REPORT ON AN AIRBORNE MAGNETIC AND VLF-EM SURVEY GARRISON TOWNSHIP LARDER LAKE MINING DIVISION, ONTARIO

for

MR. G. ERIKSON

by

TERRAQUEST LTD.
Toronto, Canada

March 17, 1985

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Richmond Street West, Toronto, Canada, M5H 2K1. Telephone (416) 869-0010

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1. INTRODUCTION

This report describes the specifications and results of a geophysical survey carried out for Mr. G. Erikson, 1710-390 Bay St., Toronto, Ontario M5H 2Y2 by Terraquest Ltd., 905 - 121 Richmond St. W., Toronto, Canada. The field work was performed on January 20, 1986 and the data processing, interpretation and reporting from January 21 to March 17, 1986.

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 Garrison township, in the Larder Lake Mining Division of Ontario about 29 kilometers east of the town of Matheson. The property lies in the northwest quadrant of the township and can be reached by highway # 101 which passes along the southern edge of the property.

The latitude and longitude are 48 degrees 31 min., and 80 degrees 00 min. respectively, and the N.T.S. references are 32D/12 and 42A/9.

The claim numbers are:

L-800484-800486	(3)	
L-800493-800502	(10)	.....total claims 13

The Report of Work as recorded with the Mining Recorder is #52-86.

