



**REPORT ON A HELICOPTER-BORNE  
TIME DOMAIN ELECTROMAGNETIC  
GEOPHYSICAL SURVEY**

2.31892

**Burchell Lake Property Survey  
Shebandowan Belt Area  
Ontario, Canada**

2.31892

for  
**Alto Ventures Ltd.**

By

**Geotech Ltd.  
30 Industrial Parkway South  
Aurora, Ontario L4G 3W2  
Tel: 905 841 5004  
Fax: 905 841 0611  
www.geotechairborne.com**

**Email: info@geotechairborne.com**

**Survey flown in May 2005**

**Project 533  
June, 2005**

**RECEIVED**  
MAR 28 2006  
GEOSCIENCE ASSESSMENT  
OFFICE

## TABLE OF CONTENTS

INTRODUCTION .....	4
AIRCRAFT AND EQUIPMENT .....	8
1 Aircraft.....	8
2 Electromagnetic System.....	8
3 Airborne magnetometer .....	9
4 Ancillary Systems.....	9
4.1 Radar Altimeter.....	9
4.2 GPS Navigation System.....	9
4.3 Digital Acquisition System.....	9
5 Base Station.....	10
PERSONNEL .....	11
DATA PROCESSING AND PRESENTATION.....	12
INTERPRETIVE NOTES .....	13
DELIVERABLES.....	24
CONCLUSIONS.....	25

## TABLE OF FIGURES

FIGURE 1 - LOCATION MAP.....	5
FIGURE 2.....	8
FIGURE 3.....	8
FIGURE 4 - SHOWING THE [EARLY TIME] 150 MSEC RESPONSE AND THE POSITION OF THE CONDUCTOR AXES .....	13
FIGURE 5 - SHOWING L8540 WITH THREE PANELS (TOP=TMI AND 2VD, MID=EARLY TIME EM, LOWER=LATE TIME EM) RED ARROWS DEPICT ORIENTATION OF CONDUCTORS AND APPROXIMATE AXIS.....	19
FIGURE 6 - SHOWING L8560 WITH THREE PANELS (TOP=TMI AND 2VD, MID=EARLY TIME EM, LOWER=LATE TIME EM) RED ARROWS DEPICT ORIENTATION OF CONDUCTORS AND APPROXIMATE AXIS.....	19
FIGURE 7 - SHOWING L8590 WITH THREE PANELS (TOP=TMI AND 2VD, MID=EARLY TIME EM, LOWER=LATE TIME EM) RED ARROWS DEPICT ORIENTATION OF CONDUCTORS AND APPROXIMATE AXIS.....	20
FIGURE 8 - SHOWING L8600 WITH THREE PANELS (TOP=TMI AND 2VD, MID=EARLY TIME EM, LOWER=LATE TIME EM) RED ARROWS DEPICT ORIENTATION OF CONDUCTORS AND APPROXIMATE AXIS.....	20
FIGURE 9 - SHOWING L8610 WITH THREE PANELS (TOP=TMI AND 2VD, MID=EARLY TIME EM, LOWER=LATE TIME EM) RED ARROWS DEPICT ORIENTATION OF CONDUCTORS AND APPROXIMATE AXIS.....	21
FIGURE 10 - SHOWING L8620 WITH THREE PANELS (TOP=TMI AND 2VD, MID=EARLY TIME EM, LOWER=LATE TIME EM) RED ARROWS DEPICT ORIENTATION OF CONDUCTORS AND APPROXIMATE AXIS.....	21
FIGURE 11 - SHOWING SECOND DERIVATIVE MAP WITH CONDUCTIVE AXES MARKED WITH SYMBOLS.....	22



## TABLES

TABLE 1 - SURVEY BLOCKS.....	6
TABLE 2 - SURVEY SCHEDULE.....	7
TABLE 3 - SAMPLING RATES.....	10
TABLE 4 - LISTS OF CONDUCTOR.....	14
TABLE 5 - SIX CATEGORIES OF CONDUCTORS.....	18
TABLE 6 - SUMMARY OF CONDUCTIVE ZONES > THAN 5 SIEMENS.....	22



# REPORT ON A HELICOPTER-BORNE TIME DOMAIN ELECTROMAGNETIC SURVEY

Burchell Lake Property Survey, Ontario, Canada

## INTRODUCTION

This report describes the helicopter-borne geophysical survey carried out on behalf of Alto Ventures Ltd. by Geotech Ltd. under an agreement dated April 2005. Principal geophysical sensors included a time domain electromagnetic system and a cesium magnetometer. Ancillary equipment included a GPS navigation system and a radar altimeter.

One block, referred to as Burchell Lake Property Survey, was surveyed. The Burchell Lake Property Survey is located approximately 15 km south-west of Kashabowie, Ontario. The coordinates of the centre of the block are: 90° 37' W, 48° 36' N. The area of the block is 22.9 km<sup>2</sup>, the total line kilometres flown was 252.4 km.

Data acquisition was initiated on May 18<sup>th</sup> and completed on May 20<sup>th</sup>, 2005.

This report describes the survey, the data processing and presentation.





## SURVEY AREA

The survey areas are shown in figure 1.

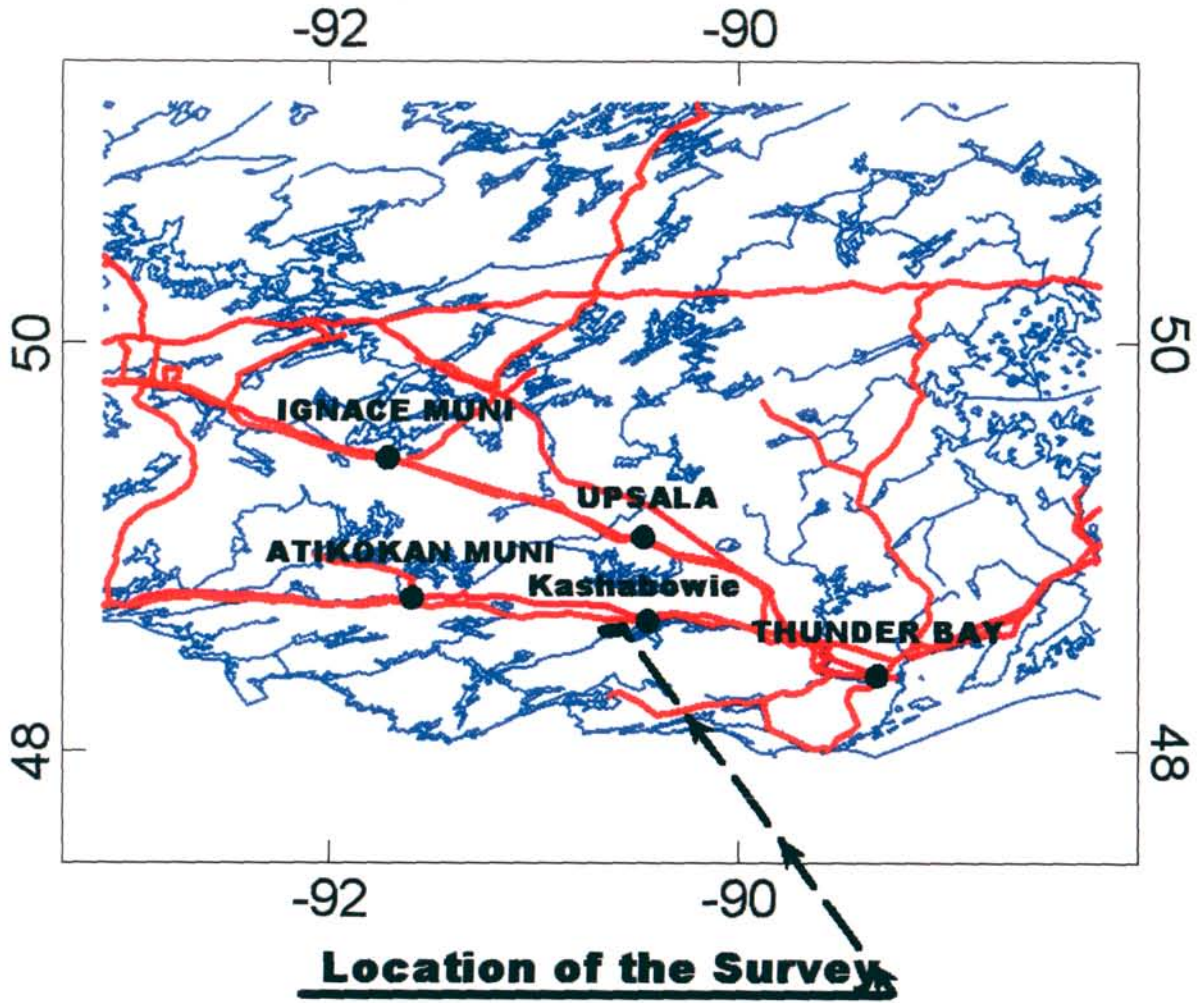


Figure 1 - Location Map



The survey specifications are summarised in the following table:

BLOCK NAME	AREA KM <sup>2</sup>	LINE SPACING	LINE KM	FLIGHT DIRECTION
Burchell Lake Property Survey	22.9	100 m - lines 1150 m - tie	230.4 22.0	N 30 W lines N 60 E tie

Table 1 - Survey Blocks

## SURVEY OPERATIONS

Survey operations were based out of Kashabowie, Ontario.  
The following table shows the timing of the flying.

