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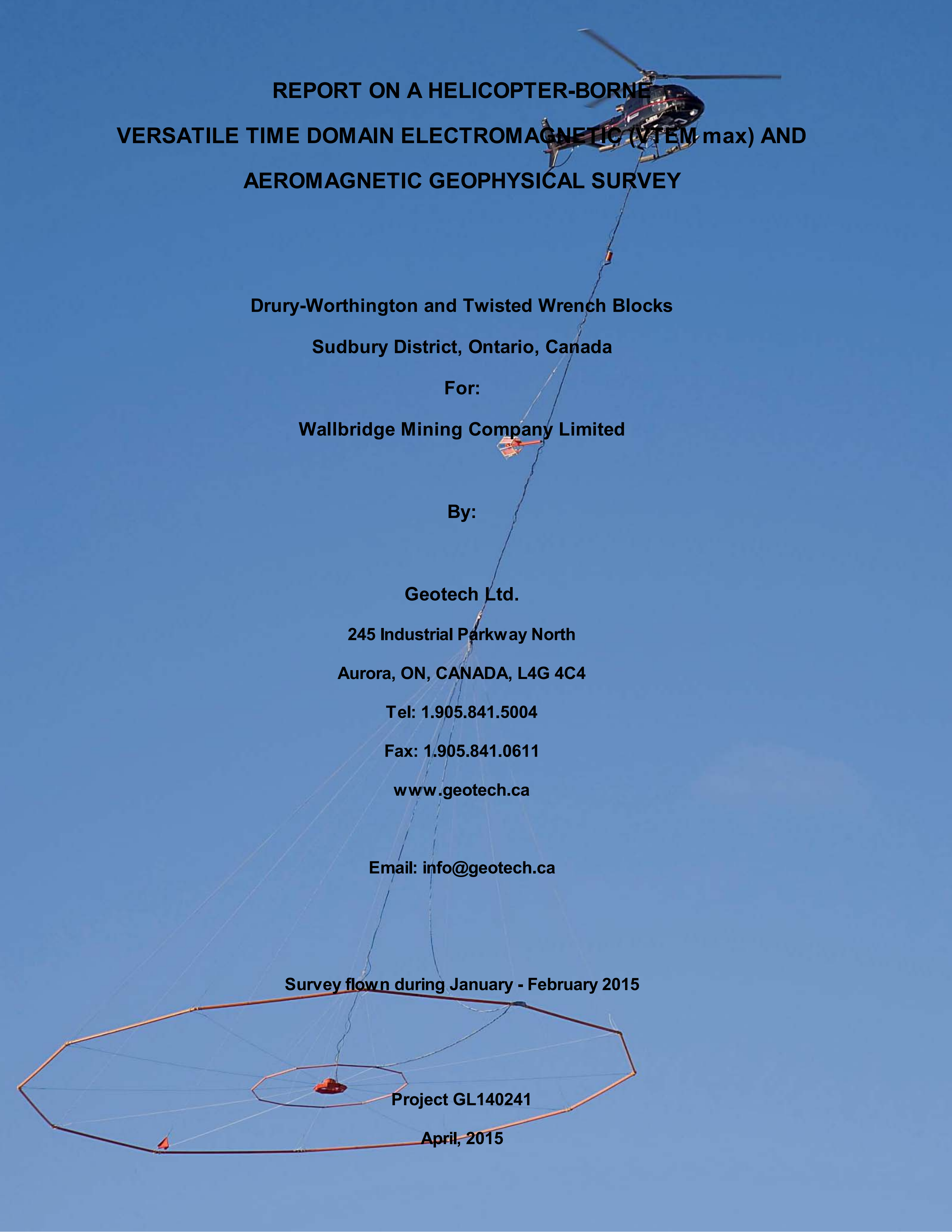

REPORT ON A HELICOPTER-BORNE VERSATILE TIME DOMAIN ELECTROMAGNETIC (VTEM max) AND AEROMAGNETIC GEOPHYSICAL SURVEY

Drury-Worthington and Twisted Wrench Blocks

Sudbury District, Ontario, Canada

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Survey flown during January - February 2015

Project GL140241

April, 2015

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Drury-Worthington and Twisted Wrench Blocks
Sudbury District, Ontario, Canada

EXECUTIVE SUMMARY

During January 20th to February 4th and March 19th 2015 Geotech Ltd. carried out a helicopter-borne geophysical survey over the Drury-Worthington and Twisted Wrench Blocks situated near Windy Lake, Ontario.

Principal geophysical sensors included a versatile time domain electromagnetic (VTEM max) system, and a caesium magnetometer. Ancillary equipment included a GPS navigation system and a radar altimeter. A total of 429 line-kilometres of geophysical data were acquired during the survey.

In-field data quality assurance and preliminary processing were carried out on a daily basis during the acquisition phase. Preliminary and final data processing, including generation of final digital data and map products were undertaken from the office of Geotech Ltd. in Aurora, Ontario.

The processed survey results are presented as the following maps:

- Electromagnetic stacked profiles of the B-field Z Component,
- Electromagnetic stacked profiles of dB/dt Z Components,
- Colour grids of a B-Field Z Component Channel,
- Fraser Filtered dB/dt X Component,
- Total Magnetic Intensity (TMI), and
- EM Time-constant dB/dt Z Component (Tau).

Digital data includes all electromagnetic and magnetic products, plus ancillary data including the waveform.

The survey report describes the procedures for data acquisition, processing, final image presentation and the specifications for the digital data set.

1. INTRODUCTION

1.1 General Considerations

Geotech Ltd. performed a helicopter-borne geophysical survey over the Drury-Worthington and Twisted Wrench blocks situated near Windy Lake, Ontario (Figure 1 & Figure 2).

Natalie J. MacLean represented Wallbridge Mining Company Limited during the data acquisition and data processing phases of this project.

The geophysical surveys consisted of helicopter borne EM using the versatile time-domain electromagnetic (VTEM max) with full receiver-waveform streamed data recorded system with Z and X component measurements and aeromagnetics using a caesium magnetometer. A total of 429 line-km of geophysical data were acquired during the survey.

The crew was based out of Windy Lake (Figure 2) in Ontario for the acquisition phase of the survey. Survey flying started on January 20th and was completed on February 4th and March 19th 2015.

Data quality control and quality assurance, and preliminary data processing were carried out on a daily basis during the acquisition phase of the project. Final data processing followed immediately after the end of the survey. Final reporting, data presentation and archiving, were completed from the Aurora office of Geotech Ltd. in April 2015.

Figure 1: Property Location.

1.2 Survey and System Specifications

Drury-Worthington is located west of Sudbury and south of Windy Lake. The Twisted Wrench Block is located north of Sudbury and northeast of Windy Lake (Figure 2).

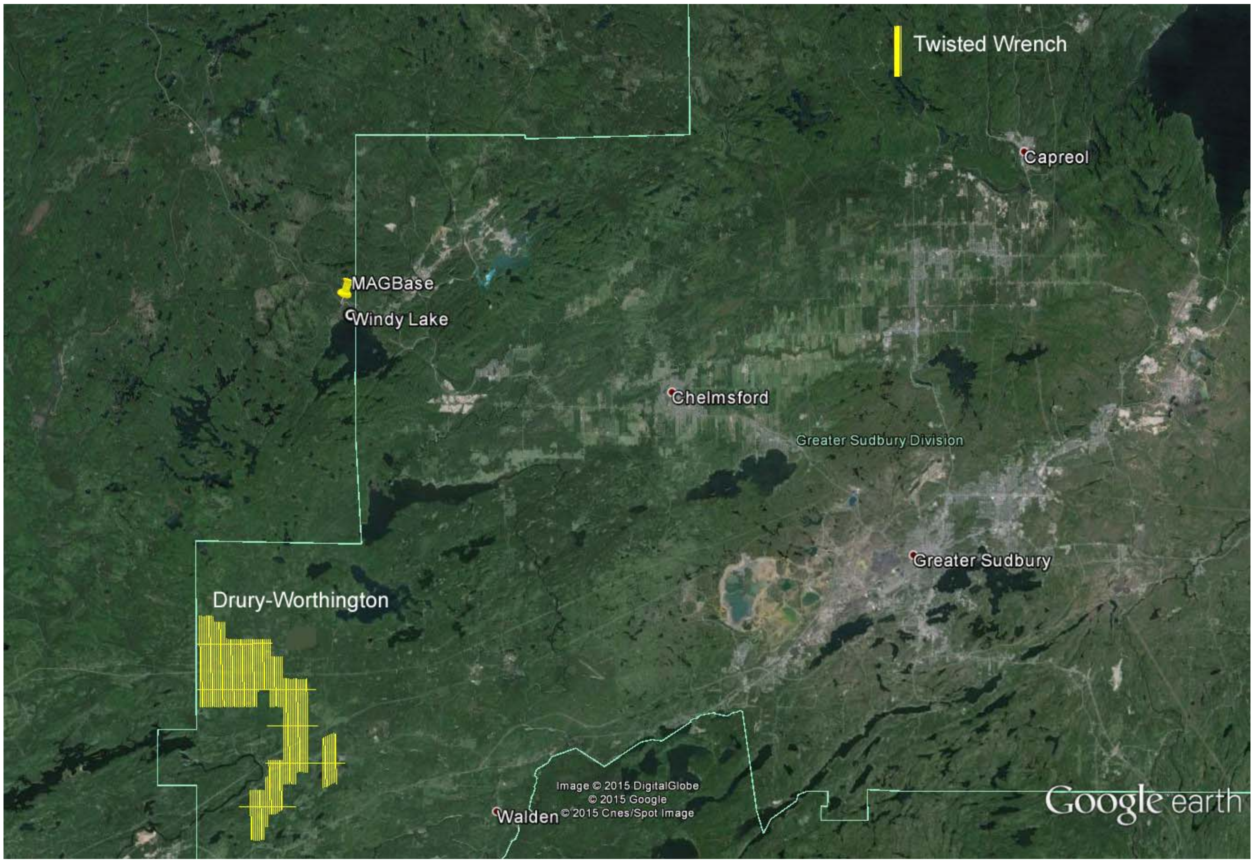

Figure 2: Survey areas location on Google Earth.

The survey area were flown in a south to north (N 0° E azimuth) direction, with traverse line spacing of 100 & 60 metres as depicted in Figure 3. Tie lines were flown perpendicular to the traverse lines. For more detailed information on the flight spacing and direction see Table 1.

Figure 4: Flight path over a Google Earth Image- Twisted Wrench Block

The survey area is covered by NTS (National Topographic Survey) of Canada sheets 041I05, 041I06, 041I11 and 041I14.

2. DATA ACQUISITION

2.1 Survey Area

The survey block (see Figure 3 and Appendix A) and general flight specifications are as follows:

Table 1: Survey Specifications

Survey block	Line spacing (m)	Area (Km^2)	Planned[1] Line-km	Actual Line-km	Flight direction	Line numbers
Drury-Worthington	Traverse: 100	40	408	425.8	N 0° E / N 180° E	L1000 – L1730
	Tie: n/a				N 90° E / N 270° E	T2000 – T2040
Twisted Wrench	Traverse: 60	1.5	21	22	N 0° E / N 180° E	L3000 – L3060
TOTAL		41.5	429	447.8		

Survey block boundaries co-ordinates are provided in Appendix B.

2.2 Survey Operations

Survey operations were based out of Windy Lake, Ontario from January 20th to February 4th and March 19th 2015. The following table shows the timing of the flying.

Table 2: Survey schedule

Date	Flight #	Flow km	Block	Crew location	Comments
20-Jan-2015				Sudbury, Ontario	System assembly
21-Jan-2015				Sudbury, Ontario	equipment damaged by airport fuel truck
22-Jan-2015				Sudbury, Ontario	System repairs
23-Jan-2015				Sudbury, Ontario	System repairs
24-Jan-2015				Sudbury, Ontario	System repairs
25-Jan-2015				Sudbury, Ontario	Waiting for replacement parts
26-Jan-2015				Sudbury, Ontario	Waiting for replacement parts
27-Jan-2015				Sudbury, Ontario	Waiting for replacement parts
28-Jan-2015				Sudbury, Ontario	System repairs & testing
29-Jan-2015				Sudbury, Ontario	mobilization
30-Jan-2015	1,2	141	A1/A2	Windy Lake, Ontario	141km flown
31-Jan-2015				Windy Lake, Ontario	No production due to weather
1-Feb-2015	3,4	132	A1	Windy Lake, Ontario	132km flown
2-Feb-2015				Windy Lake, Ontario	No production due to ground activity
3-Feb-2015	5,6	135	A1	Windy Lake, Ontario	135km flown
4-Feb-2015	7	21	Twisted	Windy Lake, Ontario	Data not accepted
19-Mar-2015	8	21	Twisted	Windy Lake, Ontario	Remaining kms were flown – flying complete

[1] Note: Actual Line kilometres represent the total line kilometres in the final database. These line-km normally exceed the Planned line-km, as indicated in the survey NAV files.

2.3 Flight Specifications

During the survey the helicopter was maintained at a mean altitude of 93 metres above the ground with an average survey speed of 80 km/hour. This allowed for an actual average EM transmitter-receiver loop terrain clearance of 45 metres and a magnetic sensor clearance of 83 metres.

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

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. The data were then uploaded via ftp to the Geotech office in Aurora for daily quality assurance and quality control by qualified personnel.

2.4 Aircraft and Equipment

2.4.1 Survey Aircraft

The survey was flown using an Agusta AW119 Koala helicopter, registration C-GVMX. The helicopter is owned and operated by Geotech Aviation. Installation of the geophysical and ancillary equipment was carried out by a Geotech Ltd crew.

2.4.2 Electromagnetic System

The electromagnetic system was a Geotech Time Domain EM (VTEM max) full receiver-waveform streamed data recorded system. The “full waveform VTEM system” uses the streamed half-cycle recording of transmitter and receiver waveforms to obtain a complete system response calibration throughout the entire survey flight. VTEM, with the serial number 36 had been used for the survey. The VTEM transmitter current waveform is shown diagrammatically in Figure 5. The configuration is as indicated in Figure 6.

The VTEM max Receiver and transmitter coils were in concentric-coplanar and Z-direction oriented configuration. The receiver system for the project also included a coincident-coaxial X-direction coil to measure the in-line dB/dt and calculate B-Field responses. The EM transmitter-receiver loop was towed at a mean distance of 48 metres below the aircraft as shown in Figure 6.

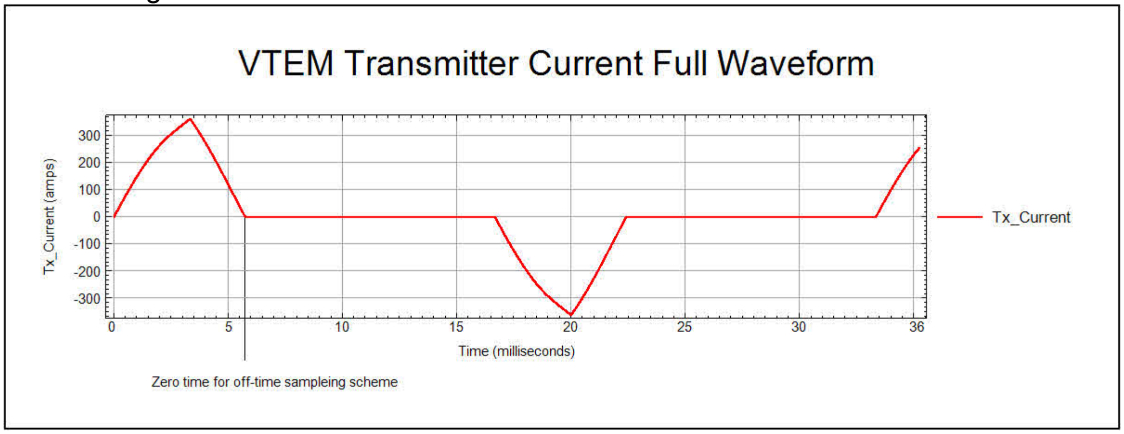

Figure 5: VTEM Transmitter Current Waveform

The VTEM decay sampling scheme is shown in Table 3 below. Forty four time measurement gates were used for the final data processing in the range from 0.021 to 9.286 msec. Zero time for the off-time sampling scheme is equal to the current pulse width and is defined as the time near the end of the turn-off ramp where the dI/dt waveform falls to 1/2 of its peak value.

Table 3: Off-Time Decay Sampling Scheme

VTEM Decay Sampling Scheme				
index	**Start**	**End**	**Middle**	**Width**
Miliseconds				
4	0.018	0.023	0.021	0.005
5	0.023	0.029	0.026	0.005
6	0.029	0.034	0.031	0.005
7	0.034	0.039	0.036	0.005
8	0.039	0.045	0.042	0.006
9	0.045	0.051	0.048	0.007
10	0.051	0.059	0.055	0.008
11	0.059	0.068	0.063	0.009
12	0.068	0.078	0.073	0.010
13	0.078	0.090	0.083	0.012
14	0.090	0.103	0.096	0.013
15	0.103	0.118	0.110	0.015
16	0.118	0.136	0.126	0.018
17	0.136	0.156	0.145	0.020
18	0.156	0.179	0.167	0.023
19	0.179	0.206	0.192	0.027
20	0.206	0.236	0.220	0.030
21	0.236	0.271	0.253	0.035
22	0.271	0.312	0.290	0.040
23	0.312	0.358	0.333	0.046
24	0.358	0.411	0.383	0.053
25	0.411	0.472	0.440	0.061
26	0.472	0.543	0.505	0.070
27	0.543	0.623	0.580	0.081
28	0.623	0.716	0.667	0.093
29	0.716	0.823	0.766	0.107
30	0.823	0.945	0.880	0.122
31	0.945	1.086	1.010	0.141
32	1.086	1.247	1.161	0.161
33	1.247	1.432	1.333	0.185
34	1.432	1.646	1.531	0.214
35	1.646	1.891	1.760	0.245
36	1.891	2.172	2.021	0.281
37	2.172	2.495	2.323	0.323

VTEM Decay Sampling Scheme				
index	Start	End	Middle	Width
Miliseconds				
38	2.495	2.865	2.667	0.370
39	2.865	3.292	3.063	0.427
40	3.292	3.781	3.521	0.490
41	3.781	4.341	4.042	0.560
42	4.341	4.987	4.641	0.646
43	4.987	5.729	5.333	0.742
44	5.729	6.581	6.125	0.852
45	6.581	7.560	7.036	0.979
46	7.560	8.685	8.083	1.125
47	8.685	9.977	9.286	1.292

Z Component: 4 - 47 time gates
X Component: 20 - 47 time gates.

VTEM max system specification:

Transmitter

- Transmitter loop diameter: 35 m
- Effective Transmitter loop area: 3848 m^2
- Number of turns: 4
- Transmitter base frequency: 30 Hz
- Peak current: 362 A
- Pulse width: 5.75 ms
- Wave form shape: trapezoid
- Peak dipole moment: 1,392,976 nIA
- Vverage EM Transmitter-receiver loop terrain clearance: 45 metres above the ground

Receiver

- X Coil diameter: 0.32 m
- Number of turns: 245
- Effective coil area: 19.69 m^2
- Z-Coil diameter: 1.2 m
- Number of turns: 100
- Effective coil area: 113.04 m^2

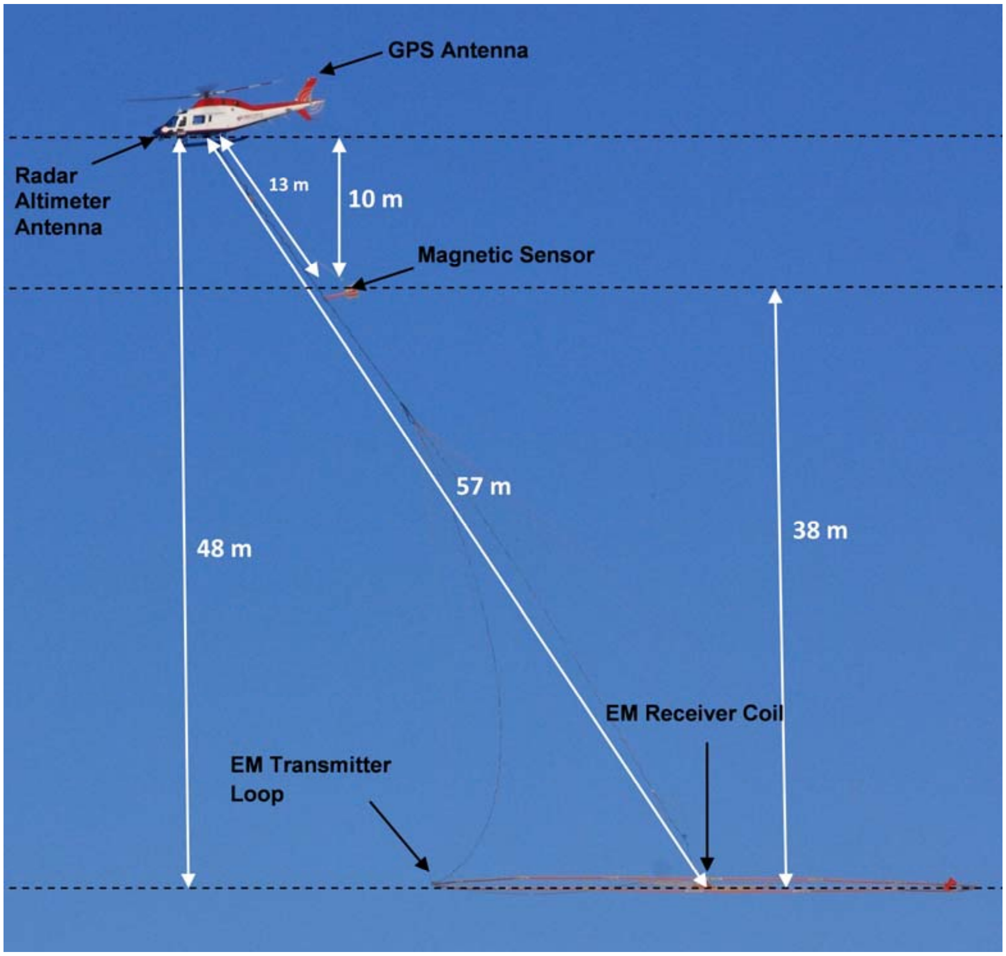

Figure 6: VTEM max System Configuration.

2.4.3 Airborne magnetometer

The magnetic sensor utilized for the survey was Geometrics optically pumped caesium vapour magnetic field sensor mounted 10 metres below the helicopter, as shown in Figure 6. The sensitivity of the magnetic sensor is 0.02 nanoTesla (nT) at a sampling interval of 0.1 seconds.

2.4.4 FULL WAVEFORM VTEM Sensor Calibration

The calibration is performed on the complete VTEM system installed in and connected to the helicopter, using special calibration equipment.

The procedure takes half-cycle files acquired and calculates a calibration file consisting of a single stacked half-cycle waveform. The purpose of the stacking is to attenuate natural and man-made magnetic signals, leaving only the response to the calibration signal.

2.4.5 Radar Altimeter

A Terra TRA 3000/TRI 40 radar altimeter was used to record terrain clearance. The antenna was mounted beneath the bubble of the helicopter cockpit (Figure 6).

2.4.6 GPS Navigation System

The navigation system used was a Geotech PC104 based navigation system utilizing a NovAtel's WAAS (Wide Area Augmentation System) enabled GPS receiver, Geotech navigate software, a full screen display with controls in front of the pilot to direct the flight and a NovAtel GPS antenna mounted on the helicopter tail (Figure 6). As many as 11 GPS and two WAAS satellites may be monitored at any one time. The positional accuracy or circular error probability (CEP) is 1.8 m, with WAAS active, it is 1.0 m. The co-ordinates of the block were set-up prior to the survey and the information was fed into the airborne navigation system.

2.4.7 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. The data type and sampling interval as provided in Table 4.

Table 4: Acquisition Sampling Rates

Data Type	Sampling
TDEM	0.1 sec
Magnetometer	0.1 sec
GPS Position	0.2 sec
Radar Altimeter	0.2 sec

2.5 Base Station

A combined magnetometer/GPS base station was utilized on this project. A Geometrics Caesium 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 (46° 37.4576' N, 81° 27.3442' W); away from electric transmission lines and moving ferrous objects such as motor vehicles. The base station data were backed-up to the data processing computer at the end of each survey day.

3. PERSONNEL

The following Geotech Ltd. personnel were involved in the project.

<u>Field:</u>

Project Manager:	Darren Tuck (Office)
Data QC:	Nick Venter (Office)
Crew chief:	Gavin Boege
Operator:	Jason McKinnon

The survey pilot and the mechanical engineer were employed directly by the helicopter operator – Geotech Aviation

Pilot:	Jocelyn Vallieres

<u>Office</u>:

Preliminary Data Processing:	Nick Venter
Final Data Processing:	Keeme Mokubung Marta Orta
Final Data QA/QC:	Geoffrey Plastow
Reporting/Mapping:	Wendy Acorn

Data acquisition phase was carried out under the supervision of Andrei Bagrianski, P. Geo, Chief Operating Officer. The processing and interpretation phase was under the supervision of Geoffrey Plastow, P. Geo Data Processing Manager. The customer relations were looked after by Paolo Berardelli.

4. DATA PROCESSING AND PRESENTATION

Data compilation and processing were carried out by the application of Geosoft OASIS Montaj and programs proprietary to Geotech Ltd.

4.1 Flight Path

The flight path, recorded by the acquisition program as WGS 84 latitude/longitude, was converted into the NAD27, UTM Zone 17 North coordinate 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 easting's (x) and UTM northing's (y).

4.2 Electromagnetic Data

The Full Waveform EM specific data processing operations included:

- Half cycle stacking (performed at time of acquisition);
- System response correction;
- Parasitic and drift removal.

A three stage digital filtering process was used to reject major sferic events and to reduce system noise. Local sferic 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 sferic events.

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 15 metres. This filter is a symmetrical 1 sec linear filter.

