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FINAL REPORT ON A MULTIPLE DISCIPLINE GEOPHYSICAL SURVEY

Claim Block I & III in the Tartan Lake and Hicks Lake Area
Thunder Bay, Ontario

By

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1. SUMMARY

A multiple-discipline, geophysical survey-programme with land and airborne survey components was completed on the claims registered to John Patrick Sheridan, held in trust for Polar Platinum Inc., in the Tartan Lake and Hicks Lake area of Ontario over claim blocks I and III in the Thunder Bay Mining District.. The programme consisted of helicopter-airborne magnetic gradiometer and radiometric surveys, which were done in separate flights.

Data acquisition for the airborne phase was initiated September 18th, 2010 and completed on October 3rd, 2010. In all, a total of 784.518 line-kilometers of magnetic and 1,226.445 line-kilometers of radiometric data were acquired. The aircraft used for the towed-bird magnetic gradiometer system was a Robinson R44. The spectrometer pack was mounted in the rear, passenger compartment of the helicopter. Flight lines were oriented North-South with a line separation of 250 meters and tie lines were oriented East-West with a line separation of 1,000 meters for the magnetic survey, while a line separation of 150 meters was used for the radiometric survey.

The multiple-discipline, geophysical survey over Tartan Lake and Hicks Lake area claim blocks I & III has identified eighteen (18) targets for additional study as prelude to drill target selection. The anomalies are summarized as follows:

- 4 magnetic anomalies at Block I (2 high priority, 2 moderate priority)
- 5 radiometric anomalies at Block I (1 high priority, 4 moderate priority)
- 5 magnetic anomalies at Block III (1 high priority, 4 moderate Priority)
- 4 radiometric anomalies at Block III (3 high priority, 1 moderate priority)

In total, 18 targets have been identified for additional study.

The recommended follow-up studies, see Section 8.3.3 for more detail, are to incorporate all or some of the following methodologies:

- Geological mapping, including prospecting using a Geiger counter or hand-held spectrometer and grab sampling;
- Heavy mineral sampling for kimberlite-indicator minerals where appropriate;
- Geochemical sampling, including stream sediment and lake sediment sampling where appropriate for copper, gold, and silver in addition to uranium;
- Till sampling in areas where glacial overburden coverage is a problem;
- Magnetometric ground-surveying to confirm the location of the magnetic targets;
- Spectrometer ground-surveying to be used to calibrate and confirm the airborne radiometric survey; and
- Detailed surveying for conductive sulphide deposits at depth using either IP or TDEM where appropriate.
- Increased resolution airborne magnetic gradiometer surveying

2. INTRODUCTION

A multiple-discipline, geophysical, survey-programme with airborne survey components was completed on the Tartan Lake and Hicks Lake area of Ontario by Voisey's Bay Geophysics Ltd., in the Thunder Bay Mining District, held by the Sheridan Platinum Group Ltd. The programme consisted of a high-resolution, helicopter-airborne magnetic gradiometer and radiometric survey.

The detailed, high resolution, helicopter-borne magnetic gradiometer and radiometric surveys were completed on October 3rd, 2010.

The purpose of the survey was to acquire geophysical data to map the magnetic and radiometric anomalies, geophysical characteristics of the geology and structure in an effort to extend the zones of known, economic-size and economic- grade nickel-platinum ore bodies and to explore the possibility that there may be interesting radioactivity deposits in the adjoining ground. Survey polygons are located within high magnetic anomalies indicated by general magnetic survey with the line spacing of 1000 meters (See figure below from the Ontario Ministry of Northern Development, Mines and Forestry).

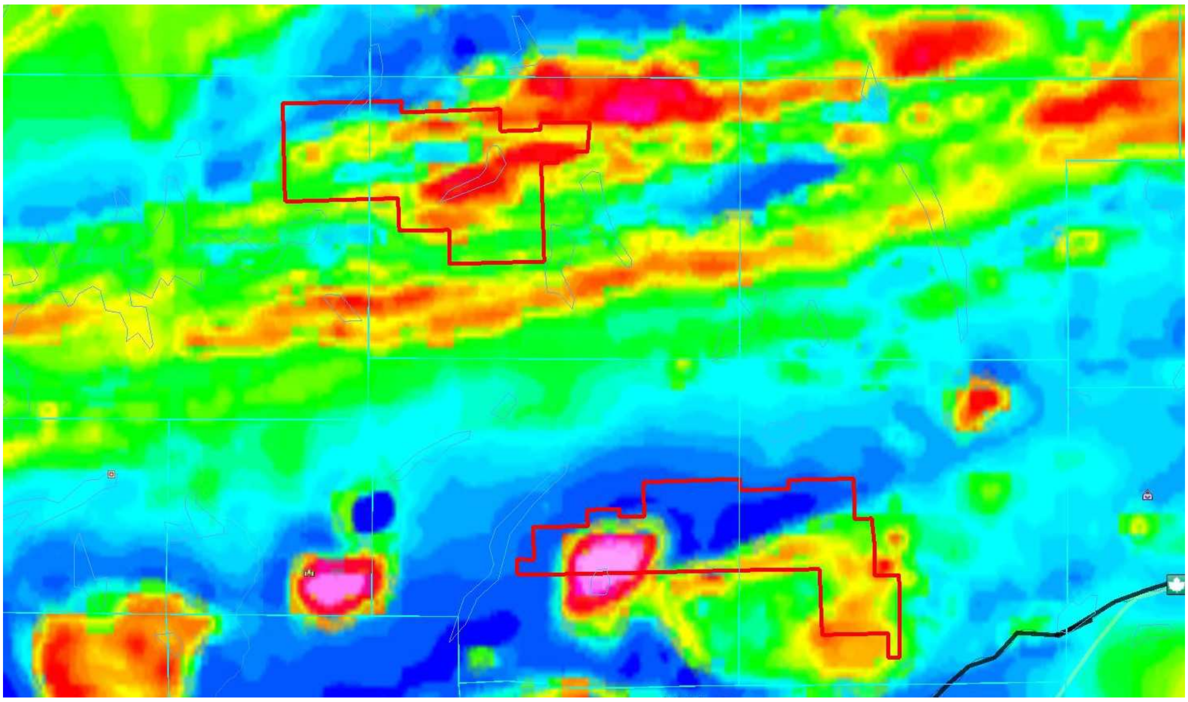


Figure 1 - Regional Magnetics of Tartan Lake, Onion Lake, and Hicks Lake Area

This report describes the surveys, the data processing and the data presentation. The following table provides a description of the airborne survey area.

Table 1. Airborne Survey-Area Description for the Magnetics Survey

Block #	Number of Claims	Total Area sq. km	Survey Grid	Survey Lines (km)	Tie Line (km)
1	40	77.99	250x1000	296.117	76.806
3	34	80.00	250x1000	314.885	74.108

Table 2 - Airborne Survey Area Description for the Radiometrics Survey

Block #	Number of Claims	Total Area sq. km	Survey Grid	Survey Lines (km)	Tie Line (km)
1	40	77.99	150x1000	515.610	76.806
3	34	80.00	150x1000	527.575	74.108

2.1.Magnetic and Radiometric Data Acquisition

The data acquisition involved the use of precision GPS positioning, a high-sensitivity magnetic gradiometer system towed beneath a helicopter and a multi-channel, gamma-ray spectrometer with 16.8 litres “downward-looking” NaI sensor.

Data were acquired along north-south flight lines with a line separation of 250 meters and east-west tie lines with a line separation of 1000 meters of all blocks for the magnetic survey, while the radiometric survey data were acquired along north-south flight lines with a line separation of 150 meters and east-west tie lines with a line separation of 1000 meters.

A mean terrain-clearance of 70 meters for the magnetometer bird and 100 meters for the helicopter was obtained during the first survey for the magnetic data. For the radiometric survey, flown separately, had the spectrometer crystal-pack onboard over the survey blocks.

3. SURVEY AREA

The survey on the Tartan Lake and Kicks Lake areas consists of blocks identified as:

- Block I
- Block III

Blocks I & III are located in the Tartan Lake and Hicks Lake area of Northwestern Ontario, Canada. The primary objective of the survey was to acquire magnetic and radiometric data in support of nickel-platinum-palladium ore deposits.

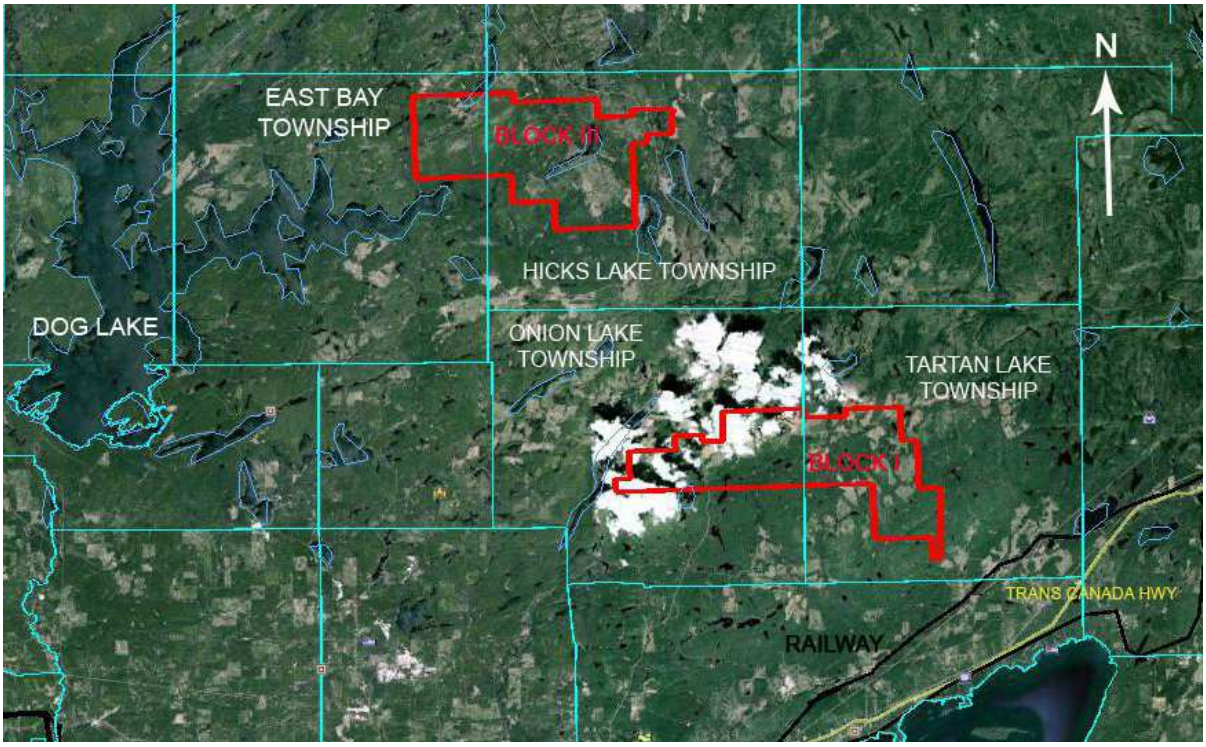


Figure 2 - Location of multiple-parameter, geophysical survey - Thunder Bay, Ontario

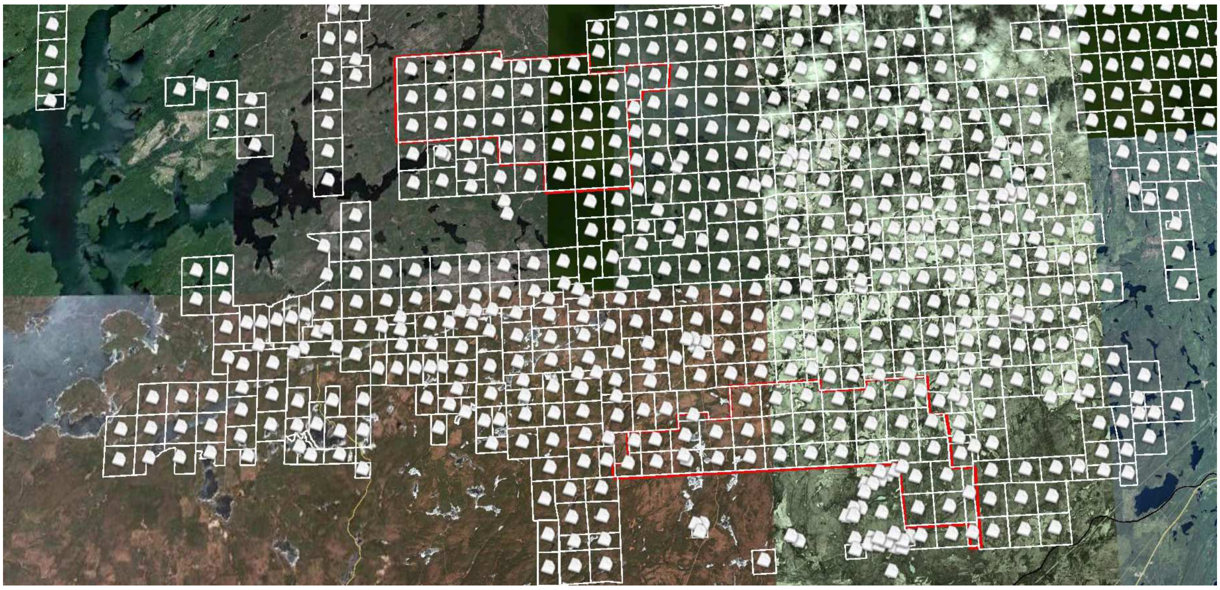


Figure 3 - Location of Claim Blocks

Table 3 - List of Claims

Township/Area	Claim Number	Recording Date	Claim Due Date	Status	Percent Option	Work Required	Total Applied	Total Reserve	Claim Bank
EAST BAY AREA	4257616	2010-Apr-28	2013-Feb-14	A	100 %	$ 6,400	$ 0	$ 0	$ 0
EAST BAY AREA	4257617	2010-Apr-28	2013-Feb-14	A	100 %	$ 6,400	$ 0	$ 0	$ 0
EAST BAY AREA	4257625	2010-Apr-28	2013-Feb-14	A	100 %	$ 6,400	$ 0	$ 0	$ 0
EAST BAY AREA	4257626	2010-Apr-28	2013-Feb-14	A	100 %	$ 6,400	$ 0	$ 0	$ 0
EAST BAY AREA	4257634	2010-Apr-28	2013-Feb-14	A	100 %	$ 6,400	$ 0	$ 0	$ 0
EAST BAY AREA	4257635	2010-Apr-28	2013-Feb-14	A	100 %	$ 6,400	$ 0	$ 0	$ 0
HICKS LAKE AREA	4257608	2010-Apr-28	2013-Feb-14	A	100 %	$ 6,400	$ 0	$ 0	$ 0
HICKS LAKE AREA	4257609	2010-Apr-28	2013-Feb-14	A	100 %	$ 6,400	$ 0	$ 0	$ 0
HICKS LAKE AREA	4257610	2010-Apr-28	2013-Feb-14	A	100 %	$ 5,600	$ 0	$ 0	$ 0
HICKS LAKE AREA	4257611	2010-Apr-28	2013-Feb-14	A	100 %	$ 3,200	$ 0	$ 0	$ 0
HICKS LAKE AREA	4257612	2010-Apr-28	2013-Feb-14	A	100 %	$ 6,400	$ 0	$ 0	$ 0
HICKS LAKE AREA	4257613	2010-Apr-28	2013-Feb-14	A	100 %	$ 6,400	$ 0	$ 0	$ 0
HICKS LAKE AREA	4257614	2010-Apr-28	2013-Feb-14	A	100 %	$ 6,400	$ 0	$ 0	$ 0
HICKS LAKE AREA	4257615	2010-Apr-28	2013-Feb-14	A	100 %	$ 5,600	$ 0	$ 0	$ 0
HICKS LAKE AREA	4257618	2010-Apr-28	2013-Feb-14	A	100 %	$ 6,400	$ 0	$ 0	$ 0
HICKS LAKE AREA	4257619	2010-Apr-28	2013-Feb-14	A	100 %	$ 6,400	$ 0	$ 0	$ 0
HICKS LAKE AREA	4257620	2010-Apr-28	2013-Feb-14	A	100 %	$ 6,400	$ 0	$ 0	$ 0
HICKS LAKE AREA	4257621	2010-Apr-28	2013-Feb-14	A	100 %	$ 6,400	$ 0	$ 0	$ 0
HICKS LAKE AREA	4257622	2010-Apr-28	2013-Feb-14	A	100 %	$ 6,400	$ 0	$ 0	$ 0
HICKS LAKE AREA	4257623	2010-Apr-28	2013-Feb-14	A	100 %	$ 5,600	$ 0	$ 0	$ 0
HICKS LAKE AREA	4257624	2010-May-04	2013-Feb-14	A	100 %	$ 2,400	$ 0	$ 0	$ 0
HICKS LAKE AREA	4257627	2010-Apr-28	2013-Feb-14	A	100 %	$ 6,400	$ 0	$ 0	$ 0
HICKS LAKE AREA	4257628	2010-Apr-28	2013-Feb-14	A	100 %	$ 6,400	$ 0	$ 0	$ 0
HICKS LAKE AREA	4257629	2010-Apr-28	2013-Feb-14	A	100 %	$ 6,400	$ 0	$ 0	$ 0

