

63 2049

REPORT ON  
AIRBORNE GEOPHYSICAL SURVEY  
OF THE  
MOOSONEE AREA  
FOR  
ARGOR EXPLORA'



421 16N70005 63.2049 FLINCH LAKE

I. INTRODUCTION

010

This report pertains to the combined airborne EM and magnetometer survey flown on behalf of Argor Explorations Limited in the Moosonee area of Ontario. The flying was accomplished on September 18, 1966, by the Canadian Aero Mineral Surveys Limited geophysically equipped Otter aircraft (registration CF-IGM).

The survey was flown at a mean terrain clearance of 150 feet with flight lines spaced at 1/8 mile intervals. All lines were oriented N50°W in the Partridge River area and east-west in the South Bluff River area. The geophysical data acquired in these areas totalled 133 and 119 line miles respectively.

Canadian Aero Mineral Surveys Limited personnel associated with the project were as follows:

K. Dempster	-	Pilot
T. Korpatt	-	Navigator
T. Peacock	-	Operator
R. Petherbridge	-	Data Compiler
D. Graham	-	Data Compiler
G. Granger	-	Draftsman
P. Tallyhoe	-	Data Chief
R. J. Stemp	-	Geophysicist.

For the Partridge River area, the EM data and all magnetic anomalies coincident with conductors are plotted on a plan map at the scale of 1" = 1/4 mile. In addition, magnetic contour maps (50g contour interval) are presented for both areas. An airphoto laydown provided the base for these maps.

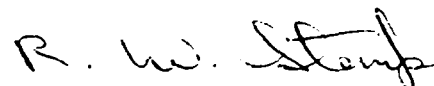
## II. DISCUSSION OF EM RESULTS

Conductor 1 is the only good massive sulphide prospect outlined by the airborne survey. Unfortunately, information on it is limited as it appeared on the first flight line only. It exhibits good conductivity (ratio of in-phase to out-of-phase response) and correlates directly with a 100g magnetic anomaly. This anomaly should definitely be checked out on the ground.

The remaining three conducting zones that have been plotted are entirely out-of-phase responses. Zone 3 is broad and multiple and may be related to conductive material in young, flat lying sediments. However, the conductivity is too low for massive sulphides. Conductors 2 and 4 may also be weak bedrock conductors but may only be surface conductors from conducting overburden.

Surface conductivity does appear to be quite prevalent throughout the area. However, if zones 2, 3 or 4 should prove of any interest, the out-of-phase results should be examined more closely.

Respectfully submitted,



OTTAWA, Ontario,  
October 24, 1966.

R. W. Stemp, P.Eng.,  
Geophysicist.

## APPENDIX I

PROJECT NO. 7012 - PARTRIDGE RIVER AREA

<u>Anomaly</u>	<u>Fiducials</u>	<u>In-Phase</u> <u>Quad</u>	<u>Altitude</u>	<u>Magnetics</u>	<u>Rate</u>	<u>Comments</u>
1 A	8410/4	0/50	135	nil	3	Double
1 B	8380/4	100/40	150	Dir. 100g	3	
2 A	8464/77	0/120	115	Assoc. 110g	3	Broad, mult.
3 A	8843/56	0/150	125	Assoc. 140g	3	Broad, mult.
4 A	8861/82	0/360	110	nil	3	Broad, mult.
5 A	9266/81	0/80	150	nil	3	Broad, mult.
6 A	9307/26	0/90	135	Assoc. 110g	3	" "
7 A	9713/28	0/80	130	Assoc. 160g	3	" "
8 A	9743/64	0/160	130	Assoc. 400g	3	" "
9 A	181/91	0/130	125	Assoc. 70g	3	" "
10 A	206/21	0/40	125	Assoc. 150g	3	" "
23 A	2642/55	0/70	130	Assoc. 580g	3	" "

## APPENDIX II

### A. EQUIPMENT

The electromagnetic unit and the magnetometer are the key instruments in the Canadian Aero Mineral Surveys Limited Otter survey system. The remainder of the equipment consists of a radio-altimeter, a scintillation counter, an accelerometer, a continuous-strip camera, two recorders and a fiducial numbering system.

The EM unit is the low frequency (320 c.p.s.) in-phase/out-of-phase system designed by Mullard Ltd. of England and operated formerly by Riocanex. The transmitting and receiving coils are mounted on the wingtips of the Otter, with a vertical coplanar orientation and a separation of 61 feet. An electronic null device is adjusted so that in the absence of a conductor within the range of the system no signal is recorded. The anomalous signal is divided into two components, the "in-phase" component having the same phase as the transmitted field and the "quadrature" or "out-of-phase" component being at right angles to it. These two measurements are recorded on two channels of the six-channel recorder.

Variations in the total magnetic field of the earth are measured by the Elliott electron-beam tube magnetometer mounted in the aircraft. This instrument was designed by Elliott Brothers (London) Ltd. Anomalies as small as 10-15 gammas can normally be distinguished. The output of the magnetometer is presented as one channel on the six-channel recorder to facilitate correlation with the EM traces. It is also presented at a larger scale and in rectilinear form on a separate recorder, these recordings being used in the preparation of isomagnetic contour maps whenever they are required.

An APN-1 radio altimeter provides a terrain clearance profile on one channel of the six-channel recorder. Because EM response decays rapidly with increasing altitude this altitude information is important in the analysis of the EM data.

A vertical accelerometer mounted in the aircraft provides a record of the air turbulence and of any drastic manoeuvres of the aircraft. The accelerometer trace on the six-channel recorder is often helpful in recognizing spurious blips on the EM traces caused by air turbulence on drastic manoeuvres.

A Nuclear Enterprises Mark VI-A scintillation counter in the aircraft records gamma radiation from the land surface. This record can be used as auxiliary location information since outcrop, overburden-covered areas and swamps are readily distinguishable by their radiation levels.

The entire flight path is photographed by a vertically-mounted Aeropath 35 mm. continuous-strip camera.

Synchronization of the film strip with the two recorders is accomplished by means of an automatic fiducial numbering system which prints simultaneous time markers on all three records at regular time intervals, normally every ten seconds.

B. DESCRIPTION OF RECORDS

Rectilinear Magnetic Record

With the chart oriented so that fiducial numbers increase from right to left, upward deflections on the chart indicate increases in the total magnetic field of the earth. At the normal setting (250 scale) the smallest division on the chart is approximately equivalent to 10 gammas. When the record "steps" a change of approximately 400 gammas is indicated. Three other scales are available to accommodate areas of large magnetic relief. On the "500" scale 1 small division is 20 gammas and a step is equivalent to 800 gammas. On the "1250" scale 1 division is 50 gammas and a step is 2000 gammas, and on the "2500" scale 1 division is 100 gammas and a step is 4000 gammas. All changes of scale are noted on the tape by the operator.

The fiducial marks are normally spaced at 10-second intervals, a spacing which is equivalent to approximately 1500 feet on the ground. The exact horizontal scale of the tape can be established by measuring the fiducial spacing on the map.

Brush Six-Channel Record

With the chart oriented so that fiducial numbers increase from right to left the tracings from the bottom to the top of the chart are as follows:

- 1) Fiducial markers - same comments as above.
- 2) Magnetometer - positive upward. At the normal setting (250 scale) 1 mm. is approximately equivalent to 12.5 gammas and a step is approximately 400 gammas. At the "500", "1250", and "2500" scales 1 mm. is 25 gammas, 62.5 gammas, and 125 gammas respectively and the steps are 800, 2000, and 4000 gammas.

It should be noted that this trace is a differential record with a time constant of some 4 seconds. The net result of this is to wipe out long term variations but to leave short term changes relatively unaltered. This magnetometer record is therefore used primarily to check for possible relationships between EM anomalies and sharp magnetic features.

- 3) EM In-Phase - positive upward. 1 mm. represents approximately 20 parts per million, referred to the primary field at the receiving coil. The scale is linear until approximately 600 p.p.m. is reached, after which compression occurs to a level of 1200 p.p.m., beyond which the value is "off-scale."
- 4) EM Quadrature - positive upward. Same scale as In-Phase.
- 5) Altimeter - increasing altitude upward. Centre line position approximately 150 feet. Scale below 150 feet approximately 5 feet per mm. Scale above 150 feet approximately 7 feet per mm.
- 6) Accelerometer - an acceleration of  $1/3$ "G" is equivalent to a 5 mm. deflection from the central point.
- 7) Scintillometer - positive upward. 5 mm. represents a change of approximately 0.06 mr./hr.

C. SURVEY AND MAP COMPILATION PROCEDURES

Uncontrolled airphoto mosaics usually serve as base maps for flying the survey and for compilation of the geophysical data. The most common scale is 1/4 mile per inch.

The flight lines are oriented perpendicular to the assumed longest dimension of massive sulphide occurrences anticipated in the survey area. Occasionally two or more line directions have to be used to accommodate changes of geological strike within the area. Line spacings normally range between 1/8 mile and 1/4 mile.