The results are presented as stacked profiles of EM voltages for the time gates, in linear - logarithmic scale for the B-field Z component and dB/dt responses in the Z and X components. B-field Z component time channel recorded at 0.880 milliseconds after the termination of the impulse is also presented as contour colour images. Fraser Filter X component is also presented as a colour image. Calculated Time Constant (TAU) with Calculated Vertical Derivative contours is presented in Appendix C and E. Resistivity Depth Image (RDI) is also presented in Appendix F and G.

VTEM max has two receiver coil orientations. Z-axis coil is oriented parallel to the transmitter coil axis and both are horizontal to the ground. The X-axis coil is oriented parallel to the ground and along the line-of-flight. This combined two coil configuration provides information on the position, depth, dip and thickness of a conductor. Generalized modeling results of VTEM max data are shown in Appendix D.

In general X-component data produce cross-over type anomalies: from "+ to – "in flight direction of flight for "thin" sub vertical targets and from "- to +" in direction of flight for "thick" targets. Z component data produce double peak type anomalies for "thin" sub vertical targets and single peak for "thick" targets.

The limits and change-over of "thin-thick" depends on dimensions of a TEM system.

Because of X component polarity is under line-of-flight, convolution Fraser filter (FF, Figure 7) is applied to X component data to represent axes of conductors in the form of grid map. In this case positive FF anomalies always correspond to "plus-to-minus" X data crossovers independently of direction of flight.

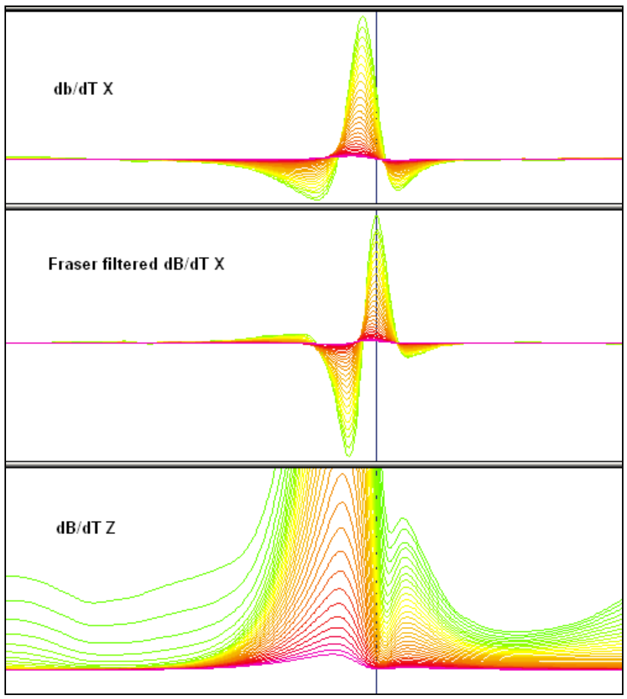

Figure 7: Z, X and Fraser filtered X (FFx) components for "thin" target.

4.3 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 aeromagnetic data was corrected for diurnal variations by subtracting the observed magnetic base station deviations.

The corrected magnetic data 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 25 metres at the mapping scale. The Minimum Curvature algorithm was used to interpolate values onto a rectangular regular spaced grid.

5. DELIVERABLES

5.1 Survey Report

The survey report describes the data acquisition, processing, and final presentation of the survey results. The survey report is provided in two paper copies and digitally in PDF format.

5.2 Maps

Final maps were produced at a scale of 1:20,000 and 1:10,000 for best representation of the survey size and line spacing. The coordinate/projection system used was NAD27 Datum, UTM zone 17 North. All maps show the mining claims, flight path trace and topographic data; latitude and longitude are also noted on maps.

The preliminary and final results of the survey are presented as EM profiles, a late-time gate gridded EM channel, and a colour magnetic TMI contour map.

- Maps at 1:20,000 and 1:10,000 in Geosoft MAP format, as follows:

GL140241_**k_dBdt_bb:	dB/dt profiles Z Component, Time Gates 0.220 – 7.036 ms in linear – logarithmic scale.
GL140241_**k_Bfield_bb:	B-field profiles Z Component, Time Gates 0.220 – 7.036 ms in linear – logarithmic scale over Total Magnetic Intensity
GL140241_**k _BFz30_bb:	B-field late time Z Component Channel 30, Time Gate 0.880 ms
GL140241_**k_TMI_bb:	Total Magnetic Intensity (TMI)
GL140241_**k_PLM_bb:	Power Line Monitor (PLM)
GL140241_**k_SFxFF24_bb:	Fraser Filtered dB/dt X Component, Channel 24, Time Gate 0.383 ms
GL140241_**k_TauSF_bb:	dB/dt Calculated Time Constant (TAU) with Calculated Vertical Derivative contours

Where ** represents the scale and bb represents the block
i.e. GL140241_10K_TMI_TwistedWrench

Maps are also presented in PDF format.

- 1:50,000 topographic vectors were taken from the NRCAN Geogratis database at; http://geogratis.gc.ca/geogratis/en/index.html.
- A Google Earth file *GL140241_Wallbridge.kml* showing the flight path of the block is included. Free versions of Google Earth software from: http://earth.google.com/download-earth.html

5.3 Digital Data

Two copies of the data and maps on DVD were prepared to accompany the report. Each DVD contains a digital file of the line data in GDB Geosoft Montaj format as well as the maps in Geosoft Montaj Map and PDF format.

- DVD structure.

  Data contains databases, grids and maps, as described below.
  Report contains a copy of the report and appendices in PDF format.

Databases in Geosoft GDB format, containing the channels listed in Table 5.

Table 5: Geosoft GDB Data Format

Channel name	Units	Description
X:	metres	UTM Easting NAD27 Zone 17 North
Y:	metres	UTM Northing NAD27 Zone 17 North
Longitude:	Decimal Degrees	WGS 84 Longitude data
Latitude:	Decimal Degrees	WGS 84 Latitude data
Z:	metres	Aircraft GPS antenna elevation (above Geoid)
Zb:	metres	Transmitter-receiver loop elevation (above Geoid)
Radar:	metres	helicopter terrain clearance from radar altimeter
Radarb:	metres	Calculated EM transmitter-receiver loop terrain clearance from radar altimeter
DEM:	metres	Digital Elevation Model
Gtime:	Seconds of the day	GPS time
Mag1:	nT	Raw Total Magnetic field data
Basemag:	nT	Magnetic diurnal variation data
Mag2:	nT	Diurnal corrected Total Magnetic field data
Mag3:	nT	Levelled Total Magnetic field data
CVG	nT/m	Calculated Vertical Derivative
SFz[4]:	$pV/(A*m^4)$	Z dB/dt 0.021 millisecond time channel
SFz[5]:	$pV/(A*m^4)$	Z dB/dt 0.026 millisecond time channel
SFz[6]:	$pV/(A*m^4)$	Z dB/dt 0.031 millisecond time channel
SFz[7]:	$pV/(A*m^4)$	Z dB/dt 0.036 millisecond time channel
SFz[8]:	$pV/(A*m^4)$	Z dB/dt 0.042 millisecond time channel
SFz[9]:	$pV/(A*m^4)$	Z dB/dt 0.048 millisecond time channel
SFz[10]:	$pV/(A*m^4)$	Z dB/dt 0.055 millisecond time channel
SFz[11]:	$pV/(A*m^4)$	Z dB/dt 0.063 millisecond time channel
SFz[12]:	$pV/(A*m^4)$	Z dB/dt 0.073 millisecond time channel
SFz[13]:	$pV/(A*m^4)$	Z dB/dt 0.083 millisecond time channel
SFz[14]:	$pV/(A*m^4)$	Z dB/dt 0.096 millisecond time channel
SFz[15]:	$pV/(A*m^4)$	Z dB/dt 0.110 millisecond time channel
SFz[16]:	$pV/(A*m^4)$	Z dB/dt 0.126 millisecond time channel
SFz[17]:	$pV/(A*m^4)$	Z dB/dt 0.145 millisecond time channel
SFz[18]:	$pV/(A*m^4)$	Z dB/dt 0.167 millisecond time channel
SFz[19]:	$pV/(A*m^4)$	Z dB/dt 0.192 millisecond time channel
SFz[20]:	$pV/(A*m^4)$	Z dB/dt 0.220 millisecond time channel
SFz[21]:	$pV/(A*m^4)$	Z dB/dt 0.253 millisecond time channel
SFz[22]:	$pV/(A*m^4)$	Z dB/dt 0.290 millisecond time channel
SFz[23]:	$pV/(A*m^4)$	Z dB/dt 0.333 millisecond time channel
SFz[24]:	$pV/(A*m^4)$	Z dB/dt 0.383 millisecond time channel
SFz[25]:	$pV/(A*m^4)$	Z dB/dt 0.440 millisecond time channel
SFz[26]:	$pV/(A*m^4)$	Z dB/dt 0.505 millisecond time channel
SFz[27]:	$pV/(A*m^4)$	Z dB/dt 0.580 millisecond time channel
SFz[28]:	$pV/(A*m^4)$	Z dB/dt 0.667 millisecond time channel

Channel name	Units	Description
SFz[29]:	pV/(A*m^4)	Z dB/dt 0.766 millisecond time channel
SFz[30]:	pV/(A*m^4)	Z dB/dt 0.880 millisecond time channel
SFz[31]:	pV/(A*m^4)	Z dB/dt 1.010 millisecond time channel
SFz[32]:	pV/(A*m^4)	Z dB/dt 1.161 millisecond time channel
SFz[33]:	pV/(A*m^4)	Z dB/dt 1.333 millisecond time channel
SFz[34]:	pV/(A*m^4)	Z dB/dt 1.531 millisecond time channel
SFz[35]:	pV/(A*m^4)	Z dB/dt 1.760 millisecond time channel
SFz[36]:	pV/(A*m^4)	Z dB/dt 2.021 millisecond time channel
SFz[37]:	pV/(A*m^4)	Z dB/dt 2.323 millisecond time channel
SFz[38]:	pV/(A*m^4)	Z dB/dt 2.667 millisecond time channel
SFz[39]:	pV/(A*m^4)	Z dB/dt 3.063 millisecond time channel
SFz[40]:	pV/(A*m^4)	Z dB/dt 3.521 millisecond time channel
SFz[41]:	pV/(A*m^4)	Z dB/dt 4.042 millisecond time channel
SFz[42]:	pV/(A*m^4)	Z dB/dt 4.641 millisecond time channel
SFz[43]:	pV/(A*m^4)	Z dB/dt 5.333 millisecond time channel
SFz[44]:	pV/(A*m^4)	Z dB/dt 6.125 millisecond time channel
SFz[45]:	pV/(A*m^4)	Z dB/dt 7.036 millisecond time channel
SFz[46]:	pV/(A*m^4)	Z dB/dt 8.083 millisecond time channel
SFz[47]:	pV/(A*m^4)	Z dB/dt 9.286 millisecond time channel
SFx[20]:	pV/(A*m^4)	X dB/dt 0.220 millisecond time channel
SFx[21]:	pV/(A*m^4)	X dB/dt 0.253 millisecond time channel
SFx[22]:	pV/(A*m^4)	X dB/dt 0.290 millisecond time channel
SFx[23]:	pV/(A*m^4)	X dB/dt 0.333 millisecond time channel
SFx[24]:	pV/(A*m^4)	X dB/dt 0.383 millisecond time channel
SFx[25]:	pV/(A*m^4)	X dB/dt 0.440 millisecond time channel
SFx[26]:	pV/(A*m^4)	X dB/dt 0.505 millisecond time channel
SFx[27]:	pV/(A*m^4)	X dB/dt 0.580 millisecond time channel
SFx[28]:	pV/(A*m^4)	X dB/dt 0.667 millisecond time channel
SFx[29]:	pV/(A*m^4)	X dB/dt 0.766 millisecond time channel
SFx[30]:	pV/(A*m^4)	X dB/dt 0.880 millisecond time channel
SFx[31]:	pV/(A*m^4)	X dB/dt 1.010 millisecond time channel
SFx[32]:	pV/(A*m^4)	X dB/dt 1.161 millisecond time channel
SFx[33]:	pV/(A*m^4)	X dB/dt 1.333 millisecond time channel
SFx[34]:	pV/(A*m^4)	X dB/dt 1.531 millisecond time channel
SFx[35]:	pV/(A*m^4)	X dB/dt 1.760 millisecond time channel
SFx[36]:	pV/(A*m^4)	X dB/dt 2.021 millisecond time channel
SFx[37]:	pV/(A*m^4)	X dB/dt 2.323 millisecond time channel
SFx[38]:	pV/(A*m^4)	X dB/dt 2.667 millisecond time channel
SFx[39]:	pV/(A*m^4)	X dB/dt 3.063 millisecond time channel
SFx[40]:	pV/(A*m^4)	X dB/dt 3.521 millisecond time channel
SFx[41]:	pV/(A*m^4)	X dB/dt 4.042 millisecond time channel
SFx[42]:	pV/(A*m^4)	X dB/dt 4.641 millisecond time channel
SFx[43]:	pV/(A*m^4)	X dB/dt 5.333 millisecond time channel
SFx[44]:	pV/(A*m^4)	X dB/dt 6.125 millisecond time channel
SFx[45]:	pV/(A*m^4)	X dB/dt 7.036 millisecond time channel
SFx[46]:	pV/(A*m^4)	X dB/dt 8.083 millisecond time channel
SFx[47]:	pV/(A*m^4)	X dB/dt 9.286 millisecond time channel
BFz	(pV*ms)/(A*m^4)	Z B-Field data for time channels 4 to 47
BFx	(pV*ms)/(A*m^4)	X B-Field data for time channels 20 to 47
SFxFF	pV/(A*m4)	Fraser filtered X dB/dt

Channel name	Units	Description
NchanBF		Last channel where the algorithm stops calculation, B-Field
TauBF	milliseconds	Time Constant (Tau) calculated from B-field data
NchanSF		Last channel where the algorithm stops calculation, dB/dt
TauSF	milliseconds	Time Constant (Tau) calculated from dB/dt data
PLM:		60 Hz power line monitor

Electromagnetic B-field and dB/dt Z component data is found in array channel format between indexes 4 – 47, and X component data from 20 – 47, as described above.

- Database of the Resistivity Depth Images in Geosoft GDB format, containing the following channels:

Table 6: Geosoft Resistivity Depth Image GDB Data Format

Channel name	Units	Description
Xg	metres	UTM Easting NAD27 Zone 17 North
Yg	metres	UTM Northing NAD27 Zone 17 North
Dist:	meters	Distance from the beginning of the line
Depth:	meters	array channel, depth from the surface
Z:	meters	array channel, depth from sea level
AppRes:	Ohm-m	array channel, Apparent Resistivity
TR:	meters	EM system height from sea level
Topo:	meters	digital elevation model
Radarb:	metres	Calculated Transmitter-receiver loop terrain clearance from radar altimeter
SF:	pV/(A*m^4)	array channel, dB/dT
MAG:	nT	TMI data
CVG:	nT/m	CVG data
DOI:	metres	Depth of Investigation: a measure of VTEM depth effectiveness
PLM:		60Hz Power Line Monitor

- Database of the VTEM Waveform "GL140241_waveform_final.gdb" in Geosoft GDB format, containing the following channels:

Table 7: Geosoft database for the VTEM waveform

Channel name	Units	Description
Time:	milliseconds	Sampling rate interval, 5.2083 microseconds
Tx_Current:	amps	Output current of the transmitter

- Grids in Geosoft GRD and GeoTIFF format, as follows:

BFz30:	B-Field Z Component Channel 30 (Time Gate 0.880 ms)
SFz10:	dB/dt Z Component Channel 10 (Time Gate 0.055 ms)
SFz25:	dB/dt Z Component Channel 25 (Time Gate 0.440 ms)
SFz40:	dB/dt Z Component Channel 40 (Time Gate 3.521 ms)
TMI:	Total Magnetic Intensity (nT)
CVG:	Calculated Vertical Derivative (nT/m)
TauBF:	B-Field Calculated Time Constant (ms)
TauSF:	dB/dt Calculated Time Constant (ms)
SFxFF20:	Fraser Filter X Component dB/dt Channel 20 (Time Gate 0.220 ms)
DEM:	Digital Elevation Model (metres)
PLM:	Power Line Monitor (60Hz)

A Geosoft .GRD file has a .GI metadata file associated with it, containing grid projection information. A grid cell size of 25 metres was used for Drury-Worthington block, while 15 metres grid cell size was used for the Twisted-Wrench block.

CONCLUSIONS AND RECOMMENDATIONS

A helicopter-borne versatile time domain electromagnetic (VTEM max) geophysical survey has been completed over the Drury-Worthington and Twisted Wrench Blocks near Windy Lake, Ontario.

The total area coverage for all properties is 41.5 km^2. Total survey line coverage is 429 line kilometres. The principal sensors included a Time Domain EM system and a magnetometer. Results have been presented as stacked profiles, and contour color images at a scale of 1:20,000 and 1:10,000 No formal Interpretation has been included.

Based on the geophysical results obtained, a number of TEM anomalous zones are identified across the properties. They can be seen overlapping the TAU decay parameter image presented with the calculated vertical magnetic gradient (CVG) contours (see Appendix C). There is strong cultural noise across the Drury-Worthington block, and some anomalous responses are due to power lines.

The anomalous zones in the Drury-Worthington block can be interpreted as lithological conductors and local targets, and anomalies that are not associated with power lines are at depth. Some of the anomalous zones are associated with the magnetic anomalies. The anomalous zones have dBz/dt time constant ranging from 0.1 to 5.45 ms. The apparent resistivity of the anomalous zones is estimated to be less than 800.0 Ohm.m. According to apparent resistivity depth images over the selected lines, the estimated depth of the top of the anomalous zones is approximately from near surface to about 400 meters.

Conductive responses in the Twisted-Wrench block are induced by very-low conductive targets, the time-constant (Tau) calculated from dBz/dt data is < 0.87 ms. These single-peak anomalies exhibit association to magnetics.

If the conductors correspond to an exploration model on the area it is recommended picking EM anomalies with conductance grading and center localization of the targets, detail resistivity depth imaging and plate modeling with test drill hole parameters planning prior to ground follow up and drill testing.

Respectfully submitted[2],

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Geotech Ltd.

Keeme Mokubung
Geotech Ltd.

Marta Orta
Geotech Ltd.

Geoffrey Plastow, P.Geo.
Data Processing Manager
Geotech Ltd.

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GEOFFREY C. PLASTOW
PRACTISING MEMBER
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4/23/15
ONTARIO

April 2015

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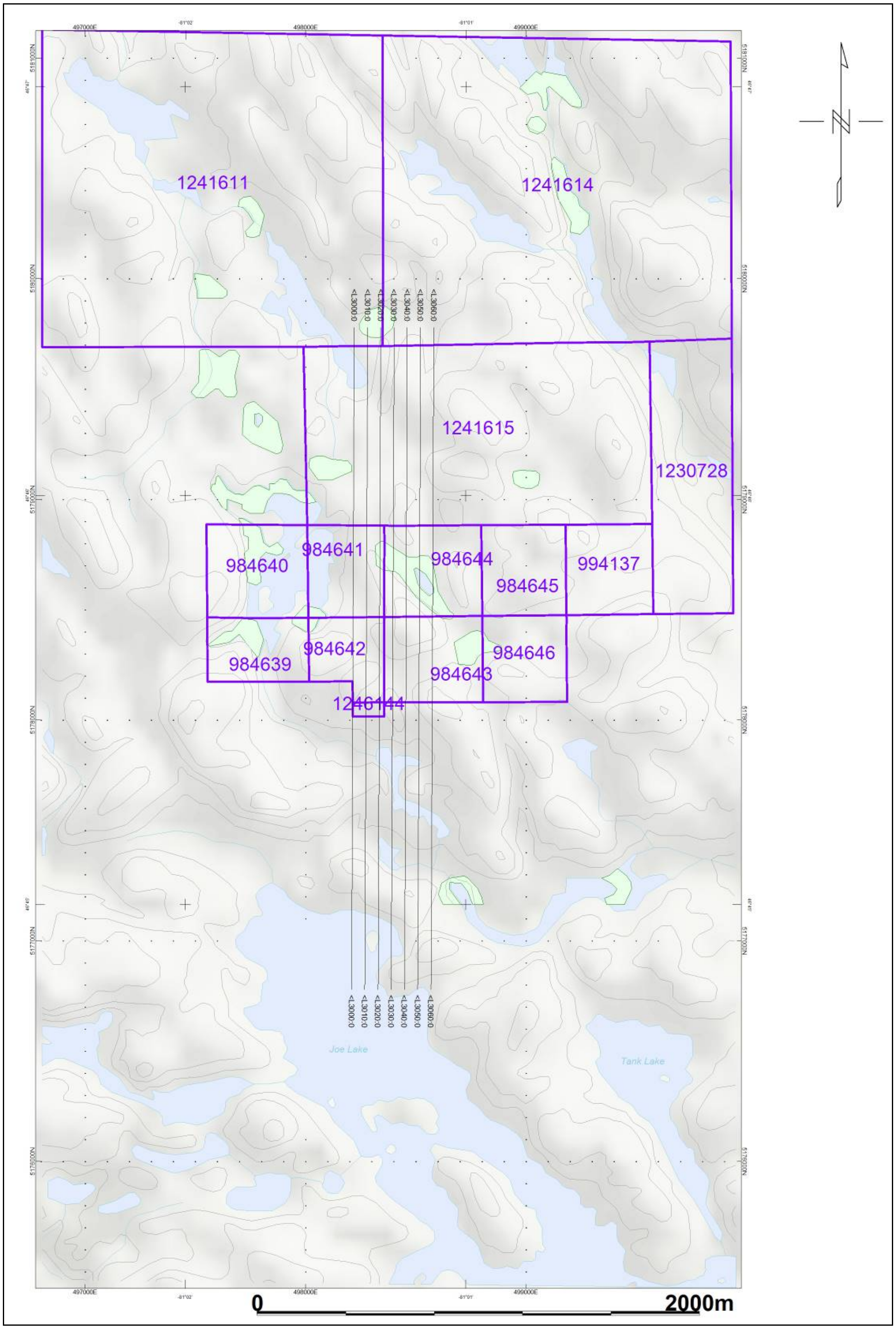
[2] Final data processing of the EM and magnetic data were carried out by Nick Venter, Keeme Mokubung and Marta Orta, under the supervision of Geoffrey Plastow, P.Geo., Data Processing Manager, from the office of Geotech Ltd. in Aurora, Ontario

APPENDIX A

SURVEY LOCATION MAP

Overview of the Survey Area



Mining Claims – Twisted Wrench Block

APPENDIX B

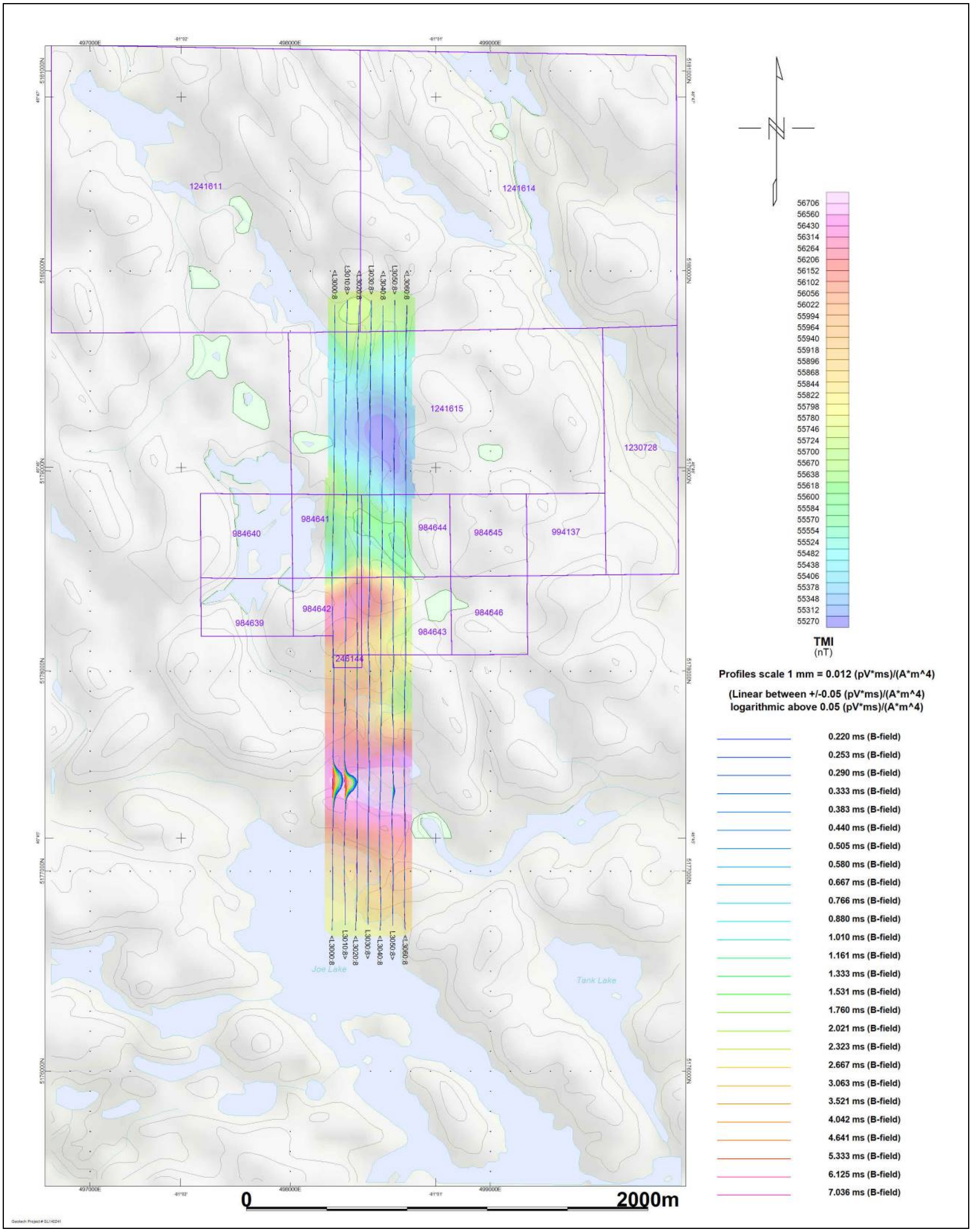
SURVEY BLOCK COORDINATES

(WGS 84, UTM Zone 17 North)

