XMET INC.

GPS-INTEGRATED GROUND MAGNETIC SURVEY

BLACKFLAKE WEST PROJECT

FEAGAN LAKE AREA, ONTARIO, CANADA

LOGISTICS & INTERPRETATION REPORT

14N040 **AUGUST 2014**

PGE | C | Fe | Ag | Cu | Au | Zn | REE | Li | Mo | U | Ni | Cr | Pb

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ABSTRACT

*On behalf of Xmet Inc., a **GPS-integrated ground magnetic field** survey was carried out part of the Blackflake West property located within the Feagan Lake area, 80 km NW of Hearst, Ontario. The goal of this geophysical campaign was to highlight low amplitude magnetic features that might relate to an economic hydrothermal graphite deposit.*

*From **July 17 to 20, 2014**, a total of **41.1 km** of magnetic data were gathered over 25 N-S regularly spaced lines. Survey specifications, instrumentation control, data acquisition and processing were all successfully performed within our Quality System framework.*

The ground magnetic survey successfully and clearly mapped the lithological formations of the Blackflake West grid. The dominant interpreted features are two intersecting magnetic lineaments trending NW and WNW, and an open ended irregular shaped magnetic anomaly located north of the grid. Faulting patterns crossing the property were also successfully identified. A potential shear-zone was also interpreted following a weak magnetic trend that is weaker than the magnetic background.

A three-dimensional magnetic susceptibility model was built and proposed for the studied grid. We propose a combination of magnetic and electromagnetic surveys (VTEM survey) in order to verify the nature of the weakly magnetized zones.

1. THE MANDATE

❑ *PROJECT ID*	**Blackflake West Project** (Our reference: **14N040**)
❑ *GENERAL LOCATION*	80 km northwest of Hearst, Ontario, Canada
❑ *CUSTOMER*	**Xmet Inc.** 120 Adelaide Street West, Suite 2500 Toronto, Ontario M5H 1T1 **Telephone**: (416) 644-6588 http://xmet.ca
❑ *REPRESENTATIVE*	**Mr. Justin Rocco, P. Eng.** Geological Engineer justinrocco@live.com
❑ *SURVEY TYPE*	**GPS-integrated ground magnetic field**
❑ *GEOPHYSICAL OBJECTIVE*	To highlight low magnetic features that might relate to an economic hydrothermal graphite deposit

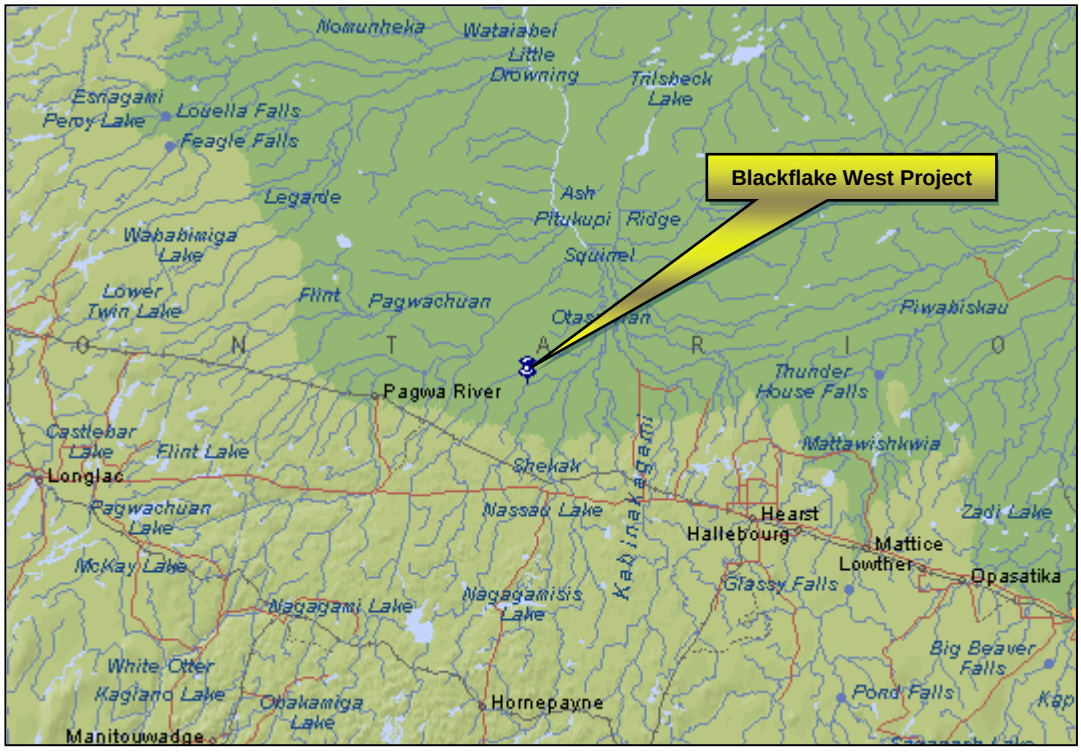

Figure 1. General location of the Blackflake West Project

2. THE BLACKFLAKE WEST PROJECT

- ❑ *LOCATION*

  Feagan Lake area, Ontario, Canada
  Latitude: 50°03' N, Longitude: 84°36' W
  UTM : 671 300 mE, 5 548 000 mN (NAD83, zone 16N)
  NTS sheet: **42K/02**

- ❑ *NEAREST SETTLEMENT*

  Hearst: 80 km to the southeast.

- ❑ *ACCESS*

  The Blackflake West grid was accessed daily from Hearst by taking highway 11 west for ~70 km. From here, an access road (forest road) was taken north for about ~30 km. From there the grid was accessed by ATV after driving approximately 15 km and walking about 0.7 km.

- ❑ *GEOMORPHOLOGY*

  The terrain of the Blackflake West property shows moderate to flat topographic relief with elevation varying from 134 to 144 m above mean see level. Vegetation is classified as thick boreal forest consisting of spruce, fir and birch. The middle of the property the ground is swampy.

- ❑ *CULTURAL FEATURES*

  No cultural features have affected the quality of the geophysical data.

