GM 64640

HIGH RESOLUTION STINGER MOUNTED MAGNETOMETER AND RADIOMETRIC SURVEY

Report #07059-2

HIGH RESOLUTION STINGER MOUNTED MAGNETOMETER AND RADIOMETRIC SURVEY FOR AREVA QUEBEC INC.

NORTHERN QUEBEC

NTS: 24I/5,6,10-15 and 24P/2,3,5,6,7

Fugro Airborne Surveys Corp.
Mississauga, Ontario

September 19, 2008

SUMMARY

This report describes the logistics, data acquisition and processing of results from a high resolution magnetometer and radiometric airborne geophysical survey carried out for Areva Quebec Inc. over the Cage B block in northern Québec. The area was flown in two phases. The first phase of data acquisition was conducted using one aircraft in August and September of 2007. This second phase of flying used two aircraft in July 2008 and combined with data collected in August and September of 2007 completed the 11466.7 km Cage B block.

The purpose of the survey was to record detailed magnetic and radiometric data over the property that could be used to map the geology and structure of the survey area and highlight potential targets for follow-up. This was accomplished by using high sensitivity cesium magnetometers and 256-channel spectrometers. The information from these sensors was processed to produce maps that display the magnetic and radiometric properties of the survey area. A GPS electronic navigation system ensured accurate positioning of the geophysical data with respect to the base maps.

The survey data were processed and compiled in the Fugro Airborne Surveys Toronto office.

CONTENTS

1. INTRODUCTION

A high resolution magnetic and radiometric survey was started for Areva Quebec Inc., with flying from August 8th to September 9th, 2007, completely covering the Cage A survey block and partially covering the Cage B survey block located in Nunavik, Northern Quebec. The survey areas can be located on NTS map sheets 24I/5,6,10,11,12,13,14,15 and 24P/2,3,5,6,7. The completed Cage A survey data has already been provided to Areva Quebec Inc.

Survey coverage of the Cage B block in 2007 consisted of approximately 2053.2 line-km, including 1077.53 line-km of tie lines. Coverage in 2008 consisted of 9413.5 kms all traverse lines. Flight lines were flown in an azimuthal direction of 45° for the block with a line separation of 150 m. Tie lines were flown orthogonal to the traverse lines for each block with a line separation of 1500 m.

The survey employed the HM1 magnetic system. Ancillary equipment consisted of radar, laser and barometric altimeter, video camera, digital recorders, a 256-channel spectrometer and an electronic navigation system. In 2007 a single system was employed for the duration of the survey with the instrumentation installed in an AS350B type turbine helicopter with the registration C-FDYS provided by Questral Helicopters Inc.. In 2008 two systems were used, both installed in AS350B type turbine helicopters C-FHPC and C-GSMY provided by Expedition Helicopters The helicopters flew at an average airspeed of 110 km/h with a magnetometer sensor height of approximately 50 m

Figure 1: Fugro Airborne Surveys HM1 with AS350B

2. SURVEY OPERATIONS

Survey operations were based in Kangiqsualujjuaq (George River), Nunavik, Northern Quebec for the duration of flying from August 16th to September 9th, 2007 and July 6 to July 17, 2008.

The planned survey area can be located on NTS map sheets 24I/5,6,10-15 and 24P/2,3,5,6,7. The survey blocks are found in UTM Zone 20N coordinate system (Figure 2). Survey flying in 2007 consisted of complete coverage of the Cage_A block and partial coverage of the Cage_B block. Survey flying in 2008 consisted of the completion of the Cage B block.

Table 2-1 lists the corner coordinates of the flight planning for the CAGE_B survey block in NAD83, UTM Zone 20N, central meridian 63°.

TABLE 2-1

Vertex #	Block	X_UTM	Y_UTM
1	**CAGE_B**	387307	6571501
2		390557	6530225
3		396557	6522725
4		394557	6520475
5		395735	6512137
6		383557	6502476
7		371430	6517968
8		368250	6515309
9		354245	6530103
10		352330	6536543

The survey specifications were as follows:

ALL SURVEY BLOCKS

Parameter	Specifications
Traverse line direction	N45°E
Traverse line spacing	150 m
Tie line direction	N135°E
Tie line spacing	1500 m
Sample interval	10 Hz, 3.0 m @ 110 km/h for mag; 1Hz, 30m @ 110 km/h for spectrometry
Aircraft mean terrain clearance	50 m
Mag sensor mean terrain clearance	50 m
Average speed	110 km/h
Navigation (guidance)	±5 m, Real-time GPS
Post-survey flight path	±2 m, Differential GPS

Survey block locations are as follows:

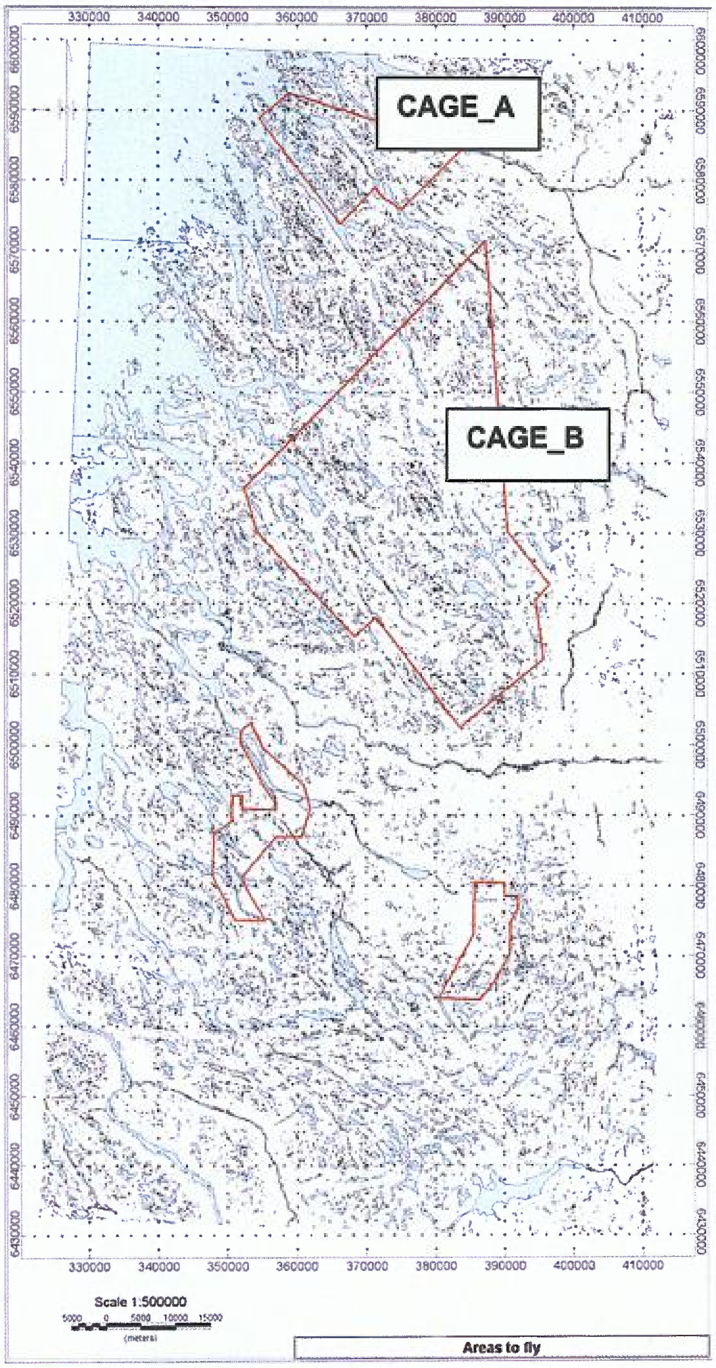


Figure 2
Location Map
Cage Zones and Extensions, Northern Quebec
Job # 07059

3. SURVEY EQUIPMENT

This section provides a brief description of the geophysical instruments used to acquire the survey data and the calibration procedures employed. The geophysical equipment was installed in an AS350B type helicopter. This aircraft provides a safe and efficient platform for surveys of this type.

Airborne Magnetometer

Model:	Fugro D1344 processor with Scintrex CS3 sensor
Type:	Optically pumped cesium vapour
Sensitivity:	0.01 nT
Sample rate:	10 per second

The magnetometer sensor is housed in a stinger mounted on the helicopter.

Magnetic Base Station

There were two magnetic base station setups used for the 2007 portion of this survey. One was located close to the survey blocks and was known as the CAGE_AREVA location. The second was located at the operational base in George River. The base station known as CAGE_AREVA was moved to George River on August 23 to act as the backup base station for the duration of the survey.

Primary – CAGE_AREVA

Model:	GEM Systems GSM-19T
Type:	Digital recording proton precession
Sensitivity:	0.10 nT
Sample rate:	3 second intervals

Primary – George River

Model:	Fugro CF1 base station with timing provided by integrated GPS	
Sensor type:	Scintrex CS-2	
Counter specifications:	Accuracy:	±0.1 nT
	Resolution:	0.01 nT
	Sample rate	1 Hz
GPS specifications:	Model:	Marconi Allstar with CMT-1200 antenna
	Type:	Code and carrier tracking of L1 band, 12-channel, C/A code at 1575.42 MHz
	Sensitivity:	-90 dBm, 1.0 second update
	Accuracy:	Manufacturer's stated accuracy for differential corrected GPS is 2 metres

Environmental Monitor specifications:

Temperature:

- Accuracy: ±1.5°C max
- Resolution: 0.0305°C
- Sample rate: 1 Hz
- Range: -40°C to +75°C

Barometric pressure:

- Model: Motorola MPXA4115A
- Accuracy: ±3.0° kPa max (-20°C to 105°C temp. ranges)
- Resolution: 0.013 kPa
- Sample rate: 1 Hz
- Range: 55 kPa to 108 kPa

Backup – George River

Model:	GEM Systems GSM-19T
Type:	Digital recording proton precession
Sensitivity:	0.10 nT
Sample rate:	3 second intervals

The 2008 portion of the survey featured a magnetic base station and back up located at the George River Airport.

Primary – George River Airport

Model:	Fugro CF1 base station with timing provided by integrated GPS	
Sensor type:	Scintrex CS-2	
Counter specifications:	Accuracy:	±0.1 nT
	Resolution:	0.01 nT
	Sample rate	1 Hz
GPS specifications:	Model:	Marconi Allstar with CMT-1200 antenna
	Type:	Code and carrier tracking of L1 band, 12-channel, C/A code at 1575.42 MHz
	Sensitivity:	-90 dBm, 1.0 second update
	Accuracy:	Manufacturer's stated accuracy for differential corrected GPS is 2 metres

Environmental Monitor specifications:

Temperature:

- Accuracy: ±1.5°C max
- Resolution: 0.0305°C
- Sample rate: 1 Hz
- Range: -40°C to +75°C

Barometric pressure:

- Model: Motorola MPXA4115A
- Accuracy: ±3.0° kPa max (-20°C to 105°C temp. ranges)
- Resolution: 0.013 kPa
- Sample rate: 1 Hz
- Range: 55 kPa to 108 kPa

Backup – George River Airport

Model:	GEM Systems GSM-19T
Type:	Digital recording proton precession
Sensitivity:	0.10 nT
Sample rate:	3 second intervals

A digital recorder is operated in conjunction with the base station magnetometer to record the diurnal variations of the earth's magnetic field. The clock of the base station is synchronized with that of the airborne system, using GPS time, to permit subsequent removal of diurnal drift. There were two magnetic base stations at the start of the 2007 survey operations, at George River and near the survey area at CAGE_AREVA. The magnetic base station location for each of these base station set-ups, in WGS84 LAT/LONG coordinates, was as follows:

Location	Date (2007)	Latitude	Longitude	Height
CAGE_AREVA	Aug 15 – Aug 23	59° 10' 16"N	65° 35' 04"W	50 m
George River	Aug 10 – Sep 9	58° 42' 31"N	66° 59' 25"W	52 m

George River Primary Magnetic Base station setup
Job 07059, 2007

The 2008 portion of the survey had a primary and backup magnetic base station located at the George River Airport. The magnetic base station location for each of these base station set-ups, in WGS84 LAT/LONG coordinates, was as follows:

Location	Date (2007)	Latitude	Longitude	Height

George River Airport primary	July 6 – July 17	58º 42' 31"N	65º 59' 22"W	53.5 m
George River Airport secondary	July 6 – July 17	58º 42' 31"N	65º 59' 25"W	53 m

George River Airport Primary Magnetic Base station setup
Job 07059, 2008

Location	Date (2008)	Latitude	Longitude	Height
George River Airport	July 3 – July 18	58º 42' 31.059"N	65º 59' 21.5826"W	45.3 m

Navigation (Global Positioning System)

Airborne Receiver for Flight Path Recovery and Navigational Guidance

Model:	Novatel OEM4
Type:	Code and carrier tracking of L1-C/A code at 1575.42 MHz and L2-P code at 1227.0 MHz. Dual frequency, 24-channel.
Sample rate:	10 Hz update. 2Hz recording
Accuracy:	Manufacturer's stated accuracy for differential corrected GPS is better than 1 metre.
Antenna:	Mounted on tail of aircraft.

Primary GPS Base Station

Model:	Novatel OEM4
Type:	Code and carrier tracking of L1-C/A code at 1575.42 MHz and L2-P code at 1227.0 MHz. Dual frequency, 24-channel.
Sample rate:	10 Hz update. 2Hz recording
Accuracy:	Manufacturer's stated accuracy for differential corrected GPS is better than 1 metre.

The Novatel OEM4 captured the airborne positional data which were post processed using the base station GPS to provide differentially corrected positional data. The Novatel OEM4 is operated as the primary base station and utilizes time-coded signals from at least four of the twenty-four NAVSTAR satellites. The base station raw XYZ data are recorded, thereby permitting post-survey processing for theoretical accuracy of better than 5 m.

The Novatel OEM4 receiver was coupled with a PNAV navigation system for real-time guidance.

Although the base station receiver is able to calculate its own latitude and longitude, a higher degree of accuracy can be obtained if the reference unit is established on a known benchmark or triangulation point. For the 2007 survey there was one operational base in George River with both a primary and secondary GPS base station setup. The GPS location for each of these base station set-ups, in WGS84 LAT/LONG coordinates, was as follows:

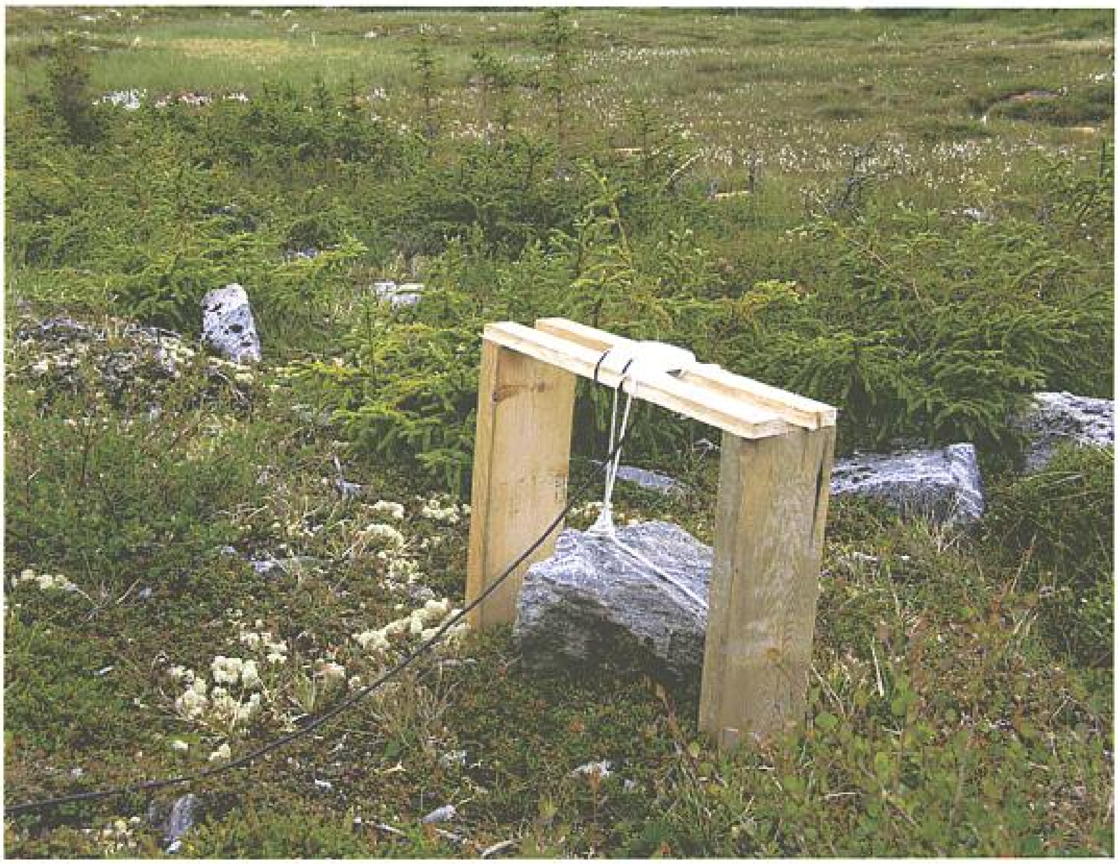
Location	Date (2007)	Latitude	Longitude	Height
George River primary	Aug 10 – Sep 9	58° 42' 31"N	65° 59' 22"W	53.5 m
George River secondary	Aug 10 – Sep 9	58° 42' 31"N	65° 59' 25"W	53 m

The GPS records data relative to the WGS84 ellipsoid, which is the basis of the revised North American Datum (NAD83). Conversion software is used to transform the WGS84 coordinates to the NAD83 UTM system displayed on the maps.

George River Primary GPS base station setup
Job 07059, 2007

The 2008 survey also had the primary GPS base station located at the George River airport. The GPS location for this base station set-up, in WGS84 LAT/LONG coordinates, was as follows:

Location	Date (2007)	Latitude	Longitude	Height
George River primary	Aug 10 – Sep 9	58º 42' 31"N	65º 59' 22"W	53.5 m



George River Primary GPS base station setup
Job 07059, 2008

Location	Date (2008)	Latitude	Longitude	Height
George River Airport	July 3 – July 18	58º 42' 31.059"N	65º 59' 21.5826"W	45.3 m

Radar Altimeter

Manufacturer: Honeywell/Sperry

Model: RT300/AT220

Type: Short pulse modulation, 4.3 GHz

Sensitivity:	0.3 m
Sample rate:	2 per second

The radar altimeter measures the vertical distance between the helicopter and the ground, except in areas of dense trees.

Barometric Pressure and Temperature Sensors

Type:	Motorola MPX4115AP analog pressure sensor AD592AN high-impedance remote temperature sensors	
Sensitivity:	Pressure:	150 mV/kPa
	Temperature:	100 mV/°C or 10 mV/°C (selectable)
Sample rate:	10 per second	

The D1300 circuit is used in conjunction with one barometric sensor and up to three temperature sensors. Three sensors (baro, temp_int and temp_ext) are installed in the data acquisition system in the aircraft, to monitor pressure and internal and external operating temperatures.

Laser Altimeter

Manufacturer:	Optech
Model:	G150
Type:	Fixed pulse repetition rate of 2 kHz

Sensitivity:	±5 cm from 10°C to 30°C ±10 cm from -20°C to +50°C
Sample rate:	2 per second

The laser altimeter is mounted to the helicopter belly, and measures the distance from the helicopter to the ground.

Digital Data Acquisition System

Manufacturer:	Fugro
Model:	HeliDAS
Recorder:	Compact Flash Card

The stored data are downloaded to the field workstation PC at the survey base, for verification, backup and preparation of in-field products.

