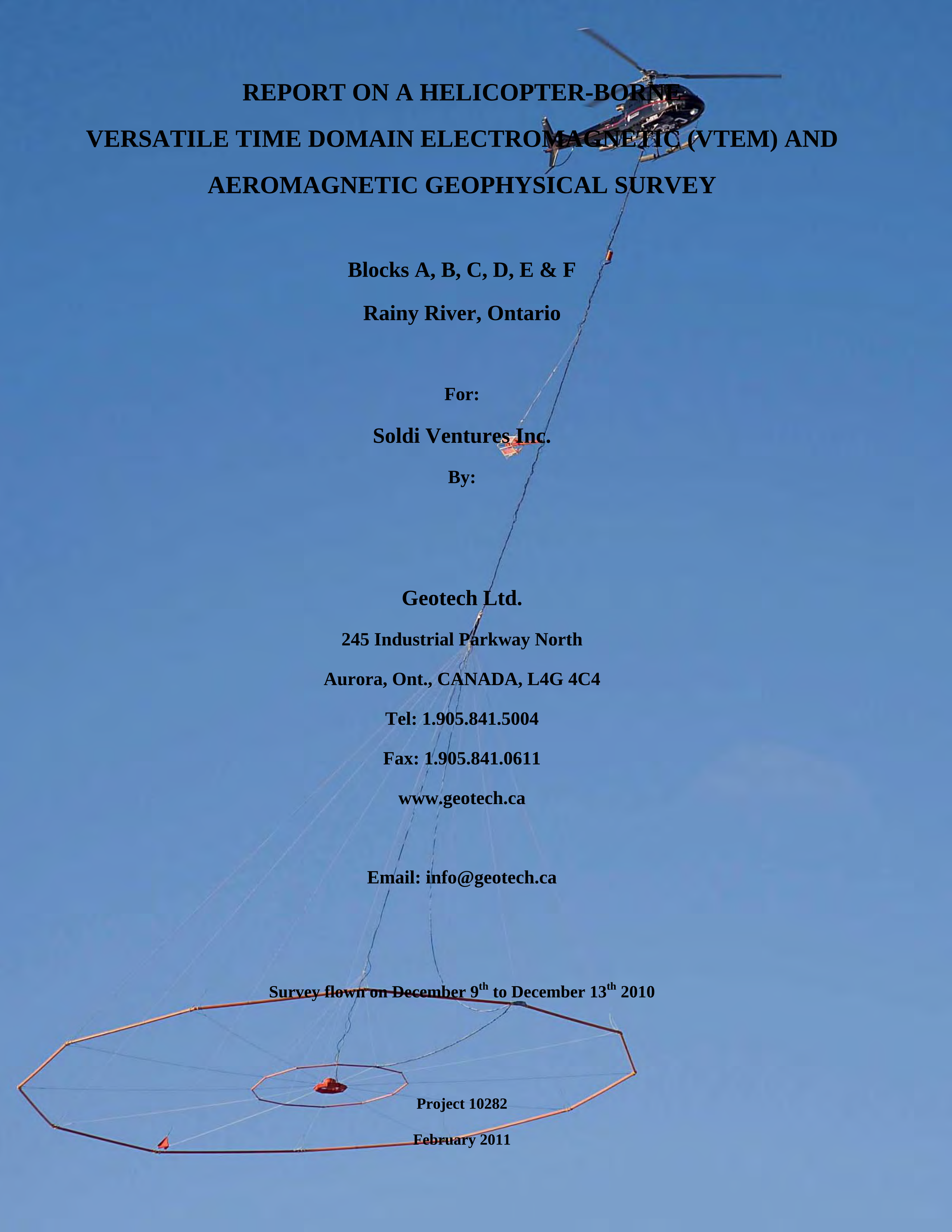
SOLDI VENTURES INC.

RAINY RIVER PROJECT
KENORA MINING DIVISION
NORTHWEST ONTARIO

REPORT ON A VTEM® AIRBORNE SURVEY

APPENDIX 1
LOGISTICS REPORT
BY GEOTECH LTD.

HILLDALE GEOSCIENCE INC.



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

Blocks A, B, C, D, E & F

Rainy River, Ontario

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Survey flown on December 9th to December 13th 2010

Project 10282

February 2011

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REPORT ON A HELICOPTER-BORNE VERSATILE TIME DOMAIN ELECTROMAGNETIC (VTEM) and AEROMAGNETIC SURVEY

Blocks A, B, C, D, E & F
Rainy River, Ontario

Executive Summary

On December 9th to December 13th 2010, Geotech Ltd. carried out a helicopter-borne geophysical survey over the Blocks A, B, C, D, E & F. about 34 km East of Rainy River, Ontario, Canada.

Principal geophysical sensors included a versatile time domain electromagnetic (VTEM) system, and a cesium magnetometer. Ancillary equipment included a GPS navigation system and a radar altimeter. A total of 1257.9 line-kilometres geophysical data was acquired during the survey.

The survey operations were based out of Nestor Falls Hotel located in Nestor Falls, Ontario. 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;

- Electromagnetic stacked profiles of the B-field and dB/dt Z Component
- Colour grids of a B-Field Z Component Channel
- Total Magnetic Intensity (TMI)
- Calculated dB/dt Time Constant (TAU) map
- Fraser filtered dB/dt (SFx_FF) map

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 Blocks A, B, C, D, E & F located about 34 km East of Rainy River, Ontario (Figure 1 & 2).

Charles Desjardins represented Soldi Ventures Inc. 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) system with Z and X component measurements and aeromagnetics using a cesium magnetometer. A total of 1257.9 line-km of geophysical data were acquired during the survey. The entire survey area is shown in Figure 1.

The crew was based out of Nestor Falls Hotel in Nestor Falls, Ontario for the acquisition phase of the survey. Survey flying started December 9th to December 13th 2010.

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 February, 2011.

Figure 1 - Property Location

1.2 Survey and System Specifications

The survey blocks are located about 34 kilometres East of Rainy River, Ontario (Figure 2).

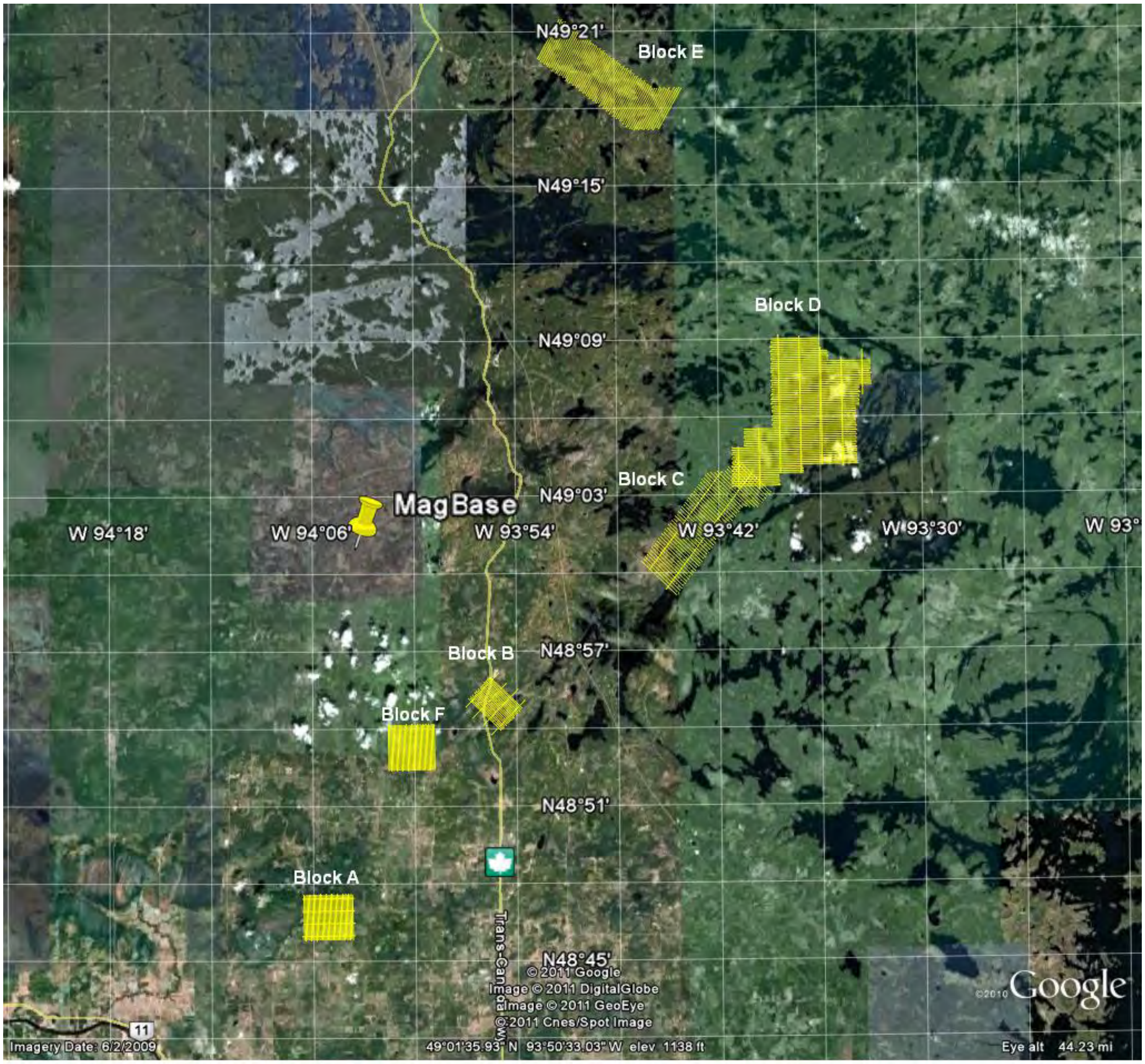


Figure 2 – **The block, showing the magnetic base station location on Google Earth**

- Block A was flown in a North to South (N 0° E / N 180° E) direction with traverse line spacing of 100 metres as depicted in Figure 3. Tie lines were flown perpendicular to the traverse lines at a spacing of 900 metres (N 90° E / N 270° E).
- Block B was flown in a Northwest to Southeast (N 135° E / N 315° E) direction with traverse line spacing of 100 metres as depicted in 4. Tie lines were flown perpendicular to the traverse lines at a spacing of 900 metres (N 45° E / N 225° E).

- Block C was flown in a Northwest to Southeast (N 135° E / N 315° E) direction with traverse line spacing of 200 metres as depicted in Figure 5. Tie lines were flown perpendicular to the traverse lines at a spacing of 1800 metres (N 45° E / N 225° E).
- Block D was flown in an East to West (N 90° E / N 270° E) direction with traverse line spacing of 150 metres as depicted in Figure 5. Tie lines were flown perpendicular to the traverse lines at a spacing of 1500 metres (N 0° E / N 180° E).
- Block E was flown in a Southwest to Northeast (N 30° E / N 215° E) direction with traverse line spacing of 150 metres as depicted in Figure 6. No tie lines were planned for this block.
- Block E was flown in a North to South (N 0° E / N 180° E) direction with traverse line spacing of 150 metres as depicted in Figure 7. No tie lines were planned for this block.

For more detailed information on the flight spacing and direction see Table 1.

1.3 Topographic Relief and Cultural Features

Topographically, the block exhibits a moderate relief with an elevation ranging from 324 to 457 metres above sea level over a total area of 160 square kilometres (Figure 2). There are numerous rivers connecting to various lakes and wetlands in the vicinity of the survey area. There are various visible signs of culture such as roads & powerlines; the closest populated area is Rainy River, Ontario located 34 kilometers West of Block A.

The blocks are covered by numerous mining claims, which are shown in Appendix A, and are plotted on all maps. The survey area is covered by NTS (National Topographic Survey) of Canada sheet 052F04, 052F05, 052C13, 052D16 & 052D09.

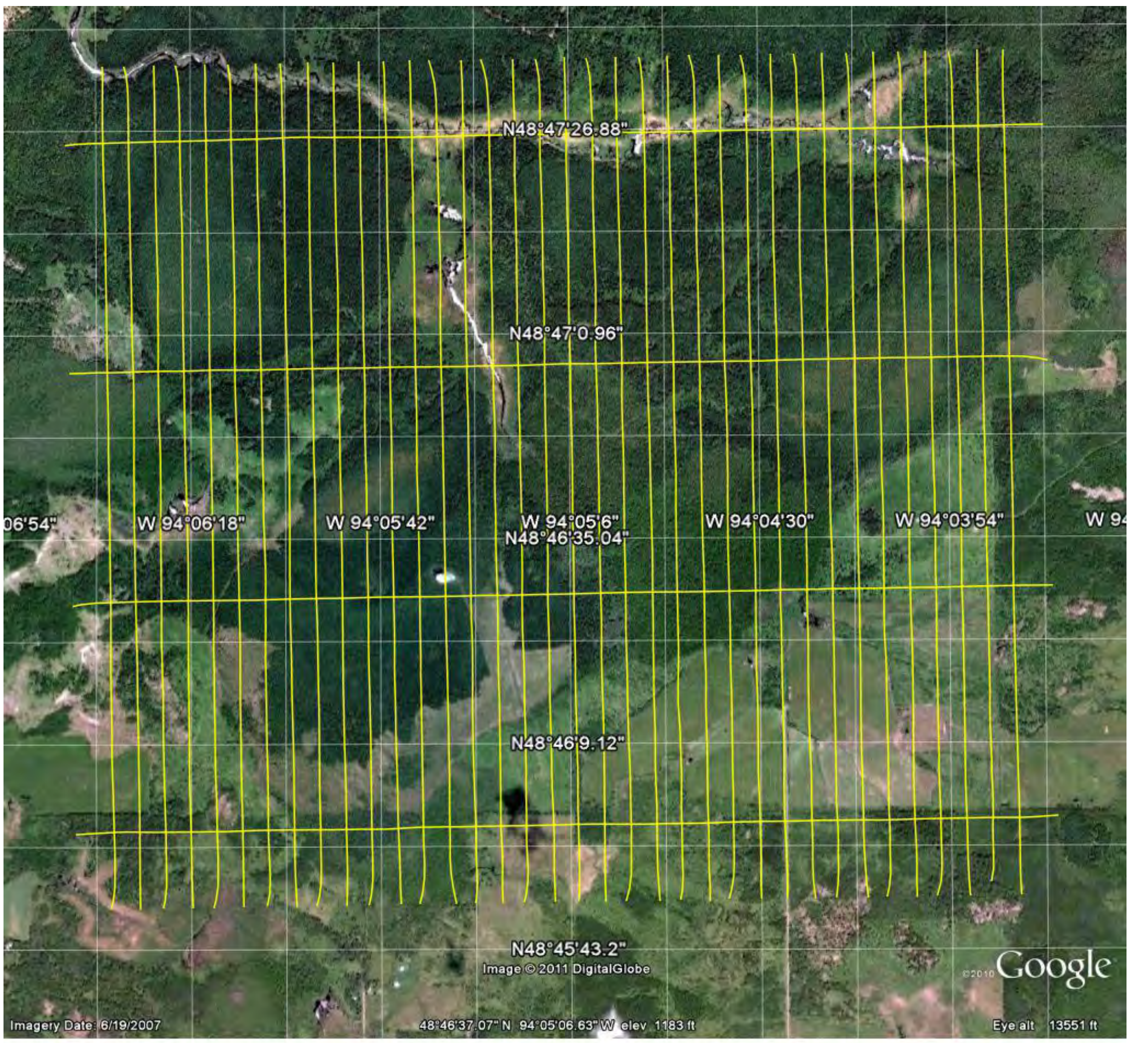


Figure 3 – Block A Flight path over a Google Earth Image.

Figure 4 – Block B Flight path over a Google Earth Image.

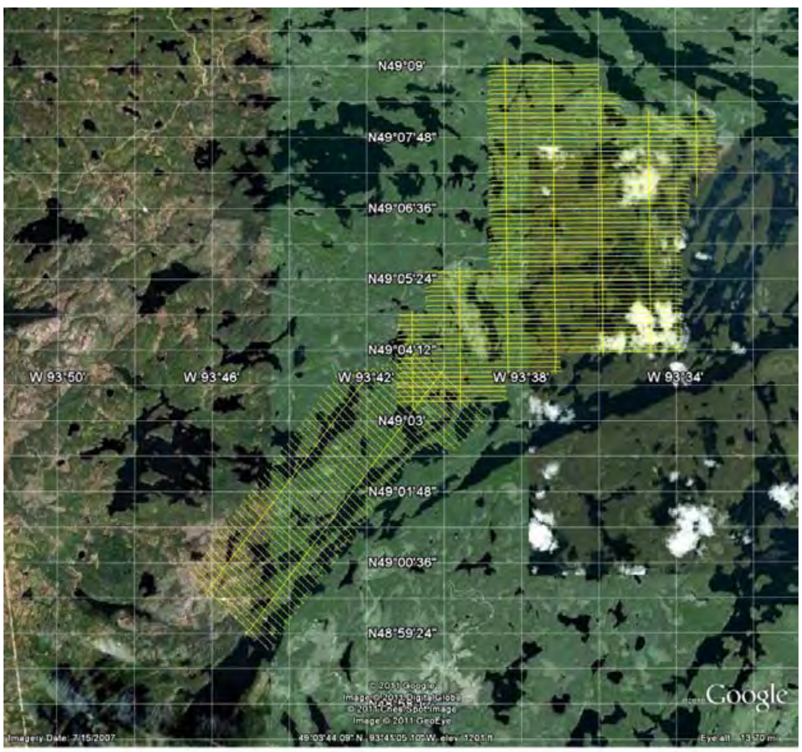


Figure 5 – Block C & D Flight path over a Google Earth Image.

Figure 6 – Block E Flight path over a Google Earth Image.

Figure 7 – Block F Flight path over a Google Earth Image.

2. DATA ACQUISITION

2.1 Survey Area

The survey block (see Figure 3-7 and Appendix A) and general flight specifications are as follows:

Table 1 - Survey Specifications

Survey block	Traverse Line spacing (m)	Area (Km^2)	Planned1 Line-km	Line-km flown	Flight direction	Line numbers
Block A	Traverse: 100	12	108	118.7	180° Azimuth	L1000 - 1350
	Tie: 900		14	15.2		T1900 - 1930
Block B	Traverse: 100	9	69	75.1	135° Azimuth	L2000 - 2220
	Tie: 900		12	14		T2900 - 2930
Block C	Traverse: 200	28	158.6	179	135° Azimuth	L3000 - 3500
	Tie: 1800		18.6	19.5		T3900 - 3910
Block D	Traverse: 150	70	411.4	447.5	90° Azimuth	L4000 - 4700
	Tie: 1500		44.7	47		T4900 - 4960
Block E	Traverse: 150	30	204.1	229.7	30° Azimuth	L5000 - 5670
	Tie: N/A		19.6			N/A
Block F	Traverse: 150	11	102	112.2	0° Azimuth	L6000 - 6330
	Tie: N/A		13.2			N/A
TOTAL		**160**	**1175.3**	1257.9		

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

2.2 Survey Operations

Survey operations were based out of Nestor Falls Hotel for December 9th to December 13th 2010. The following table shows the timing of the flying.

1 Actual Line-km represents the total line-km contained in the final database. These line-km normally exceed the Planned line-km's, as indicated in the survey NAV files.

Date	Flight #	Block	Crew location	Comments
9-Dec-10			Nestor Falls, ON	No production due to weather
10-Dec-10	1,2	E	Nestor Falls, ON	189km flown
11-Dec-10	3,4	E,D	Nestor Falls, ON	353km flown
12-Dec-10	5,6	D,C	Nestor Falls, ON	315km flown
13-Dec-10	7,8	A,F,B	Nestor Falls, ON	318km flown – flying complete

Table 2 - Survey schedule

2.3 Flight Specifications

During the survey of the block the helicopter was maintained at a mean altitude of 76 metres above the ground with a nominal survey speed of 80 km/hour. This allowed for a nominal EM bird terrain clearance of 41 metres and a magnetic sensor clearance of 63 metres.

An operator on board was 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 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. 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 a Geotech Aviation (Astar) 350 B3 helicopter, registration C-GEOY. The helicopter is owned by Geotech Ltd. and operated by Geotech Aviation Ltd. out of North Bay, Ontario. Installation of the geophysical and ancillary equipment was carried out by Geotech Ltd crew.

2.4.2 Electromagnetic System

The electromagnetic system was a Geotech Time Domain EM (VTEM) system. The configuration is as indicated in Figure 8 below.

The VTEM Receiver and transmitter coils are concentric-coplanar and Z-direction oriented. The receiver system for the project also included a coincident-coaxial X-direction sensor to measure the in-line dB/dt and calculate B-Field responses. All loops were towed at a mean distance of 35 metres below the aircraft as shown in Figure 8 and Figure 10. The receiver decay recording scheme is shown diagrammatically in Figure 9.

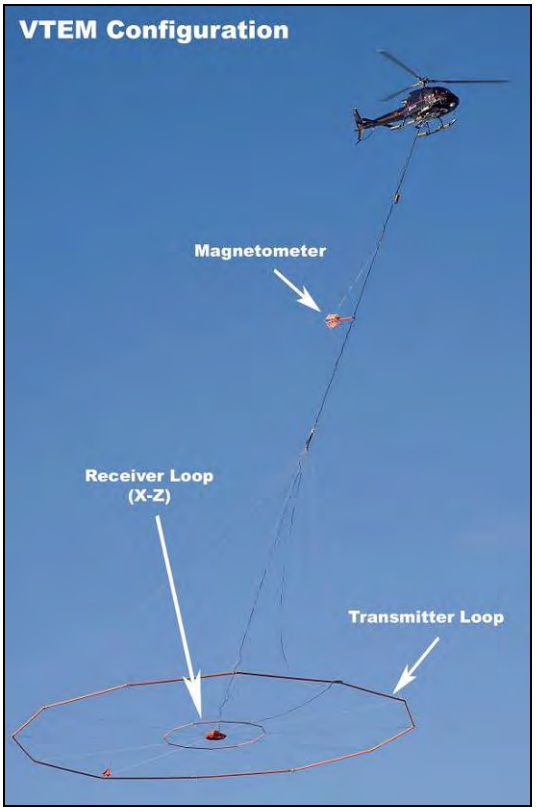


Figure 8 - VTEM Configuration, with magnetometer.

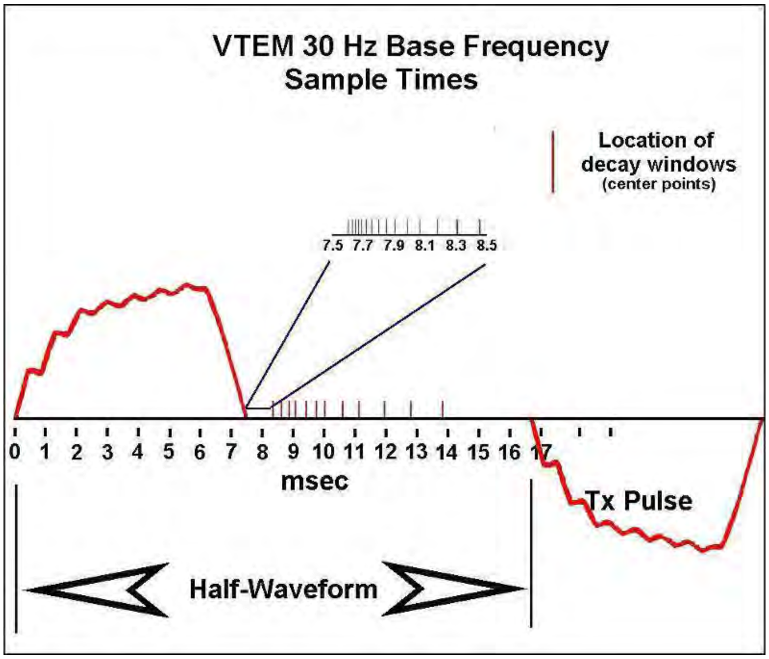


Figure 9 - VTEM Waveform & Sample Times

The VTEM decay sampling scheme is shown in Table 3 below. Thirty-two time measurement gates were used for the final data processing in the range from 96 to 7036 μ sec.

Table 3 - Decay Sampling Scheme

VTEM Decay Sampling Scheme				
Index	Middle	Start	End	Window
	Microseconds			
14	96	90	103	13
15	110	103	118	15
16	126	118	136	18
17	145	136	156	20
18	167	156	179	23
19	192	179	206	27
20	220	206	236	30
21	253	236	271	35
22	290	271	312	40
23	333	312	358	46
24	383	358	411	53
25	440	411	472	61
26	505	472	543	70
27	580	543	623	81
28	667	623	716	93
29	766	716	823	107
30	880	823	945	122
31	1,010	945	1,086	141
32	1,161	1,086	1,247	161
33	1,333	1,247	1,432	185
34	1,531	1,432	1,646	214
35	1,760	1,646	1,891	245
36	2,021	1,891	2,172	281
37	2,323	2,172	2,495	323
38	2,667	2,495	2,865	370
39	3,063	2,865	3,292	427
40	3,521	3,292	3,781	490
41	4,042	3,781	4,341	560
42	4,641	4,341	4,987	646
43	5,333	4,987	5,729	742
44	6,125	5,729	6,581	852
45	7,036	6,581	7,560	979

VTEM system parameters

Survey Helicopter	
Model	AS 350 – B3
Registration	C-GEOY
Operating Company	Geotech Aviation
Nominal survey speed (km/h)	80
Average terrain clearance (m)	76
VTEM Transmitter	
Coil diameter (m)	26
Number of turns	4
Pulse repetition rate (Hz)	30
Peak current (Amp)	190
Duty cycle (%)	43
Peak dipole moment (nIA)	403,506
Pulse width (ms)	7.16
Average terrain clearance (m)	41
Z-coil Receiver	
Coil diameter (m)	1.2
Number of turns	100
Effective area (m^2)	113.10
Sampling interval (s)	0.1
Average terrain clearance (m)	41
X-coil Receiver	
Coil diameter (m)	0.32
Number of turns	245
Effective area (m^2)	19.70
Sampling interval (s)	0.1
Average terrain clearance (m)	41
Magnetometer	
Type	Geometrics
Model	Optically pumped cesium vapour
Sensitivity (nT)	0.02
Sampling interval (s)	0.1
Cable length (m)	13
Average terrain clearance (m)	63

Radar Altimeter	
Type	Terra TRA 3000/TRI 40
Position	Beneath cockpit
Sampling interval (s)	0.2
GPS navigation system	
Type	NovAtel
Model	CDGPS enabled OEM4-G2-3151W
Antenna position	Helicopter tail
Sampling interval (s)	0.2
Base Station Magnetometer/GPS	
Type	Geometrics
Model	Cesium vapour
Sensitivity (nT)	0.001
Sampling interval (s)	1
Location	049º 06.5557 N, 93º55.3997 W

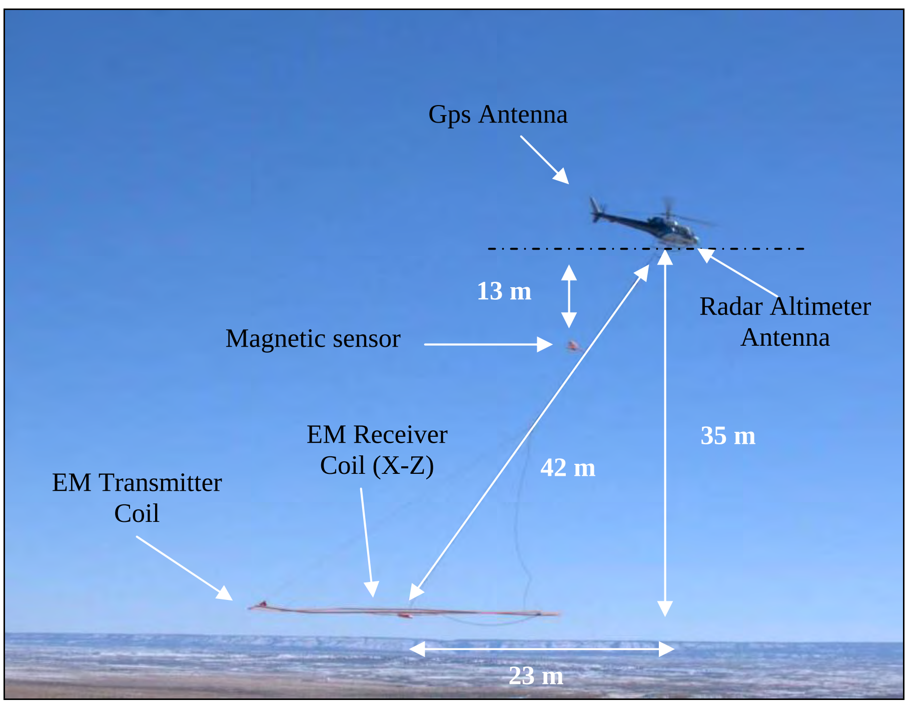


Figure 10 - VTEM System Configuration

2.4.3 Airborne magnetometer

The magnetic sensor utilized for the survey was Geometrics optically pumped cesium vapour magnetic field sensor mounted 13 metres below the helicopter, as shown in Figure 10. The sensitivity of the magnetic sensor is 0.02 nanoTesla (nT) at a sampling interval of 0.1 seconds.

2.4.4 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 10).

2.4.5 GPS Navigation System

The navigation system used was a Geotech PC104 based navigation system utilizing a NovAtel's CDGPS (Canada-Wide Differential Global Positioning System Correction Service) 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 (Figure 10). As many as 11 GPS and two CDGPS satellites may be monitored at any one time. The positional accuracy or circular error probability (CEP) is 1.8 m, with CDGPS 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.

2.4.6 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 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 an open field 200 metres from the landing spot (049º 06.5557 N, 93º55.3997 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.

Field:

Project Manager:	Darren Tuck (Office)
Data QC:	Nick Venter (Office)
Crew chief:	Alex Smirnov
Operator:	Jim Bratton

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

Pilot:	Brad MaCrae
Mechanical Engineer:	Tyler McLellan

Office:

Preliminary Data Processing:	Nick Venter
Final Data Processing:	Nick Venter
Final Data QA/QC:	Timothy Eadie
Reporting/Mapping:	Corrie Laver

Data acquisition phase was carried out under the supervision of Andrei Bagrianski, P. Geo, Chief Operating Officer. Processing phase was carried out under the supervision of Harish Kumar, P.Geo, Assistant Manager of Data Processing. Interpretation phase was carried out under the supervision of Alex Prikhodko P.Geo. 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 NAD83 Datum, UTM Zone 15 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

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 channels were recorded at 3.063, 2.021, 1.161, 1.531 & 2.667 milliseconds after the termination of the impulse is also presented as contour color image.

VTEM 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 graund and along the line-of-flight. This combined two coil configuration provides information on the position, depth, dip and thickness of a conductor. The responses are free from a system geometric effect and can be easily compared to model type curves in most cases. Generalized modeling results of VTEM data, are shown in Appendix E.

In general X-component data produce cross-over type anomalies: from "+ to –" in direction of flight for "thin" subvertical targets and from "- to +" in direction of flight for "thick" targets.

Z component data produce double peak type anomalies for “thin” subvertical targets and single peak for “thick” targets.

The limits and change-over of “thin-tick” depends on footprint (diameter of a TEM system and bird height). For example, for VTEM-26 with nominal terrain clearance the change – over between “thin” and “thick” equal to 25-30 m thickness (Appendix E, Fig.E-16).

Because of X component polarity is under line-of-flight, convolution Fraser filter (Fig.11) 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.

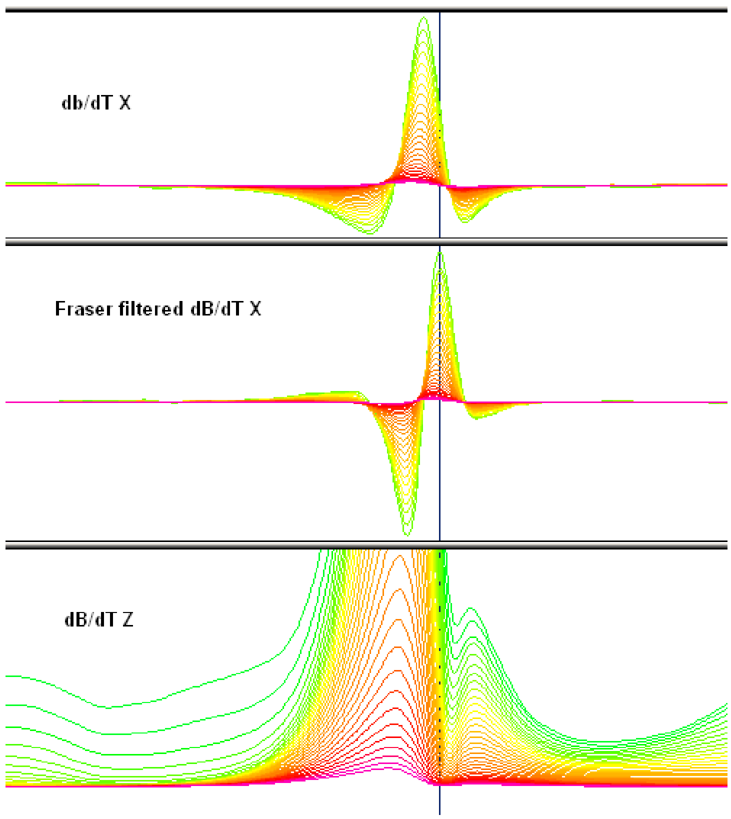


Figure 11 - Z,X and Fraser filtered X (FFx) components for “thin” target.

Graphical representations of the VTEM transmitter input current and the output voltage of the receiver coil are shown in Appendix C.

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.

Tie line levelling was carried out by adjusting intersection points along traverse lines. A micro-levelling procedure was applied to remove persistent low-amplitude components of flight-line noise remaining in the data.

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 scale of 1:10,000 & 1:20,000 for best representation of the survey size and line spacing. The coordinate/projection system used was NAD83 Datum, UTM Zone 15 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 color magnetic TMI contour map. The following maps are presented on paper;

- VTEM dB/dt profiles Z Component, Time Gates 0.220 – 7.036 ms in linear – logarithmic scale.
- VTEM B-field late time Z Component Channel 32, 34, 36, 38 & 39 Time Gates 1.161, 1.531, 2.021, 2.667 & 3.063 ms color image.
- VTEM B-Field profiles Z Component, Time Gates 0.220 – 7.036 ms in linear – logarithmic scale.
- Total magnetic intensity (TMI) color image and contours.
- Fraser Filtered X dB/dt, Time Gates 0.220 – 7.036 ms
- Latest time Gate (Tau) dB/dt with CVG contours

- Powerline Monitor (PLM) for Block B

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 # 1structure.

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

- DVD # 2 structure.