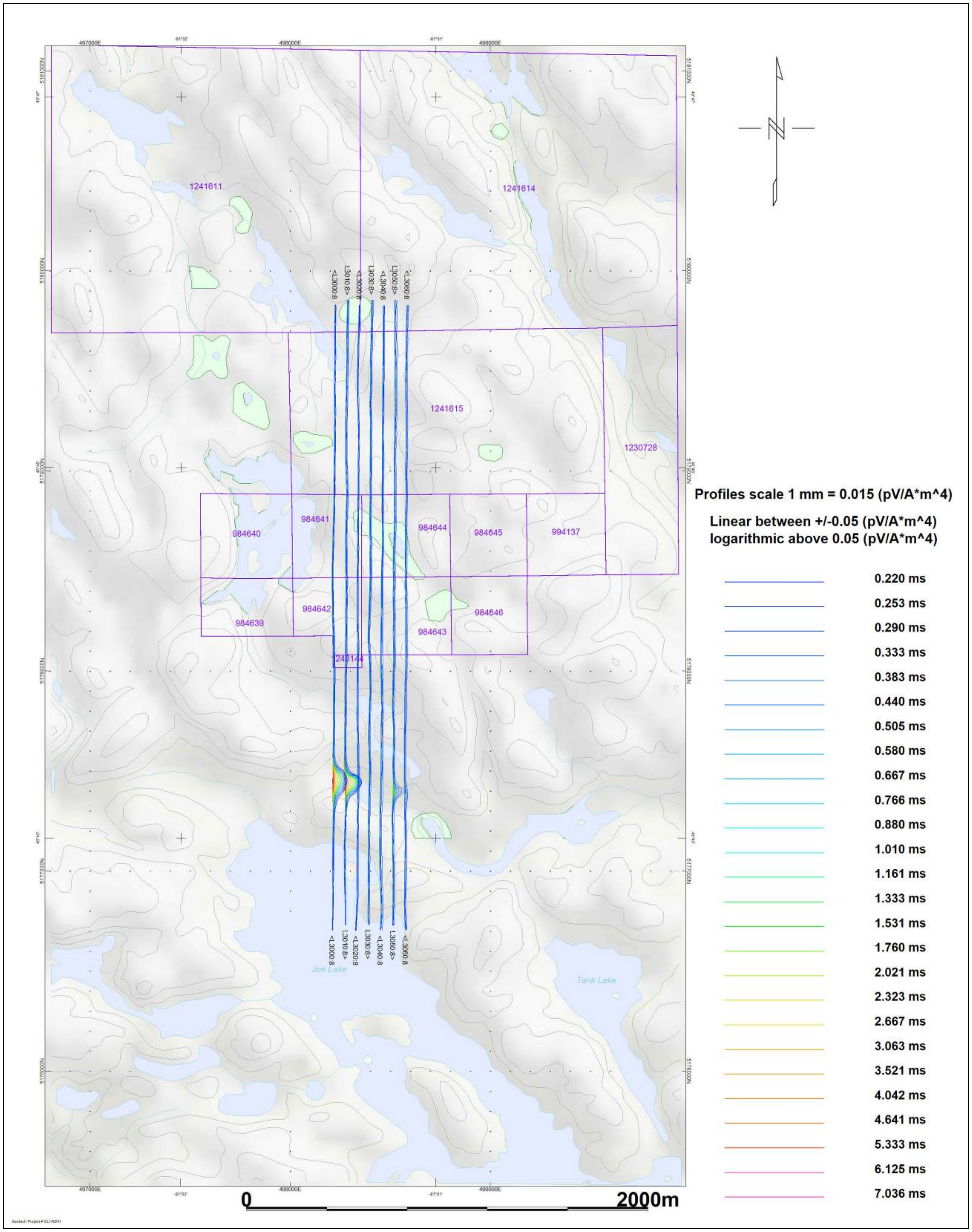
Drury - Area 1	
WGS84 UTM Zone 17N	
X	Y
456615	5145020
456615	5139591
460024	5139591
460124	5140595
460726	5140595
460826	5139591
461528	5139591
461628	5138108
461628	5136535
461528	5136423
460726	5136423
460625	5135430
460525	5135430
460425	5134630
459623	5134630
459623	5131633
460425	5131633
460525	5132432
460626	5132432
460726	5133182
461127	5133182
461525	5133485
461617	5134980
462315	5134980
462430	5135691
463032	5135691
463031	5141256
461628	5141286
461527	5142591
460926	5142591
460826	5143623
458219	5143626
458119	5144670
457517	5144670
457417	5145020
456615	5145020

Drury - Area 2	
WGS84 UTM Zone 17N	
X	Y
464636	5137992
464535	5137992
463934	5137696
463934	5134698
464736	5135090
464736	5137792

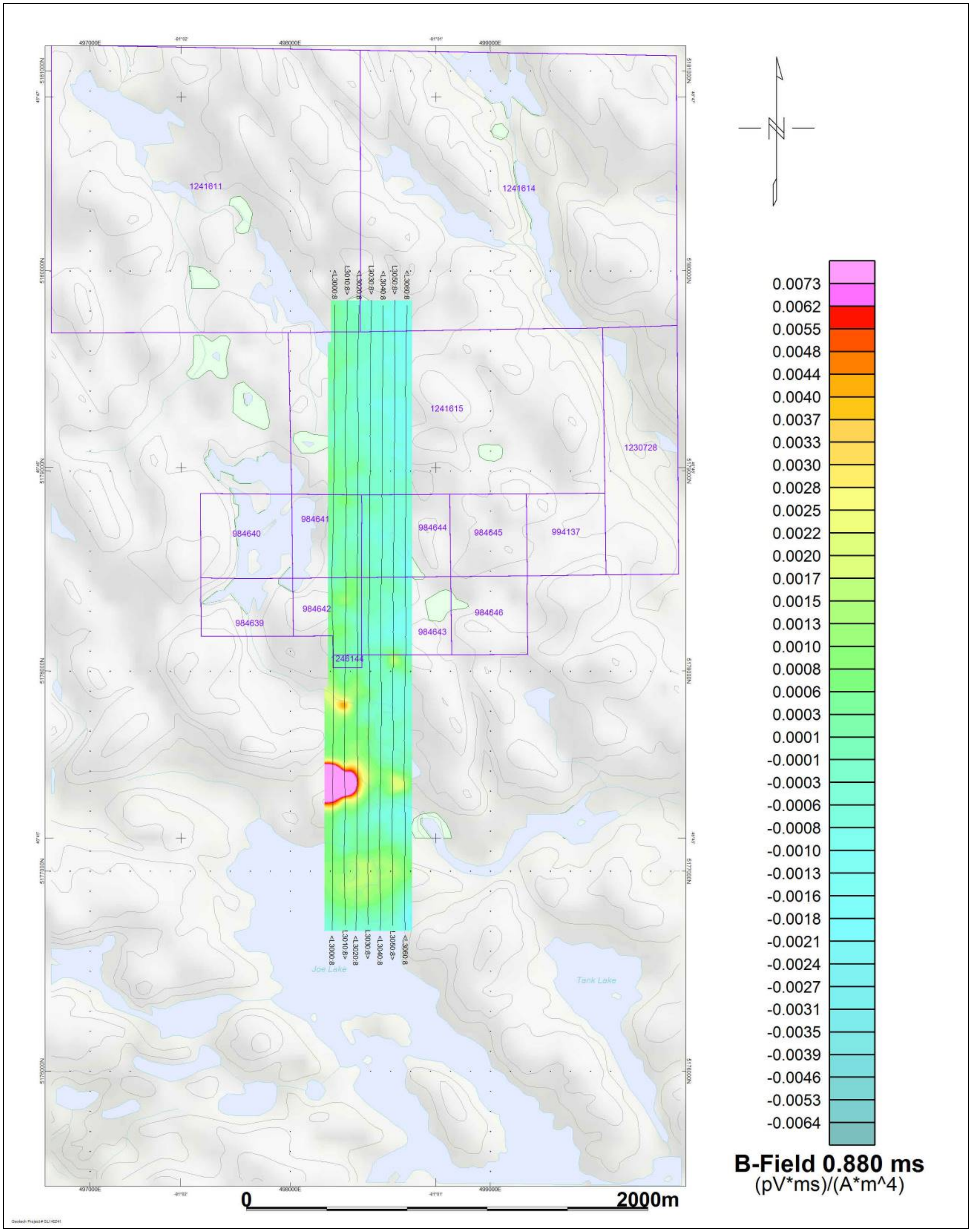
Twisted Wrench	
WGS84 UTM Zone 17N	
X	Y
498235	5179501
498226	5177501
498286	5177501
498587	5177501



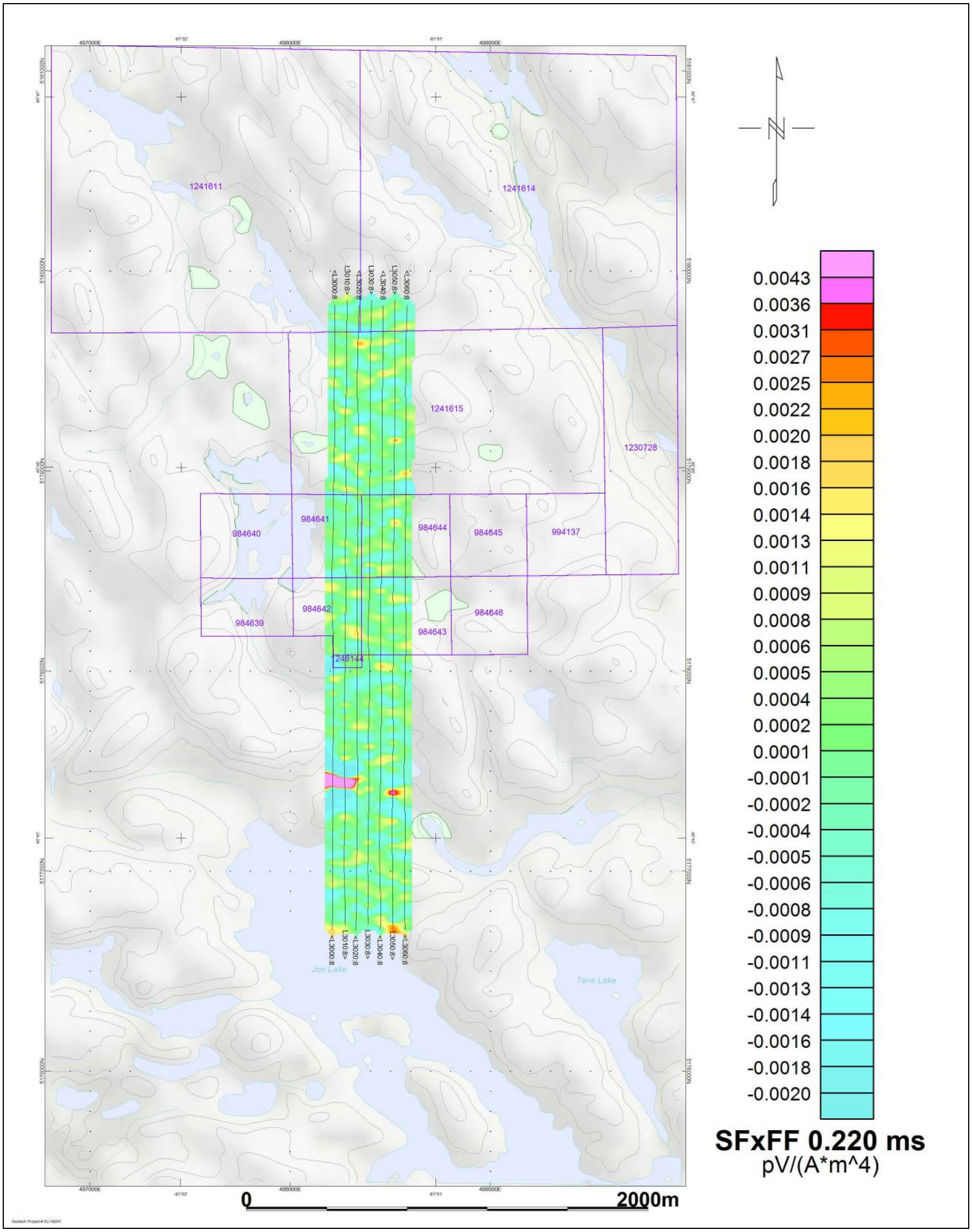
VTEM B-Field Z Component Profiles, Time Gates 0.220 to 7.036 ms – Twisted Wrench



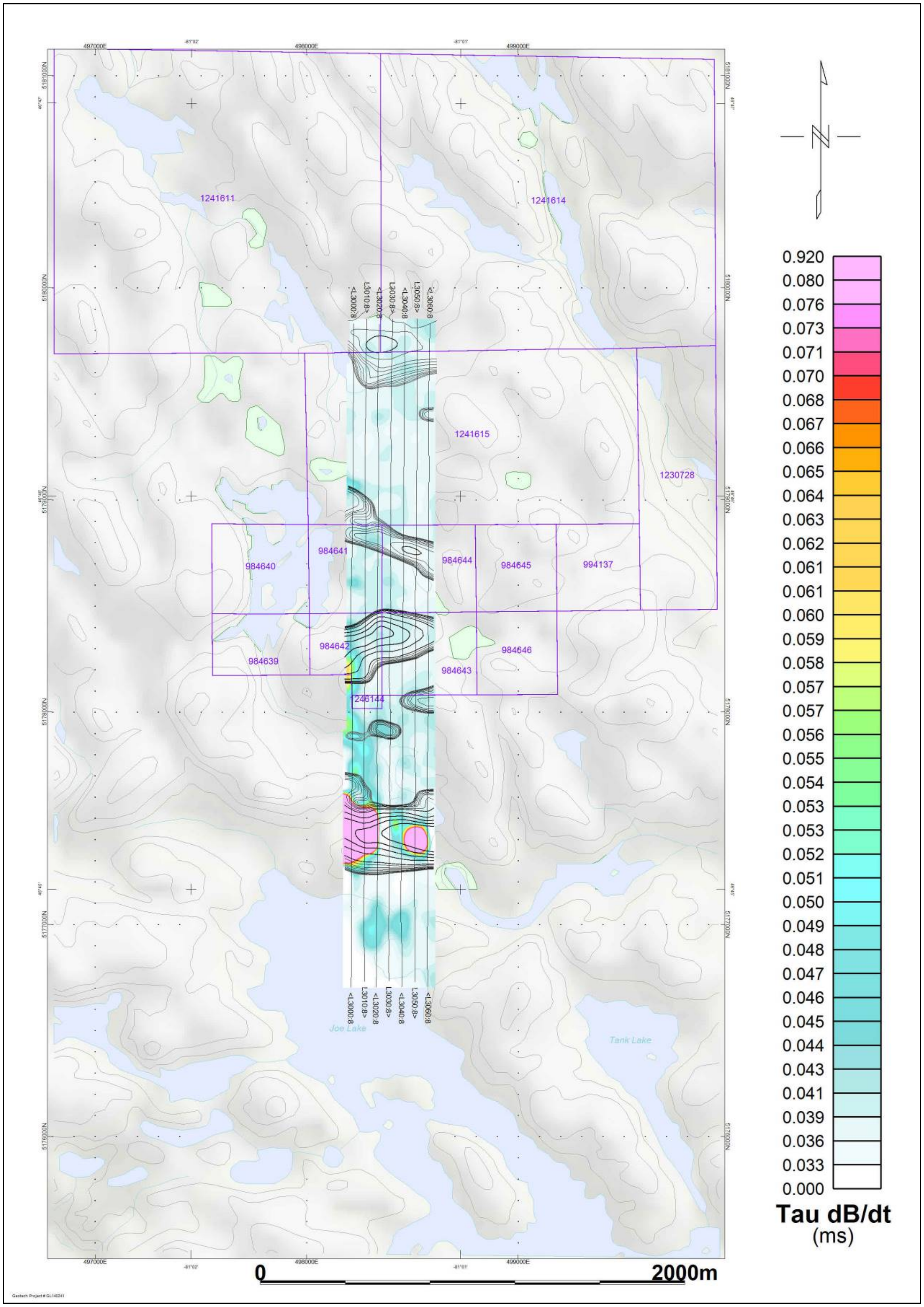
VTEM dB/dt Z Component Profiles, Time Gates 0.220 to 7.036 ms – Twisted Wrench



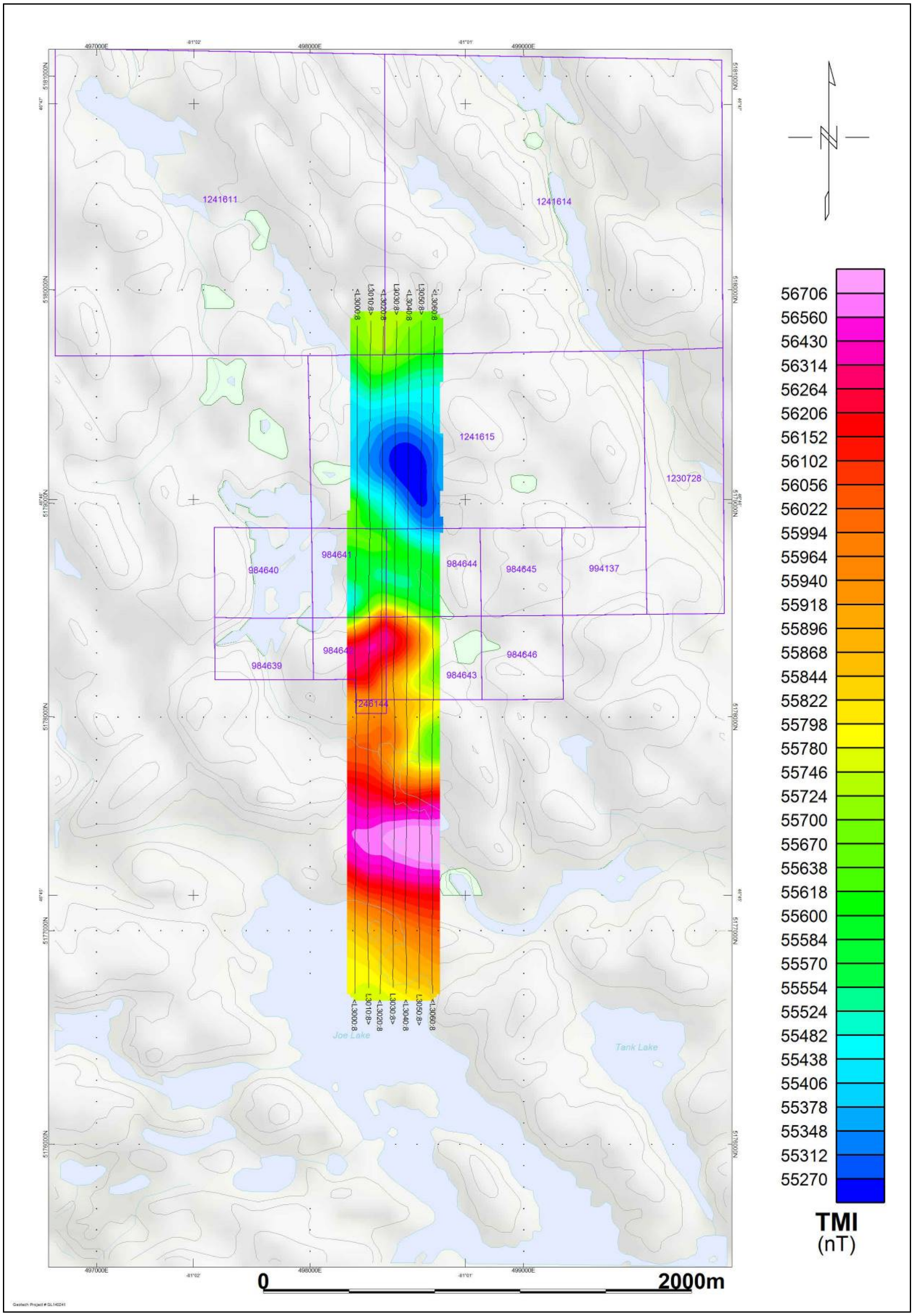
VTEM B-Field Z Component Channel 30, Time Gate 0.880 ms – Twisted Wrench



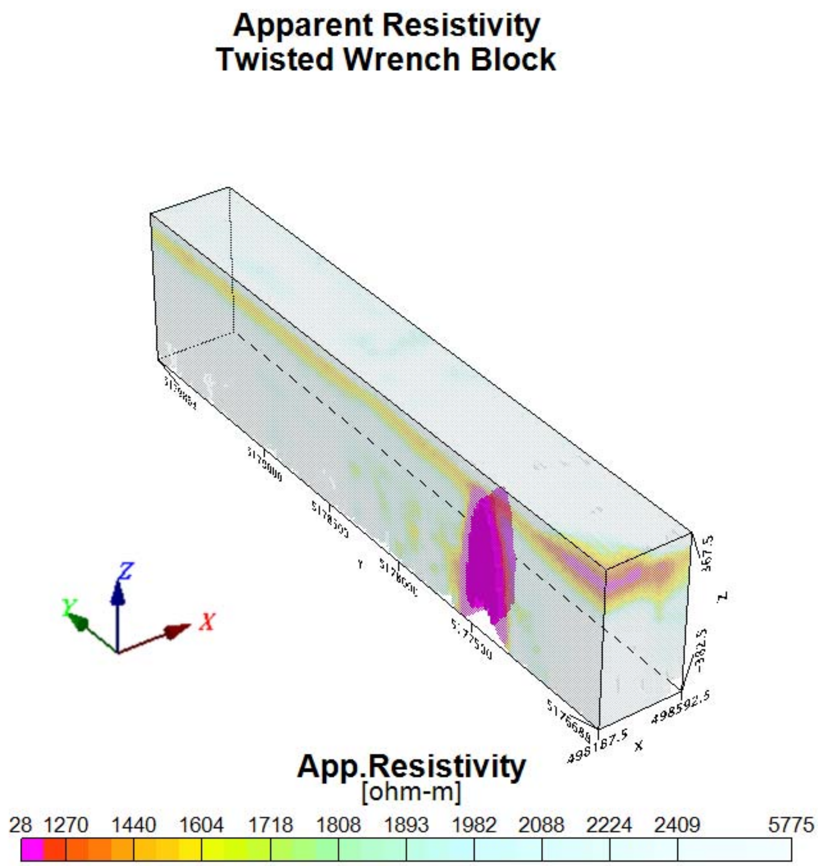
Fraser Filtered dB/dt X Component Channel 20, Time Gate 0.220 ms – Twisted Wrench



dB/dt Calculated Time Constant (Tau) with Calculated Vertical Derivative contours – Twisted Wrench



Total Magnetic Intensity (TMI) – Twisted Wrench



3D Resistivity Depth Images (RDI) – Twisted Wrench

APPENDIX D

GENERALIZED MODELING RESULTS OF THE VTEM SYSTEM

Introduction

The VTEM system is based on a concentric or central loop design, whereby, the receiver is positioned at the centre of a transmitter loop that produces a primary field. The wave form is a bi-polar, modified square wave with a turn-on and turn-off at each end.

During turn-on and turn-off, a time varying field is produced (dB/dt) and an electro-motive force (emf) is created as a finite impulse response. A current ring around the transmitter loop moves outward and downward as time progresses. When conductive rocks and mineralization are encountered, a secondary field is created by mutual induction and measured by the receiver at the centre of the transmitter loop.

Efficient modeling of the results can be carried out on regularly shaped geometries, thus yielding close approximations to the parameters of the measured targets. The following is a description of a series of common models made for the purpose of promoting a general understanding of the measured results.

A set of models has been produced for the Geotech VTEM® system dB/dT Z and X components (see models D1 to D16). The Maxwell TM modeling program (EMIT Technology Pty. Ltd. Midland, WA, AU) used to generate the following responses assumes a resistive half-space. The reader is encouraged to review these models, so as to get a general understanding of the responses as they apply to survey results. While these models do not begin to cover all possibilities, they give a general perspective on the simple and most commonly encountered anomalies.

As the plate dips and departs from the vertical position, the peaks become asymmetrical.

As the dip increases, the aspect ratio (Min/Max) decreases and this aspect ratio can be used as an empirical guide to dip angles from near 90º to about 30º. The method is not sensitive enough where dips are less than about 30º.