- ❑ *MINING LAND TENURE*

  The location of the Blackflake West grid is illustrated on the following page. The claims encompassed in the present project are wholly owned (100%) by Xmet Inc.

- ❑ *SECURITY AND ENVIRONMENT*

  As part of the Abitibi Geophysics EHS program, crew members received first aid training and are provided with the safety equipment and specialized training for the geophysical techniques utilized on this project.

  No incident was reported during this project.

- ❑ *SURVEY GRID*

  The survey grid consists of twenty-five (25) lines regularly spaced at 75 m and oriented N-S direction. The lines are 1.5 km in length. Two tie-lines spaced at 600 m complete the survey grid.

  Refer to figure 2, on page 5 for a plan view of the region covered by the present survey.

- ❑ *COORDINATE SYSTEM*

  Projection: Universal Transverse Mercator (UTM), zone 16N
  Datum: NAD 83

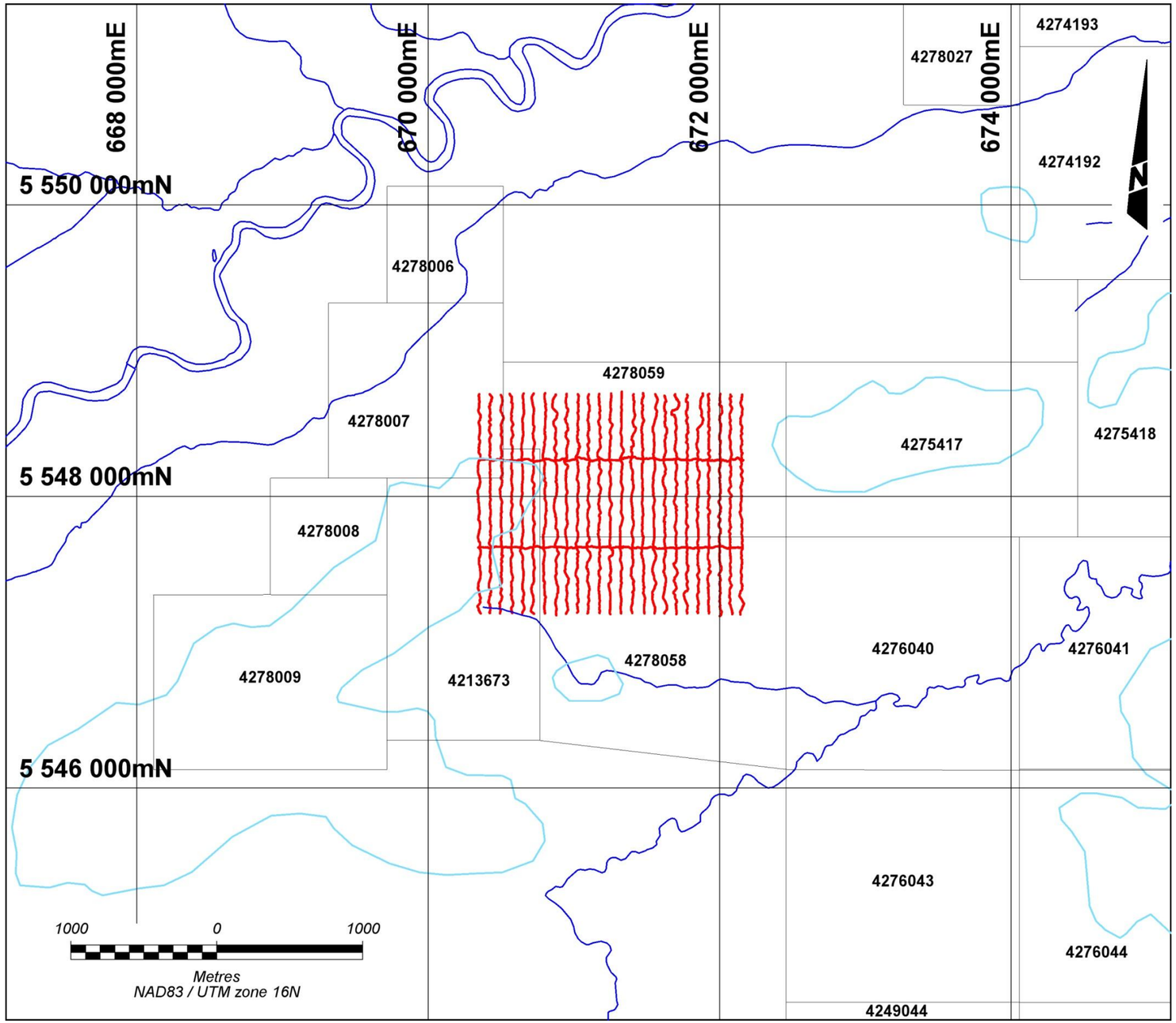

Figure 2. Index of claims and ground magnetic survey coverage over the Blackflake West Project

3. GPS-INTEGRATED GROUND MAGNETIC FIELD SURVEY

- ❑ *TYPE OF SURVEY*

  Measurement of the Total Magnetic Field (TMF) with GPS readings recorded every second. The plotted values were corrected for diurnal variations using readings from a synchronized MAG base station.

- ❑ *PERSONNEL*

Philippe Larouche,	Chief crew, geophysical operator
Barbara Estor,	Geophysical operator
Carole Picard, Tech.,	Plotting
Martin Dubois, P. Geo.,	Logistics
Madjid Chemam, P. Geo.,	QC, Data processing & interpretation
Chris Brown, P. Geo.,	Final validation of product conformity

- ❑ *DATA ACQUISITION*

  From July 17 to 20, 2014

- ❑ *SURVEY COVERAGE*

  41.1 km

- ❑ *FIELD MAGNETOMETERS*

  GEM Systems GSM-19W, s/n 2085540, 2071191
  Proton precession magnetometers with Overhauser effect and built-in GPS.