HICKS LAKE AREA	4257630	2010-Apr-28	2013-Feb-14	A	100 %	$ 6,400	$ 0	$ 0	$ 0
HICKS LAKE AREA	4257631	2010-Apr-28	2013-Feb-14	A	100 %	$ 6,400	$ 0	$ 0	$ 0
HICKS LAKE AREA	4257632	2010-May-04	2013-Feb-14	A	100 %	$ 6,400	$ 0	$ 0	$ 0
HICKS LAKE AREA	4257633	2010-May-04	2013-Feb-14	A	100 %	$ 4,400	$ 0	$ 0	$ 0
HICKS LAKE AREA	4257636	2010-Apr-28	2013-Feb-14	A	100 %	$ 6,400	$ 0	$ 0	$ 0
HICKS LAKE AREA	4257637	2010-May-04	2013-Feb-14	A	100 %	$ 4,800	$ 0	$ 0	$ 0
HICKS LAKE AREA	4257638	2010-May-04	2013-Feb-14	A	100 %	$ 1,600	$ 0	$ 0	$ 0
HICKS LAKE AREA	4257639	2010-May-04	2013-Feb-14	A	100 %	$ 3,200	$ 0	$ 0	$ 0
HICKS LAKE AREA	4257640	2010-May-04	2013-Feb-14	A	100 %	$ 3,200	$ 0	$ 0	$ 0
HICKS LAKE AREA	4257641	2010-May-04	2013-Feb-14	A	100 %	$ 4,400	$ 0	$ 0	$ 0
ONION LAKE AREA	4257665	2010-May-04	2013-Feb-14	A	100 %	$ 2,400	$ 0	$ 0	$ 0
ONION LAKE AREA	4257666	2010-May-04	2013-Feb-14	A	100 %	$ 4,800	$ 0	$ 0	$ 0
ONION LAKE AREA	4257667	2010-May-04	2013-Feb-14	A	100 %	$ 6,000	$ 0	$ 0	$ 0
ONION LAKE AREA	4257668	2010-May-04	2013-Feb-14	A	100 %	$ 6,400	$ 0	$ 0	$ 0
ONION LAKE AREA	4257669	2010-May-04	2013-Feb-14	A	100 %	$ 1,600	$ 0	$ 0	$ 0
ONION LAKE AREA	4257670	2010-May-04	2013-Feb-14	A	100 %	$ 6,400	$ 0	$ 0	$ 0
ONION LAKE AREA	4257671	2010-May-04	2013-Feb-14	A	100 %	$ 6,400	$ 0	$ 0	$ 0
ONION LAKE AREA	4257672	2010-May-04	2013-Feb-14	A	100 %	$ 6,400	$ 0	$ 0	$ 0
ONION LAKE AREA	4257673	2010-May-04	2013-Feb-14	A	100 %	$ 3,200	$ 0	$ 0	$ 0
ONION LAKE AREA	4257674	2010-May-04	2013-Feb-14	A	100 %	$ 4,800	$ 0	$ 0	$ 0
ONION LAKE AREA	4257675	2010-May-04	2013-Feb-14	A	100 %	$ 4,400	$ 0	$ 0	$ 0
ONION LAKE AREA	4257676	2010-May-04	2013-Feb-14	A	100 %	$ 4,800	$ 0	$ 0	$ 0
ONION LAKE AREA	4257677	2010-May-04	2013-Feb-14	A	100 %	$ 6,400	$ 0	$ 0	$ 0
ONION LAKE AREA	4257678	2010-May-04	2013-Feb-14	A	100 %	$ 6,400	$ 0	$ 0	$ 0
ONION LAKE AREA	4257680	2010-May-04	2013-Feb-14	A	100 %	$ 4,800	$ 0	$ 0	$ 0
ONION LAKE AREA	4257681	2010-May-04	2013-Feb-14	A	100 %	$ 4,800	$ 0	$ 0	$ 0
TARTAN LAKE AREA	4257653	2010-May-04	2013-Feb-14	A	100 %	$ 4,000	$ 0	$ 0	$ 0
TARTAN LAKE AREA	4257654	2010-May-04	2013-Feb-14	A	100 %	$ 4,800	$ 0	$ 0	$ 0

TARTAN LAKE AREA	4257655	2010-May-04	2013-Feb-14	A	100 %	$ 2,000	$ 0	$ 0	$ 0
TARTAN LAKE AREA	4257656	2010-May-04	2013-Feb-14	A	100 %	$ 4,400	$ 0	$ 0	$ 0
TARTAN LAKE AREA	4257679	2010-May-04	2013-Feb-14	A	100 %	$ 6,400	$ 0	$ 0	$ 0
TARTAN LAKE AREA	4257682	2010-May-05	2013-Feb-14	A	100 %	$ 4,800	$ 0	$ 0	$ 0
TARTAN LAKE AREA	4257683	2010-May-04	2013-Feb-14	A	100 %	$ 4,800	$ 0	$ 0	$ 0
TARTAN LAKE AREA	4257684	2010-May-04	2013-Feb-14	A	100 %	$ 6,400	$ 0	$ 0	$ 0
TARTAN LAKE AREA	4257685	2010-May-04	2013-Feb-14	A	100 %	$ 4,800	$ 0	$ 0	$ 0
TARTAN LAKE AREA	4257686	2010-May-04	2013-Feb-14	A	100 %	$ 1,600	$ 0	$ 0	$ 0
TARTAN LAKE AREA	4257687	2010-May-04	2013-Feb-14	A	100 %	$ 1,600	$ 0	$ 0	$ 0
TARTAN LAKE AREA	4257688	2010-May-04	2013-Feb-14	A	100 %	$ 5,600	$ 0	$ 0	$ 0
TARTAN LAKE AREA	4257689	2010-May-04	2013-Feb-14	A	100 %	$ 6,000	$ 0	$ 0	$ 0
TARTAN LAKE AREA	4257690	2010-May-04	2013-Feb-14	A	100 %	$ 2,400	$ 0	$ 0	$ 0
TARTAN LAKE AREA	4257691	2010-May-04	2013-Feb-14	A	100 %	$ 6,400	$ 0	$ 0	$ 0
TARTAN LAKE AREA	4257692	2010-May-04	2013-Feb-14	A	100 %	$ 6,400	$ 0	$ 0	$ 0
TARTAN LAKE AREA	4257693	2010-May-04	2013-Feb-14	A	100 %	$ 5,600	$ 0	$ 0	$ 0
TARTAN LAKE AREA	4257694	2010-May-04	2013-Feb-14	A	100 %	$ 4,800	$ 0	$ 0	$ 0
TARTAN LAKE AREA	4257695	2010-May-04	2013-Feb-14	A	100 %	$ 4,800	$ 0	$ 0	$ 0
TARTAN LAKE AREA	4257696	2010-May-04	2013-Feb-14	A	100 %	$ 4,400	$ 0	$ 0	$ 0
TARTAN LAKE AREA	4257697	2010-May-04	2013-Feb-14	A	100 %	$ 6,000	$ 0	$ 0	$ 0
TARTAN LAKE AREA	4257698	2010-May-04	2013-Feb-14	A	100 %	$ 6,000	$ 0	$ 0	$ 0
TARTAN LAKE AREA	4257699	2010-May-04	2013-Feb-14	A	100 %	$ 6,400	$ 0	$ 0	$ 0
TARTAN LAKE AREA	4257700	2010-May-04	2013-Feb-14	A	100 %	$ 6,400	$ 0	$ 0	$ 0

3.1.Block I

Block I is located 34 kilometers NE of Thunder Bay, Ontario. The property is surrounded with numerous small lakes, ponds, and rivers. Weather conditions during the survey were warm (average 20°C) and sunny with periods of cloud.

The survey coordinates were provided by Voisey Bay Geophysics Ltd. in NAD83 zone 16 UTM easting and northing. The following table contains block corners for Block I.

Table 4 - Corner Coordinates for Thunder Bay Claims, Block I

Corner	Geo West	Geo North	UTM Easting	UTM Northing
1	89.14834	48.66141	341807	5392045
2	89.14803	48.65531	341811	5391366
3	88.94707	48.65756	356616	5391219
4	88.94578	48.62899	356630	5388041
5	88.90148	48.62899	359894	5387959
6	88.90105	48.61857	359897	5386800
7	88.89378	48.61903	360434	5386838
8	88.89474	48.65564	360464	5390908
9	88.91111	48.655	359257	5390867
10	88.91336	48.67971	359160	5393618
11	88.92396	48.68003	358381	5393673
12	88.92461	48.70057	358391	5395958
13	88.96825	48.69994	355178	5395969
14	88.96793	48.69352	355183	5395255
15	89.00069	48.69287	352771	5395246
16	89.001	48.69704	352760	5395710
17	89.06457	48.69608	348080	5395728
18	89.06456	48.68132	348036	5394087
19	89.08029	48.68035	346875	5394011
20	89.08093	48.68388	346839	5394405
21	89.10244	48.6842	345257	5394484
22	89.10212	48.6765	345257	5393627
23	89.13808	48.67618	342609	5393665
24	89.13775	48.66141	342587	5392023

Data were acquired along north-south flight lines with a line separation of 250 meters and east-west tie lines with a line separation of 1,000 meters.

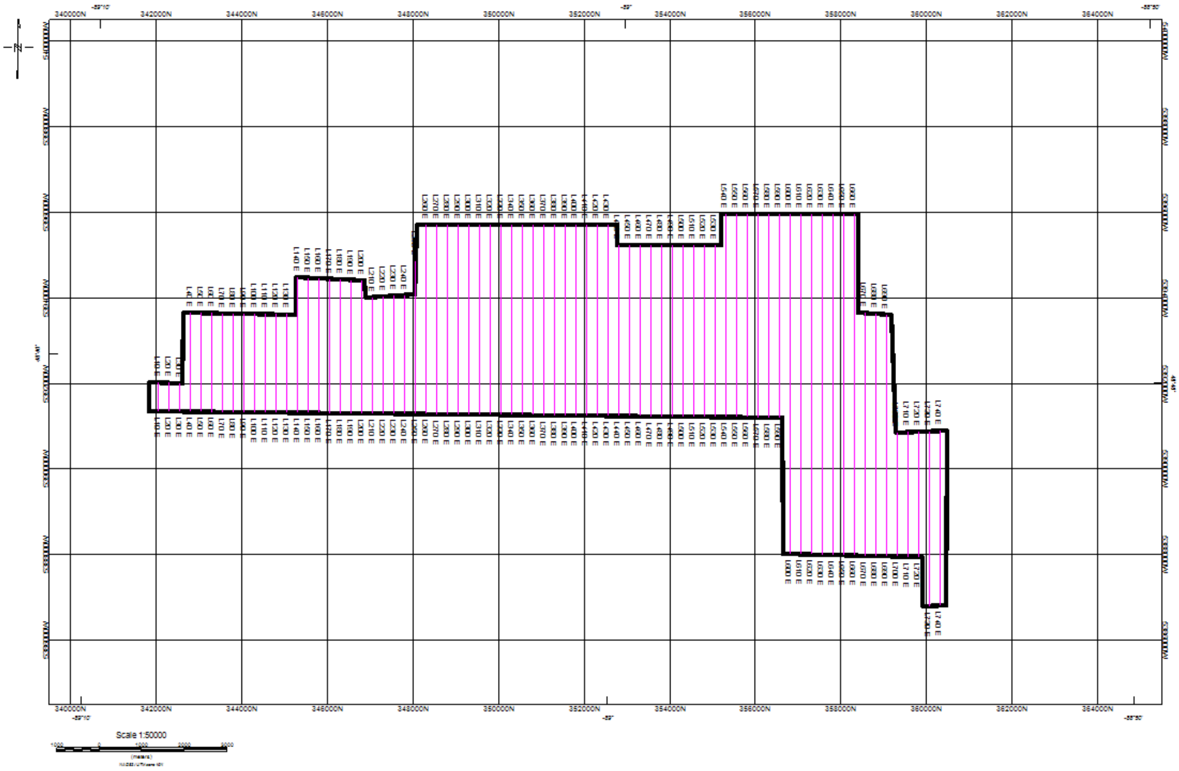


Figure 4 - Block I, Theoretical Survey Lines

3.2. Block III

Block III is located 36 kilometers NNE of Thunder Bay, Ontario. The property is surrounded with numerous small lakes, ponds, and rivers. Weather conditions during the survey were warm (average 20°C) and sunny with periods of cloud.

The survey coordinates were provided by Voisey Bay Geophysics Ltd. in NAD83 zone 16 UTM easting and northing. The following table contains block corners for Block III.

Table 5 - Corner Coordinates for Thunder Bay Claims, Block III

Corner	Geo West	Geo North	UTM Easting	UTM Northing
1	83.30854	48.86301	330691	5414797
2	83.22892	48.86461	336535	5414801
3	83.2286	48.85948	336542	5414230
4	83.16375	48.86076	341302	5414235
5	83.16279	48.85114	341342	5413163
6	83.13615	48.85209	343299	5413214
7	83.13583	48.85466	343331	5413499
8	83.10308	48.85563	345736	5413539
9	83.10405	48.84246	345624	5412078
10	83.12299	48.8415	344232	5412010
11	83.12396	48.83701	344147	5411512
12	83.13487	48.83765	343348	5411606
13	83.13294	48.79464	343356	5406821
14	83.19586	48.79303	338730	5406774
15	83.1965	48.80748	338729	5408381
16	83.2302	48.80715	336254	5408417
17	83.23053	48.82128	336276	5409988
18	83.30629	48.81967	330710	5409975

Data were acquired along north-south flight lines with a line separation of 250 meters and east-west tie lines with a line separation of 1,000 meters.

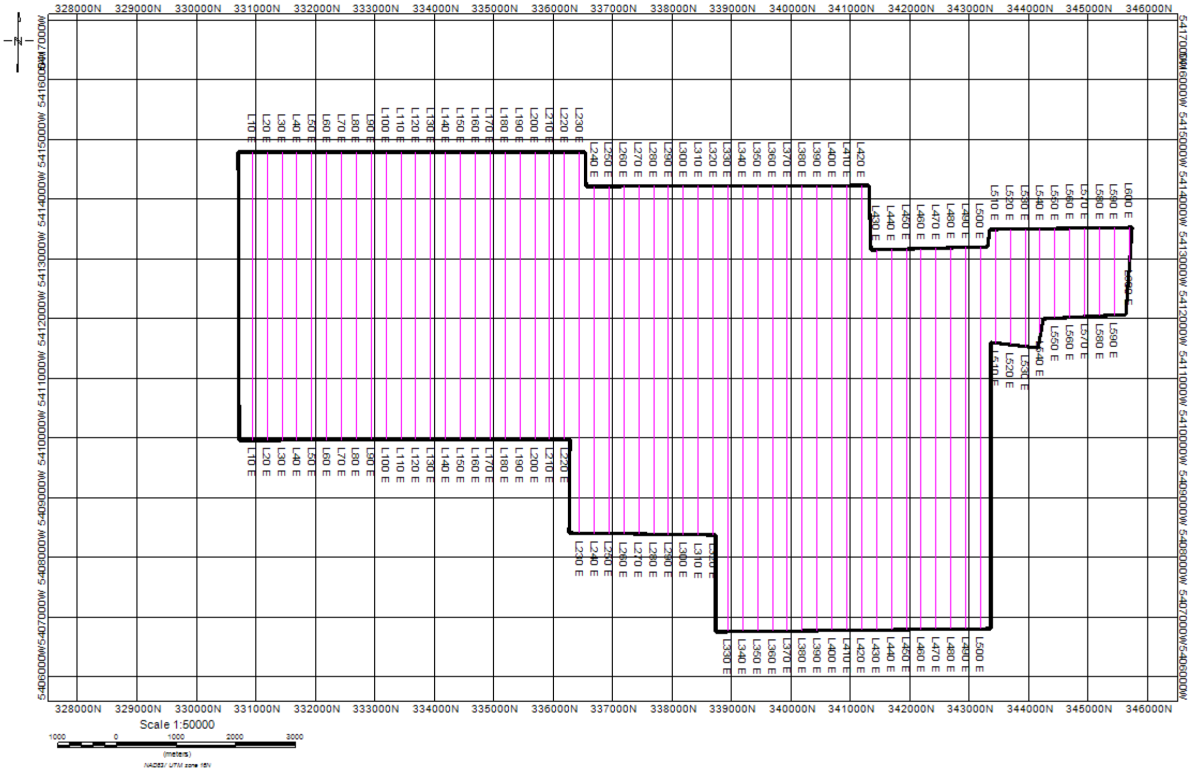


Figure 5 - Block III, Theoretical Survey Lines

4. SURVEY OPERATIONS

4.1. Operations Base

Survey operations were based at the Thunder Bay International Airport (GEO : X = 89°19'35.30"W Y = 48°22'21.05"N) helipad located Thunder Bay, Ontario. Permission was obtained to operate and park the helicopter as well as to locate, establish, and operate instruments. A Robinson R44 Raven helicopter, owned and operated by Air44 Helicopters Inc., was used for the transportation of the crew and equipment to survey areas and for the subsequent, airborne, magnetic and radiometric surveys.

Figure 6 - Helipad at the Thunder Bay Internation Airport, Thunder Bay, Ontario

4.2.Survey Conditions

Temperatures averaged 20°C during the day. Occasional rain, fog and low visibility caused some delays during the survey, however this did not hinder the survey operations.

4.3. Magnetic and Radiometric Survey Technique/Methodology

The airborne, magnetic gradiometer and radiometric survey comprised the following components:

- Testing of the towed, bird magnetic sensor;
- Calibration and testing of the radiometric system;
- Acquisition of magnetic and radiometric data over the survey blocks on 250 m and 150m separation flight lines respectively and 1,000m separation tie lines;
- Data quality control and preliminary data-processing.

4.4. Magnetic and Radiometric Survey Logistics

Weight and fuel-imposed restrictions with the Robinson R44 helicopter occurred during the survey. Due to the local ground hazards such as hydro lines, an engineer had to monitor the instruments for the pilot of the helicopter disabling the crew to fly both radiometrics and magnetics at the same time. Thus, each were flown separately.

Figure 7 - View of the helicopter's seat and the data acquisition systems.

Regular flight-following and technical assistance while the helicopter was on survey were maintained through use of FM-radio communication and/or satellite telephone communication with the operations base.

4.5. Navigation

The nominal data-acquisition speed of the helicopter was approximately 100 kilometers per hour. Scan rates for magnetic data-acquisition was 0.05 seconds (20 Hz), 1.0 second (1 Hz) for the spectrometer and radar altimeter, and 0.2 second (5 Hz) for the GPS navigation/positioning system.

Navigation was conducted by a GPS-receiver system that reported GPS co-ordinates as WGS-84 latitude and longitude and directed the pilot over a pre-programmed two-dimensional (2-D) survey grid. The x-y-z position of the aircraft as reported by the GPS system and terrain-clearance determined from the radar altimeter were recorded on the data-acquisition systems. For surveying purposes, the co-ordinates of the survey area were transformed from WGS-84 geographic co-ordinates to projected NAD83 Zone 16N co-ordinates.

Vertical navigation along flight lines was established using the radar altimeter. The optimum terrain clearance during normal survey-flying was 100 metres for the helicopter and radiometric system and 70 metres for the magnetometer-bird. However, at all times during the survey, the pilot's judgment of safe flying conditions was the final arbiter in the determination of safe terrain-clearance and, hence, the contract specification may not have been possible 100% of the time.

The final, vertical and horizontal survey-positions were real-time-corrected in-flight to a precision of approximately ±1.5 metres.

4.6. Magnetic and Radiometric Field Processing and Quality Control

All survey data were transferred to portable, magnetic media on a flight-by-flight bases, and then copied to the field data-processing workstation.

Immediate in-field data analysis was conducted with Surfer 8 software. In-field data processing included reduction of the data to GEOSOFT GDB database format and inspection of the magnetometer data for adherence to contract specifications. Survey lines that exhibited excessive deviation after differential correction, or that were considered to be of inferior quality, were marked to be re-flown.

5. HELICOPTER AND EQUIPMENT

5.1. The Helicopter

The survey was flown using a Robinson R44 Raven helicopter, with Canadian registration C-GDKP provided by Air44 Helicopters Inc. This helicopter is capable of up to 5 hours flight-duration with the geophysical equipment and a crew of 2 persons on board.