The navigator is provided with "flight strips" of the area to be surveyed. These flight strips are a copy of the airphoto mosaic, with the intended flight lines inked and numbered. Navigation along the parallel flight lines is accomplished by visual means based on the physical detail observed on the photos. The aircraft is flown at a terrain clearance of 150 feet or, in rough terrain, at the lowest safe altitude.

Flight path is recovered in the field by comparison of the 35 mm. strip film with the airphoto mosaics. Identifiable points are marked on the mosaics and designated by numbers determined from the fiducial numbering system on the film. These recovered flight lines provide the positional basis for plotting the geophysical data. The EM anomalies are listed and graded in the field and are often plotted on the field mosaics to permit immediate acquisition of ground.

In our Ottawa office transparent overlays of the mosaics are prepared, upon which are drafted the recovered

fiducial points, the interpolated flight line positions, the key planimetric features as traced from the mosaics, and the significant geophysical data. The geophysical data are subjected to a careful analysis by a geophysicist who prepares an interpretation report including recommendations for further work.

D. DATA PRESENTATION

The data presentation procedure which we employ for the Otter geophysical system is a combination of an anomaly listing and a plan map plot of graded EM anomalies. The anomaly listing provides the significant details concerning each anomaly and the map gives a "bird's eye view" of the conductors detected.

For purposes of listing and to facilitate reference in the report each EM anomaly is assigned a "name," which is made up of the number of the line upon which the anomaly occurs plus a letter. For example, on line 257 anomalies would be named 257A, 257B, 257C, etc., from south to north or from west to east. The letter which appears beside each EM anomaly on the map is therefore part of its name. These names also appear on the Brush records and in the anomaly list.

The anomaly list contains the fiducial numbers at the edges of the EM anomaly, the in-phase and quadrature amplitudes in p.p.m., the altitude at which the anomaly was detected, the positional relationship of the EM anomaly to magnetic anomalies (if any), a rating, and comments concerning any other pertinent characteristics of the anomaly.

The nomenclature used in the "magnetics" column of the anomaly list requires some explanation. The main terms used are side, flank, edge and direct. These refer to the position of the EM peak relative to the axis of the magnetic feature. "Direct" depicts coincident peaks and similar widths; "edge" is slightly offset; "flank" is somewhere along the flank of the magnetic anomaly; "side" is down near the base. "N. Flank 800g" means that the EM anomaly occurs along the northern flank of a magnetic feature of 800 gammas total amplitude. When one peak of a multiple EM anomaly coincides with a magnetic high the specific peak may be designated. For example, if the southern peak of a double EM anomaly coincided with a 250 gamma magnetic anomaly the nomenclature would be "Dir. S. 250g".

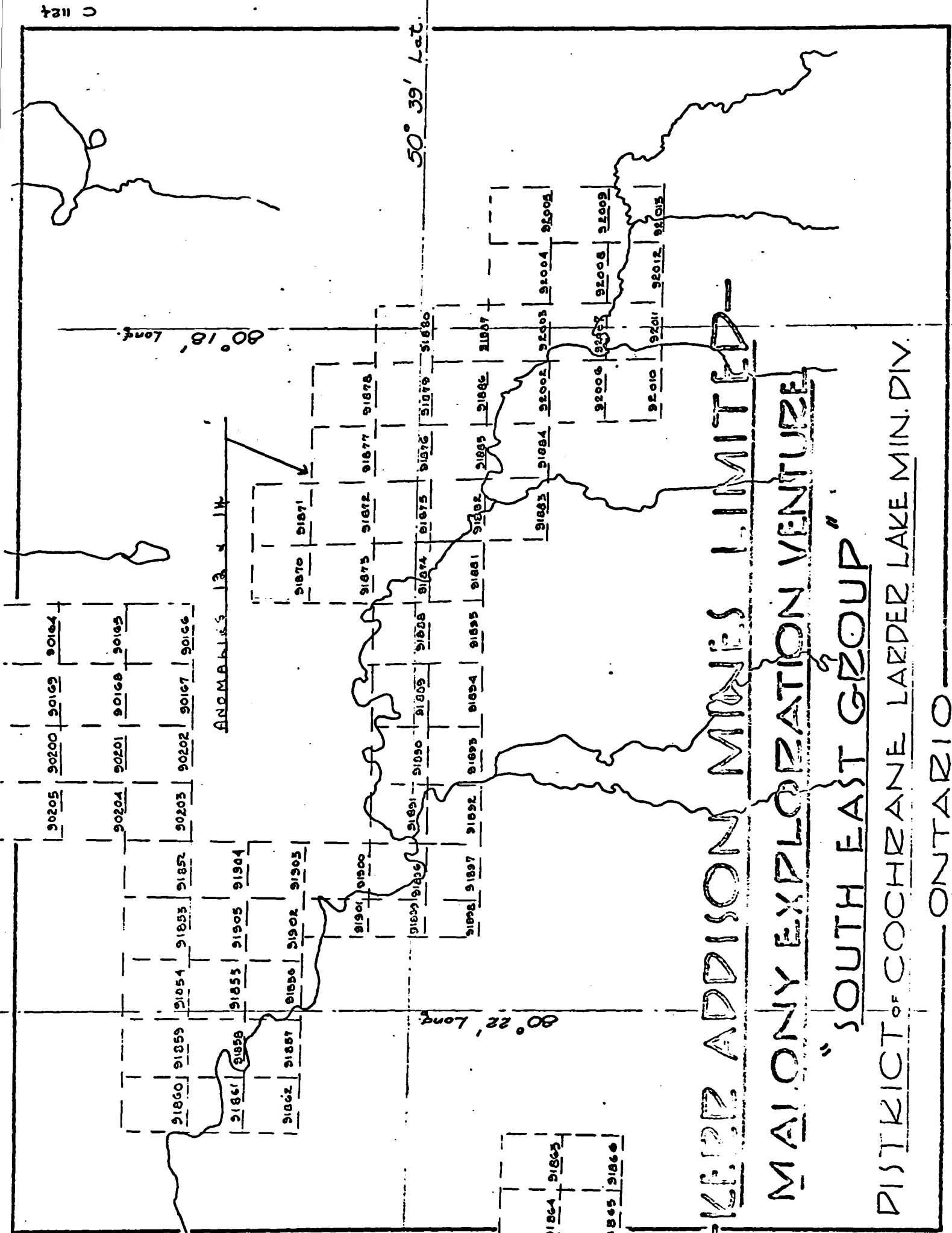
The rating assigned to each EM anomaly in the listing determines the symbol which represents the anomaly on the map. Six categories of anomalies are defined: 1A, 1B, 2A, 2B, 3, and X. The numbers "1", "2" and "3" are primarily a measure of in-phase amplitude corrected for altitude variation: "1" is for very large anomalies, "2" for intermediate, and "3" for relatively weak response. This rating is sometimes affected by the shape, by the in-phase to quadrature ratio, or by the location of the anomaly. The letters "A" and "B" merely refer to the magnetics:

"A" indicates a directly coincident magnetic anomaly, and "B" indicates the lack thereof. The "X" rating is reserved for questionable anomalies. The legend on the map shows the symbol used for each of these ratings. In general, the more the rectangle is filled in, the stronger the anomaly.

In the case of directly coincident magnetic anomalies, the amplitude of the magnetic feature is shown on the EM map. It is stencilled beneath the symbol which portrays the EM anomaly.

During the final interpretation stage, EM anomalies are correlated from line to line wherever possible and the conductive zones are outlined. All definite conductors are numbered on the map and discussed in the report.





80° 18' Long.

50° 39' Lat.

ANDMABLES 13 & 14

80° 22' Long.

KEENE ADDISON MINES LIMITED  
 MALONEY EXPLORATION VENTURE

"SOUTH EAST GROUP"

DISTRICT OF COCHRANE LAKE MIN. DIV.

ONTARIO

91864 91863

91865 91866

90205 90200 90169 90164

90204 90201 90168 90165

90203 90202 90167 90166

91860 91859 91854 91853 91852

91861 91858 91855 91905 91904

91862 91887 91856 91902 91905

91891 91900

91899 91926

91898 91897

91891 91901

91892 91893 91894 91895 91896

91893 91894 92002 92003 92004 92005

92006 92007 92008 92009

92010 92011 92012 92015

91870 91871

91873 91872 91877 91878

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91883 91884 92002 92003 92004 92005

