REPORT ON AN AIRBORNE MAGNETIC AND VLF-EM SURVEY HOMER TOWNSHIP SAULT STE. MARIE MINING DIVISION, ONTARIO

for

655 GROUP HOLDINGS LIMITED

by

TERRAQUEST LTD.
Toronto, Canada

JULY 15, 1985

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1. INTRODUCTION

This report describes the specifications and results of a geophysical survey carried out for 655 Group Holdings Limited of Timmins, Ontario by Terraquest Ltd., 905 - 121 Richmond St. W., Toronto, Canada. The field work was performed on April 27, 1985 and the data processing, interpretation and reporting from April 28 to July 15, 1985.

The purpose of a survey of this type is two-fold. One is to prospect directly for anomalously conductive and magnetic areas in the earth's crust which may be caused by, or at least related to, mineral deposits. A second is to use the magnetic and conductivity patterns derived from the survey results to assist in mapping geology, and to indicate the presence of faults, shear zones, folding, alteration zones and other structures potentially favourable to the presence of gold and base-metal concentration. To achieve this purpose the survey area was systematically traversed by an aircraft carrying geophysical instruments along parallel flight lines spaced at even intervals, 100 meters above the terrain surface, and aligned so as to intersect the regional geology in a way to provide the optimum contour patterns of geophysical data.

2. THE PROPERTY

The property is located in Homer Township, in the Sault Ste. Marie Mining Division of Ontario about 85 kilometers west of the town of Wawa, Ontario. The claims are bounded on the southwest by Lake Superior and can be reached by float plane or helicopter from Wawa.

The latitude and longitude are 85° 50', and 47° 59' respectively, and the N.T.S. reference is 42 C/4.
The claim numbers are 663381 to 663398 and 689383 to 689400.

3. GEOLOGY

Map References

1. Map 2332, Pukaskwa River, 1:63,360, O.D.M. 1976.

The main suite of rock types underlying the claim group is early precambrian mafic volcanics, mostly massive to foliated andesite and basalt. These contain interbedded flows of rhyolite and dacite and some iron formation. Some exposures of diabase dykes are seen conforming with the volcanic flows rather than crosscutting them as is more often the case in the precambrian shield.
A showing of pyrite and chalcopyrite occurs near the lake in the basic volcanics.