3. GEOLOGY

Map References

1. Map 1949-1: Township of Garrison, District of Cochrane, Ontario. scale 1:12,000, O.D.M. 1949

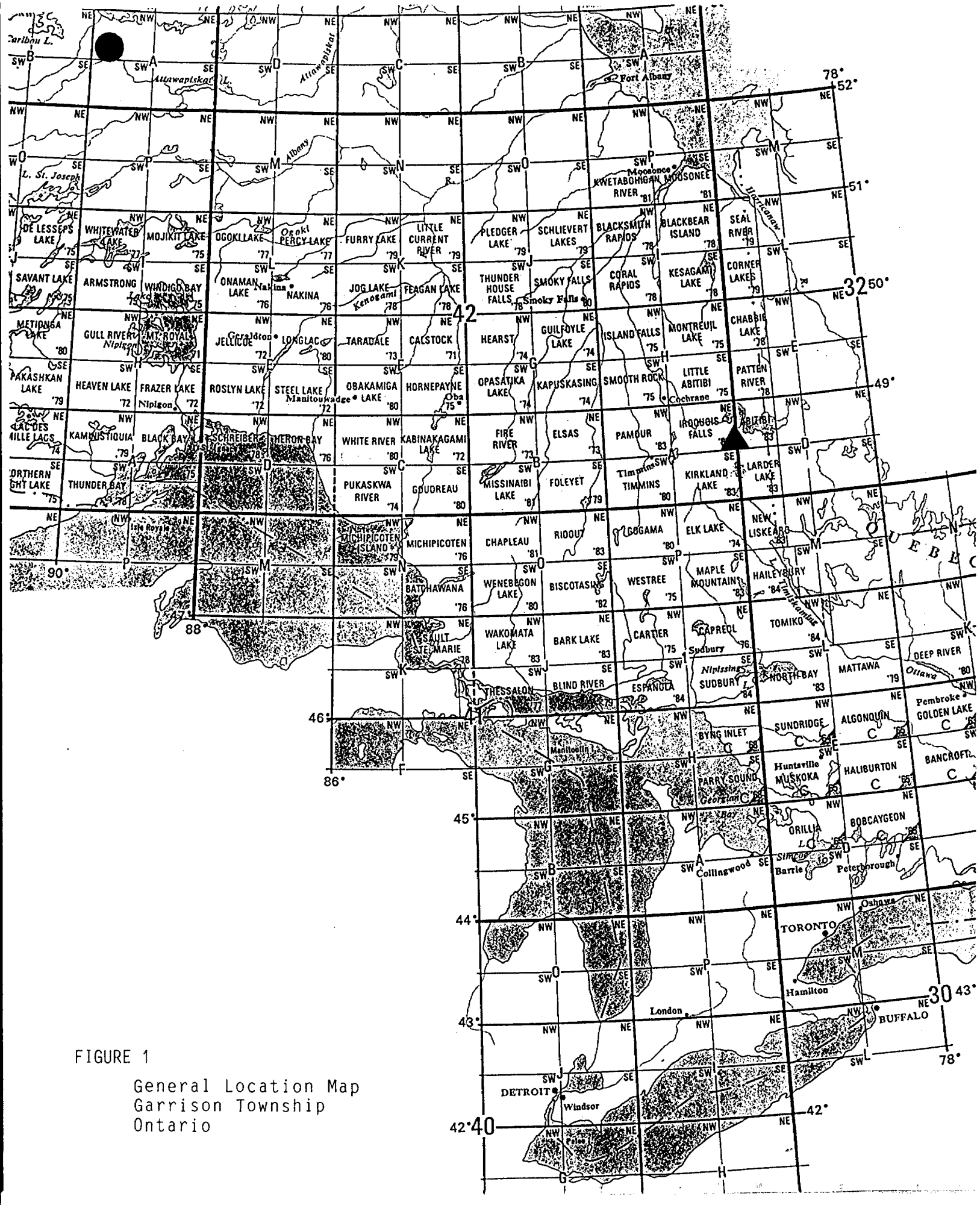

FIGURE 1

General Location Map
Garrison Township
Ontario

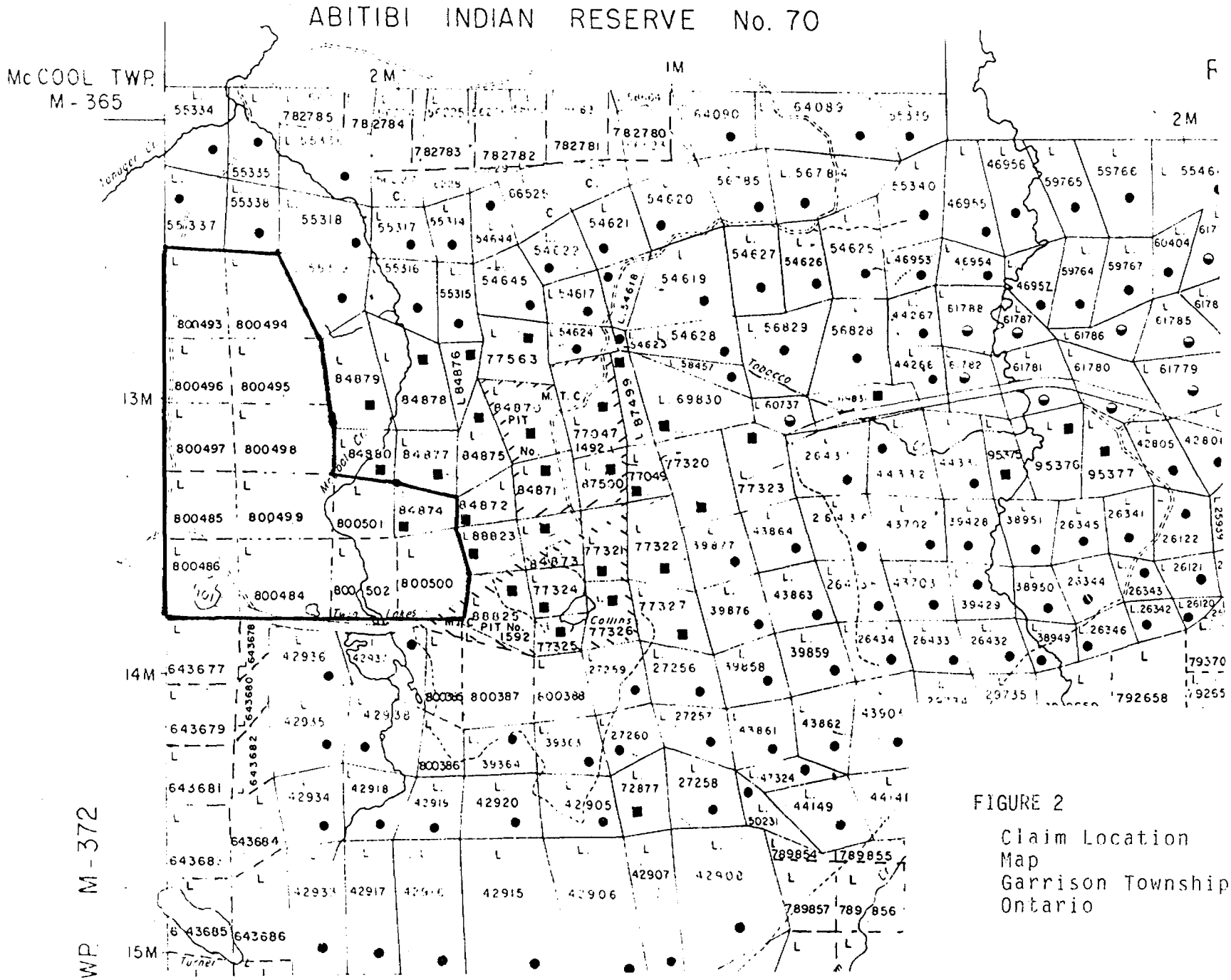

FIGURE 2

Claim Location Map
Garrison Township, Ontario

The survey area is underlain primarily by intermediate to mafic volcanics. These range from andesitic to basaltic to diabasic, as pillow to fragmental lavas. Diorite and gabbro units are indicated to the south by drill core west of Twin Lakes and to the north by numnerous outcrops forming a northwest trend across the township.

Schistocities trend to the northeast. Faults defined by the volcanics to the north trend to the north-northeast. Major east-west trending regional faults, the Munro and Destor-Porcupine Breaks, occur to the immediate south of the property.

