81-#1220 - 10 007

REPORT ON A HELICOPTER E.M. AND MAGNETOMETER SURVEY ON THE ECSTALL 1-14 CLAIMS ECSTALL RIVER AREA SKEENA MINING DIVISION BRITISH COLUMBIA

FOR OPERATOR

WELCOME NORTH MINES LTD.
1027 - 470 Granville Street
Vancouver, B.C.
V6C 1C5

AND OWNER

MR. CHRIS GRAF

ECSTALL RIVER PROJECT: LATITUDE 53° 53' LONGITUDE 129° 31'W
NTS: 103H 13F

SURVEY DATES: June 12-15, 1981

July 3, 1981
Vancouver, B.C.

Apex Airborne Surveys Ltd.
Ronald F. Sheldrake, B.Sc.

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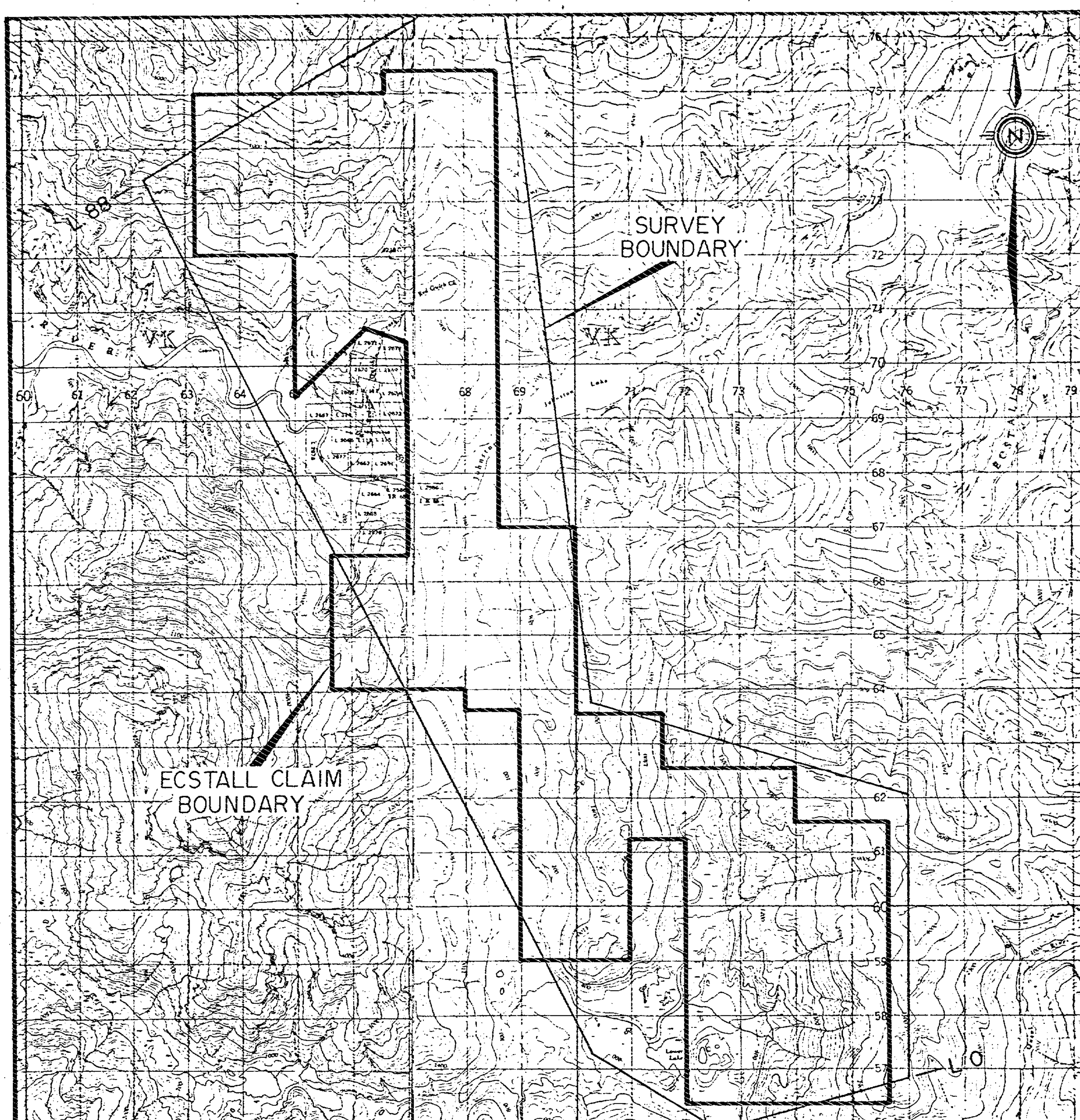