Final adjustments, calibration and testing were completed prior to production survey-flights commencing from the operations base.

Figure 8 - Helicopter C-GKDP

Aircraft Registration:	Canadian, C-GKDP
Engine:	Textron Lycoming – 0-540-FIBS – 245 hp
Empty weight:	1,442lbs/655kg
Gross weight:	2,400lbs/1,088kg

Max cruise:	113knots/205kph
HIGE:	6,400ft/1969m
HOGE:	5,100ft/1,569m
Service ceiling:	14,000ft/4,267.2m
Standard fuel:	49 gallons/187 litres
Survey duration:	4.0 hours
Maximum Range:	approx. 400 miles (640km)

5.2. eTrex Venture

The eTrex Venture offers a worldwide database of cities and increased internal memory. It is also one of the eTrex units that are designed to provide precise GPS positioning, using correction-data obtained from the Wide Area Augmentation System (WAAS). This product will provide position accuracy to less than three metres when receiving WAAS corrections.

The memory capacity of one megabyte allows the eTrex Venture to accept downloaded information from Garmin's MapSource® Points of Interest CD-ROM. The CD enables users to download locations such as restaurants, hotels, shopping, and entertainment. Once the information is loaded into the unit, you can make a selection and telephone and address information for the particular point of interest will appear on the screen. The CD also includes marine data such as light, buoys, wrecks, and obstructions. The eTrex Venture comes housed in a stylish, translucent, green case.

Figure 9 - eTrex Venture GPS Receiver

5.3. Magnetic and Radiometric Survey Instrumentation Overview

The instrumentation installed in the helicopter for the magnetic and radiometric survey included:

- The GSMP-30A Airborne Potassium Magnetometer System mounted in a towed bird;
- A Pico-Envirotec GRS-10 self-stabilizing, multi-channel, gamma-ray spectrometer with two 16.8 litres, "downward looking", NaI sensors;
- An AGIS Data Acquisition System;
- A navigation system, comprising a GARMIN 35 GPS receiver and AGIS data-acquisition and navigation system; and
- A Terra TRA-3000/TRI-30 Radar Altimeter.

5.3.1.Optically Pumped Potassium Magnetometers

Alkali-vapour, optically-pumped magnetometers use alkali metals including cesium, potassium or rubidium. The cell containing the metal must be continuously heated to approximately 45° to 55° degrees Celsius to render the metal in gaseous form.

These magnetometers operate on virtually the same principle as illustrated, in part, below.

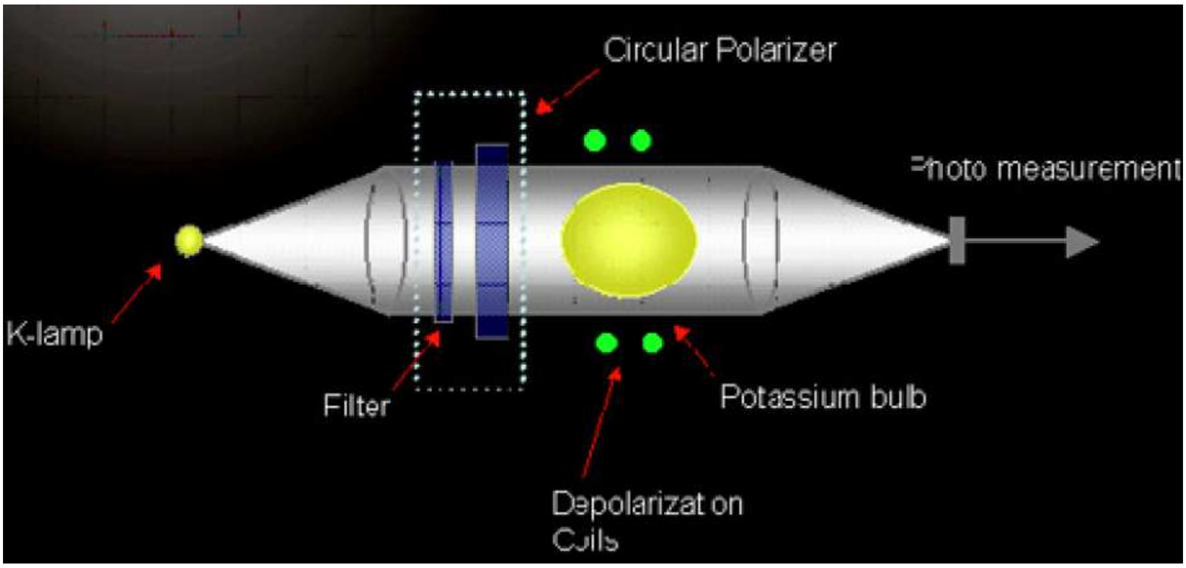


Figure 10 - Potassium alkali-vapour Magnetometer

The glass vapour-cell, containing gaseous metal, is exposed to (or pumped by) a light of a very specific wavelength – an effect called light polarisation. The frequency of light is specifically selected and circularly polarised for each element (i.e. the D_1 spectral line) to shift electrons from the ground level 2 to the excited metastable state 3 (see Figure 10 - Potassium alkali-vapour Magnetometer).

Electrons at level 3 are not stable; they spontaneously decay to both energy level 1 and 2. Eventually, the level 1 is fully populated (i.e. level 2 is depleted). When this happens, the absorption of polarising light ceases and the vapour-cell becomes more transparent.

This is when RF depolarisation comes into play. RF power corresponding to the energy difference between levels 1 and 2 is applied to the cell to move electrons from level 1 to level 2, at which point the cell once again becomes opaque. The frequency of the RF field required to repopulate level 2 varies with the ambient magnetic field and is called Larmor frequency.

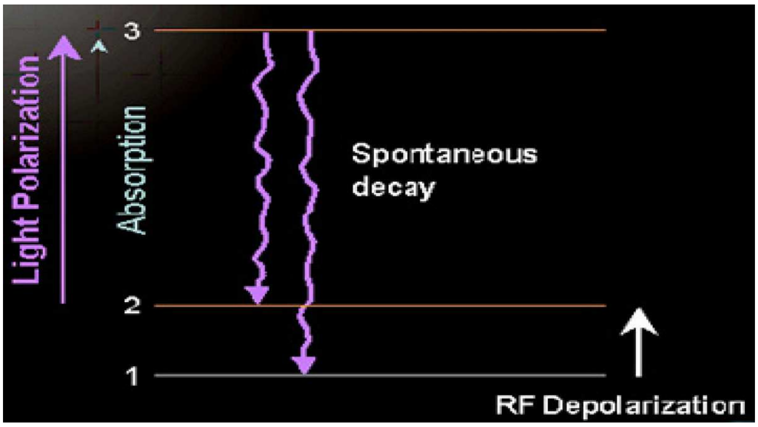


Figure 11 - Quantum mechanics of alkali system

The vertical, helicopter-gradiometer is a single axis system with two sensors; one above and one below. Differences between the two sensors are measured and used to derive the vertical gradient at each survey location. The image below shows a vertical gradiometer. It is important that the reader appreciate the difference between a measured and a calculated, first vertical derivative.

Figure 12 - GSMP vertical gradiometer

5.3.2. GSMP-30A Airborne Magnetometer System

5.3.2.1. Specifications

- Sensitivity: 0.0005 nT /vHz @ 1 Hz
- Resolution: 0.001 nT
- Absolute Accuracy: ±0.1 nT
- Dynamic Range: 10,000 120,000 nT
- Gradient Tolerance: 2,500 nT/m
- Sampling rate: 20 Hz

5.3.2.2. Orientation and Heading Error

- SENSOR Angle: Optimum angle 30° between sensor head axis & field vector
- Orientation: 10° to 80° and 100° to 170°
- Heading error: <0.1 nT between 10° to 80° and 360° full rotation about axis

5.3.2.3. Environmental

- Operating Temperature: -40°C to +55°C
- Storage Temperature: -70°C TO +55°C
- Humidity: 0 to 100%, splash proof

5.3.2.4. Dimensions & Weights

- Sensor: 89mm diameter x 152mm length, and < 1.3kg
- Pre-amplifier: 30.6cm x 8.5cm x 7.5cm and 1.6kg

5.3.2.5. Power

- Power Supply: 12 to 35 V DC
- Power Requirement: Approx. 25 W at start up, dropping to 8 W after warm-up
- Power Consumption: 8 W typical at 20°C
- Warm-up Time: ’15 minutes “ -40°C

5.3.2.6. Outputs

- Cycled measurements of the total magnetic field with position & time as digital readout or graph form on the console or as ASCII format through an RS-232 COM port
- Pre-amplifier outputs are continuous signals at the potassium Larmor frequency, which is proportional to the magnetic field (7 Hz/nT)

5.3.2.7. Components

- Sensor, pre-amplifier, console, 4m sensor/pre-amplifier cable, manual & ship case
- TRA3500 Radar Altimeter
- 1000-lb reinforced Kevlar tow cable
- Helicopter on-board cable

- Aashtech G12

5.4. Airborne Gamma-Ray Spectrometers

The GRS-10 system is an intelligent, self-calibrating gamma-ray spectrometer using NaI, large-volume detector-arrays. They are used for natural and man-made radiation-contamination detection. Simple serial (RS-232) communications protocol allows them to be connected to any PC-compatible computer system. All dedicated electronics modules are housed within the detector container. By virtue of application software, any personal computer may be transformed into a sophisticated gamma-spectrum analyser.

The GRS-10 series of gamma spectrometers is widely used in geological and geophysical exploration and mapping as well as in environmental and nuclear surveillance.

Individual, independent detector-processing provides real-time-gain and linearity correction. PEI's ongoing research to improve the system stabilisation algorithms makes these spectrometer systems fully automated and self-stabilising on natural, radioactive elements. This eliminates the requirement for regular, time-consuming, and frequent system-checking and re-calibration by the user. Furthermore, it provides excellent accuracy and reliability of the gamma measurements.

Specially developed software-algorithms provide results in absolute units of contamination and dosage that are automatically corrected from acquisition altitude to ground-level equivalents. Individual, crystal-detector signal-processing provides accurate control over each contributing sensor, providing the user with the best possible spectra alignment for the complete system. New design techniques for the peak-detection electronics almost completely eliminate 'pulse pile up' and 'dead time' effects.

Figure 13 - Gamma-ray spectrometer

5.4.1. Technical Specifications

5.4.1.1. Spectrometer front end electronics

- High Voltage controlled remotely via software
- Digital peak-detector
- Elimination of dead time
- Elimination of pulse pile-up
- Count rates of up to 60,000 pps per detector
- Count capacity per channel 65535
- Energy detection range: 36 KeV to 3 MeV

- Cosmic channel above 3 MeV
- Internal spectrum resolution 1024 channels
- Output on request via RS-232 serial communication
- Mechanical design complies with PC-104 standard

5.4.1.2. Spectrometer concentrator

- High voltage controlled remotely via software
- Based on PC-104 technology
- GRS-10 up to 10 detectors
- GRS-16 up to 16 detectors
- Spectra stabilisation: real-time, automatic corrections on radio nuclei: Th, U, K. No implanted sources
- Time to stabilisation:
  - On the ground, usually less than 1 minute
  - In the air, usually less than 4 minutes
  - Data inputs: serial (RS-232) protocol
- Optional:
  - 4-channel, 15-bit resolution A/D converter for temperature, altitude, pressure, temperature and humidity measurements
- Data output: serial communications (RS-232) protocol
  - GRS-10: Individual and/or summed spectra
  - GRS-16: summed spectra only
- Each gamma-detector can be designed as upwards- or downwards-looking
- Software
  - Calibration:
    - High-voltage adjustment
    - Linearity correction coefficients calculation
    - Communication test support
    - Resolution: detector dependant – better than 9% @Cs^{137}
  - Real-Time Data Collection:
    - Collected spectrum 256/512 channels
    - Automatic gain real time control on natural isotopes
    - Optional software to calculate absolute levels of contamination by different radio nuclei on the ground and total dose at 1 metre above the ground
  - PC-based test and calibration software suite

5.5. The Towed-Bird Airfoil and Tow Cable

The towed-bird airfoil is essentially a hollow Kevlar tube, 4.5 metres long, with bulbous hands into which the potassium magnetometer sensors are mounted in a 3D hand-aligned gymbal. The finned tail of the airfoil is to stabilise the bird in flight.

The tow-cable is constructed of co-axial cables complete with a strain member. The length of the tow-cable is 30 metres. The tow-cable was attached to the helicopter by a weak-link assembly. The on=board section of the tow-cable consists of a co-axial cable, the length of which is customized to suit the helicopter.

5.6. Navigation

The Ashtech G12™ GPS board from Thales Navigation sets the standard for superior performance in a wide assortment of high-accuracy marine, avionics, and land-navigation applications.

This powerful, 12-channel receiver is the first of its kind to offer a 20hz update-rate for real-time guidance, position, and raw-data output. The G12 offers differential accuracy better than 40 centimetres and position-latency less than 50 milliseconds. It delivers precise, three dimensional positions to meet the demanding requirements of high-end OEM system integration.

The G12 incorporates all-in-view tracking of up to 12 satellites with a loss-of-lock re-acquisition time of less than 2 seconds, and delivers unsurpassed position accuracies of better than 40 centimetres, achieved immediately following satellite acquisition.

The Strove Correlator™ technology provides unmatched code multipath mitigation, providing the best possible position accuracy. The G12 offers distinct timing-options for precise timing and frequency, or time-tagging of positions, including 1 PPS time-pulse, an event marker to time-tag a position, and a programmable measurement-strobe that generates a pulse at a programmable interval in advance of measurements.

5.7. Data-Acquisition System

PEI’s data- acquisition system is able to display geographical information (map, aerial photo) overlain with the navigation information. Complete, operator/pilot navigation=guidance system is included in the data-acquisition.

Reliable, versatile, but flexible data recording structure has been developed to allow only one set of field-QC. Data-format conversion programmes support all PEI instruments.

Airborne Geophysical Information System (AGIS): A lightweight, robust, real-time data-acquisition and navigation system integrated into a single unit that can be easily installed in a wide variety of mobile platforms without a need for a permanent installation in the carrying vehicle.

Integrated Radiation Information System (IRIS): A real-time, data-acquisition, and navigation system is advanced, software-driven instrumentation specifically designed for mobile applications. It is equipped with precise satellite navigation, includes real-time displayed vehicle-path underlain with an image (geographical map) of the area, and provides reliable data-acquisition, and radiation information in conjunction with the GRS-10 gamma spectrometer.

5.8. Altimeter

A Terra TRA-3000/TRI-30 radar altimeter was used to record terrain-clearance to an accuracy of about 1 ft (30 cm), over a range of 12 to 762 metres. The antenna was mounted beneath the bubble of the helicopter cockpit. The recorded value of terrain-clearance was adjusted to give bird-height above ground. This was possible, given the fixed tow cable length of 30 metres.

The altimeter was interfaced to the data-acquisition system with an output repetition rate of 0.1 seconds, and digitally recorded.

5.9. Field Computer Workstation

A Data Processing Field Workstation (FWS), comprised of a dedicated PC-based notebook computer for use at the technical base in the field, was used on this project. The FWS is designed for use with Surfer 8 and GEOSOFT OASIS/Montaj Data Processing Software. The FWS has a data re-plot capability, and may be used to produce pseudo-analogue charts from the recorded, digital data within less than 12 hours after completion of daily survey-production if this is necessary. It is also capable of processing and imaging all the geophysical and navigation data acquired during the survey, producing semi-final, preliminary-reduced maps.

The FWS was used to accomplish the following:

- Quality Control/Digital Verification – magnetic, gamma and GPS data-quality and completeness were assured by both statistical and graphical means on a daily basis.
- Preliminary Maps – the Surfer 8 software system permitted preliminary maps to be quickly and efficiently created for noise and coherency checks.

Surfer is contouring and 3D-surface mapping-programme that runs under Microsoft Windows. It quickly and easily converts data into outstanding contour, surface, wireframe, vector, image, shaded-relief, and post maps.

The GEOSOFT OASIS/Montaj software is designed for airborne-data editing, compilation, processing and plotting. The software reads the portable data media from the airborne system, checks them for gaps, spikes or other defects, and permits the data to be edited where necessary. The base station GPS/magnetometer data are checked, edited, processed, and then merged with the airborne data. GPS flight path plots are created and plotted for both flight planning and flight path verification.

5.10. Spares

A normal compliment of spare parts, tools, back-up software, and necessary test instrumentation were available in the office at the operation base.

6. INSTRUMENT CHECKS AND CALIBRATIONS

6.1. Airborne Magnetic System Tests and Calibrations

6.1.1. Magnetic Heading Effect

The magnetic heading effect was determined by flying a cloverleaf pattern oriented in the same direction as the survey lines and tie lines. Two passes in each direction were flowing over the recognizable feature on the ground in order to obtain sufficient statistical information to estimate the heading error. The heading error was determined from tests completed before September 18th, 2010.

6.1.2. Lag Test

A lag test was performed before the survey on September 18th, 2010, to ascertain the time difference between the magnetometer readings and the operation of the GPS System. The test was carried out over an identifiable magnetic anomaly by flying the same line in opposite directions at survey altitude.

6.2. Airborne Gamma-Ray Spectrometer System Tests and Calibrations

6.2.1. Test Line

A test line was flown and recorded at survey altitude at the start and end of each survey flight to test the repeatability of the gamma-ray spectrometer system. The minimum, maximum, and average deviation for each of the four windows (TC, U, Th, and K) were calculated and stored in a database for future reference and use.

6.2.2. Altitude Attenuation Coefficient

The altitude attenuation coefficient was derived from a test fight completed on September 25th, 2010 prior to commencement of the survey. This was accomplished by flying at various altitudes from 200’ (63 m) up to 1,000’ (305 m) above the test line.

6.3. Altimeter Calibration Checks

An altimeter test flight was performed on September 18th, 2010. The radar altimeter was calibrated by comparing the radar altitude with a suitable reading from the GPS navigation system during radar ‘stack’ flown over the Camp 26 helipad. The ellipsoidal height at this location on the helipad was determined by the GPS. The procedure involved having the helicopter hover for 30 seconds at various altitudes above the ground (45, 60, 76, 91, 152 metres) and recording the values of the radar altimeter and GPS altimeter. These values were then plotted and compared.

6.4. GPS Static Test

In addition to carefully selecting a magnetically suitable area for positioning the magnetometer base station, care was taken to ensure that the exact position of the GPS base station (operational base) was determined. The GPS system data were averaged over a period of time to calculate the location coordinates.

7. QC AND DATA-PROCESSING

Daily quality control, initial processing, and archiving of the aeromagnetic and radiometric data were completed on-site at the base of operations, using Surfer 8 software for the geophysical data and PIEView post-processing software for the radiometric data. The software was installed on the FWS computers. All data were verified upon receipt and checked against the operator's logs.