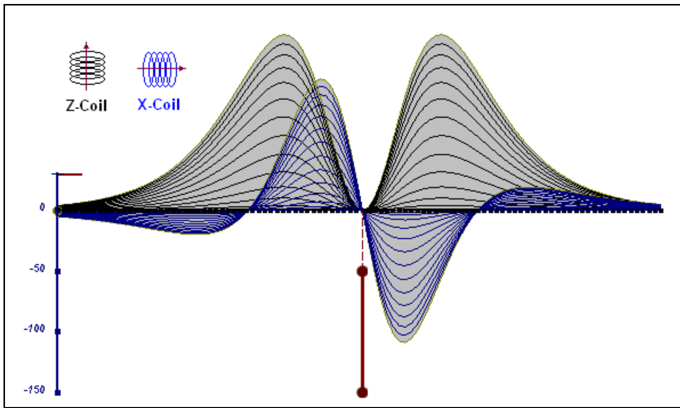


Figure D-1: vertical thin plate

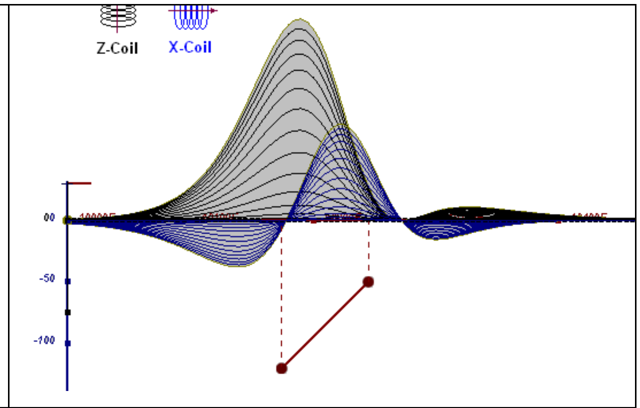


Figure D-2: inclined thin plate

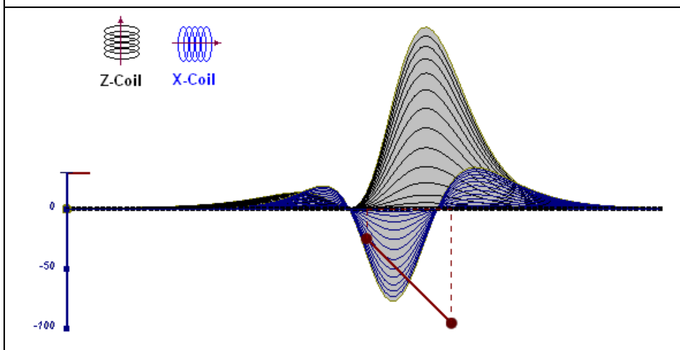


Figure D-3: inclined thin plate

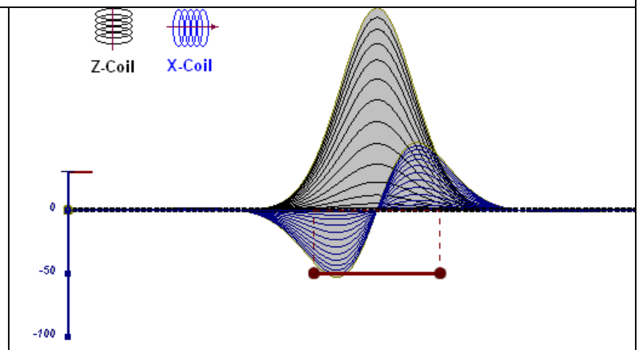


Figure D-4: horizontal thin plate

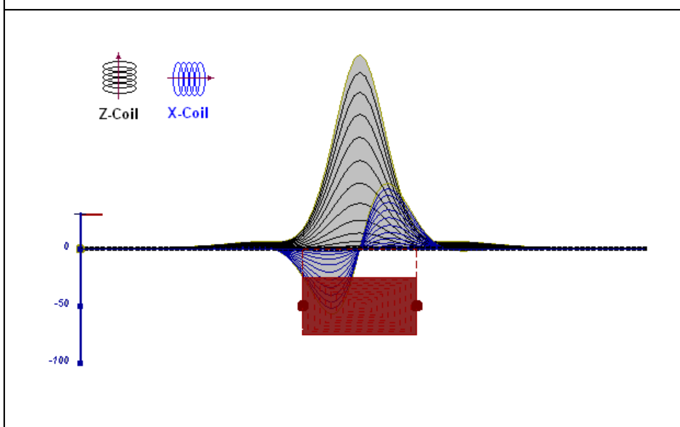


Figure D-5: horizontal thick plate (linear scale of the response)

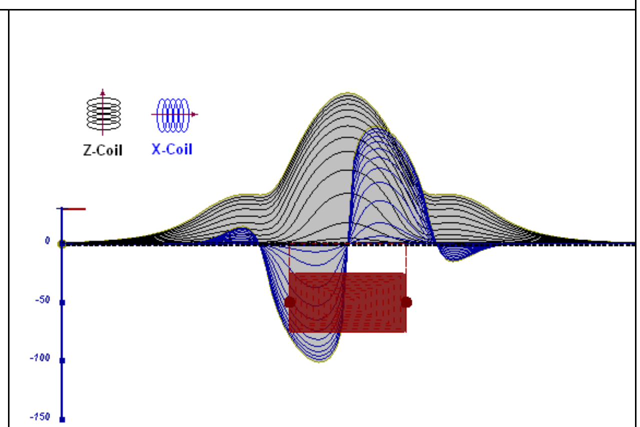


Figure D-6: horizontal thick plate (log scale of the response)

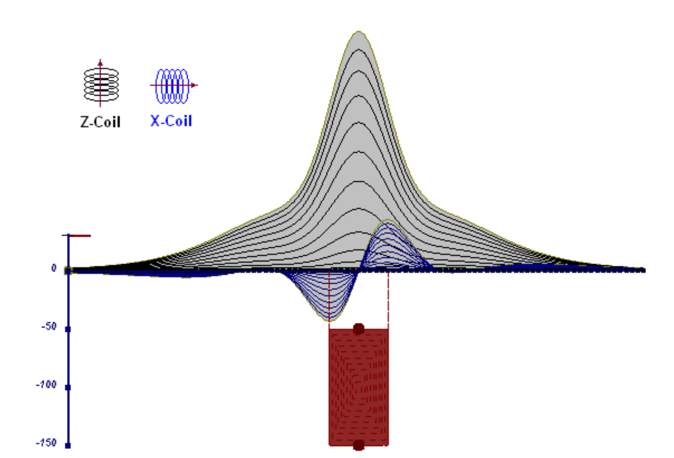


Figure D-7: vertical thick plate (linear scale of the response). 50 m depth

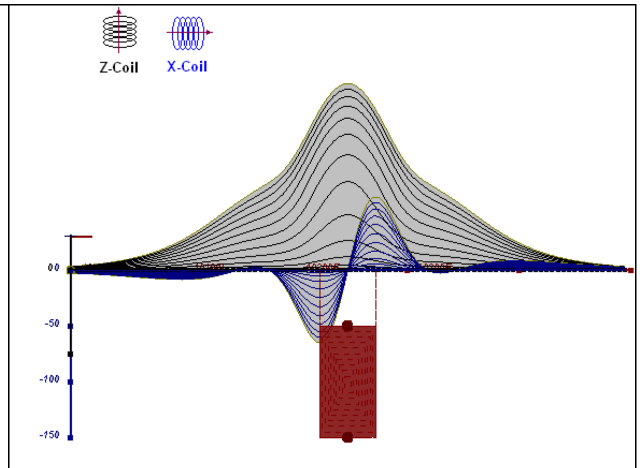


Figure D-8: vertical thick plate (log scale of the response). 50 m depth

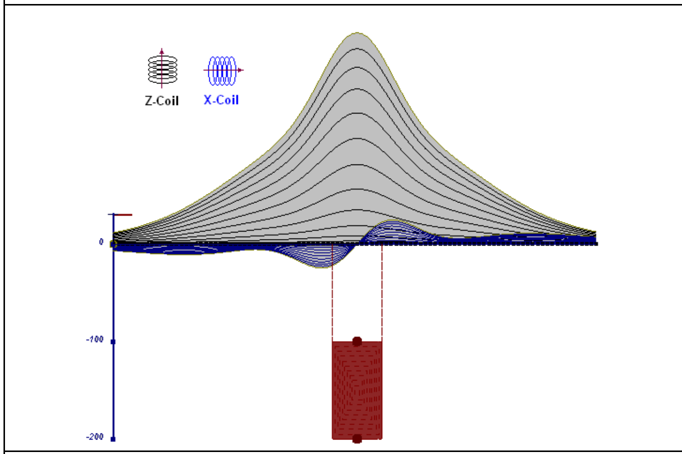


Figure D-9: vertical thick plate (linear scale of the response). 100 m depth

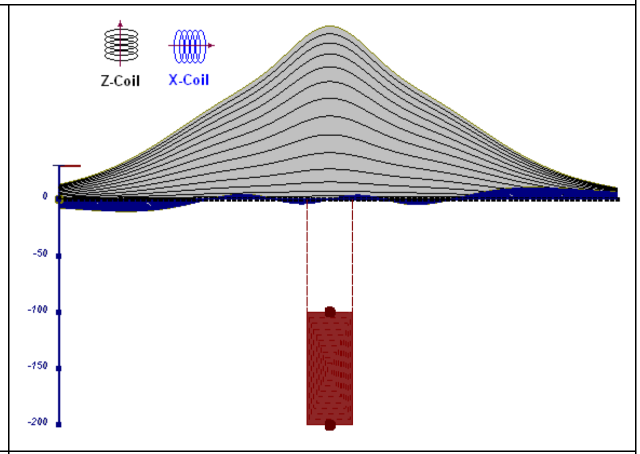


Figure D-10: vertical thick plate (linear scale of the response). Depth/hor.thickness=2.5

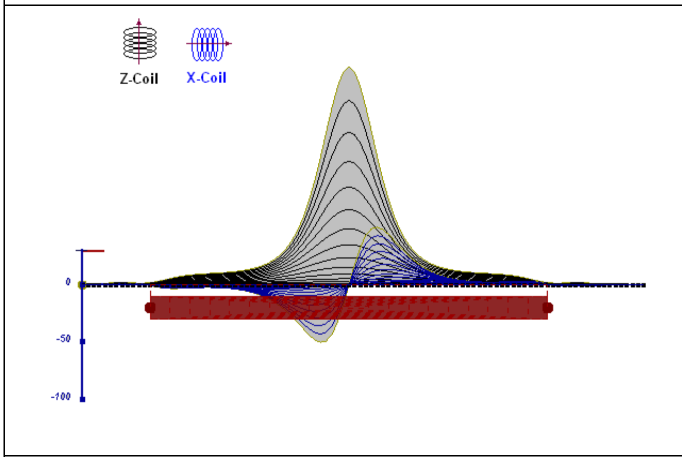


Figure D-11: horizontal thick plate (linear scale of the response)

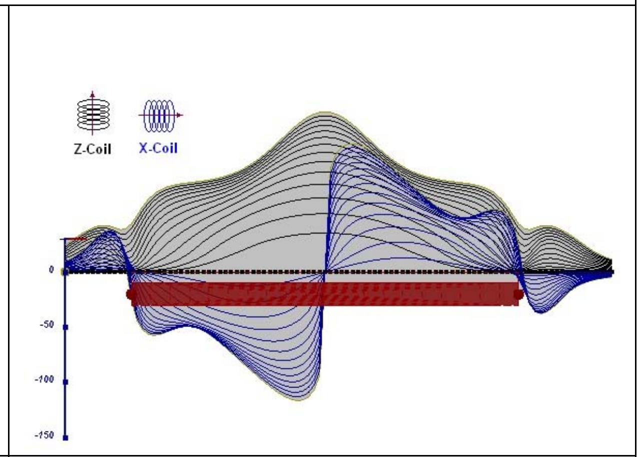


Figure D-12: horizontal thick plate (log scale of the response)

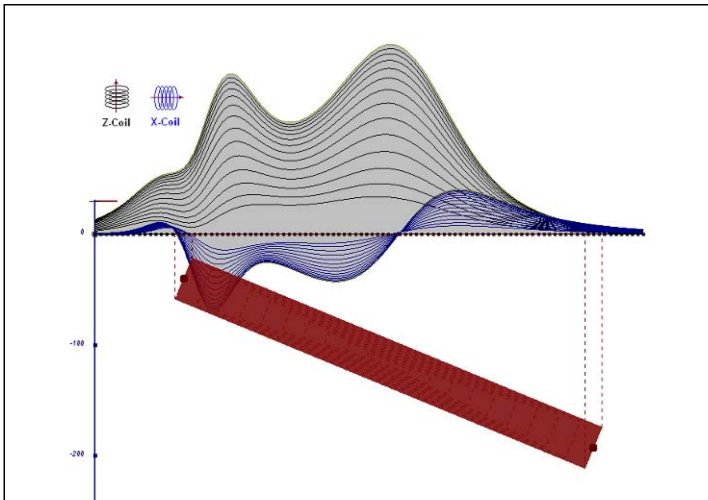


Figure D-13: inclined long thick plate

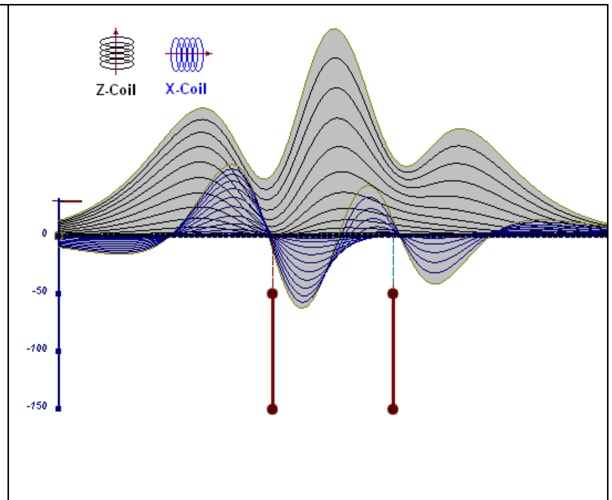


Figure D-14: two vertical thin plates

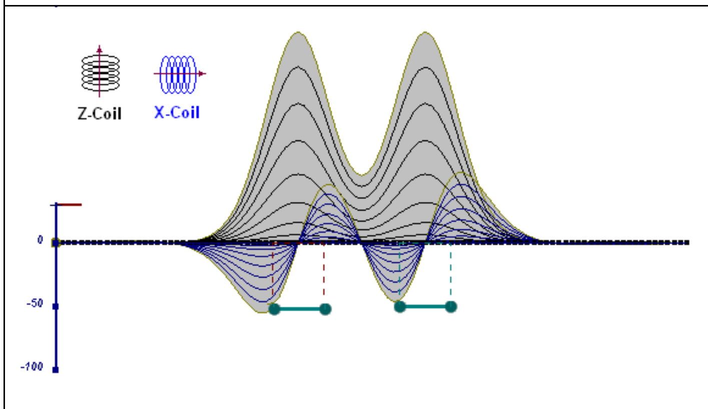


Figure D-15: two horizontal thin plates

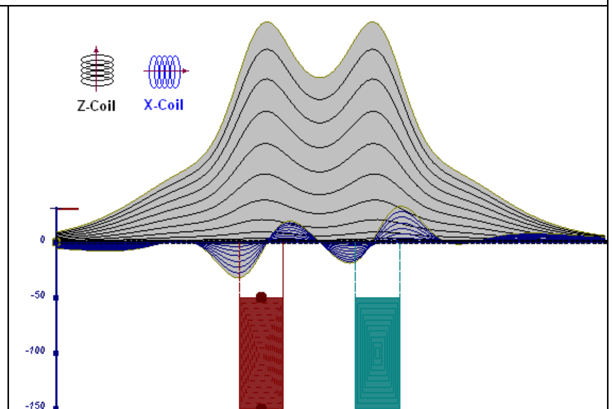


Figure D-16: two vertical thick plates

The same type of target but with different thickness, for example, creates different form of the response:

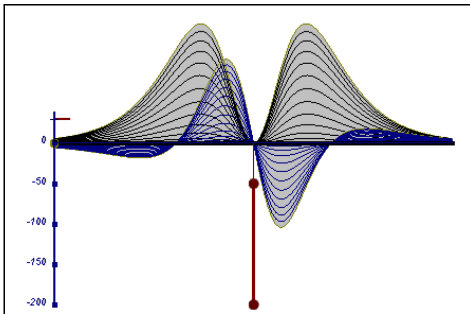
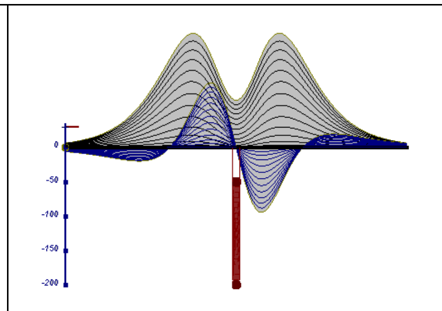
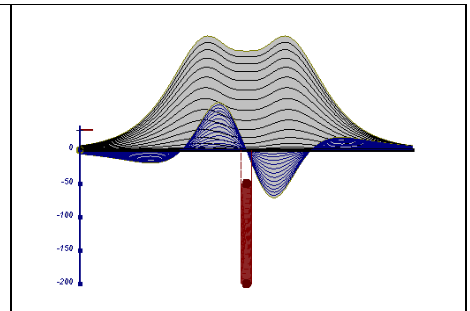
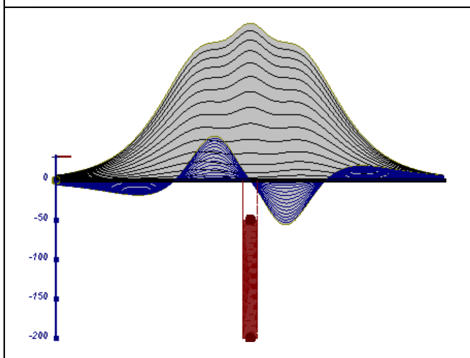
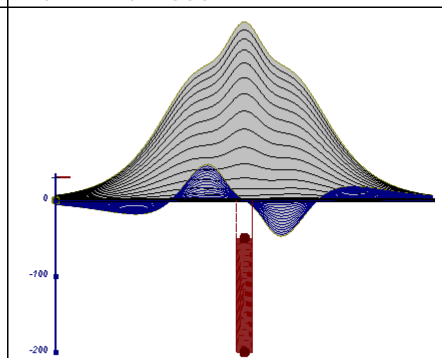
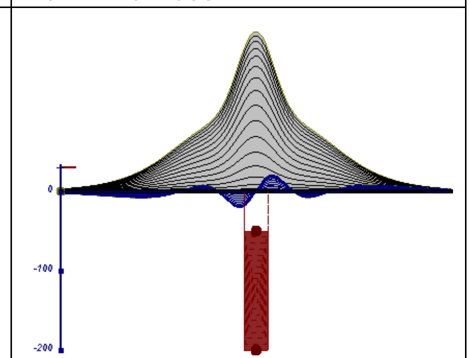
		
“thin”	10 m thickness	15 m thickness
		
18 m thickness	20 m thickness	30 m thickness

Figure D-17: Conductive vertical plate, depth 50 m, strike length 200 m, depth extend 150 m.

Alexander Prikhodko, PhD, P.Geo
Geotech Ltd.

September 2010

APPENDIX E

EM TIME CONSTANT (TAU) ANALYSIS

Estimation of time constant parameter[1] in transient electromagnetic method is one of the steps toward the extraction of the information about conductances beneath the surface from TEM measurements.

The most reliable method to discriminate or rank conductors from overburden, background or one and other is by calculating the EM field decay time constant (TAU parameter), which directly depends on conductance despite their depth and accordingly amplitude of the response.

Theory

As established in electromagnetic theory, the magnitude of the electro-motive force (emf) induced is proportional to the time rate of change of primary magnetic field at the conductor. This emf causes eddy currents to flow in the conductor with a characteristic transient decay, whose Time Constant (Tau) is a function of the conductance of the survey target or conductivity and geometry (including dimensions) of the target. The decaying currents generate a proportional secondary magnetic field, the time rate of change of which is measured by the receiver coil as induced voltage during the Off time.

The receiver coil output voltage (**e_0**) is proportional to the time rate of change of the secondary magnetic field and has the form,

$$e_0 \alpha (1 / \tau) e^{-(t / \tau)}$$

Where,
τ = L/R is the characteristic time constant of the target (TAU)
R = resistance
L = inductance

From the expression, conductive targets that have small value of resistance and hence large value of τ yield signals with small initial amplitude that decays relatively slowly with progress of time. Conversely, signals from poorly conducting targets that have large resistance value and small τ, have high initial amplitude but decay rapidly with time[1] (Figure E-1).

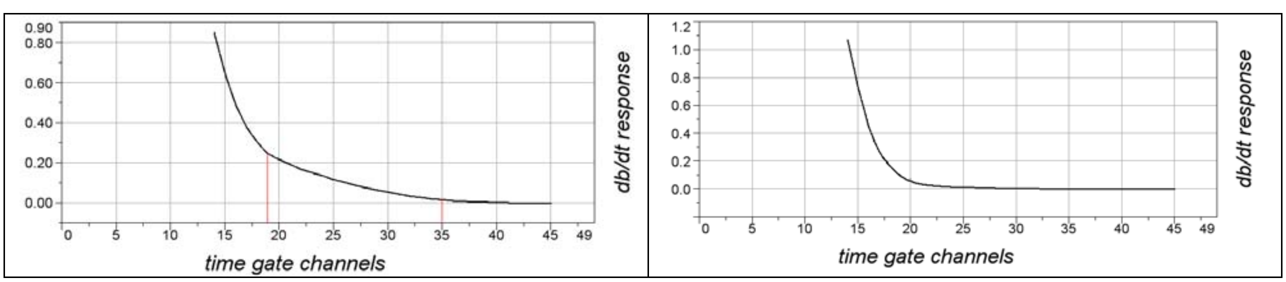


Figure E-1: Left – presence of good conductor, right – poor conductor.

[1] McNeill, JD, 1980, "Applications of Transient Electromagnetic Techniques", Technical Note TN-7 page 5, Geonics Limited, Mississauga, Ontario.

EM Time Constant (Tau) Calculation

The EM Time-Constant (TAU) is a general measure of the speed of decay of the electromagnetic response and indicates the presence of eddy currents in conductive sources as well as reflecting the "conductance quality" of a source. Although TAU can be calculated using either the measured dB/dt decay or the calculated B-field decay, dB/dt is commonly preferred due to better stability (S/N) relating to signal noise. Generally, TAU calculated on base of early time response reflects both near surface overburden and poor conductors whereas, in the late ranges of time, deep and more conductive sources, respectively. For example early time TAU distribution in an area that indicates conductive overburden is shown in Figure 2.

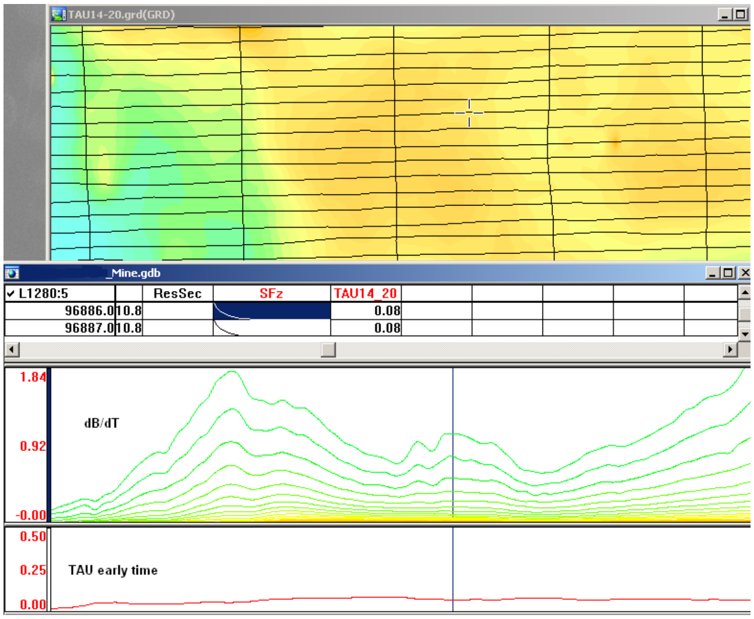


Figure E-2: Map of early time TAU. Area with overburden conductive layer and local sources.

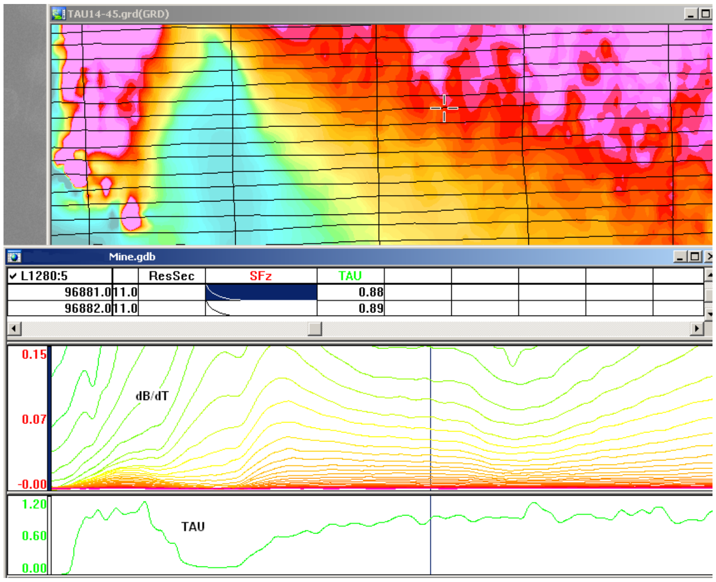


Figure E-3: Map of full time range TAU with EM anomaly due to deep highly conductive target.

There are many advantages of TAU maps:

- TAU depends only on one parameter (conductance) in contrast to response magnitude;
- TAU is integral parameter, which covers time range and all conductive zones and targets are displayed independently of their depth and conductivity on a single map.
- Very good differential resolution in complex conductive places with many sources with different conductivity.
- Signs of the presence of good conductive targets are amplified and emphasized independently of their depth and level of response accordingly.

In the example shown in Figure 4 and 5, three local targets are defined, each of them with a different depth of burial, as indicated on the resistivity depth image (RDI). All are very good conductors but the deeper target (number 2) has a relatively weak dB/dt signal yet also features the strongest total TAU (Figure 4). This example highlights the benefit of TAU analysis in terms of an additional target discrimination tool.

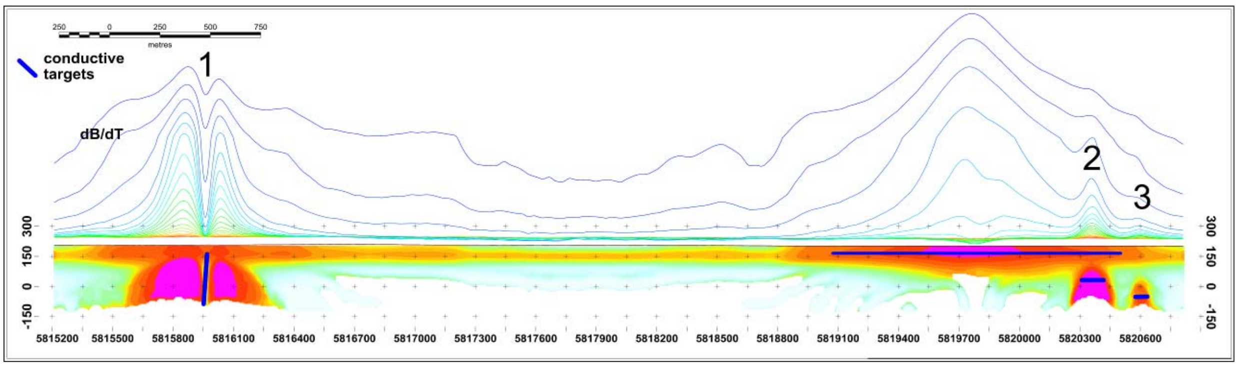


Figure E-4: dB/dt profile and RDI with different depths of targets.