Databases	contains the final databases

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

Due to the size of the project, the databases were presented on a separate DVD

Table 5 - Geosoft GDB Data Format

Channel name	Units	Description
X:	metres	UTM Easting NAD83 Zone 15 North
Y:	metres	UTM Northing NAD83 Zone 15 North
Longitude:	Decimal Degrees	WGS 84 Longitude data
Latitude:	Decimal Degrees	WGS 84 Latitude data
Z:	metres	GPS antenna elevation (above Geoid)
Radar:	metres	helicopter terrain clearance from radar altimeter
Radarb:	metres	Calculated EM bird 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
SFz[14]:	$pV/(A*m^4)$	Z dB/dt 96 microsecond time channel
SFz[15]:	$pV/(A*m^4)$	Z dB/dt 110 microsecond time channel
SFz[16]:	$pV/(A*m^4)$	Z dB/dt 126 microsecond time channel
SFz[17]:	$pV/(A*m^4)$	Z dB/dt 145 microsecond time channel
SFz[18]:	$pV/(A*m^4)$	Z dB/dt 167 microsecond time channel
SFz[19]:	$pV/(A*m^4)$	Z dB/dt 192 microsecond time channel
SFz[20]:	$pV/(A*m^4)$	Z dB/dt 220 microsecond time channel
SFz[21]:	$pV/(A*m^4)$	Z dB/dt 253 microsecond time channel
SFz[22]:	$pV/(A*m^4)$	Z dB/dt 290 microsecond time channel
SFz[23]:	$pV/(A*m^4)$	Z dB/dt 333 microsecond time channel
SFz[24]:	$pV/(A*m^4)$	Z dB/dt 383 microsecond time channel
SFz[25]:	$pV/(A*m^4)$	Z dB/dt 440 microsecond time channel
SFz[26]:	$pV/(A*m^4)$	Z dB/dt 505 microsecond time channel
SFz[27]:	$pV/(A*m^4)$	Z dB/dt 580 microsecond time channel
SFz[28]:	$pV/(A*m^4)$	Z dB/dt 667 microsecond time channel
SFz[29]:	$pV/(A*m^4)$	Z dB/dt 766 microsecond time channel
SFz[30]:	$pV/(A*m^4)$	Z dB/dt 880 microsecond time channel
SFz[31]:	$pV/(A*m^4)$	Z dB/dt 1010 microsecond time channel
SFz[32]:	$pV/(A*m^4)$	Z dB/dt 1161 microsecond time channel
SFz[33]:	$pV/(A*m^4)$	Z dB/dt 1333 microsecond time channel
SFz[34]:	$pV/(A*m^4)$	Z dB/dt 1531 microsecond time channel
SFz[35]:	$pV/(A*m^4)$	Z dB/dt 1760 microsecond time channel
SFz[36]:	$pV/(A*m^4)$	Z dB/dt 2021 microsecond time channel
SFz[37]:	$pV/(A*m^4)$	Z dB/dt 2323 microsecond time channel
SFz[38]:	$pV/(A*m^4)$	Z dB/dt 2667 microsecond time channel
SFz[39]:	$pV/(A*m^4)$	Z dB/dt 3063 microsecond time channel
SFz[40]:	$pV/(A*m^4)$	Z dB/dt 3521 microsecond time channel
SFz[41]:	$pV/(A*m^4)$	Z dB/dt 4042 microsecond time channel
SFz[42]:	$pV/(A*m^4)$	Z dB/dt 4641 microsecond time channel
SFz[43]:	$pV/(A*m^4)$	Z dB/dt 5333 microsecond time channel
SFz[44]:	$pV/(A*m^4)$	Z dB/dt 6125 microsecond time channel
SFz[45]:	$pV/(A*m^4)$	Z dB/dt 7036 microsecond time channel
SFx[20]:	$pV/(A*m^4)$	X dB/dt 220 microsecond time channel
SFx[21]:	$pV/(A*m^4)$	X dB/dt 253 microsecond time channel
SFx[22]:	$pV/(A*m^4)$	X dB/dt 290 microsecond time channel
SFx[23]:	$pV/(A*m^4)$	X dB/dt 333 microsecond time channel
SFx[24]:	$pV/(A*m^4)$	X dB/dt 383 microsecond time channel
SFx[25]:	$pV/(A*m^4)$	X dB/dt 440 microsecond time channel

Channel name	Units	Description
SFx[26]:	$pV/(A*m^4)$	X dB/dt 505 microsecond time channel
SFx[27]:	$pV/(A*m^4)$	X dB/dt 580 microsecond time channel
SFx[28]:	$pV/(A*m^4)$	X dB/dt 667 microsecond time channel
SFx[29]:	$pV/(A*m^4)$	X dB/dt 766 microsecond time channel
SFx[30]:	$pV/(A*m^4)$	X dB/dt 880 microsecond time channel
SFx[31]:	$pV/(A*m^4)$	X dB/dt 1010 microsecond time channel
SFx[32]:	$pV/(A*m^4)$	X dB/dt 1161 microsecond time channel
SFx[33]:	$pV/(A*m^4)$	X dB/dt 1333 microsecond time channel
SFx[34]:	$pV/(A*m^4)$	X dB/dt 1531 microsecond time channel
SFx[35]:	$pV/(A*m^4)$	X dB/dt 1760 microsecond time channel
SFx[36]:	$pV/(A*m^4)$	X dB/dt 2021 microsecond time channel
SFx[37]:	$pV/(A*m^4)$	X dB/dt 2323 microsecond time channel
SFx[38]:	$pV/(A*m^4)$	X dB/dt 2667 microsecond time channel
SFx[39]:	$pV/(A*m^4)$	X dB/dt 3063 microsecond time channel
SFx[40]:	$pV/(A*m^4)$	X dB/dt 3521 microsecond time channel
SFx[41]:	$pV/(A*m^4)$	X dB/dt 4042 microsecond time channel
SFx[42]:	$pV/(A*m^4)$	X dB/dt 4641 microsecond time channel
SFx[43]:	$pV/(A*m^4)$	X dB/dt 5333 microsecond time channel
SFx[44]:	$pV/(A*m^4)$	X dB/dt 6125 microsecond time channel
SFx[45]:	$pV/(A*m^4)$	X dB/dt 7036 microsecond time channel
BFz	$(pV*ms)/(A*m^4)$	Z B-Field data for time channels 14 to 45
PLM:		60 Hz power line monitor
TauSF	milliseconds	Time Constant (Tau) calculated from dB/dt data
CVG	nT/m	Calculated Magnetic Vertical Gradient
SFx_m5ff		Fraser Filtered dB/dt

Electromagnetic B-field and dB/dt Z component data is found in array channel format between indexes 14 – 45, and X component data from 20 – 45, as described above.

- Database of the VTEM Waveform "10282_waveform_final.gdb" in Geosoft GDB format, containing the following channels:

  Time: Sampling rate interval, 5.2083 microseconds
  Rx_Volt: Output voltage of the receiver coil (Volt)
  Tx_Current: Output current of the transmitter (Amp)

- Grids in Geosoft GRD format, as follows:

  BFz32: B-Field Z Component Channel 32 (Time Gate 1.161 ms)
  BFz34: B-Field Z Component Channel 34 (Time Gate 1.531 ms)
  BFz36: B-Field Z Component Channel 36 (Time Gate 2.021 ms)
  BFz38: B-Field Z Component Channel 38 (Time Gate 2.667 ms)
  BFz39: B-Field Z Component Channel 39 (Time Gate 3.063 ms)
  MAG: Total magnetic intensity (nT)
  TAUSFz: dB/dt Calculated Time Constant (TAU)
  CVG: Calculated Vertical Gradient
  SFxFF_30: Fraser Filtered X dB/dt
  SFxFF_33: Fraser Filtered X dB/dt
  SFxFF_34: Fraser Filtered X dB/dt

  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.

- Example of Block C Maps in Geosoft MAP format, as follows:

10282_10k_dBdtz_bb:	dB/dt profiles Z Component, Time Gates 0.220 – 7.036 ms in linear – logarithmic scale.
10282_10k_bfield_bb:	B-field profiles Z Component, Time Gates 0.220 – 7.036 ms in linear – logarithmic scale.
10282_10k_BFz32_bb:	B-field late time Z Component Channel 62, Time Gate 1.161 ms color image.
10282_10k_TMI_bb:	Total magnetic intensity (TMI) color image and contours.
10282_10K_TAUSFz_CVG_contours_bb:	dB/dt Calculated Time Contant (TAU) with contours of anomaly areas of the Calculated Vertical Derivative of TMI
10282_10k_SFx_FF_bb:	Fraser Filtered X dB/dt, Time Gates 0.220 – 7.036 ms

Where bb represents the block name.

Maps are also presented in 1:10,000 scale Geosoft maps & 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 *10282_BlockA.kml*, *10282_BlockB.kml*, *10282_BlockC.kml*, *10282_BlockD.kml*, *10282_BlockE.kml*, *10282_BlockF.kml* showing the flight path of the block is included. Free versions of Google Earth software from: http://earth.google.com/download-earth.html

6. CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

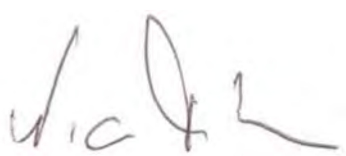
A helicopter-borne versatile time domain electromagnetic (VTEM) geophysical survey has been completed over the Blocks A, B, C, D, E & F.

The total area coverage is 160 km^2. Total survey line coverage is 1257.9 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 1:10,000 & 1:20,000. No formal Interpretation has been included.

6.2 Recommendations

Based on the geophysical results obtained, a number of interesting EM anomalies that were identified across the property. The magnetic results may also contain worthwhile information in support of exploration targets of interest. We therefore recommend a detailed interpretation of the available geophysical data, in conjunction with the geology. It should include 2D - 3D inversion modeling analyses and magnetic derivative analysis prior to ground follow up and drill testing.

Respectfully submitted[6],



Nick Venter
Geotech Ltd.

Alexander Prikhodko, P. Geo, Ph.D.
Geotech Ltd.

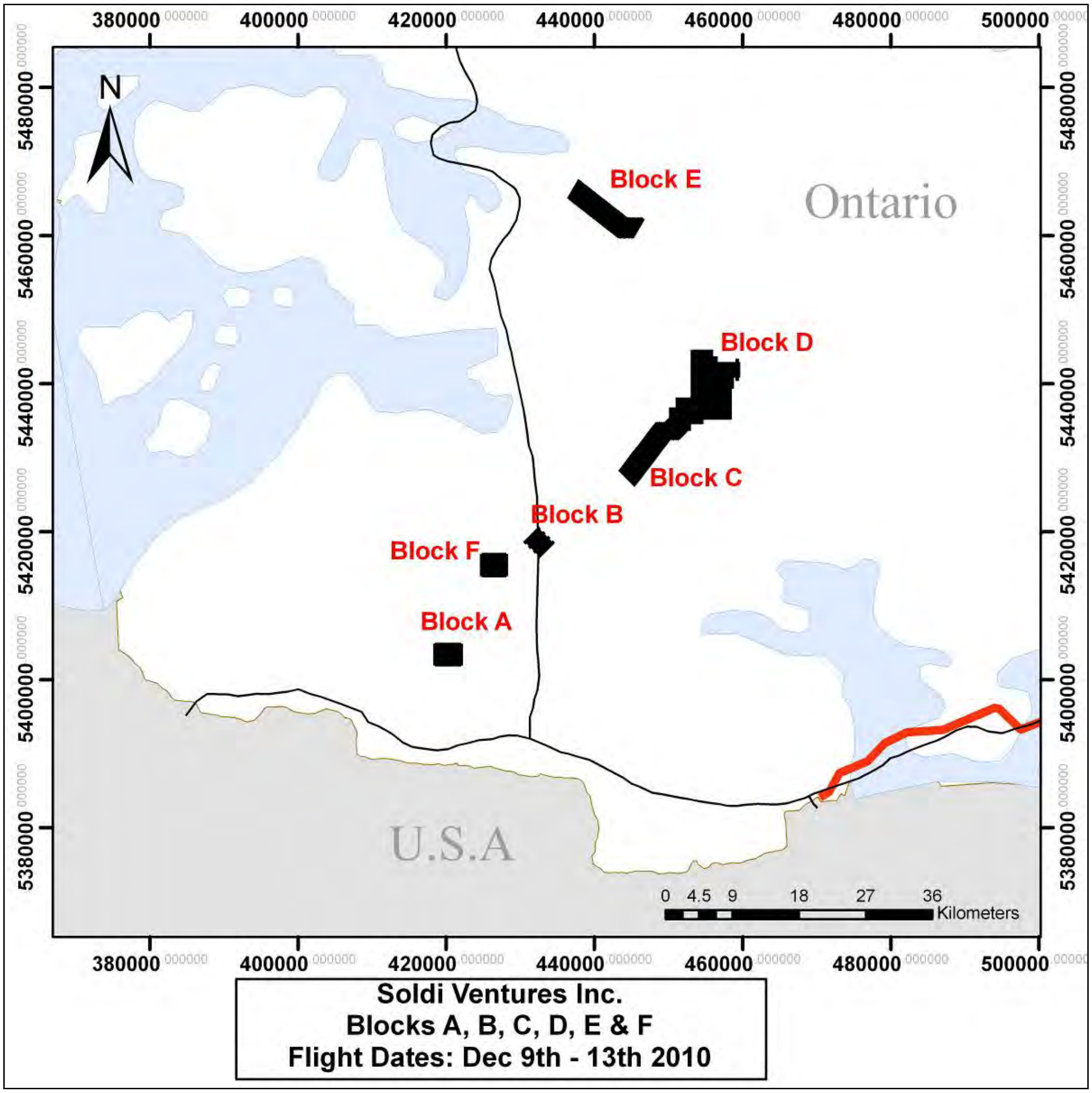
Harish Kumar P.Geo
Geotech Ltd.

February 2011

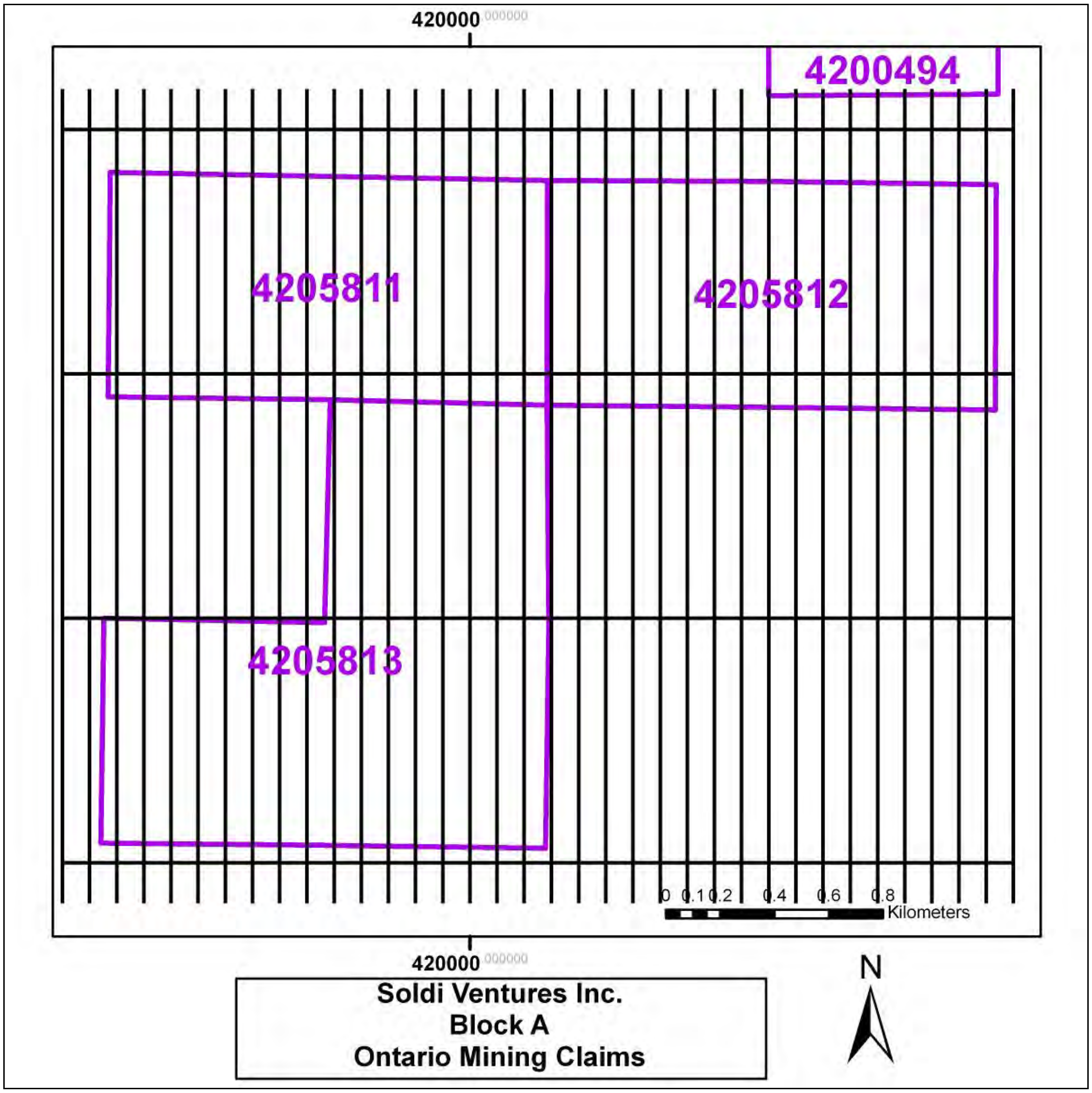
[6]Final data processing of the EM and magnetic data were carried out by Nick Venter from the office of Geotech Ltd. in Aurora, Ontario, under the supervision of Harish Kumar, Assitant Manager of Data Processing and Alex Prikhodko, P. Geo, PhD, Senior Geophysicist, VTEM interpretation supervisor.

APPENDIX A

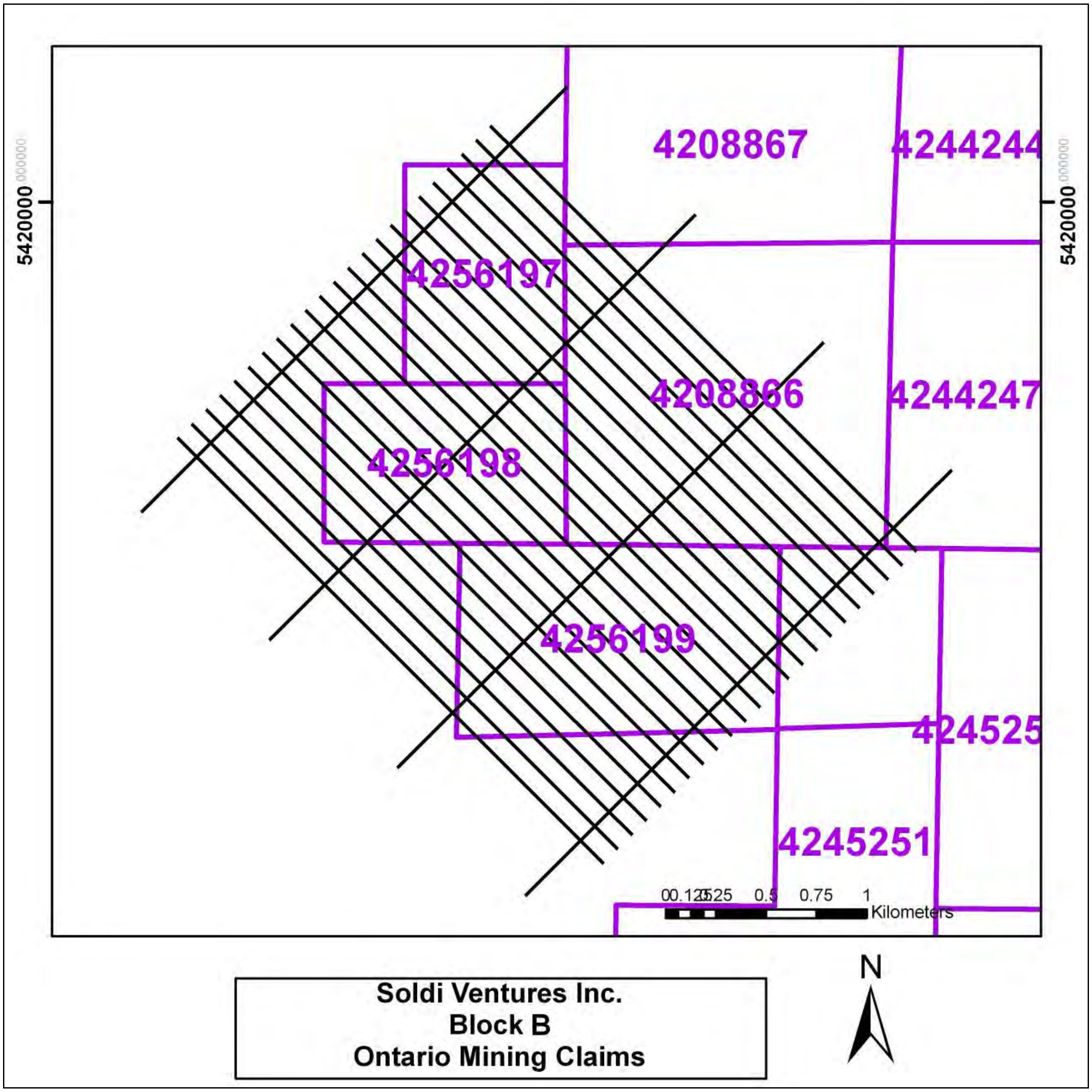
SURVEY BLOCK LOCATION MAP



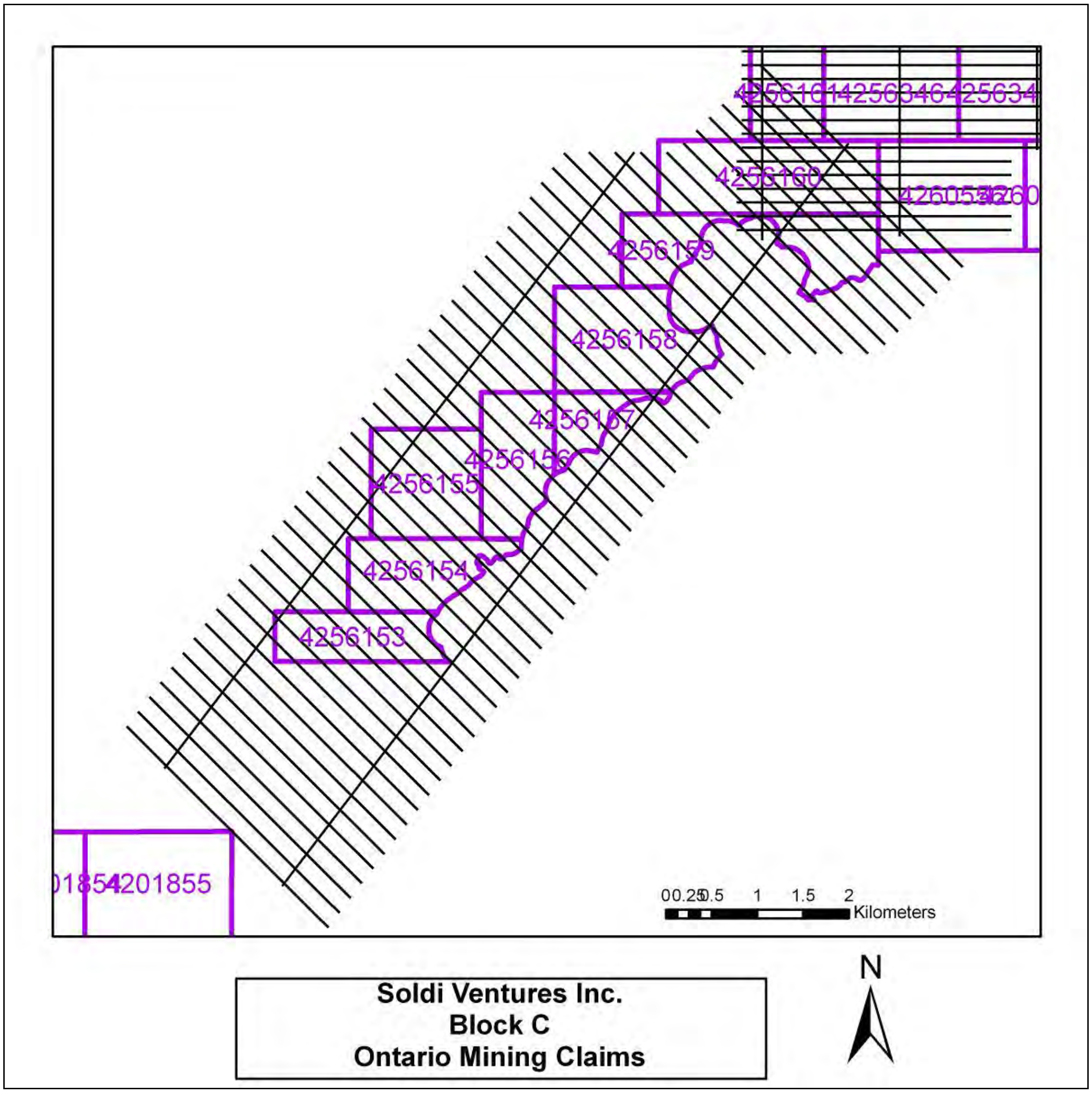
Survey Overview of the Block



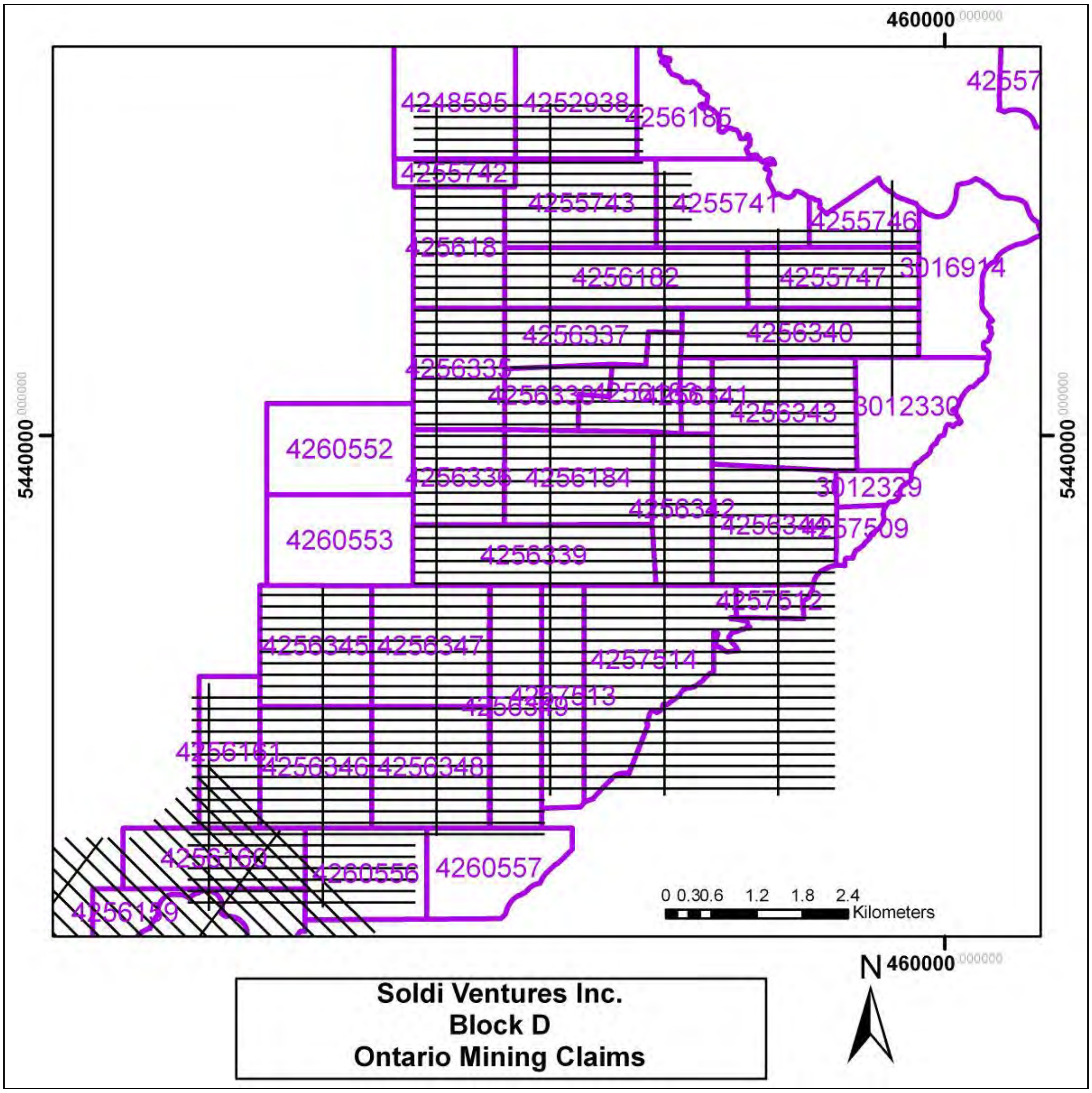
Mining Claims for Block A



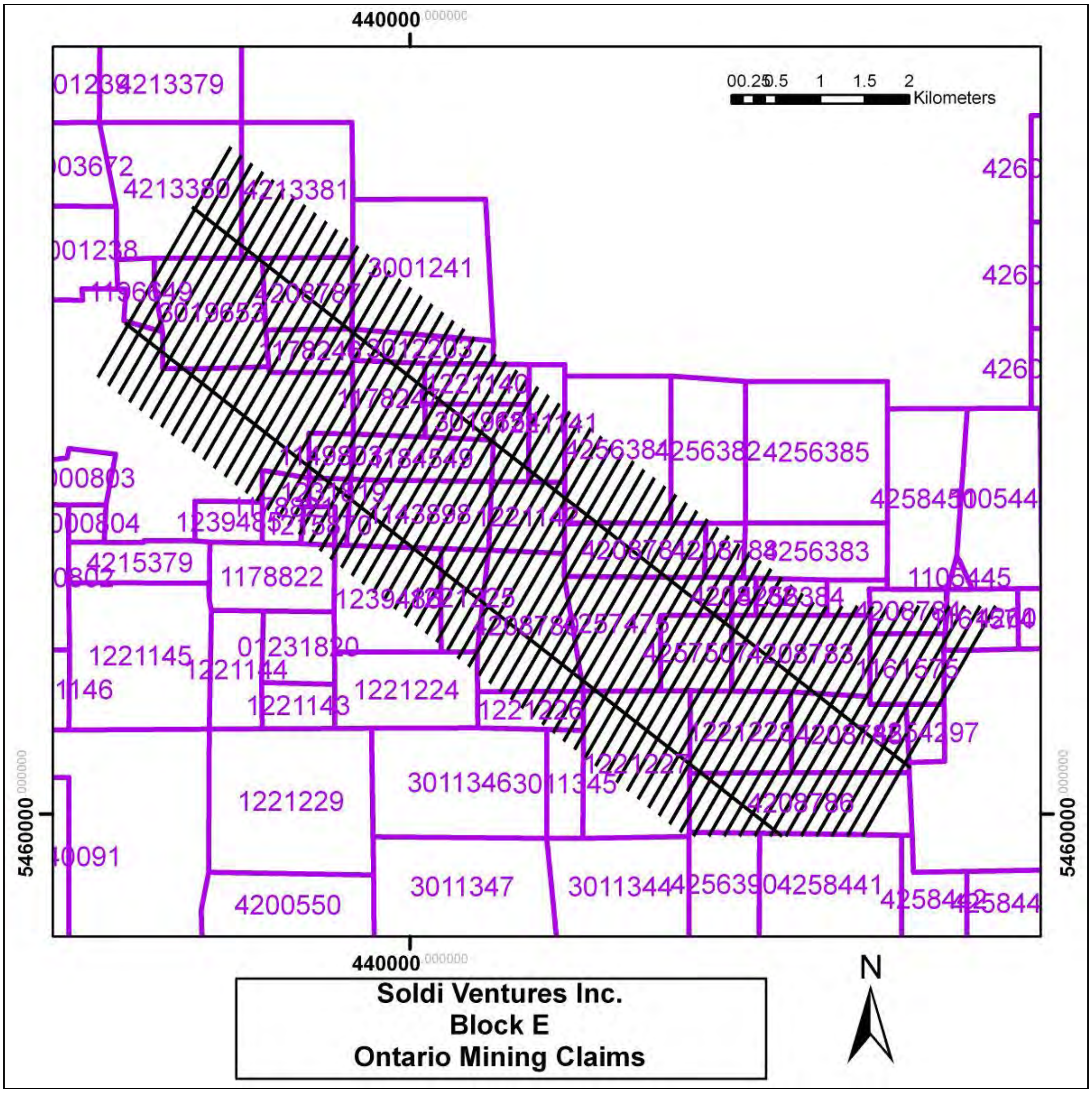
Mining Claims for Block B



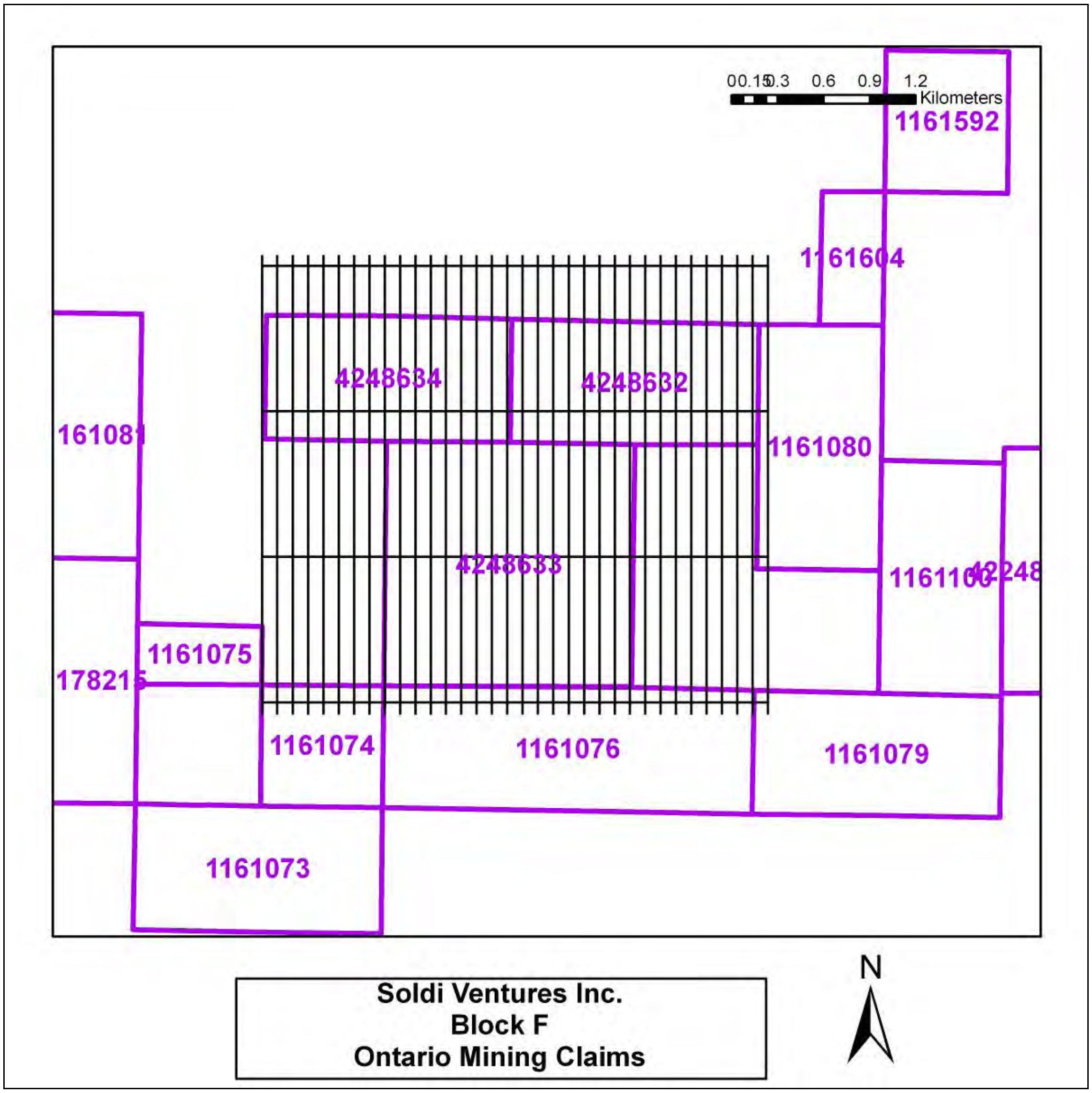
Mining Claims for Block C



Mining Claims for Block D



Mining Claims for Block E



Mining Claims for Block F

APPENDIX B

SURVEY BLOCK COORDINATES

(WGS 84, UTM Zone 15 North)