The final magnetic and radiometric data processing, map-generation, and report were completed by Voisey's Geophysics Bay Ltd.

7.1. WCS84 Ellipsoid Constants

The following constants of the WGS84 ellipsoid were used in all applicable calculations:

a=6378137 m (semi-major axis)
c = 6356752.3 m (semi-minor axis)
ye = 9.7803268 m·s−2 (standard gravity at equator)
yp = 9.8321864 m·s−2 (standard gravity at pole)
ro = 7.292115·10-5 rad·s-1 (angular velocity of the Earth)
f = 0.003352811 (ellipsoid flattening)

7.2.First Vertical Derivative

Vertical derivatives compute the rate of change of the magnetic field as it drops off when measured vertically over the same point (upward continuation). Magnetic field data obey Laplace's equation, which allows for the computation, through the FFT package, to take advantage of this symmetry and solve for the vertical or "z" component of the field. The first vertical derivative (1 VD) has the effect of sharpening anomalies, which allows for better spatial location of source-axes and boundaries.

7.3. Airborne Survey Flight Path Compilation

The airborne, survey flight path was derived from differentially corrected GPS positions using the real-time, airborne GPS data. A position was calculated every 1.0 second (approximately every 30 metres along the flight path) to an accuracy of better than ± 1.5 metres. The position-data were then merged into the magnetic and radiometric data in the respective Surfer database.

As part of the QA/QC process, the following GPS parameters were checked on a daily basis:

- number of satellites under observation (average of 6, minimum of 4 allowed);
- PDOP (position dilution of precision; maximum value of 3 allowed); and
- flight path deviation in X, Y and Z (maximum deviation in X and Y of 50% of line spacing over a linear distance of 5000 metres).

All positional data was maintained in WGS 84 (World) co-ordinates.

7.4. Corrections to the Magnetic Data

The processing of the data involved the application of the following corrections:

- Adjustment of the data for time lag between the GPS position and the position of the magnetic sensor;
- Correction for the heading effect; and
- Network adjustment, using the flight line and tie line information, to level the survey data set.

7.4.1. Additional Corrections Applied to Profile Data

After applying the above corrections to the magnetic profile data, residual line-direction-related noise was removed through application of micro-levelling. The micro-levelling technique consists of applying directional and high-pass filters to produce a grid containing noise-only in the line-direction. In order to differentiate between the two of them, the grid is extracted to the profile database, and an amplitude limit and a filter length are determined, so that the final error channel reflects only noise present on the grid without removing or changing geological signal. This error channel is then subtracted from the initial data channel in order to obtain the final micro-levelled channel. The resulting grid is free of line-direction noise.

7.4.2. Filter Derivatives

The total magnetic intensity (TMI) data were subject to:

- International Geomagnetic Reference Field (IGRF) removal;
- Reduction-to-the-pole
- Calculation of the first vertical derivative (1 VD)
- Calculation of the second derivative (2 VD)
- Calculation of the total horizontal derivative (TOTHDRV); and
- Calculation of the analytic signal.

Colour/contour images were produced for all the above-listed magnetic products.

All of these spatial filtering techniques were completed using the Oasis Montaj Magmap and IGRF modules for filtering in the 2D FFT domain.

7.4.2.1. IGRF Removal

The International Geomagnetic Reference Field (IGRF) is a long-wavelength, regional, magnetic field calculated from permanent, magnetic observatory data collected around the world. The IGRF is updated and determined by an international committee of geophysicists every 5 years. Secular variations in the Earth's magnetic field are incorporated into the determination of the IGRF.

Through the removal of the IGRF from the observed total magnetic intensity (TMI), the resulting residual magnetic intensity allows for more valid modelling of individual, near-surface anomalies. Additionally, the data can be more easily incorporated into databases of magnetic data acquired in the past or to be acquired in the future.

7.4.2.2. Reduction-to-the-Pole

To compensate for the shift of the true anomaly position over the causative source, due to the magnetic inclination and declination, the magnetic data were recomputed so that magnetic anomalies would appear as if located at the north magnetic pole. The result of this operation is that, in theory, the magnetic anomaly is located directly over top of the causative source. The computation is referred to as "reduction-to-the-pole" (RTF). The reduction-to-the-pole is computed using a FFT (Fast Fourier Transform) operator.

The RTF not only shifts the anomalies to their correct position with respect to the causative, magnetic bodies, but assists in the direct correlation and comparison of magnetic anomalies, trends, structural axis, and discontinuities with mapped geological surface expression.

The RTF was calculated using the following parameters for the survey area:

- Declination = -24.692° changing by 0.362 °/year;
- Inclination = 78.641° changing by -0.077 °/year;
- X component = 10,283.53 changing by 87.26 nT/year;
- Y component = -4,728.22 changing by 32.02 nT/year;
- Z component = 56,339.19 changing by -76.03 nT/year;
- Horizontal Intensity = 11,318.44 changing by 64.04 nT/year; and
- Total Intensity = 57,464.87 changing by -62.86 nT/year.

7.4.2.3. Calculation of the First Vertical Derivative (1VD)

Vertical derivatives compute the rate of change of the field as it drops off when measured vertically over the same point (upward continuation). Potential field data obey Laplace's equation, which allows for the computation, through the FFT package, to take advantage of this symmetry and solve for the vertical or "z" component of the field. The first vertical derivative (1 VD) has the effect of sharpening anomalies, which allows for better spatial location of source-axes and boundaries. In our particular survey, we do not calculate the first vertical derivative; we measure it. Measured first vertical derivative have the advantage of more closely defining the target zone than is possibly with a calculated first vertical derivative.

7.5. Corrections to Radiometric Data

7.5.1. Background to Corrections and Processing

Gamma-ray spectrometer surveys are utilised for mapping the concentration and distribution of naturally occurring radio-elements. The use of an airborne, gamma-ray spectrometer allows for the *in situ* analysis of radio-element concentrations of naturally occurring potassium (K), uranium (U) and thorium (Th) in the field.

For a geologist, maps showing concentrations of K, U, and Th can be diagnostic in the mapping of rocks and soils, which aid in geological mapping and in the exploration for uranium, gold, tin and tungsten deposits where the primary mineralisation process is often related to K metasomatism or alteration.

Radioactivity measurements from an airborne platform are dependent upon the detection of gamma rays produced through radioactive decay of the nuclide to be detected. Only three radioactive elements emit sufficient gamma-radiation to be measured by airborne methods. These three major sources are:

- potassium-40 (4aK), which is 0.011 % of all potassium;
- daughter-products from the 238U decay series; and
- daughter-products from the 232Th decay series.

High-energy, cosmic rays of non-terrestrial origin can be detected by airborne, gamma-ray spectrometer surveys. This cosmic radiation interacts with molecules in the atmosphere, the aircraft, and the NaI detectors, resulting in the production of high-energy radiation. This radiation is detectable and increases exponentially with height above sea level and it must be compensated for, to obtain reliable and repeatable measurements and to detect terrestrial radiation sources.

The traditional energy windows used to detect gamma-ray radiation from K, Th, and U sources have overlapping areas where the energy recorded for a given element contains some contribution from all three radio-elements. A correction procedure, known as stripping, is applied to the data to compensate for this spectral overlapping.

The natural, gamma-ray spectrum over the range of 0 to approximately 3000 keV is resolved by the spectrometer used into 511 channels, each channel ranging from 5 to 6.5 KeV in width. A separate channel records all high-energy radiation above 3000 KeV, the cosmic radiation contribution. Within the defined radio-element windows, the counts recorded are summed over a given time period.

Care must be taken during the acquisition of gamma-ray spectrometer data because the contribution from radon gas and related decay products in the atmosphere can result in misleading count rates. Radon gas can also diffuse from the ground, but only one radon nuclide is directly related to the uranium decay series. In order to minimize the impact of radon "contamination", radiometric surveys are not completed during rain ("washes" radon from the air and increases ground concentrations) or fog conditions and for a period of not less than 2 hours after precipitation has finished in order to allow for dispersion of radon gas to normal background levels.

Radiometric surveys have no depth penetration; most radioactive sources are recorded from the upper 1.5 metres of the ground. Radiometric surveys are ineffective over water bodies or snow covered areas; the presence of water (in either liquid or solid state) effectively masks the radiation.

Spectrometer data are recorded in counts per second. The instrumentation requires a fraction of a second to process the incoming data—during this time period no counts are recorded. This interval is referred to as "equipment down time” or “system dead-time ". A correction is applied to compensate for this time period.

Micro-levelling of the radiometric data was completed to eliminate or reduce streaking on final girded images of the individual channels.

8. INTERPRETATION

8.1. General Geology of the Prospected Area

Indications of nickel and PGM's have been noted throughout the general area, some of which are rather spectacular. Adjacent to Blocks I & III, is the Magma Metals Limited flagship property with significant platinum group metal findings. It is reasonable to believe that somewhere in this area there may lay an economical deposit. Hence, the magnetic and radiometric survey was conducted.

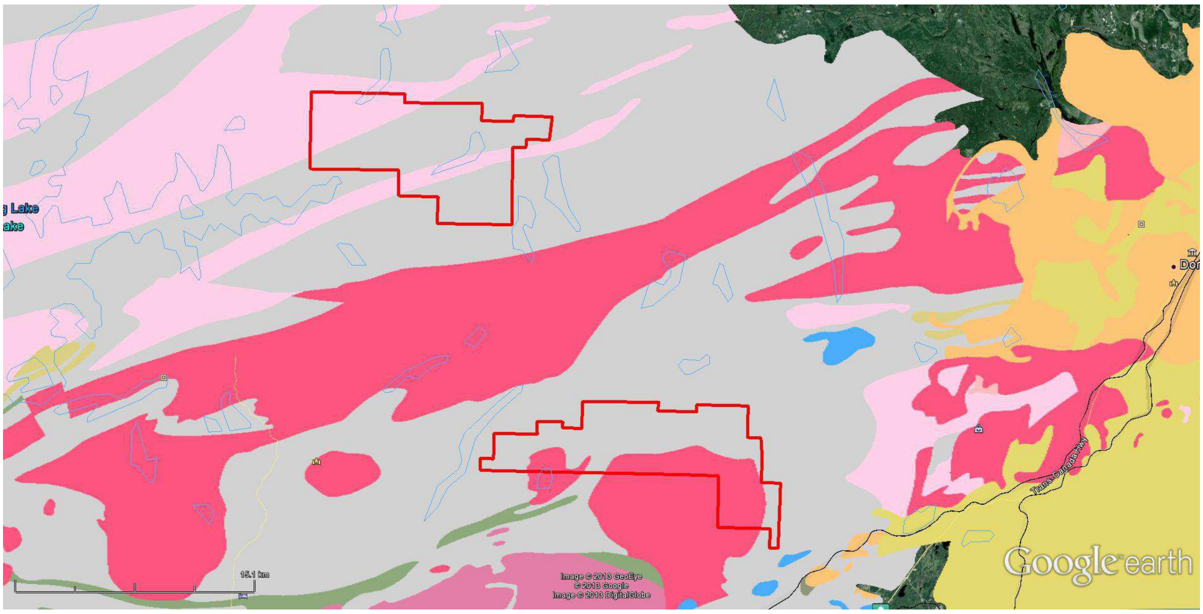


Figure 14 - Gamma-ray spectrometer

8.2.Data Processing for Interpretation

The following sections briefly describe the processes applied to complete the interpretation.

8.2.1.First Vertical Derivative (1VP) of the TMI and CBA

The vertical derivative is the measurement of the rate of change of the magnetic field when measured vertically over a given location.

The net effect of measuring the first vertical derivative (1VD) when applied to the RTP-TMI is the increased definition and/or sharpening of individual anomalies, allowing for better spatial location of magnetic source axes and boundaries. The vertical gradient reaches a maximum directly over the point of inflection in the TMI field, therefore defining the approximate edges of the causative body. In the example of a large, broad magnetic unit, the maxima of the anomaly will generally occur over the centre of the magnetic body, with minima over the edge of the body.

8.2.2.Magnetic Pole Reduction

Reduction to the pole is used in low magnetic latitudes to change an anomaly to its equivalent as would be observed at the north magnetic pole. This transformation simplifies the interpretation and visualization of anomalies from low magnetic latitudes.

The reduction to the pole is:

L(Θ) = 1/(sin *Ia + i* cos *I* cos(D - Θ))2

where

I = Geomagnetic inclination

Ia = Inclination for amplitude correction (never less than I)

D = Geomagnetic declination

Parameter

/a = Inclination to use for the amplitude correction. Default is ± 20. *(*I*a* = 20, if I >0;

I*a* = (-20), if *I* <0). If │/a│is specified to be less then │ *I* │, it is set to *I*.

Reduction to the pole has an amplitude component and a phase component: sin(I) and icos(I)cos(D-Θ) respectively. When reducing to the pole from equatorial latitudes, north-south features can blow-up due to the strong amplitude correction that is applied when D-Θ is *π/2*, i.e. a magnetic east-west wavenumber). By specifying a higher latitude for the amplitude correction alone, this problem can be reduced or eliminated at the expense of under-correcting the amplitude of north south features.

8.2.3.Fast Fourier Transform

A grid (in the space domain) is transformed to and from the wavenumber domain by use of a Fast Fourier Transform (FFT). The equivalent data set in the wavenumber domain is commonly called a Transform. A Transform of a grid is composed of wavenumbers, which have units of cycles/metre and have a real and imaginary component. Just as a grid samples a space domain function at even distance increments, a Transform samples the Fourier domain function at even increments of l/(grid size) (cycles/metre) between 0 and the Nyquist wavenumber (l/[2*cell size]).

A given potential field function in the space domain has a single and unique wavenumber domain function, and vice-versa. The addition of two functions (anomalies) in the space domain is equivalent to the addition of their Transforms.

The energy spectrum is a 2-D function of the energy relative to wavenumber and direction. The radially averaged energy spectrum is a function of wavenumber alone and is calculated by averaging the energy at all directions for the same wavenumber.

8.2.4. Analytical Signal

The analytic signal is the square root of the sum of the squares of the derivatives in the x, y, and z directions:

$$Asig = \sqrt{dx^2 + dy^2 + dz^2}$$

The analytic signal is useful in locating the edges of magnetic source bodies, particularly where remnants and/or low magnetic latitude complicates interpretation.

8.2.5. Tilt Derivative

The tilt derivative and its total horizontal derivative are useful for mapping shallow basement structures and mineral exploration targets.

The tilt derivative is defined as:

$$TDR = \arctan(VDR/THDR)$$

where VDR and THDR are first vertical and total horizontal derivatives, respectively, of the total magnetic intensity T, i.e.:

$$VDR = dT/dz$$

$$THDR = \sqrt{(dT/dx)^2 + (dT/dy)^2}$$

The total horizontal derivative of the tilt derivative is defined as:

$$HD\_TDR = \sqrt{(dTDR/dx)^2 + (dTDR/dy)^2}$$

8.2.6. Radiometric Ratios and Ternary Mapping

The apparent concentration of radio-element K, U, and Th channels is often used to produce the standard ratios of U/K, U/Th and Th/K. Through the process of calculating the radio-element ratios, one can often identify subtle variances in the data that may have a significant geological impact with respect to the commodity being explored for.

A ternary colour plot was used in an attempt to present the acquired two dimensional (2D) radioelement data (K, U, Th) in three dimensions (3D). the common convention used to produce a ternary plot is to assign a colour to each of the three (3) radio-elements. The colour convention used was: uranium (U) in yellow; potassium (K) in magenta; and thorium (Th) in cyan.

At each of the vertices of the triangle, the colours are displayed at full intensity without any contribution from the other colours. At the mid-point of the side opposite a given vertex, the colour intensity assigned to the vertex is zero (0). At the centre of the ternary triangle, the colour intensity is one half of each colour resulting in a “grey” or black spot.

The ternary plot is useful took in the mapping of geologic units and in the identification of relationships between the three (3) radio-elements (U, K, and Th) that can be subtle and of interest.

8.3.Interpretation of Survey Blocks

The data have all been processed and treated in the same fashion for all areas. In the following discussion, the results and the implication of the results have been dealt with on an individual survey block basis.

8.3.1.Magnetics

The reader should remember that the main thrust of the air-magnetic survey was the measurement of the first vertical derivative of the magnetic field. The first vertical derivative response over an orezone of high magnetic susceptibility will have its peak of intensity directly over the body of high magnetic susceptibility.

As a first approximation, if the profile is symmetrical, the magnetic body may be considered to be steeply dipping. If the profile is asymmetrical as a first approximation, the reader may assume that the steeper side reflects the up-dip side of the magnetic body.

The reader should bear in mind that the asymmetry of any profile may be affected by neighbouring bodies. In the particular case in point, previous geological exploration history has identified, in many cases, multiple zones of mineralisation. Detailed interpretation should be carried out by examining each profile in detail.

General remarks: This area is known to contain multiple zones of ore-grade magnetite and hematite mineralisation. The survey has indicated additional zones, and extensions of zones, of known mineralisation. It will require detailed co-relation with previous exploration and test-mining results for maximum utilisation of the geophysical data.

8.3.2.Radiometrics

The radiometrics have indicated zones of multiple, high radioactivity and the reader should bear in mind that the radioactive response is affected by the amount of ground cover on the underlying rocks. Thus, intermittent radioactive highs may come from a single, radioactive source-rock that is only partially exposed.

The amount of radioactivity reflected in this survey in this general area is remarkably high and probably reflects the existence, in many areas, of radioactive source-rocks that bear further examination.

8.3.3.Recommendations

The airborne, magnetic surveys should be carefully co-related with known mineralisation from the previous, extensive work. New indications for mineralisation should be followed up by a programme of higher resolution airborne geophysical surveys, satellite photograph examination and possibly by prospecting the areas of interest on the ground. In this regard, satellite pictures are available generally and economically to a macro level and also, at a somewhat more costly basis, on a micro level. These procedures should be used in any future follow-up in order to minimise the amount of ground expenditures to fully evaluate the situation.

8.4. Summary

The recently completed multiple-discipline geophysical survey over blocks I & III in the Tartan Lake and Hicks Lake area of Ontario, in the Thunder Bay Mining District has identified several targets for additional study and potential drilling. The anomalies may be broken down as follows:

The multiple-discipline, geophysical survey over Block I has identified nine (9) targets for additional study as a prelude to drill target selection. The anomalies are summarized as follows:

- 4 magnetic anomalies (2 high priority, 2 moderate priority)
- 5 radiometric anomalies (1 high priority, 4 moderate priority)

Block III has identified nine (9) targets for additional study as a prelude to drill target selection. The anomalies are summarized as follows:

- 5 magnetic anomalies (1 high priority, 4 moderate Priority)
- 4 radiometric anomalies (3 high priority, 1 moderate priority)

The follow-up studies over the majority of the anomalies require the completion of higher resolution airborne geophysical surveys, detailed geologic mapping and ground confirmation of the anomaly presence, prior to the spotting of diamond drill test hole collars.

