REPORT ON THE SHERATON-TIMMINS-EGAN TOWNSHIP CLAIMS

PORCUPINE & LARDER LAKE MINING DIVISIONS, ONTARIO

INDUCED POLARIZATION / MAGNETIC SURVEY

for

HADDINGTON RESOURCES LTD. &
SILVERSTONE RESOURCES LTD.

Submitted by: R.J. Meikle
Geophysical Engineering & Surveys Inc.
January, 1998

TABLE OF CONTENTS

CONTENTS	PAGE NO.
INTRODUCTION	1
LOCATION AND ACCESS	1
CLAIM STATUS	2
PERSONNEL	2
PREVIOUS WORK	3
PROPERTY GEOLOGY	4
SURVEY PARAMETERS	4,5,6
SURVEY RESULTS	7,8
CONCLUSIONS AND RECOMMENDATIONS	8
CERTIFICATE	9

LIST OF FIGURES

LOCATION MAP NO.1

CLAIM SKETCH MAP NO.2

GEOLOGY MAP NO.3

APPENDIX

APPENDIX "A" - SCINTREX IPR-12 - RECEIVER
APPENDIX "B" - SCINTREX TSQ- 3 - TRANSMITTER

MAPS

IP PSUEDOSECTIONS - SCALE 1:2500
POCKET 1. NE LINES, NW LINES
POCKET 2. SE LINES, PATENTED BLOCK LINES

MAGNETOMETER MAP - SCALE 1:5000
POCKET 3. TOTAL FIELD MAGNETOMETER

INTRODUCTION

This report deals with the logistics and results of a Magnetometer & Induced Polarization Survey on the Sheraton-Timmins-Egan Township Property, Porcupine and Larder Lake Mining Divisions, Ontario. The work was done on a contract basis by Geophysical Engineering & Surveys Inc., Timmins, Ontario, for Haddington Resources and Silverstone Resources Ltd.

The Magnetic Survey covered two patented claims in the centre of the property recently acquired by Haddington and subsequently not covered by the 1995 Magnetic Survey.

A 1995 I.P. Survey outlined an anomaly which appeared to extend through the above two patented claims. The current I.P. Survey covered the patented claims, outlining and confirming the continuity of the anomaly across the two claims. The current I.P. Survey covered the strike extension of this anomaly to the northwest and southeast, as well as an area of felsic volcanics bounded by L18e-L26e, from 500n to 1100n.

LOCATION AND ACCESS

The claim groups are centred near the corners of Sheraton, Timmins, and Egan Townships, approximately 50 km ESE of Timmins, Ontario. Sheraton and Timmins Townships are located within the Porcupine Mining Division, Ontario and Egan Township in the Larder Lake Mining Division, Ontario.

Access to the property is via the all weather, Gibson Lake Road which heads south from the intersection of Hwy 101 and Hwy 67, for approximately 28 km, where a branch road leads east to Lipsett Lake (approx. 3.5 km), where a road continues north to the west part of the claims, accessible by truck. The south and east parts of the property are accessible via a 4 wheel drive road leading east from Lipsett Lake.

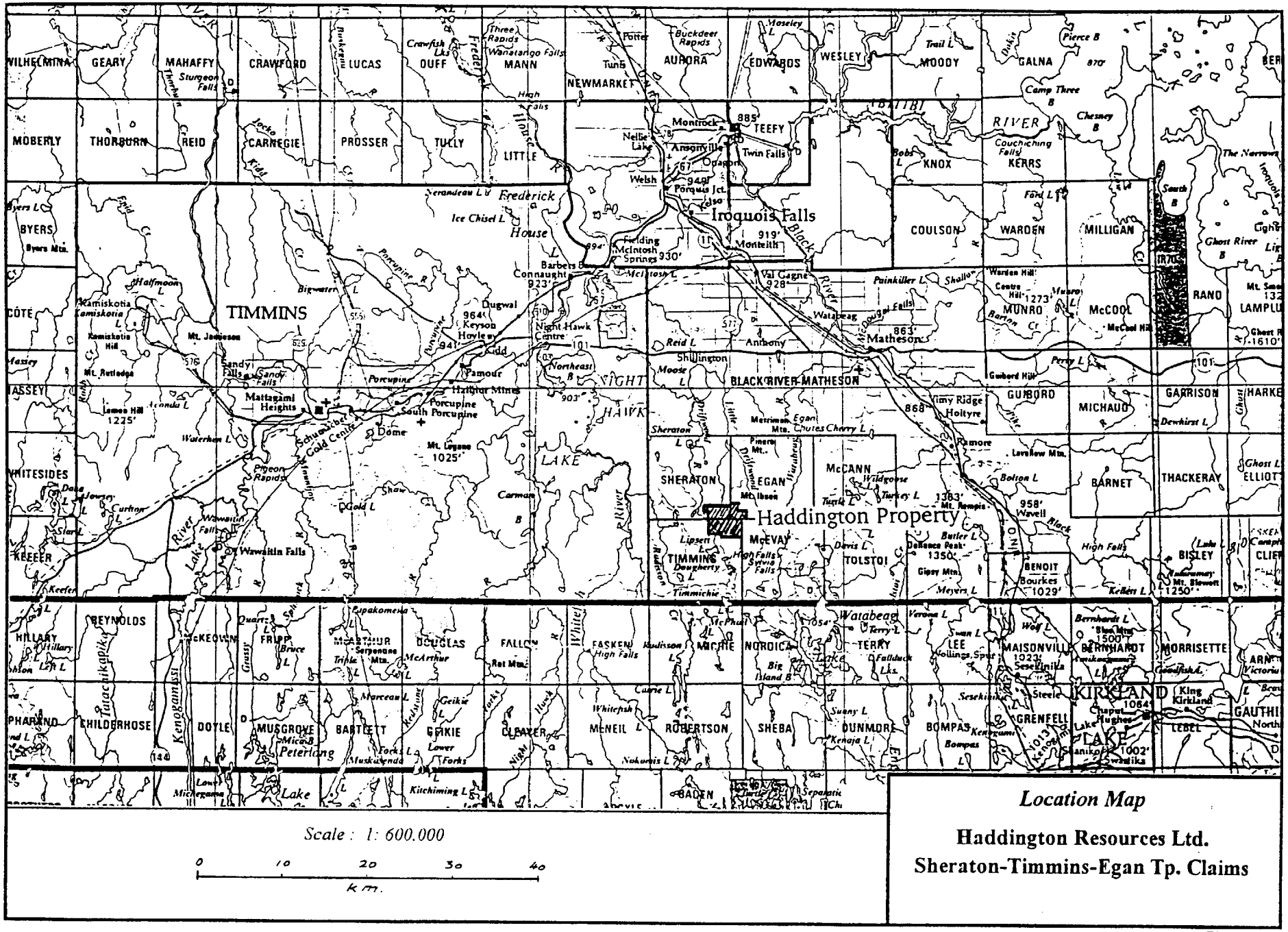

Haddington Property
Iroquois Falls
TIMMINS
BLACK RIVER-MATHESON
SHERATON
McCANN
EGAN
McEVAY
TIMMINS
TOLSTOI
KIRKLAND LAKE
Scale : 1: 600.000
0 10 20 30 40
km.
Location Map
Haddington Resources Ltd.
Sheraton-Timmins-Egan Tp. Claims

Fig. 1

CLAIM STATUS

The property consists of a contiguous group of 72 claim units in SE Sheraton, NE Timmins and SW Egan Townships as well as two patented claims in NE Timmins Township, as shown in Fig. 2. The claims are held by Haddington Resources Ltd., under three separate option agreements. The following is a list of the claim numbers.

Sheraton Township	Claims	#Units
	1156114	1
	1145115	1
	1158839	1
	1158841	1
	1158842	1
	1175435	1
	1175436	1
	1175437	1
	1175438	1
	1175439	1
	1175440	1
	1204143	2
Timmins Township	1158840	1
	1128983	16
	1128984	15
	1204296	12
	1204297	1
Egan Township	1204220	8
	1204298	4
	Total Unpatented	70 units
Timmins Township	34452, 34453	2 Patented

PERSONNEL

The following personnel were directly involved with the Magnetic and I.P. Surveys:

R.J. Meikle	Supervisor	Timmins, Ontario
D. Brazeau	Operator	"
D. Mckinnon	Operator	Connaught, Ontario
K. Giroux	Helper	Timmins, Ontario
R. Chartrand	Helper	"
L. Anderson	Helper	"

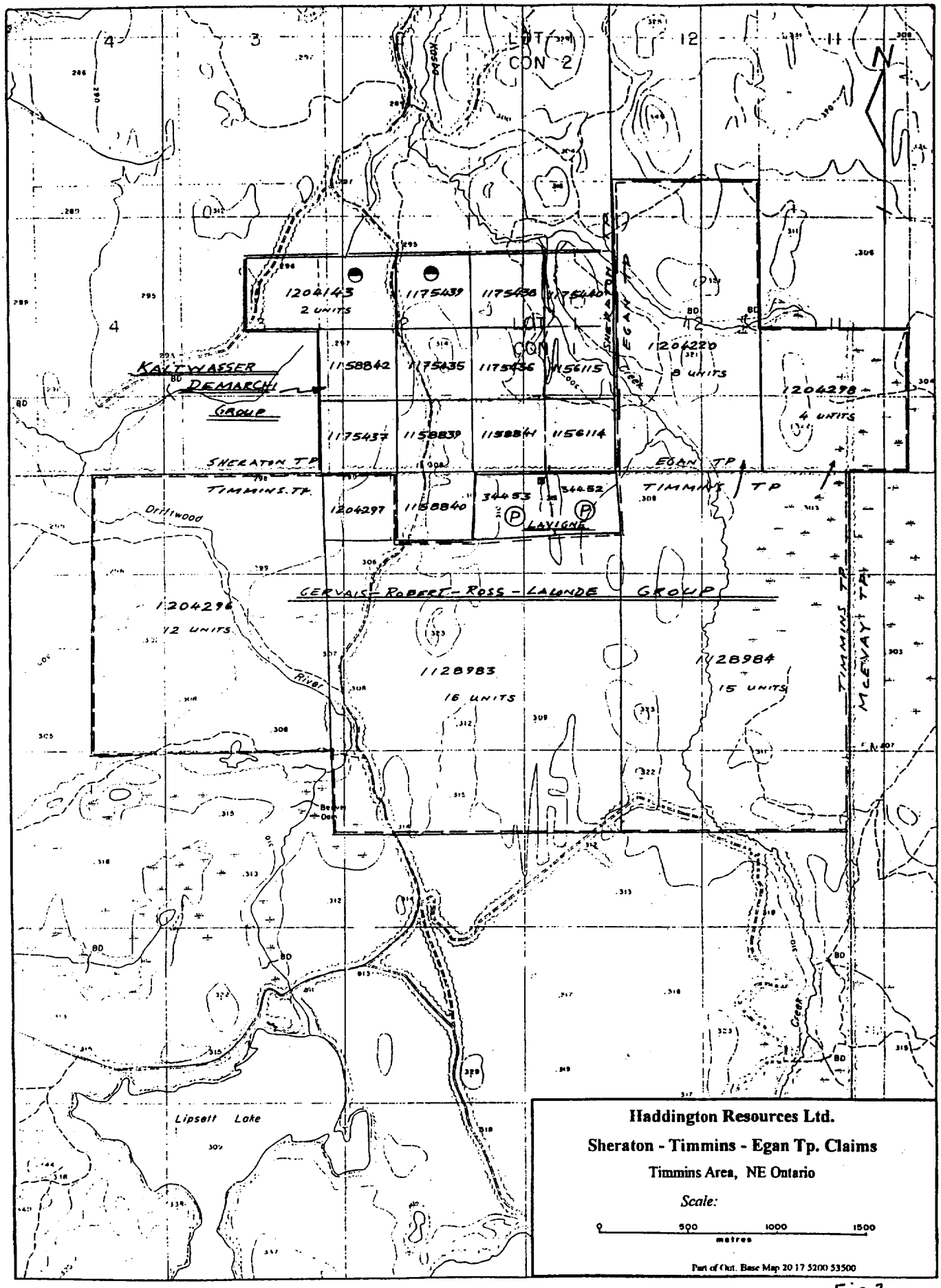
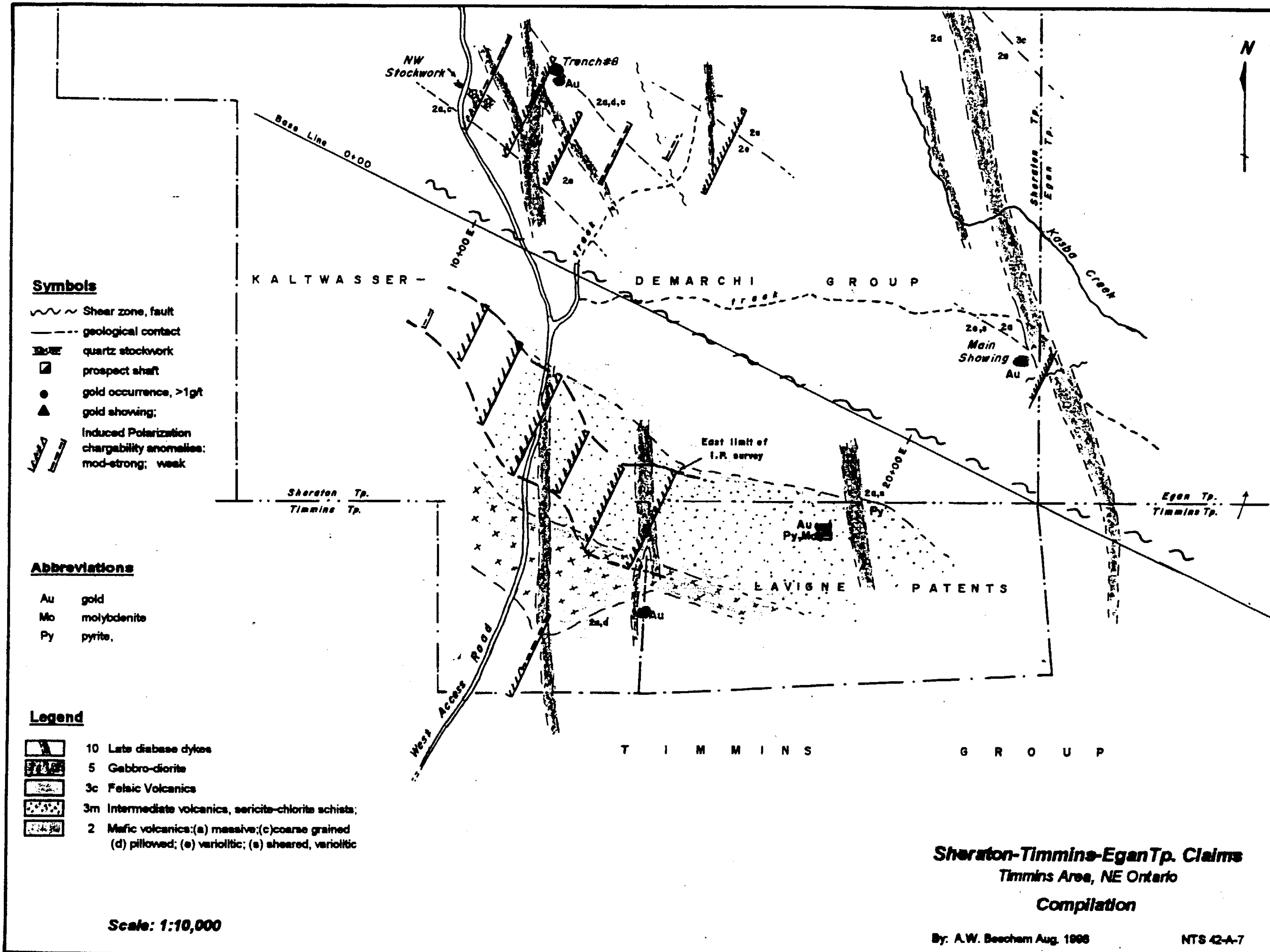