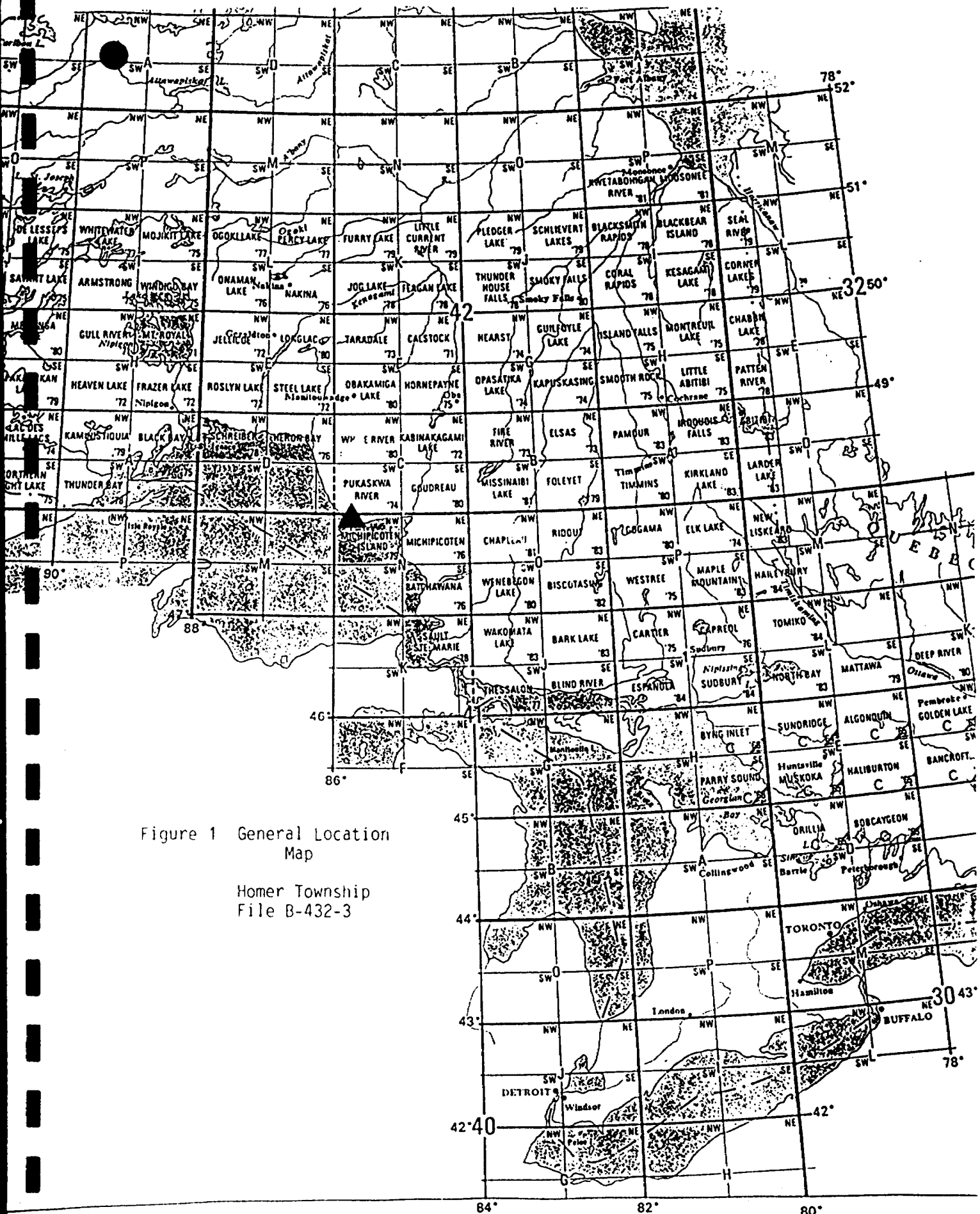


Figure 1 General Location Map

Homer Township
File B-432-3

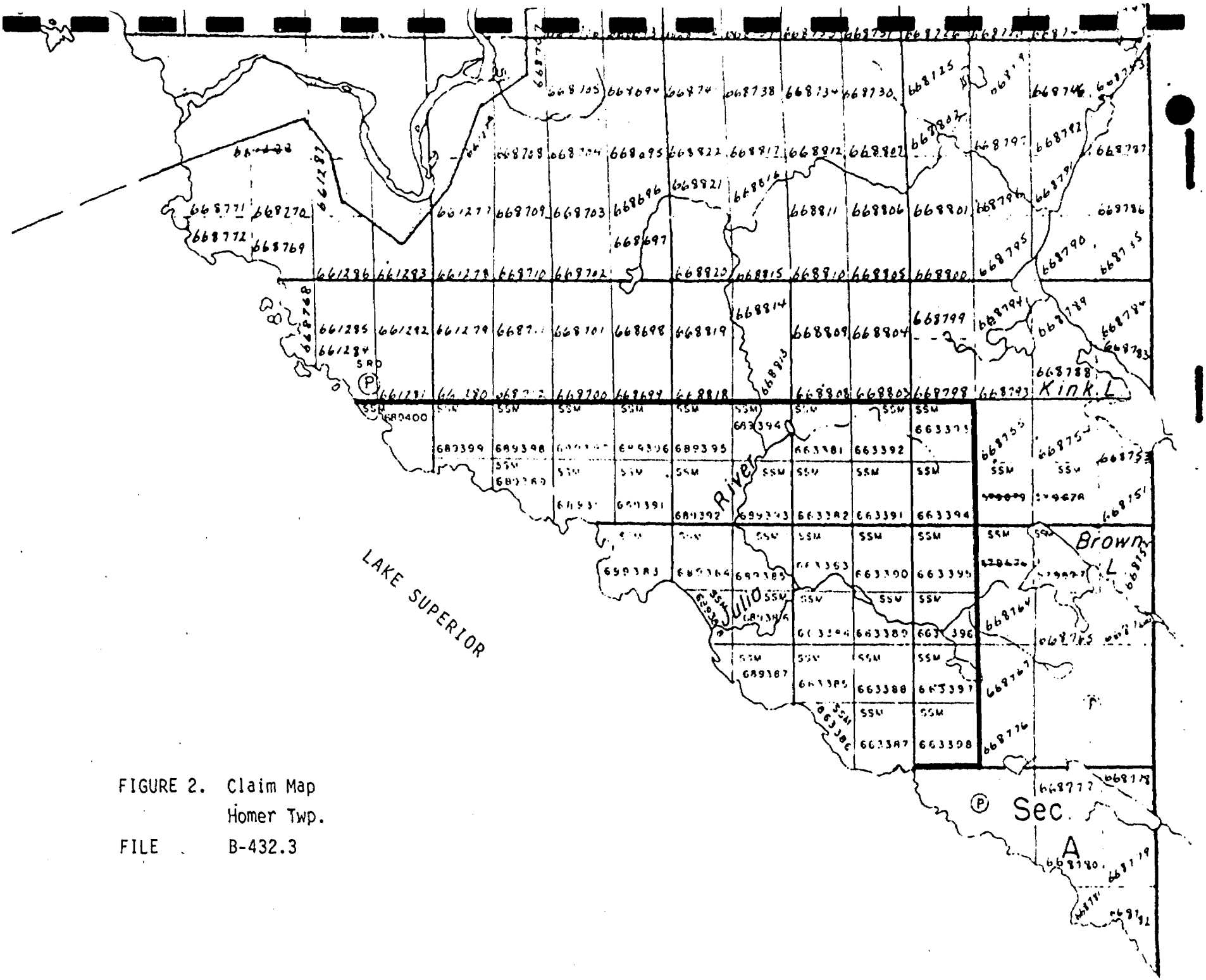


FIGURE 2. Claim Map
Homer Twp.
FILE B-432.3

4. SURVEY SPECIFICATIONS

4.1 Instruments

The survey was carried out using a Cessna 182 aircraft, registration C-FAKK, which carries a magnetometer and a VLF electromagnetic detector.

The magnetometer is a proton precession type with the sensor element mounted in an extension of the right wing tip. It's specifications are as follows:

Resolution:	0.5 gamma
Accuracy:	One gamma
Cycle time:	One second
Range:	20,000 - 100,000 gammas in 23 overlapping steps
Gradient tolerance:	Up to 5000 gammas per meter
Model:	GSM-8BA
Manufacturer:	GEM Systems Inc., 105 Scarsdale Rd., Don Mills, Ontario, M3B 2R5

The VLF-EM unit uses three orthoganol detector coils to measure (a) the total field strength of the time-varying EM field and (b) the phase relationship between the vertical coil and both the "along line" coil (LINE) and the "cross-line" coil (ORTHO). The LINE coil is tuned to a transmitter station that is ideally positioned at right angles to the flight lines, while the ORTHO coil transmitter should be in line with the flight lines. It's specifications are:

Accuracy:	1%
Reading interval:	1/2 second
Model:	TOTEM 2A
Manufacturer:	Herz Industries, Toronto

The VLF sensor is mounted in the left wing tip extension.

Other instruments are:

- King KRA-10A Radar altimeter
- UDAS-100 data processor with Digidata nine track tape recorder, manufactured by Urtec Ltd., Markham, Ontario.
- Geocam video camera and recorder for flight path recovery, manufactured by Geotech Ltd., Markham, Ontario.

4.2 Lines and Data

a) Line spacing:	100 meters
b) Line direction:	37 degrees
c) Terrain clearance:	100 meters
d) Average ground speed:	156 km/hr.
e) Data point interval:	