Block A - WGS 84 UTM Zone 15N	
X	Y
418500	5401900
418500	5404900
422000	5404900
422000	5401900

Block B - WGS 84 UTM Zone 15N	
X	Y
432800	5416700
430700	5418800
432300	5420400
434400	5418300

Block C - WGS 84 UTM Zone 15N	
X	Y
452550	5433500
451550	5432500
450350	5432500
445550	5426200
443350	5428400
448150	5434700
449350	5434700
450350	5435700

Block D - WGS 84 UTM Zone 15N	
X	Y
454734	5435273
454734	5434724
452976	5434724
452976	5433781
450083	5433781
450083	5436696
450978	5436696
450978	5437999
453008	5437999
453008	5444378
456029	5444378
456029	5443486
456668	5443486
456668	5442732
459689	5442732

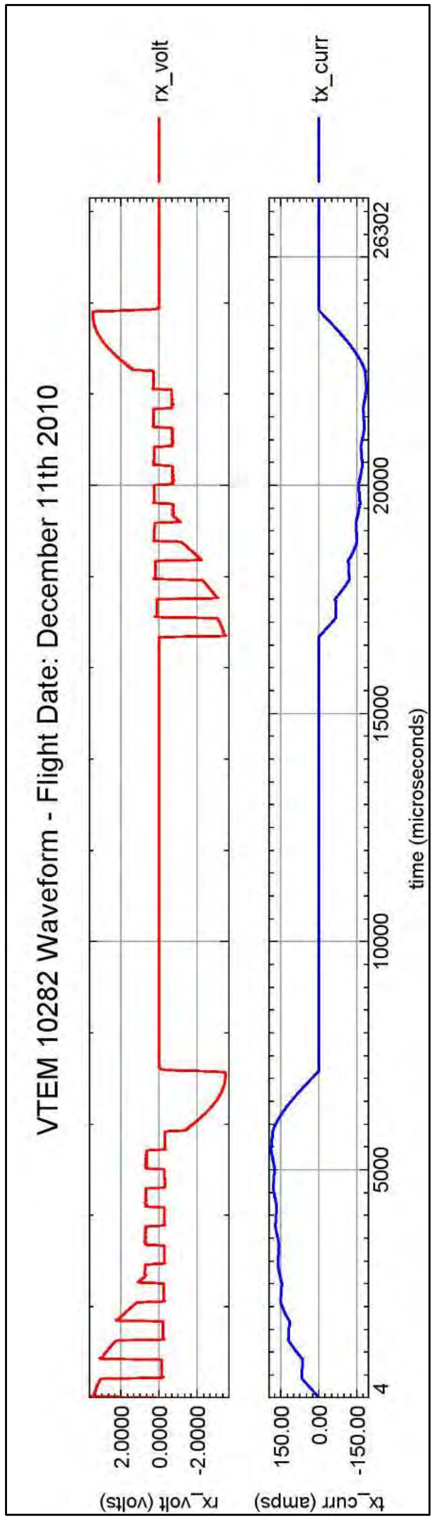
459689	5441000
458842	5441000
458842	5439474
458554	5439474
458554	5435255
454766	5435255

Block E - WGS 84 UTM Zone 15N	
X	Y
437950	5467550
444600	5462350
446700	5462350
445200	5459750
443100	5459750
436450	5464950

Block F - WGS 84 UTM Zone 15N	
X	Y
424800	5414000
424800	5417000
428100	5417000
428100	5414000

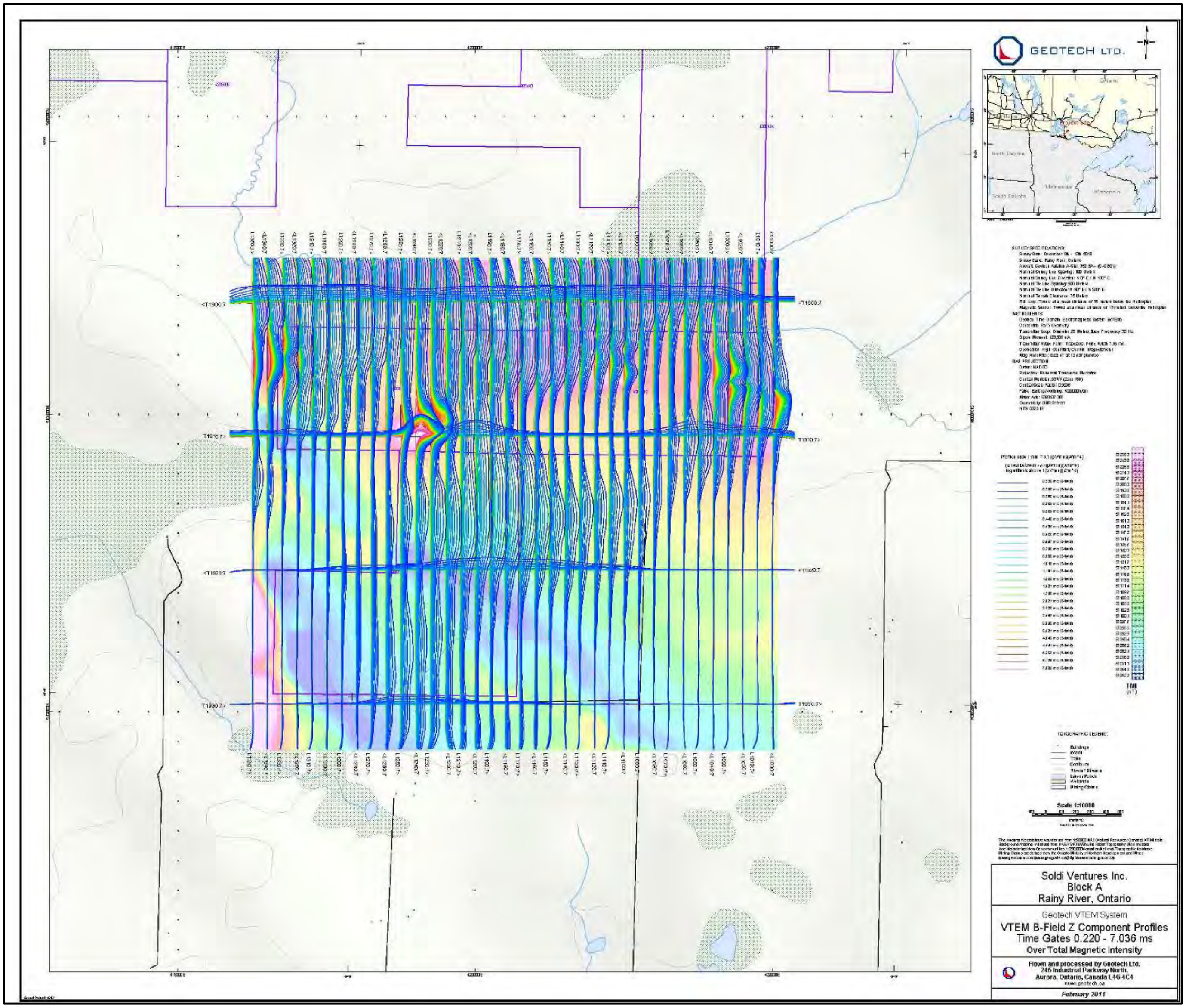
APPENDIX C

VTEM WAVEFORM



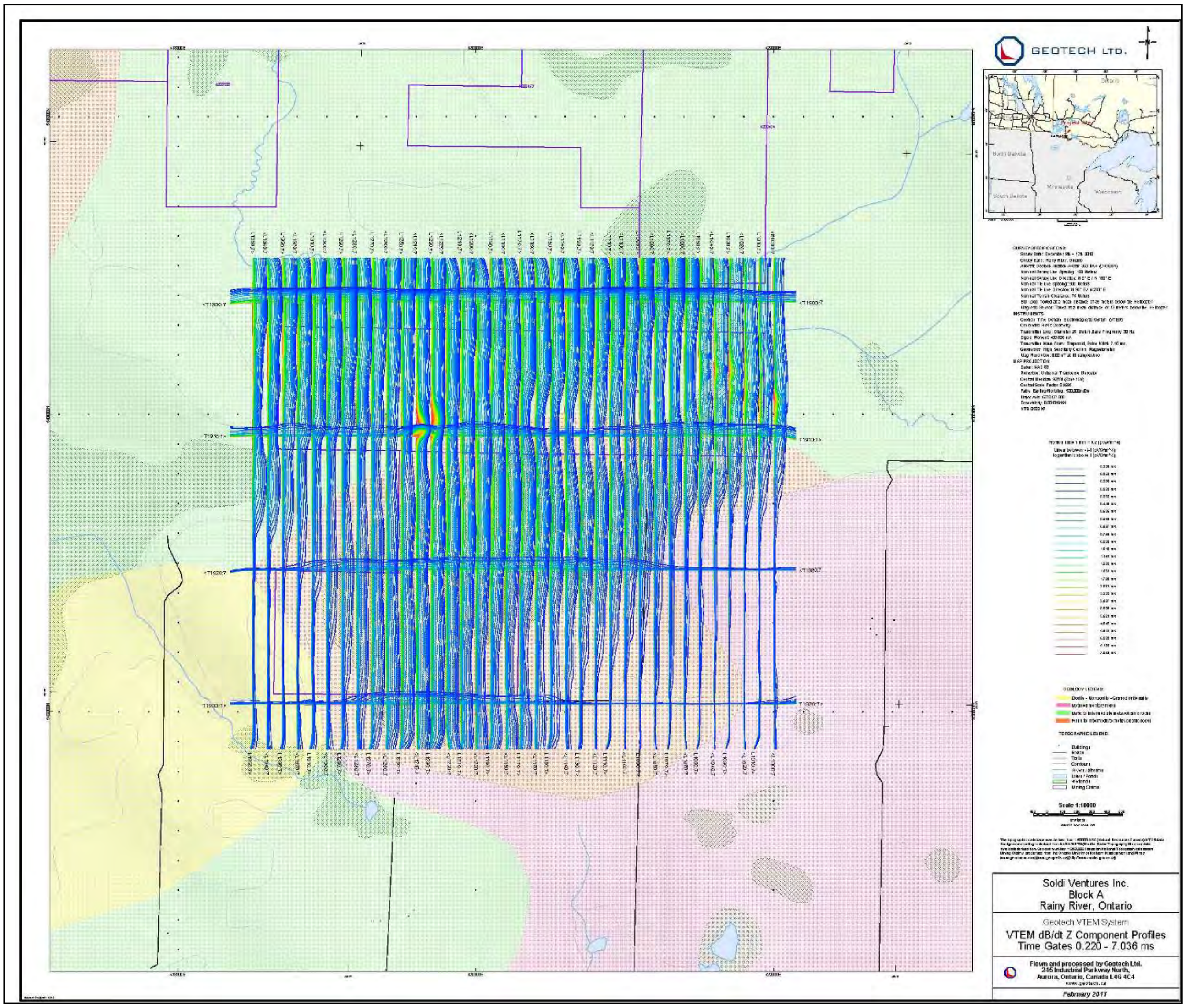
APPENDIX D

GEOPHYSICAL MAPS[1]

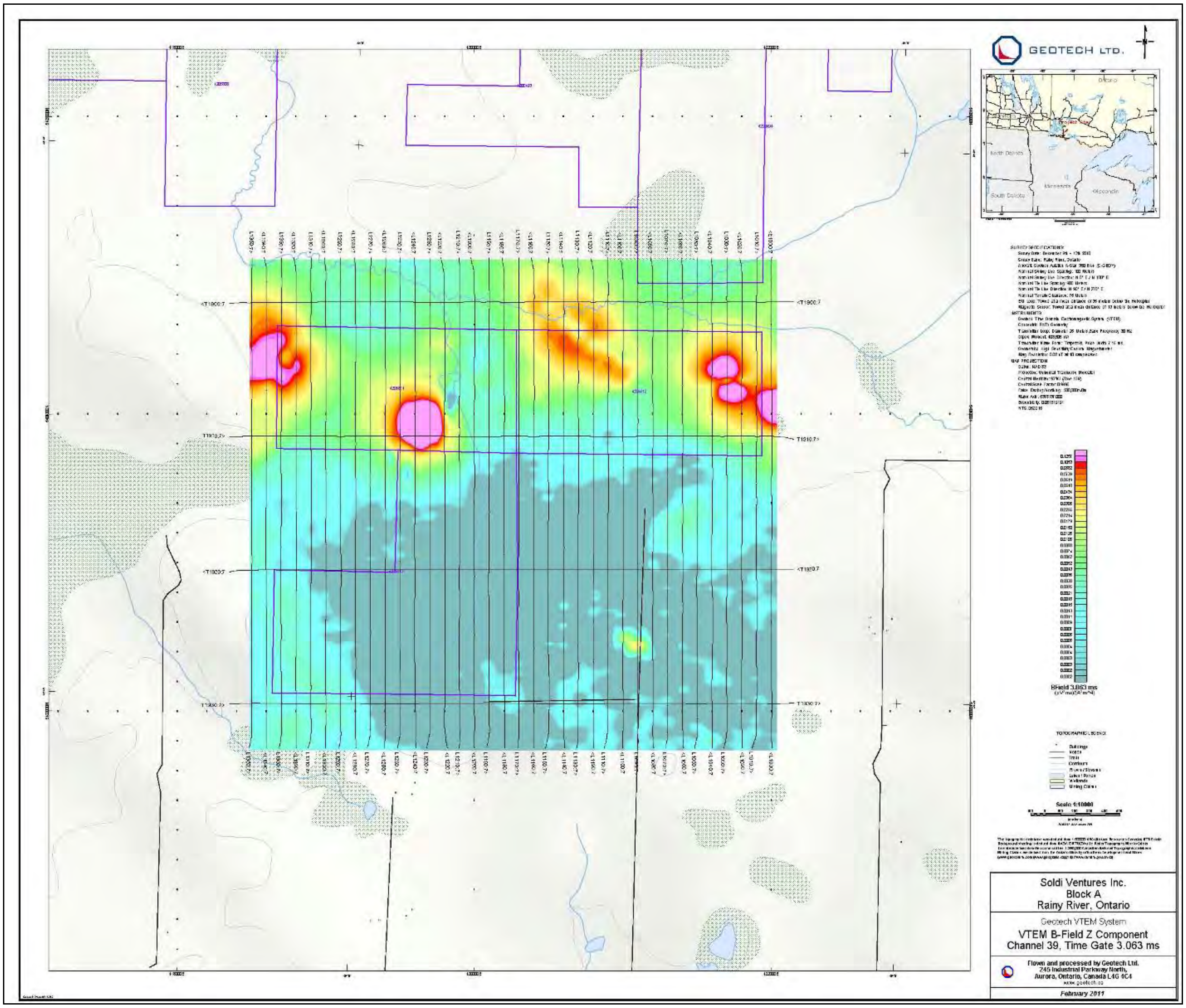


VTEM B-Field Z Component Profiles, Time Gates 0.220 to 7.036 ms (Block A)

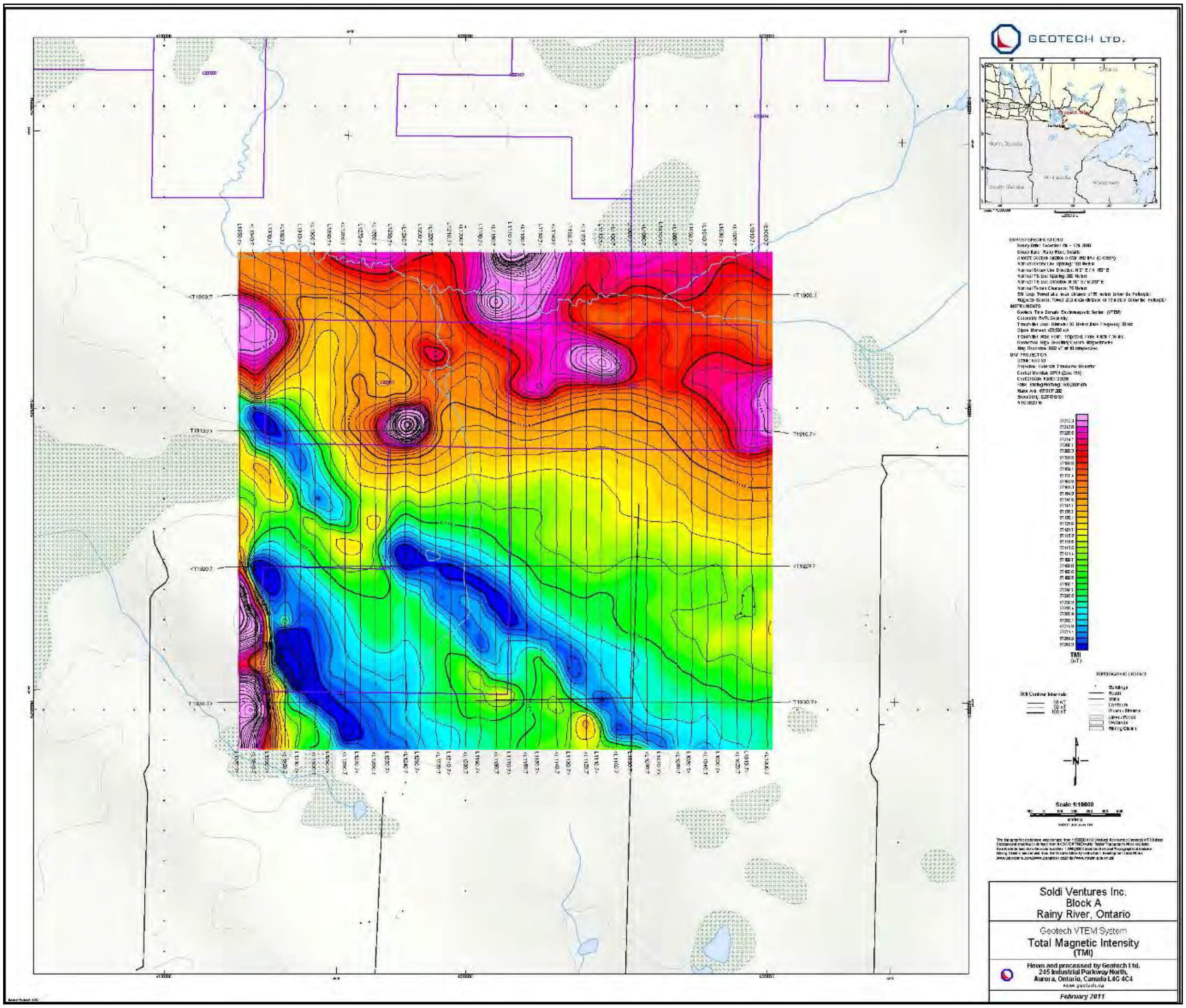
[1] Full size geophysical maps are also available in PDF format on the final DVD



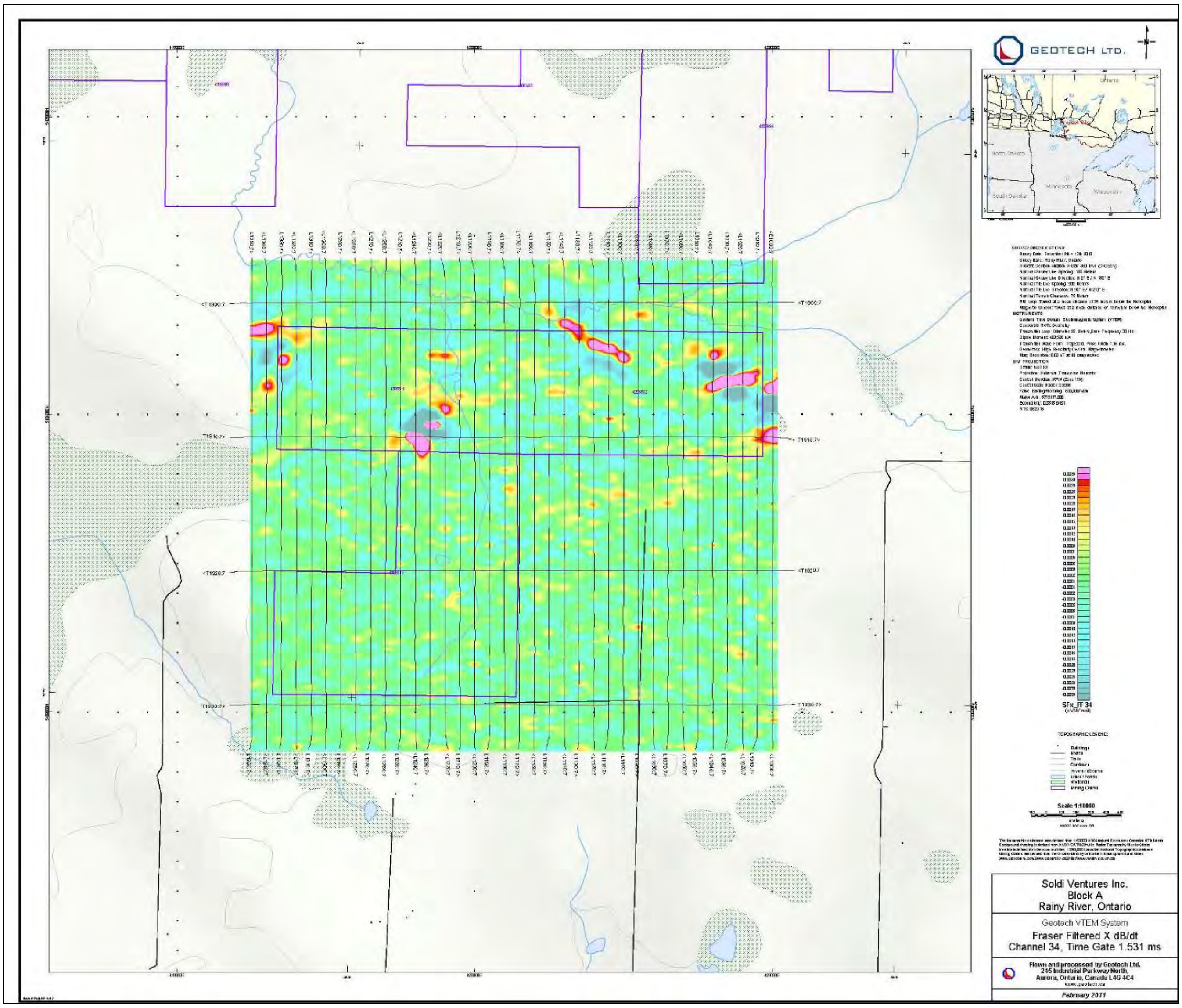
VTEM dB/dt Z Component Profiles, Time Gates 0.220 to 7.036 ms (Block A)



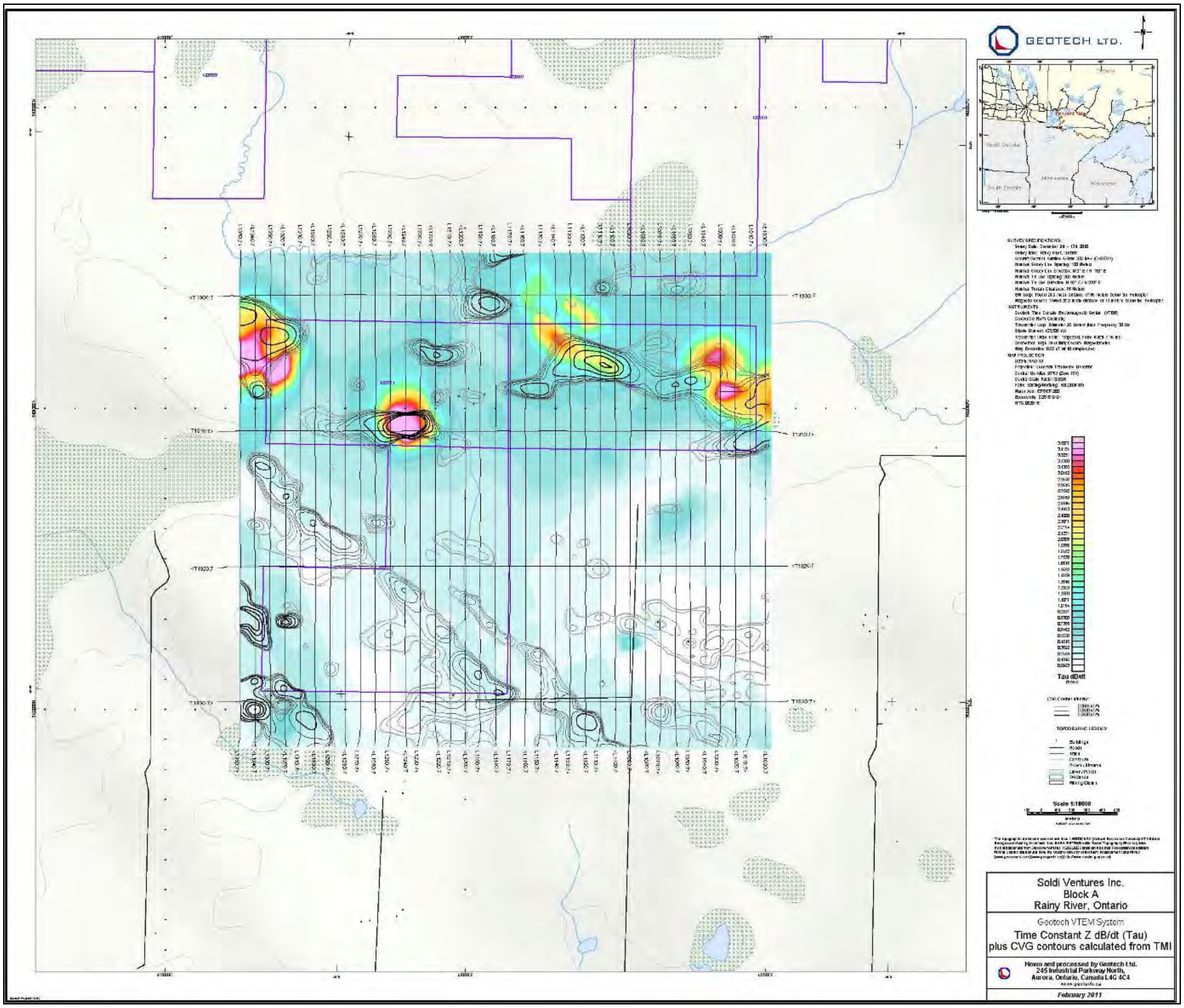
VTEM B-Field Z Component Channel 39, Time Gate 3.063 ms (Block A)



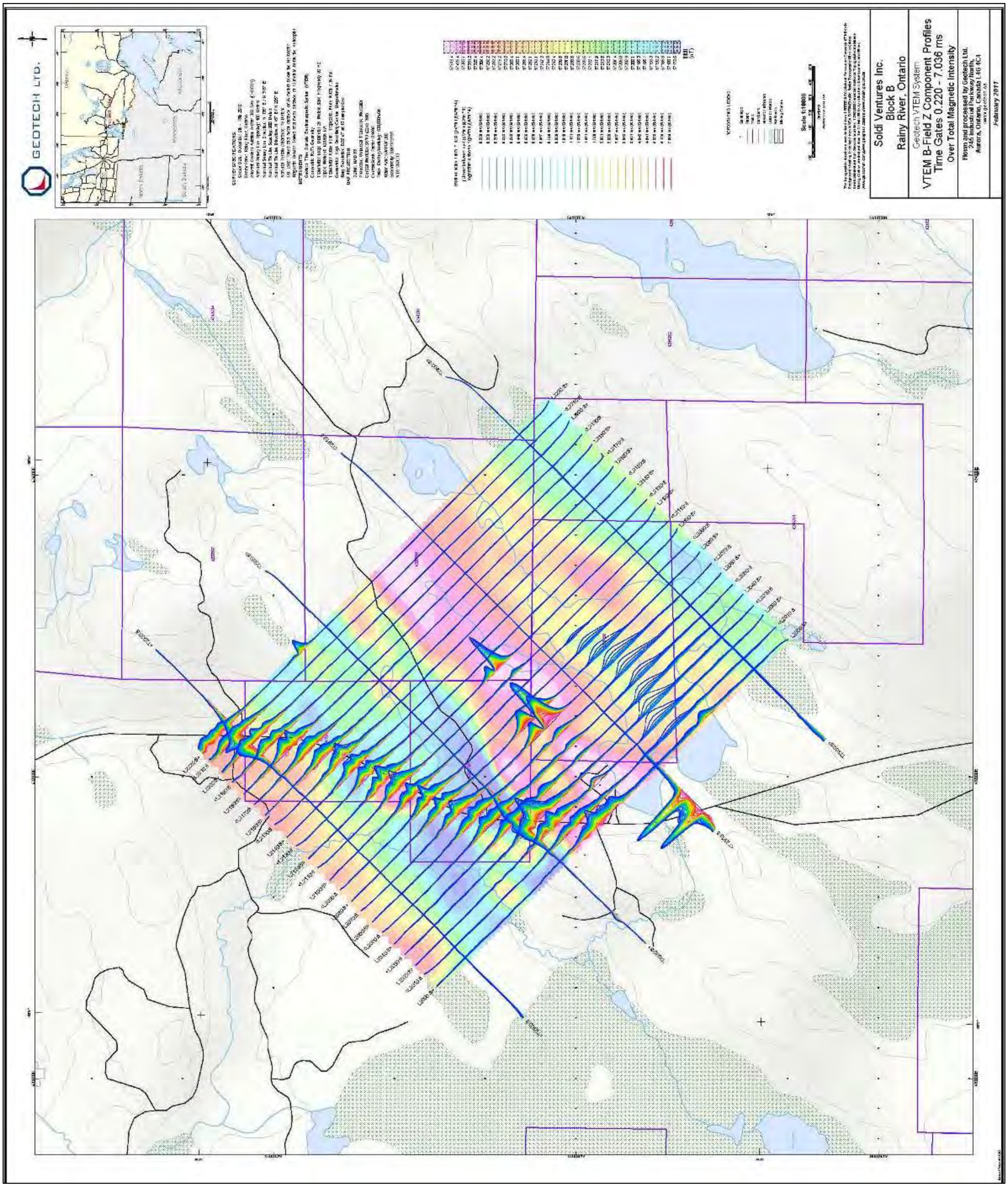
Total Magnetic Intensity (TMI) (Block A)



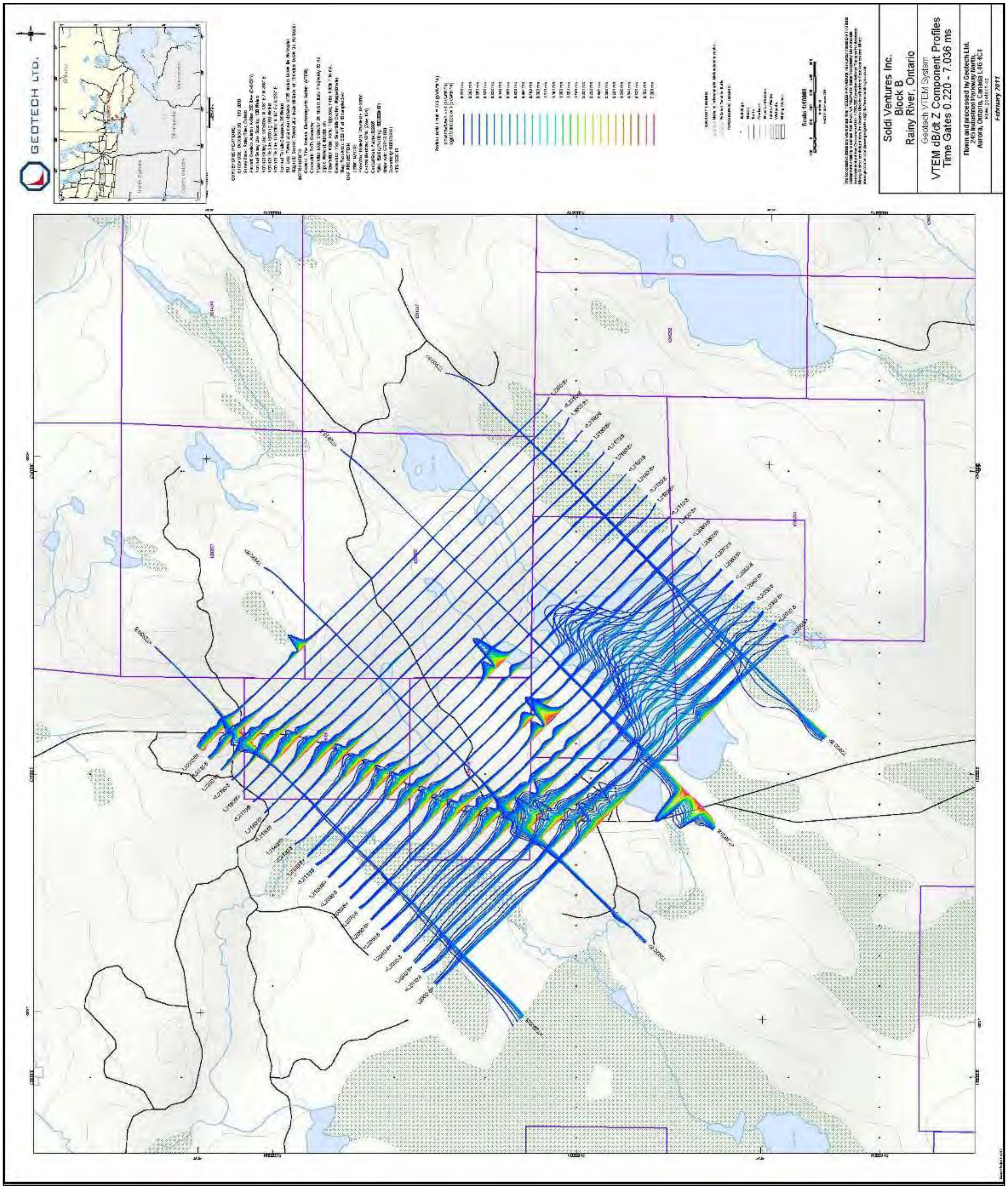
Fraser Filtered dB/dt X (SFx_FF) (Block A)