Date	Flight #	Block flown	Flown, km	Stand-by reason
18-May-05	1, 2	Burchell Lake Property Survey	115.8	
19-May-05		Burchell Lake Property Survey		Rain and high wind Stand-by-day 1
20-May-05	3, 4	Burchell Lake Property Survey	136.6	
		TOTAL	<b>252.4</b>	

Table 2 - Survey Schedule

Nominal traverse separation was 100 meters for the survey. The nominal EM sensor terrain clearance was 40 m (EM bird height above ground, i.e. helicopter is maintained 85 m above ground). Nominal survey speed was 80 km/hour. The data-recording rate of the data acquisition was 0.1 second for electromagnetics and magnetometer, 0.2 second for altimeter and GPS. This translates to a geophysical reading about every 2 metres along flight track. Navigation was assisted by a GPS receiver and data acquisition system, which reports GPS co-ordinates as latitude/longitude and directs the pilot over a pre-programmed survey grid.

The operator was responsible for monitoring of the system integrity. He also maintained a detailed flight log during the survey noting the times of the flight as well as any unusual geophysical or topographic feature.

On return of the aircrew to the base camp the survey data was transferred from a compact flash card (PCMCIA) to the data processing computer.



## AIRCRAFT AND EQUIPMENT

### 1 Aircraft

An Astar BA+ helicopter, registration C-GCYE - owned and operated by Expedition Helicopt was used for the survey. Installation of the geophysical and ancillary equipment was carried out by Geotech Ltd.

### 2 Electromagnetic System

The electromagnetic system was a Geotech Time Domain EM system. The layout is as indicated in Figures 2 below.

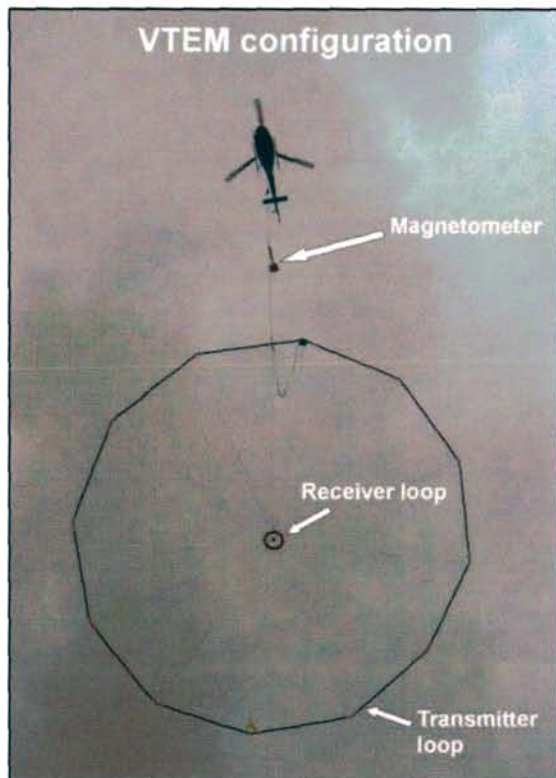


Figure 2

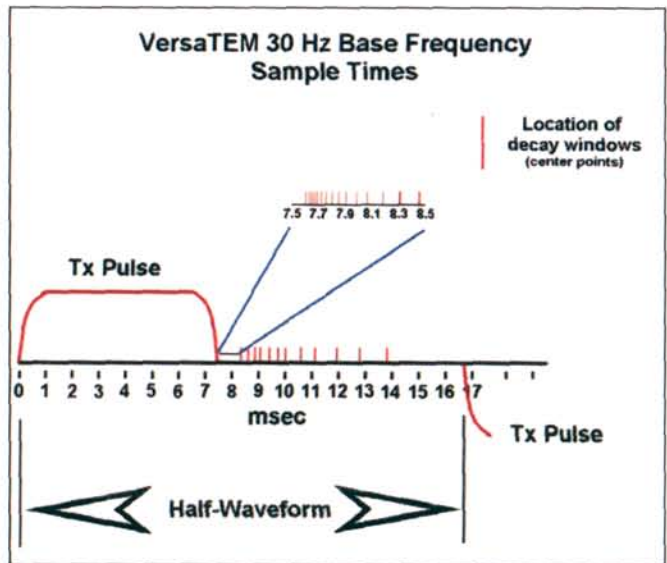


Figure 3

Receiver and transmitter coils were concentric and Z-direction oriented.

Transmitter coil diameter was 26 metres, the number of turns was 4.  
Receiver coil diameter was 1.1 metre, the number of turns was 60.  
Transmitter pulse repetition rate was 30 Hz.  
Peak current was 200 A.  
Duty cycle was 40%.  
Peak dipole moment was 425,000 NIA.  
Wave form □ trapezoid.  
Twenty-five measurement gates were used in the range from 130  $\mu$ s to 6340  $\mu$ s.  
The transmitter waveform and the receiver decay recording scheme is shown diagrammatically in Figure 3.  
Recording sampling rate was 10 samples per second.  
The EM bird was towed 45 m below the helicopter when flown.

### 3 Airborne magnetometer

The magnetic sensor utilized for the survey was a Geometrics optically pumped cesium vapor magnetic field sensor, mounted in a separate bird towed 15 m below the helicopter. The sensitivity of the magnetic sensor is 0.02 nanoTesla (nT) at a sampling interval of 0.1 seconds. The magnetometer sends the measured magnetic field strength as nanoTeslas to the data acquisition system via the RS-232 port.

### 4 Ancillary Systems

#### 4.1 Radar Altimeter

A Terra TRA 3000/TRI 30 radar altimeter was used to record terrain clearance. The antenna was mounted beneath the bubble of the helicopter cockpit.

#### 4.2 GPS Navigation System

The navigation system used was a Geotech PC based navigation system utilizing a NovAtel □ WAAS enable OEM4-G2-3151W GPS receiver, Geotech navigate software, a full screen display with controls in front of the pilot to direct the flight and an NovAtel GPS antenna mounted on the helicopter tail.

The co-ordinates of the block were set-up prior to the survey and the information was fed into the airborne navigation system.

#### 4.3 Digital Acquisition System

A Geotech data acquisition system recorded the digital survey data on an internal compact flash card. Data is displayed on an LCD screen as traces to allow the operator to monitor the integrity of the system. Contents and update rates were as follows:

DATA TYPE	SAMPLING
TDEM	0.1 sec
Magnetometer	0.1 sec
GPS Position	0.2 sec
Radar Altimeter	0.2 sec

Table 3 - Sampling Rates

## 5 Base Station

A combine magnetometer/GPS base station was utilized on this project. A Geometrics Cesium vapour magnetometer was used as a magnetic sensor with a sensitivity of 0.001 nT. The base station was recording the magnetic field together with the GPS time at 1 Hz on a base station computer. The base station magnetometer sensor was installed in Kashabowie away from electric transmission lines and moving ferrous objects such as motor vehicles. The magnetometer base station's data was backed-up to the data processing computer at the end of each survey day.

## PERSONNEL

The following Geotech Ltd. personnel were involved in the project

### Field

Field Manager:	Duncan Wilson
Geophysicist:	Sean Hayes
Operators:	Michel Roy

### Office

Data Processing/Reporting:	Andrei Bagrianski
	Jennifer Zhu
	Shawn Grant
	Roger Barlow

The survey pilot and the mechanic were employed directly by the helicopter operator  Expedition Helicopt.

Pilot:	Don Plattel
Mechanic:	Gerry Gauthier

Overall management of the survey was carried out from the Aurora offices of Geotech Ltd. by Edward Morrison, President.



## DATA PROCESSING AND PRESENTATION

### Flight Path

The flight path, recorded by the acquisition program as WGS 84 latitude/longitude, was converted into the UTM co-ordinate system in Oasis Montaj.

The flight path was drawn using linear interpolation between x,y positions from the navigation system. Positions are updated every second and expressed as UTM eastings (x) and UTM northings (y).

### Electromagnetic Data

A three stage digital filtering process was used to reject major spheric events and to reduce system noise. Local spheric activity can produce sharp, large amplitude events that cannot be removed by conventional filtering procedures. Smoothing or stacking will reduce their amplitude but leave a broader residual response that can be confused with geological phenomena. To avoid this possibility, a computer algorithm searches out and rejects the major spheric events. The filter used was a 16 point non-linear filter.

The signal to noise ratio was further improved by the application of a low pass linear digital filter. This filter has zero phase shift which prevents any lag or peak displacement from occurring, and it suppresses only variations with a wavelength less than about 1 second or 20 metres. This filter is a symmetrical 1 sec linear filter.

The results are presented as stacked profiles of EM voltages for the gate times.

### Magnetic Data

The processing of the magnetic data involved the correction for diurnal variations by using the digitally recorded ground base station magnetic values. The base station magnetometer data was edited and merged into the Geosoft GDB database on a daily basis. The aero magnetic data was corrected for diurnal variations by subtracting the observed magnetic base station deviations. The corrected magnetic line data from the survey was interpolated between survey lines using a random point gridding method to yield x-y grid values for a standard grid cell size of approximately 0.2 cm at the mapping scale. The Minimum Curvature algorithm was used to interpolate values onto a rectangular regular spaced grid.