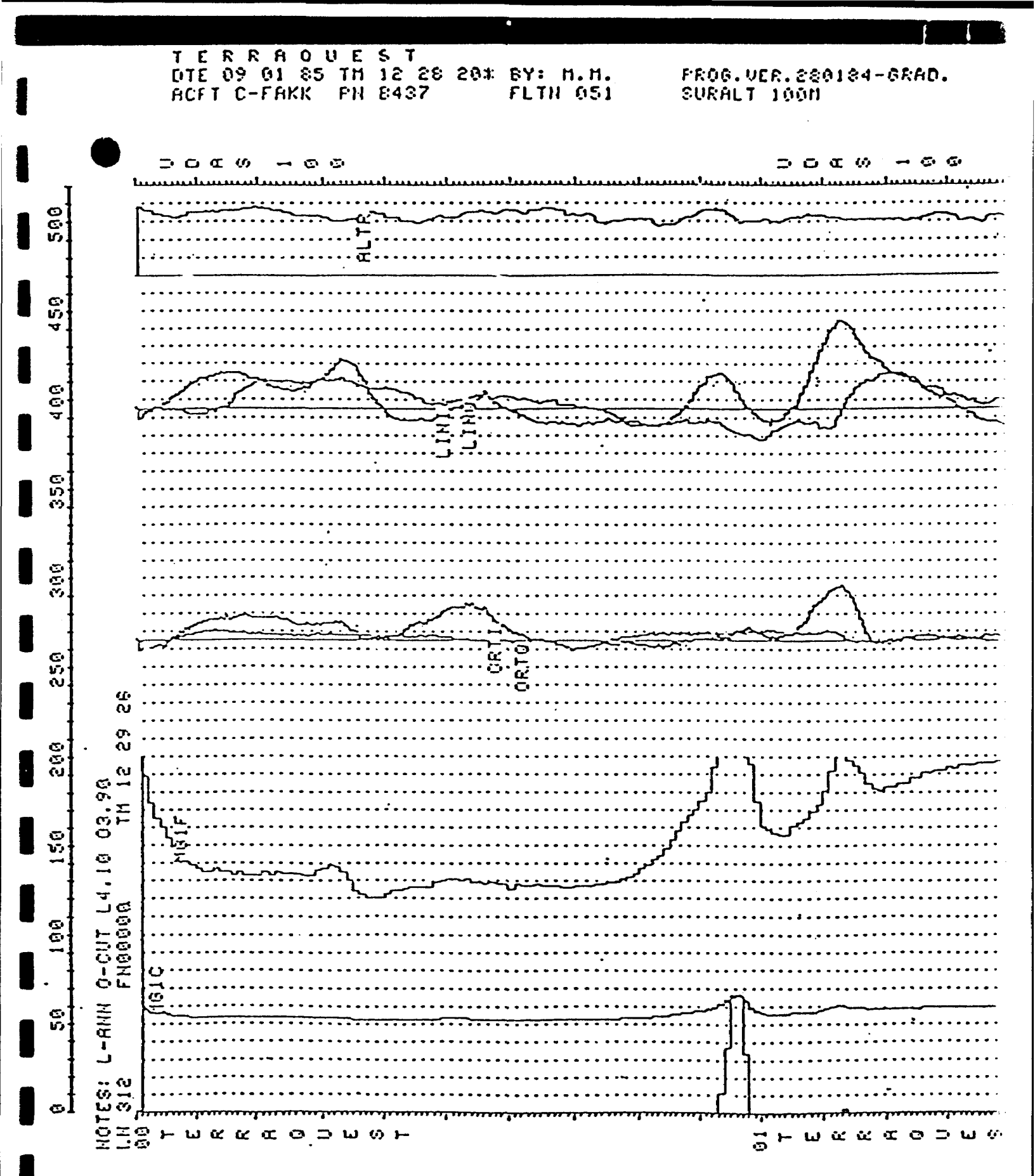


FIGURE 3. SAMPLE OF ANALOGUE DATA

Magnetic: 42 meters
VLF-EM: 21 meters
f) Tie Line interval: 2 kilometers
g) Channel 1 (LINE): NSS Annapolis, 21.4 kHz
h) Channel 2 (ORTHO): NAA Cutler, Me., 24.0 kHz
i) Line km over total survey area: 97
j) Line km over claim groups: 62

4.3 Tolerances

a) Line spacing: Any gaps wider than twice the line spacing and longer than 10 times the line spacing were filled in by a new line.
b) Terrain clearance: Portions of line which were flown above 125 meters for more than one km were reflown if safety considerations were acceptable.
c) Diurnal magnetic variation: Less than twenty gammas deviation from a smooth background over a period of two minutes or less as seen on the base station analogue record.
d) Manoeuvre noise: Approximately +/-5 gammas.

4.4 Photomosaics

For navigating the aircraft and recovering the flight path, mosaics of aerial photographs were made from existing air photos. In order to provide a semi-controlled base the photos were laid down on a topographic map which had been photographically adjusted to the photo scale. The laydown was then photographed and printed at the final map scale.

5. DATA PROCESSING

Flight path recovery was carried out in the field using a video tape viewer to observe the flight path as recorded by the Geocam video camera system. The flight path recovery was completed daily to enable reflights to be selected where needed for the following day.

The magnetic data was levelled in the standard manner by tying survey lines to the tie lines. The IGRF was not been removed. The total field was contoured by computer using a program provided by Dataplotting Services Inc. To do this the final levelled data set is gridded at a grid cell spacing of 1/4 the flight line spacing.

The vertical magnetic gradient is computed from the total field data using a method of transforming the data set into the frequency domain, applying a transfer function to calculate the gradient, and then transforming back into the spatial domain. The method is described by a number of authors including Grant, 1972 and Spector, 1968.

Grant, F.S.; Review of Data Processing and Interpretation Methods in Gravity and Magnetics; Geophysics, August 1972.
Spector, A.; Spectral Analysis of Aeromagnetic maps; unpublished thesis; University of Toronto, 1961.

The VLF data was treated automatically so as to normalize the non conductive background areas to 100 (total field strength) and zero (quadrature). The algorithms to do this were developed by Terraquest and will be provided to anyone interested by application to the company.

All of these dataprocessing calculations and map contouring were carried out by Dataplotting Services Inc. of Toronto.

6. INTERPRETATION

6.1 General Approach

To satisfy the purpose of the survey as stated in the introduction, the interpretation procedure was carried out on both the magnetic and VLF data. On a local scale the magnetic gradient contour patterns were used to outline geological units which have different magnetic intensity and patterns or "signatures". Where possible these are related to existing geology to provide a geological identity to the units. On a regional scale the total field contour patterns were used in the same way.

