# A GEOPHYSICAL REPORT
# ON
# A COMBINED GROUND MAGNETIC
# AND ELECTROMAGNETIC SURVEY
# FOR
# CANEX AERIAL EXPLORATION LTD

BY

KENTING EARTH SCIENCES
TORONTO, CANADA
APRIL, 1970

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# 1. INTRODUCTION

## 1.1 General

This report is based on a combined ground magnetic and electromagnetic survey conducted in the Sturgeon Lake Area, Ontario, by Kenting Earth Sciences for Canex Aerial Exploration Ltd.

The field work was performed during the period January 19th - March 12th 1970 by a crew consisting of senior operator, operator and helper. Supervisory visits were made to the area by Mr. T.R.B. Dundas, geophysicist for Kenting Earth Sciences and also by Mr. J.B. Boniwell, a consultant for Canex Aerial Exploration Ltd.

1970

The instruments used were a McPhar SS15 vertical loop electromagnetic system and a Jalander fluxgate magnetometer.

The object of the survey was to try and locate conductive zones beneath the northeast arm of Sturgeon Lake.

## 1.2 The Property

The property is located at the northern end of the North-East Arm of Sturgeon Lake. The major portion of the property is covered by water so that ground surveying had to be carried out during freeze-up.

AUTOPOSITIVES FILED SEPERATELY ✓

## 1.3 Geology

The geology of the area has been described in the Annual Report of Ontario Department of Mines, Vol 39 (1930), Part II P36-50.

The oldest rocks in the area are Keewatin in age and consist of rhyolites, tuffs, breccias, agglomerates, schists, andesites and basalts. These have been intruded by the Pre-Algoman Intrusives - diorites, porphyrites, diabases, gabbros and amphibolites. These two series cover most of the area of the claim group. The youngest rocks are intrusives of Algoman age which are mainly acidic in composition. These appear to be limited to dyke like zones which locally are orientated approximately in a North-South direction.

A number of old abandoned mines near the claim group were located on small gold veins.

## 2. MAGNETIC SURVEY

### 2.1 Survey Specifications

Measurements were to be taken of the vertical magnetic intensity using a Jalander magnetometer at 100 foot intervals along the survey lines and corrected for diurnal drift.

### 2.2 Field Procedure

The survey was carried out according to the specifications. A main base station was set up and all measurements were corrected to that base. Secondary base stations were also set up at convenient intervals. As line cutting had not been completed at the start of the survey, the crew had time to take extra readings at 50 foot intervals over anomalous areas.

### 2.3 Presentation of Results

The results have been presented as two contour maps, Drawings 3 and 4 at a scale of 1 inch = 400 feet. The contour interval selected was 200 gammas near the background level and this was expanded over the anomalous areas.

## 3. ELECTROMAGNETIC SURVEY

### 3.1 Survey Specifications

Measurements of the dip angle were to be taken at 100 foot intervals along the survey lines using a McPhar SS15 vertical loop electromagnetic system.

A line map with the suggested transmitter locations was provided by Mr. J.B. Boniwell.

A frequency of 1000 c.p.s. was used throughout the survey.

### 3.2 Field Procedure

The survey was carried out according to the specifications using the field procedure described in Appendix I. The convention used for the dip angle results was that of a east dip being positive and a west dip being negative. Near the end of the survey a visit was made to the area by Mr. Boniwell and a number of anomalies were detailed at his request.

### 3.3 Presentation of Results

The results have been presented as profiles on two separate maps - Drawings 1 and 2 at a scale of 1 inch = 400 feet. A vertical scale of 1 inch = 20 degrees was used for the dip angles. The location of interpreted conductors have been marked on the plan map.

## 4. INTERPRETATION

### 4.1 Magnetic Survey

The wide line spacing relative to the 100 foot station interval makes it difficult to establish the strike of many of the magnetic anomalies.

A rough correlation with the geology is obvious in that the areas underlain by the Keewatin Series shows very little magnetic variation. Most of the south and west of the grid system shows this relationship. The north part of the grid shows a much greater magnetic variation and here it is difficult to relate the values in this area to a particular geological sequence.

The most dominant feature in the magnetic results is a strong trend which strikes approximately North-South. This consists of two separate magnetic zones where the values are generally 1000-2000 gammas above the background level. One of these zones is limited to the northern part of the property and is located at the eastern boundary (Drawing 3) whereas the other is located at the eastern boundary of the southern part of the property (Drawing 4).

These two zones may have originally formed a single continuous zone as both appear to terminate at approximately L16N. This is uncertain as there is not sufficient coverage

to determine whether the northern zone in fact terminates at approximately L16N or if it continues to the south. If a single zone did exist, then there has been a lateral displacement of approximately 4000'.

These zones are probably related to the Algoman Series which locally form dyke-like intrusions with a similar strike.

4.2 Electromagnetic Survey

A number of conductors have been interpreted and these are shown on the plan maps.

The response obtained from a conductor will vary depending on the depth to the top of the conductor in relation to the separation between the transmitter and receiver coils. The depth of penetration will increase with an increase in the coil separation. The results of the survey show that the majority of the conductors which have been interpreted were located when the coils were two lines apart (minimum separation of 1600'). This demonstrates that the depth to the top of some of the conductors is large and that when the coils were on adjacent lines (minimum separation of 800') the depth of penetration may not have been sufficient to produce a definite anomaly.

The results show a number of distinct anomalies on separate lines with no apparent continuity between lines which may in part be explained by the above. Some of the weaker anomalies have therefore also been marked.

The location and interpretation of each of the anomalies is as follows:

(1) L 64N 39.5E

The anomaly was located with a transmitter-receiver separation of 1600'.

A conductor dipping to the east has been interpreted which shows no obvious relationship to any geological structure. The magnetic values locally are at the background level, but there is a very slight increase at one station corresponding to the anomaly.

The anomaly was confirmed when repeated during detailing and this is rated as one of the best on the property.

L 8N 19E

The anomaly was located with a transmitter-receiver separation of 800'.

The response is similar to the previous anomaly and again has been interpreted as a conductor having a dip to the east. The magnetic values show no variation over the conductor. It is, however, located at the north end of one of the major North-South striking magnetic anomalies discussed in the magnetic interpretation and could therefore be related to cross-faulting.