Compensation System

Manufacturer:	Fugro
Model:	HeliDAS, with fluxgate magnetometer

The presence of the helicopter in close proximity to the sensors causes considerable deviations on the readings. The orientation of the aircraft with respect to the sensors and the motion of the aircraft through the earth's magnetic field are contributing factors.

A special calibration flight is flown to record the information necessary to remove these effects.

The manoeuvre consists of flying a series of calibration lines at high altitude to gain information in each of the required line directions. During this procedure, the pitch, roll and yaw of the aircraft are varied. Each variation is conducted in succession (first vary pitch, then roll, then yaw). This provides a complete picture of the effects of the aircraft at designated headings in all orientations.

The HeliDAS compensation system derives a set of coefficients for each line direction and for each magnetometer sensor. The coefficients can be applied real-time or in a post-processing environment.

Video Flight Path Recording System

<u>2007</u>

Type:	Panasonic WVCD/32 Colour
Recorder:	Panasonic AG720
Format:	Blocked binary digital format with index to allow for extraction of individual JPEG images (.BDX, .BIN files)

<u>2008</u>

Type:	Axis 2420 Digital Network Camera
Recorder:	Axis 241S Video Server and tablet computer

Format:	Blocked binary digital format with index to allow for extraction of individual JPEG images (.BDX, .BIN files)

Fiducial numbers are recorded continuously and are displayed on the margin of each digital image. This procedure ensures accurate correlation of data with respect to visible features on the ground.

Spectrometer

Manufacturer:	Exploranium
Model:	GR-820
Type:	256 Multichannel, Thorium stabilized
Accuracy:	1 count/sec.
Update:	1 integrated sample/sec.

The GR-820 Airborne Spectrometer was coupled with four downward looking crystals (1024 cu.in.- 16.8 L) and one upward looking crystal (256 cu.in.- 4.2 L). The downward crystals record the radiometric spectrum from 410 KeV to 3 MeV over 256 discrete energy windows, as well as a cosmic ray channel which detects photons with energy levels above 3.0 MeV. From these 256 channels, the standard Total Count, Potassium, Uranium and Thorium channels are extracted. The upward crystal is used to measure and correct for Radon.

The shock-protected Sodium Iodide (Thallium) crystal package is unheated, and is automatically stabilized with respect to the Thorium peak. The GR-820 provides raw or Compton stripped data that has been automatically corrected for gain, base level, ADC offset and dead time.

The system is calibrated before and after each flight using three accurately positioned hand-held sources. Additionally, fixed-site hover tests or repeat test lines are flown to determine if there are any differences in background. This procedure allows corrections to be applied to each survey flight, to eliminate any differences that might result from changes in temperature or humidity.

4. QUALITY CONTROL AND IN-FIELD PROCESSING

Digital data for each flight were transferred to the field workstation, in order to verify data quality and completeness. A database was created and updated using Geosoft Oasis Montaj and proprietary Fugro Atlas software. This allowed the field personnel to calculate, display and verify both the positional (flight path) and geophysical data on a screen or printer. Records were examined as a preliminary assessment of the data acquired for each flight.

In-field processing of Fugro survey data consists of differential corrections to the airborne GPS data, spike rejection and filtering of all geophysical and ancillary data, verification of flight videos, diurnal correction, preliminary leveling of magnetic data, and verification of spectrometer source checks and the repeat test line.

All data, including base station records, were checked on a daily basis, to ensure compliance with the survey contract specifications. Reflights were required if any of the following specifications were not met.

Navigation - Digital positioning must be available; PDOP of less than 10 and 4 or more satellites to be available for GPS solution.

Flight Path - No lines to exceed ±30 m departure from planned flight path over a continuous distance of more than 2000 m, except for reasons of safety.

Clearance - Mean terrain sensor clearance of 50 m with altitude deviation from planned clearance not to exceed +/- 15 m over a continuous distance of 2000 m, except where precluded by safety considerations, e.g., restricted or populated areas, severe topography, obstructions, tree canopy, aerodynamic limitations, etc., as decided by the pilot.

Airborne Mag - The typical Figure of Merit for the magnetometer will be no greater than 2.0 nT The non-normalized 4th difference not to exceed 1.6 nT over a continuous distance of 1000 m excluding areas where this specification is exceeded due to natural anomalies. Noise envelope for the magnetometer data not to exceed +/- 0.1 nT over a continuous distance of 2000 m

Base Mag - Diurnal variations not to exceed 10 nT peak to peak over a straight line time chord of 1 minute.

Spectrometer - Resolution of the spectrometer and crystal pack as calculated by FWHM of the Th peak must be better than 7%.

5. DATA PROCESSING

Flight Path Recovery

The raw range data from at least four satellites are simultaneously recorded by both the base and mobile GPS units. The geographic positions of both units, relative to the model ellipsoid, are calculated from this information. Differential corrections, which are obtained from the base station, are applied to the mobile unit data to provide a post-flight track of the aircraft, accurate to within 2 m. Speed checks of the flight path are also carried out to determine if there are any spikes or gaps in the data.

The corrected WGS84 latitude/longitude coordinates are transformed to the coordinate system used on the final maps. Images or plots are then created to provide a visual check of the flight path.

Total Magnetic Field

The magnetic data were corrected to produce a final leveled total field product by the application of the following sequence of procedures:

- Data quality check on the raw and compensated magnetic data
- Lag correction.
- Loading, checking and application of the measured diurnal data.

- Removal of the IGRF
- Leveling of total magnetic field data.

The data quality check was accomplished in the field by applying a fourth difference filter to all raw compensated magnetic data after it had been loaded into the Oasis montaj™ database. Plotting the raw and compensated data together permitted tracking the performance of the magnetometer sensor as well as monitoring the noise levels that were superimposed on the data during survey activities. Magnetometer noise levels were maintained within stated specifications.

The aeromagnetic data from the magnetic sensor was inspected in both grid and profile format. Spikes were removed manually with the aid of a fourth difference calculation and small gaps were interpolated using an Akima spline.

A lag correction was applied to remove the effects of temporal delay inherent in the data acquisition system. A correction 1.5 seconds was applied to data collected in 2007 and a lag correction of 1.4 seconds was applied to the 2008 data from both systems.

The diurnal variations recorded by the base station were edited for any cultural contamination and filtered to remove high-frequency noise. This diurnal magnetic data was then subtracted from the despiked, lagged TMI to provide a first order diurnal correction. For the 2007 flying of CAGE_B,George River CF1 magnetic base station was used as the primary base station. For 2008 flying the George River Airport CF1 magnetic base station was used as the primary base station. Examination of the 2007 and 2008 data gridded together revealed that the2007 flying had 425 nT more removed from it's base station data than did the 2008 flying. A shift of +425nT was applied to the 2007 flying to bring the data to a similar level as the 2008 data.

The diurnal removed magnetic field data were then gridded and compared to a grid of the despiked, lagged magnetic data to ensure that the data quality was improved by diurnal removal.

Once the lagged and diurnal removed grids were created and examined, additional leveling was performed. A Geosoft MAP (Block_B_MAGIGRF_DIFF.MAP) showing the difference between the IGRF removed magnetic field values at the tieline/traverse-line intersection point accompanies this report. The levelling procedure allows for rejection of intersection information in the levelling process, based on criteria of 1) localized magnetic gradients, 2) altitude differences between the tie line data and traverse line data, and 3) amplitude of magnetic differences at the intersection point. There are significant differences in magnetic gradient at intersection points throughout the survey area. Of the 6961 intersections in the area 3443 have gradients in excess of .5nT/m. The altimeter difference at the intersection points can be clearly seen in the accompanying Geosoft MAP (BLOCK_B_ALT_DIFF.MAP) that shows 1140 of the intersections to have traverse/tie altitude differences in excess of 20m. The restriction of intersections by these parameters resulted in more than half of the network being rejected. If the gradient and altitude cutoffs were relaxed the computed corrections included many bad values that introduced errors into the data. After trying several methods for computing the levelling network each with a large range of altitude and gradient cutoffs no tie line levelling network could be created that improved the dataset. For this reason tie line levelling was not applied. Manual adjustments were made to the magnetic data to eliminate the levelling errors and then a procedure known as microleveling was applied. This technique is designed to remove any persistent, low-amplitude component of flight line noise remaining after leveling. A series of directional filters were applied to the magnetic grid to produce a decorrugation "noise" grid. This grid is then re-sampled back into the database where the resultant "noise" channel was filtered to remove any remaining short wavelength responses that could be due to geologic sources. The amplitude of the "noise" channel was also limited to restrict the effect that the microleveling might have on strong geologic response. Finally, the "noise" channel is subtracted from the leveled channel created earlier in the processing sequence, resulting in the final leveled IGRF removed magnetic field channel.

There are several areas in the dataset where the topography changes rapidly and the pilot has been unable to maintain the aircraft height above ground consistently from line to line. Where these altitude differences have occurred in high gradient areas evident differences in magnetic values from line to line are seen. Care has been taken to remove these problems where possible but because the wavelength of these differences can be very short and the amplitudes of the anomalies can be quite high it is difficult to remove them entirely without risking the removal of real geological feature of similar characteristics.

IGRF Removal

The International Geomagnetic Reference Field (IGRF) was calculated at a 1 Hz interval for all survey data based on the flight date, the latitude and longitude of each survey point and the value of the GPS height above the spheroid. The IGRF field was calculated using the

2005 IGRF model and interpolated to 10 Hz before being subtracted from the final lagged, diurnally corrected total magnetic field. The IGRF corrected channel was used in the magnetic levelling procedure. The final levelled magnetics with IGRF removed are archived as MAG_LEV.

Calculated Vertical Magnetic Gradient

The levelled total magnetic field data were subjected to a processing algorithm that enhances the response of magnetic bodies in the upper 500 m and attenuates the response of deeper bodies. The resulting vertical gradient map provides better definition and resolution of near-surface magnetic units. It also identifies weak magnetic features that may not be evident on the total field map. However, regional magnetic variations and changes in lithology may be better defined on the total magnetic field map.

Digital Elevation

The radar altimeter values (ALTR – aircraft to ground clearance) were subtracted from the differentially corrected and de-spiked GPS-Z values to produce profiles of the height above the ellipsoid along the survey lines. These values were gridded to produce contour maps showing approximate elevations within the survey area. Any remaining subtle line-to-line discrepancies were manually removed. After the manual corrections were applied, the digital terrain data were filtered with a microlevelling algorithm .

The accuracy of the elevation calculation is directly dependent on the accuracy of the two input parameters, ALTR and GPS-Z. The ALTR value may be erroneous in areas of heavy tree cover, where the altimeter reflects the distance to the tree canopy rather than the ground. The GPS-Z value is primarily dependent on the number of available satellites. Although post-processing of GPS data will yield X and Y accuracies in the order of 1-2 metres, the accuracy of the Z value is usually much less, sometimes in the ±5 metre range. Further inaccuracies may be introduced during the interpolation and gridding process.

Because of the inherent inaccuracies of this method, no guarantee is made or implied that the information displayed is a true representation of the height above sea level. Although this product may be of some use as a general reference, <u>THIS PRODUCT MUST NOT BE USED FOR NAVIGATION PURPOSES.</u>

Radiometrics

All radiometric data reductions performed by Fugro rigorously follow the procedures described in the IAEA Technical Report[1].

All processing of radiometric data was undertaken at the natural sampling rate of the spectrometer, i.e., one second. The data were not interpolated to match the fundamental 0.1-second interval of the magnetic data.

The following sections describe each step in the process.

Spectrum Stability

In order to monitor spectral drift, the average spectrum for each flight line was examined and peak position analysis was performed on the K, U and Th peaks. The centroid position for each peak is reported to one tenth of a channel and is reviewed according to the radiometric QC requirement of less than one channel change in peak position for the Th peak. The results of this analysis for data from CAGE_B are shown in Appendix D.

---

1 Exploranium, I.A.E.A. Report, Airborne Gamma-Ray Spectrometer Surveying, Technical Report No. 323, 1991. Revised and improved in 2003 : Technical Report no 1363, IAEA, Vienna

Pre-filtering

Four parameters were filtered, but not returned to the database:

- Radar altimeter, pressure and temperature data was processed with a 7-point median filter to remove spikes and then smoothed with a 7-point Hanning filter
- The Cosmic window was smoothed with a 13-point Hanning filter (Cos_f).

Reduction to Standard Temperature and Pressure

The radar altimeter data were converted to effective height (h_e) in metres using the acquired temperature and pressure data, according to the following formula:

$$h_e = h * \frac{273.15}{T + 273.15} * \frac{P}{1013.25}$$

where: *h* is the observed crystal to ground distance in metres

T is the measured air temperature in degrees Celsius

P is the barometric pressure in kilopascals

Statistical Noise Reduction (spectrum smoothing)

Noise reduction of the 256 channel spectrum was carried out using the noise adjusted singular value decomposition (NASVD) method as described by Hovgaard and Grasty, 1997. The resulting spectrum is archived in the final database and windowed data was resampled from the NASVD spectrum for further processing of the downward looking total count, potassium, thorium and uranium regions of interest (ROI).

Live Time Correction

The spectrometer, an Exploranium GR-820, uses the notion of "live time" to express the relative period of time the instrument was able to register new pulses per sample interval. This is the opposite of the traditional "dead time", which is an expression of the relative period of time the system was unable to register new pulses per sample interval.

The GR-820 measures the live time electronically, and outputs the value in milliseconds. The live time correction is applied to the total count, potassium, uranium, thorium, upward uranium and cosmic channels. The formula used to apply the correction is as follows:

$$C_{lt} = C_{raw} * \frac{1000.0}{L}$$

where: C_{lt} is the live time corrected channel in counts per second

C_{raw} is the raw channel data in counts per second

L is the live time in milliseconds

Aircraft and Cosmic Background

Aircraft background and cosmic stripping corrections were applied to the total count, potassium, uranium, thorium and upward uranium channels using the following formula:

$$C_{ac} = C_{lt} - (a_c + b_c * \mathrm{Cos}_f)$$

where: C_{ac} is the background and cosmic corrected channel

C_{lt} is the live time corrected channel

a_c is the aircraft background for this channel

b_c is the cosmic stripping coefficient for this channel

Cos_f is the filtered Cosmic channel

Radon Background

The determination of calibration constants that enable the stripping of the effects of atmospheric radon from the downward-looking detectors through the use of an upward-looking detector is divided into two parts:

1) Determine the relationship between the upward- and downward-looking detector count rates for radiation originating from the ground.

2) Determine the relationship between the upward- and downward-looking detector count rates for radiation due to atmospheric radon.

The procedures to determine these calibration factors are documented in IAEA Report #323 on airborne gamma-ray surveying. The calibrations for the first part were determined as outlined in the report.

The latter case normally requires many over-water measurements where there is no contribution from the ground. Where this is not possible, it is standard procedure to establish a test line over which a series of repeat measurements are acquired. From these repeat flights, any change in the downward uranium window due to variations in radon background would be directly related to variations in the upward window and the other downward windows.

The validity of this technique rests on the assumption that the radiation from the ground is essentially constant from flight to flight. Inhomogeneities in the ground, coupled with deviations in the flight path between test runs, add to the inaccuracy of the accumulated results. Variations in flying heights and other environmental factors also contribute to the uncertainty.

The use of test lines is a common solution for a fixed-wing acquisition platform. The ability of rotary wing platforms to hover at a constant height over a fixed position eliminates a number of the variations which degrade the accuracy of the results required for this calibration.

A test site was established in or near the survey area. The tests were carried out at the start and end of each day, and at the end of each flight. Data were acquired over the test line at the nominal survey altitude (50 m). The data were then corrected for live time, aircraft background and cosmic activity.

Once the survey was completed, the relationships between the counts in the downward uranium window and in the other four windows due to atmospheric radon were determined using linear regression for each of the hover sites. The following equations were used:

$$u_r = a_u Ur + b_u$$

$$K_r = a_K U_r + b_K$$

$$T_r = a_T U_r + b_T$$

$$I_r = a_I U_r + b_I$$

where: u_r is the radon component in the upward uranium window

K_r, U_r, T_r and I_r are the radon components in the various windows of the downward detectors

the various "a" and "b" coefficients are the required calibration constants

In practice, only the "a" constants were used in the final processing. The "b" constants, which are normally near zero for over-water calibrations, were of no value as they reflected the local distribution of the ground concentrations measured in the five windows.

The thorium, uranium and upward uranium data for each line were copied into temporary arrays, then smoothed with 21, 21 and 51 point Hanning filters to product Th_f, U_f, and u_f

respectively. The radon component in the downward uranium window was then determined using the following formula:

$$U_r = \frac{u_f - a_1 * U_f - a_2 * Th_f + a_2 * b_{Th} - b_u}{a_u - a_1 - a_2 * a_{Th}}$$

where: U_r is the radon component in the downward uranium window

u_f is the filtered upward uranium

U_f is the filtered uranium

Th_f is the filtered thorium

a_1, a_2, a_u and a_{Th} are proportionality factors and

b_u and b_{Th} are constants determined experimentally

The effects of radon in the downward uranium are removed by simply subtracting U_r from U_{ac}. The effects of radon in the total count, potassium, thorium and upward uranium are then removed based upon previously established relationships with U_r. The corrections are applied using the following formula:

$$C_{rc} = C_{ac} - (a_c * U_r + b_c)$$

where: C_{rc} is the radon corrected channel

C_{ac} is the background and cosmic corrected channel

U_r is the radon component in the downward uranium window

a_c is the proportionality factor and

b_c is the constant determined experimentally for this channel

Compton Stripping

Following the radon correction, the potassium, uranium and thorium are corrected for spectral overlap. First, α,β and γ the stripping ratios, are modified according to altitude. Then an adjustment factor based on a, the reversed stripping ratio, uranium into thorium, is calculated. (Note: the stripping ratio altitude correction constants are expressed in change per metre. A constant of 0.3048 is required to conform to the internal usage of height in feet):

$$\alpha_h = \alpha + h_{ef} * 0.00049$$

$$\alpha_r = \frac{1.0}{1.0 - a * \alpha_h}$$

$$\beta_h = \beta + h_{ef} * 0.00065$$

$$\gamma_h = \gamma + h_{ef} * 0.00069$$

where: α, β, γ are the Compton stripping coefficients

α_h, β_h, γ_h are the height corrected Compton stripping coefficients

h_{ef} is the height above ground in metres

α_r is the scaling factor correcting for back scatter

a is the reverse stripping ratio

The stripping corrections are then carried out using the following formulas:

$$Th_c = (Th_{rc} - a * U_{rc}) * \alpha_r$$

$$U_c = (U_{rc} - \alpha_h * Th_{rc}) * \alpha_r$$

$$K_c = K_{rc} - \gamma_h * U_c - \beta_h * Th_c$$

where: U_c, Th_c and K_c are corrected uranium, thorium and potassium

$\alpha_h, \beta_h, \gamma_h$ are the height corrected Compton stripping coefficients

U_{rc}, Th_{rc} and K_{rc} are radon-corrected uranium, thorium and potassium

α_r is the backscatter correction

Attenuation Corrections

The total count, potassium, uranium and thorium data are then corrected to a nominal survey altitude, in this case 50 m. This is done according to the equation:

$$C_a = C * e^{\mu(h_0 - h_{ef})}$$

where: C_a is the output altitude corrected channel

C is the input channel

e^{μ} is the attenuation correction for that channel

h_{ef} is the effective altitude

h_0 is the nominal survey altitude to correct to

Conversion to Apparent Radioelement Concentrations

The fully corrected count rate data is used to estimate the concentrations in the ground of each of the three radioelements, potassium, uranium and thorium. The procedure determines the concentrations that would give the observed count rates, if uniformly distributed in an infinite horizontal slab source. Because the U and Th windows actually measure ^{214}Bi and ^{208}Tl respectively, the calculation implicitly assumes radioactive equilibrium in the U and Th decay series. The U and Th concentrations are therefore expressed as equivalent concentrations, eU and eTh. The calculated potassium, uranium and thorium concentrations are determined using the expression:

$$C = N / S \qquad (4.7)$$

where: C is the concentration of element (K%, eU ppm or eTh ppm)

S is he broad source sensitivity for the window, and

N is the count rate for each window, after dead-time, background, stripping and attenuation correction.

