A REPORT

ON

SPECTRAL IP/RESISTIVITY

AND MAGNETOMETER SURVEYS

CONDUCTED IN

THE SHINING TREE AREA,

GOLDEYE / LACARTE PROPERTY

DRILLHOLE GRID

TYRRELL TOWNSHIP, ONTARIO

JVX Ltd.

A REPORT

ON

SPECTRAL I.P., RESISTIVITY AND MAGNETOMETER SURVEYS

CONDUCTED IN

THE SHINING TREE AREA, GOLDEYE / LACARTE PROPERTY DRILLHOLE GRID TYRRELL TOWNSHIP, ONTARIO

For: Haddington Resources Ltd.
1755 East Bank Rd.
Pickering, Ontario
L1V 3J4
Tel: (905) 420-9040
Fax: (905) 420-1761

Attention: Walter A. Nash

By: JVX Ltd.
60 West Wilmot Street, Unit #22
Richmond Hill, Ontario
L4B 1M6
Tel: (905) 731-0972
Fax: (905) 731-9312

Contact: Blaine Webster

Rec'd. # 2.28

JVX Ref: 9507
October, 1995

TABLE OF CONTENTS

1. INTRODUCTION 1
1.1 PURPOSE 1
2. SURVEY SPECIFICATIONS 1
3. PRODUCTION SUMMARY 2
4. PERSONNEL 4
5. FIELD INSTRUMENTATION 4
5.1 IP TRANSMITTER 4
5.2 IP RECEIVER 5
5.3 MAGNETOMETER 5
6. DATA PROCESSING 5
6.1 I.P. AND RESISTIVITY SURVEY 5
6.2 MAGNETICS SURVEY 6
7. INTERPRETATION METHODOLOGY 6
7.1 I.P. AND RESISTIVITY SURVEY 6
7.2 MAGNETICS SURVEY 8
8. DISCUSSION AND RECOMMENDATIONS 8
8.1 RECOMMENDATIONS FOR ADDITIONAL WORK 10

LIST OF FIGURES

Figure 1 : Location Map

Figure 2 : Grid / Claim Map

LIST OF TABLES

Table 1A : Survey Specifications for the IP/Resistivity Survey
Table 1B : Survey Specifications for the Magnetometer Survey
Table 2A : Survey Summary for Magnetic Survey
Table 2B : Survey Summary for IP/Resistivity Survey

LIST OF APPENDICES

Appendix A: Background to the Geophysical Methods

Appendix B: Plates

LIST OF PLATES

Plate 1 : Total Field Magnetic Contours, Scale 1:2500

Plate 2 : Total Field Magnetic Profiles, Scale 1:2500

Plate 3: Chargeability (*m7*) Contour Map (for n=2)

Plate 4 : Resistivity (ρ_a) Contour Map (for n=2)

Plate 5 : Position of the Drillhole Grid on top of the E-W grid

Plate 6 : Line 9500E, *m7*, ρ_a, *M-IP*, and τ Pseudosections, Scale 1:2500

Plate 7 : Line 9900E and 10,000E *m7*, ρ_a, *M-IP*, and τ Pseudosections, Scale 1:2500

Plate 8a: Lines 10400E, 10500E, 10600E, 10700E, 10800E, 10900E, 11000E, *m7* and ρ_a, Scale 1:2500

Plate 8b: Lines 10400E, 10500E, 10600E, 10700E, 10800E, 10900E, 11000E, *M-IP* and τ, Scale 1:2500

Plate 9: Compilation Map, Scale 1:2500

1. INTRODUCTION

JVX Ltd. conducted time-domain spectral induced polarization/resistivity (I.P.) and magnetometer surveys from February 2 to 18, 1995 on behalf of Haddington Resources Ltd. The surveys were located in the Shining Tree Area, Goldeye / LaCarte property (Figure 1) in Tyrrell Township, Ontario (N.T.S. 41 P/11).

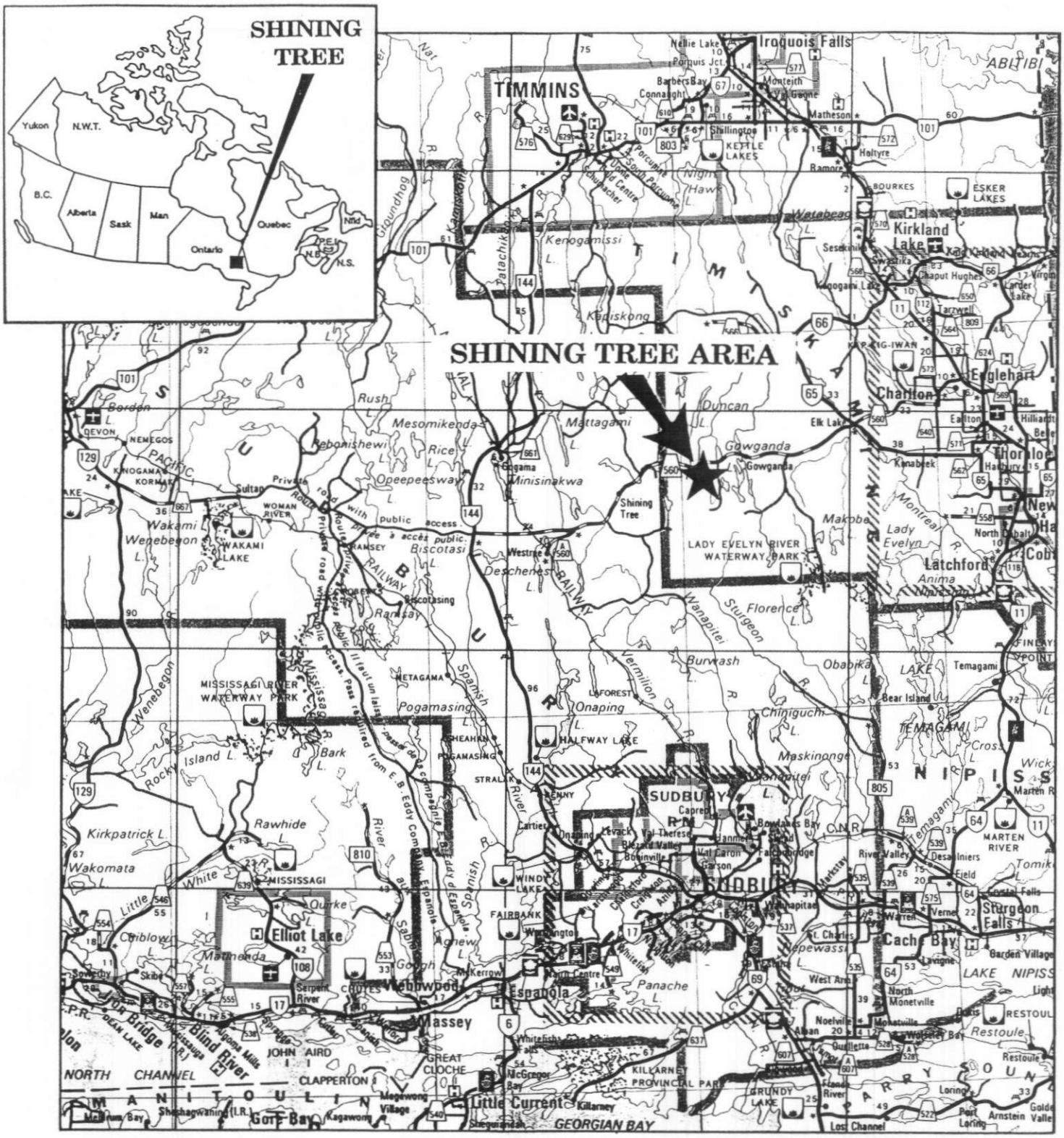
1.1 PURPOSE

Geophysical surveys were carried out over the *drillhole grid* (Figure 2) in order to guide drilling and aid geologic interpretation. The *drillhole grid* is oriented with survey lines perpendicular to a shear zone. The shear zone is thought to be related either directly or indirectly to gold mineralization. IP and magnetometer surveys were done to identify areas of disseminated metallic sulphides and determine their relationship with geologic structures defined by high and low resistivity and magnetic areas. An interpretation of these survey data would provide recommendations of exploration targets which are thought to be favourable sites for gold deposits.

2. SURVEY SPECIFICATIONS

I.P./Resistivity	
Transmitter	Scintrex IPC-7/2.5 kW
Receiver	Scintrex IPR-11
Array Type	Pole-Dipole
Transmit Cycle Time	2 sec
Receive Cycle Time	2 sec
Number of Potential Electrode Pairs	6
Electrode Spacing (*a spacing*)	25 m
Number of Lines Surveyed	11 (a=25 m)
Survey Coverage	7325 metres (a=25 m)

Table 1A : Survey Specifications for the IP/Resistivity Survey



LOCATION MAP

HADDINGTON RESOURCES LTD.

SHINING TREE AREA

Tyrrell Twp., Ontario

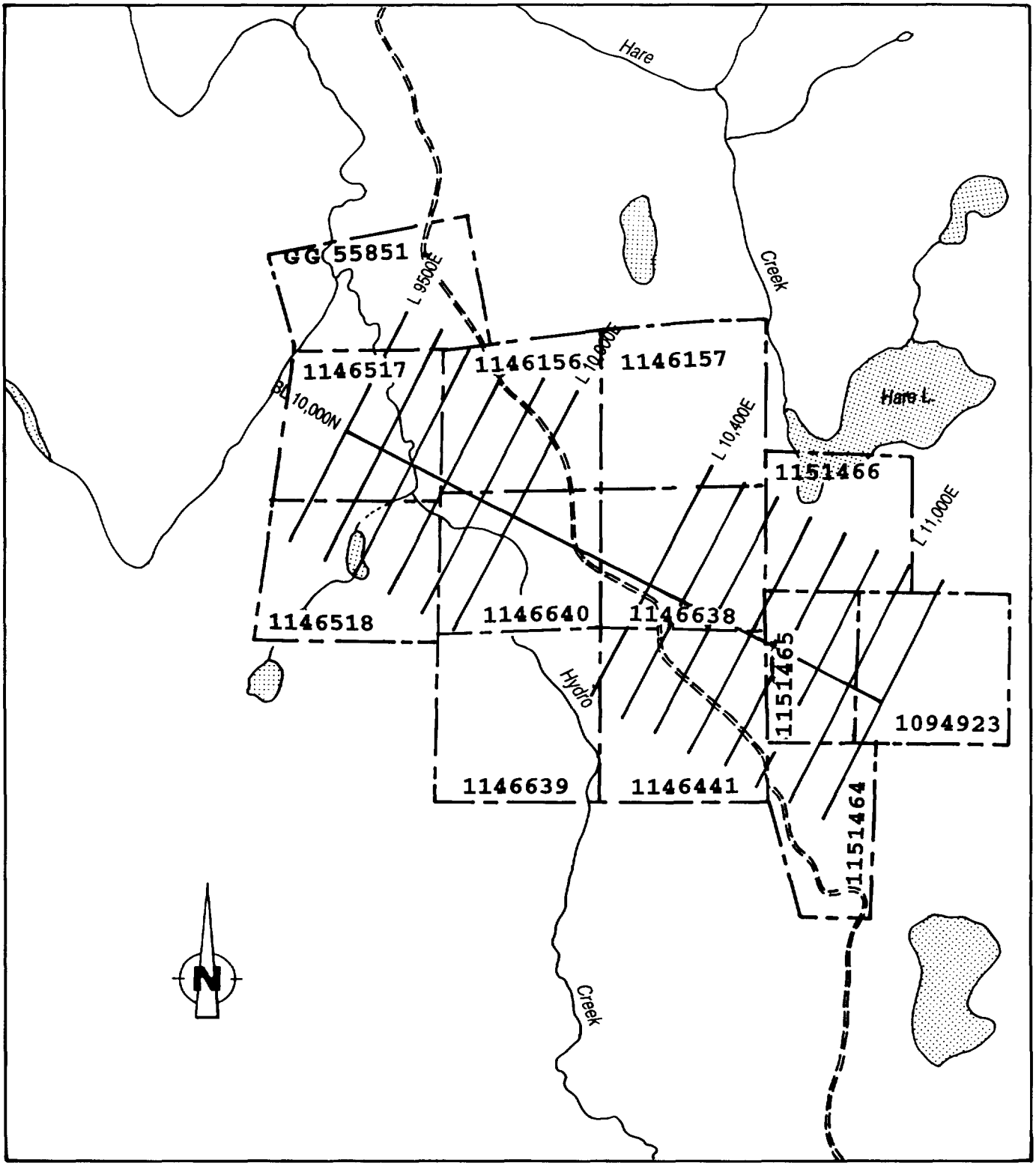
GROUND GEOPHYSICAL SURVEY

Scale: 1 : 1,600,000

Surveyed by **JVX Ltd.**

Winter 1995

Figure 1



GRID / CLAIM MAP

HADDINGTON RESOURCES LTD.

SHINING TREE AREA

Tyrrell Twp., Ontario

GROUND GEOPHYSICAL SURVEY

Scale: 1 : 15,000 (approx.)

Surveyed by **JVX Ltd.**

Winter 1995

Figure 2

Total Magnetic Field	
Instrument	GSM-19, "Walking Magnetometer"
Sensor Type	Overhauser Magnetometer
Station Spacing	10 metres
Survey Coverage	14,825 metres

Table 1B : Survey Specifications for the Magnetometer Survey

3. PRODUCTION SUMMARY

The location of the survey grid is shown in Figure 1.

The total IP coverage was 7,325 metres. The total magnetometer coverage was 14,825 metres. The following tables list the survey coverage in detail.

Line	From Station	To Station	Distance (m)	No. of Readings
9500 E	9625 N	10350 N	725.00	668
9600 E	9600 N	10350 N	750.00	731
9700 E	9650 N	10350 N	700.00	691
9800 E	9650 N	10350 N	700.00	683
9900 E	9650 N	10350 N	700.00	680
10000 E	9625 N	10350 N	725.00	707
10400 E	9650 N	10350 N	700.00	684
10500 E	9625 N	10350 N	725.00	682
10600 E	9650 N	10350 N	700.00	682
10700 E	9650 N	10350 N	700.00	678
10800 E	9600 N	10350 N	750.00	738

10900 E	9650 N	10350 N	700.00	700
11000 E	9650 N	10350 N	700.00	698
11100 E	9650 N	10350 N	700.00	685
9900 N	9500 E	11200 E	1700.00	1674
10000 N	9500 E	11400 E	1900.00	1893
1000 N	0 E	625 E	625.00	532
1100 N	0 E	625 E	625.00	584
Total			14825.00	14490

Table 2A : Survey Summary for Magnetometer Survey

Line	From Station	To Station	Distance (m)	No. of Readings
11100 E	650 N	1350 N	700	27
11000 E	650 N	1350 N	700	27
10900 E	625 N	1350 N	725	28
10800 E	650 N	1325 N	675	21
10700 E	625 N	1350 N	725	28
10600 E	625 N	1350 N	725	28
10500 E	625 N	1350 N	725	28
10400 E	625 N	1350 N	725	28
10000 E	625 N	1350 N	725	28
9900 E	625 N	1350 N	725	28
9500 E	625 N	350 N	275	26
Total			7325	297

Table 2B : Survey Summary for IP/Resistivity Survey

4. PERSONNEL

Graham Stone (Geophysical Party Chief):
Mr. Stone operated the Scintrex IPR-11 receiver, collected magnetometer data using the GSM-19 magnetometer and was responsible for data quality and the day to day operation and direction of the survey.