The anomaly was again confirmed when repeated during detailing.

L 16S 18.5W

This anomaly was the strongest obtained during the survey. The transmitter-receiver separation was at 1600'. The anomaly, however, is not considered good as the response was very weak when detailed.

The conductor is located in an area where the geology suggests that there is a major geological boundary locally. No confirmation of this is possible from the magnetic results which show no corresponding variation.

Two very weak zones to the North-East on lines 8N and 16N are only worth considering as they are possibly located on the extension of the same geological boundary.

L. 16S 12E

A very weak anomaly obtained at the wide separation on detailing. The anomaly is too weak to suggest a dip and the depth to the top is considerably more than those discussed previously. There is no associated magnetic variation.

L. 32N 25E

This anomaly is similar to the previous one, but was not detailed. There is, however, a slight decrease in the magnetic intensity over the location of the anomaly.

L. 112N 22E

The anomaly was located at station 27E during the reconnaissance survey, but re-located at station 22E by detailing. This anomaly is rated as the poorest in the area, but may be worthy of consideration later if there is a geological reason for indicating a conductor locally. The actual location cannot be stated with any confidence based on these results.

## Summary and Conclusions

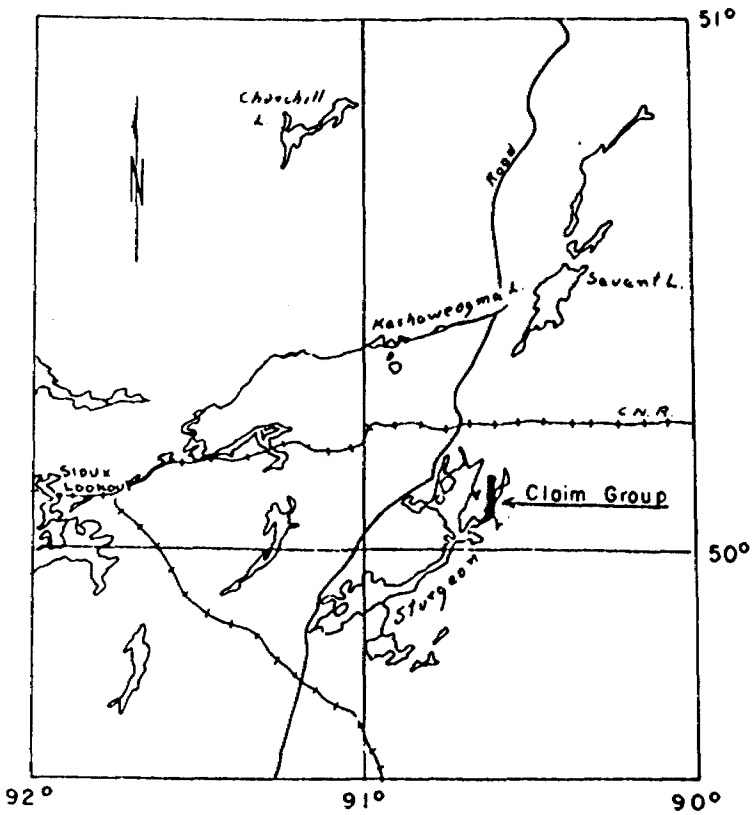
A number of conductors were located in the area, but the response was generally very weak. This is probably a reflection of the large depth to the top of the conductors.

The magnetic results generally showed no variation over the interpreted conductors, but located two separate magnetic zones striking in a North-South direction.

Respecfully submitted,
KENTING EARTH SCIENCES

Trevor R. Dundas, M.Sc.
Geophysicist

Frank L. Jagodits, P. Eng.
Senior Geophysicist




General Location of Claim Group
Sturgeon Lake Area
Patricia Mining Division, Ontario

25 miles

N.T.S. 52-J-2 V118 A

# APPENDIX I

## Vertical Loop Method

### Theory

In the vertical loop electromagnetic method an alternating primary magnetic field is generated by passing alternating current through a coil of wire, the plane of which is maintained in a vertical position. This primary field will generate currents in subsurface conductors which in turn will set up their own magnetic fields. These are termed secondary fields and these distort the primary magnetic field. The angle of distortion can be determined by means of a search coil, the amount of the deviation being termed the 'dip angle'.

If the plane of the vertical transmitting coil is adjusted so that it always passes through the observation point, then the primary field will always be horizontal at the receiver and produce a "null" in the receiving coil when the plane is horizontal.

Any misalignment between the transmitter and receiver would be expressed as an error in the dip angle at the receiver position. It is therefore essential that there is good communication between the transmitter and receiver operators in order to establish their relative positions.

The anomaly produced by a subsurface conductor would consist of a change from positive to negative values, the zero point being located directly above the top of the conductor. The shape of the anomaly, whether positive to the right and negative to the left or vice-versa, will depend on the convention used. Reversed cross-overs can be obtained, but these are produced as side effects of proper cross-overs.

The response from a conductor is directly related to its size, conductivity and the frequency employed. The relative responses obtained when using a high and a low frequency can therefore be used to give some estimate of the conductivity of the source. In the McPhar system frequencies of 1000 c.p.s. and 5000 c.p.s. are available.

Field Procedure

In the field the receiver is moved along the survey lines which should be perpendicular to the geologic strike. The maximum separation between the coils is usually approximately 2000' with this system. The plane of the transmitting coil is oriented so that it passes through each receiver station and this can be maintained by means of a plane table, if direct vision is not possible.

The transmitter is usually set upon one of the survey lines so that the receiver cannot be used on that line due to the coil separation being too small to give sufficient

penetration. The transmitter has therefore to be moved to cover that line and this also gives extra coverage on other adjacent lines.