Contour, Colour and Shadow Map Displays

The magnetic geophysical data and the digital terrain data are interpolated onto a regular grid using a modified Akima spline technique. The resulting grid is suitable for image processing and generation of contour maps. The grid cell size is 20% of the line interval.

The radiometric geophysical data are interpolated onto a regular grid using a minimum curvature technique. The grid cell size is 25% of the line interval. Resulting grids are resampled to 20% of the line interval to match the final cell size of the magnetic and dem grids.

Colour maps are produced by interpolating the grid down to the pixel size. The parameter is then incremented with respect to specific amplitude ranges to provide colour "contour" maps.

6. PRODUCTS

This section lists the final maps and products that have been provided under the terms of the survey agreement. Other products can be prepared from the existing dataset, if requested.

Base Maps

Base maps of the survey area were produced by scanning published topographic maps to a bitmap (.bmp) format. This process provides a relatively accurate, distortion-free base that facilitates correlation of the navigation data to the map coordinate system. The topographic files will be combined with geophysical data for plotting the final maps. Maps will be created using the following parameters:

Projection Description:

Datum:	NAD83 Canada		
Ellipsoid:	GRS80		
Projection:	UTM (Zone: 20N)		
Central Meridian:	63°		
False Northing:	0		
False Easting:	500000		
Scale Factor:	0.9996		
WGS84 to Local Conversion:	Molodensky		
Datum Shifts:	DX: 0	DY: 0	DZ: 0

All maps include flight lines, contours and topography, unless otherwise indicated. No map products have been produced. Final map products will be prepared at 1:100 000 scale and delivered in HP2500 compatible print file format as well as PDF format.

Final Products

	No. of Map Sets		
	Mylar	Blackline	Colour
Flight Lines		5	
DEM			5
Total Magnetic Field – IGRF removed			5
Radiometrics - Doserate			5
- Potassium (%)			5
- Uranium (eq. ppm)			5
- Thorium (eq. ppm)			5

7. CONCLUSIONS AND RECOMMENDATIONS

This report provides a very brief description of the survey results and describes the equipment, data processing procedures and logistics of the survey.

Respectfully submitted,

FUGRO AIRBORNE SURVEYS CORP.

APPENDIX A

LIST OF PERSONNEL

The following personnel were involved in the acquisition, processing, interpretation and presentation of data, relating to a high resolution magnetometer and radiometric airborne geophysical survey carried out for Areva Quebec Inc..

2007

David Miles	Manager, Helicopter Operations
Emily Farquhar	Manager, Data Processing and Interpretation
Rildo Araujo	Geophysical Operator
Brett Robinson	Field Geophysicist/ Supervisor
Marcio de Souza	Field Geophysicist
Matt Ritchie	Pilot Questral Helicopters
Wayne Keizer	Pilot Questral Helicopters
Stephane Fortin	AME Questral Helicopters
Barry Orme	AME Questral Helicopters
Lyn Vanderstarren	Drafting Supervisor
Susan Pothiah	Word Processing Operator
Albina Tonello	Secretary/Expeditor

2008

David Miles	Manager, Geophysical Projects
Emily Farquhar	Manager, Geophysical Services
Darren James	Geophysical Operator
Varun Mehta	Geophysical Operator
Igor Sram	Field Geophysicist/ Supervisor
Yuri Mironenko	Field Geophysicist/Supervisor
Jean Handfield	Pilot Heli Boreal
Nicolas Chatel	Pilot Heli Boreal
Mark Cusack	Pilot Expedition Helicopters
Davin Landis	Pilot Expedition Helicopters
David Wilson	AME Expedition Helicopters
Thierry Brie	AME Heli Boreal
Lyn Vanderstarren	Drafting Supervisor
Susan Pothiah	Word Processing Operator
Albina Tonello	Secretary/Expeditor

The Cage B portion of the 2007 survey consisted of 2053.2 km of coverage, flown from August 16th to September 9th, 2007. The 2008 portion of the survey consisted of 9413.5 km of coverage flown from July 7 to 16th, 2008.

All personnel are employees of Fugro Airborne Surveys, except as indicated.

APPENDIX B

BACKGROUND INFORMATION

- Appendix B.1 -

BACKGROUND INFORMATION

Magnetic Responses

The measured total magnetic field provides information on the magnetic properties of the earth materials in the survey area. The information can be used to locate magnetic bodies of direct interest for exploration, and for structural and lithological mapping.

The total magnetic field response reflects the abundance of magnetic material in the source. Magnetite is the most common magnetic mineral. Other minerals such as ilmenite, pyrrhotite, franklinite, chromite, hematite, arsenopyrite, limonite and pyrite are also magnetic, but to a lesser extent than magnetite on average.

In some geological environments, an EM anomaly with magnetic correlation has a greater likelihood of being produced by sulphides than one which is non-magnetic. However, sulphide ore bodies may be non-magnetic (e.g., the Kidd Creek deposit near Timmins, Canada) as well as magnetic (e.g., the Mattabi deposit near Sturgeon Lake, Canada).

Iron ore deposits will be anomalously magnetic in comparison to surrounding rock due to the concentration of iron minerals such as magnetite, ilmenite and hematite.

Changes in magnetic susceptibility often allow rock units to be differentiated based on the total field magnetic response. Geophysical classifications may differ from geological classifications if various magnetite levels exist within one general geological classification. Geometric considerations of the source such as shape, dip and depth, inclination of the earth's field and remanent magnetization will complicate such an analysis.

In general, mafic lithologies contain more magnetite and are therefore more magnetic than many sediments which tend to be weakly magnetic. Metamorphism and alteration can also increase or decrease the magnetization of a rock unit.

Textural differences on a total field magnetic contour, colour or shadow map due to the frequency of activity of the magnetic parameter resulting from inhomogeneities in the distribution of magnetite within the rock, may define certain lithologies. For example, near surface volcanics may display highly complex contour patterns with little line-to-line correlation.

Rock units may be differentiated based on the plan shapes of their total field magnetic responses. Mafic intrusive plugs can appear as isolated "bulls-eye" anomalies. Granitic intrusives appear as sub-circular zones, and may have contrasting rings due to contact metamorphism. Generally, granitic terrain will lack a pronounced strike direction, although granite gneiss may display strike.

Linear north-south units are theoretically not well-defined on total field magnetic maps in equatorial regions due to the low inclination of the earth's magnetic field. However, most stratigraphic units will have variations in composition along strike that will cause the units to appear as a series of alternating magnetic highs and lows.

Faults and shear zones may be characterized by alteration that causes destruction of magnetite (e.g., weathering) that produces a contrast with surrounding rock. Structural breaks may be filled by magnetite-rich, fracture filling material as is the case with diabase dikes, or by non-magnetic felsic material.

Faulting can also be identified by patterns in the magnetic total field contours or colours. Faults and dikes tend to appear as lineaments and often have strike lengths of several kilometres. Offsets in narrow, magnetic, stratigraphic trends also delineate structure. Sharp contrasts in magnetic lithologies may arise due to large displacements along strike-slip or dip-slip faults.

Gamma Ray Spectrometry

Radioelement concentrations are measures of the abundance of radioactive elements in the rock. The original abundance of the radioelements in any rock can be altered by the subsequent processes of metamorphism and weathering.

Gamma radiation in the range that is measured in the thorium, potassium, uranium and total count windows is strongly attenuated by rock, overburden and water. Almost all of the total radiation measured from rock and overburden originates in the upper 0.5 metres. Moisture in soil and bodies of water will mask the radioactivity from underlying rock. Weathered rock materials that have been displaced by glacial, water or wind action will not reflect the general composition of the underlying bedrock. Where residual soils exist, they may reflect the composition of underlying rock except where equilibrium does not exist between the original radioelement and the products in its decay series.

Radioelement counts (expressed as counts per second) are the rates of detection of the gamma radiation from specific decaying particles corresponding to products in each radioelements decay series. The radiation source for uranium is bismuth (Bi-214), for thorium it is thallium (Tl-208) and for potassium it is potassium (K-40).

The uranium and thorium radioelement concentrations are dependent on a state of equilibrium between the parent and daughter products in the decay series. Some daughter products in the uranium decay are long lived and could be removed by processes such as leaching. One product in the series, radon (Rn-222), is a gas which can easily escape. Both of these factors can affect the degree to which the calculated uranium concentrations reflect the actual composition of the source rock. Because the daughter products of thorium are relatively short lived, there is more likelihood that the thorium decay series is in equilibrium.

Lithological discrimination can be based on the measured relative concentrations and total, combined, radioactivity of the radioelements. Feldspar and mica contain potassium. Zircon, sphene and apatite are accessory minerals in igneous rocks that are sources of uranium and thorium. Monazite, thorianite, thorite, uraninite and uranothorite are also sources of uranium and thorium which are found in granites and pegmatites.

In general, the abundance of uranium, thorium and potassium in igneous rock increases with acidity. Pegmatites commonly have elevated concentrations of uranium relative to thorium. Sedimentary rocks derived from igneous rocks may have characteristic signatures that are influenced by their parent rocks, but these will have been altered by subsequent weathering and alteration.

Metamorphism and alteration will cause variations in the abundance of certain radioelements relative to each other. For example, alterative processes may cause uranium enrichment to the extent that a rock will be of economic interest. Uranium anomalies are more likely to be economically significant if they consist of an increase in the uranium relative to thorium and potassium, rather than a sympathetic increase in all three radioelements.

Faults can exhibit radioactive highs due to increased permeability which allows radon migration, or as lows due to structural control of drainage and fluvial sediments which attenuate gamma radiation from the underlying rocks. Faults can also be recognized by sharp contrasts in radiometric lithologies due to large strike-slip or dip-slip displacements. Changes in relative radioelement concentrations due to alteration will also define faults.

Similar to magnetics, certain rock types can be identified by their plan shapes if they also produce a radiometric contrast with surrounding rock. For example, granite intrusions will appear as sub-circular bodies, and may display concentric zonations. They will tend to lack a prominent strike direction. Offsets of narrow, continuous, stratigraphic units with contrasting radiometric signatures can identify faulting, and folding of stratigraphic trends will also be apparent.

APPENDIX C

DATA ARCHIVE DESCRIPTION

APPENDIX C

ARCHIVE DESCRIPTION

FUGRO JOB NUMBER.....	07059-2
SURVEY COMPANY.......	Fugro Airborne Surveys Pty Ltd
CLIENT...............	Areva Quebec Inc.
SURVEY TYPE..........	MAG/RADIOMETRICS
AREA NAME............	CAGE_B area, Nunavik, Northern Quebec
DATE FLOWN...........	August 16 to September 9, 2007 and July 7th to July 16th, 2008 from George River

AIRBORNE SURVEY PARAMETERS

LINE SPACING.........	150 m
TIE LINE SPACING.....	1500 m
LINE DIRECTION.......	045 / 225 degrees
TIE LINE DIRECTION...	135 / 315 degrees
TERRAIN CLEARANCE....	50 m nominal
AIRCRAFT.............	AS-350B
AIRCRAFT SPEED.......	30 m/s
POSITIONAL CONTROL...	Post-processed differential GPS used in processing,
DIGITAL RECORDING....	HeliDAS acquisition system

EQUIPMENT SPECIFICATIONS

SAMPLING.............	10 Hz (approximately 3.0 m)
CORRECTIONS..........	The radar altimeter data has been filtered and lagged where necessary for this dataset. The Mag data have been compensated, lagged, diurnally corrected and IGRF removed before manual levelling was applied. Radiometric data has had statistical noise reduce through NASVD, then rewindowed and processed with coefficients determined from test flights. Conversion to concentrations was made with historic calibration coefficients appropriate to platform type and survey altitude.

MAP COORDINATES

MAP PROJECTION.....	UTM Z20N
SPHEROID...........	WGS84
CENTRAL MERIDIAN...	63 degrees west

Output field format : Geosoft database channels
Number of fields : 40

Field	Channel	Sample	Units	Description

		Rate		
1	LINE	0.10		Line No
2	FLT	0.10		Flight No
3	Date	0.10		Flight Date
4	FID	0.10		Fiducial
5	UTC_SSM	0.10		UTC TIME seconds
6	X_UTM	0.10	m	UTME-Z20N
7	Y_UTM	0.10	m	UTMN-Z20N
8	GPS_Z	0.10	m	Height above Spheroid
9	LON_WGS84	0.10	Degrees	LONGITUDE- WGS84
10	LAT_WGS84	0.10	Degrees	LATITUDE - WGS84
11	ALTRAD_MT	0.10	m	Radar Altimeter
12	DTM	0.10	m	Digital Terrain relative to GPS spheroid
13	DIURNAL	0.10	nT	Diurnal Magnetics
14	DIURNAL_COR	0.10	nT	Diurnal Correction
15	DIURNAL_FILT	0.10	nT	Filtered Diurnal Magnetics
16	MAG_RAW	0.10	nT	Raw Total Field Magnetics
17	MAG_COMP	0.10	nT	Compensated Total Field Magnetics
18	MAG_LD	0.10	nT	Lagged, diurnal cor, total field magnetics
19	IGRF	0.10		IGRF
20	RES_MAG	0.10		Leveled total field mag, IGRF removed
21	PRESSURE	0.10	kpa	Air pressure
22	TEMP_EXT	0.10	degrees C	External air temperature
23	EffectiveHeight	0.10	m	Effective hgt for radiometric correction
24	COSMIC	1.00	counts	Cosmic counts
25	LIVE_TIME	1.00	mS	Spectrometer livetime
26	TC_NASVD	1.00	counts	Total count raw NASVD
27	K_NASVD	1.00	counts	Potassium window counts raw NASVD
28	U_NASVD	1.00	counts	Uranium window counts raw NASVD
29	TH_NASVD	1.00	counts	Thorium window counts raw NASVD
30	U_UP	1.00	counts	Upward looking Uranium window raw
31	TC_COR_CPS	1.00	cps	Total count corrected
32	K_COR_CPS	1.00	cps	Potassium window counts corrected
33	U_COR_CPS	1.00	cps	Uranium window counts corrected
34	TH_COR_CPS	1.00	cps	Thorium window counts corrected
35	Doserate	1.00	nGy/h	Doserate from Total Count
36	K_percent	1.00	%	Potassium concentration
37	U_PPM	1.00	ppm	Equivalent Uranium concentration
38	TH_PPM	1.00	ppm	Equivalent Thorium concentration
39	GR820_DOWN			256 channel spectrum, array channel
40	GR820_DOWN_NASVD			NASVD 256 channel spectrum, array

APPENDIX D

TESTS AND CALIBRATIONS

APPENDIX D

TESTS AND CALIBRATIONS 2007
Aircraft Registration C-FDYS
Flights 1045-1090

LAG TEST

A magnetic lag test is flown to calculate the positional lag that develops between the time a reading is made and the time it is recorded in the data. A large metallic body such as railway tracks, a bridge, buildings or a distinct magnetic anomaly is flown over along a single line, at survey altitude, in opposite directions. This allows the time constant value that will line-up the magnetic anomaly peaks or troughs that are produced to be determined. This time shift constant is then applied to the data collected during the survey.
Lag test was flown on Aug 20, 2007. Lag determined for job 07059 is 1.5 seconds. In processing the survey data the lag was later refined to 1.4 seconds.

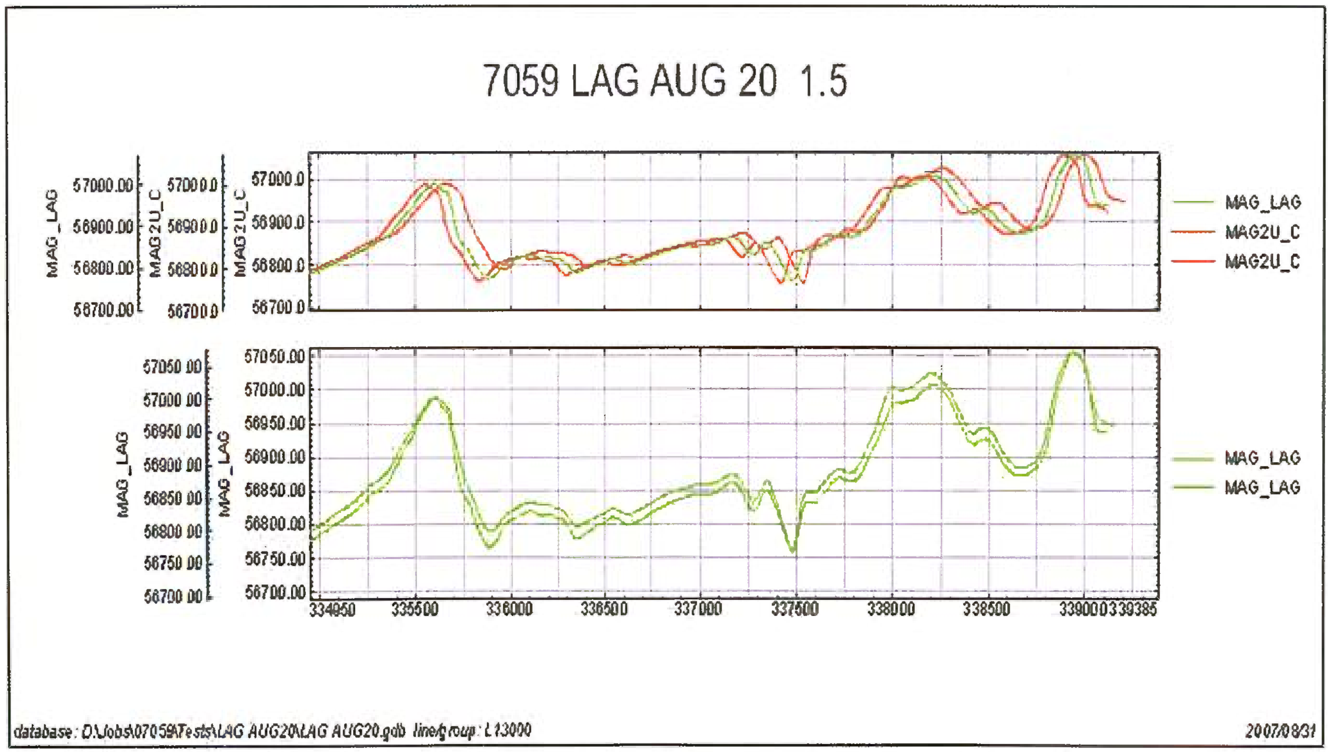


FIGURE OF MERIT

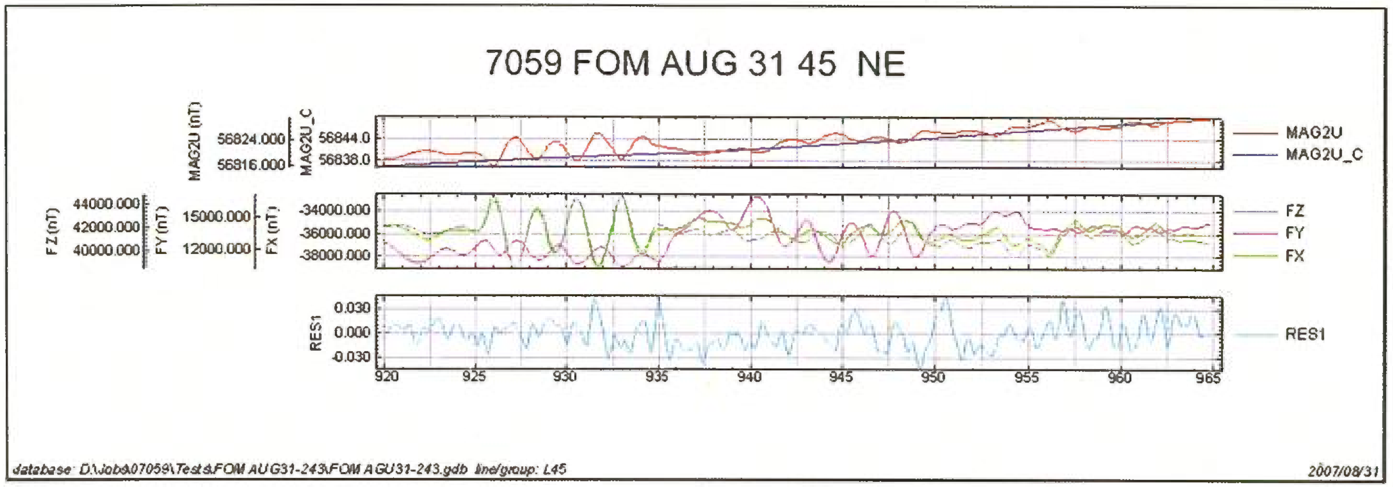
Compensation of magnetic readings is required when the magnetometers are mounted on, or in close proximity to, the aircraft. The aircraft with its metallic parts and surfaces creates secondary magnetic fields while the aircraft moves through the earth's magnetic field. Therefore the compensation calibration test is flown to calculate the effects of the aircraft and its control surfaces on the magnetic field. The test is flown at high altitude, outside the effect of geology on the magnetic readings. The aircraft flies in each of the survey directions performing a series of manoeuvres that moves the aircraft along each of its three axis of rotation. The aircrafts affect on the magnetic data is calculated and then subtracted from the magnetic data collected during the survey.