92006 92007 92008 92009

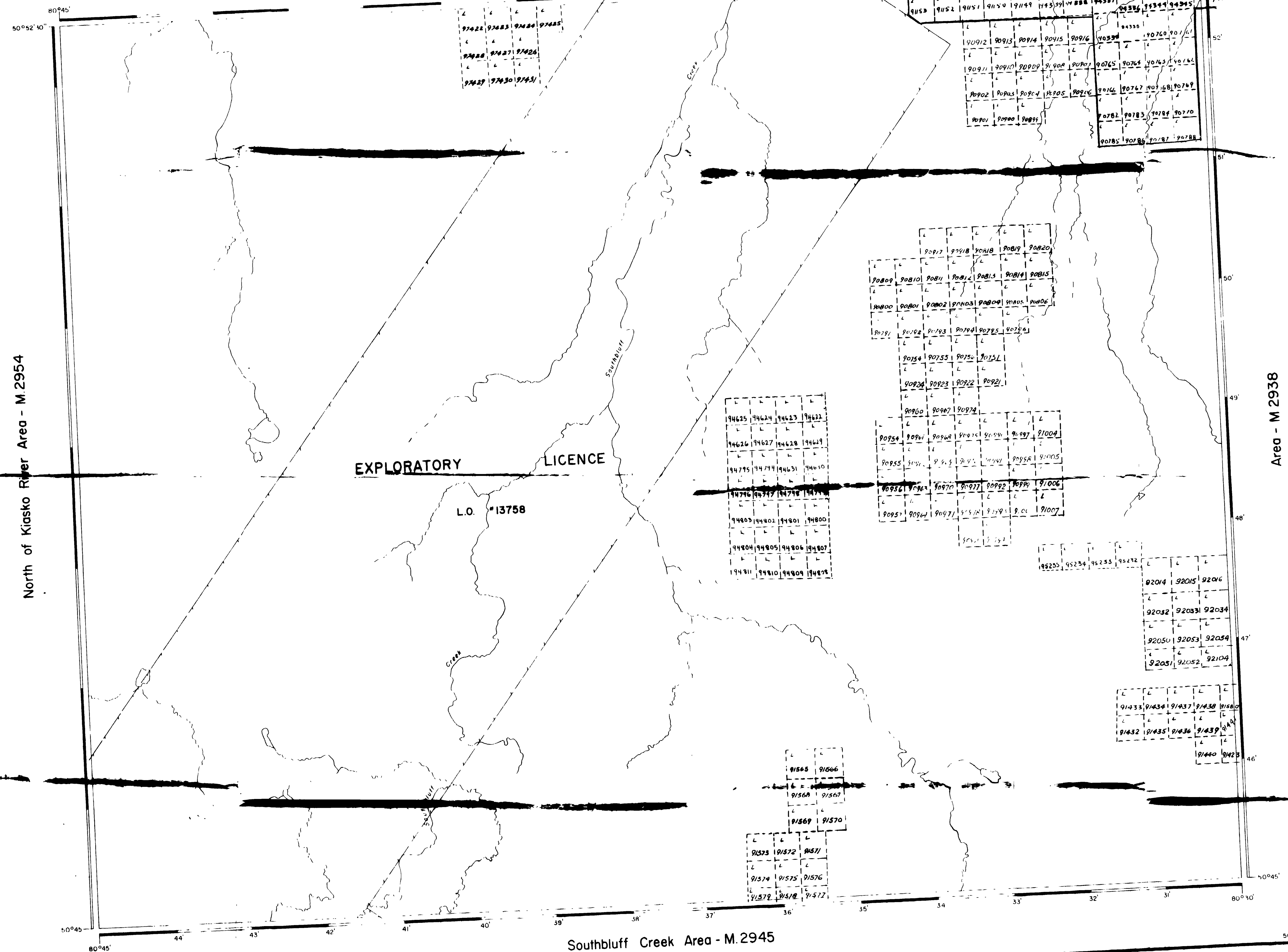
92010 92011 92012 92015

WS222

CENTER PART SOUTHBLUFF CREEK

WS222

North Part Southbluff Creek Area - M.2955



Southbluff Creek Area - M.2945

AREA OF  
**CENTER PART  
 SOUTHBLUFF CREEK**

DISTRICT OF  
COCHRANE

LARDER LAKE  
MINING DIVISION

SCALE: 1-INCH = 40 CHAINS

LEGEND

- PATENTED LAND
- CROWN LAND SALE
- LEASES
- LOCATED LAND
- LICENSE OF OCCUPATION
- MINING RIGHTS ONLY
- SURFACE RIGHTS ONLY
- ROADS
- IMPROVED ROADS
- KING'S HIGHWAYS
- RAILWAYS
- POWER LINES
- MARSH OR MUSKEG
- MINES
- CANCELLED



NOTES

400' Surface Rights Reservation around all lakes and rivers

DATE OF ISSUE

Jan 27 1967

ONTARIO DEPT. OF MINES

ON: DEPT OF MINES  
 MINING LANDS BR  
 THIS MAP FOR CHECKING  
 PURPOSES ONLY - MUST  
 NOT BE SOLD

PLAN NO. **M.2956**

DEPARTMENT OF MINES  
— ONTARIO —



200

TRIM LINE

507803

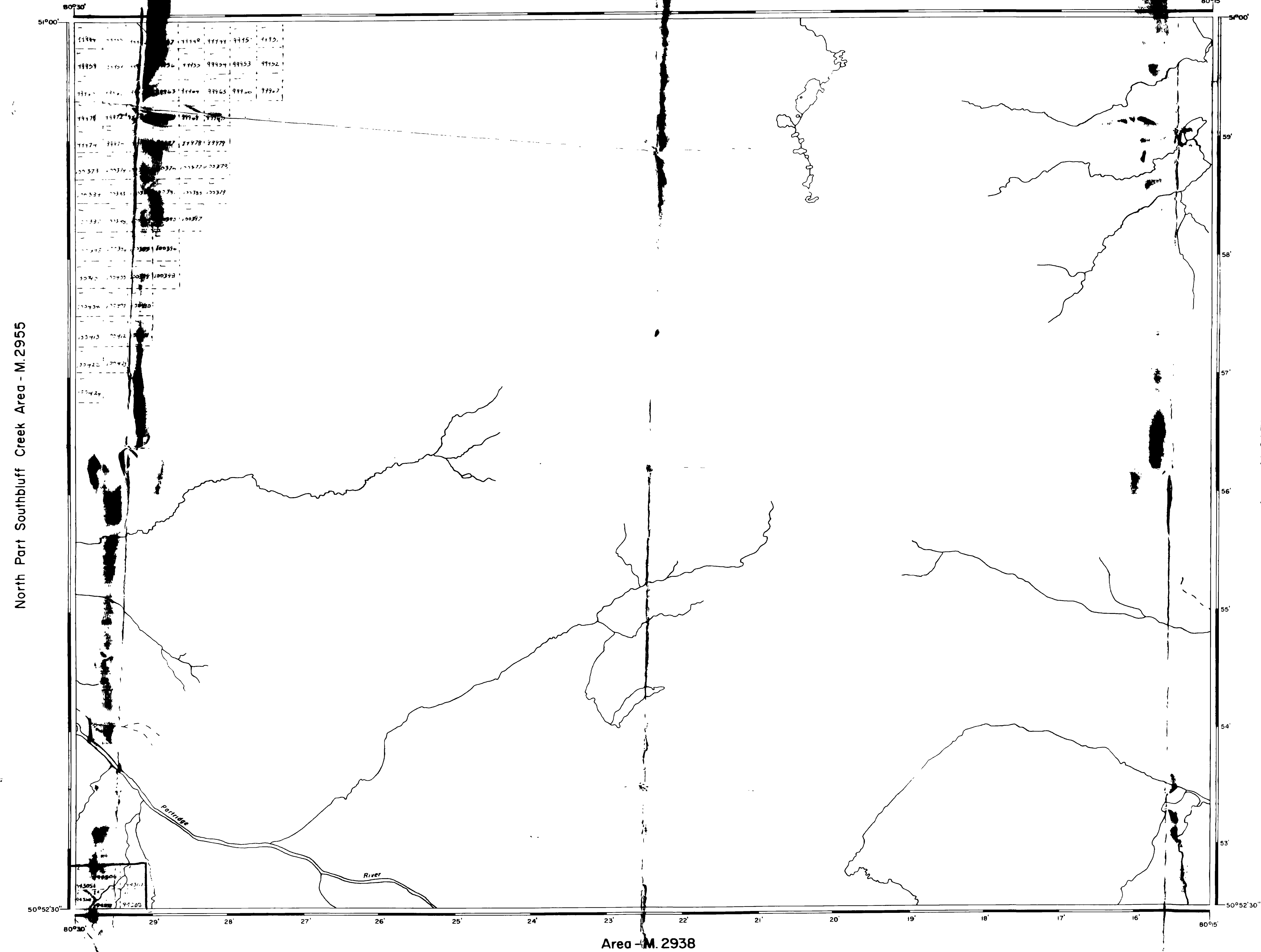
W.5232

W.5232

W.5232

W.5232

South of Partridge River Area - M.2951



North Part Southbluff Creek Area - M.2955

Area - M. 2935

Area - M. 2938

AREA OF

DISTRICT OF COCHRANE

LARDER LAKE MINING DIVISION

SCALE: 1-INCH = 40 CHAINS

LEGEND

PATENTED LAND	⊙
CROWN LAND SALE	C.S.
LEASES	⊖
LOCATED LAND	Loc.
LICENSE OF OCCUPATION	L.O.
MINING RIGHTS ONLY	M.R.O.
SURFACE RIGHTS ONLY	S.R.O.
ROADS	—
IMPROVED ROADS	—
KING'S HIGHWAYS	—
RAILWAYS	—
POWER LINES	—
MARSH OR MUSKEG	—
MINES	⋆
CANCELLED	C.

