor biotite calc-silicate hornfels of Precambrian age. The sedimary rocks are cut by numerous small intrusive plugs, stocks and dykes. The general area is of generally anomalously high bedrock copper content and copper occurrences have been noted in a variety of host rocks and geological associations.

"On the Dolores Creek property, three miles to the east mineralization occurs as, massive chalcopyrite within quartz-siderite material; localized copper-cobalt mineralization - a sample assaying 0.08 oz Au/ton, 0.30 oz Ag/ton, 4.02% Cu, 1.02% N and 4.33% Co; slates and phyllitic rocks with fine chalcopyrite along bedding and cleavage planes; lenses and patches of massive chalcopyrite replacing dolomite; patchy disseminated chalcopyrite in a syenite intrusive."

A sample of a rock (possibly in place) was picked up by Mr. Boitard and assayed. It ran 2.68% copper, 0.03 oz/ton gold 0.08 oz/ton silver, and less than 0.01% cobalt. The writer examined what was apparently a similar rock and appeared to

be syenite well-disseminated with chalcopyrite.

INSTRUMENTATION AND THEORY

1. Magnetometer Survey

The magnetic data was detected using an ELSEC nuclear free precession magnetometer, type 592. This measures the absolute value of the earth's magnetic field intensity. The sensitivity is 1 gamma and the absolute calibration is governed by a crystal-controlled oscillator so that it cannot drift.

Data was then recorded on a Bausch and Lomb 6" strip chart recorder.

Only two commonly occurring minerals are strongly magnetic; magnetite and pyrrhotite. Hence, magnetic surveys, both ground and airborne, are used to detect the presence of these minerals in varying concentrations. Magnetic data are also useful as a reconnaissance tool for mapping geologic lithology and structure since different rock types have different background amounts of magnetite and/or pyrrhotite.

2) VLF-EM

A VLF-EM receiver manufactured by Sabre Electronics of Vancouver, B.C. and an Esterline Angus Port-a-graph T171B recorder were used for the VLF-EM survey. This instrument is designed to measure the current induced, in a vertical coil, by the primary and secondary fields of the very low frequency electromagnetic

field (VLF-EM) transmitted at 18.6 KHz from Seattle, Washington. Both the dip angle and field strength are measured by this instrument.

In all electromagnetic prospecting, a transmitter produces an alternating magnetic field (primary) by a strong alternating current usually through a coil of wire. If a conductive mass such as a sulphide body is within this magnetic field, a secondary alternating current is induced within it which in turn induces a secondary magnetic field that distorts the primary magnetic field. It is this distortion that the EM receiver measures. The VLF-EM uses a frequency range from 16 to 24 KHz. whereas most EM instruments use frequencies ranging from a few hundred to a few thousand Hz. Because of its relatively high frequency, the VLF-EM can pick up bodies of a much lower conductivity and therefore it is more susceptible to clay beds, electrolyte-filling fault or shear zones and porous horizons, graphite, carbonaceous sediments, lithological contacts as well as sulphide bodies of too low a conductivity for other EM methods to pick up. Consequently, the VLF-EM has additional uses in mapping structure and in picking up sulphide bodies of too low a conductivity for conventional EM methods and too small for induced polarization (in places it can be used instead of IP). However, its susceptibility to lower conductive bodies results in a number of anomalies, many of them difficult to explain and, thus, VLF-EM preferably should not be interpreted without a good geological knowledge

of the property and/or other geophysical and geochemical surveys.

SURVEY PROCEDURE

A Bell Jet-Ranger helicopter was used to fly the survey. The survey was carried out by following pre-established lines drawn on a blown up photograph of the area. Lines were on an average 700 feet apart and flown in an east-west direction. The terrain clearance was kept at approximately 400 feet. Tie points were made over prominent topographic features, were numbered, recorded and plotted on the maps.

The magnetic readings were taken with the magnetometer set on a 1.7 second recycling period which, considering the helicopter speed corresponds to readings taken at intervals of about 150 feet.