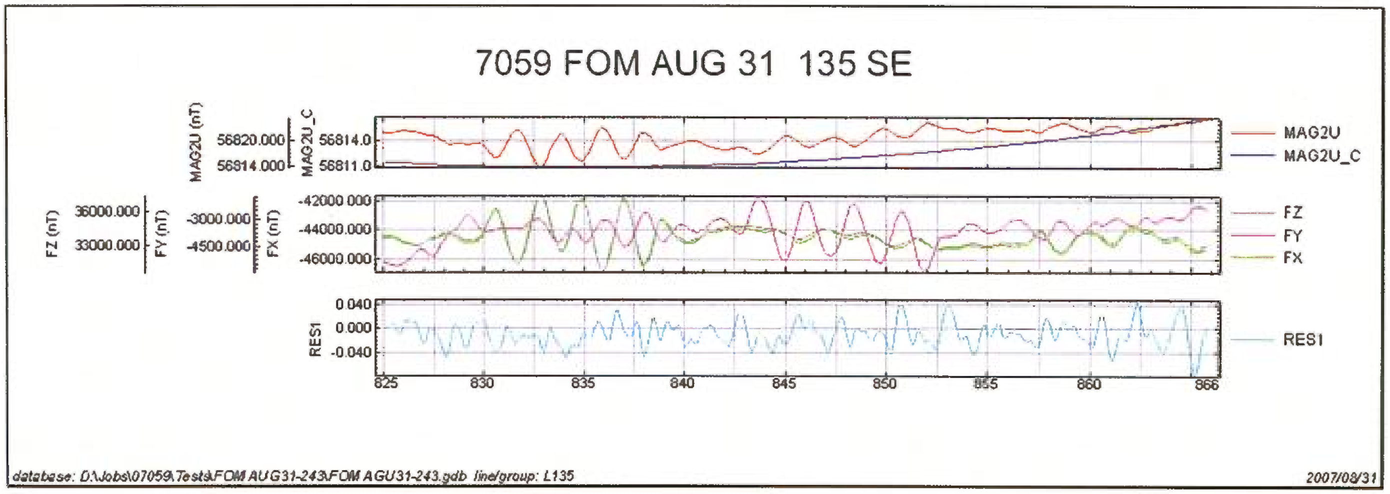
MAGNETIC COMPENSATION CALIBRATION

Number:	07059	**Geosoft Database:**	FOM AUG31-243.gdb
Date Flown:	31-Aug-07	**Helicopter Registration:**	C-FDYS
Flight Number:	70/71	**System Type:**	

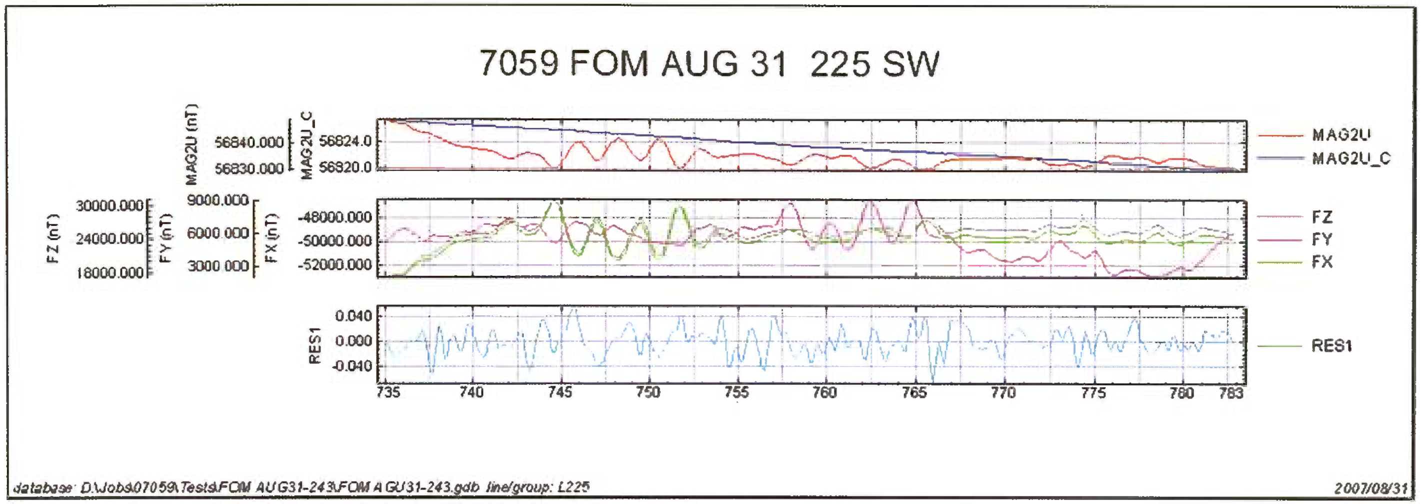
BOX 1	**Sensor Position:**		-	**Pitch**			**Roll**			**Yaw**			**Figure of Merit**
	Raw Mag Channel:		MAG2_U	**Residual Peak to Peak**			**Residual Peak to Peak**			**Residual Peak to Peak**			
	Line Number	**Bearing**	**Ave GPS Height**	**min**	**MAX**	**Total**	**min**	**MAX**	**Total**	**min**	**MAX**	**Total**	
Direction 1:	S1	045		-0.03	0.042	0.072	-0.039	0.027	0.066	-0.021	0.032	0.053	**0.909**
Direction 2:	S1	135		-0.046	0.029	0.075	-0.04	0.04	0.08	-0.053	0.045	0.098	
Direction 3:	S1	225		-0.037	0.055	0.092	-0.034	0.027	0.061	-0.041	0.041	0.082	
Direction 4:	S1	315		-0.038	0.037	0.075	-0.035	0.043	0.078	-0.034	0.043	0.077	

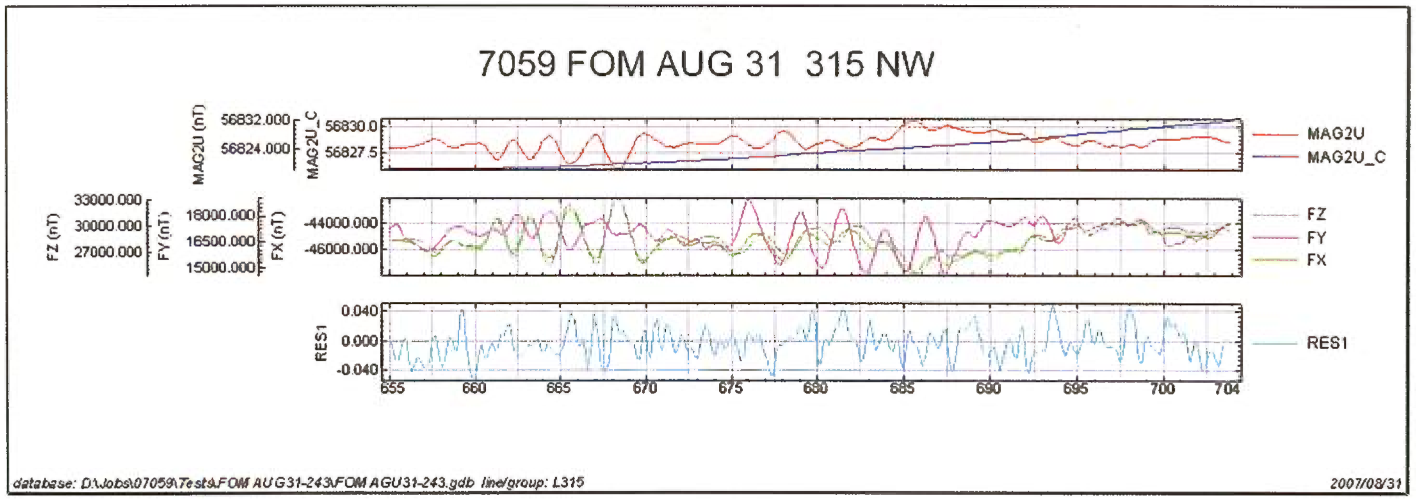
- Appendix D.10





- Appendix D.11





COSMIC / AIRCRAFT BACKGROUND TEST

A cosmic test is conducted to determine both the effects of cosmic radiation and aircraft background radiation on the spectrometer readings. This test is conducted at high altitude, outside the geological effect on the spectrometer data and well above the maximum altitude that will be achieved during survey. The aircraft is flown at a series of altitudes for a set amount of time to minimize statistical error. The effects of altitude on the level of cosmic radiation are calculated and this data is extrapolated to and corrected for in the data collected during the survey.

COSMIC CORRECTION COEFFICENTS

	07059	Heli Registration:	C-FDYS	Spec Pack(s) Serial Number:	2516
Date Flown:	21-AUG-2007	GDB Name:	Cosmic-aug21-233.gdb	Spec Console Type:	-GR820
Flight Number:	1034	Crystal Pack Volume:	- One Crystal Pack 16.8 L Down, 4.2 L Up	Spec Console Serial Number:	8329

LINE	AVERAGE TC_DOWN_COS	Use Data Point	AVERAGE K_DOWN_COS	Use Data Point	AVERAGE U_DOWN_COS	Use Data Point	AVERAGE TH_DOWN_COS	Use Data Point	AVERAGE U_UP_COS	Use Data Point	AVERAGE COSMIC_COS
8000	170.3		11.9		7.2		8.1		2.0		199.4
8500	185.9		12.9		7.9		9.1		2.3		218.7
9000	199.8		13.7		8.5		9.9		2.4		238.3
9500	215.3		15.2		9.1		10.7		2.6		255.9
10000	231.9		15.7		10.2		11.6		2.8		279.0

Summary of Cosmic Correction Coefficents

	Cosmic Stripping (Slope)	Aircraft Background (Intercept)
TC	0.776	15.729
K	0.050	1.843
U	0.037	0.0
Th	0.044	0.0
U Up	0.009	0.0

ALTITUDE ATTENUATION TEST

An altitude attenuation test is conducted to determine the drop off rate of the spectrometer signal with altitude. A test line is flown at several different altitudes and the attenuation, with increased ground clearance, of the various spectral elements is determined. These attenuation factors are applied to the data collected throughout the survey. During processing these factors were refined to those documented in the radiometric processing control file.

ALTITUDE ATTENUATION COEFFICENTS

Job Number:	07059	**Heli Registration:**	C-FDYS	**Spec Pack(s) Serial Number:**	2516
Date Flown:	15-AUG-2007	**GDB Name:**	7059-ATTENUATION AUG15.GDB	**Spec Console Type:**	GR820
Flight Number:	1013	**Crystal Pack Volume:**	One Crystal Pack 16.8 L Down, 4.2 L Up	**Spec Console Serial Number:**	8329

LINE	AVERAGE TC_DOWN_ ATTENCOR	Use Data Point	AVERAGE K_DOWN_ ATTENCOR	Use Data Point	AVERAGE U_DOWN_ ATTENCOR	Use Data Point	AVERAGE TH_DOWN_ ATTENCOR	Use Data Point	AVERAGE EFFECTIVE HEIGHT
100	1028.8		137.6		11.1		25.9		29.5
200	863.9		104.1		11.3		21.6		56.2
300	695.3		74.1		9.7		17.8		83.9
400	572.7		58.6		8.3		14.1		109.5
500	509.1		47.6		8.1		13.4		137.7

Summary of Altitude Attenuation Coefficents (Must Be Negative)	
TC	**-0.00670**
K	**-0.00998**
U	**-0.00571**
Th	**-0.00740**

- Appendix D.14

TEST LINE STATISTICS

DATE	LINE NUMBER	AVERAGE ALTITUDE			VALUE OF CHANNEL AVERAGED ALONG THE TEST LINE						
		ALTRADM	ALTLASM	EFFECTIVE HEIGHT	TC_COR	K_COR	U_COR	Th_COR	U_UP_COR	MAG_LD	Th % dev
14-Aug-07	12007	51.31	71.67	48.027	771.98	75.69	9.67	23.67	1.75	56335.22	-1.78
14-Aug-07	12010	60.46	77.04	56.33	752.49	74.51	9.57	22.76	1.73	56393.17	-5.56
15-Aug-07	12014	52.44	0	47.87	775.84	75.7	9.83	23.11	1.9	56339.76	-4.11
15-Aug-07	12017	63.14	57.49	52.56	782.26	77.91	10.22	23.48	2.08	56335.22	-2.57
19-Aug-07	12023	57.84	53.48	51	766.77	76.84	9.56	23.42	1.79	56338.24	-2.82
19-Aug-07											
20-Aug-07	12029	66.19	74.05	63.35	741.71	73.88	9.01	22.54	1.54	56339.48	-6.47
20-Aug-07	12030	59.28	71.51	56.65	733.13	71.45	9.53	22.04	1.89	56339.65	-8.55
22-Aug-07	12037	56.92	62.99	53.69	774.67	75.85	10.67	22.85	2.27	56333.31	-5.19
22-Aug-07	12040	51.96	72.68	48.29	769.46	77.35	9.89	22.81	1.78	56300.55	-5.35
23-Aug-07	12043	54.54	60.62	50.27	781.92	76.49	10.7	23.50	2.18	56333.89	-2.49
23-Aug-07	12046	47.35	36.27	43.2	790.83	78.66	10.53	23.30	1.9	56334.25	-3.32
24-Aug-07	12049	48.28	49.53	44.33	810.21	79.74	10.85	23.87	2.14	56335.36	-0.95
24-Aug-07	12051	48.71	50.86	44.78	855.05	80.94	14.13	24.10	2.84	56329.91	0.00
27-Aug-07	12054	53.09	55.43	50.58	757.36	75.48	10.1	22.90	1.83	56330.98	-4.98
27-Aug-07	12060	50	57.83	46.24	793.46	79.2	10.91	23.53	2.02	56325.32	-2.37
29-Aug-07	1065	49.86	59.71	46.77	751.39	75.3	9.81	22.71	1.76	56338.05	-5.77
29-Aug-07	1067	48.93	65.46	45.8	794.4	79.53	10.27	24.19	2	56333.96	0.37
03-Sep-07	1076	48.22	50.65	45.39	806.06	80.34	10.82	24.14	2.18	56327.41	0.17
03-Sep-07	1080	48.02	49.59	44.9	802.44	80.17	10.59	24.01	1.91	56337.11	-0.37
04-Sep-07	1083	48.88	49.24	46.9	760.41	76.95	9.57	23.15	1.73	56333.62	-3.94
04-Sep-07											
07-Sep-07	1090	49.99	58.48	48.3	754.16	76.12	9.63	23.07	1.84	56336.51	-4.27
07-Sep-07	1092	48.53	71.91	46.86	772.64	77.37	10.37	22.67	1.92	56331.9	-5.93

- Appendix D.15

SOURCE CHECK STATISTICS C-FDYS

Check #	Date	AM / PM	U Cnts	U Ave	U % Dev	Th Cnts	Th Ave	Th % Dev	Cs Peak	Cs Res
1	14-Aug-07	AM	2374	-	#VALUE!	4291	-	-	0.0	0.0%
2	14-Aug-07	PM	2038	2206	-7.62	4044	4168	-2.96	0.0	0.0%
3	15-Aug-07	AM	2189	2200	-0.52	4317	4217	2.36	0.0	0.0%
4	15-Aug-07	PM	1931	2133	-9.47	3949	4150	-4.85	0.0	0.0%
5	19-Aug-07	AM	1982	2103	-5.74	4077	4136	-1.42	54.7	8.6%
6	19-Aug-07	PM	1989	2084	-4.55	4100	4130	-0.72	0.0	0.0%
7	20-Aug-07	AM	2051	2079	-1.35	4006	4112	-2.58	54.7	8.6%
8	20-Aug-07	PM	2018	2072	-2.58	3994	4097	-2.52	0.0	0.0%
9	23-Aug-07	AM	1973	2061	-4.25	3864	4071	-5.09	54.8	8.9%
10	23-Aug-07	PM	2037	2058	-1.03	3777	4042	-6.55	0.0	0.0%
11	24-Aug-07	AM	1959	2049	-4.40	4032	4041	-0.22	54.9	8.7%
12	24-Aug-07	PM	2092	2053	1.91	3988	4037	-1.20	0.0	0.0%
13	27-Aug-07	AM	2096	2056	1.94	4125	4043	2.02	54.6	8.6%
14	27-Aug-07	PM	2024	2054	-1.45	4244	4058	4.59	54.9	8.7%
15	29-Aug-07	AM	2165	2061	5.04	4215	4068	3.61	54.7	8.6%
16	29-Aug-07	PM	2047	2060	-0.65	4121	4072	1.22	54.7	8.6%
17	3-Sep-07	AM	2002	2057	-2.67	4044	4070	-0.64	54.6	8.9%
18	3-Sep-07	PM	1970	2052	-4.00	3944	4063	-2.93	54.9	8.8%
19	4-Sep-07	AM	2045	2052		4080	4064	0.40	54.8	8.6%
20	4-Sep-07	PM	2037	2051	-0.68	4199	4071	3.16	54.8	8.7%

RESULTS OF PEAK ANALYSIS FOR CAGE_B DATASET C-FDYS

InputSpectrum = GR820_DOWN
PEAK CENTROID POSITION AND RESOLUTION

Line/Flt	CentroidK	ResK	CentroidU	ResU	CentroidTh	ResTh
L20010:1050	122.284	6.459	148.281	5.411	218.556	5.328
L20020:1050	122.298	6.464	148.283	5.413	218.567	5.335
L20030:1065	122.276	6.453	148.335	5.362	218.552	5.324
L20031:1065	122.276	6.453	148.335	5.362	218.552	5.324
L20032:1077	122.218	6.468	148.242	5.430	218.526	5.275
L20040:1065	122.282	6.455	148.335	5.364	218.555	5.324
L20050:1066	122.302	6.447	148.452	5.279	218.563	5.329
L20060:1066	122.299	6.450	148.435	5.294	218.564	5.331
L20070:1066	122.300	6.454	148.363	5.349	218.564	5.333
L20080:1066	122.295	6.453	148.363	5.348	218.563	5.334
L20090:1067	122.278	6.449	148.361	5.344	218.554	5.325
L20100:1067	122.289	6.450	148.365	5.344	218.559	5.331
L20110:1067	122.299	6.450	148.434	5.294	218.565	5.335
L20120:1067	122.296	6.450	148.427	5.297	218.564	5.334
L20130:1077	122.260	6.452	148.287	5.403	218.545	5.319
L20140:1077	122.266	6.461	148.270	5.417	218.548	5.320
L20150:1083	122.286	6.445	148.433	5.284	218.554	5.322
L20160:1083	122.285	6.448	148.374	5.334	218.554	5.324
L20170:1083	122.285	6.446	148.435	5.284	218.554	5.321
L20180:1083	122.280	6.445	148.380	5.328	218.551	5.321
L20190:1084	122.280	6.433	148.503	5.223	218.548	5.311
L20230:1090	122.229	6.449	148.285	5.402	218.533	5.301
L20240:1090	122.229	6.449	148.285	5.402	218.533	5.301
L20241:1090	122.242	6.436	148.363	5.332	218.540	5.314

TESTS AND CALIBRATIONS 2008-08-26
Aircraft Registration C-FHPC
Flights 23011-23060

LAG TEST

A magnetic lag test is flown to calculate the positional lag that develops between the time a reading is made and the time it is recorded in the data. A large metallic body such as railway tracks, a bridge, buildings or a distinct magnetic anomaly is flown over along a single line, at survey altitude, in opposite directions. This allows the time constant value that will line-up the magnetic anomaly peaks or troughs that are produced to be determined. This time shift constant is then applied to the data collected during the survey.
Lag test was flown on July 5, 2008. Lag determined for job C_FHPC is 1.7 seconds. In processing the survey data the lag was confirmed as 1.7 seconds.