LOT
CON 2
CON 1
1204143
2 UNITS
1175439
1175436
1175440
1158842
1175435
1175436
1156115
1175437
1158839
1158841
1156114
KALTWASSER
DEMARCHI
GROUP
SHERATON TP
TIMMINS TP
EGAN TP
1204220
8 UNITS
1204298
4 UNITS
1204297
1158840
34453
34452
LAVIGNE
GERVAIS - ROBERT - ROSS - LALONDE GROUP
1204296
12 UNITS
1128983
16 UNITS
1128984
15 UNITS
McENAY TP
Driftwood
River
Beaver Dam
Lipsett Lake
Creek
Haddington Resources Ltd.
Sheraton - Timmins - Egan Tp. Claims
Timmins Area, NE Ontario
Scale:
500
1000
1500
metres
Part of Ont. Base Map 20 17 5200 53500

Fig 2



NW Stockwork
Trench#8
Au
2a,c
2a,d,c
2a
2e
Base Line 0+00
10+00 E
20+00 E
creek
3c
2a
Sheraton Tp.
Egan Tp.
Kasba Creek
N
KALTWASSER – DEMARCHI GROUP
2a,s
Main Showing
East limit of I.P. survey
Sheraton Tp.
Timmins Tp.
Egan Tp.
Timmins Tp.
Py
Au
Py Mo
2a,d
LAVIGNE PATENTS
West Access Road
TIMMINS GROUP
Symbols
Shear zone, fault
geological contact
quartz stockwork
prospect shaft
gold occurrence, >1g/t
gold showing;
Induced Polarization chargability anomalies: mod-strong; weak
Abbreviations
Au gold
Mo molybdenite
Py pyrite,
Legend
10 Late diabase dykes
5 Gabbro-diorite
3c Felsic Volcanics
3m Intermediate volcanics, sericite-chlorite schists;
2 Mafic volcanics:(a) massive;(c)coarse grained (d) pillowed; (e) variolitic; (s) sheared, variolitic
Sheraton-Timmins-Egan Tp. Claims
Timmins Area, NE Ontario
Compilation
Scale: 1:10,000
By: A.W. Beecham Aug. 1996
NTS 42-A-7

Fig. 3

PREVIOUS WORK

The following is a brief outline of previous work done on the property:

1910-1911
- Two claims (now patented), #34452,34453, staked by L.A. Blanchette and Napoleon Seguin.
- 40 ft. exploration shaft sunk on #34453 to test narrow qtz. veins at contact of feldspar porphyry dikes and chlorite schists, with reported high Au. values.

1937
- Blanchette-Porcupine Mines drilled numerous holes in the area of the above shaft, no logs available.

1947
- 5 ddh's on claim #34452
- narrow qtz. stringers with pyrite noted, no gold values reported.

1974
- stripping and trenching, various parts of property.

1981-1984
- Johns-Manville Canada Inc., geological/geophysical surveys and stripping and trenching. Gold values reported from samples of quartz veins in feldspar porphyry dikes.

1987
- Placer-Dome Inc., held 15 units in SE Sheraton Twp.
- Magnetic and VLF-EM Surveys.

1988
- T. McAllister did Mag/VLF Survey over SE part of the current Kaltwasser-Demarchi claims and Kimex Inc. did the same over the western part as well as other parts of the property.

1990
- R. Kaltwasser and D. Demarchi re-discovered significant gold values in an old rock trench in the SE corner of Sheraton Twp.
- between 1992-1994 they did some trenching, chip sampling, magnetic surveys and soil sampling.

1995
- The unpatented claims comprising the property subject of this report were optioned by Haddington Resources Ltd.
- 97.6 km grid cut and surveyed by Magnetometer, covering all of the Kaltwasser and Timmins group.
- some of the main area was re-mapped at 1:2500 and soil sampled.
- selected areas over known showing covered by I.P. Survey.
- two patented claims described above were optioned in July/96.

PROPERTY GEOLOGY

The following is a condensed version of the "Property Geology and Mineral Occurrences" from a report entitled "Report on the Sheraton-Timmins-Egan Township Claims" by A.W. Beecham, August 1996. (see Fig. 3, taken from above report).

The property is approximately 45 km. ESE of the Timmins Camp and 20 km. south of the Destor-Porcupine Fault zone. The property is reported to be underlain predominately by Mafic volcanics with some intermediate and felsic volcanics as well as a small intrusion of feldspar porphyry in the main showing area. In the NW corner of Lot 2, Con. V1, Timmins Twp., a coarse grained, gabbro is reported to intrude between intermediate-felsic volcanics to the north and mafic volcanics to the south. Numerous NNW striking Archean, diabase dikes cut through the property.

SURVEY PARAMETERS

Magnetometer Survey

In 1997, a total of 4.5 km. of Magnetic Survey was completed over the two patented claims, #34452 and 34453. This data was tied in to and merged with 97.5 km of data from a 1995 magnetometer survey done on the rest of the property which at that time surrounded but did not include the two patented claims. The merged data was processed and plotted (Map. No. 1). The following is a brief description of the parameters used for the Magnetic Survey:

A GEM Systems, GSM-19, Proton Precession magnetometer was used to carry out the magnetometer survey. The instrument is synchronized with an identical unit recording base station to help eliminate magnetic diurnal variation. This should ensure an accuracy of less than 10 Nt.

The Proton Precession method involves energizing a wire coil immersed in a hydrocarbon fluid. This causes the protons in the proton rich fluid to spin or precess simulating spinning magnetic dipoles. When the current is removed the protons precess about the direction of the earth's magnetic field, generating a signal in the same coil which is proportional to the total magnetic field intensity. In this way, the horizontal gradient of the earth's magnetic field can be measured and plotted in plan form with values of equal intensity joined to form a contour map.

This presentation is useful in correlating with other data sets to aid in structural interpretation. Individual magnetic responses can be interpreted for dip, depth and width estimates after profiling the data.

The following parameters were employed for the survey:

Instrument - GEM Systems, GSM-19 Proton Magnetometer
Station Interval - 12.5m
Line Interval - 100m
Diurnal Correction Method - GSM-19 Recording Base Station
Data Presentation - Posted, Contoured plan Map No. 1
- 1:5000 scale
- Contour interval = 100 nano-teslas

Induced Polarization Survey

The current I.P. Survey was carried out over four separate parts of the property, described as the SE Lines, NW Lines and NE Lines, and Patent Block Lines. The following is a brief description of the I.P. Survey Method and the parameters used for the survey:

General IP Theory

The IP method involves applying voltage across two electrodes in a pulsed manner i.e. 2 seconds on, 2 seconds off. A second "dipole" or electrode pair, measures the residual potential or voltage between them after the voltage is shut off or during the 2 second off cycle. The potential is recorded at different times after the shut off. If, for example, there is sulphide mineralization within the measuring dipoles, they will be polarized or charges set up on the sulphide particles. This polarization gives the zone a capacitor effect, thereby blocking the current delay giving a higher chargeability reading.

A typical signature for many gold showings would be a chargeability high, resistivity high and magnetic low. This would be characteristic of a mineralized, highly altered carbonated and/or silicified zone. However, this is by no means the only geological setting for gold, therefore every profile should be looked at individually and correlated with all other geophysical-geological data.

Electrode Array

The electrode array used for the survey was the Pole-Dipole Array. In this array, one current electrode (C1) and two receiver or potential electrodes (P1,P2), are moved down a line in unison. A second current electrode (C2), is placed normal to the expected strike direction an infinite distance away, at least one km. The two current electrodes are hooked up to a motor-generator and a current applied across them, usually less than 3 amperes. The applied voltage is pulsed in a 2 second on, 2 second off pattern controlled by the transmitter.

Thus we have a single pole current electrode following a pair or dipole of potential electrodes moving down the line. The advantage of this "Pole-Dipole" array over the "Dipole-Dipole" array is a deeper current pattern between the infinite and moving current electrode, resulting in better penetration of conductive overburden. Also, this array is considerably faster in areas of high electrode contact impedance due to frozen and or rocky ground conditions because only one current electrode placement is needed for each reading. A disadvantage of the "Pole-Dipole" array is a slightly more ambiguous interpretation due to the assymetry of the array.

The distance between the potential electrodes is fixed, usually 25 or 50 meters and this is called the "a" spacing. When the potential dipole is positioned with one "a" spacing between the C1 and the nearest P1, it is called a "N=1" reading with a theoretical plot point at the intersection of a 45 degree line drawn down in a section format from the C1 and nearest P1. When this N=1 reading is finished, the C1 remains stationary and the P1P2 dipole moves ahead one "a" spacing and a N=2 reading is obtained. Using the above plot convention it can be seen that the plot point is now further from the C1 and deeper. This is repeated for as many "N" readings as desired.

IP Survey Parameters

The IP survey was carried out using the following parameters:

Method: Time Domain
Electrode Array: Pole-Dipole
"a" spacing: 25 meters
Number of Dipoles Read: 1-6 inclusive
Pulse Duration: 2 seconds on, 2 seconds off
Delay Time: 310 milliseconds
Integration Time: 140 milliseconds
Receiver: Scintrex IPR-12
Transmitter: Scintrex TSQ-3 3KVA.
Data Presentation: Individual Psuedosections
4 Plates Scale: 1:2500

SURVEY RESULTS

The Magnetometer Survey consisted of 4.5 km to cover two newly acquired patented claims in the middle of the property. The results indicate that a large magnetic unit striking SE, diagonally across the property from the west boundary to the patented claims (1995 magnetic survey), does indeed continue through the patents, joining the same unit southeast of the patents. As per a report on the property by A.W. Beecham, 1996, this magnetic anomaly has a coincident I.P. response with known pyrite mineralization and coincident gold values.

Initially, the Sept.1997 I.P. Survey covered the newly acquired patented claims on parts of Lines 17e-22e (patented block) and the results indicated that the SE trending I.P. anomaly on the west edge of the patents continues through the patents from L17e/250s - L21e/260s. The anomaly appears to be shifted to the south on L22e @ 400s. The anomaly is resistive and strongly chargeable, especially on the southeastern part. This anomaly has a coincident magnetic correlation of a few thousand nano-teslas above background. A parallel anomaly to the south was detected on L17e/480s and L18e/525s. It is resistive and strongly chargeable with a strong, coincident magnetic correlation. The magnetic anomaly continues southeast along strike to L20e but the I.P. Survey coverage did not cover it east of L18e.

In Dec.1997, Haddington decided to extend I.P. Survey coverage to trace the northernmost anomaly described above to the southeast. The results show the anomaly continuing but with a change of strike direction to east-west. The anomaly was traced from L23e/475s to L25e/400s. The anomaly is strongly chargeable and resistive with a coincident magnetic high correlation. The anomaly was not detected on L26e and L27e and the I.P. coverage was not extended any further to the east. However, a similar magnetic anomaly is evident on L28e and L29e @ 350n, which could be a continuation of the I.P. anomaly. The magnetic map shows a linear, north-south trending magnetic low feature which could be a fault which would explain the break in the magnetic anomaly between L25e and L28e.

Also in Dec.1997, Lines 18e, 20e, and 22e were surveyed by I.P. from approximately 500n to 950n, to cover an area of felsic volcanics outlined in the most recent mapping program by Mr. A.W. Beecham. Survey production was slow in this area due to areas of outcrop and poor ground contacts. Three anomalies were detected.

The first anomaly is on L18e/725n and appears to be coincident with a north-south linear magnetic anomaly, most likely a dike. The second on L18e/600n is a weak to moderately chargeable, moderately resistive zone, possibly part of the first anomaly.

The third anomaly is on L22e/approx.975n, and although not as chargeable, it appears to be coincident with a parallel north-south dike. However, the I.P. survey coverage did not extend far enough to resolve the above.

The Dec.1997 I.P. Survey also covered the northwest strike extension of the main, northern anomaly running through the two patented claims from L7e - L10e. The anomaly appears to continue to the northwest from L11e, but the chargeability is much weaker. There is a strong magnetic correlation with the I.P. anomaly on L9e and L8e, as well as a weaker magnetic correlation on L10e. There appears to be a northsouth break in the magnetics between L9e and L11e. L7e did not extend far enough south to cover the anomaly.

CONCLUSIONS AND RECOMMENDATIONS

The I.P. Survey was successful in extending the strike length of the main anomaly through the patents and to the southeast as well as to northwest.

Further work on this anomaly would depend on a compilation of the I.P. results with all recent drilling and mapping results. It appears that the I.P. method works reasonably well on the known mineralization on the property and as such more I.P. Survey may be warranted covering other prospective parts of the property.

CERTIFICATION

I, Raymond Joseph Meikle of Timmins, Ontario hereby certify that:

1. I hold a three year Technologist Diploma from the Haileybury School of Mines, Haileybury, Ontario, obtained in May 1975.

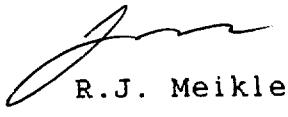
2. I have been practising my profession since 1973 in Ontario, Quebec, Nova Scotia, New Brunswick, Newfoundland, NWT, Manitoba, Germany and Chile.

3. I have been employed directly with Teck Corporation, Metallgessellschaft Canada Ltd. Sabina Industries, R.S. Middleton Exploration Services Ltd., self employed 1979-1997 (Rayan Exploration Ltd.) and currently with Geophysical Engineering & Surveys Inc.

4. I have based conclusions and recommendations contained in this report on knowledge of the area, my previous experience and on the results of the field work conducted on the property during 1997.

5. I hold no interest, directly or indirectly in this property, nor do I expect to receive any interest or considerations from the property, other than for professional fees rendered.

Dated this 20th day of Jan., 1998
at Timmins, Ontario.



R.J. Meikle

APPENDIX 'A'

SCINTREX IPR-12, I.P. RECEIVER

SCINTREX

IPR-12 Time Domain Induced Polarization/Resistivity Receiver

Brief Description

The IPR-12 Time Domain IP/Resistivity Receiver is principally used in exploration for precious and base metal mineral deposits. In addition, it is used in geoelectrical surveying for groundwater or geothermal resources, often to great depths. For these latter targets, the induced polarization measurements may be as useful as the high accuracy resistivity results since it often happens that geological materials have IP contrasts when resistivity differences are absent.

Due to its integrated, lightweight, microprocessor based design and its large, 16 line display screen, the IPR-12 is a remarkably powerful, yet easy to use instrument. A wide variety of alphanumeric and graphical information can be viewed by the operator during and after the taking of readings. Signals from up to eight potential dipoles can be measured simultaneously and recorded in solid-state memory along with automatically calculated parameters. Later, data can be output to a printer or a PC (direct or via modem) for processing into profiles and maps.

The IPR-12 is compatible with Scintrex IPC and TSQ Transmitters, or others which output square waves with equal on and off periods and polarity changes each half cycle. The IPR-12 measures the primary voltage (Vp), self potential (SP) and time domain induced polarization (Mi) characteristics of the received waveform. Resistivity, statistical and Cole-Cole parameters are calculated and recorded in memory with the measured data and time.

Scintrex has been active in induced polarization research, development, manufacturing, consulting and surveying for over thirty years. We offer a full range of instrumentation, accessories and training.

The IPR-12 Receiver measures spectral IP signals from eight dipoles simultaneously then records measured and calculated parameters in memory.

Benefits

Speed Up Surveys

The IPR-12 saves you time and money in carrying out field surveys. Its capacity to measure up to eight dipoles simultaneously is far more efficient than older receivers measuring a single dipole. This advantage is particularly valuable in drillhole logging where electrode movement time is minimal.

The built-in, solid-state memory records all information associated with a reading, dispensing with the need for any hand written notes. PC compatibility means rapid electronic transfer of data from the receiver to a computer for rapid data processing.

