HELIBORNE HIGH RESOLUTION AEROMAGNETIC, SPECTROMETRIC AND ELECTROMAGNETIC SURVEY

Project: McVicar and Siderock

Pickel Lake Area, Ontario and Bissett Area, Manitoba

For:

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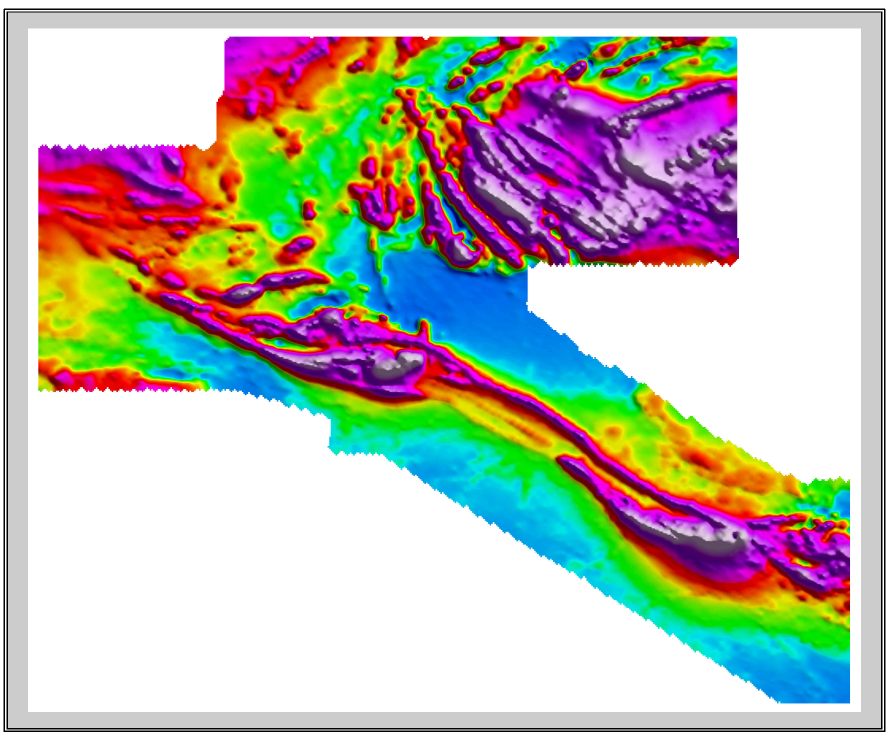
Project Ref.: P10-027 **Technical and Operation Report**

July 2011



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TECHNICAL AND OPERATION REPORT

July 2011

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1.0 INTRODUCTION

On May 25th, 2011, **GEO DATA SOLUTIONS GDS INC. (GDS)** was awarded contract P10-027 by **WILDCAT EXPLORATION LTD (WILDCAT)**. The contract required **GDS** to carry out a high-resolution helicopter borne magnetic and spectrometric survey on one block, named **McVicar**, located approximately 86 km West of Pickle Lake, Ontario, and a magnetic and electromagnetic survey on a second block, named **Siderock**, located approximately 28 km East of Bissett, Manitoba. The field base of operation was established at Pickel Lake, for the **McVicar** project, and Bissett, Manitoba, for the **Siderock** project.

On both blocks, traverses were 100-metres spaced and oriented North-South while control-lines were 500-metres spaced and oriented East-West. Table 1 presents survey specifications, figure 1 shows block locations and flight paths, and tables 2 and 3 define block co-ordinates.

The helicopter nominal ground clearance was 40 metres, for the **McVicar** block, and 85 metres, for the **Siderock** block.

Four production flights, flown on June 11th and 12th, were needed to cover the **McVicar** block, and three production flights, flown on June 22nd and 23rd, were needed for the **Siderock** block.

This report describes survey procedures and data verification, which were carried out in the field, and data processing, which followed at the office.

Table 1: Survey Specifications

Block	Technique	Traverse Spacing (m)	Traverse Azimuths	Tie Line Spacing (m)	Tie Line Azimuths	Total Line-km
McVicar Lake Ontario	Mag-Spectro	100	N-S	500	E-W	711
Siderock Manitoba	Mag-EM	100	N-S	500	E-W	391
					Total	**1 102**

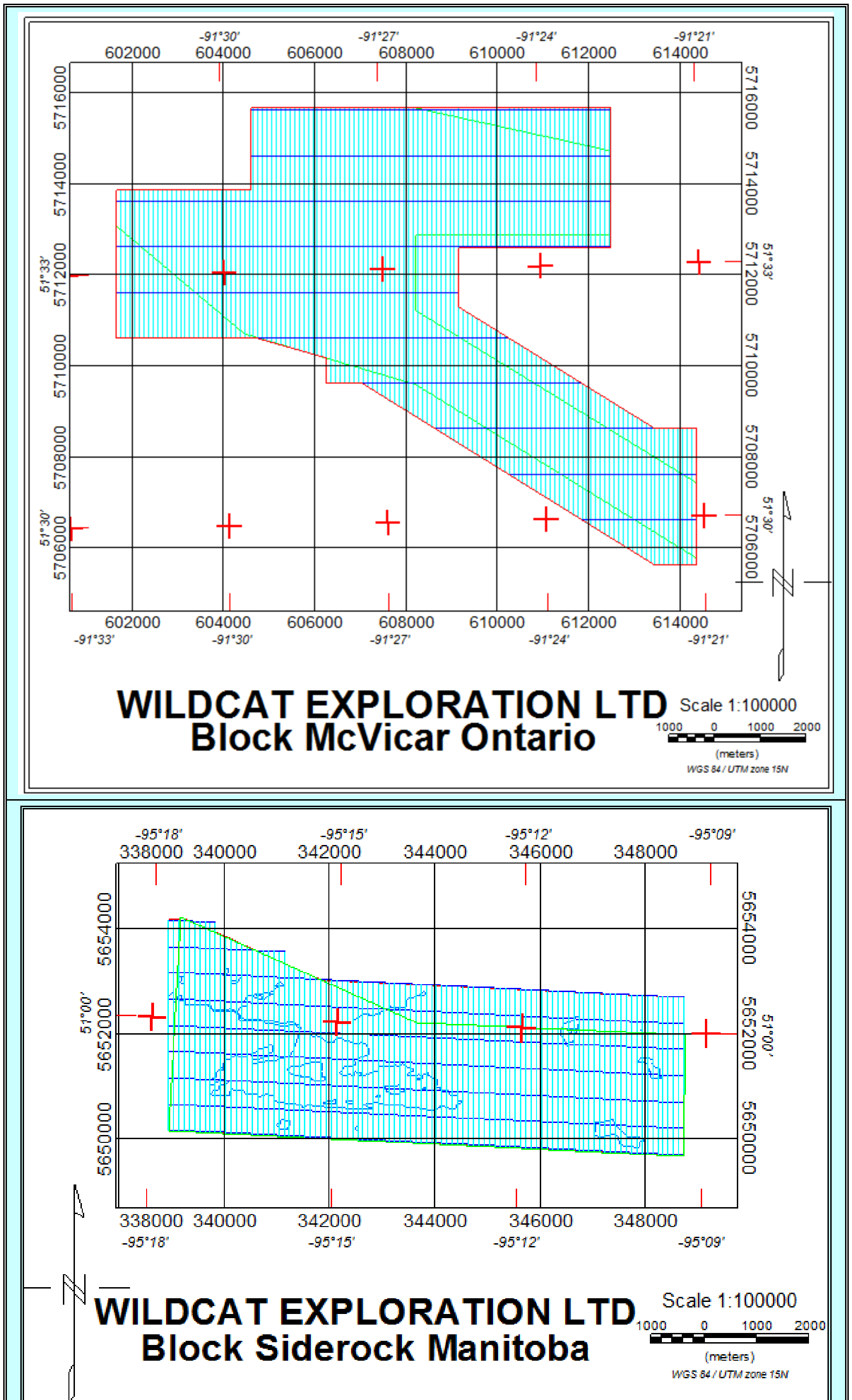


Figure 1: Block Locations and Theoretical Flight Paths

Table 2: McVicar Lake block co-ordinates (Nad83, UTM zone 15N)				
Vertex	**Latitude**	**Longitude**	**X (UTM)**	**Y (UTM)**
1	51° 29' 24.30" N	91° 21" 09.46" W	614 370	5 705 613
2	51° 29' 24.96" N	91° 21" 56.36" W	613 465	5 705 613
3	51° 31' 38.90" N	91° 27" 25.38" W	607 033	5 709 613
4	51° 31' 39.43" N	91° 28" 05.22" W	606 265	5 709 613
5	51° 31' 57.51" N	91° 28" 04.62" W	606 265	5 710 172
6	51° 32' 12.79" N	91° 29" 21.97" W	604 765	5 710 613
7	51° 32' 14.85" N	91° 32" 04.12" W	601 640	5 710 613
8	51° 33' 59.92" N	91° 32" 00.74" W	601 640	5 713 860
9	51° 33' 57.97" N	91° 29" 26.53" W	604 610	5 713 860
10	51° 34' 56.21" N	91° 29" 24.61" W	604 610	5 715 660
11	51° 34' 50.75" N	91° 22" 35.34" W	612 490	5 715 660
12	51° 33' 11.35" N	91° 22" 38.88" W	612 490	5 712 588
13	51° 33' 13.70" N	91° 25" 31.46" W	609 165	5 712 588
14	51° 32' 31.76" N	91° 25" 32.91" W	609 165	5 711 292
15	51° 31' 02.03" N	91° 21" 52.89" W	613 465	5 708 613
16	51° 31' 01.37" N	91° 21" 06.21" W	614 365	5 708 613