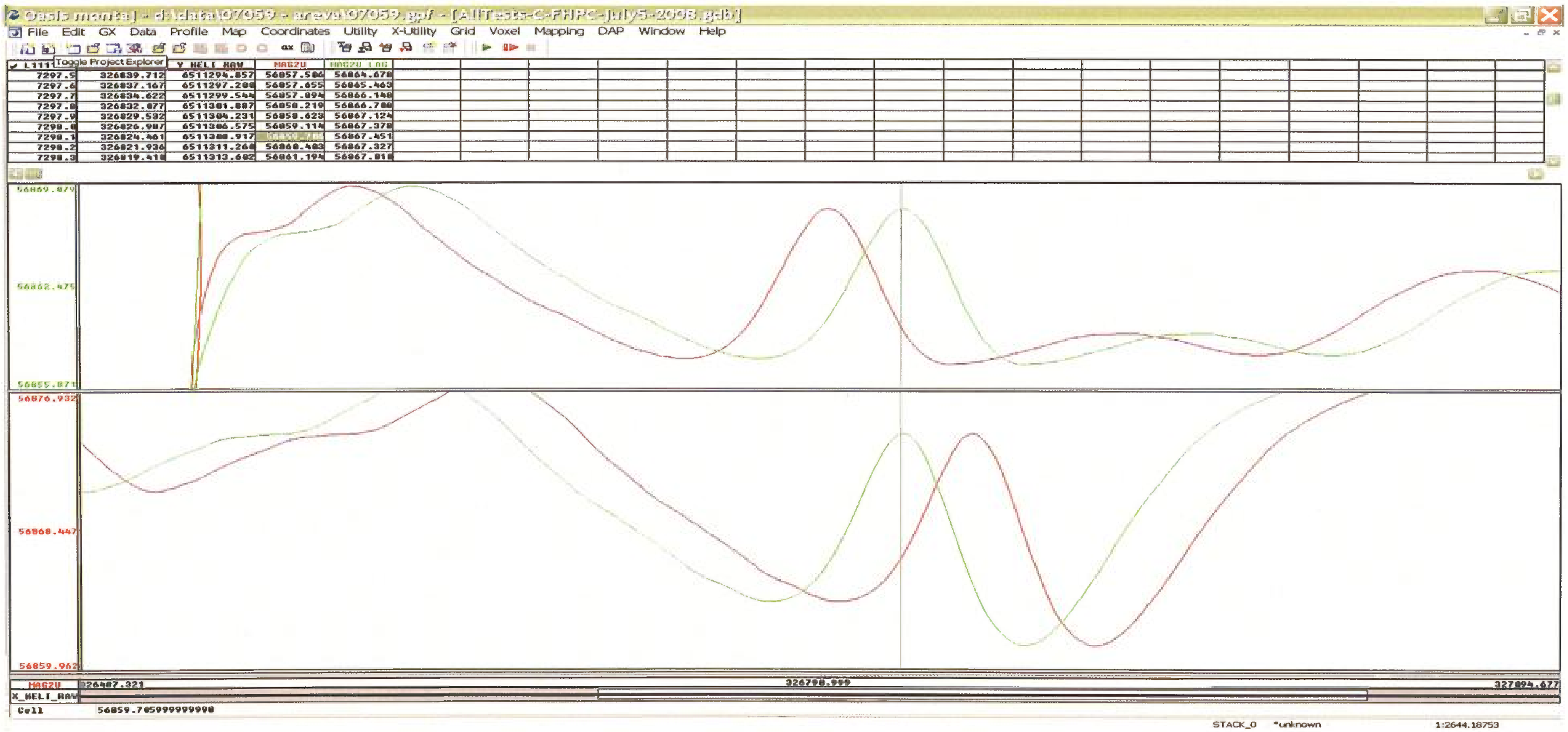


FIGURE OF MERIT

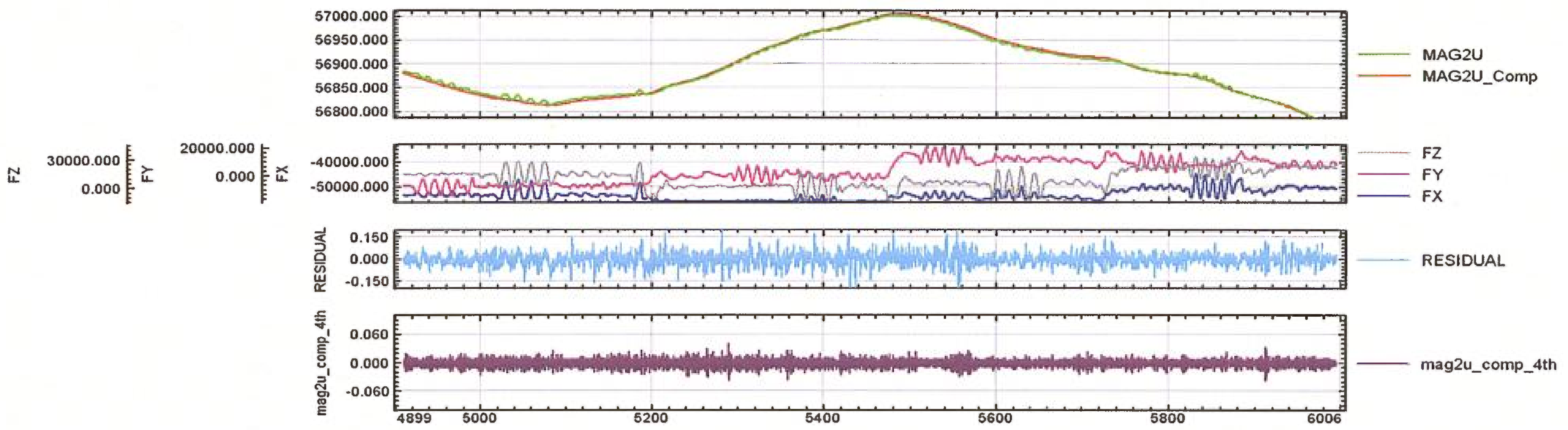
Compensation of magnetic readings is required when the magnetometers are mounted on, or in close proximity to, the aircraft. The aircraft with its metallic parts and surfaces creates secondary magnetic fields while the aircraft moves through the earth's magnetic field. Therefore the compensation calibration test is flown to calculate the effects of the aircraft and its control surfaces on the magnetic field. The test is flown at high altitude, outside the effect of geology on the magnetic readings. The aircraft flies in each of the survey directions performing a series of manoeuvres that moves the aircraft along each of its three axis of rotation. The aircrafts affect on the magnetic data is calculated and then subtracted from the magnetic data collected during the survey.

MAGNETIC COMPENSATION CALIBRATION

Job Number:	7059	**Geosoft Database:**	alltests-c-fhpc-july5-2008.gdb
Date Flown:	5-Jul	**Helicopter Registration:**	C-FHPC
	23008	**System Type:**	Stinger/Spec

BOX 1			In Stinger	Pitch			Roll			Yaw			Figure of Merit
		Raw Mag Channel:	MAG2U	**Residual Peak to Peak**			**Residual Peak to Peak**			**Residual Peak to Peak**			
	Line Number	**Bearing**	**Ave GPS Height**	**min**	**MAX**	**Total**	**min**	**MAX**	**Total**	**min**	**MAX**	**Total**	
Direction 1:	4444.00	045	3240	-0.09	0.05	0.14	-0.10	0.09	0.19	-0.10	0.07	0.16	1.52
Direction 2:	4444.00	135	3240	-0.09	0.14	0.23	-0.07	0.06	0.12	-0.12	0.06	0.17	
Direction 3:	4444.00	225	3240	-0.09	0.09	0.18	-0.05	0.06	0.11	-0.06	0.10	0.15	
Direction 4:	4444.00	315	3240	-0.07	0.06	0.13	-0.05	0.06	0.11	-0.08	0.08	0.17	

Compensation Flight - C-FHPC (July 5 2008)



database: D:\DATA\07059 - Areva\07059\Tests\TestFlight-C-FHPC-July5-2008\AllTests-C-FHPC-july5-2008.gdb line/group: L4444 *2008/07/09*

COSMIC / AIRCRAFT BACKGROUND TEST

A cosmic test is conducted to determine both the effects of cosmic radiation and aircraft background radiation on the spectrometer readings. This test is conducted at high altitude, outside the geological effect on the spectrometer data and well above the maximum altitude that will be achieved during survey. The aircraft is flown at a series of altitudes for a set amount of time to minimize statistical error. The effects of altitude on the level of cosmic radiation are calculated and this data is extrapolated to and corrected for in the data collected during the survey.

COSMIC CORRECTION COEFFICENTS

Job Number:	7059	Heli Registration:	C-FHPC	Spec Pack(s) Serial Number:	
Date Flown:	5-Jul	GDB Name:	AllTests-F-FHPC-july5-2008	Spec Console Type:	GR820
Flight Number:	23008	Crystal Pack Volume:	One Crystal Pack 16.8 L Dc	Spec Console Serial Number:	

LINE	AVERAGE TC_DOWN_COS	Use Data Point	AVERAGE K_DOWN_COS	Use Data Point	AVERAGE U_DOWN_COS	Use Data Point	AVERAGE TH_DOWN_COS	Use Data Point	AVERAGE U_UP_C	Use Data Point	AVERAGE COSMIC_COS
6000	154.92188	☑	10.38283	☑	6.30997	☑	7.25378	☑	1.85756	☑	164.20862
6500	163.94431	☑	11.06060	☑	7.20929	☑	7.65310	☑	1.92082	☑	177.66223
7000	175.77463	☑	11.99191	☑	7.77903	☑	8.17908	☑	2.04058	☑	193.09845
8000	201.43953	☑	13.57191	☑	8.65861	☑	9.55551	☑	2.41479	☑	226.40975
9000	229.36878	☑	15.09100	☑	9.78337	☑	10.89496	☑	2.74613	☑	266.29917
9500	244.28180	☑	16.04061	☑	10.56802	☑	11.72300	☑	2.94535	☑	288.90147
10000	263.05546	☑	17.12368	☑	11.69266	☑	12.26374	☑	3.18244	☑	310.37962

Summary of Cosmic Correction Coefficents		
	Cosmic Stripping (Slope)	Aircraft Background (Intercept)
TC	0.73310	34.29380
K	0.04504	3.14098
U	0.03342	1.09020
Th	0.03533	1.43435
U Up	0.00920	0.30522

ALTITUDE ATTENUATION TEST

An altitude attenuation test is conducted to determine the drop off rate of the spectrometer signal with altitude. A test line is flown at several different altitudes and the attenuation, with increased ground clearance, of the various spectral elements is determined. These attenuation factors are applied to the data collected throughout the survey. During processing these factors were refined to those documented in the radiometric processing control file.

ALTITUDE ATTENUATION COEFFICENTS

Job Number:	7059	Heli Registration:	C-FHPC	Pack(s) Serial Number:	
Date Flown:	5-Jul	GDB Name:	AllTests-F-FHPC-july5-200	Spec Console Type:	GR820
Flight Number:	23008	Crystal Pack Volume:	One Crystal Pack 16.8 L D	Console Serial Number:	

LINE	AVERAGE TC_DOWN_ ATTENCOR	Use Data Point	AVERAGE K_DOWN_ ATTENCOR	Use Data Point	AVERAGE U_DOWN_ ATTENCOR	Use Data Point	AVERAGE TH_DOWN_ ATTENCOR	Use Data Point	AVERAGE EFFECTIVE HEIGHT
100	997.13202	☑	137.18822	☑	8.58534	☑	24.63010	☑	104.84861
150	896.60831	☑	117.51365	☑	7.41320	☑	22.28316	☑	151.47644
200	765.53770	☑	93.42294	☑	6.23684	☑	18.50532	☑	201.39433
250	675.77890	☑	80.04672	☑	4.02842	☑	16.73635	☑	246.15345
300	622.01946	☑	69.35291	☑	3.70268	☑	16.37557	☑	292.89620
350	564.65340	☑	58.67748	☑	3.27220	☑	14.63793	☑	339.22700
400	506.21022	☑	51.92888	☑	3.02875	☑	13.46525	☑	385.58820
450	454.27849	☑	43.71814	☑	2.17949	☑	13.37992	☑	429.50099
500	411.94355	☑	38.11281	☑	2.37509	☑	11.00636	☑	490.11064

Summary of Altitude Attenuation Coefficents (Must Be Negative)	
TC	-0.00232
K	-0.00337
U	-0.00367
Th	-0.00195

TEST LINE STATISTICS

DATE	LINE NUMBER	AVERAGE ALTITUDE			VALUE OF CHANNEL AVERAGED ALONG THE TEST LINE						PERCENTAGE DIFFERENCES FROM BASE VALUE OF EACH TEST LINE					
		ALTRADM	ALTLASM	EFFECTIVE HEIGHT	TC_COR	K_COR	U_COR	Th_COR	U_UP_COR	MAG_LD	TC % dev	K % dev	U % dev	Th % dev	U_UP % dev	MAG % dev
09-Jul-08	9075	55.93	55.41	52.75	738.97	73.93	9.14	21.10	1.44	56718.53	-14.74	-17.01	-22.90	-13.43	-27.54	0.00
	9076	48.43	48.25	45.85	820.57	82.27	11.70	23.35	1.94	56718.39	-5.32	-7.65	-1.32	-4.19	-2.18	0.00
10-Jul-08	1075	42.33	43.72	40.16	840.81	85.50	11.11	23.97	1.95	56659.79	-2.99	-4.03	-6.25	-1.64	-1.50	-0.10
	1076	52.50	52.41	49.64	787.40	76.81	11.53	22.35	1.68	56704.24	-9.15	-13.78	-2.75	-8.29	-15.25	-0.03
	1077	47.26	46.88	44.59	803.11	80.89	10.31	22.72	1.61	56714.64	-7.34	-9.20	-13.02	-6.78	-18.70	-0.01
	1078	63.72	63.83	60.53	837.14	85.76	11.85	23.43	1.78	56688.08	-3.41	-3.73	0.00	-3.85	-10.31	-0.05
11-Jul-08	1175	54.59	54.51	52.08	807.92	81.06	11.37	23.27	1.81	56681.34	-6.78	-9.01	-4.08	-4.52	-8.64	-0.07
	1176	45.61	45.31	43.45	820.83	83.35	10.74	22.87	1.85	56715.08	-5.29	-6.44	-9.41	-6.17	-6.74	-0.01
12-Jul-08	231201	54.97	54.57	90.02	794.78	80.90	10.47	22.19	1.72	56717.17	-8.30	-9.19	-11.64	-8.96	-13.22	0.00
	231202	41.85	41.87	60.90	869.97	90.85	11.46	24.03	1.99	56713.81	0.38	1.98	-3.30	-1.41	0.35	-0.01
13-Jul-08	231301	45.43	44.94	52.86	847.83	84.40	11.03	24.34	1.96	56715.94	-2.18	-5.26	-6.94	-0.13	-1.24	0.00
14-Jul-08	231401	58.67	58.38	128.04	827.89	85.47	11.21	23.69	1.62	56712.39	-4.48	-4.06	-5.46	-2.80	-18.48	-0.01
	231402	44.89	44.68	73.26	866.66	89.21	12.33	24.38	2.00	56720.44	-0.01	0.14	4.00	0.05	0.89	0.00
	231403	49.13	48.76	61.98	834.39	83.86	12.46	23.08	2.25	56713.50	-3.73	-5.86	5.08	-5.29	13.43	-0.01
16-Jul-08	231601	48.02	48.36	69.88	866.77	88.96	11.05	25.09	1.95	56713.71	0.01	-0.14	-6.81	2.94	-1.68	-0.01
	231602	49.27	50.26	68.47	836.89	85.03	11.48	23.49	1.72	56721.33	-3.44	-4.55	-3.16	-3.62	-13.26	0.01
17-Jul-08	231701	44.42	44.90	56.32	875.16	87.27	11.49	24.23	2.14	56713.45	0.97	-2.04	-3.06	-0.59	8.00	-0.01
	231702	47.60	48.39	61.92	842.04	86.51	11.44	24.39	1.87	56717.24	-2.85	-2.89	-3.52	0.08	-5.40	0.00

- Appendix D.23

SOURCE CHECK STATISTICS C-FHPC

Check #	Date	AM / PM	U Cnts	U Ave	U % Dev	Th Cnts	Th Ave	Th % Dev	Cs Peak	Cs Res
1	5-Jul-08	am	6871	-	-	13819	-	-	0.0	0.0%
2	5-Jul-08	pm	6897	6884	0.19	14143	13981	1.16	0.0	0.0%
3	6-Jul-08	am	6802	6857	-0.80	13289	13750	-3.36	55.0	8.7%
4	6-Jul-08	pm	6686	6814	-1.88	13793	13761	0.23	55.0	8.6%
5	9-Jul-08	am	6742	6800	-0.85	13784	13766	0.13	54.9	8.6%
6	9-Jul-08	pm	6588	6764	-2.61	13459	13715	-1.86	54.9	8.7%
7	10-Jul-08	am	6734	6760	-0.38	13640	13704	-0.47	54.9	8.8%
8	10-Jul-08	pm	6573	6737	-2.43	13631	13695	-0.47	0.0	0.0%
9	11-Jul-08	am	6658	6728	-1.04	13889	13716	1.26	56.6	9.3%
10	11-Jul-08	pm	6885	6744	2.10	14001	13745	1.86	55.0	8.7%
11	12-Jul-08	am	6628	6733	-1.56	13972	13765	1.50	56.7	9.3%
12	12-Jul-08	pm	6813	6740	1.09	13796	13768	0.20	54.9	8.6%
13	13-Jul-08	am	6772	6742	0.44	13801	13771	0.22	55.0	8.7%
14	13-Jul-08	pm	6649	6736	-1.29	13312	13738	-3.10	54.9	8.7%
15	14-Jul-08	am	6504	6720	-3.22	13441	13718	-2.02	0.0	0.0%
16	14-Jul-08	pm	4916	6607	-25.60	10387	13510	-23.12	0.0	0.0%
17	16-Jul-08	am	6693	6612	1.22	13701	13521	1.33	0.0	0.0%
18	16-Jul-08	pm	6691	6617	1.12	13465	13518	-0.39	55.0	8.8%
19	17-Jul-08	am	6698	6621	1.16	13400	13512	-0.83	55.0	8.7%
20	17-Jul-08	pm	6535	6617	-1.24	13350	13504	-1.14	0.0	0.0%

