010

A-724.1

Suite 905, 121 Richmond Street West, Toronto, Canada, M5H 2K1, Telephone (416) 869-0010

REPORT ON AN

AIRBORNE MAGNETIC AND VLF-EM SURVEY

Kaladar
ADDINGTON TOWNSHIP

SUDBURY MINING DIVISION, ONTARIO

for

CATHEDRAL GOLD CORP.

by

TERRAQUEST LTD.
Toronto, Canada

October 29, 1987

LIST OF FIGURES

LIST OF MAPS IN JACKET

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1. INTRODUCTION

This report describes the specifications and results of a geophysical survey carried out for Cathedral Gold Corp. of 800-601 West Hastings, Vancouver, B.C., V6B 5A6 by Terraquest Ltd., 905 - 121 Richmond Street West, Toronto, Canada. The field work was performed on October 12, 1987 and the data processing, interpretation and reporting from October 13 to October 29, 1987.

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 metres 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 Kaladar township, in the Eastern Ontario Mining Division of Ontario about 35 kilometres northeast of the settlement of Madoc. The property lies in the north central part of the township and can be accessed readily by roads along the east, south and west sides of the property.

The latitude and longitude are 44 degrees 43 minutes, and 77 degrees 11 minutes respectively, and the N.T.S. reference is 31C/11.

The claim numbers are shown in figure 2 and listed below:

EO	592053-592054	(2)	
	612721-612725	(5)	
	627650	(1)	
	748053-748054	(2)	
	748317	(1)	
	748374-748376	(3)	
	862451	(1)	
	862468-862469	(2)	
	907016-907017	(2)	
	960055	(1)	
	960058	(1)	.... Total 21 claims

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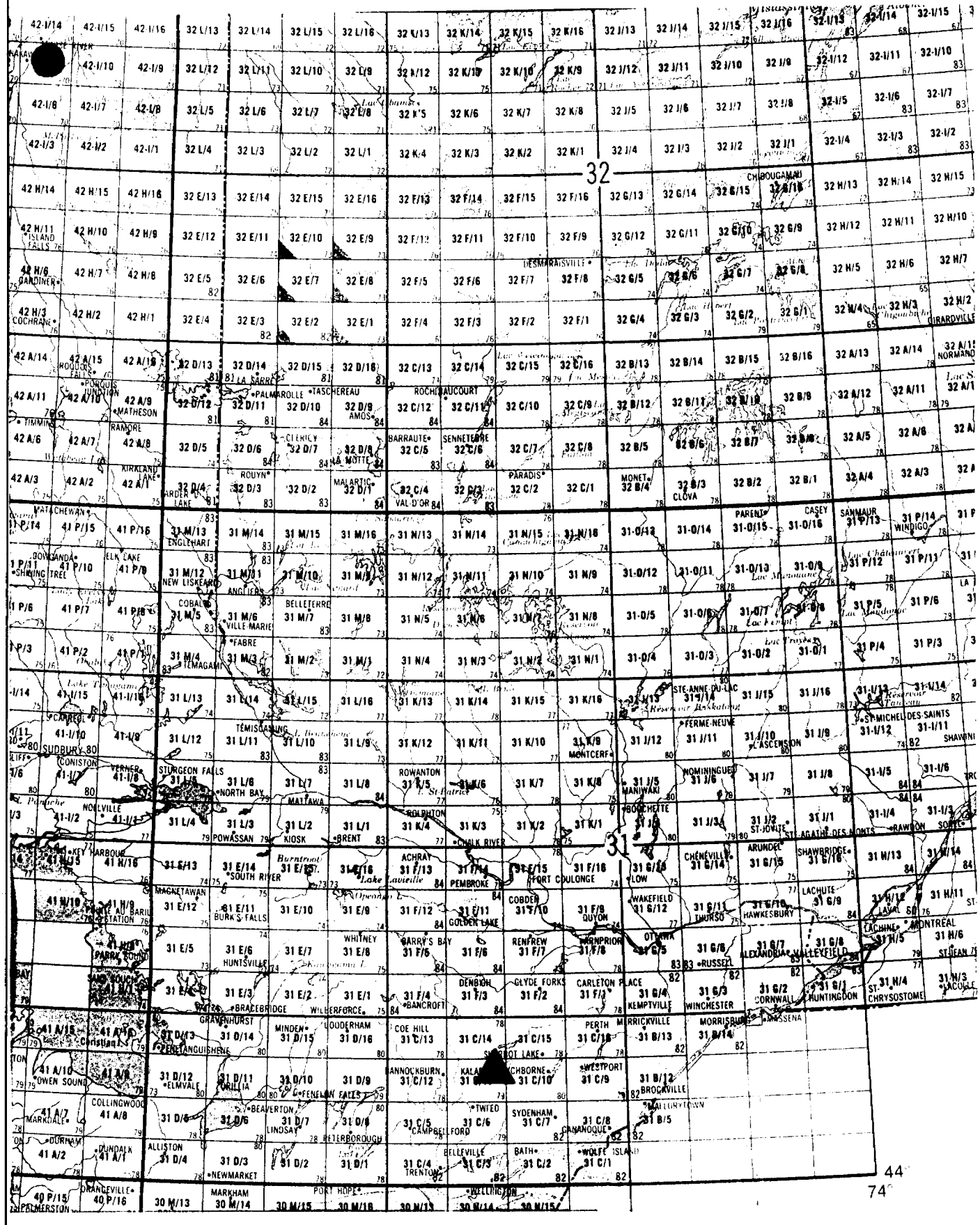