Claudia Wilck (Geophysical Technician):
Ms. Wilck operated the IP transmitter and collected the magnetometer data.

Michael Fecteau (Geophysical Technician):
Mr. Fecteau operated the IP transmitter and collected the magnetometer data.

Three field assistants were also engaged by JVX.

Aleksandra Savic (Geophysicist):
Ms. Savic processed the data, prepared the plots, and is responsible for the data storage.

Dagmar Piska (Draftsperson):
Ms. Piska did manual drafting, prepared the compilation map, and assembled and bound the report.

Joe Mihelcic (Geophysicist):
Mr. Mihelcic interpreted the data and wrote this report.

Blaine Webster (President, JVX Ltd.):
Mr. Webster provided overall supervision of the survey, the interpretation of the data and writing of the report.

5. FIELD INSTRUMENTATION

JVX supplied the following geophysical instruments. Additional information about the geophysical methods can be found in Appendix A.

5.1 IP Transmitter

The *Scintrex IPC-7/2.5 kW Time Domain Transmitter* powered by an eight horsepower motor generator was used. The transmitter generates square wave current output with a period of 4, 8, or 16 seconds. A digital multimeter in series with the transmitter is used to measure the magnitude of the current output.

5.2 IP Receiver

The *Scintrex IPR-11 Time Domain Receiver* was used. This unit samples the voltage decay curve as measured by the potential electrodes at ten points in time. Readings are repeated until they converge to within a tolerance level, and the data are stored in solid-state memory.

5.3 Magnetometer

The *GSM-19* Overhauser Proton Magnetometer system (a "walking magnetometer") was used to measure the total magnetic field over the grid. A second base magnetometer monitored the background magnetic field at a location off of the survey grid. These base station data were used to make the diurnal correction.
After being transferred to a field computer at the end of each survey day, the data are examined, corrected, and organised by the instrument operator. The results are plotted on the following printers:

- STAR NX-80 colour dot-matrix printer
- EPSON FX-80 dot-matrix printer

These plots are used to monitor progress and data quality, and to make an initial interpretation. Thus the survey parameters and design can be altered if necessary.

The data are sent by courier to the head office of JVX in Richmond Hill, Ontario. They are processed and results are plotted on the following printers as necessary:

- NICOLET ZETA 36 inch pen plotter
- TEKTRONIX COLORQUICK ink jet printer
- FUJITSU DL2400 colour dot-matrix printer
- TEXAS INSTRUMENTS MicroLaser Pro 600 Laser printer

The processing procedure is outlined below.

6. DATA PROCESSING

6.1 I.P. and Resistivity Survey

Steps 1) and 2) are performed both in the field and in the head office. Steps 3) and 4) are performed at the head office.

1) The **GEOPAK IPSECT Package** is used to generate colour pseudosections of chargeability and resistivity data.

2) The in-house **JVX SOFT II Package** is used to perform spectral analysis of the time-domain data. This step is crucial to maximising the information which can be obtained from I.P. data. This software analyses the shape of the I.P. decay curve, giving information about:
   (a) the grain size (indicated by the parameter τ),
   (b) the uniformity of the grain size (indicated by *c*), and
   (c) the magnitude of the chargeable source (indicated by *M-IP*).
   (Please see Appendix A for more information about spectral analysis.)

3) The pseudosections from 2) above are aligned in the **AUTOCAD** computer-aided drafting package, then plotted.

4) Contoured plan maps of both chargeability and resistivity data from one dipole are produced using **JVX** in-house software and the **GEOPAK Line Processing Package**. Additional drafting on these maps is done through **AUTOCAD**.

6.2 Magnetics Survey

1) A contour map and profile plots of the magnetic data, and profile plots of the VLF data are generated both in the field and in the head office using the **GEOPAK Line Processing** package.

2) At the head office, the **AUTOCAD** computer-aided drafting package is used to add any necessary features (e.g. title block, north arrow).

JVX uses its many years of experience in geophysical interpretation to extract the most accurate information from the data. The procedures involved are simplified for the sake of clarity.

7. INTERPRETATION METHODOLOGY

7.1 I.P. and Resistivity Survey

The I.P. and resistivity data are interpreted using the following procedure:

1) Chargeability anomalies are picked on the pseudosections and classified using the following scheme as a guide:

▬▬▬	*Very Strong* (> 30 mV/V) and well-defined
———	*Strong* (20 to 30 mV/V) and well-defined
— —	*Moderate* (10 to 20 mV/V) and well-defined
– – –	*Weak* (5 to 10 mV/V) and well-defined
. . . . .	*Very Weak* (3 to 5 mV/V) and poorly defined
x x x x x x	*Extremely Weak* (<3 mV/V) and very poorly defined

The peak of the anomaly gives a qualitative indication of the depth to the top of the anomalous source and the location of the centre of the body. Where possible, the location and dipole number of the peak is written beside the anomaly bar.

2) The spectral characteristics of the anomalies are examined. The peak value of *M-IP* is noted, and τ is classified according to the following scheme:

L *Long* (> 10.0 sec)

M *Medium* (1.0 to 10.0 sec)

S *Short* (< 1.0 sec)

3) Resistivity anomalies are picked on the pseudosections and classified using the following scheme as a guide:

VH(*n*) *Very High* (> 25 000 Wm) ¾ highly silicified

H(*n*) *High* (> 10 000 Wm) ¾ probably silicified

WH(*n*) *Weak High* (< 10 000 Wm) ¾ relative increase compared to surrounding material

SL(*n*) *Strong Low* ¾ strong decrease in resistivity

ML(*n*) *Medium Low* ¾ medium decrease in resistivity

WL(*n*) *Weak Low* ¾ slight resistivity decrease relative to surrounding material

where *n* is the dipole number at which the anomaly peak is located.

4) The anomalies from steps 1) to 3) are marked on the compilation map.

5) Resistivity anomalies on the compilation map are joined into conductive and resistive zones.

6) Zones of high chargeability are interpreted based on spectral, resistivity, and geometric information.

7) The anomalies are rated according to JVX' past experience. The following are some of the characteristics which may be indicative of economic mineralisation:

- A moderate to high chargeability anomaly flanked by a narrow finger-shaped resistivity high.

- High *M-IP* values (> 300 mV/V) which are not associated with a resistivity low, indicating a large quantity of metallic sulphides).

- Low τ values (short time constant), which indicate that the chargeable source is disseminated and fine-grained. Gold mineralisation is generally associated with fine-grained sulphides. However, in environments where the sulphides have been remobilised, gold mineralisation may be associated with coarse-grained sulphides (long time constant).

- In particular, very high *M-IP* values (> 900 mV/V) with short τ are typically the most favourable spectral I.P. targets.

7.2 Magnetics Survey

The total field magnetic data are studied for lateral changes of the strength of the magnetic field. Magnetic lows associated with chargeability responses may indicate a hydrothermal alteration zone which are important exploration targets. The representative contours are chosen to best express both anomalous bodies and lithological contacts.

8. DISCUSSION AND RECOMMENDATIONS

The interpretation of the geophysical data was compiled in a single map (Compilation Map, Plate 9) included in Appendix B. The Compilation Map includes the chargeability, resistivity, magnetic anomaly zones and recommended drillhole targets.

I.P./resistivity and magnetometer anomalies have been grouped into several major zones. These are shown on the compilation map. I.P. zones in particular have been labelled **A** through **D**. A brief discussion of the I.P. zones along with resistivity and magnetics data follows:

A zone: This well defined chargeability zone runs sub-parallel to a magnetometer high zone likely attributable to a diabase dyke (see Compilation Map, Plate 10). It also correlates well with a resistivity high zone. Spectral parameters for the *A* zone range from M-IP=133 units / τ=short in the southeast to M-IP=453 units / τ=long over short in the central part of the grid. These parameters are typical of fine-grained sulphide mineralization, possibly within or adjecent to silicified rock.

A1 & A2 zone: These zones appear to extend northwards from the *A* zone previously described. Unlike the *A* zone, there does not appear to be a direct relationship with magnetic and apparent resistivity high zones. Spectral parameters suggests fine-grained sulphides. M-IP values are significantly higher for both branches - as high as 528 units at *A1*. The lack of sub-parallel resistivity high zones suggests that the sulphides are not related to rock which may be silicified.

B zone: This zone is similar to the *A* zone since it also runs sub-parallel to magnetometer and apparent resistivity high zones. Spectral M-IP values are between 237 units and 630 units. Spectral τ are short. These parameters are also typical of fine-grained sulphide mineralization.

C, *C1*, & *C2* zone: These chargeability zones exist at the northeast survey boundary. *C1* and *C2* appear to be related to magnetic and apparent resistivity high zones. This is uncertain for *C* due to the survey limits.

D zone: This zone is quite similar to *A1* and *A2* zones as they do not appear to be related to magnetic and apparent resistivity high zones. Spectral M-IP values are significantly lower - less than 302 units. Spectral τ indicates fin-grained sulphide mineralization.

Anomalous zones could not be identified west of L10400E because coverage is sparse.

8.1 Recommendations for Additional Work

Several target areas have been identified on the Compilation Map (see Plate 9). They have been prioritized from *High* to *Low* based on factors including chargeability, apparent resistivity, magnetics, and the proximity of each of these with each other. Targets which have not yet been drilled are generally given a higher priority.

All of the targets recommended by JVX should be field checked geologically and geochemically. Some reverse circulation drilling work may be helpful in further prioritizing the geophysical anomalies. At least one target has been identified for each of the anomalous chargeability zones discussed earlier. If favourable results are acquired, these zones should be further investigated along their trend. Targets identified in the western portion of the grid (i.e., west of L10400E) should also be tested. If favourable results are acquired in these areas, additional induced polarization is recommended to further delineate their extent.

If there are any questions with regard to the conducting of the surveys or the interpretation of the data, please do not hesitate to call the undersigned at JVX Ltd.

Respectfully submitted,

JVX Ltd.

Joe Mihelcic, B.Sc., P.Eng., M.B.A.
Geophysicist

Blaine Webster, B.Sc.
President

APPENDIX A

Background

to the

Geophysical Methods

INDUCED POLARIZATION AND RESISTIVITY

1 THE IP EFFECT

The induced polarization (IP) phenomenon is primarily caused by:

1) electrical polarization at the boundary between the rock or soil and the pore fluids, and

2) electrical polarization at the boundary between metallic minerals (particularly sulphides) within pores and the pore fluids.

This polarization occurs when a current is applied across these boundaries. Its magnitude can be measured in two ways:

1) in the frequency domain (also known as phase IP), in which the applied current is sinusoidal, or

2) in the time domain, in which the applied current is a modified square wave.

JVX conducts IP surveys in the time domain because spectral analysis, a powerful interpretive tool, can only be performed in the time domain.

Generally, the current is transmitted as a modified square wave with a period of eight seconds (two seconds positive, two seconds off, two seconds negative, two seconds off). The voltage measured in the ground will have the form shown in figure IP-1. The IP effect is manifested as a roughly exponential voltage decay after the current is turned off, similar to the relaxation effect of a discharging capacitor. The IP receiver samples this voltage decay curve at a number of points.

The **SCINTREX IPR-11** receiver repeats and averages the following measurements until they converge:

V_p The primary voltage (the steady-state amplitude of the voltage while the current is being transmitted).

SP — The self-potential (the steady state voltage when no current is being transmitted).

m0 to m9 — The chargeabilities (measures of the IP effect at different times along the decay voltage curve $V_s(t)$).

Each chargeability value (m0 to m9) is the ratio of the average secondary voltage over a time window to the primary voltage. Mathematically, this is given by:

$$m = \frac{1000}{V_p(t_2-t_1)} \int_{t_1}^{t_2} V_s(t)\, dt$$

where

m = chargeability (in mV/V)
$V_s(t)$ = secondary voltage (i.e. the voltage decay)
V_p = primary voltage
t_1 = beginning of time window
t_2 = end of time window

The IPR-11 uses the ten time windows, also known as time slices, listed in table IP-1 and shown in figure IP-2. Unless otherwise stated, the term chargeability refers to the eighth time window (m7).

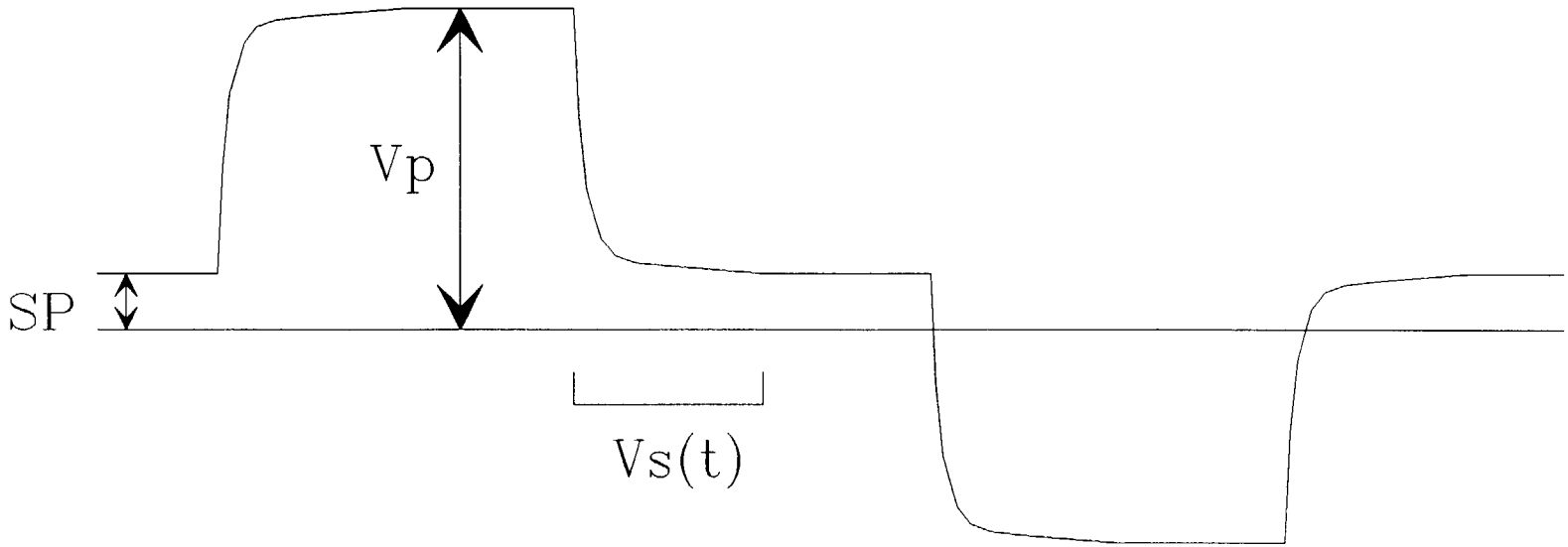


Figure IP-1 : The I.P. Waveform

SLICE	DURATION (msec)	FROM (msec)	TO (msec)	MIDPOINT (msec)
m0	30	30	60	45
m1	30	60	90	75
m2	30	90	120	105
m3	30	120	150	135
m4	180	150	330	240
m5	180	330	510	420
m6	180	510	690	600
m7	360	690	1050	870
m8	360	1050	1410	1230
m9	360	1410	1770	1590

Table IP-1 : Time slices recorded by the IPR-11 receiver

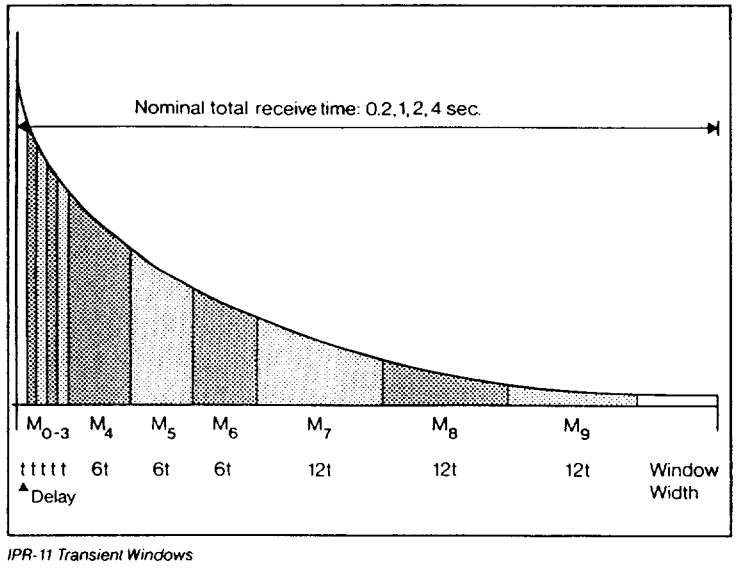


Figure IP-2 : IP effect decay curve with IPR-11 time slices

2 SPECTRAL ANALYSIS

With the ability to sample the decay curve at a number of points, the shape of the decay curve can be analysed. This gives important information about the characteristics of the source.