RESULTS OF PEAK ANALYSIS FOR CAGE_B DATASET C-FHPC

InputSpectrum = GR820_DOWN
PEAK CENTROID POSITION AND RESOLUTION

Line/Flt	CentroidK	ResK	CentroidU	ResU	CentroidTh	ResTh
L21170:23060	122.340	6.453	148.266	5.420	218.348	5.235
L21180:23060	122.403	6.455	148.353	5.356	218.464	5.275
L21190:23060	122.284	6.473	148.378	5.349	218.299	5.246
L21200:23060	122.415	6.493	148.311	5.396	218.424	5.209
L21210:23060	122.266	6.466	148.469	5.268	218.213	5.238
L21220:23060	122.281	6.468	148.325	5.338	218.101	5.224
L21230:23057	122.342	6.417	148.277	5.408	218.335	5.242
L21240:23057	122.299	6.424	148.258	5.420	218.373	5.261
L21250:23057	122.324	6.497	148.280	5.398	218.383	5.207
L21260:23057	122.292	6.431	148.411	5.245	218.241	5.249
L21270:23057	122.311	6.465	148.279	5.388	218.293	5.214
L21280:23057	122.445	6.453	148.296	5.410	218.575	5.226
L21290:23056	122.306	6.469	148.300	5.427	218.429	5.203
L21300:23039	122.366	6.414	148.368	5.359	218.365	5.207
L21310:23039	122.406	6.399	148.476	5.299	218.439	5.271
L21320:23039	122.448	6.423	148.534	5.303	218.561	5.239
L21330:23039	122.322	6.431	148.444	5.292	218.290	5.241
L21340:23039	122.396	6.415	148.294	5.432	218.367	5.236
L21350:23039	122.340	6.492	148.260	5.434	218.278	5.213
L21360:23039	122.409	6.476	148.425	5.330	218.412	5.319
L21370:23039	122.361	6.472	148.294	5.419	218.378	5.230
L21380:23040	122.429	6.461	148.283	5.404	218.449	5.136
L21390:23040	122.283	6.474	148.263	5.447	218.280	5.196
L21400:23040	122.376	6.437	148.347	5.377	218.431	5.316
L21410:23040	122.332	6.580	148.465	5.219	218.366	5.297
L21420:23040	122.323	6.483	148.363	5.424	218.311	5.221
L21430:23040	122.396	6.461	148.541	5.222	218.415	5.192
L21440:23040	122.404	6.444	148.940	4.542	218.526	5.079
L21441:23040	122.316	6.475	148.304	5.355	218.313	5.233
L21450:23040	122.335	6.532	148.270	5.416	218.376	5.157

L21460:23040	122.311	6.453	148.444	5.318	218.392	5.266
L21470:23040	122.363	6.473	148.353	5.403	218.381	5.276
L21480:23041	122.355	6.486	148.264	5.429	218.480	5.268
L21490:23041	122.389	6.524	148.439	5.280	218.474	5.315
L21500:23041	122.449	6.489	148.486	5.280	218.560	5.291
L21510:23041	122.359	6.490	148.274	5.410	218.330	5.236
L21520:23041	122.385	6.481	148.485	5.281	218.388	5.242
L21521:23055	122.252	6.389	148.509	5.096	218.152	4.952
L21531:23055	122.233	6.496	148.212	5.415	218.237	5.227
L21540:23055	122.262	6.466	148.265	5.427	218.257	5.132
L21550:23046	122.330	6.525	148.514	5.296	218.521	5.272
L21560:23046	122.371	6.427	148.441	5.322	218.613	5.261
L21570:23046	122.467	6.392	148.281	5.423	218.705	5.237
L21580:23046	122.411	6.487	148.253	5.432	218.602	5.186
L21590:23047	122.258	6.490	148.240	5.426	218.292	5.271
L21591:23055	122.324	6.317	148.564	4.997	218.305	5.173
L21600:23047	122.282	6.543	148.251	5.434	218.308	5.258
L21610:23047	122.408	6.543	148.249	5.451	218.600	5.281
L21620:23047	122.357	6.504	148.244	5.438	218.451	5.251
L21630:23047	122.442	6.515	148.250	5.444	218.631	5.284
L21640:23047	122.380	6.513	148.324	5.361	218.458	5.247
L21650:23047	122.501	6.446	148.252	5.411	218.685	5.267
L21660:23047	122.371	6.492	148.225	5.474	218.388	5.204
L21670:23055	122.282	6.494	148.217	5.445	218.217	5.228
L21680:23055	122.352	6.440	148.239	5.444	218.345	5.256
L21690:23055	122.271	6.470	148.248	5.443	218.311	5.259
L21700:23055	122.243	6.515	148.261	5.419	218.273	5.177
L21710:23056	122.345	6.462	148.255	5.441	218.437	5.239
L21720:23056	122.219	6.482	148.251	5.435	218.210	5.308
L21730:23036	122.453	6.429	148.233	5.428	218.643	5.219
L21740:23036	122.323	6.452	148.205	5.457	218.468	5.199
L21750:23036	122.312	6.483	148.257	5.444	218.379	5.172
L21760:23036	122.358	6.418	148.251	5.445	218.518	5.176
L21770:23036	122.221	6.534	148.252	5.452	218.213	5.168
L21780:23036	122.253	6.487	148.245	5.414	218.334	5.145
L21790:23035	122.319	6.495	148.217	5.443	218.263	5.172
L21800:23035	122.374	6.531	148.266	5.444	218.413	5.210

L21810:23035	122.295	6.447	148.239	5.440	218.273	5.274
L21820:23035	122.489	6.419	148.277	5.433	218.650	5.184
L21830:23035	122.221	6.517	148.119	5.489	218.178	5.304
L21840:23035	122.287	6.485	148.234	5.427	218.282	5.163
L21850:23035	122.411	6.462	148.241	5.435	218.471	5.192
L21860:23035	122.325	6.463	148.225	5.455	218.497	5.212
L21870:23035	122.312	6.434	148.224	5.430	218.349	5.169
L21880:23035	122.483	6.461	148.264	5.406	218.672	5.253
L21890:23035	122.449	6.489	148.349	5.407	218.629	5.198
L21900:23035	122.389	6.434	148.252	5.417	218.566	5.250
L21910:23034	122.249	6.493	148.224	5.434	218.242	5.162
L21920:23034	122.326	6.450	148.220	5.442	218.487	5.114
L21930:23034	122.396	6.441	148.459	5.292	218.627	5.210
L21940:23034	122.255	6.488	148.205	5.473	218.393	5.102
L21941:23056	122.364	6.453	148.257	5.441	218.414	5.134
L21950:23034	122.247	6.492	148.146	5.515	218.371	5.139
L21951:23056	122.254	6.464	148.247	5.421	218.131	5.228
L21960:23033	122.367	6.460	148.296	5.405	218.525	5.346
L21970:23033	122.460	6.495	148.266	5.452	218.683	4.995
L21980:23033	122.276	6.464	148.225	5.405	218.319	5.268
L21990:23033	122.373	6.504	148.215	5.442	218.433	5.166
L22000:23033	122.329	6.358	148.270	5.406	218.529	5.185
L22010:23033	122.323	6.489	148.231	5.433	218.518	5.260
L22020:23033	122.297	6.427	148.243	5.434	218.477	5.125
L22030:23033	122.459	6.444	148.334	5.408	218.676	5.189
L22040:23033	122.322	6.406	148.360	5.366	218.411	5.127
L22050:23033	122.423	6.515	148.210	5.466	218.655	5.253
L22060:23033	122.274	6.474	148.243	5.464	218.330	5.208
L22070:23033	122.389	6.580	148.277	5.456	218.666	5.188
L22080:23033	122.472	6.553	148.462	5.335	218.682	5.246
L22090:23056	122.305	6.466	148.258	5.416	218.350	5.257
L22091:23033	122.806	6.933	148.762	5.556	219.210	5.667
L22100:23028	122.276	6.563	148.217	5.439	218.198	5.301
L22110:23028	122.409	6.435	148.229	5.468	218.519	5.191
L22120:23028	122.241	6.472	148.192	5.453	218.139	5.131
L22130:23028	122.433	6.477	148.262	5.457	218.436	5.238
L22140:23028	122.194	6.560	148.196	5.450	218.113	5.175

- Appendix D.27

L22150:23028	122.392	6.530	148.408	5.406	218.566	5.254		
L22160:23028	122.265	6.509	148.225	5.434	218.272	5.202		
L22170:23028	122.483	6.434	148.272	5.418	218.679	5.204		
L22180:23028	122.251	6.472	148.244	5.430	218.281	5.273		
L22190:23028	122.392	6.489	148.261	5.410	218.548	5.202		
L22200:23028	122.292	6.499	148.245	5.450	218.442	5.162		
L22210:23028	122.322	6.451	148.246	5.433	218.508	5.270		
L22220:23027	122.226	6.454	148.203	5.456	218.245	5.281		
L22230:23027	122.375	6.440	148.339	5.322	218.465	5.337		
L22240:23027	122.281	6.440	148.719	4.119	218.286	5.246		
L22241:23056	122.193	6.416	148.325	5.330	217.977	5.336		
L22242:23027	122.209	6.534	148.190	5.476	218.250	5.207		
L22250:23027	122.450	6.375	148.297	5.364	218.588	5.159		
L22251:23056	122.410	6.405	148.229	5.458	218.638	5.302		
L22260:23027	122.315	6.437	148.237	5.434	218.426	5.225		
L22261:23056	122.296	6.449	148.234	5.482	218.433	5.188		
L22270:23027	122.385	6.387	148.236	5.457	218.521	5.199		
L22271:23056	122.341	6.469	148.255	5.426	218.491	5.164		
L22280:23027	122.283	6.531	148.143	5.494	218.353	5.065		
L22281:23056	122.347	6.402	148.021	5.506	218.410	5.437		
L22282:23027	122.272	6.444	148.183	5.464	218.187	5.153		
L22290:23027	122.491	6.339	148.464	5.387	218.646	5.199		
L22291:23056	122.316	6.509	148.431	5.190	218.319	5.253		
L22300:23027	122.268	6.536	148.188	5.441	218.337	5.240		
L22310:23027	122.289	6.513	148.241	5.426	218.372	5.130		
L22320:23027	122.375	6.469	148.264	5.430	218.559	5.186		
L22330:23027	122.334	6.367	148.251	5.425	218.437	5.149		
L22340:23026	122.328	6.409	148.295	5.343	218.294	5.210		
L22350:23026	122.198	6.486	148.261	5.434	218.128	5.175		
L22360:23026	122.174	6.474	148.130	5.487	218.096	5.261		
L22361:23056	122.358	6.601	148.285	5.423	218.415	5.209		
L22370:23026	122.392	6.410	148.260	5.413	218.492	5.086		
L22380:23026	122.185	6.524	148.223	5.426	218.183	5.296		
L22390:23026	122.241	6.467	148.212	5.438	218.254	5.202		
L22400:23026	122.361	6.484	148.272	5.413	218.445	5.207		
L22410:23026	122.317	6.456	148.284	5.343	218.375	5.117		
L22420:23026	122.254	6.549	148.183	5.460	218.289	5.148		

- Appendix D.28

L22430:23026	122.402	6.448	148.415	5.362	218.558	5.152
L22440:23026	122.137	6.431	148.196	5.445	218.111	5.231
L22450:23026	122.237	6.475	148.251	5.428	218.396	5.184
L22460:23022	122.359	6.408	148.208	5.441	218.431	5.166
L22470:23022	122.455	6.508	148.242	5.442	218.579	5.205
L22480:23022	122.376	6.461	148.253	5.414	218.420	5.226
L22490:23022	122.385	6.460	148.249	5.473	218.645	5.213
L22500:23022	122.363	6.412	148.268	5.423	218.515	5.227
L22510:23022	122.397	6.498	148.274	5.421	218.541	5.313
L22521:23022	122.379	6.459	148.225	5.447	218.628	5.201
L22530:23022	122.375	6.554	148.235	5.465	218.589	5.199
L22540:23022	122.346	6.481	148.237	5.445	218.590	5.186
L22550:23022	122.419	6.510	148.240	5.471	218.576	5.212
L22560:23022	122.428	6.497	148.251	5.443	218.669	5.166
L22571:23022	122.508	6.397	148.413	5.288	218.766	5.109
L22580:23021	122.326	6.455	148.223	5.435	218.241	5.224
L22590:23021	122.461	6.506	148.403	5.366	218.673	5.230
L22600:23021	122.249	6.511	148.204	5.457	218.219	5.301
L22610:23021	122.387	6.499	148.280	5.406	218.449	5.197
L22620:23021	122.315	6.475	148.219	5.453	218.213	5.235
L22630:23021	122.373	6.408	148.350	5.364	218.340	5.296
L22640:23021	122.225	6.502	148.323	5.325	218.236	5.222
L22650:23021	122.471	6.511	148.480	5.336	218.571	5.201
L22660:23021	122.238	6.462	148.254	5.448	218.201	5.197
L22670:23021	122.380	6.499	148.390	5.328	218.422	5.142
L22671:23021	122.380	6.499	148.390	5.328	218.422	5.142
L22680:23021	122.289	6.452	148.259	5.436	218.202	5.194
L22690:23021	122.241	6.495	148.244	5.421	218.220	5.226
L22700:23018	122.262	6.445	148.230	5.437	218.262	5.226
L22710:23018	122.412	6.439	148.489	5.326	218.600	5.210
L22720:23018	122.441	6.357	148.281	5.430	218.508	5.214
L22730:23018	122.320	6.467	148.252	5.424	218.420	5.162
L22731:23056	122.201	6.529	148.231	5.454	218.496	4.841
L22733:23018	122.356	6.453	148.231	5.454	218.342	5.186
L22740:23018	122.413	6.438	148.882	4.901	218.432	5.137
L22741:23056	122.242	6.403	148.904	4.607	217.877	5.063
L22743:23018	122.369	6.426	148.246	5.419	218.538	5.157

L22750:23018	122.405	6.501	148.267	5.429	218.609	5.179
L22760:23018	122.181	6.445	148.204	5.437	218.232	5.219
L22770:23018	122.254	6.594	148.197	5.474	218.370	5.234
L22780:23018	122.120	6.528	148.202	5.427	218.060	5.301
L22790:23018	122.277	6.546	148.194	5.434	218.383	5.160
L22800:23018	122.185	6.425	148.092	5.441	218.159	5.089
L22811:23018	122.043	6.446	148.034	5.509	217.882	5.181
L22820:23015	122.463	6.440	148.314	5.315	218.629	5.156
L22830:23015	122.183	6.520	148.209	5.449	218.261	5.274
L22840:23015	122.211	6.430	148.216	5.437	218.155	5.160
L22850:23015	122.276	6.507	148.209	5.437	218.277	5.166
L22860:23015	122.353	6.525	148.197	5.468	218.429	5.188
L22870:23015	122.194	6.497	148.200	5.436	218.197	5.204
L22881:23015	122.347	6.451	148.236	5.446	218.444	5.157
L22890:23012	122.244	6.536	148.230	5.417	218.399	5.167
L22900:23012	122.283	6.452	148.241	5.443	218.516	5.217
L22910:23012	122.289	6.449	148.184	5.468	218.355	5.180
L22920:23012	122.425	6.402	148.202	5.456	218.473	5.170
L22930:23012	122.379	6.490	148.249	5.425	218.566	5.129
L22940:23012	122.344	6.557	148.255	5.432	218.517	5.184
L22950:23012	122.206	6.536	148.189	5.443	218.271	5.185
L22960:23012	122.403	6.468	148.212	5.443	218.652	5.141
L22970:23012	122.411	6.495	148.262	5.446	218.539	5.136
L22980:23012	122.262	6.473	148.211	5.445	218.410	5.235
L22981:23056	122.300	6.592	148.213	5.417	218.233	5.088
L22983:23012	122.340	6.463	148.186	5.468	218.292	5.058
L22990:23012	122.236	6.549	148.201	5.463	218.331	5.235
L23000:23012	122.281	6.556	148.218	5.451	218.448	5.215
L23010:23012	122.263	6.602	148.193	5.453	218.291	5.261
L23020:23012	122.263	6.555	148.141	5.433	218.327	5.209
L23030:23011	122.345	6.577	148.234	5.449	218.510	5.246
L23040:23011	122.478	6.437	148.225	5.475	218.809	5.096
L23050:23011	122.450	6.466	148.211	5.424	218.702	5.208
L23061:23011	122.514	6.551	148.199	5.444	218.777	5.232
L23070:23011	122.283	6.565	148.158	5.449	218.394	5.211
L23081:23011	122.281	6.505	148.041	5.405	218.422	5.246
L23090:23011	122.231	6.469	148.199	5.439	218.317	5.142

L23100:23011	122.308	6.426	148.154	5.447	218.424	5.126
L23110:23011	122.277	6.506	148.178	5.460	218.266	5.263
L23120:23011	122.359	6.477	148.209	5.489	218.602	5.197
L23130:23011	122.324	6.534	148.220	5.472	218.472	5.220
L23140:23011	122.355	6.435	148.264	5.458	218.565	5.204
L23141:23056	122.478	6.500	148.256	5.450	218.623	5.043
L23150:23011	122.185	6.558	148.218	5.442	218.185	5.215
L23160:23011	122.189	6.521	148.013	5.442	218.214	5.185
L23170:23011	122.001	6.403	147.882	5.547	217.960	5.166
L23180:23011	122.239	6.406	148.231	5.458	218.002	5.033
L23190:23011	122.254	6.320	148.301	5.354	218.462	4.659
L23200:23011	122.443	6.186	148.141	5.542	218.531	4.770

TESTS AND CALIBRATIONS 2008-08-26
Aircraft Registration C-GSMY
Flights 25030-25077

LAG TEST

A magnetic lag test is flown to calculate the positional lag that develops between the time a reading is made and the time it is recorded in the data. A large metallic body such as railway tracks, a bridge, buildings or a distinct magnetic anomaly is flown over along a single line, at survey altitude, in opposite directions. This allows the time constant value that will line-up the magnetic anomaly peaks or troughs that are produced to be determined. This time shift constant is then applied to the data collected during the survey.
Lag test was flown on July 5, 2008. Lag determined for C-GSMY is 1.7 seconds. In processing the survey data the lag was confirmed to be 1.7 seconds.