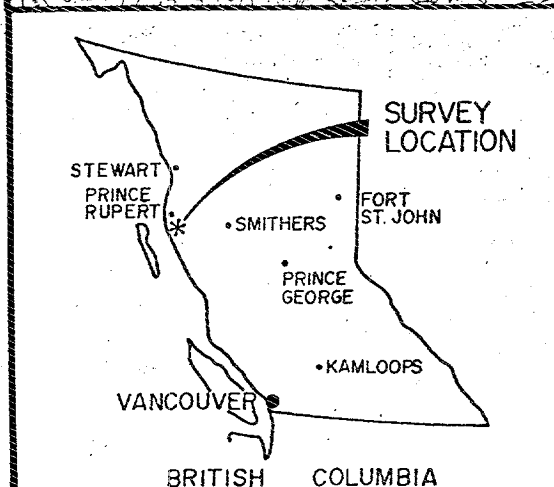

SURVEY & CLAIM LOCATION MAP

ECSTALL RIVER PROJECT

SKEENA MINING DIVISION

BRITISH COLUMBIA

FIGURE I.

N.T.S. 103H/14W

WELCOME NORTH MINES LTD.

APEX AIRBORNE SURVEYS LTD.

DATE: JULY 1981

SCALE: 1: 100,000

1. SUMMARY

The geophysical survey has identified five target zones in the Ecstall River area that are suitable as prospects for massive sulphide mineralization. Recommendations for follow-up have been made.

2. INTRODUCTION

This report describes the results of a helicopter-borne electromagnetic and magnetic survey flown for Welcome North Mines Ltd.

The survey was flown over an area about 4 km wide and 20 km long in rugged terrain ranging in elevation from sea level to 1290 metres.

The survey consisted of 88 traverses and one tie line totalling 436 linear kilometres of traverse.

Aircraft positioning was controlled from a 1:20,000 photomosaic map. A mean terrain clearance of 30 to 40 metres (for the E.M. sensor) was maintained where possible.

The Geonics 33-1 Electromagnetometer is a solid state system especially designed for helicopter transport.

It consists of two coaxial coils, one serving as a transmitter and the other as a receiver, which are mounted 6 metres apart, in a rigid "bird" with their axes horizontal and in the direction of flight. The bird is towed 30 metres below the helicopter by means of a suitable cable which also carried the electrical signals and power to and from the bird.

The system operates at 918 hertz. Changes in the alternating magnetic field at the receiver coil, caused by eddy currents in the subsurface rock, are recorded. These changes are expressed in ratios of the normal undistorted primary field. They are so small as to be expressed in parts per million or p.p.m.

The magnetometer used on this survey was a Geometrics 803. It is a total field nuclear precession instrument which measures the magnetic field strength with a sensitivity of one gamma. The sensor is toroidal and is positioned half way between the helicopter and the E.M. 33-1 bird.

Appendix I gives details of the geophysical equipment used for this survey. Appendix II describes the flight record and flight path recovery process.

CLAIMS

Claim Name		Record Number	No. of Units	Staked By	Recording Date	Due Dates
Ecstall	1	2716	15	Chris Graf	December 17, 1980	December 17, 1981
	2	2717	18	Chris Graf	December 17, 1980	December 17, 1981
	3	2718	8	Chris Graf	December 17, 1980	December 17, 1981
	4	2719	20	Chris Graf	December 17, 1980	December 17, 1981
	5	2720	20	Chris Graf	December 17, 1980	December 17, 1981
	6	2721	20	Chris Graf	December 17, 1980	December 17, 1981
	7	2722	20	Chris Graf	December 17, 1980	December 17, 1981
	8	2723	20	Chris Graf	December 17, 1980	December 17, 1981
	9	2724	18	Chris Graf	December 17, 1980	December 17, 1981
	10	2725	20	Chris Graf	December 17, 1980	December 17, 1981
	11	2726	18	Chris Graf	December 17, 1980	December 17, 1981
	12	2727	20	Chris Graf	December 17, 1980	December 17, 1981
	13	2728	20	Chris Graf	December 17, 1980	December 17, 1981
	14	2729	20	Chris Graf	December 17, 1980	December 17, 1981

LOCATION AND ACCESS

The ECSTALL CLAIM GROUP is located about 75 km southeast of Prince Rupert, B.C. (53° 53' Latitude 129° 31' Longitude). The claims overlay part of the Ecstall River in the area of Johnstone Lake.

Access to the area is by helicopter along the Ecstall River from Prince Rupert. Johnstone Lake is sufficiently large to provide landing for float equipped aircraft. No roads give access to the area.