Table 3: Siderock block co-ordinates (Nad83, UTM zone 15N)				
Vertex	**Latitude**	**Longitude**	**X (UTM)**	**Y (UTM)**
1	50° 58' 43.72" N	95° 09' 17.33" W	348 736	5 649 679
2	50° 58' 49.49" N	95° 17' 40.30" W	338 935	5 650 153
3	51° 00' 59.88" N	95° 17' 46.69" W	338 936	5 654 184
4	51° 00' 59.76" N	95° 17' 34.77" W	339 168	5 654 173
5	51° 01' 02.02" N	95° 17' 34.68" W	339 172	5 654 243
6	51° 00' 59.68" N	95° 17' 25.63" W	339 346	5 654 165
7	51° 00' 59.39" N	95° 17' 00.46" W	339 836	5 654 141
8	51° 00' 52.99" N	95° 17' 00.15" W	339 836	5 653 943
9	51° 00' 42.77" N	95° 16' 21.05" W	340 588	5 653 604
10	51° 00' 42.48" N	95° 15' 52.91" W	341 136	5 653 578
11	51° 00' 35.33" N	95° 15' 52.56" W	341 136	5 653 357
12	51° 00' 25.86" N	95° 15' 16.48" W	341 830	5 653 043
13	51° 00' 21.78" N	95° 09' 21.88" W	348 736	5 652 710

2.0 SURVEY SPECIFICATIONS

Airborne survey and noise specifications were as follows:

a) Traverse and tie-line spacing and direction
   - Table 1 presents traverse/tie-line spacing and direction requested.

b) Total number of line-km flown:

McVicar Block:	711 km
Siderock Block:	391 km

c) Nominal terrain clearances

McVicar Block

• Helicopter nominal terrain clearances:	40 metres
• Spectrometer nominal ground clearance:	40 metres
• Magnetometer nominal terrain clearances:	40 metres

Siderock Block (figure 4)

• Helicopter nominal terrain clearances:	85 metres
• Magnetometer nominal terrain clearances:	60 metres
• EM receiver nominal terrain clearances:	60 metres
• EM transmitter nominal terrain clearance:	35 metres

d) Magnetic diurnal variation
   - A maximum diurnal deviation of 5.0 nT (peak to peak) from a long chord equivalent to a period of one minute was not tolerated without re-flight

e) Magnetometer noise envelope
   - base station noise envelope did not exceeded 0.2 nT
   - on board magnetometer noise envelope did not exceeded 0.02 nT over 500 metres line-length without re-flight

f) Re-flights and turns
   - line spacing did not varied by more than 50 % from the indicated spacing over a distance of more than 1 km. The minimum length of any survey line was 3 km.
   - all reflights of line segments intersected at least two control lines

g) Helicopter speed
   - helicopter speed was approximately 90 km/h and distance between samples along survey lines was typically 2.5 meters for the magnetic and ProspecTEM data

h) Soil moisture
   - no gamma-ray spectrometric survey was flown during or for 3 hours after measurable precipitation
   - in the event of heavy precipitation yielding more than 2 cm of ground soaking rain, flying was suspended for at least 12 hours after end of precipitation or until soil returns to its "normal" moisture level.

3.0 AIRCRAFT, EQUIPMENT AND PERSONNEL

3.1 Aircraft and Equipment

Table 4 presents the helicopter characteristics used during data acquisition.

Table 4: The Robinson R44 Helicopter Characteristics	
Power plant	One 195kW (260hp) Textron Lycoming O-540 flat six piston engine
Rate of climb 1000 ft/min	1000 ft/min
Number of main rotor blades	2
Cruising speed at 75% power	209 MPH
Service ceiling	14,000 ft
Range with no reserve	645 km
Empty weight	635 kg
Maximum takeoff	1,090 kg

Magnetometer: Geometrics Cesium split-beam total field magnetic sensor installed in a towed bird with a sensitivity of 0.01 nT, a sampling rate of 10 Hz and a resolution better than 0.025 nT per measurement. The sensor tolerates gradients up to 10 000 nT/m, and operates in a range from 20 000 nT to 100 000 nT. A 0.5 nT noise envelope was not exceeded over 500 metres line-length without a reflight.

Magnetometer Base Station: A GEM GSM-19 Overhauser magnetometer base station was mounted in a magnetically quiet area. The base station measures total intensities of the earth's magnetic field in units of 0.01 nT at intervals of 1 second and within a noise envelope of 0.10 nT. The base station magnetometer was located near the base of operation.

At the end of the data acquisition periods, the averaged values of the base station magnetometer were 57 512 nT (**McVicar** Block) and 55 598 nT (**Siderock** Block).

Figure 2: Base Station Magnetometer and Console

Electromagnetic System: Transient helicopter-borne EM system (ProspecTEM), with the following specifications (figures 3 and 4):

1. 2.4-kW generator in the transmitter, electrically isolated from the helicopter;
2. Alternating 2.8 ms half-sine pulses with intervening off-times of 12.5 ms;
3. 1024 samples of transmitter current per cycle.
4. Orthogonal (X-Y-Z) component receiver in bird above transmitter;
5. 1024 samples of response per component per cycle;
6. 10-Hz output rate of 10 on-time and 20 off-time channels of transmitter current, Z-component.
7. Cable
   - Cable- length (helicopter-transmitter): 55 metres
   - Distance helicopter-receiver: 28 metres
   - Nominal EM transmitter ground-clearance: 35 metres
   - Nominal EM receiver ground-clearance: 60 metres
   - Cable dip: 63°
8. Transmitter

Maximum Current:	1 500 A
Diameter:	7.5 metres
Dipolar moment:	170 000 A-t (Z-axis)
Total number of wire turns:	2

9. Receiver Windows (Table 5)

The two-turn ProspecTEM transmitter has a rapid and stable turn-off, minimizing primary-field artefacts in early-time response. This clarifies the identification of poorly conductive features, enabling more reliable ranking of highly conductive targets for drilling. With its diameter of 7.5 m, the rigid PropecTEM transmitter has inherent in-flight stability. This helps the pilot maintaining a stable geometry and contour the ground more accurately to obtain strong, consistent and interpretable measurements. This stability is particularly important in rough terrain and turbulent conditions.