Faults and shear zones are interpreted mainly from lateral displacements of otherwise linear magnetic anomalies but also from long narrow "lows". The direction of regional faulting in the general area is taken into account when selecting faults. Folding is usually seen as curved regional patterns. Alteration zones can show up as anomalously quiet areas, often adjacent to strong, circular anomalies that represent intrusives. Magnetic anomalies that are caused by iron deposits of ore quality are usually obvious owing to their high amplitude, often in tens of thousands of gammas.

VLF anomalies are categorized according to whether the phase response is normal, reverse, or no phase at all. The significance of the differing phase responses is not completely understood although in general reverse phase indicates either overburden as the source or a conductor with considerable depth extent, or both. Normal phase response is theoretically caused by surface conductors with limited depth extent.

Areas showing a smooth response somewhat above background (ie. 110 or so) are likely caused by overburden which is thick enough and conductive enough to saturate at these frequencies. In this case no response from bedrock is seen.

6.2 Interpretation

The total field magnetic data shows about 1800 gammas relief over the survey area. There is fair correlation between magnetic anomalies and exposures of units 1a and 2a, and these units have been remapped on this basis using the vertical gradient data to assist in marking contacts. Some faults have been interpreted from lateral displacements of linear magnetic trends

VLF conductor axes appear to conform well with the magnetic pattern indicating that their source is probably in bedrock. They lie

mostly in unit 1a. Any which are clearly coincident with patches of overburden in bedrock exposures can be attributed to overburden. Others may be caused by sulphide minerals or other conductive minerals and should be followed up on the ground by conventional EM or IP methods.

The mapped sulphide mineral showing lies in an area interpreted as being underlain by unit 2a (rhyolite) instead of 1a as mapped. If ground inspection supports this interpretation a prospecting program along the whole of the newly interpreted unit 2a is warranted.

7. SUMMARY

A combined magnetic and VLF-EM survey has been done on the survey area at a data density of approximately 1.6 km. per mineral claim. The magnetic data has been used to modify and update the existing geology and has shown a number of new contacts and faults. A number of VLF-EM conductor axes were found of which some are believed to be have potential sulphide origin and have been recommended for additional investigation.

TERRAQUEST LTD.

Roger K. Watson, B.A.Sc., P.Eng.
Geophysicist

Dual. 63.1498

900

Mining Lands Section

File No 2.8301

Control Sheet

TYPE OF SURVEY ✓ GEOPHYSICAL

____ GEOLOGICAL

____ GEOCHEMICAL

____ EXPENDITURE

MINING LANDS COMMENTS:

lgd

ID

Signature of Assessor

26/7/85

Date

2.8301

File _____

Ontario

Ministry of Natural Resources

GEOPHYSICAL – GEOLOGICAL – GEOCHEMICAL TECHNICAL DATA STATEMENT

TO BE ATTACHED AS AN APPENDIX TO TECHNICAL REPORT
FACTS SHOWN HERE NEED NOT BE REPEATED IN REPORT
TECHNICAL REPORT MUST CONTAIN INTERPRETATION, CONCLUSIONS ETC.

Type of Survey(s) AIRBORNE MAG & VLF

Township or Area HOMER

Claim Holder(s) 655 GROUP HOLDINGS LIMITED

Survey Company TERRAQUEST LTD.

Author of Report R. K. WATSON

Address of Author 905 - 121 RICHMOND ST W.

Covering Dates of Survey Apr 27, 1985 (linecutting to office)

Total Miles of Line Cut _____

SPECIAL PROVISIONS CREDITS REQUESTED		DAYS per claim.
ENTER 40 days (includes line cutting) for first survey.	Geophysical	
	–Electromagnetic	
	–Magnetometer	
	–Radiometric	
ENTER 20 days for each additional survey using same grid.	–Other	
	Geological	
	Geochemical	

AIRBORNE CREDITS (Special provision credits do not apply to airborne surveys)

Magnetometer 40 Electromagnetic 40 (enter days per claim) Radiometric _____

DATE: July 30/85 SIGNATURE: _____ Author of Report or Agent

Res. Geol. _____ Qualifications _____

Previous Surveys

File No.	Type	Date	Claim Holder

MINING CLAIMS TRAVERSED
List numerically

SSM - 663381 → 663398 (prefix) (number)

SSM - 689383 → 689400

see attached list

If space insufficient, attach list

TOTAL CLAIMS 36

837 (5/79)

SELF POTENTIAL

Instrument _____ Range _____

Survey Method _____

_____

Corrections made _____

_____

RADIOMETRIC

Instrument _____

Values measured _____

Energy windows (levels) _____

Height of instrument _____ Background Count _____

Size of detector _____

Overburden _____

(type, depth – include outcrop map)

OTHERS (SEISMIC, DRILL WELL LOGGING ETC.)