## INTERPRETIVE NOTES

The Alta block is composed of a few tabular, “plate-like” conductors of moderate conductance that range from < 1 Siemens to 34.3 Siemens. The parameters for each conductor are tabulated in a table below. The X and Y position refers to the position of the top of a dipping to semi vertical plate or the centre of a flat lying plate (< 30°) otherwise referred to as the conductor axis.

The conductive anomalies are shown, superimposed on an image of the 150 microsecond channel that shows a large area of conductive lake sediments in the centre – left of the survey area. Further east conductive areas below the anomalies are most probably associated with bedrock targets. In the case of the solid symbol conductor, shown below, it correlates with an abandoned mine site.

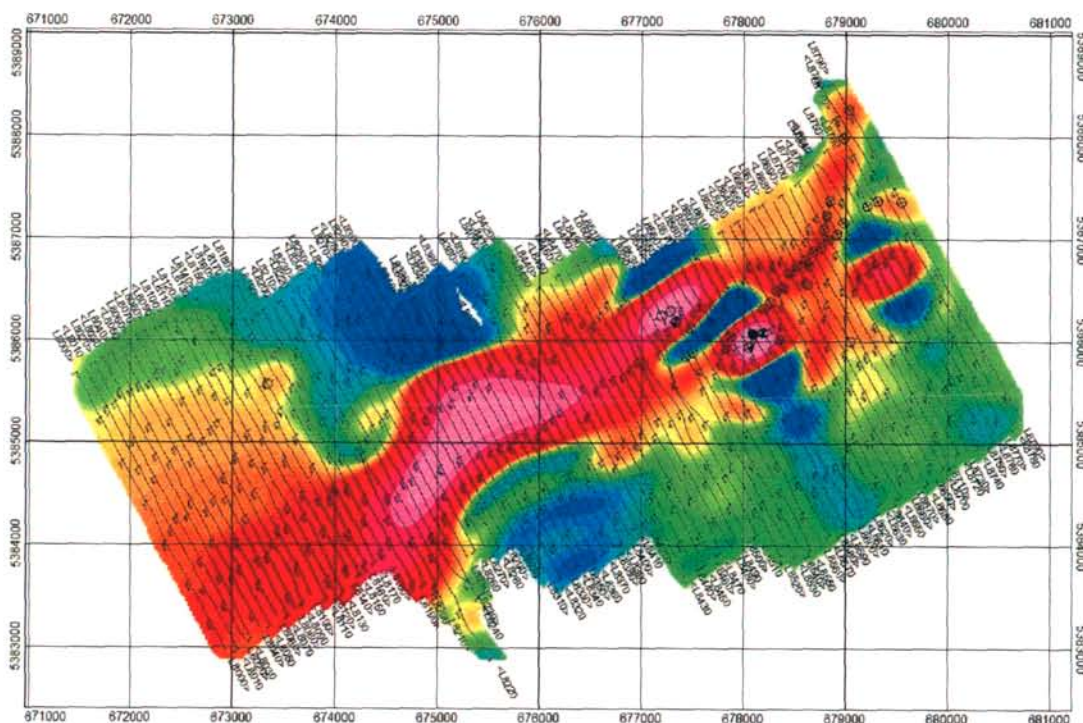


Figure 4 - Showing the “early time” 150  $\mu$ sec response and the position of the conductor axes.

The table below lists the conductor parameters, example Conductance (S), Time Constant (Tau, millisecc), Last Channel ( $\mu$ sec) and other associated information

Table 4 - Lists of Conductor

Line No. X coor m	Y coor m	Z m	Bird Heigh m	Line No	2VD Mag nT/m/m	Anomaly Letter	Conductance Siemens	Tau time cons millisec	Last EM Channel microsec	Mag nT
Line 8160										
673337	5385572	562.8	44.97	8160	0.00071	"A"	0.7	0.57	11	57785.29
Line 8530										
677431	5385852	539.64	56.68	8530	-0.00452	"A"	1.4	0.47	1900	57474.27
677194	5386246	524.83	49.05	8530	0.00341	"B"	0.3	0.04	300	57609.98
Line 8540										
677279	5386294	521.99	42.98	8540	0.00055	"A"	0.3	0.04	300	57601.1
677336	5386196	523.01	45.15	8540	-0.0033	"B"	11.5	2.48	6340	57520.59
677501	5385884	538.22	54.61	8540	-0.00396	"C"	1.4	0.77	1340	57467.64
Line 8550										
677484	5386127	531.22	39.2	8550	-0.00506	"A"	4.6	5.04	4460	57462.51
Line 8560										
677644	5386041	539.49	45.27	8560	0.00392	"A"	5.6	1.61	4460	57464.37
Line 8570										
677823	5385932	550.52	56.53	8570	-0.02215	"A"	2.3	0.77	3180	57563.63
677685	5386188	541.06	40.67	8570	-0.00364	"B"	3.2	2.4	3180	57441.01
Line 8580										
677873	5386044	546.74	52.42	8580	-0.02373	"A"	2.7	1.04	3180	57452.29

Line No. X coord m	Y coord m	Z m	Bird Height m	Line No	2VD Mag nT/m/m	Anomaly Letter	Conductance Siemens	Tau time cons millisec	Last EM Channel microsec	Mag nT
Line 8590										
678049	5385944	542.9	47.27	8590	0.05583	"A"	11.4	1.39	4460	57952.54
Line 8600										
678092	5386075	543.62	47.83	8600	0.02904	"A"	34.3	2.76	6340	57789.13
Line 8610										
678194	5386084	549.2	52.22	8611	0.0205	"A"	15.4	2.36	6340	57719.8
Line 8620										
678192	5386323	549.18	56.75	8620	-0.03265	"A"	1.5	0.98	2240	57446.72
678349	5386014	552.3	47.98	8620	-0.02675	"C"	6.6	1.68	6340	57687.91
Line 8630										
678258	5386379	542.66	50.03	8630	-0.01496	"A"	2.7	0.89	4460	57401.78
Line 8640										
678327	5386491	545.21	49.04	8640	0.00564	"A"	1.5	0.61	3180	57406.51
Line 8650										
678386	5386526	550.04	51.52	8650	0.00048	"A"	2.9	0.55	1900	57421.37
Line 8660										
678445	5386671	550.3	56.65	8660	-0.00066	"A"	1.8	1.87	3180	57474.84
Line 8670										
678522	5386742	541.25	52.09	8670	-0.00515	"A"	1.2	0.55	1900	57494.58
678625	5386559	546.87	51.75	8670	-0.00096	"B"	1.8	0.99	1900	57403.34



Line No. X coord m	Y coord m	Z m	Bird Height m	Line No	2VD Mag nT/m/m	Anomaly Letter	Conductance Siemens	Tau time cons millisec	Last EM Channel microsec	Mag nT
Line 8680										
679043	5386002	562.62	49.26	8680	-0.0408	"A"	0.8	0.46	1600	57824.56
678636	5386743	544.96	52.5	8680	0.00011	"B"	1.7	0.51	3780	57474.75
678608	5386795	538.37	49.63	8680	-0.00016	"C"	1.6	0.74	2240	57501.27
Line 8690										
678681	5386883	534.53	52.92	8690	-0.0022	"A"	2.4	1.32	3780	57518.06
Line 8700										
678757	5386919	534.2	47.15	8700	-0.00132	"A"	1.2	0.5	2240	57515.35
Line 8710										
678783	5387098	527.7	51.32	8710	0.01411	"A"	2.4	1.39	4460	57613.38
678832	5387000	534.53	55.18	8710	-0.00409	"A"	1.7	1.95	2240	57531.14
Line 8720										
678916	5387052	530.47	49.97	8720	-0.00132	"A"	1.1	0.47	1600	57530.47
678815	5387237	522.94	49.5	8720	0.00621	"B"	1.4	0.75	1600	57683.68
Line 8730										
678846	5387382	523.08	46.08	8730	0.00025	"A"	2.3	0.83	4460	57682.66
678978	5387159	518.91	40.6	8730	0.00769	"B"	2.8	1.21	3180	57538.63
Line 8760										
679210	5387330	540.15	55.85	8760	-0.00084	"A"	1.6	1.16	1900	57553.59
Line 8770										
678979	5387986	532.44	54.24	8770	-0.00094	"A"	1.2	0.56	3180	57723.24

Line No. X coor m	Y coor m	Z m	Bird Heigh m	Line No	2VD Mag nT/m/m	Anomaly Letter	Conductance Siemens	Tau time cons millisec	Last EM Channel microsec	Mag nT
679315	5387372	539.27	48.57	8770	-0.00106	"B"	1.3	0.48	3180	57553.06
Line 8790										
679035	5388267	532.84	52.65	8790	0.00106	"A"	1.7	0.71	1900	57742.78
679545	5387368	539.95	44.47	8790	0.00009	"B"	2.5	1.46	3780	57558.07

The conductors are classified into six categories as follows:

Table 5 - Six Categories of Conductors

Class	From	To	Units of Conductance	Comments
6 Best	> 30		Siemens	1
5 Better	20	30	Siemens	No anomalies
4 Good	10	20	Siemens	3
3 Average	5	10	Siemens	2
2 Pass	1	5	Siemens	28
1 Poor	< 1		Siemens	4

In the following section, lines having conductors with conductance above 5 Siemens are profiled using three panels. The top panel shows the Total Magnetic Intensity and the Second Vertical Derivative of the Total Magnetic Intensity. This panel is very useful for evaluating conductors that correlate with a magnetic expression. The second Vertical Derivative very accurately shows the position of magnetic units within a TMI anomaly and therefore can inform the geoscientist as to whether the EM anomaly is on the flank of the magnetic expression or whether it is associated directly with the magnetic zone.