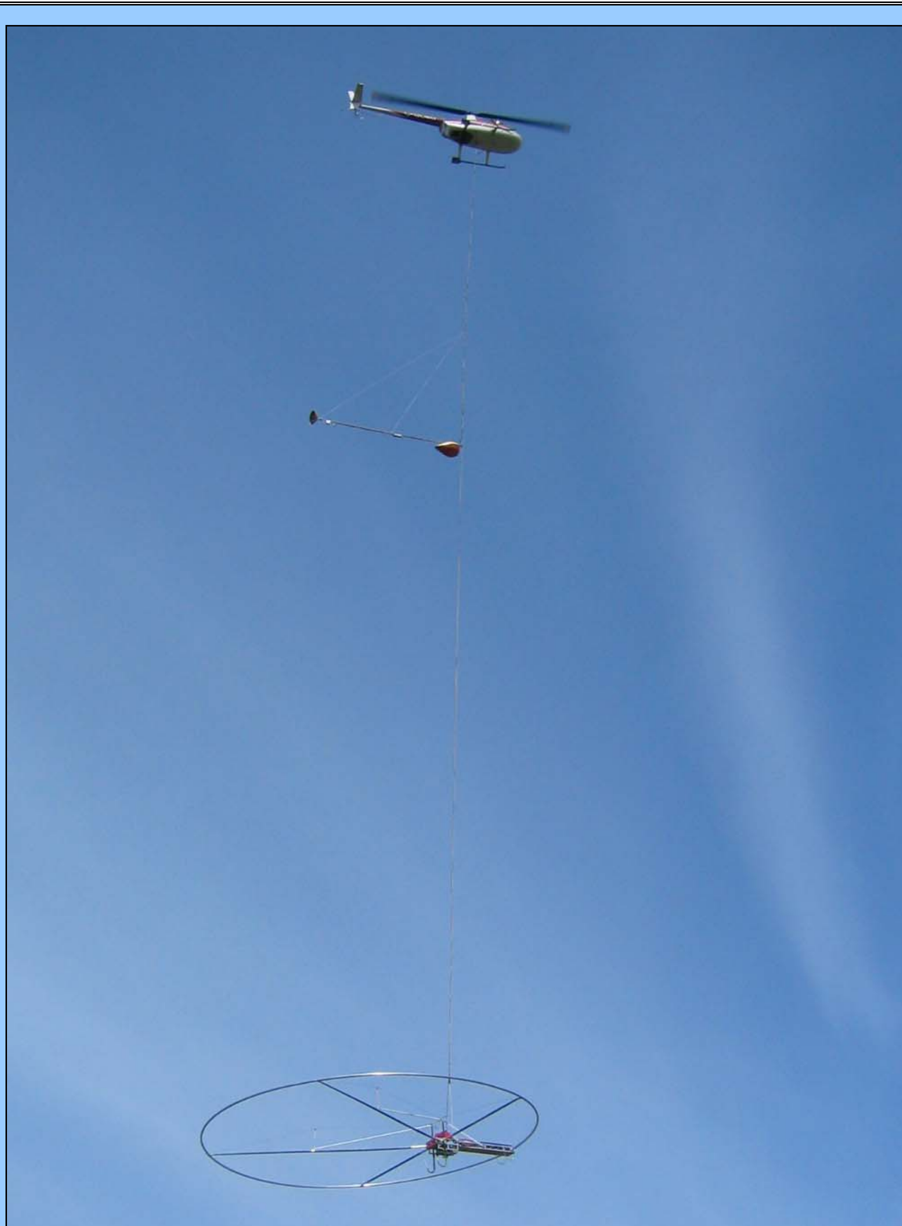


Figure 3: The Geophysical System

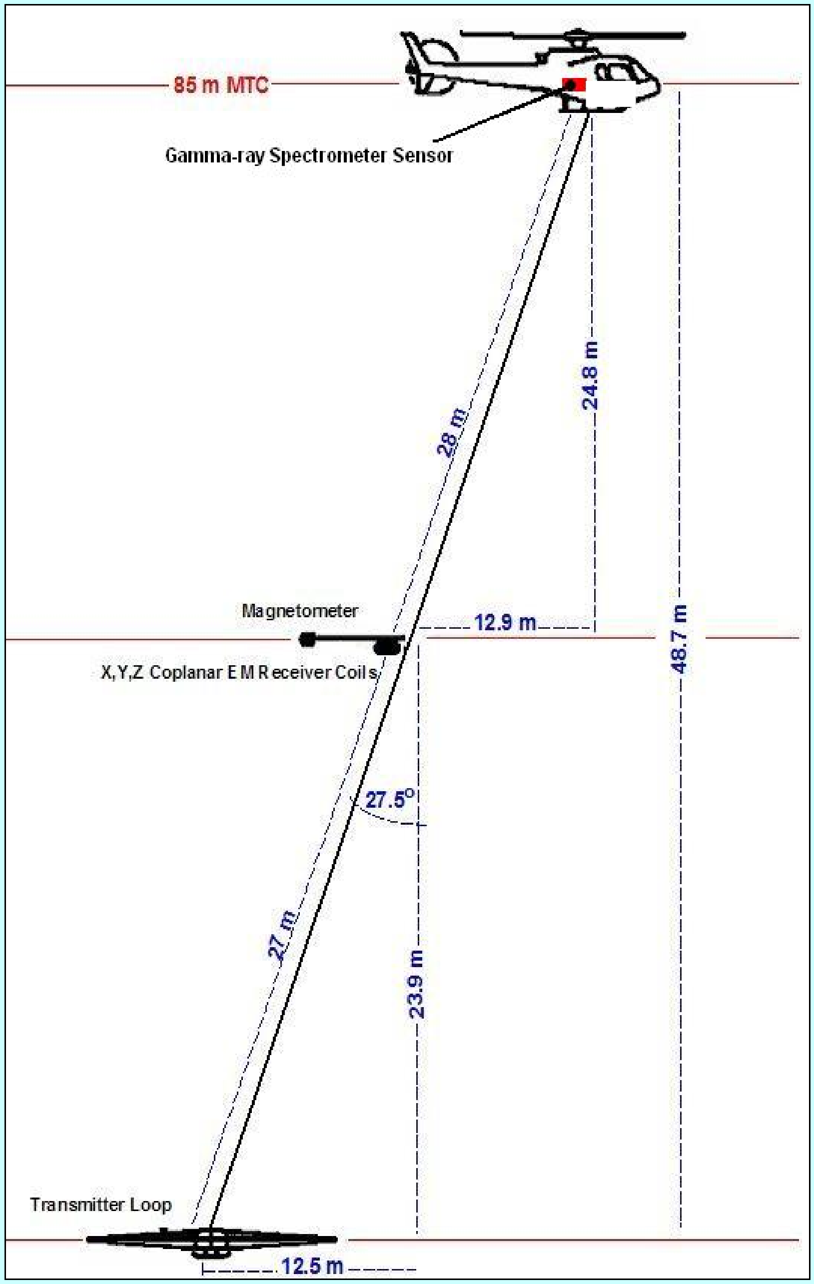


Figure 4: Configuration of the Geophysical System

Table 5: EM Windows							
Channel	**Starting time (msec)**	**Width (msec)**	**Pulse**	**Channel**	**Starting time (msec)**	**Width (msec)**	**Pulse**
1	0,16667	0,01667	**ON**	**21**	3,15	0,53333	**OFF**
2	0,25	0,01667	**ON**	**22**	3,26667	0,53333	**OFF**
3	0,33333	0,01667	**ON**	**23**	3,4	0,53333	**OFF**
4	1,3	0,01667	**ON**	**24**	3,26667	1,1	**OFF**
5	1,31667	0,01667	**ON**	**25**	3,45	1,1	**OFF**
6	1,33333	0,01667	**ON**	**26**	3,65	1,1	**OFF**
7	2,58333	0,01667	**ON**	**27**	3,88333	1,1	**OFF**
8	2,66667	0,01667	**ON**	**28**	4,13333	1,1	**OFF**
9	2,8	0,08333	**ON**	**29**	4,43333	1,1	**OFF**
10	2,81667	0,08333	**ON**	**30**	4,76667	1,1	**OFF**
11	2,83333	0,08333	**ON**	**31**	5,16667	1,1	**OFF**
12	2,85	0,16667	**RAMP**	**32**	5,05	2,2	**OFF**
13	2,86667	0,18333	**OFF**	**33**	5,55	2,2	**OFF**
14	2,86667	0,25	**OFF**	**34**	6,13333	2,2	**OFF**
15	2,86667	0,36667	**OFF**	**35**	6,78333	2,2	**OFF**
16	2,91667	0,36667	**OFF**	**36**	7,51667	2,2	**OFF**
17	2,91667	0,53333	**OFF**	**37**	8,36667	2,2	**OFF**
18	2,95	0,53333	**OFF**	**38**	9,33333	2,2	**OFF**
19	3	0,53333	**OFF**	**39**	10,45	2,2	**OFF**
20	3,03333	0,53333	**OFF**	**40**	11,7	2,2	**OFF**

Spectrometric System: A crystal pack containing 4 downward-looking crystals (16.8 litres) and 1 upward-looking crystal (4.2 litres) analyzed gamma radiations with a Radiation Solutions Inc. RSX-5 1024-channel spectrometer. The RSX-5 is self-calibrating and has automatic gain control, which eliminates the use of radioactive sources in the field. The spectrometer records total count, counts for potassium, uranium and thorium, along with the entire 1024-channel spectra and live-time at a rate of 1 Hz.

Digital Acquisition System: A data acquisition system (AGIS Pico Envirotec Instruments) recorded geophysical and ancillary data on a removable media every 0.1 s.

Radar Altimeter: TRA-3000, accuracy 5%, sensitivity one foot, range 0 to 2,500 feet, 1 sec. recording interval

Electronic Navigation: Real-Time Differentially Corrected Omnistar System, 1.0 sec. recording interval, accuracy of ±5 metres.

Ancillary Equipment: Computer workstation, complement of spare parts and test equipment

3.2 Personnel

Project general management was monitored offsite by Mr. Mouhamed Moussaoui, **GDS**'s President. Mr. Alain Tremblay was responsible for the field electronic system maintenance. Final data evaluation and processing was carried out at the Laval **GDS** office by Mr. Saleh Elmoussaoui, for magnetic data, and Mrs My Phuong Vo, for EM data, on the Siderock Block, and Mr. Carlos Cortada, for magnetic and spectrometric data, on the McVicar Block. Survey crew and office personnel are listed in table 6.

Table 6: Field and Office Crew

Position	Name
Project Manager	Mr. Mouhamed Moussaoui, P.Eng.
Electronic maintenance	Mr. Frank Beillard
Field Operator	Mr. Alain Tremblay
Pilot	Mr. Alain Tremblay
Field Quality Control	Mr. Carlos Cortada
Final Processing	Mr. Saleh Elmoussaoui (mag. data, Siderock Block) Mrs. My Phuong Vo (EM data, Siderock Block) Mr. Carlos Cortada (mag. and spectro. data, McVicar Block)
Survey Report	Mr. Camille St-Hilaire, P.Geo

4.0 SURVEY SCHEDULE

The survey was flown over two blocks with flight line bearing selected to run perpendicular to the average trend of the local geological structures. Survey steps were:

For the **McVicar** Block (Mag. And Spectro.):

Mobilization to Pickel Lake:	June 11th, 2011
Survey:	June 11th and 12th, 2011
Demobilization:	June 12th, 2011

For the **Siderock** Block (Mag. and EM):

Mobilization to Bissett:	June 21st, 2011
Survey:	June 22nd and 23rd, 2011
Demobilization:	June 23rd, 2011

Preliminary maps were sent to **WILDCAT** few days after survey completion while final maps and data were delivered at the end of July 2011.