Resolution:	0.01 nT / 1 m
Absolute accuracy:	0.2 nT / 2-5 m
Gradient tolerance:	>10 000 nT/m
TMI sensor:	at a height of 1.8 m above ground
Sensors:	83450 & 83191

- ❑ *BASE STATION*

  GEM Systems GSM-19, s/n 70824767
  Proton precession magnetometer with Overhauser effect

Resolution:	0.01 nT
Absolute accuracy:	0.2 nT
Cycle time:	**10 seconds**
Sensor:	3020
Location (UTM NAD83):	5 540 470 mN, 662 540 mE
Reference field:	56 930 nT

❑ *QUALITY CONTROLS* *(RECORDS AVAILABLE UPON REQUEST)*

Before the survey:

✓ All magnetometers were successfully field-tested on Abitibi Geophysics' private control line.

Every day during data acquisition:

✓ Every morning, the operator had to successfully test for any magnetic contamination.

✓ In the evening, the geophysical operator reviewed the base station and the mobile units recordings using MAGneto ® processing and QC, in-house software.

✓ The geophysical operator ensures no active geomagnetic activity would be encountered during the survey by visiting the Space Weather Canada website (www.spaceweather.gc.ca).

At the Base of Operations:

✓ Field QCs were inspected & validated.

✓ All profiles were inspected and only a few spikes were removed from the database.

❑ *QUALITY STATISTICS*

Table 1. Quality statistics – Ground Magnetic

Blackflake West Project – MAG-GPS survey		
Field magnetometer s/n: 2085540		
Reading	**Readings towards**	
	North	South
1	56898.12 nT	56899.82 nT
2	56898.37 nT	56899.72 nT
3	56898.30 nT	56899.73 nT
Average	56898.26 nT	56899.75 nT
Difference	1.49 nT (must be ≤ 2 nT)	
Field magnetometer s/n: 2071191		
1	56899.76	56898.12
2	56899.69	56898.96
3	56899.72	56898.88
Average	56899.72	56898.65
Difference	1.07 nT (must be ≤ 2 nT)	

4. DATA PRESENTATION

❑ *TOTAL MAGNETIC FIELD CONTOURS*

The total magnetic field (TMF) was gridded using a minimum curvature algorithm with grid cell size of 20 m. One pass of a 3 x 3 Hanning filter was applied to the resulting grid, which was then re-gridded with a cell size of 10 m to improve the overall appearance of the final map (#1.2). The Geosoft colour table (Clrb64.tbl) was used with linear interval of 10 from 56 940 nT to 57 400 nT.

❑ *RESIDUAL ANOMALY CONTOURS*

To isolate the local magnetic anomaly from the regional component for the Blackflake West grid, an upward continuation of the total magnetic field at 700 m was implemented.

The residual anomaly was generated in a straightforward way by removing the calculated regional grid from the *Total magnetic field* grid (figure 4.A, map #1.3).

❑ *FIRST VERTICAL DERIVATIVE*

Using a convolution filter method, the first vertical derivative (vertical gradient) of the TMI anomaly was calculated (#2.7). One pass of a Hanning 3 x 3 filter was applied to the resulting grid to improve the overall appearance of the *final contours* map (#1.4).

The Oasis Montaj color table (Clra64.tbl) was used with linear interval of 0.25 mGal/m from -1.75 to 6.25 mGal/m.

❑ *MAPS PRODUCED*

The following colour maps are bound or inserted in pockets at the end of this report. All plan maps are registered to the NAD 83, zone 16N, UTM grid coordinate system.

Our Quality System requires every final map to be inspected by at least two qualified persons before being approved and included within a final report.

Table 2. Maps produced

Map #	Description	Scale
MAG-GPS Survey		
1.1	GPS-positioned Magnetic Field Survey – Total Magnetic Intensity Anomaly Profiles (nT)	1:5000
1.2	GPS-positioned Magnetic Field Survey – Total Magnetic Intensity Anomaly Contours (nT)	1:5000
1.3	GPS- positioned Magnetic Field Survey – Upward Residual Anomaly Contours (nT)	1:5000
1.4	GPS-positioned Magnetic Field Survey – First Vertical Derivative Contours (nT/m)	1:5000
10.0	Geophysical Interpretation	1:5000

❑ *DIGITAL DATA*

The above-described maps are delivered in the Oasis Montaj map and JPG file formats on DVD-Rom.

A copy of all survey acquisition data (ASCII text format) and processed data (Geosoft Montaj databases) are also delivered on DVD-Rom.

5. GEOPHYSICAL INTERPRETATION

- *GROUND MAGNETIC SURVEY*

The area of investigation is located between longitudes 84° 37' 15'' and 84° 35' 45'' W, and latitudes 50° 03' 10'' and 50°03' 50'' N. The magnetic survey method is a useful mapping tool, outlining both lithological and structural trends. The principal purpose of this study is to delineate low magnetic features that might relate to a hydrothermal graphite deposit within the Blackflake West property.

Analysis of the magnetic data allowed the identification of two distinctive magnetic lineaments (dyke structures) trending NW and WNW in the center south part of the grid. Also interpreted from the data were an irregular shaped magnetic feature in the north between the lines 17+25E to 20+25E which is open to the north, an arc-shaped magnetic lineament to the NE side, and finally a low magnetic zone in the SW of the property.

As shown on the residual magnetic map (figure 4-A), amplitudes of the positive magnetic features range from 10 nT to more than 400 nT above a magnetic background of 57 010 nT. The two delineated dominant dyke units intersect one another and the narrow one which is trending NW-SE seems post-intruded.

A few negative magnetic anomalies of -100 nT in amplitude were observed on the residual magnetic anomaly (figure 4-A). To clarify the nature of these anomalies, a Total Gradient Amplitude (Analytic Signal) was calculated (figure 4-B). This enhancement technique allowed us to better define boundaries of magnetic sources, especially the bipolar magnetic anomaly type. The detected negative magnetic anomalies in the middle-north of the grid could correspond to a shear zone / magnetic contact zone which may be associated with graphite. It's difficult for us to associate this type of response with graphite without the support or integration of EM data (VTEM survey, etc.). Several lineations that are indicative of faults have affected the studied grid by causing distortions in the shape of the magnetic signatures. These faults were interpreted and reported on the geophysical interpretation map (figure 6).