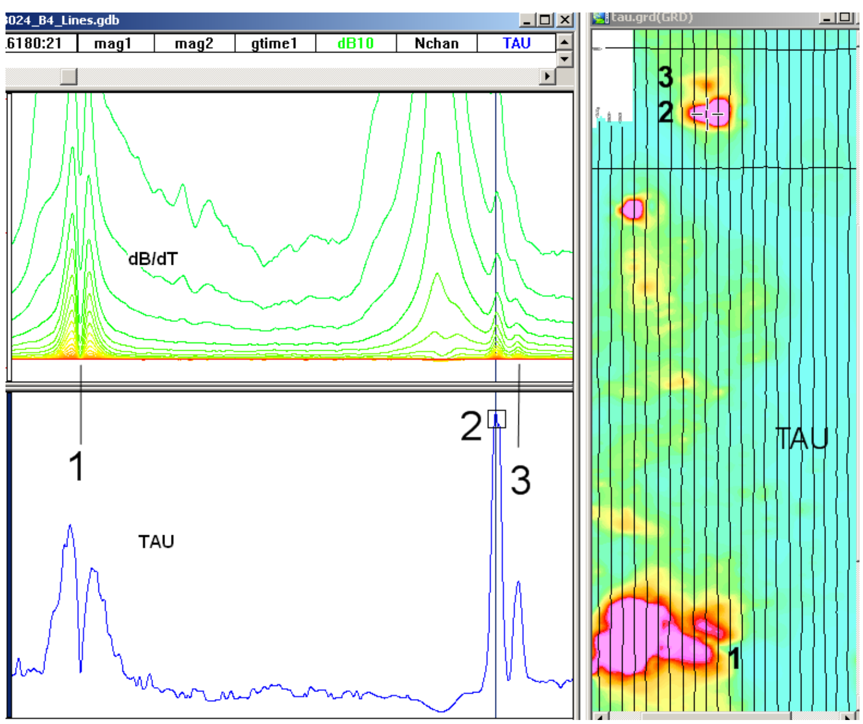


Figure E-5: Map of total TAU and dB/dt profile.

The EM Time Constants for dB/dt and B-field were calculated using the "sliding Tau" in-house program developed at Geotech[2]. The principle of the calculation is based on using of time window (4 time channels) which is sliding along the curve decay and looking for latest time channels which have a response above the level of noise and decay. The EM decays are obtained from all available decay channels, starting at the latest channel. Time constants are taken from a least square fit of a straight-line (log/linear space) over the last 4 gates above a pre-set signal threshold level (Figure F6). Threshold settings are pointed in the "label" property of TAU database channels. The sliding Tau method determines that, as the amplitudes increase, the time-constant is taken at progressively later times in the EM decay. Conversely, as the amplitudes decrease, Tau is taken at progressively earlier times in the decay. If the maximum signal amplitude falls below the threshold, or becomes negative for any of the 4 time gates, then Tau is not calculated and is assigned a value of "dummy" by default.

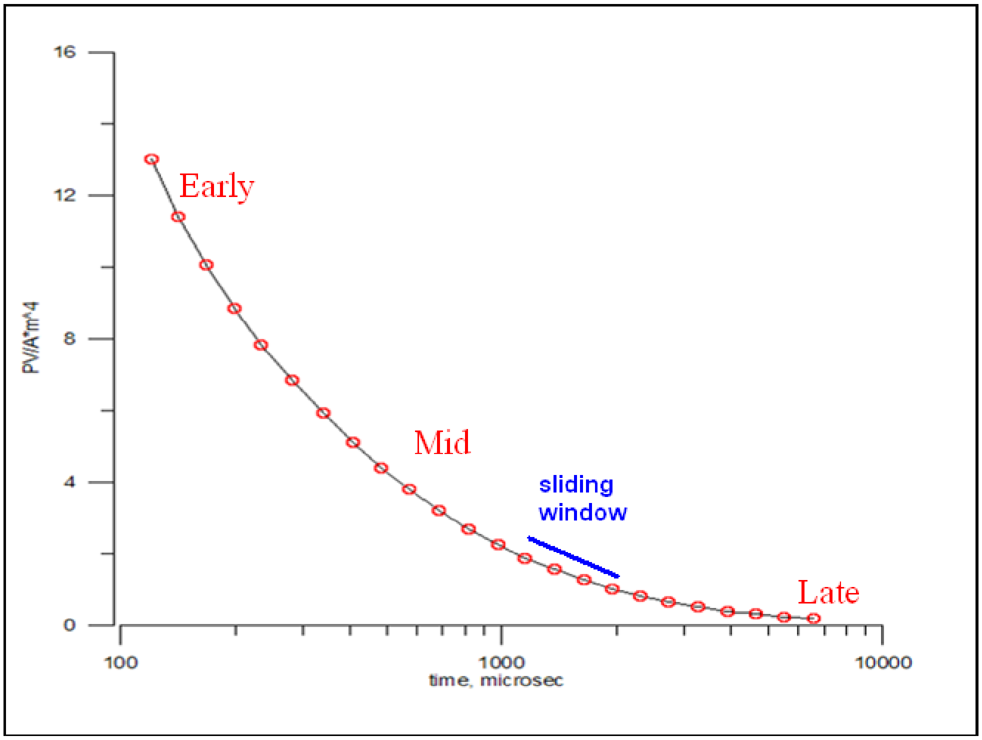


Figure E-6: Typical dB/dt decays of VTEM data

Alexander Prikhodko, PhD, P.Geo
Geotech Ltd.

September 2010

[2] by A.Prikhodko

APPENDIX F

TEM RESISTIVITY DEPTH IMAGING (RDI)

Resistivity depth imaging (RDI) is technique used to rapidly convert EM profile decay data into an equivalent resistivity versus depth cross-section, by deconvolving the measured TEM data.
The used RDI algorithm of Resistivity-Depth transformation is based on scheme of the apparent resistivity transform of Maxwell A.Meju (1998)[1] and TEM response from conductive half-space. The program is developed by Alexander Prikhodko and depth calibrated based on forward plate modeling for VTEM system configuration (Fig. 1-10).

RDIs provide reasonable indications of conductor relative depth and vertical extent, as well as accurate 1D layered-earth apparent conductivity/resistivity structure across VTEM flight lines. Approximate depth of investigation of a TEM system, image of secondary field distribution in half space, effective resistivity, initial geometry and position of conductive targets is the information obtained on base of the RDIs.

Maxwell forward modeling with RDI sections from the synthetic responses (VTEM system)

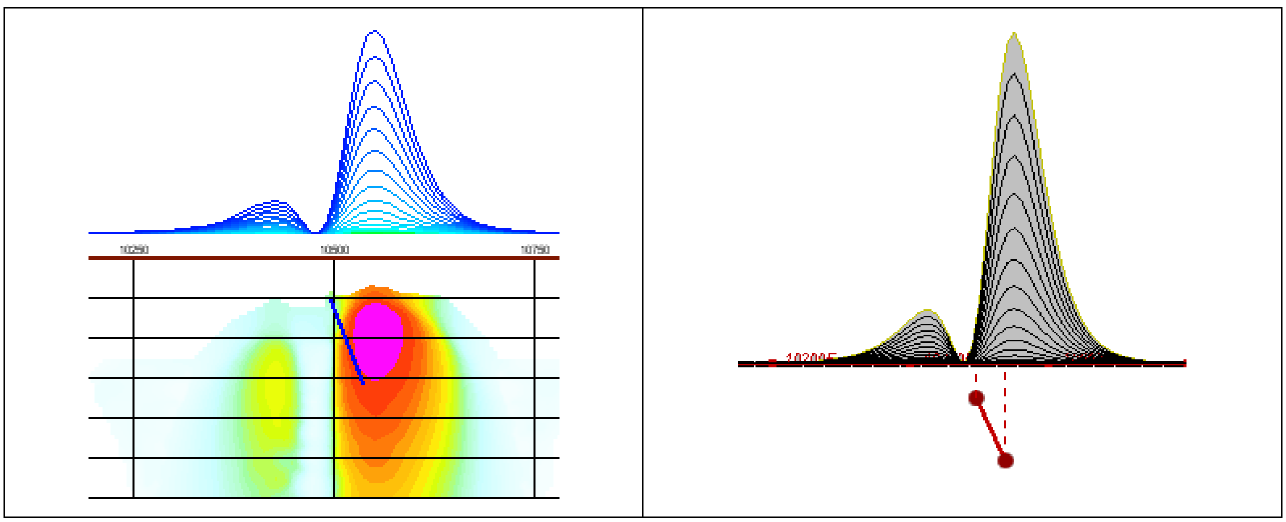


Figure F-1: Maxwell plate model and RDI from the calculated response for conductive "thin" plate (depth 50 m, dip 65 degree, depth extend 100 m).

[1] Maxwell A.Meju, 1998, Short Note: A simple method of transient electromagnetic data analysis, Geophysics, **63**, 405–410.

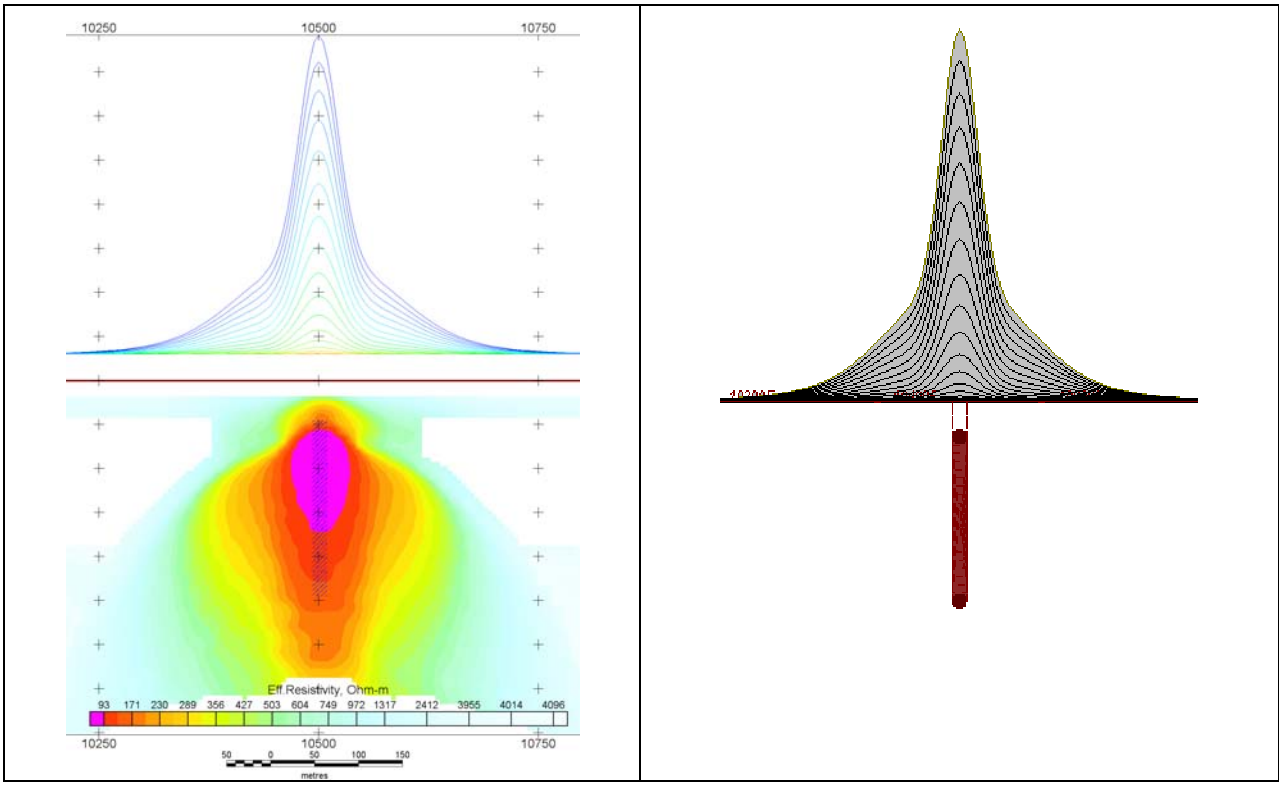


Figure F-2: Maxwell plate model and RDI from the calculated response for “thick” plate 18 m thickness, depth 50 m, depth extend 200 m).

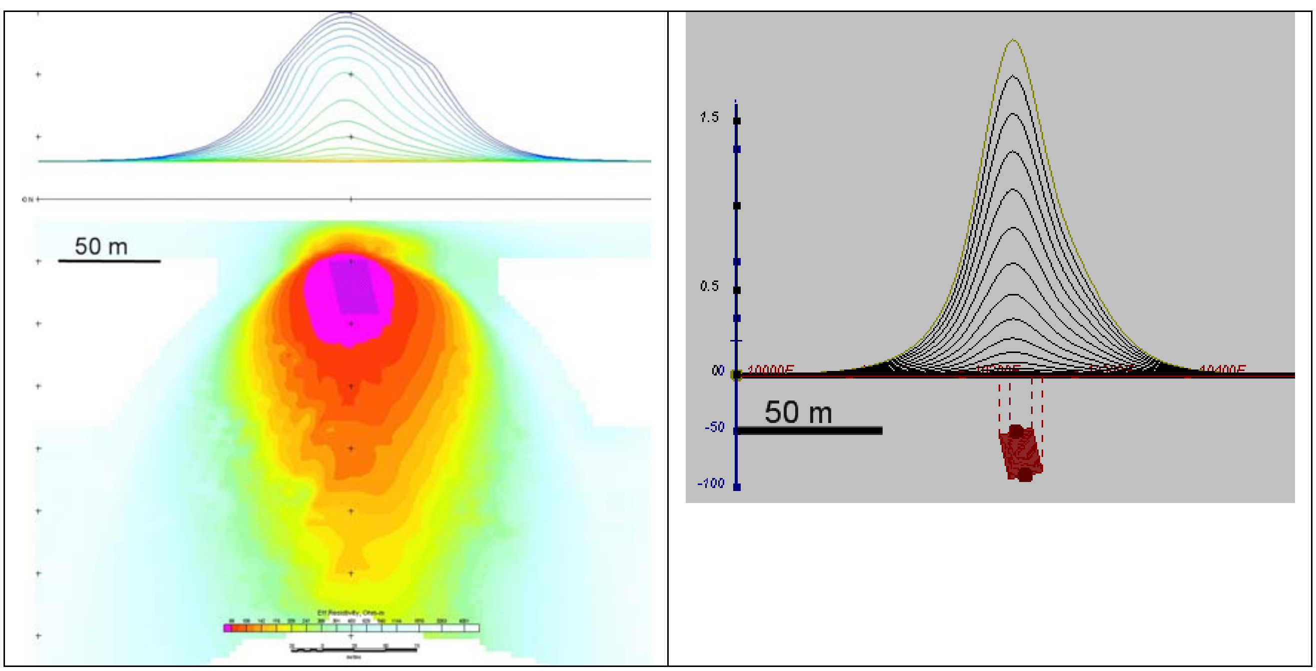


Figure F-3: Maxwell plate model and RDI from the calculated response for bulk (“thick”) 100 m length, 40 m depth extend, 30 m thickness

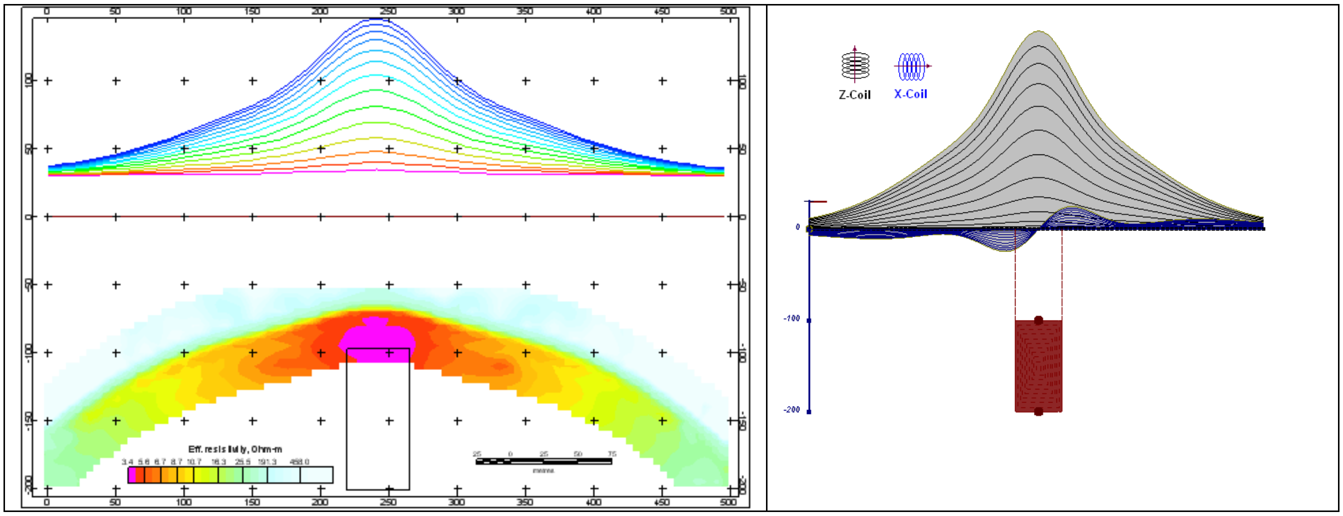


Figure F-4: Maxwell plate model and RDI from the calculated response for "thick" vertical target (depth 100 m, depth extend 100 m). 19-44 chan.

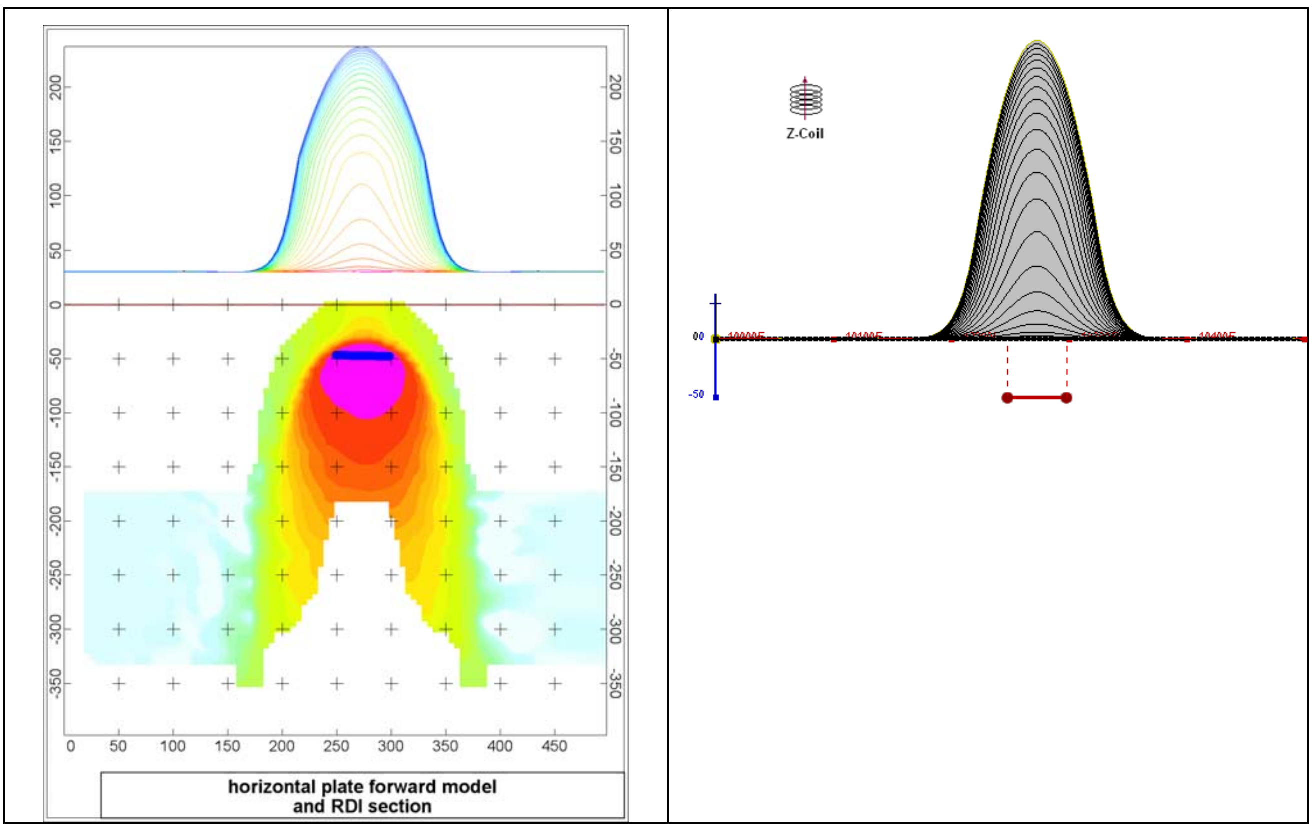


Figure F-5: Maxwell plate model and RDI from the calculated response for horizontal thin plate (depth 50 m, dim 50x100 m). 15-44 chan.

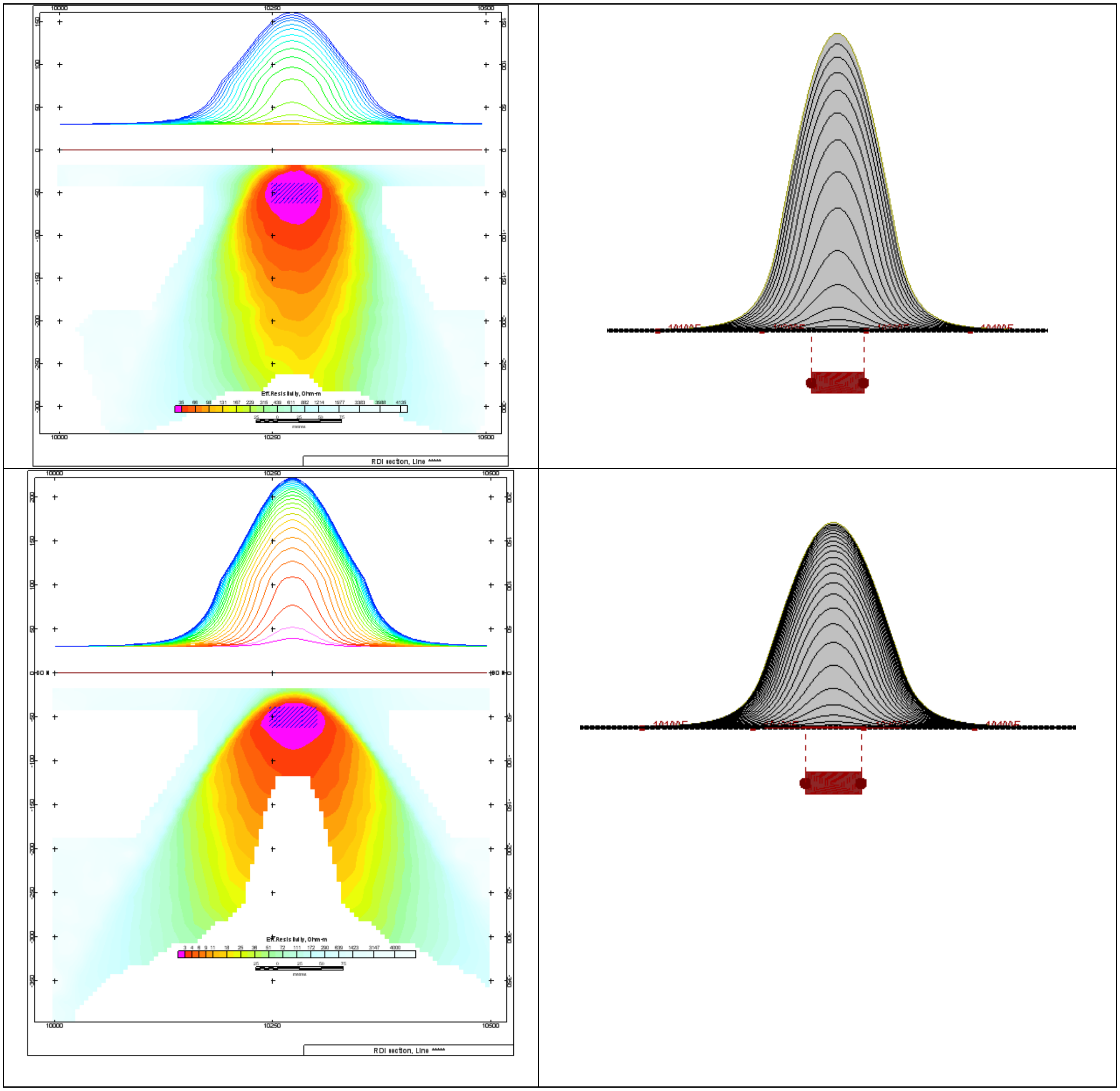


Figure F-6: Maxwell plate model and RDI from the calculated response for horizontal thick (20m) plate – less conductive (on the top), more conductive (below)

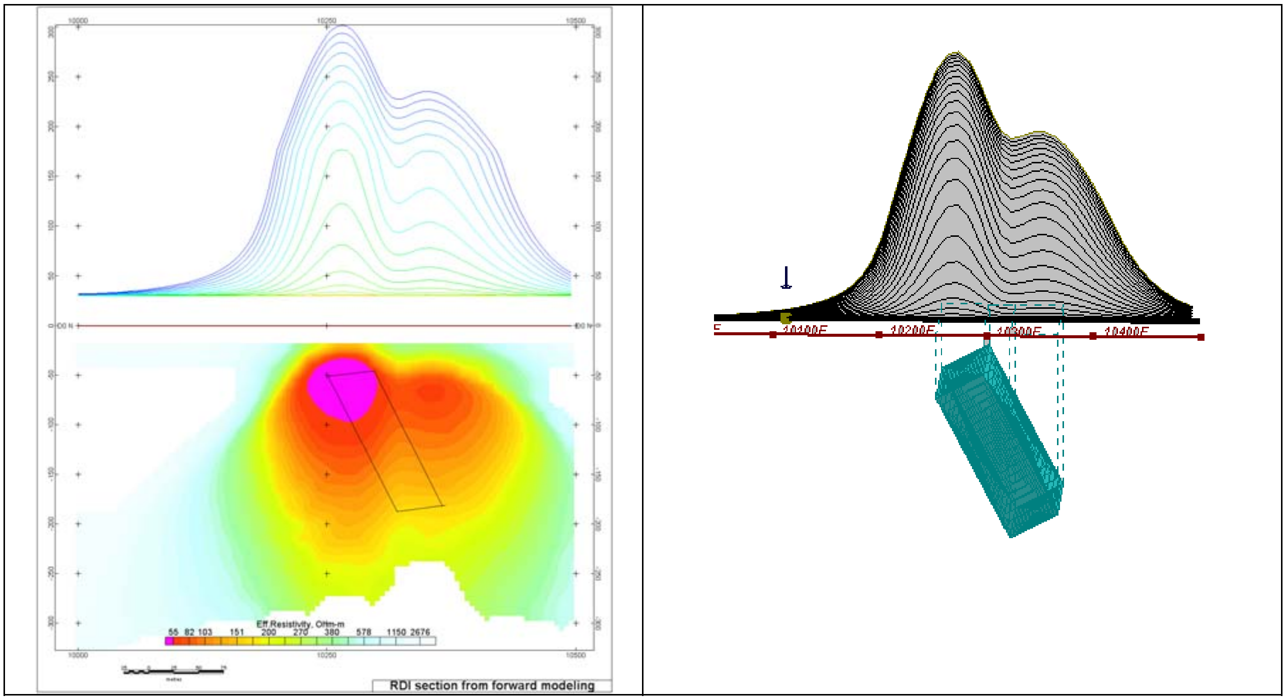


Figure F-7: Maxwell plate model and RDI from the calculated response for inclined thick (50m) plate. Depth extends 150 m, depth to the target 50 m.