Taking a reading is simple and fast. Only a few keystrokes are virtually needed since the IPR-12 features automatic circuit resistance checks, SP buckout and gain setting.

High Quality Data

One of the most important features of the IPR-12 in permitting high quality data to be acquired, is the large display screen which allows the operator easy real time access to graphic and alphanumeric displays of instrument status and measured data. The IPR-12 ensures that the operator obtains accurate data from field work.

The number and relative widths of the IP decay curve windows have been carefully chosen to yield the transient information required for proper interpretation of spectral IP data. Timings are selectable to permit a very wide range of responses to be measured.

Specifications

Inputs
1 to 8 dipoles are measured simultaneously.

Input Impedance
16 Megohms

SP Bucking
±10 volt range. Automatic linear correction operating on a cycle by cycle basis.

Input Voltage (Vp) Range
50 µvolt to 14 volt

Chargeability (M) Range
0 to 300millivolt

Tau Range
1 millisecond to 1000 seconds

Reading Resolution of Vp, SP and M
Vp, 10 microvolt; SP, 1 millivolt; M, 0.01 millivolt/volt

Absolute Accuracy of Vp, SP and M
Better than 1%

Common Mode Rejection
At input more than 100db

Vp Integration Time
10% to 80% of the current on time.

IP Transient Program
Total measuring time keyboard selectable at 1, 2, 4, 8, 16 or 32 seconds. Normally 14 windows except that the first four are not measured on the 1 second timing, the first three are not measured on the 2 second timing and the first is not measured on the 4 second timing. (See diagram on page 2.) An additional transient slice of minimum 10 ms width, and 10ms steps, with delay of at least 40 ms is keyboard selectable.

Transmitter Timing
Equal on and off times with polarity change each half cycle. On/off times of 1, 2, 4, 8, 16 or 32 seconds. Timing accuracy of ±100 ppm or better is required.

External Circuit Test
All dipoles are measured individually in sequence, using a 10 Hz square wave. The range is 0 to 2 Mohm with 0.1kohm resolution. Circuit resistances are displayed and recorded.

Synchronization
Self synchronization on the signal received at a keyboard selectable dipole. Limited to avoid mistriggering.

Filtering
RF filter, 10 Hz 6 pole low pass filter, statistical noise spike removal.

Internal Test Generator
1200 mV of SP; 807 mV of Vp and 30.28 mV/V of M.

Analog Meter
For monitoring input signals; switchable to any dipole via keyboard.

Keyboard
17 key keypad with direct one key access to the most frequently used functions.

Display
16 lines by 42 characters, 128 x 256 dots, Backlit Liquid Crystal Display. Displays instrument status and data during and after reading. Alphanumeric and graphic displays.

Display Heater
Available for below -15°C operation.

Memory Capacity
Stores approximately 400 dipoles of information when 8 dipoles are measured simultaneously.

Real Time Clock
Data is recorded with year, month, day, hour, minute and second.

Digital Data Output
Formatted serial data output for printer and PC etc. Data output in 7 or 8 bit ASCII, one start, one stop bit, no parity format. Baud rate is keyboard selectable for standard rates between 300 baud and 51.6 kBaud. Selectable carriage return delay to accommodate slow peripherals. Handshaking is done by X-on/X-off.

Standard Rechargeable Batteries
Eight rechargeable Ni-Cad D cells. Supplied with a charger, suitable for 110/230V, 50 to 60 Hz, 10W. More than 20 hours service at +25°C, more than 8 hours at -30°C.

Ancillary Rechargeable Batteries
An additional eight rechargeable Ni-Cad D cells may be installed in the console along with the Standard Rechargeable Batteries. Used to power the Display Heater or as back up power. Supplied with a second charger. More than 6 hours service at -30°C.

Use of Non-Rechargeable Batteries
Can be powered by D size Alkaline batteries, but rechargeable batteries are recommended for longer life and lower cost over time.

Operating Temperature Range
-30°C to +50°C

Storage Temperature Range
-30°C to +50°C

Dimensions
Console: 355 x 270 x 165 mm
Charger: 120 x 95 x 55mm

Weights
Console: 5.8 kg
Standard or Ancillary Rechargeable Batteries: 1.3 kg
Charger: 1.1 kg

Transmitters available

IPC-9	200 W
TSQ-2E	750 W
TSQ-3	3 kW
TSQ-4	10 kW

SCINTREX

In Canada

222 Snidercroft Rd.
Concord, Ontario
Canada, L4K 1B5

Tel.: (905) 669-2280
Fax: (905) 669-6403
Telex: (905) 06-964570

In the U.S.A.

85 River Rock Drive
Unit # 202
Buffalo, N.Y.
U.S.A. 14207

Tel.: (716) 298-1219
Fax: (716) 298-1317

IPR-12/94

APPENDIX 'B'

SCINTREX TSQ-3, I.P. TRANSMITTER

SCINTREX TSQ-3 3000 W

Time and Frequency Domain IP and Resistivity Transmitter

Function

The TSQ-3 is a multi-frequency, square wave transmitter suitable for induced polarization and resistivity measurements in either the time or frequency domain. The unit is powered by a separate motor-generator.

The favourable power/weight ratio and compact design of this system make it portable and highly versatile for use with a wide variety of electrode arrays. The medium range power rating is sufficient for use under most geophysical conditions.

The TSQ-3 has been designed primarily for use with the Scintrex Time Domain and Frequency Domain Receivers, for combined induced polarization and resistivity measurements, although it is compatible with most standard time domain and frequency domain receivers. It is also compatible with the Scintrex Commutated DC Resistivity Receivers for resistivity surveying. The TSQ-3 may also be used as a very low frequency electromagnetic transmitter.

Basically the transmitter functions as follows. The motor turns the generator (alternator) which produces 800 Hz, three phase, 230 V AC. This energy is transformed upwards according to a front panel voltage setting by a large transformer housed in the TSQ-3. The resulting AC is then rectified in a rectifier bridge. Commutator switches then control the DC voltage output according to the waveform and frequency selected. Excellent output current stability is ensured by a unique, highly efficient technique based on control of the phase angle of the three phase input power.

Features

Current outputs up to 10 amperes, voltage outputs up to 1500 volts, maximum power 3000 VA.

Solid state design for both power switching and electronic timing control circuits.

Circuit boards are removable for easy servicing.

Switch selectable wave forms: square wave continuous for frequency domain and square wave interrupted with automatic polarity change for time domain.

Switch selectable frequencies and pulse times.

Overload, underload and thermal protection for maximum safety.

Digital readout of output current.

Programmer is crystal controlled for very high stability.

Low loss, solid state output current regulation over broad range of load and input voltage variations.

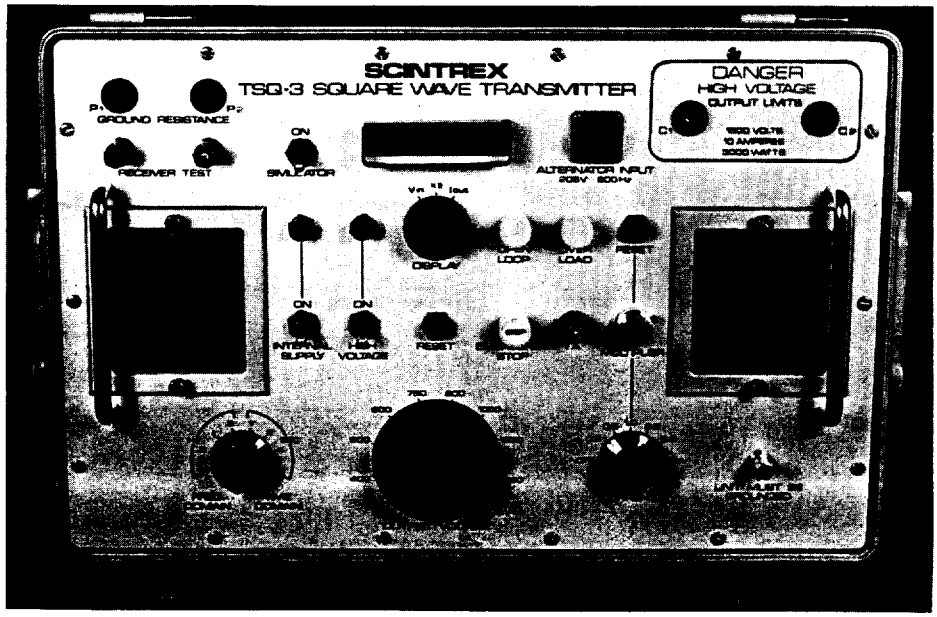
Rectifier circuit is protected against transients.

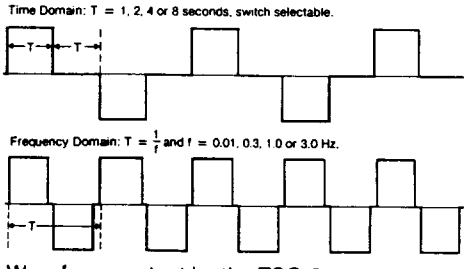
Excellent power/weight ratio and efficiency.

Designed for field portability; motor-generator is installed on a convenient frame and is easily man-portable. The transmitter is housed in an aluminum case.

The motor-generator consists of a reliable Briggs and Stratton four stroke engine coupled to a brushless permanent magnet alternator.

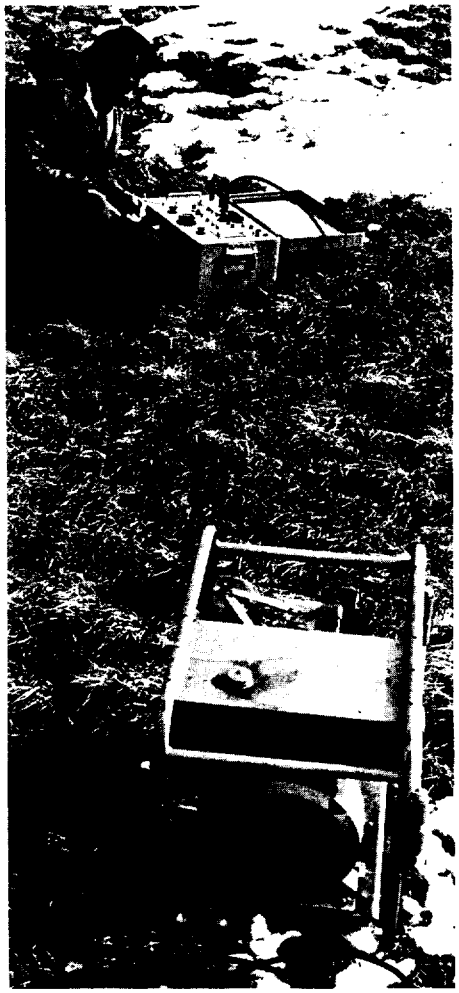
New motor-generator design eliminates need for time domain dummy load.





Waveforms output by the TSQ-3

Technical Description of TSQ-3/3000W Time and Frequency Domain IP and Resistivity Transmitter



TSQ-3 transmitter with portable motor generator unit

Transmitter Console	
Output Power	3000 VA maximum
Output Voltages	300, 400, 500, 600, 750, 900, 1050, 1200, 1350 and 1500 volts, switch selectable
Output Current	10 amperes maximum
Output Current Stability	Automatically controlled to within ±0.1% for up to 20% external load variation or up to ±10% input voltage variation
Digital Display	Light emitting diodes permit display up to 1999 with variable decimal point; switch selectable to read input voltage, output current, external circuit resistance. Dual current range, switch selectable
Absolute Accuracy	±3% of full range
Current Reading Resolution	10 mA on coarse range (0-10A) 1 mA on fine range (0-2A)
Frequency Domain Waveform	Square wave, continuous with approximately 6% off time at polarity change
Frequency Domain Frequencies	Standard: 0.1, 0.3, 1.0 and 3.0 Hz, switch selectable Optional: any number of frequencies in range 0 to 5 Hz.
Time Domain Cycle Timing	t:t:t:t;on:off:on:off;automatic
Time Domain Polarity Change	each 2t; automatic
Time Domain Pulse Durations	Standard: t = 1, 2, 4 or 8 seconds Optional: any other timings
Time and Frequency Stability	Crystal controlled to better than .01%
Efficiency	.78
Operating Temperature Range	−30°C to +50°C
Overload Protection	Automatic shut-off at 3300 VA
Underload Protection	Automatic shut-off at current below 75mA
Thermal Protection	Automatic shut-off at internal temperature of +85°C
Dimensions	350 mm x 530 mm x 320 mm
Weight	25.0 kg.
Power Source	
Type	Motor flexibly coupled to alternator and installed on a frame with carrying handles.
Motor	Briggs and Stratton, four stroke, 8 H.P.
Alternator	Permanent magnet type. 800 Hz, three phase 230 V AC
Output Power	3500 VA maximum
Dimensions	520 mm x 715 mm x 560 mm
Weight	72.5 kg
Total System	
Shipping Weight	150 kg includes transmitter console, motor generator, connecting cables and re-usable wooden crates

SCINTREX

222 Snidercroft Road
Concord Ontario Canada
L4K 1B5

Telephone: (416) 669-2280
Cable: Geoscint Toronto
Telex: 06-964570

Geophysical and Geochemical
Instrumentation and Services

Ontario Ministry of Northern Development and Mines

Declaration of Assessment Work Performed on Mining Land

Mining Act, Subsection 65(2) and 66(3), R.S.O. 1990

Transaction Number (office use)
W9860.00149
Assessment Files Research Imaging
W9880.00147

42A07NE2003 2.18227 EGAN 900

...ctions 65(2) and 66(3) of the Mining Act. Under section 8 of the Mining Act, this ...t work and correspond with the mining land holder. Questions about this collection ...nt and Mines, 3rd Floor, 933 Ramsey Lake Road, Sudbury, Ontario, P3E 6B5.

Instructions: - For work performed on Crown Lands before recording a claim, use form 0240.
- Please type or print in ink.

1. Recorded holder(s) (Attach a list if necessary)

Name: RICHARD KALTWASSER	Client Number: 150541
Address: BOX 34, 448 - 8th AVE	Telephone Number: 705-273-2733
MATHESON, ONT. P0K 1N0	Fax Number:
Name: JCL CORPORATION	Client Number: 303255
Address: BOX 630, 1110 LAVIGNE BLVD.	Telephone Number: 705-264-4750
TIMMINS, ONT. P4N 7G2	Fax Number:

(See attached Supplemental List)

2. Type of work performed: Check (✓) and report on only ONE of the following groups for this declaration.

☑ Geotechnical: prospecting, surveys, assays and work under section 18 (regs) ☐ Physical: drilling stripping, trenching and associated assays ☐ Rehabilitation

Work Type: MAG. & I.P. SURVEYS	Office Use
	Commodity
	Total $ Value of Work Claimed: 26,410
Dates Work Performed: From 01 (Day) 08 (Month) 96 (Year) To 31 (Day) 12 (Month) 97 (Year)	NTS Reference
Global Positioning System Data (If available)	Mining Division: ~~Timmins~~ Porcupine
Township/Area: SHERATON/TIMMINS/EGAN	Resident Geologist District: Timmins/Kirkland Lake
M or G-Plan Number: M-346/M-314/G-3971	

Please remember to: - obtain a work permit from the Ministry of Natural Resources as required;
- provide proper notice to surface rights holders before starting work;
- complete and attach a Statement of Costs, form 0212;
- provide a map showing contiguous mining lands that are linked for assigning work;
- include two copies of your technical report.