FIGURE 1. General Location

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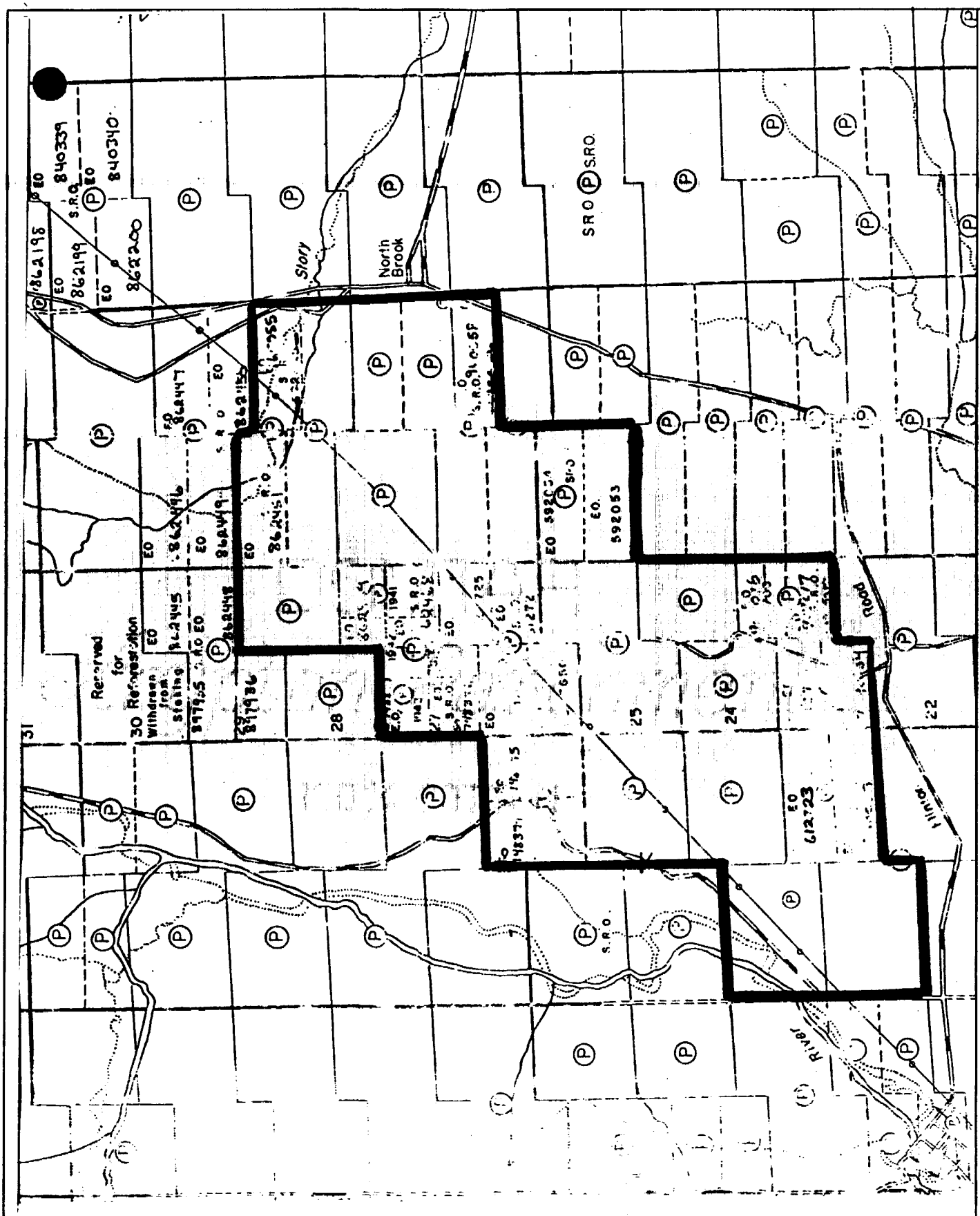

FIGURE 2 Claim Location Map
(exact locations not certified)

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3. GEOLOGY

Map References

1. Map 51D: Grimsthorpe-Kennebec Area. scale 1:63,360. O.D.M. 1942.
2. Map 2432: Kaladar. scale 1:31,680. O.G.S. 1981.
3. Report: Addington Gold Mine, Detailed Property Description. O.G.S. 1984.

The survey area is underlain by north-northeast trending mafic to intermediate metavolcanics and metasediments that form a narrow belt between the Elzevir Batholith to the west and the Northbrook Batholith to the east. The metavolcanics belong to the Hermon Group and are comprised predominantly of massive amphibolite with variable amounts of chlorite and biotite and plagioclase-hornblende gneiss. The metasediments belong to the Flinton Group are comprised predominantly of quartz pebble conglomerate of the Bishop Corners Formation and lie unconformably over the metavolcanics. Carbonate equivalents of these rocks occur as horizons within these units and belong to the Lessard Formation.

Structural lineaments trend to the east and northeast. Shear zones occur near the contacts of the major lithologies.

Gold mineralization has been discovered at several sites along the contact between the metasediments and the metavolcanics. Gold was discovered at the Addington Mine site in 1881 with intermittent development and mining until 1939. The gold is hosted in a quartz stringer vein shear zone which occurs obliquely across the metasediment-metavolcanic unconformity. Accessory minerals include pyrite, arsenopyrite, chalcopyrite, carbonate, chlorite and magnetite.