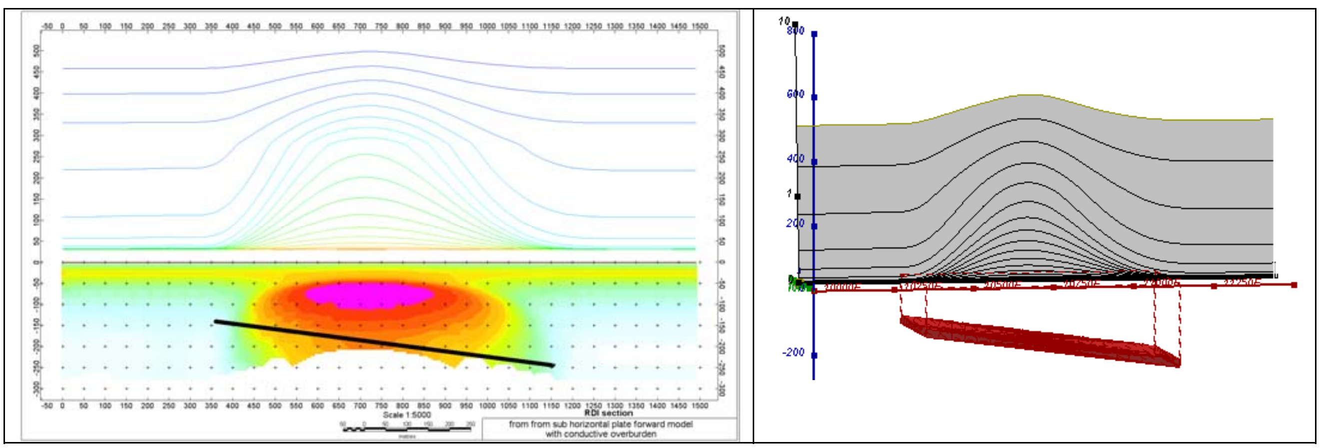


Figure F-8: Maxwell plate model and RDI from the calculated response for the long, wide and deep subhorizontal plate (depth 140 m, dim 25x500x800 m) with conductive overburden.

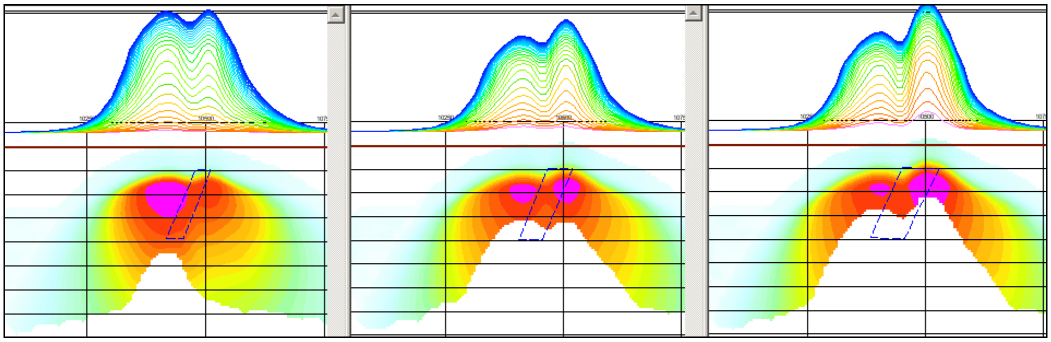


Figure F-9: Maxwell plate models and RDIs from the calculated response for “thick” dipping plates (35, 50, 75 m thickness), depth 50 m, conductivity 2.5 S/m.

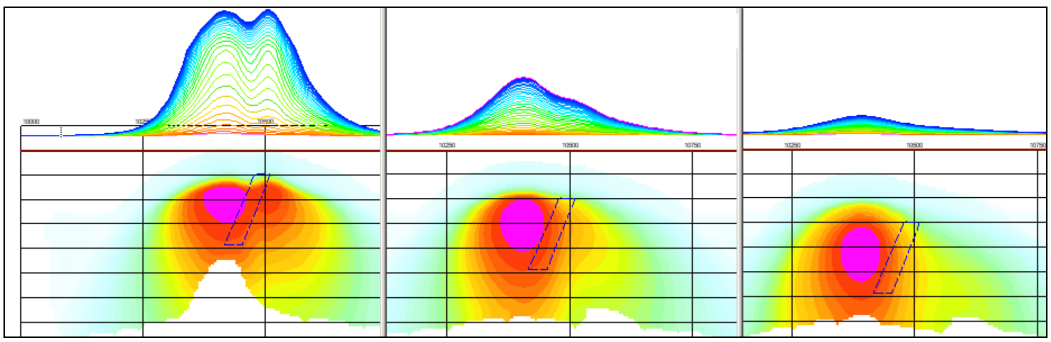


Figure F-10: Maxwell plate models and RDIs from the calculated response for “thick” (35 m thickness) dipping plate on different depth (50, 100, 150 m), conductivity 2.5 S/m.

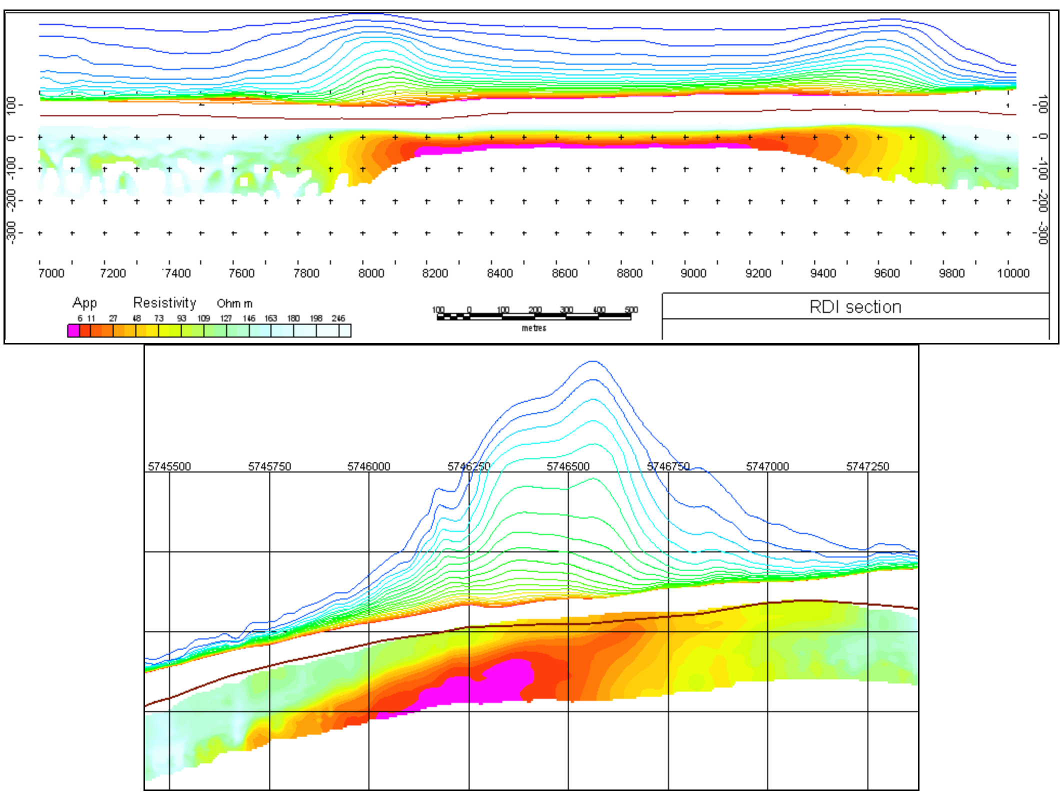
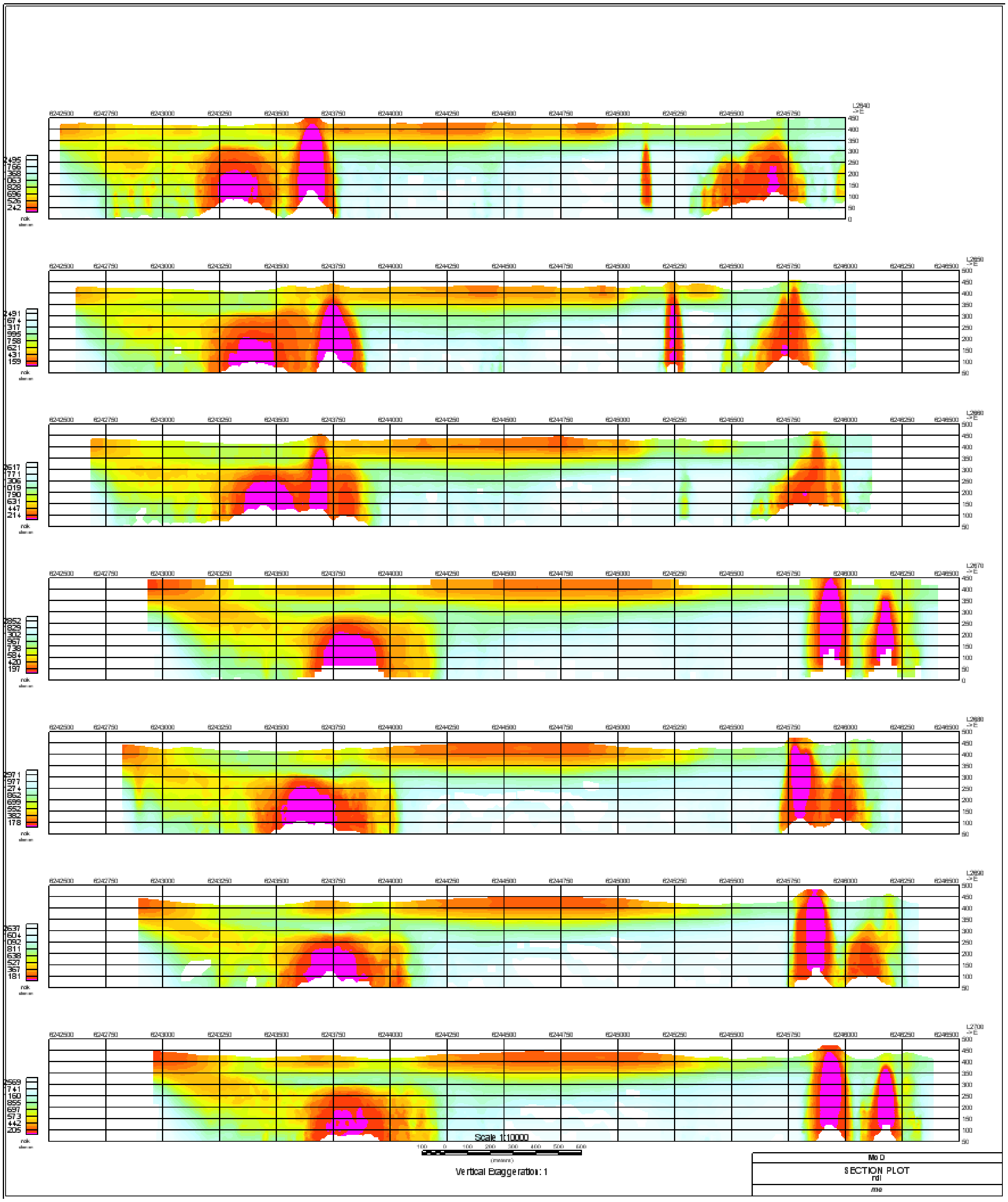


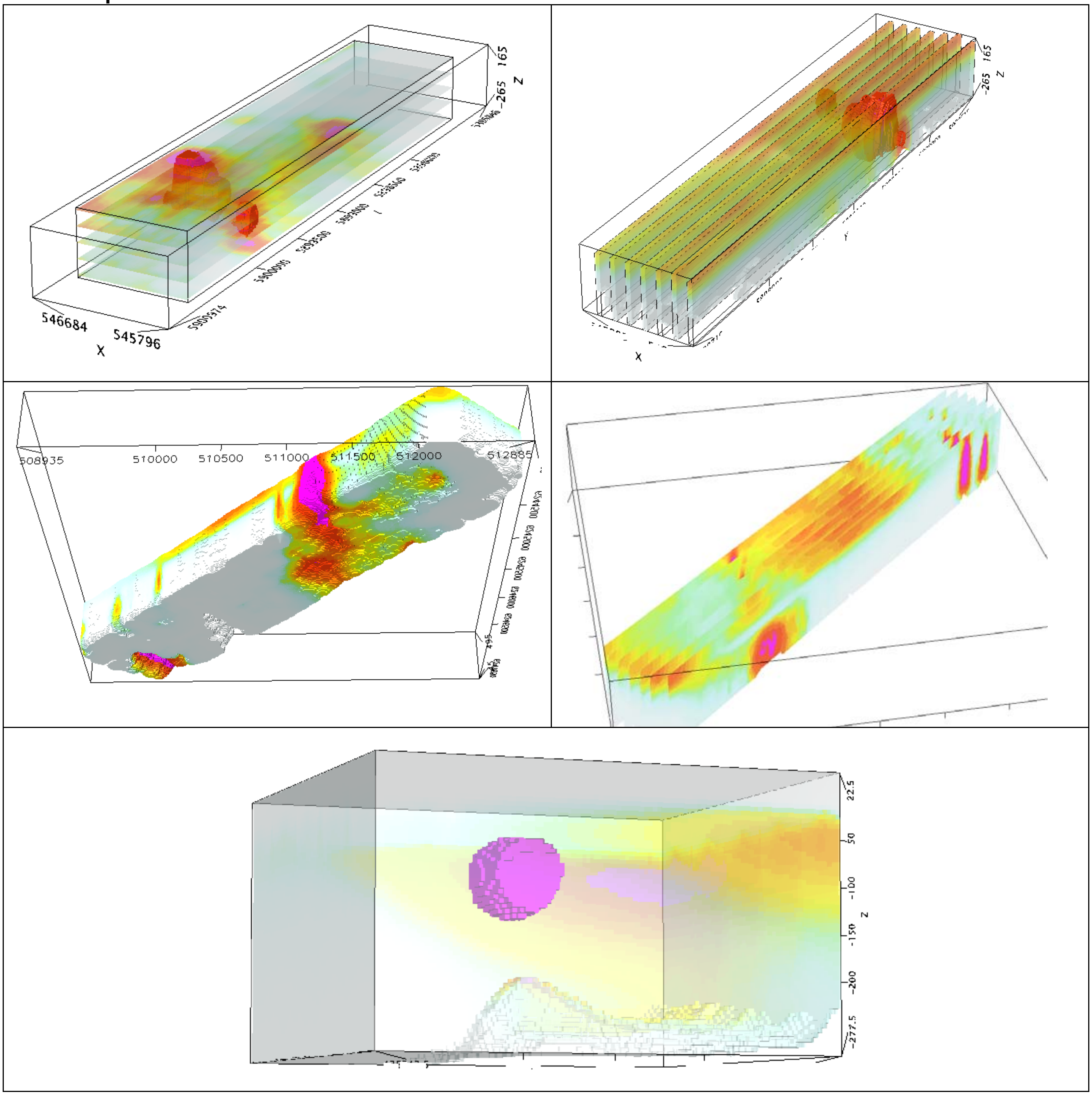
Figure F-11: RDI section for the real horizontal and slightly dipping conductive layers

FORMS OF RDI PRESENTATION

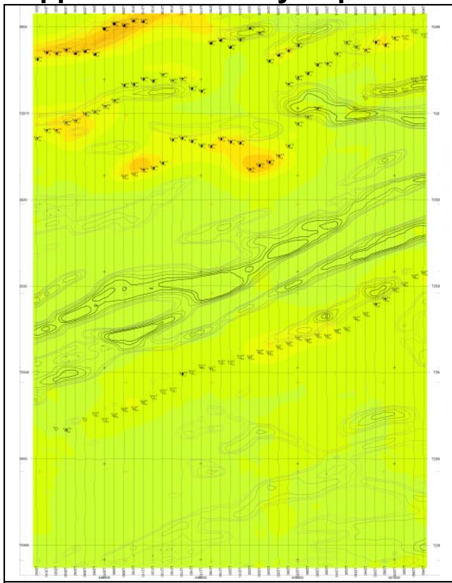
Presentation of series of lines

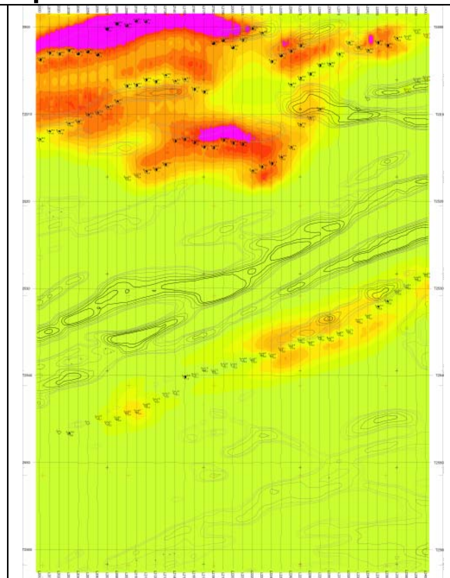


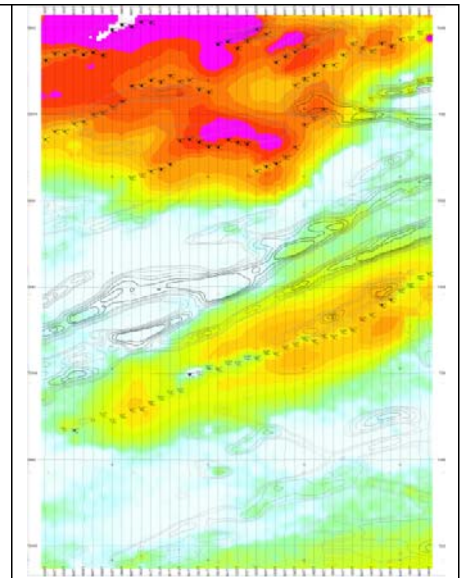
3d presentation of RDIs



Apparent Resistivity Depth Slices plans:

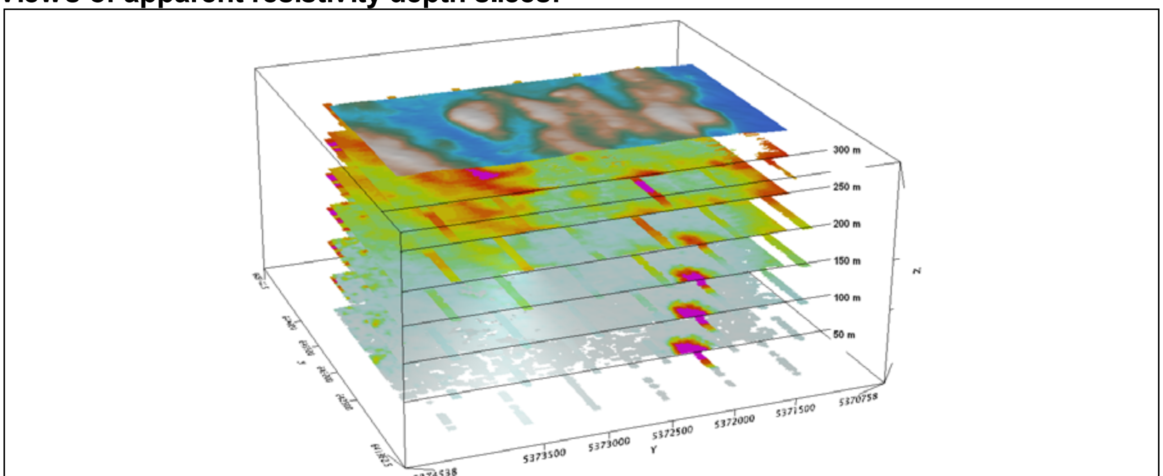


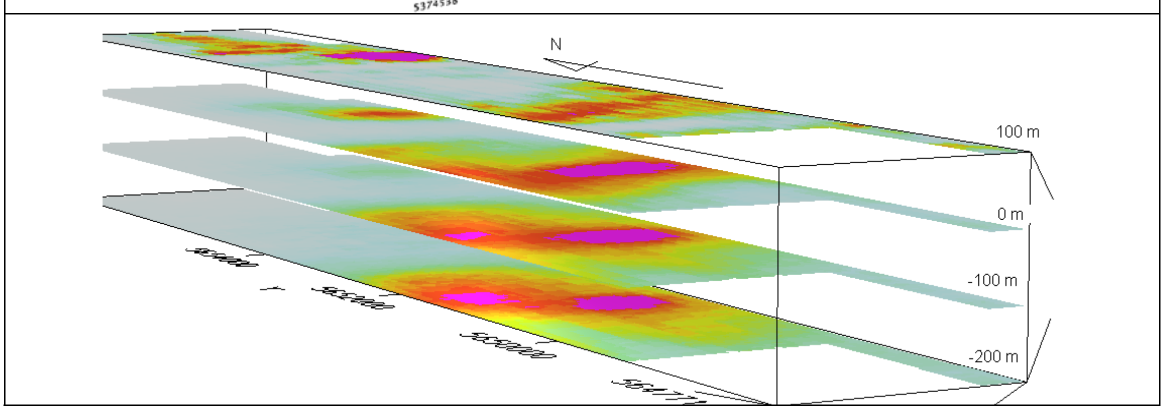




0 m (surface)	-100 m	-200 m

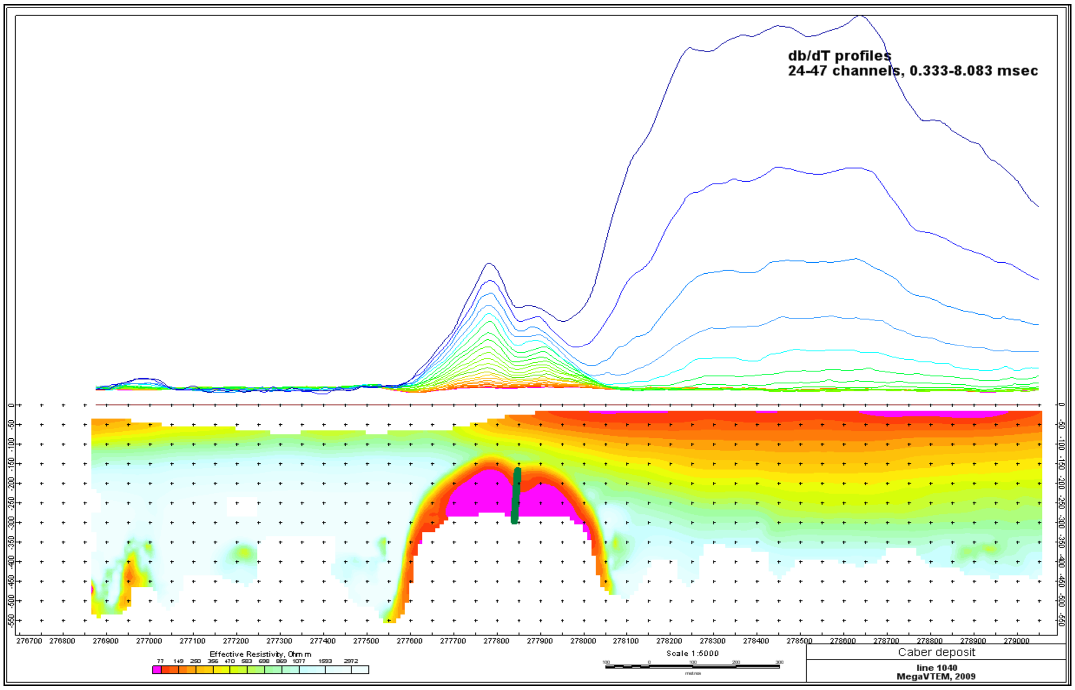
3d views of apparent resistivity depth slices:



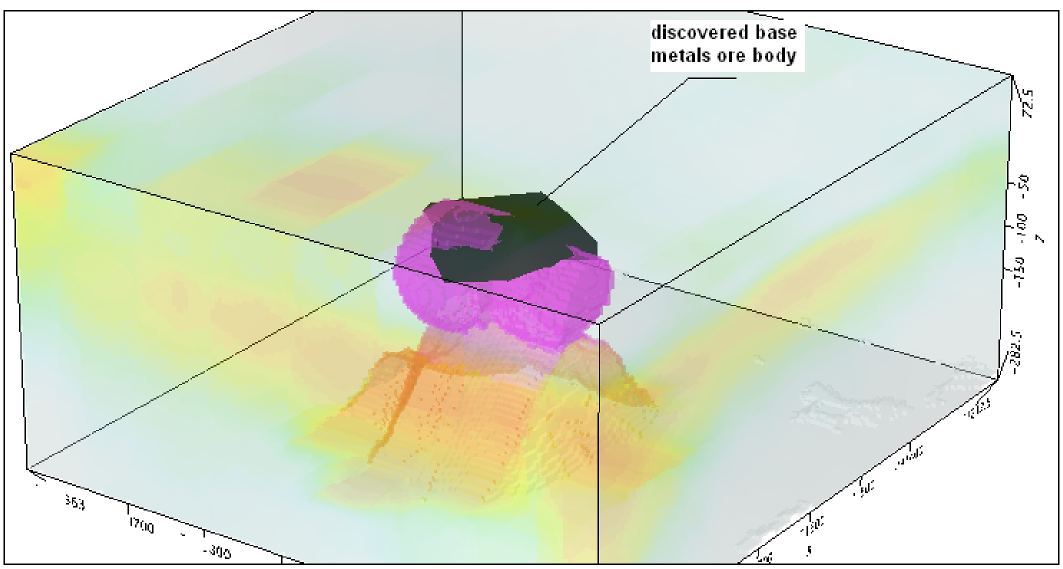


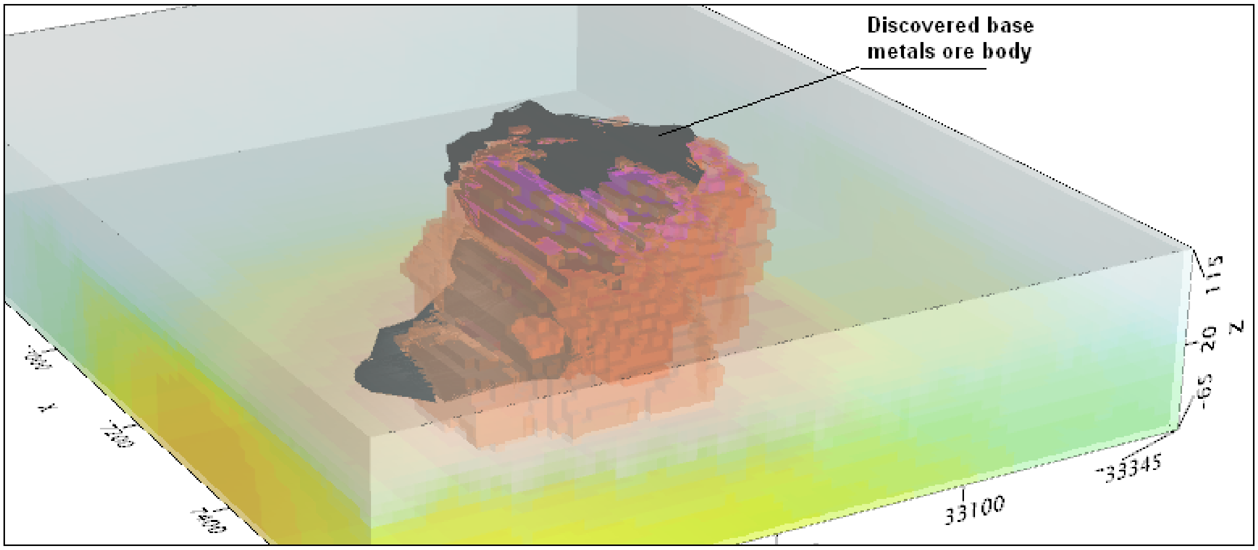
Real base metal targets in comparison with RDIs:

RDI section of the line over Caber deposit (“thin” subvertical plate target and conductive overburden).



3d RDI voxels with base metals ore bodies (Middle East):



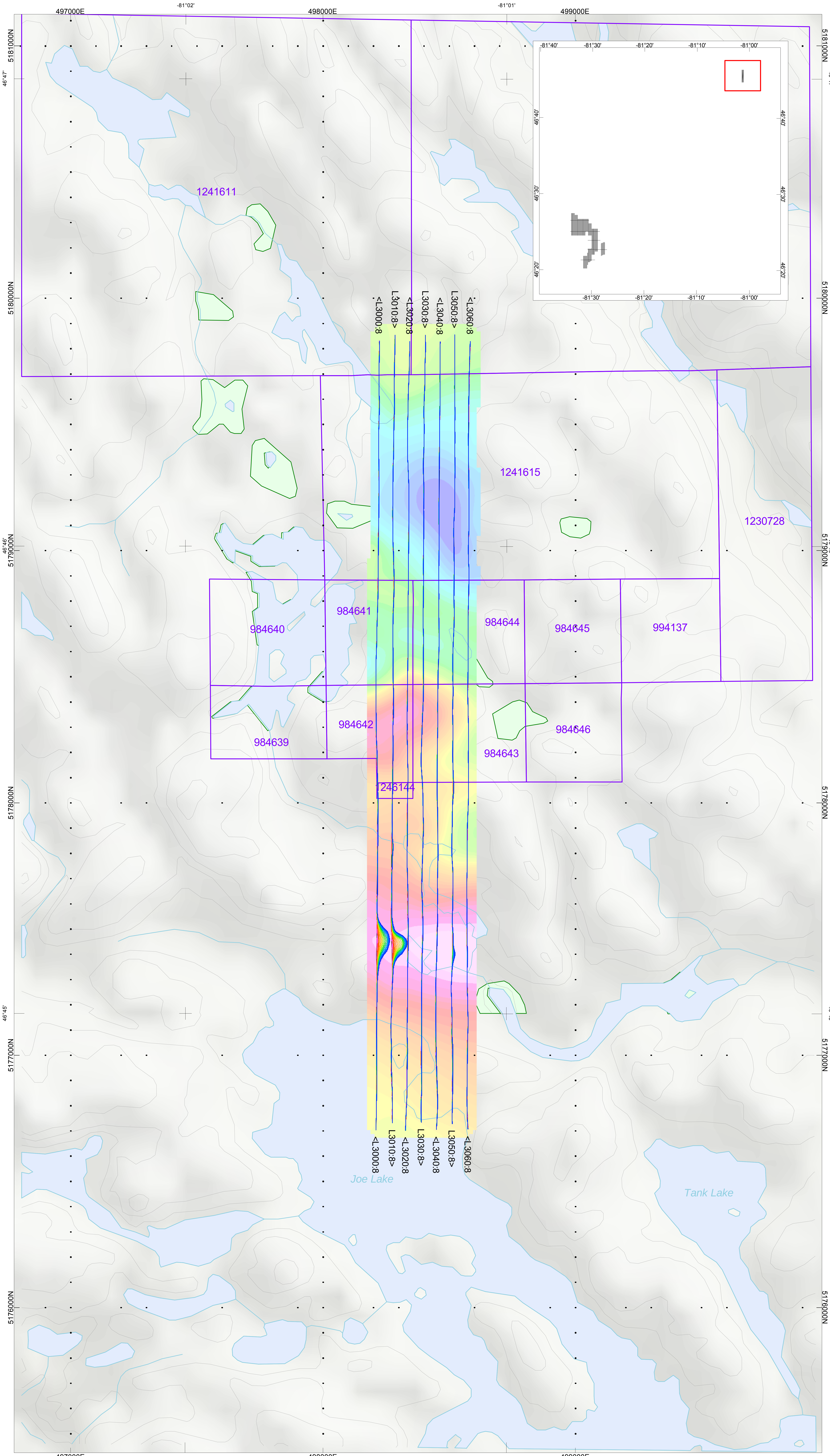


Alexander Prikhodko, PhD, P.Geo
Geotech Ltd.
April 2011

APPENDIX G

Resistivity Depth Images (RDI)

Please see RDI folder on attached DVD for PDF



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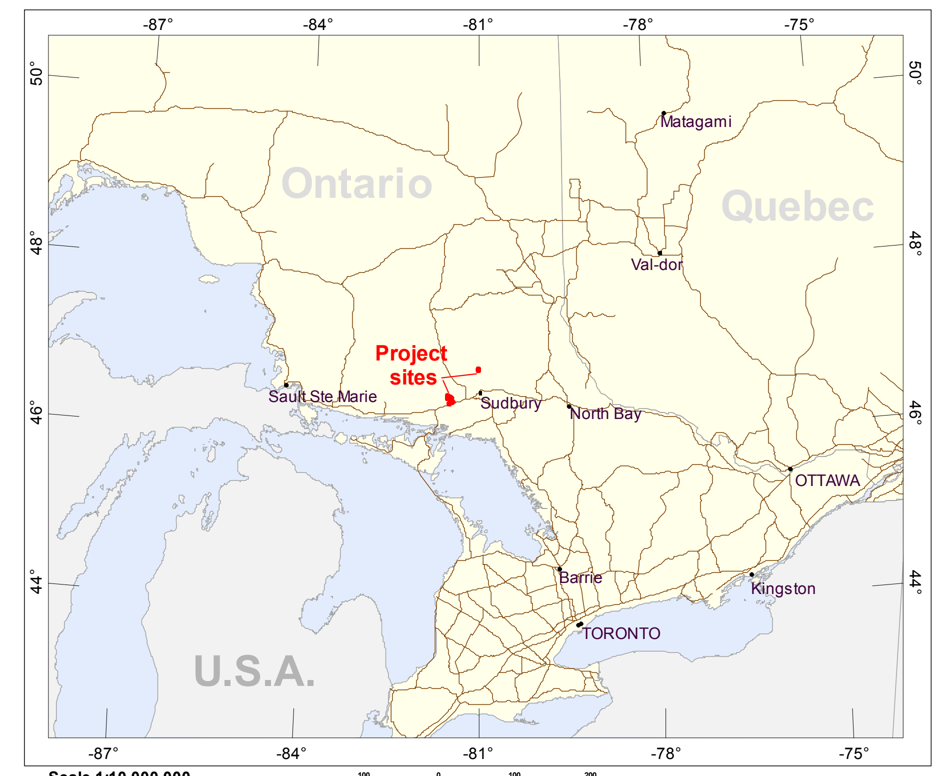

Scale 1:10,000,000

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SURVEY SPECIFICATIONS:
- Survey Date: January 20th to February 4th and March 19,2015
- Survey Base: Windy Lake, Ontario
- Aircraft: Aerospatiale AW 119 Koala (C-GVMX)
- Survey Line Spacing: 60 Meters
- Survey Line Direction: N 0° E / N 180° E
- Tie Line Spacing: n/a
- Tie Line Direction: n/a
- Average Aircraft Terrain Clearance: 93 Meters
- EM Transmitter Loop: Towed at an average terrain clearance of 48 meters below the helicopter
- Magnetic Sensor: Towed at an average terrain clearance of 10 meters below the helicopter

INSTRUMENTS
- Geotech Time Domain Electromagnetic System (VTEM)
- Concentric Rx/Tx Geometry
- X-Coil Diameter 0.32m
- Z-Coil Diameter 1.2m
- Transmitter Loop: Diameter 35 Meters
- Dipole Moment: 1,392,976 nIA
- Transmitter Wave Form: Trapezoid, Pulse Width 5.75 ms, Base Frequency 30 Hz
- Geometrics High Sensitivity Caesium Magnetometers
- Mag Resolution: 0.02 nT at 10 samples/sec

MAP PROJECTION
- Datum: NAD27
- Projection: Universal Transverse Mercator
- Central Meridian: 81°W (Zone 17N)
- Central Scale Factor: 0.9996
- False Easting/Northing: 500,000m/0m
- Major Axis: 6378206.4
- Inverse Flattening: 294.9787
- NTS: 041I05, 041I06, 041I11, 041I14

Profiles scale 1 mm = 0.012 (pV*ms)/(A*m^4)

(Linear between +/-0.05 (pV*ms)/(A*m^4) logarithmic above 0.05 (pV*ms)/(A*m^4)

- 0.220 ms (B-field)
- 0.253 ms (B-field)
- 0.290 ms (B-field)
- 0.333 ms (B-field)
- 0.383 ms (B-field)
- 0.440 ms (B-field)
- 0.505 ms (B-field)
- 0.580 ms (B-field)
- 0.667 ms (B-field)
- 0.766 ms (B-field)
- 0.880 ms (B-field)
- 1.010 ms (B-field)
- 1.161 ms (B-field)
- 1.333 ms (B-field)
- 1.531 ms (B-field)
- 1.760 ms (B-field)
- 2.021 ms (B-field)
- 2.323 ms (B-field)
- 2.667 ms (B-field)
- 3.063 ms (B-field)
- 3.521 ms (B-field)
- 4.042 ms (B-field)
- 4.641 ms (B-field)
- 5.333 ms (B-field)
- 6.125 ms (B-field)
- 7.036 ms (B-field)

56706
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TMI
(nT)

TOPOGRAPHIC LEGEND:
- Streams / Rivers
- Contours
- Lakes / Ponds
- Wetlands
- Mining Claims

N

Scale 1:10000

100 0 100 200 300 400 500

(meters)

NAD27 / UTM zone 17N

The topographic data base was derived from 1:50000 NRC (Natural Resources Canada) NTDB data
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(www.geocomm.com)(www.geogratis.ca)(http://www.mndm.gov.on.ca)

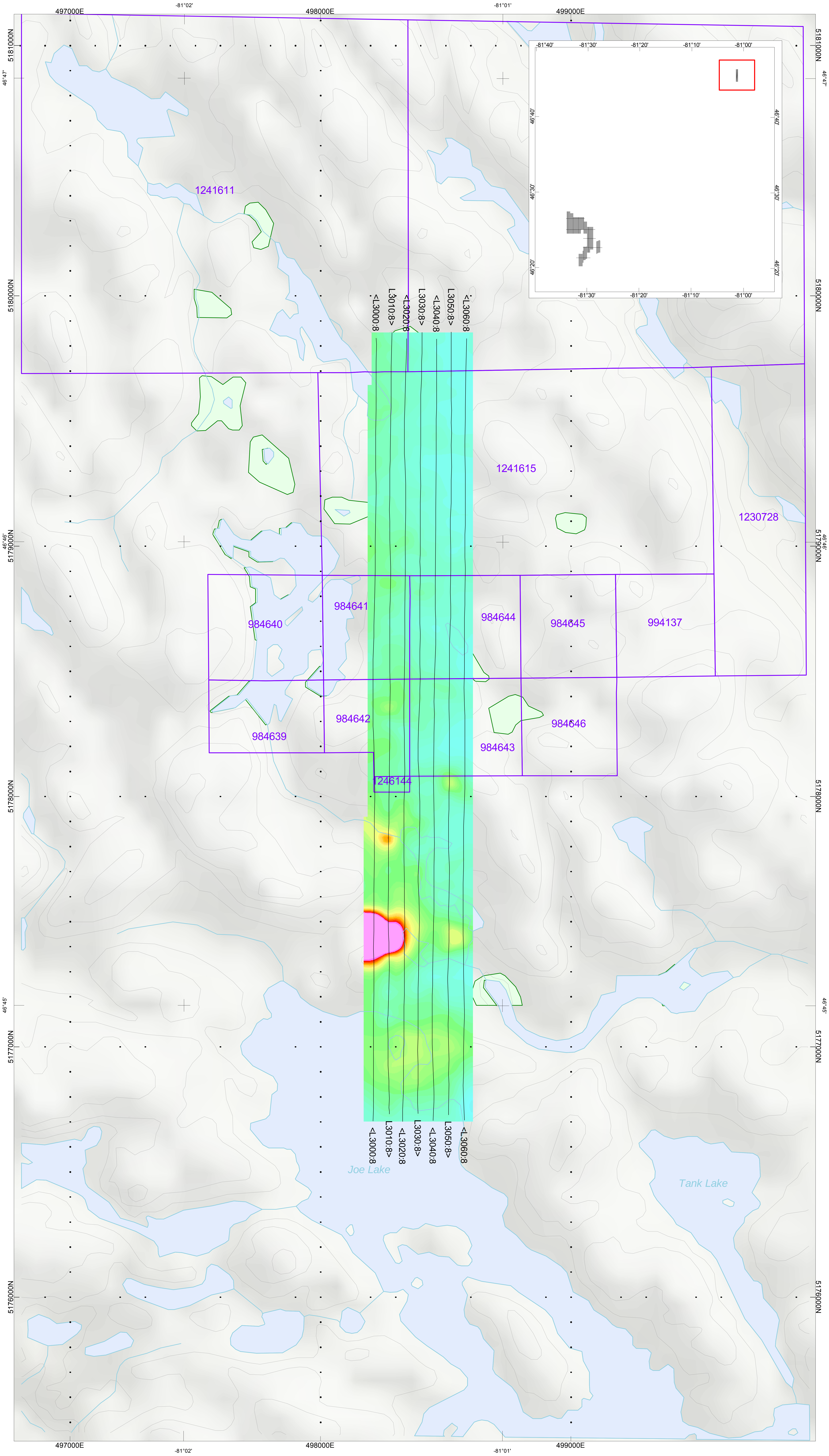
Wallbridge Mining Company Limited
Twisted Wrench Block
Sudbury District, Ontario, Canada

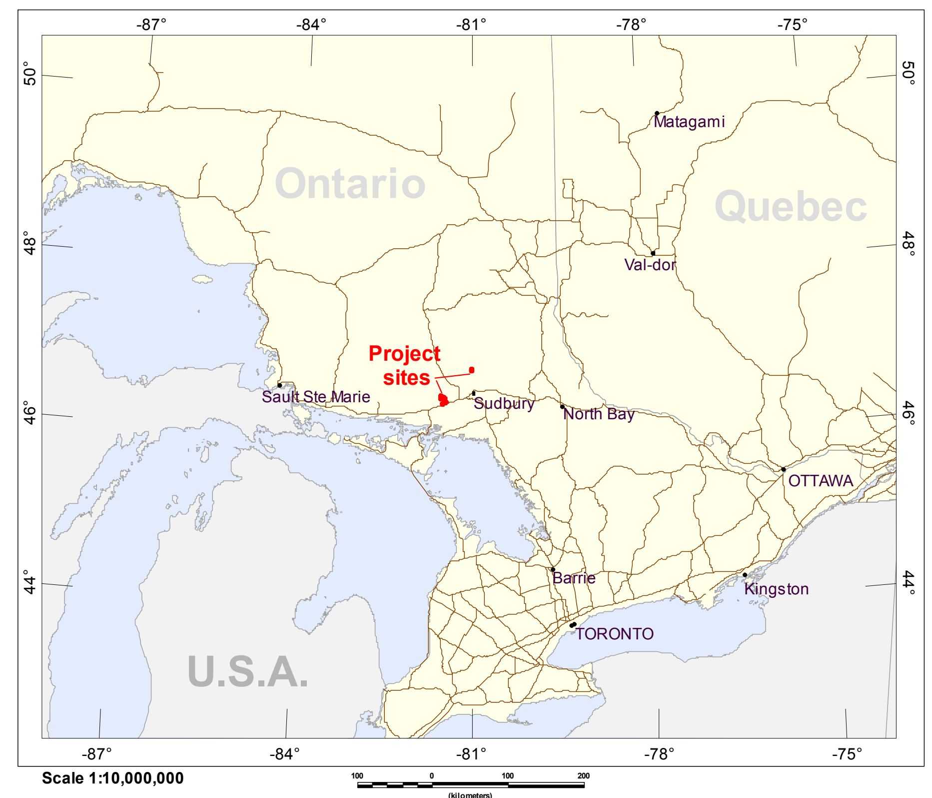
Geotech VTEM System
VTEM B-Field Z Component Profiles
Time Gates 0.220 - 7.036 ms
over Total Magnetic Intensity

Flown and processed by Geotech Ltd.
245 Industrial Parkway North,
Aurora, Ontario, Canada L4G 4C4
www.geotech.ca

March 2015

Geotech Project # GL140241





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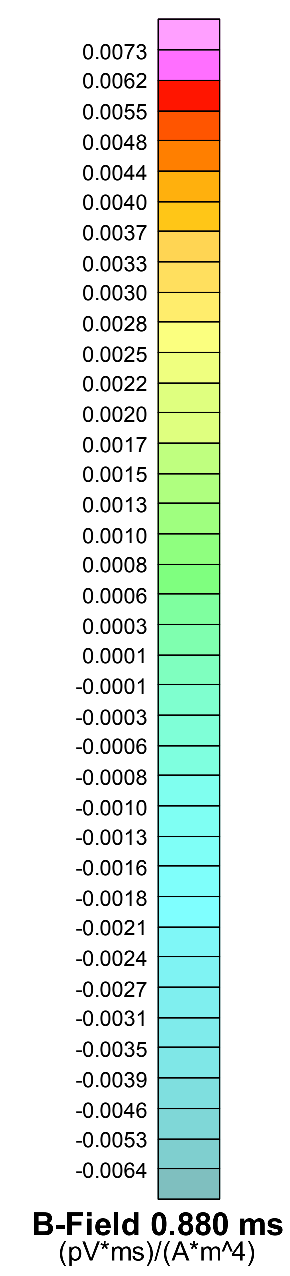

TOPOGRAPHIC LEGEND:

- Streams / Rivers
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- Mining Claims

Scale 1:10000

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(meters)

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Twisted Wrench Block
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Geotech VTEM System
VTEM B-Field Z Component
CHannel 30, TIme Gate 0.880 ms

Flown and processed by Geotech Ltd.
245 Industrial Parkway North,
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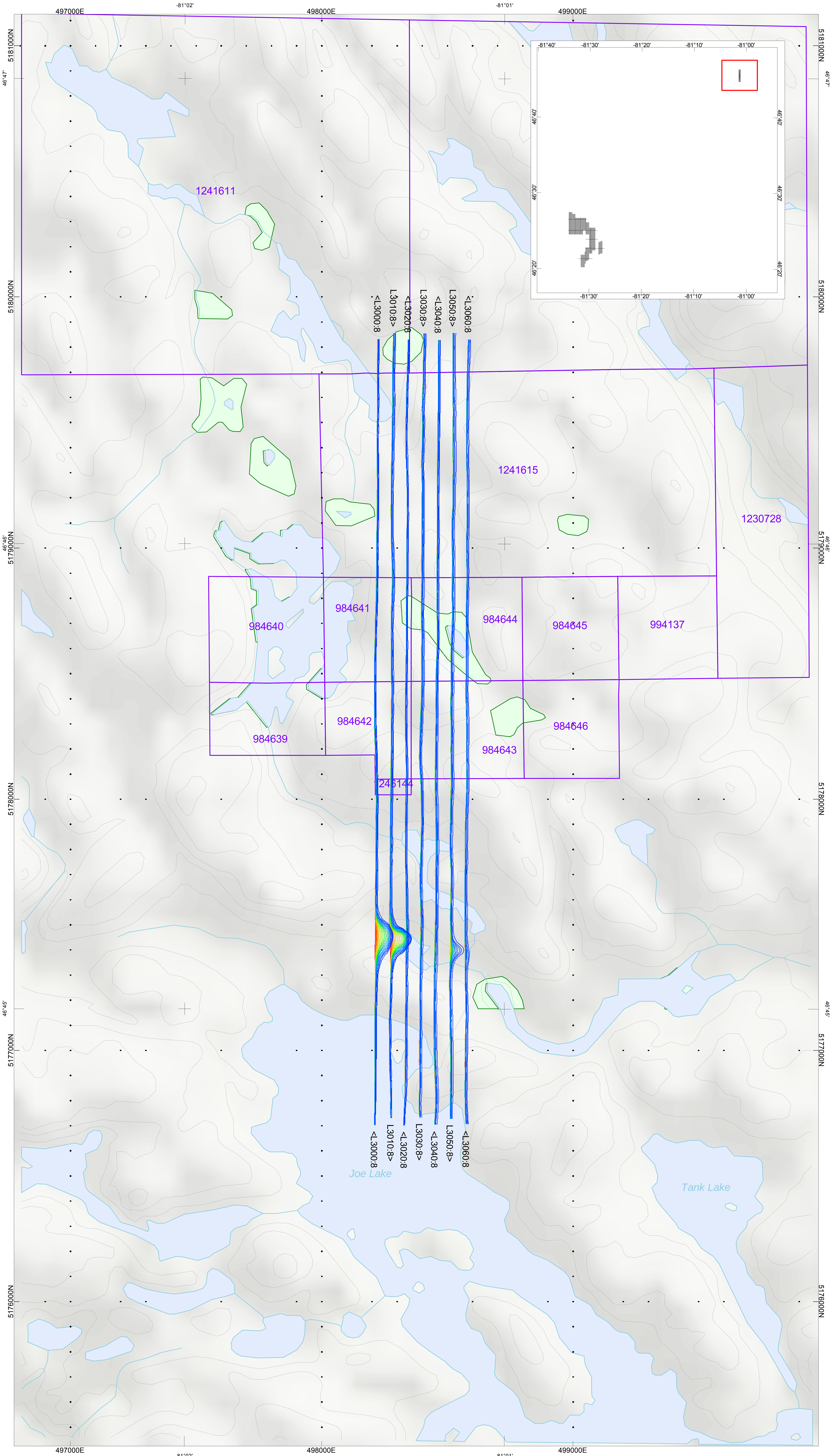
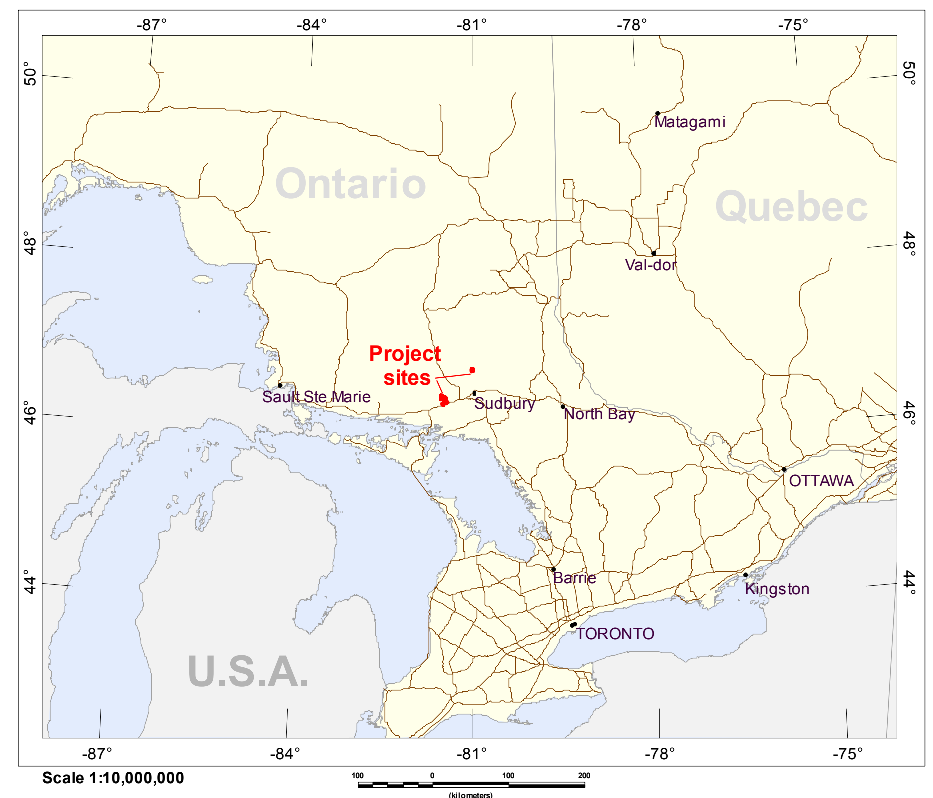
March 2015

Geotech Project # GL140241





GEOTECH LTD.

