• RPT on IP Survey

2.1017

SUMMARY

An induced polarization and resistivity survey was executed over an E-W grid in the northern parts of Halliday and Midlothian Twps.

The background chargeabilities and resistivities obtained over the felsic metavolcanics are in the neighbourhood of 5 milliseconds, and ranging up to 10,000 ohmmeters respectively.

At least three parallel bands of polarizable material are detected. Zone B, which is the center band, shows the strongest responses, with Zones A and C respectively south and north of Zone B being somewhat weaker.

An initial drill program totalling 1,800 feet in length is recommended to investigate the sources of anomalous polarization.

AUGUST 1972

REPORT ON AN
INDUCED POLARIZATION SURVEY
HALLIDAY AND MIDLOTHIAN TWP.,
LARDER LAKE MINING DIVISION
ON BEHALF OF
GLEN COPPER MINES LTD.

INTRODUCTION

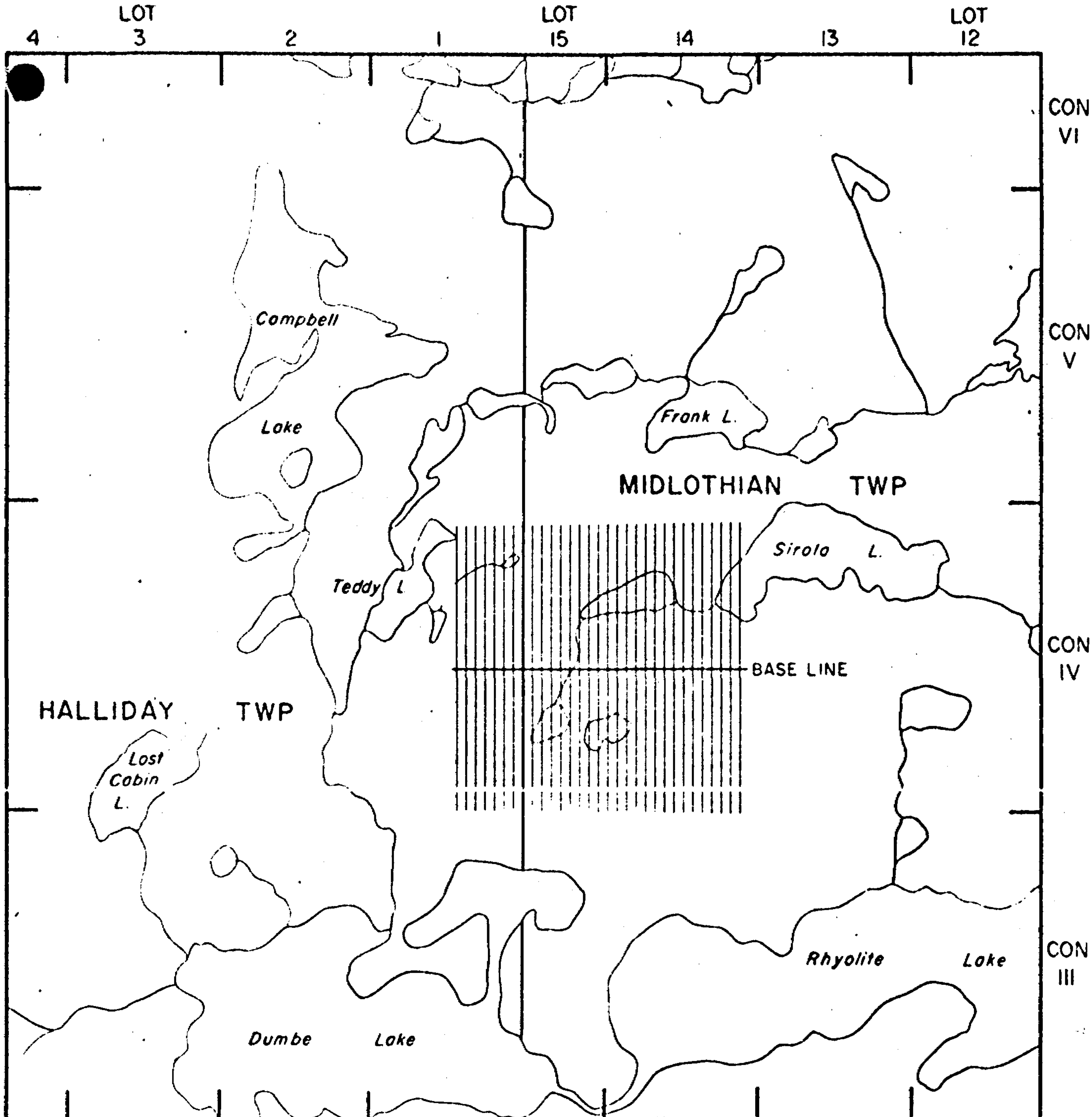
During the period July 18th to 26th, 1972, an induced polarization survey was conducted in Halliday and Midlothian Twps., Larder Lake Mining Division, Northern Ontario, under the direction of Mr. P. Robertshaw, M.Sc., of Seigel Associates Limited, on behalf of Glen Copper Mines Ltd.

The property is located in northern Halliday and Midlothian Twps., approximately 20 miles west of Matachewan, Northern Ontario (Figure 1). Access is by dirt road from Highway 566 to the Stairs Midlothian Mine, then by logging road to Sirola Lake.

During the period June 1st to 10th, 1972, Mr. J.R. Boissoneault, P.Eng., conducted a magnetometer survey over the property and performed geological mapping as well. This work does not fall under the responsibility of Seigel Associates Limited. The results, however, are incorporated in this report and used in the interpretation.

GEOLOGY

The grid area is underlain by Precambrian felsic metavolcanics consisting of brecciated rhyolites, rhyolite-dacite, sericite schists, etc. This area is located within the northeastern part of a 20-mile long rhyolitic dome (Geology of Halliday and Midlothian Townships, Geological Report #79,



LOCATION MAP

GLEN COPPER MINES LTD.

HALLIDAY & MIDLOTHIAN TOWNSHIP
ONTARIO

INDUCED POLARIZATION SURVEY

SCALE: 1/2 mile to 1 inch

FIGURE 1

E.G. Bright, 1970). A number of showings occur on the property, mainly close to the base line, indicating widespread pyrite and sphalerite mineralization. The paragenisis of the mineralization here is uncertain and direct coincidence of sphalerite and pyrite concentrations may not occur. Minor lead and copper, and some silver occur in some showings.

Sphalerite, although a metallic sulphide mineral, is considered undetectable to induced polarization methods due to its high resistivity (especially in the case of low-iron forms). The purpose of the induced polarization survey, therefore, was to detect concentrations of other sulphides (pyrite, galena, chalcopyrite, etc.) with which sphalerite may be associated.

METHOD AND INSTRUMENTATION

During the present survey, a 2.5 kw Scintrex Mk VII time domain, pulse-type induced polarization unit was employed (see Specification Sheet attached). The receiver was the remote-triggered Scintrex IPR-VII. Current-on and -off times of two seconds were used, and normalized transient polarization voltages are integrated from .45 seconds to 1.10 seconds after current-off time. The resulting quantities are expressed in units of milliseconds and called the chargeability, 'M'. Beside the chargeability, the resistivity, in units of ohmmeters, is simultaneously measured. Anomalous induced polarization responses may result from metallic sulphides, graphitic and carbonaceous material, as well as from clay minerals, chlorite, sericite, serpentinized rocks and other platey minerals derived from weathering, etc. It is not always possible on the basis of induced polarization data alone to discriminate between these potential sources of anomalous polarization.