9. DELIVERABLE PRODUCTS

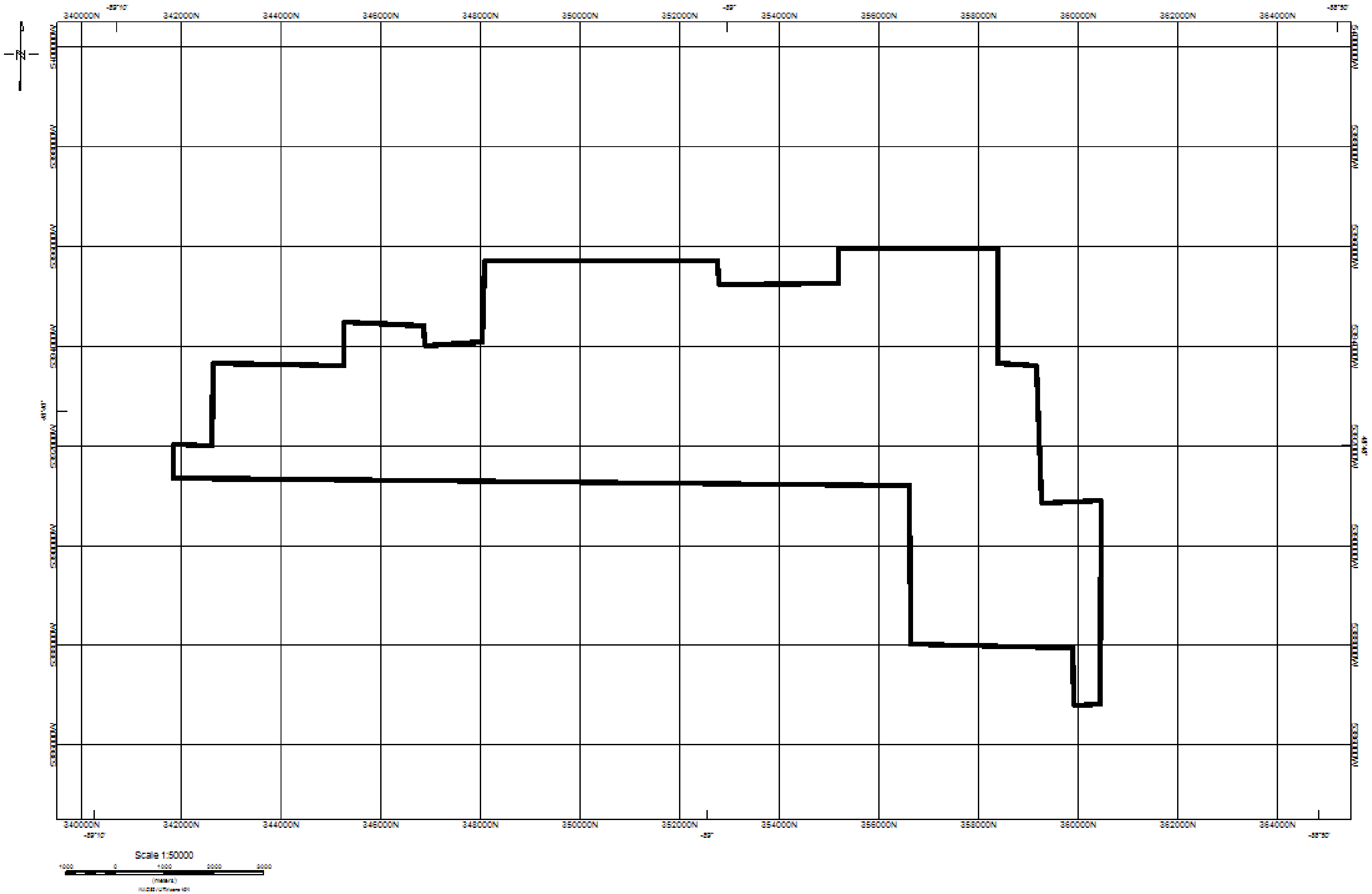


Figure 15 - Block I, Survey Polygon

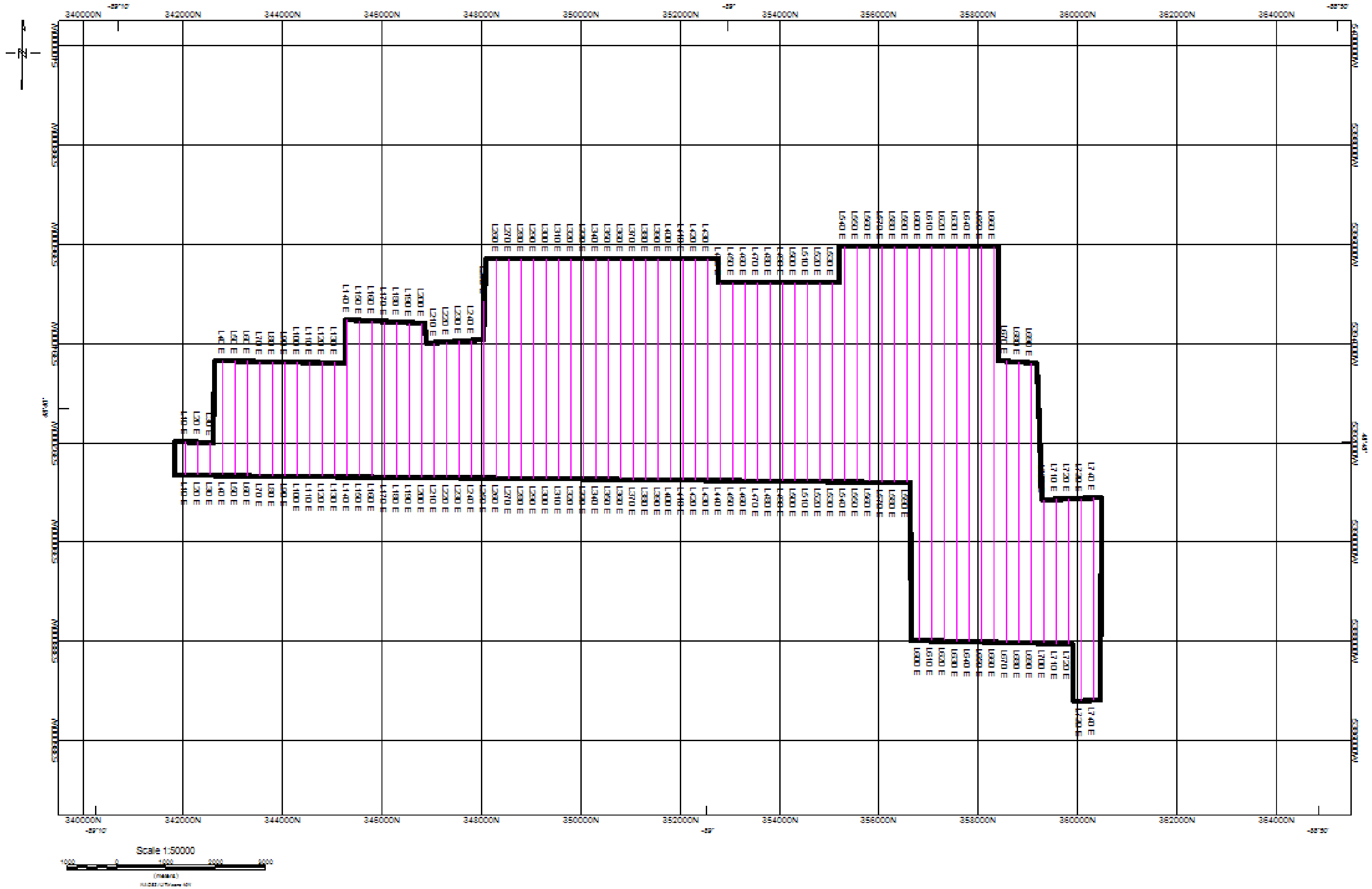


Figure 16 - Block I, Theoretical Survey Lines

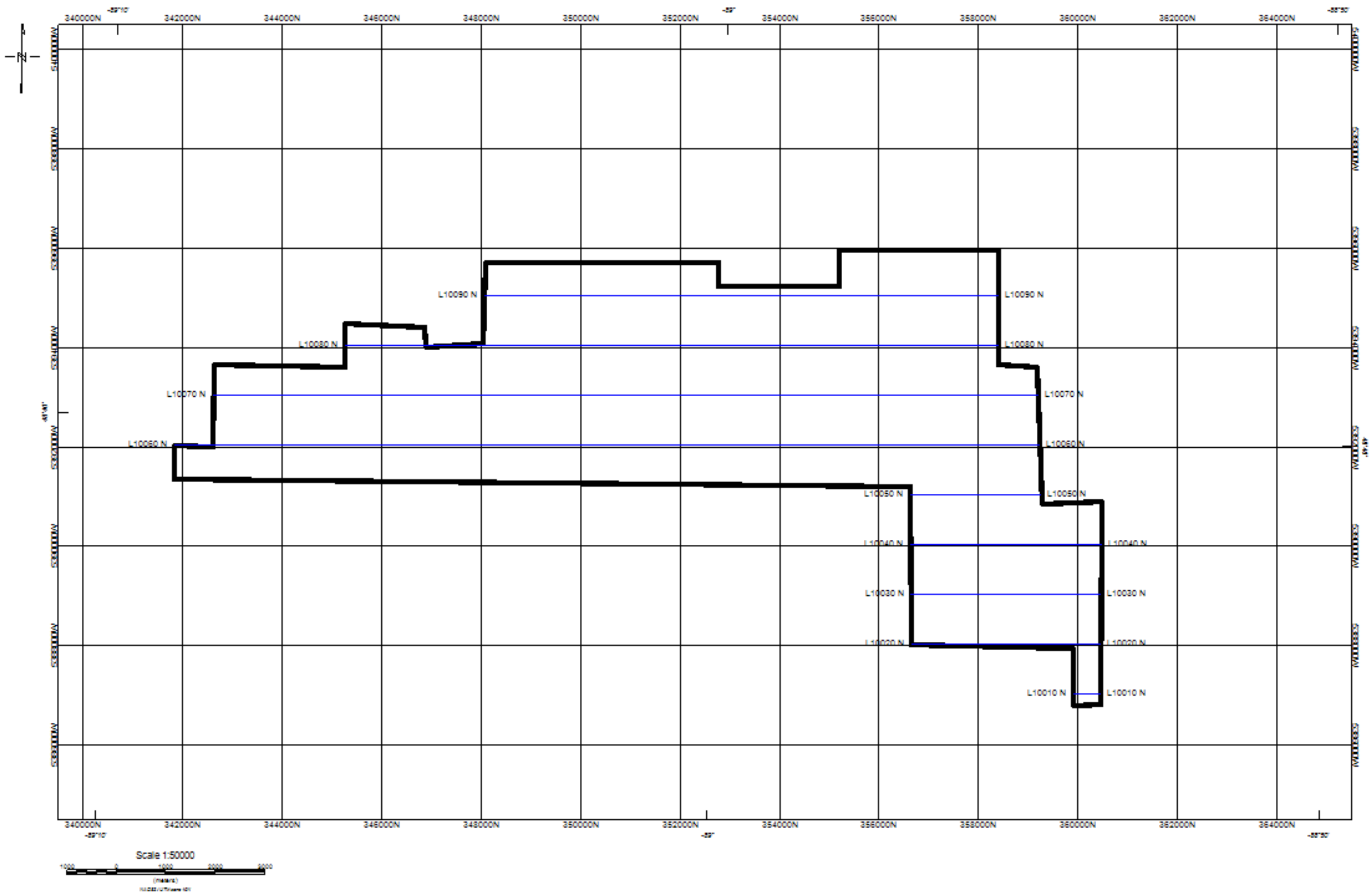


Figure 17 - Block I, Theoretical Tie Lines

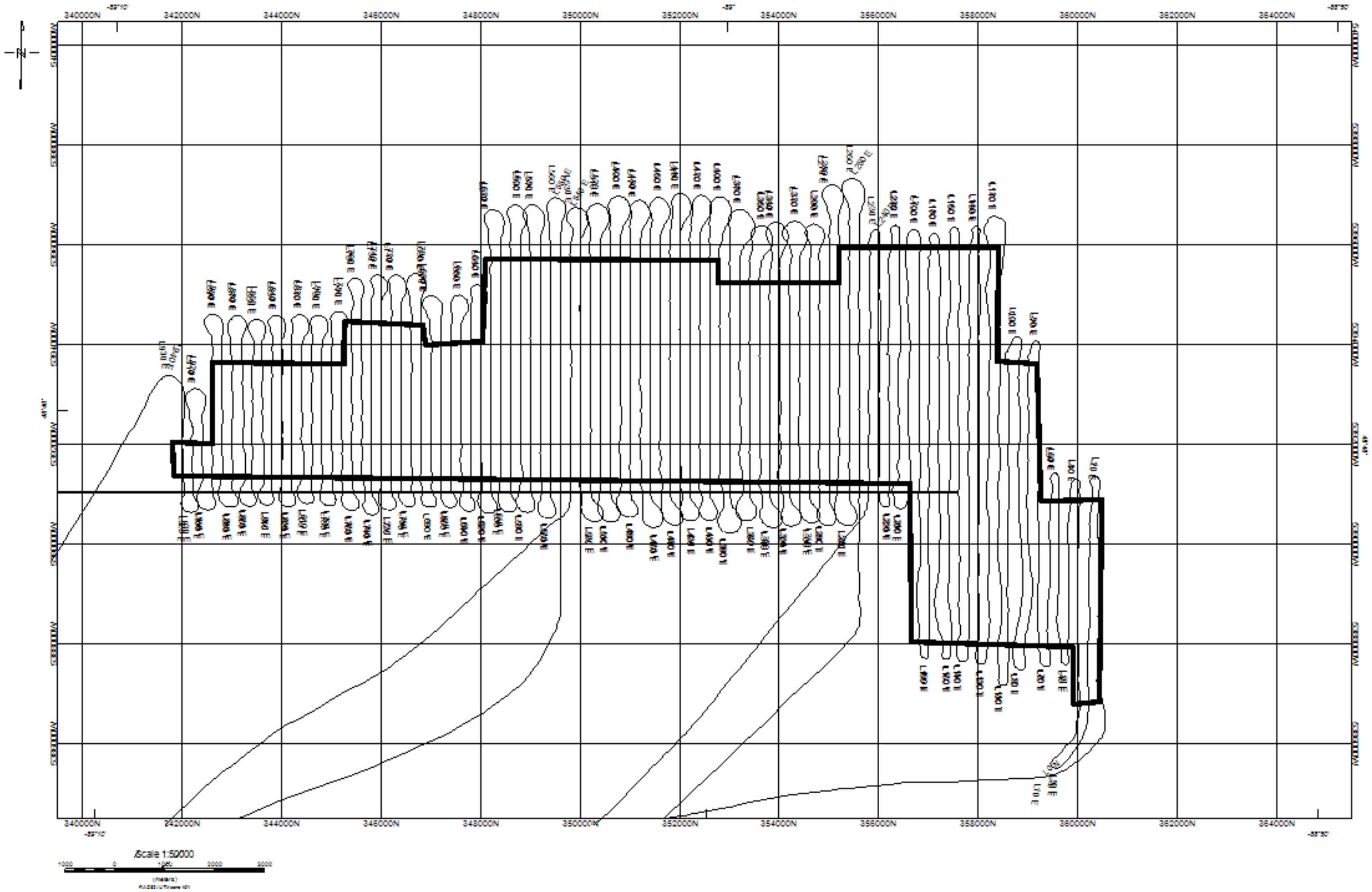


Figure 18 - Block I, Actual Flight Lines

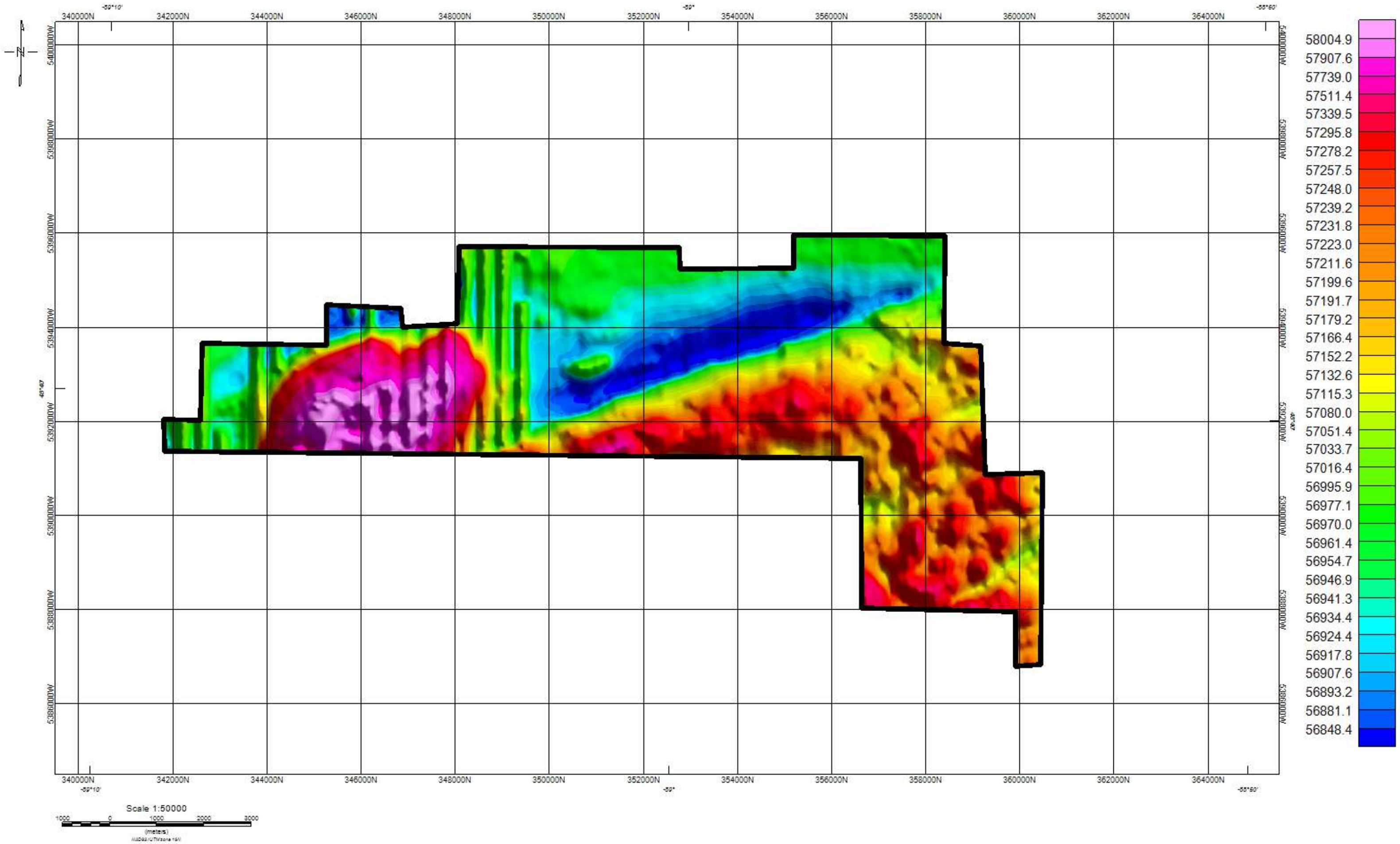


Figure 19 - Block I, Total Magnetic Field

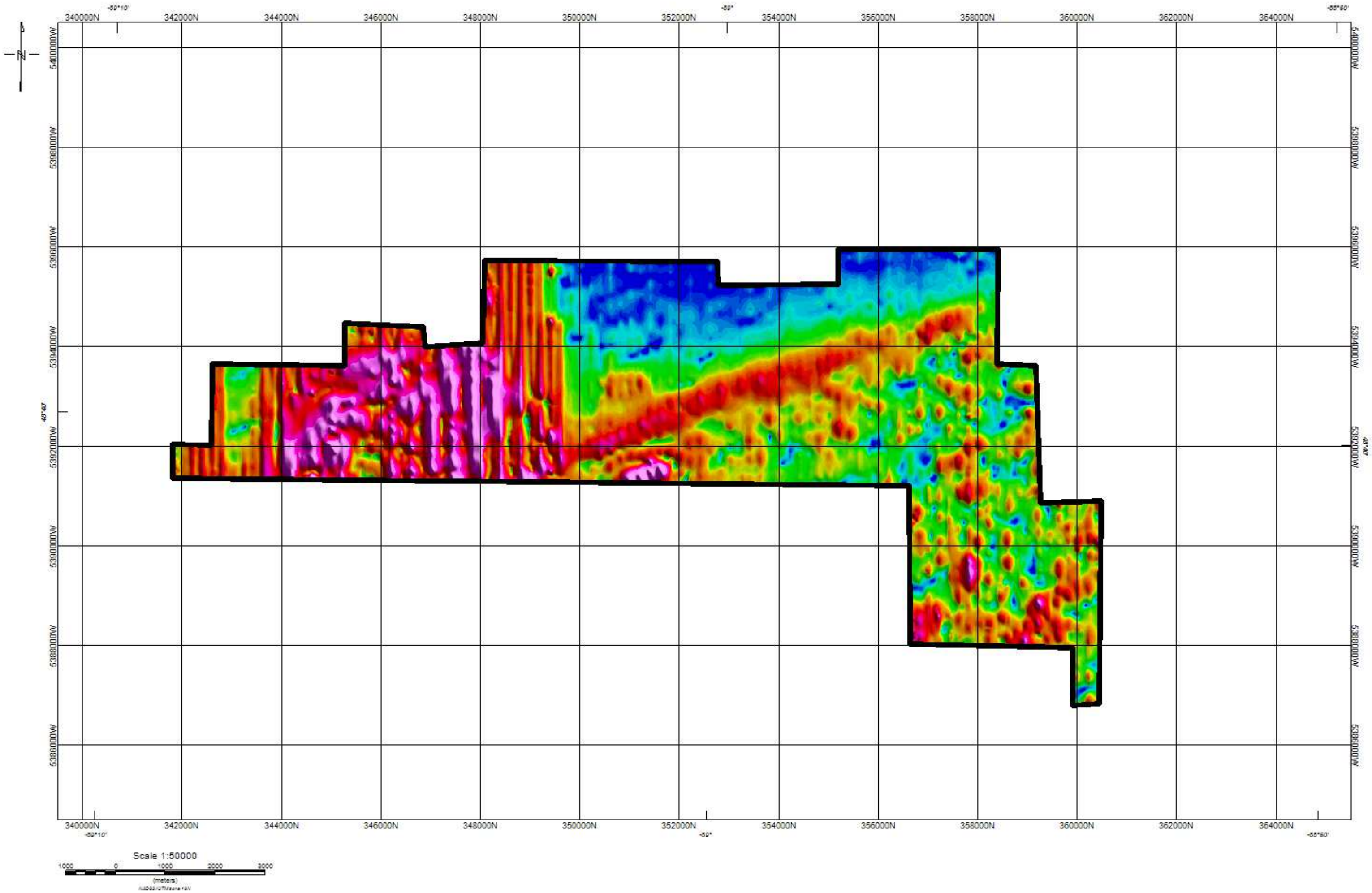


Figure 20 - Block I, Total Magnetic Field - Analytical Signal

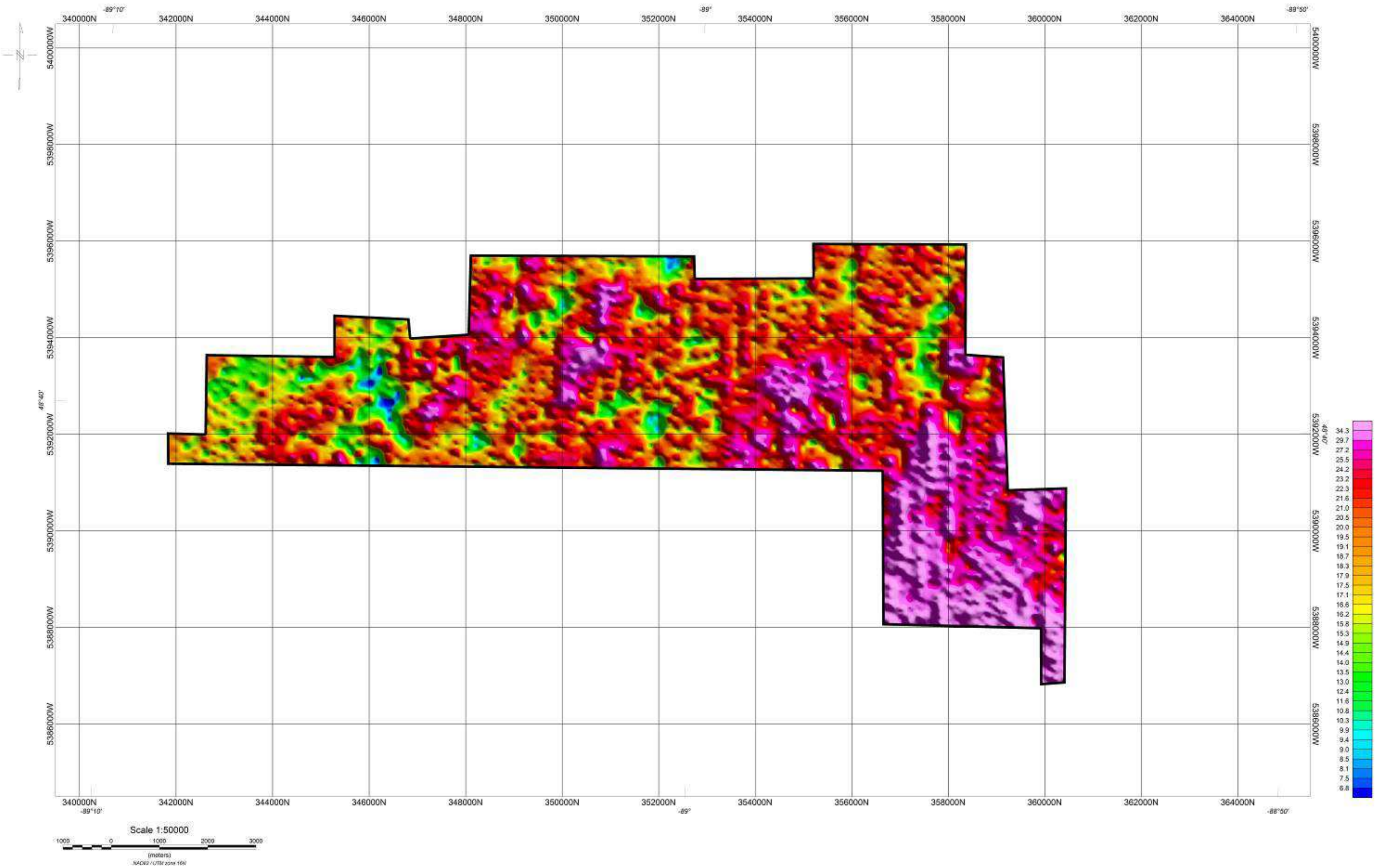


Figure 21 - Block I, Potassium Counts

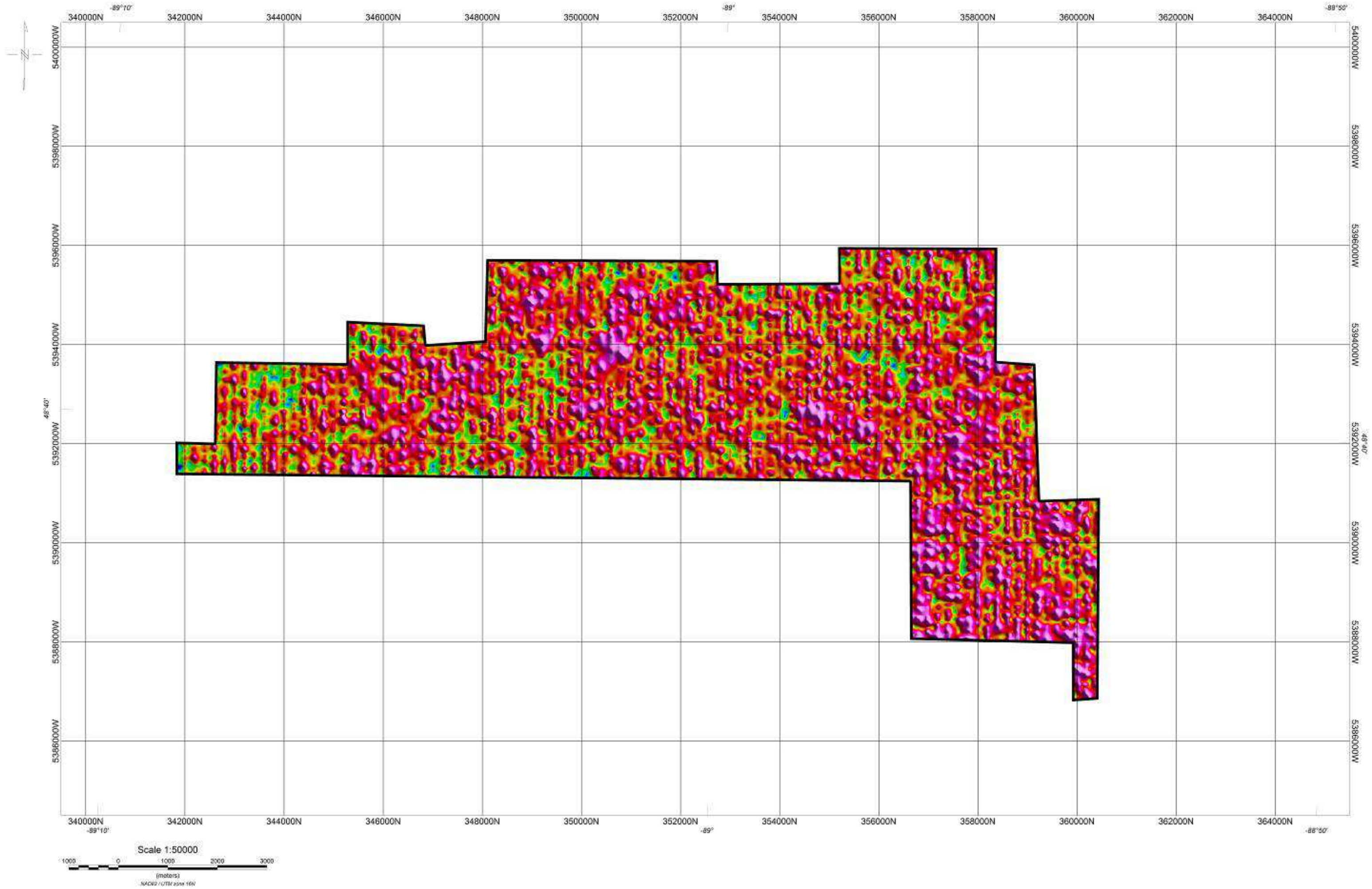


Figure 22 - Block I, Potassium Counts - Analytical Signal