GEOLOGY

*"The geology of the southern half of the area is contained in the G.S.C. Paper 70-41, Douglas Channel - Hecate Strait map area. The geology of the northern half is described in G.S.C. Paper 66-33, Prince Rupert-Skeena Map area, and on accompanying G.S.C. Map 12-1966. G.S.C. Map 1427A is a new revised geology map of the Prince Rupert area.

Much of the area on the two map sheets is underlain by Coast Range plutonic rocks and high grade metamorphic rocks of the Central Gneiss Complex. Two narrow, elongate belts of schistose volcanic and sedimentary rocks occur as remnants or roof pendants on the crystalline rocks, and are considered to be favourable exploration targets. These rocks outcrop in two separate belts, each roughly 12 km wide by 75 to 100 km long.

The dominant lithologies of the favorable belts are chloriate schists, sericite schists, hornblende schists, black graphite schists, quartzites, argillites and marble."

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* part of a private Mineral Exploration Proposal by Chris Graf. Original sources G.S.C. Papers 70-41, 66-33.

3. DATA PRESENTATION

3.1 Electromagnetics (Plate I)

The Electromagnetic Survey Profiles Map shows the profiles of inphase and quadrature E.M. responses along the flight lines. The E.M. profiles are transcribed and plotted from the digital chart recorded in flight, after assigning a suitable base level value.

3.2 Magnetics (Plate II)

The Total Field Magnetic Map shows contours of the total magnetic field uncorrected for regional variation. The maps are plotted from the digital chart recorded in flight, and contoured at an interval of 20 gammas.

3.3 Interpretation Map (Plate III)

The Interpretation Map provides a summary of the interpretated information. Formational responses, rock types and contact zones are displayed as well as target conductors that may be suitable for massive sulphide exploration.

4. INTERPRETATION

Both Magnetic and Electromagnetic Maps can be interpreted to reveal areas underlain by different rock types and lineaments which could indicate contact or fault zones. Magnetic Maps can reveal the location of orebodies which contain higher percentages of magnetite or pyrrhotite than the surrounding rocks.

Conductivity thickness is the "parameter-pair" measured with the electromagnetometer. Materials which conduct electronically, metallic sulphides and graphite, have higher conductivity-thickness values than electrolytic conductors such as clays (in overburden) and ion-rich sloughs or creeks, however, there is considerable overlap.

In general, the electromagnetic responses encountered by an electromagnetic survey are of four main types.

1. Bedrock conductors: including formational graphitic responses and massive sulphide targets.

2. Surficial conductors: overburden and lake responses.

3. A combination of 1 and 2: when a conductive material overlays a bedrock conductor the response due to the bedrock is superimposed on the response of the overburden or lake response. Depending upon the conductivity contrasts, and the thickness of the overburden, some bedrock conductors can be recognized through the surficial layer.