NOTES

This area represents north-west part of AEROMAGNETIC MAP 2363 G

400' Surface Rights Reservation around all lakes and rivers

DATE OF ISSUE

JAN 27 1967

ONTARIO DEPT. OF MINES

ONT. DEPT. OF MINES  
MINING LANDS BR.

THIS MAP FOR CHECKING  
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PLAN NO. M.2936

DEPARTMENT OF MINES

— ONTARIO —

508802



W.S.222

NORTH PART SOUTHBLUFF CREEK

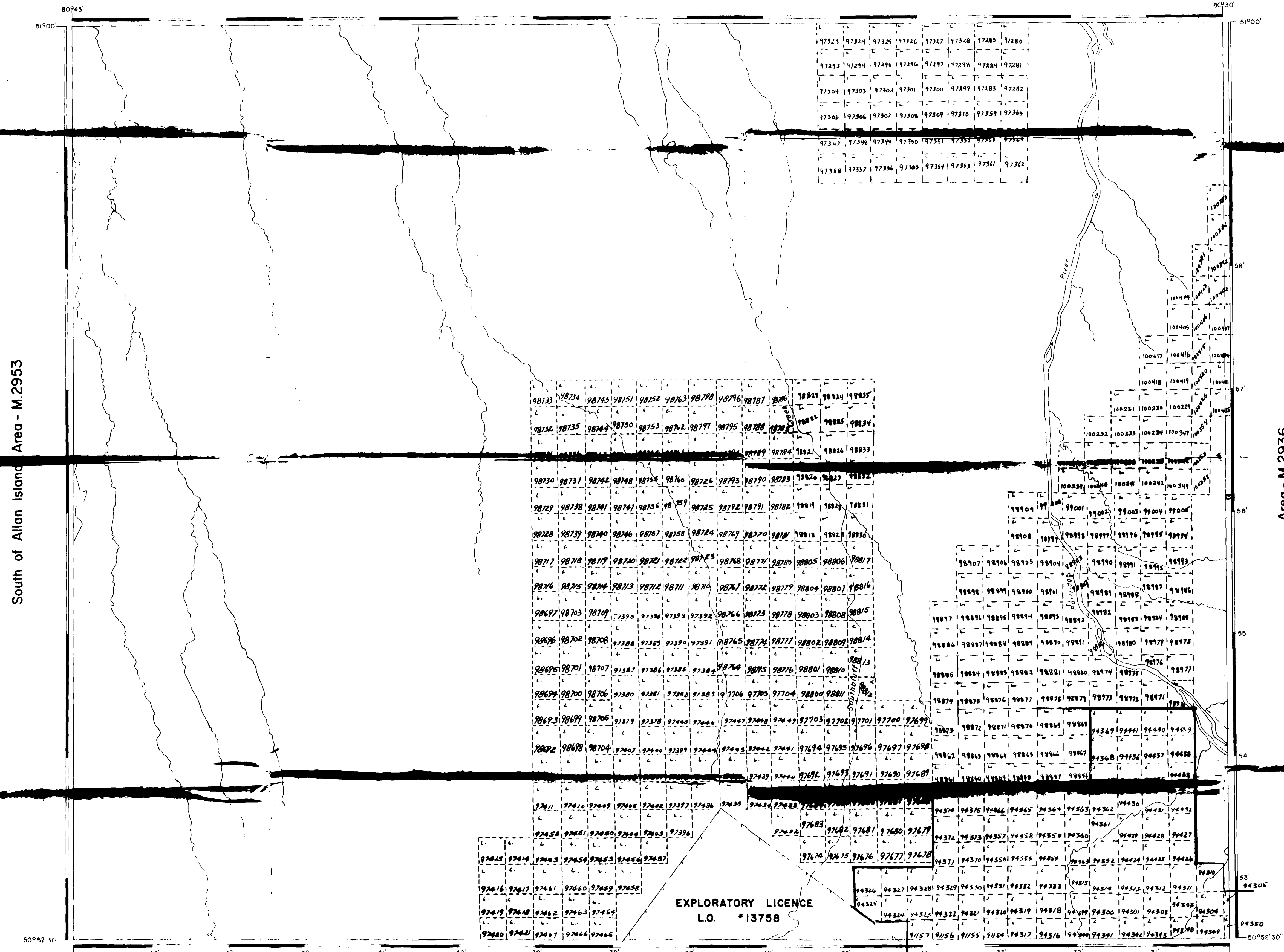
222S.M

W.S.222

NORTH PART SOUTHBLUFF CREEK

222S.M

South of Bushy Island Area - M.2934



Center Part Southbluff Creek Area - M.2956

TRIM LINE

AREA OF NORTH PART SOUTHBLUFF CREEK

DISTRICT OF COCHRANE

LARDER LAKE MINING DIVISION

SCALE: 1-INCH = 40 CHAINS

LEGEND

- PATENTED LAND
- CROWN LAND SALE
- LEASES
- LOCATED LAND
- LICENSE OF OCCUPATION
- MINING RIGHTS ONLY
- SURFACE RIGHTS ONLY
- ROADS
- IMPROVED ROADS
- KING'S HIGHWAYS
- RAILWAYS
- POWER LINES
- MARSH OR MUSKEG
- MINES
- CANCELLED

- CS
- Loc
- LO
- MRO
- SRO

NOTES

400' Surface Rights Reservation around all lakes and rivers

DATE OF ISSUE  
JAN 27 1967  
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MINING LANDS BR.  
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PLAN NO. M.2955

DEPARTMENT OF MINES  
- ONTARIO -

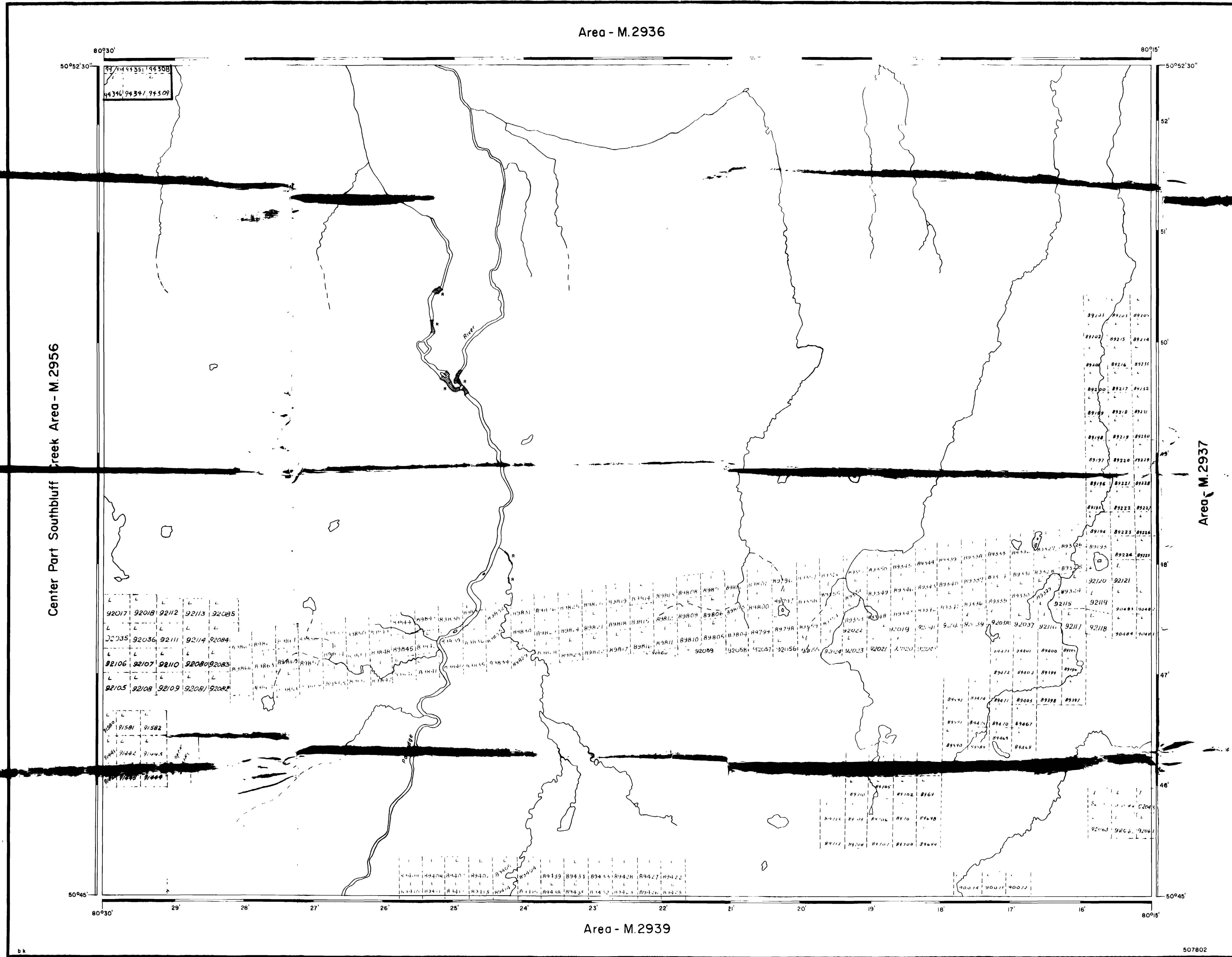




85ES.M

85ES.M

TRIM LINE



AREA OF

DISTRICT OF COCHRANE

LARDER LAKE MINING DIVISION

SCALE: 1-INCH = 40 CHAINS

**LEGEND**

PATENTED LAND	⊙
CROWN LAND SALE	CS
LEASES	⊙
LOCATED LAND	Loc
LICENSE OF OCCUPATION	LO
MINING RIGHTS ONLY	MRO
SURFACE RIGHTS ONLY	SRO
ROADS	—
IMPROVED ROADS	—
KING'S HIGHWAYS	—
RAILWAYS	—
POWER LINES	—
MARSH OR MUSKEG	—
MINES	⋈
CANCELLED	C.