5.0 DATA ACQUISITION

After each day, profiles were examined as a preliminary assessment of the noise level on the recorded data. Altimeter deviations from the prescribed flying altitudes were also closely examined as well as the magnetic diurnal activity, as recorded at the base station.

All digital data were verified for validity and continuity. Data from helicopter and base station were transferred to the PC's hard disk. Basic statistics were generated for each parameter recorded. These included the minimum, maximum and mean values, the standard deviation and any null values located. Editing of all recorded parameters for spikes or datum shifts was done, followed by final data verification via an interactive graphic screen with on-screen editing and interpolation routines.

The quality of the GPS navigation was controlled on a daily basis by recovering the helicopter flight path.

Checking all data for adherence to specifications was carried out before crew and aircraft demobilization by **GDS**'s geophysicist.

6.0 DATA COMPILATION AND PROCESSING

6.1 Base maps

Base maps of the survey area were plotted from topographic maps of the Department of Natural Resources Canada at a scale of 1:50 000.

Projection description

Datum:	Nad 83
Projection:	Universal Transverse Mercador, UTM Zone 15N
False Easting:	500 000
False Northing:	0
Scale Factor:	0.9996

6.2 Processing of Base Station Data

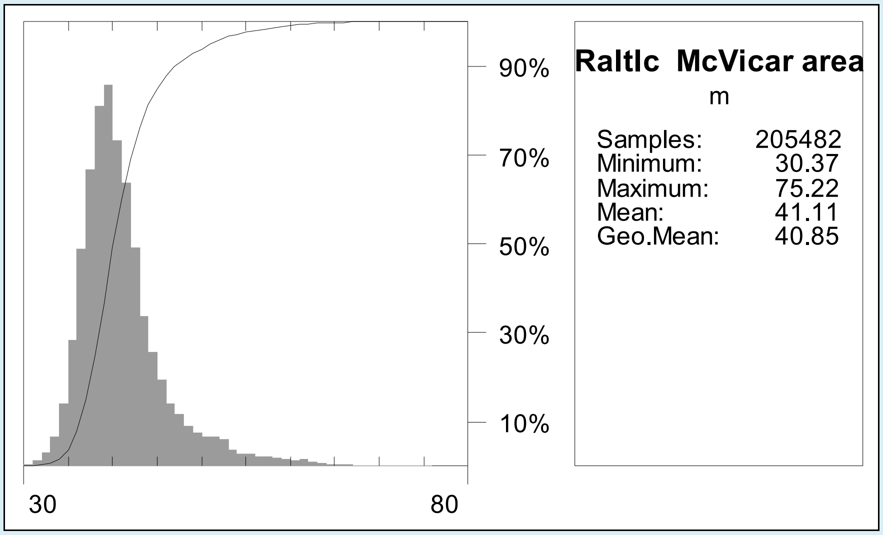
Recorded magnetic diurnal data from the magnetometer base station were reformatted and loaded into the OASIS database. After initial verification of the integrity of the data from statistical analysis, the appropriate portion of the data was selected to correspond to the exact start and end time of the flight. Data were then checked and corrected for spikes using a fourth difference editing routine. Following this, interactive editing of data was done, via a graphic editing tool, to remove events caused by man-made disturbances. A small low pass noise filter (30 seconds) was then applied. Averages of the Total Field Magnetic Intensity measured at the Base Station were 57 512 nT, for the **McVicar** Block, and 55 598 nT for the **Siderock** Block.

6.3 Processing of the Positioning Data (GPS)

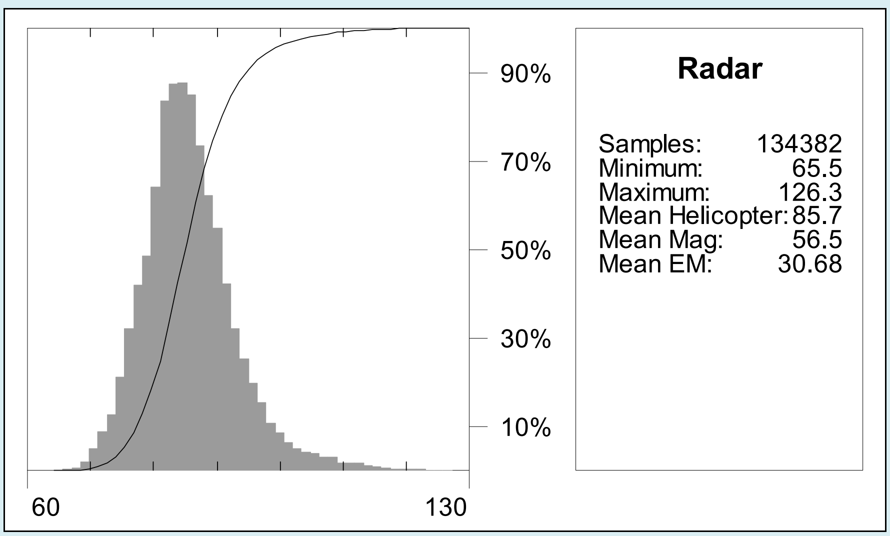
The raw GPS data were recovered and corrected from spikes. The resulting corrected latitudes and longitudes were then converted to the local map projection and datum (Nad83). A point-to-point speed calculation was then done from the final X, Y coordinates and reviewed as part of the quality control. The flight data were then cut back to the proper survey line limits and a preliminary plot of the flight path was done and compared to the planned flight path to verify the navigation. The positioning data were then exported to the other processing files.

6.4 Processing of the Altimeter Data

The altimeter data, which includes the radar altimeter and the GPS elevation values, were checked and corrected for spikes using a fourth difference editing routine. A small low pass filter of 2 seconds was then applied to the data. Following this, a digital terrain trace was computed by subtracting the radar altimeter values from the corrected GPS elevation values. All resulting parameters were then checked, in profile form, for integrity and consistency, using a graphic viewing editor. Aircraft ground clearance was well maintained during this survey (figure 5).



McVicar Block



Siderock Block

Figure 5: Ground Clearance (metres)

6.5 Processing of Magnetic Data

The airborne magnetic data were reformatted and loaded into the OASIS database. After initial verification of the data by statistical analysis, the values were adjusted for system lag. The data were then checked and corrected for any spikes using a fourth difference editing routine and inspected on the screen using a graphic profile display. Interactive editing, if necessary, was done at this stage. Following this, the long wavelength component of the diurnal was subtracted from the data as a pre micro-levelling step. A preliminary grid of the values was then created and verified for obvious problems, such as errors in positioning or bad diurnal. Appropriate corrections were then applied to the data, as required.

6.5.1 Micro-Levelling

Complex airborne datasets acquired on parallel lines often exhibit subtle artefacts in the line direction.

Micro-levelling is used to filter the primary gridded data in order to reduce or remove long-wavelength noise along survey lines, caused by non-geological effects. For this survey, **GDS** used a proprietary micro-levelling technique. It uses modified median filters that are designed to match the statistical nature of geophysical data. Along-line and cross-line directional filters plus clean-up filters are used to isolate and remove this sort of noise from the gridded images. Naudy-type thresholds are used to limit the amplitude of change at any data point.

Once the micro-levelling process is applied, colour-shaded images are studied to verify that the line noise has been minimized, and that new line noise has not been introduced. The micro-level correction grid is reviewed to confirm that no significant geological signal had been lost. The final stage is to sample the correction grid and apply these corrections to the geophysical data profile.

Micro-levelling was applied on both blocks.

6.5.2 Total Magnetic field and First Vertical Derivative Grids

The reprocessed total field magnetic grid was calculated from the final reprocessed profiles by a minimum curvature algorithm. The accuracy standard for gridding was that the grid values fit the profile data to within 0.01 nT for 99.99% of the profile data points. The grid cell size was 25 metres.

Minimum curvature gridding provides the smoothest possible grid surface that also honours the profile line data. However, sometimes this can cause narrow linear anomalies cutting across flight lines to appear as a series of isolated spots.

The first vertical derivative of the total magnetic field was computed to enhance small and weak near-surface anomalies and as an aid to delineate the geologic contacts having contrasting susceptibilities. The calculation was done in the frequency domain, using Win-Trans FFT algorithms.

6.6 Processing of Electromagnetic Data

After initial verification of the integrity of the EM data from statistical analysis, the off-time data from dB/dt Z Coil channels 13-36 were checked and corrected for spikes and lag. Drift correction was applied to each of the channels (13 to 36) using a low order polynomial function, generated from chosen background segments. Afterwards, interactive editing of the profiles was done, via a graphical editing tool, and levelling routines were then applied.