4. SURVEY SPECIFICATIONS

4.1 Instruments

The survey was carried out using a Cessna 206 aircraft, registration C-GGLS, which carries a magnetometer and a VLF electromagnetic detector.

The magnetometer is a high sensitivity airborne proton (Overhauser) type with the sensor element mounted in a towed bird at an elevation of 15 metres below the aircraft. It's specifications are as follows:

Resolution:	0.01 gamma
Accuracy:	0.02 gamma for 2 readings per second
Cycle time:	0.5 second
Range:	20000-100000 gammas in 23 overlapping steps
Gradient tolerance:	Up to 5000 gammas per meter
Model:	GSM-11
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

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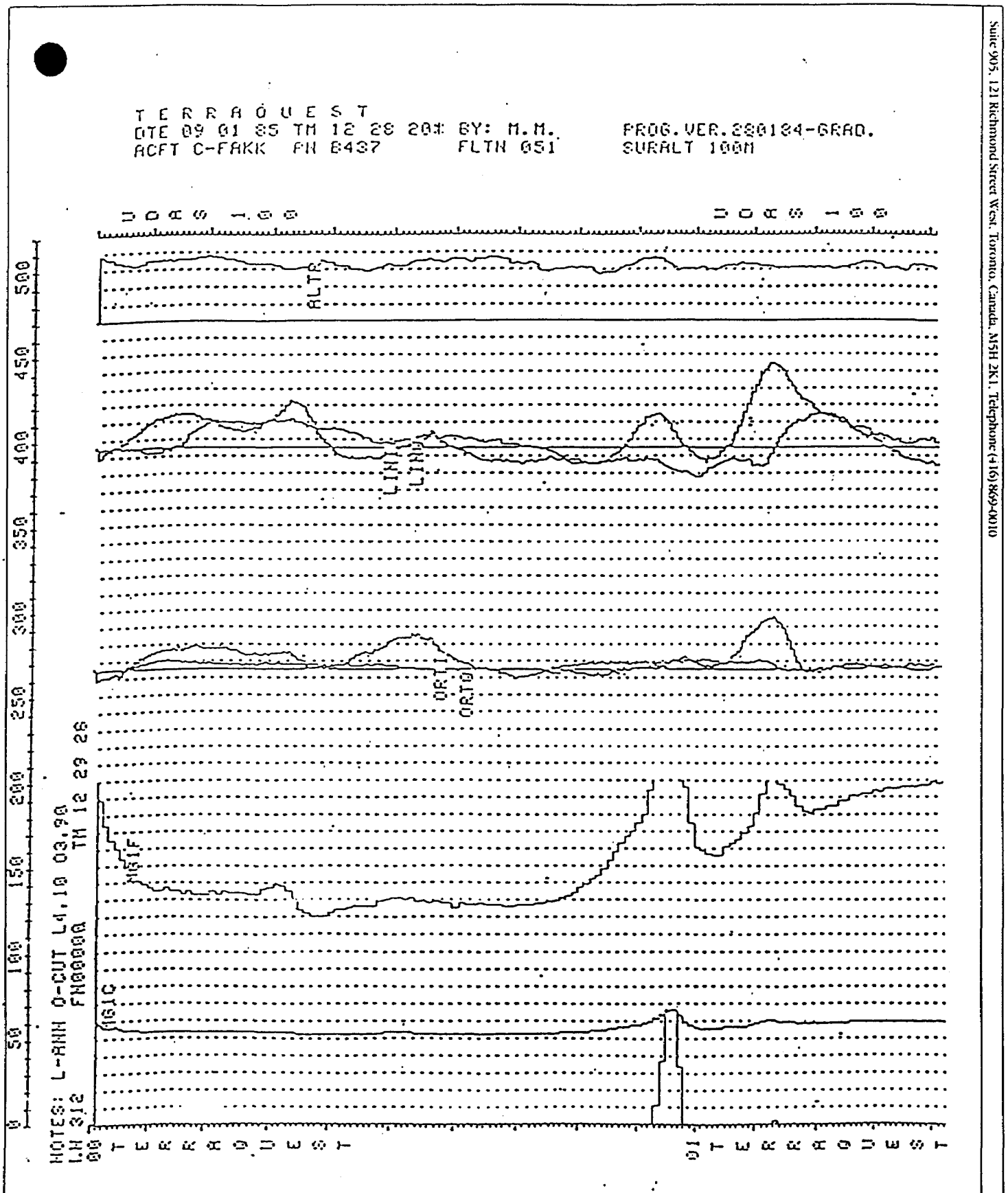