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 based on the Overhauser effect. The Overhauser effect allows for polarization of a proton rich liquid of the sensor by adding a "free radical" to it and irradiating it by RF magnetic field. Strong precession signals are generated with modest RF power. The sensor element is mounted in an extension of the right wing tip. It's specifications are as follows:

Resolution:	0.5 gamma
Accuracy:	0.5 gamma

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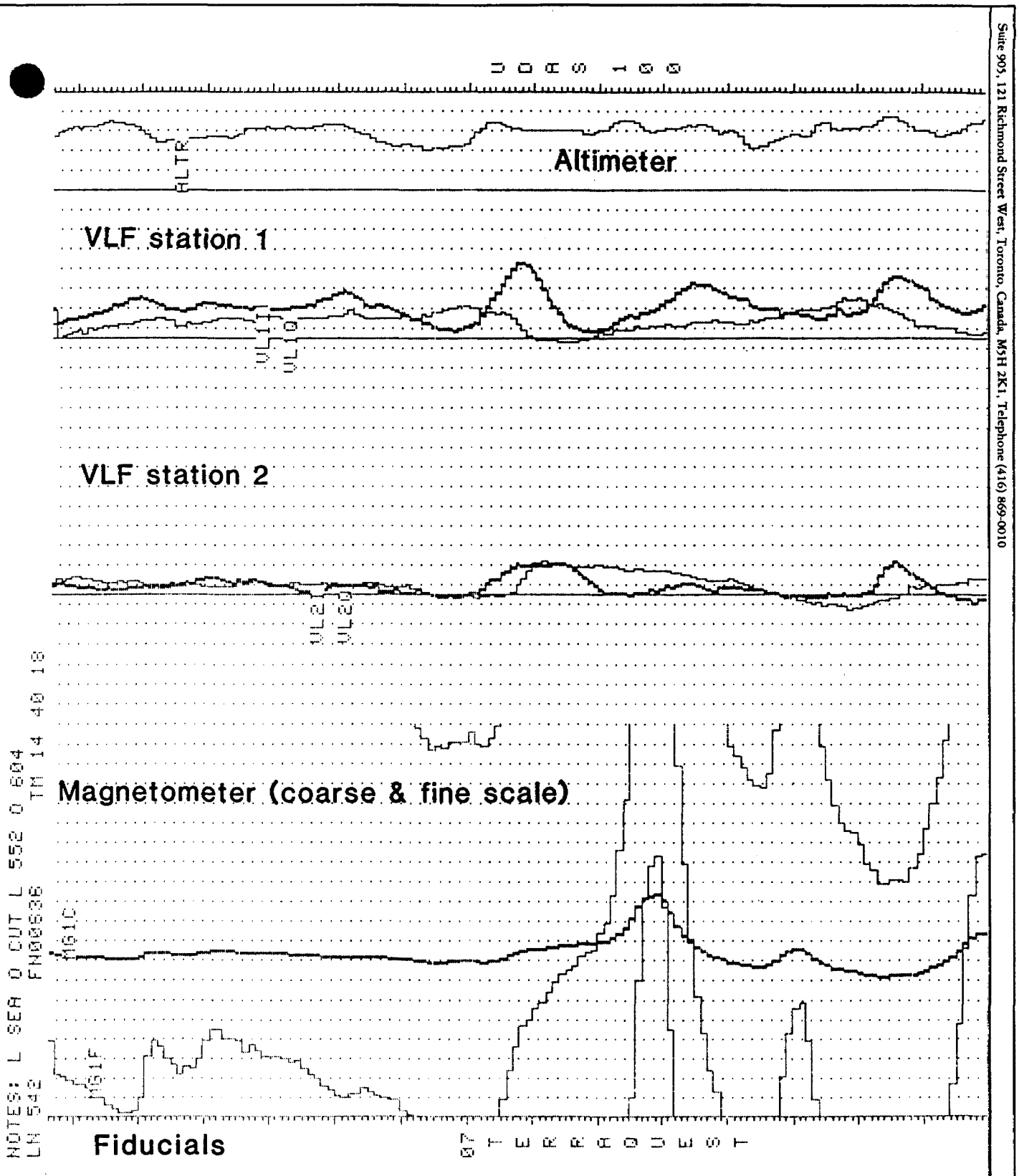

FIGURE 3. Sample of analogue data

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Cycle time: 0.5 second
Range: 20,000 - 100,000 gammas in 23 overlapping steps
Gradient tolerance: Up to 5000 gammas per metre
Model: GSM-9BA
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 metres
b) Line direction: 115 degrees
c) Terrain clearance: 100 metres
d) Average ground speed: 156 km/hr.
e) Data point interval:
Magnetic: 27 metres
VLF-EM: 27 metres
f) Tie Line interval: 2 kilometres
g) Channel 1 (LINE): NSS Annapolis, 21.4 kHz
h) Channel 2 (ORTHO): NAA Cutler, 24.0 kHz

Note: The responses using the Annapolis transmitter were very weak to nonexistent over the southern half of the survey, probably due to temporary malfunctioning in the Annapolis transmitter. The VLF-EM data map produced in this report is based on the Cutler transmitter although responses from both transmitters are used on the final interpretation map.

i) Line km over total survey area including overrun: 360 line km

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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 metres 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.

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 has 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 1/10th of an inch at map scale.

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 computer program for this purpose is provided by Paterson, Grant and Watson Ltd. of Toronto

Grant, F.S. and Spector A., 1970: Statistical Models for Interpreting Aeromagnetic Data; Geophysics, Vol 35
Grant, F.S., 1972: Review of Data Processing and Interpretation Methods in Gravity and Magnetics; Geophysics Vol 37-4
Spector, A., 1968: Spectral Analysis of Aeromagnetic maps; unpublished thesis; University of Toronto

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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.

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.