Spectral analysis utilises the Cole-Cole model of the IP effect (Pelton et al., 1978). This model uses the following four parameters (described in Johnson, 1984) to calculate a theoretical IP decay curve:

ρ_a **Resistivity** (Ωm)
This quantity is described in detail later in this appendix.

M-IP **Chargeability Amplitude** (mV/V)
This quantity is related to the volume percent of the chargeable source, although there is no simple quantitative relationship.

τ **Time Constant** (seconds)
The time constant is related to the grain size of the source. A short time constant (0.01 to 0.3 s) indicates a fine-grained source. A long time constant (30 to 100 s) indicates a coarse-grained, interconnected, or massive source.

c **Exponent** (dimensionless)
A high value (e.g. 0.5) indicates that the grain size is uniform. A low value (e.g. 0.1) indicates that there is a mixture of grain sizes.

Conventional chargeability is a combination of these spectral parameters. A change in any one parameter will produce a change in the apparent chargeability. *In the absence of spectral analysis, such changes are always ascribed to a change in the volume percent of the chargeable source, even though the cause may be a shift from fine-grained to coarse-grained material.*

JVX has developed a software package called **SOFT II** which determines the spectral parameters by comparing the measured decay curve with a library of model curves. The quality of the fit is given as a root-mean-square difference (expressed as a percentage). A low value (e.g. 1 %) indicates high quality data of medium to high amplitude. A high value (e.g. greater than 10 %) indicates poor quality or low amplitude data. If the fit is greater than 5 %, the spectral parameters are considered to be of poor quality, and therefore are usually discarded.

3 ARRAY CONFIGURATION

As mentioned above, a current must be flowing through the ground in order for the IP effect to occur. This current is applied using two electrodes, which are called C1 and C2, and the voltage decay is measured using two potential electrodes, P1 and P2. The distance separating P1 and P2 is known as the *a-spacing*, or *a*, and generally remains constant during the survey.

The three most common electrode array configurations are:

1) **Gradient**
C1 and C2 are located at an "infinite" distance (i.e. very far) from the grid, with one on each side. The potential electrodes move throughout the grid.

2) **Dipole-Dipole**
C1 and C2 are separated by a distance of *a*, and move along with the potential electrodes.

3) **Pole-Dipole**
C2 is located at "infinity". C1 moves along with the potential electrodes throughout the grid.

The gradient array allows for fast reconnaissance surveys. However, no depth information is obtained (described below), and the resolution is much lower because all of the ground between C1 and C2 is energised. Furthermore, the current will be channelled through conductive zones, which could result in inaccurate chargeability and resistivity values. Thus, great care must be used when using a gradient array.

In JVX' experience, the pole-dipole array is superior to the dipole-dipole array. Since C2 is located at an infinite distance, a greater volume of ground is energised. This results in better depth penetration (i.e. higher quality data), and is particularly important in the presence of thick and/or conductive overburden. However, the pole-dipole array does not have the disadvantages of the gradient array. Since C1 is located near the potential electrodes, depth information is obtained (see below), and resolution is high.

4 A-SPACING AND NUMBER OF DIPOLES

The resolution of the data depends on *a*, the electrode spacing. The smaller *a* is, the greater the resolution. However, the depth of penetration is also smaller. A larger *a* results in greater depth, but less resolution. Thus, both factors must be considered when selecting the electrode spacing.

The standard pole-dipole array is shown in figure IP-2. Seven potential electrodes are used to measure the voltage simultaneously across six electrode pairs (P1-P2, P2-P3, P3-

P4, etc.). Each pair is labelled using an integer, *n*, where *na* is the distance between the first potential electrode and the nearest current electrode.

The depth of investigation is greater when the potential electrode pair is farther from the current electrode (i.e. larger *n*). However, a greater separation distance also results in greater signal attenuation, limiting the number of dipoles which could be used effectively.

5 RESISTIVITY

The DC apparent resistivity (ρ_a) is a measure of the bulk electrical resistivity of the subsurface. Electricity flows primarily through the groundwater within fractures and pore spaces. Therefore, fault zones can be detected as low resistivity zones. However, sulphide minerals, some oxides, and graphite are also good conductors and so produce low resistivity zones. The current flow is electronic in these minerals rather than electrolytic as it is in groundwater. Sometimes, the geometry of the low resistivity zone can distinguish between a fault zone and a mineral source. In other cases, additional geological information is needed. Silicates, the most common rock forming minerals, are very poor conductors of electricity, producing high resistivity zones.

The resistivity is measured simultaneously with the IP data. For a homogeneous and isotropic subsurface, it is given by the following formula:

$$\rho_a = \frac{k\, V_p}{I}$$

where

ρ_a = apparent resistivity (Ωm)
V_p = primary voltage (measured while current is on) (mV)
k = k-factor (m)

The *k-factor* is an array-dependant component. For a pole-dipole array, it is given by:

$$k = 2\pi n(n+1)a$$

where

n = dipole multiple (dimensionless)
a = electrode separation (m)

Although the assumption of a homogeneous and isotropic earth is unrealistic, the calculated value of ρ_a can be used qualitatively to map changes in rock type (even to identify the rock type in some cases), and to map low resistivity fault zones.

References

Johnson, I.M. Spectral I.P. Parameters as Determined through Time Domain Measurements, pp. 1993-2003 *Geophysics* **49**, 1984

Johnson, I.M., B. Webster, R. Mathews, and S. McMullan Time Domain Spectral IP Results from Three Gold Deposits in Northern Saskatchewan, *The Canadian Mining and Metallurgical Bulletin*, Feb. 1989

Pelton, W.H., S.H. Ward, P.G. Hallof, W.P. Sill, P.H.Nelson Mineral Discrimination and Removal of Inductive Coupling with Multifrequency IP, pp. 588-609, *Geophysics* **43**, 1978

MAGNETIC METHOD

The magnetic field measured at any point on or above the earth's surface is a combination of:

1) the earth's magnetic field,

2) the induced magnetization of near-surface material, and

3) the remanent magnetization of near-surface material.

The total measured field is equal to the vector sum of the magnetic field arising from all three factors.

1 THE EARTH'S MAGNETIC FIELD

The earth's magnetic field is similar in form to that of a bar magnet. The flux lines of the geomagnetic field are vertical at the north and south magnetic poles where the strength is approximately 60 000 nT (or gammas). In the equatorial region, the field is horizontal and its strength is approximately 30 000 nT. This field can be considered to be constant in space and time for exploration surveys.

2 INDUCED MAGNETIZATION

An external magnetic field (for example, the earth's) induces the magnetization of a ferrous body. This magnetized body then produces an additional magnetic field, known as the *induced field*, which is given by the following formula:

$$\mathbf{I} = k\,\mathbf{H}$$

where:

$\mathbf{I}$ = the induced magnetic field (nT) — a vector
k = the volume magnetic susceptibility of the material
$\mathbf{H}$ = the external magnetic field (nT) — a vector

Thus, the strength of the induced magnetic field is a function of the susceptibility of the body. In turn, the susceptibility is a reflection of the content of ferrous minerals, most importantly magnetite. Note that the induced field is parallel to the external field.

3 REMANENT MAGNETIZATION

The remanent magnetization of rocks depends both on their composition and their previous history. Whereas the induced magnetization is nearly always parallel to the direction of the geomagnetic field, the natural remanent magnetization may bear no relation to the present direction and intensity of the earth's field. The remanent magnetization is related to the direction of the earth's field at the time the rocks were last magnetized. Generally, one can assume that there is no significant remanent magnetization when interpreting magnetic data.

4 DIURNAL CORRECTION

Although the earth's magnetic field is essentially constant, time-varying magnetic fields may result from atmospheric phenomena. Fields due to magnetic storms may vary by hundreds of nanoteslas in a few minutes. Therefore, it is necessary to monitor the background magnetic field constantly using a stationary base station magnetometer. The field measurements can then be corrected for the background magnetic variation. This process is known as diurnal correction.

5 INTERPRETATION

Magnetic data are used to map regions of different magnetic susceptibilities (i.e. ferrous content). The magnetic method cannot detect gold directly, but it can map structures which can aid in locating areas of silicification and carbonization. When used in conjunction with geological and other geophysical data, magnetic data can help select targets which are favourable for economic mineralisation.

APPENDIX B

Plates

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)
W9680.00642
Assessment Files Research Imaging
2.17004

Personal information collected on this form is obtained under the authority of the Mining Act. Under section 8 of the Mining Act, the information will be used to maintain a record of work and correspond with the mining land holder. Questions about this collection may be directed to the Ministry of Northern Development and Mines, 6th Floor, 933 Ramsey Lake Road, Sudbury, Ontario, P3E 6B5.

41P11NE0073 2.17004 TYRELL

900

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: HADDINGTON RESOURCES LTD	Client Number: 300638
Address: 11TH FLOOR - 809 WEST HASTINGS ST	Telephone Number: 604-687-7463
VANCOUVER B.C. V6C 2X4	Fax Number: 604 681-2575
Name: GOLDEYE EXPLORATIONS LTD.	Client Number:
Address: A. LACARTE, R.G. KOMARECHKA	Telephone Number:
R. MACCALLUM, BHP Minerals Canada Ltd	Fax Number:
See attached 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: INDUCED POLARIZATION (SPECTRAL I.P.) AND MAGNETOMETER	Office Use
	Commodity
	Total $ Value of Work Claimed: 36455
Dates Work Performed: From 2ND Day FEB Month 1995 Year To 18TH Day FEB Month 1995 Year	NTS Reference
Global Positioning System Data (if available)	Township/Area: TYRRELL,
	M or G-Plan Number: G-3725
	Mining Division: Larder Lake
	Resident Geologist District: Cobalt

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.

RECEIVED
JAN 14 1997
MINING LANDS BRANCH

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

Name: JVX LTD. - 60 WEST WILMOT ST.	Telephone Number: 905 731-0972
Address: UNIT 22 RICHMOND HILL, ON. L4B 1M6	Fax Number: 905 731-9312
Name:	Telephone Number:
Address:	Fax Number:
Name:	Telephone Number:
Address:	Fax Number:

RECEIVED
LARDER LAKE
MINING DIVISION
DEC 31 1996

4. Certification by Recorded Holder or Agent

I, A.W. BEECHAM (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: A.W. Beecham (AGENT)		Date: 26 DEC. 1996
Agent's Address: BOX 867 HALEYBURY, ONT. P0J 1K0	Telephone Number: 705 672-5023	Fax Number: 705 672-3980

0241 (02/96)

Deemed — Mail 31/97

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.

2.17004

	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
Tyr 1	1151466	1	$3132	N/A	$2800	$332
MacMurdo 2	1146646	1		400		
3	1146647	1		400		
4	1146648	1		400		
5	1147074	1		400		
6	1147075	1		400		
7	1147076	1		400		
8	1147077	1		400		
Tyr 9	1151465	1	$4726	400	$4000	$326
MacMurdo 10	1147104	1		400		
11	1147105	1		400		
12	1147106	1		400		
13	1147107	1		400		
14	1147114	1		400		
15	1147115	1		400		
	Column Totals					

I, A.W. BEECHAM (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. SH 1 OF 3

Signature of Recorded Holder or Agent Authorized in Writing: A.W. Beecham (Agent)

RECEIVED JAN 14 1997 MINING LANDS BRANCH

Date: 29/12/96

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	Deemed Approved Date	Date Notification Sent
RECEIVED LAND USE MINING DIVISION DEC 31 1996	Date Approved	Total Value of Credit Approved
	Approved for Recording by Mining Recorder (Signature)	

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. 2.17	Bank. Value of work to be distributed at a future date. 004
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
MacMurchy 1 ✓	1147,116	1		#400		
" 2 ✓	1147,117	1		400		
" 3 ✓	1147,118	1		400		
" 4 ✓	1147,124	1		400		
Tyrrell 5 ✓	1151464	1	#2117	400	#1600	#117
MacMurchy 6 ✓	1147125	1		400		
" 7 ✓	1147,126	1		400		
" 8 ✓	1147,127	1		400		
Tyrrell 9 ✓	1131,920	1		400		
10 ✓	1146,156	1	#3192	#1200		1992
11 ✓	1146,441	1	6497	#1200		5297
12 ✓	1146,640	1	3594	1200		2394
13 ✓	1146638	1	6246	1200	3200	1816
14 ✓	1146157	1		1200		
15 ✓	1146442	1		800		
✓	1146639	1		1200		
		~~Column Totals~~				

Sh. 2 of 3

I, A.W. BEECHAM (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: A.W. Beecham Agent Date: 29/12/96

RECEIVED
JAN 14 1997
MINING LANDS BRANCH

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: DEC 31 1996

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

0241 (02/96)

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.
					2,17004	
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	1094923	1	#3124	#800	#2000	#324
✓2	1094761	1		400		
✓3	1094763	1		800		
✓4	1094764	1		800		
5						
✓6	1146517	1	#1929	#~~400~~ 800		#~~529~~ 1129
✓7	1146518	1	1928	#~~400~~ 800	#~~400~~ 1600	~~428~~ 328
✓8	1146519	1		#~~400~~ 800 AuB		AuB
9			10 claims			
10			10 Units			
11						
12						
13						
14						
15						
		Column Totals	#36,455	~~21,200~~ 22,400 AuB	#~~14,000~~ 14,400 ~~15,200~~ Au6 AuB	#~~5255~~ 14055

I, A'W. BEECHAM (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 (Agent) Date 29/12/96

RECEIVED
JAN 14 1997
MINING LANDS BRANCH

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):

SH. 3 of 3.

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	Deemed Approved Date: 97 Mar 31	Date Notification Sent
	Date Approved	Total Value of Credit Approved
	Approved for Recording by Mining Recorder (Signature)	

0241 (02/96)

Ontario

Ministry of Northern Development and Mines

Ministère du Développement du Nord et des mines

Statement of Costs for Assessment Credit

État des coûts aux fins du crédit d'évaluation

Mining Act/Loi sur les mines

Transaction No./N° de transaction

2.17004

Personal information collected on this form is obtained under the authority of the Mining Act. This information will be used to maintain a record and ongoing status of the mining claim(s). Questions about this collection should be directed to the Provincial Manager, Minings Lands, Ministry of Northern Development and Mines, 4th Floor, 159 Cedar Street, Sudbury, Ontario P3E 6A5, telephone (705) 670-7264.