# ASSESSMENT CREDIT DATA

Personnel & Dates Worked

| Linecutting: | Dates Worked | No. of Days |
|---|---|---|
| Andre Chartrand, Mont Laurier, Quebec | Jan.16,17, 19-22, 24-31 Feb.1-5, 8-14, 16-20, 23-26, 1970. | 35 |
| Sydney Hollingsworth, Mont Laurier, Quebec | Jan.16,17, 19-22, 24-31 Feb.1-5, 8-14, 16-20, 23-26, 1970. | 35 |
| Roger Rock, Mont Laurier, Quebec | Jan.16,17, 19-22, 24-31 Feb.1-5, 8-14, 16-20, 23-26, 1970. | 35 |
| Gerard Thibeault, St.Ann du Lac, Quebec | Jan.16,17, 19-22, 24-31 Feb.1-5, 8-14, 16-20, 23-26, 1970. | 35 |
| Wilbrod Thibeault, St.Ann du Lac, Quebec | Jan.16-17, 19-22, 24-31 Feb.1-5, 8-14, 16-20, 23-26, 1970. | 35 |
| A. Thibeault, St.Ann du Lac, Quebec | Jan.16-17, 19-22, 24-31 Feb.1-5, 8-14, 16-20, 23-26, 1970. | 35 |
| Leo Salois, King Edward Hotel, Timmins, Ont. | Jan.26-31, Feb.1-5, 8-14, 16-26, 1970. | 29 |
| | Total Man Days | 239 |

Geophysical Surveys

| Field Work: | Address | Type of Work | Dates Worked | No. of Days |
|---|---|---|---|---|
| F. Smith | c/o Kenting Earth Sciences<br>Suite 701, 67 Richmond St. W.<br>Toronto, Ontario. | Operator | Jan.22, 23,<br>Jan.29-Mar.12,<br>April 6-8, 1970. | 48 |
| R. Marvin | c/o Kenting Earth Sciences<br>Suite 701, 67 Richmond St. W.<br>Toronto, Ontario. | Operator | Jan.22, 23,<br>Jan.29-Mar.12, 1970. | 45 |
| D. Maxwell | P.O. Box 465,<br>Sioux Lookout, Ontario | Operator | Jan.22, 23,<br>Jan.29-Mar.12, 1970. | 45 |
| Office Work: | | | | |
| T. Dundas | 2505, 30 Hillsboro Ave.,<br>Toronto 5, Ontario. | Geophysicist | April 20-23, 1970 | 4 |
| E. Melkio | 98 Ferris Road,<br>Toronto 374, Ontario. | Draftsman | March 26, 27<br>April 6-10, 1970 | 7 |
| Mrs. V. Lymberis | c/o Kenting Earth Sciences<br>Suite 701, 67 Richmond St. W.<br>Toronto, Ontario. | Draftsman | March 26<br>April 6-8, 1970. | 4 |
| | | | Total Man Days | 153 |

The claim group comprises 160 contiguous claims in the Patricia Mining Division:

120 Claims completely covered by the ground geophysical surveys:

| | |
|---|---|
| PA-218412 S | PA-227921-923 inclusive B |
| PA-218418 S | PA-235327-370 S " |
| PA-218421-429 inclusive S | PA-235373-383 S " |
| PA-218431-434 S " | PA-235386-395 S " |
| PA-218455-459 S " | PA-235397-406 S " |
| PA-227415 B | PA-243513-518 B " |
| PA-227417 B | PA-246515-520 S " |
| PA-227871-874 inclusive B | PA-250338-342 S " |

15 Claims partially covered by the ground geophysical surveys:

| | | |
|---|---|---|
| PA-218410 S | PA-218430 S | PA-243519 B |
| PA-218411 S | PA-235371 S | PA-244127 B |
| PA-218413 S | PA-235372 S | PA-246512 S |
| PA-218417 S | PA-235385 B | PA-246514 S |
| PA-218420 S | PA-235396 S | PA-250337 S |

No geophysical work done on 25 claims:

| | | |
|---|---|---|
| PA-218414-416 inclusive S | PA-227861-864 inclusive B | PA-246513 S |
| PA-218419 S | PA-235383 S | PA-250336 S |
| PA-227416 S | PA-235384 B | |
| PA-227418 S | PA-243520-527 B inclusive | |
| PA-227419 S | PA-246511 S | |

Linecutting - 63 miles

Ground Magnetic Survey: 53.1 line miles
800' line spacing
3482 stations @ 100' intervals with 50' intervals over anomalous areas.

Ground E.M. Survey: 53.5 line miles
800' line spacing
2867 stations @ 100' intervals

Assessment Credits:
Special Provision applied at half the normal days credit.

E.M. Survey: 18.4 days x 135 claims (20 days for each claim completely covered, 6 days for partial coverage.)

Magnetic Survey: 9.2 days x 135 claims (10 days for each claim completely covered, 3 days for partial coverage)

CANEX AERIAL EXPLORATION LTD.

R. Shklanka

R. Shklanka, Ph.D.
Manager of Exploration, Eastern Canada

900

ONTARIO

PROJECTS SECTION

DEPARTMENT OF MINES AND NORTHERN AFFAIRS

FILE: 2.135

# TECHNICAL ASSESSMENT WORK CREDITS

Recorder Holder: Arthur Theriault, Frank Theriault, Albert Theriault, A. Chartrand, Andre Cote and Canex Aerial Exploration Limited

Township or Area: Beckington and Squaw Lakes Area

| Type of Survey and number of Assessment Days Credits per claim | |
|---|---|
| GEOPHYSICAL Airborne ☐ Ground ☒ | |
| Magnetometer | 9.2 days |
| Electromagnetic | 18.4 days |
| Radiometric | days |
| | |
| GEOLOGICAL | days |
| GEOCHEMICAL | days |
| SECTION 84 (14) | days |
| Special Provision ☒ | Man days ☐ |

NOTICE OF INTENT TO BE ISSUED

☐ Credits have been reduced because of partial coverage of claims.

☐ Credits have been reduced because of corrections to work dates and figures of applicant.