Type of survey _____

Instrument _____

Accuracy _____

Parameters measured _____

_____

Additional information (for understanding results) _____

_____

_____

AIRBORNE SURVEYS

Type of survey(s) MAG ; VLF-EM

Instrument(s) GEM-8BA ; TOTEM-2A

(specify for each type of survey)

Accuracy 1 gamma ; 1%

(specify for each type of survey)

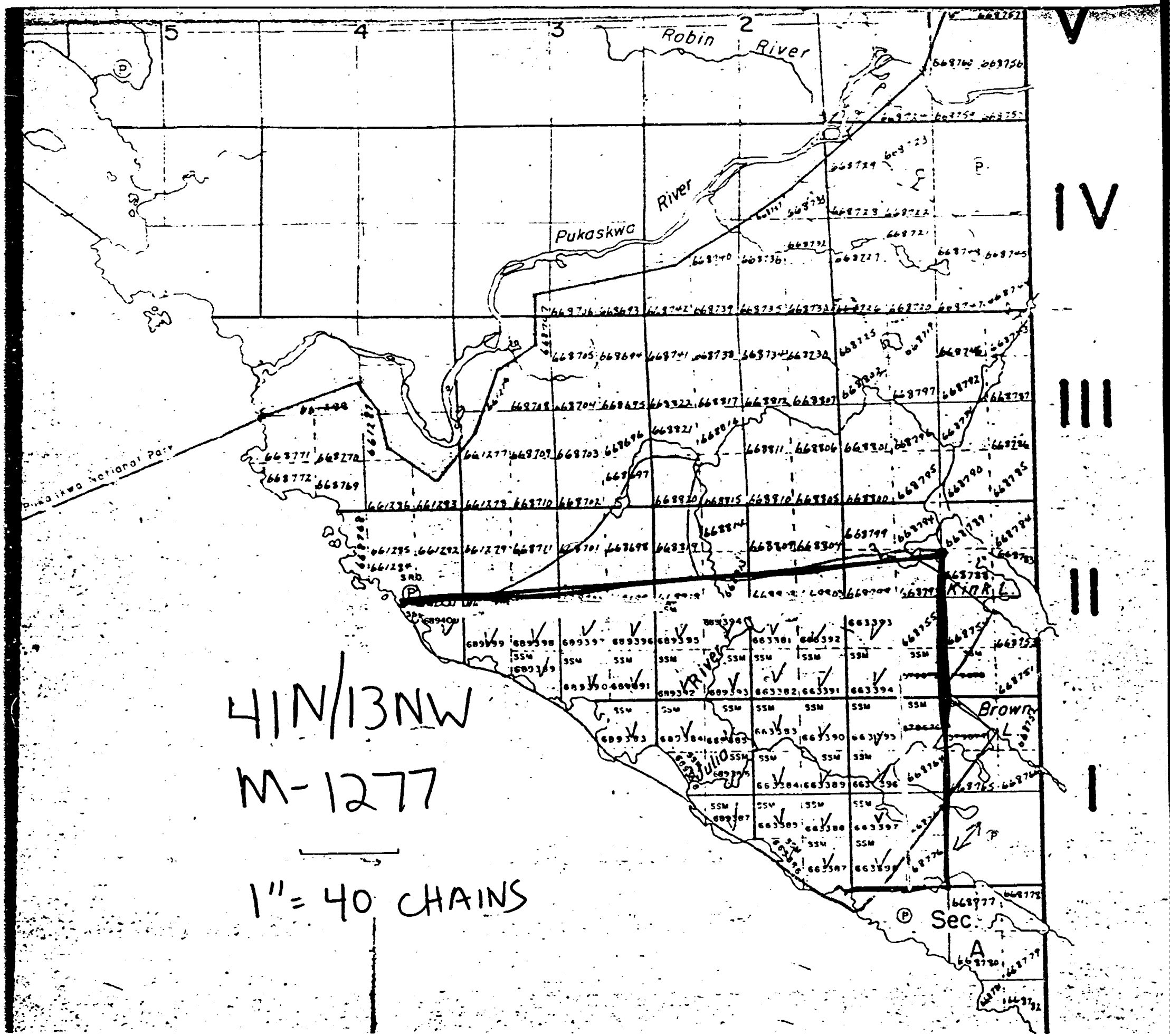
Aircraft used CESSNA 182 N

Sensor altitude 100 metres

Navigation and flight path recovery method airphoto mosaic - visual; recovery by video recorder