The VLF-EM equipment provided for a continuous plotting of both the dip angle and the field strength.

Much time was spent in attempting to run the survey lines in a north-south direction but the rugged terrain made this impossible.

COMPILATION OF DATA

1. Magnetic Survey

Values were picked off of the strip charts at intervals of 200 feet and plotted on sheet No. 1. They were then contoured at a 50-gamma interval.

2. VLF-EM Survey

Only the anomalies were plotted, and these on sheet 2, as follows: 0% was plotted on the edge of each anomaly; the highest magnitude of each anomaly was plotted in the centre along with the dip angle (the range from positive peak to negative peak); and the field strength of each anomaly was contoured at an interval of 2%.

DISCUSSION OF RESULTS

1. Magnetic Survey

The values vary from a minimum of 58,560 gammas to a maximum of 58,770 gammas to give a range of 210 gammas. Though this may seem to be a moderate relief for an airborne magnetic survey, the data is extremely quiet. It very gradually changes from the minimum value at the east end of the survey area to the maximum value at the west end. Most of the variation within the gradual change is probably little more than noise.

One possible course of the gradual increase towards the west is a gradual thinning of overlying sedimentary rocks. That is, the basement rock, probably magnetic, becomes

shallower towards the west.

Another cause could be a gradual increase in the magnetic content of the sedimentary rocks.

Though the data is very quiet, there appears to be three small slight magnetic highs labelled 1, 2 and 3. These would be reflecting intrusive dykes and/or biotite calc-silicate hornfels.

2. VLF-EM Survey

The VLF-EM survey results are clouded by severe noise, especially near the confluence of North Creek with Cobalt Creek. Therefore, any electromagnetic anomalies that may exist in this area have been masked by the noise. The noise is probably caused by either variation in the terrain clearance and/or wind. It would have been desirable to redo the Creek Line to see if the noise could have been reduced.

Two anomalies were picked, however, that possibly may not have been caused by noise. These have been labelled A and B respectively as shown on Sheet 2. They are one-line anomalies with Anomaly A reaching a high of 6% with a dip angle change of 4^{o} and anomaly B reaching a high of 5% (its dip angle change could not be determined). Without any additional information, the causative source could be postulated to be anything from sulphides to graphite to fault zones. Sulphides

of course, are known to occur in the area and probably on the property.

Respectfully submitted,
GEOTRONICS SURVEYS LTD.,

David G. Mark
Geophysicist

April 16, 1975

SELECTED BIBLIOGRAPHY

Geology Map, Nadaleen River, Yukon Territory - Northwest Territories, Geol. Surv. of Can., Open File 205, June, 1974.

Ricker, Karl E., Surficial Geology of the Nadaleen River Map area, Yukon Territory - Northwest Territories (106C), Geol. Surv. of Can., Unedited Manuscript, April, 1974.

Sookochoff, Larry, Geological Report on the Cobalt Creek Property of Menika Mining Ltd. (NPL), Mayo M.D., T. R. Tough & Associates Ltd., Vancouver, B.C. February 19, 1975.

GEOPHYSICIST'S CERTIFICATE

I, DAVID G. MARK, of the City of Vancouver, in the Province of British Columbia, do hereby certify:

That I am a Consulting Geophysicist of Geotronics Surveys Ltd., with offices at 302-475 Howe Street, Vancouver, British Columbia.

I further certify that:

1. I am a graduate of the University of British Columbia (1968) and hold a B.Sc., degree in Geophysics.

2. I have been practising in my profession for the past seven years and have been active in the mining industry for the past ten years.