FIGURE 3. SAMPLE OF ANALOGUE DATA

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- 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:	360 degrees	
c) Terrain clearance:	100 meters	
d) Average ground speed:	193 km/hr.	
e) Data point interval:	Magnetic:	27 meters
	VLF-EM:	27 meters
f) Tie Line interval:	2 kilometers	
g) Channel 1 (LINE):	NLK Seattle, 24.8 kHz	
h) Channel 2 (ORTHO):	NSS Annapolis, 21.4 kHz	

i) Line km over total survey area: 46
j) Line km over claim groups: 25

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.

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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.

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.

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.

Grant, F.S. and Spector A.; 1970; Statistical Models for Interpreting Aeromagnetic Data; Geophysics, Vol 35

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.

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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 over the entire area surveyed has a relief of approximately 7,200 gammas. The major part of this activity is related to two east-west trends to the north and south of the claim group. The relief over the claim group is about 250 gammas.

The vertical derivative magnetic data provides vastly improved magnetic resolution and delineation of lithological units. This has formed the basis of the magnetic interpretation.

The very strong magnetic unit to the north is in close proximity to the geologically mapped, extensive gabbroic unit. Even for a mafic intrusive this represents a substantial relief and indicates the presence of highly concentrated iron rich minerals, possibly even an iron formation.

The moderate strength magnetic trends along the southern boundary are interpreted to be conformable dioritic intrusives (Unit 4) based on the correlation with one drill hole on the west side of Twin Lakes. These may be interpreted as hypabyssal volcanics.

The remaining area is characterized by relatively uniform magnetic activity and is interpreted to be a thick sequence of mafic to intermediate lavas (Unit 2). Narrow bands (Unit 2m) of slightly enhanced magnetic response may be related to increased proportions of

mafic constituents or disseminated sulphide mineralization, particularly pyrrhotite.

Several north-northeast trending faults are indicated by the displacements of magnetic units. Any east-west trending displacements would be difficult to detect as they would parallel magnetic trends.

The VLF-EM data shows two conductor axes. The northern one apppears to be associated with the contact of the strong magnetic trend and may be related to fault or contact origins such as gouge, graphite or disseminated sulphides. The relatively weak conductor axis crossing the northwestern boundary parallels magnetic stratigraphy and is truncated by a fault. Both aspects are consistent with a bedrock origin. This conductor axis may represent disseminated sulphides within the volcanics and should be investigated on ground by EM or I.P. techniques. Several overburden drill holes may be useful across this axis and the 2m horizons to accurately identify the lithologies present and their economic potential.

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. Two VLF-EM conductor axes were found. One in particular has potential for a sulphide origin and has been recommended for additional investigation.

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2.8305

Charles Q. Barrie, M.Sc.
Geologist

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900

Mining Lands Section

File No 2.8989

Control Sheet

TYPE OF SURVEY ✓ GEOPHYSICAL

____ GEOLOGICAL

____ GEOCHEMICAL

____ EXPENDITURE

MINING LANDS COMMENTS:

LD

Lgd.

Dennis K.

Signature of Assessor

Apr. 8/86.

Date

Ministry of Northern Affairs and Mines
Ontario

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

52/86
Mining Act 2.8989

Apr. 3

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 shaded areas below.