The VLF-EM conductor axes have been identified and evaluated according to the Terraquest classification system (Figure 4). This system correlates the nature and orientation of the conductor axes

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FIGURE 4

TERRAQUEST CLASSIFICATION OF VLF-EM CONDUCTOR AXES

SYMBOL	CORRELATION	ASSOCIATION: Possible Origins
a , A	Coincident with magnetic stratigraphy	Bedrock magnetic horizons: stratabound mineralogic origin or shear zone
b , B	Parallel to magnetic stratigraphy	Bedrock non-magnetic horizons: stratabound mineralogic origin or shear zone
c , C	No correlation with magnetic stratigraphy	Association not known: possible small scale stratabound mineralogic origin, fault or shear zone, overburden
d , D	Coincident with magnetic dyke	Dyke or possible fault: mineralogic or electrolytic
f , F	Coincident with topographic lineament or parallel to fault system	Fault zone: mineralogic or electrolytic
ob , OB	Contours of total field response conform to topographic depression	Most likely overburden: clayey sediments, swampy mud
cul , CUL	Coincident with cultural sources	Electrical, pipe or railway lines

NOTES

1 - Upper case symbols denote a relatively strong total field strength

2 - Underlined symbols denote a relatively strong quadrature response

3 - Mineralogic origins include sulphides, graphite, and in fault zones, gouge

4 - Electrolytic origins imply conductivity related to porosity or high moisture content

with stratigraphic, structural and topographic features to obtain an association from which one or more origins may be selected. Alternate associations are indicated in parentheses.

6.2 Interpretation

The magnetic and VLF-EM data are shown in contoured format on maps in the back pocket. A first pass interpretation map is also provided. The following notes are intended to supplement these maps.

The total magnetic field has a relief of approximately 700 gammas and shows well defined magnetic anomalies trending to the north. The strongest responses occur along the western side of the survey. The vertical magnetic gradient map shows improved resolution and enhances minor trends and has been used to delineate the stratigraphy and structure.

The Northbrook Batholith (Unit 9) correlates with low and relatively uniform magnetic responses. Magnetically active areas within these rocks (Unit 9m) may be related to more magnetic zones within the batholith or to intercalations of metavolcanic rocks.

The mafic to intermediate metavolcanics of the Tudor Formation (Unit 1) correlate with the strongest magnetic responses in the map area. Of these responses the stronger values (Unit 1m) probably correlate with more mafic compositions or to increased concentrations of magnetic minerals such as magnetite or pyrrhotite. The eastern most 1m unit may in part represent a reaction rim around the Northbrook Batholith.

The sediments of the Bishop Corners Formation (Unit 10) and the Lessard Formation (Unit 11) correlate with weak magnetic responses. The magnetic susceptibilities of these two units appear to be very similar and therefore it is difficult to discriminate them by magnetic mapping. A very subtle magnetic anomaly to the southeast shown on the vertical derivative magnetic map suggests that the Lessard Formation sediments are slightly more magnetic than the Bishop Corners Formation.

Magnetically interpreted faults trend to the northeast, east and southeast. The east trending set appears to be more continuous and is probably the youngest set. Faults or shear zones parallel to the stratigraphy are suspected, but are difficult to detect as they are parallel to the magnetic trends.

The total field VLF-EM responses are weak to strong and the quadrature responses are generally weak. The power line across the centre of the property and along the roads exhibit well defined VLF-EM responses.

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Most of the remaining responses are associated with faults or shear zones. This type of conductivity may be related to: a) minerals such as sulphides, graphite or gouge along the structure, or to b) an ionic effect created by water or porosity within the structure or to clay in an overlying topographic depression.

Conductor axes using the Annapolis transmitter are also shown on the interpretation map as solid lines, the quadrature responses are not shown. The conductor axes to the northwest correlate with the sediments of the Lesard Formation and are probably due to conductive overburden associated with the recessive nature of these sediments. The conductor axes to the northeast correlate with the magnetic metavolcanics and have potential for sulphide or graphite sources and should be followed up on the ground using IP or EM methods.

7. SUMMARY

An airborne combined magnetic and VLF-EM survey has been done on the property at line intervals of 100 metres. The total field and vertical gradient magnetic data, VLF-EM data and interpretation maps are produced at a scale of 1:5,000.

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 have potential sulphide origins and have been recommended for additional investigation.

TERRAQUEST LTD.

GEOLOGICAL ASSOCIATION OF CANADA
CHARLES Q. BARRIE
FELLOW

Charles Q. Barrie, M.Sc.
Geologist

Qual. 2.8305

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Resident Geologist Tweed.

Dec. 15

Ministry of Northern Development and Mines

Ontario

Report of Work #87-55

(Geophysical, Geological, Geochemical and Expenditures)

31C11NE0013 2.10510 KALADAR

Minin

900

Type of Survey(s)	Township or Area
AIRBORNE ELECTROMAGNECTIC AND MAGNECTIC	KALADAR M-108

Claim Holder(s)

1. CATHEDRAL GOLD CORPORATION, 2. C. Roger Young, 3. R. C. Longmuir

Prospector's Licence No.