Les renseignements personnels contenus dans la présente formule sont recueillis en vertu de la Loi sur les mines et serviront à tenir à jour un registre des concessions minières. Adresser toute quesiton sur la collece de ces renseignements au chef provincial des terrains miniers, ministère du Développement du Nord et des Mines, 159, rue Cedar, 4e étage, Sudbury (Ontario) P3E 6A5, téléphone (705) 670-7264.

1. Direct Costs/Coûts directs

Type	Description	Amount Montant	Totals Total global
Wages Salaires	Labour Main-d'oeuvre		
	Field Supervision Supervision sur le terrain	$ 1021	1021
Contractor's and Consultant's Fees Droits de l'entrepreneur et de l'expert-conseil	Type: Line-Cutting	3500	
	Magnetometer Su.	2597	
	I.P. Survey	27,803	33900
Supplies Used Fournitures utilisées	Type		
Equipment Rental Location de matériel	Type		
	Total Direct Costs Total des coûts directs		34921

2. Indirect Costs/Coûts indirects

** **Note:** When claiming Rehabilitation work Indirect costs are not allowable as assessment work.
Pour le remboursement des travaux de réhabilitation, les coûts indirects ne sont pas admissibles en tant que travaux d'évaluation.

Type	Description	Amount Montant	Totals Total global
Transportation Transport	Type: Included in Contractors charges		
Food and Lodging Nourriture et hébergement		$ 1534	1534
Mobilization and Demobilization Mobilisation et démobilisation			
	Sub Total of Indirect Costs Total partiel des coûts indirects		1534
	Amount Allowable (not greater than 20% of Direct Costs) Montant admissible (n'excédant pas 20 % des coûts directs)		1534
	Total Value of Assessment Credit (Total of Direct and Allowable Indirect costs) **Valeur totale du crédit d'évaluation (Total des coûts directs et indirects admissibles**		36,455

Note: The recorded holder will be required to verify expenditures claimed in this statement of costs within 30 days of a request for verification. If verification is not made, the Minister may reject for assessment work all or part of the assessment work submitted.

Note : Le titulaire enregistré sera tenu de vérifier les dépenses demandées dans le présent état des coûts dans les 30 jours suivant une demande à cet effet. Si la vérification n'est pas effectuée, le ministre peut rejeter tout ou une partie des travaux d'évaluation présentés.

RECEIVED
JAN 14 1997
MINING LANDS BRANCH

Filing Discounts

1. Work filed within two years of completion is claimed at 100% of the above Total Value of Assessment Credit.

2. Work filed three, four or five years after completion is claimed at 50% of the above Total Value of Assessment Credit. See calculations below:

Total Value of Assessment Credit	Total Assessment Claimed
× 0.50 =	

Remises pour dépôt

1. Les travaux déposés dans les deux ans suivant leur achèvement sont remboursés à 100 % de la valeur totale susmentionnée du crédit d'évaluation.

2. Les travaux déposés trois, quatre ou cinq ans après leur achèvement sont remboursés à 50 % de la valeur totale du crédit d'évaluation susmentionné. Voir les calculs ci-dessous.

Valeur totale du crédit d'évaluation	Évaluation totale demandée
× 0,50 =	

Certification Verifying Statement of Costs

I hereby certify:
that the amounts shown are as accurate as possible and these costs were incurred while conducting assessment work on the lands shown on the accompanying Report of Work form.

that as Agent (Recorded Holder, Agent, Position in Company) I am authorized

to make this certification

Attestation de l'état des coûts

J'atteste par la présente :
que les montants indiqués sont le plus exact possible et que ces dépenses ont été engagées pour effectuer les travaux d'évaluation sur les terrains indiqués dans la formule de rapport de travail ci-joint.

Et qu'à titre de _____ (titulaire enregistré, représentant, poste occupé dans la compagnie) je suis autorisé

à faire cette attestation.

Signature	Date
	30/12/96

0212 (04/91)

Nota : Dans cette formule, lorsqu'il désigne des personnes, le masculin est utilisé au sens neutre.

Goldeye Group
Recorded Claim Holder:

Goldeye Explorations Ltd.
60 West Wilmot, Unit 22
RICHMOND HILL, ON.
L4B 1M6

Tel: 905 731 0972
Client # 137849

Fax: 905 731 9312

2.17004

Leonard Twp.	*Tyrrell Tp (cont'd)*	*Tyrrell Tp (cont'd)*	*Tyrrell Tp (cont'd)*
1171400	1133994	1146675	1151462
1171401	1133999	1146676	1151463
	1134000	1146677	1151464
MacMurchy Twp.	1134001	1147084	1151465
1131930	1134002	1147085	1151466
1131931	1134003	1147086	1171382
1131932	1134004	1147087	1171383
1131933	1134005	1147088	1171384
1131934	1134010	1147089	1171385
1146644	1134011	1147094	1171386
1146645	1134012	1147095	1171387
1146646	1134013	1147096	1171388
1146647	1134014	1147097	1171389
1146648	1134015	1147098	1171390
1147074	1134016	1147119	1171391
1147075	1134017	1147120	1171392
1147076	1134018	1147134	1171393
1147077	1134019	1147135	1171394
1147104	1134020	1147136	1171395
1147105	1134021	1147137	1171396
1147106	1134022	1147138	1171397
1147107	1134023	1147139	1171398
1147114	1134257	1147140	1171399
1147115	1134258	1147296	1197546
1147116	1134259	1147297	1198620
1147117	1134260	1147310	
1147118	1134261	1147311	
1147124	1146649	1151444	
1147125	1146650	1151445	
1147126	1146654	1151446	
1147127	1146655	1151447	
	1146656	1151448	
Tyrrell Twp.	1146657	1151449	
1131920	1146658	1151450	
1131921	1146659	1151451	
1131922	1146660	1151452	
1131923	1146664	1151453	
1131924	1146665	1151454	
1131925	1146666	1151455	
1131926	1146667	1151456	
1133979	1146668	1151457	
1133980	1146669	1151458	
1133993	1146670	1151459	
	1146674	1151460	

2.17004

Addendum to Report of Work
Recorded Claim Holders

Hydro Creek Group

Recorded Claim Holder:	Claim #
Mr A.A. Lacarte	1146156
1 Lake St. GOWGANDA, ON	1146157
P0J 1J0	1146441
Tel: 705 624 2300	1146442
Client # 155166	1146638
	1146639
	1146640

Hare Lake Group

Recorded Claim Holder:	Claim #
R. G. Komarechka	1094763
573 Haig St. Apt #1	1094764
SUDBURY, ON; P3C 4N3	1094921
Tel: 705 673 0873	1094922
Client #: 153168	1094923
	1094924
	1098984
Recorded Claim Holders:	1098985
Mr. A.A. Lacarte	
Address above, &	1167805
Mr. R. MacCallum	1167806
6 Queen St. Box 754	1186282
ENGLEHART, ONT, P0J 1H0	
Tel: 705 544 8406; Client # 161860	

Recorded Claim Holder:
Haddington Resources Ltd.
11th Floor - 808 West Hastings St.
VANCOUVER, BC
V6C 2X4
Tel: 604 687 7463
Fax: 604 681 2578
Client # 300638

Claim #
1198620 Tyrrell Tp

Recorded Claim Holder
BHP Minerals Canada Ltd.
33 Yonge St. Ste 610,
Toronto, ON. M5E 1G4
Tel: 416 368 3884
Fax: 416 365 0763
Client No. 108137

Claim #
1146517 Tyrrell Tp
1146518 Tyrrell Tp
1146519 Tyrrell Tp

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: (705) 670-5853
Fax: (705) 670-5863

April 28, 1997

Roy Spooner
Mining Recorder
4 Government Road East
Kirkland Lake, ON
P2N 1A2

Dear Sir or Madam:

Submission Number: 2.17004

Subject: Transaction Number(s):		Status
	W9680.00642	Approval After Notice

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.

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

NOTE: This correspondence may affect the status of your mining lands. Please contact the Mining Recorder to determine the available options and the status of your claims.

If you have any questions regarding this correspondence, please contact Bruce Gates by e-mail at gates_b@torv05.ndm.gov.on.ca or by telephone at (705) 670-5856.

Yours sincerely,

ORIGINAL SIGNED BY
Ron C. Gashinski
Senior Manager, Mining Lands Section
Mines and Minerals Division

Correspondence ID: 10760
Copy for: Assessment Library

Work Report Assessment Results

Submission Number: 2.17004

Date Correspondence Sent: April 28, 1997 **Assessor:** Bruce Gates

Transaction Number	First Claim Number	Township(s) / Area(s)	Status	Approval Date
W9680.00642	1151466	TYRRELL	Approval After Notice	April 19, 1997

Section:

14 Geophysical IP
14 Geophysical MAG

The 45 days outlined in the Notice dated March 5, 1997 have passed.

Assessment work credit has been approved as outlined on the attached Distribution of Assessment Work Credit sheet.

Correspondence ID: 10760

Work Report Assessment Results

Submission Number: 2.17004

Correspondence to:

Mining Recorder
Kirkland Lake, ON

Resident Geologist
Cobalt, ON

Assessment Files Library
Sudbury, ON

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

A. W. Beecham
HAILEYBURY, ONTARIO, CANADA

ARCHIE ALBANY LACARTE
GOWGANDA, Ontario

ROBERT GERALD KOMARECHKA
SUDBURY, Ontario

ROBERT MACCALLUM
ENGLEHART, Ontario

HADDINGTON RESOURCES LTD.
VANCOUVER, B.C.

BHP MINERALS CANADA LTD.
TORONTO, ONTARIO

Correspondence ID: 10760

Distribution of Assessment Work Credit

The following credit distribution reflects the value of assessment work performed on the mining land(s). Please contact the Mining Recorder to determine if this affects the status of your claims.

Date: April 28, 1997

Submission Number: 2.17004

Transaction Number: W9680.00642

Claim Number	Value Of Work Performed
1151466	1,755.00
1151465	2,650.00
1151464	1,187.00
1146156	1,790.00
1146441	3,643.00
1146640	2,015.00
1146638	3,485.00
1094923	1,752.00
1146517	1,082.00
1146518	1,080.00
Total: $	20,439.00

Correspondence ID: 10760

Ontario Ministry of Natural Resources | Ministry of Northern Development and Mines

INDEX TO LAND DISPOSITION

M.N.R. ADMINISTRATIVE DISTRICT
KIRKLAND LAKE

PLAN
~~M.253~~
G-3725
TOWNSHIP
TYRRELL

DATE OF ISSUE JAN 10 1997 LARDER LAKE MINING RECORDER'S DISTRICT

MINING DIVISION
LARDER LAKE

LAND TITLES/REGISTRY DIVISION
TIMISKAMING

RECEIVED JAN 14 1997 MINING LANDS BRANCH

Scale 1:20 000

1000 Metres 0 1000 2000 Metres

1000 Feet 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10 000 Feet

Contour Interval 10 Metres

2.17004

MAG, IP

KNIGHT TOWNSHIP

MACMURCHY TOWNSHIP

MILNER TOWNSHIP

LEONARD TOWNSHIP

DISTRICT OF SUDBURY

DISTRICT OF TIMISKAMING

CLM 296

T.F.0.22

AREAS WITHDRAWN FROM DISPOSITION

MRO – Mining Rights Only
SRO – Surface Rights Only
M+S – Mining and Surface Rights

Description	Order No.	Date	Disposition	File
(R) W-L-58/96 NER		SEPT 17/96	SRO	ARCHAEOLOGICAL SITE

SYMBOLS

Boundary
- Administrative District
- Township, Meridian, Baseline
- Road allowance; surveyed
  - shore
- Lot/Concession; surveyed
  - unsurveyed
- Parcel; surveyed
  - unsurveyed
- Right-of-way; road
  - railway
  - utility
- Reservation
- Cliff, Pit, Pile
- Contour
  - interpolated
  - Approximate
  - Depression
- Control point (horizontal)
- Flooded land
- Mine shaft
- Pipeline (above ground)
- Railway; single track
  - double track
  - abandoned
- River/Stream/Creek
  - intermittent
- Road; highway, county, township
  - access
  - trail, bush
- Shoreline (original)
- Transmission line
- Wooded area

DISPOSITION OF CROWN LANDS

Patent
- Surface & Mining Rights
- Surface Rights Only
- Mining Rights Only

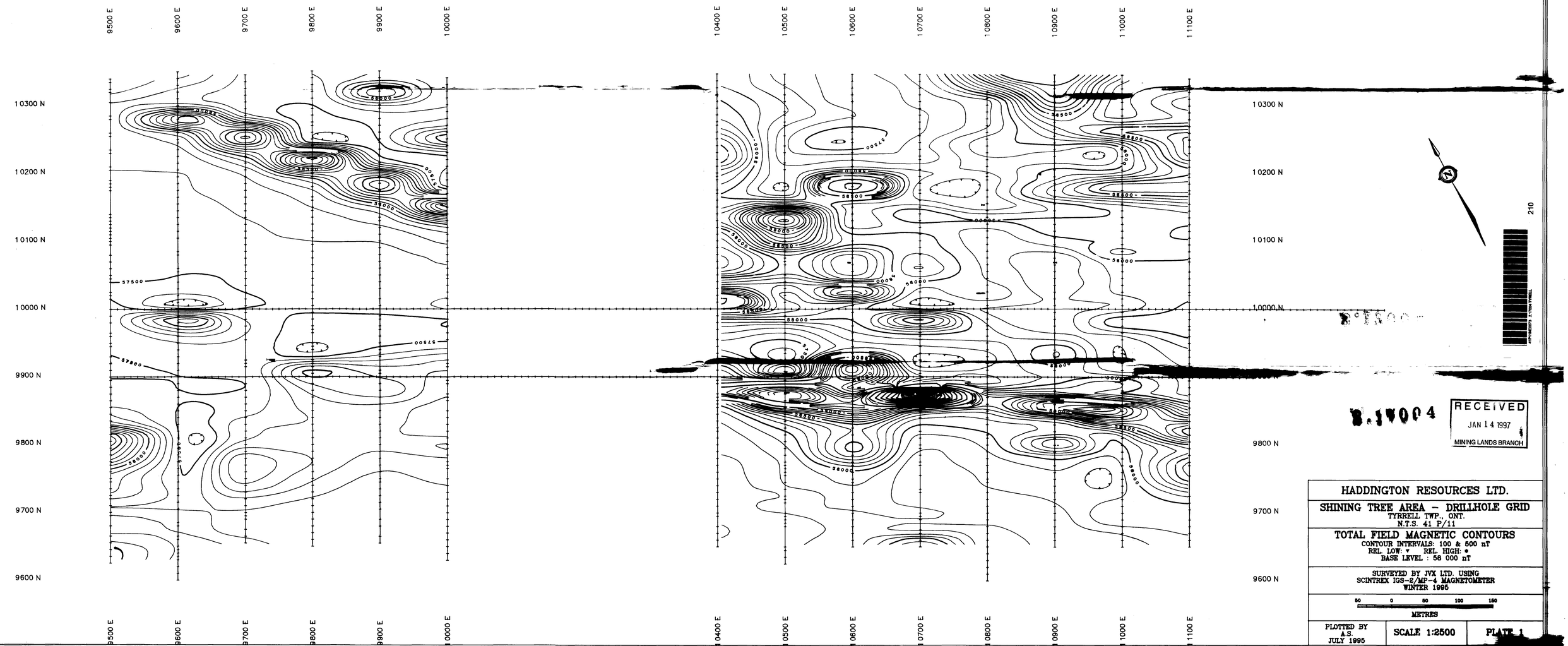
Lease
- Surface & Mining Rights
- Surface Rights Only
- Mining Rights Only

Licence of Occupation
- Order-in-Council (OC)
- Cancelled
- Reservation
- Sand & Gravel
- Land Use permit

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.