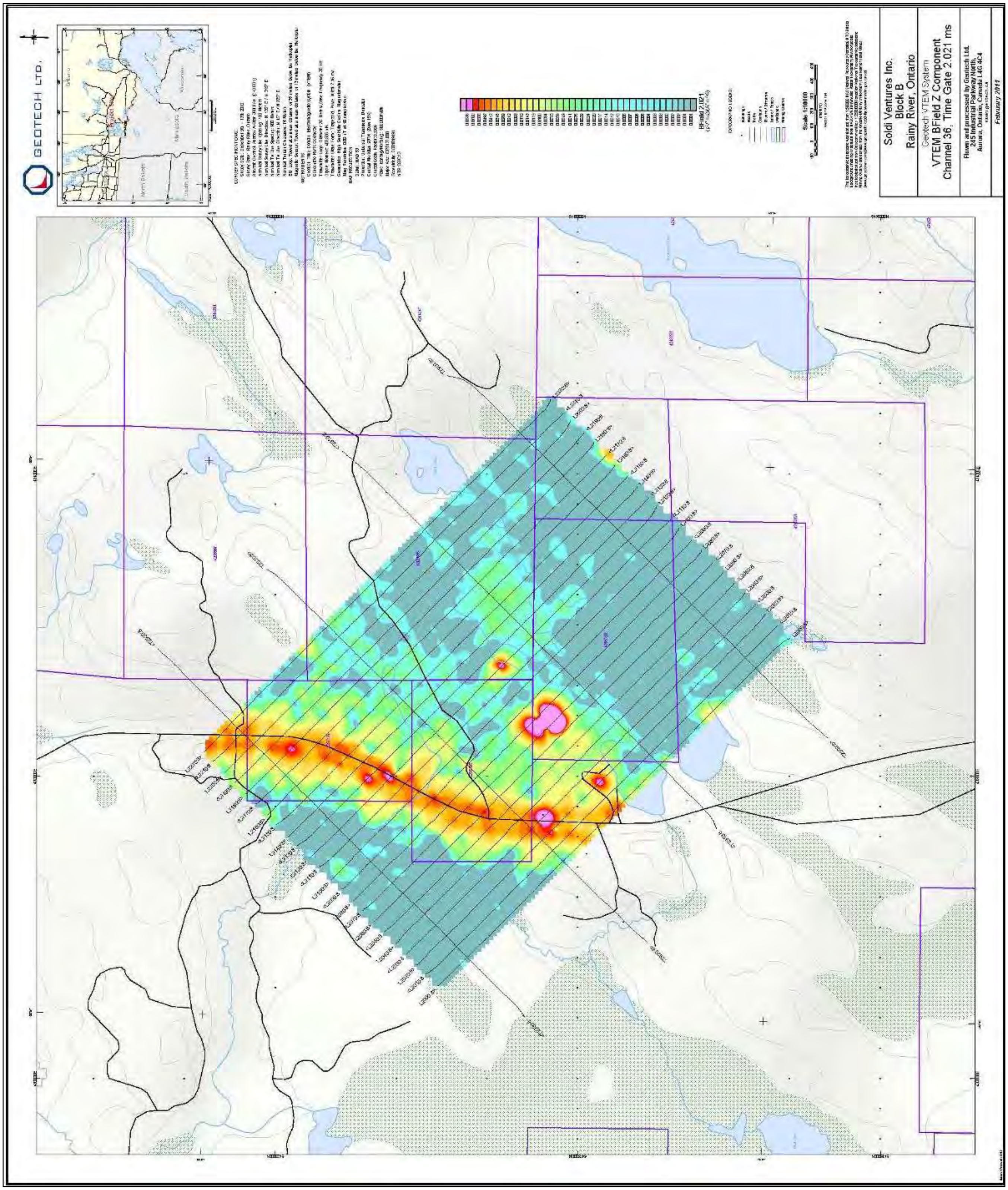
Latest Time Gate (Tau) SF dB/dt with CVG contours(Block A)



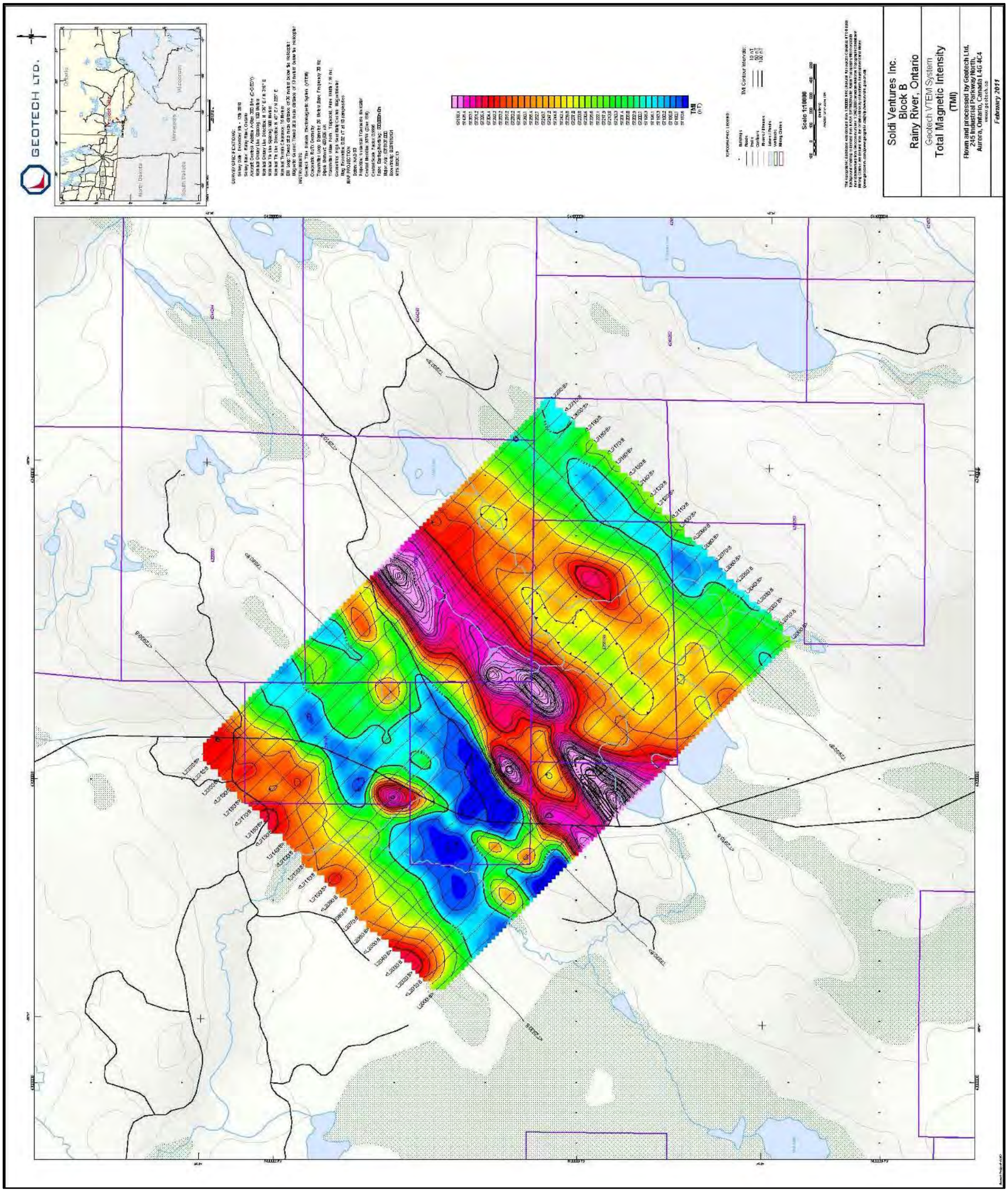
VTEM B-Field Z Component Profiles, Time Gates 0.220 to 7.036 ms (Block B)



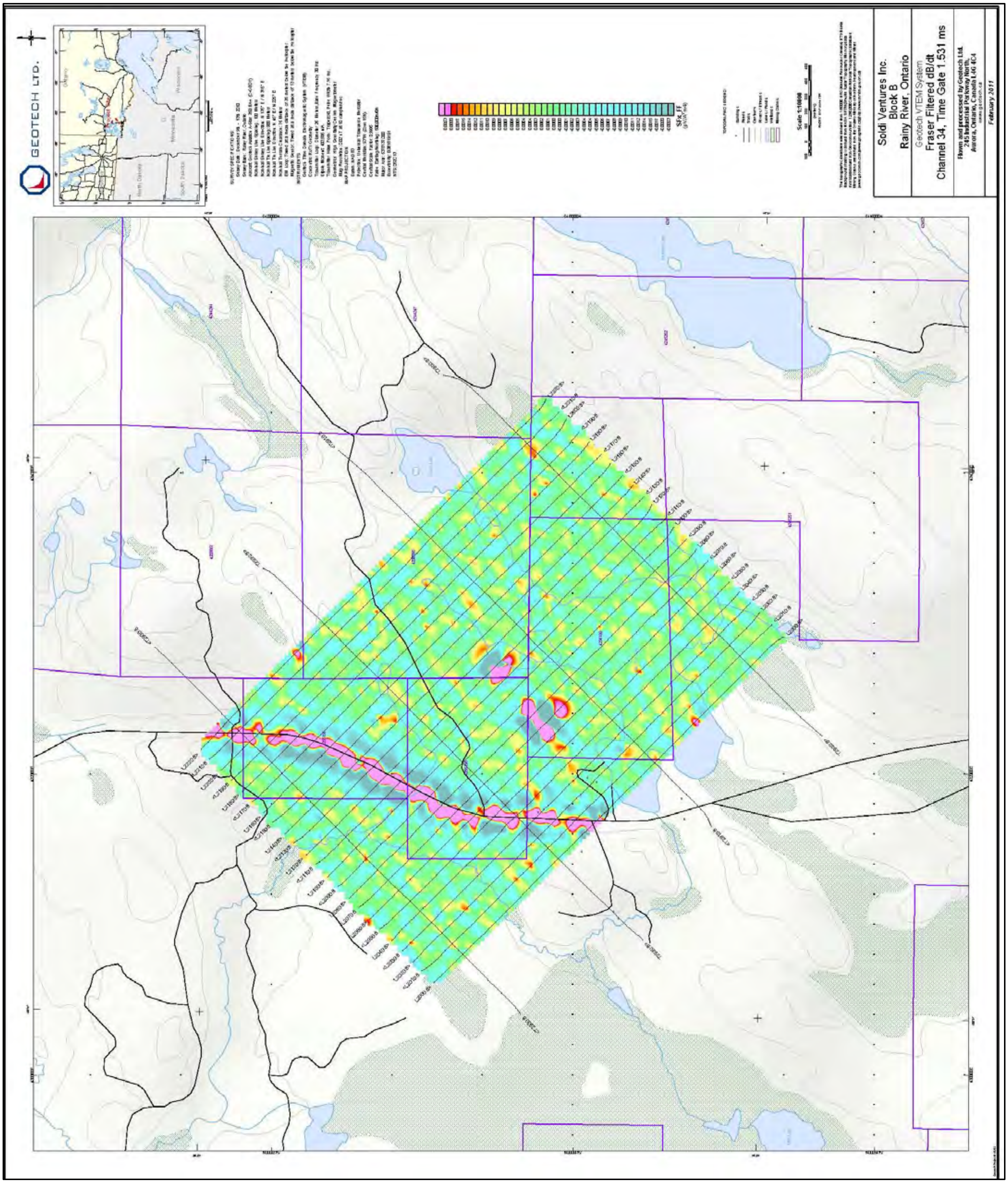
VTEM dB/dt Z Component Profiles, Time Gates 0.220 to 7.036 ms (Block B)



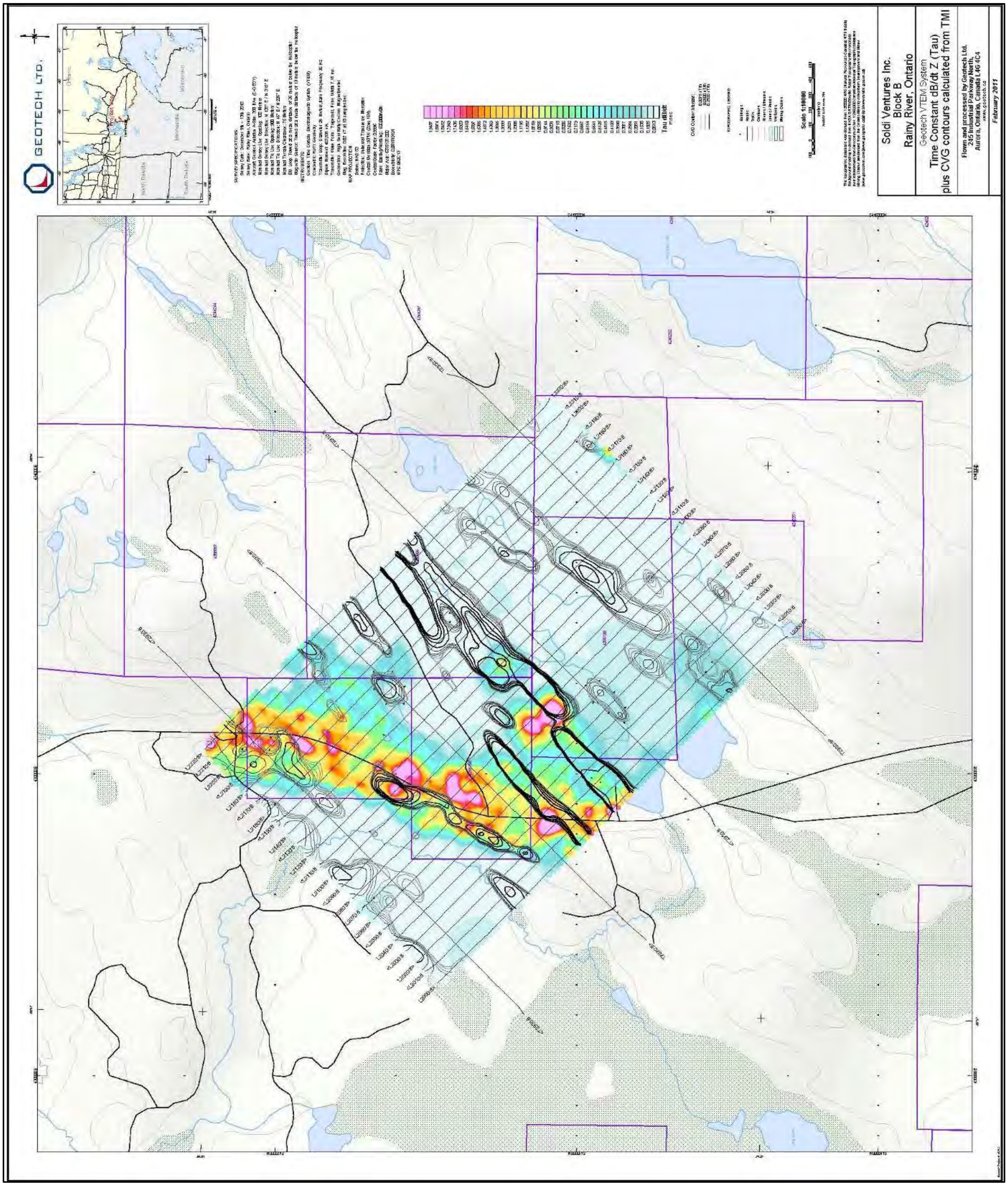
VTEM B-Field Z Component Channel 36, Time Gate 2.021 ms (Block B)



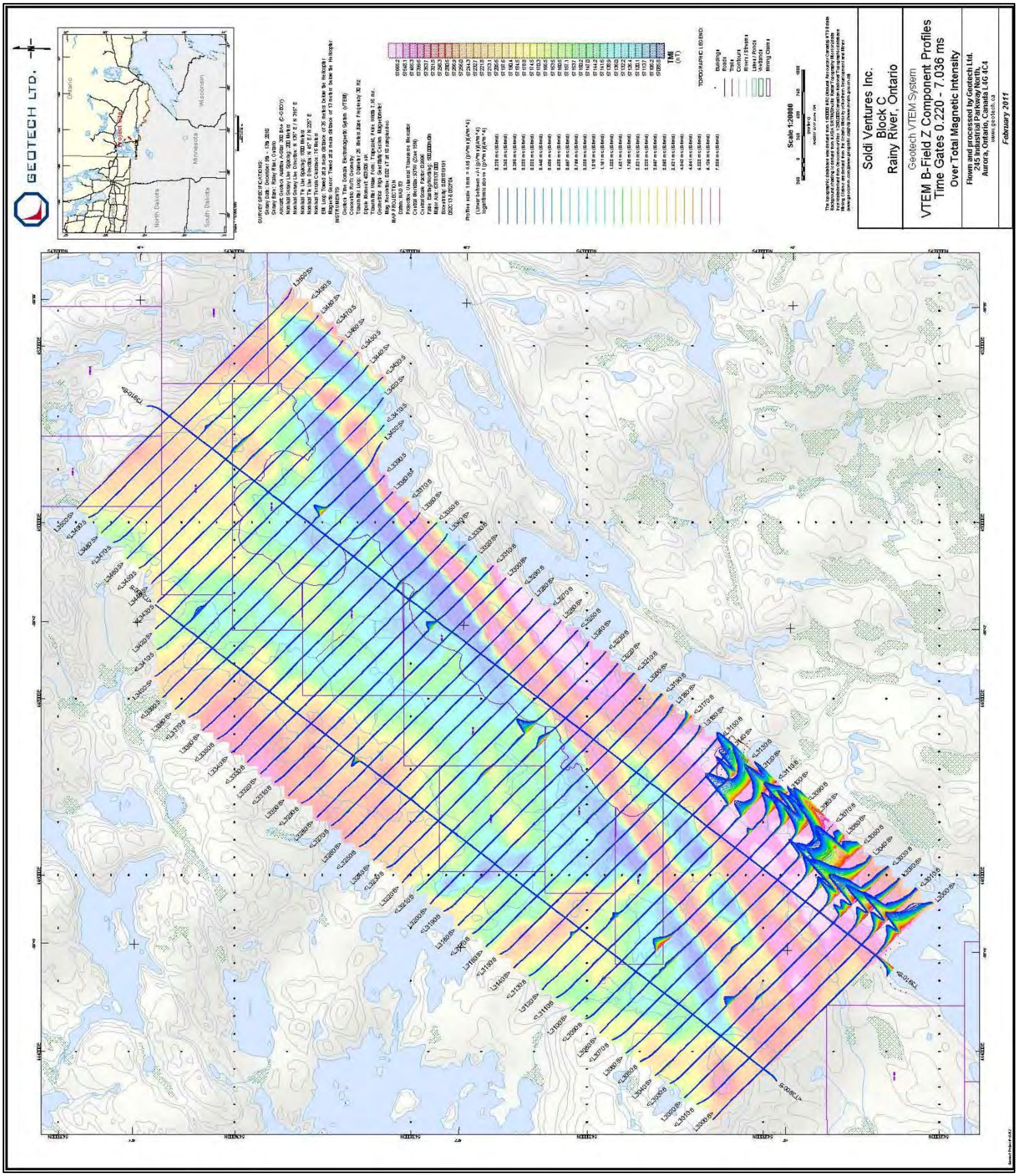
Total Magnetic Intensity (TMI) (Block B)



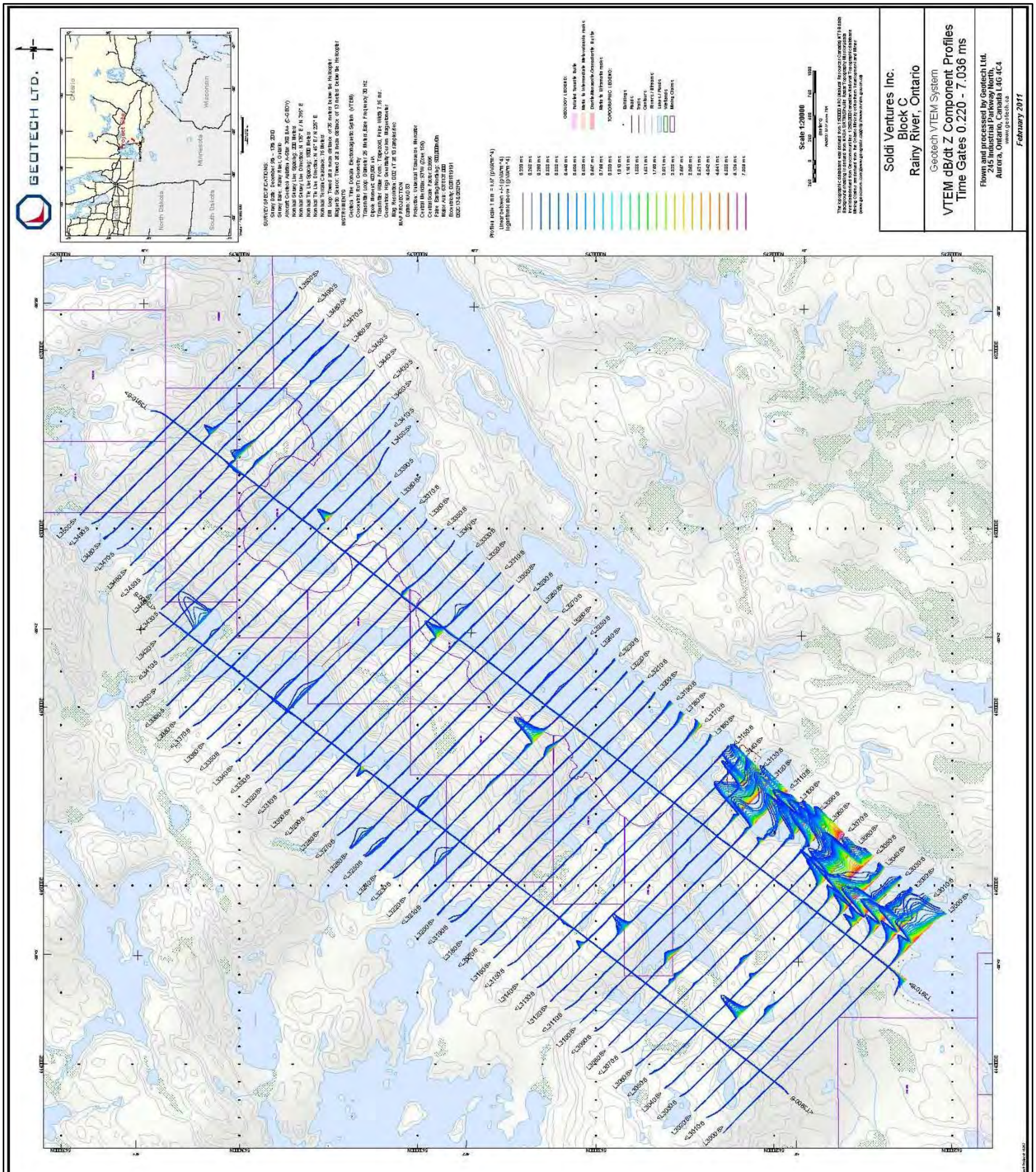
Fraser Filtered dB/dt X (SFx_FF) (Block B)



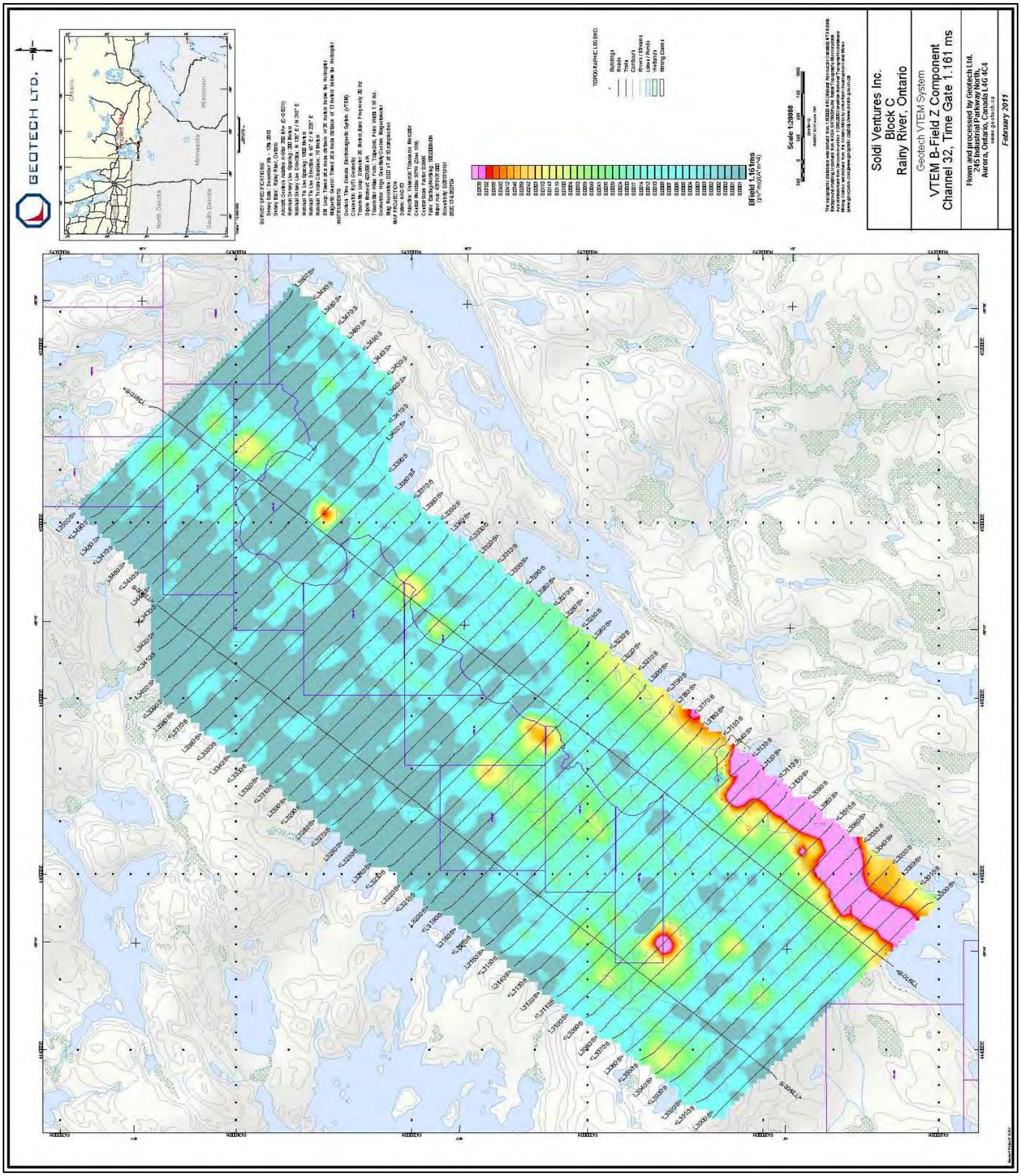
Latest Time Gate (Tau) SF dB/dt with CVG contours(Block B)



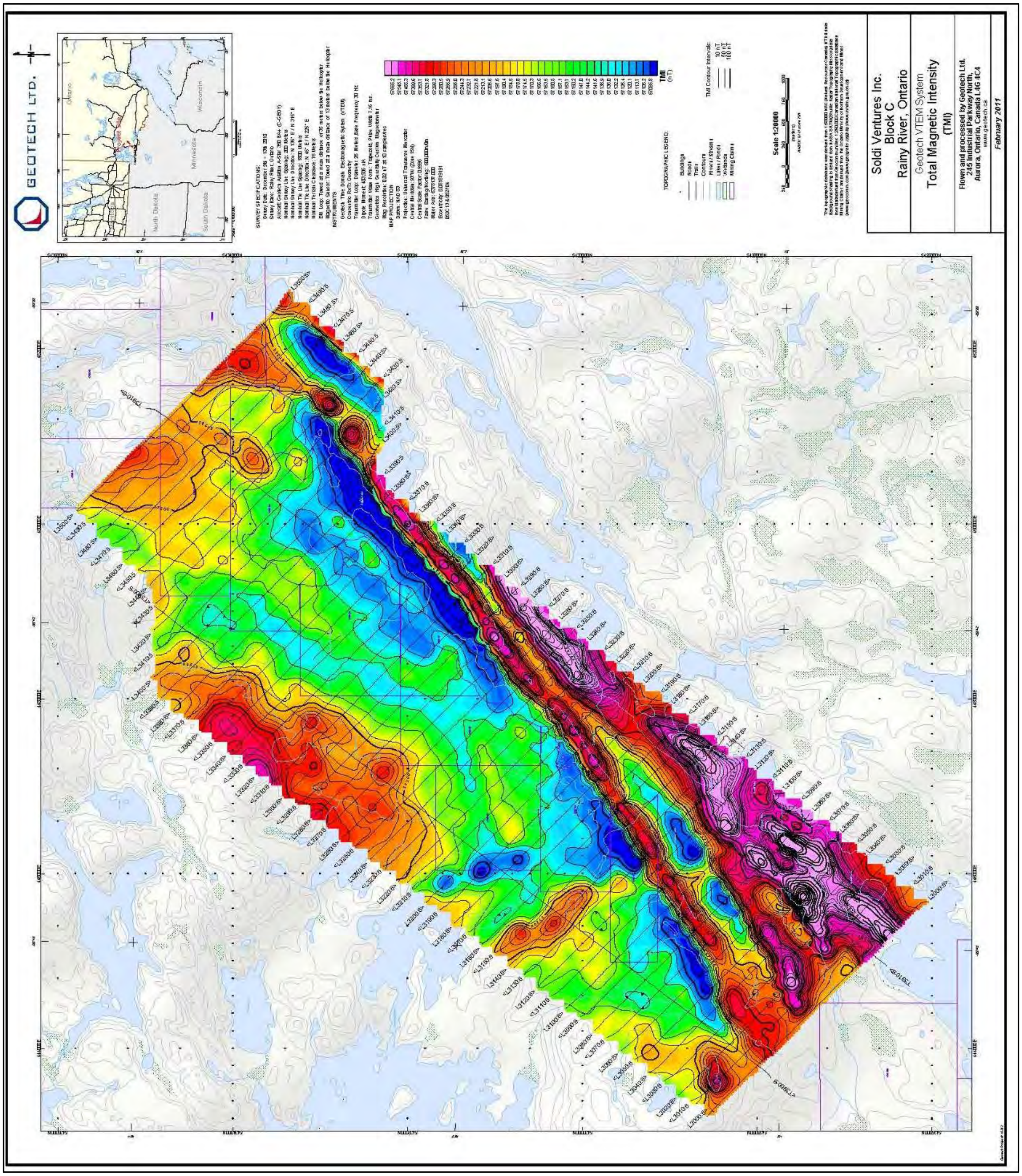
VTEM B-Field Z Component Profiles, Time Gates 0.220 to 7.036 ms (Block C)



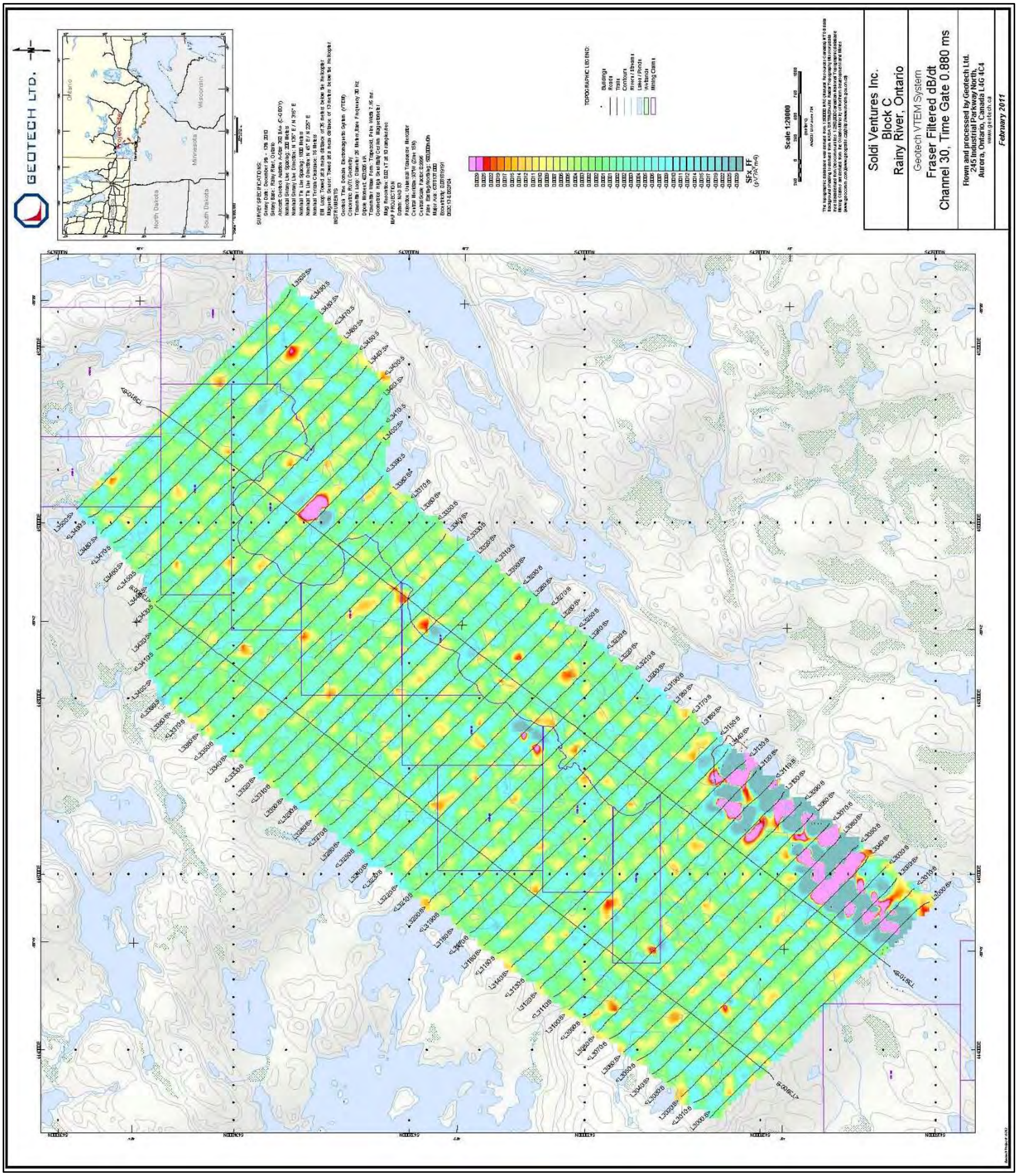
VTEM dB/dt Z Component Profiles, Time Gates 0.220 to 7.036 ms (Block C)