Aircraft altitude 100 metres Line Spacing 100 metres

Miles flown over total area 97 km (61 miles) Over claims only 64 km (40 miles)


5
4
3
2
1
Robin River
Pukaskwa River
Pukaskwa National Park
Julio River
Brown L.
Sec. A
V
IV
III
II
41N/13NW
M-1277
1" = 40 CHAINS

Ministry of Natural Resources
Ontario

Report of Work
(Geophysical, Geological, Geochemical and Expenditures)

~~#88-85~~ 2836

The Mining Act

Instructions: – Please type or print.
– If number of mining claims traversed exceeds space on this form, attach a list.

Note: – Only days credits calculated in the "Expenditures" section may be entered in the "Expend. Days Cr." columns. Do not use fractions or decimals.

Type of Survey(s)
Airborne Geophysical - EM, MAG-VLF

Township or Area
Homer Township

Claim Holder(s)
655 GROUP HOLDINGS LIMITED
c/o Robert M. Onotsky

Prospector's Licence No.
T - 1200

Address
680 Dieppe Street - P.O. Box 216 - Timmins, Ontario - P4N-7C9

Survey Company
TERRAQUEST LTD.

Date of Survey (from & to)
From: 27 Day | 04 Mo. | 85 Yr.
To: 27 Day | 04 Mo. | 85 Yr.

Total Miles of line Cut

Name and Address of Author (of Geo-Technical report)
Roger K. Watson - 905-121 Richmond Street, West - Toronto, Ontario - M5H-2K1

Credits Requested per Each Claim in Columns at right

		Days per Claim
Special Provisions For first survey: Enter 40 days. (This includes line cutting) For each additional survey: using the same grid: Enter 20 days (for each)	Geophysical	
	- Electromagnetic	
	- Magnetometer	
	- Radiometric	
	Other	
	Geological	
	Geochemical	
Man Days Complete reverse side and enter total(s) here	Geophysical	Days per Claim
	- Electromagnetic	
	- Magnetometer	
	- Radiometric	
	- Other	
	Geological	
	Geochemical	
Airborne Credits Note: Special provisions credits do not apply to Airborne Surveys.		Days per Claim
	Electromagnetic	40
	Magnetometer	40
	Radiometric	

Mining Claims Traversed (List in numerical sequence)

Prefix	Mining Claim Number	Expend. Days Cr.
SSM	663381	~~80~~
	663382	~~80~~
	663383	~~80~~
	663384	~~80~~
	663385	~~80~~
	663386	~~80~~
	663387	~~80~~
	663388	~~80~~
	663389	~~80~~
	663390	~~80~~
	663391	~~80~~
	663392	~~80~~
	663393	~~80~~
	663394	~~80~~
	663395	~~80~~
	663396	~~80~~
	663397	~~80~~
	663398	~~80~~
SSM	689383	~~80~~
	689384	~~80~~
	689385	~~80~~
	689386	~~80~~
	689387	~~80~~
	689388	~~80~~
	689389	~~80~~
	689390	~~80~~
	689391	~~80~~
	689392	~~80~~
	689393	~~80~~
	689394	~~80~~
	689395	~~80~~
	689396	~~80~~
	689397	~~80~~
	689398	~~80~~
	689399	~~80~~
	689400	~~80~~

SUDBURY MINING DIV.
RECEIVED
MAY 28 1985
MINING LANDS SECTION

Total number of mining claims covered by this report of work: 36

Expenditures (excludes power stripping)

Type of Work Performed

Performed on Claim(s)

Calculation of Expenditure Days Credits: Total Expenditures $ ÷ 15 = Total Days Credits

Instructions
Total Days Credits may be apportioned at the claim holder's choice. Enter number of days credits per claim selected in columns at right.

For Office Use Only

Total Days Cr. Recorded	Date Recorded	Mining Recorder
2880	May 28/85	
	Date Approved as Recorded	Branch Director
	85-08-02	

Date: May 24, 1985

Recorded Holder or Agent (Signature): Robert M. Onotsky

Certification Verifying Report of Work

I hereby certify that I have a personal and intimate knowledge of the facts set forth in the Report of Work annexed hereto, having performed the work or witnessed same during and/or after its completion and the annexed report is true.