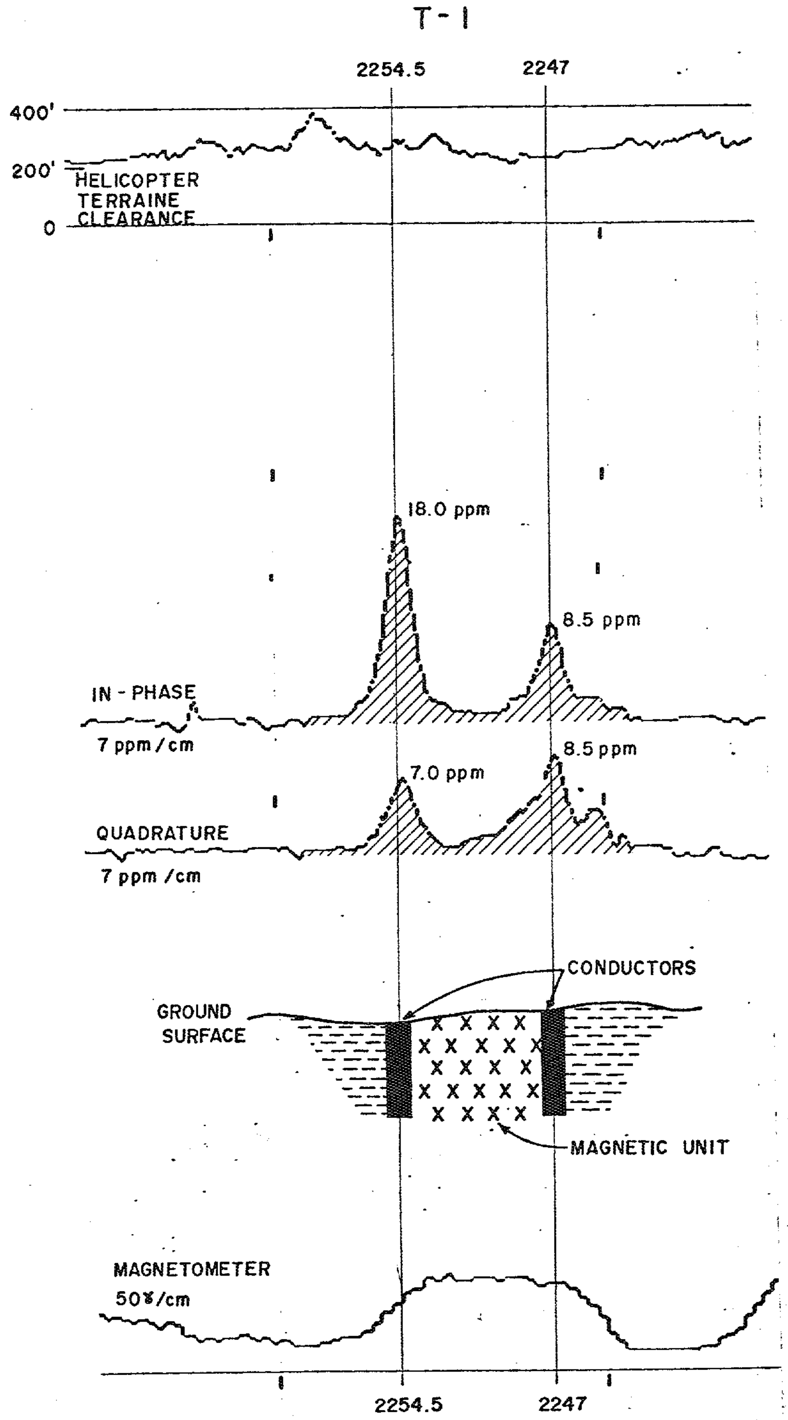
4. "Negative" magnetic effects: When conductors are also magnetic, the electromagnetic responses can become distorted. The distortion tends to decrease the inphase response, often reversing the sign of the E.M. anomaly. Apparent depths and conductivity-thickness products, in this case, are generally not representative.

5. DISCUSSION OF RESULTS

The geophysical measurements indicate five target conductors that may be due to concentrations of massive sulphides. A description of each follows below.

Target Zone T-1

The anomalies in Target Zone T-1 appear to be part of a magnetic and conductive formation that extends from L78 in the north to L62 in the south. However, the nature of the responses changes within the Target Zone which may indicate that there are geological distortions or alterations occuring that are not evident elsewhere along the formational unit. Figure 2 is a transcription of the geophysical data from L72, and schematically shows relative locations and attitudes. (The schematic diagrams do not reflect the true geological complexity).



