

2900

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 2900 MAP

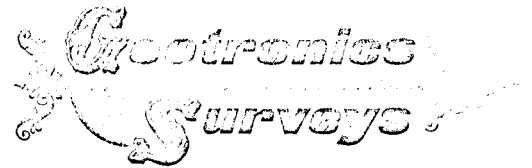
Stamp: Mining Registrar
MAR 13 1971
SUSP. NO. 79785A
GOLDEN, M.D.
82K/8W

ELECTROMAGNETIC SURVEY
J. H. CONROY
DUTCHY CLAIM GROUP
INVERMERE AREA, GOLDEN M.D., B.C.
SEPTEMBER 8 - 11, 1970

Dutchy Claim Group: 21.5 miles S40°W of Invermere
50° 116° SE
N.T.S. - 82K/8W

Report by: GEOTRONICS SURVEYS LTD.
DAVID G. MARK, B.Sc.
Geophysicist
OCTOBER, 1970

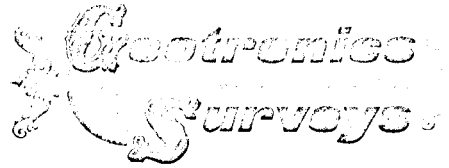
Submitted to: J. H. CONROY
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Invermere, B.C.



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SUMMARY

A vertical loop EM survey was completed over a portion of the Dutchy Claim Group. These claims are located within the Purcell Mountain Range near the end of Copper Creek, a tributary of Dutch Creek. Topography is comprised mainly of steep mountain slopes and terrain is extremely rough in places.

The claims contain a copper prospect that was discovered around the turn of the century. The copper is in the form of chalcopyrite found, with pyrite, in a quartz gangue. This is injected into a shear zone cutting across phyllitic argillites of the Kitchener-Siyeh Formation.

The instrument failed to react to the known mineralization. However, it did pick up a conductor, probably sulphides, 100 to 200 feet east of the mineralized zone. It has a known length of 200 feet and is open at both ends.

The instrument failed to pick up any other conductors.

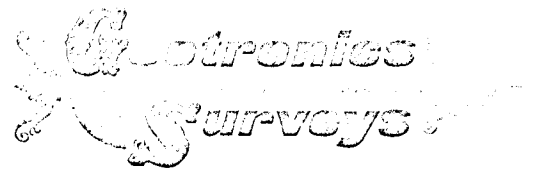
CONCLUSIONS AND RECOMMENDATIONS

It is in the writer's opinion that the crossovers on lines 7N and 9N are caused by sulphide mineralization. The possibility of graphite, however, must be considered.

No other geophysical survey work is recommended, because of the rough terrain. Soil sampling for copper and careful prospecting in the area of the conductor, if possible, would be helpful.

It has been recommended by Chamberlain, previous to this survey, to diamond drill the zone for possible depth extent and width. The presence of the conductor strengthens the reason for bringing a diamond drill onto the property. The conductor would best be drilled in the area of L-9N, with the hole set at 100 feet east of the conductor at a 45° angle towards the conductor and perpendicular to its strike. If vertical, the conductor will be encountered after approximately 140 feet of drilling. If no conductor is found, then additional drilling should be done in order to cover the possibility of

- (1) Greater depth
- (2) A dip to the west
- (3) A 'hole' in the conductor.



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GEOPHYSICAL REPORT ON ELECTROMAGNETIC SURVEY
ON THE
DUTCHY CLAIM GROUP
INVERMERE AREA, GOLDEN M.D., B. C.
SEPTEMBER 8 - 11, 1970

INTRODUCTION

This report discusses the results of a vertical loop electromagnetic survey carried out by the writer on the Dutchy 3 - 7 mineral claims in the Golden Mining Division of British Columbia, between September 8 and September 11, 1970. The Dutchy group consists of 10 mineral claims.

The Dutchy property contains copper mineralization in massive form within a shear zone. The object of the survey was therefore to explore for any possible extension to the zone and additional zones.