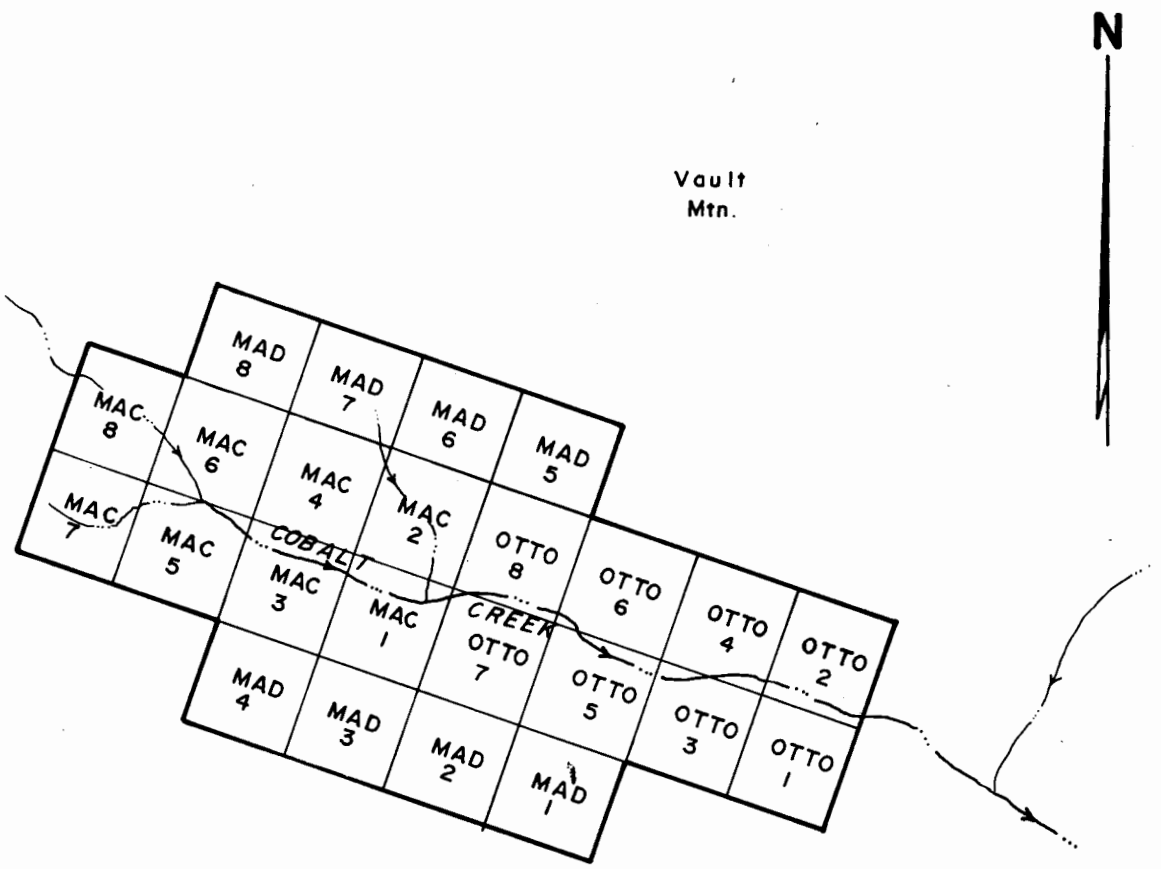
3. I am an active member of the Society of Exploration Geophysicists and a member of the European Association of Exploration Geophysicists.

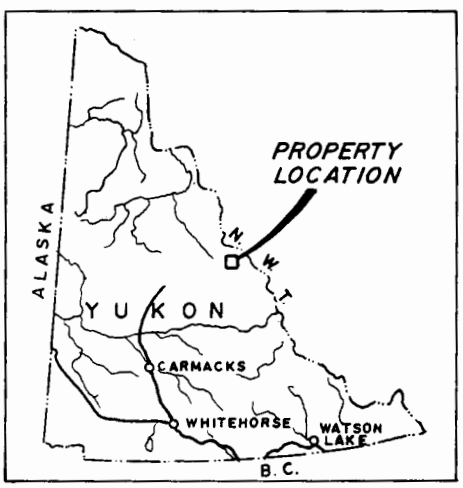
4. This report is compiled from data obtained from Airborne Magnetic and VLF-EM survey carried out under the supervision of Stanley Mauer in May, 1974 on the MAC, OTTO and MAD claims, Mayo Mining Division, Yukon Territory.