CIRCULATED AUGUST 15/96
ARCHIVED SEPT 17/96

200



B.17004

RECEIVED
JAN 14 1997
MINING LANDS BRANCH

HADDINGTON RESOURCES LTD.

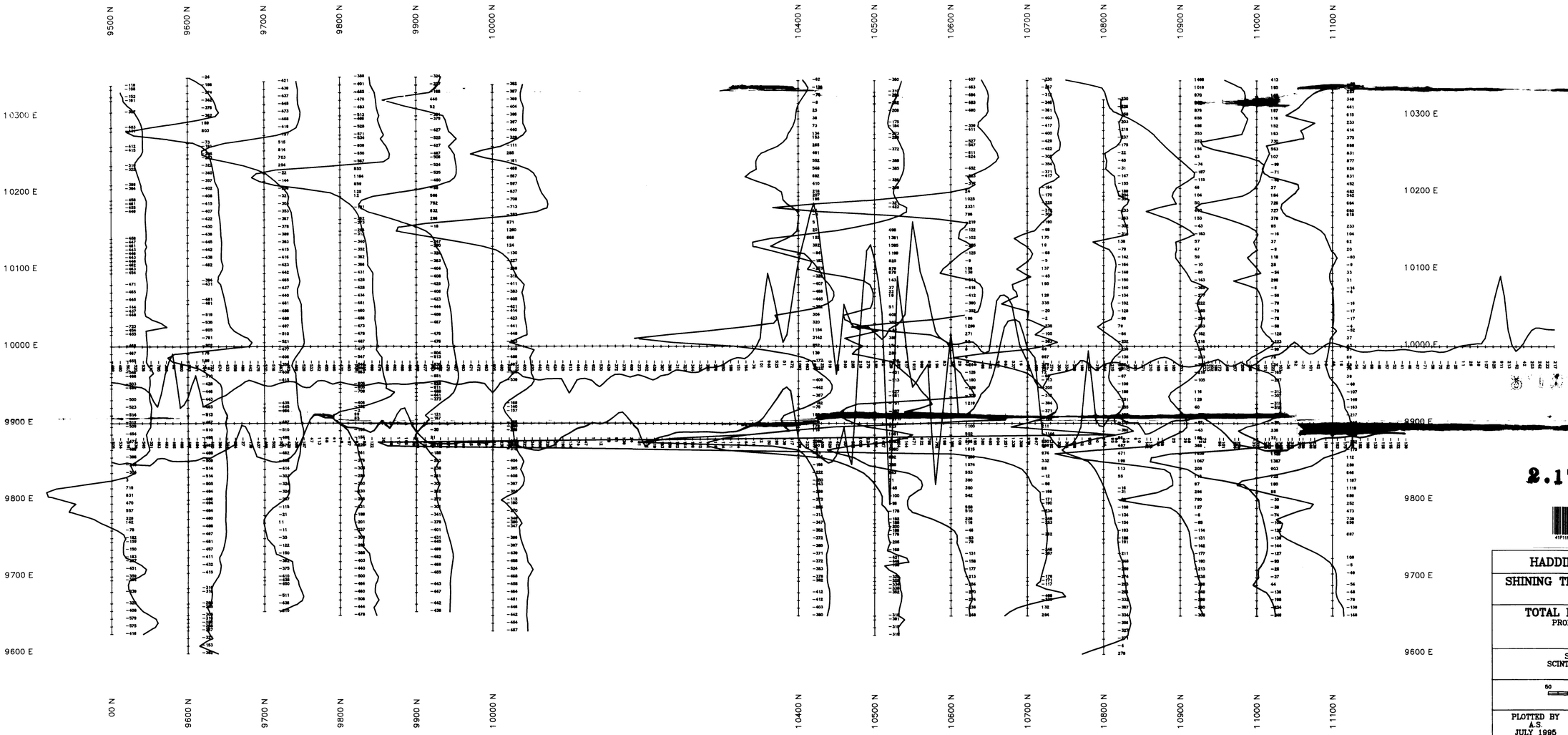
SHINING TREE AREA – DRILLHOLE GRID
TYRRELL TWP., ONT.
N.T.S. 41 P/11

TOTAL FIELD MAGNETIC CONTOURS
CONTOUR INTERVALS: 100 & 500 nT
REL. LOW: ▼ REL. HIGH: ●
BASE LEVEL : 58 000 nT

SURVEYED BY JVX LTD. USING
SCINTREX IGS-2/MP-4 MAGNETOMETER
WINTER 1995

50 0 50 100 150
METRES

PLOTTED BY A.S. JULY 1995	SCALE 1:2500	PLATE 1



HADDINGTON RESOURCES LTD.

SHINING TREE AREA – DRILLHOLE GRID

TYRRELL TWP., ONT.
N.T.S. 41 F/11

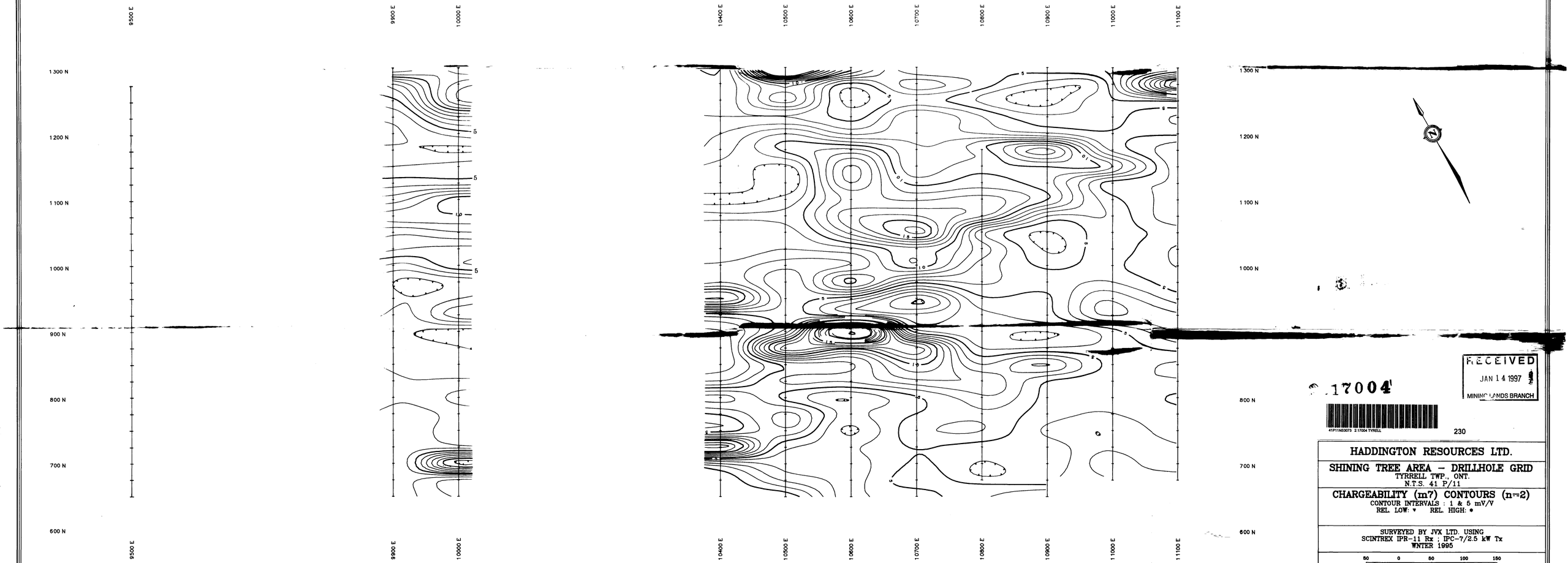
TOTAL FIELD MAGNETIC PROFILES

PROFILE SCALE : 1 cm rep. 250 nT
POSITIVE WESTWARDS
BASE LEVEL : 58 000 nT

SURVEYED BY JVX LTD. USING
SCINTREX IGS-2/MP-4 MAGNETOMETER
WINTER 1995

50 0 50 100 150
METRES

PLOTTED BY A.S. JULY 1995	SCALE 1:2500	PLATE 2



230

HADDINGTON RESOURCES LTD.

SHINING TREE AREA – DRILLHOLE GRID

TYRRELL TWP., ONT.
N.T.S. 41 P/11

CHARGEABILITY (m7) CONTOURS (n=2)

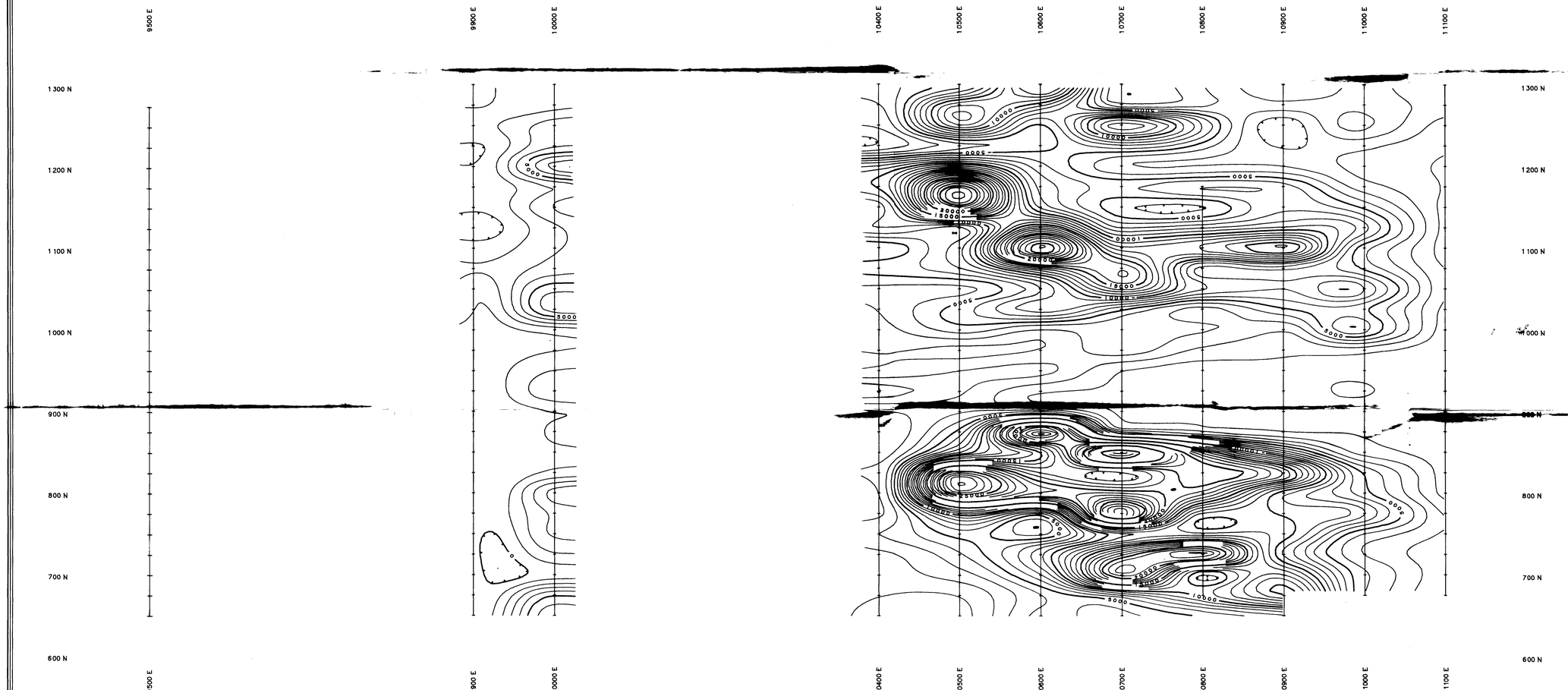
CONTOUR INTERVALS : 1 & 5 mV/V
REL. LOW: ▼ REL. HIGH: ●

SURVEYED BY JVX LTD. USING
SCINTREX IPR-11 Rx ; IPC-7/2.5 kW Tx
WNTER 1995

50 0 50 100 150
METRES

PLOTTED BY A.S. JULY 1995	SCALE 1:2500	PLATE 3

JVX ref. no. 9507



2.17004

41P11NE0073 2.17004 TYRRELL

240

HADDINGTON RESOURCES LTD.

SHINING TREE AREA -- DRILLHOLE GRID

TYRRELL TWP., ONT.
N.T.S. 41 P/11

RESISTIVITY CONTOURS (n=2)

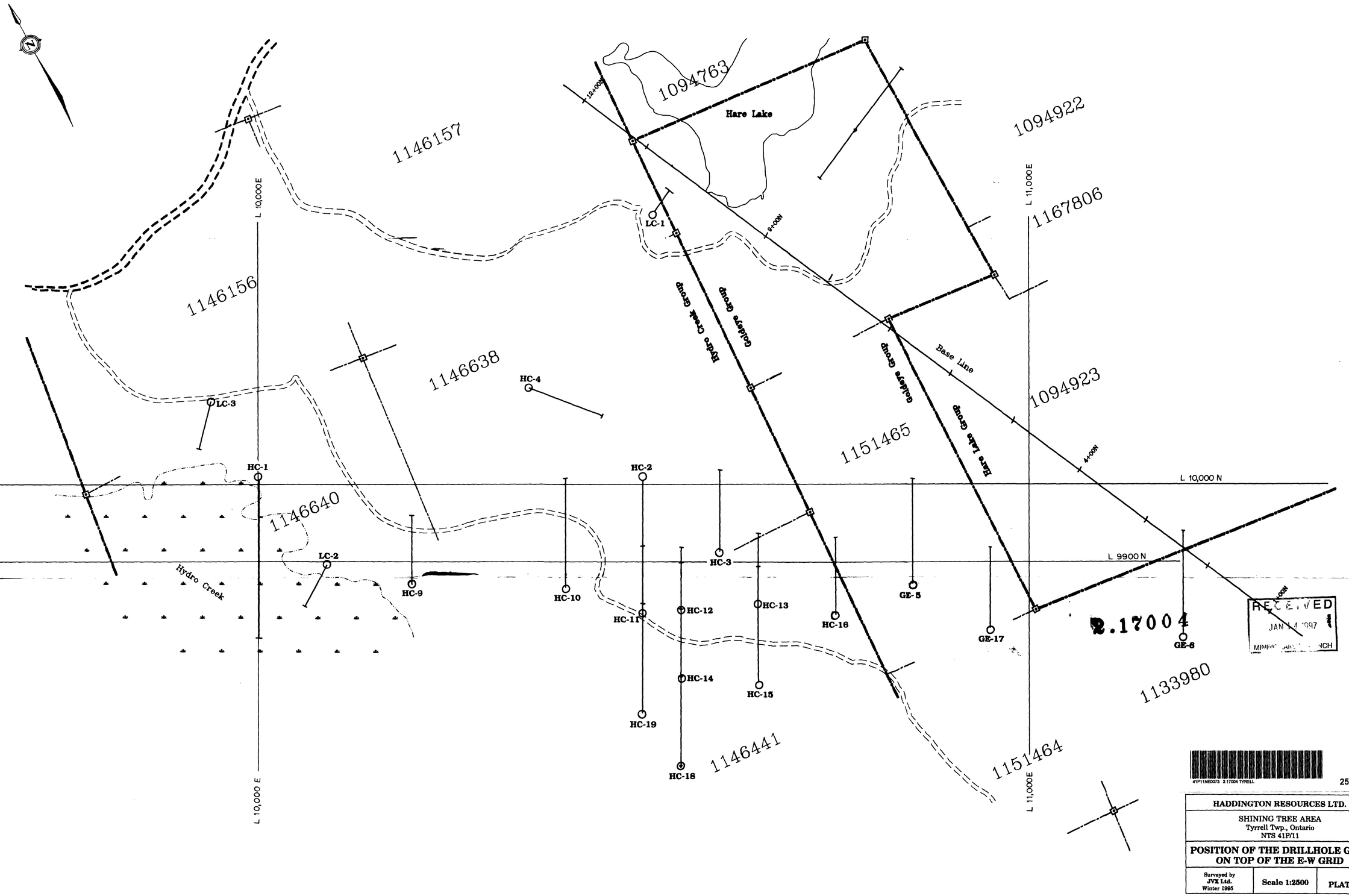
CONTOUR INTERVALS : 1000 & 5000 ohm m
REL. LOW: ▼ REL. HIGH: ●

SURVEYED BY JVX LTD. USING
SCINTREX IPR-11 Rx ; IPC-7/2.5 kW Tx
WINTER 1995

50 0 50 100 150
METRES

PLOTTED BY A.S. JULY 1995	SCALE 1:2500	PLATE 4

JVX ref. no. 9507



HADDINGTON RESOURCES LTD.		
SHINING TREE AREA Tyrrell Twp., Ontario NTS 41P/11		
POSITION OF THE DRILLHOLE GRID ON TOP OF THE E-W GRID		
Surveyed by JVX Ltd. Winter 1995	Scale 1:2500	PLATE 5

Haddington Resources Ltd.