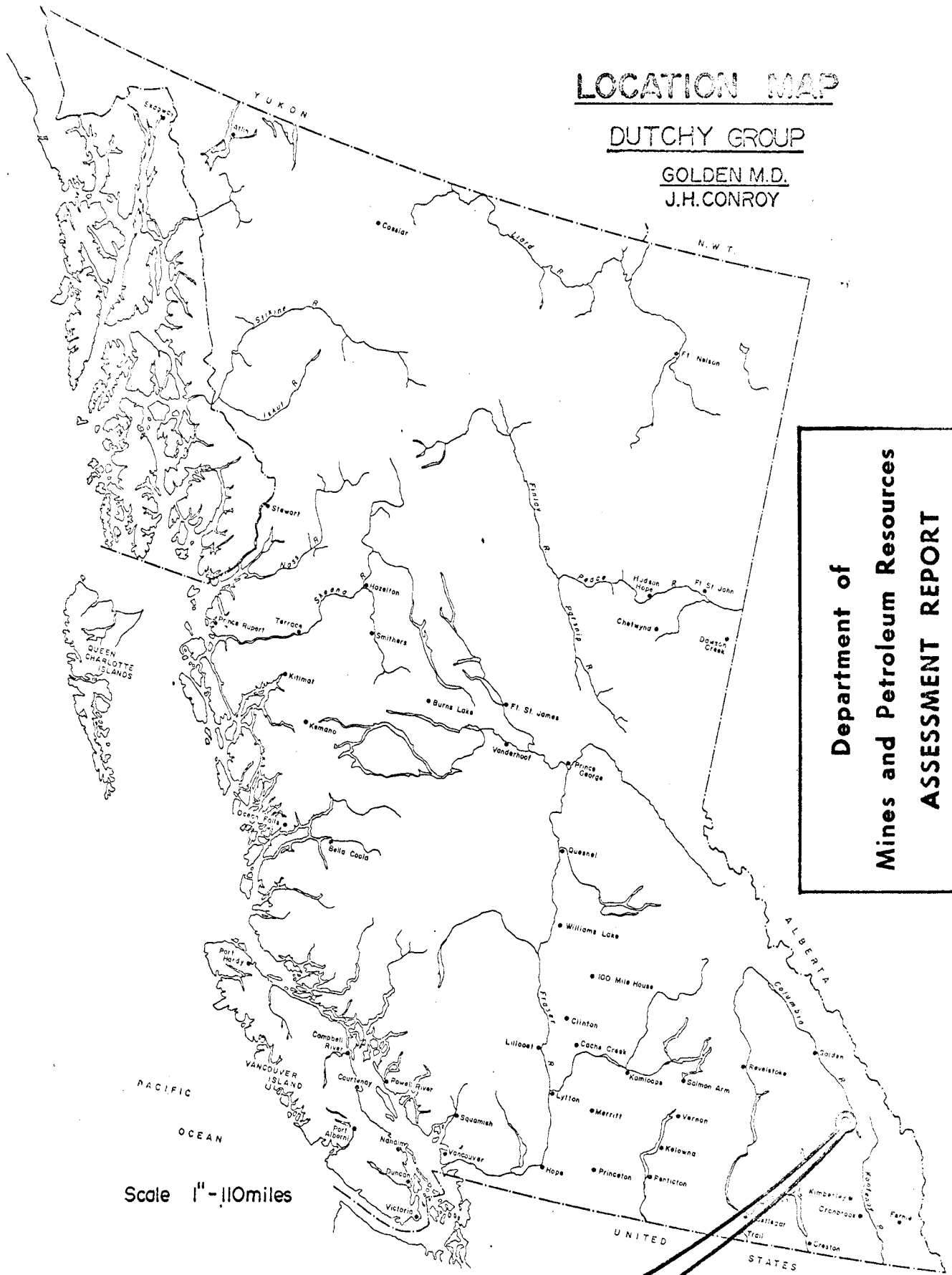
LOCATION

The claims are located up Copper Creek, a tributary of Dutch Creek, near the base of Coppercrown Mountain in the

LOCATION MAP

DUTCHY GROUP

GOLDEN M.D.
J.H. CONROY



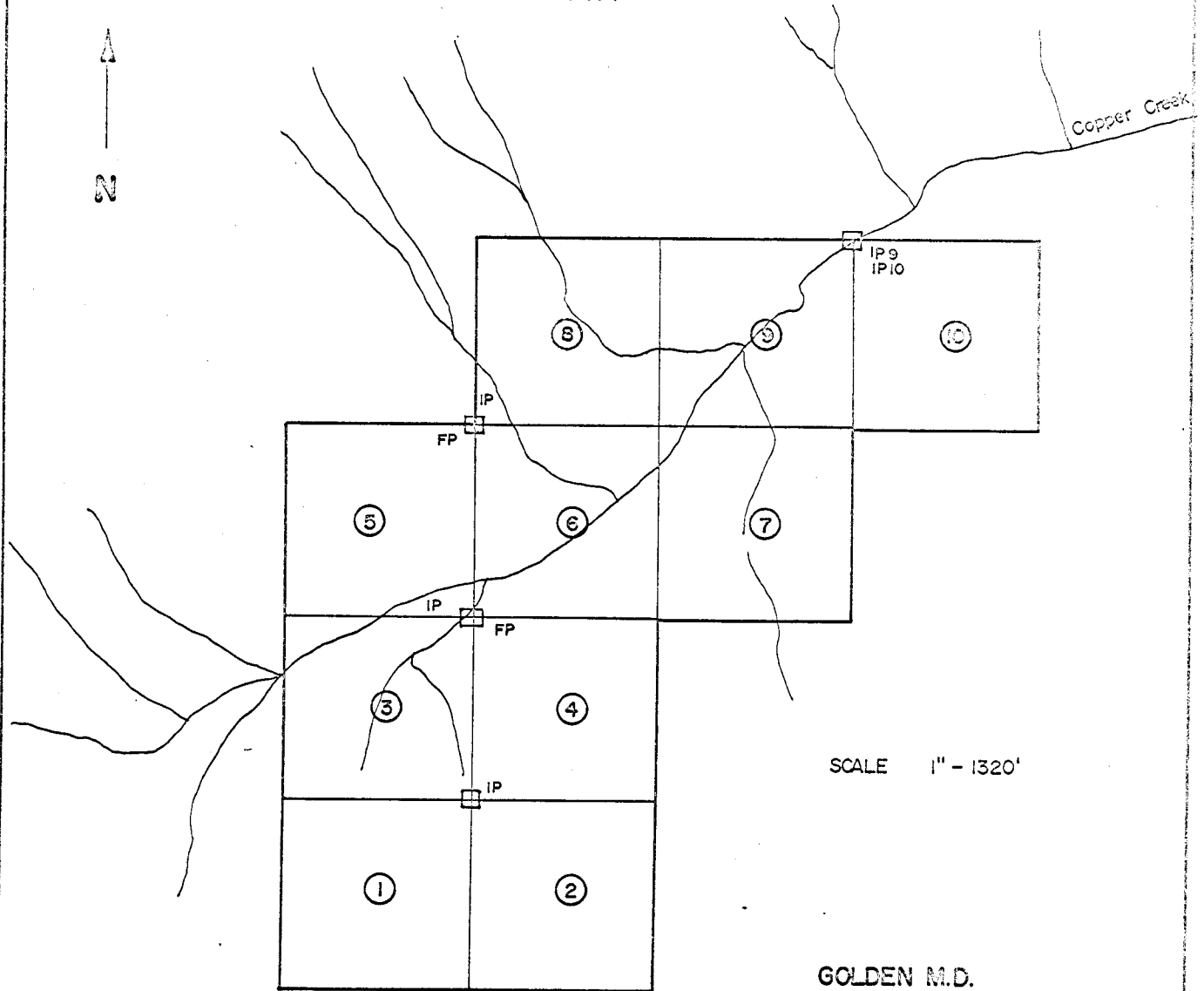
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ASSESSMENT REPORT
NO. 2900 MAP #1