The following off-time profiles were finally plotted: channel 16, channel 20, channel 27, channel 30 and channel 36 along with the interpreted anomalies (figure 6).

Time constant calculation for a line of EM data is based on the impulse/step response at each time fid decays piece-wise exponentially. If the amplitude of the impulse/step response signals at $t = 0$ is A_0, at any further time it can be predicted by:

$$A(t_j) = A_0 e^{-\frac{t_j}{\tau}}$$

where t_j is the window center time (ms) of the j-th time gate, and τ (TAU) is the decay constant. A slow rate of decay, reflecting a high conductivity, will be represented by a high decay constant. For the present datasets, decay constants were calculated by fitting dB/dt Z coil responses from channels 13 to 27 to the exponential function (Ref.: Reford S. and Rainsford D., 2001. Report on Reid-Mahaffy Airborne Geophysical Test Site (2000-2002). Ontario Geological Survey, Geophysical Data Set 1111).

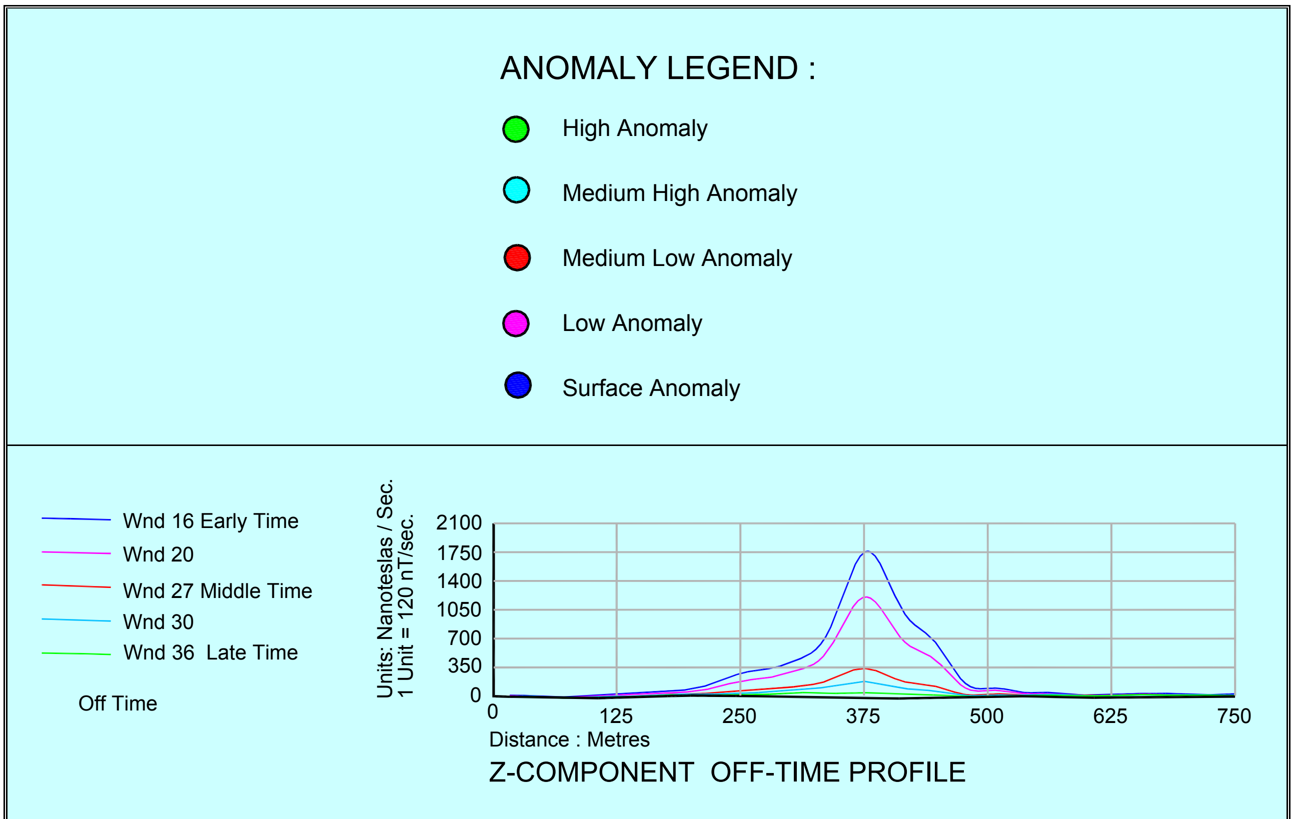


Figure 6: EM Profile and Anomaly Legend

6.7 Processing of Spectrometric Data

6.7.1 Field Processing

The following tests and calibrations were performed prior to survey commencement and during survey flying:

- Compton stripping coefficients;
- aircraft and cosmic backgrounds;
- height attenuation coefficient;
- radioelement sensitivities;
- radon removal parameters.

These calibrations and tests were flown either near the Breckenridge test site or over the survey site, as part of the start-up and monitoring procedures. Details of each test and their results are given in Appendix B.

A periodic AGS test line was performed daily pre- and post flight.

The Airborne Gamma-ray Spectrometric data was subjected to primary quality control, complete data reduction, gridding and imaging in the field during the data acquisition phase.

6.7.2 Office Processing

GDS utilized an ***improved*** methodology for AGS data reduction based on the standard techniques outlined in the following references:

- IAEA-Tecdoc-1363, *Guidelines for radioelement mapping using gamma ray spectrometric data*;
- AGSO Record 1995/60, *A Guide to the Technical Specifications for Airborne Gamma-Ray Surveys*.
- IAEA-TECDOC-1363, "Guidelines for radioelement mapping using gamma ray spectrometry data" (July 2003).

Parameters used for this processing were based on those determined during the calibration and testing phase of the survey (see Appendix B) and on subsequent analysis of the whole AGS data set including background-over-water measurements. Primary AGS data consists of the 1024 channel spectra collected at 1 Hz for both the downward-looking (16.8 litres) and upward-looking (4.2 litres) crystal packs. Major data reduction stages are:

- Analysis of the 1024 channel AGS spectra and applying of in-house specific filters
- Appropriate filtering of auxiliary data (ground clearance, temperature, pressure and cosmic)
- Calculation of effective height (at STP = "Hstp")
- Background removal (aircraft, cosmic and atmospheric radon)
- Compton stripping (spectral unfolding)

- Adjustment for height attenuation
- Conversion to radioelement ground concentrations (TC, K U, TH)
- Gridding and evaluation
- Calculation of derivative products

Each of the radioelement results: total count (TC); potassium (K); uranium (U); and thorium (TH) were evaluated using statistical and image analysis techniques.

6.7.3 Noise Reduction

GDS's personnel have extensive experience with reduction of noise presents on the gamma-ray spectrometric data. Specific in-house filters were applied to both downward and upward 1024 channel spectra in order to reduce statistical noise.

The noise–reduced spectra were then used to extract new TC, K, U and TH and UPU (upward-looking uranium) ROI count rates, which then have less noise than the original raw ROI. For the uranium measurement, in particular, it is possible to achieve a significant reduction in statistical noise.

With this particular pre-processing, we obtain more precise measures of the radioelement ground concentrations, which improve the discrimination between different geologic units with similar concentration values. However, no significant improvement occurs for the total count measurement since it already incorporates a major part of the gamma-ray spectrum. The improved maps or images can reveal patterns and shapes previously hidden or barely discernible in the noise.

6.7.4 Spikes and Corrupted Data Removal

All primary data was edited in the field to eliminate rare instances of spikes and corrupted data points. During data reduction, appropriate filtering was applied to selected AGS fields in order to match measurement parameters to the primary gamma-ray data and/or improve accuracy.

6.7.5 Ground Clearance

Helicopter ground clearance was well maintained during this survey. AGS data is quite sensitive to height of the spectrometer above ground. The effective height at STP (Hstp) is used in data reduction. Note that the mean ground clearance obtained over the **McVicar** block is quite close to the planned survey height of 40 m (figure 5).

6.7.6 Atmospheric Radon Background Removal

The upward-looking detector method was used to remove the effects of atmospheric radon from the downward spectrometer count rates. The determination of the coefficients to be applied in this process, are described in Appendix B. The upward-looking spectrometer measures count rates in a "uranium" ROI.

The atmospheric radon levels, during this survey, fell within the expected range of concentrations.

In order to determine the AGS system response to atmospheric radon, a series of data were collected at survey height over a large lake in the survey area. All measurement points were at least 500 metres from shore, which results in negligible gamma contribution from the land. The background-over-water measurements (BOW) were made under a range of times-of-day and weather conditions in order to encounter a range of atmospheric radon concentrations. The resulting data are analyzed to obtain:

(a) Radon response coefficients for use with the upward-looking radon-removal technique;
(b) An improved estimate of the aircraft background.

6.7.7 Gridding

Total Count, uranium, thorium and potassium contributions were gridded using a minimum curvature algorithm (Oasis Montaj) with controls optimized for AGS data. A grid cell size of 25 metres was used. Tie lines were not included in the gridding process. The grids were evaluated at all stages using image analysis techniques.