Type of Survey(s)	Township or Area
Magnetic and VLF-EM Survey (Airborne)	Garrison

Claim Holder(s)	Prospector's Licence No.
Sydney F. Chapman	A-39486

Address: 1710 - 390 Bay St., Toronto, ON M5H 2Y2

Survey Company	Date of Survey (from & to)	Total Miles of line Cut
Terraquest Limited	20 01 86 (Day Mo. Yr.) 20 01 86 (Day Mo. Yr.)	

Name and Address of Author (of Geo-Technical report)
Charles O. Barrie, Terraquest Limited, 121 Richmond St. W., Ste. 905, Toronto, ON 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	
	Geophysical - Magnetometer	
	Geophysical - Radiometric	
	Geophysical - Other	
	Geological	
	Geochemical	
Man Days Complete reverse side and enter total(s) here	Geophysical	Days per Claim
	Geophysical - Electromagnetic	
	Geophysical - Magnetometer	
	Geophysical - Radiometric	
	Geophysical - 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)

Mining Claim Prefix	Mining Claim Number	Expend. Days Cr.
L	800484	
	800485	
	800486	
	800493	
	800494	
	800495	
	800496	
	800497	
	800498	
	800499	
	800500	
	800501	
	800502	

Mining Claim Prefix	Mining Claim Number	Expend. Days Cr.

RECEIVED
FEB 27 1986
MINING LANDS SECTION

Expenditures (excludes power stripping)

Type of Work Performed	
Performed on Claim(s)	

Calculation of Expenditure Days Credits

Total Expenditures			=	Total Days Credits
$	÷	15	=	

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.

Total number of mining claims covered by this report of work: 13

For Office Use Only

Total Days Cr. Recorded	Date Recorded	Mining Recorder
1040	FEB 12 1986	
	Date Approved as Recorded: 86.4.11	Branch Director

Date	Recorded Holder or Agent (Signature)
02/10/86	

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
Charles O. Barrie, Terraquest Ltd., 121 Richmond St. Ste 905, Toronto, ON M5H 2K1

Date Certified	Certified by (Signature)
02/10/86	

1362 (85/9)

ABITIBI INDIAN RESERVE No. 70

McCOOL TWP. M-365

RAND TWP. M-383

MICHAUD TWP. M-372

HARKER TWP. M-353

THACKERAY TWP M-394

ELLIOT TWP M-347

28089

THE TOWNSHIP
OF

Jan. 8/86

GARRISON

DISTRICT OF
COCHRANE

LARDER LAKE
MINING DIVISION

SCALE: 1-INCH 40 CHAINS

DISPOSITION OF CROWN LANDS

PATENT, SURFACE AND MINING RIGHTS
" , SURFACE RIGHTS ONLY
" , MINING RIGHTS ONLY
LEASE, SURFACE AND MINING RIGHTS
" , SURFACE RIGHTS ONLY
" , MINING RIGHTS ONLY
LICENCE OF OCCUPATION

ROADS
IMPROVED ROADS
KING'S HIGHWAYS
RAILWAYS.
POWER LINES
MARSH OR MUSKEG
MINES
CANCELLED

NOTES

200' surface rights reservation along the shores of all lakes & rivers.

Ⓡ mining and surface rights withdrawn from prospecting, staking out, sale or lease Sec 36, The Mining Act, R.S.O. 1980 Order M.R.O. 65/83 Dec. 2, 1983, 9:40 a.m.

#3

PLAN NO. M-349

ONTARIO
MINISTRY OF NATURAL RESOURCES
SURVEYS AND MAPPING BRANCH

Rec'd May 9/84

LEGEND

Terrain Clearance	100 meters
Line Spacing	100 meters
1000 gammas	
250 gammas	
50 gammas	
10 gammas	