Scale 1" = 110 miles

DUTCHY GROUP

DUTCHY GROUP - CLAIM MAP

J. H. CONROY



LEGEND

- 3 Claim No.
- Claim Group Boundary
- ~ Creek

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Purcell Range. They are 21.5 miles S40°W of the town of Invermere at 50° 16' latitude and 116° 22.5' longitude.

Access is best by helicopter, considering the distance from the nearest road and elevation of the property, which is between 6500 and 7200 feet. The claims can also be reached by approximately 18 miles of trail.

TOPOGRAPHY

The claims are found at the upper end of a narrow U-shaped valley with glaciers in the surrounding upper cirques. Elevation in the area varies from 6000 feet in the creek bottom to over 9500 feet on the mountain top. The local terrain is extremely rough, especially on the mountain sides.

PREVIOUS WORK

The copper prospect was discovered around the turn of the century at which time a 30-foot adit was driven across the vein. Trenches and pits were also dug.

In 1968, George Webber of Cominco mapped the area, and in 1969, J. A. Chamberlain mapped and made a report on the property.

As far as can be ascertained, it has never been diamond drilled.

INSTRUMENTATION

A Crone VEM vertical loop electromagnetic instrument (fixed source) manufactured by Crone Geophysics Limited of Mississauga, Ontario was used for the survey. The transmitter uses a large coil, 9 feet high and 8 feet wide that rotates about a vertical axis. There are 3 power output positions giving a survey range up to 2000 feet. The EM unit has 2 frequency ranges: 480 Hz and 1800 Hz. The 1800 Hz frequency was used for all stations and the 480 Hz frequency was used only in checking the conductivity of a conductor.

In general, an EM instrument is designed to pick up conductive zones through electromagnetic induction. The EM transmitter sets up an alternating magnetic field, called the primary, by passing an alternating current through the transmitter coil. If a conductive mass is nearby, the primary magnetic field induces electric currents in the mass which produces a secondary magnetic field. This secondary field distorts the primary field, and it is a measure of this distortion that constitutes the results of the electromagnetic survey. The angle of this distorted field, called the dip angle, is what is measured by the Crone VEM receiver (some instruments measure field strength).

With a vertical loop instrument (and the convention employed here), a conductor is indicated by west readings on the west side of the conductor and east readings on the east side. The zero point (where west readings change to east readings) is then usually directly over the top edge of the conductor (certain transmitter locations and certain geologic conditions may change this) and this is called a "true crossover." If west readings are east of the crossover and east

readings west of the crossover, then this type is called a "reverse crossover" and does not indicate a conductor.

SURVEY PROCEDURE

Lines had been previously cut out and marked from 14N to 20N inclusive every 200 feet, and 300 feet on each side of the baseline. The baseline runs in the direction of approximately N10W - S10E and the crosslines were run perpendicular to it. The electromagnetic survey was done over this existing grid and extensions of it.

The transmitter was first set up on the baseline at 14N. From this location, 2 lines, 7N and 9N, were run over the mineralized zone as a test in seeing how the instrument reacted over the ore zone. Two additional transmitter locations were used in carrying out the rest of the survey, on baseline at 20N, and (20N, 8E).

Readings were taken every 100 feet by the VEM receiver and 50 feet around crossovers. The 1800 Hz frequency was used for all readings, and both 480 and 1800 Hz frequency was used in the area of the conductor. For each reading, the transmitter coil was 'aimed' so that the point of observation was contained within the plane of the coil.