The principles, field procedures and nature of results obtained over several base metal deposits are described in the accompanying article by Dr. H.O. Seigel entitled "Induced Polarization Method".

PRESENTATION OF DATA

The induced polarization results are presented in profile form on Plate 1, on a horizontal scale of 1" = 400 feet. The interline spacing is not to scale. The chargeabilities are plotted with a vertical scale of 1" = 10 milli-seconds, and the resistivities are on a logarithmic vertical scale for which 1.33" = a factof of 10. The datum level for the resistivity profiles is 100 ohm-meters.

The 3-array electrode configuration was used throughout the survey with the potential dipole always to the north.

The magnetic results obtained by Mr. J.R. Boissoneault are shown in contour plan on Figure 2 on a scale of 1" = 400', and a contour inter-val of 50 gammas. A McPhar M-700 magnetometer was used.

The location of pits and trenches (Figure 4) and the geological results (Figure 3) are shown on separate plates on a scale of 1" = 400'. Showings are indicated by means of a circle and a description of the rocks found. The pits and trenches are numbered with the percentages of zinc and lead, and ounces of silver and gold tabulated.

The anomalous zones obtained with the 200-foot electrode spacing are presented on the base of Figure 2 in Figure 5.

DISCUSSION OF RESULTS

The magnetic contour plan shows a N60° strike direction, which is undoubtedly related to the formational strike of the felsic metavolcanics. The relief is in general low (150 gammas), ranging from the low 500 gamma values to the higher 600 gamma values, as marked on Mr. J.R. Boissoneault's contour plan. Several narrow, linear structures have been shown, which might suggest that the different rhyolite horizons are not exceeding 50-100 feet in thickness. However, in sections where the contours are wider apart, more massive rhyolite bodies might be present. It is difficult to say if the change in magnetic values is directly related to a change in magnetite content only, or that remnant magnetism is part of the pattern displayed.

The geological plan shows that on many places pyrite, iron oxides, minor copper, zinc or lead have been found. The assay results reveal that the highest zinc content is 2.10% (pit #28).

The background chargeability level obtained employing spacings ranging from 100-400 feet are approximately 5 milliseconds (southern parts of lines 20-28E). The corresponding resistivities are in the neighbourhood of 10,000 ohmmeters, and the magnetic contour plan shows a more-or-less homogeneous mass with values ranging from 400-600 gammas. However, on the average, they lie between 450-550 gammas.

This 5 millisecond level is quite normal for unmineralized rhyolitic rocks, and one might assume that values rising over 10 milliseconds are anomalous.

Anomalous regions are shown on all lines. The profile patterns suggest that at least three parallel anomalous zones are present in the eastern part of the grid. These zones seem to merge into one vast anomalous region to the west of line 0+00. The strongest chargeabilities were measured on lines 0+00 and 4E employing the narrowest spacing (100 feet). A value of 39 milliseconds was measured at line 0+00 at station 5+50N, and a value of 36.7 milliseconds on line 4E at station 6+50N. Comparing the peak amplitudes and curve shapes of the anomalous zone directly north of the baseline on lines 0+00, 4E and 8E suggests that two parallel bands of steeply-dipping material are coming close to surface. The material might increase in volume or percentage of sulphide with depth.

Further to the west the chargeability level increases gradually, showing a broad anomaly on line 12W of approximately 25 milliseconds, with no apparent change in resistivity from on or about 5,000 ohmmeters. Comparing the chargeability and resistivity results on this line shows that the strongest chargeabilities correspond with minor decreases in resistivities. The same is obvious on lines 0+00, 4E and 8E. This might suggest that a certain amount of interconnection between the polarizable grains (sulphide) might occur even though the writer does not want to call it massive mineralization.

The anomalous zones are superimposed on Figure 2 (Mr. J.R. Boissoneault's magnetic contour plan), and in Figure 5 the chargeabilities indicated are those higher than 10 milliseconds obtained with the 200-foot electrode separation. The main zone described above is labelled 'B'.

Two other zones are indicated on Figure 5, labelled 'A' and 'C'. Both, as mentioned earlier, parallel Zone B, but they are of lesser strength. However, the peak amplitudes of Zone A on line 8E and 12E, of approximately 20 milliseconds, might still be representing 1-3% of sulphides by volume while Zone B near its highest peaks might contain as much as 5-7% of polarizable material by volume. Zone C is interrupted by Patricia Lake (lines 16E, 20E and 24E), but possibly reappears on line 28E near station 19N.

Figure 5 shows that the anomalous zones parallel approximately the strike direction as given by the magnetics. It is of great importance to see that the pits as located between lines 0+00 and 8E immediately around or north of the baseline are not underlain directly by the chargeability peaks but are located near the proximities of the anomalous zones. One might therefore assume that better sulphide values will occur at depth, and that the pits only might reflect patchy mineralization.

CONCLUSIONS AND RECOMMENDATIONS

An induced polarization and resistivity survey was executed over an E-W grid in the northern parts of Halliday and Midlothian Twps. The eleven lines vary in length from 1,300 feet to 3,400 feet.

The background chargeabilities and resistivities obtained over the felsic metavolcanics are in the neighbourhood of 5 milliseconds, and ranging up to 10,000 ohmmeters respectively. Five milliseconds might be considered normal for unmineralized felsic metavolcanics. The magnetic contour plan as obtained from Mr. J.R. Boissoneault reveals a relatively homogeneous magnetic pattern over the area in the southwestern part of the grid, which only revealed background chargeability levels.

Most of the grid shows strong chargeabilities, and Figure 5 shows the zones as delineated from the 200-foot electrode separation and a 10 milli-second cut-off level. At least three parallel bands of polarizable material are detected. Zone B, which is the center band, shows the strongest responses, with Zones A and C respectively south and north of Zone B being somewhat weaker. However to the west these three zones most likely merge, presenting chargeabilities in the range of those obtained over Zone B.

At the present time it is suggested to test only parts of those zones by means of diamond drilling:

1. Collar on line 0+00 at station 8+00N; drill 45° south for 400 feet depth.
2. Collar on line 0+00 at station 0+50N; drill 45° north for 400 feet.

Holes 1 and 2 were discussed between the writer and Mr. J.R. Boissoneault and started 100' further away from the anomaly than suggested by the geophysical results, to allow intersecting of possible sphalerite.

3. Collar on line 4E at station 5+50N; drill 45° north for 400 feet.
4. Collar on line 12E at station 6+00S; drill 45° north for 300 feet depth.
5. Collar on line 28E at station 14N; drill 45° south for 300 feet.

Additional drilling on Zones A, B and C, as well as the western extension of those zones would be predicated on the results of these initial holes, whereas the above holes are up to 400 feet recommended length this length is intended as a minimum one. In the event that interesting sulphide mineralization persists beyond the indicated depth in any one of the holes, this hole should obviously be extended.