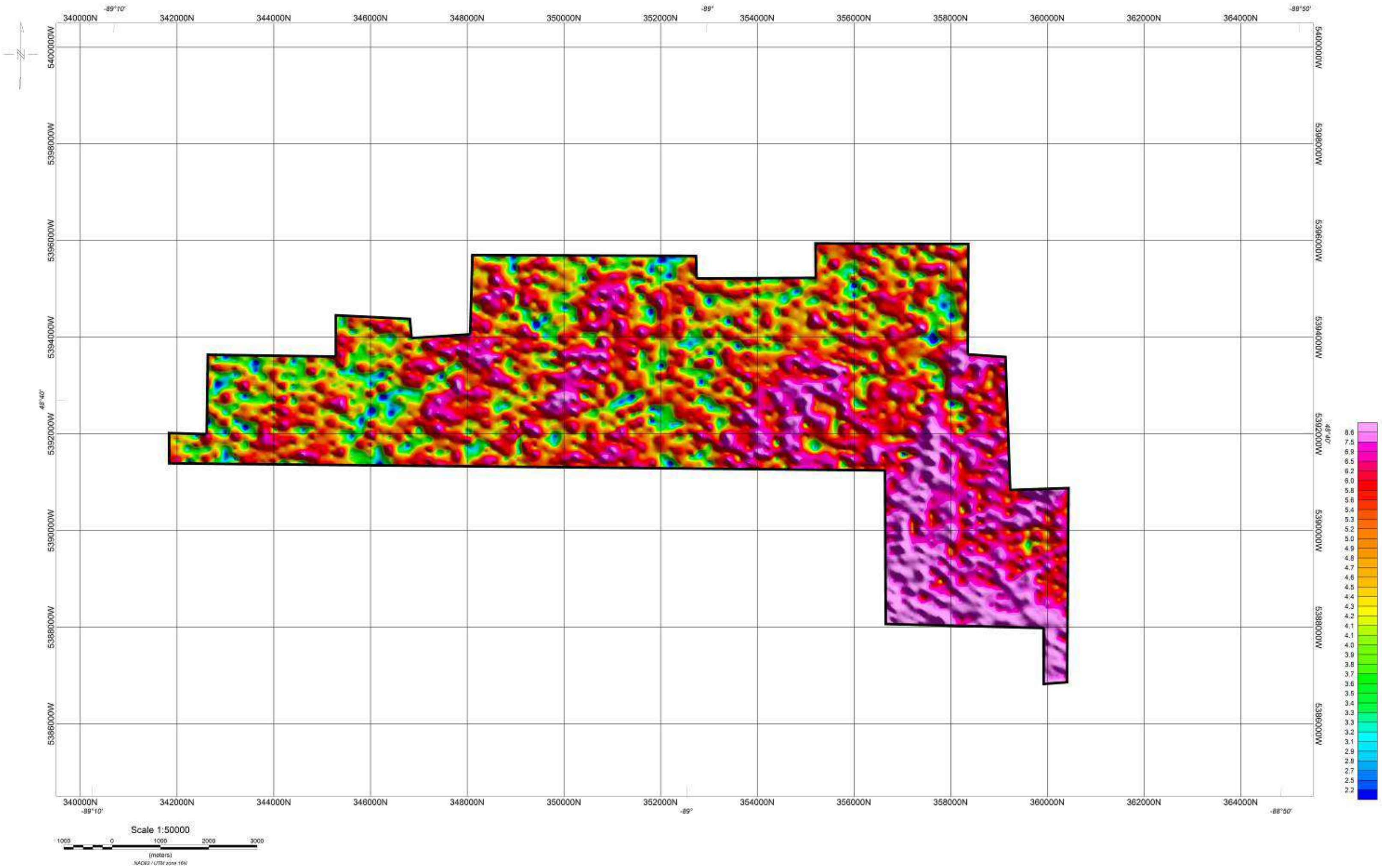


Figure 23 - Block I, Radioactive Uranium Counts

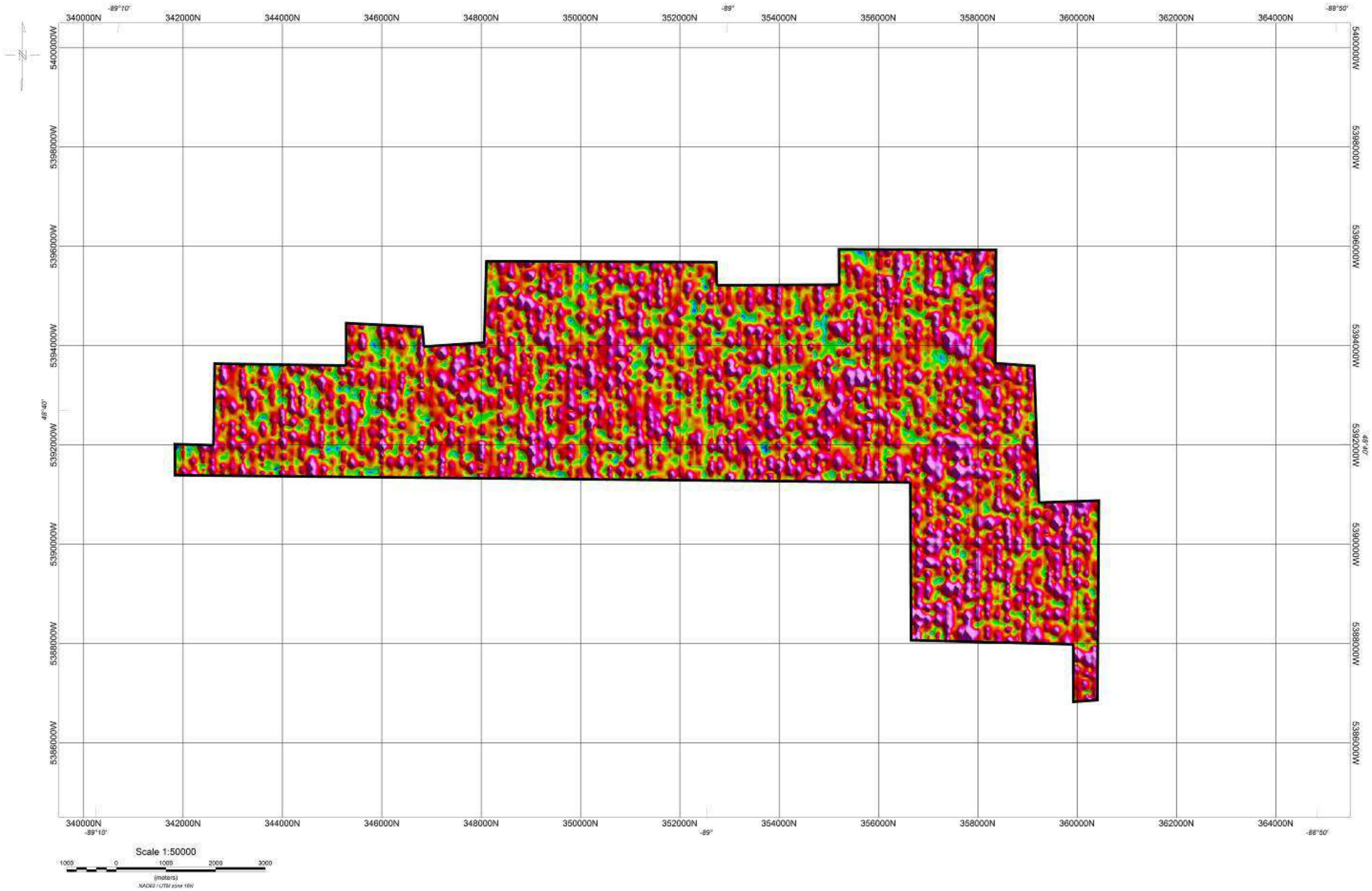


Figure 24 - Block I, Radioactive Uranium Counts - Analytical Signal

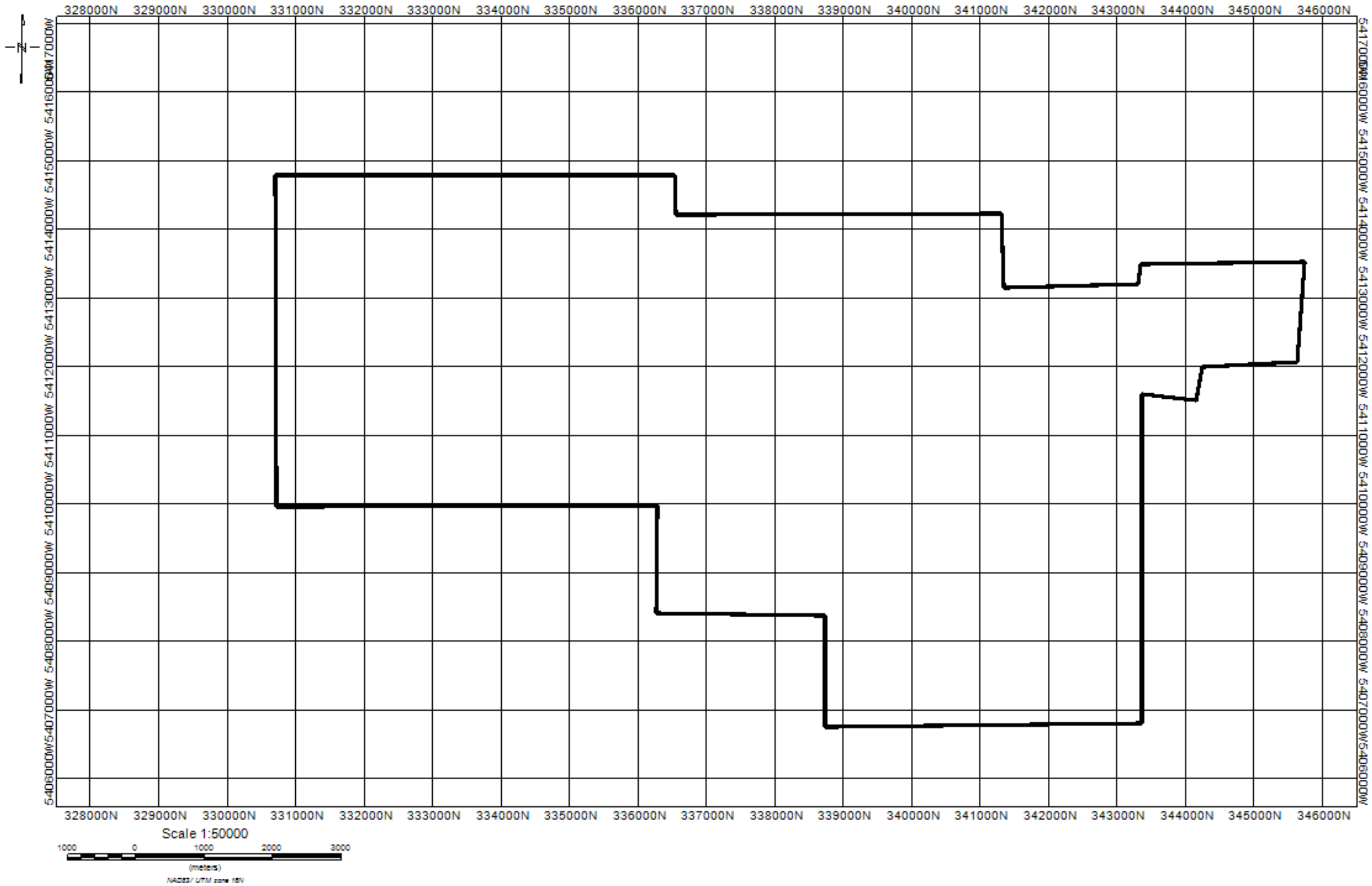


Figure 25 - Block III, Survey Polygon

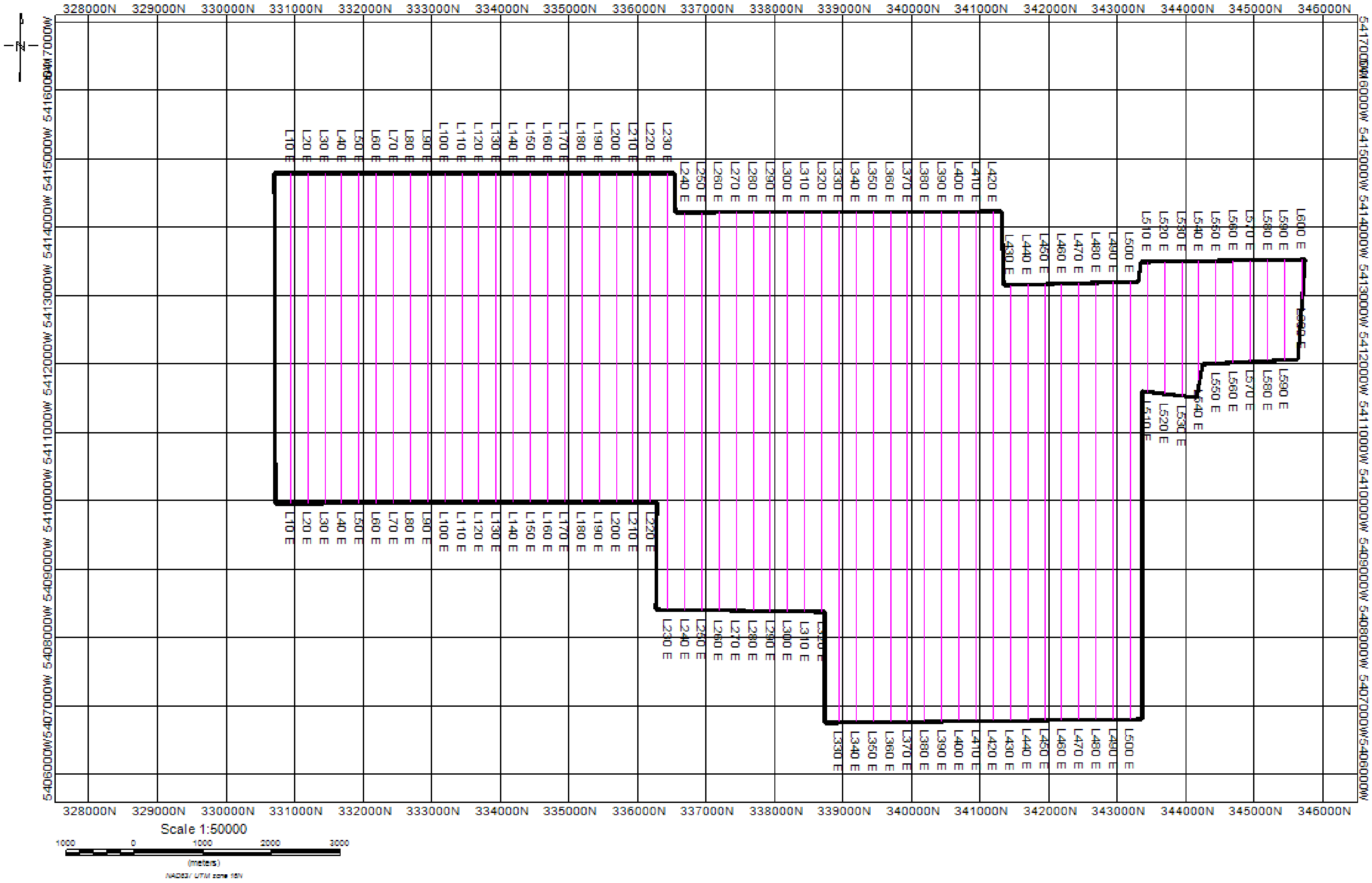


Figure 26 - Block III, Theoretical Survey

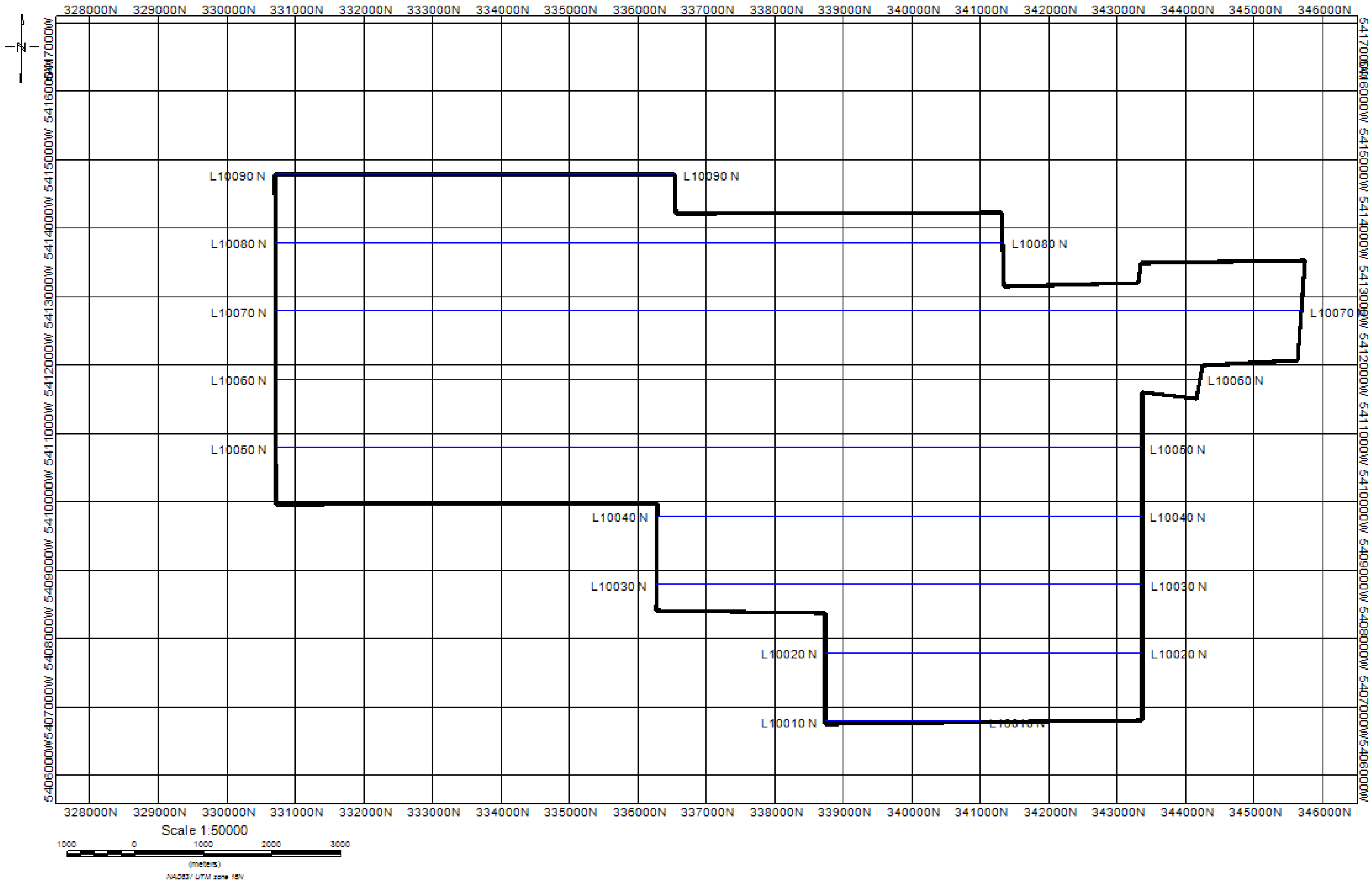


Figure 27 - Block III, Theoretical Tie Lines

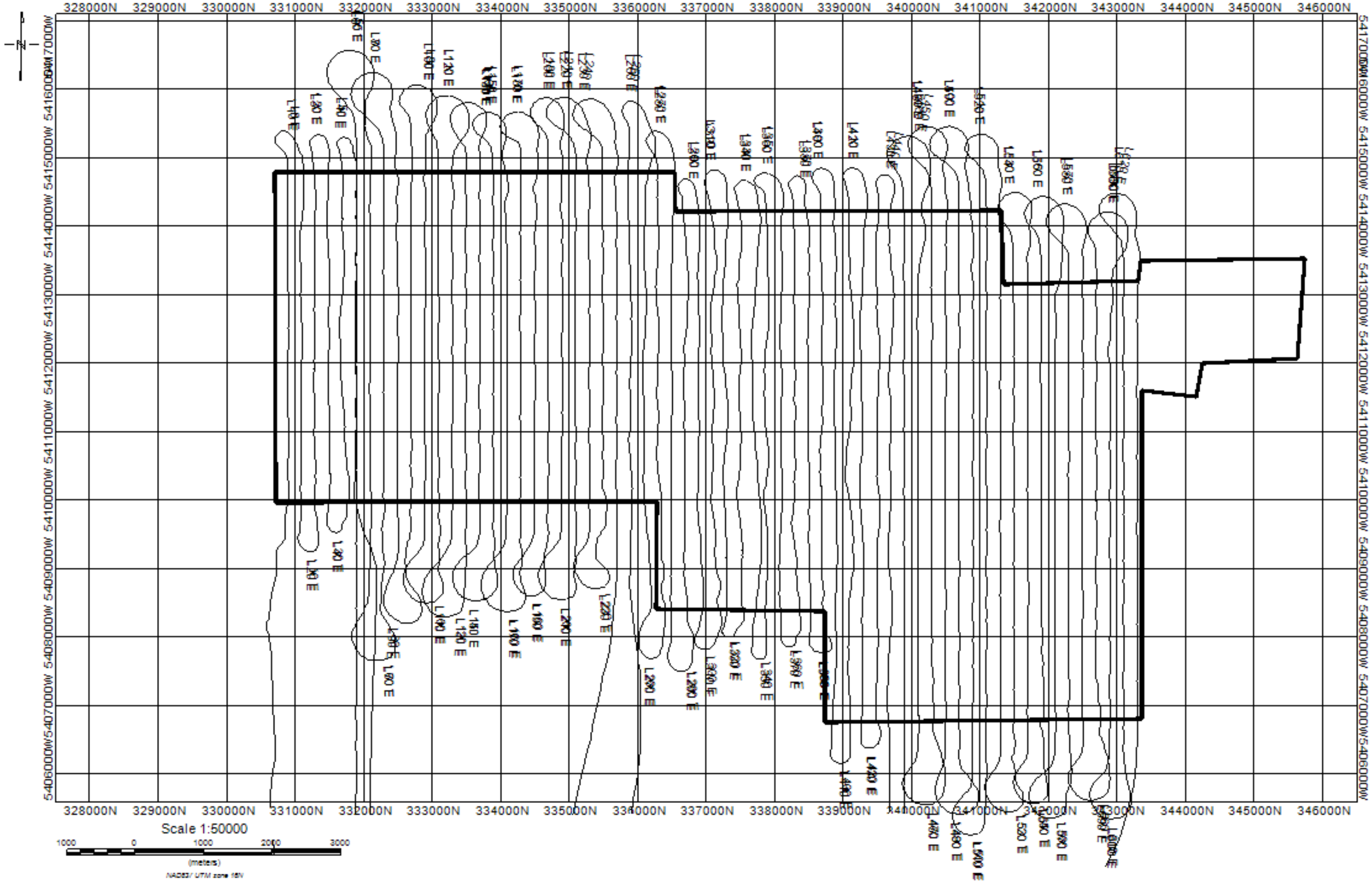


Figure 28 - Block III, Actual Flight Lines

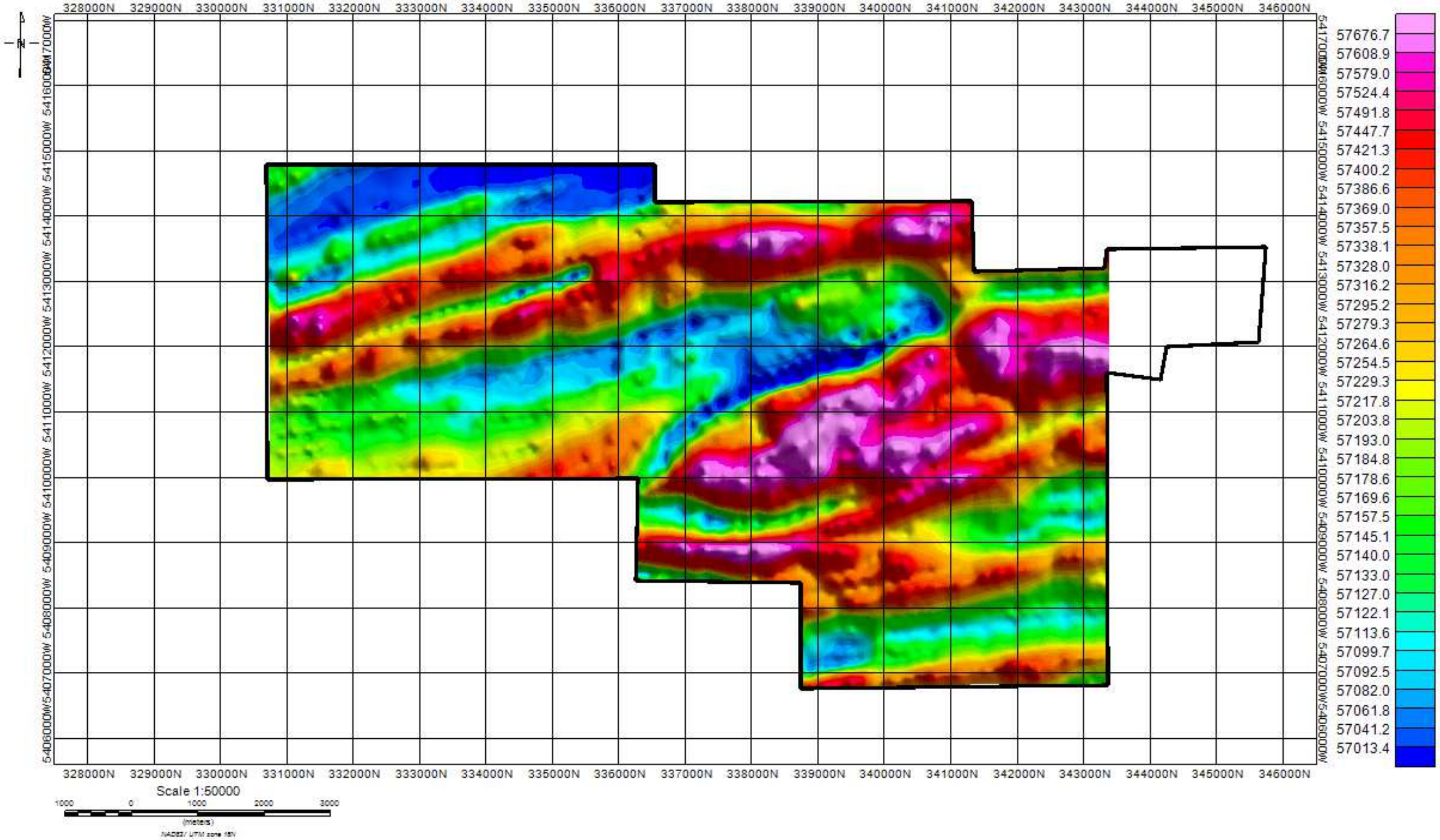


Figure 29 - Block III, Total Magnetic Field

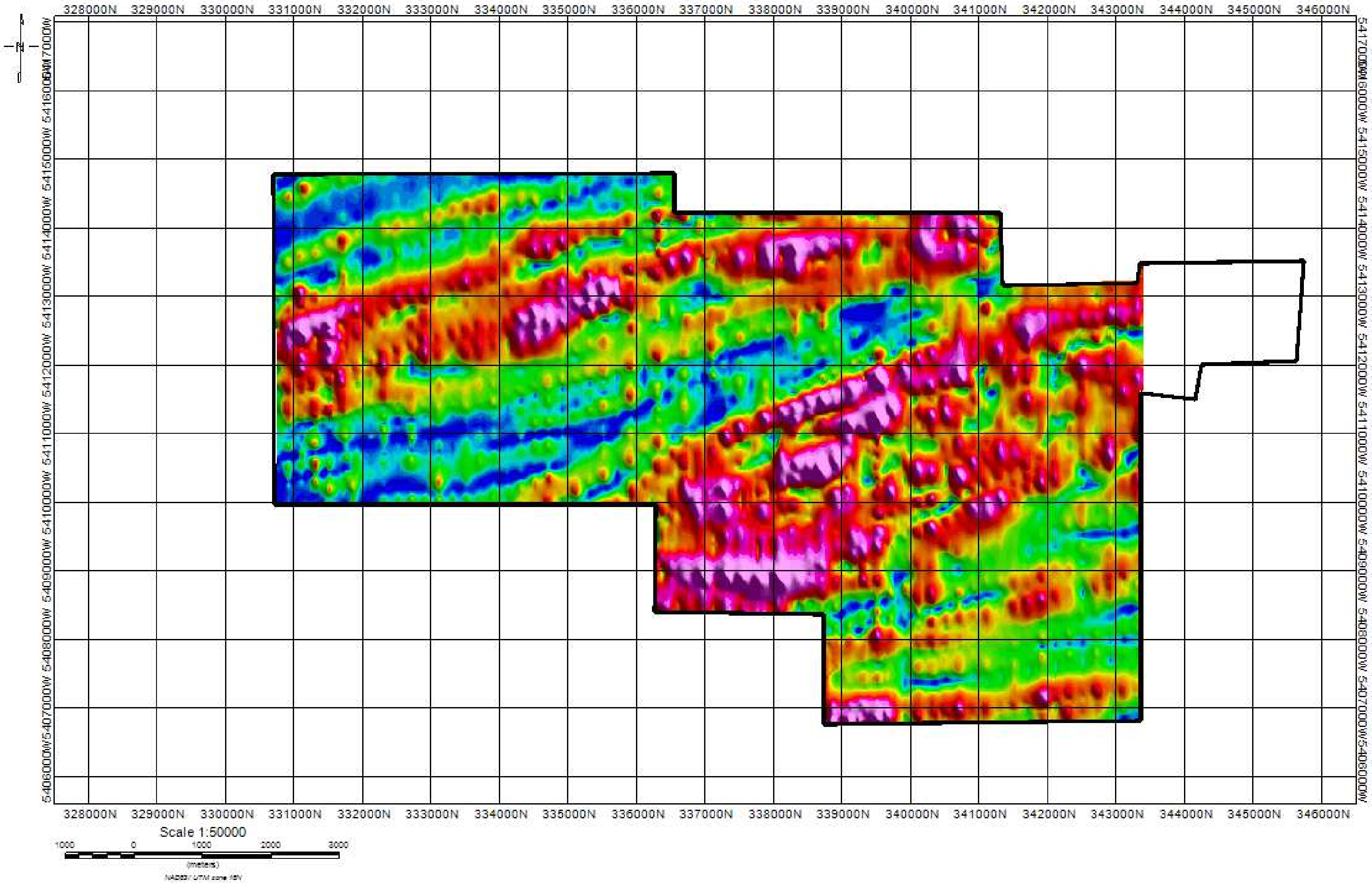


Figure 30 - Block III, Total Magnetic Field - Analytical Signal