Mr. G. ERIKSON

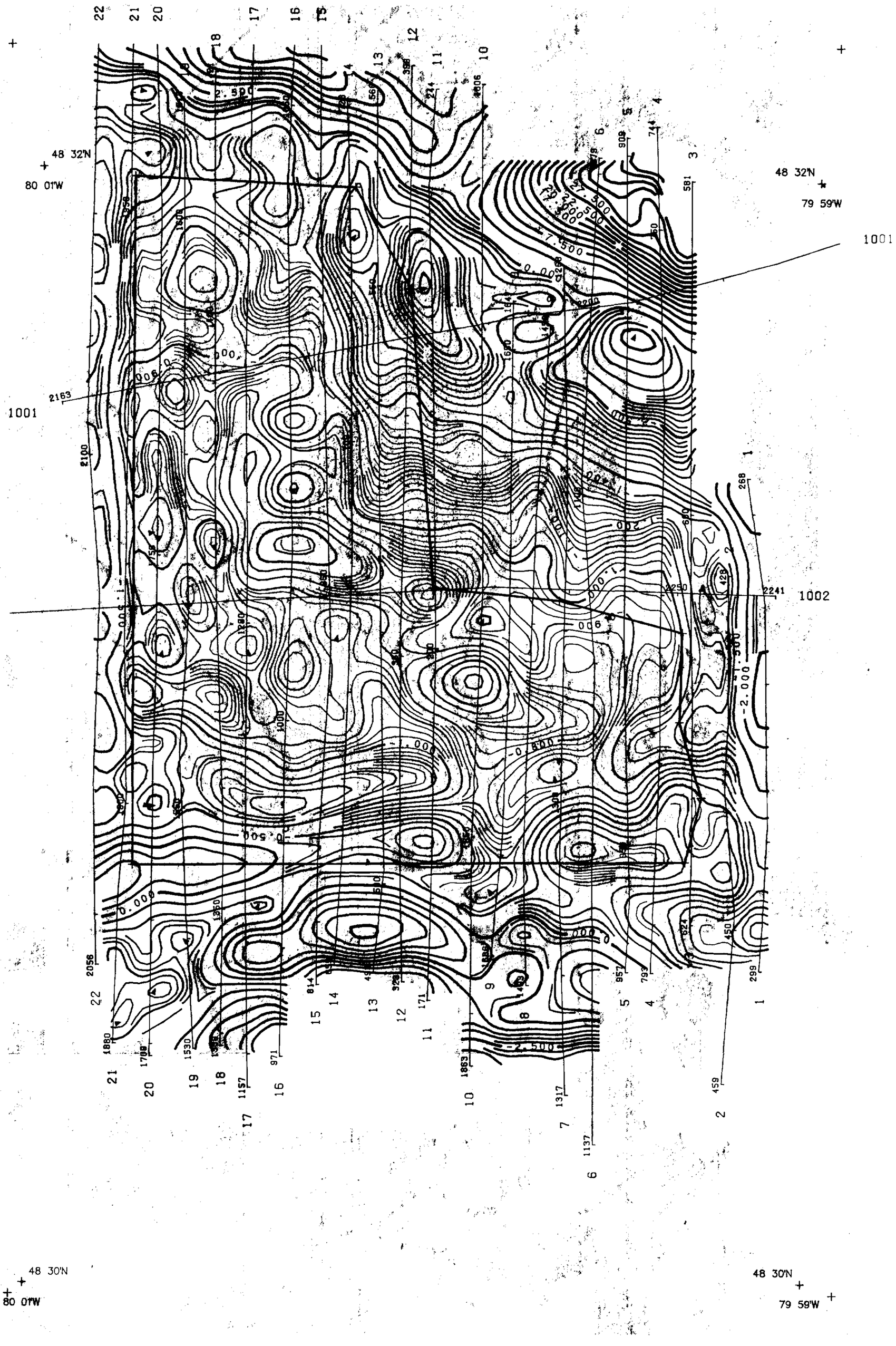
AIRBORNE MAGNETIC SURVEY
TOTAL MAGNETIC FIELD

GARRISON TWP. PROPERTY
ONTARIO

N.T.S. NO: 32D/12 42A/9	DRAWING NO. A-602-1
SCALE 1:10,000	DATE: March 1986

TERRAQUEST LTD.
TORONTO, CANADA

2.8989



LEGEND

Terrain Clearance	100 meters
Line Spacing	100 meters
2.500 gammas / meter	
.500 gammas / meter	
.100 gammas / meter	
.025 gammas / meter	