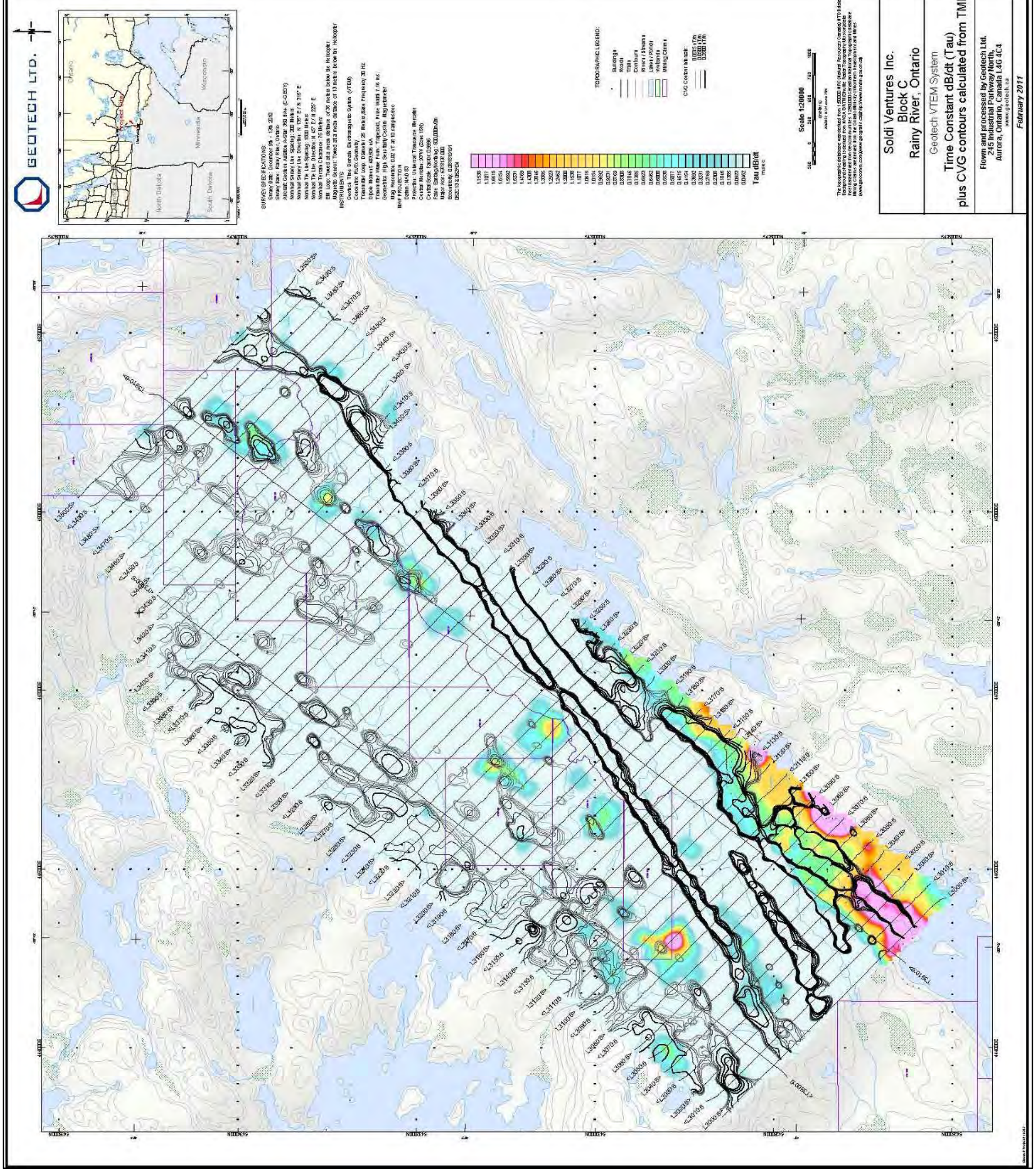
VTEM B-Field Z Component Channel 32, Time Gate 1.161 ms (Block C)



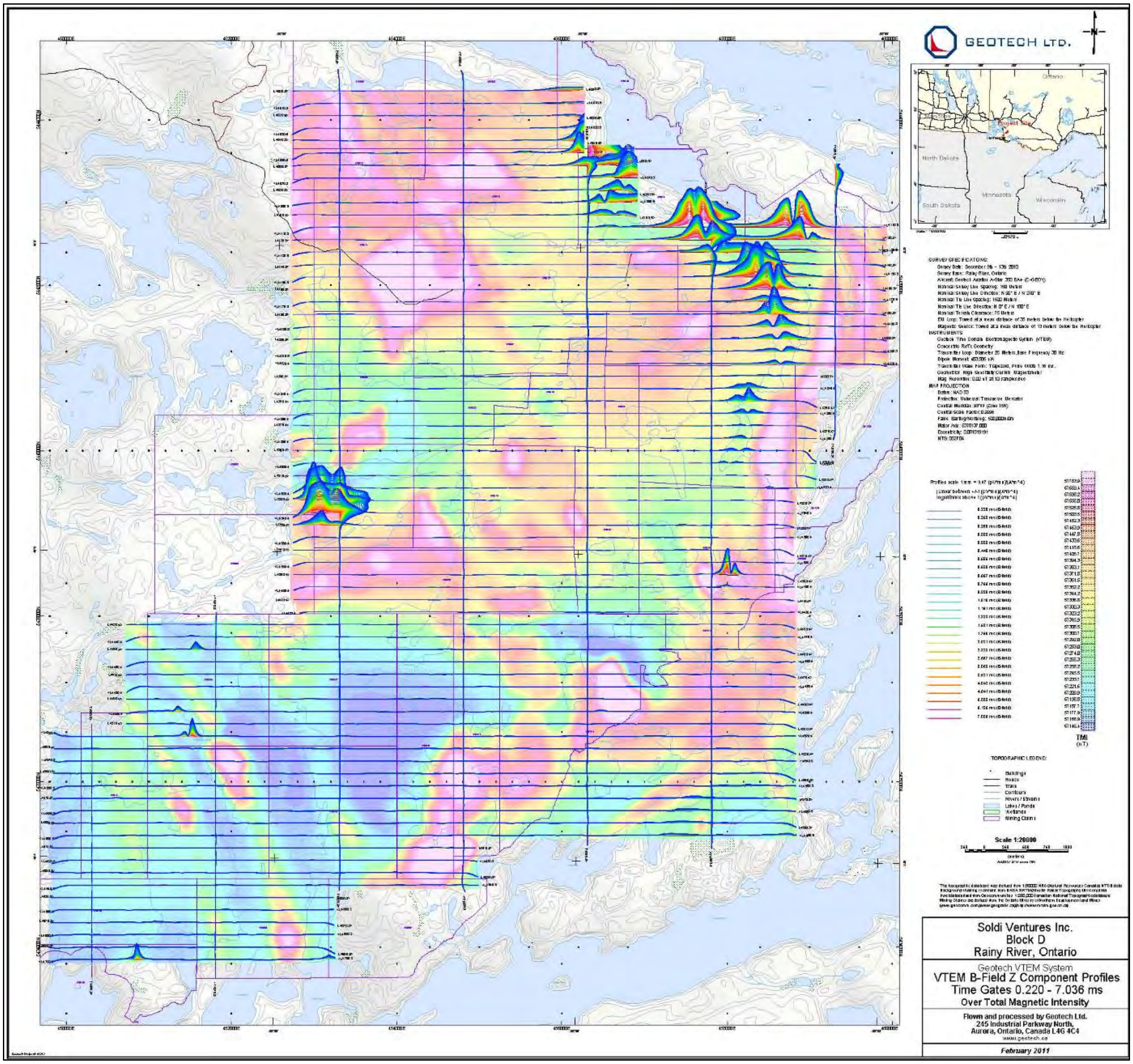
Total Magnetic Intensity (TMI) (Block C)



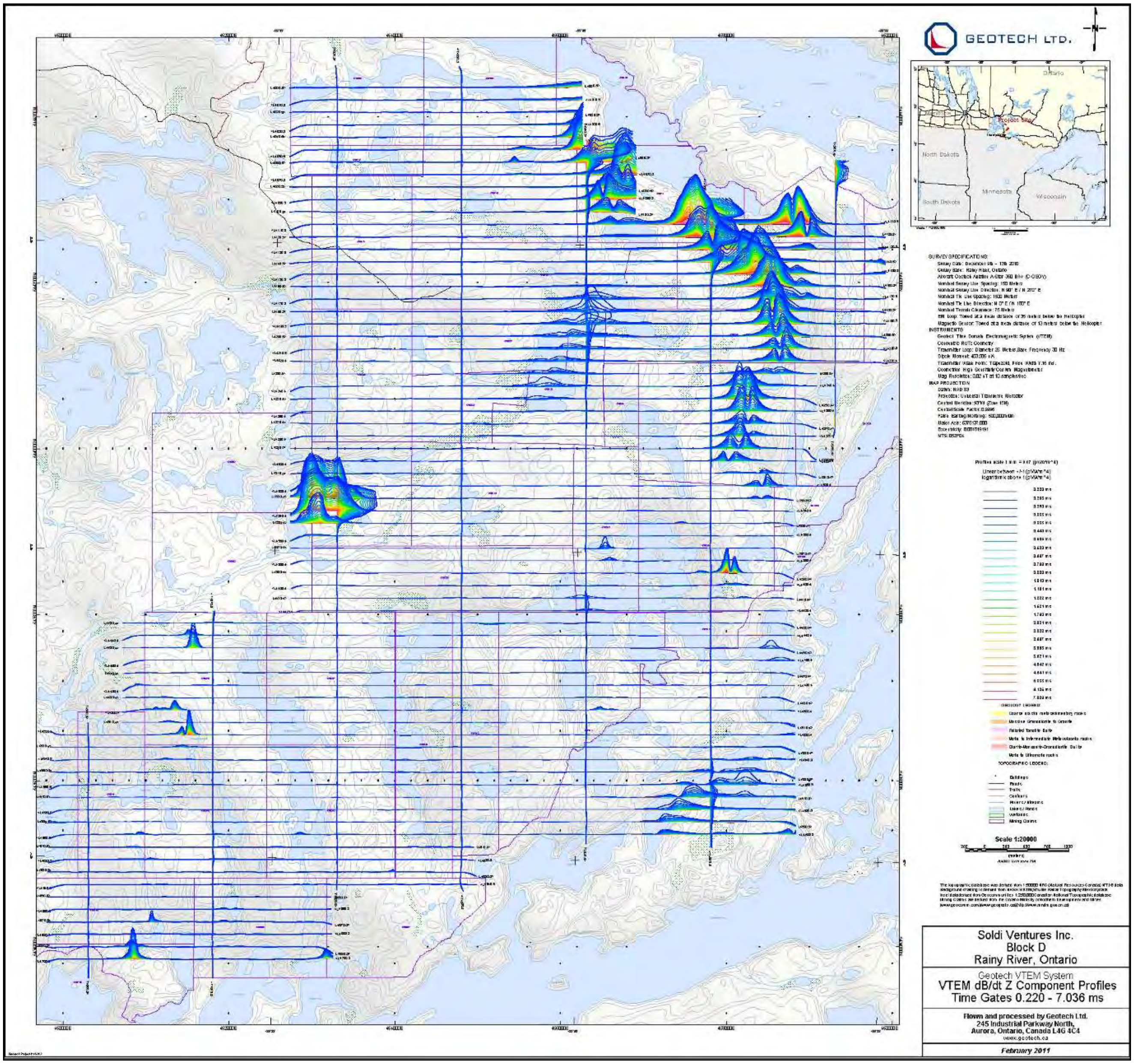
Fraser Filtered dB/dt X (SFx_FF) (Block C)



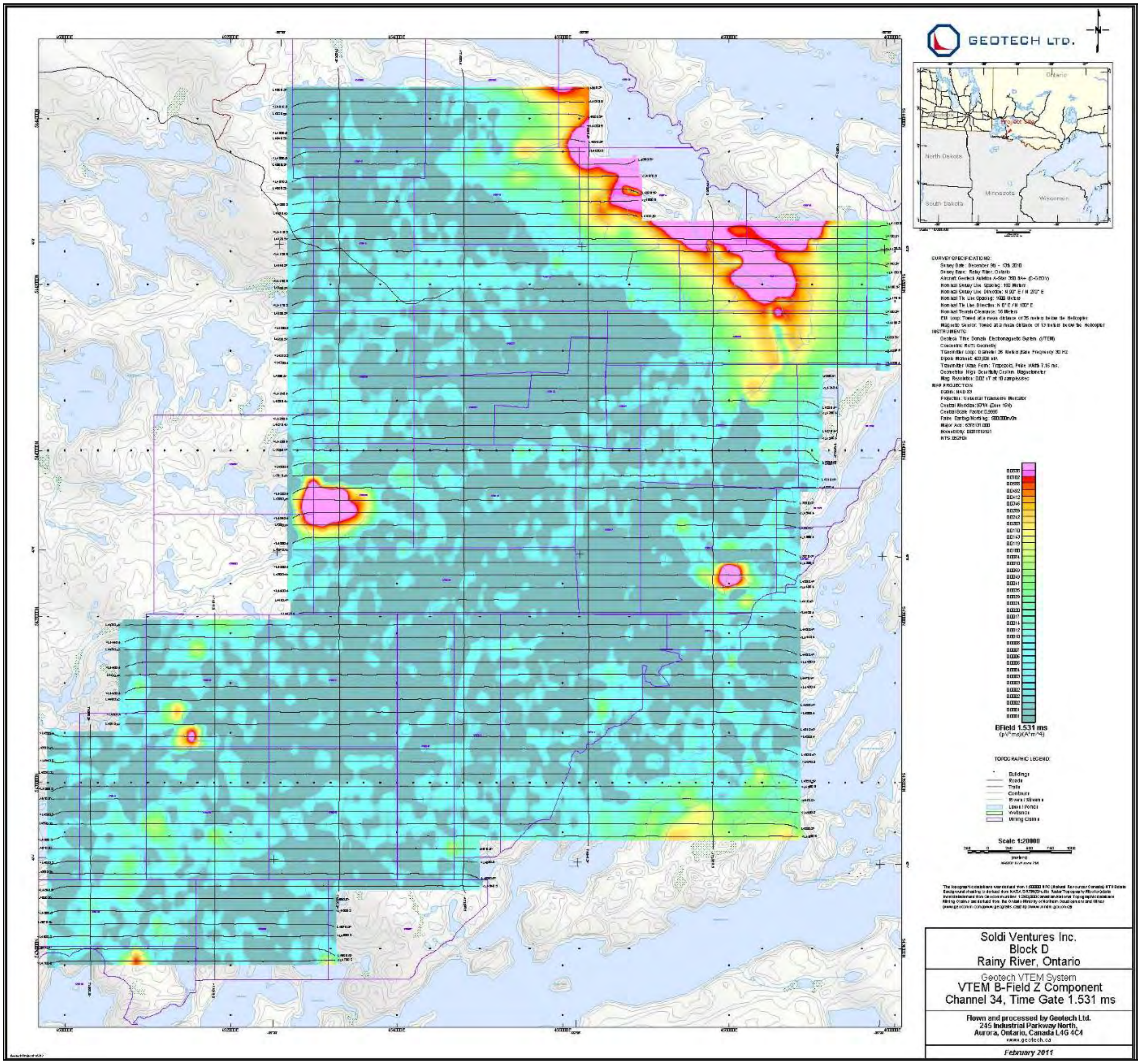
Latest Time Gate (Tau) SF dB/dt with CVG contours(Block C)



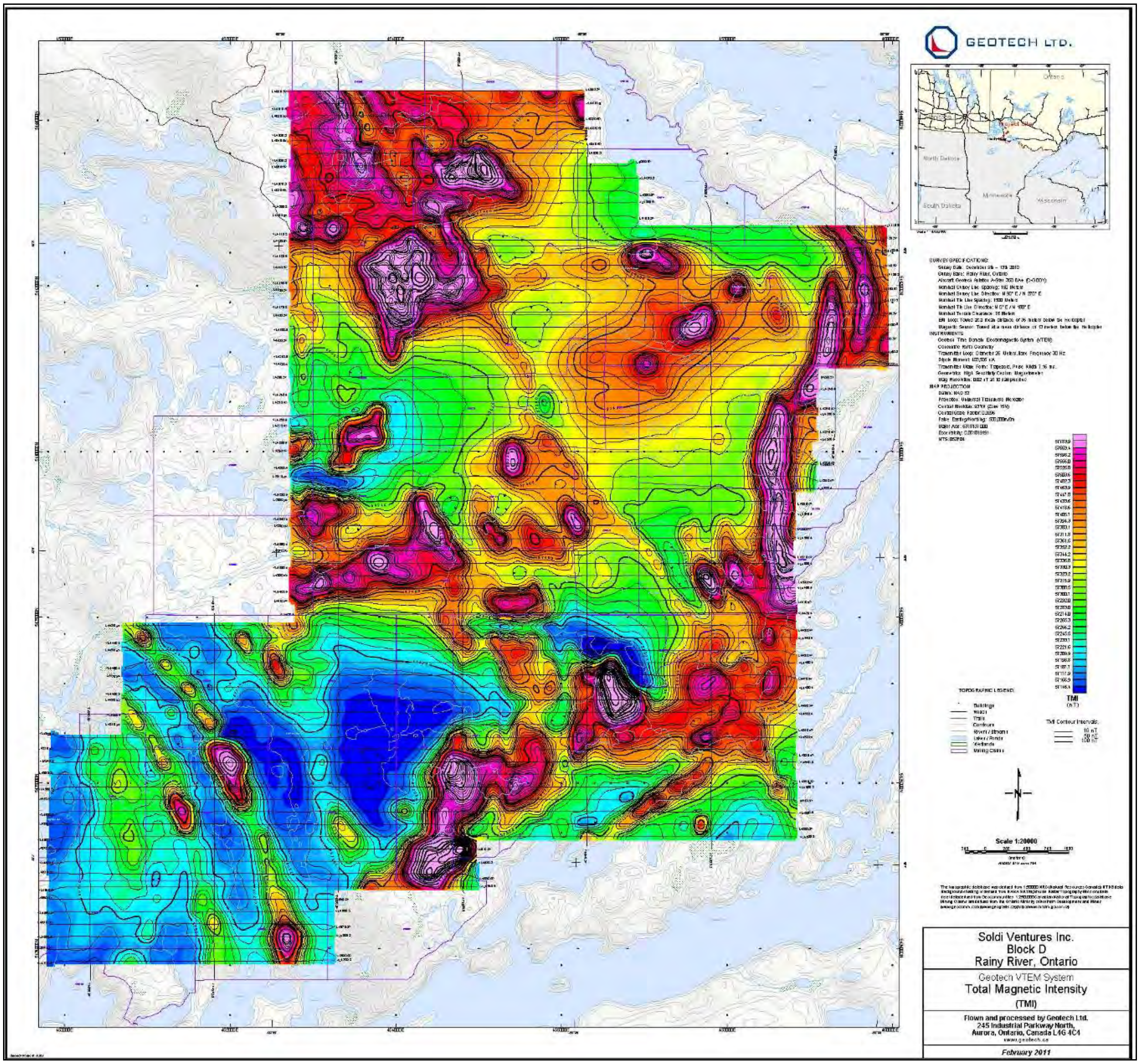
VTEM B-Field Z Component Profiles, Time Gates 0.220 to 7.036 ms (Block D)



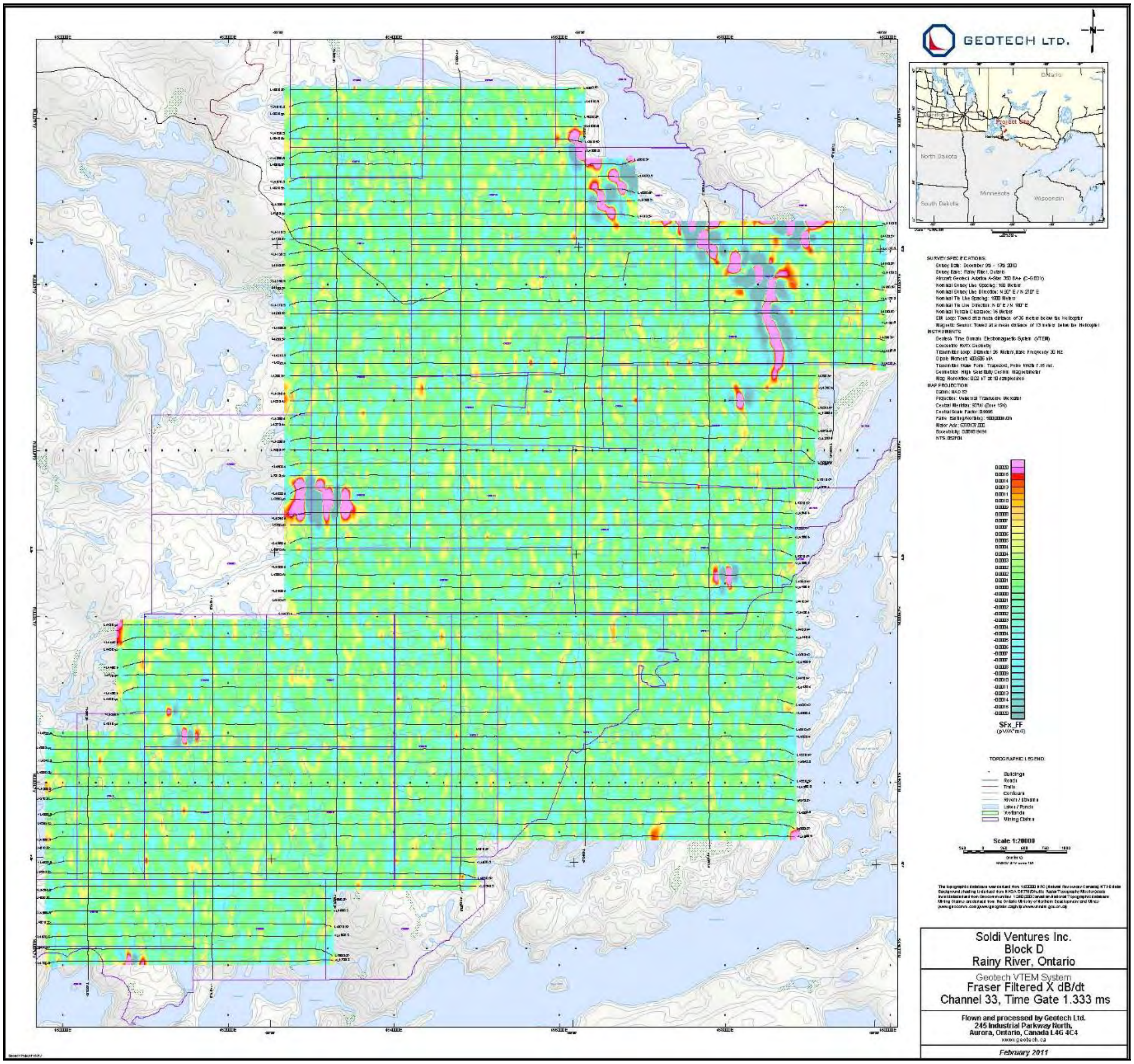
VTEM dB/dt Z Component Profiles, Time Gates 0.220 to 7.036 ms (Block D)



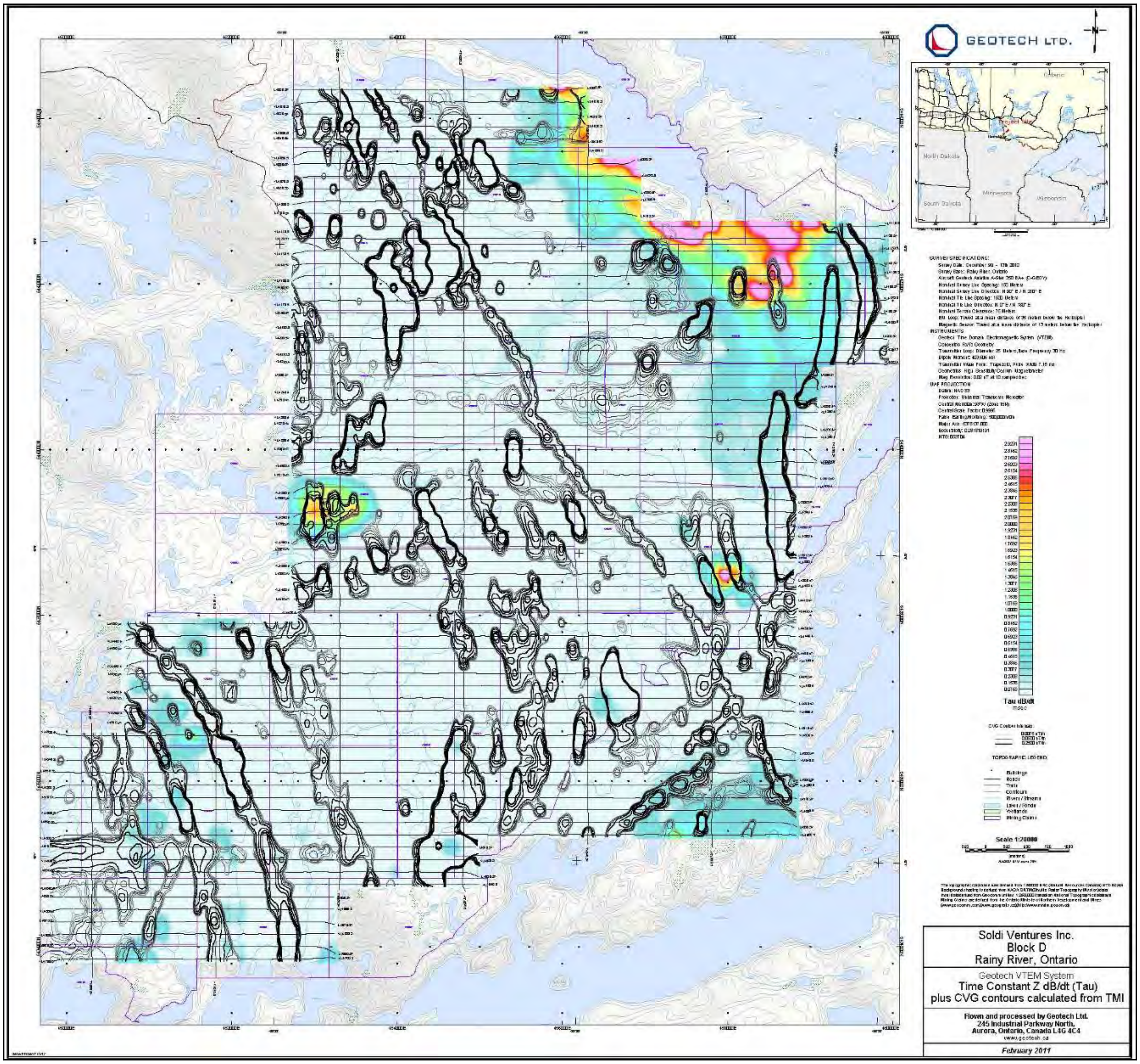
VTEM B-Field Z Component Channel 34, Time Gate 1.531 ms (Block D)



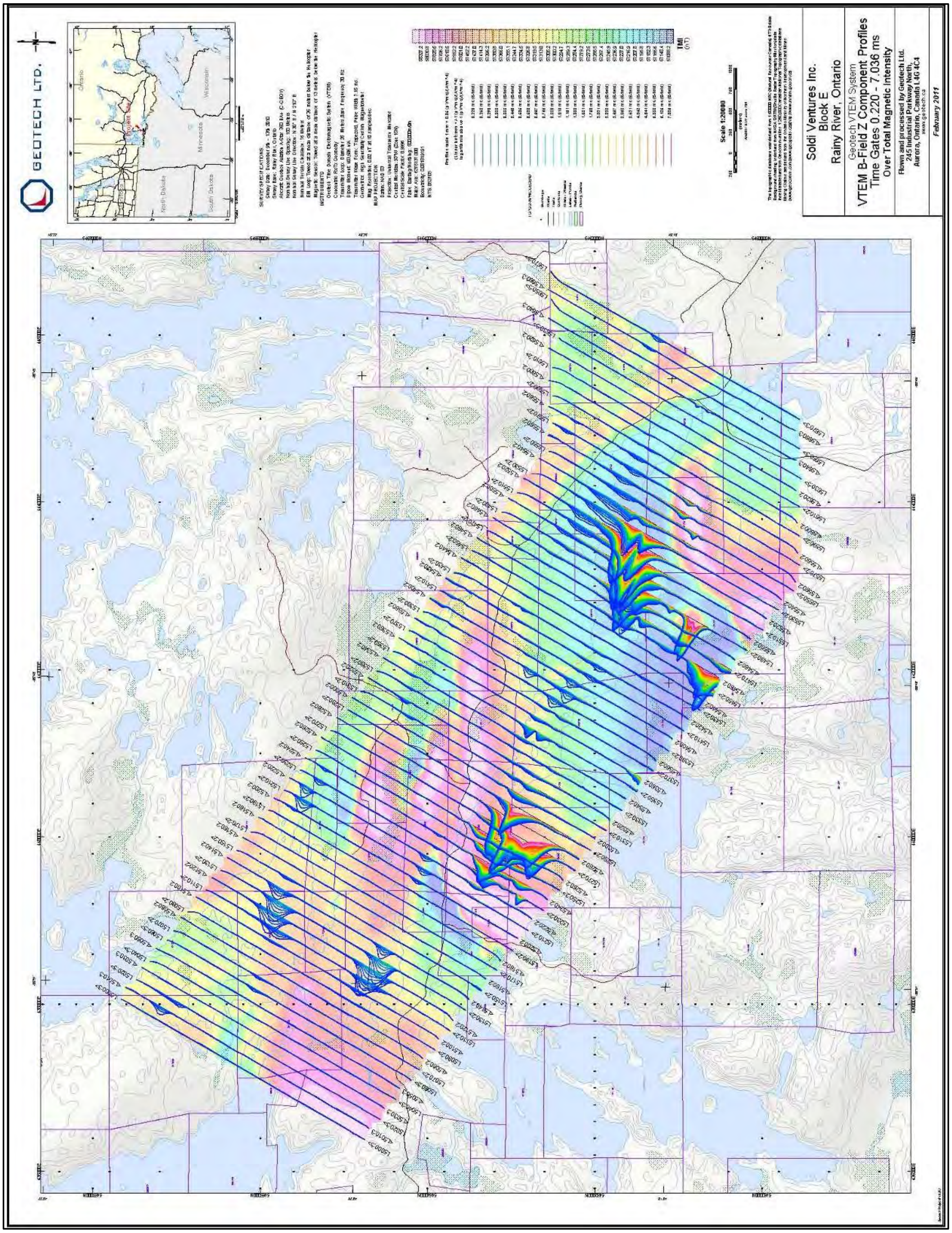
Total Magnetic Intensity (TMI) (Block D)



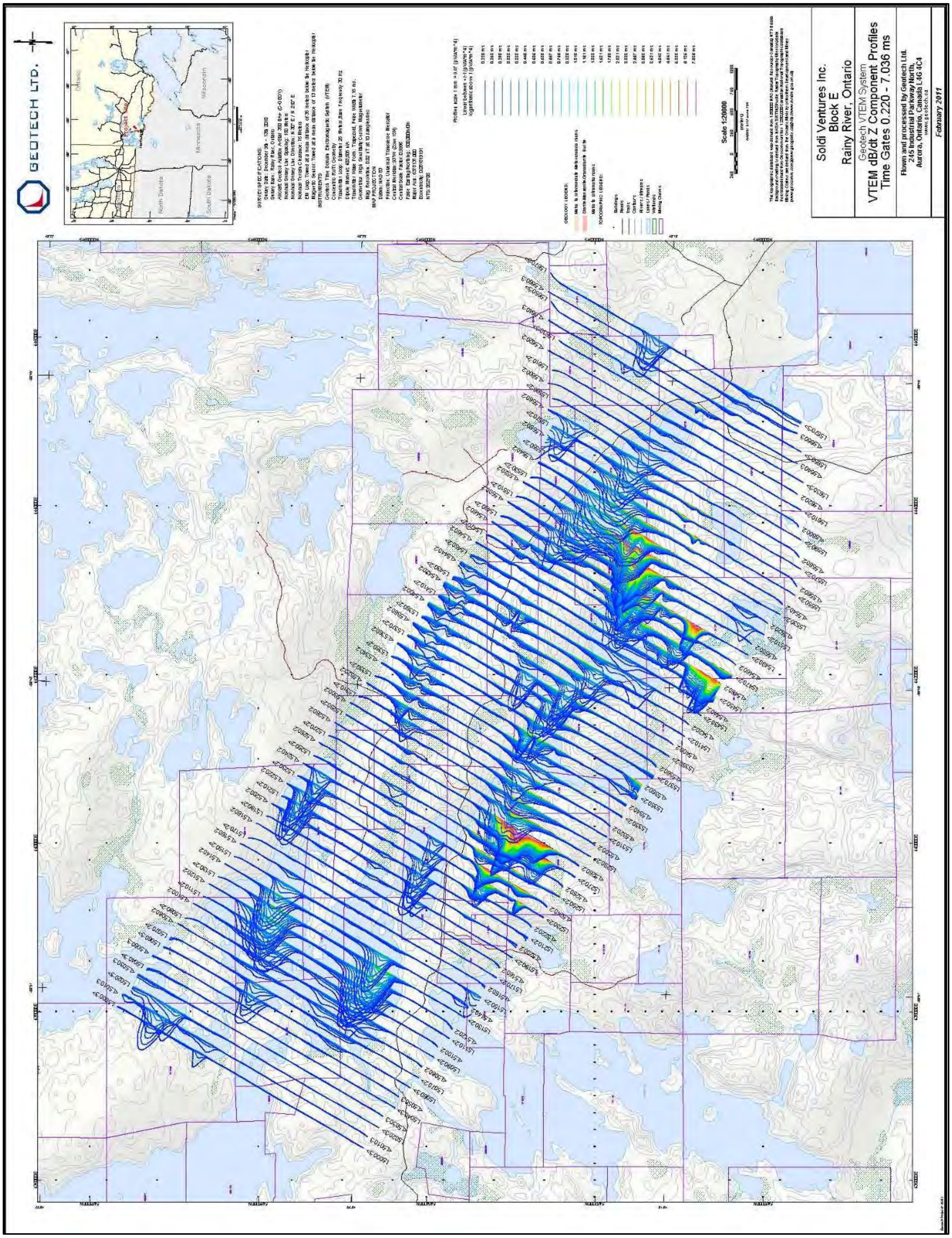
Fraser Filtered dB/dt X (SFx_FF) (Block D)



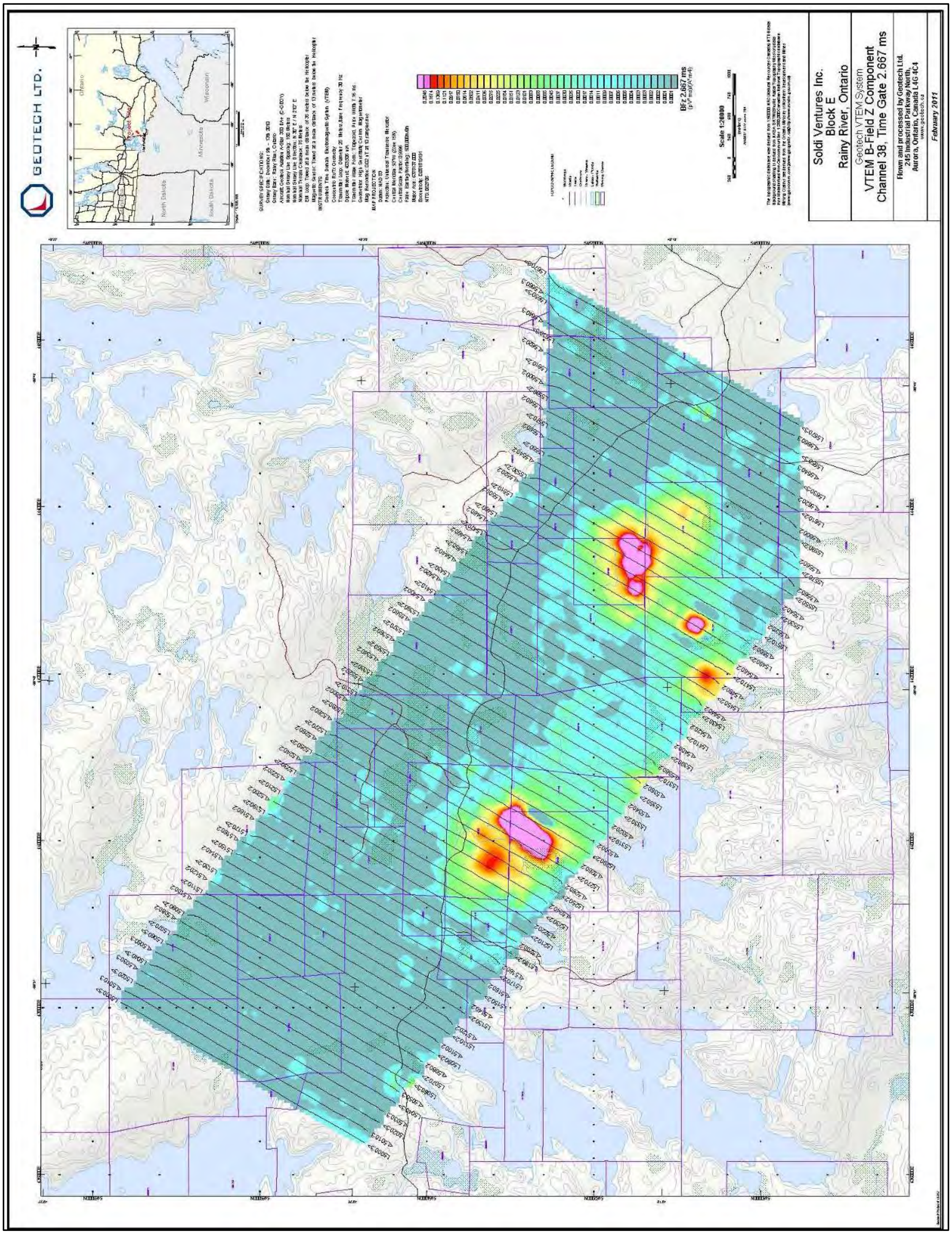
Latest Time Gate (Tau) SF dB/dt with CVG contours(Block D)