Respectfully submitted,

Jan Klein

Jan Klein, M.Sc., P.Eng.,
Geophysicist.

2-1017

APPENDIX

2

RECEIVED
MAR 14 1973
PROJECTS SECTION

Induced polarization survey

by Seagle Ass. of Toronto

on Rousseau property, Midlothian-Halliday Twp.

Claims

L292002-03, L292006-07, L292012-13,

L278570-73 inclusive, and L255465

During the period of June 1 - 10, 1972, a magnetometer survey was carried out by the writer on the claims indicated above for Glenn Copper Mines Ltd, of Vancouver, British Columbia to supplement an I-P survey which was to follow. This was done along north-south pickets, 400 feet apart. A total of 6.5 miles were covered and 370 readings were taken. The instrument used was a McPhar M-700, "fluxgate" type magnetometer, which measures the vertical components of the earth's magnetic field. The tie-in procedure is explained on the enclosed sheet, the base stations being, the base line pickets at each cross line.

The readings taken are shown on the contoured accompanying map. The results show a series of weak, roughly parallel highs and lows, north of the base line, trending in a direction north-70°-east. This is indicative of a series of interbanded, rhyolitic and dacitic flows, folded into a near vertical position and dipping steeply southward. South of the base line, the irregularity and sparsity of contours is a result of a massive body of rhyolite which outcrops in several places.

...... 2

Two linear magnetic anomalies, in the surveyed area could be due to concentrations of metallic mineralization containing pyrrhotite; one is the "high" at 250 north on line 4 East, and the other is the "high" crossing line 32 East at 1100 north, and 28 East at 850 north, along with its associated "low" to the south. Both these bodies have steep southerly dips, the latter being in excess of 500 feet long.

REGISTERED PROFESSIONAL ENGINEER
J. R. BOISSONEAULT
PROVINCE OF ONTARIO

John Boissoneault

JB/lb

Tie In Procedure to Correct Diurnal Variation

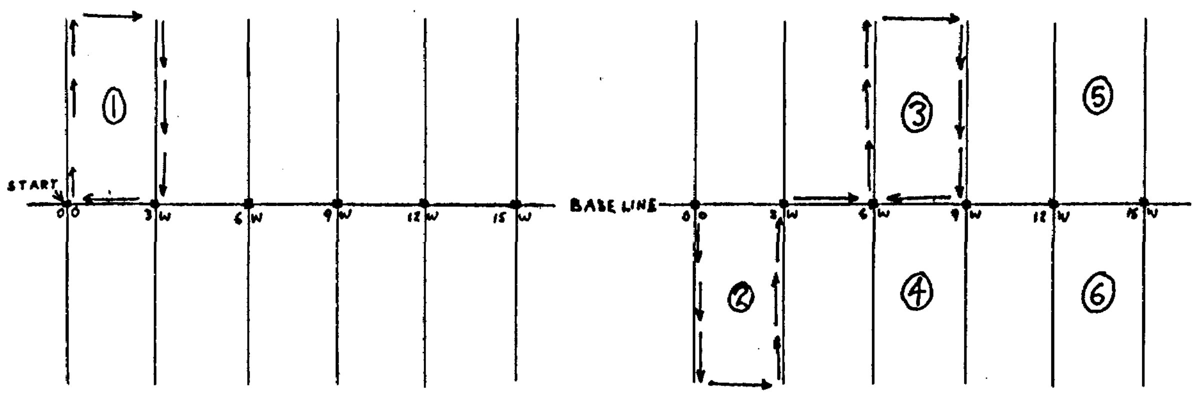


fig.(1) fig.(2)

The method used to correct Diurnal Variation is one suggested by D. S. Parasnis (1966) as being "sufficiently accurate for most surveys". It consists of repeating the reading taken at a base station after an interval of less than two hours during which traverses are carried out. Any increase in the repeated reading "d" is divided by the number of readings 'n' and each reading corrected by subtracting d/n . x (where x = the ordinal number of the reading). For example, if the diurnal variation was +120 gamma and 60 readings were taken, the correction for the 25th reading = -d/n . x or -120/60 . 25 = -50 gamma.

In order to extend this over the entire grid, the survey is done in loops (see map), beginning and ending at a base station on the base line and then tying in to the next base station, also on the base line. For example, when loop 1 is completed, base stations 00 and 3W are tied in. When loop 2 is completed, station 6W is tied in and loop 3 is started.

As a further check, when the last loop is completed at 15W, all the base stations are read on the way back. This is done as quickly as possible to minimize the effects of drift.

One makes the assumption that the change 'd' occurred at a fairly constant rate, and that the time interval between the readings is relatively constant.

The method allows reasonably accurate corrections, for drift in the instrument due to such factors as temperature changes, as well as, for diurnal variation.

41P14NE0032 2.1017 MIDLOTHIAN

900
PROJECTS SECTION

GEOPHYSICAL – GEOLO(TECHNICAL DA7

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

Type of Survey MAGNETOMETER
Township or Area HALLIDAY TWP.
Claim holder(s) ALFRED ROUSSEAU
19 FOGG ST. SOUTH
TIMMINS ONT.
Author of Report Mr. Jan KLEIN
Address 222 SNIDERCROFT ROAD., CONCORD, ONT.
Covering Dates of Survey June 1-10, 1972
(linecutting to office)
Total Miles of Line cut 1 mile

SPECIAL PROVISIONS CREDITS REQUESTED

ENTER 40 days (includes line cutting) for first survey.

ENTER 20 days for each additional survey using same grid.

Geophysical	DAYS per claim
–Electromagnetic	
–Magnetometer	40
–Radiometric	
–Other	
Geological	
Geochemical	

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

Magnetometer ______ Electromagnetic ______ Radiometric ______
(enter days per claim)

DATE: Oct 06, 1972 SIGNATURE: John Boissonault
Author of Report or Agent

PROJECTS SECTION
Res. Geol. ______ Qualifications ______
Previous Surveys ______

Checked by ______ date ______

GEOLOGICAL BRANCH ______

Approved by ______ date ______

GEOLOGICAL BRANCH ______

Approved by ______ date ______

OFFICE USE ONLY

MINING CLAIMS TRAVERSED
List numerically

(prefix)	(number)
L-255463	–
278570	1/3 not covered
71	–
72	1/4
73	1/3
292002	N/C
3	1/3
292006	–
7	–
292012	1/3
13	1/4

– Claims covered
(4) 40 days each

If space insufficient, attach list

TOTAL CLAIMS 1

Show instrument technical data in each space for type of survey submitted or indicate "not applicable"

GEOPHYSICAL TECHNICAL DATA

GROUND SURVEYS

Number of Stations 53 Number of Readings 53

Station interval 100'

Line spacing 400'

Profile scale or Contour intervals 50 gamma
(specify for each type of survey)

MAGNETIC

Instrument Mc PHAR M-700 (FLUXGATE)

Accuracy - Scale constant ± 10 gamma.