A 25018, T-4999, A 43799

Address

1. Suite 800, 601 West Hastings Street, Vancouver, B.C. V6B 5A6
2. 1380 Hawthorne Dr., Peterborough, Ont. K9J 7E9
3. R.R.#1, Havelock, Ont. K0L 1Z0

Survey Company	Date of Survey (from & to) Day / Mo. / Yr.	Total Miles of line Cut
TERRAQUEST LTD.	12 10 87 — 12 10 87	

Name and Address of Author (of Geo-Technical report)

C.K. BARRY, Suite 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	
	Geophysical - Magnetometer	
	Geophysical - Radiometric	
	Geophysical - 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)

Mining Claim Prefix	Mining Claim Number	Expend. Days Cr.
	S0748374	80
	S0748375	80
	S0748376	80
	S0748377	80
	E0960055	80
	E0960058	80
	E0748053	80
	E0748054	80
	E0907016	80
	E0907017	80

Mining Claim Prefix	Mining Claim Number	Expend. Days Cr.

ONTARIO GEOLOGICAL SURVEY
ASSESSMENT FILES
RESEARCH OFFICE
JAN 13 1988
RECEIVED

SOUTHERN ONTARIO MINING DIV.
RECEIVED
OCT 27 1987
AM 7 8 9 10 11 12 1 2 3 4 5 6 PM

Total number of mining claims covered by this report of work: 10

Expenditures (excludes power stripping)

Type of Work Performed

Performed on Claim(s)

Calculation of Expenditure Days Credits

Total Expenditures: S ÷ 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
800	Oct. 27, 1987	D. Gillespie
	Date Approved as Recorded: 30 Dec 87	Branch Director: W. Bowman

Date	Recorded Holder or Agent (Signature)
October 13/87	

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

DENNIS GORC, Suite 800, 601 West Hastings Street, Vancouver, B.C. V6B 5A6

Date Certified	Certified by (Signature)
October 13/87	

Anglesea Twp. (M.43)

Barrie Twp. (M.50)

Elzevir Twp. (M.89)

Kennebec Twp. (M.109)

Hungerford Twp. (M.105)

Sheffield Twp. (M.150)

I II III IV V VI VII VIII IX X XI

Deerock Lake (Rock Lake)

Reserved for Reforestation

Reserved for 30 Reforestation Withdrawn from Staking

Story

North Brook

Cr.

SRO

Flinton Road

Flinton

River

Skootamatta

Bridgewater

Road

GRAVEL RESERVE

Reserved for Reforestation

DEPT OF HWY 2

CANADA

COMPANY

TELEPHONE

THE BELL

LO 2394

Addington

KALADAR

PACIFIC

RAILWAY

Lakes

Creek

Otter

Raccon Lake

Lingham

Cr.

CANADIAN

Skootamatta

Little

Todd L

Shirtcliff L

(Marble Twin L.)

S.R.O. Reserved for Public Use

NORTH AST.

THE TOWNSHIP OF

KALADAR

COUNTY OF LENNOX & ADDINGTON

MINING DIVISION

SCALE: 1-INCH = 40 CHAINS

LEGEND

PATENTED LAND	(P)
CROWN LAND SALE	C.S.
LEASES	(L)
LOCATED LAND	Loc.
LICENSE OF OCCUPATION	L.O.
MINING RIGHTS ONLY	M.R.O.
SURFACE RIGHTS ONLY	S.R.O.
ROADS	
IMPROVED ROADS	
KINGS HIGHWAYS	
RAILWAYS	
POWER LINES	
MARSH OR MUSKEG	
MINES	
CANCELLED	C.
PATENTED S.R.O.	

NOTES

400' surface rights reservation along the shores of all lakes and rivers.

Original shoreline shown thus: ~~~

E.R.L. shoreline shown thus: ·····

This Map Is Not To Be Used --FOR SURVEY PURPOSES--

AREAS WITHDRAWN FROM STAKING

S.R. – SURFACE RIGHTS M.R.–MINING RIGHTS

Section	Order No.	Date	Disposition	File
(5)	42(R.S.O.1960)		SR&MR	3053
(5,6)	42(R.S.O.1960)		S.R.	37760