The rough terrain severely limited the extent of the survey. Lines 7N and 9N, for example, could not be completed properly for this reason.

MAPPING

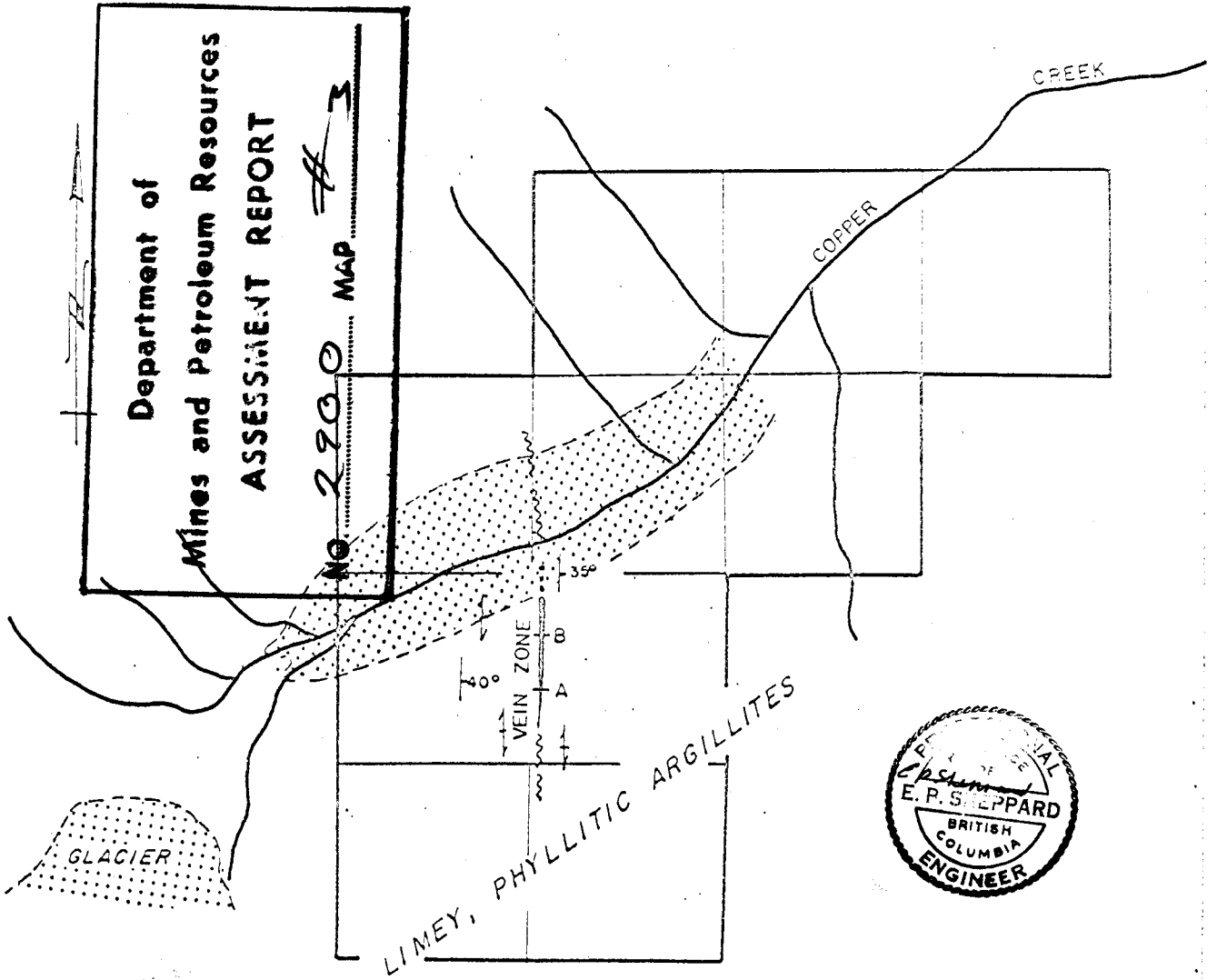
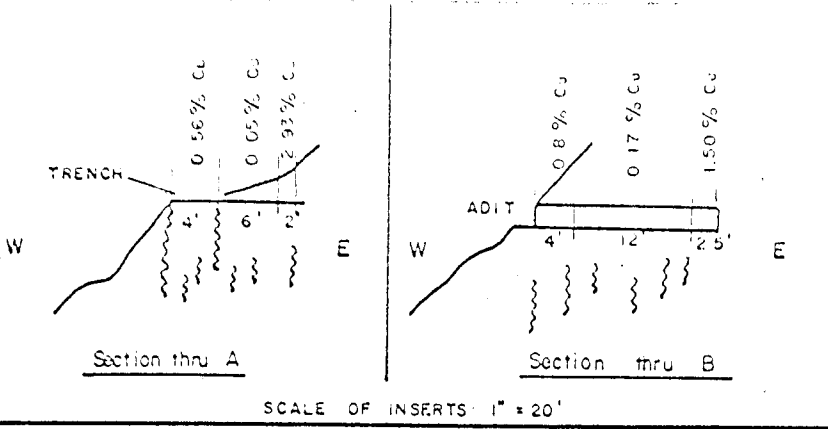
The survey plan map contains all readings taken as well as the creek and claims, on a scale of 1" = 200'. Profiles are plotted also of all the readings on the same scale horizontally and a vertical scale of 1" = 20'.