Diurnal correction method BASE LINE PICKETS USED AS BASE STATIONS AND READ DURING SHORT INTERVAL

Base station location
BASE LINE PICKETS + ONE MAIN STATION AT SIROLA LAKE

ELECTROMAGNETIC

Instrument

Coil configuration

Coil separation

Accuracy

Method: ☐ Fixed transmitter ☐ Shoot back ☐ In line ☐ Parallel line

Frequency
(specify V.L.F. station)

Parameters measured

GRAVITY

Instrument

Scale constant

Corrections made

Base station value and location

Elevation accuracy

INDUCED POLARIZATION – RESISTIVITY

Instrument

Time domain Frequency domain

Frequency Range

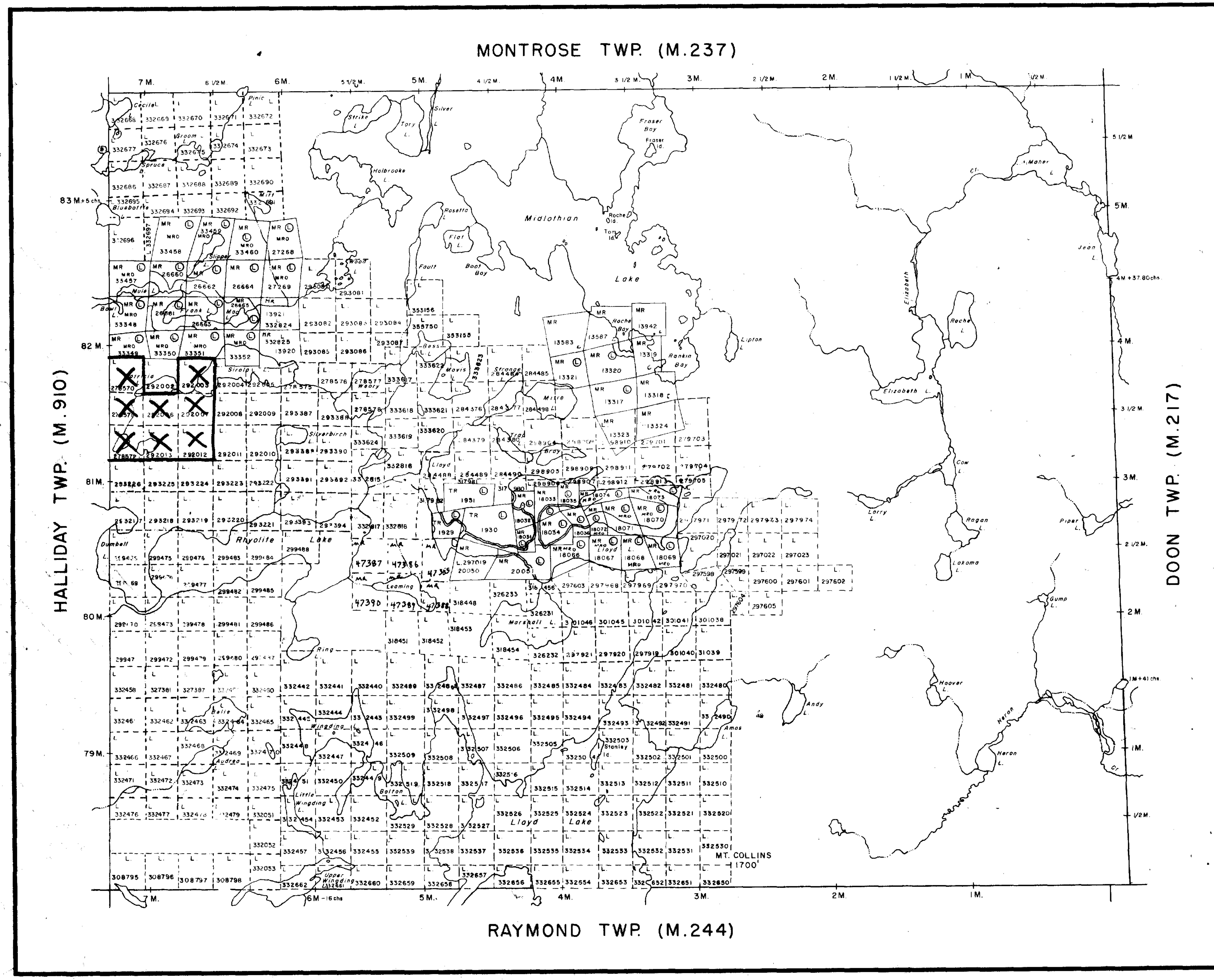
Power

Electrode array

Electrode spacing

Type of electrode

TRIM LINE



THE TOWNSHIP OF

MIDLOTHIAN

DISTRICT OF TIMISKAMING

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

400' surface rights reservation around all lakes and rivers.

DATE OF ISSUE

SEP 25 1972

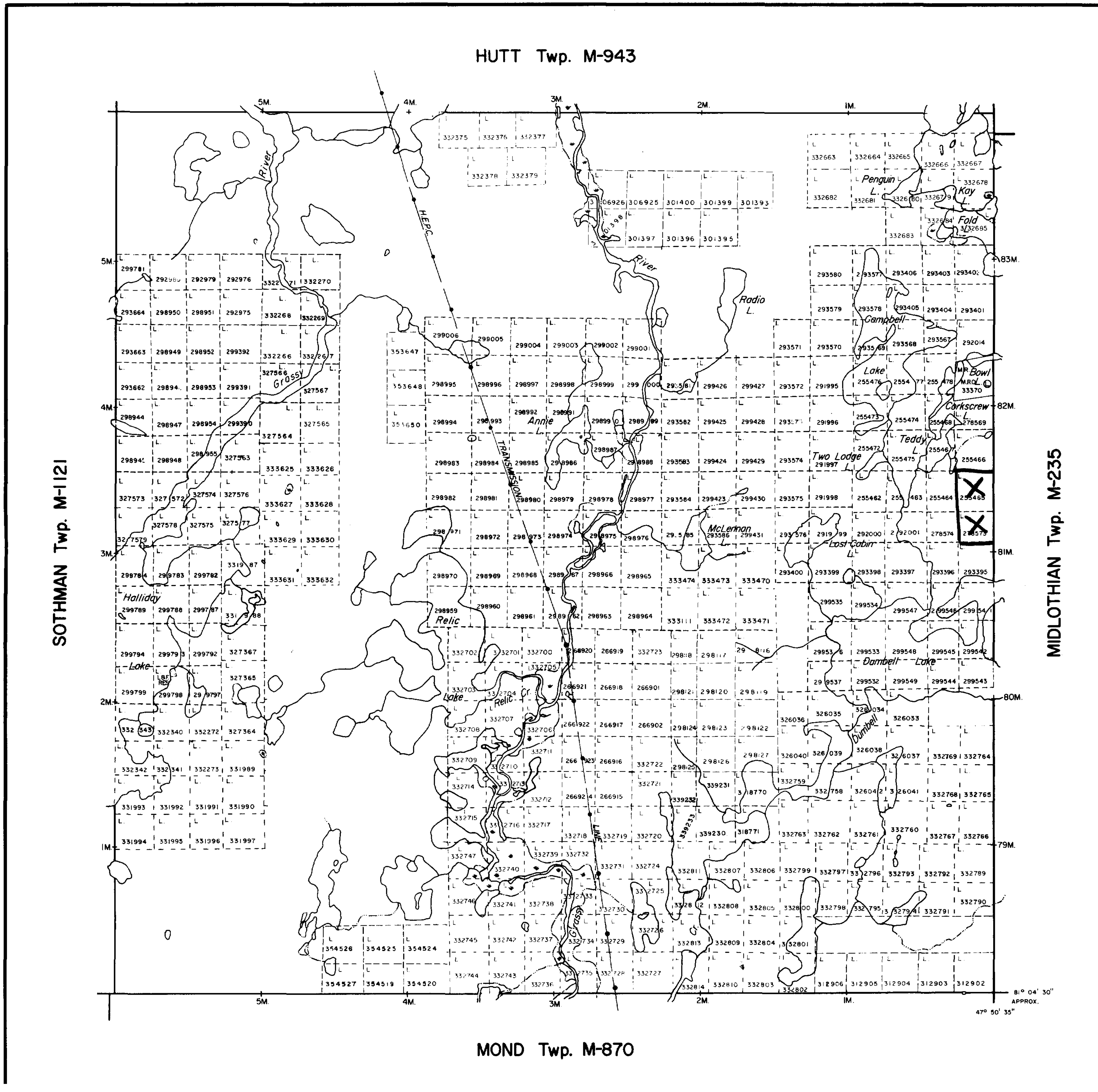
ONT. DEPT. OF MINES AND NORTHERN AFFAIRS