7.0 FINAL PRODUCTS

7.1 Maps

GDS made base maps from information present on published topographic maps. Each map was produce at a scale of 1:20 000 and displayed base-map features, flight path and UTM co-ordinates. One paper copy of the following final maps was delivered to **WILDCAT**:

For the McVicar Block:

(a) Shaded Magnetic Total Field (colour interval)
(b) Shaded Magnetic First Vertical Derivative (colour interval)
(c) Gamma-Ray Total-Count
(d) Apparent Potassium-Concentration (%)
(e) Equivalent Thorium-Concentration (ppm)
(f) Equivalent Uranium-Concentration (ppm)
(g) Uranium/Thorium Ratio
(h) Uranium/Potassium Ratio

For the Siderock Block:

(a) Shaded Magnetic Total Field (colour interval)
(b) Shaded Magnetic First Vertical Derivative (colour interval)
(c) ProspecTEM Z-Component Off-Time stacked profiles with EM anomalies picked
(d) Decay constant (TAU) Maps

7.2 Final digital archive of line data

GDS produced three copies of a CD-ROM containing digital archives and maps (PDF and Map formats). Digital archives, described in Appendix A, contain Geosoft databases of all survey data. Databases are referenced to the standard UTM co-ordinates for the area. A list of all EM anomalies was also included on the CD-ROM. **GDS** stored a copy of the digital archive for one year after the production of the final products.

7.3 Miscellaneous

Three paper copies of this technical report, with the corresponding digital PDF file, have been produced and delivered to **WILDCAT**.

8.0 CONCLUSION

Flown on June 11th and 12th, 2011 (**McVicar** Block) and on June 22nd and 23rd, 2011 (**Siderock** Block), the helicopter borne magnetic, spectrometric and electromagnetic survey were completed inside the estimated time frame.

All airborne and ground-based records were of excellent quality.

Magnetic data acquisition was done in good diurnal conditions. The noise level for the measured Total Magnetic Field was well within the accepted limits, determined from the fourth difference of the lagged, edited airborne magnetic data.

The acquisition of the electromagnetic data was done in excellent noise conditions. Final maps and database show that the noise level (sferics) was low on all EM channels.

Acquisition of the Gamma-Ray Spectrometric data was done in excellent weather conditions. Atmospheric radon levels fell within expected range of concentrations. Final maps and database show that noise levels were very low on all the spectrometric channels.

GPS results proved to be of high quality. The flight path was surveyed accurately and speed checks showed no abnormal jumps in the data.

It is hoped that the information presented in this report, and on the accompanying products, will be useful both in planning subsequent exploration efforts and in the interpretation of related exploration data.

Respectfully Submitted,

Camille St-Hilaire, M.Sc.A.
P.Geo.

APPENDIX A

DIGITAL ARCHIVE DESCRIPTION

Magnetic and Spectrometric Channels
McVicar Block

Magnetic and Spectrometric Channel List

Channel	Description	Sampling	Unit	Format
fid	RMS Fiducial	10Hz		d8.1
date	Date flown	10Hz	yyyy/mm/dd	f11.0
flt	Flight number	10Hz		s5.0
line	Line number	10Hz		I6.0
UTC	UTC Time (seconds after midnight) corrected	10Hz	sec	d8.1
lat	Latitude, WGS84	10Hz	dd.mm.ss.s	d13.2
lon	Longitude WGS84	10Hz	dd.mm.ss.s	d14.2
x	X, WGS84 UTM Z21N	10Hz	m	d9.2
y	Y, WGS84 UTM Z21N	10Hz	m	d10.2
z	Z, (MSL)	10Hz	m	d7.2
raltlc	Radar Corrected (final)	10Hz	m	d8.2
DTM	Digital Terrain Model (corrected)	10Hz	m	d7.2
basea	Edited and filtered base mag	10Hz	nT	d10.3
MBc	Tail Raw compensated mag	10Hz	nT	d10.3
MBclc	Tail mag Edited and filtered	10Hz	nT	d10.3
drift_LF	Low-Frequency diurnal correction	10Hz	nT	d10.3
magbc	Mag Diurnal corrected (TMI)	10Hz	nT	d10.3
coralt	Altitude correction	10Hz	nT	d10.3
magalt	Altitude corrected mag	10Hz	nT	d10.3
cormicro	Microlevelling correction	10Hz	nT	d10.3
magmicro	Final mag after all corrections	10Hz	nT	d10.3
pressc	Pressure	1Hz	mBar	d10.1
oatc	Temperature	1Hz	°C	d10.1
Hstp	Effective height	1Hz	m	d7.2
stime	Sample time	1Hz	ms	s8.0
ltime	Live Time	1Hz	ms	s7.0
rawCOS	Raw Cosmic channel	1Hz	cps	s8.0
filCOS	Filtered Cosmic channel (Hanning 35 sec)	1Hz	cps	d8.3
rawspecD	Raw Downward array 256 channels	1Hz	cps	s[256]
rawspecU	Raw Upward array 256 channels	1Hz	cps	s[256]
rawTC	Raw Total Count	1Hz	cps	I8.0
rawK	Raw Potassium	1Hz	cps	I8.0
rawU	Raw Uranium	1Hz	cps	I8.0
rawTH	Raw Thorium	1Hz	cps	I8.0
rawUPU	Raw Up Uranium	1Hz	cps	I8.0
ltcTC	Live-Time Cor. Total Count	1Hz	cps	d10.3
ltcK	Live-Time Cor. Potassium	1Hz	cps	d10.3
ltcU	Live-Time Cor. Uranium	1Hz	cps	d10.3
ltcTH	Live-Time Cor. Thorium	1Hz	cps	d10.3
ltcUPU	Live-Time Cor. Up Uranium	1Hz	cps	d10.3
filTC	Filtered Total Count	1Hz	cps	d10.3

filK	Filtered Potassium	1Hz	cps	d10.3
filU	Filtered Uranium	1Hz	cps	d10.3
filTH	Filtered Thorium	1Hz	cps	d10.3
filUPU	Filtered Up Uranium	1Hz	cps	d10.3
bakTC	Background and Cosmic Cor. Total Count	1Hz	cps	d10.3
bakK	Background and Cosmic Cor. Potassium	1Hz	cps	d10.3
bakU	Background and Cosmic Cor. Uranium	1Hz	cps	d10.3
bakTH	Background and Cosmic Cor. Thorium	1Hz	cps	d10.3
bakUPU	Background and Cosmic Cor. Up Uranium	1Hz	cps	d10.3
rnrTC	Radon Removed Total Count	1Hz	cps	d10.3
rnrK	Radon Removed Potassium	1Hz	cps	d10.3
rnrU	Radon Removed Uranium	1Hz	cps	d10.3
rnrTH	Radon Removed Thorium	1Hz	cps	d10.3
csK	Compton Stripping Potassium	1Hz	cps	d10.3
csU	Compton Stripping Uranium	1Hz	cps	d10.3
csTH	Compton Stripping Thorium	1Hz	cps	d10.3
attTC	Altitude Attenuation Cor. Total Count	1Hz	cps	d10.3
attK	Altitude Attenuation Cor. Potassium	1Hz	cps	d10.3
attU	Altitude Attenuation Cor. Uranium	1Hz	cps	d10.3
attTH	Altitude Attenuation Cor. Thorium	1Hz	cps	d10.3
conTCngyh	Total Count air adsorbed Dose Rate	1Hz	nGgy/h	d10.3
conKper	Potassium Concentration	1Hz	%	d10.3
conUppm	Uranium Concentration	1Hz	ppm	d10.3
conTHppm	Thorium Concentration	1Hz	ppm	d10.3
ratioTHK	Thorium over Potassium Ratio	1Hz	ppm/%	d10.3
ratioUK	Uranium over Potassium Ratio	1Hz	ppm/%	d10.3
ratioUTH	Uranium over Thorium Ratio	1Hz	ppm/ppm	d10.3

Magnetic and Electromagnetic Channels
Siderock Block

EM Channel list

General line information:		
Line		Line number
UTC	Sec	UTC time in second after midnight
Flt		Flight number
Date		Flight date (yyyy/mm/dd)
Edited GPS channels		
X	m	Easting, WGS-84 UTM Z15N
Y	m	Northing, WGS-84 UTM Z15N
Lon	Deg	Longitude, WGS-84
Lat	Deg	Latitude, WGS-84
Z	m	Zgps
Altimeter		
Radar	m	Radar Altimeter
DTMC	m	Digital Terrain Model (from Zgps and Radar)
Electromagnetic Data:		
Wnd1 - 40	nT/s	Raw dB/dt Z Coil Channels 1-40
Wnd13_l - Wnd36_l	nT/s	Lagged dB/dt Z Coil Channels 13-36
Wnd13_ld1f0_tr5f – Wnd36_ld1f0_tr5f	nT/s	Drift-corrected dB/dt Z Coil Channels 13-36
mm13fm0_tr5f – mm36fm0_tr5f	nT/s	Final dB/dt Z Coil Channels 13-36
TAUz13_27us_f	µs	Decay Constant (Tau) from dB/dt Z Channels 13-27
Anomaly		0 – Surface Anomaly (Channels 13-16)
		1 – Low Anomaly (Channels 13-20)
		2 – Medium Low Anomaly (Channels 13-27)
		3 – Medium High Anomaly (Channels 13-30)
		4 – High Anomaly (Channels 13-36)