3. Person or companies who prepared the technical report (Attach a list if necessary)

Name: RAY MEIKLE	Telephone Number: 705-268-4866
Address: 170 SECOND AVE. BOX 15 TIMMINS ONT P4N 7C5	Fax Number: 705-360-7733
Name:	Telephone Number:
Address:	Fax Number:
Name:	Telephone Number:
Address:	Fax Number:

RECEIVED
MAR - 3 1998
10:15
GEOSCIENCE ASSESSMENT OFFICE

4. Certification by Recorded Holder or Agent

I, NEIL MAC ISAAC (Print Name), do hereby certify that I have personal knowledge of the facts set forth in this Declaration of Assessment Work having caused the work to be performed or witnessed the same during or after its completion and, to the best of my knowledge, the annexed report is true.

Signature of Recorded Holder or Agent: Neil Mac Isaac (Agent)	Date: Feb 27/98
Agent's Address: BOX 802 SCHUMACHER, ONT. P0N 1G0	Telephone Number: 705-264-3531 Fax Number: 705-264-3531

0241 (03/97)

Deemed May 28/98

RECEIVED
FEB 27 1998
4:25 PM
PORCUPINE ... SION

W9860.00149
W9880.00147

Recorded Holders (Supplementary List)

JACQUES ROBERT — CLIENT # 188148
321 HAILEYBURY CRES.
PORCUPINE, ONT. — TEL/FAX 705-235-8029
GEN. DEL P0N 1C0

DAVID E. DEMARCHI — CLIENT # 125156
BOX 36
11 BRUCE ST. — TEL 705-235-3888
SOUTH PORCUPINE, ONT.
P0N 1H0

HADDINGTON RESOURCES LTD. (OPTIONEE)
11th FLOOR - 808 WEST HASTINGS ST.
VANCOUVER BC. — CLIENT # 300638
V6C 2X4 — TEL 604-687-7463
FAX 604-681-2578

5. Work to be recorded and distributed. Work can only be assigned to claims that are contiguous (adjoining) to the mining land where work was performed, at the time work was performed. A map showing the contiguous link must accompany this form.

	Mining Claim Number. Or if work was done on other eligible mining land, show in this column the location number indicated on the claim map.	Number of Claim Units. For other mining land, list hectares.	Value of work performed on this claim or other mining land.	Value of work applied to this claim.	Value of work assigned to other mining claims.	Bank. Value of work to be distributed at a future date
eg	TB 7827	16 ha	$26,825	N/A	$24,000	$2,825
eg	1234567	12	0	$24,000	0	0
eg	1234568	2	$ 8,892	$ 4,000	0	$4,892
1	P-34452 PAT.	1	4732. ✓	—	4732.	10.
2	P-34453 PAT.	1	3738. ✓	—	3738.	
3	P-1128983	16	1685.	6400.		
4	P-1128984	15	4490. ✓	6000.		
5	P-1156114	1	1148. ✓	—	1148.	
6	P-1156115	1	816. ✓	400.	416.	
7	P-1158839	1	—	400.		
8	P-1158840	1	—	—		
9	P-1158841	1	1760. ✓	—	1760.	
10	P-1158842	1	2630. ✓	—	2630.	
11	P-1175435	1	—	800.		
12	P-1175436	1	—	800.		
13	P-1175437	1	2040. ✓	400.	1640.	
14	P-1175438	1	—	800.		
15	P-1175439	1	—	800.		
	Column Totals		(CONTINUED ON NEXT Page)			

I, NEIL MAC ISAAC (Print Full Name), do hereby certify that the above work credits are eligible under subsection 7 (1) of the Assessment Work Regulation 6/96 for assignment to contiguous claims or for application to the claim where the work was done.

Signature of Recorded Holder or Agent Authorized in Writing	Date
Neil Mac Isaac	Feb 27/98

6. Instructions for cutting back credits that are not approved.

Some of the credits claimed in this declaration may be cut back. Please check (✓) in the boxes below to show how you wish to prioritize the deletion of credits:

- ☐ 1. Credits are to be cut back from the Bank first, followed by option 2 or 3 or 4 as indicated.
- ☐ 2. Credits are to be cut back starting with the claims listed last, working backwards; or
- ☐ 3. Credits are to be cut back equally over all claims listed in this declaration; or
- ☐ 4. Credits are to be cut back as prioritized on the attached appendix or as follows (describe):

Note: If you have not indicated how your credits are to be deleted, credits will be cut back from the Bank first, followed by option number 2 if necessary.

For Office Use Only

Received Stamp

RECEIVED
FEB 27 1998
4:25PM
PORCUPINE MINING DIVISION

Deemed Approved Date	Date Notification Sent
Date Approved	Total Value of Credit Approved
Approved for Recording by Mining Recorder (Signature)	

0241 (03/97)

RECEIVED
MAR - 3 1998
GEOSCIENCE ASSESSMENT OFFICE

5. **Work to be recorded and distributed.** Work can only be assigned to claims that are contiguous (adjoining) to the mining land where work was performed, at the time work was performed. A map showing the contiguous link must accompany this form. P-3 (Con't from P. 2) W9880.00147 / W9860.00149

	Mining Claim Number. Or if work was done on other eligible mining land, show in this column the location number indicated on the claim map.	Number of Claim Units. For other mining land, list hectares.	Value of work performed on this claim or other mining land.	Value of work applied to this claim.	Value of work assigned to other mining claims.	Bank. Value of work to be distributed at a future date
eg	TB 7827	16 ha	$26,825	N/A	$24,000	$2,825
eg	1234567	12	0	$24,000	0	
eg	1234568	2	$ 8,892	$ 4,000	0	
16	P 1175440	1	130.	800.	50.	
17	P. 1204143	2	410.	800.		
18	P. 1204220	8	1660.	3200.		
19	P. 1204296	12	—	4800.		
20	P. 1204297	1	—	—		
21	P. 1204298	4	—	—		
7						
8						
9						
10						
11						
12						
13						
14						
15						
	Column Totals		26,410.	26,400.	16,555.	10.

I, NEIL MACISAAC (Print Full Name), do hereby certify that the above work credits are eligible under subsection 7 (1) of the Assessment Work Regulation 6/96 for assignment to contiguous claims or for application to the claim where the work was done.

Signature of Recorded Holder or Agent Authorized in Writing	Date
Neil MacIsaac	Feb 26th / 98

6. Instructions for cutting back credits that are not approved.

Some of the credits claimed in this declaration may be cut back. Please check (✓) in the boxes below to show how you wish to prioritize the deletion of credits:

- ☐ 1. Credits are to be cut back from the Bank first, followed by option 2 or 3 or 4 as indicated.
- ☐ 2. Credits are to be cut back starting with the claims listed last, working backwards; or
- ☐ 3. Credits are to be cut back equally over all claims listed in this declaration; or
- ☐ 4. Credits are to be cut back as prioritized on the attached appendix or as follows (describe):

Note: If you have not indicated how your credits are to be deleted, credits will be cut back from the Bank first, followed by option number 2 if necessary.

For Office Use Only

Received Stamp

RECEIVED
FEB 27 1998
4:25PM
PORCUPINE MINING DIVISION

Deemed Approved Date	Date Notification Sent
Date Approved	Total Value of Credit Approved
Approved for Recording by Mining Recorder (Signature)	

RECEIVED
MAR - 3 1998
GEOSCIENCE ASSESSMENT OFFICE

0241 (03/97)

W9880. 00147

Transaction Number (office use)
W9860. 00149

Ontario Ministry of Northern Development and Mines

Statement of Costs for Assessment Credit

Personal information collected on this form is obtained under the authority of subsection 6 (1) of the Assessment Work Regulation 6/96. Under section 8 of the Mining Act, this information is a public record. This information will be used to review the assessment work and correspond with the mining land holder. Questions about this collection should be directed to a Provincial Mining Recorder, Ministry of Northern Development and Mines, 3rd Floor, 933 Ramsey Lake Road, Sudbury, Ontario, P3E 6B5.

Work Type	Units of work Depending on the type of work, list the number of hours/days worked, metres of drilling, kilometres of grid line, number of samples, etc.	Cost Per Unit of work	Total Cost
MAG. SURVEY	4.5 K.m	85.	383.
DATA PROCESSING - MERGE W PREV. MAG. DATA, etc			600.
I.P. SURVEY	16 DAYS	1450.	22,800.
ASSESSMENT	REPORT & MAPS, Pseudo Sections		600.
		SUB. TOT.	24,383.
		G.S.T.	1707.
SUPERVISION	1.5 DAYS	200./dy.	300.
Associated Costs (e.g. supplies, mobilization and demobilization).			
	SUPPLIES		20.
Transportation Costs			
Food and Lodging Costs			
		Total Value of Assessment Work	26,410.

RECEIVED
MAR - 3 1998
GEOSCIENCE ASSESSMENT OFFICE

Calculations of Filing Discounts:

1. Work filed within two years of performance is claimed at 100% of the above Total Value of Assessment Work.
2. If work is filed after two years and up to five years after performance, it can only be claimed at 50% of the Total Value of Assessment Work. If this situation applies to your claims, use the calculation below:

TOTAL VALUE OF ASSESSMENT WORK x 0.50 = Total $ value of worked claimed.

Note:
- Work older than 5 years is not eligible for credit.
- A recorded holder may be required to verify expenditures claimed in this statement of costs within 45 days of a request for verification and/or correction/clarification. If verification and/or correction/clarification is not made, the Minister may reject all or part of the assessment work submitted.

Certification verifying costs:

I, NEIL MAC ISAAC (please print full name), do hereby certify, that the amounts shown are as accurate as may reasonably be determined and the costs were incurred while conducting assessment work on the lands indicated on the accompanying Declaration of Work form as AGENT (recorded holder, agent, or state company position with signing authority) I am authorized to make this certification.

RECEIVED
FEB 27 1998
4:25 PM
PORCUPINE MINING DIVISION

Signature	Date
Neil MacIsaac	Feb 27/98

0212 (03/97)

Ministry of Northern Development and Mines

Ministère du Développement du Nord et des Mines

Ontario

Geoscience Assessment Office
933 Ramsey Lake Road
6th Floor
Sudbury, Ontario
P3E 6B5

Telephone: (888) 415-9846
Fax: (705) 670-5881

May 13, 1998

RICHARD F. KALTWASSER
P.O. BOX 34
MATHESON, Ontario
P0K-1N0

Dear Sir or Madam:

Submission Number: 2.18227

Subject: Transaction Number(s):		**Status**
	W9860.00149	Deemed Approval
	W9880.00147	Deemed Approval

We have reviewed your Assessment Work submission with the above noted Transaction Number(s). The attached summary page(s) indicate the results of the review. WE RECOMMEND YOU READ THIS SUMMARY FOR THE DETAILS PERTAINING TO YOUR ASSESSMENT WORK.

If the status for a transaction is a 45 Day Notice, the summary will outline the reasons for the notice, and any steps you can take to remedy deficiencies. The 90-day deemed approval provision, subsection 6(7) of the Assessment Work Regulation, will no longer be in effect for assessment work which has received a 45 Day Notice. Allowable changes to your credit distribution can be made by contacting the Geoscience Assessment Office within this 45 Day period, otherwise assessment credit will be cut back and distributed as outlined in Section #6 of the Declaration of Assessment work form.

Please note any revisions must be submitted in DUPLICATE to the Geoscience Assessment Office, by the response date on the summary.

If you have any questions regarding this correspondence, please contact Steve Beneteau by e-mail at benetest@epo.gov.on.ca or by telephone at (705) 670-5855.

Yours sincerely,

ORIGINAL SIGNED BY
Blair Kite
Supervisor, Geoscience Assessment Office
Mining Lands Section

Correspondence ID: 12264
Copy for: Assessment Library

Work Report Assessment Results

Submission Number: 2.18227

Date Correspondence Sent: May 13, 1998 **Assessor:** Steve Beneteau

Transaction Number	First Claim Number	Township(s) / Area(s)	Status	Approval Date
W9860.00149	1128983	SHERATON, TIMMINS	Deemed Approval	April 29, 1998

Section:
14 Geophysical MAG
14 Geophysical IP

Transaction Number	First Claim Number	Township(s) / Area(s)	Status	Approval Date
W9880.00147	1204220	EGAN	Deemed Approval	April 29, 1998

Section:
14 Geophysical IP
14 Geophysical MAG

Correspondence ID: 12264

Work Report Assessment Results

Submission Number: 2.18227

Correspondence to:

Resident Geologist
South Porcupine, ON

Assessment Files Library
Sudbury, ON

Recorded Holder(s) and/or Agent(s):

Neil MacIsaac
SCHUMACHER, ONTARIO, CANADA

RICHARD F. KALTWASSER
MATHESON, Ontario

JCL CORPORATION
TIMMINS, ONTARIO

JACQUES ROBERT
PORCUPINE, Ontario

DAVID ENIO DEMARCHI
SOUTH PORCUPINE, ON

HADDINGTON RESOURCES LTD.
VANCOUVER, B.C.

AREAS WITHDRAWN FROM DISPOSITION

M.R.O. – MINING RIGHTS ONLY
S.R.O. – SURFACE RIGHTS ONLY
M.+S. – MINING AND SURFACE RIGHTS

Description	Order No.	Date	Disposition	File
(R4)	W 68/77	4/8/77	S.R.O.	177198
~~(R5)~~	~~NWR 18/72~~	~~19/5/82~~	~~S.R.O. MR~~	
~~(R5)~~	~~NWR 41/83~~	~~22/06/85~~	~~S.R.O. MR~~	

(R4) — MINING AND SURFACE RIGHTS RE-OPENED UNDER SECTION 35 OF THE MINING ACT, R.S.O. 1990 ORDER NO. O-P-13/97 NER DATED MAY 16/97, ORDER COMES INTO EFFECT AT 8AM STD TIME, JUNE 1, 1997.

(R5) — MINING AND SURFACE RIGHTS RE-OPENED UNDER SECTION 35 OF THE MINING ACT, R.S.O. 1990, ORDER NO. O-P 15/97 NER DATED MAY 26/97, ORDER COMES INTO EFFECT AT 8AM STD TIME, JUNE 10, 1997.

THE INFORMATION THAT APPEARS ON THIS MAP HAS BEEN COMPILED FROM VARIOUS SOURCES, AND ACCURACY IS NOT GUARANTEED. THOSE WISHING TO STAKE MINING CLAIMS SHOULD CONSULT WITH THE MINING RECORDER, MINISTRY OF NORTHERN DEVELOPMENT AND MINES, FOR ADDITIONAL INFORMATION ON THE STATUS OF THE LANDS SHOWN HEREON.

42A07NE2003 2.18227 EGAN 200

BOND TOWNSHIP

THOMAS TOWNSHIP

EGAN TOWNSHIP

TIMMINS TOWNSHIP

VI V IV III II I

12 11 10 9 8 7 6 5 4 3 2 1

F1 THIS TWP. IS SUBJECT TO FOREST ACTIVITY IN 1994/95 FURTHER INFORMATION ON FILE.

F2 THIS TWP. IS SUBJECT TO FOREST ACTIVITY IN 1995/96. FURTHER INFORMATION AVAILABLE ON FILE.

2.18227 MAG, IP

LEGEND

HIGHWAY AND ROUTE No.
OTHER ROADS
RAILWAY
SURVEYED LINES
TOWNSHIPS, BASE LINES, ETC.
LOTS, MINING CLAIMS, PARCELS, ETC.
UNSURVEYED LINES
LOT LINES
PARCEL BOUNDARY
MINING CLAIMS ETC.
RAILWAY AND RIGHT OF WAY
UTILITY LINES
NON PERENNIAL STREAM
FLOODING OR FLOODING RIGHTS
SUBDIVISION OR COMPOSITE PLAN
RESERVATIONS
ORIGINAL SHORELINE
MARSH OR MUSKEG
MINES
TRAVERSE MONUMENT

DISPOSITION OF CROWN LANDS

TYPE OF DOCUMENT — TYPE

PATENT, SURFACE & MINING RIGHTS
" SURFACE RIGHTS ONLY
" MINING RIGHTS
LEASE, SURFACE & MINING
" SURFACE RIGHTS ONLY
" MINING RIGHTS ONLY
LICENCE OF OCCUPATION
ORDER IN COUNCIL
RESERVATION
CANCELLED
SAND & GRAVEL

NOTE MINING RIGHTS IN PARCEL PATENTED PRIOR TO JUNE 6, 1913, VESTED IN ORIGINAL PATENTEE SUBJECT TO PUBLIC LANDS ACT, R.S.O. 1970, CHAP. 309, SEC. 36, SEC. 37.