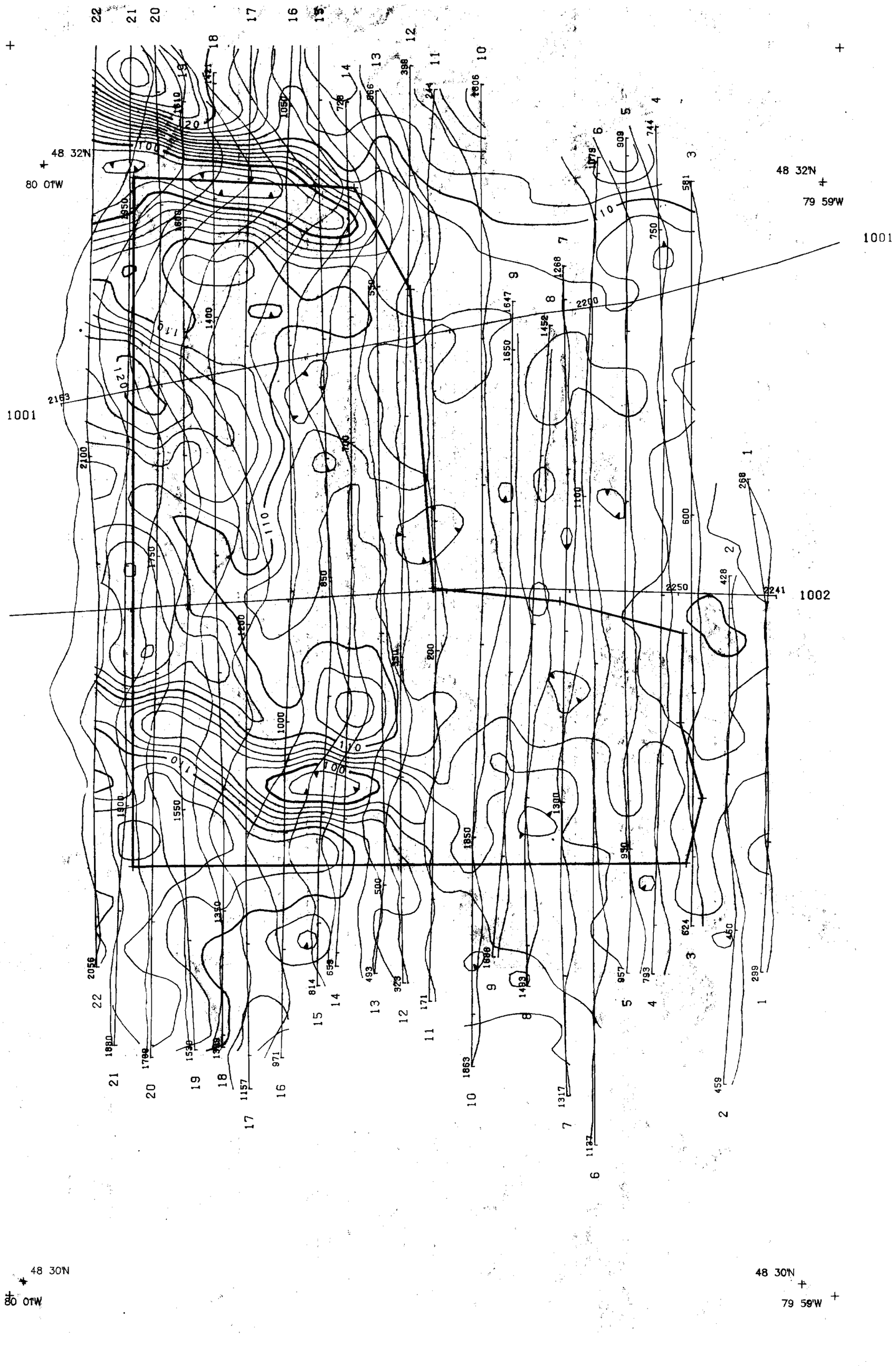
Mr. G. ERIKSON

AIRBORNE MAGNETIC SURVEY
VERTICAL MAGNETIC GRADIENT
Calculated From Total Field

GARRISON TWP. PROPERTY
ONTARIO

N.T.S. NO: 32D/12 42A/9	**DRAWING NO.** A-602-2
SCALE 1:10,000	**DATE:** March 1986

TERRAQUEST LTD.
TORONTO, CANADA



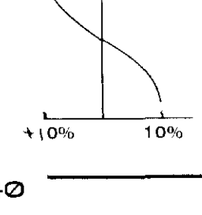
VLF TRANSMITTER
NLK Seattle 24.8 kHz
286.3° Az.