PLAN NO. M.235

ONTARIO DEPARTMENT OF MINES AND NORTHERN AFFAIRS

41P14NE0032 2.1017 MIDLOTHIAN

200



NOTES

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

DATE OF ISSUE
SEP 29 1972
ONT. DEPT. OF MINES AND NORTHERN AFFAIRS

LEGEND

PATENTED LAND	Ⓟ or ●*
PATENTED FOR SURFACE RIGHTS ONLY	◓*
LEASE	Ⓛ
LICENSE OF OCCUPATION	L.O.
CROWN LAND SALES	C.S.
LOCATED LAND	Loc.
CANCELLED	C.
MINING RIGHTS ONLY	M.R.O.
SURFACE RIGHTS ONLY	S.R.O.
HIGHWAY & ROUTE NO.	17
ROADS	
TRAILS	
RAILWAYS	
POWER LINES	
MARSH OR MUSKEG	
MINES	⚒

*used only with summer resort locations or when space is limited

TOWNSHIP OF

HALLIDAY

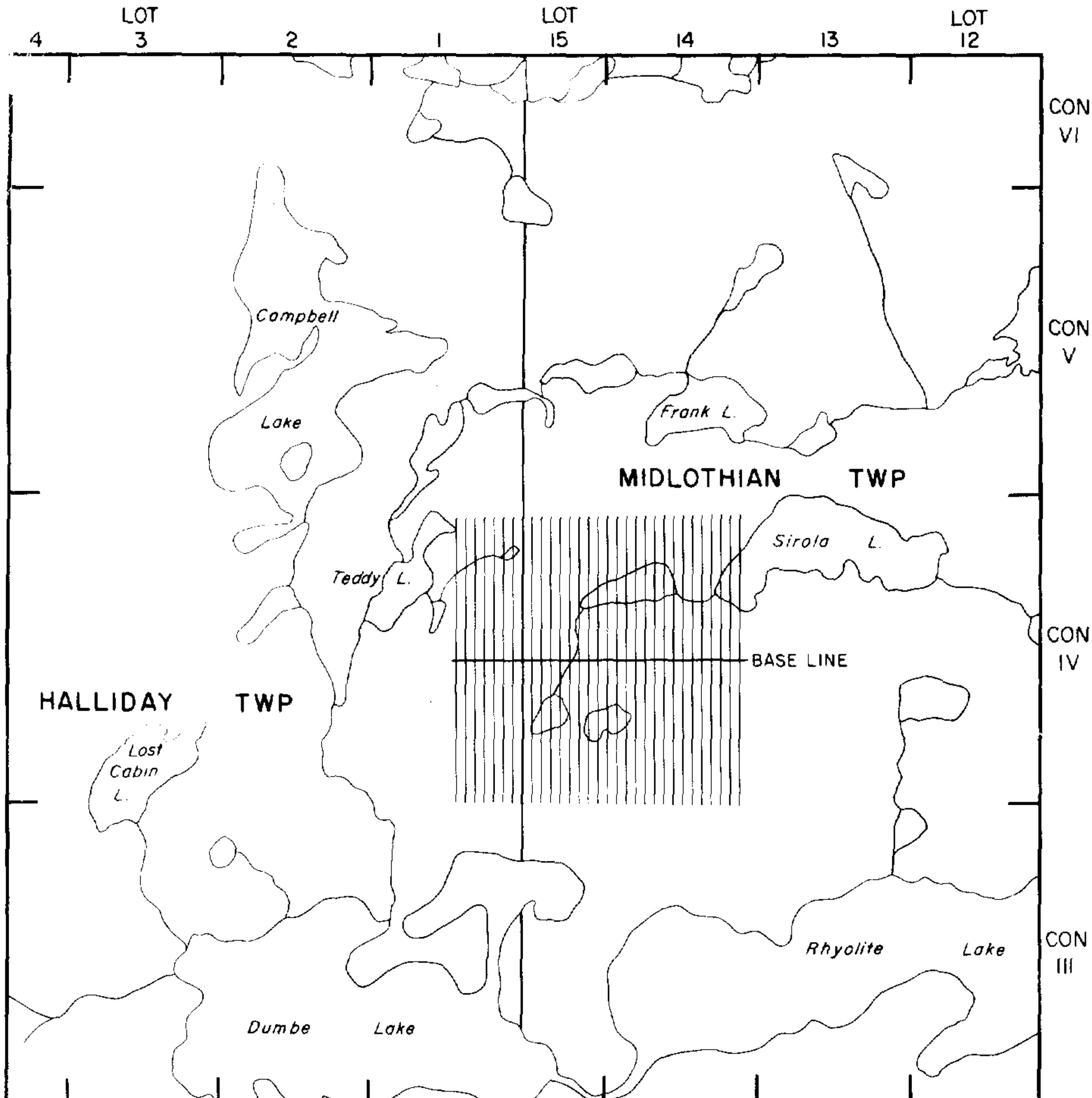
DISTRICT OF
SUDBURY

LARDER LAKE
MINING DIVISION

SCALE : 1 INCH = 40 CHAINS (1/2 MILE)

DR. RWN	PLAN NO. **M-910**
DATE FEB. 2, 71.	

ONTARIO
DEPARTMENT OF MINES
AND NORTHERN AFFAIRS



LOCATION MAP

GLEN COPPER MINES LTD.