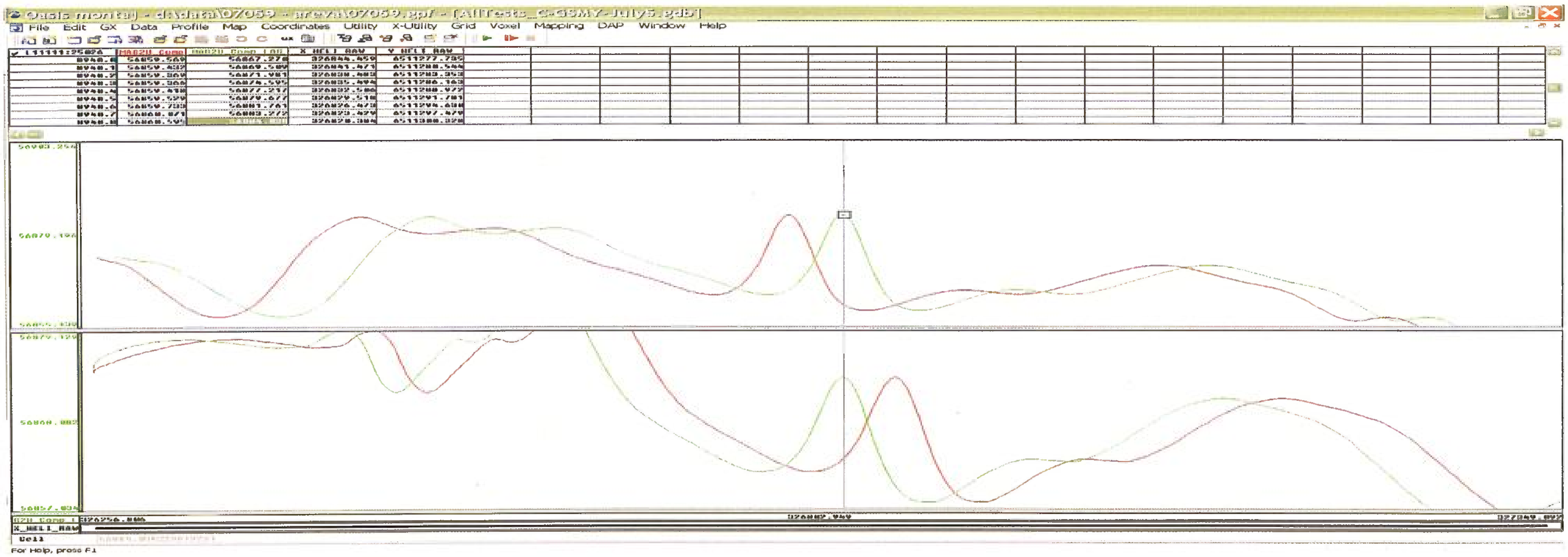


FIGURE OF MERIT

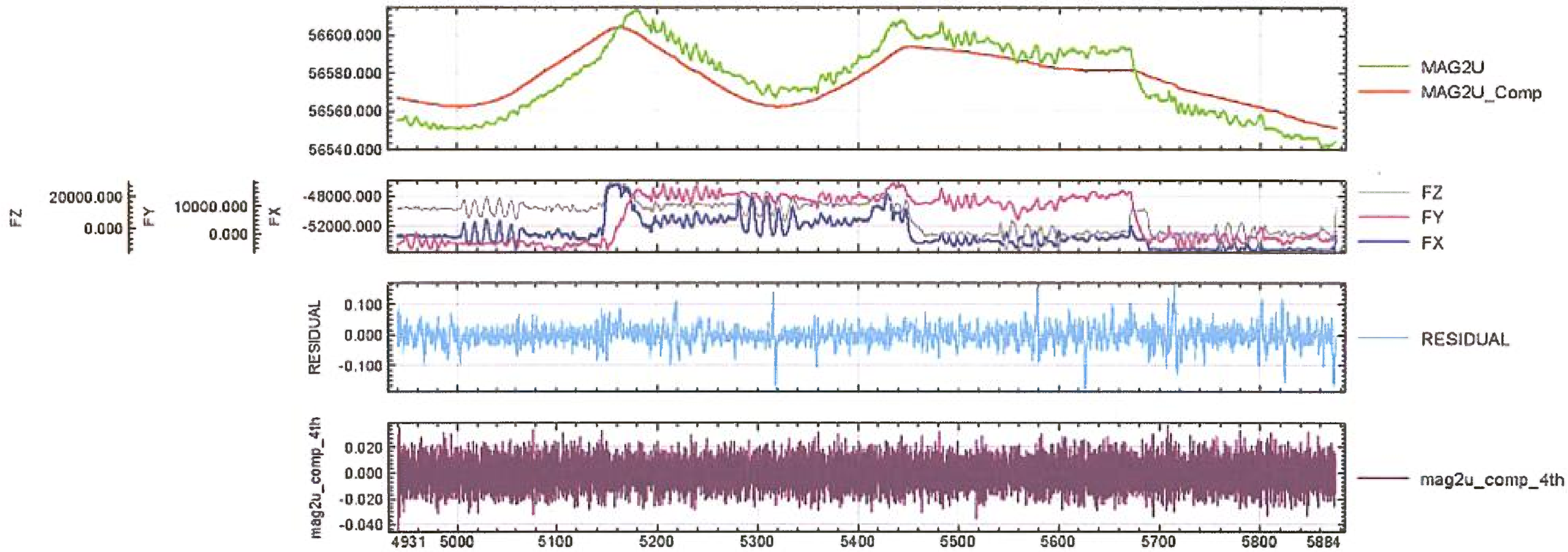
Compensation of magnetic readings is required when the magnetometers are mounted on, or in close proximity to, the aircraft. The aircraft with its metallic parts and surfaces creates secondary magnetic fields while the aircraft moves through the earth's magnetic field. Therefore the compensation calibration test is flown to calculate the effects of the aircraft and its control surfaces on the magnetic field. The test is flown at high altitude, outside the effect of geology on the magnetic readings. The aircraft flies in each of the survey directions performing a series of manoeuvres that moves the aircraft along each of its three axis of rotation. The aircrafts affect on the magnetic data is calculated and then subtracted from the magnetic data collected during the survey.

MAGNETIC COMPENSATION CALIBRATION

Job Number:	7059	Geosoft Database:	alltests-c-gsmy-july5-2008.gdb
Date Flown:	5-Jul	Helicopter Registration:	C-GSMY
Flight Number:	25026	System Type:	Stinger/Spec

BOX 1	Sensor Position:		In Stinger	Pitch			Roll			Yaw			Figure of Merit
	Raw Mag Channel:		MAG2U	Residual Peak to Peak			Residual Peak to Peak			Residual Peak to Peak			
	Line Number	Bearing	Ave GPS Height	min	MAX	Total	min	MAX	Total	min	MAX	Total	
Direction 1:	4444.00	045	3240	-0.10	0.06	0.16	-0.04	0.04	0.07	-0.04	0.04	0.08	1.14
Direction 2:	4444.00	135	3240	-0.07	0.06	0.13	-0.04	0.02	0.07	-0.06	0.05	0.12	
Direction 3:	4444.00	225	3240	-0.04	0.05	0.09	-0.06	0.08	0.14	-0.05	0.07	0.12	
Direction 4:	4444.00	315	3240	-0.08	0.06	0.14	-0.06	0.05	0.11	-0.07	0.07	0.14	

Compensation Flight C-GSMY - July 5



database: D:\DATA\07059 - Areva\07059\Tests\TestFlight-C-GSMY-July5-2008\AllTests_C-GSMY-July5.gdb line/group: L44444 *2008/07/25*

COSMIC / AIRCRAFT BACKGROUND TEST

A cosmic test is conducted to determine both the effects of cosmic radiation and aircraft background radiation on the spectrometer readings. This test is conducted at high altitude, outside the geological effect on the spectrometer data and well above the maximum altitude that will be achieved during survey. The aircraft is flown at a series of altitudes for a set amount of time to minimize statistical error. The effects of altitude on the level of cosmic radiation are calculated and this data is extrapolated to and corrected for in the data collected during the survey.

COSMIC CORRECTION COEFFICENTS

Job Number:	7059	Heli Registration:	C-GSMY	pec Pack(s) Serial Number:	
Date Flown:	5-Jul	GDB Name:	alltests_c-gsmy-july5.gdb	Spec Console Type:	GR820
Flight Number:	25026	Crystal Pack Volume:	One Crystal Pack 16.8 L Down	ec Console Serial Number:	

LINE	AVERAGE TC_DOWN_COS	Use Data Point	AVERAGE K_DOWN_COS	Use Data Point	AVERAGE U_DOWN_COS	Use Data Point	AVERAGE TH_DOWN_COS	Use Data Point	AVERAGE U_UP_COS	Use Data Point	AVERAGE COSMIC_COS
6000	144.11917	☑	10.66474	☑	6.56471	☑	6.46816	☑	1.80712	☑	125.64205
7000	160.28354	☑	11.39039	☑	7.18674	☑	7.67274	☑	1.87960	☑	121.45257
8000	182.55127	☑	12.82623	☑	8.57347	☑	8.55532	☑	2.31615	☑	144.60389
9000	208.74602	☑	14.32220	☑	9.91501	☑	10.28731	☑	2.53508	☑	167.24625
10000	238.55537	☑	16.27194	☑	11.26763	☑	11.97238	☑	2.97179	☑	202.69421
		☐		☐		☐		☐		☐	
		☐		☐		☐		☐		☐	

Summary of Cosmic Correction Coefficents

	Cosmic Stripping (Slope)	Aircraft Background (Intercept)
TC	1.09817	19.56981
K	0.06643	2.97666
U	0.05622	0.13709
Th	0.06264	-0.55023
U Up	0.01413	0.15003

ALTITUDE ATTENUATION TEST

An altitude attenuation test is conducted to determine the drop off rate of the spectrometer signal with altitude. A test line is flown at several different altitudes and the attenuation, with increased ground clearance, of the various spectral elements is determined. These attenuation factors are applied to the data collected throughout the survey. During processing these factors were refined to those documented in the radiometric processing control file.

ALTITUDE ATTENUATION COEFFICENTS

Job Number:	7059	Heli Registration:	C-GSMY	Spec Pack(s) Serial Number:	
Date Flown:	5-Jul	GDB Name:	alltests_C-GSMY-July5.gdb	Spec Console Type:	GR820
Flight Number:	25026	Crystal Pack Volume:	One Crystal Pack 16.8 L Down	Spec Console Serial Number:	

LINE	AVERAGE TC_DOWN_ ATTENCOR	Use Data Point	AVERAGE K_DOWN_ ATTENCOR	Use Data Point	AVERAGE U_DOWN_ ATTENCOR	Use Data Point	AVERAGE TH_DOWN_ ATTENCOR	Use Data Point	AVERAGE EFFECTIVE HEIGHT
100	1060.99469	☑	146.07449	☑	10.96022	☑	26.75500	☑	96.81410
150	963.02495	☑	122.58432	☑	9.09728	☑	25.67911	☑	146.97307
200	850.94007	☑	100.55490	☑	8.24590	☑	22.35559	☑	196.02545
250	757.87993	☑	90.86074	☑	5.85928	☑	20.32897	☑	237.60134
300	628.64062	☑	70.42820	☑	4.64466	☑	16.23247	☑	291.07361
350	591.53371	☑	62.69156	☑	3.81850	☑	16.00570	☑	334.43032
400	545.92249	☑	56.23985	☑	2.59995	☑	16.25490	☑	380.75118
450	483.77855	☑	47.83779	☑	1.51919	☑	14.04780	☑	421.94448
500	457.01375	☑	45.81392	☑	2.39770	☑	12.84674	☑	469.10201

Summary of Altitude Attenuation Coefficents (Must Be Negative)	
TC	-0.00237
K	-0.00324
U	-0.00509
Th	-0.00203

- Appendix D.36

TEST LINE STATISTICS

DATE	LINE NUMBER	AVERAGE ALTITUDE			VALUE OF CHANNEL AVERAGED ALONG THE TEST LINE						PERCENTAGE DIFFERENCES FROM BASE VALUE OF EACH TEST LINE					
		ALTRADM	ALTLASM	EFFECTIVE HEIGHT	TC_COR	K_COR	U_COR	Th_COR	U_UP_COR	MAG_LD	TC % dev	K % dev	U % dev	Th % dev	U_UP % dev	MAG % dev
06-Jul-08	6071	53.84	55.81	50.58	758.32	80.70	9.75	22.35	1.41	56701.22	-9.24	-8.37	-8.12	-3.72	-24.85	0.00
	6072	53.55	55.40	49.83	798.99	81.77	10.78	23.15	1.93		-4.37	-7.15	1.66	-0.28	2.32	
09-Jul-08	9071	73.79	78.92	69.54	684.25	69.85	8.77	19.64	0.99	56692.14	-18.10	-20.69	-17.35	-15.38	-47.51	-0.01
10-Jul-08	1071	51.48	53.11	48.50	766.49	80.75	8.54	22.87	1.32	56698.02	-8.26	-8.31	-19.51	-1.47	-29.89	0.00
	1072	55.94	57.90	52.99	761.88	80.70	9.52	21.64	1.34	56697.09	-8.81	-8.36	-10.23	-6.76	-28.88	0.00
	1073	57.43	59.10	54.55	748.47	78.36	9.91	21.54	1.43	56696.66	-10.42	-11.03	-6.61	-7.19	-24.16	-0.01
11-Jul-08	7110	55.35	57.03	52.80	765.77	80.57	9.79	22.81	1.33	56659.79	-8.35	-8.52	-7.71	-1.72	-29.55	-0.07
	7112	54.62	56.58	51.51	770.48	83.06	9.29	22.35	1.46	56696.55	-7.78	-5.68	-12.47	-3.73	-22.49	-0.01
12-Jul-08	251201	64.45	66.47	61.23	711.74	74.88	9.24	20.30	1.26	56695.22	-14.81	-14.98	-12.89	-12.54	-33.16	-0.01
	251202	64.58	67.16	60.41	737.77	76.27	9.88	20.63	1.57	56692.76	-11.70	-13.40	-6.90	-11.13	-16.56	-0.01
13-Jul-08	251301	45.87	47.47	42.40	837.54	87.89	10.75	23.28	1.88	56699.71	0.24	-0.21	1.31	0.28	-0.07	0.00
	251302	59.67	61.77	53.97	751.93	78.34	10.37	20.62	1.51	56702.62	-10.00	-11.04	-2.22	-11.18	-19.72	0.01
14-Jul-08	251401	55.97	57.36	51.53	796.43	86.39	10.27	22.49	1.53	56693.45	-4.67	-1.91	-3.21	-3.10	-18.76	-0.01
	251402	55.97	57.81	51.30	754.90	80.80	10.24	21.37	1.36	56697.31	-9.65	-8.25	-3.46	-7.92	-27.99	0.00
16-Jul-08	251601	45.11	47.05	42.32	833.62	89.56	10.22	24.30	1.83	56693.99	-0.22	1.70	-3.71	4.66	-2.67	-0.01
	251602	48.15	49.87	44.82	835.32	88.25	10.61	24.03	1.76	56683.43	-0.02	0.21	0.00	3.52	-6.37	-0.03
17-Jul-08	251701	49.13	50.68	45.55	793.14	81.77	10.32	22.92	1.88	56694.58	-5.07	-7.15	-2.70	-1.28	0.07	-0.01
	251702	52.42	55.46	47.96	790.19	84.44	9.70	22.58	1.64	56697.84	-5.42	-4.12	-8.55	-2.72	-12.81	0.00

- Appendix D.37

SOURCE CHECK STATISTICS C-GSMY

Check #	Date	AM / PM	U Cnts	U Ave	U % Dev	Th Cnts	Th Ave	Th % Dev	Cs Peak	Cs Res
1	5-Jul-08	am	4979	-	-	7265	-	-	0.0	0.0%
2	5-Jul-08	pm	5715	5347	6.88	7640	7453	2.52	0.0	0.0%
4	6-Jul-08	pm	5488	5394	1.74	7097	7334	-3.23	54.9	9.0%
5	9-Jul-08	am	5448	5408	0.75	7240	7311	-0.96	0.0	0.0%
6	9-Jul-08	pm	5376	5401	-0.47	6898	7228	-4.57	54.9	8.9%
7	10-Jul-08	am	5368	5396	-0.51	6771	7152	-5.32	53.8	9.1%
8	10-Jul-08	pm	5321	5385	-1.19	6885	7114	-3.22	0.0	0.0%
9	11-Jul-08	am	5125	5353	-4.25	7151	7118	0.46	0.0	0.0%
10	11-Jul-08	pm	5426	5361	1.22	7047	7110	-0.89	0.0	0.0%
11	12-Jul-08	am	5174	5342	-3.14	7123	7112	0.16	56.5	9.3%
12	12-Jul-08	pm	5618	5367	4.67	7350	7133	3.04	55.0	0.0%
13	13-Jul-08	am	5500	5378	2.27	7231	7142	1.25	55.0	8.8%
14	13-Jul-08	pm	5597	5395	3.74	7042	7134	-1.29	55.0	8.8%
15	14-Jul-08	am	5510	5403	1.98	7165	7136	0.41	54.9	8.9%
16	14-Jul-08	pm	5561	5414	2.72	7220	7142	1.10	0.0	0.0%
17	16-Jul-08	am	5768	5436	6.11	7400	7158	3.38	54.0	8.0%
18	16-Jul-08	pm	5713	5452	4.78	7318	7167	2.10	55.0	8.8%
19	17-Jul-08	am	5691	5465	4.13	7381	7179	2.81	55.0	8.7%
20	17-Jul-08	pm	5579	5471	1.97	7300	7185	1.59	55.1	8.8%

RESULTS OF PEAK ANALYSIS FOR CAGE_B DATASET

InputSpectrum = GR820_DOWN
PEAK CENTROID POSITION AND RESOLUTION

Line/Flt	CentroidK	ResK	CentroidU	ResU	CentroidTh	ResTh
L20201:25076	122.353	6.398	148.759	4.992	218.448	5.107
L20211:25076	122.395	6.342	148.656	5.099	218.516	5.143
L20221:25076	122.304	6.384	148.537	5.073	218.353	5.163
L20231:25076	122.379	6.384	148.647	4.884	218.523	5.187
L20242:25076	122.252	6.367	148.695	4.909	218.349	5.168
L20251:25030	122.153	6.409	148.557	5.193	218.307	5.127
L20261:25030	122.259	6.368	148.472	5.180	218.474	5.149
L20270:25030	122.189	6.439	148.750	4.918	218.514	5.123
L20280:25031	122.198	6.385	148.556	5.114	218.558	5.167
L20290:25031	122.178	6.424	148.623	5.050	218.488	5.154
L20300:25031	122.302	6.370	148.555	4.981	218.582	5.148
L20310:25031	122.193	6.418	148.364	5.110	218.404	5.157
L20320:25031	122.317	6.422	148.688	5.016	218.614	5.206
L20321:25076	122.101	6.377	148.401	5.042	217.979	5.125
L20330:25033	122.227	6.350	148.646	5.007	218.442	5.108
L20340:25033	122.290	6.401	148.660	5.037	218.629	5.126
L20350:25033	122.203	6.233	149.485	4.482	218.282	5.160
L20352:25033	122.214	6.405	148.560	5.022	218.505	5.181
L20360:25042	122.251	6.393	148.673	5.021	218.361	5.185
L20370:25042	122.215	6.445	148.602	4.990	218.468	5.138
L20380:25048	122.241	6.335	148.739	4.886	218.560	5.116
L20390:25037	122.262	6.322	148.714	4.969	218.390	5.041
L20400:25037	122.226	6.352	148.713	4.852	218.391	5.137
L20410:25037	122.174	6.344	148.549	4.928	218.354	5.055
L20420:25037	122.264	6.405	148.483	5.107	218.590	5.150
L20430:25037	122.281	6.371	148.669	5.073	218.534	5.074
L20440:25037	122.244	6.367	148.491	4.852	218.428	5.155
L20450:25042	122.317	6.410	148.834	4.739	218.531	5.080
L20460:25042	122.257	6.393	148.497	5.087	218.342	5.114
L20470:25042	122.187	6.421	148.642	5.019	218.270	5.145