To improve the geological understanding of the Blackflake West region, regional analysis of the magnetic field has been performed. The regional vertical magnetic gradient (Figure 7) reveals the presence of four (4) large zones of negative magnetic values. These zones could be perspective for hydrothermal graphite exploration. The most interesting negative magnetic is **zone 1** which is located just NW of the surveyed grid.

- *UNCONSTRAINED 3D MAGNETIC INVERSION*

The principal purpose of this interpretation is to produce a subsurface magnetic susceptibility model for the Blackflake West Project. The resulting 3D map will provide a model of the architecture that should assist in the identification of favourable zones for graphite deposition (if they exist), therefore helping in the design of a follow up drilling program.

In this study, an unconstrained magnetic inversion has been performed on the ground magnetic data. First-Order removed trend residual magnetic data is used as input file for producing a 3D magnetic susceptibility model. The topography is included in the modelling process.

The final inversion result is illustrated in figures 8 and 9, as three-dimensional isosurfaces. As shown in these figures, the unconstrained inversion reveals the 3D geometry of the major structures of the Blackflake West Project.

Susceptibility isosurfaces with negative values ranging from -0.01 to -0.002 SI, were left in the recovered model to show the potential zones for graphite deposition (figures 7 & 8). Physically speaking, negative susceptibility values don't make any sense, they should be always positive. In this study, the recovered negative susceptibility values indicate zones of negative susceptibility contrasts which could reflect shear zones, etc. However, this type of signature could also indicate the footprint of the remanent magnetization effect.

Interpreted positive magnetic signatures could correspond to intermediate or mafic rocks lying within the Blakflake West property (figure 6).

The final 3D magnetic susceptibility model is delivered in the Autocad dxf file for the geophysical / geological data integration.

Due to the unconstrained character of the 3D magnetic inversion and the non-uniqueness of potential field modeling, any parametric calculation resulting from this study is only one possible solution. Only sampling by drilling through the rock formation may give the final answer to the origin of the detected magnetic features.

6. CONCLUSIONS

The interpretation of the ground magnetic survey has improved the understanding of the geological setting of the Blackflake West Project. Several magnetic structures showing generally low to moderate amplitudes were identified from the present magnetic survey. High quality displays of the TMF, the residual anomaly, the total gradient amplitude (TGA), and the first vertical derivative were generated in order to highlight and define more mainly subtle magnetic features and to improve the magnetic picture of the Blackflake West property.

Despite the generic nature of the unconstrained magnetic inversion, this 3D interpretation has shown a possible 3D geological model of the studied grid. Low magnetic zones that may reflect shear zones / large fractures have been delineated. The resulting inversion model may be used as a guide for determining the potential zones for graphite.

We recommend integrating additional geophysical information such as VTEM data to verify if the identified negative magnetic anomalies are associated with conductive orebodies.

The interpretation of the geophysical data embodied in this report is essentially a geophysical appraisal of the Blackflake West Project. As such, it incorporates only as much geoscientific information as the author had on hand at the time. Geologists thoroughly familiar with the area may be in a better position to evaluate the geological significance of the various geophysical signatures. Moreover, as time passes and data provided by follow-up programs are compiled, the priority and significance of exploration targets reported in this study may be downgraded or upgraded.

Respectfully submitted,
Abitibi Geophysics Inc.