TAU_SR.grd: Decay Constant (Tau) from dB/dt Z Coil Channels 13-27
EM_SideRock.gdb: Electromagnetic database
Gridding cell size is 25 m

Magnetic Channel List

Channel	Description	Sampling	Unit	Format
Fid	RMS Fiducial	10Hz		d8.1
Date	Date flown	10Hz	yyyy/mm/dd	f11.0
flt	Flight number	10Hz		s5.0
Line	Line number	10Hz		I6.0
UTC	UTC Time (seconds after midnight) corrected	10Hz	sec	d8.1
lat	Latitude, WGS84	10Hz	dd.mm.ss.s	d13.2
lon	Longitude WGS84	10Hz	dd.mm.ss.s	d14.2
x	X, WGS84 UTM Z15N	10Hz	m	d9.2
y	Y, WGS84 UTM Z15N	10Hz	m	d10.2
z	Z, (MSL)	10Hz	m	d7.2
raltlc	Radar Corrected (final)	10Hz	m	d8.2
DTM	Digital Terrain Model (corrected)	10Hz	m	d7.2
basea	Edited and filtered base mag	10Hz	nT	d10.3
MBc	Tail Raw compensated mag	10Hz	nT	d10.3
MBclc	Tail mag Edited and filtered	10Hz	nT	d10.3
drift_LF	Low-Frequency diurnal correction	10Hz	nT	d10.3
magbc	Mag Diurnal corrected (TMI)	10Hz	nT	d10.3
cormicro	Microlevelling correction	10Hz	nT	d10.3
magmicro	Final mag after all corrections	10Hz	nT	d10.3

APPENDIX B

CALIBRATION AND TESTS

Geo Data Solutions GDS Inc.

ALTIMETER CALIBRATION

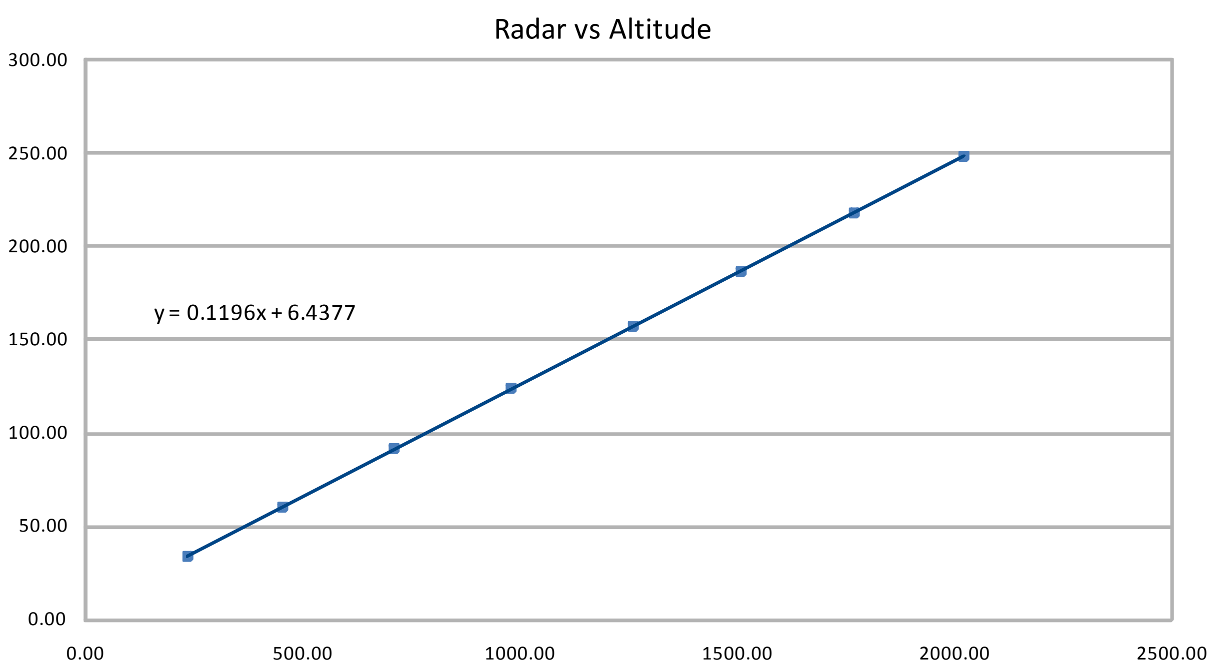
Location: Breckenridge, ON
Pilot: Alain
Operator: Alain

Date: 3-Jun-11
Aircraft: Heli Alain
Compiled by: Carlos Cortada

Antenna Height (m): 2.0

Terrain clearance (ft)	Radar raw (mvolt)	Zgps (m)	Topo (m)	Altitude (m)
100	233.68	99.55	63.66	33.89
200	453.09	126.48	63.65	60.83
300	711.20	157.66	63.68	91.98
400	978.87	189.36	63.65	123.71
500	1259.61	222.69	63.65	157.04
600	1508.63	251.91	63.64	186.27
700	1767.45	283.48	63.65	217.83
800	2020.64	313.89	63.65	248.24

radar(m)= **0.1196** x (mvolt) **+ 6.44**



RADIATION SOLUTIONS INC

CALIBRATION SHEET

Instrument: **RSX-5**

Customer: PROSPECTAIR
Contact:
Console : N/A
Detector 1: 5512
Detector 2: N/A

Date: 5/25/2011
Tech.: R.I
Job Order: SO#
Customer PO PO#

Channels: 1024 **ADC Offset:** N/A

	A1	A2	A3	A4	A5
High Voltages	603	603	630	643	648

Stripping Constant	"this system"	"normal"
Alpha	**0.272**	0.250
Beta	**0.410**	0.400
Gamma	**0.763**	0.810
a	**0.048**	0.060
b	**0.001**	0.000
g	**-0.001**	0.003

ROI#	Channel	IAEA Specification [keV]	Label
1	137-937	410-2810	Total Count
2	457-523	1370-1570	Potassium K
3	553-620	1660-1860	Uranium U
4	803-937	2410-2810	Thorium Th
5			
6			
7			
8	553-620	1660-1860	Uranium Upper U

Det#	Peak Cs	Cs FWHM		Peak Th	Th FWHM
A1					
A2					
A3					
A4					
Sum Dn					
Sum Up					

386 Watline Avenue Mississauga ♦ Ontario Canada L4Z 1X2 ♦ Tel (905) 890 1111 ♦ Fax (905) 890 1964 ♦ e-mail sales@radiationsolutions.ca

BRECKENRIDGE CALIBRATION

Location:	Breckenridge, ON	Date:	3-Jun-11
Operator:	Alain Tremblay	Aircraft:	Heli Alain
Compiled by:	Carlos Cortada	No. Crystal Packs:	1

Temp=	18,0	°C
Pressure=	985,7	kPa
Flt Hight=	45,0	m

Ground Concentration	
TC=	48,774 nGy/h
K=	1,748 %
eU=	1,304 ppm
eTH=	7,420 ppm

Stripping Coeff.			
α=	0,272	a=	0,048
β=	0,410	b=	0,001
γ=	0,763	g=	0,000

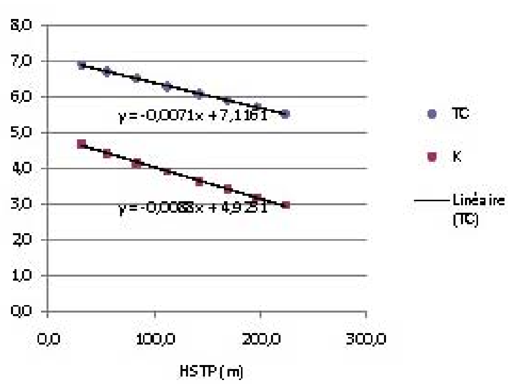
Altimeters (m)		Counts over water (cps)			
Radar	H_{STP}	TC	K	U	TH
34,15	31,35	115,66	13,54	4,29	3,77
60,30	55,36	121,11	13,72	4,75	3,76
91,72	84,03	123,16	14,43	4,89	4,04
123,47	112,99	125,04	14,40	5,02	3,85
156,63	143,02	128,31	14,20	5,39	4,14
185,58	169,15	131,52	14,26	5,74	4,29
216,56	197,03	134,22	14,83	5,78	3,98
248,32	225,71	134,68	14,53	5,61	4,13