Metres 150 0 300 Metres
Chains 10 0 10 20 30 0 5 Chains
Feet 500 0 1000 2000 3000 Feet

SCALE 1:20 000

NOTES

DATE OF ISSUE
MAR 2 5 1998
PROVINCIAL RECORDING OFFICE - SUDBURY

TOWNSHIP
SHERATON

M.N.R. ADMINISTRATIVE DISTRICT
TIMMINS
MINING DIVISION
PORCUPINE
LAND TITLES / REGISTRY DIVISION
COCHRANE

Ministry of Natural Resources Ontario
Ministry of Northern Development and Mines

DATE OF SURVEY
OK BY AL OCT 2016 B.B

NUMBER
G-3971

SHERATON TWP. M. 386

EGAN TWP. M. 346

2.18227

MAG IP

BLACKSTOCK TWP. M. 263

McEVAY TWP. M. 367

MICHIE TWP. M. 301

TIMMINS TWP. M. 314

1212699

1207301

1212700 (4 UNITS)

1206912

1200273

1207302

1193739 16 UNITS

1200279 16 UNITS

(16 UNITS)

1207056 (5 UNITS)

1200269

1200272 16 UNITS

1207303

1193744 16 UNITS

1207306

1193740 16 UNITS

1206913 (16 UNITS)

1229896

1228945

1228850

1228852

(12 UNITS)

1228589

1200268 16 UNITS

1200267 16 UNITS

1207304

1193745 16 UNITS

1193741 16 UNITS

1226217

1200280 12 UNITS

1200262 12 UNITS

1200259 16 UNITS

1193746 16 UNITS

1193742 Greenock 12 UNITS

1200244 15 UNITS

1226218

1228853

1207307

1200284 8 UNITS

1200285 16 UNITS

1193700

1193747 16 UNITS

1193743 8 UNITS

1200241 (9 UNITS)

1224507

1203973

1200242 6 UNITS

F.O. P.01198

1200291 8 UNITS

1200290 16 UNITS

1193701

1193703 16 UNITS

1193706 12 UNITS

1193749 2 UNITS

1193750 9 UNITS

1203972

1200243 15 UNITS

1223413

1128984

1128985

1190148 10 UNITS

1190503 2 UNITS

1128986 16 UNITS

15 UNITS

1228045

1228885

1228853

NOTES

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

Areas withdrawn from staking under Section 43 of the Mining Act, R.S.O. 1970

	Order No.	File	Date	Disposition
(R1)	W 67/77	192164	28/6/77	S.R.O.
(R2)	W 86/77	188543	27/10/77	S.R.O.
(R3)	W. 19/78	188543	10/10/78	S.R.O.
(R4)	W 34/85	188543	to 1/11/85	S.R. + M.R.

SAND and GRAVEL

(B) Quarry Permit

(T) THIS TWP. IS SUBJECT TO FOREST ACTIVITY IN 1995/96. FURTHER INFORMATION IS AVAILABLE ON FILE.

LEGEND

PATENTED LAND	(P) or
PATENTED FOR SURFACE RIGHTS ONLY	
LEASE	(L)
LICENSE OF OCCUPATION	L.O.
CROWN LAND SALE	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

TIMMINS

DATE OF ISSUE

MAY 15 1986

PROVINCIAL RECORDING OFFICE - SUDBURY

DISTRICT OF COCHRANE

PORCUPINE MINING DIVISION

SCALE 1 INCH 40 CHAINS (1/2 MILE)

DR. VT

DATE MARCH 71

PLAN NO. M.314

ONTARIO

MINISTRY OF NATURAL RESOURCES

SURVEYS AND MAPPING BRANCH

THE INFOPMATION THAT APPEARS ON THIS MAP HAS BEEN COMPILED FROM VARIOUS SOURCES, AND ACCURACY IS NOT GUARANTEED. THOSE WISHING TO STAKE MINING CLAIMS SHOULD CONSULT WITH THE MINING RECORDER, MINISTRY OF NORTHERN DEVELOPMENT AND MINES, FOR ADDITIONAL INFORMATION ON THE STATUS OF THE LANDS SHOWN HEREON.

M.314

EGAN TOWNSHIP

LARDER LAKE MINING DIVISION

ONTARIO
MINISTRY OF NATURAL RESOURCES
SURVEYS AND MAPPING BRANCH

DISTRICT OF COCHRANE

M.346

N

SCALE 40 CHAINS TO ONE INCH

CURRIE TWP.

SHERATON TWP.

McCANN TWP.

VI V IV III II I

1224125 1224126 1224127 1226292 1228508 1228221

F.O. L.01198

1224128 1224133 1227615 1228509

1224130 1224129 1212999 1227616

1224131 1222440 1228222

1224132 1228662 1228220

1223825 1222429 1228507

2111 2110 1214071 1217563 1225289

1217564 1222439

1217561 1217562 1224326 1224325 1217524 1217525

1227648

1204220 1204298 1219400 1218945 1224324 1217523 1217522

MRO

M.R.O.

L.UP

River

Wanabeg

12 11 10 9 8 7 6 5 4 3 2 1

McEVAY TWP.

THE INFORMATION THAT APPEARS ON THIS MAP HAS BEEN COMPILED FROM VARIOUS SOURCES, AND ACCURACY IS NOT GUARANTEED. THOSE WISHING TO STAKE MINING CLAIMS SHOULD CONSULT WITH THE MINING RECORDER, MINISTRY OF NORTHERN DEVELOPMENT AND MINES, FOR ADDITIONAL INFORMATION ON THE STATUS OF THE LANDS SHOWN HEREON.

2.18227
MAG, IP

LEGEND.

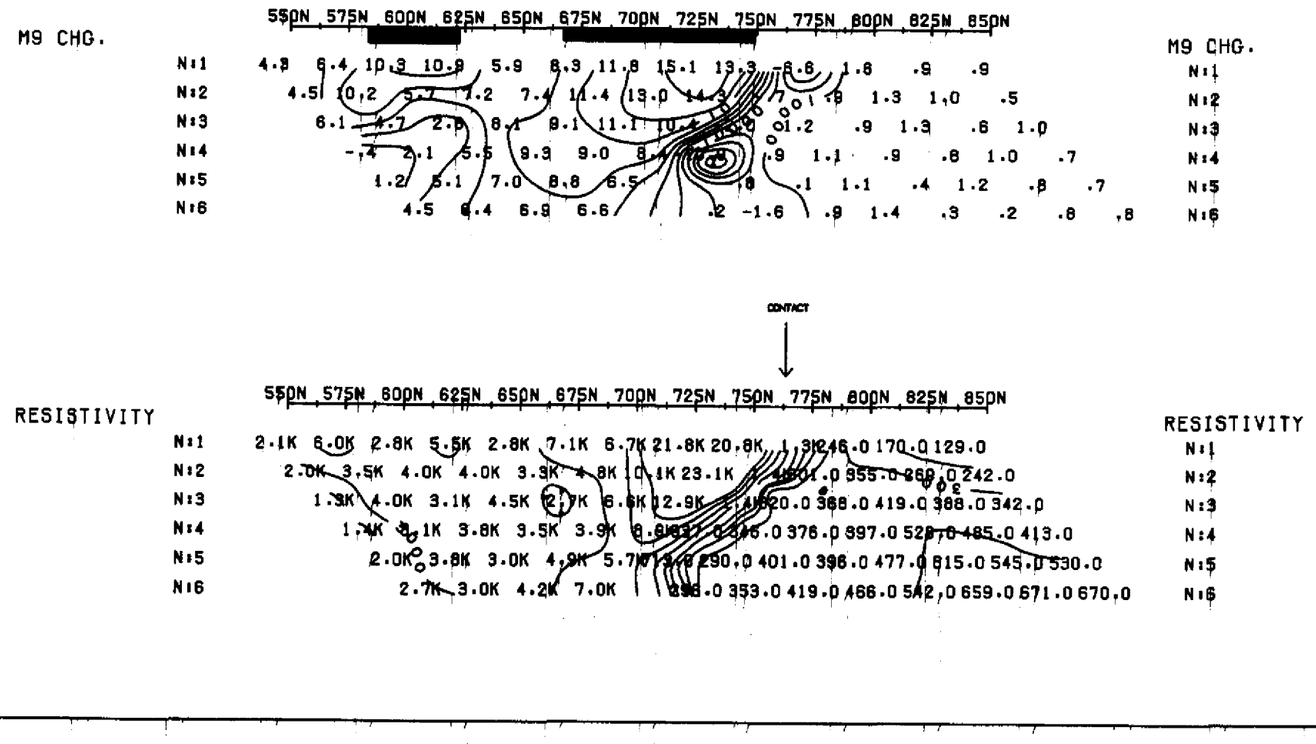
LEASES
MINING RIGHTS ONLY — M.R.O
SURFACE RIGHTS ONLY — S.R.O
CANCELLED — C.
IMPROVED ROADS ..... ———
TRAILS ..... - - - - - -
PATENTED LANDS ..... (P)
CROWN LAND SALES ..... (S)
LICENSE OF OCCUPATION ... L.O
LOCATED LANDS ..... Loc.

400' Surface rights reservation around all lakes and rivers.

NOTICE OF FORESTRY ACTIVITY

THIS TOWNSHIP / AREA FALLS WITHIN THE ONTARIO PAPER FOREST MANAGEMENT AGREEMENT

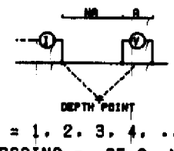
AND MAY BE SUBJECT TO FORESTRY OPERATIONS. THE MNR UNIT FORESTER FOR THIS AREA CAN BE CONTACTED AT: 896 RIVERSIDE DR. TIMMINS, ONT. P4N 3W2 705-267-7951



LINE : 1800 E

INDUCED POLARIZATION SURVEY

POLE-DIPOLE ARRAY



N = 1, 2, 3, 4, ...
"A" SPACING = 25.0 METRES

RECEIVER: SCINTREX IPR-12 TIME DOMAIN
RX-TX TIMING: 2 sec ON 2 sec OFF
TRANSMITTER: SCINTREX TSQ-3 3KVA
SLICE TIMING: 310-405 ms
PLOTTED WINDOW: SLICE #9

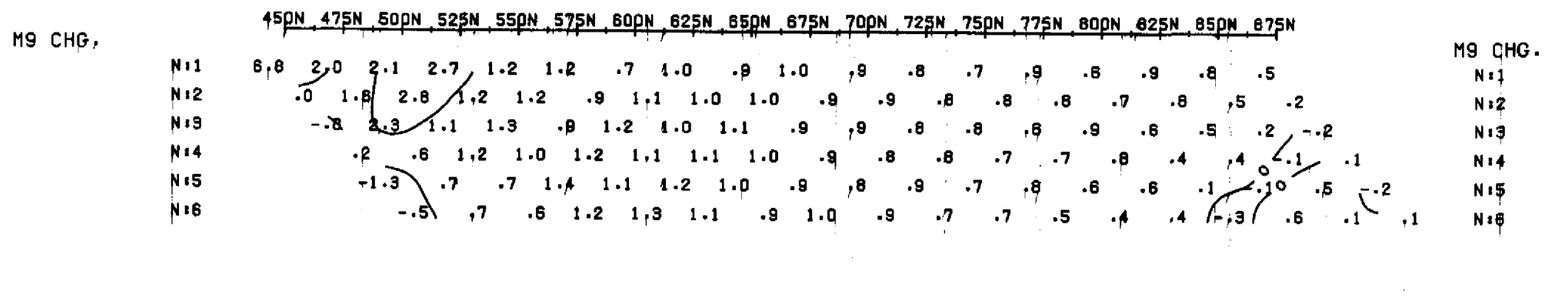
HADDINGTON RESOURCES LTD.

SHERATON - TIMMINS - EGAN PROPERTY

DATE : DEC.\97 | REF : 05

SCALE = 1: 2500

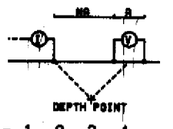
GEOPHYSICAL ENGINEERING & SURVEYS INC.



LINE : 2000 E

INDUCED POLARIZATION SURVEY

POLE-DIPOLE ARRAY



N = 1, 2, 3, 4, ...
"A" SPACING = 25.0 METRES

RECEIVER: SCINTREX IPR-12 TIME DOMAIN
RX-TX TIMING: 2 sec ON 2 sec OFF
TRANSMITTER: SCINTREX TSQ-3 3KVA
SLICE TIMING: 310-405 ms
PLOTTED WINDOW: SLICE #9

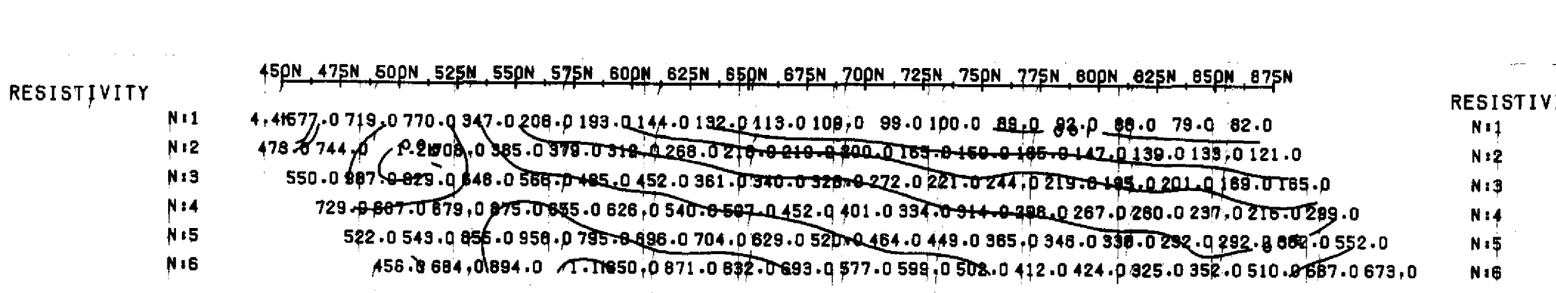
HADDINGTON RESOURCES LTD.

SHERATON - TIMMINS - EGAN PROPERTY

DATE : DEC.\97 | REF : 05

SCALE = 1: 2500

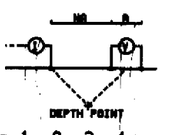
GEOPHYSICAL ENGINEERING & SURVEYS INC.



LINE : 2200 E

INDUCED POLARIZATION SURVEY

POLE-DIPOLE ARRAY



N = 1, 2, 3, 4, ...
"A" SPACING = 25.0 METRES

RECEIVER: SCINTREX IPR-12 TIME DOMAIN
RX-TX TIMING: 2 sec ON 2 sec OFF
TRANSMITTER: SCINTREX TSQ-3 3KVA
SLICE TIMING: 310-405 ms
PLOTTED WINDOW: SLICE #9

HADDINGTON RESOURCES LTD.

SHERATON - TIMMINS - EGAN PROPERTY

DATE : DEC.\97 | REF : 05

SCALE = 1: 2500

GEOPHYSICAL ENGINEERING & SURVEYS INC.