LEGEND

Terrain Clearance	100 meters
Line Spacing	100 meters

Field Strength
50%
10%
2%

QUADRATURE



Mr. G. ERIKSON

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

GARRISON TWP. PROPERTY
ONTARIO

N.T.S. NO: 32D/12 42A/9	**DRAWING NO.** A-602-3
SCALE 1:10,000	**DATE:** March 1986

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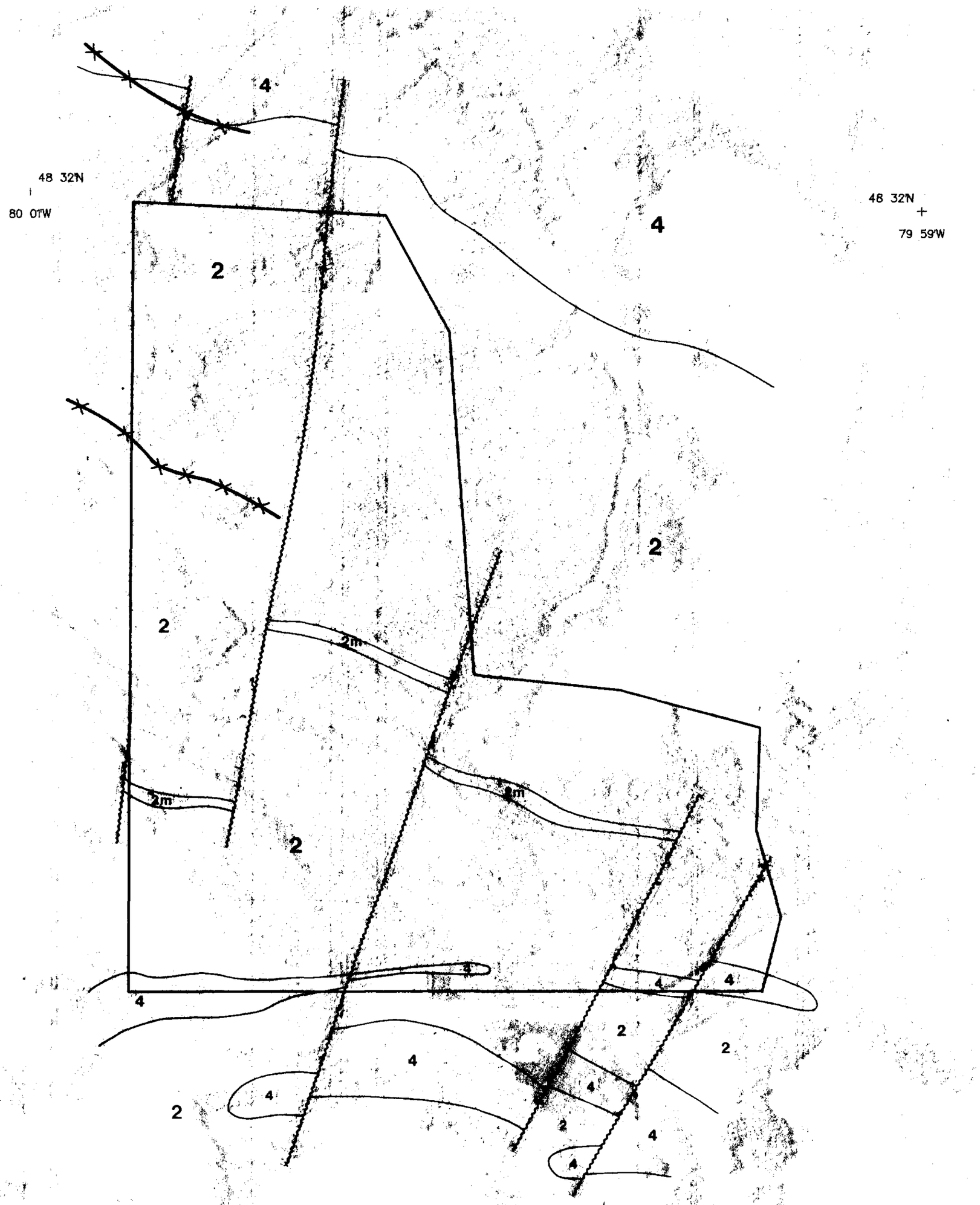
TORONTO, CANADA



VLF TRANSMITTER
NLK Seattle 24.8 kHz
286·3° Az.

LEGEND

INTERPRETATION

- Contact
- Fault
- Property Boundary

VLF-EM Conductor Axes

- normal quadrature
- *reverse quadrature*
- in phase only (no quadrature)

LITHOLOGY

4	Gabbro, Diorite
2m	Magnetic unit within 2
2	Mafic to intermediate volcanics

Mr. G. ERIKSON

INTERPRETATION

GARRISON TWP. PROPERTY
ONTARIO

N.T.S. NO: 32D/12 42A/9	**DRAWING NO.** A-602-4
SCALE 1:10,000	**DATE:** March 1986

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