☒ NO CREDITS have been allowed for the following mining claims as they were not sufficiently covered by the survey:

PA. 235383 - 84

| Mining Claims |
|---|
| PA. 218410 to 13 Inclusive |
| 218417 - 18 |
| 218420 to 34 Inclusive |
| 218455 to 59 Inclusive |
| 227415 - 17 |
| 227871 to 74 Inclusive |
| 227921 to 23 Inclusive |
| 235327 to 82 Inclusive |
| 235385 to 406 Inclusive |
| 243513 to 19 Inclusive |
| 244127 |
| 246512 |
| 246514 to 20 Inclusive |
| 250337 to 42 Inclusive |

*The Mining Recorder may reduce the above credits if necessary in order that the total number of approved assessment days recorded on each claim does not exceed the maximum allowed as follows: Geophysical – 80; Geological – 40; Geochemical – 40;*

2.135

AREA CODE — 416
TELEPHONE — 365-6918

ONTARIO

WHITNEY BLOCK
QUEEN'S PARK
TORONTO 182, ONT

DEPARTMENT OF MINES AND NORTHERN AFFAIRS
MINING LANDS BRANCH

March 24th. 1971.

Mr. W.A. Buchan,
Mining Recorder,
Court House,
Sioux Lookout, Ontario.

Re: Mining Claims PA. 218410 et al,
Beckington and Squaw Lakes Area,
File No. 2.135

Dear Sir:

The Geophysical (Magnetometer and Electromagnetic) assessment work credits as listed with my Notice of Intent dated March 9th, 1971, have been approved as of the date above. Please inform the recorded holder and so indicate on your records.

Yours very truly,

Fred W. Matthews,
Supervisor,
Projects Section.