SCINTREX IPR-11 RECEIVER — TX PULSE TIME: 2.0 SEC
POLE-DIPOLE ARRAY — RECEIVE TIME: 2.0 SEC
TRAV. DIRECTION: NORTH — C1 POSITION: TRAILING
SCALE 1: 2500

LINE NUMBER: 9500 EAST
"A": 25.0 METRES — N=1 TO 6

IP TAU (SEC)

650N 675N 700N 725N 750N 775N 800N 825N 850N 875N 900N 925N 950N 975N 1000N 1025N 1050N 1075N 1100N 1125N 1150N 1175N 1200N 1225N 1250N 1275N

1 .03 .01 .01 .01 .01 .03 .10 .03 .10 .01 .01 .03 .03 .03 1.00 .03 .10 .01 .01 .01 .01 .01 .03
2 .01 .03 .03 .01 .01 .03 .03 .01 .01 .03 .01 30.00 .03 .10 .10 30.00 .10 .03 .03 .01 .03 .01 .01
3 .03 .03 .01 3.00 .01 .01 .03 .01 .03 .03 .10 .10 .01 .01 18.00 .10 .01 .03 .03 .01 .01
4 .03 .03 .00 .01 .03 .03 .30 .01 .10 .01 .10 .10 .01 .03 .03 .03
5 .03 .30 .01 .01 .03 .01 .01 .01 .10 .10 .10 .03 .03 .03 .01 .03 .03
6 .01 .03 .01 .03 .03 10.00 30.00 .03 .01 .01 .03 .01 .10 .03 .03 .10 .03

IP COLE-COLE "m" (MV/V)

650N 675N 700N 725N 750N 775N 800N 825N 850N 875N 900N 925N 950N 975N 1000N 1025N 1050N 1075N 1100N 1125N 1150N 1175N 1200N 1225N 1250N 1275N

1 48.5 103.6 94.4 108.5 118.0 104.8 88.2 111.0 87.9 306.6 204.2 87.8 68.4 60.7 38.8
2 88.1 83.4 104.9 175.8 135.7 130.0 128.4 112.2 384.9 394.5 88.6 72.2 74.5 55.9 89.1 49.4
3 85.0 104.1 143.0 132.1 128.0 160.0 130.2 116.5 138.8 98.1 82.7 71.4 88.5
4 116.8 160.1 118.4 97.3 372.8 182.2 104.4 97.0 99.8
5 122.6 112.8 143.2 167.6 119.0 108.2 70.9 428.4 383.5 364.0 128.2 116.4 91.3 104.7 66.8 33.7
6 193.6 87.1 177.3 124.1 77.8 125.0 434.3 384.4 216.7 115.6 118.8 108.6 168.3 141.6

RECEIVED
4 1997
MINING DIVISION

1504

260

Haddington Resources Ltd.

SCINTREX IPR-11 RECEIVER — TX PULSE TIME: 2.0 SEC
POLE-DIPOLE ARRAY — RECEIVE TIME: 2.0 SEC
TRAV. DIRECTION: NORTH — C1 POSITION: TRAILING
SCALE 1: 2500

LINE NUMBER: 9500 EAST
"A": 25.0 METRES — N=1 TO 6

RESISTIVITY /100

650N 675N 700N 725N 750N 775N 800N 825N 850N 875N 900N 925N 950N 975N 1000N 1025N 1050N 1075N 1100N 1125N 1150N 1175N 1200N 1225N 1250N 1275N

1 193.5 173.1 344.1 281.5 250.7 87.1 88.3 72.7 72.0 28.6 28.6 155.3 325.0 129.3 83.8 19.4 11.8 11.4 12.2 13.8 12.9
2 100.6 201.2 310.2 313.8 288.1 108.3 219.0 82.6 198.8 21.7 38.1 27.0 224.4 38.6 32.5 17.1 22.1
3 351.5 270.2 287.8 124.7 84.5 38.8 31.3 44.9 23.8 38.8 42.2 23.0 34.2 37.4 4.8
4 283.6 238.2 166.0 34.2 48.2 82.4 24.4 30.1 40.9 44.8 43.4 4.1
5 285.4 219.2 38.4 65.1 82.8 24.3 28.5 31.4 57.3 64.4 84.3 76.3 6.5
6 252.5 194.1 45.3 99.9 213.8 33.5 25.4 33.1 68.1

SLICE 8 (MT)

650N 675N 700N 725N 750N 775N 800N 825N 850N 875N 900N 925N 950N 975N 1000N 1025N 1050N 1075N 1100N 1125N 1150N 1175N 1200N 1225N 1250N 1275N

1 2.8 4.2 3.8 5.2 4.3 5.3 6.2 4.4 3.0 3.1 2.7 1.7 -.9
2 3.5 4.8 5.4 5.6 5.2 6.8 4.4 3.6 3.0 2.8 -.9
3 5.4 5.9 7.1 5.2 4.4 3.4 3.2 -3.1 -1.8
4 6.9 5.3 7.1 7.5 8.6 4.2 4.4 3.4 -.1
5 6.3 5.4 6.6 5.1 7.0 6.7 4.2 4.4 -1.6
6 7.8 6.9 6.5 4.0 7.5 6.9 6.8 7.2 5.0 3.8 3.9 -2.5

Poss. QFP(?)

n=1 n=1 n=3 n=3

SHORT with minor mod. time constant

41P11NE0073 2.17004 TYRELL

PLATE 6

Haddington Resources Ltd.

Tyrrell Twp., Ont.

LINE NUMBER: 10,000 EAST

"A": 25.0 METRES N=1 TO 6

SCINTREX IPR-11 RECEIVER — TX PULSE TIME: 2.0 SEC
POLE-DIPOLE ARRAY — RECEIVE TIME: 2.0 SEC
TRAV. DIRECTION: NORTH — C1 POSITION: TRAILING
SCALE 1: 2500

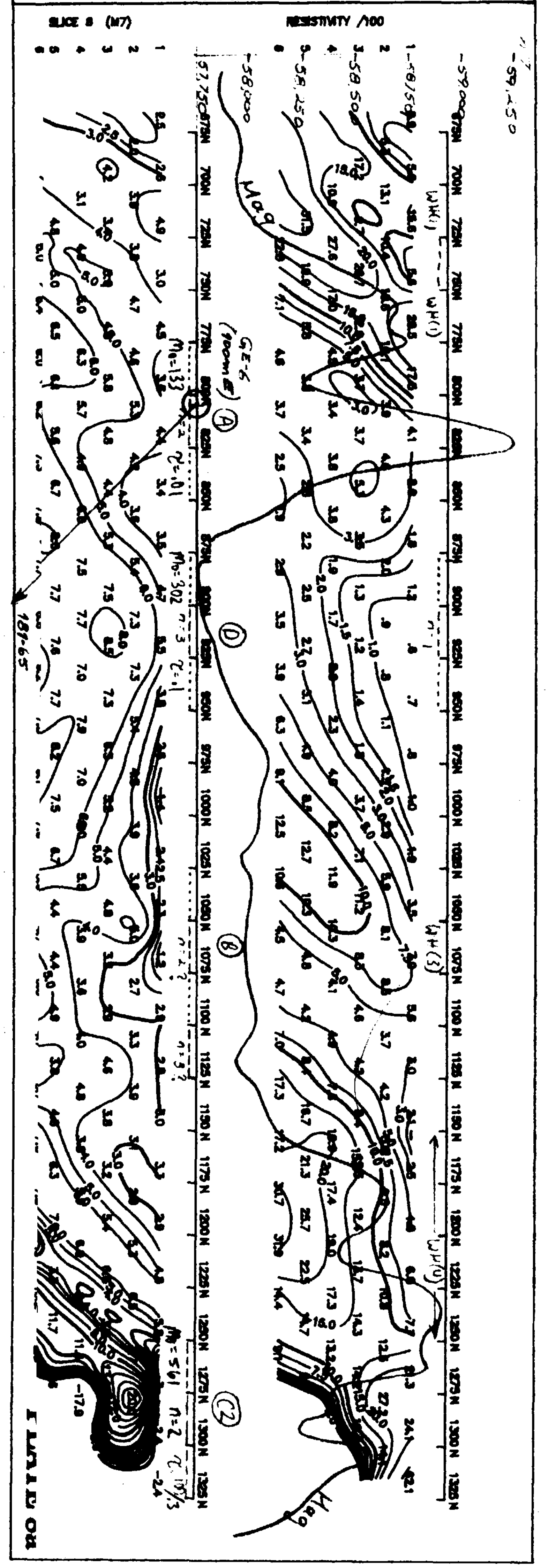
SLICE 8 (M7) RESISTIVITY /100

IP COLE-COLE "M" (MV/V) IP TAU (SEC)

PLATE 7

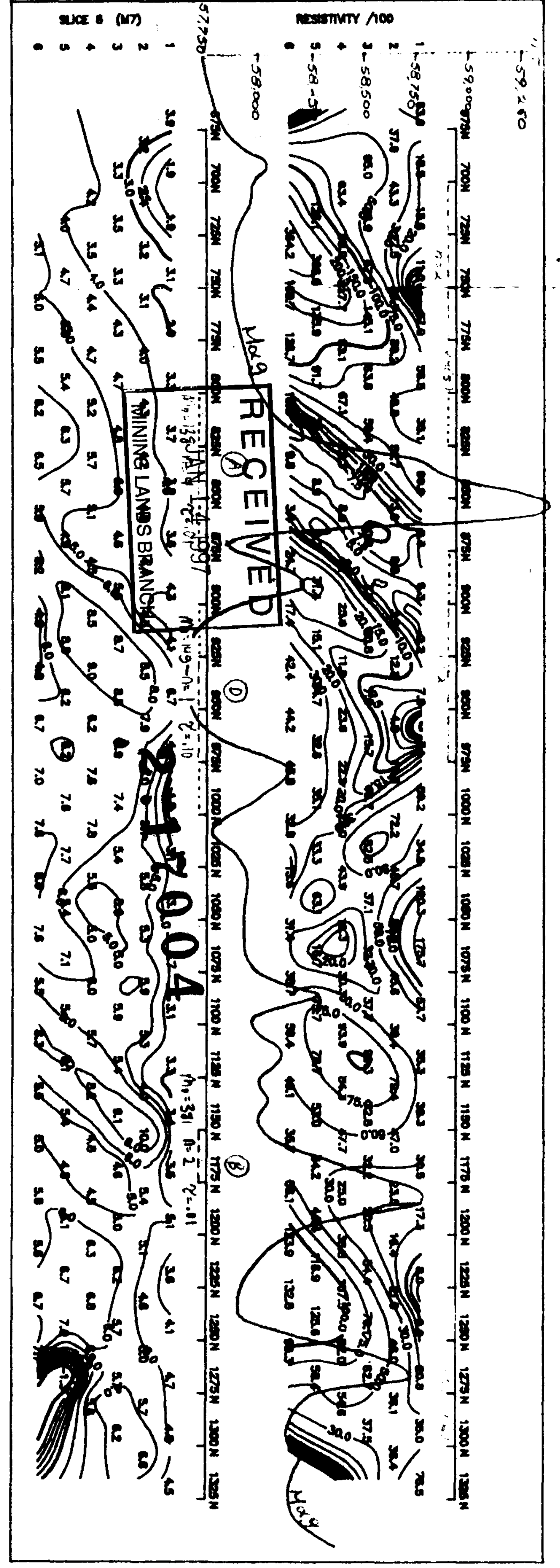
Haddington Resources Ltd.

Tyrrell Twp., Ont.
LINE NUMBER: 11,100 EAST
"A": 25.0 METRES N=1 TO 6
SCINTREX IPR-11 RECEIVER TX PULSE TIME: 2.0 SEC
POLE-DIPOLE ARRAY RECEIVE TIME: 2.0 SEC
TRAV. DIRECTION: NORTH C1 POSITION: TRAILING
SCALE 1: 2500



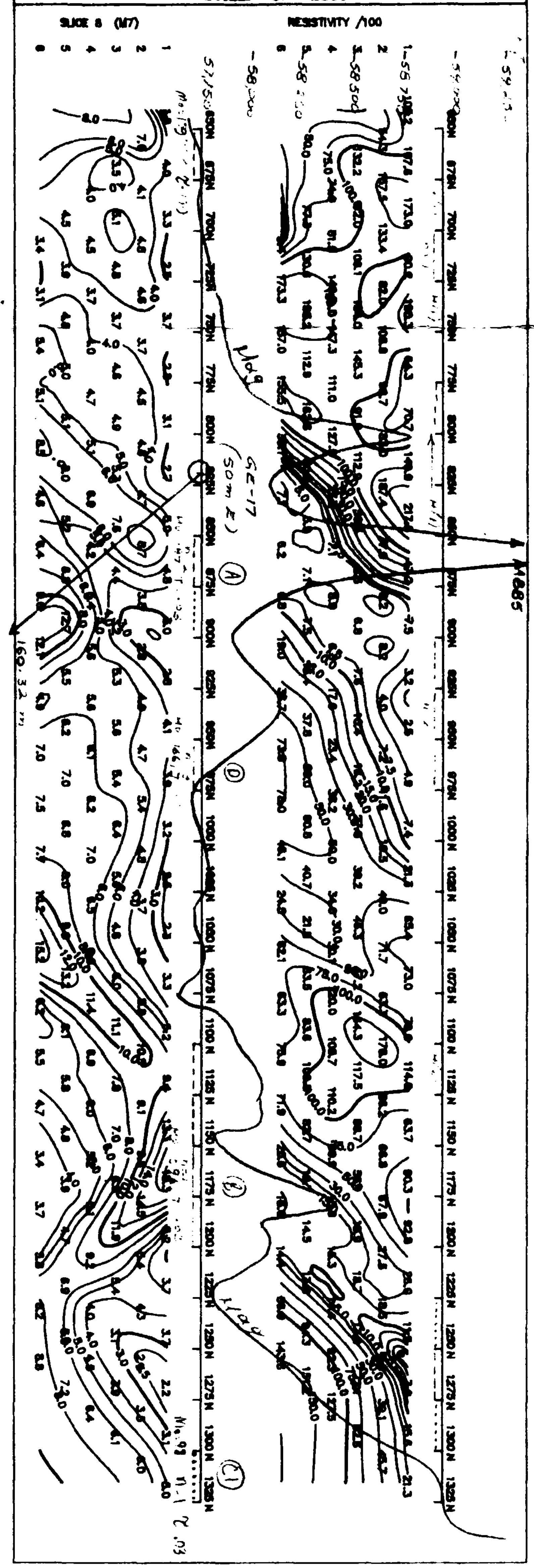
Haddington Resources Ltd.