Name and Postal Address of Person Certifying
Roger K. Watson - TERRAQUEST LTD - 905-121 Richmond St. West - Toronto, Ont - M5H-2K1

Date Certified: May 16, 1985

Certified by (Signature): Roger K. Watson

0362 (81/9)

REGISTERED

July 17, 1985 Report of Work #88

655 Group Holdings Limited
c/o Robert M. Onotsky
680 Dieppe Street
P.O. Box 126
Timmins, Ontario
P4N 7C9

Dear Sir:

RE: Mining Claims SSM 663381, et al,
in Homer Township

I have not received the reports and maps (in duplicate) for the Airborne Geophysical (Electromagnetic & Magnetometer) Survey on the above-mentioned claims.

As the assessment "Report of Work" was recorded by the Mining Recorder on May 28, 1985 the 60 day period allowed by Section 77 of the Mining Act for the submission of the technical reports and maps to this office will expire on July 27, 1985.

If the material is not submitted to this office by July 27, 1985, I will have no alternative but to instruct the Mining Recorder to delete the work credits from the claim record sheets.

For further information, please contact Mr. Arthur Barr at (416)965-4888.

Yours sincerely,

S.E. Yundt
Director
Land Management Branch

Whitney Block, Room 6643
Queen's Park
Toronto, Ontario
M7A 1W3
Phone:(416)965-4888

A. Barr:mc

cc: Mining Recorder
Sault Ste. Marie, Ontario

cc: Roger K. Watson
Terraquest Ltd
Suite 905

For Additional Information See Maps:

41N/13NW-0012-A1 ## 1-4

LEGEND

PROPERTY BOUNDARY .....
TERRAIN CLEARANCE ..... 100 meters
LINE SPACING ..... 100 meters

2000 gammas
500 gammas
100 gammas
20 gammas

41 N/13NW-0012-A1,#1

655 GROUP HOLDINGS LIMITED

AIRBORNE MAGNETIC SURVEY
TOTAL MAGNETIC FIELD

HOMER TWP

N.T.S. NO: 42 C/4 41 N/13	DRAWING NO. B-432.3-1
SCALE 1 : 10,000	DATE: JULY 1985

TERRAQUEST LTD.
TORONTO, CANADA

R. K. WATSON

200

HIN | 13NW-0013-AI, #2

LEGEND

PROPERTY BOUNDARY
TERRAIN CLEARANCE
LINE SPACING 100 meters

100 meters

5,000 gammas / meter
1,000 gammas / meter
250 gammas / meter
250 gammas / meter

655 GROUP HOLDINGS LIMITED

AIRBORNE MAGNETIC SURVEY
VERTICAL MAGNETIC GRADIENT
Calculated From Total Field

HOMER TWP

N.T.S. NO: 42 C/4 41 N/13	DRAWING NO. B-4323-2
SCALE 1 : 10,000	DATE: JULY 1985

TERRAQUEST LTD.
TORONTO, CANADA

47 58N
85 48' 30"W
48 00N
85 37'30"W

LEGEND

PROPERTY BOUNDARY ..... 100 meters
TERRAIN CLEARANCE ..... 100 meters
LINE SPACING .....

FIELD STRENGTH
50 %
10 %
2 %

QUADRATURE
+10% −10%

41N/13NW-0012- A1, #3

655 GROUP HOLDINGS LIMITED

AIRBORNE VLF–EM SURVEY
CONTOURS OF TOTAL FIELD STRENGTH
PROFILES OF QUADRATURE

HOMER TWP

N.T.S. NO: 42 C/4 41 N/13	DRAWING NO. B-432.3-3
SCALE 1 : 10,000	DATE: JULY 1985

TERRAQUEST LTD.
TORONTO, CANADA

48°00'N
85°53' 30"W

LAKE

SUPERIOR

2a
1a
2a
2
2
1a
2
1a
2a
1d
2a
2a
1a
2
1d
2a
2a
Py, Cu
1a
2
1d
1d
2
2
1d
1a
I.F.
1a
2
2
1a
2
2
2
1a
1d
1d
2
47°58'N
85°48'30"W

VLF STATION –
NSS ANNAPOLIS, MD - 21.4 kHz.

INTERPRETATION LEGEND

- Contact
- Fault
- 2 — Felsic Volcanics, unsubdivided
- 2a — Dacite to Rhyolite flows
- 1a — Massive to foliated Andesite to Basalt
- 1d — Metagabbro

VLF-EM CONDUCTOR AXES

- Normal quadrature
- Reverse quadrature
- In phase only (no quadrature)

LEGEND

PROPERTY BOUNDARY .....

41N13NW-0012-A1, #4

655 GROUP HOLDINGS LIMITED

INTERPRETATION

HOMER TWP

N.T.S. NO: 42 C/4 41 N/13	DRAWING NO. B-432.3-4
SCALE 1 : 10,000	DATE: JULY 1985

TERRAQUEST LTD.
TORONTO, CANADA