5. I have no direct or indirect interest in the properties or securities of Menika Mining Ltd. Vancouver, B.C. nor do I expect to receive any interest therein.

David G. Mark
Geophysicist

April 16, 1975





MILES

1/2 0 1/2

MENIKA MINING LIMITED

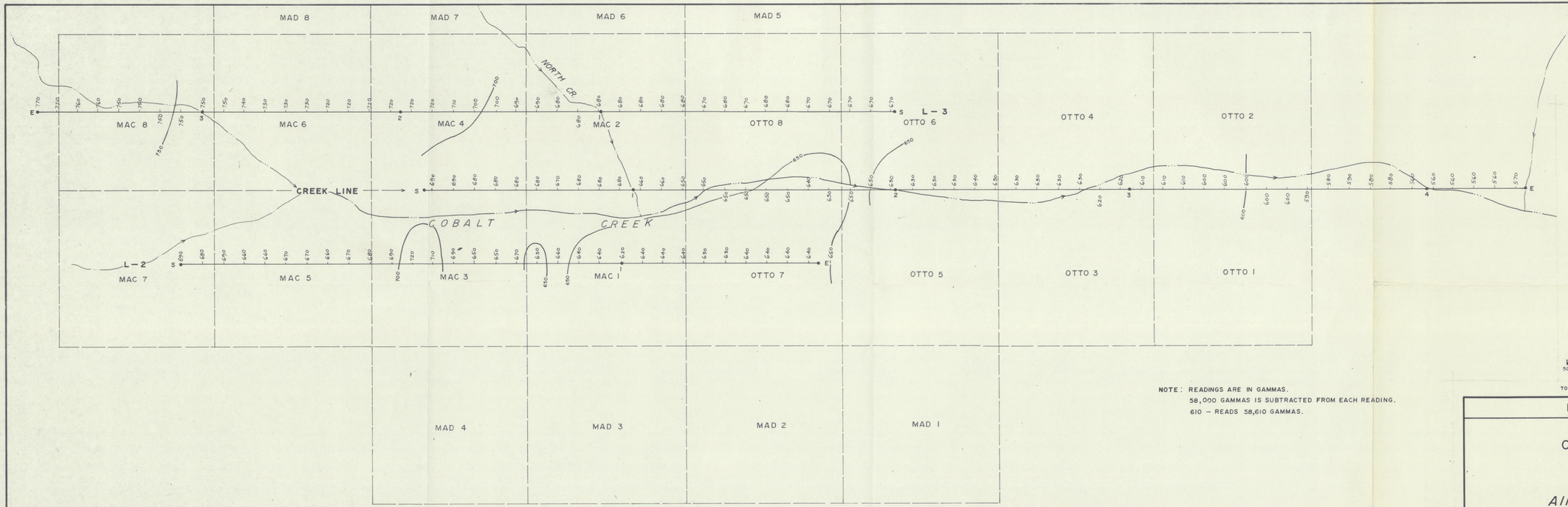
COBALT CREEK PROPERTY

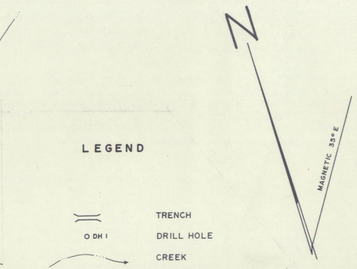
YUKON TERRITORY

CLAIM MAP & LOCATION

NTS 106 C/14

MARCH 1975





LEGEND

- TRENCH
- DRILL HOLE
- CREEK
- L-2 FLIGHT LINE
- TIE POINT
- S START OF FLIGHT LINE
- E END OF FLIGHT LINE
- CLAIM BOUNDARY

NOTE : TOPOGRAPHY SKETCHED FROM AIR PHOTO MOSAIC.
CLAIM BOUNDARIES ARE APPROXIMATE.