Madjid Chemam, P.Geo.
Geophysicist
OGQ # 1259

MC/mw

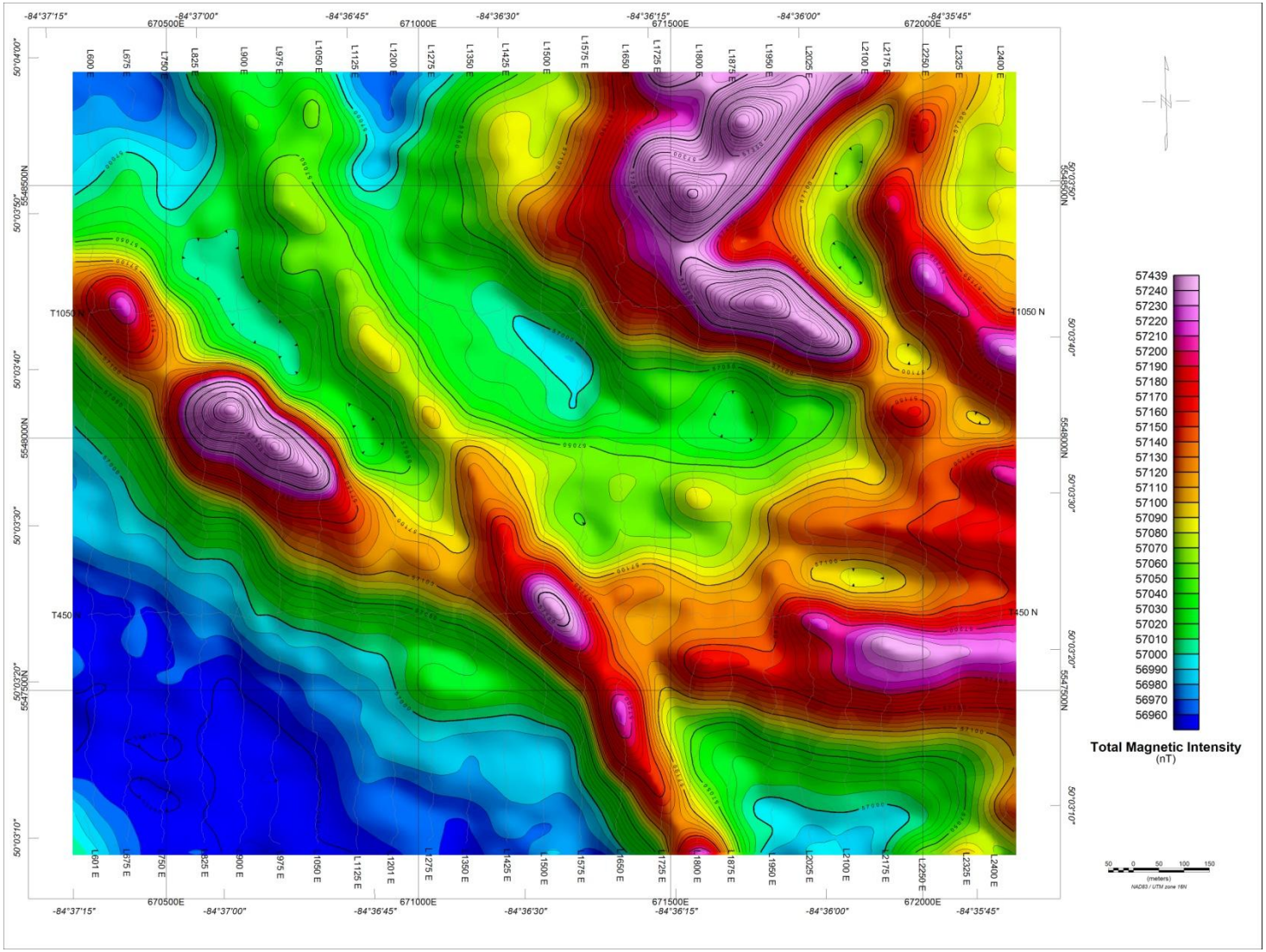

Figure 3. Total magnetic intensity contours map of the Blackflake West Project

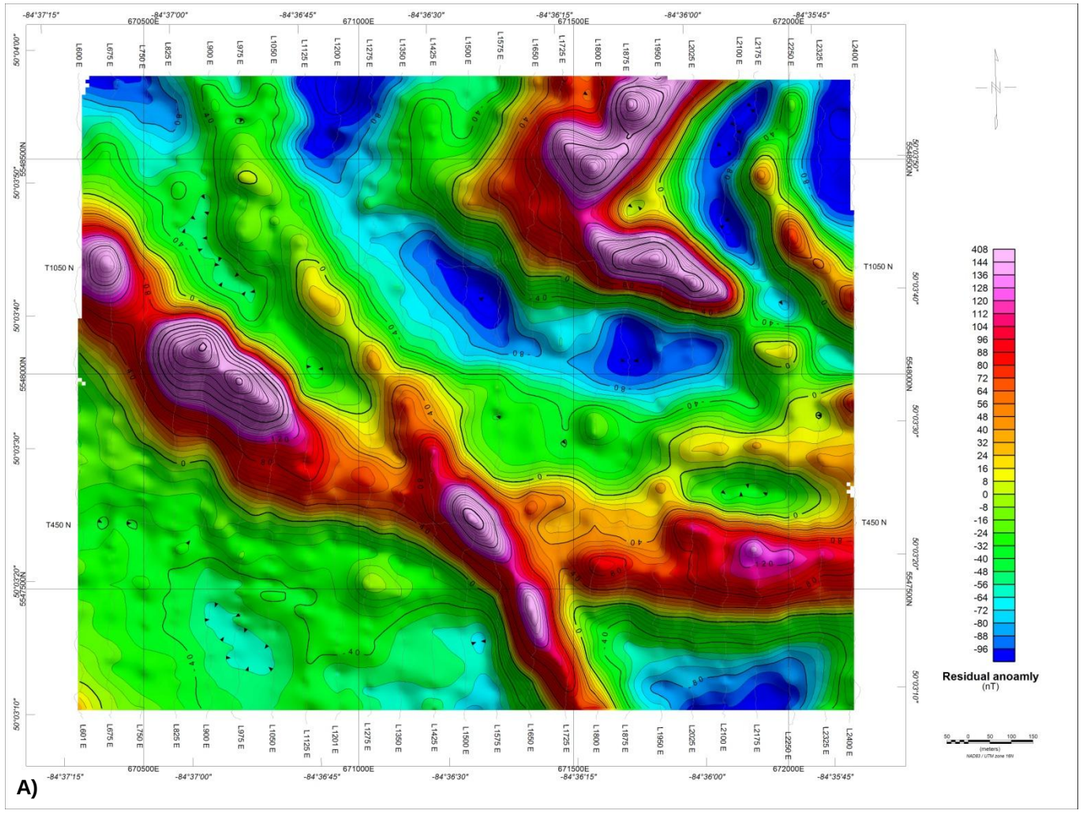

Figure 4. A) Residual magnetic contours map; B) Total Gradient Amplitude (analytic signal) contours map of the Blackflake West Project