ANOMALY 2254.5

APPARENT CONDUCTANCE 30 - 50 mhos
APPARENT DEPTH 0 - 5 metres

ANOMALY 2247

APPARENT CONDUCTANCE 6 - 10 mhos
APPARENT DEPTH 0 - 5 metres

NOTES: Horizontal Scale 1 : 20,000

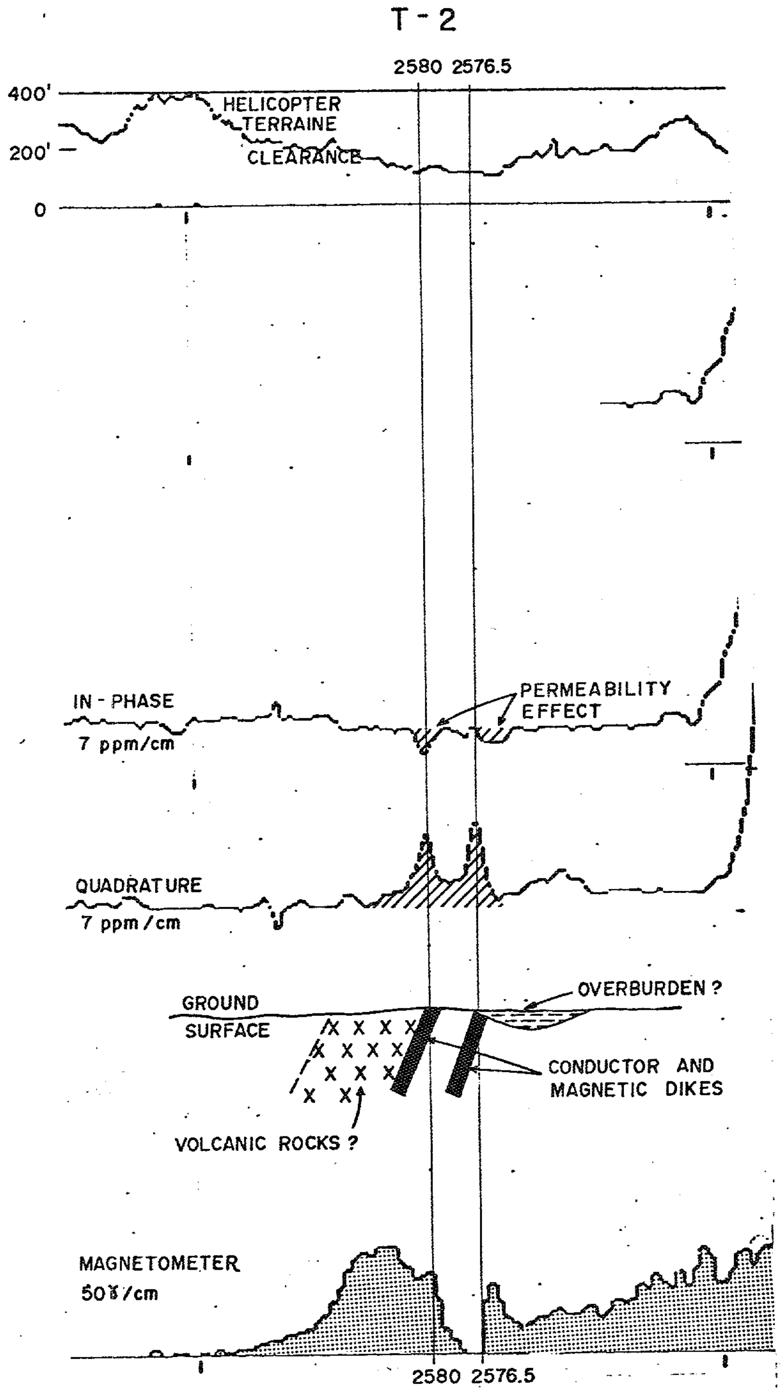
FIGURE 2

DETAIL ANOMALY LINE 72

Target Zone T-2

The responses over this Target Zone are noteworthy not because of their high conductance (although they might well be quite conductive), but because of their limited strike length (non-formational) and their association to concentrations of magnetic minerals.

See Figure 3 for the schematic representation of the data on L74.



NOTES :

- Horizontal Scale 1:20,000
- Both Conductors Near Surface
- Conductors May be Due to Magnetite and Sulphides