GEOLOGY

The geology of the claims area have been well covered in previous maps and reports by Webber and Chamberlain. The following will be a summary of their comments and observations. The next page is a copy of a map of the geology drawn by Chamberlain.

The mineralized zone is found in the Kitchener-Siyeh Formation of Proterozoic Age and around the claims area this is composed of limey, thin bedded argillites. They strike north-south and have a moderate dip to the east. Within these rocks is a vertical, north-south shear zone which contains the mineralization. This shear zone is very likely the same one upon which the Mineral King Mine is found $5\frac{1}{2}$ miles N35°W of this zone.

The copper mineralization is strictly in the form of chalcopyrite, found along with pyrite in veinlets up to an inch wide within a quartz gangue. The attitude of the veinlets is conformable to that of the shear zone. The sulphide mineralization varies in width up to 30 feet but probably averages about 18 feet.



<p>LEGEND</p> <p> VERTICAL SCHISTOCITY</p> <p> BEDDING</p> <p> SHEAR ZONE</p> <p> OVERBURDEN</p> <p>A, B SAMPLE SITES (see insert)</p>	<p>DOLMAGE-CAMPBELL & ASSOCIATES CONSULTANTS VANCOUVER, CANADA</p>
	<p>CENPET EXPLORATION LTD. CALGARY, CANADA</p> <p><u>GEOLOGY PLAN</u></p> <p>DUTCHY CLAIM GROUP</p>
<p>SCALE 1" = 1320'</p>	<p>JULY 7, 1969</p>
	<p>FIG 3</p>

INTERPRETATION

The instrument seemed not to react over the ore zone on lines 7N and 9N (though 9N was not followed out properly because of topography). The reason is no doubt the mineralization is not continuous enough to produce a conductor.

Just east of the known mineralization, however, on the test lines, the instrument picked up a conductor that seems to be striking approximately N20°E, and is shown on both the survey plan map and the profiles. Also indicative of a conductor was that around the crossovers the instrument null was extremely narrow. The ratio of the 480 Hz to the 1800 Hz readings on the peak of the profile (maximum tilt angle) is approximately 0.7 which is indicative of a good conductor, usually sulphides. Dip, depth, depth extent, and width are difficult to ascertain because of the rough terrain. This causes:

- (1) Non-interpretable profile shape.
- (2) Limited extent of lines, so that, especially on L-9N, there is a "half-finished" profile over a conductor.
- (3) Possible error, up to 3°, in measuring tilt angle.

However, dip, because of the nearby shear zone, is assumed vertical. Known length is 200 feet and is open at both ends.

LEGEND

TRANSMITTER LOCATION - ▲

electromagnetic value
 Frequency 1800Hz ← 14E/10E
 Frequency 480 Hz ←

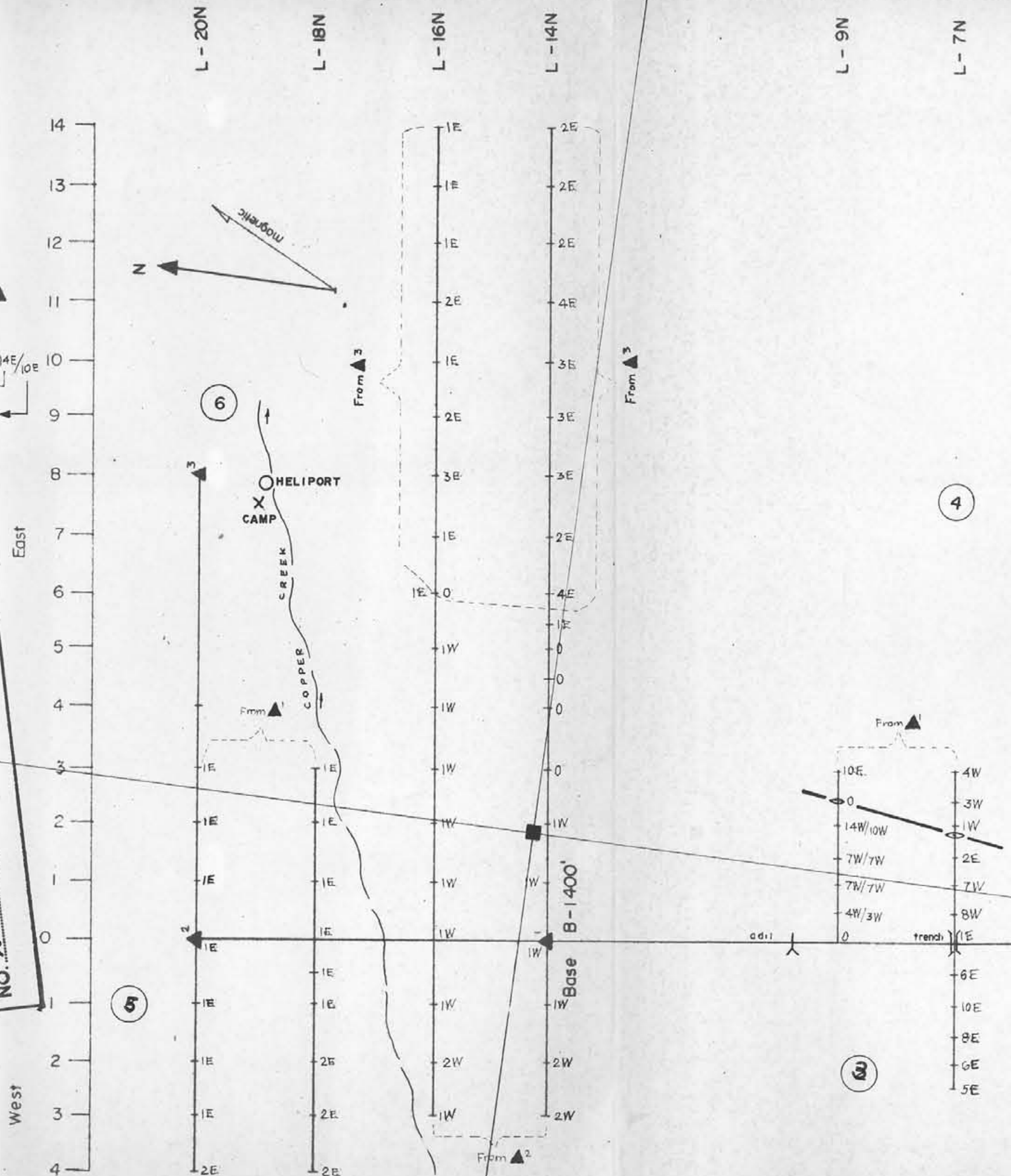
Claim No. - (4)