**NOTES**

This area represents south-west part of AEROMAGNETIC MAP 2363G

400' Surface Rights Reservation around all lakes and rivers.

DATE OF ISSUE

JAN 27 1967

ONTARIO DEPT. OF MINES

ONT. DEPT. OF MINES  
MINING LANDS BR.

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PLAN NO. **M.2938**

DEPARTMENT OF MINES

— ONTARIO —

85ES.M

85ES.M



230

TRIM LINE

507802

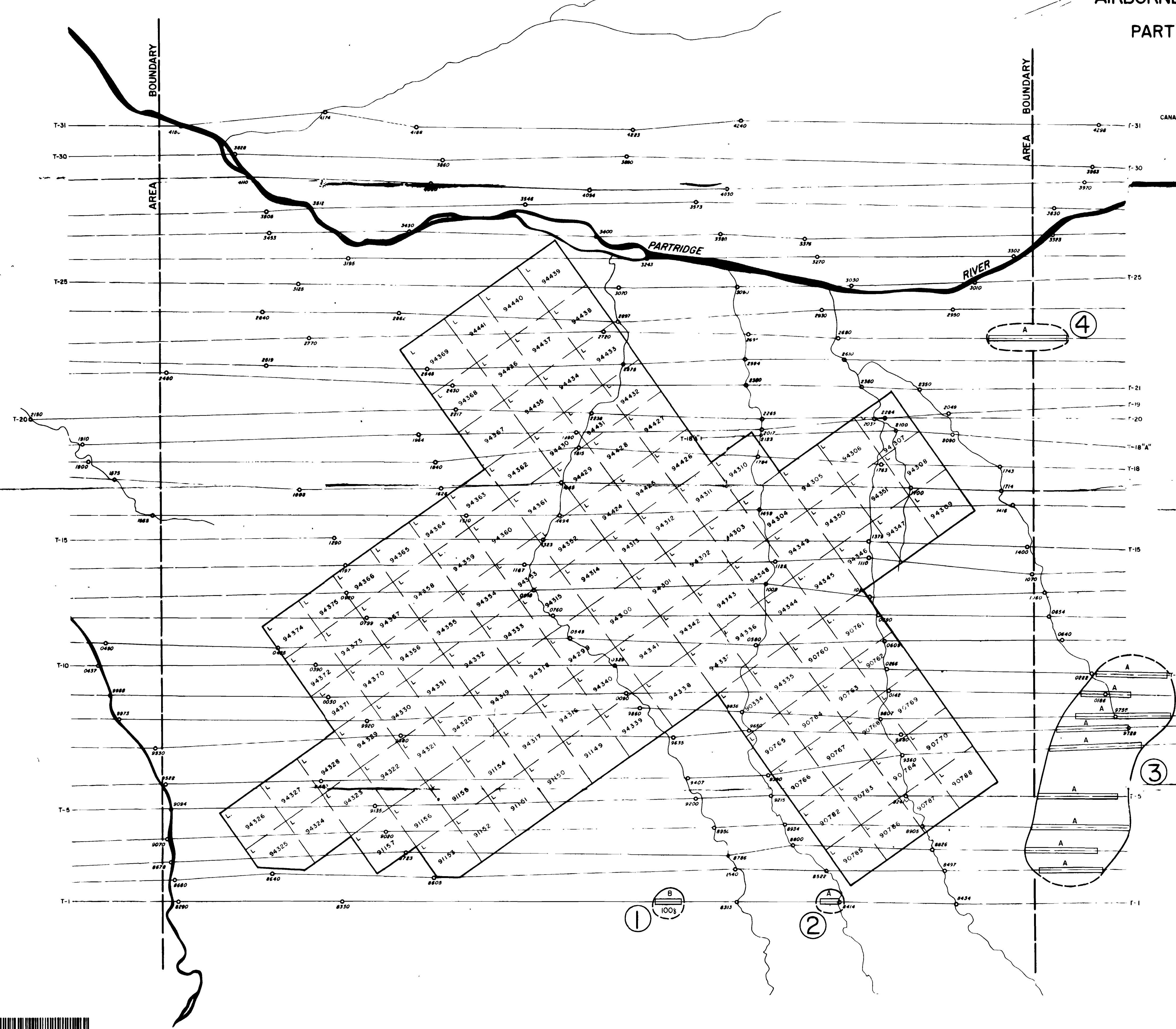
# AIRBORNE ELECTROMAGNETIC SURVEY PARTRIDGE RIVER AREA, ONTARIO

FOR  
A. W. STOLLERY  
BY



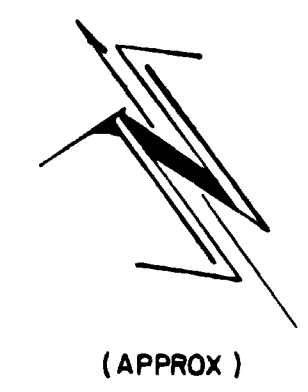
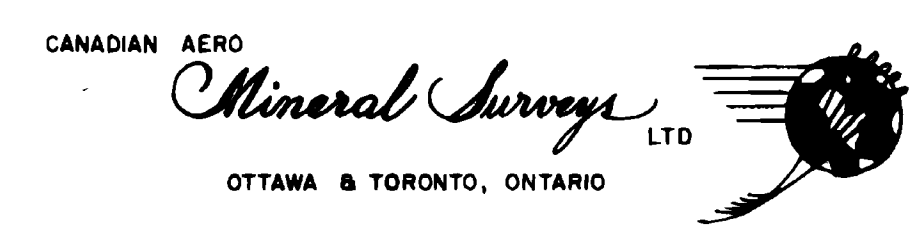
SCALE: 1 INCH = 1/4 MILE (approx.)

- LEGEND**
- 1 A ANOMALY
  - 1 B ANOMALY
  - 2 A ANOMALY
  - 2 B ANOMALY
  - 3 ANOMALY
  - X type ANOMALY
- MEAN TERRAIN CLEARANCE 150 FEET  
 FLIGHT LINE SPACING 1/8 MILE  
 RIVERS AND LAKES
- HORIZONTAL CONTROL BASED ON PHOTO LAYDOWN