SAND and GRAVEL

(5) MNR Gravel Reserve No. 240, Gravel File 45432

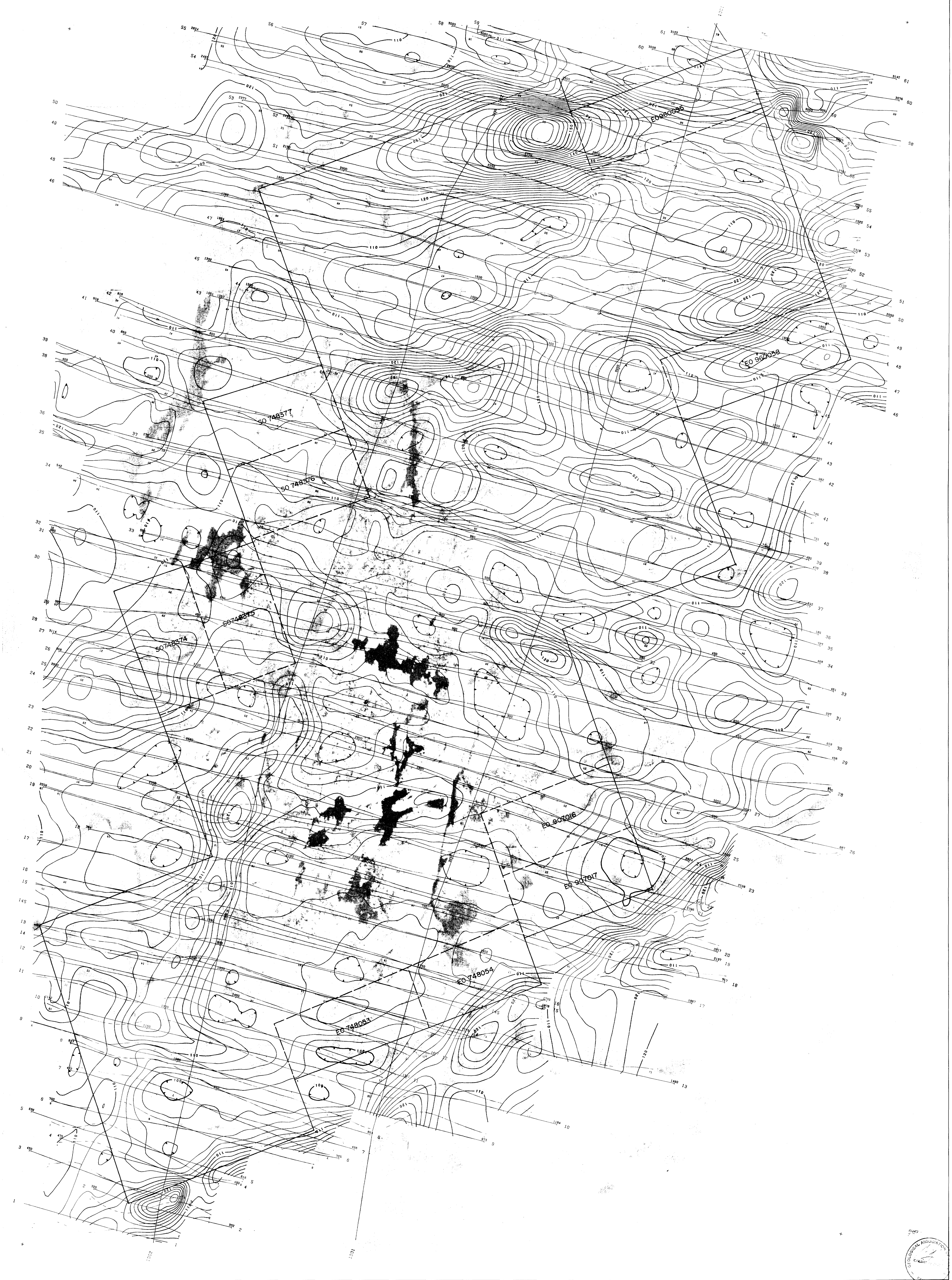
QUARRY PERMIT (6)

PLAN NO.-M.108

ONTARIO

MINISTRY OF NATURAL RESOURCES

SURVEYS AND MAPPING BRANCH



VLF Transmitter
NAA Cutler, 24.0 kHz
Azimuth 087

LEGEND

Terrain Clearance .... 100 meters
Line Spacing .... 100 meters

TOTAL FIELD STRENGTH (Contours)
50%
10%
2%

QUADRATURE (Profiles)
Normal Slope
Reverse Slope

+10%
−10%

CATHEDRAL GOLD CORP.