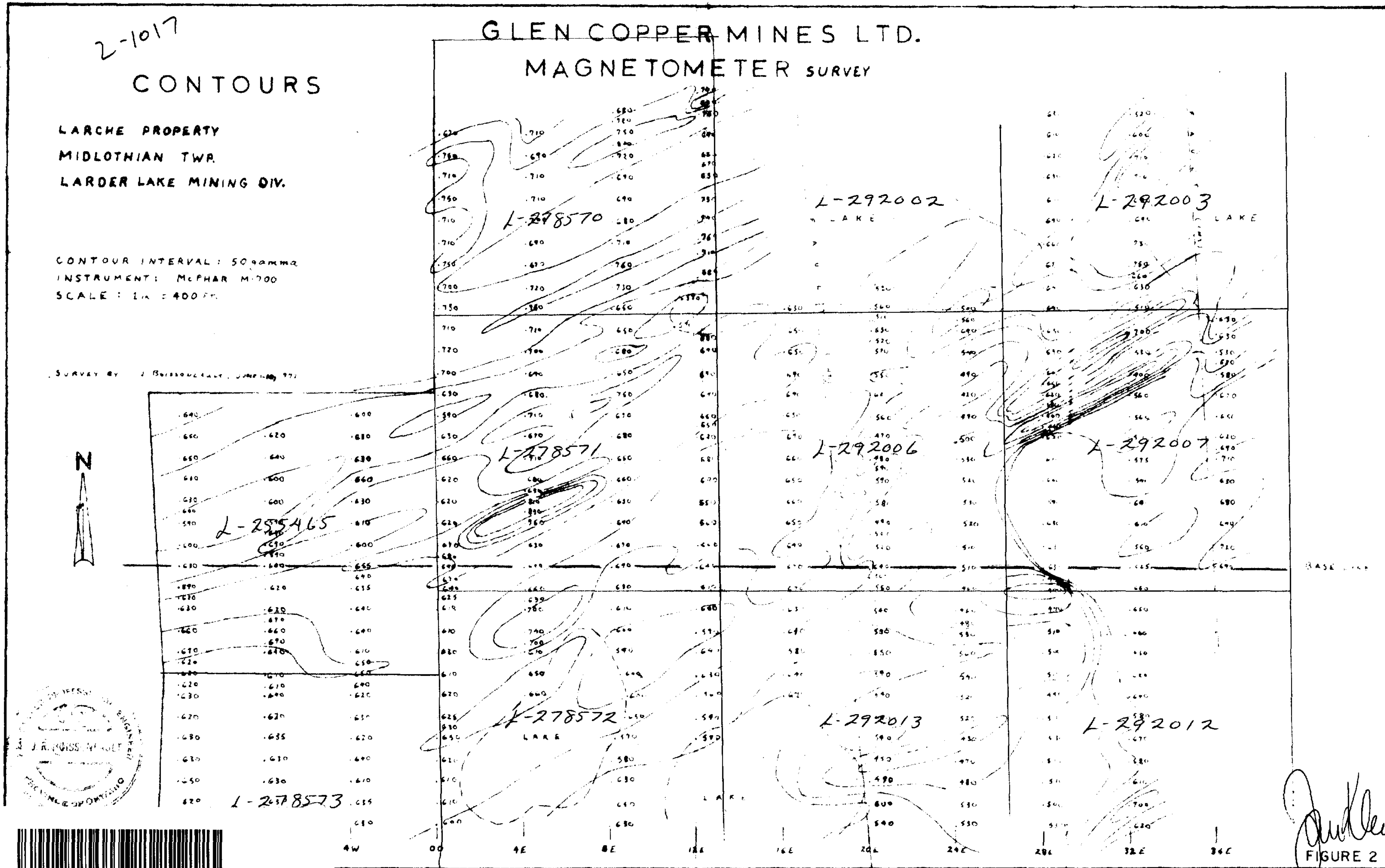
HALLIDAY & MIDLOTHIAN TOWNSHIP
ONTARIO

INDUCED POLARIZATION SURVEY

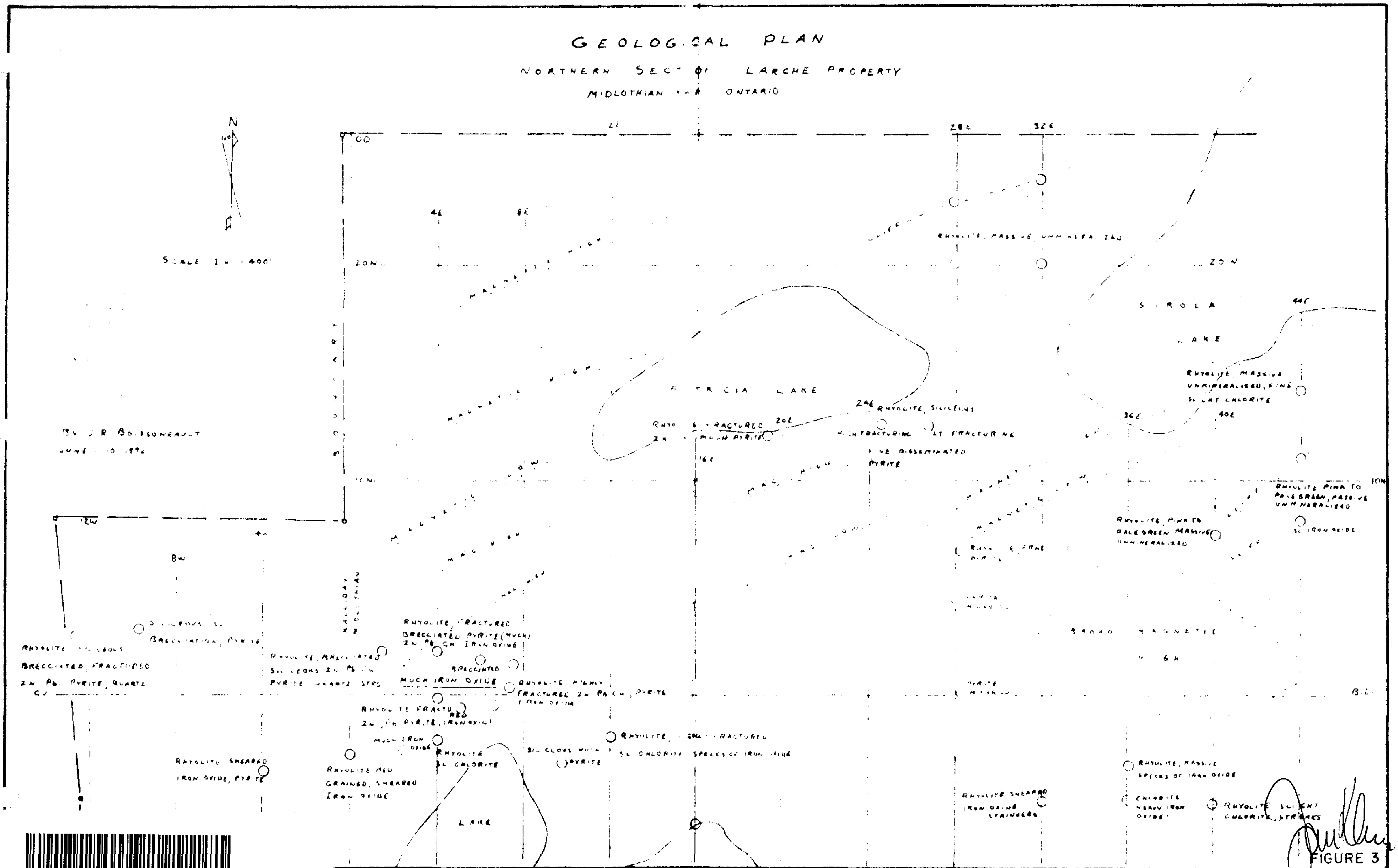
SCALE: 1/2 mile to 1 inch

FIGURE 1

72-9574

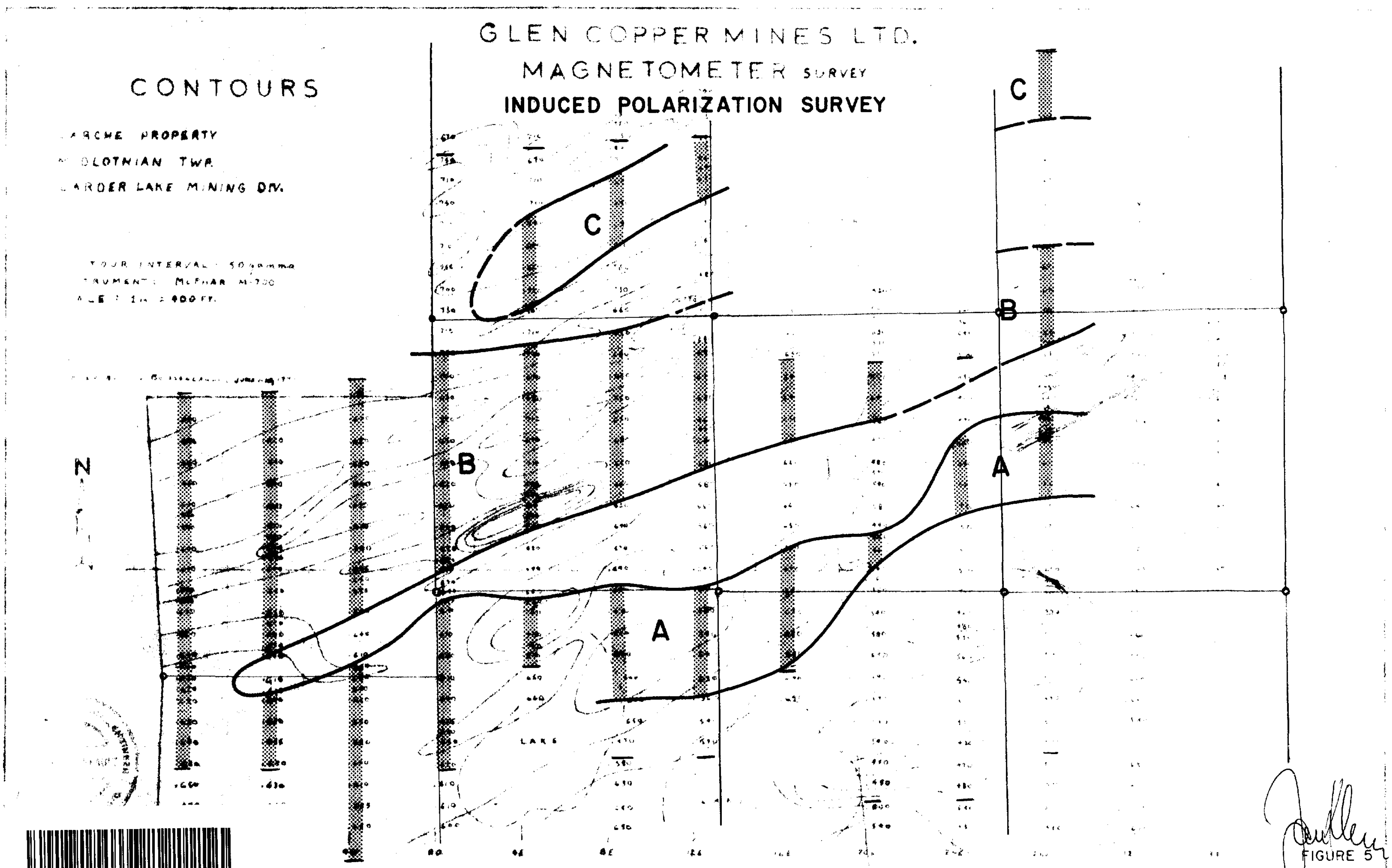


2-1017
CONTOURS
LARCHE PROPERTY
MIDLOTHIAN TWP.
LARDER LAKE MINING DIV.
CONTOUR INTERVAL: 50 gamma
INSTRUMENT: McPHAR M-700
SCALE: 1 in = 400 ft.
GLEN COPPER MINES LTD.
MAGNETOMETER SURVEY
N
L-278570
L-292002
L-292003
L-278571
L-292006
L-292007
L-255465
L-278572
L-292013
L-292012
L-278573
LAKE
BASE LINE
4W
00
4E
8E
12E
16E
20E
24E
28E
32E
36E
FIGURE 2