The middle panel shows the early time stack from 130 to 960  $\mu$ sec and is useful for describing weaker bedrock anomalies and the overburden response as well as cultural responses.

The lower panel shows the late time responses largely associated with bedrock conductors. Both the middle and lower panels are used

### L8540

Three anomalies are present on line 8540. The centre conductor has a conductance of 11.5 Siemens and is flat lying. Conductors to either side are much weaker (0.3 & 1.4 S). The weak conductor to the northwest is most likely related to overburden.

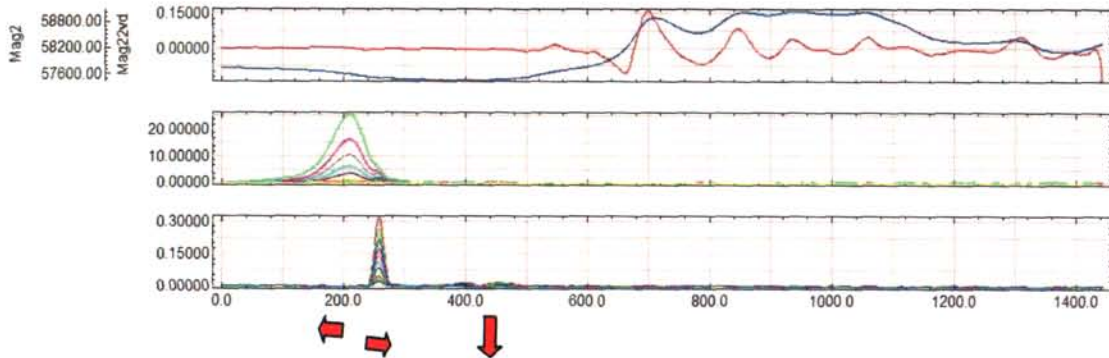


Figure 5 - Showing L8540 with three panels (top=TMI and 2VD, mid=Early time EM, Lower=Late time EM) Red arrows depict orientation of conductors and approximate axis.

### Line 8560

On line 8560, the flat lying anomaly shown has a conductance of 5.6 Siemens. The flatlying “overburden” response to the northwest is present as well.

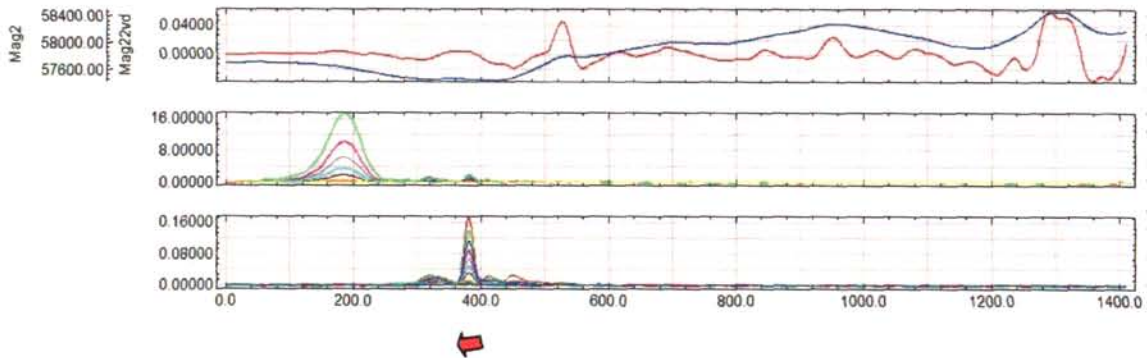


Figure 6 - Showing L8560 with three panels (top=TMI and 2VD, mid=Early time EM, Lower=Late time EM) Red arrows depict orientation of conductors and approximate axis.



### Line 8590

Line 8590 has a flat lying conductor that continues over the next three lines.

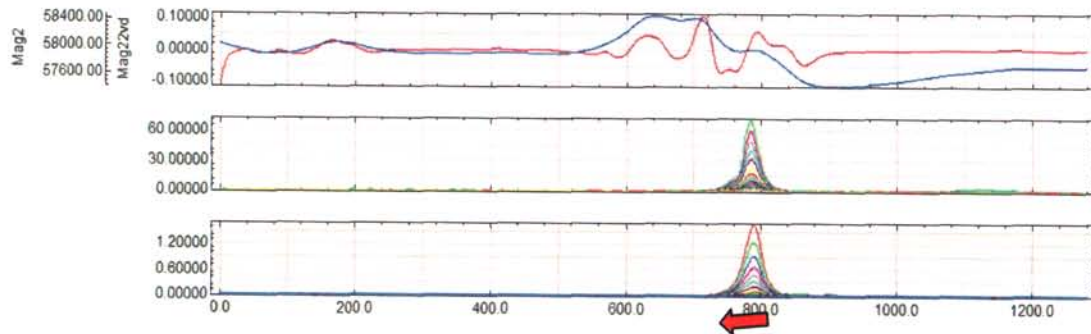


Figure 7 - Showing L8590 with three panels (top=TMI and 2VD, mid=Early time EM, Lower=Late time EM) Red arrows depict orientation of conductors and approximate axis.

The anomaly has a conductance of 11.4 Siemens.

### L 8600

The conductor on line 8600 has a conductance of 34.3 Siemens and is less than 10 metres deep. This response could be related to culture (ie Power Line Tower). The conductor continues for the next two lines. At this point, the conductor has a magnetic response of about 200 nT.

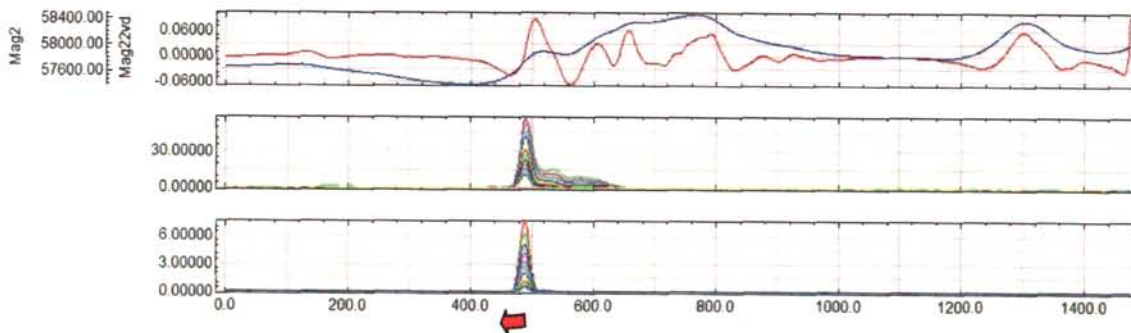


Figure 8 - Showing L8600 with three panels (top=TMI and 2VD, mid=Early time EM, Lower=Late time EM) Red arrows depict orientation of conductors and approximate axis.

## L8610

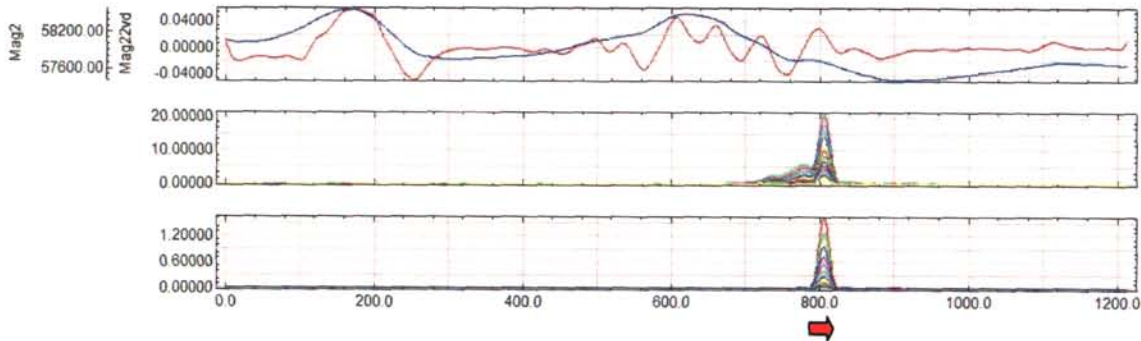


Figure 9 - Showing L8610 with three panels (top=TMI and 2VD, mid=Early time EM, Lower=Late time EM) Red arrows depict orientation of conductors and approximate axis.

On line 8610, the conductor has a conductance of 15.4 Siemens and, again is flat lying.