Crossover - ⊕

Conductor axis - —

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SCALE 1" = 200'



J.H. CONROY
DUTCHY CLAIM GROUP

GOLDEN M.D.

ELECTROMAGNETIC - VERTICAL LOOP
SURVEY PLAN



Base A - 0'

N.T.S. - 82K/8W

LEGEND

- ▲ Transmitter location
- x— 1800 Hz readings
- - - 480 Hz readings
- ⊕ crossover indicating a conductor

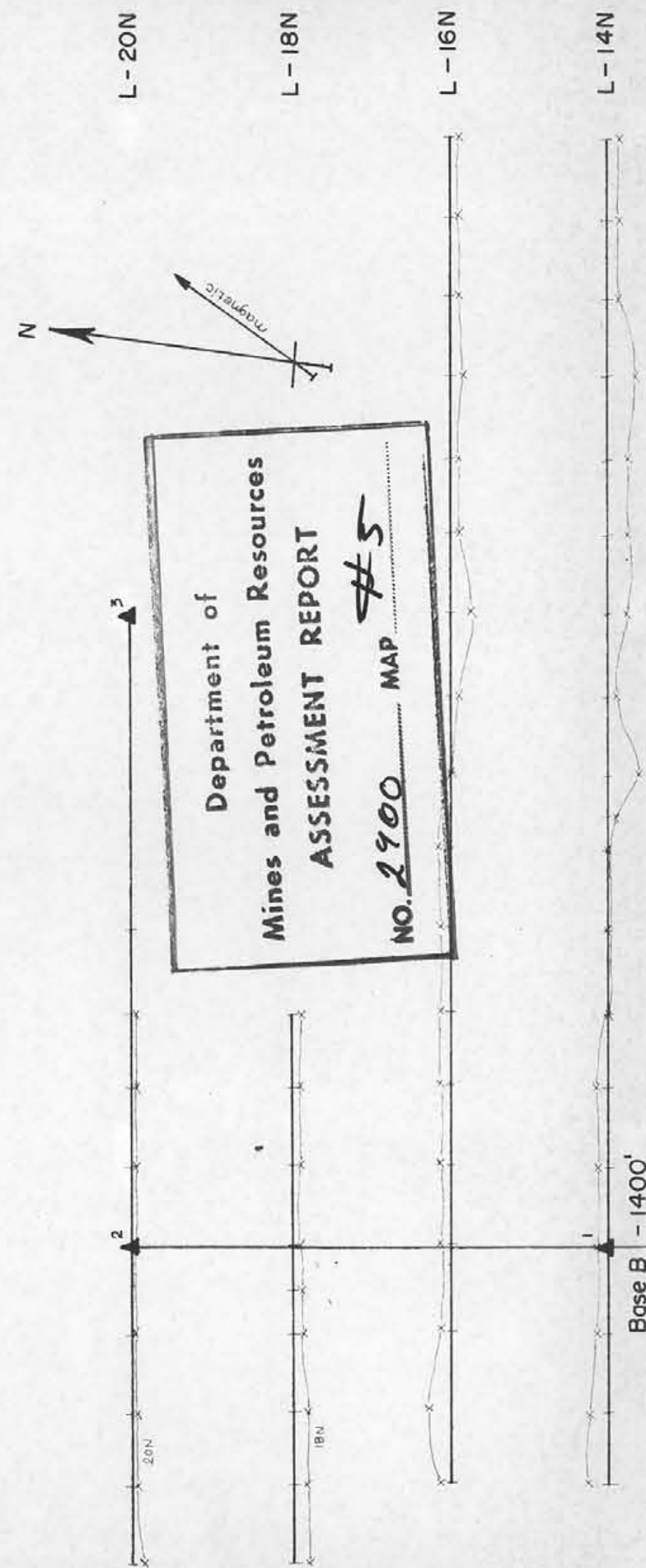
INSTRUMENT

Crane V.E.M. vertical loop

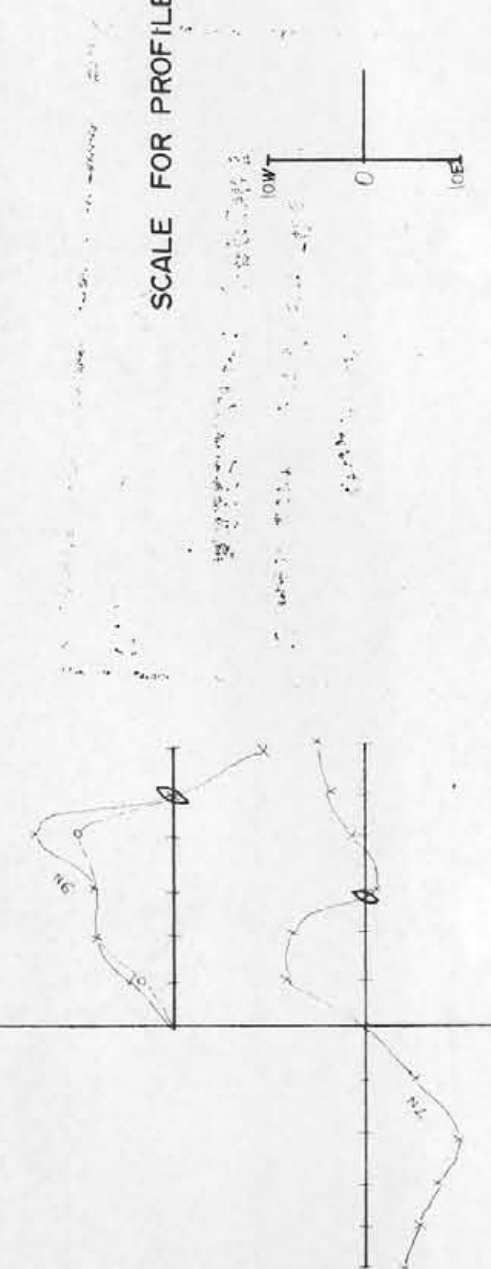
SCALE 1" = 200'

EAST

WEST



SCALE FOR PROFILES 1" = 20°



PROFILES



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DUTCHY CLAIM GROUP
 GOLDEN M.D.

Base A - 0'

As indicated above, the conductor appears to be sulphides. However, there is an element of uncertainty in the readings because of the terrain. For this reason and the fact that the country rock is a phyllitic argillite, it is possible that the conductor is a graphitic zone.

It seems, from studying the profile for L-7N that if one could go further west, one would encounter a conductor. However, the profile slope is becoming more gentle in this direction and the nulls were not becoming narrower.

There is a crossover, also, on L-16N but this is probably caused by the change in transmitter location. There is a fourth crossover on L-14N that is within the noise level and, thus, is non-interpretible. No other crossovers were encountered.