c.c. Arthur Theriault,

c.c. Frank Theriault,

c.c. Albert Theriault,

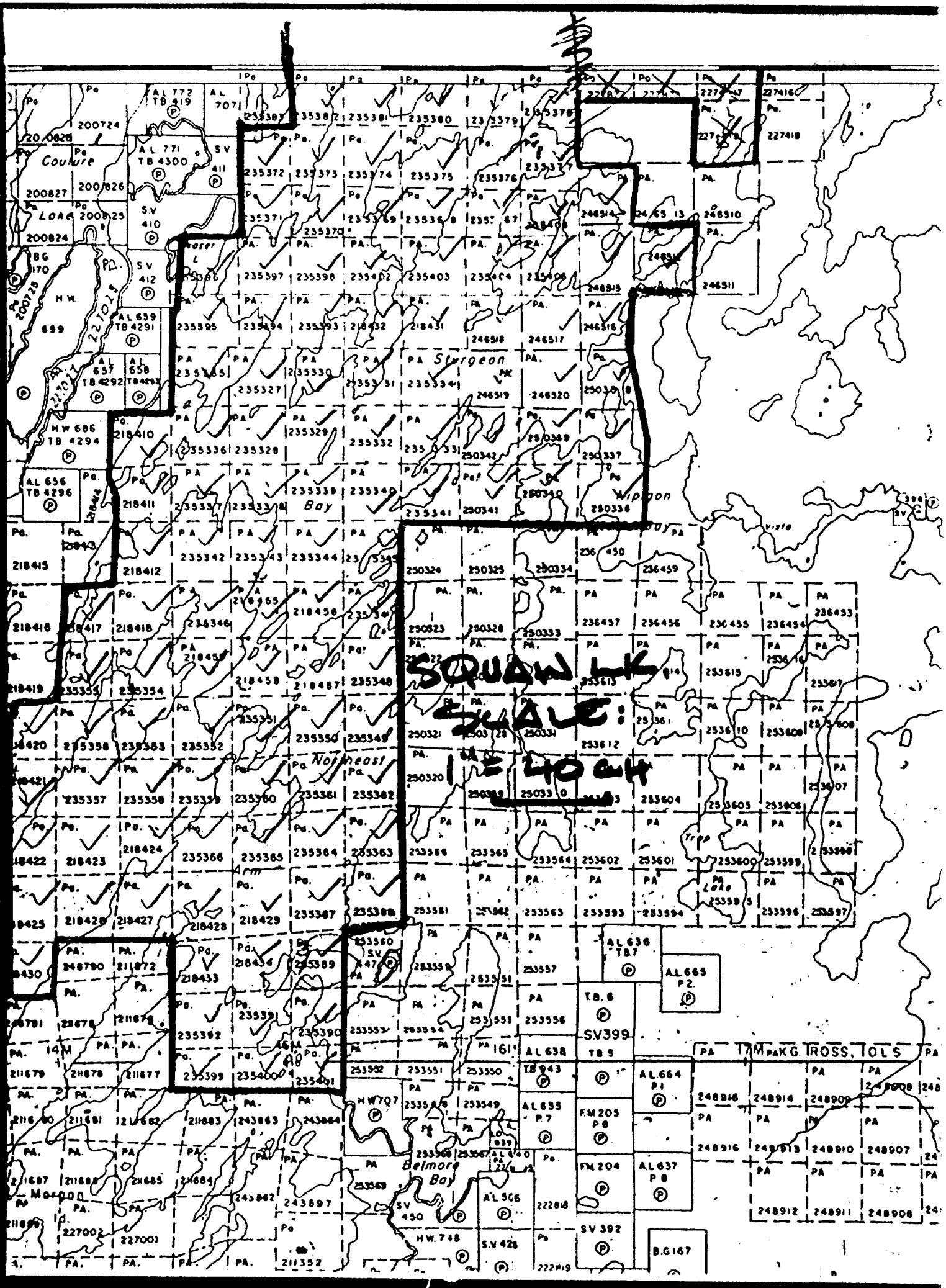
c.c. A. Chartrand,

c.c. Andre Cote,

c.c. Canex Aerial Exploration Ltd.,

FWM/mr

c.c. Mr. H.L. King. ✓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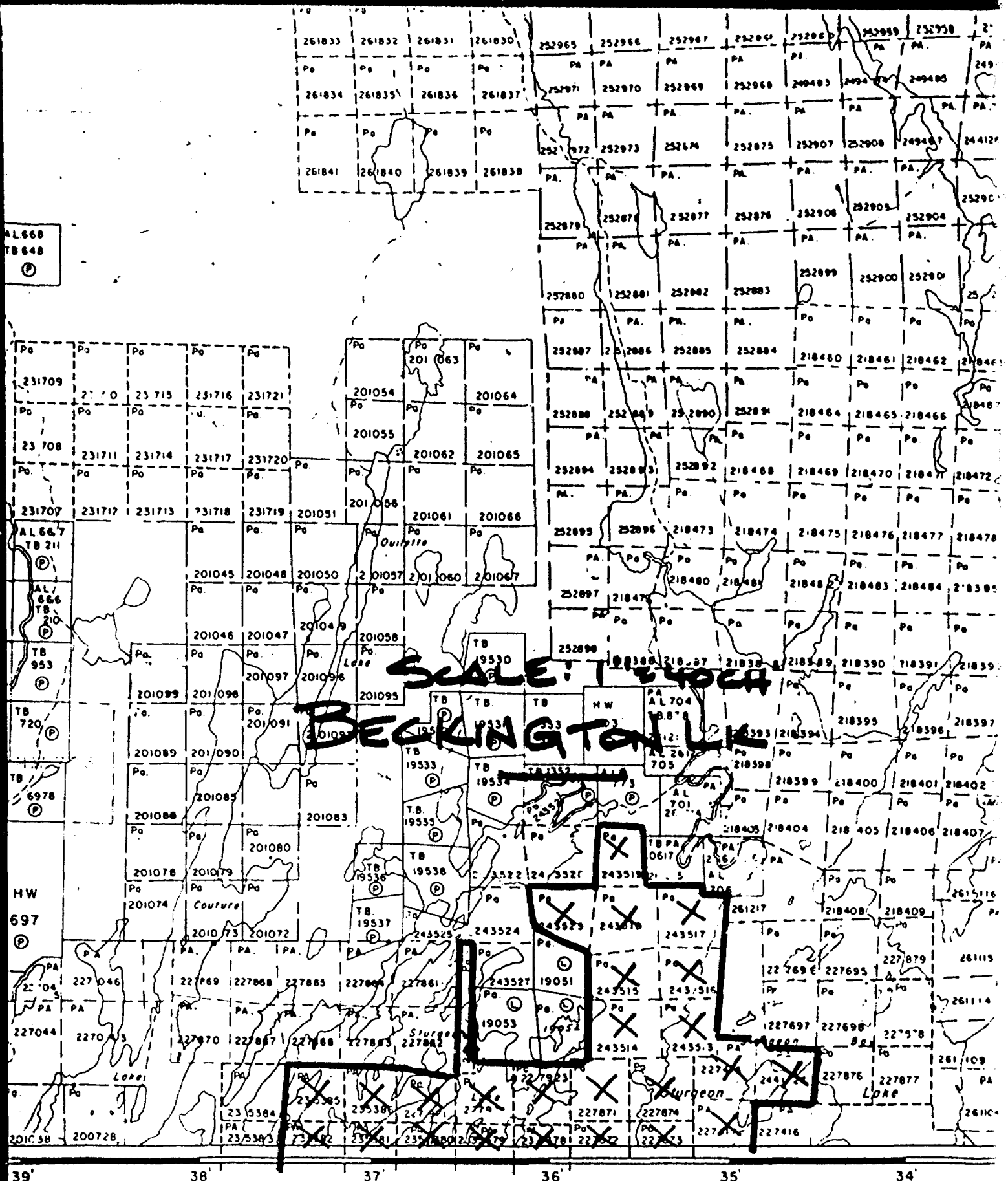
1" = 40 CHS