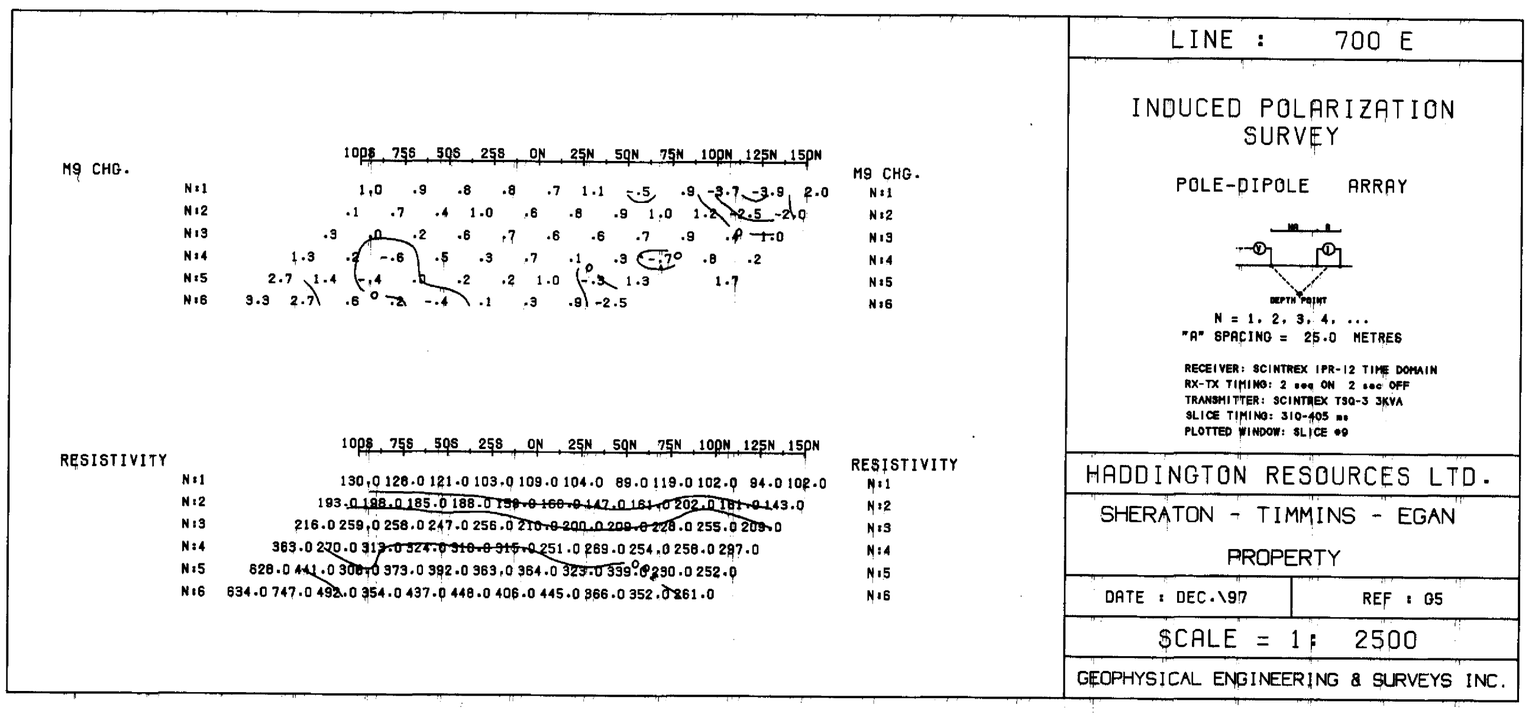
2.18227

HADDINGTON RESOURCES LTD.

SHERATON - TIMMINS - EGAN TWP. PROPERTY

I.P. PSUEDOSECTIONS - NE LINES

PLATE 1 of 1 1:2500



LINE : 700 E

INDUCED POLARIZATION SURVEY

POLE-DIPOLE ARRAY

N = 1, 2, 3, 4, ...
"A" SPACING = 25.0 METRES

RECEIVER: SCINTREX IPR-12 TIME DOMAIN
RX-TX TIMING: 2 sec ON 2 sec OFF
TRANSMITTER: SCINTREX TSQ-3 3KVA
SLICE TIMING: 310-405 ms
PLOTTED WINDOW: SLICE #9

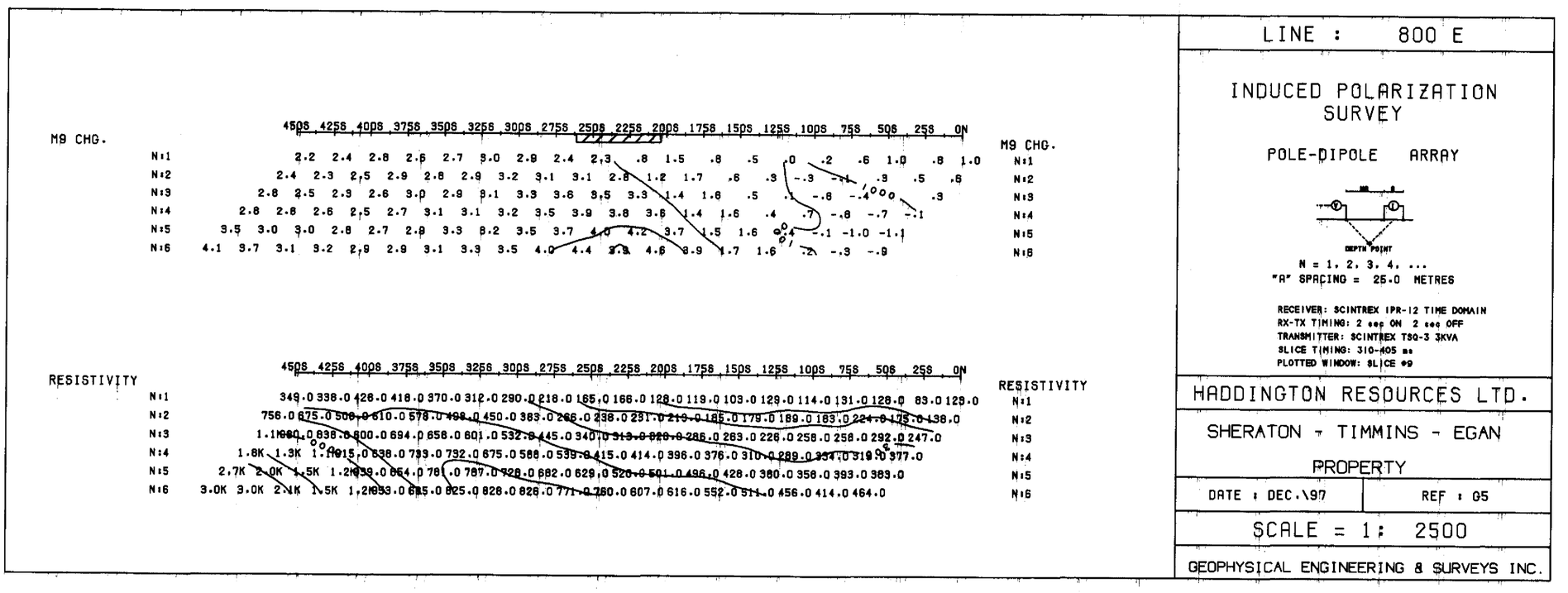
HADDINGTON RESOURCES LTD.

SHERATON - TIMMINS - EGAN PROPERTY

DATE : DEC.\97 | REF : 05

SCALE = 1: 2500

GEOPHYSICAL ENGINEERING & SURVEYS INC.



LINE : 800 E

INDUCED POLARIZATION SURVEY

POLE-DIPOLE ARRAY

N = 1, 2, 3, 4, ...
"A" SPACING = 25.0 METRES

RECEIVER: SCINTREX IPR-12 TIME DOMAIN
RX-TX TIMING: 2 sec ON 2 sec OFF
TRANSMITTER: SCINTREX TSQ-3 3KVA
SLICE TIMING: 310-405 ms
PLOTTED WINDOW: SLICE #9

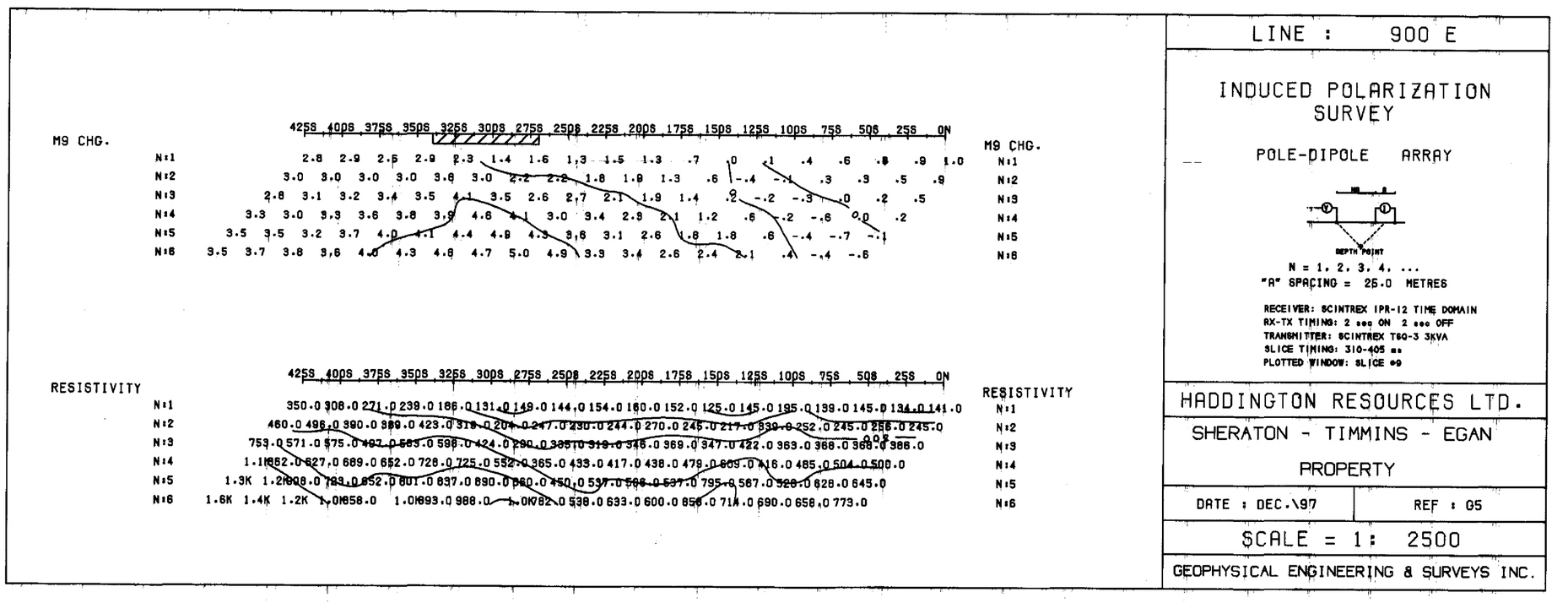
HADDINGTON RESOURCES LTD.

SHERATON - TIMMINS - EGAN PROPERTY

DATE : DEC.\97 | REF : 05

SCALE = 1: 2500

GEOPHYSICAL ENGINEERING & SURVEYS INC.



LINE : 900 E

INDUCED POLARIZATION SURVEY

POLE-DIPOLE ARRAY

N = 1, 2, 3, 4, ...
"A" SPACING = 25.0 METRES

RECEIVER: SCINTREX IPR-12 TIME DOMAIN
RX-TX TIMING: 2 sec ON 2 sec OFF
TRANSMITTER: SCINTREX TSQ-3 3KVA
SLICE TIMING: 310-405 ms
PLOTTED WINDOW: SLICE #9

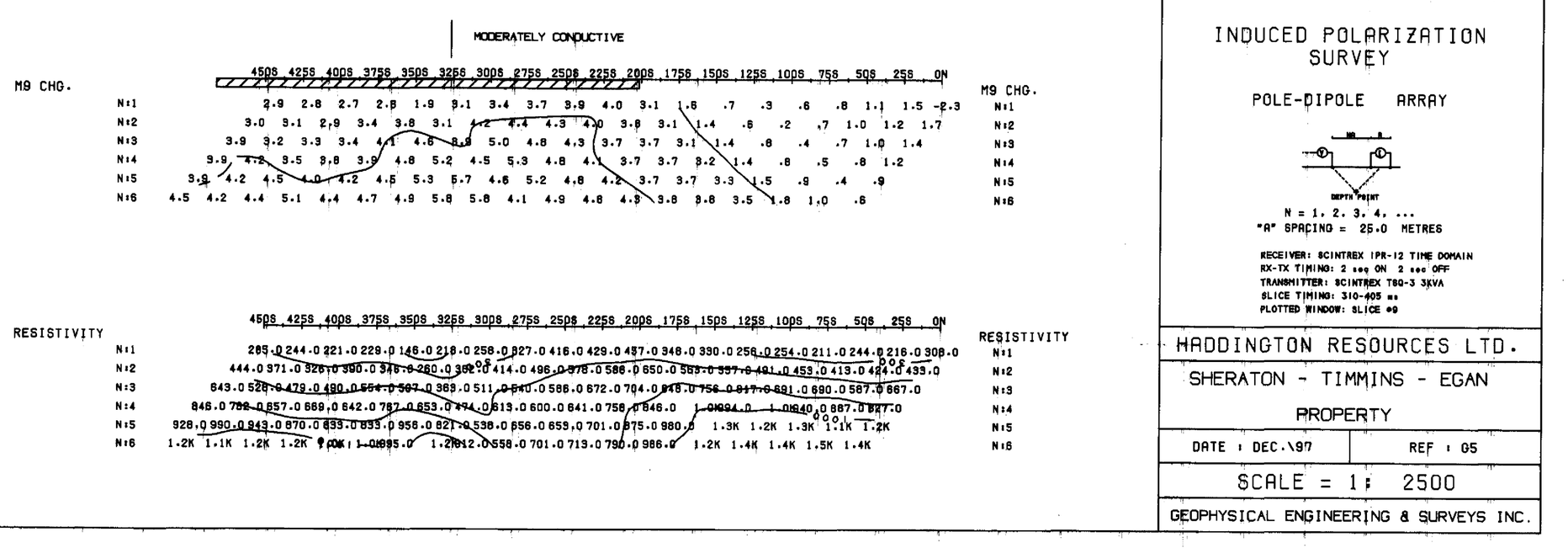
HADDINGTON RESOURCES LTD.

SHERATON - TIMMINS - EGAN PROPERTY

DATE : DEC.\97 | REF : 05

SCALE = 1: 2500

GEOPHYSICAL ENGINEERING & SURVEYS INC.



LINE : 1000 E

INDUCED POLARIZATION SURVEY

POLE-DIPOLE ARRAY

N = 1, 2, 3, 4, ...
"A" SPACING = 25.0 METRES

RECEIVER: SCINTREX IPR-12 TIME DOMAIN
RX-TX TIMING: 2 sec ON 2 sec OFF
TRANSMITTER: SCINTREX TSQ-3 3KVA
SLICE TIMING: 310-405 ms
PLOTTED WINDOW: SLICE #9

HADDINGTON RESOURCES LTD.