# AIRBORNE MAGNETOMETER SURVEY PARTRIDGE RIVER AREA, ONTARIO

FOR  
A. W. STOLLERY  
BY

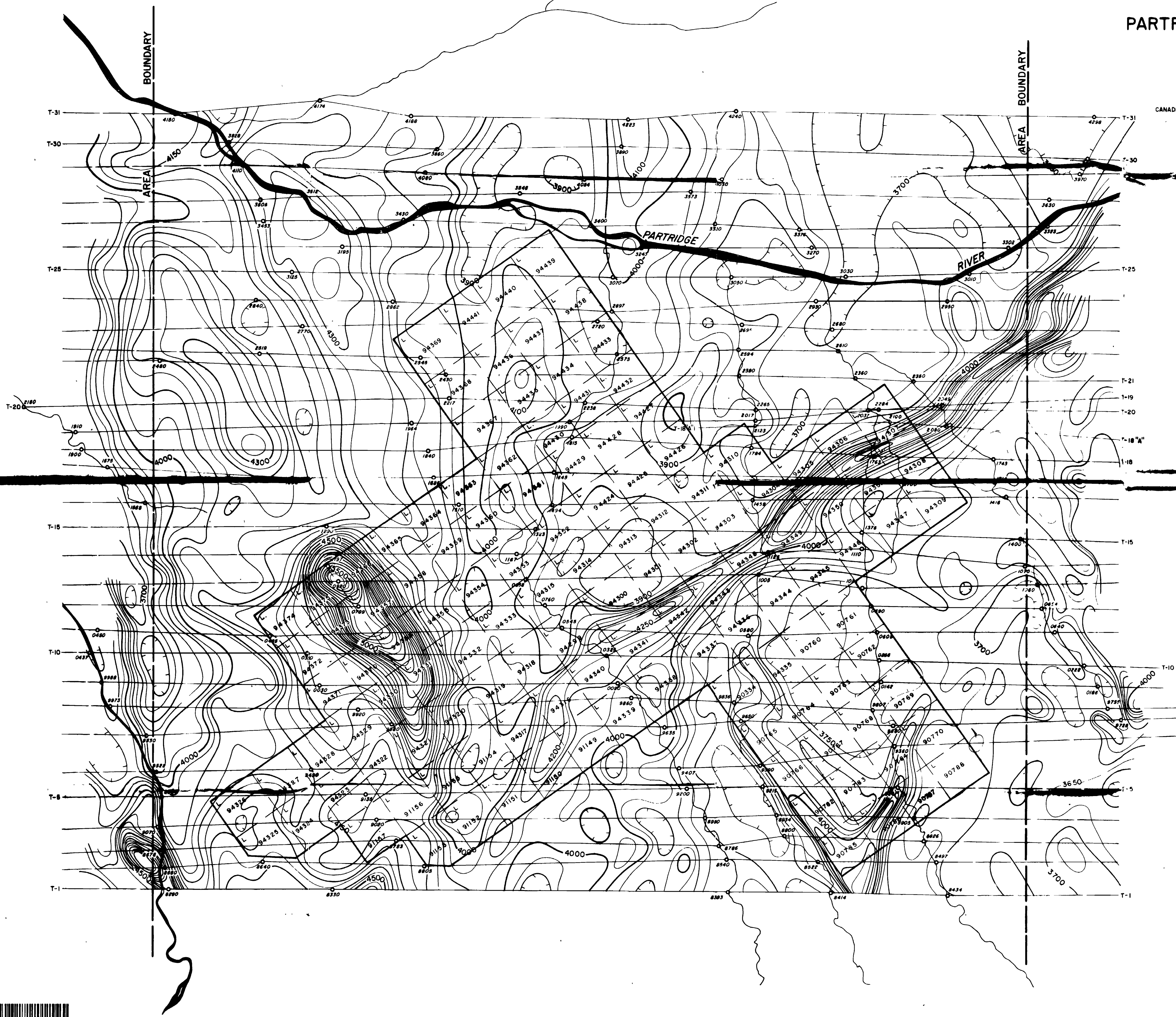


SCALE: 1 INCH = 1/4 MILE (approx.)

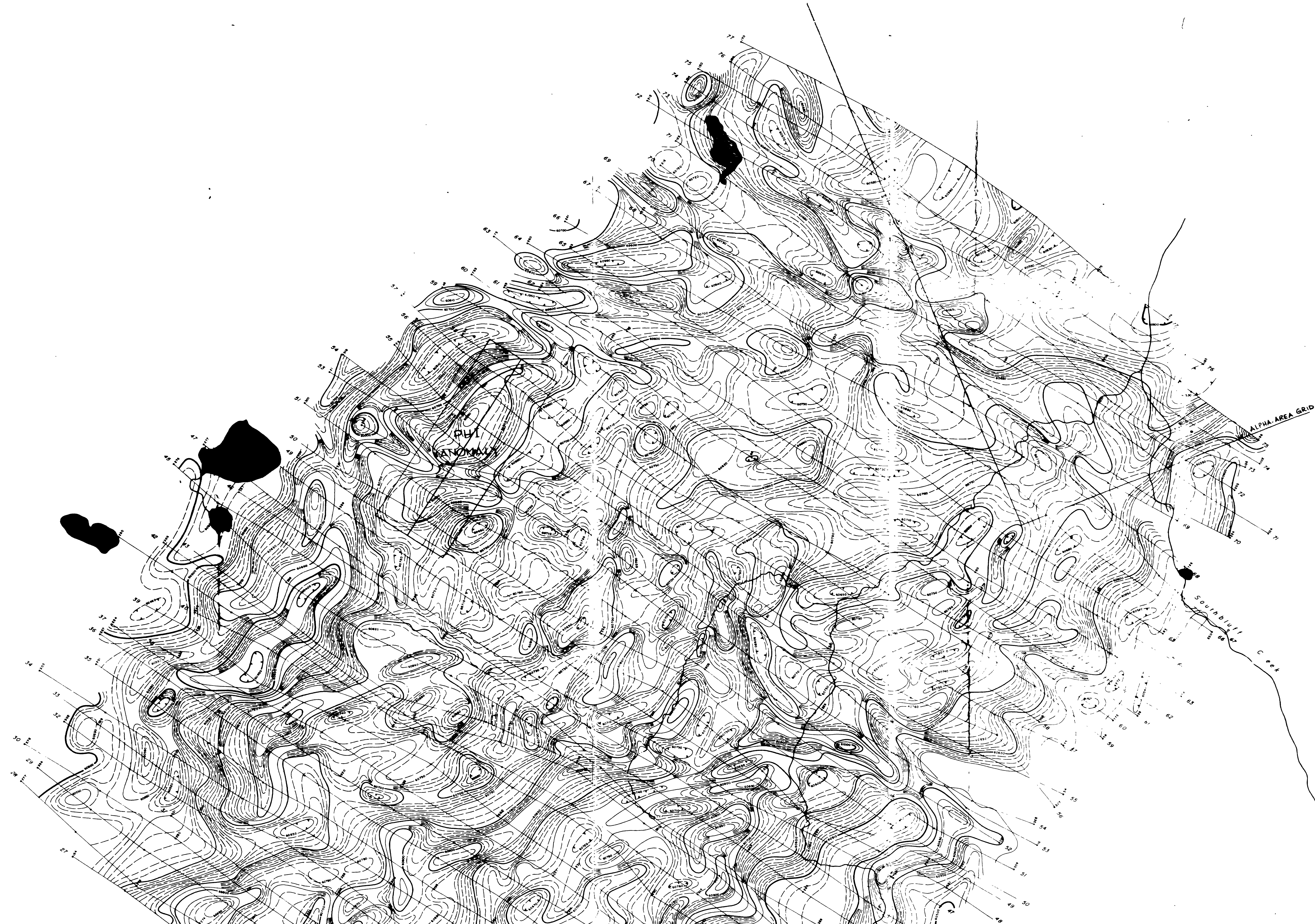
### LEGEND

- CONTOUR INTERVAL 50 GAMMAS
- 500 GAMMA CONTOUR
- 100 GAMMA CONTOUR
- 50 GAMMA CONTOUR
- MAGNETIC LOW

- MEAN TERRAIN CLEARANCE... 150 FEET
- FLIGHT LINE SPACING... 1/8 MILE
- RIVERS AND LAKES...
- HORIZONTAL CONTROL BASED ON PHOTO LAYDOWN







LEGEND

- 10 Contour interval
- 500 Contour interval
- 100 Contour interval
- 50 Contour interval
- 10 Contour interval
- Depression
- Flight line

INDEX

A

ARGOR EXPLORATIONS LTD.  
Aeromagnetic Survey ASSIGNMENT WORK

TOTAL INTENSITY CONTOURS T.1232  
**ALPHA GAMMA AREA**

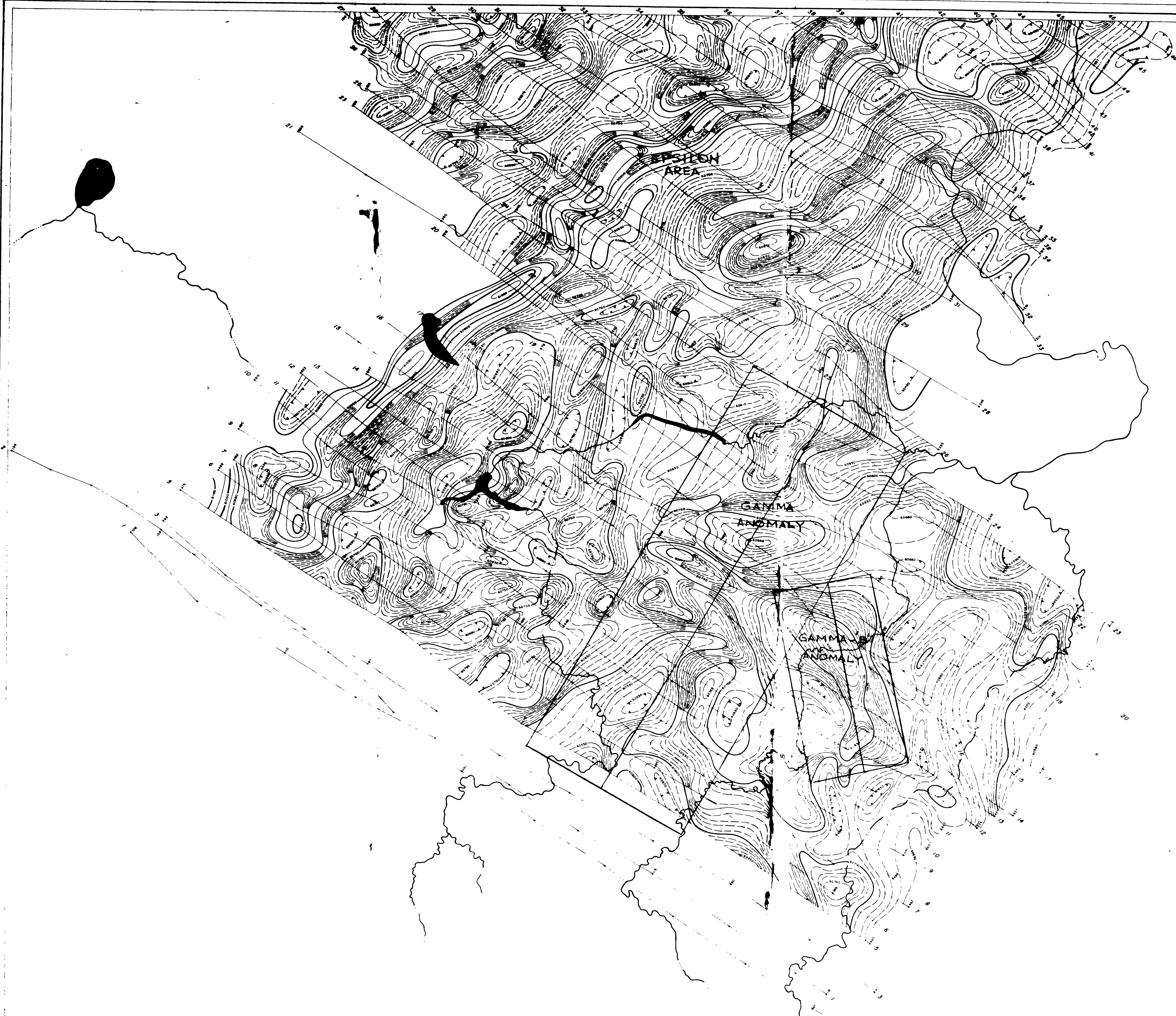
Scale 1" = 660 Feet (approx)