Respectfully submitted,

GOTRONICS SURVEYS LTD.



DAVID G. MARK, B.Sc.
Geophysicist

DGM:ly

October 31, 1970

SELECTED BIBLIOGRAPHY

Chamberlain, J.A.: Geological Examination of the Dutch Creek Copper Deposit, Invermere, B.C.; Dolmage, Campbell & Associates, July 3, 1969.

Evans, C.S.: Brisco-Dogtooth Map-Area, B.C.; Geol. Surv., Canada, Sum. Rept. 1932 pt. AII, pp. 106-176 (1933).

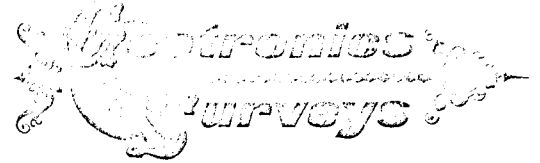
Grant, F.S. and West, G.F.: Interpretation Theory in Applied Geophysics; New York, McGraw-Hill Book Company, Inc., 1965.

Little, H.W.: Salmo Map-Area, British Columbia; Geol. Surv., Canada, Paper 50-19 (1950).

Reesor, J.E.: Geology Map, Lardeau (East Half); Geol. Surv., Canada, Map 12-1957, 1957.

Walker, J.F.: Geology and Mineral Deposits of Windermere Map-Area, B.C.; Geol. Surv., Canada, Mem. 148 (1926).

Webber, George L.: Profile Geology Map - Dutchy Group of M.C.'s Cominco, September 24, 1968.



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RESUME OF TECHNICAL AND FIELD EXPERIENCE
of
DAVID MARK, B.Sc.

EDUCATION

Graduate of University of British Columbia in Science (B.Sc.)
in Geophysics.