FIGURE 3

DETAIL ANOMALY
LINE 74

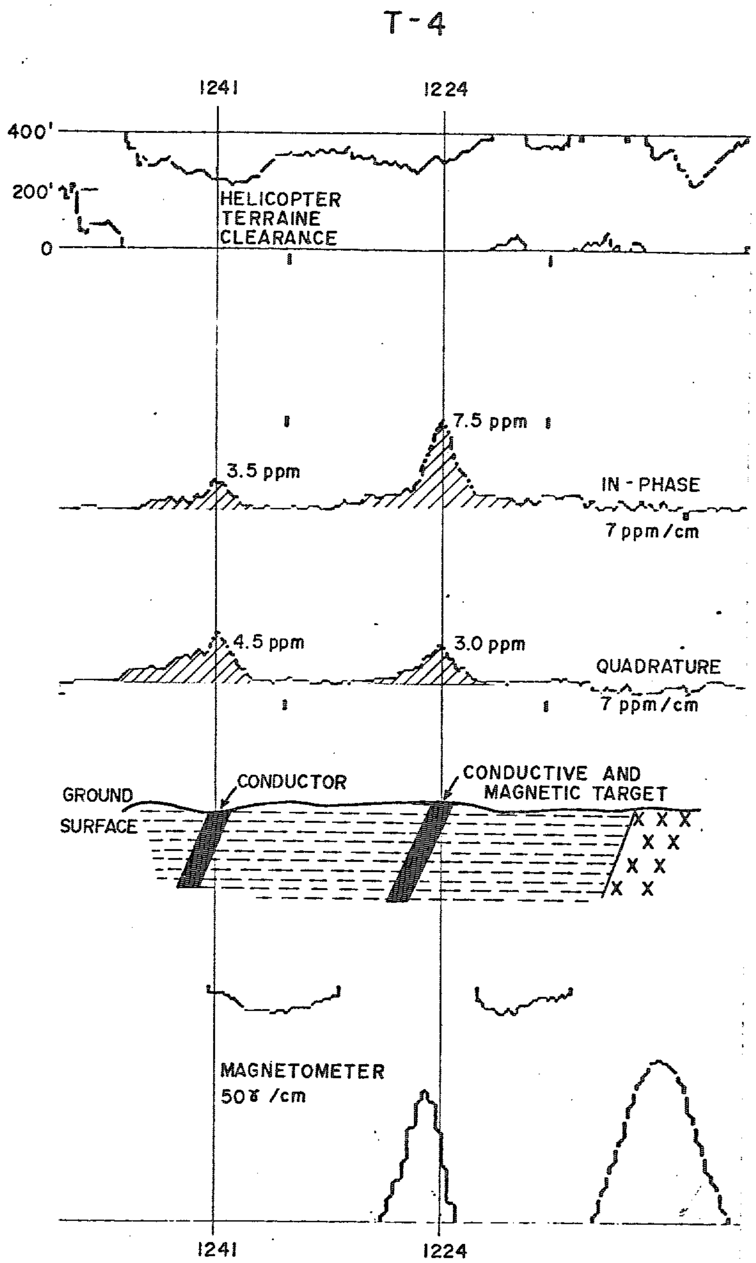
Target Zone T-3

This anomaly stands by itself at the extreme end of L50. The response is narrow indicating a vertical dyke-like source. It is not associated with any local magnetic variations and probably lies in a sedimentary sequence. The apparent depth (to the top of the conductor) is 0 to 3 metre range with an apparent conductance of 15 to 20 mhos.

Target Zone T-4

Target Zone T-4 centers on the anomaly located at fiducial 1224 on L11. It is coincident with a local distortion in the magnetic contour pattern and has an apparent conductance of 20 to 30 mhos (moderate to good range). The target is apparently bounded on both sides by rocks of sedimentary origin.

See Figure 4 for the schematic representation of the data on Line 11.



ANOMALY 1224

APPARENT CONDUCTANCE 20-30 mhos
APPARENT DEPTH 0-3 meters
PRIORITY I

ANOMALY 1241

APPARENT CONDUCTANCE 3.5 mhos (low)
APPARENT DEPTH 0-3 metres

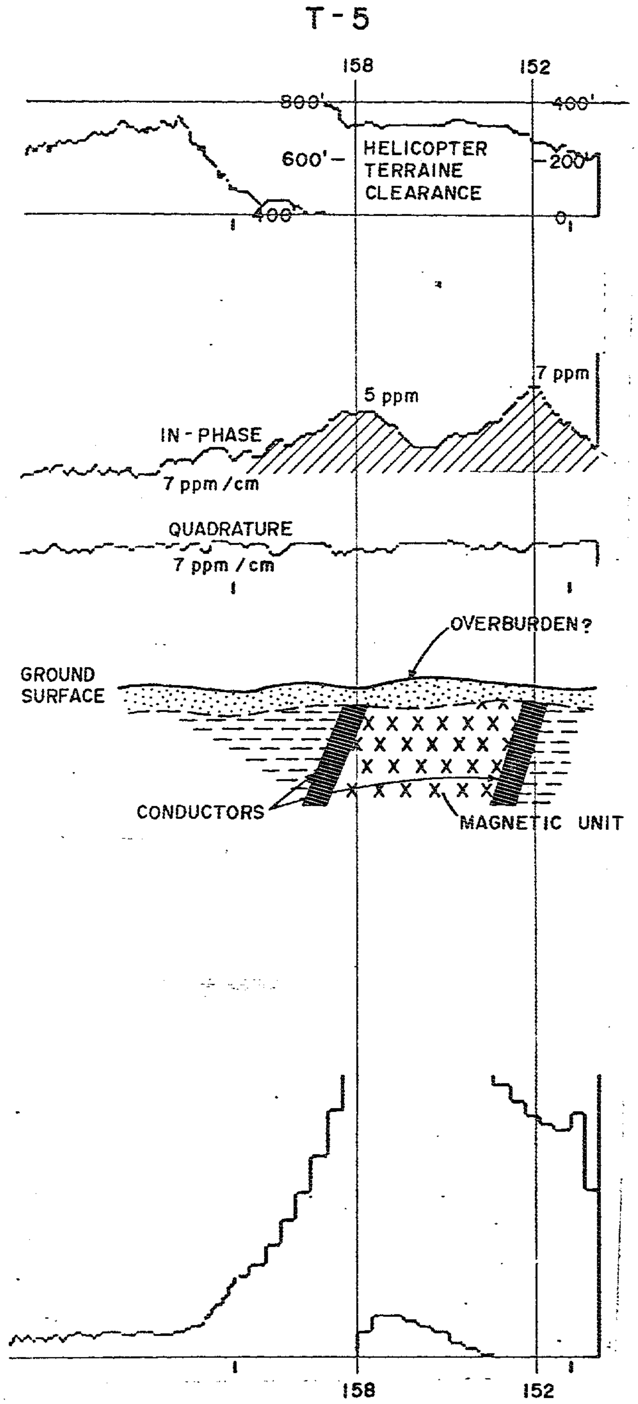
NOTES: Horizontal Scale 1:20,000
Anomaly 1224 has Priority