## Line 8620

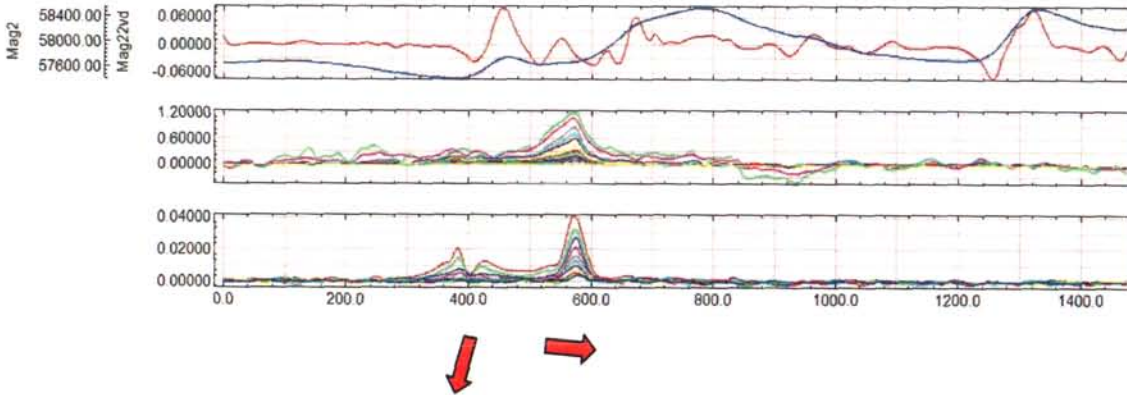


Figure 10 - Showing L8620 with three panels (top=TMI and 2VD, mid=Early time EM, Lower=Late time EM) Red arrows depict orientation of conductors and approximate axis.

The conductor on the left is a near vertical plate with a conductance of 1.5 siemen. The conductor on the right is flat lying with a conductance of 6.6 Siemens.

Table 6 - Summary of Conductive Zones > Than 5 Siemens

Ref Line	Type	Cond	Dip	Depth	Tau
L8540	Flat	11.5 S	~0°	< 15 m	2.48 millisecc
L8560	Flat	5.6 S	~0°	<15 m	1.61 millisecc
L8590	Flat	11.4 S	~0°	< 15 m	1.39 millisecc
L8600	Flat	34.3 S	~0°	<10 m	2.76 millisecc
L8610	Flat	15.4 S	~0°	<10 m	2.36 millisecc
L8620	Flat	6.6 S	~0°	<15 m	1.68 millisecc
Error		+/- 5 S	+/- 5°	+/- 10 m	+/- 0.5 msec

### Magnetics and EM Conductors

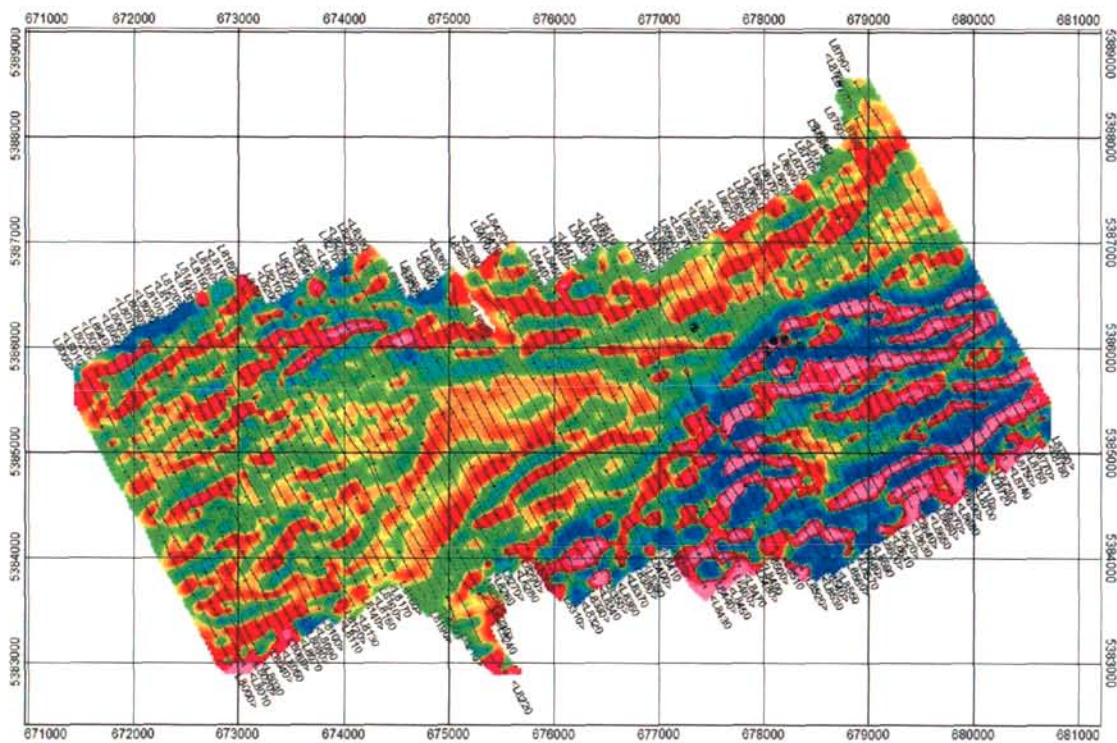


Figure 11 - Showing Second Derivative map with Conductive Axes marked with symbols

The conductive trend is associated with the top of a mafic complex. The EM anomalies are coincident with a second derivative magnetic anomaly. A postulated fault on the east end of the trend is deduced by observing the offset in the second derivative anomaly. At this point, the



conductor appears to be dragged to the south by the through of the fault.

An anomaly to the north of this group is an isolated target but a medium strength bedrock conductor.

### Suggested Priorities

All conductors listed in summary of conductive zones > than 5 Siemens, are worthy of further exploration and/or evaluation by drilling. The conductive trend from line 8590 to line 8620 correlates with the abandoned mine site is the most interesting as it lies at the top of a postulated mafic complex. However, the anomalies in this trend fall on the mine waste site and therefore could be an old delivery pipe. The top of this conductor is very close to surface.

The central conductor on line 8540 is worth following up on and drill testing, however this anomaly and several related anomalies surrounding it, appear to lie above the mafic complex.

The trends that are outlined by weaker anomalies should be prospected. They may relate to conductive lake sediments in the small chain of lakes to the north and east of the mine site.



## DELIVERABLES

The survey is described in a report, which is provided in two copies. The preliminary maps were produced at a scale of 1:20,000, and final maps at a scale of 1:10,000.

### MAPS

The final results of the survey are presented in a colour magnetic contour map and an EM profiles map at a linear-logarithmic scale. The coordinate/projection system used was WGS 84, Universal Transverse Mercator, zone 15. For reference the WGS 84 latitude and longitude are also noted on the maps. All the maps show the flight path trace.

The map products are as follows:

Final maps:

1. Total Field Magnetic color contour map on the GPS flight path, on paper in two copies
2. EM Profile Map at a linear-logarithmic scale of the twenty one gates times (220  $\square$  6340  $\mu$ s) on the GPS flight path, on paper in two copies

Preliminary maps (WGS 84, Universal Transverse Mercator, zone 15):

1. TDEM Profiles, Time Gates 0.19  $\square$  0.68 ms on the GPS flight path, on paper in one copy
2. TDEM Profiles, Time Gates 1.6  $\square$  6.34 ms on the GPS flight path, on paper in one copy
3. Total Field Magnetics on the GPS flight path, on paper in one copy.

### DIGITAL DATA on CD-ROM

Two copies of CD-ROMs were prepared to accompany the report. Each CD-ROM contains a digital file of the line data in GDB Geosoft Montaj format in addition to the maps in Geosoft Montaj Map format. A *readme.txt* file may be found on the CD-ROM that describes the contents in more detail.





## CONCLUSIONS

A time domain electromagnetic helicopter-borne geophysical survey has been completed over the Burchell Lake Property Survey in the Shebandowan Belt Area, Ontario, Canada. The total area coverage amounts to 22.9 km<sup>2</sup>. Total survey line coverage is 252.4 line kilometres. The principal sensors included a Time Domain EM system and a magnetometer. Results have been presented as colour maps at a scale of 1:10,000.