Flown by  
NIAGARA HELICOPTERS LTD  
Niagara Falls, Ontario.  
Compilation & Drafting by  
BARRINGER RESEARCH LTD  
Toronto, Canada  
Mar - April - May 1967  
DWG 6-141-1A

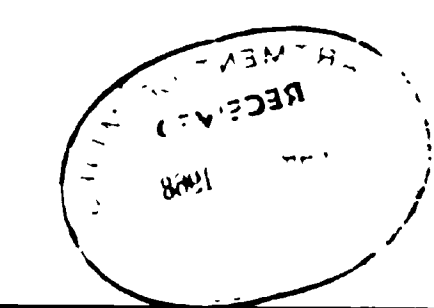
Magnetic declination  
12° 00' West

260






  
 270



**LEGEND**  
 10 ft Contour interval  
 500 ft Contour interval  
 100 ft Contour interval  
 50 ft Contour interval  
 10 ft Contour interval  
 Depression  
 Flight line

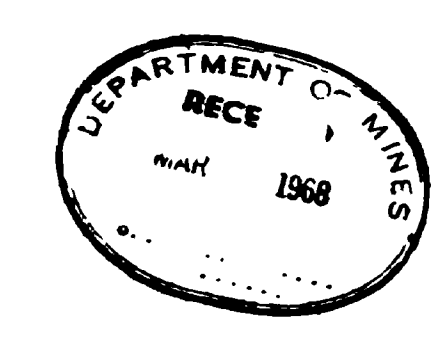
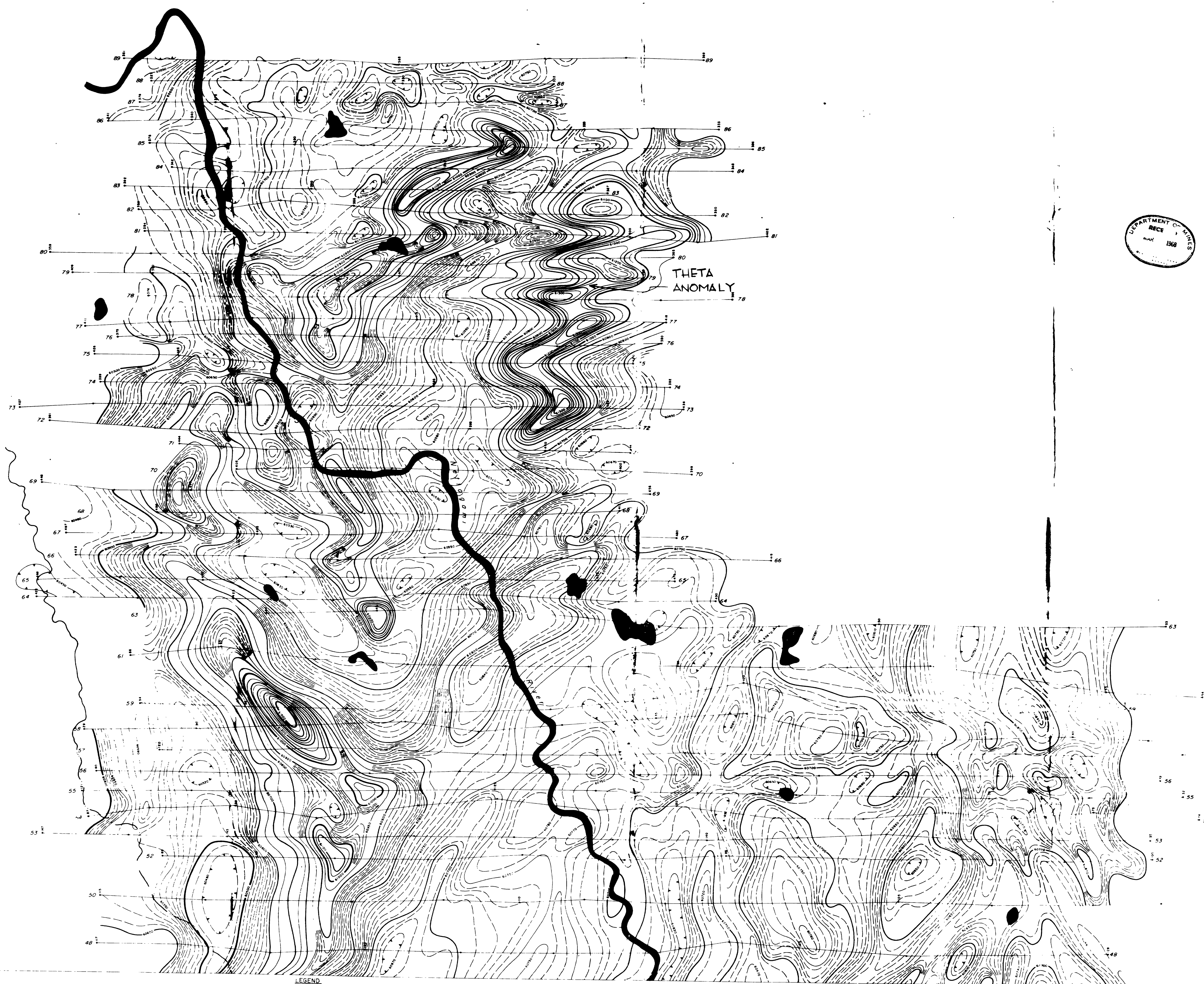
**INDEX**  
 A  
 B

ARGOR EXPLORATIONS LTD.  
 Aeromagnetic Survey  
 TOTAL INTENSITY CONTOURS  
**ALPHA GAMMA AREA**

Scale 1" = 660 Feet (approx.)

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 NIAGARA HELICOPTERS LTD  
 Niagara Falls, Ontario  
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 Toronto, Canada  
 Mar-Apr-May 1967  
 DWG 6-141-15





THETA  
ANOMALY

- LEGEND
- 10 ft Contour interval
  - 500 ft Contour interval
  - 100 ft Contour interval
  - 50 ft Contour interval
  - 10 ft Contour interval
  - Depression
  - Flight line