L20471:25042	122.260	6.406	148.601	5.052	218.397	5.118
L20490:25048	122.176	6.378	148.701	4.768	218.309	5.125
L20500:25044	122.416	6.402	148.728	4.952	218.662	5.102
L20510:25044	122.361	6.341	148.627	5.089	218.604	5.164
L20520:25044	122.295	6.353	148.629	5.012	218.516	5.053
L20530:25043	122.271	6.339	148.724	4.942	218.469	5.158
L20540:25043	122.287	6.348	148.831	4.989	218.470	5.121
L20541:25043	122.226	6.343	148.617	5.105	218.407	5.137
L20550:25044	122.246	6.389	148.572	4.997	218.426	5.153
L20560:25044	122.154	6.414	148.441	5.258	218.448	5.158
L20570:25048	122.328	6.407	148.510	5.183	218.534	5.187
L20580:25047	122.381	6.377	148.396	5.137	218.569	5.092
L20590:25047	122.318	6.403	148.618	4.860	218.439	5.127
L20600:25047	122.270	6.356	148.470	5.125	218.380	5.124
L20610:25047	122.384	6.408	148.589	5.169	218.680	5.176
L20621:25047	122.384	6.388	148.451	5.165	218.615	5.111
L20631:25047	122.325	6.419	148.307	5.252	218.582	5.224
L20640:25048	122.388	6.369	148.806	4.975	218.706	5.138
L20650:25048	122.304	6.383	148.632	5.000	218.563	5.134
L20660:25049	122.300	6.400	148.630	5.055	218.546	5.120
L20670:25048	122.199	6.380	148.447	5.219	218.333	5.104
L20680:25049	122.267	6.341	148.753	4.913	218.448	5.094
L20690:25049	122.356	6.399	148.589	5.096	218.671	5.067
L20700:25055	122.266	6.368	148.468	5.121	218.531	5.055
L20701:25076	122.376	6.341	148.867	4.970	218.425	5.261
L20702:25055	122.147	6.379	148.356	5.306	218.336	5.135
L20710:25055	122.140	6.370	148.540	5.142	218.109	5.139
L20711:25077	122.212	6.373	148.294	5.242	218.399	5.173
L20712:25055	122.415	6.310	148.714	4.854	218.778	5.092
L20720:25055	122.321	6.407	148.597	5.056	218.618	5.176
L20721:25077	121.982	6.389	148.944	4.911	217.798	5.141
L20722:25055	122.221	6.481	148.619	5.026	218.440	5.090
L20730:25055	122.226	6.363	148.619	5.046	218.484	5.089
L20740:25056	122.297	6.359	148.484	5.149	218.565	5.088
L20741:25077	122.241	6.248	148.807	4.492	218.160	4.983
L20742:25056	122.177	6.405	148.815	4.840	218.264	5.076
L20750:25056	122.248	6.405	148.623	5.086	218.525	5.142

L20751:25077	122.335	6.378	148.727	5.005	218.596	5.211
L20752:25056	122.152	6.347	148.754	4.791	218.329	5.096
L20760:25056	122.195	6.372	148.426	5.169	218.270	5.126
L20761:25077	122.238	6.312	149.348	4.224	218.431	5.117
L20770:25056	122.294	6.399	148.590	5.055	218.528	5.133
L20771:25076	122.337	6.384	148.844	4.895	218.359	5.067
L20780:25058	122.308	6.442	148.635	4.909	218.494	5.123
L20781:25077	122.384	6.306	148.429	5.049	218.440	5.023
L20782:25058	122.295	6.343	148.750	5.072	218.594	5.043
L20790:25058	122.408	6.224	148.825	4.606	218.876	5.080
L20791:25077	122.267	6.370	148.508	5.172	218.573	5.094
L20792:25058	122.405	6.386	148.903	4.849	218.554	5.189
L20800:25058	122.332	6.348	148.346	5.177	218.489	5.087
L20801:25077	122.310	6.398	148.944	4.747	218.188	5.105
L20802:25058	122.192	6.307	148.570	4.977	218.238	5.025
L20810:25058	122.333	6.416	148.335	5.333	218.441	5.200
L20811:25077	122.348	6.482	148.814	5.136	218.515	5.302
L20812:25058	122.237	6.390	148.666	4.770	218.309	5.123
L20820:25060	122.368	6.348	148.552	4.972	218.503	5.052
L20830:25060	122.406	6.336	148.609	5.106	218.541	5.169
L20840:25060	122.418	6.361	148.475	5.152	218.551	5.151
L20850:25060	122.322	6.333	148.284	5.399	218.349	5.160
L20860:25060	122.355	6.396	148.521	5.094	218.383	5.120
L20870:25060	122.404	6.391	148.710	4.978	218.508	5.138
L20880:25061	122.243	6.458	148.386	5.193	218.304	5.187
L20890:25061	122.337	6.406	148.669	5.033	218.462	5.197
L20900:25061	122.407	6.368	148.760	4.943	218.538	5.141
L20901:25077	122.418	6.273	148.941	4.875	218.602	4.860
L20902:25061	122.325	6.340	148.288	5.360	218.178	5.140
L20910:25061	122.407	6.363	148.601	5.064	218.513	5.146
L20920:25061	122.378	6.407	148.987	4.755	218.551	5.188
L20930:25061	122.346	6.383	148.620	5.004	218.465	5.177
L20940:25062	122.322	6.404	148.825	4.953	218.463	5.176
L20950:25062	122.426	6.342	148.841	4.736	218.633	5.113
L20960:25071	122.233	6.402	148.776	5.073	218.402	5.074
L20970:25077	122.334	6.373	148.577	5.121	218.459	5.191
L20980:25071	122.329	6.350	148.638	5.038	218.532	5.119

- Appendix D.41

L20990:25065	122.349	6.374	148.588	5.166	218.614	5.145
L21000:25065	122.356	6.408	148.466	5.189	218.604	5.182
L21010:25065	122.382	6.392	148.753	5.003	218.617	5.174
L21020:25065	122.429	6.318	148.742	4.970	218.695	5.177
L21030:25065	122.419	6.380	148.777	4.792	218.640	5.130
L21040:25065	122.365	6.378	148.719	4.901	218.563	5.154
L21050:25071	122.353	6.347	148.647	5.030	218.598	5.101
L21060:25072	122.239	6.365	148.466	5.105	218.316	5.104
L21070:25072	122.207	6.361	148.461	5.191	218.330	5.141
L21080:25072	122.332	6.350	148.559	5.080	218.519	5.070
L21090:25073	122.265	6.422	148.728	4.932	218.533	5.167
L21091:25077	122.236	6.318	148.231	5.454	218.361	5.105
L21100:25073	122.229	6.351	148.449	5.166	218.348	5.179
L21101:25077	122.263	6.375	148.231	5.454	218.149	5.148
L21110:25073	122.451	6.381	148.792	4.905	218.625	5.130
L21120:25073	122.310	6.343	148.505	5.074	218.462	5.139
L21130:25073	122.370	6.382	148.720	4.992	218.490	5.145
L21140:25073	122.368	6.321	148.702	4.930	218.505	5.163
L21150:25077	122.374	6.410	148.494	5.198	218.495	5.140
L21160:25077	122.304	6.388	148.519	5.109	218.364	5.141
L21530:25077	122.405	6.412	148.293	5.350	218.583	5.112

APPENDIX E

RADIOMETRIC PROCESSING CONTROL FILE

APPENDIX E

RADIOMETRIC PROCESSING CONTROL FILE

FOR SURVEY PLATFORM : C-FDYS

```
////////////////////////////////////////////////
// Atlas Control/Workspace File
// # or // for commment
////////////////////////////////////////////////

CONTROL_BEGIN

 PROGRAM  = AGSCorrection
 VERSION  = 1.4.0

  ### Process or Calibration? ###
    WhatToDo = Process Survey Line

  ### Corrections to apply ###
    CorrectionType = Yes  Filtering
    CorrectionType = Yes  LiveTimeCorrection
    CorrectionType = Yes  CosmicAircraftBGRemove
    CorrectionType = Yes  CalcEffectiveHeight
    CorrectionType = Yes  RadonBGRemove
    CorrectionType = Yes  ComptonStripping
    CorrectionType = Yes  HeightCorrection
    CorrectionType = Yes  ConvertToConcentration


  ### Main I/O settings ###
    MainChannelIO|TC       = tc_nasvd   --> tc_rad_Cor
    MainChannelIO|K        = k_nasvd    --> k_rad_Cor
    MainChannelIO|U        = u_nasvd    --> u_rad_Cor
    MainChannelIO|Th       = th_nasvd   --> th_rad_Cor
    MainChannelIO|UpU      = U_UP       --> U_UP_Cor
    MainChannelIO|Cosmic   = COSMIC     --> COSMIC_Cor
    MainChannelIO|Spectrum =            -->

  ### Control Channel I/O settings ###
    ControlChannel|RadarAltimeter     = ALTRAD_MT_LAG  [metres]
    ControlChannel|Pressure/Barometer = KPA            [kPa]
    ControlChannel|Temperature        = TEMP_EXT


  ### Input for correction ###
    InputForCorrection   = ROIs
```

```
### Pre-filtering settings ###
   Filtering|TC     = 0
   Filtering|K      = 0
   Filtering|U      = 0
   Filtering|Th     = 0
   Filtering|UpU    = 0
   Filtering|Cosmic  = 13
   Filtering|RadarAltimeter     = 7
   Filtering|Pressure/Barometer = 7
   Filtering|Temperature        = 7

### Live-time correction settings ###
   LiveTimeChannel           = live_time
   LiveTimeUnits             = milli-seconds
   ApplyLiveTimeCorrToUpU     = Yes

### Cosmic correction settings ###
   CosmicCorrParam|TC    = 0.776,  15.729
   CosmicCorrParam|K     = 0.050,  1.8430
   CosmicCorrParam|U     = 0.037,  0.00
   CosmicCorrParam|Th    = 0.044,  0.00
   CosmicCorrParam|UpU  = 0.009,  0.00
   CosmicCorrParam|SpectrumBackgroundFile    =

### Effective-Height settings ###
   EffectiveHeightOutputChannel = EffectiveHeight
   EffectiveHeightOutputUnits   = metres

### Special Stripping (Compton Stripping) ###
   ComptonCorrParam_Stripping_Alpha     = 0.237000
   ComptonCorrParam_Stripping_Beta     = 0.384000
   ComptonCorrParam_Stripping_Gamma     = 0.713000
   ComptonCorrParam_AlphaPerMetre      = 0.000010
   ComptonCorrParam_BetaPerMetre       = 0.000010
   ComptonCorrParam_GammaPerMetre       = 0.000010
   ComptonCorrParam_GrastyBackscatter_a = 0.060000
   ComptonCorrParam_GrastyBackscatter_b = 0.003000
   ComptonCorrParam_GrastyBackscatter_g = 0.003000

### Height Correction settings ###
   SurveyHeightDatum     = 50.000000
   AttenuationCorrControl = 0
   HeightCorrParam|TC     = -0.0067, 300.000000
   HeightCorrParam|K      = -0.00998, 300.000000
   HeightCorrParam|U      = -0.00571, 300.000000
```

```
    HeightCorrParam|Th     = -0.00740, 300.000000

  ### Concentration settings ###
    ConcentrationParam|K      = Concentration_K,  49.329
    ConcentrationParam|U      = Concentration_U,  6.878
    ConcentrationParam|Th     = Concentration_Th,  2.890
    AirAbsorbedDoseRateParam   = DoseRate,  16.051
    NaturalAirAbsorbedDoseRateParam = NaturalDoseRate,  0.000000, 0.000000,
0.000000


CONTROL_END
```

FOR SURVEY PLATFORM : C-FHPC

```
////////////////////////////////////////////////
// Atlas Control/Workspace File
// # or // for commment
////////////////////////////////////////////////

CONTROL_BEGIN

 PROGRAM  = AGSCorrection
 VERSION  = 1.4.0

  ### Process or Calibration? ###
    WhatToDo = Process Survey Line

  ### Corrections to apply ###
    CorrectionType = Yes  Filtering
    CorrectionType = Yes  LiveTimeCorrection
    CorrectionType = Yes  CosmicAircraftBGRemove
    CorrectionType = Yes  CalcEffectiveHeight
    CorrectionType = No   RadonBGRemove
    CorrectionType = Yes  ComptonStripping
    CorrectionType = Yes  HeightCorrection
    CorrectionType = Yes  ConvertToConcentration


  ### Main I/O settings ###
    MainChannelIO|TC      = TC_From_GR820_DOWN_NASVD --> TC_NASVD_Cor
    MainChannelIO|K       = K_From_GR820_DOWN_NASVD --> K_NASVD_Cor
    MainChannelIO|U       = U_From_GR820_DOWN_NASVD --> U_NASVD_Cor
    MainChannelIO|Th      = TH_From_GR820_DOWN_NASVD --> TH_NASVD_Cor
    MainChannelIO|UpU     = GR820_U_UP --> U_UP_Cor
    MainChannelIO|Cosmic  = GR820_COSMIC --> GR820_COSMIC_Cor
```

```
    MainChannelIO|Spectrum = GR820_DOWN_NASVD -->
GR820_DOWN_NASVD_Cor

  ### Control Channel I/O settings ###
    ControlChannel|RadarAltimeter     = ALTRAD_MT_LAG  [metres]
    ControlChannel|Pressure/Barometer = KPA       [kPa]
    ControlChannel|Temperature        = TEMP_EXT


  ### Input for correction ###
    InputForCorrection    = ROIs


  ### Pre-filtering settings ###
    Filtering|TC      = 0
    Filtering|K       = 0
    Filtering|U       = 0
    Filtering|Th      = 0
    Filtering|UpU     = 0
    Filtering|Cosmic  = 13
    Filtering|RadarAltimeter     = 7
    Filtering|Pressure/Barometer = 7
    Filtering|Temperature        = 7

  ### Live-time correction settings ###
    LiveTimeChannel            = GR820_LIVE_TIME
    LiveTimeUnits              = milli-seconds
    ApplyLiveTimeCorrToUpU     = Yes

  ### Cosmic correction settings ###
    CosmicCorrParam|TC     = 0.733104,  34.298000
    CosmicCorrParam|K      = 0.045038,  3.140980
    CosmicCorrParam|U      = 0.033418,  1.090210
    CosmicCorrParam|Th     = 0.035331,  1.434340
    CosmicCorrParam|UpU    = 0.009202,  0.305221
    CosmicCorrParam|SpectrumBackgroundFile   =

  ### Effective-Height settings ###
    EffectiveHeightOutputChannel = EffectiveHeight
    EffectiveHeightOutputUnits   = metres

  ### Special Stripping (Compton Stripping) ###
    ComptonCorrParam_Stripping_Alpha     = 0.224000
    ComptonCorrParam_Stripping_Beta      = 0.393000
    ComptonCorrParam_Stripping_Gamma     = 0.717000
    ComptonCorrParam_AlphaPerMetre       = 0.000000
    ComptonCorrParam_BetaPerMetre        = 0.000000
```

```
    ComptonCorrParam_GammaPerMetre      = 0.000000
    ComptonCorrParam_GrastyBackscatter_a = 0.051000
    ComptonCorrParam_GrastyBackscatter_b = 0.004000
    ComptonCorrParam_GrastyBackscatter_g = 0.001000

  ### Height Correction settings ###
    SurveyHeightDatum     = 60.000000
    AttenuationCorrControl = 0
    AttenuationForNegROIs  = Yes
    HeightCorrParam|TC     = -0.007318, 200.000000
    HeightCorrParam|K      = -0.009381, 200.000000
    HeightCorrParam|U      = -0.006522, 200.000000
    HeightCorrParam|Th     = -0.006939, 200.000000

  ### Concentration settings ###
    ConcentrationParam|K      = Concentration_K,  49.329
    ConcentrationParam|U      = Concentration_U,  6.878
    ConcentrationParam|Th     = Concentration_Th,  2.890
    AirAbsorbedDoseRateParam  = DoseRate,  16.051
    NaturalAirAbsorbedDoseRateParam = NaturalDoseRate,  0.000000, 0.000000,
0.000000


CONTROL_END
```

<u>FOR SURVEY PLATFORM : C-GSMY</u>

```
////////////////////////////////////////////////
// Atlas Control/Workspace File
// # or // for commment
////////////////////////////////////////////////

CONTROL_BEGIN

 PROGRAM  = AGSCorrection
 VERSION  = 1.4.0

  ### Process or Calibration? ###
    WhatToDo = Process Survey Line

  ### Corrections to apply ###
    CorrectionType = Yes  Filtering
    CorrectionType = Yes  LiveTimeCorrection
    CorrectionType = Yes  CosmicAircraftBGRemove
    CorrectionType = Yes  CalcEffectiveHeight
    CorrectionType = No   RadonBGRemove
    CorrectionType = Yes  ComptonStripping
```

```
   CorrectionType = Yes  HeightCorrection
   CorrectionType = Yes  ConvertToConcentration


### Main I/O settings ###
   MainChannelIO|TC       = TC_From_GR820_DOWN_NASVD --> TC_NASVD_Cor
   MainChannelIO|K        = K_From_GR820_DOWN_NASVD --> K_NASVD_Cor
   MainChannelIO|U        = U_From_GR820_DOWN_NASVD --> U_NASVD_Cor
   MainChannelIO|Th       = TH_From_GR820_DOWN_NASVD --> TH_NASVD_Cor
   MainChannelIO|UpU      = GR820_U_UP --> U_UP_Cor
   MainChannelIO|Cosmic   = GR820_COSMIC --> GR820_COSMIC_Cor
   MainChannelIO|Spectrum = GR820_DOWN_NASVD -->
GR820_DOWN_NASVD_Cor

### Control Channel I/O settings ###
   ControlChannel|RadarAltimeter     = ALTRAD_MT_LAG  [metres]
   ControlChannel|Pressure/Barometer = KPA        [kPa]
   ControlChannel|Temperature        = TEMP_EXT


### Input for correction ###
   InputForCorrection    = ROIs


### Pre-filtering settings ###
   Filtering|TC      = 0
   Filtering|K       = 0
   Filtering|U       = 0
   Filtering|Th      = 0
   Filtering|UpU     = 0
   Filtering|Cosmic  = 13
   Filtering|RadarAltimeter     = 7
   Filtering|Pressure/Barometer = 7
   Filtering|Temperature        = 7

### Live-time correction settings ###
   LiveTimeChannel          = GR820_LIVE_TIME
   LiveTimeUnits            = milli-seconds
   ApplyLiveTimeCorrToUpU   = Yes

### Cosmic correction settings ###
   CosmicCorrParam|TC     = 1.098170,  19.569800
   CosmicCorrParam|K      = 0.066425,  2.976660
   CosmicCorrParam|U      = 0.056224,  0.137087
   CosmicCorrParam|Th     = 0.062637,  -0.550230
   CosmicCorrParam|UpU    = 0.014127,  0.150030
   CosmicCorrParam|SpectrumBackgroundFile   =
```

```
### Effective-Height settings ###
   EffectiveHeightOutputChannel = EffectiveHeight
   EffectiveHeightOutputUnits  = metres

### Special Stripping (Compton Stripping) ###
   ComptonCorrParam_Stripping_Alpha     = 0.235000
   ComptonCorrParam_Stripping_Beta      = 0.404000
   ComptonCorrParam_Stripping_Gamma     = 0.727000
   ComptonCorrParam_AlphaPerMetre       = 0.000000
   ComptonCorrParam_BetaPerMetre        = 0.000000
   ComptonCorrParam_GammaPerMetre       = 0.000000
   ComptonCorrParam_GrastyBackscatter_a = 0.047000
   ComptonCorrParam_GrastyBackscatter_b = 0.003000
   ComptonCorrParam_GrastyBackscatter_g = 0.011000

### Height Correction settings ###
   SurveyHeightDatum      = 60.000000
   AttenuationCorrControl = 0
   AttenuationForNegROIs  = Yes
   HeightCorrParam|TC     = -0.007366, 200.000000
   HeightCorrParam|K      = -0.009241, 200.000000
   HeightCorrParam|U      = -0.008090, 200.000000
   HeightCorrParam|Th     = -0.007055, 200.000000

### Concentration settings ###
  ConcentrationParam|K      = Concentration_K,  49.329
  ConcentrationParam|U      = Concentration_U,  6.878
  ConcentrationParam|Th     = Concentration_Th,  2.890
  AirAbsorbedDoseRateParam  = DoseRate,  16.051
  NaturalAirAbsorbedDoseRateParam = NaturalDoseRate,  0.000000, 0.000000,
0.000000

CONTROL_END
```