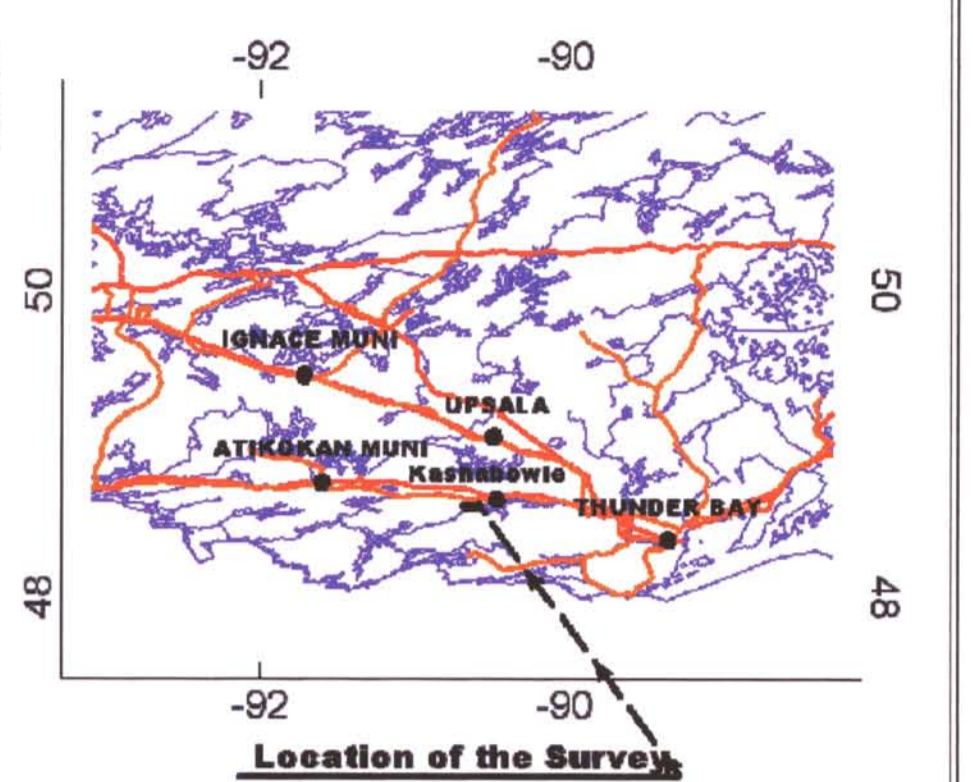
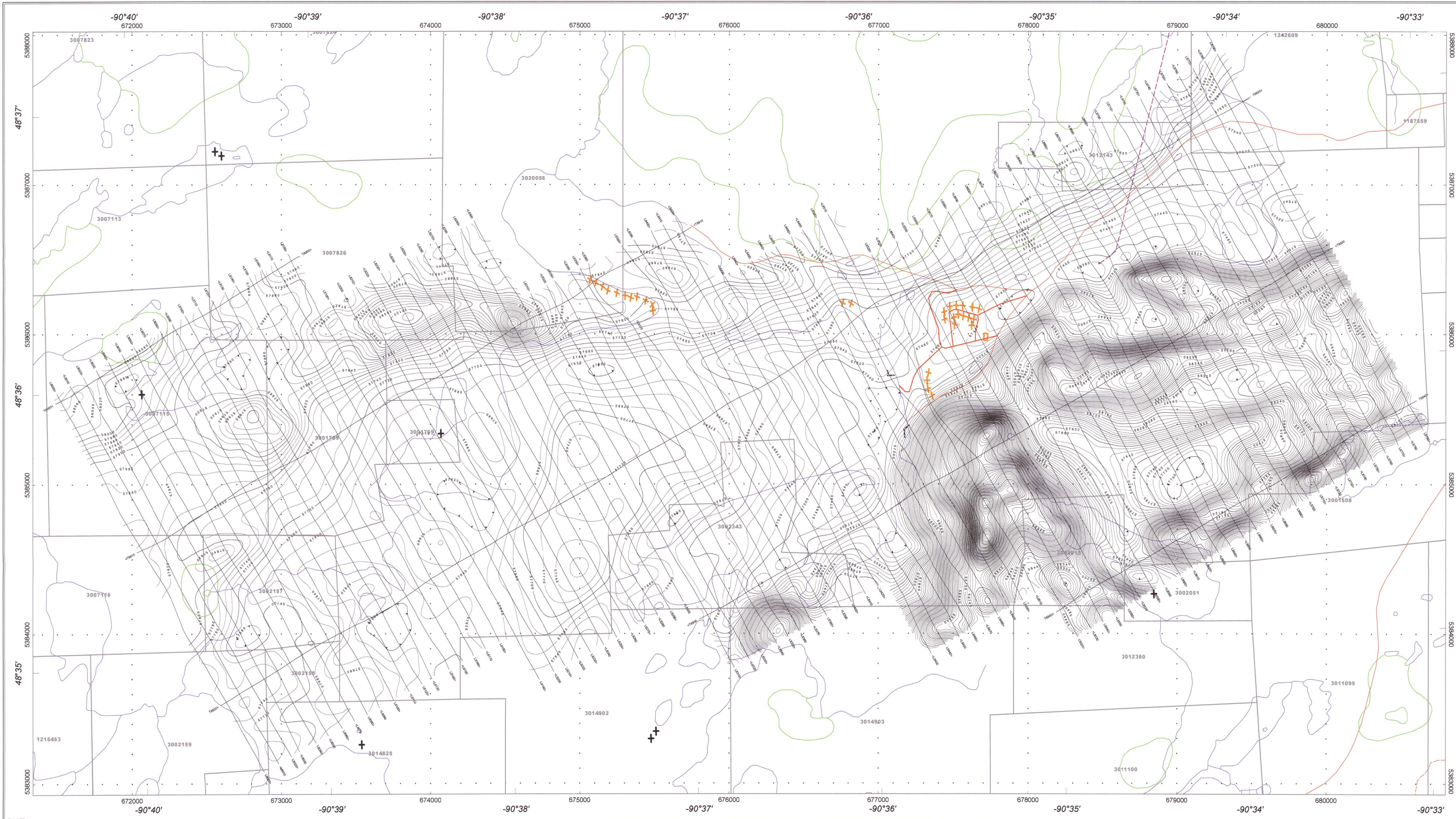
A number of EM anomaly groupings were identified. Ground follow-up of those anomalies should be carried out if favourably supported by other geoscientific data.

Respectfully submitted,

Andrei Bagrianski/Jennifer Zhu,  
Geotech Ltd.







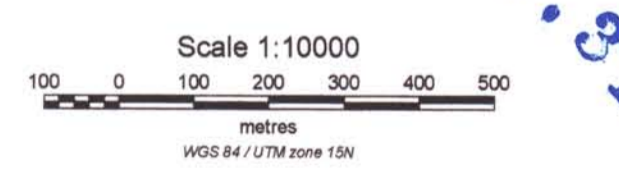
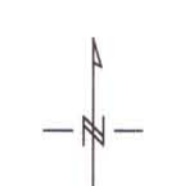
**Survey Specifications:**  
 Aircraft: Astar BA+ helicopter, Registration C-GCYE  
 Flight Line Spacing: 100 metres  
 Nominal terrain clearance: 65 metres  
 EM Loop is 55 metres under helicopter  
 Magnetic sensor is 15 metres under helicopter

**Instruments:**  
 Geotech Time Domain Electromagnetic System (VTEM) with concentric Rx/Tx geometry  
 Transmitter Loop Diameter 20 m, Base Frequency 30 Hz  
 Dipole Moment 425,000 N/A  
 Transmitter Wave Form: Trapezoid, Pulse Width 7.5 ms  
 Geometrical Optical Gyrocompass  
 High Sensitivity Caesium Magnetometer  
 Mag Resolution 0.02 nT at 10 samples/sec

**Legend**

- Transmission Line
- Claims
- Trail
- Road
- Main Road
- River
- Lake
- Wet Land
- Building
- Rock in Water
- Wharf

Contour Intervals:  
 20 nT  
 100 nT



**Alto Ventures Ltd.**  
 Burchell Lake Property  
 Shebandowan Belt, Ontario

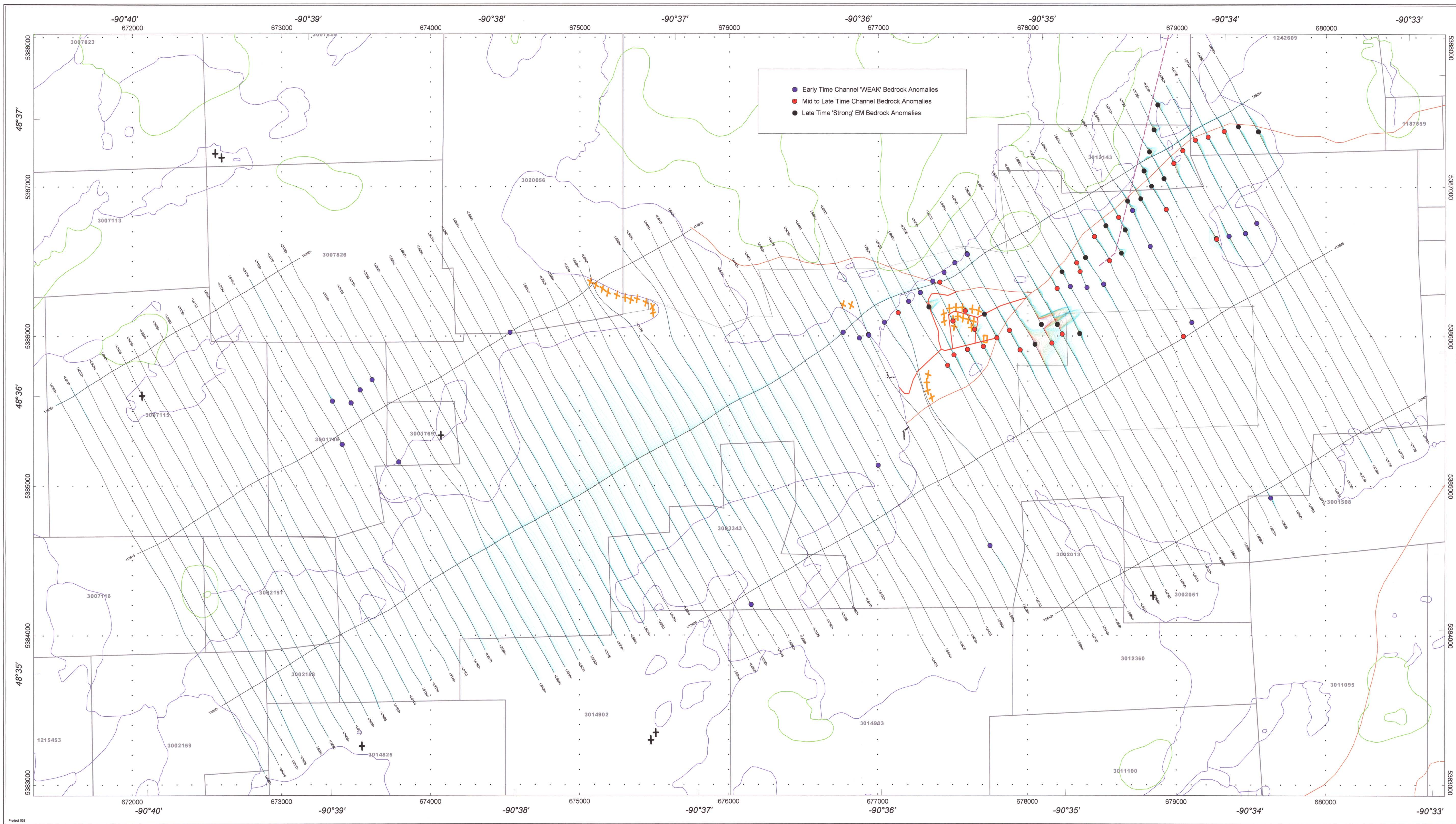
Geotech VTEM System  
 Total Field Magnetics  
 Colours and Contours