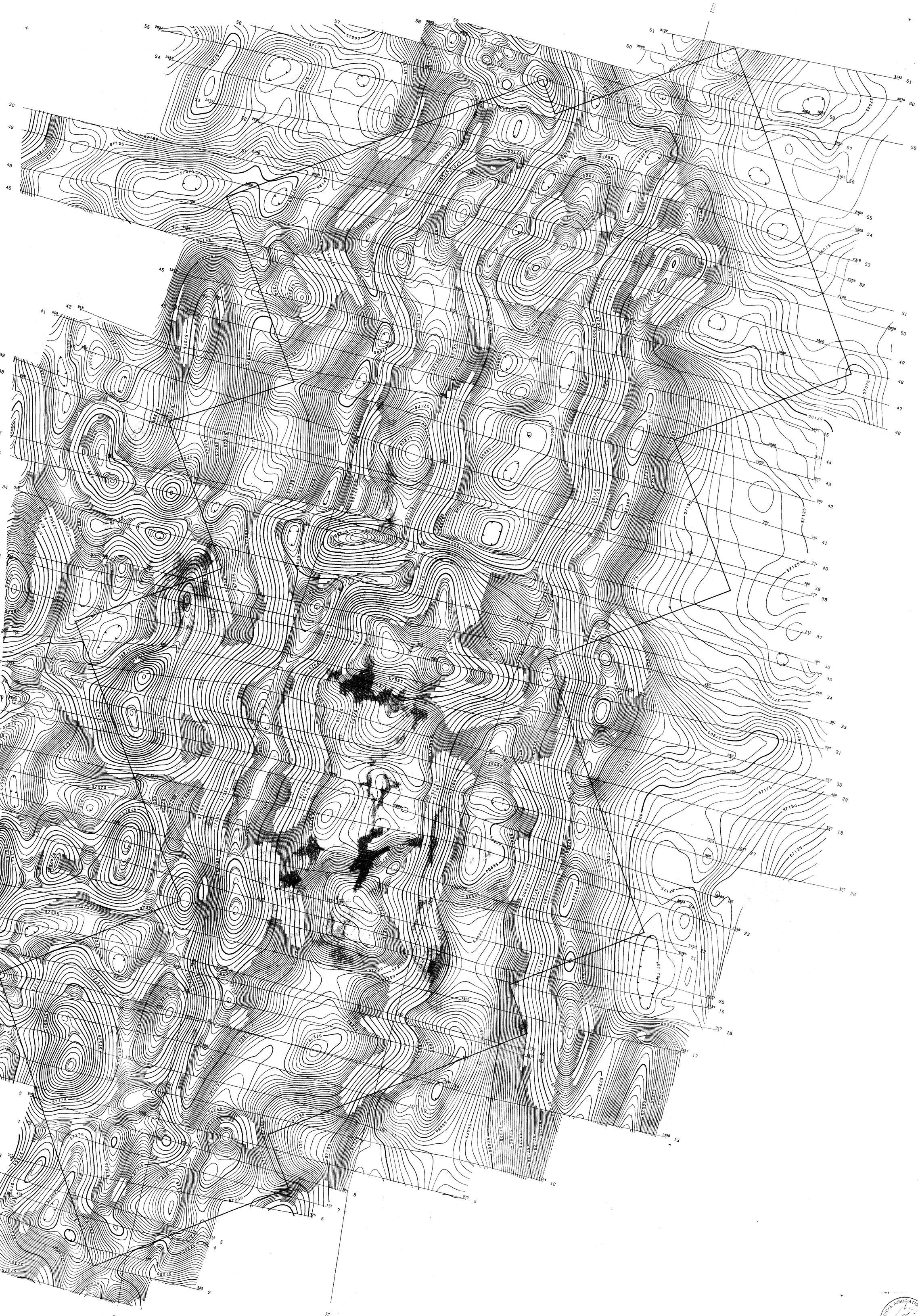
AIRBORNE VLF-EM SURVEY
CONTOURS OF TOTAL FIELD STRENGTH
PROFILES OF QUADRATURE

ADDINGTON PROJECT
ONTARIO

N.T.S. NO. 31C/11 DRAWING NO. A-724.1-3
SCALE 1:5,000 DATE October 1987

TERRAQUEST LTD.

210



LEGEND

Terrain Clearance	100 meters
Line Spacing	100 meters

TOTAL MAGNETIC FIELD

500 gammas	———
100 gammas	———
25 gammas	———
5 gammas	———

CATHEDRAL GOLD CORP.

AIRBORNE MAGNETIC SURVEY
TOTAL MAGNETIC FIELD

ADDINGTON PROJECT
ONTARIO

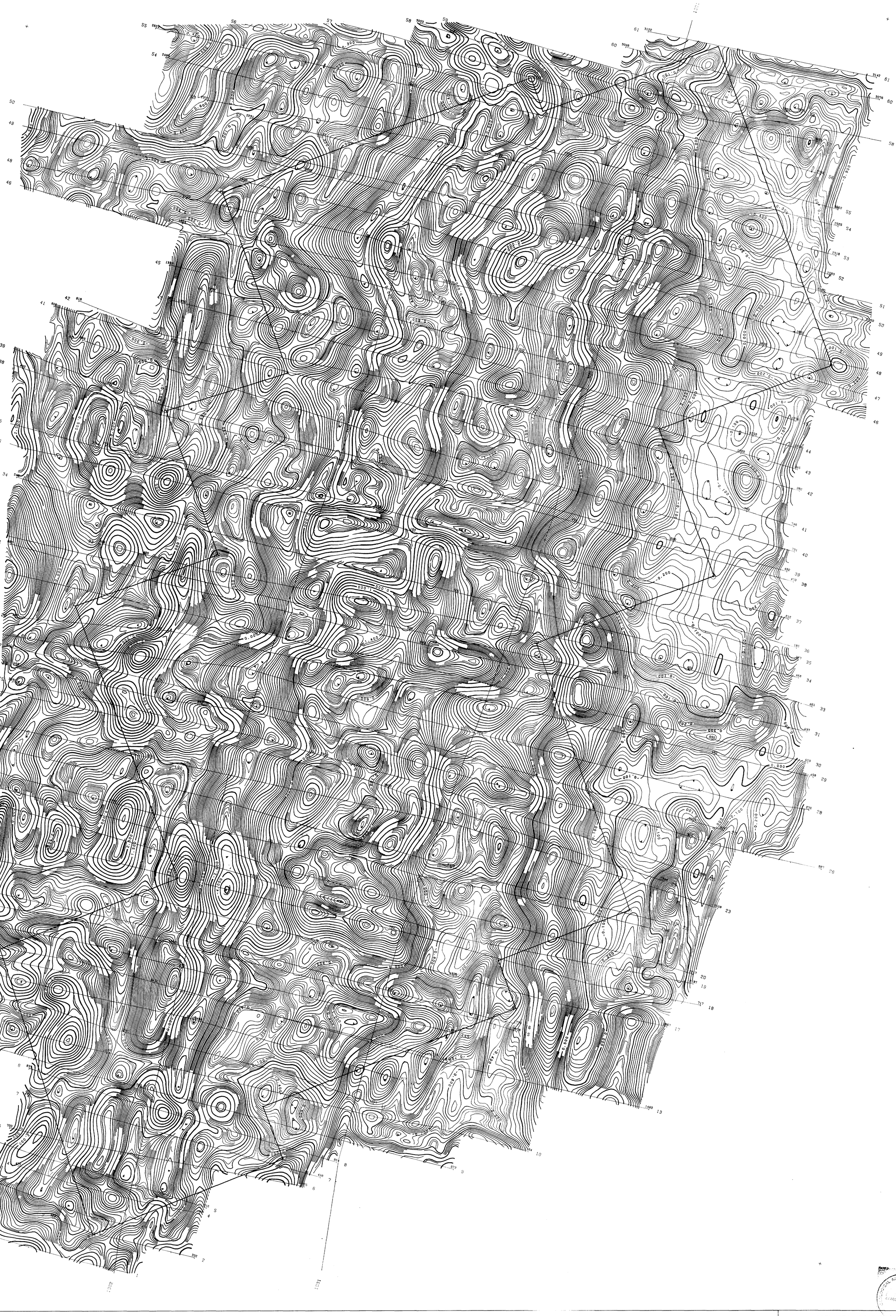
SURVEY 310/11 DRAWING NO. A 724 1 1

SCALE 1:5,000 DATE October 1987

TERRAQUEST LTD.