FIGURE 4

DETAIL ANOMALY
LINE 11

Target Zone T-5

This Target Zone centers on a response recorded at fiducials 158 and 152 on L3. The responses indicates very high conductances (larger than 150 mhos) as indicated by their lack of quadrature response. These conductors are apparently contiguous with a magnetic unit and may be relatively deep. Apparent depths indicate 5 to 20 metre range to the top of the Target. See Figure 5 for a schematic representation of the data.



ANOMALY 158

APPARENT CONDUCTANCE <150 mhos (high)
APPARENT DEPTH 5-20 metres
PRIORITY 1

ANOMALY 152

APPARENT CONDUCTANCE <150 mhos (high)
APPARENT DEPTH 5-20 metres
PRIORITY 1

NOTES: Horizontal Scale 1:20,000

FIGURE 5

DETAIL ANOMALY LINE 3

There are three massive sulphide deposits within the survey area. They are called ECSTALL, the PACKSACK and the HORSEFLY deposits.

No strong geophysical anomalies were recorded directly over any of the three deposits, however, in general, the position of the geophysical responses shifts substantially in the steep terrain and must be confirmed by ground techniques.

Ecstall Deposit

This deposit is located deep in a ravine and the E.M. sensor was probably to distant from the deposit to sense it.

Packsack Deposit

This deposit is located on the eastern flank of a ridge and ought to have been detectable with airborne system. Possibly the deposit is insufficiently or discontinuously conductive thereby not giving arise to the expected anomalous responses.

Horsefly Deposit

Some of the strongest conductance responses are located near this deposit. (See Figure 4 Target Zone 5.) It may turn out (because of the distortions in the base map in that area and the inherent mislocations due to photo-positioning) that the responses within Target Zone T-5 arise from this deposit. Target Zone T-5 indicates the highest conductance recorded on the survey.

6. CONCLUSIONS AND RECOMMENDATIONS

Five rather strong anomalous responses are evident from the data recorded on this geophysical survey. Each of these warrants thorough prospecting for massive sulphide mineralization.

For each Target Zone, several geochemistry, magnetic and VLF E.M. traverses are recommended as follow up.

Drill targets should be identifiable from that data.

Respectfully submitted

Ronald F. Sheldrake

Ronald F. Sheldrake
Apex Airborne Surveys Ltd.

BIBLIOGRAPHY

Geonics Limited (Toronto) - Technical Note TN-4 - "Interpretation Aids for E.M. 33 Helicopter Electromagnetic System".

Chris Graf - "Mineral Exploration Proposal"
Private Paper - Original Sources
G.S.C. Papers 70-41, 66-33

APPENDIX I

APPENDIX I

INSTRUMENTATION

Electromagnetic Instrument

Type:	Helicopter mounted in-phase - quadrature instrument manufactured by Geonics Limited, Toronto, Ontario.
Coils:	The transmitting and receiving coils are co-axial 6 metres apart in a towed bird 30 metres below the helicopter. The coil axis is in the direction of travel.
Frequency:	918 Hz
Noise Level:	Approximately 1/4 ppm (0.6 second time constant).

Magnetometer

Type:	Proton precession model G803 manufactured by Geometrics Corporation, Toronto.
Cycling Time:	1.0 second.
Sending Head Design:	5 inch diameter Toroid.

APPENDIX I (cont'd)

Ancillary Equipment:

UDAS Digital Acquisition System with recorder.

Geocam 35 mm Flight Path Camera
Bonzer Radio Altimeter

Geometrics G806 Magnetic Base Station and recorder.

Helicopter: Gazelle Helicopter supplied by Highwood Airservices Ltd. Calgary, Alberta.

APPENDIX II

APPENDIX II

THE "ANALOGUE" CHART AND FLIGHT PATH RECOVERY

The flight tape is a roll of chart paper which moves through the digital printer at a speed of 5.48 cm per minute.

The digital printer chart facilitates the use of a full alpha-numeric system. All "header" sensitivity and fiducial information is printed automatically.