Flown and processed by Geotech Ltd.  
 30 Industrial Parkway S.,  
 Aurora, Ontario, Canada L4G 3W2  
 www.geotechairborne.com

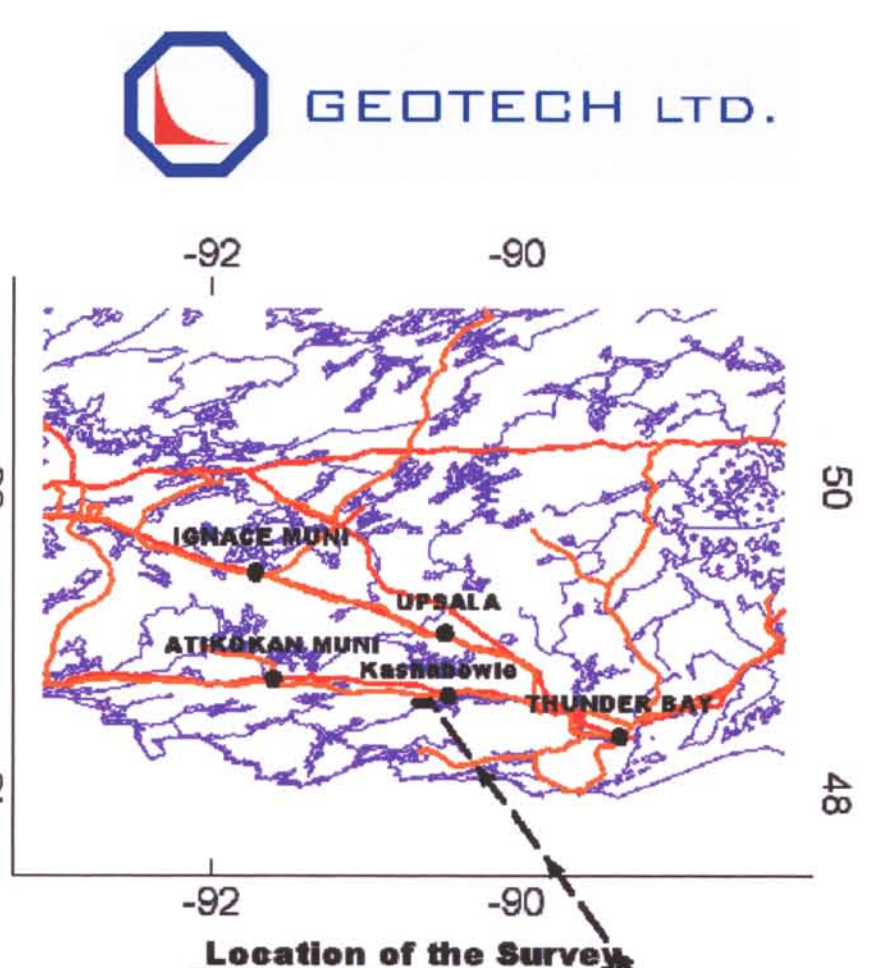
June 2005

2.31892





● Early Time Channel 'WEAK' Bedrock Anomalies  
 ● Mid to Late Time Channel Bedrock Anomalies  
 ● Late Time 'Strong' EM Bedrock Anomalies



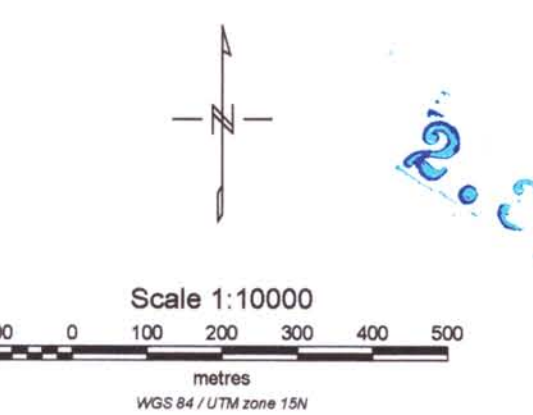
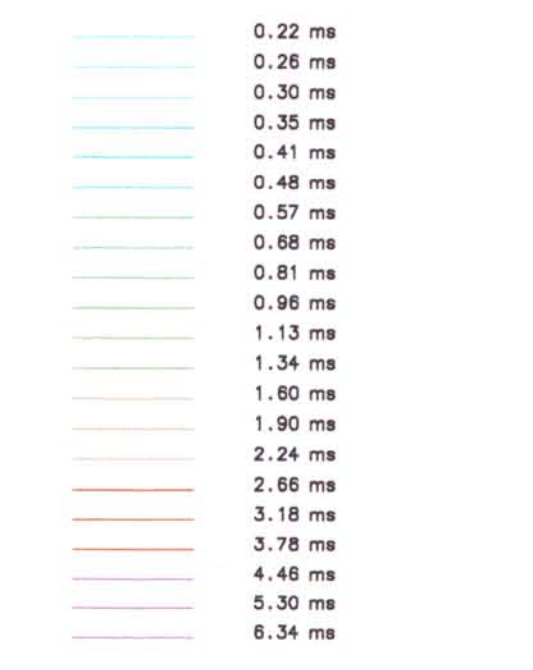
**Survey Specifications:**  
 Aircraft: Asiar BA+ helicopter, Registration C-GCYE  
 Flight Line Spacing: 100 metres  
 Nominal terrain clearance: 85 metres  
 EM Loop: 55 metres under helicopter  
 Magnetic sensor: 15 metres under helicopter

**Instruments:**  
 Geotech Time Domain Electromagnetic System (VTEM) with concentric Rx/Tx geometry  
 Transmitter Loop: Diameter 26 m, Base Frequency 30 Hz  
 Dipole Moment: 425,000 N/A  
 Transmitter Wave Form: Trapezoid, Pulse Width 7.5 ms  
 Geometrics: Optically-pumped  
 High Sensitivity Cesium Magnetometer  
 Mag Resolution: 0.02 nT at 10 samples/sec

**Lengend**

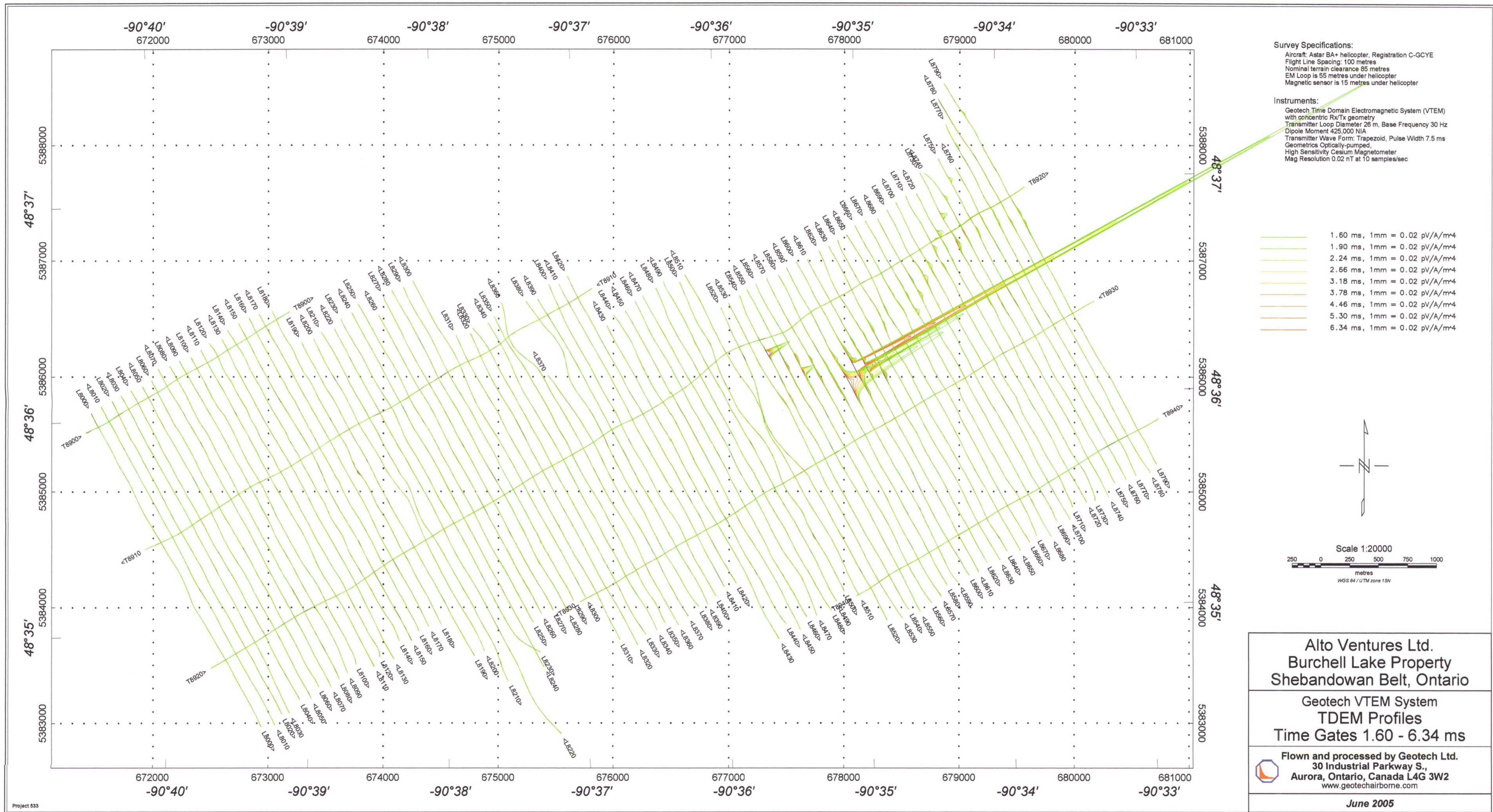
- Transmission Line
- Trail
- Road
- Main Road
- River
- Lake
- Wet Land
- Building
- Rock in Water
- Wharf