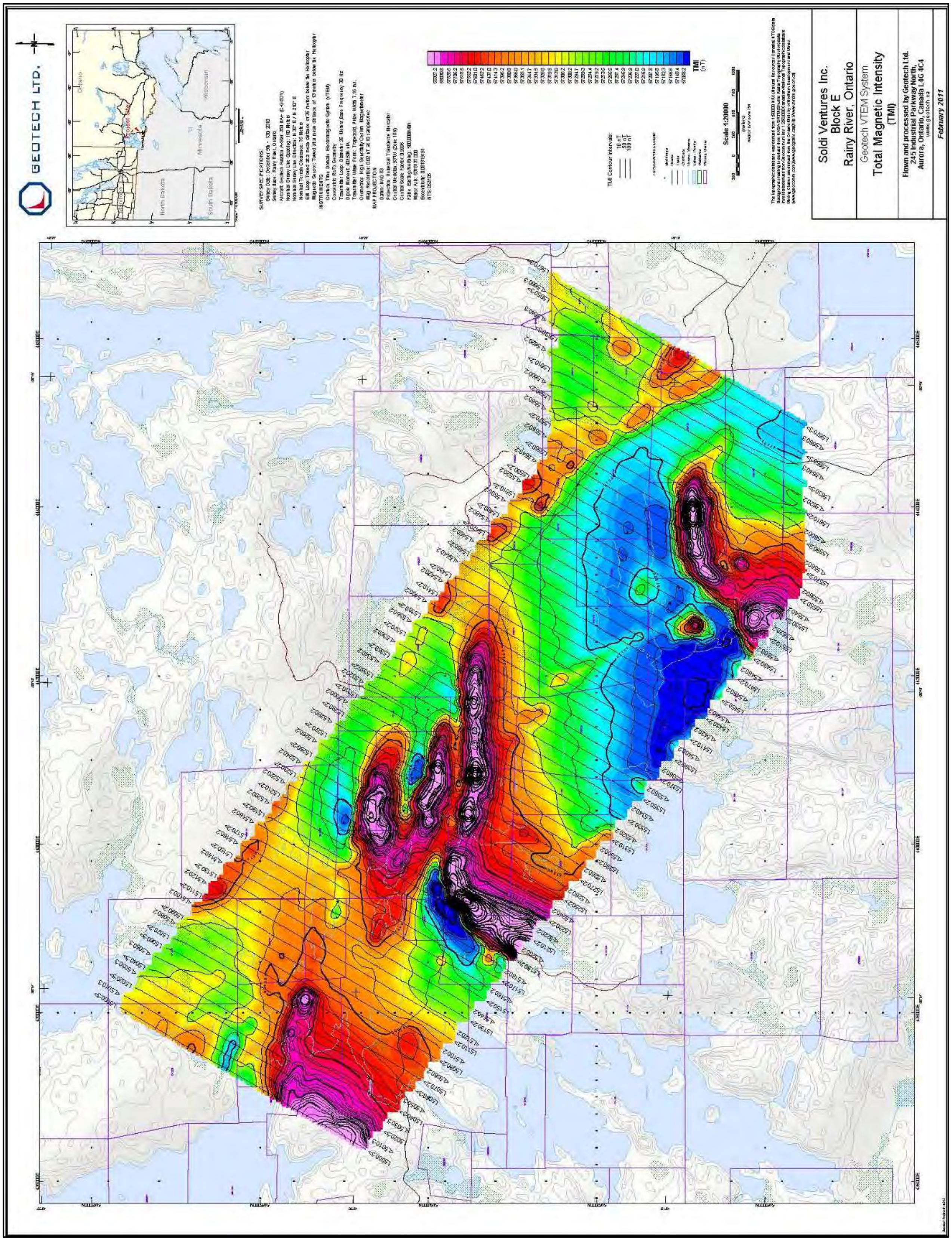
VTEM B-Field Z Component Profiles, Time Gates 0.220 to 7.036 ms (Block E)



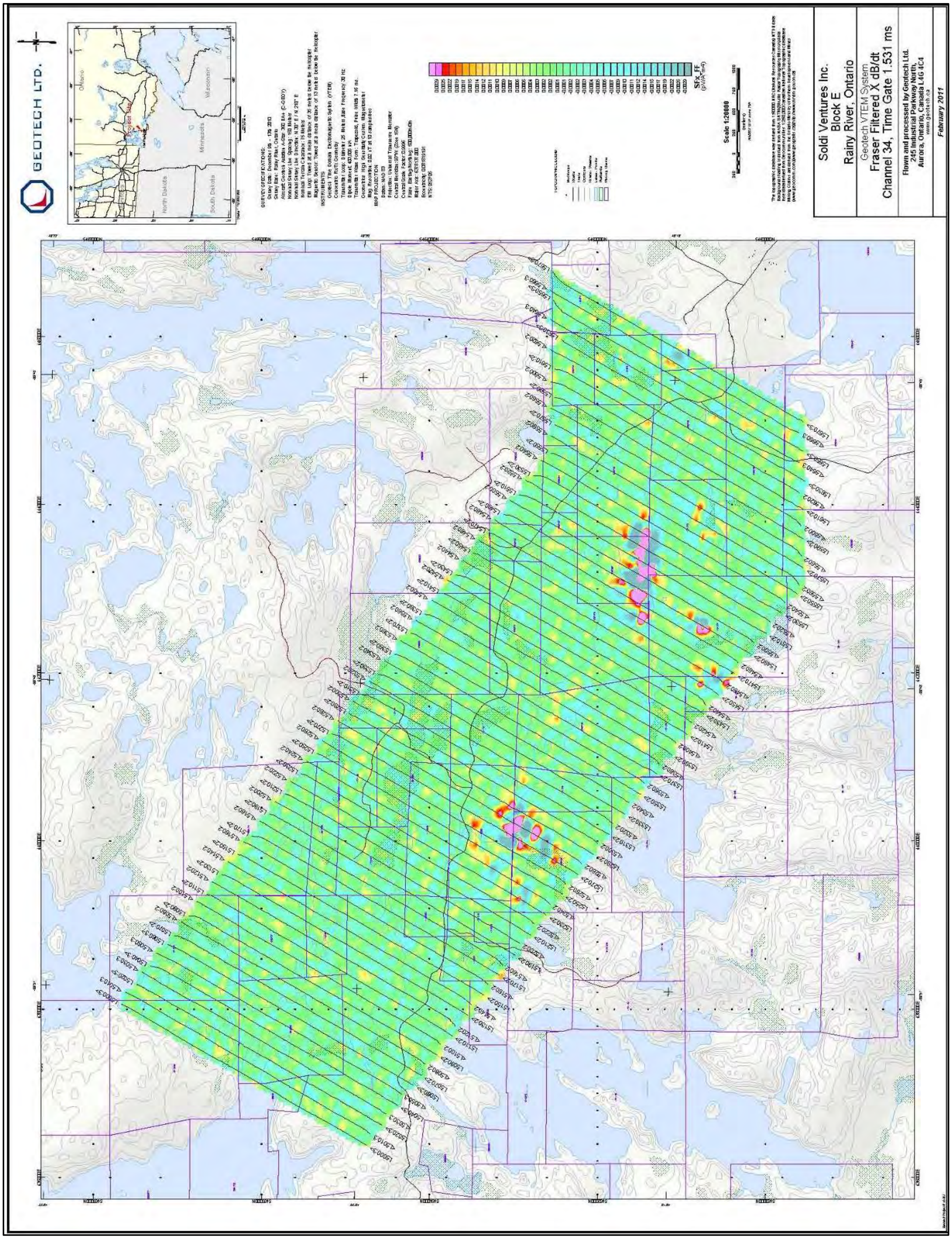
VTEM dB/dt Z Component Profiles, Time Gates 0.220 to 7.036 ms (Block E)



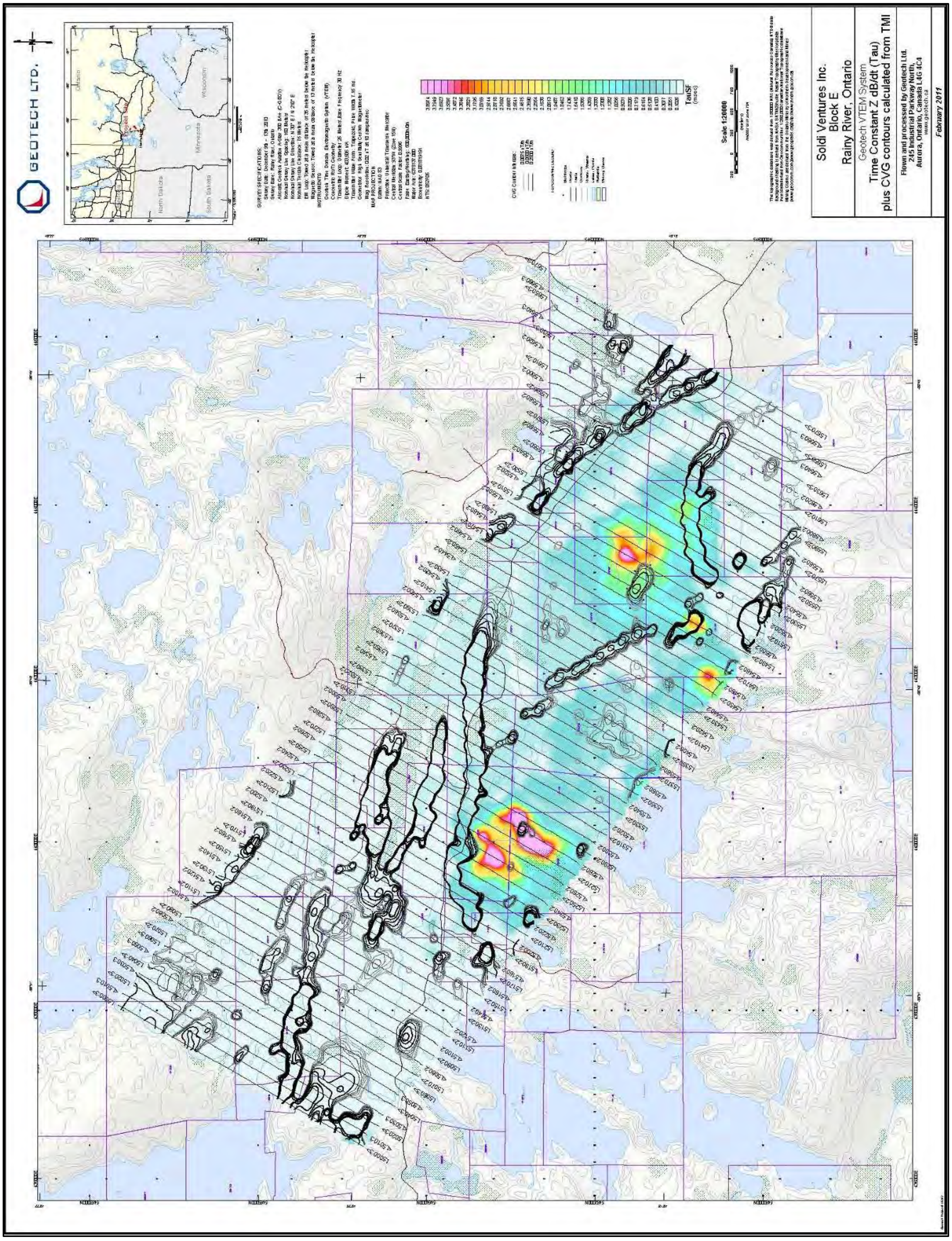
VTEM B-Field Z Component Channel 38, Time Gate 2.667 ms (Block E)



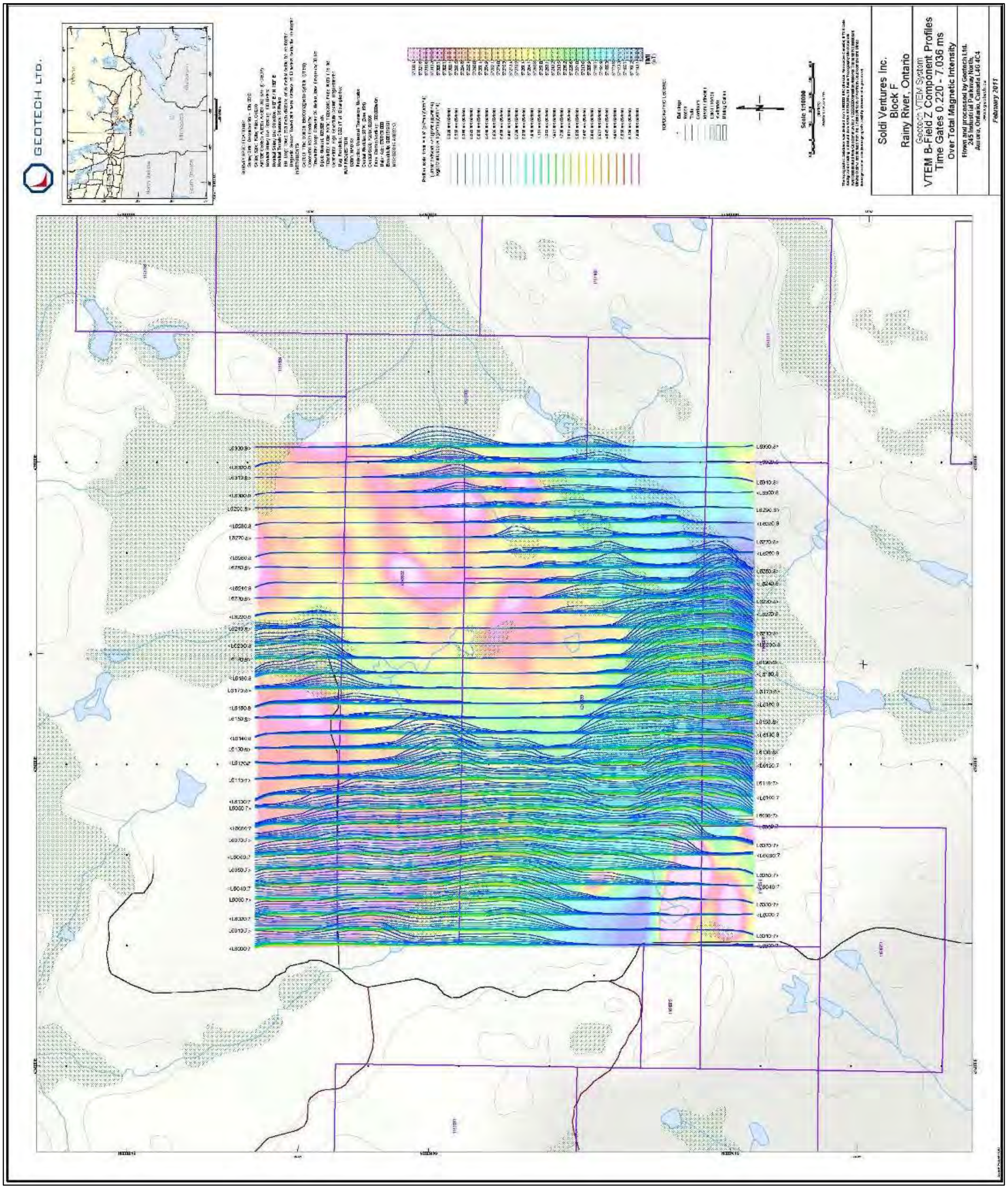
Total Magnetic Intensity (TMI) (Block E)



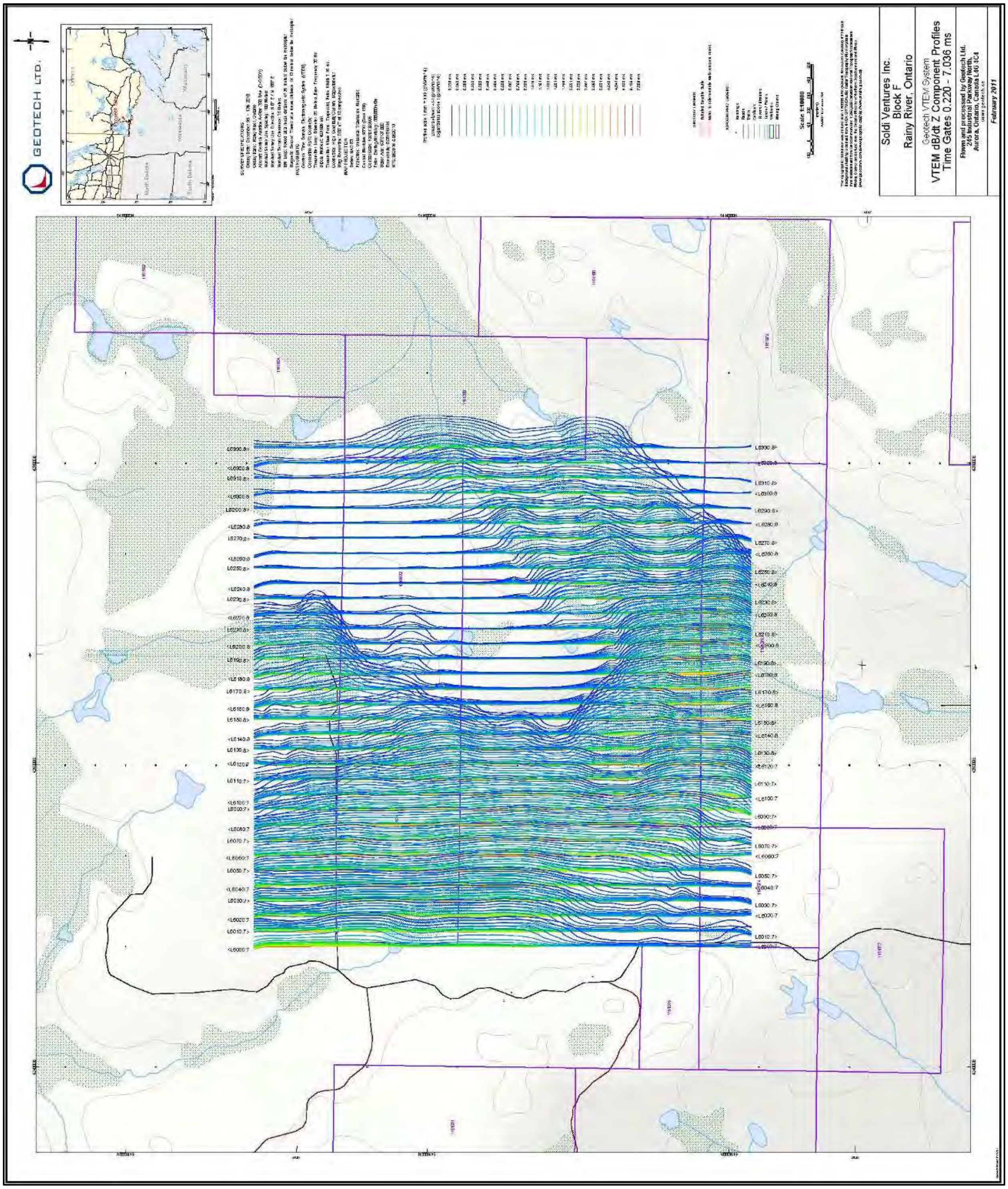
Fraser Filtered dB/dt X (SFx_FF) (Block E)



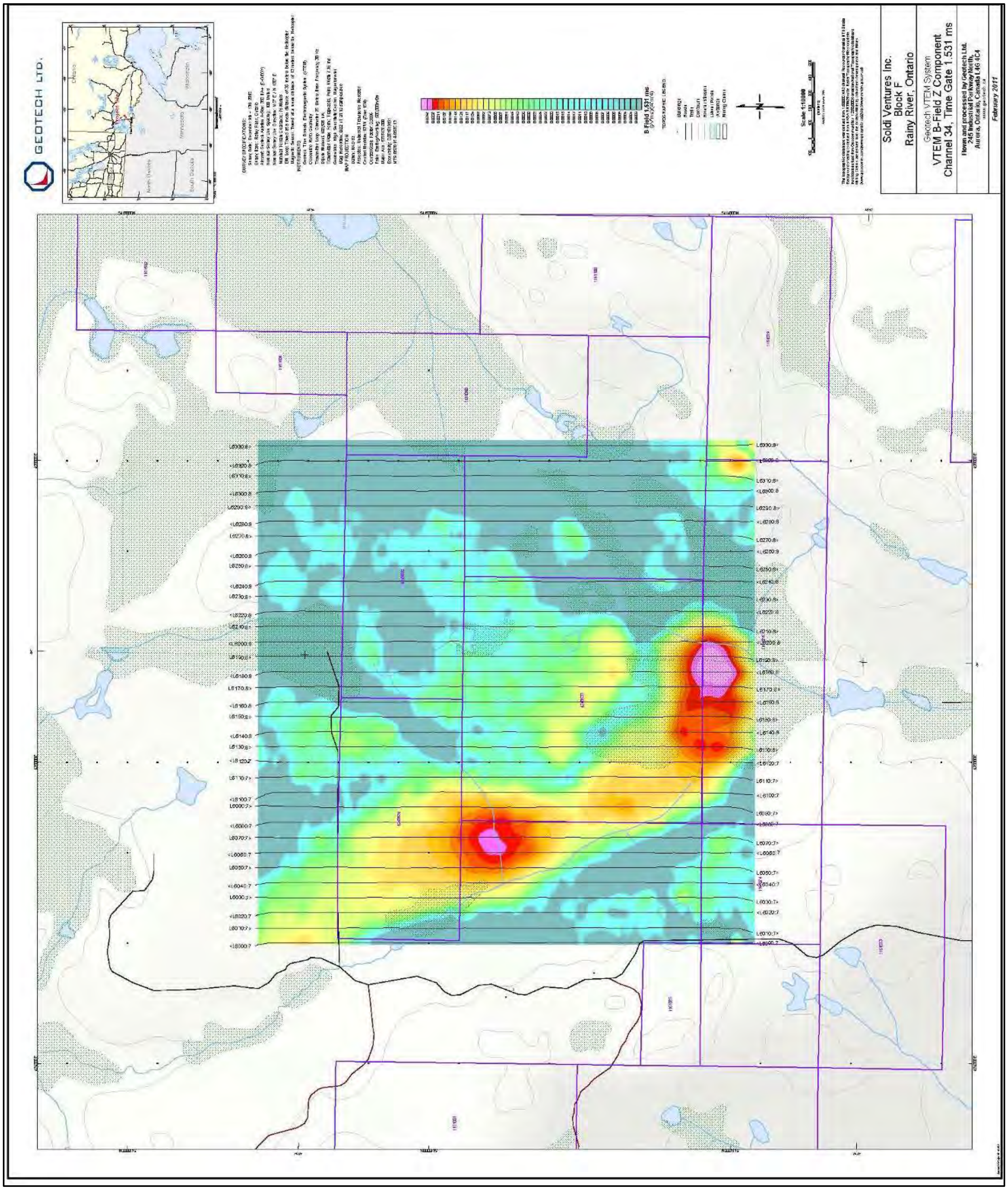
Latest Time Gate (Tau) SF dB/dt with CVG contours(Block E)



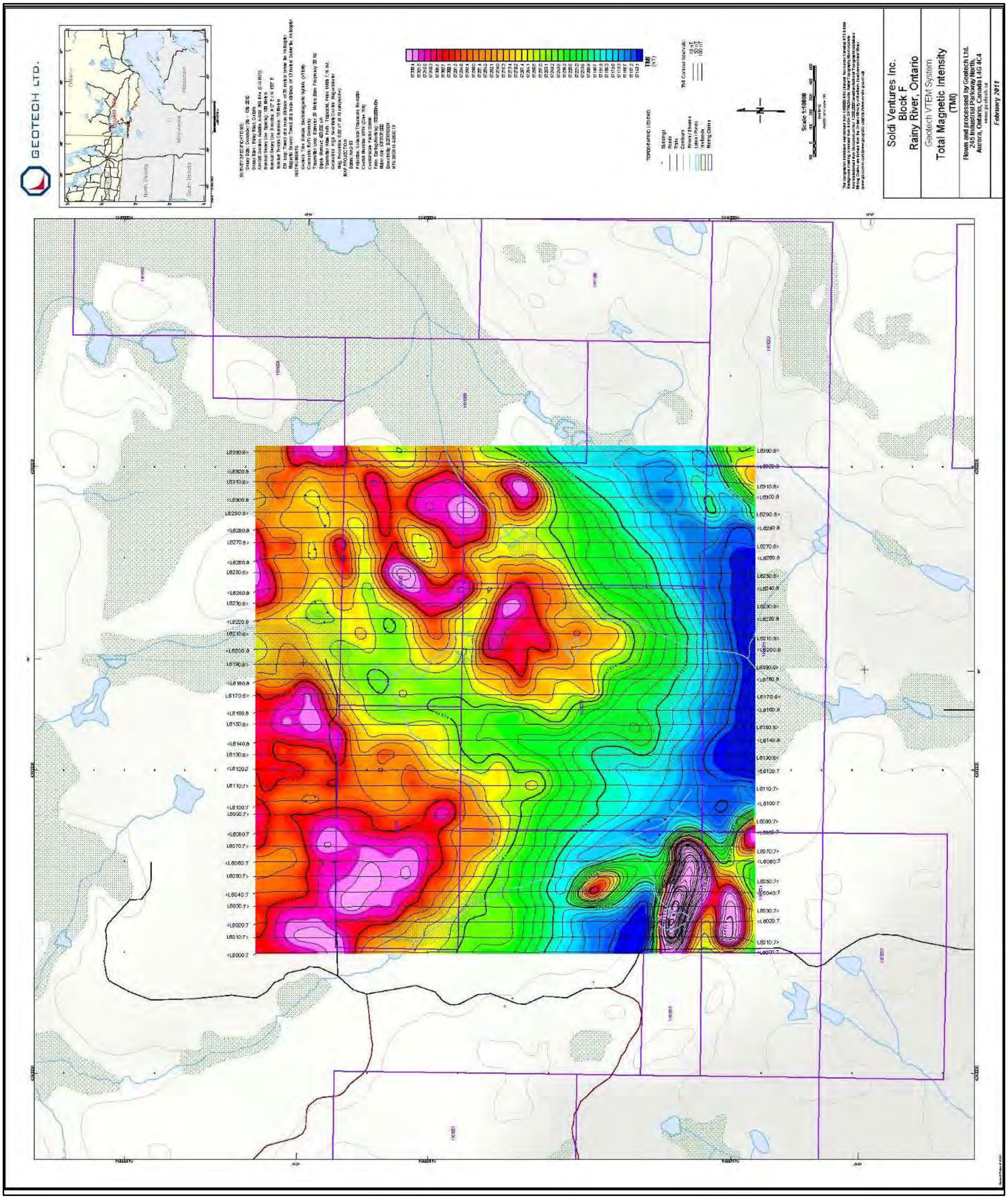
VTEM B-Field Z Component Profiles, Time Gates 0.220 to 7.036 ms (Block F)



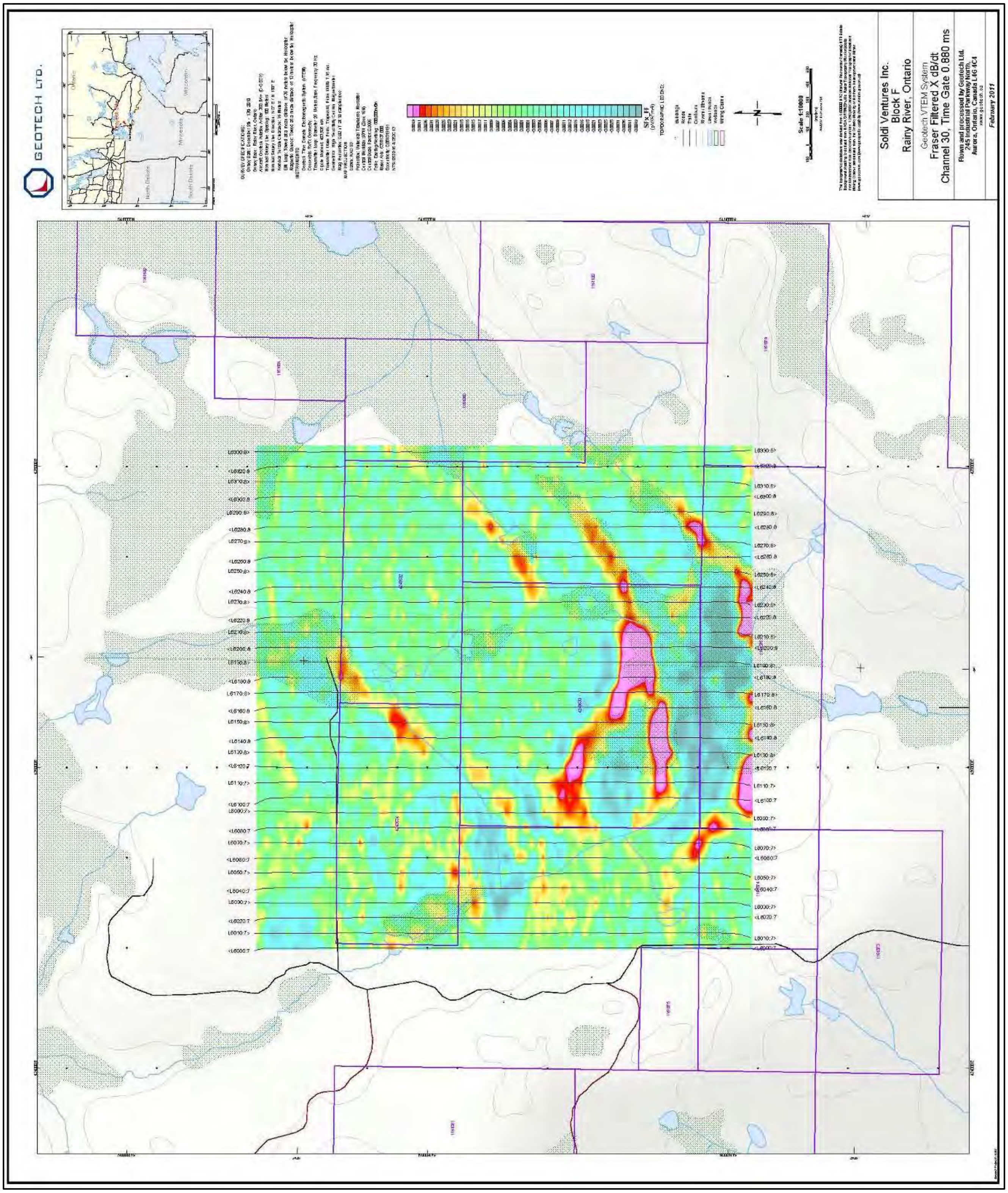
VTEM dB/dt Z Component Profiles, Time Gates 0.220 to 7.036 ms (Block F)



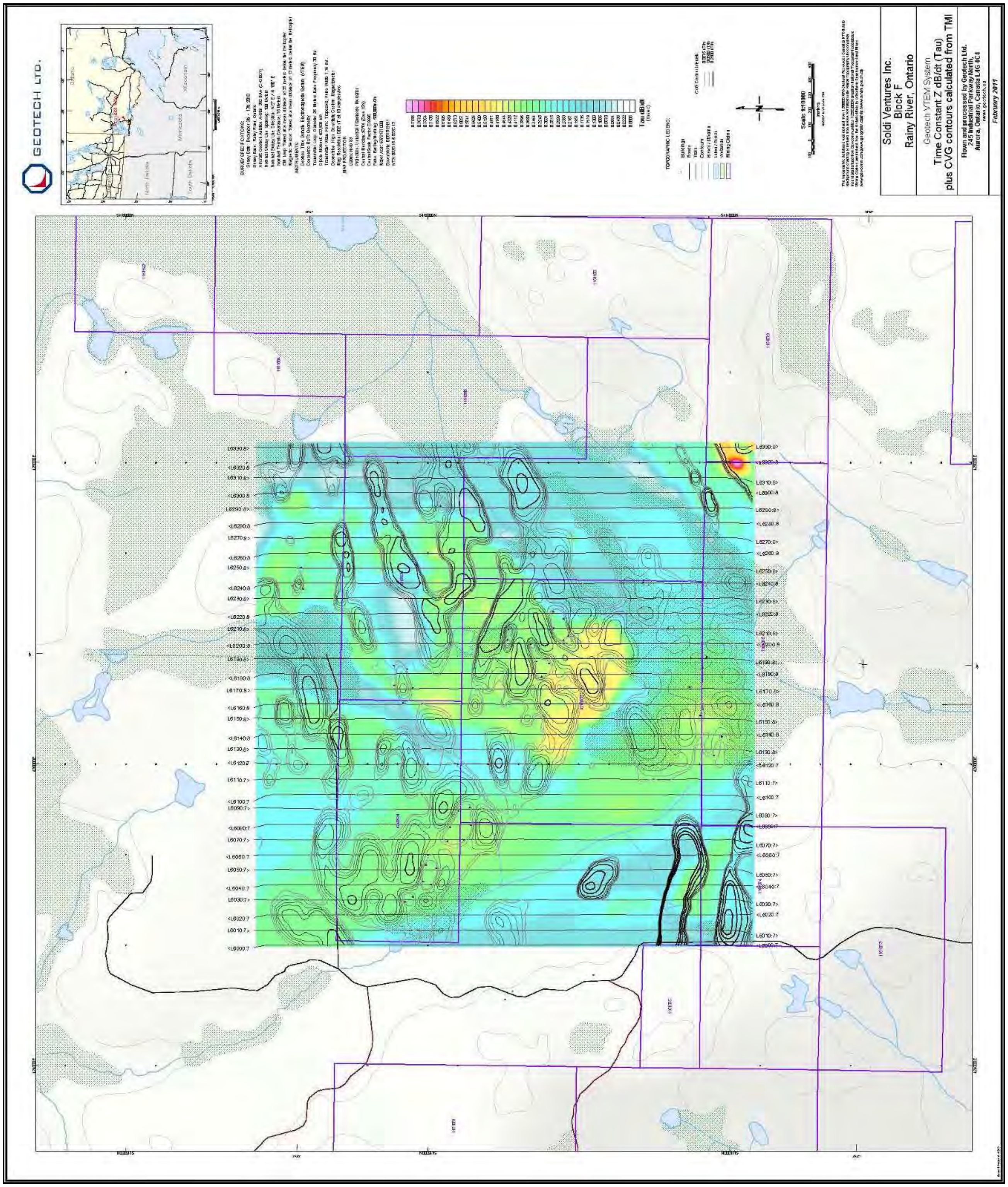
VTEM B-Field Z Component Channel 34, Time Gate 1.531 ms (Block F)



Total Magnetic Intensity (TMI) (Block F)



Fraser Filtered dB/dt X (SFx_FF) (Block F)



Latest Time Gate (Tau) SF dB/dt with CVG contours (Block F)

APPENDIX E

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 E1 to E15). The Maxwell ™ 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.