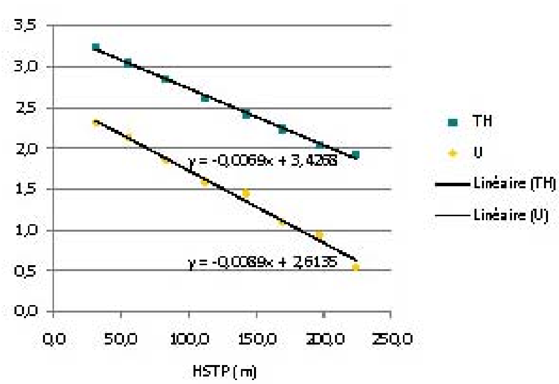
Altimeters (m)		Counts over land (cps)			
Radar	H_{STP}	TC	K	U	TH
34,39	31,44	1120,33	141,16	21,89	29,76
60,63	55,37	951,80	113,34	19,37	25,22
91,50	83,34	798,21	91,07	16,65	21,48
123,51	112,37	671,45	75,60	14,48	17,97
157,09	142,62	569,62	62,07	13,39	15,45
186,87	169,21	496,38	52,88	11,81	13,56
217,83	197,05	440,00	45,00	11,06	11,91
248,11	223,98	389,34	39,53	10,23	11,12

Background vs Altitude

TC=	0,0962	x H_{STP}	+	114,46	cps
K=	0,0050	x H_{STP}	+	13,61	cps
U=	0,0073	x H_{STP}	+	4,25	cps
TH=	0,0020	x H_{STP}	+	3,74	cps

Altimeters (m)		Background corrected & Stripped counts			
Radar	H_{STP}	TC	K	U	TH
34,39	31,44		0,00	0,00	0,00
60,63	55,37		0,00	0,00	0,00
91,50	83,34		0,00	0,00	0,00
123,51	112,37		0,00	0,00	0,00
157,09	142,62		0,00	0,00	0,00
186,87	169,21		0,00	0,00	0,00
217,83	197,05		0,00	0,00	0,00
248,11	223,98		0,00	0,00	0,00





Altitude Attenuation

Coefficients (m^{-1})	
TC	-0,0071
K	-0,0088
U	-0,0089
TH	-0,0069

Ground Concentration

Sensitivity @ 45m	
TC	18,334 cps/nGy/h
K	52,837 cps/%
U	7,025 cps/ppm
TH	3,035 cps/ppm

COSMIC CALIBRATION

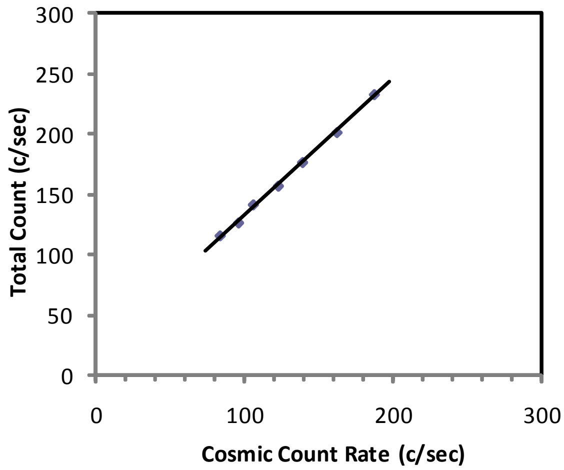
Location: Marathon, ON
Date: 09/06/2011
Operator: Alain
Aircraft: Heli
Compiled by: Carlso Cortada
No. Crystal Packs: 1

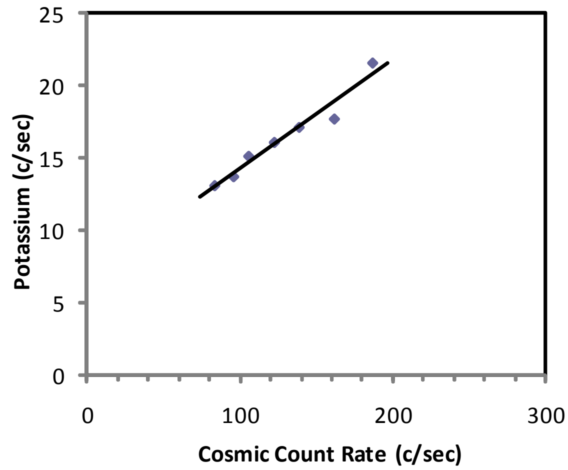
Nominal Elevation (feets)	Z GPS (meters)	COS c/sec	DOWNWARD SPECTROMETER WINDOWS TC c/sec	K c/sec	U c/sec	TH c/sec	UPU c/sec
2000	598.31	83.54	115.71	13.12	4.25	4.10	0.94
3000	905.65	95.91	126.44	13.74	4.41	5.22	1.11
4000	1208.44	105.80	141.53	15.15	5.15	6.29	1.25
5000	1505.46	122.61	157.16	16.11	5.94	6.37	1.74
6000	1811.87	138.85	176.83	17.15	6.79	8.03	1.54
7000	2130.06	161.94	201.74	17.73	8.43	9.95	2.33
8000	2419.96	187.02	233.42	21.60	9.54	11.13	2.54
9000							

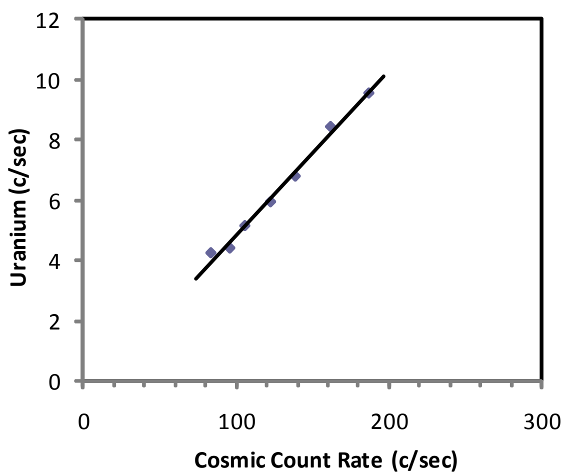
(Data have been livetime corrected, except for Cosmic-counts)

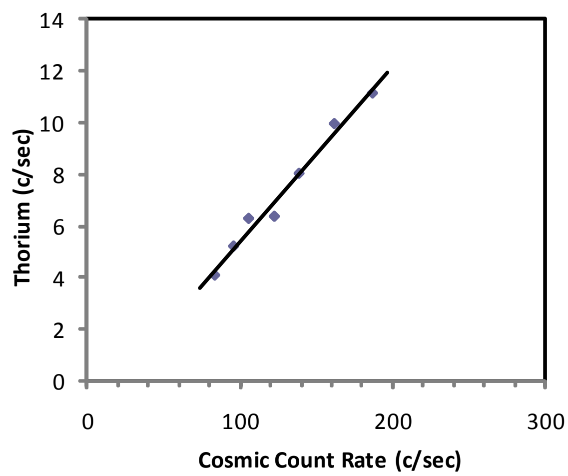
Cosmic Coeff. (c/sec)		Aircraft Background
TC	1.1357	19.369
K	0.0749	6.782
U	0.0541	-0.565
TH	0.0677	-1.359
UPU	0.0159	-0.399

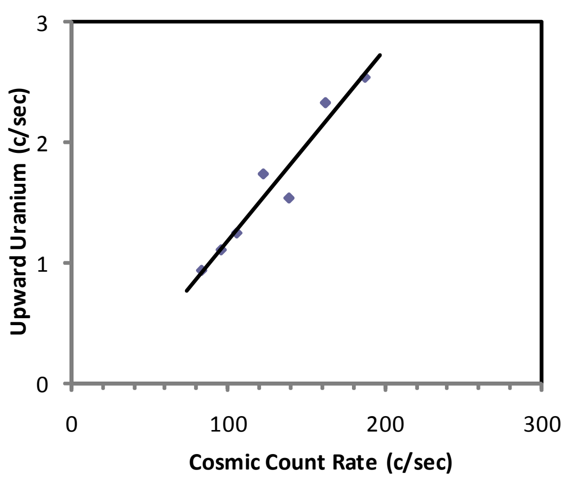
Cosmic Calibration Charts











RADON CALIBRATION

Location:	Survey Area	**Date:**	
Operator:	Alain	**Aircraft:**	Heli
Compiled by:	Carlos Cortada	**No. Crystal Packs:**	1

	TC	K	U	TH	UPU
Cosmic coeff.	1.1357	0.0749	0.0541	0.0677	0.0159
Aircraft BKGD	19.3685	6.7816	-0.5652	-1.3594	-0.3991
Adjusted Aircraft BKGD	23.8916	7.5679	-0.5652	-1.1098	-0.4677

		Background corrected counts (cps)				
Line	**Radar**	**TC**	**K**	**U**	**TH**	**UPU**
80010	32.57	18.050	1.600	1.440	-0.220	0.390
80021	30.42	21.070	1.990	1.050	0.720	0.330
80030	43.44	34.530	2.810	1.970	0.650	0.620
80051	51.11	31.800	2.240	1.760	0.370	0.490
80060	43.37	17.030	1.180	0.450	0.500	0.350
80080	43.28	11.510	1.530	0.320	0.190	-0.120
80101	46.56	7.900	0.610	0.610	0.130	-0.050
80110	37.13	6.260	1.150	0.330	0.270	0.090

Radon Ration	
a_{TC} =	14.1192
a_{K} =	0.8599
a_{TH} =	0.0773
a_{UPU} =	0.3340
All ‘b’ ratios = 0	

Radon Regression Charts **Radon Regression Charts**