Profiles scale 1 mm = 0.1 pV/A/m<sup>4</sup>  
 (Linear between +/- 0.5 pV/A/m<sup>4</sup>)  
 logarithmic above 0.5 pV/A/m<sup>4</sup>



**Alto Ventures Ltd.**  
 Burchell Lake Property  
 Shebandowan Belt, Ontario  
 Geotech VTEM System  
 TDEM Profiles  
 Time Gates 0.22 - 6.34 ms  
 Flown and processed by Geotech Ltd.  
 30 Industrial Parkway S.  
 Aurora, Ontario, Canada L4G 3W2  
 www.geotechairborne.com  
 June 2005





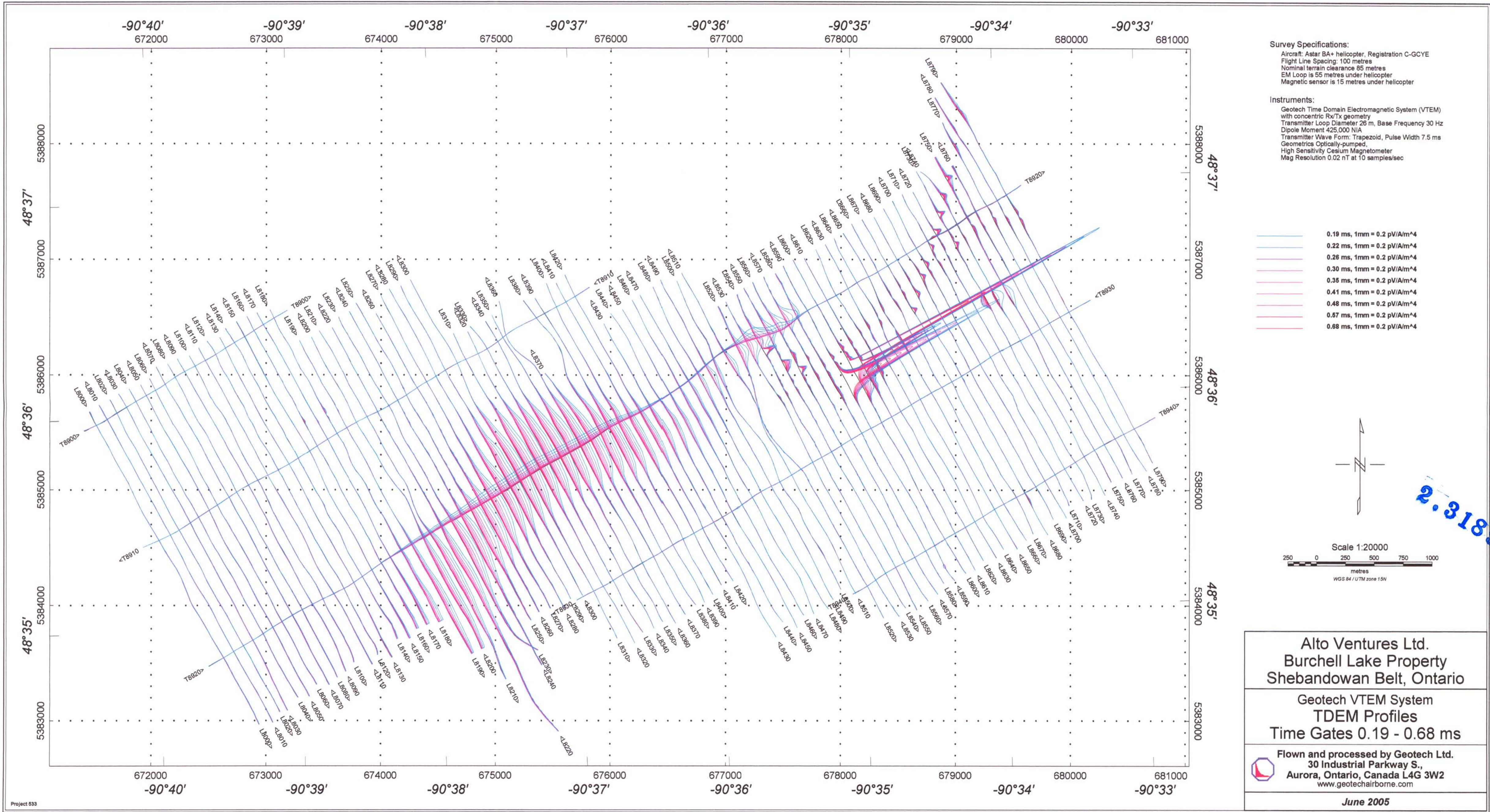
**Alto Ventures Ltd.**  
 Burchell Lake Property  
 Shebandowan Belt, Ontario

**Geotech VTEM System**  
 TDEM Profiles  
 Time Gates 1.60 - 6.34 ms

Flown and processed by Geotech Ltd.  
 30 Industrial Parkway S.,  
 Aurora, Ontario, Canada L4G 3W2  
 www.geotechairborne.com

**June 2005**

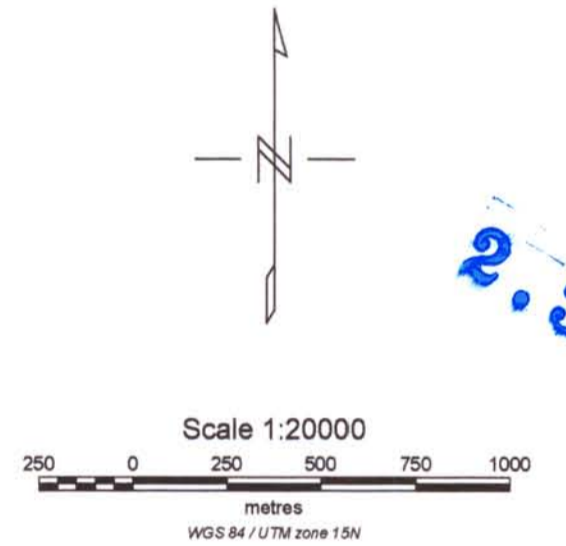




**Survey Specifications:**  
 Aircraft: Astar BA+ helicopter, Registration C-GCYE  
 Flight Line Spacing: 100 metres  
 Nominal terrain clearance 85 metres  
 EM Loop is 55 metres under helicopter  
 Magnetic sensor is 15 metres under helicopter

**Instruments:**  
 Geotech Time Domain Electromagnetic System (VTEM)  
 with concentric Rx/Tx geometry  
 Transmitter Loop Diameter 26 m, Base Frequency 30 Hz  
 Dipole Moment 425,000 NIA  
 Transmitter VVave Form: Trapezoid, Pulse Width 7.5 ms  
 Geometrics Optically-pumped,  
 High Sensitivity Cesium Magnetometer  
 Mag Resolution 0.02 nT at 10 samples/sec

- 0.19 ms, 1mm = 0.2 pV/A/m<sup>2</sup>
- 0.22 ms, 1mm = 0.2 pV/A/m<sup>2</sup>
- 0.26 ms, 1mm = 0.2 pV/A/m<sup>2</sup>
- 0.30 ms, 1mm = 0.2 pV/A/m<sup>2</sup>
- 0.35 ms, 1mm = 0.2 pV/A/m<sup>2</sup>
- 0.41 ms, 1mm = 0.2 pV/A/m<sup>2</sup>
- 0.48 ms, 1mm = 0.2 pV/A/m<sup>2</sup>
- 0.57 ms, 1mm = 0.2 pV/A/m<sup>2</sup>
- 0.68 ms, 1mm = 0.2 pV/A/m<sup>2</sup>



2.31892

Alto Ventures Ltd.  
 Burchell Lake Property  
 Shebandowan Belt, Ontario

Geotech VTEM System  
 TDEM Profiles  
 Time Gates 0.19 - 0.68 ms

Flown and processed by Geotech Ltd.  
 30 Industrial Parkway S.,  
 Aurora, Ontario, Canada L4G 3W2  
 www.geotechairborne.com

June 2005