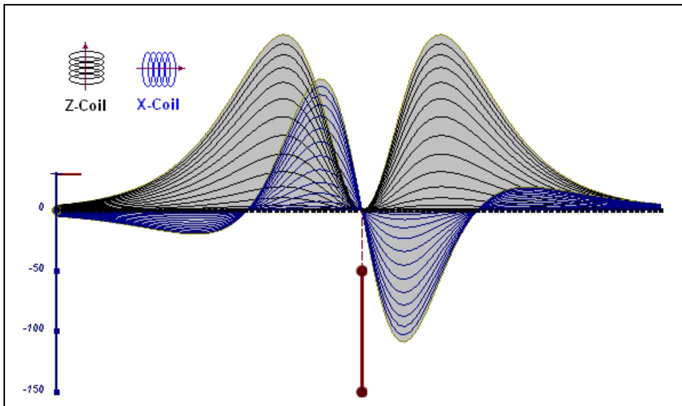


Fig E-1: vertical thin plate

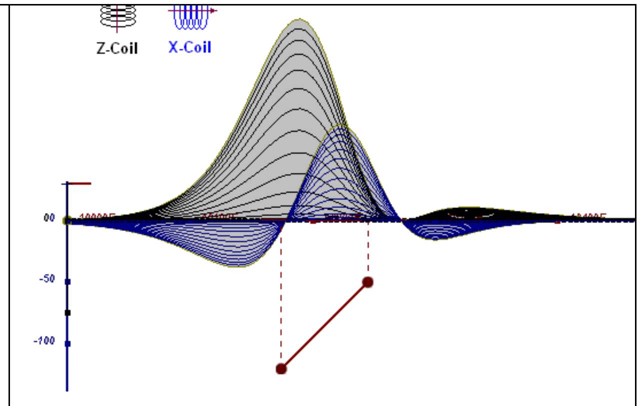


Fig E-2: inclined thin plate

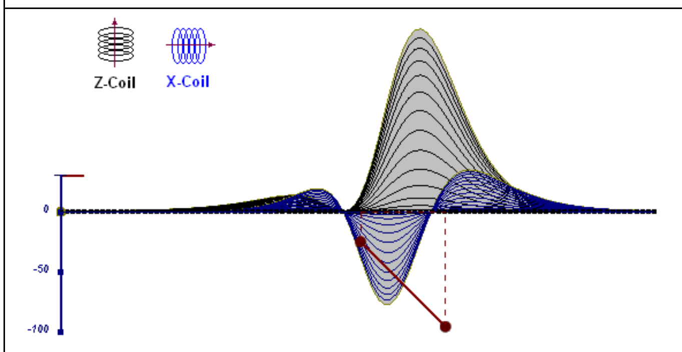


Fig E-3: inclined thin plate

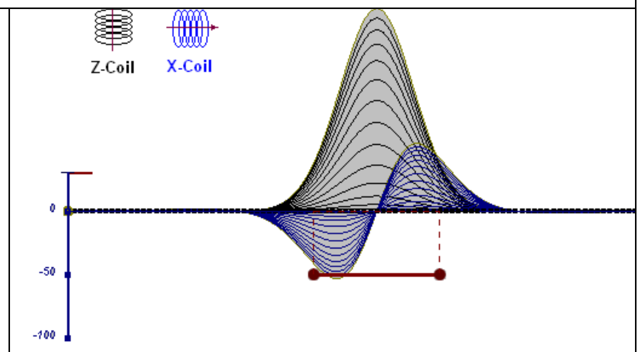


Fig E-4: horizontal thin plate

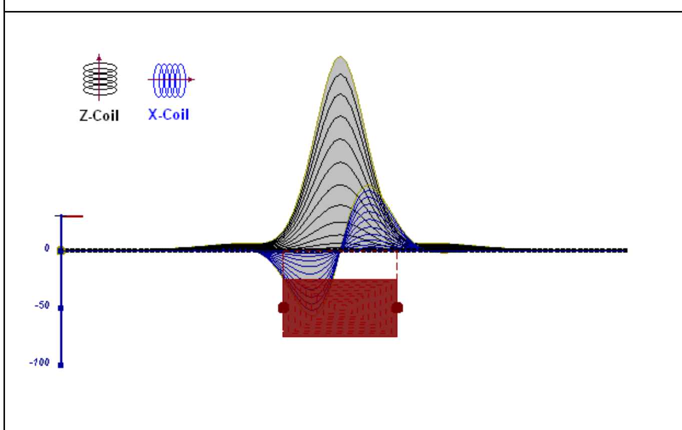


Figure E-5: horizontal thick plate (linear scale of the response)

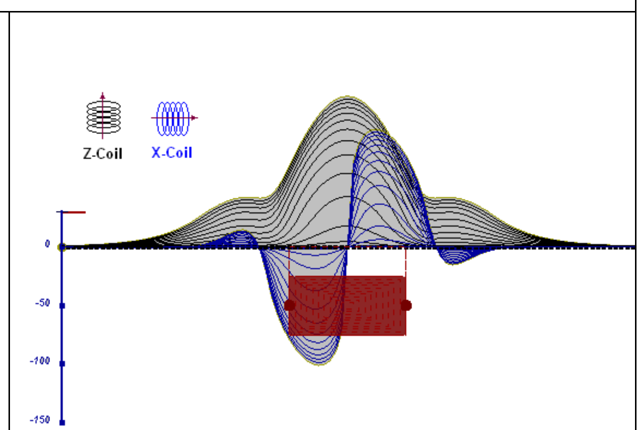


Figure E-6: horizontal thick plate (log scale of the response)

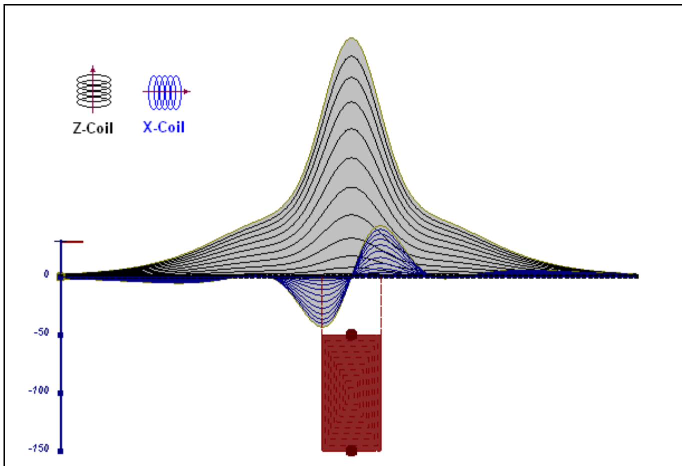


Figure E-7: vertical thick plate (linear scale of the response). 50 m depth

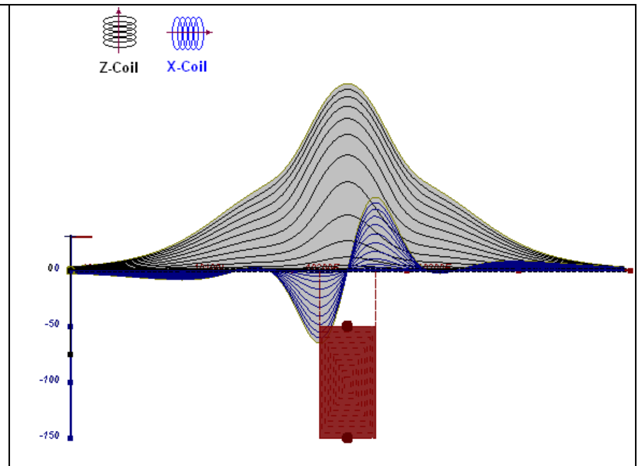


Figure E-8: vertical thick plate (log scale of the response). 50 m depth

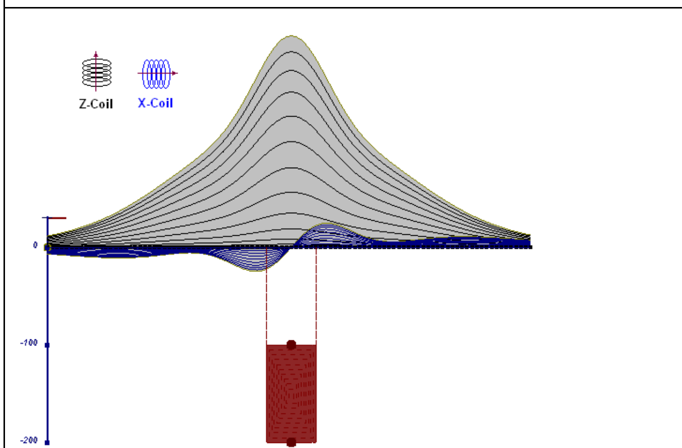


Fig E-9: vertical thick plate (linear scale of the response). 100 m depth

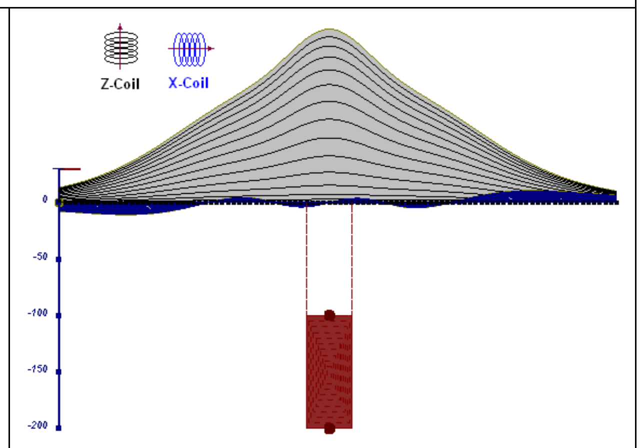


Fig E-10: vertical thick plate (linear scale of the response). Depth/hor.thickness=2.5

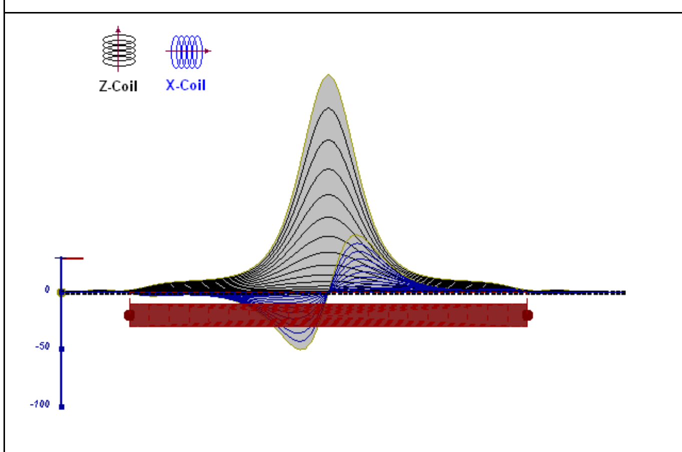


Fig E-10: horizontal thick plate (linear scale of the response)

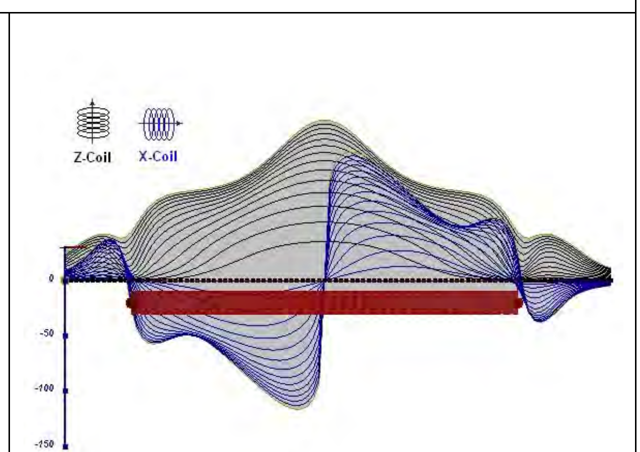


Fig E-11: horizontal thick plate (log scale of the response)

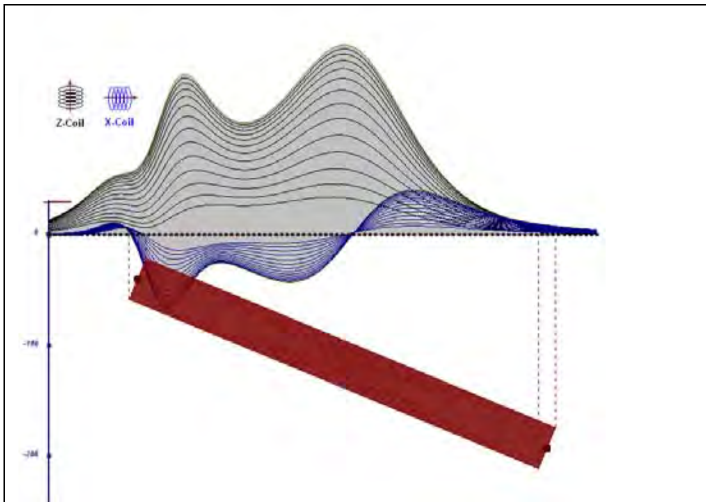


Fig E-12: inclined long thick plate

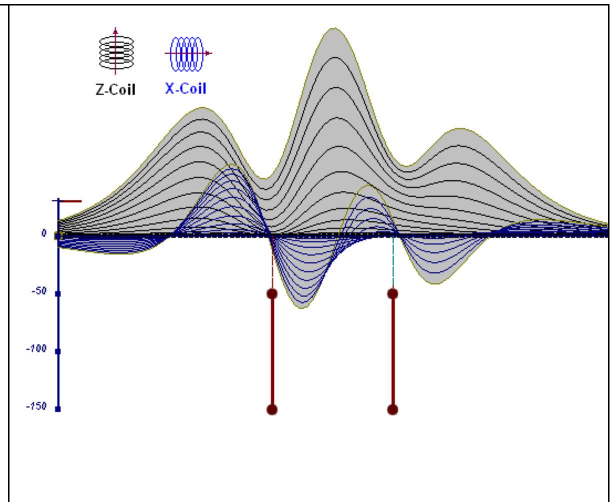


Fig E-13: two vertical thin plates

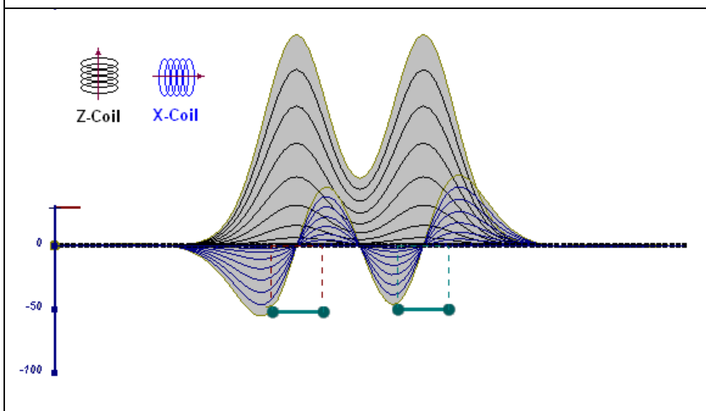


Fig E-14: two horizontal thin plates

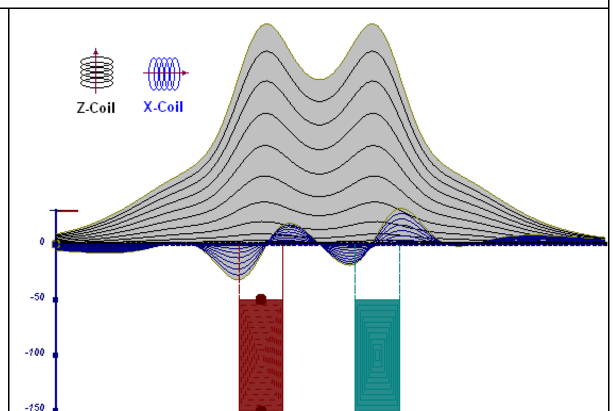


Fig E-15: two vertical thick plates

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

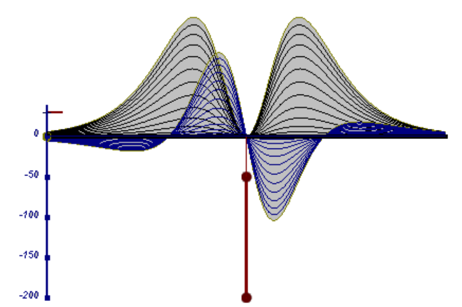
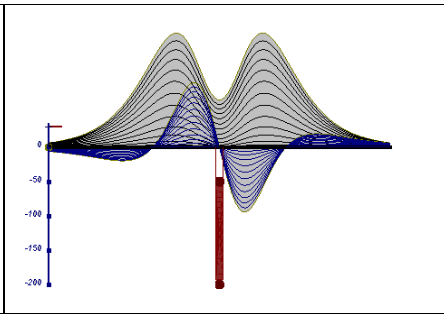
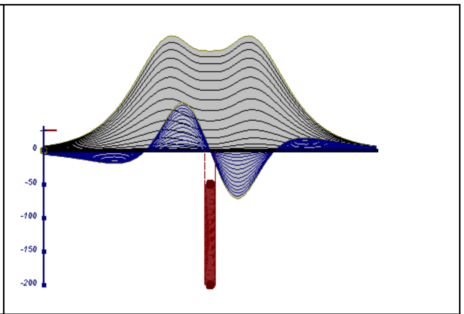
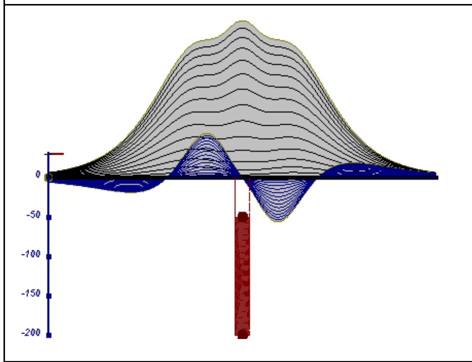
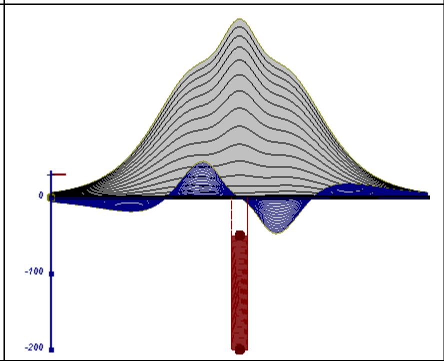
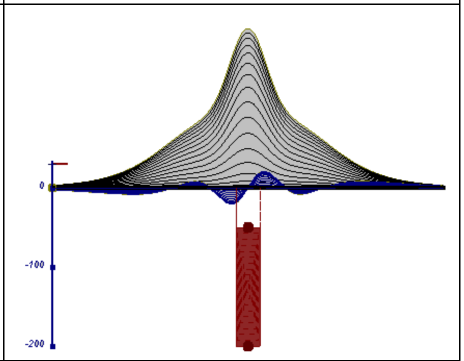
		
“thin”	10 m thickness	15 m thickness
		
18 m thickness	20 m thickness	30 m thickness

Fig.E-16 Conductive vertical plate, depth 50 m, strike length 200 m, depth extend 150 m.

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September 2010

APPENDIX F

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] (Fig. F1).

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

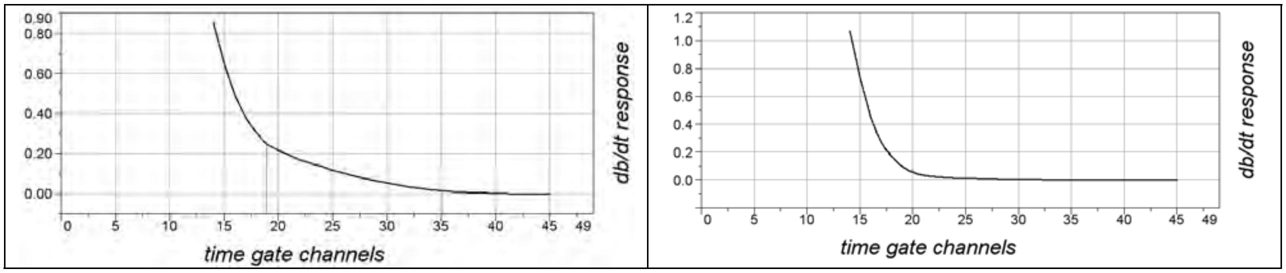

Figure F1 Left – presence of good conductor, right – poor conductor.

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.

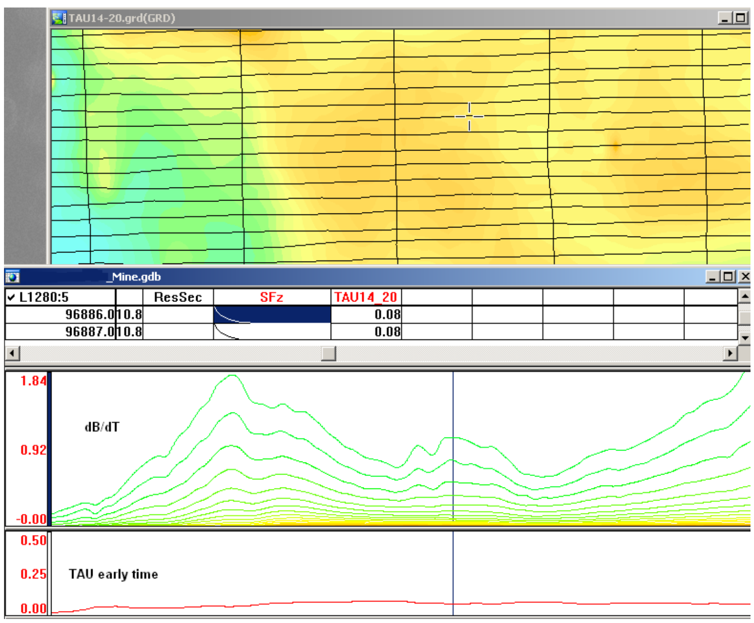

Figure F2 – Map of early time TAU. Area with overburden conductive layer and local sources.

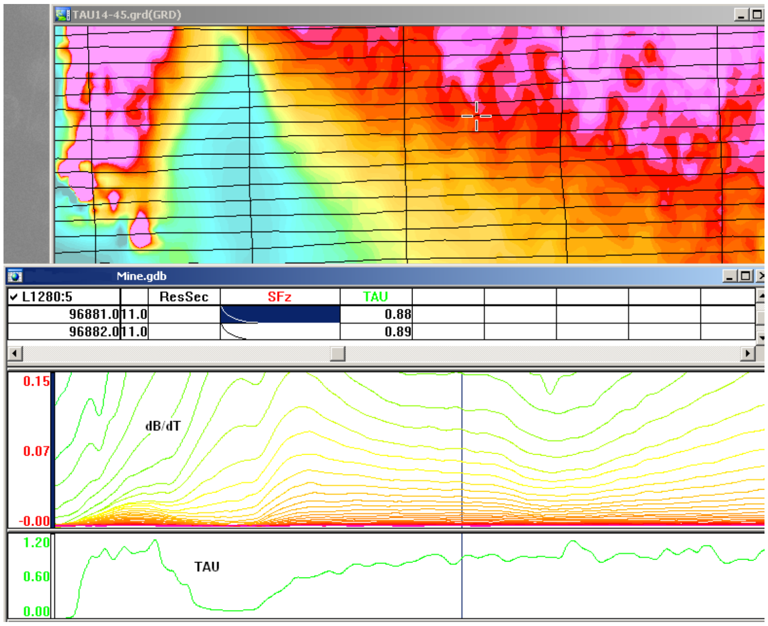

Figure F3 – Map of full time range TAU with EM anomaly due to deep highly conductive target.

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.

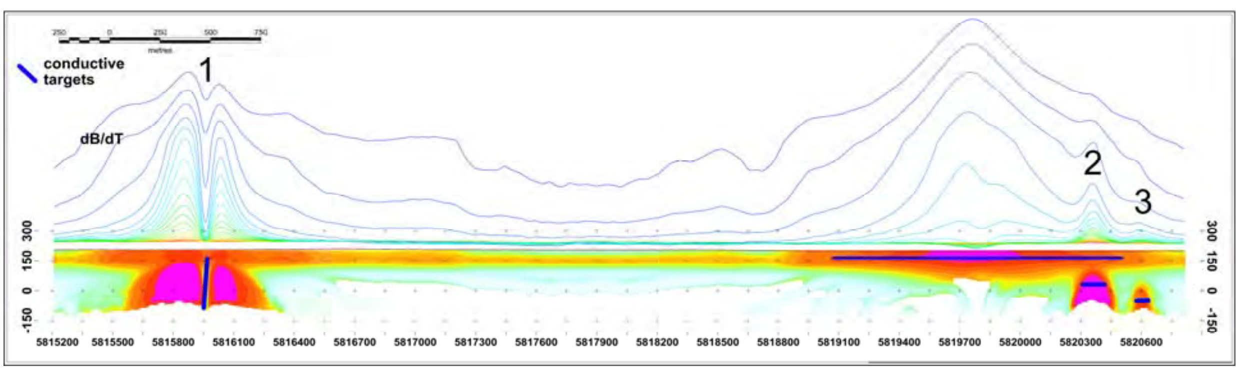

Figure F4 – dB/dt profile and RDI with different depths of targets.

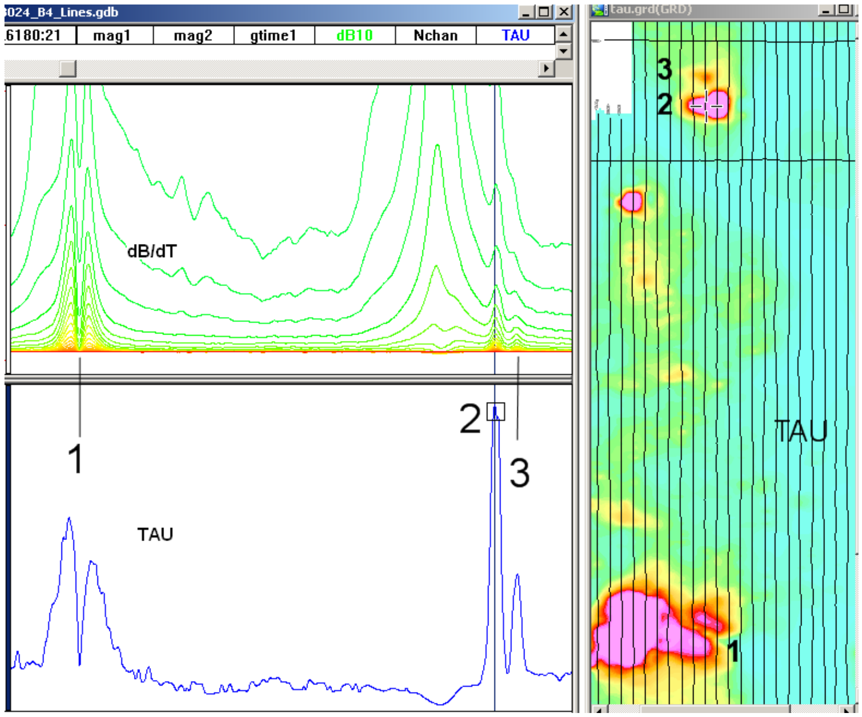

Figure F5 – Map of total TAU and dB/dt profile.

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.

[2] by A.Prikhodko

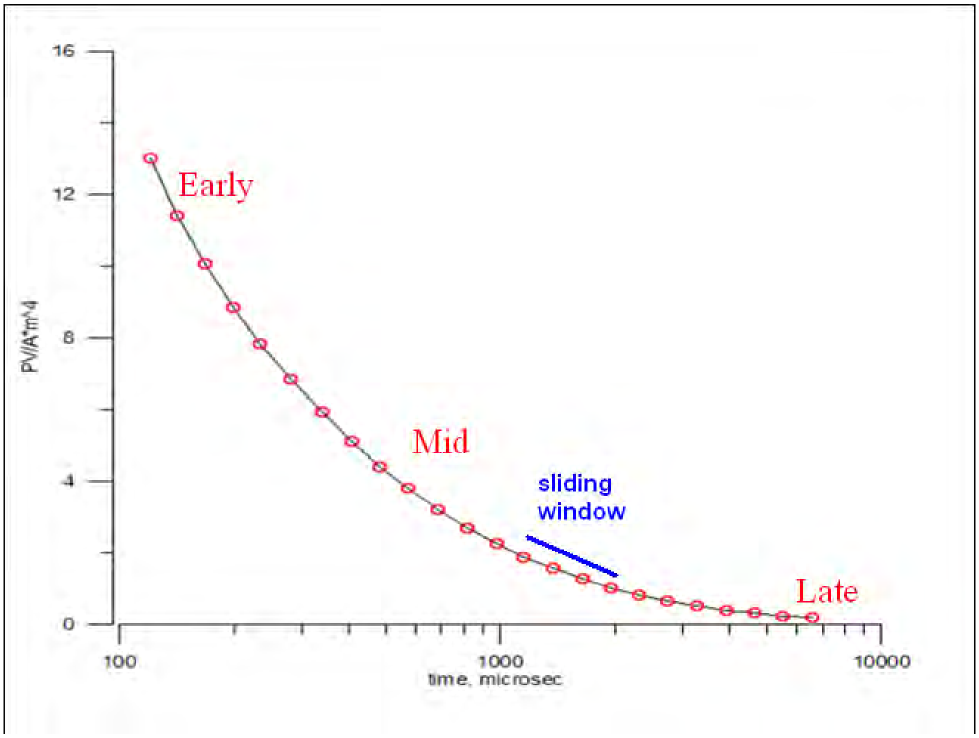

Figure F6 - Typical dB/dt decays of Vtem data

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APPENDIX G
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 system or measured waveforms from the EM data. There are many different schemes to get conductivity/resistivity depth sections from time-domain data. The used RDI algorithm of Resistivity-Depth transformation is based on scheme of on the apparent resistivity transform of Maxwell A.Meju (1998)[1] and TEM response from conductive half-space adopted for time-domain data and system configuration. The program is in-house developed at Geotech for VTEM data[2].

The VTEM Resistivity Depth Sections have checked and proven on several real known targets, results of drilling and synthetic models (Fig. 1-12). Adding individual responses across the profile produces a pseudo 2-dimensional cross-section, called a RDI. RDIs provide reasonable indications of conductor relative depth and vertical extent, as well as accurate 1D layered-earth apparent conductivity/resistivity structure across a VTEM flight line.

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.

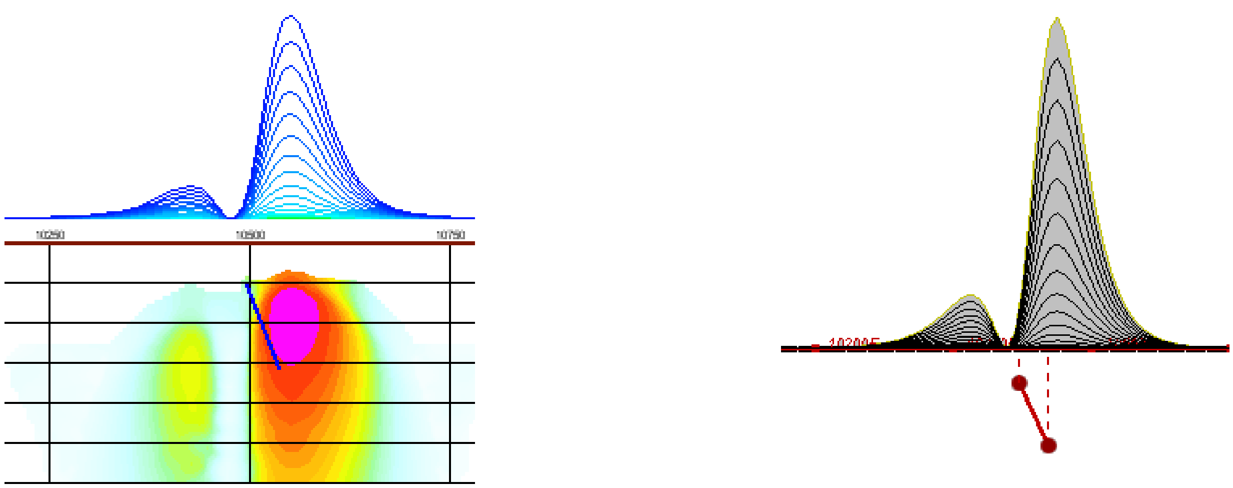

Fig. 1 Maxwell plate model and RDI from the calculated response for conductive “thin” plate (depth 50 m, dip 65 degree, depth extend 100 m).

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

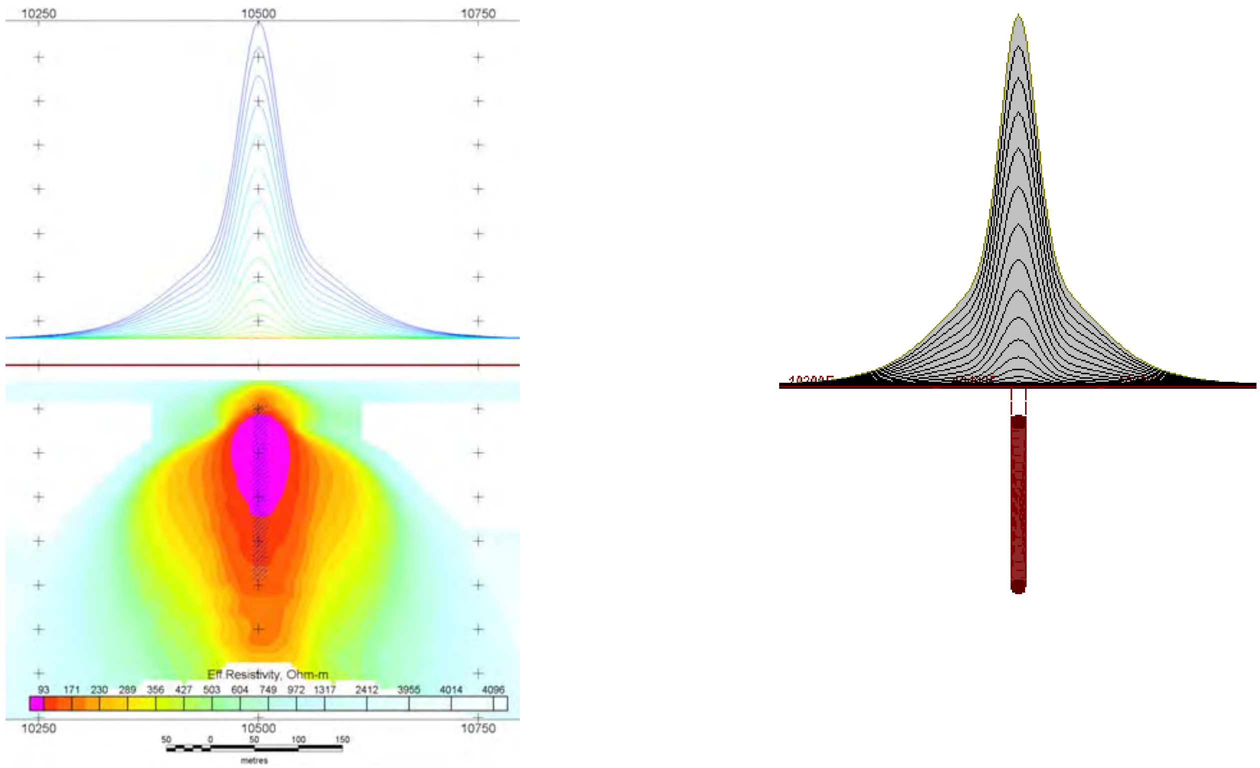

Fig. 2 Maxwell plate model and RDI from the calculated response for "thick" plate 18 m thickness, depth 50 m, depth extend 200 m).