Tyrrell Twp., Ont.
LINE NUMBER: 11,000 EAST
"A": 25.0 METRES N=1 TO 6
SCINTREX IPR-11 RECEIVER TX PULSE TIME: 2.0 SEC
POLE-DIPOLE ARRAY RECEIVE TIME: 2.0 SEC
TRAV. DIRECTION: NORTH C1 POSITION: TRAILING
SCALE 1: 2500



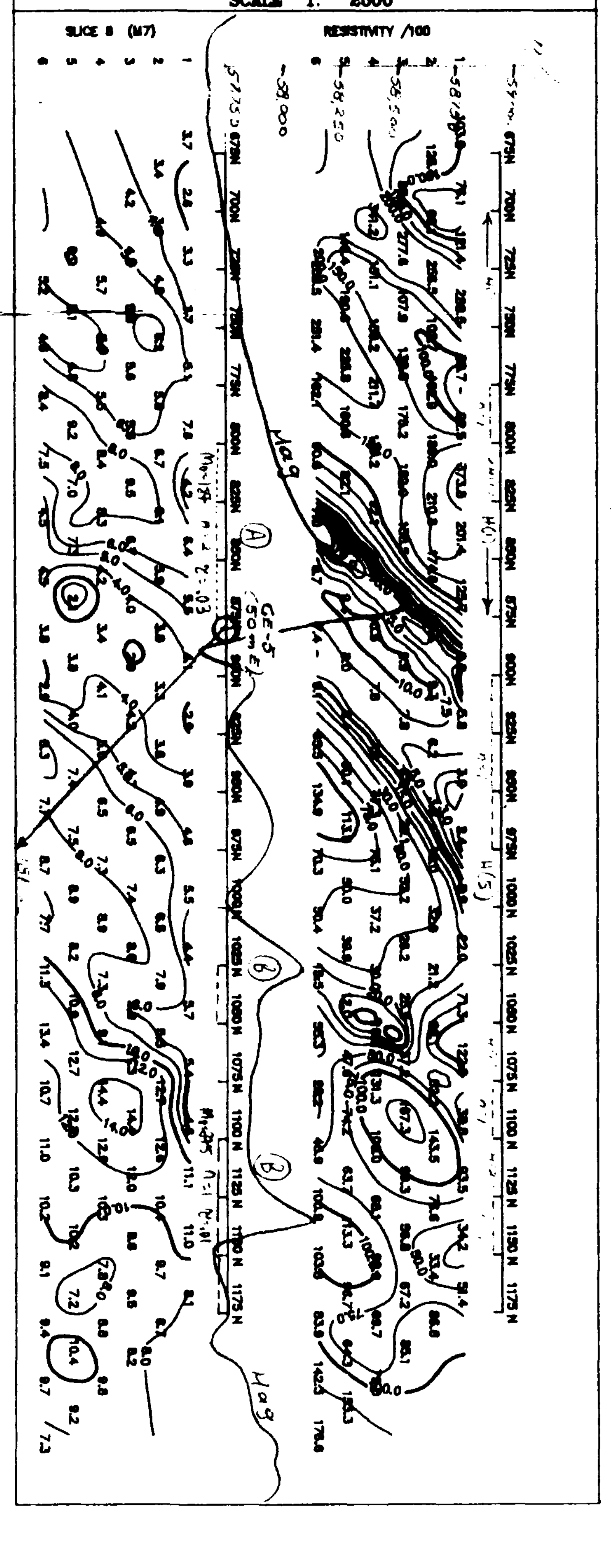
Haddington Resources Ltd.

Tyrrell Twp., Ont.
LINE NUMBER: 10,900 EAST
"A": 25.0 METRES N=1 TO 6
SCINTREX IPR-11 RECEIVER TX PULSE TIME: 2.0 SEC
POLE-DIPOLE ARRAY RECEIVE TIME: 2.0 SEC
TRAV. DIRECTION: NORTH C1 POSITION: TRAILING
SCALE 1: 2500



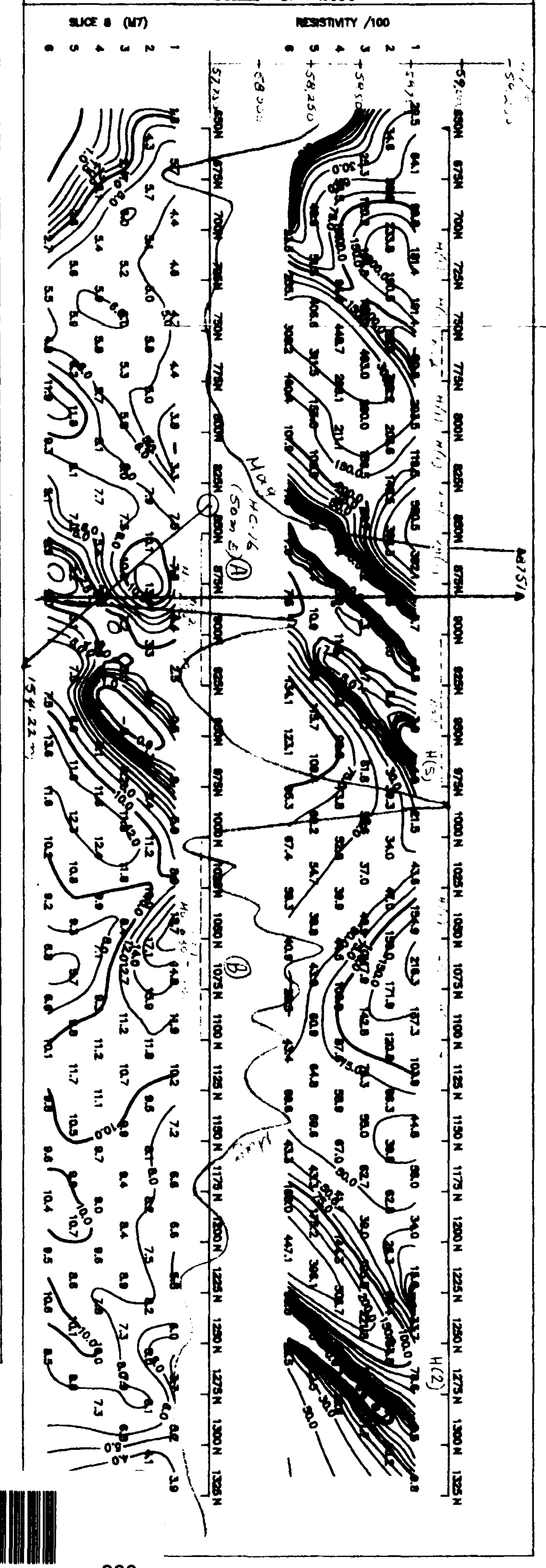
Haddington Resources Ltd.

Tyrrell Twp., Ont.
LINE NUMBER: 10,800 EAST
"A": 25.0 METRES N=1 TO 6
SCINTREX IPR-11 RECEIVER TX PULSE TIME: 2.0 SEC
POLE-DIPOLE ARRAY RECEIVE TIME: 2.0 SEC
TRAV. DIRECTION: NORTH C1 POSITION: TRAILING
SCALE 1: 2500



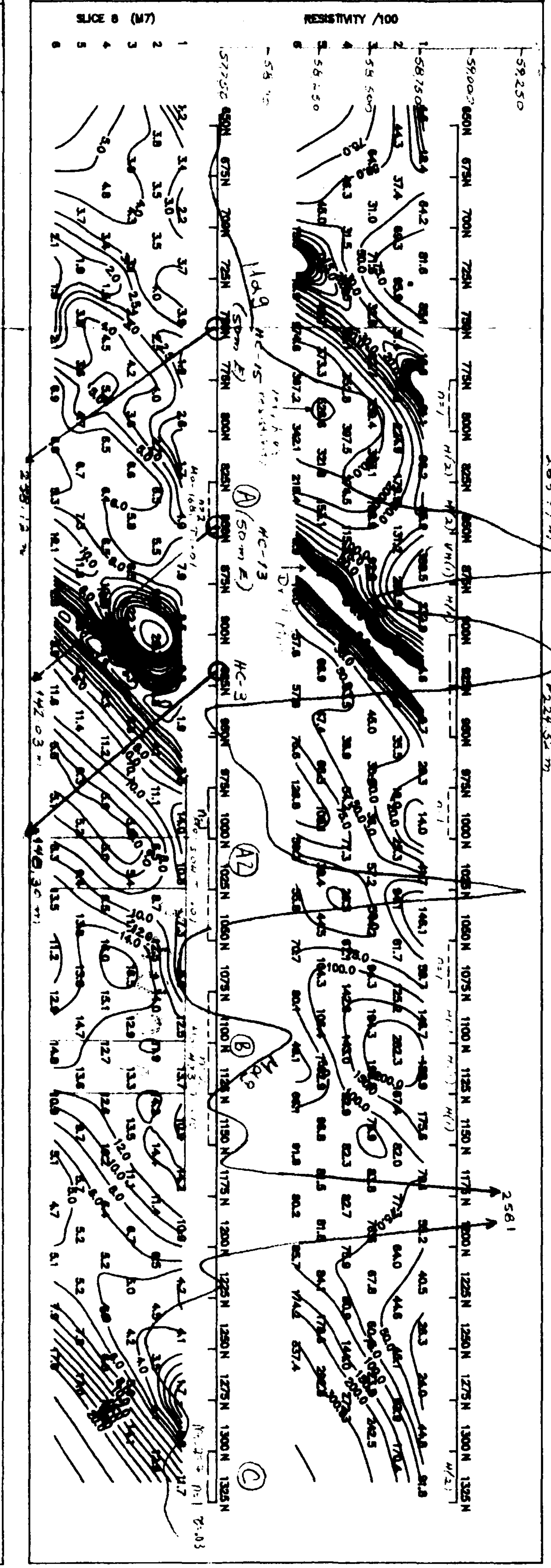
Haddington Resources Ltd.

Tyrrell Twp., Ont.
LINE NUMBER: 10,700 EAST
"A": 25.0 METRES N=1 TO 6
SCINTREX IPR-11 RECEIVER TX PULSE TIME: 2.0 SEC
POLE-DIPOLE ARRAY RECEIVE TIME: 2.0 SEC
TRAV. DIRECTION: NORTH C1 POSITION: TRAILING
SCALE 1: 2500



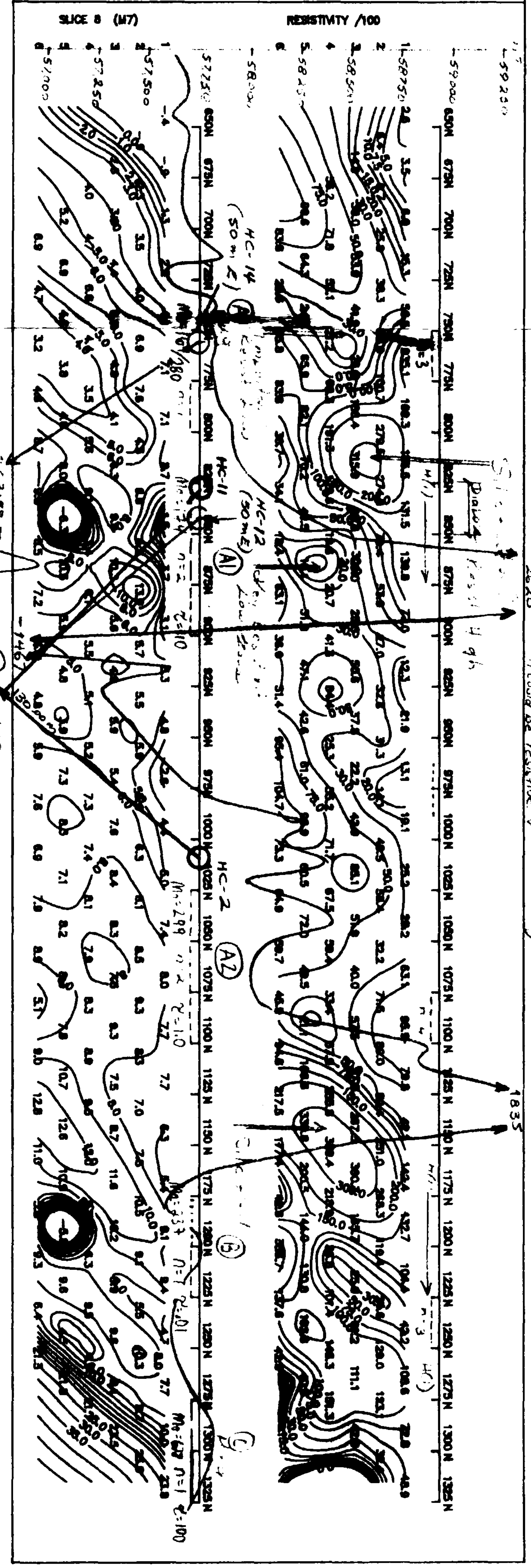
Haddington Resources Ltd.