EXPERIENCE IN INDUSTRY

1. Prospecting and geological evaluation for New Taku Mines Ltd. during exploration season of 1965.
2. Field supervisor for geophysical and geochemical work and prospecting for Mastadon - Highland Bell Mines Ltd. during exploration season of 1966.
3. Field supervisor in geochemical work and geological mapping for Anaconda (Canada) Company during exploration season of 1967.
4. Field geophysicist for Geo-X Surveys Ltd. during exploration season of 1968.
5. Presently geophysicist for Geotronics Surveys Ltd., Vancouver, B. C.
6. Experience in various geophysical instrument surveys: magnetometer, electromagnetic, self potential, gravity, induced polarization, resistivity and seismic methods.
7. Member of British Columbia Geophysical Society and Vancouver Branch of The Canadian Institute of Mining and Metallurgy.
8. P. Eng. applied for with Association of Professional Engineers of B. C.

E. P. SHEPPARD & ASSOCIATES LTD.

CONSULTING GEOLOGISTS

314-402 WEST PENDER STREET,
VANCOUVER 3, B.C.

November 3, 1970

Mr. Tom Rolston
Geotronics Surveys Ltd
514-602 W. Hastings Street
Vancouver 2, B.C.

Dear Mr. Rolston:

At your request I have reviewed the references cited below and examined the report prepared by employees of your Company, "Electromagnetic Survey, Dutchy Claim Group, Invermere Area, Golden M.D., B.C."

The claim group is located approximately 21.5 miles S40°W of Invermere, B.C. Coordinates: 50° 116°SE. Elevation is approximately 6000 feet in the creek bottom to over 9500 feet on the mountain top.

GEOLOGY

The claims are underlain by the Kitchener-Siyeh formation of Proterozoic Age composed of limy, thin-bedded argillites. These rocks strike N-S and exhibit moderate dips to the east. A vertical N-S shear zone cuts the formation and it is within this zone that the copper mineralization occurs. This copper mineralization is in the form of chalcopyrite which occurs with pyrite in veinlets up to an inch wide within a quartz gangue. The veinlets conform to the attitude of the shear zone. Sulphide mineralization varies in width up to 30 feet; the average width appears to be about 18 feet.

An electromagnetic survey was conducted over the property utilizing a Crone VEM vertical loop instrument.

There was very little reaction by the instrument over the ore zone. It is felt that (1) topography played a large part in masking results, and (2) the indications

Dutchy claim group

- 2 -

are that mineralization within the shear zone may be lenticular in horizontal extent and the profiles missed the mineralized portion. Profiles could not be completed in full owing to rough topographic conditions.

The conductor outlined occurs east of known mineralization. It trends N 20°E across lines 7N, 9N, is roughly 200 feet in extent, and is open at both ends. It is felt that this part of the survey indicates a conductor which could contain amounts of copper mineralization comparable to the known mineralization in the shear zone.

The geophysical report and maps submitted by your Company show careful preparation and professional preparation. I am satisfied that the field work performed was of the same high quality as that carried out on assignments where your crews were under my supervision.



Respectfully submitted,

E. P. Sheppard.
E. Percy Sheppard, P. Eng.
Consulting Geologist

EPS:d

References

REFERENCES:

- Chamberlain, J.A.: Geological Examination of the Dutch Creek Copper Deposit, Invermere, B.C.; Dolmage, Campbell & Associates, July 3, 1969.
- Evans, C.S.: Brisco-Dogtooth Map-Area, B.C.; Geol. Surv., Canada, Sum. Rept. 1932 pt. AII, pp. 106-176 (1933).
- Grant, F.S. and West, G.F.: Interpretation Theory in Applied Geophysics; N.Y., McGraw-Hill Book Co. Inc. 1965.
- Little, H.W.: Salmo Map-Area, B.C.; Geol. Surv. Canada, Paper 50-19 (1950).
- Reesor, J.E.: Geology Map, Lardeau (East half); G.S.C., Map 12-1957, 1957.
- Walker, J.F.: Geology and Mineral Deposits of Windermere Map-Area, B.C.; G.S.C., Mem. 148 (1926).
- Webber, George L: Profile Geology Map - Dutchy Group of M.C.'s Cominco, Sept. 24, 1968.

* *


STATUTORY DECLARATION

I, DAVID MARK, Geophysicist, employee of Geotronics Surveys Ltd., of the City of Vancouver, in the Province of British Columbia, do solemnly declare that the following is the true cost breakdown of Geotronics Surveys Ltd.'s part in carrying out a Vertical Loop Electromagnetic Survey of the Dutchy Claim Group near Invermere, in the Golden Mining Division, B.C.:

Geophysicist, 3 days @ \$100.00/day	\$ 300.00
Instrument rental, @ \$300.00/month	150.00
Instrument freight	42.00
Portable Transceiver rental	10.00
Engineering fees	150.00
Geophysical mapping and report	410.00
Survey materials	<u>10.00</u>
 TOTAL COST	 <u>\$1,072.00</u>

And I make this solemn declaration conscientiously believing it to be true, and knowing that it is of the same force and effect as if made under oath, and by virtue of the Canada Evidence Act.

Declared before me)
at *Vancouver*)
in the Province of *British Columbia*)
this *4th* day of)
November A.D. 19 *70*)



A Commissioner for taking Affidavits for
British Columbia.