INDEX  
A

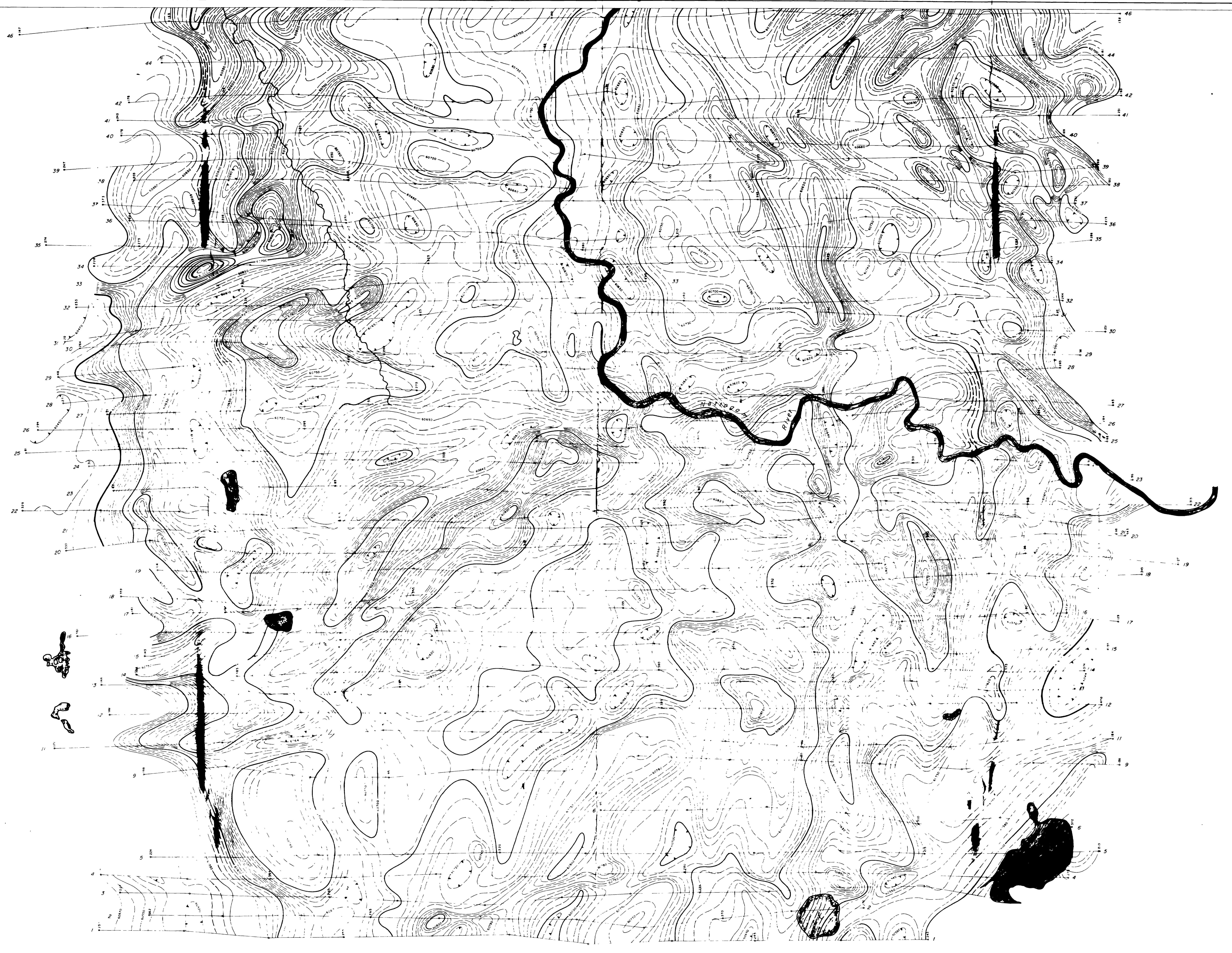
ARGOR EXPLORATIONS LTD.  
Aeromagnetic Survey  
TOTAL INTENSITY CONTOURS  
BIG EYE AREA T.1232

Scale 1" = 660 Feet (approx.)  
R. Whistler, Eng., Feb 14/68

Flown by NIAGARA HELICOPTERS LTD  
Niagara Falls, Ontario  
Completion & Drafting by BARRINGER RESEARCH LTD  
Toronto, Canada  
Mar - April - May 1967  
DWG 6-141-2A

Magnetic declination 11° 53' West  
280





END

- 10 ft Contour interval
- 500 ft Contour interval
- 100 ft Contour interval
- 50 ft Contour interval
- 10 ft Contour interval
- Depression
- Flight line

INDEX

A
B

ASSESSMENT WORK ARGOR EXPLORATIONS LTD.  
Aeromagnetic Survey

T.1232

TOTAL INTENSITY CONTOURS

**BIG EYE AREA**

Scale 1" = 660 Feet (approx)

Flown by  
NIAGARA HELICOPTERS LTD  
Niagara Falls, Ontario  
Compilation & Drafting by  
BARRINGER RESEARCH LTD  
Toronto, Canada  
Mar - April - May 1967

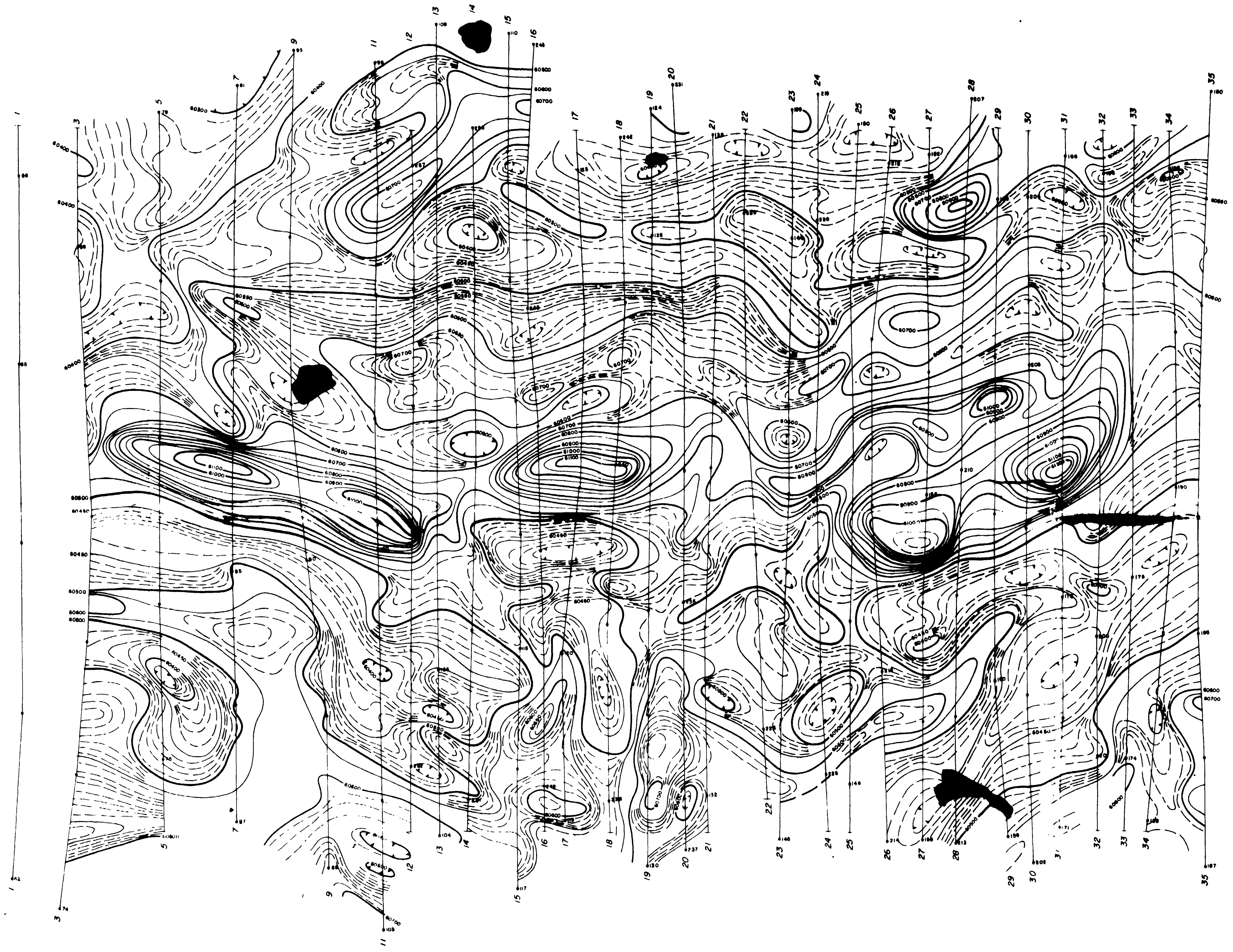
Magnetic declination  
11° 55' West





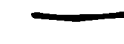
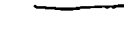

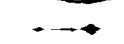

290

DWG 6-141-2B





LEGEND

-  10 ft Contour interval
-  500 ft Contour interval
-  100 ft Contour interval
-  50 ft Contour interval
-  10 ft Contour interval
-  Depression
-  Flight line

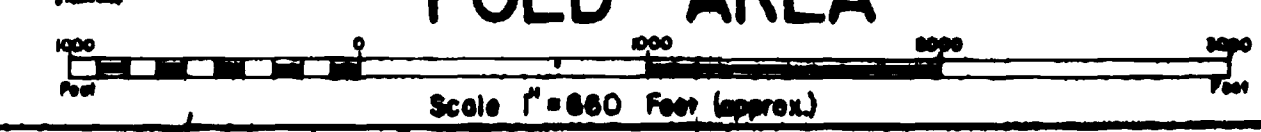
ARGOR EXPLORATIONS LTD.  
Aeromagnetic Survey

ASSESSMENT WORK

TOTAL INTENSITY CONTOURS

T.1232

FOLD AREA



Magnetic declination  
11° 58' West



300

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Toronto, Canada.  
Mar. - April - May 1967

DWG. 6-141-3

*Handwritten signature and date: [Signature] Feb 14/67*



ASSESSMENT WORK

1:1232

**LEGEND**

- 10 = Contour interval
- 500 = Contour interval
- 100 = Contour interval
- 50 = Contour interval
- 10 = Contour interval
- Depression
- Flight line

**ARGOR EXPLORATIONS LTD.**  
 Aeromagnetic Survey  
**TOTAL INTENSITY CONTOURS**  
**YESTERDAY RIVER AREA**

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Magnetic declinat  
 11°44' West



310