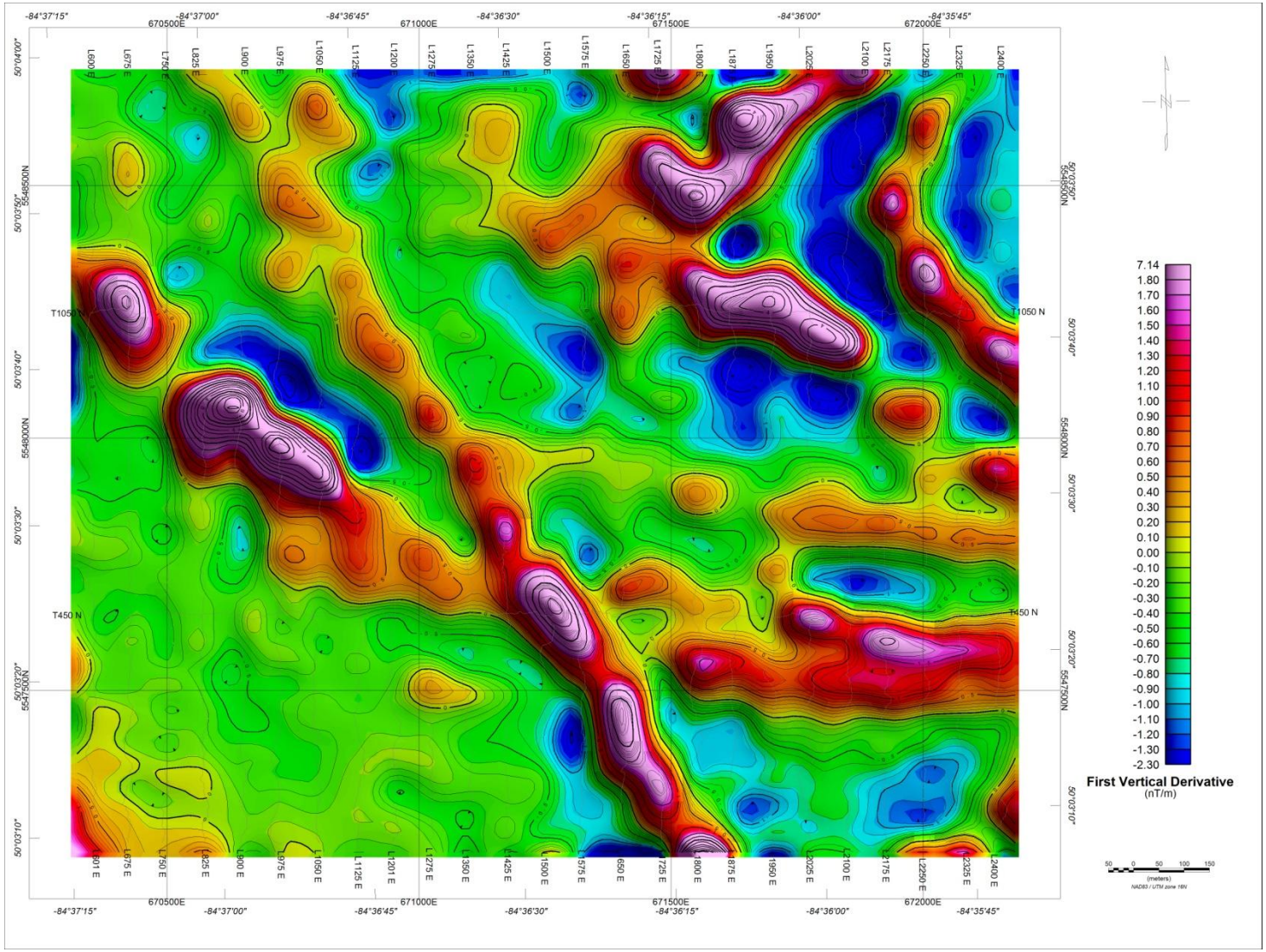

Figure 5. First Vertical Derivative contours map of the Blackflake West Project

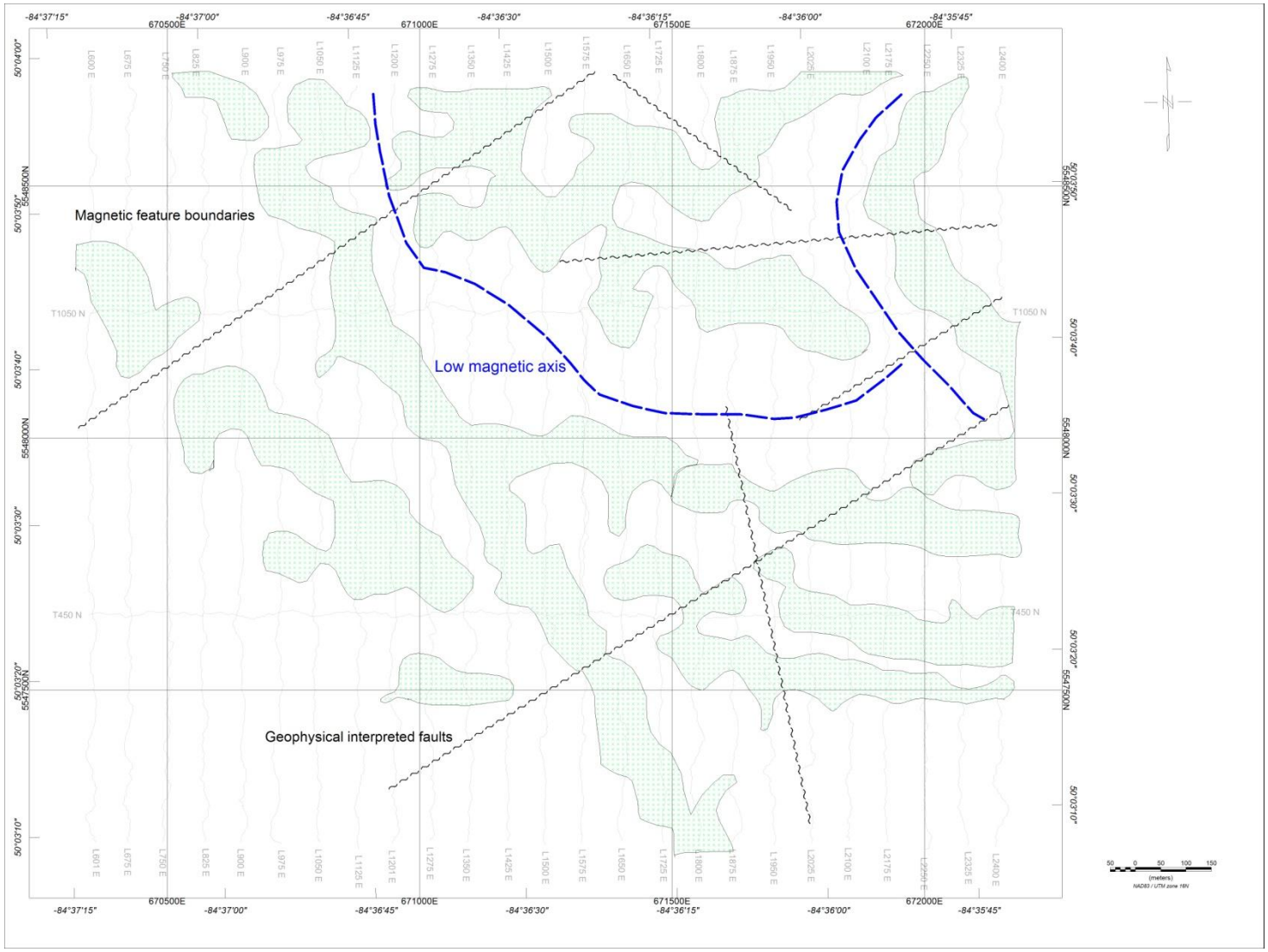

Figure 6. Simplified structural interpretation map of the Blackflake West Project