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Profiles scale 1 mm = 0.015 (pV/A*m^4)

Linear between +/-0.05 (pV/A*m^4)
logarithmic above 0.05 (pV/A*m^4)

0.220 ms
0.253 ms
0.290 ms
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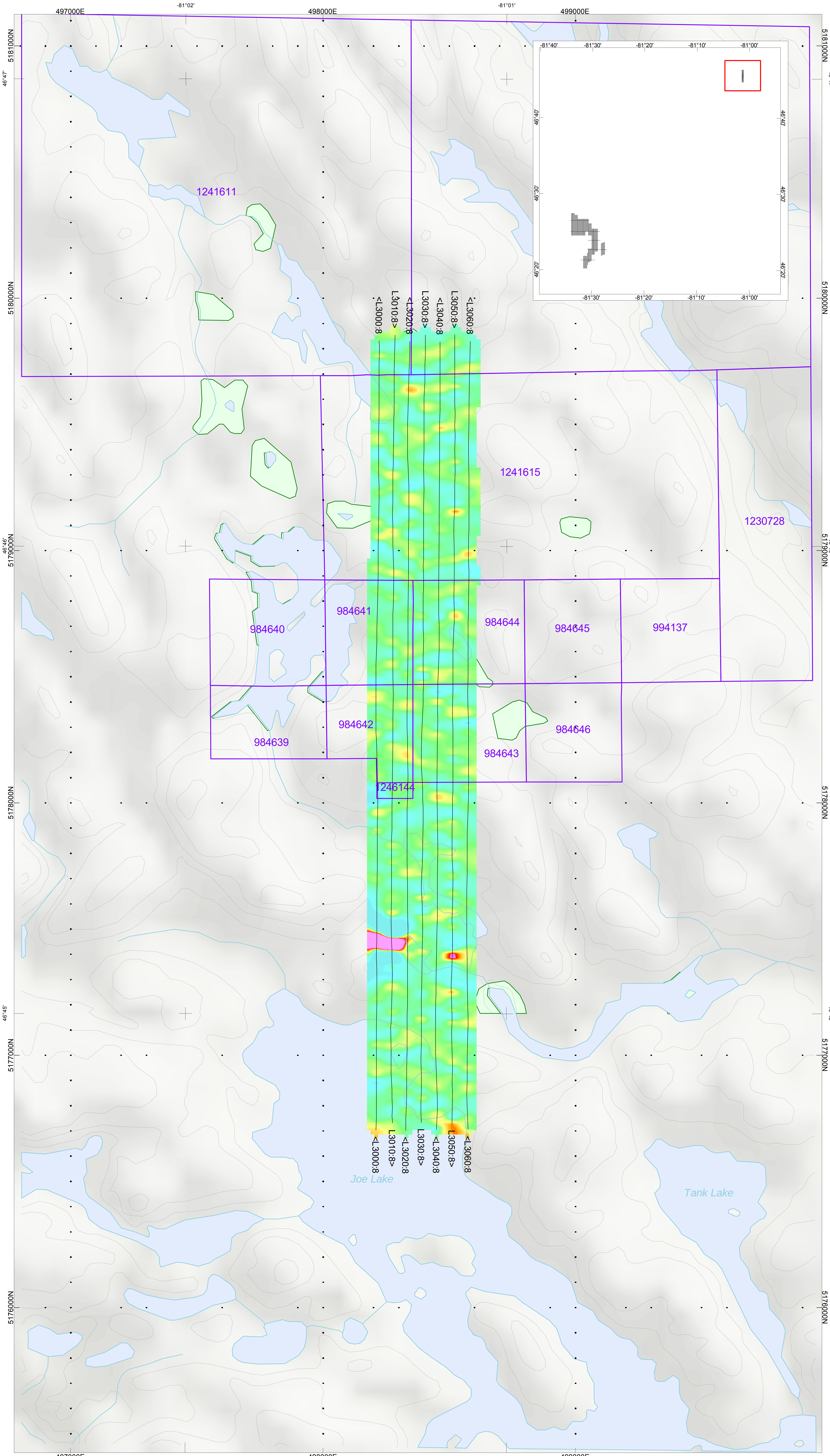
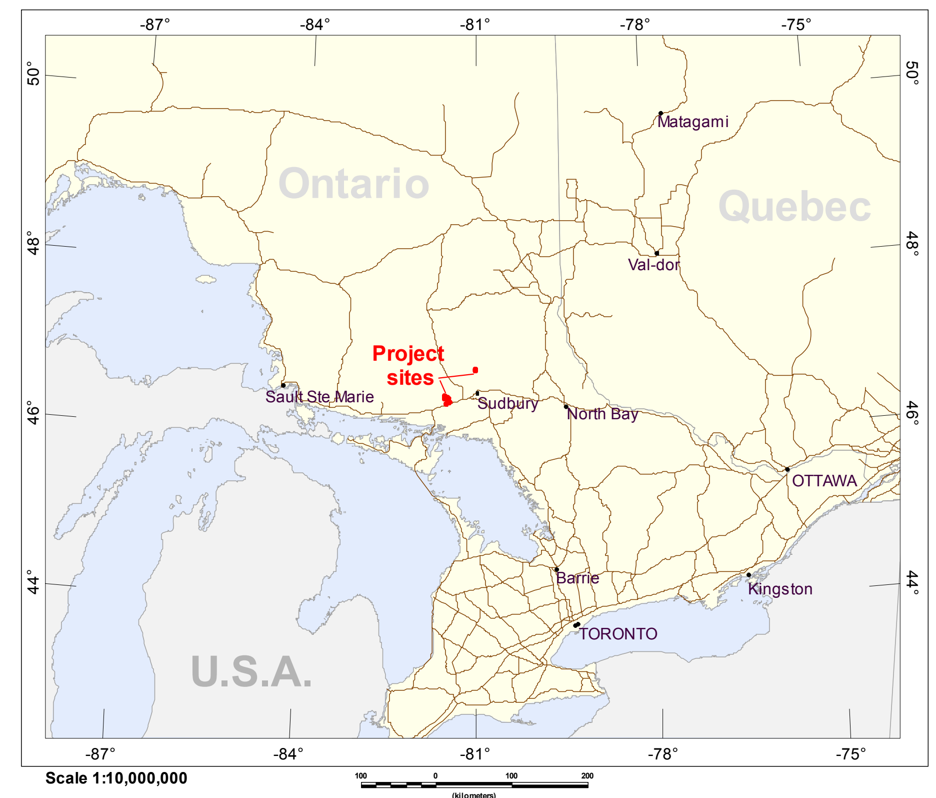
March 2015

Geotech Project # GL140241





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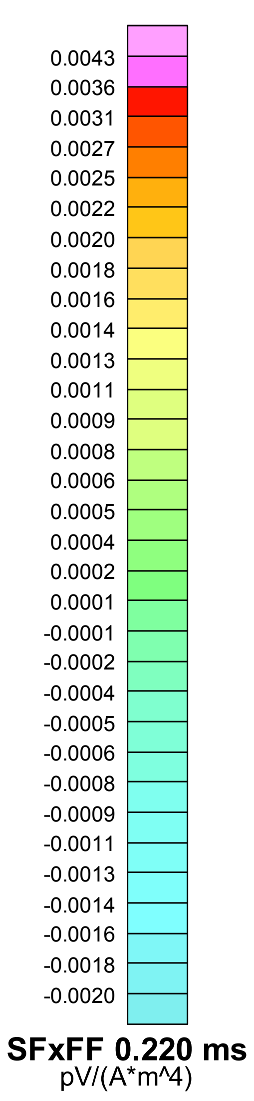

SFxFF 0.220 ms
pV/(A*m^4)

TOPOGRAPHIC LEGEND:
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100 0 100 200 300 400 500
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(www.geocomm.com)(www.geogratis.ca)(http://www.mndm.gov.on.ca)

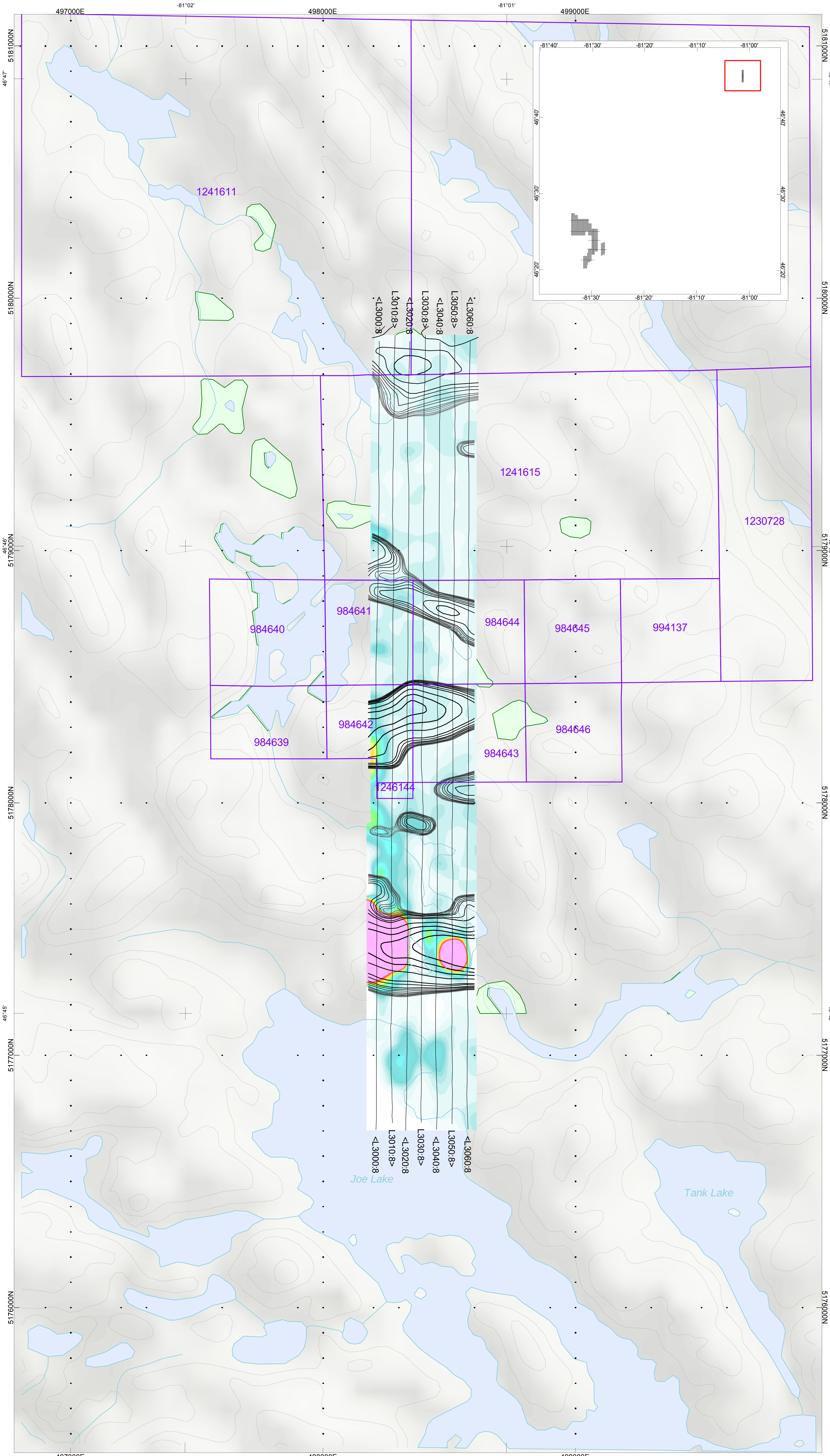
Wallbridge Mining Company Limited
Twisted Wrench Block
Sudbury District, Ontario, Canada

Geotech VTEM System
Fraser Filtered dB/dt X Component
CHannel 20, TIme Gate 0.220 ms

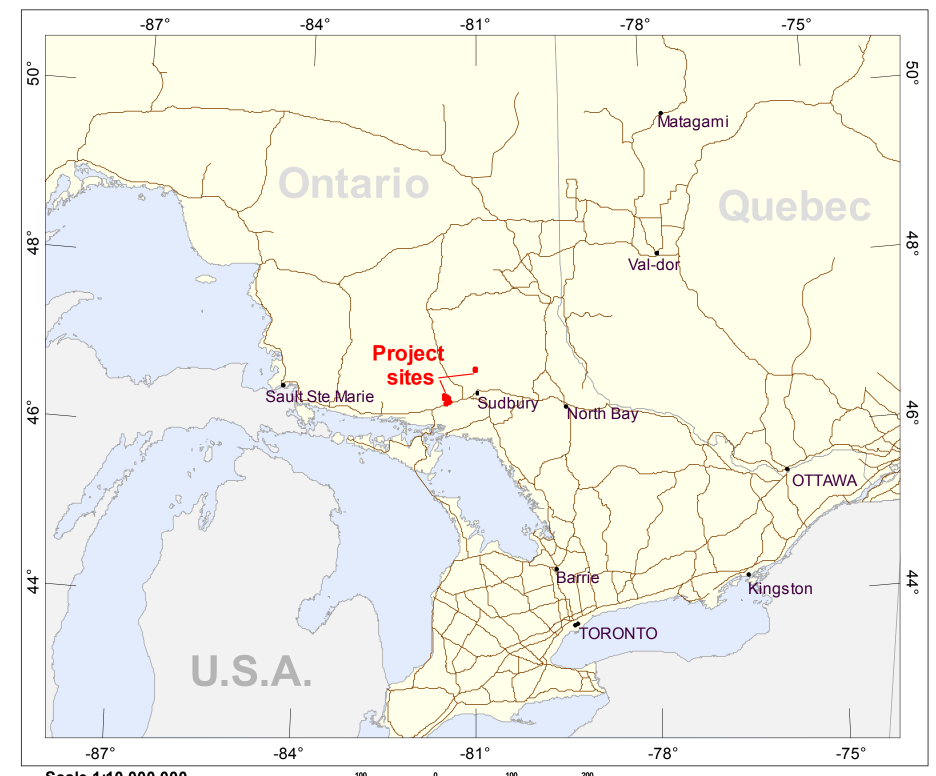
Flown and processed by Geotech Ltd.
245 Industrial Parkway North,
Aurora, Ontario, Canada L4G 4C4
www.geotech.ca

March 2015

Geotech Project # GL140241



GEOTECH LTD.



Scale 1:10,000,000
(kilometers)
NAD27 / UTM zone 17N

SURVEY SPECIFICATIONS:
- Survey Date: January 20th to February 4th and March 19,2015
- Survey Base: Windy Lake, Ontario
- Aircraft: Aerospatiale AW 119 Koala (C-GVMX)
- Survey Line Spacing: 60 Meters
- Survey Line Direction: N 0° E / N 180° E
- Tie Line Spacing: n/a
- Tie Line Direction: n/a
- Average Aircraft Terrain Clearance: 93 Meters
- EM Transmitter Loop: Towed at an average terrain clearance of 48 meters below the helicopter
- Magnetic Sensor: Towed at an average terrain clearance of 10 meters below the helicopter

INSTRUMENTS
- Geotech Time Domain Electromagnetic System (VTEM)
- Concentric Rx/Tx Geometry
- X-Coil Diameter 0.32m
- Z-Coil Diameter 1.2m
- Transmitter Loop: Diameter 35 Meters
- Dipole Moment: 1,392,976 nIA
- Transmitter Wave Form: Trapezoid, Pulse Width 5.75 ms, Base Frequency 30 Hz
- Geometrics High Sensitivity Caesium Magnetometers
- Mag Resolution: 0.02 nT at 10 samples/sec

MAP PROJECTION
- Datum: NAD27
- Projection: Universal Transverse Mercator
- Central Meridian: 81°W (Zone 17N)
- Central Scale Factor: 0.9996
- False Easting/Northing: 500,000m/0m
- Major Axis: 6378206.4
- Inverse Flattening: 294.9787
- NTS: 041I05, 041I06, 041I11, 041I14

Tau dB/dt (ms)

0.920, 0.080, 0.076, 0.073, 0.071, 0.070, 0.068, 0.067, 0.066, 0.065, 0.064, 0.063, 0.062, 0.061, 0.061, 0.060, 0.059, 0.058, 0.057, 0.057, 0.056, 0.055, 0.054, 0.053, 0.053, 0.052, 0.051, 0.050, 0.049, 0.048, 0.047, 0.046, 0.045, 0.044, 0.043, 0.041, 0.039, 0.036, 0.033, 0.000

TOPOGRAPHIC LEGEND:
- Streams / Rivers
- Contours
- Lakes / Ponds
- Wetlands
- Mining Claims

N

Scale 1:10000
100 0 100 200 300 400 500
(meters)
NAD27 / UTM zone 17N

The topographic data base was derived from 1:50000 NRC (Natural Resources Canada) NTDB data
Background shading is derived from NASA SRTM (Shuttle Radar Topography Mission) data
Inset data derived from Geocommunities 1:250,000 Canadian National Topographic database
Mining Claims are derived from the Ontario Ministry of Northern Development and Mines
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Wallbridge Mining Company Limited
Twisted Wrench Block
Sudbury District, Ontario, Canada

Geotech VTEM System
dB/dt Calculated Time Constant (Tau) with Calculated Vertical Derivative contours

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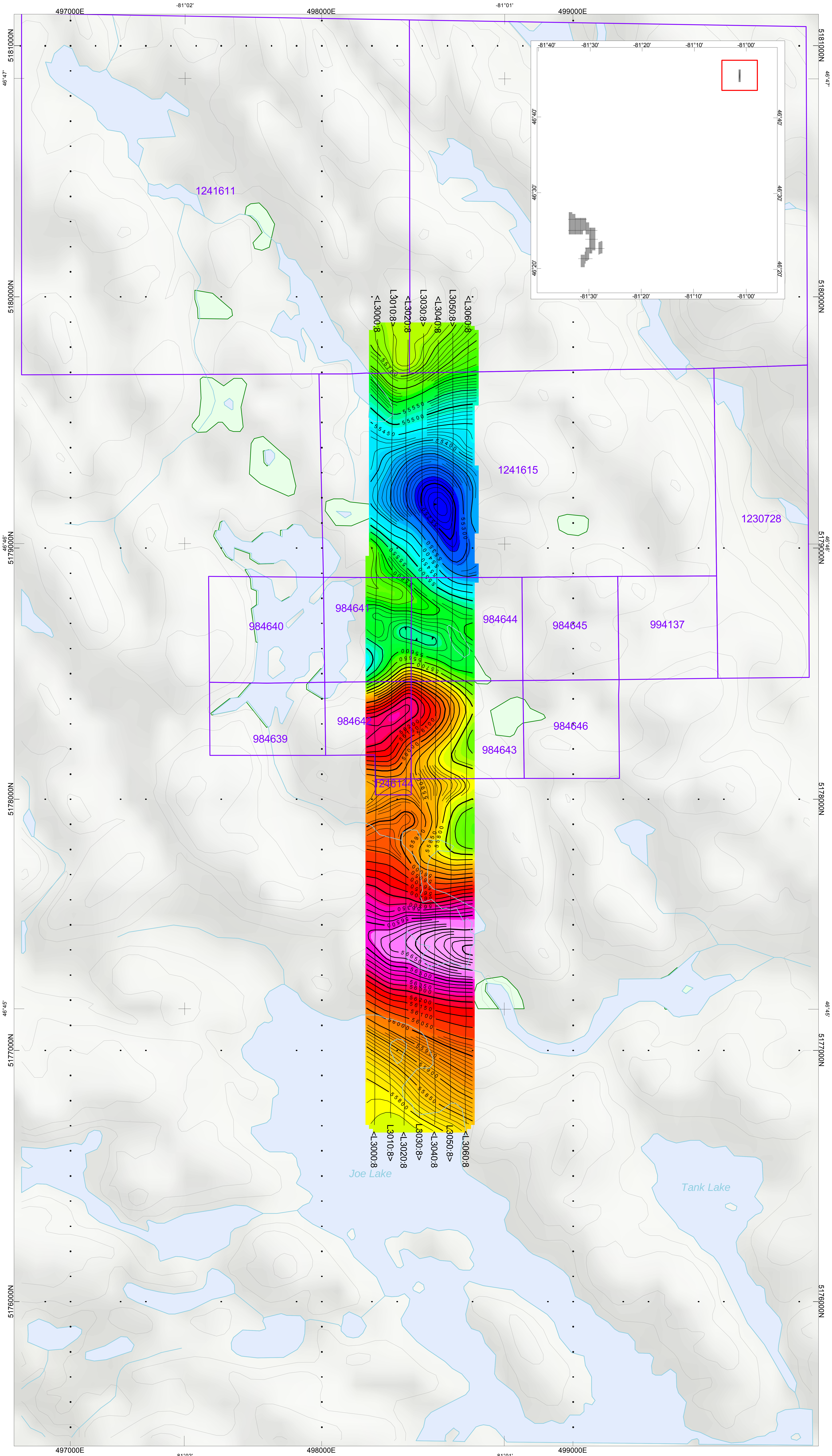
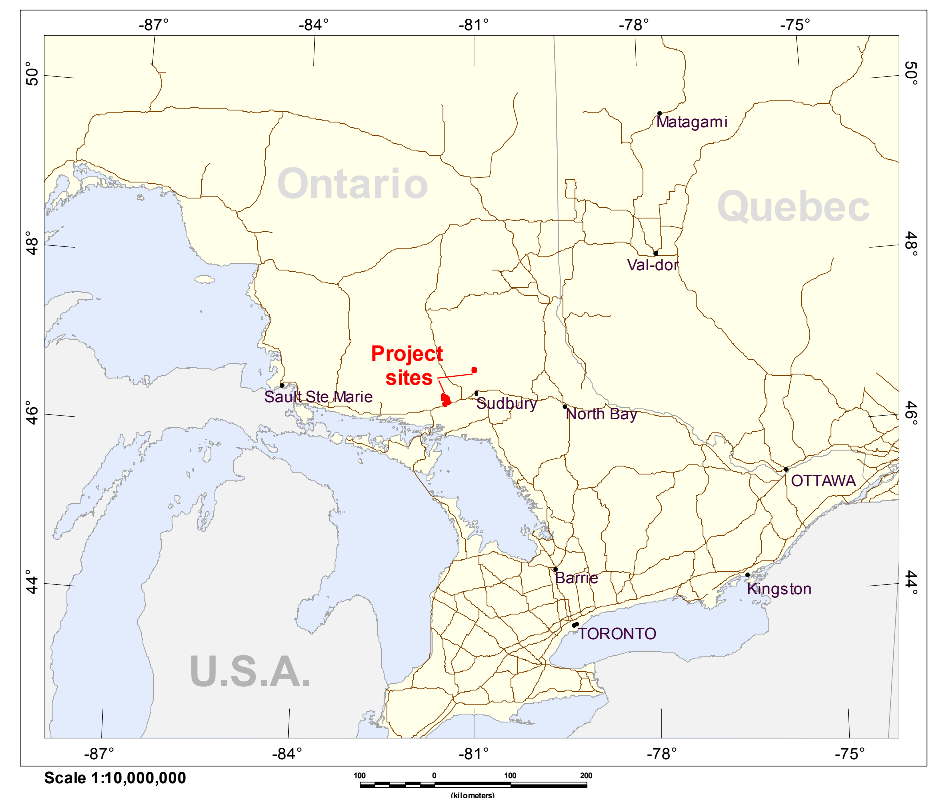
March 2015

Geotech Project # GL140241





GEOTECH LTD.

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TMI Contour Intervals:

- 10 nT
- 50 nT
- 250 nT

TOPOGRAPHIC LEGEND:

- Streams / Rivers
- Contours
- Lakes / Ponds
- Wetlands
- Mining Claims

TMI (nT)

56706, 56560, 56430, 56314, 56264, 56206, 56152, 56102, 56056, 56022, 55994, 55964, 55940, 55918, 55896, 55868, 55844, 55822, 55798, 55780, 55746, 55724, 55700, 55670, 55638, 55618, 55600, 55584, 55570, 55554, 55524, 55482, 55438, 55406, 55378, 55348, 55312, 55270

Scale 1:10000

100 0 100 200 300 400 500

(meters)

NAD27 / UTM zone 17N

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Geotech VTEM System
Total Magnetic Intensity (TMI)

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March 2015

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