SHERATON - TIMMINS - EGAN PROPERTY

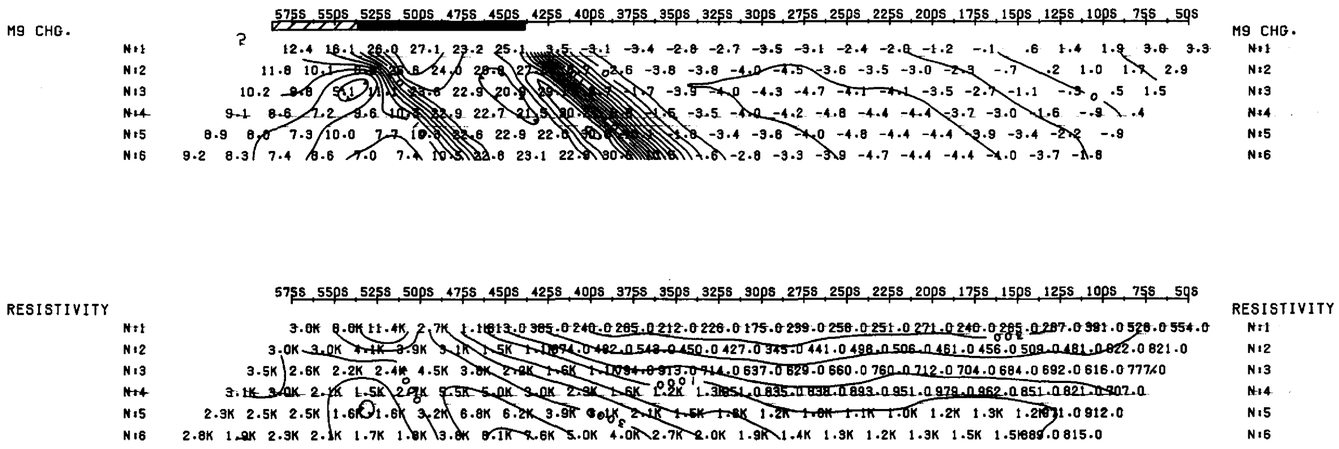
DATE : DEC.\97 | REF : 05

SCALE = 1: 2500

GEOPHYSICAL ENGINEERING & SURVEYS INC.

2.18227

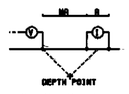
HADDINGTON RERSOURCES LTD.
SHERATON - TIMMINS - EGAN TWP. PROPERTY
I.P. PSUEDOSECTIONS - NW LINES
PLATE 1 of 1 1:2500



LINE : 2300 E

INDUCED POLARIZATION SURVEY

POLE-DIPOLE ARRAY



N = 1, 2, 3, 4, ...
"A" SPACING = 25.0 METRES

RECEIVER: SCINTREX IPR-12 TIME DOMAIN
RX-TX TIMING: 2 sec ON 2 sec OFF
TRANSMITTER: SCINTREX TSQ-3 3KVA
SLICE TIMING: 310-405 ms
PLOTTED WINDOW: SLICE #9

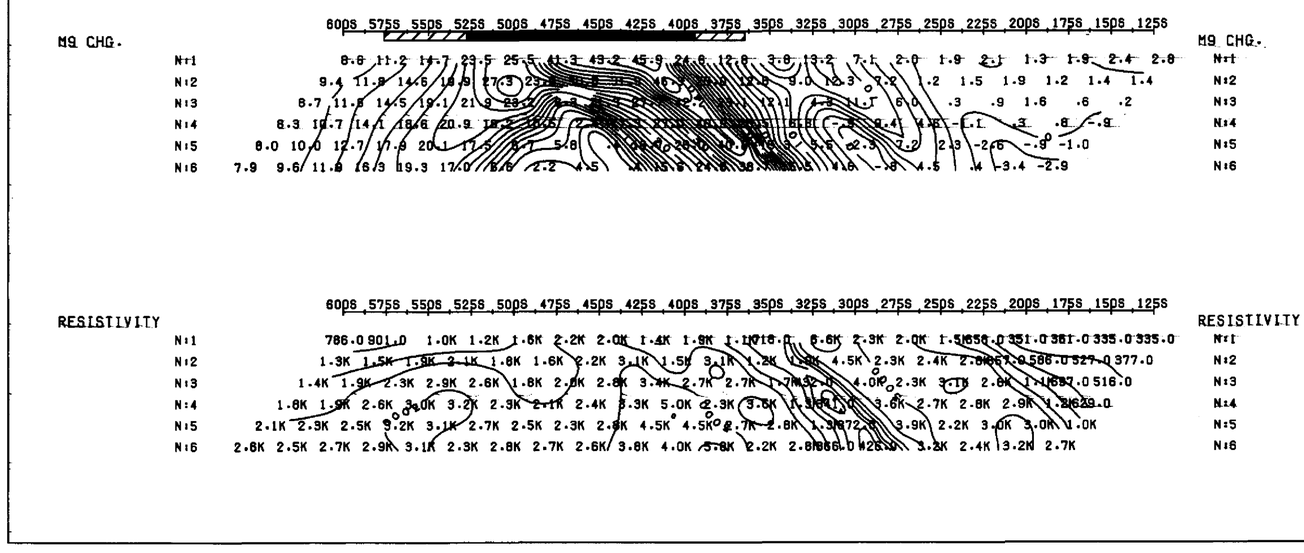
HADDINGTON RESOURCES LTD.

SHERATON - TIMMINS - EGAN PROPERTY

DATE : DEC.\97 | REF : 05

SCALE = 1: 2500

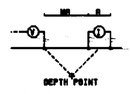
GEOPHYSICAL ENGINEERING & SURVEYS INC.



LINE : 2400 E

INDUCED POLARIZATION SURVEY

POLE-DIPOLE ARRAY



N = 1, 2, 3, 4, ...
"A" SPACING = 25.0 METRES

RECEIVER: SCINTREX IPR-12 TIME DOMAIN
RX-TX TIMING: 2 sec ON 2 sec OFF
TRANSMITTER: SCINTREX TSQ-3 3KVA
SLICE TIMING: 310-405 ms
PLOTTED WINDOW: SLICE #9

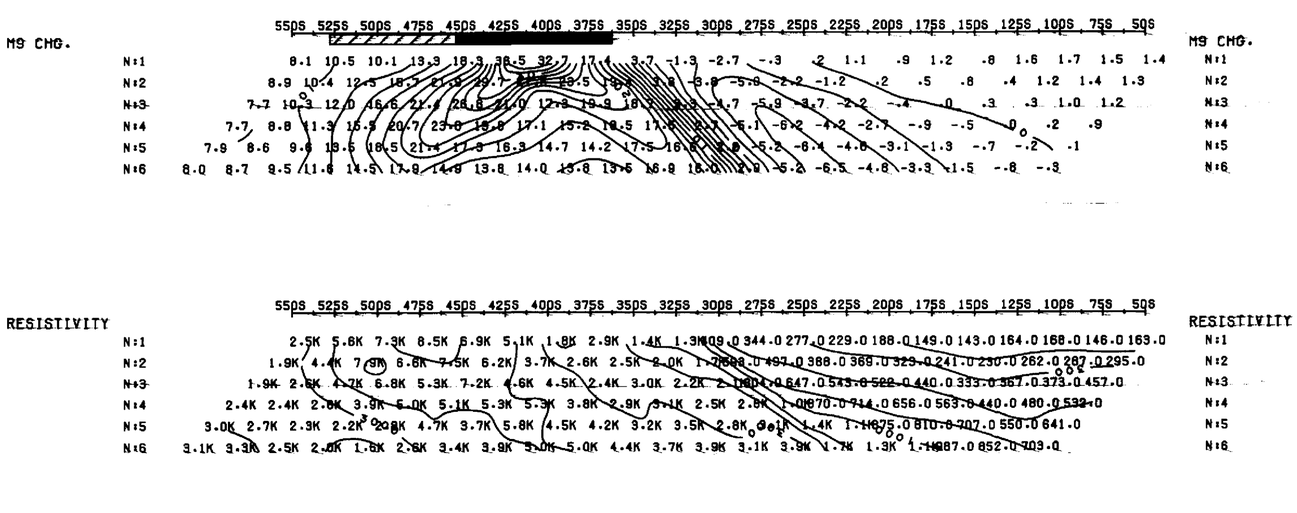
HADDINGTON RESOURCES LTD.

SHERATON - TIMMINS - EGAN PROPERTY

DATE : DEC.\97 | REF : 05

SCALE = 1: 2500

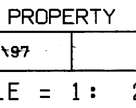
GEOPHYSICAL ENGINEERING & SURVEYS INC.



LINE : 2500 E

INDUCED POLARIZATION SURVEY

POLE-DIPOLE ARRAY



N = 1, 2, 3, 4, ...
"A" SPACING = 25.0 METRES

RECEIVER: SCINTREX IPR-12 TIME DOMAIN
RX-TX TIMING: 2 sec ON 2 sec OFF
TRANSMITTER: SCINTREX TSQ-3 3KVA
SLICE TIMING: 310-405 ms
PLOTTED WINDOW: SLICE #9

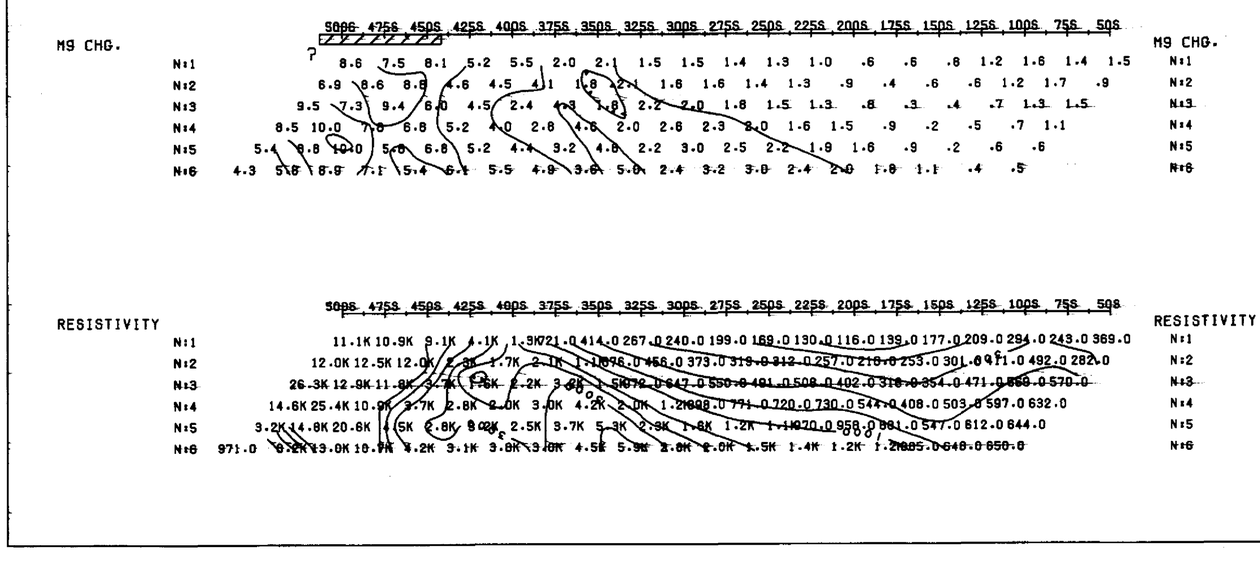
HADDINGTON RESOURCES LTD.

SHERATON - TIMMINS - EGAN PROPERTY

DATE : DEC.\97 | REF : 05

SCALE = 1: 2500

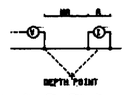
GEOPHYSICAL ENGINEERING & SURVEYS INC.



LINE : 2600 E

INDUCED POLARIZATION SURVEY

POLE-DIPOLE ARRAY



N = 1, 2, 3, 4, ...
"A" SPACING = 25.0 METRES

RECEIVER: SCINTREX IPR-12 TIME DOMAIN
RX-TX TIMING: 2 sec ON 2 sec OFF
TRANSMITTER: SCINTREX TSQ-3 3KVA
SLICE TIMING: 310-405 ms
PLOTTED WINDOW: SLICE #9

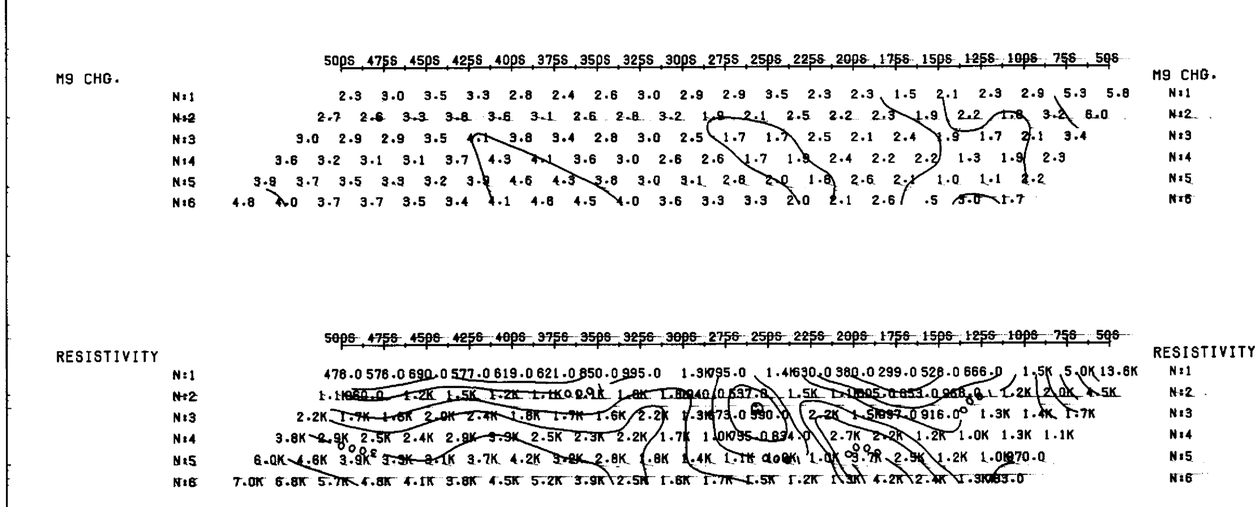
HADDINGTON RESOURCES LTD.

SHERATON - TIMMINS - EGAN PROPERTY

DATE : DEC.\97 | REF : 05

SCALE = 1: 2500

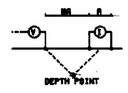
GEOPHYSICAL ENGINEERING & SURVEYS INC.



LINE : 2700 E

INDUCED POLARIZATION SURVEY

POLE-DIPOLE ARRAY



N = 1, 2, 3, 4, ...
"A" SPACING = 25.0 METRES

RECEIVER: SCINTREX IPR-12 TIME DOMAIN
RX-TX TIMING: 2 sec ON 2 sec OFF
TRANSMITTER: SCINTREX TSQ-3 3KVA
SLICE TIMING: 310-405 ms
PLOTTED WINDOW: SLICE #9

HADDINGTON RESOURCES LTD.

SHERATON - TIMMINS - EGAN PROPERTY

DATE : DEC.\97 | REF : 05

SCALE = 1: 2500

GEOPHYSICAL ENGINEERING & SURVEYS INC.

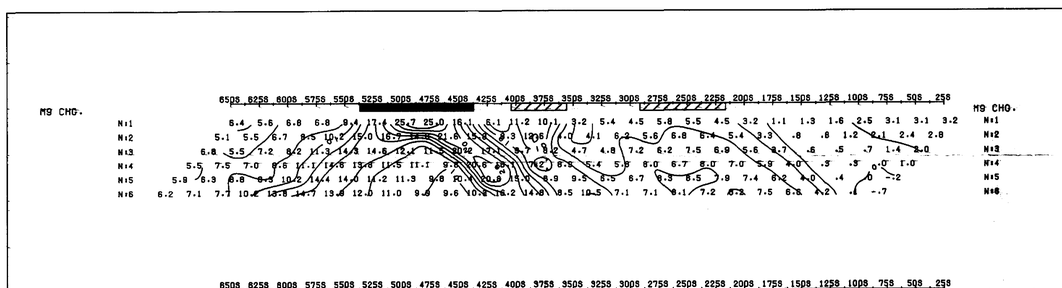
2.18227

HADDINGTON RESOURCES LTD.

I.P. PSUEDOSECTIONS

SHERATON-TIMMINS-EGAN PROPERTY

SE LINES PLATE 1of 1



LINE : 1700 E

INDUCED POLARIZATION SURVEY

POLE-DIPOLE ~~ARRAY~~

N = 1, 2, 3, 4, ...
"A" SPACING = 25.0 METRES

RECEIVER: SCINTREX IPR-12 TIME DOMAIN
RX-TX TIMING: 2 sec ON 2 sec OFF
TRANSMITTER: SCINTREX TBG-3 3KVA
SLICE TIMING: 310-405 ms
PLOTTED WINDOW: SLICE #9

HADDINGTON RESOURCES LTD.