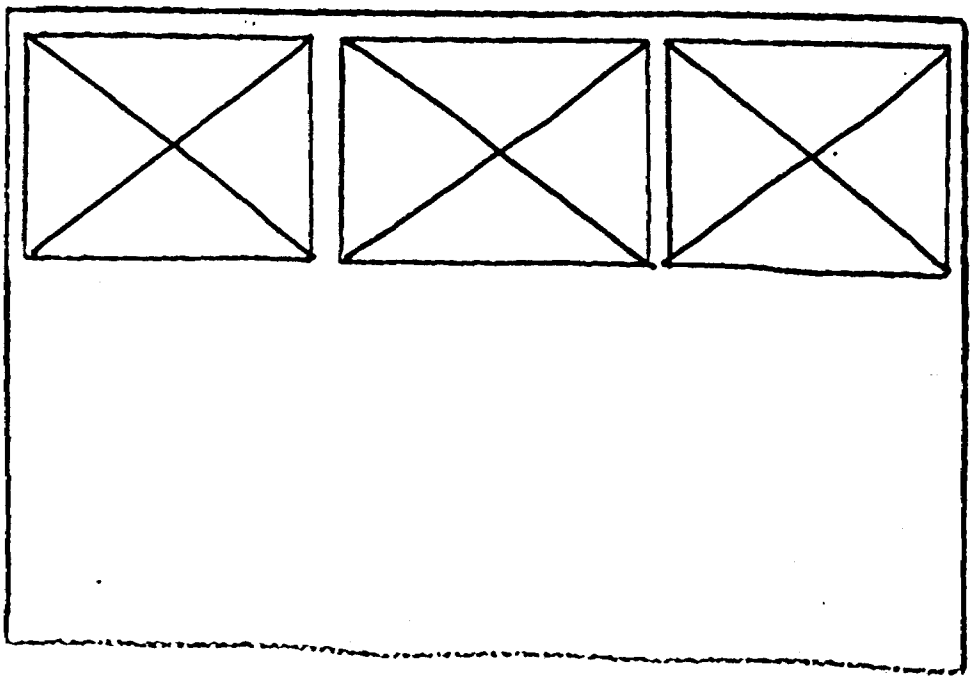



Squaw Lake Area - M.1904

SEE ACCOMPANYING MAP(S) IDENTIFIED AS

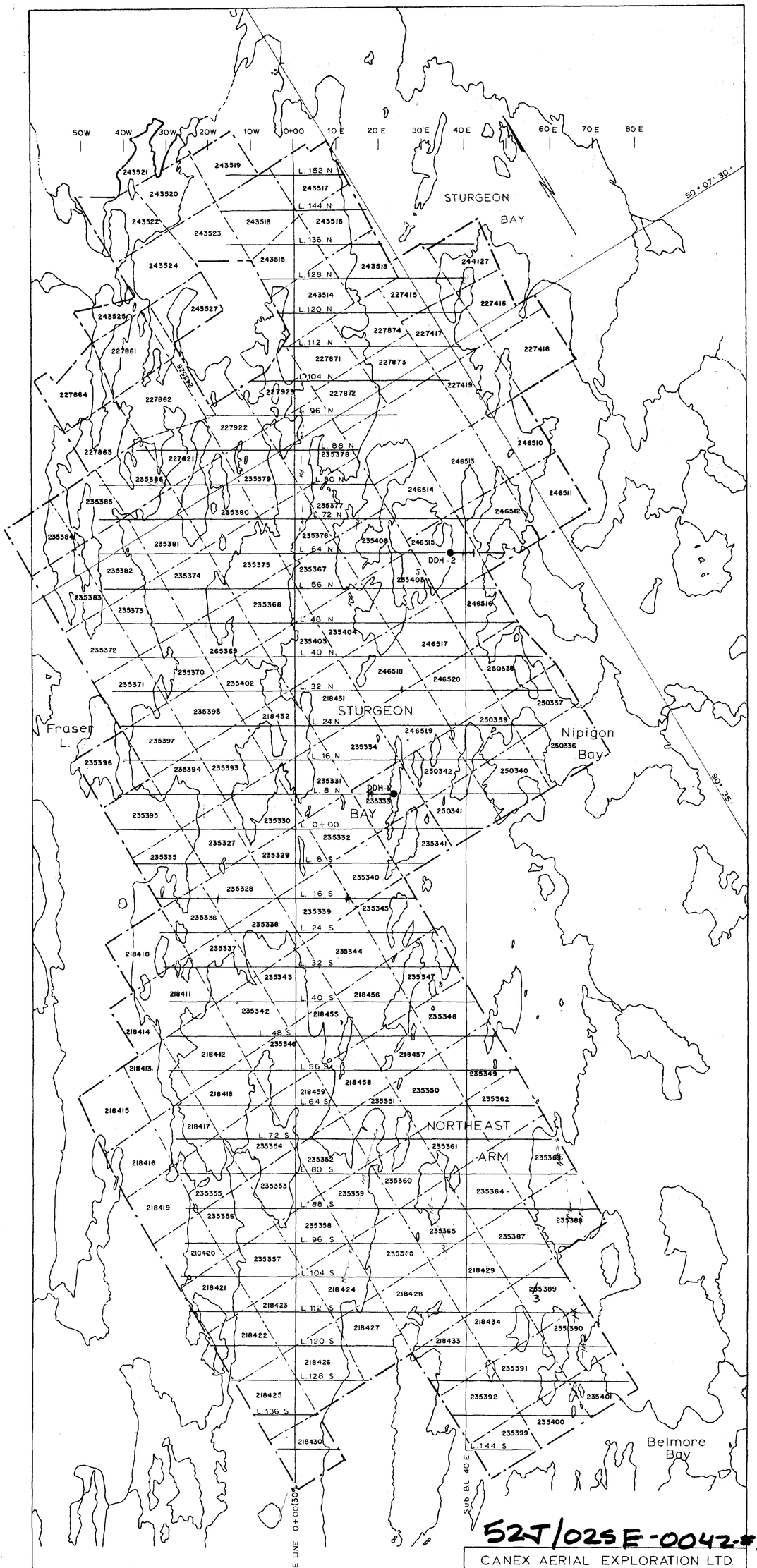
52J/02SE-0042, #1-3

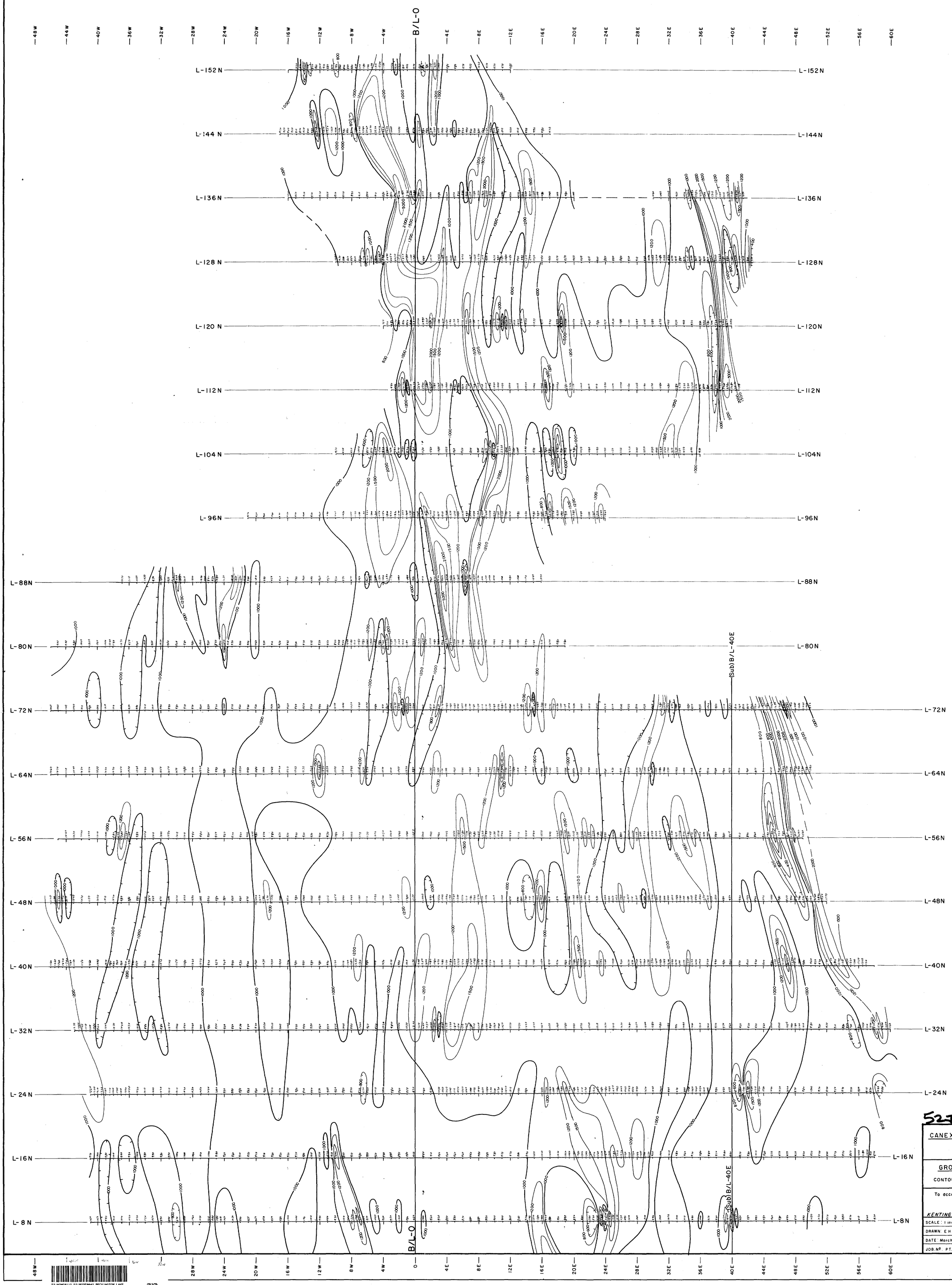
LOCATED IN THE MAP CHANNEL IN THE FOLLOWING SEQUENCE (X)