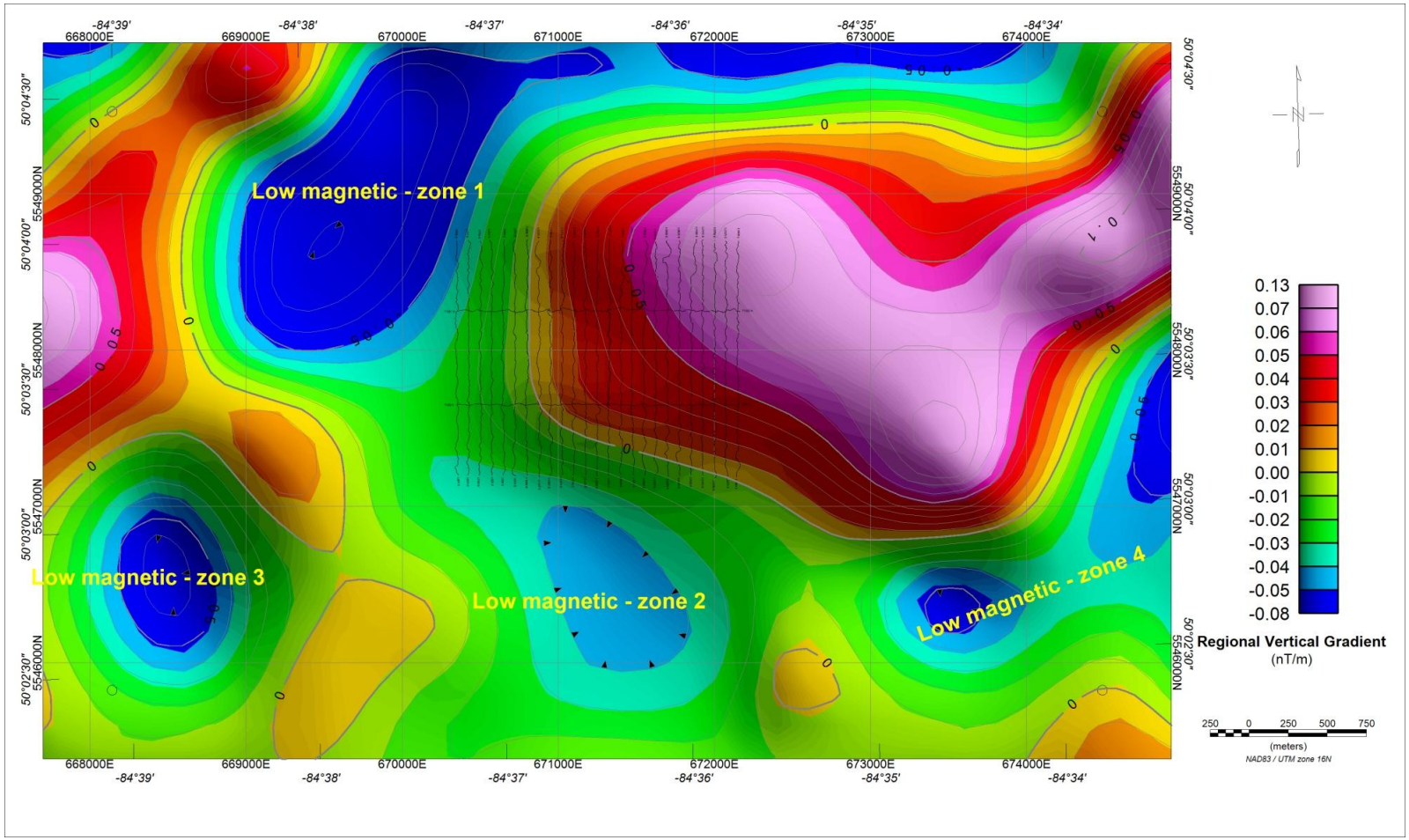

Figure 7. Regional vertical gradient magnetic field (cell size 200 m) showing the surveyed line paths and low magnetic signatures