FEET
500 0 500 1000

TO ACCOMPANY GEOPHYSICAL REPORT BY D.G. MARK, GEOPHYSICIST

NOTE: READINGS ARE IN GAMMAS.
58,000 GAMMAS IS SUBTRACTED FROM EACH READING.
610 – READS 58,610 GAMMAS.

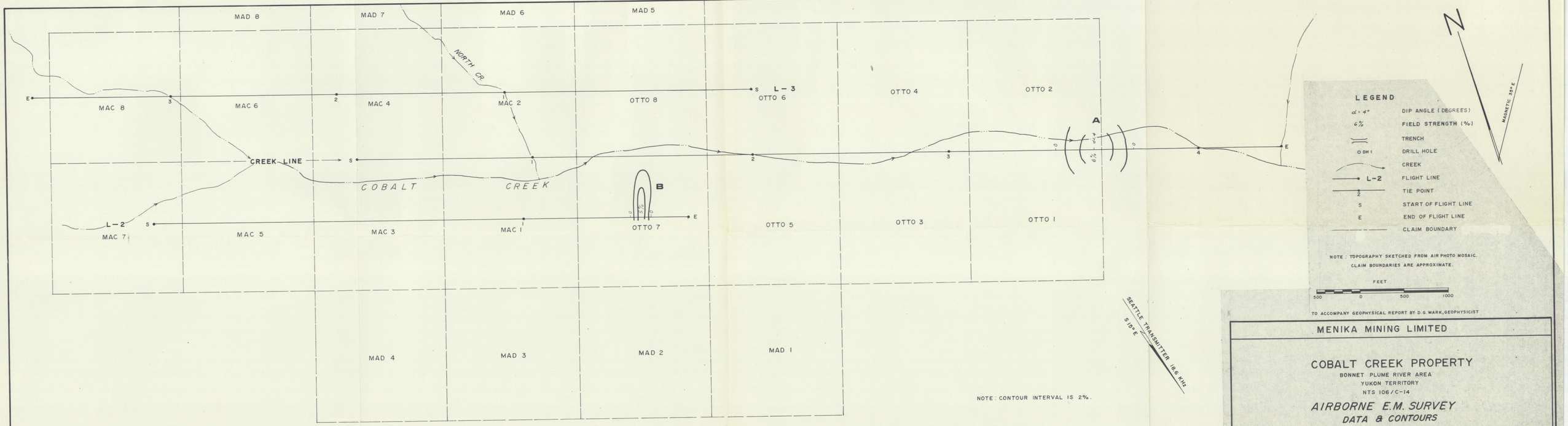
MENIKA MINING LIMITED

COBALT CREEK PROPERTY

BONNET PLUME RIVER AREA
YUKON TERRITORY
NTS 106/C-14

AIRBORNE MAGNETIC SURVEY

DRAWN	SCALE	JOB No.	DATE	SHEET
PDT DRAFTING SERVICES	1" = 500'	75 — 24	MARCH 1975	1



LEGEND

$\alpha = 4°$	DIP ANGLE (DEGREES)
6%	FIELD STRENGTH (%)
	TRENCH
O DH 1	DRILL HOLE
	CREEK
L-2	FLIGHT LINE
2	TIE POINT
S	START OF FLIGHT LINE
E	END OF FLIGHT LINE
	CLAIM BOUNDARY

NOTE: TOPOGRAPHY SKETCHED FROM AIR PHOTO MOSAIC.
CLAIM BOUNDARIES ARE APPROXIMATE.

FEET
500 0 500 1000

NOTE: CONTOUR INTERVAL IS 2%.

TO ACCOMPANY GEOPHYSICAL REPORT BY D.G. MARK, GEOPHYSICIST

MENIKA MINING LIMITED

COBALT CREEK PROPERTY

BONNET PLUME RIVER AREA
YUKON TERRITORY
NTS 106/C-14

AIRBORNE E.M. SURVEY
DATA & CONTOURS

DRAWN	SCALE	JOB No.	DATE	SHEET
PDT DRAFTING SERVICES	1" = 500'	75 — 24	MARCH 1975	2