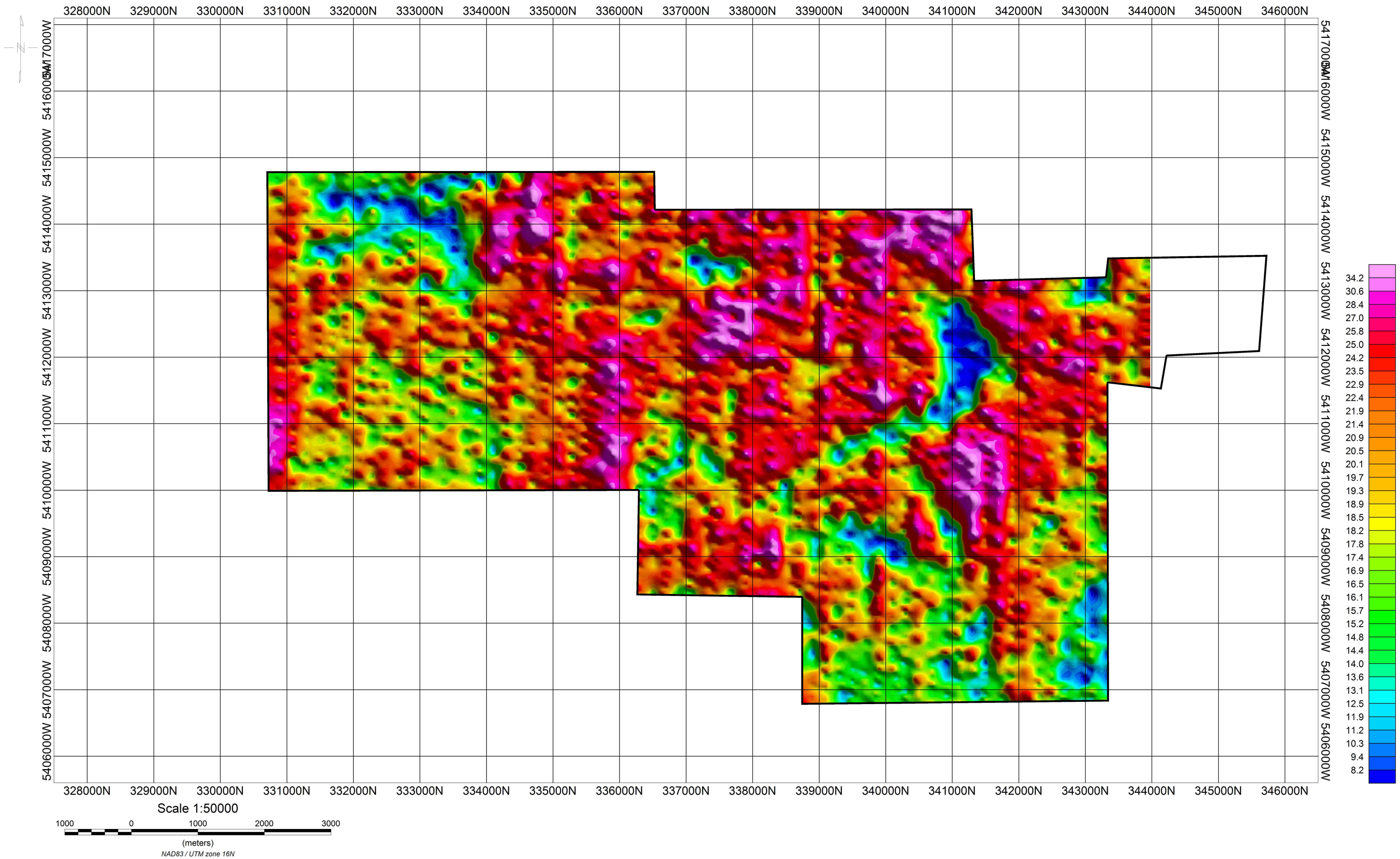


Figure 31 - Block III, Potassium Count

Figure 32 - Block III, Potassium Count – Analytical Signal

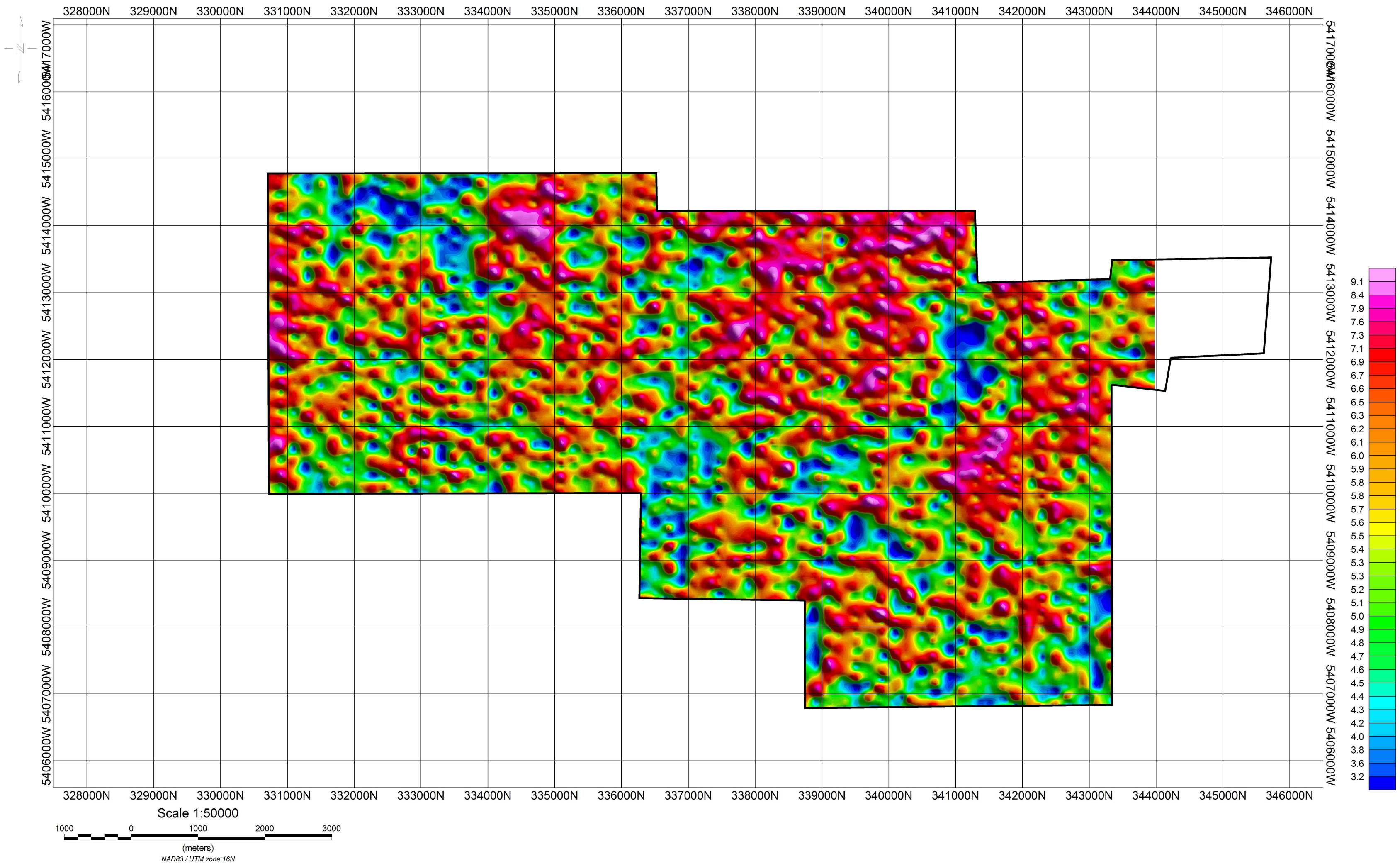


Figure 33 - Block III, Radioactive Uranium Count

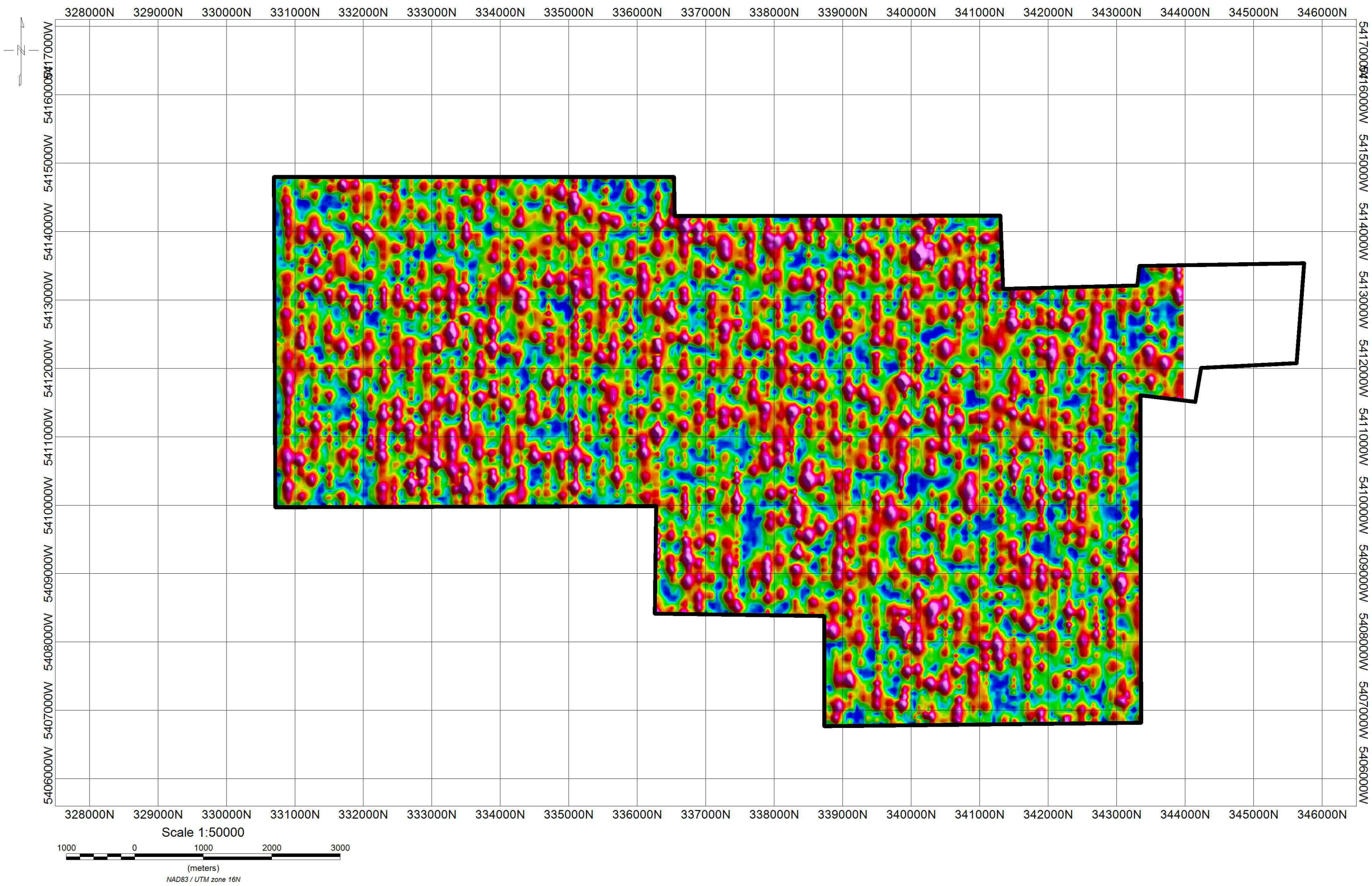


Figure 34 - Block III, Radioactive Uranium Count – Analytical Signal

10. SIGNATURE PAGE

John Patrick Sheridan, P.Eng

Dated: October 8th, 2010

11. CERTIFICATION OF QUALIFICATIONS

I, ___John Patrick Sheridan___ of ___Toronto___ in the Province of Ontario, Canada do hereby certify:

1. I am a graduate of the University of Toronto with a Bachelor of Applied Science (Engineering) in Engineering Physics.

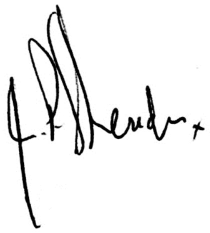
2. I am a member in good standing of the Association of Professional Engineers of Ontario and I am a qualified person to execute this report.

3. I have been practicing in my profession for over 50 years.

4. I am the author of this report. I orchestrated the logistics of the airborne geophysical survey on the Claim Blocks I and III in the Tartan Lake and Hicks Lake area in Thunder Bay, Ontario for Voisey's Bay Geophysics Ltd.

5. I am not aware of any material fact or material change with respect to the subject matter of the technical report, which is not reflected in this report.
   .

Dated at Toronto, Ontario, this _8th_ day of___October___, 2010



Supervisor(s) of the survey:

1. Alexander Dementev – 1506-145 Hillcrest Avenue, Mississauga, Ontario,L5B 3Z1