The chart is 520 dots wide as follows:

DOTS:

0 - 100	magnetometer fine - 2 gammas per dot.
100 - 180	magnetometer coarse - 25 gammas per dot.
180 - 320	quadrature 0.6 sec T.C. 1/4 ppm per dot.
320 - 460	in phase 0.6 sec T.C. 1/4 ppm per dot.
460 - 470	powerline monitor
460 - 470	spherics monitor
480 - 520	altimeter 10 feet per dot (0 - 400 feet).

The helicopter flight path is recovered from 35 mm film, which is exposed at 2.0 second intervals during the flight traverses. After processing and anotating, recognizable fiducials are pin-pointed on the photomosaic map.

<u>CERTIFICATION</u>

I, RONALD F. SHELDRAKE, of the City of Vancouver, Province of British Columbia, hereby certify as follows:

1. I am President of **Apex Airborne Surveys Ltd.** a company incorporated under the laws of the Province of British Columbia.

2. The Vancouver Office of **Apex Airborne Surveys Ltd.** is located at Suite 512 -625 Howe Street, Vancouver, British Columbia.

3. I received my B.Sc., in Geophysics from the University of British Columbia in May 1974.

4. I have practised my profession since that date.

5. I did not examine the claims area, but I am not aware of any claim conflict and believe that the data presented herein is reliable.

6. I have no interest, direct or indirect, in WELCOME NORTH MINES LTD. or its affiliates, nor do I expect to receive any.

7. I consent to the use of this report in or in connection with a Prospectus or in a Statement of Material Facts.

Ronald F. Sheldrake

Ronald F. Sheldrake

July 3, 1981

Apex Airborne Surveys Ltd.

July 3, 1981

STATEMENT OF COSTS

Type of Survey:	Helicopter Electromagnetic and Magnetic
Date(s) of Fieldwork:	June 12-15, 1981 - 3 days
Survey Kilometres:	436 kilometres
Cost per linear Kilometre:	$155.33
Additional Charges:	
Total cost of Survey:	(436 km x $155.33 = $67,725.00)

WELCOME NORTH MINES LTD.

ECSTALL RIVER PROJECT

ELECTROMAGNETIC PROFILES MAP

NOTES

MAGN. DEC. 27 E. MAGN. INCL. 74°
SENSOR HEIGHT 35m.
VERTICAL CONTROL RADAR ALTIMETER
HORIZ. CONTROL PHOTO MOSAICS

LEGEND

134 — 60 LINE No.10
CONTROL POINT (CAMERA FIDUCIAL)
PPM. 0 10 20 30 40
IN-PHASE
QUADRATURE
Vertical scale 1mm. = 1 ppm.

N.T.S. 103 H 13 E , 14 W — MINING DIV. SKEENA B.C.

LATITUDE 53° 53' N. — LONGITUDE 129° 31' W.

SCALE 1 : 20,000 — PLATE 1

INSTRUMENTATION: GEONICS 33-1
FREQUENCY : 918 HRTZ.
COIL SEPARATION 6 METERS COAXIAL

BY R. Sheldrake — DATE June, 1981

APEX AIRBORNE SURVEYS LTD.

NATURAL RESOURCES BRANCH
ASSESSMENT REPORT
NO. 10,007

NOTES

MAGN. DEC. 27E. MAGN. INCL. 74°
SENSOR HEIGHT 50 m.
VERTICAL CONTROL RADAR ALTIMETER
HORIZ. CONTROL PHOTO MOSAICS
CONTOUR INTERVAL : 20 GAMMAS
UNCORRECTED FOR REGIONAL VARIATION

LEGEND

— 57100
— 57000
MAGNETIC DEPRESSION

WELCOME NORTH MINES LTD.
ECSTALL RIVER PROJECT
MAGNETIC CONTOUR MAP

N.T.S. 103 H 13 E, 14 W — MINING DIV. SKEENA B.C.
LATITUDE 53° 53' N. — LONGITUDE 129° 31' W.
SCALE 1 : 20,000 — PLATE 2
INSTRUMENTATION MAGNETOMETETER GEOTRONICS G - 803

BY R. Sheldrake — DATE June, 1981

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WELCOME NORTH MINES LTD.
ECSTALL RIVER PROJECT

INTERPRETATION MAP

N.T.S. 103 H 13 E, 14 W — MINING DIV. SKEENA B.C.
LATITUDE 53° 53' N. — LONGITUDE 129° 31' W.
SCALE 1 : 20,000 — PLATE 3

LEGEND
- MAGNETIC FORMATION
- GEOPHYSICAL LINEAMENT
- PHOTO LINEAMENT
- T-1 TARGET ANOMALY

BY R. Sheldrake — DATE June, 1981

APEX AIRBORNE SURVEYS LTD.