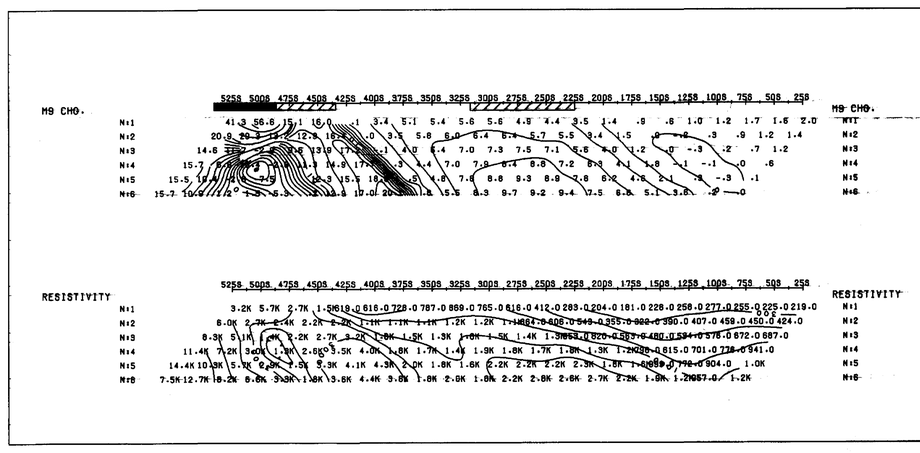
SHERATON-TIMMINS PROP.

TIMMINS, ONTARIO

DATE : SEPT. 1997 | REF : 05

SCALE = 1: 2500

GEOPHYSICAL ENGINEERING & SURVEYS INC.



LINE : 1800 E

INDUCED POLARIZATION SURVEY

POLE-DIPOLE ARRAY

N = 1, 2, 3, 4, ...
"A" SPACING = 25.0 METRES

RECEIVER: SCINTREX IPR-12 TIME DOMAIN
RX-TX TIMING: 2 sec ON 2 sec OFF
TRANSMITTER: SCINTREX TBG-3 3KVA
SLICE TIMING: 310-405 ms
PLOTTED WINDOW: SLICE #9

HADDINGTON RESOURCES LTD.

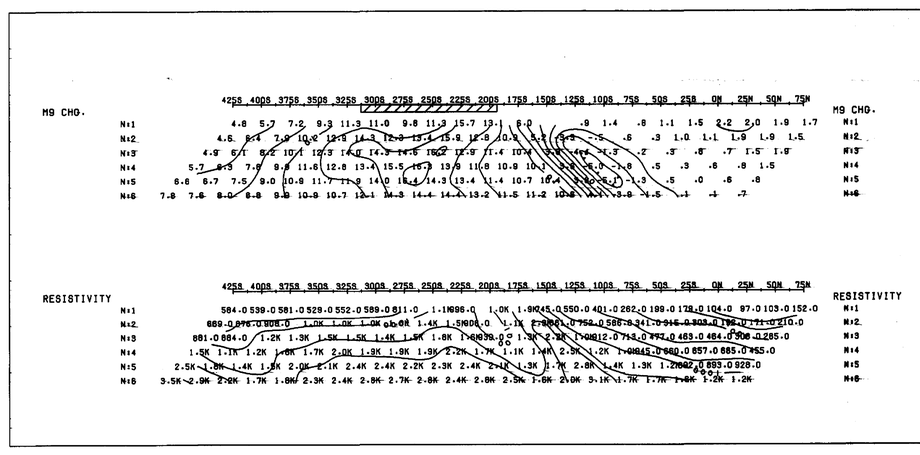
SHERATON-TIMMINS PROP.

TIMMINS, ONTARIO

DATE : SEPT. 1997 | REF : 05

SCALE = 1: 2500

GEOPHYSICAL ENGINEERING & SURVEYS INC.



LINE : 1900 E

INDUCED POLARIZATION SURVEY

POLE-DIPOLE ARRAY

N = 1, 2, 3, 4, ...
"A" SPACING = 25.0 METRES

RECEIVER: SCINTREX IPR-12 TIME DOMAIN
RX-TX TIMING: 2 sec ON 2 sec OFF
TRANSMITTER: SCINTREX TBG-3 3KVA
SLICE TIMING: 310-405 ms
PLOTTED WINDOW: SLICE #9

HADDINGTON RESOURCES LTD.

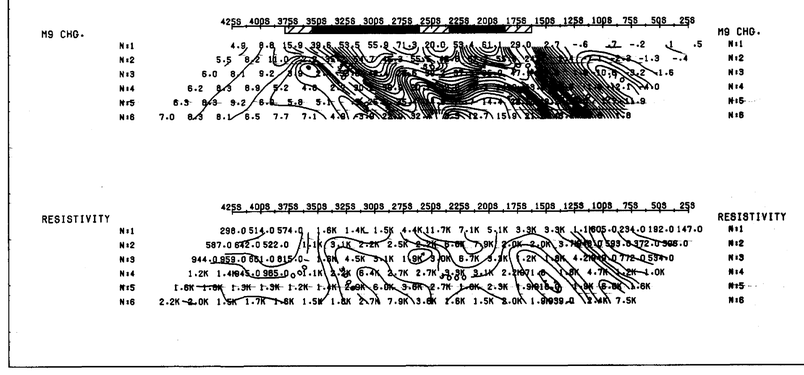
SHERATON-TIMMINS PROP.

TIMMINS, ONTARIO

~~DATE : SEPT. 1997~~ | ~~REF : 05~~

SCALE = 1: 2500

GEOPHYSICAL ENGINEERING & SURVEYS INC.



LINE : 2000 E

INDUCED POLARIZATION SURVEY

POLE-DIPOLE ARRAY

N = 1, 2, 3, 4, ...
"A" SPACING = 25.0 METRES

RECEIVER: SCINTREX IPR-12 TIME DOMAIN
RX-TX TIMING: 2 sec ON 2 sec OFF
TRANSMITTER: SCINTREX TBG-3 3KVA
SLICE TIMING: 310-405 ms
PLOTTED WINDOW: SLICE #9

HADDINGTON RESOURCES

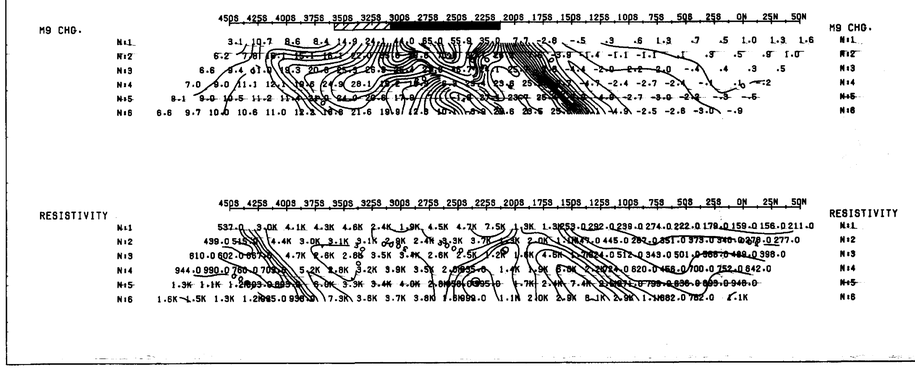
~~SHERATON-TIMMINS PROPERTY~~

TIMMINS, ONTARIO

DATE : SEPT. 1997 | REF : 05

SCALE = 1: 2500

GEOPHYSICAL ENGINEERING & SURVEYS INC.



LINE : 2100 E

INDUCED POLARIZATION SURVEY

POLE-DIPOLE ARRAY

N = 1, 2, 3, 4, ...
"A" SPACING = 25.0 METRES

RECEIVER: SCINTREX IPR-12 TIME DOMAIN
RX-TX TIMING: 2 sec ON 2 sec OFF
TRANSMITTER: SCINTREX TBG-3 3KVA
SLICE TIMING: 310-405 ms
PLOTTED WINDOW: SLICE #9

HADDINGTON RESOURCES

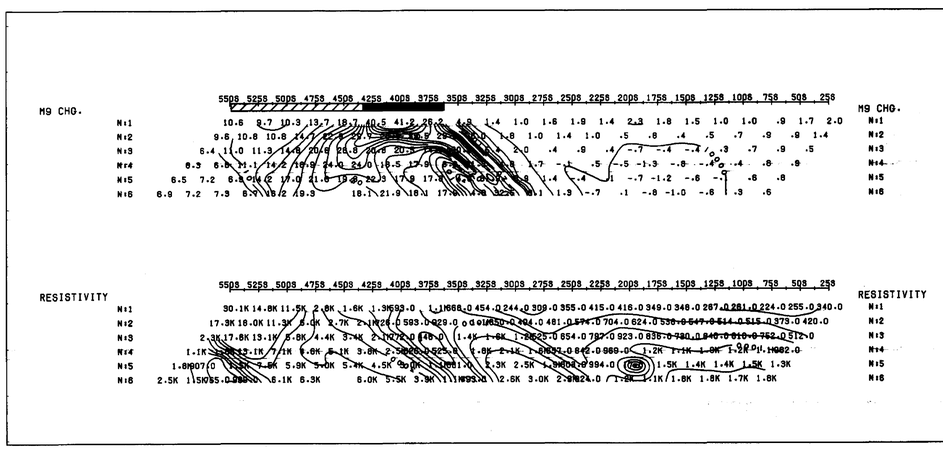
SHERATON-TIMMINS PROPERTY

TIMMINS, ONTARIO

DATE : SEPT. 1997 | REF : 05

SCALE = 1: 2500

GEOPHYSICAL ENGINEERING & SURVEYS INC.



LINE : 2200 E

INDUCED POLARIZATION SURVEY

POLE-DIPOLE ARRAY

N = 1, 2, 3, 4, ...
"A" SPACING = 25.0 METRES

RECEIVER: SCINTREX IPR-12 TIME DOMAIN
RX-TX TIMING: 2 sec ON 2 sec OFF
TRANSMITTER: SCINTREX TBG-3 3KVA
SLICE TIMING: 310-405 ms
PLOTTED WINDOW: SLICE #9

HADDINGTON RESOURCES

SHERATON-TIMMINS PROPERTY

TIMMINS, ONTARIO

DATE : SEPT. 1997 | REF : 05

SCALE = 1: 2500

GEOPHYSICAL ENGINEERING & SURVEYS INC.

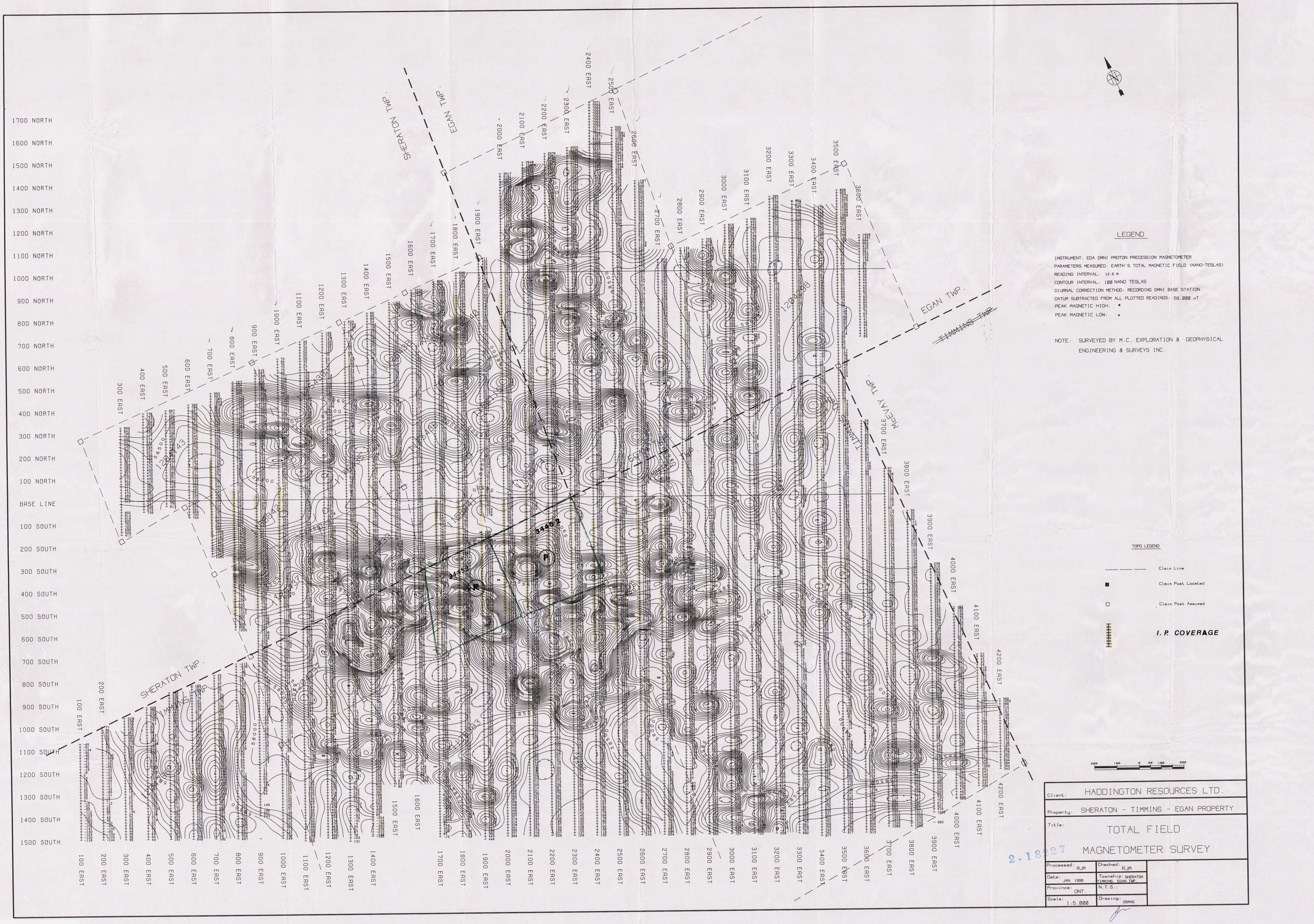
HADDINGTON RESOURCES

I.P. SURVEY 2.1 ~~2227~~

SHERATON/TIMMINS TWP. PROPERTY

PATENTED BLOCK LINES

PLATE 1 of 1 1:2500



SHERATON TWP.
EGAN TWP.
TIMMINS TWP.
MCEVAY TWP.
LEGEND
INSTRUMENT: EDA OMNI PROTON PRECESSION MAGNETOMETER
PARAMETERS MEASURED: EARTH'S TOTAL MAGNETIC FIELD (NANO-TESLAS)
READING INTERVAL: 12.5 M
CONTOUR INTERVAL: 100 NANO TESLAS
DIURNAL CORRECTION METHOD: RECORDING OMNI BASE STATION
DATUM SUBTRACTED FROM ALL PLOTTED READINGS: 58.000 nT
PEAK MAGNETIC HIGH: *
PEAK MAGNETIC LOW: ◂
NOTE: SURVEYED BY M.C. EXPLORATION & GEOPHYSICAL ENGINEERING & SURVEYS INC.
TOPO LEGEND
Claim Line
Claim Post Located
Claim Post Assumed
I.P. COVERAGE
200 100 0 50 100 200
Client: HADDINGTON RESOURCES LTD.
Property: SHERATON - TIMMINS - EGAN PROPERTY
Title: TOTAL FIELD MAGNETOMETER SURVEY
Processed: RJM
Checked: RJM
Date: JAN. 1998
Township: SHERATON TIMMINS, EGAN TWP.
Province: ONT.
N.T.S.:
Scale: 1:5,000
Drawing: G5MAG
2.18227