GEOPHYSICAL ASSOCIATION OF CANADA
CHARLES O. BAILEY

220



LEGEND

Terrain Clearance	100 meters
Line Spacing	100 meters

VERTICAL MAGNETIC GRADIENT

- 2.500 gammas/meter
- .500 gammas/meter
- .100 gammas/meter
- .025 gammas/meter

CATHEDRAL GOLD CORP.

AIRBORNE MAGNETIC SURVEY

VERTICAL MAGNETIC GRADIENT

Calculated From Total Field

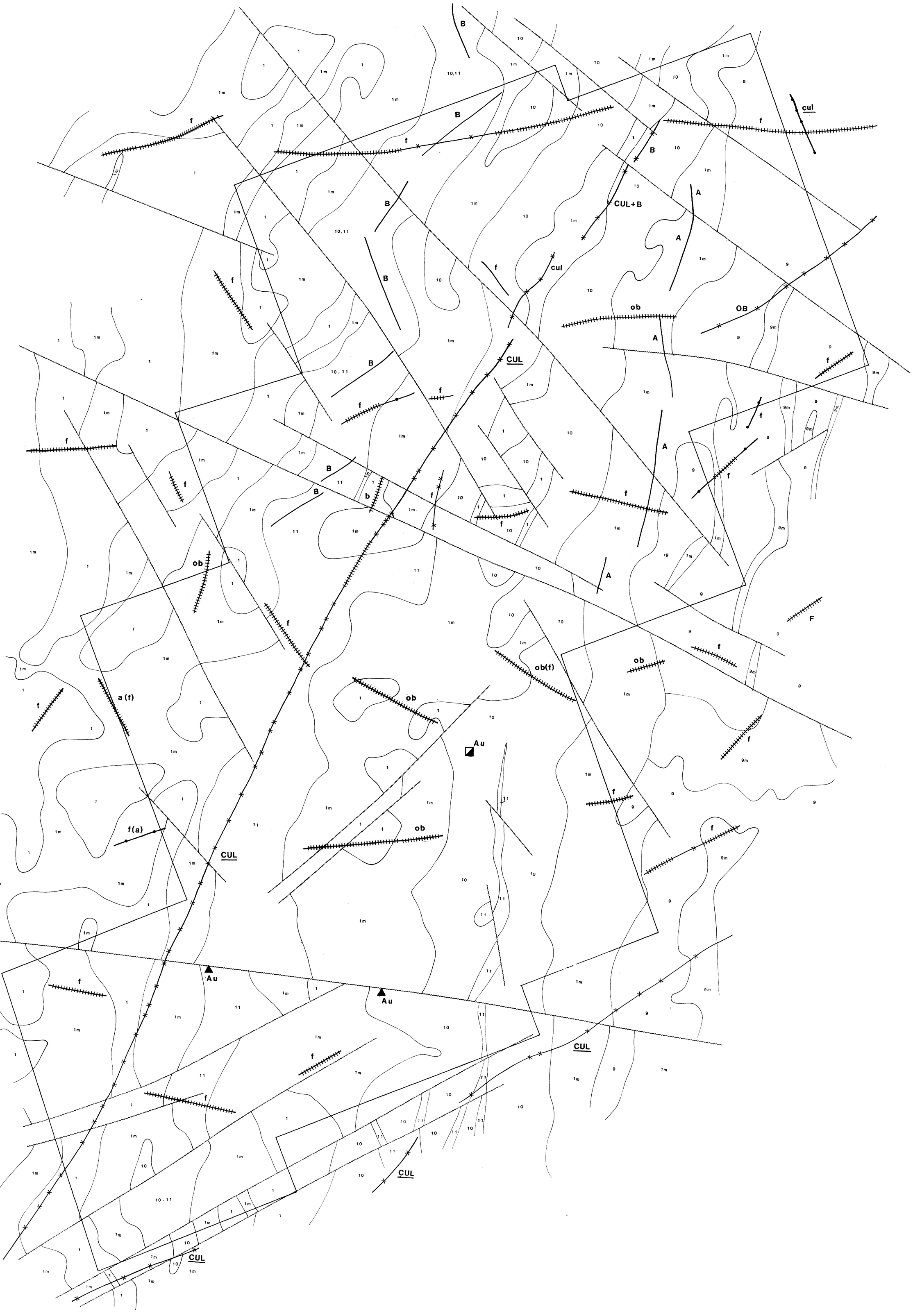
ADDINGTON PROJECT

ONTARIO

NTS No. 31C/11 DRAWING NO. A 724-1-2

SCALE 1:5,000 DATE October 1987

TERRAQUEST LTD.



VLF Transmitter
NAA Cutler, 24.0 kHz
Azimuth 087

LITHOLOGY

- 11 — Lessard Formation
- 10 — Bishop Corner Formation
- 9m — Magnetic Unit with 9
- 9 — Northbrook Batholith
- 1m — Magnetic Unit within 1
- 1 — Tudor Formation

LEGEND

Terrain Clearance ..... 100 meters
Line Spacing ..... 100 meters

INTERPRETATION

- Contact
- Fault
- Property Boundary

VLF-EM Conductor Axes

- normal quadrature
- reverse quadrature
- total field only

See text for classification of VLF-EM conductor axes

CATHEDRAL GOLD CORP.

INTERPRETATION

ADDINGTON PROJECT
ONTARIO

N.T.S. NO. 31C/11 DRAWING NO. A-724 1-4
SCALE 1:5,000 DATE October 1987

TERRAQUEST LTD.