Tyrrell Twp., Ont.
LINE NUMBER: ,600 EAST
"A": 25.0 METRES N=1 TO 6
SCINTREX IPR-11 RECEIVER TX PULSE TIME: 2.0 SEC
POLE-DIPOLE ARRAY RECEIVE TIME: 2.0 SEC
TRAV. DIRECTION: NORTH C1 POSITION: TRAILING
SCALE 1: 2500



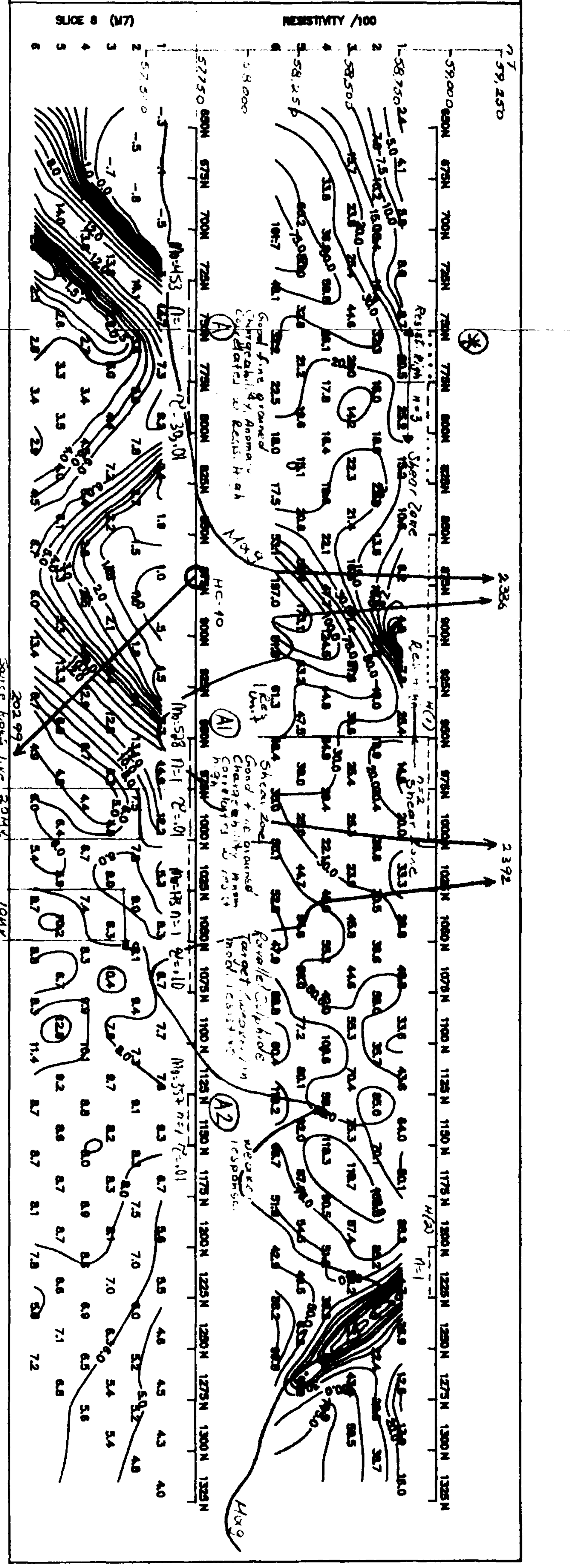
Haddington Resources Ltd.

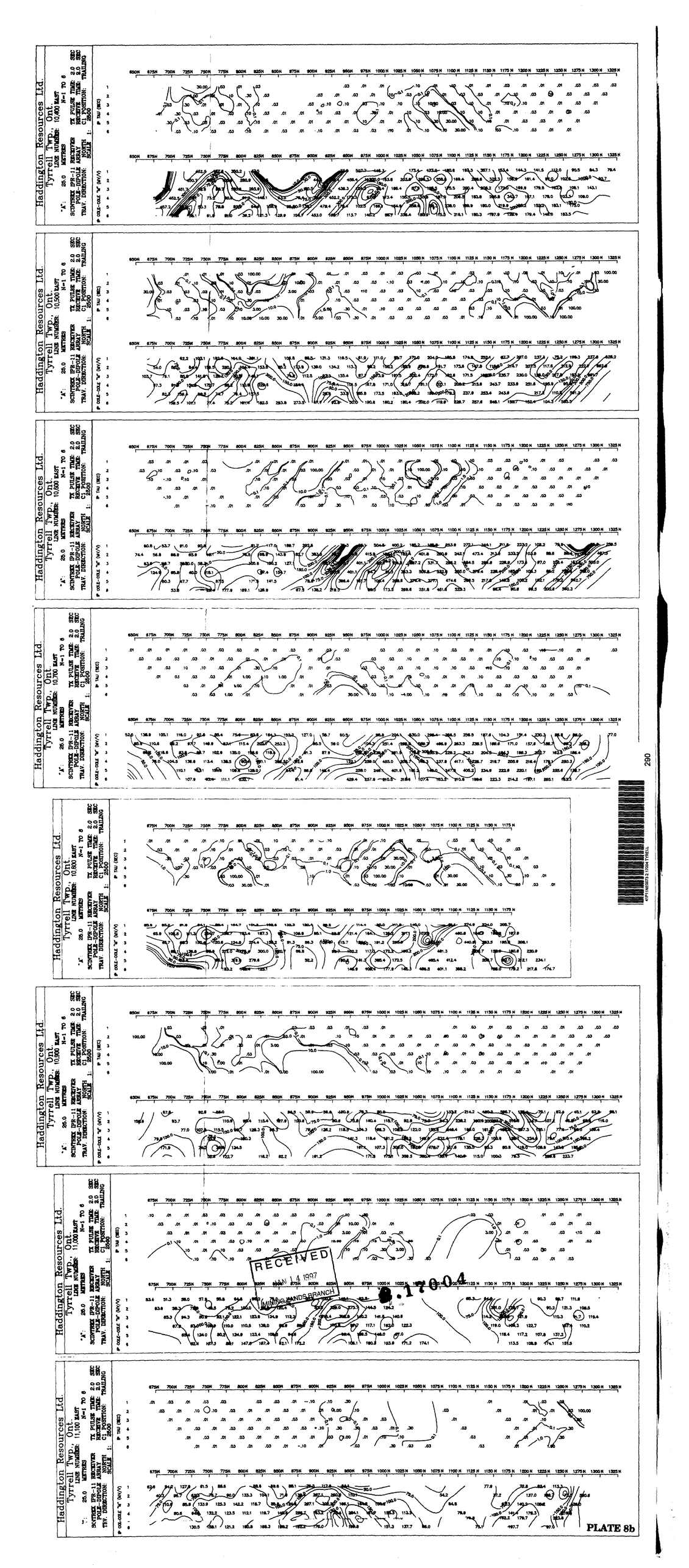
Tyrrell Twp., Ont.
LINE NUMBER: 10,500 EAST
"A": 25.0 METRES N=1 TO 6
SCINTREX IPR-11 RECEIVER TX PULSE TIME: 2.0 SEC
POLE-DIPOLE ARRAY RECEIVE TIME: 2.0 SEC
TRAV. DIRECTION: NORTH C1 POSITION: TRAILING
SCALE 1: 2500

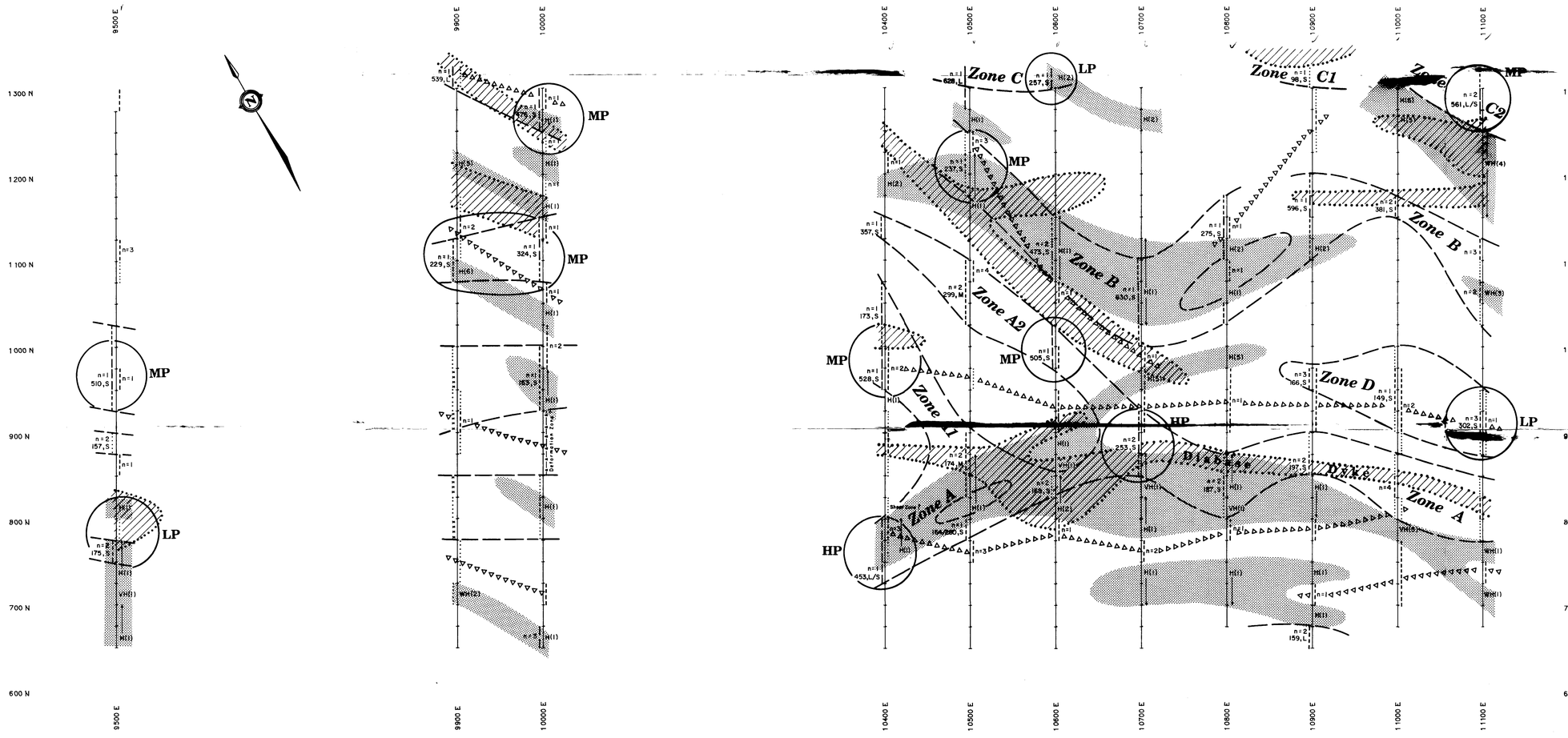


Haddington Resources Ltd.

Tyrrell Twp., Ont.
LINE NUMBER: 10,400 EAST
"A": 25.0 METRES N=1 TO 6
SCINTREX IPR-11 RECEIVER TX PULSE TIME: 2.0 SEC
POLE-DIPOLE ARRAY RECEIVE TIME: 2.0 SEC
TRAV. DIRECTION: NORTH C1 POSITION: TRAILING
SCALE 1: 2500




Haddington Resources Ltd.
Tyrrell Twp. Ont.
LINE NUMBER: 10,400 EAST
N=1 TO 6
"A": 25.0 METRES
TX PULSE TIME: 2.0 SEC
RECEIVER TIME: 3.0 SEC
C1 POSITION: TRAILING
SCINTREX IPR-11 RECEIVER
POLE-DIPOLE ARRAY
TRAV. DIRECTION: NORTH
SCALE 1: 2500
TAU (SEC)
COLE-COLE "M" (MV/V)
Haddington Resources Ltd.
Tyrrell Twp. Ont.
LINE NUMBER: 10,500 EAST
N=1 TO 6
"A": 25.0 METRES
TX PULSE TIME: 2.0 SEC
RECEIVER TIME: 3.0 SEC
C1 POSITION: TRAILING
SCINTREX IPR-11 RECEIVER
POLE-DIPOLE ARRAY
TRAV. DIRECTION: NORTH
SCALE 1: 2500
TAU (SEC)
COLE-COLE "M" (MV/V)
Haddington Resources Ltd.
Tyrrell Twp. Ont.
LINE NUMBER: 10,600 EAST
N=1 TO 6
"A": 25.0 METRES
TX PULSE TIME: 2.0 SEC
RECEIVER TIME: 3.0 SEC
C1 POSITION: TRAILING
SCINTREX IPR-11 RECEIVER
POLE-DIPOLE ARRAY
TRAV. DIRECTION: NORTH
SCALE 1: 2500
TAU (SEC)
COLE-COLE "M" (MV/V)
Haddington Resources Ltd.
Tyrrell Twp. Ont.
LINE NUMBER: 10,700 EAST
N=1 TO 6
"A": 25.0 METRES
TX PULSE TIME: 2.0 SEC
RECEIVER TIME: 3.0 SEC
C1 POSITION: TRAILING
SCINTREX IPR-11 RECEIVER
POLE-DIPOLE ARRAY
TRAV. DIRECTION: NORTH
SCALE 1: 2500
TAU (SEC)
COLE-COLE "M" (MV/V)
Haddington Resources Ltd.
Tyrrell Twp. Ont.
LINE NUMBER: 10,800 EAST
N=1 TO 6
"A": 25.0 METRES
TX PULSE TIME: 2.0 SEC
RECEIVER TIME: 3.0 SEC
C1 POSITION: TRAILING
SCINTREX IPR-11 RECEIVER
POLE-DIPOLE ARRAY
TRAV. DIRECTION: NORTH
SCALE 1: 2500
TAU (SEC)
COLE-COLE "M" (MV/V)
Haddington Resources Ltd.
Tyrrell Twp. Ont.
LINE NUMBER: 10,900 EAST
N=1 TO 6
"A": 25.0 METRES
TX PULSE TIME: 2.0 SEC
RECEIVER TIME: 3.0 SEC
C1 POSITION: TRAILING
SCINTREX IPR-11 RECEIVER
POLE-DIPOLE ARRAY
TRAV. DIRECTION: NORTH
SCALE 1: 2500
TAU (SEC)
COLE-COLE "M" (MV/V)
Haddington Resources Ltd.
Tyrrell Twp. Ont.
LINE NUMBER: 11,000 EAST
N=1 TO 6
"A": 25.0 METRES
TX PULSE TIME: 2.0 SEC
RECEIVER TIME: 3.0 SEC
C1 POSITION: TRAILING
SCINTREX IPR-11 RECEIVER
POLE-DIPOLE ARRAY
TRAV. DIRECTION: NORTH
SCALE 1: 2500
TAU (SEC)
COLE-COLE "M" (MV/V)
Haddington Resources Ltd.
Tyrrell Twp. Ont.
LINE NUMBER: 11,100 EAST
N=1 TO 6
"A": 25.0 METRES
TX PULSE TIME: 2.0 SEC
RECEIVER TIME: 3.0 SEC
C1 POSITION: TRAILING
SCINTREX IPR-11 RECEIVER
POLE-DIPOLE ARRAY
TRAV. DIRECTION: NORTH
SCALE 1: 2500
TAU (SEC)
COLE-COLE "M" (MV/V)
RECEIVED
JAN 14 1997
MINING LANDS BRANCH
290
PLATE 8b



LEGEND

Very Strong	WH(2) – Weak High Resistivity, n=2 H(1) – High Resistivity, n=1 VH(3) – Very High Resistivity, n=3
Strong	Strong Resistivity Low
Medium	Medium Resistivity Low
Weak	Weak Resistivity Low
M-IP(mV/V) 517 , L Time Constant (Long,Medium or Short)	
Very Weak	Very Weak Resistivity Low
Extremely Weak	
CHARGEABILITY ANOMALY	RESISTIVITY ANOMALY

- Zone A — Chargeability Zone
- Magnetic High
- Resistivity High
- Resistivity Low Trend
- Exploration Target
- HP High Priority
- MP Medium Priority
- LP Low Priority

300 METRES

HADDINGTON RESOURCES LTD.

SHINING TREE AREA – DRILLHOLE GRID

TYRRELL TWP., ONT.
N.T.S. 41 P/11

COMPILATION MAP

COMPILED BY JVX LTD.

50 0 50 100 150
METRES

PLOTTED BY A.S. JULY 1995 | SCALE 1:2500 | PLATE 9

JVX ref. no. 9607