# FOR ADDITIONAL INFORMATION SEE MAPS:

52J/02SE-0042 #4,5






INDEX MAP

DWG. Nº: 3

DWG. Nº: 4

52J/02SE-0042-#2

CANEX AERIAL EXPLORATION LIMITED.

STURGEON LAKE AREA — ONTARIO.

GROUND MAGNETOMETER SURVEY.

CONTOURS OF VERTICAL MAGNETIC INTENSITY.)
(INSTRUMENT USED: JALANDER)

To accompany report by:

T. R. DUNDAS, B. Sc., Geophysicist.

KENTING EARTH SCIENCES — TORONTO - CANADA.

SCALE: 1 inch = 400 feet.

DRAWN: E.H.

DATE: March 1970.

JOB. Nº. PT. 1268.

CONTOUR INTERVAL: 0, 200, 400, 600, 800, 1000, 1200, 1500, 5000, 10,000 GAMMAS.

DWG. Nº: - 3.

B/L-0

(Sub) B/L-40E

INDEX MAP.

DWG. Nº 3

DWG. Nº 4

CANEX AERIAL EXPLORATION LIMITED.

STURGEON LAKE AREA – ONTARIO.

GROUND MAGNETOMETER SURVEY.

(CONTOURS OF VERTICAL MAGNETIC INTENSITY.)
(INSTRUMENT USED: JALANDER)

To accompany report by:

J. R. DUNDAS, M.Sc., Geophysicist.

KENTING EARTH SCIENCES. TORONTO - CANADA.

SCALE: 1 inch = 400 feet.

DRAWN: E.H.

DATE: March 1970.

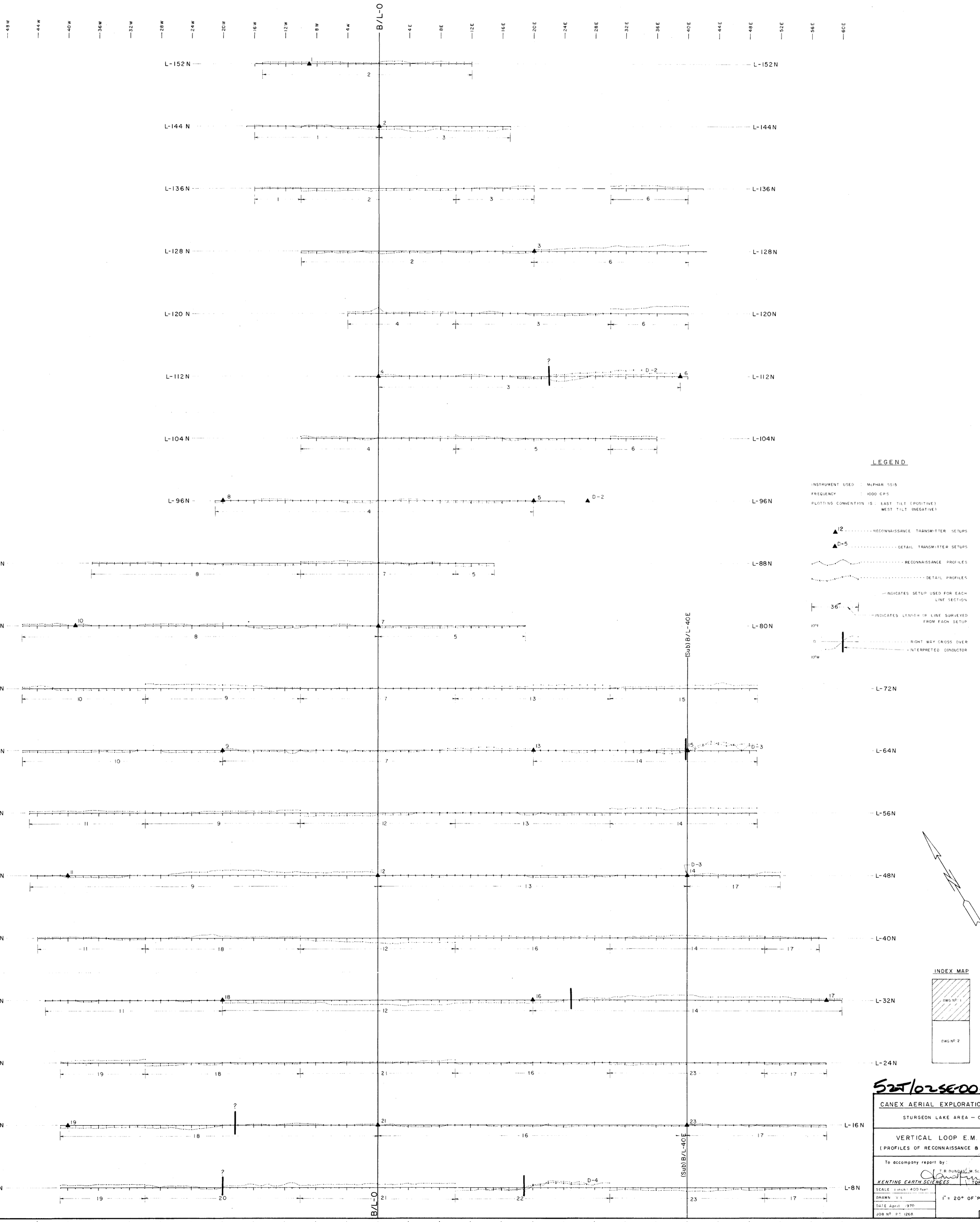
JOB. Nº PT. 1268.