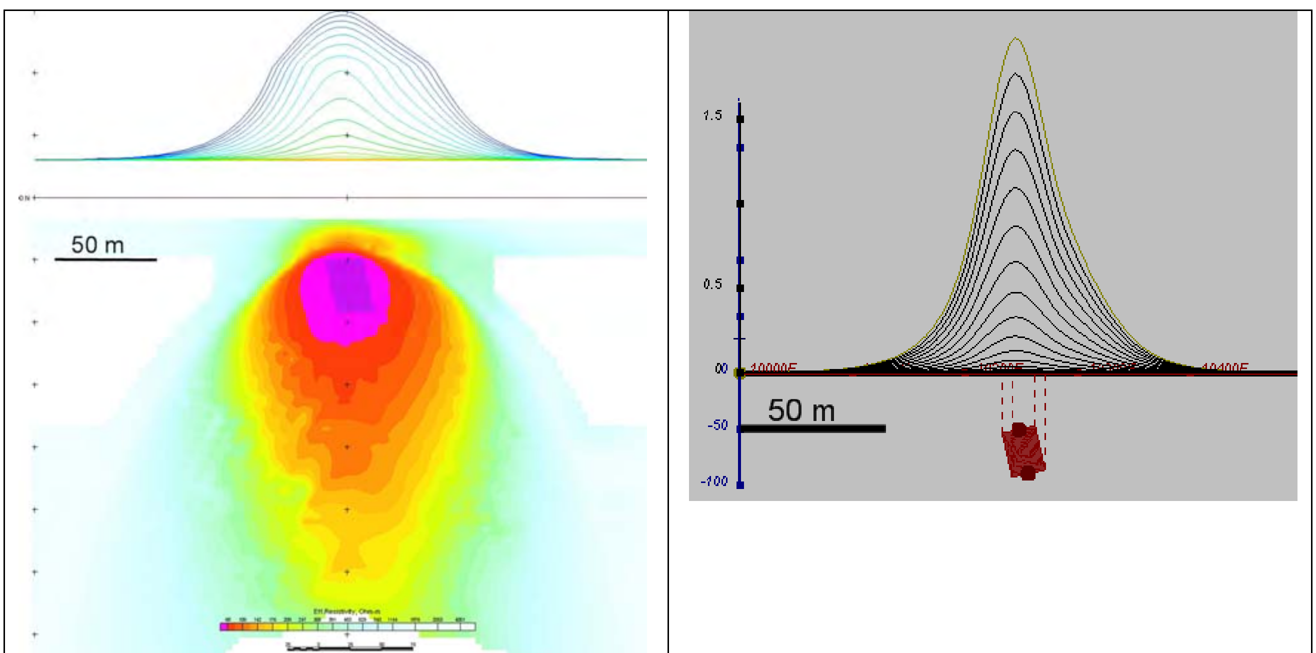

Fig.3 Maxwell plate model and RDI from the calculated response for bulk ("thick") 100 m length, 40 m depth extend, 30 m thickness

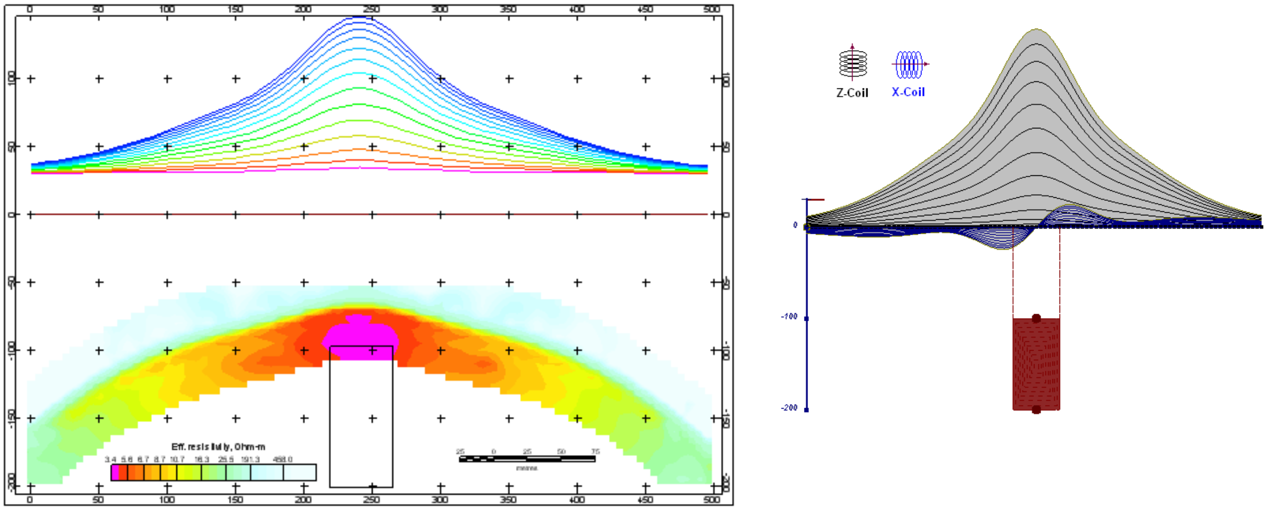

Fig. 4 Maxwell plate model and RDI from the calculated response for "thick" vertical target (depth 100 m, depth extend 100 m). 19-44 chan.

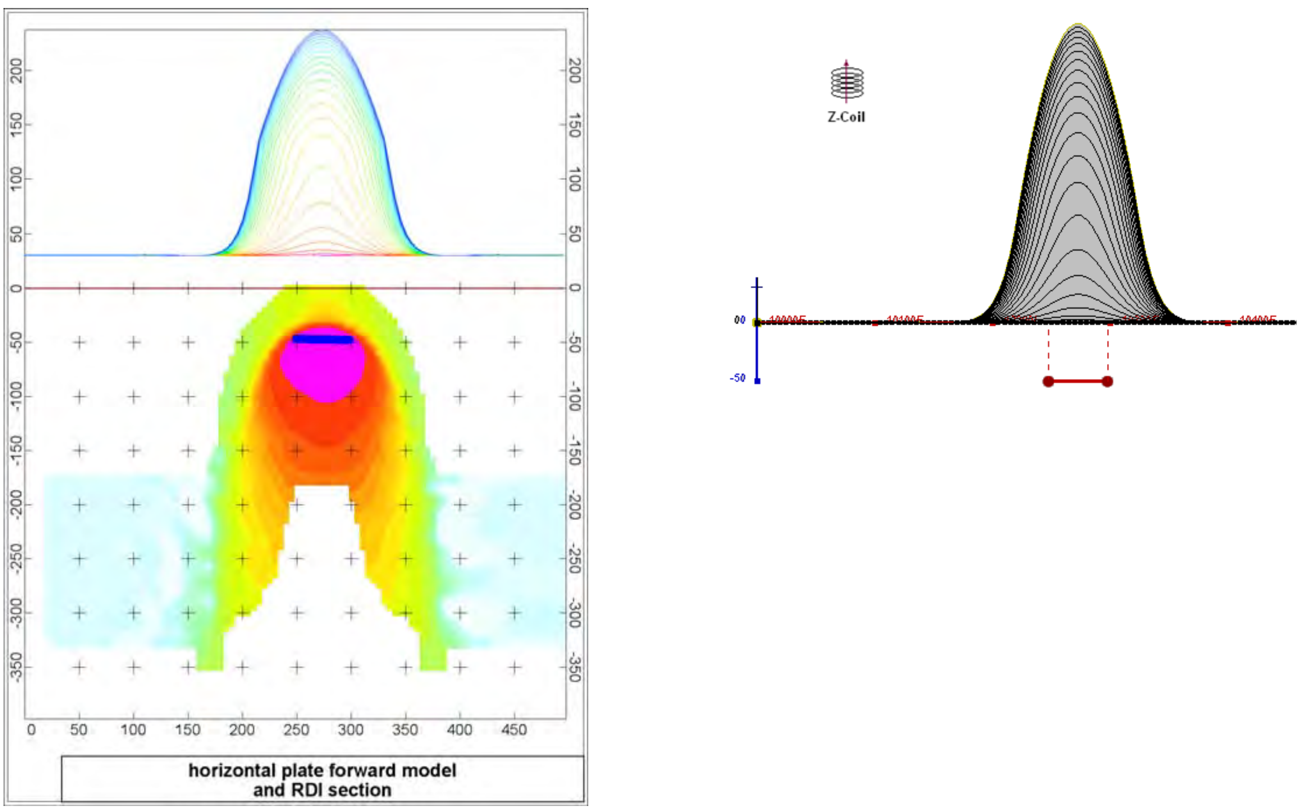

Fig. 5 Maxwell plate model and RDI from the calculated response for horizontal thin plate (depth 50 m, dim 50x100 m). 15-44 chan.

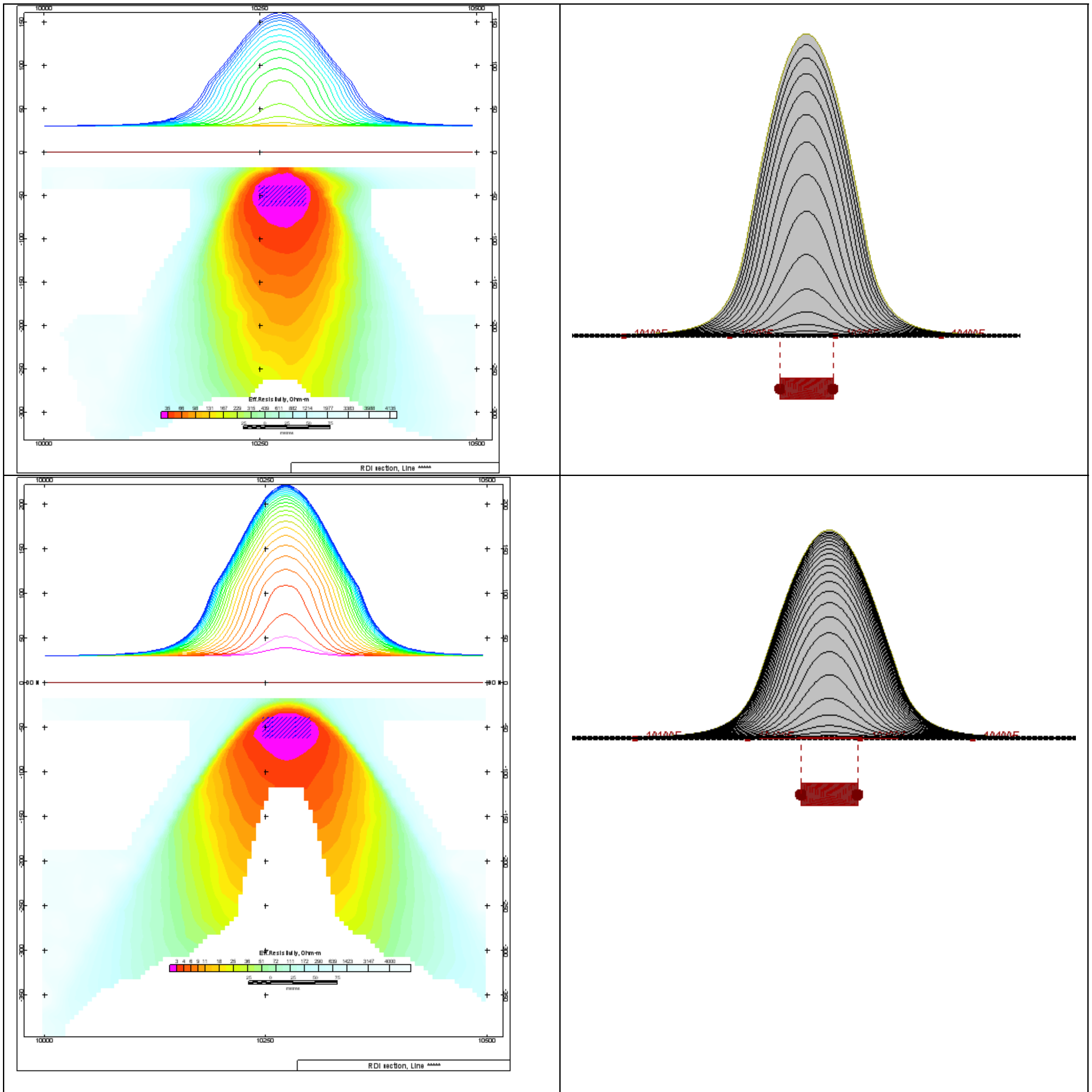

Fig.6 Maxwell plate model and RDI from the calculated response for horizontal thick (20m) plate – less conductive (on the top), more conductive (below)

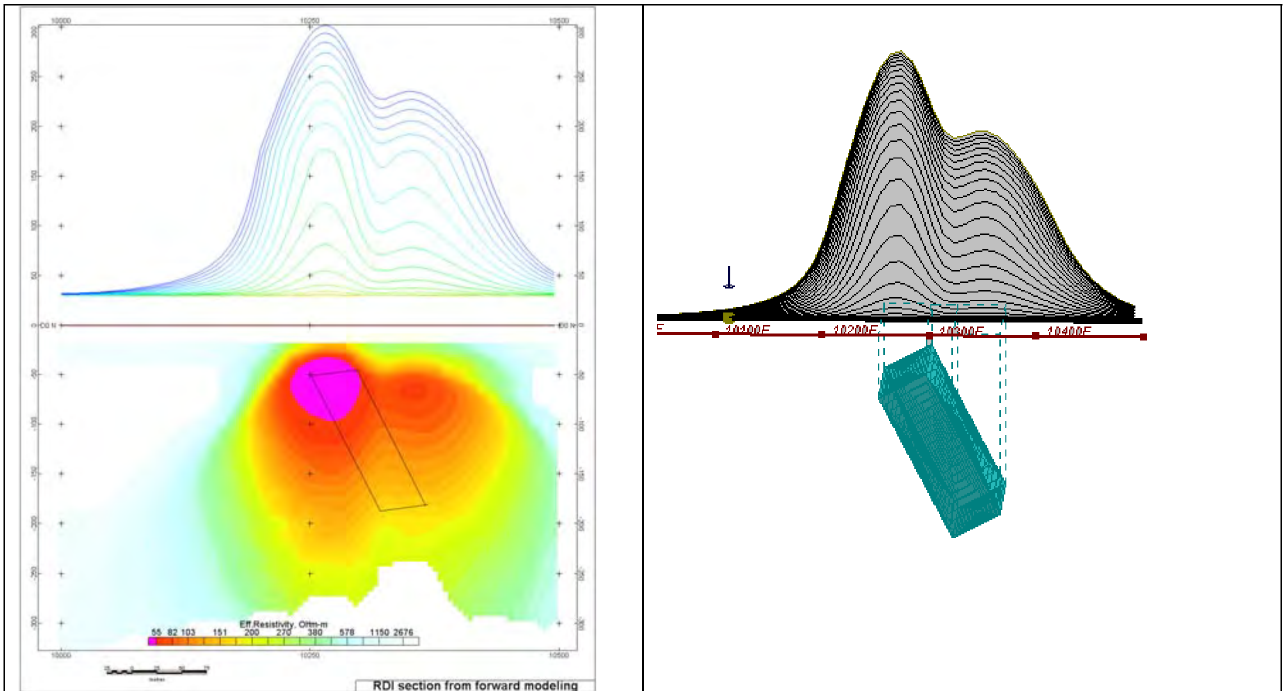

Fig.7 Maxwell plate model and RDI from the calculated response for inclined thick (50m) plate. Depth extend 150 m, depth to the target 50 m.

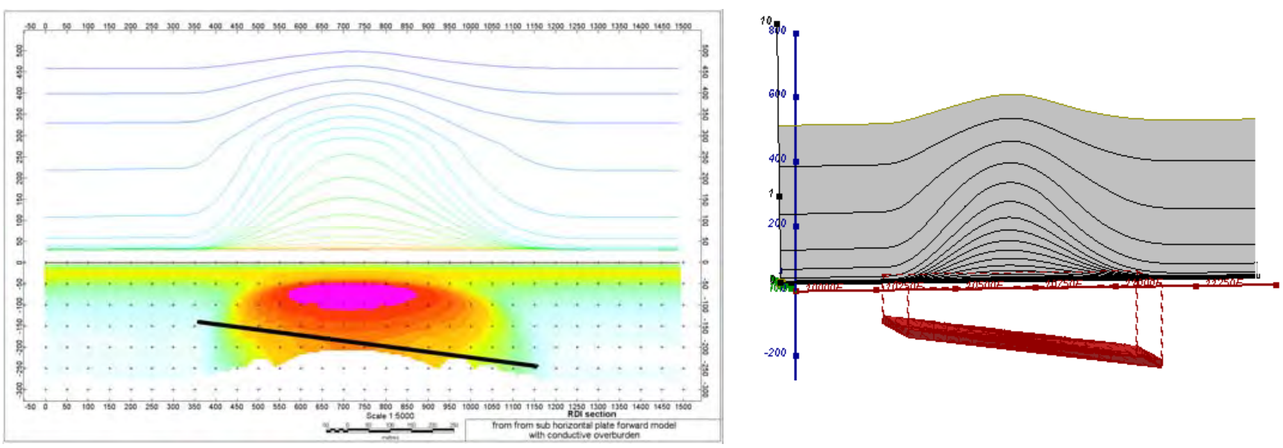

Fig.8 Maxwell plate model and RDI from the calculated response for the long, wide and deep subhorizontal plate (depth 140 m, dim 25x500x800 m) with conductive overburden.

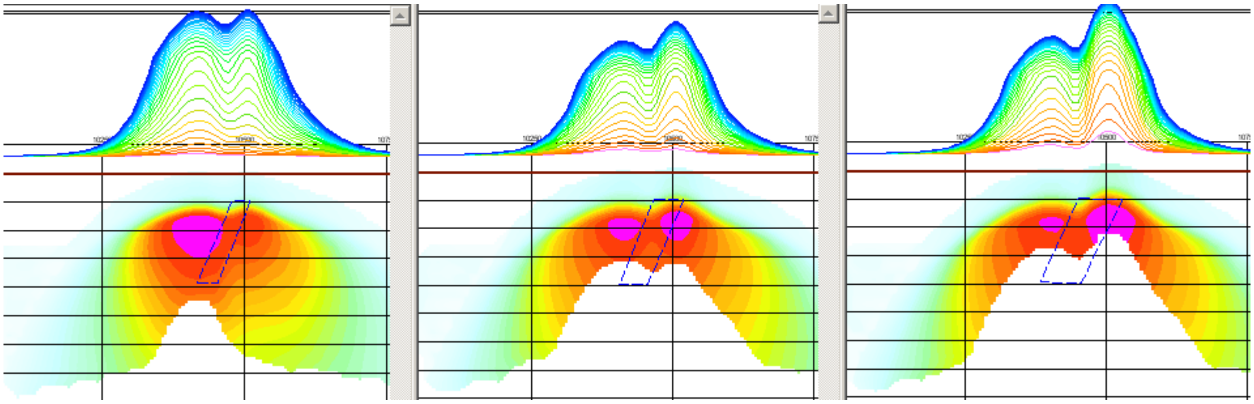

Fig.9 Maxwell plate models and RDIs from the calculated response for “thick” dipping plates (35, 50, 75 m thickness), depth 50 m, conductivity 2.5 S/m.

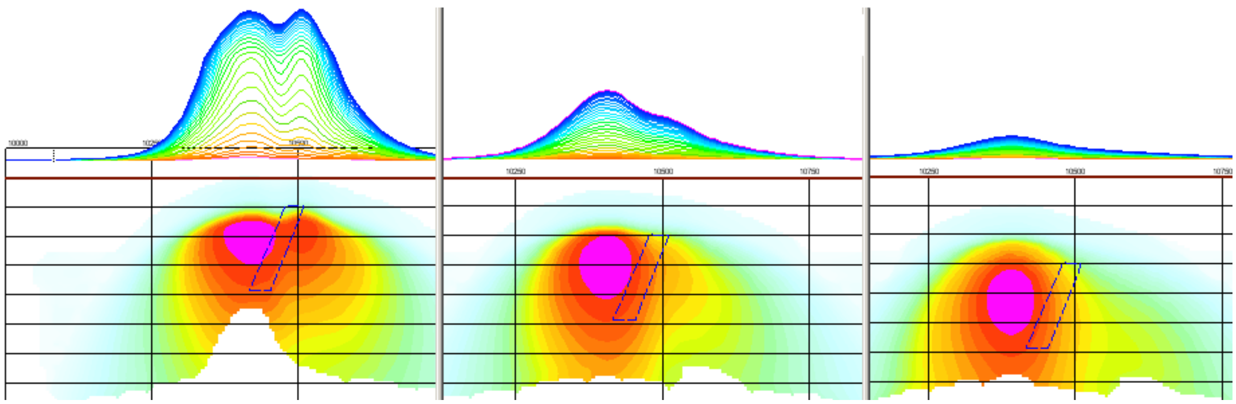

Fig.10 Maxwell plate models and RDIs from the calculated response for “thick” (35 m thickness) dipping plate on different depth (50, 100, 150 m),, conductivity 2.5 S/m.

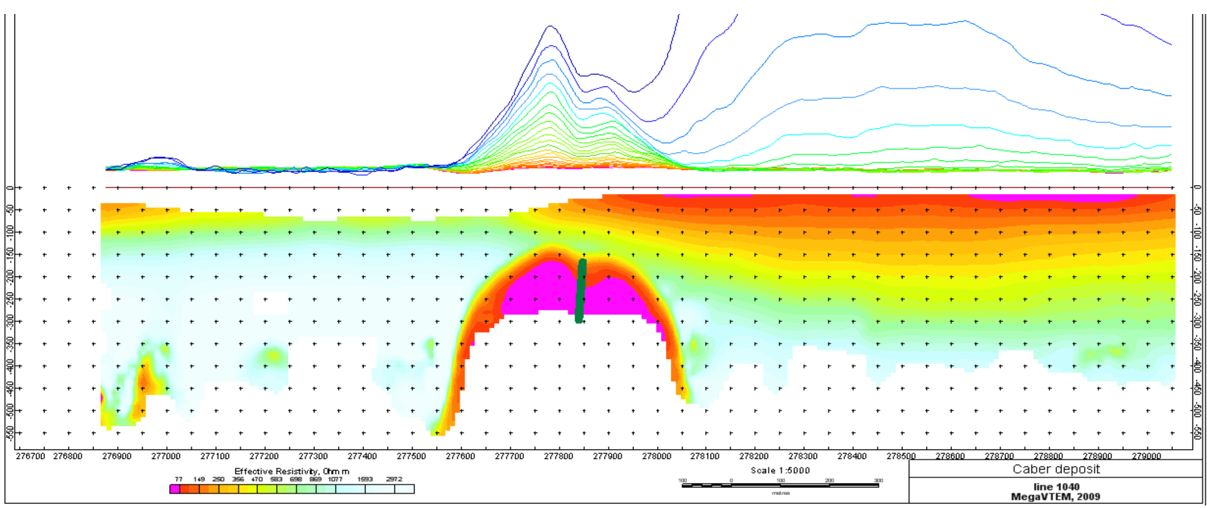

Fig. 11 RDI section of the line over Caber deposit (“thin” subvertical plate target and conductive overburden.

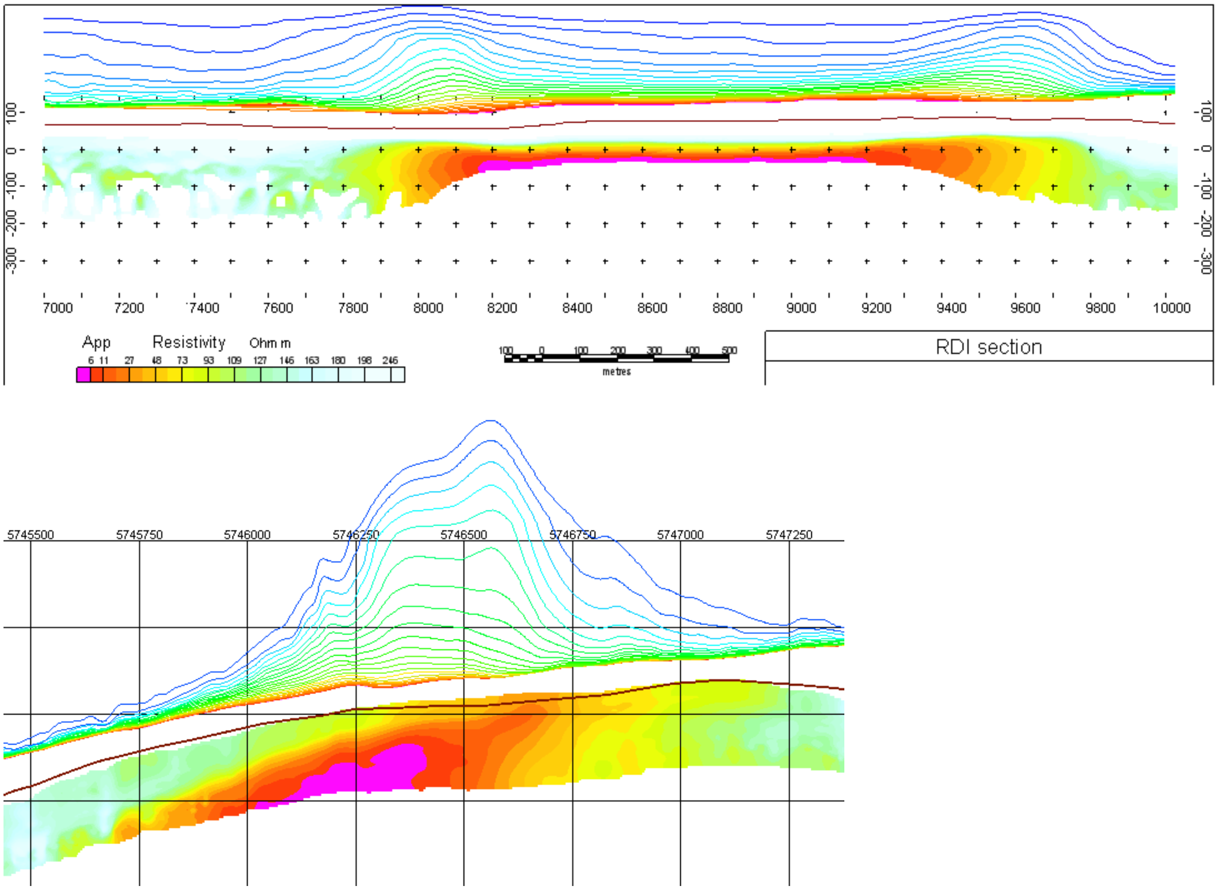

Fig.12 RDI section for the real horizontal and slightly dipping conductive layers

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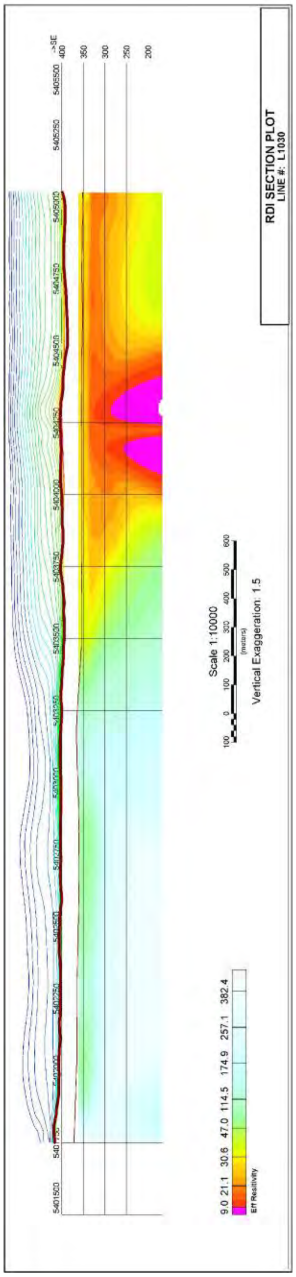
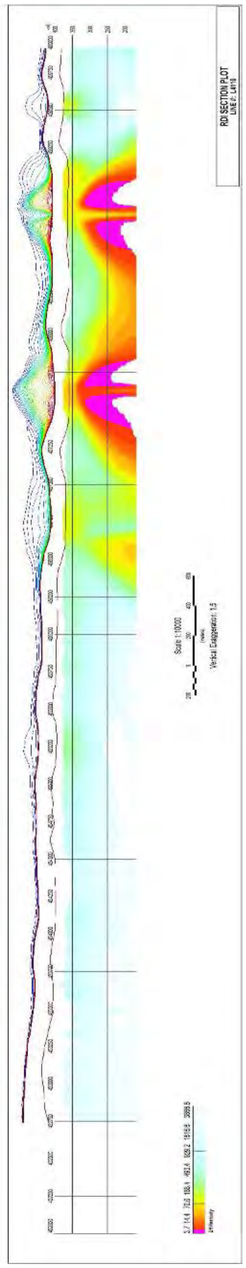
Sept 2010

Presentation of a series of lines

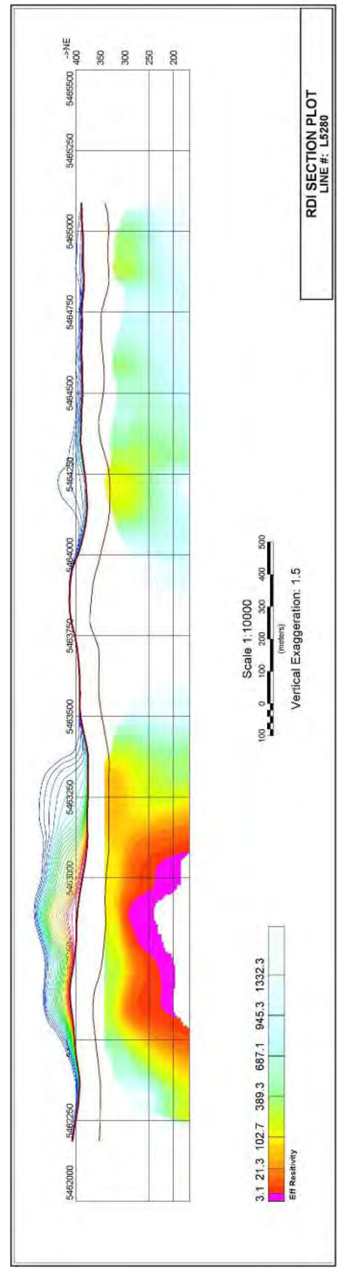
Line 1030



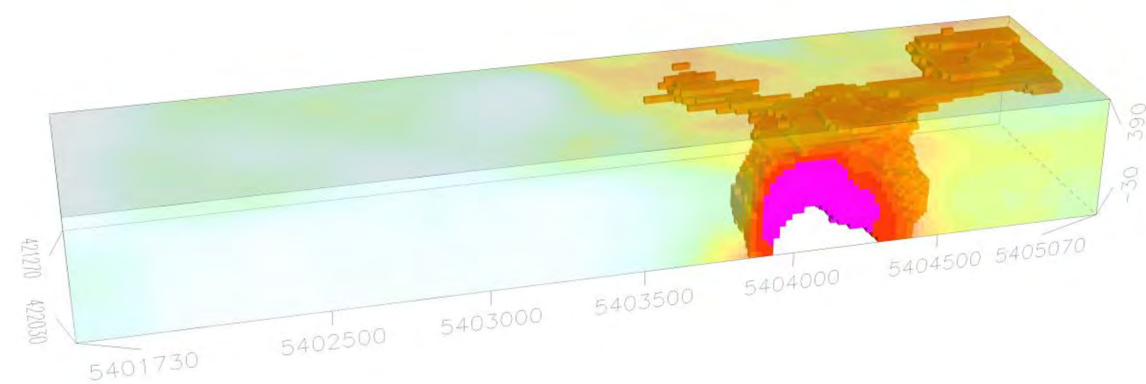
Line 4110



Line 5280



3d presentation of RDIs



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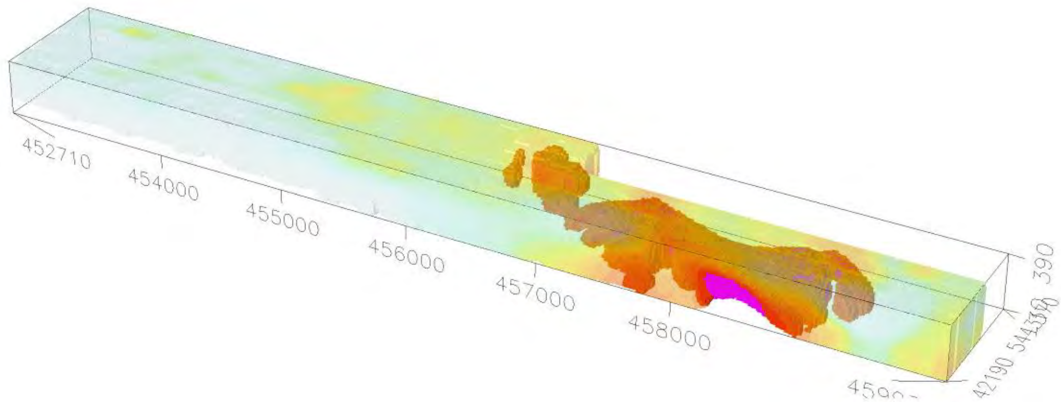

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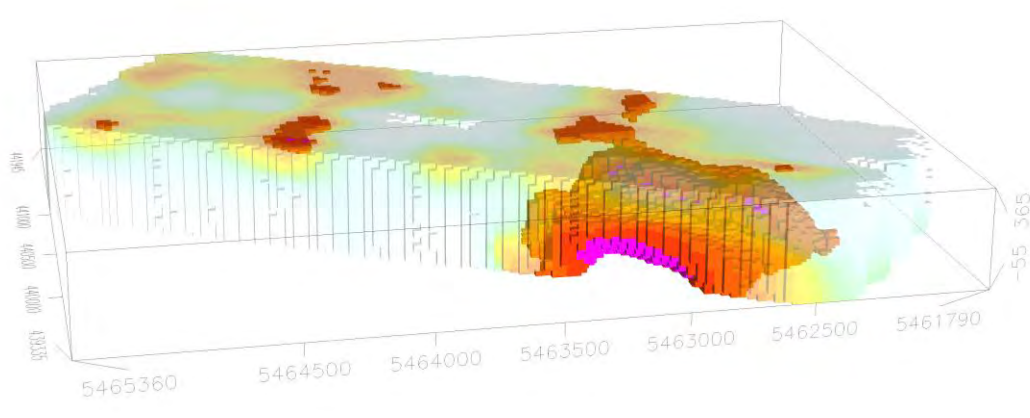

Line 5280