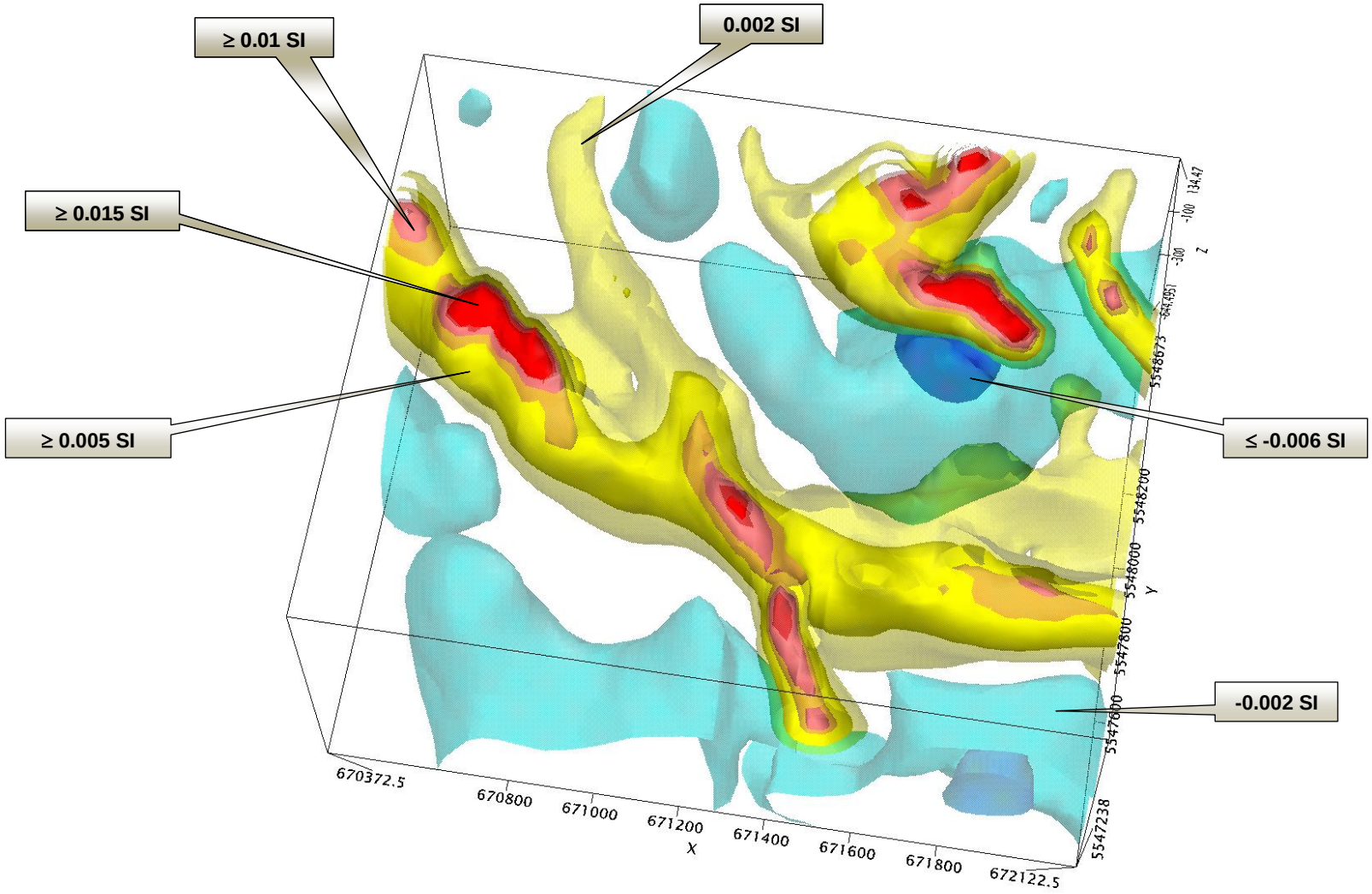

Figure 8. Perspective view showing the subsurface magnetic susceptibility isosurfaces rendered at -0.01 SI (blue dark) to 0.03 SI (red colour)

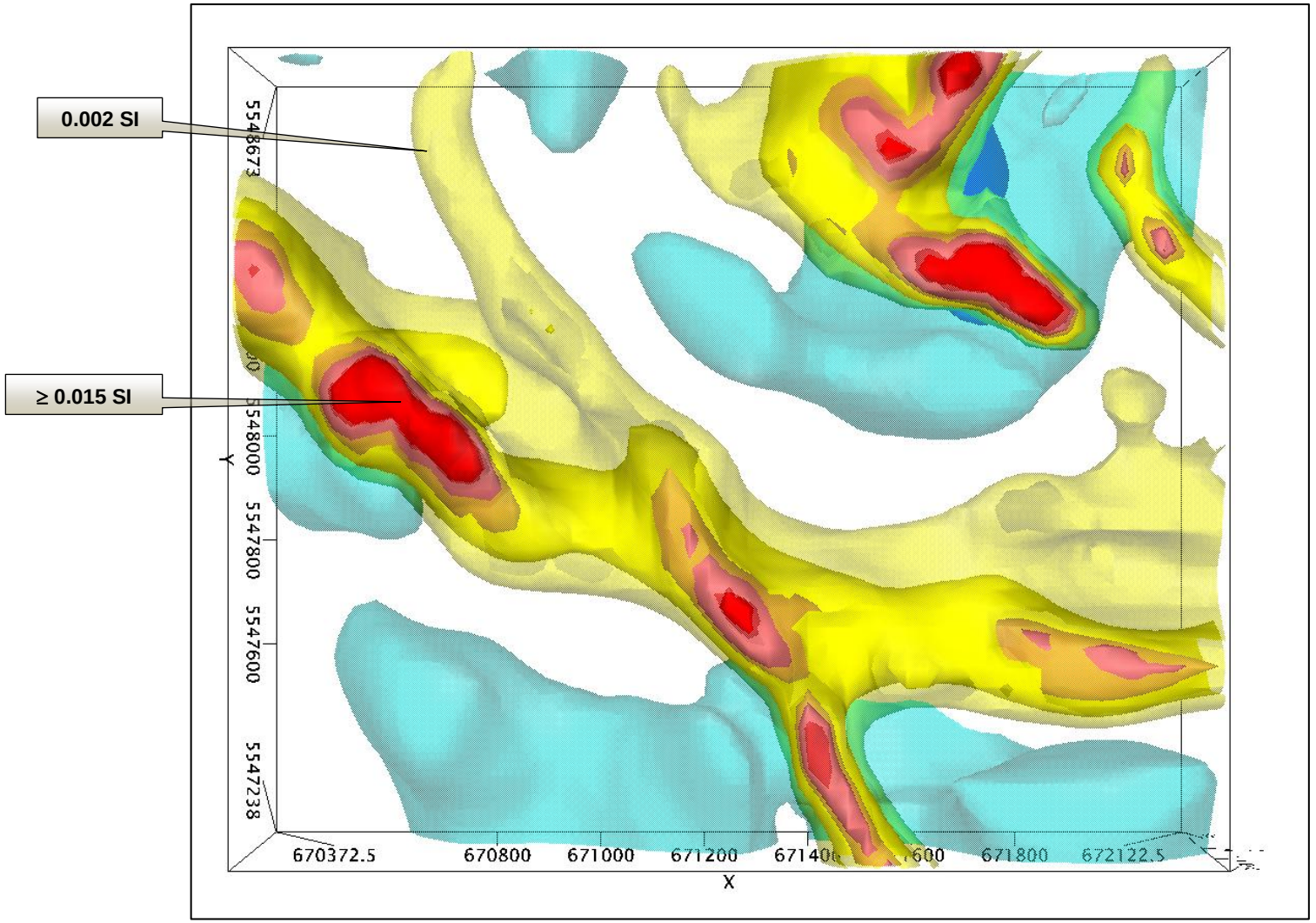

Figure 9. Top view showing the distribution of the magnetic susceptibility of the Blackflake West Project