CONTOUR INTERVAL: 0, 200, 400, 600, 800, 1000, 1200, 1500, 5000, 10,000 GAMMAS.

DWG. Nº: – 4.

52J/025E-0042-#3

52J02NE0112 52J025E0042 BECKINGTON LAKE




52J/02SE0042 #4

CANEX AERIAL EXPLORATION LIMITED.

STURGEON LAKE AREA — ONTARIO.

VERTICAL LOOP E.M. SURVEY

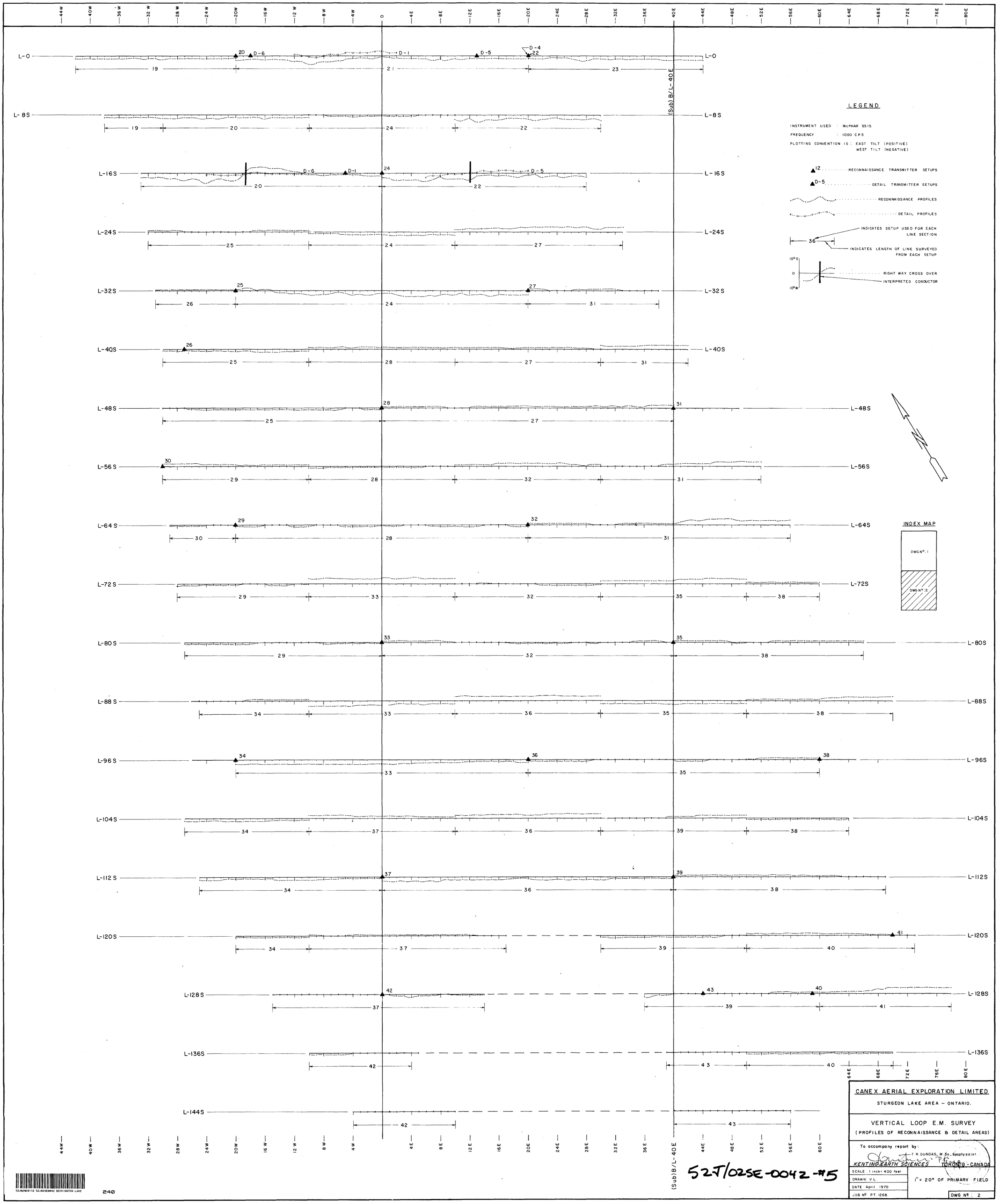
( PROFILES OF RECONNAISSANCE & DETAIL AREAS)

To accompany report by :

T.R. DUNDAS, M.Sc., Geophysicist

KENTING EARTH SCIENCES LTD. TORONTO - CANADA.

| | |
|---|---|
| SCALE 1 inch = 400 feet | 1" = 20° OF PRIMARY FIELD |
| DRAWN V.L. | |
| DATE April 1970 | |
| JOB Nº PT 1268. | DWG. Nº :- 1 |




CANEX AERIAL EXPLORATION LIMITED

STURGEON LAKE AREA – ONTARIO.

VERTICAL LOOP E.M. SURVEY

( PROFILES OF RECONNAISSANCE & DETAIL AREAS)

To accompany report by:

T. R. DUNDAS, M. Sc., Geophysicist

KENTING EARTH SCIENCES TORONTO - CANADA

| | |
|---|---|
| SCALE : 1 inch = 400 feet | 1" = 20° OF PRIMARY FIELD |
| DRAWN: V.L. | |
| DATE April 1970 | |
| JOB Nº PT. 1268 | DWG Nº : 2 |

52J/02SE-0042-#5

52J02NE0112 52J02SE0042 BECKINGTON LAKE

240