41P14NE0032 2.1017 MIDLOTHIAN

240

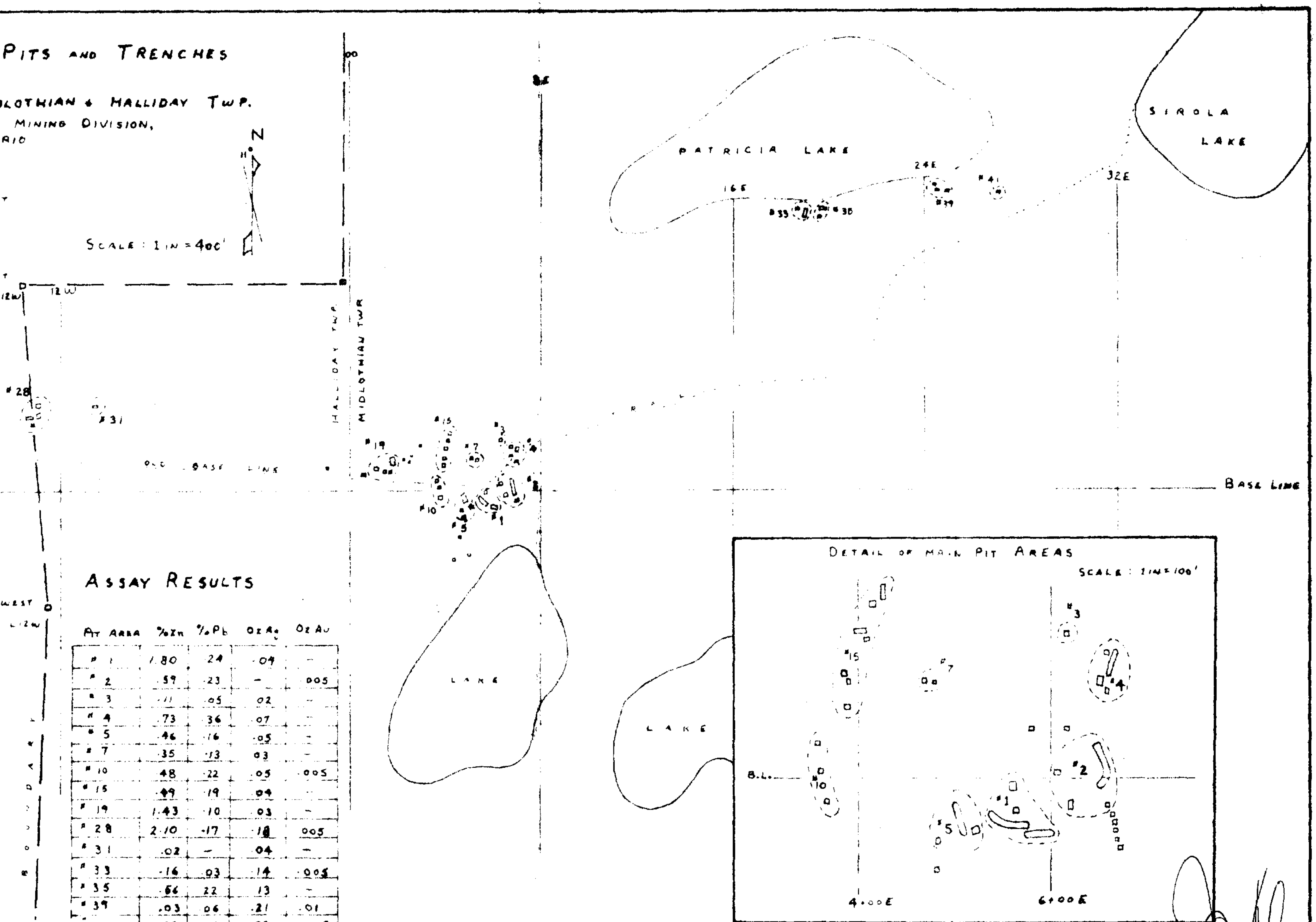

GLEN COPPER MINES LTD.
MAGNETOMETER SURVEY
INDUCED POLARIZATION SURVEY
CONTOURS
ARCHE PROPERTY
DLOTHIAN TWP.
ARDER LAKE MINING DIV.
C
B
A
N
LAKE
FIGURE 5
72-9574

LOCATION OF PITS AND TRENCHES

LARCHE PROPERTY, MIDLOTHIAN & HALLIDAY TWP.
KIRKLAND LAKE MINING DIVISION,
ONTARIO

BY: J. R. BOISSONEAULT
JUNE 10, 1972

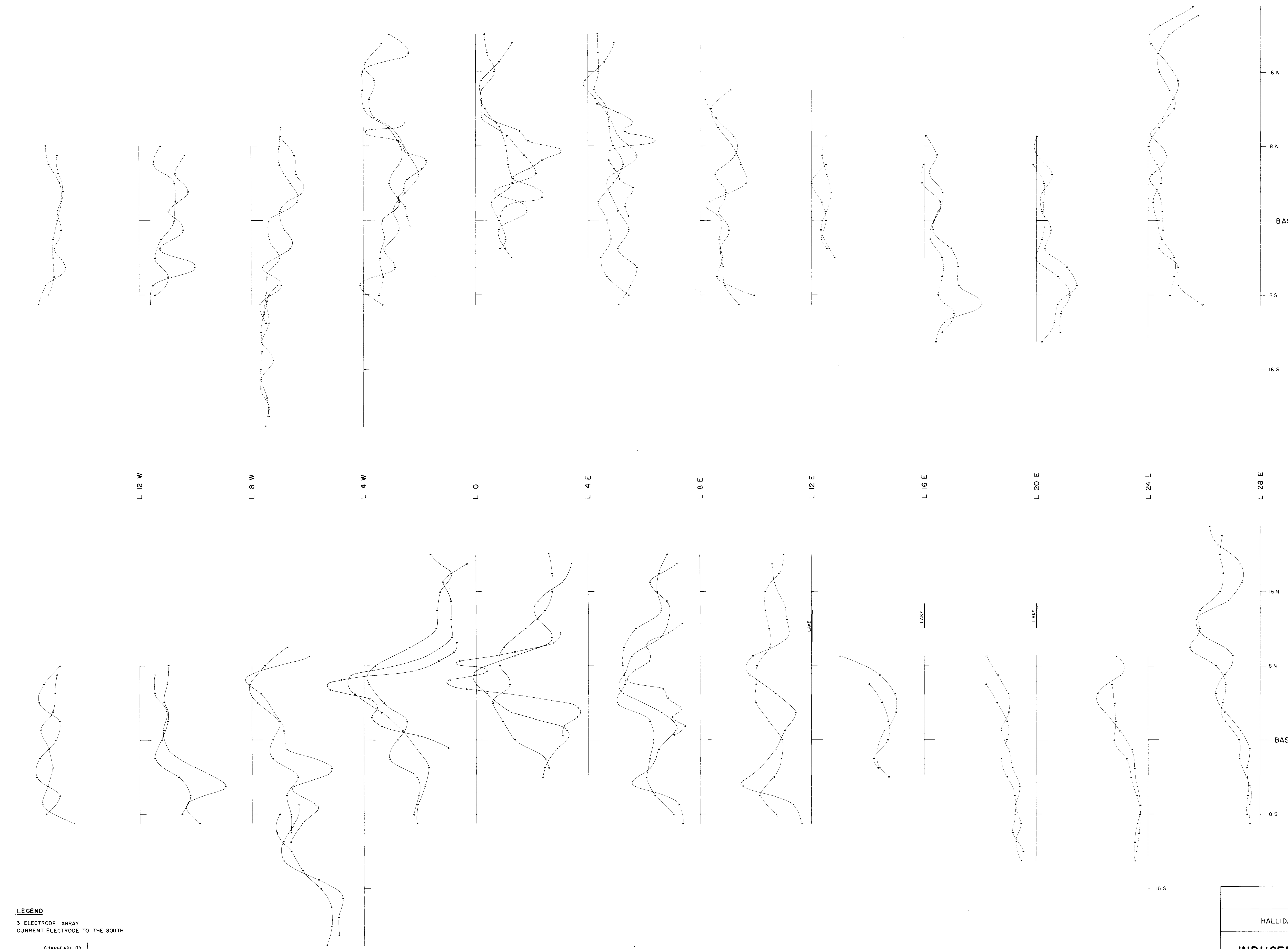
SCALE: 1 IN = 400'



ASSAY RESULTS

PIT AREA	%Zn	%Pb	Oz Ag	Oz Au
# 1	1.80	.24	.09	–
# 2	.59	.23	–	.005
# 3	.11	.05	.02	–
# 4	.73	.36	.07	–
# 5	.46	.16	.05	–
# 7	.35	.13	.03	–
# 10	.48	.22	.05	.005
# 15	.49	.19	.04	–
# 19	1.43	.10	.03	–
# 28	2.10	.17	.18	.005
# 31	.02	–	.04	–
# 33	.16	.03	.14	.005
# 35	.66	.22	.13	–
# 39	.03	.06	.21	.01
	.01	.01	.33	.005

FIGURE 4



LEGEND

3 ELECTRODE ARRAY
CURRENT ELECTRODE TO THE SOUTH

CHARGEABILITY MILLISECONDS 0 – 10
RESISTIVITY OHM-METERS 100 – 1000

a = 100 FEET
a = 200 FEET
100 FEET

NOTE
INTERLINE SPACING NOT TO SCALE

GLEN COPPER MINES LTD.

HALLIDAY & MIDLOTHIAN TOWNSHIP, ONTARIO

INDUCED POLARIZATION SURVEY

SCINTREX MARK VII 2.5 kW IP UNIT

SCALE 1" = 400'

SURVEY BY
SEIGEL ASSOCIATES LIMITED
JULY, 1972

PLATE

72-9574-01

270

41P14NE0032 2.1417 MIDLOTHIAN