

Operations Report for ESO URANIUM CORP.

High Resolution Tri-Sensor Magnetic & XDS VLF-EM Airborne Survey

> Mikwam Gold Property Cochrane, ON

> > September 4, 2008

Report #: B-287

Requested by: Jeremy Brett MPH Consulting Ltd.

Prepared by: Charles Barrie, Managing Partner **Terraquest Ltd.**

Terraquest Ltd., Airborne Geophysical Surveys Contract B-287 File: B-287-N87V 2008/09/04

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1. Introduction

1.1. Executive Summary

This report describes the specifications and parameters of an airborne geophysical survey carried out for:

ESO URANIUM CORP.

408 – 1199 Pender Street West Vancouver, BC V6E 2R1

Attention: Benjamin Ainsworth, VP Exploration Tel: 604-629-0293 Fax: 604-684-9365 Email: <u>idw@esouranium.com</u>

The survey was performed by:

Terraquest Ltd., 2-2800 John Street, Markham

ON, Canada L3R 0E2

Phone: 905-477-2800 ext. 22 Email: <u>hb@terraquest.ca</u>.

The purpose of the survey of this type is to collect geophysical data that can be used to prospect directly for economic minerals that may be characterized by anomalous magnetic or conductive responses. Secondly, the geophysical patterns can be used indirectly for exploration by mapping the geology in detail, including faults shear zones, folding, alteration zones and other structures.

To obtain this data, the area was systematically traversed along parallel flight lines by aircraft, carrying geophysical sensors and recording equipment. The lines are spaced and oriented to intersect the geology and structure so as to provide optimum contour patterns of the geophysical data.

1.2. Survey Location

The survey is located in northern Ontario, approximately 145 kilometres northeast of the town of Cochrane. The survey outline is irregular in shape. The maximum dimensions are 3.3 kilometers north–south and 6.4 kilometers east-west. The average centre of the survey area is approximately 49 degrees 49 minutes north and 79 degrees 42 minutes west.



2. SURVEY SPECIFICATIONS

2.1. LINES AND DATA

Parameter	Specification	Instrument Precision
Mean Aircraft Speed	66.5 m/sec 240 km/hr	
Sampling Interval	6-8m (10Hz)	
Flight-line Interval	100 metres	+/- 3m
Flight-line Direction	045/225 degrees	
Control-line Interval	1,00 metres	+/- 3m
Control-line Direction	135/315 degrees	
Aircraft MTC	70 metres	+/- 5m
Mag Sensor MTC	70 metres	+/- 5m

2.2. SURVEY KILOMETRAGE

Survey Kilometers:	
Survey Lines	232 km
Tie (Control) Lines	51 km
Total	283 km

2.3. NAVIGATION SPECIFICATIONS

The client provided a poly file of the claim outline. Terraquest designed the airborne survey outline to cover the claim outline plus overruns for adequate data processing purposes in accordance with industry standards. The following file is the navigation parameter file for the survey, and includes the survey corner coordinates (in WGS84 projection zone 17N), line spacing, line direction, master line and other navigational parameters.

0 1	ESOQ8431-L z 17			
2	593883 1	5485039 4		ARFA CORNER 1
2	595110 3	5483818 4		AREA CORNER 2
2	595785 4	5484504 0		AREA CORNER 3
2	596273 8	5483995 1		AREA CORNER 4
2	596663 7	5484380 9		AREA CORNER 5
2	597849.8	5483162.0		AREA CORNER 6
2	596347.7	5481758.3		AREA CORNER 7
2	595830.5	5482283.7		AREA CORNER 8
2	595444.8	5481889.7		AREA CORNER 9
2	595108.2	5482250.8		AREA CORNER 10
2	593705.8	5480844.1		AREA CORNER 11
2	592993.1	5481576.4		AREA CORNER 12
2	591906.5	5480512.8		AREA CORNER 13
2	591513.4	5480936.7		AREA CORNER 14
2	591128.1	5480528.3		AREA CORNER 15
2	589456.1	5482264.9		AREA CORNER 16
2	591710.3	5484376.5		AREA CORNER 17
2	592078.6	5483946.8		AREA CORNER 18
2	593173.3	5485036.4		AREA CORNER 19
3	593883.1	5485039.4	WPT1	WAYPOINTS 1
4	54			NUMBER OF LINES
5	100.0			SPACING, m.
6	589071.9	5481877.4		MASTER LINE BL
7	594473.1	5487278.6		MASTER LINE TL
8	75			MAX CROSS TRACK, m.
9	0 0	0		DELTA X/Y/Z
10	1			LOG FPR EVERY 1 SECS
11	0.999600000	0.0		0.0 KO, X/Y SHIFT
14	200			LINES EXTENDED BEYOND AREA
16	1010			FIRST LINE NUMBER
17	588347.0	5481011.0	45.00	MASTER POINT, HEADING
20	WGS-84	6378137.0	298.2	257223563 22 ELLIPSOID
21	0			NO EQUATORIAL CROSSING
30	20	9600 N	1 8	RS-232 PORT 2 INCOMING FORMAT
31	20	9600 N	1 8	RS-232 PORT 1 OUTGOING FORMAT
38	0			METRIC SYSTEM
39	5			RACE TRACK
41	0.00			SYSTEM LAG, Sec.
80	0.00			PLANNED ALTITUDE, units

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2.4. FLIGHT PLAN



2.5. TOLERANCES - REFLIGHT

1. Traverse Line Interval

Re-flights would take place if the flight line separation of the final corrected flight path is greater than 25 metres from the intended flight path over a distance greater than 1 kilometre.

2. Terrain Clearance:

The aircraft mean terrain clearance was smoothly maintained at 70 metres MTC in a drape mode. Re-flights were done if the final differentially corrected altitude deviated from the specified flight altitude by \pm -10m over a distance of 3 kilometres or more if, in the pilot's opinion, it was safe to do so.

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3. Diurnal Variation:

Diurnal activity during the survey was limited to 10 nT deviation from a 5 minute chord.

4. GPS Data:

GPS data included at least four satellites for accurate navigation and flight path recovery. There were no significant gaps in any of the digital data including GPS and magnetic data.

5. Radio Transmission:

The aircraft pilot makes no radio transmission that interferes with the magnetic response.

6. Sample Density:

A reflight is required if the sample density along one or more of the survey lines exceeds 10 metres over a cumulative total of 1,000 metres for the magnetic survey.

2.6. NAVIGATION AND RECOVERY

The satellite navigation system was used to ferry to the survey sites and to survey along each line. The claim outline was supplied by the client and was used to establish the survey boundaries and the flight lines.

The flight path guidance accuracy is variable depending upon the number and condition (health) of the satellites employed. The accuracy was for the most part better than 10 metres. Real-time GPS correction service provided by Omnistar for North America improves the accuracy to less than 3 metres.

A digital camera recorded the ground image along the flight path with CD-ROM media. A video display screen in the cockpit enabled the operator to monitor the flight path during the survey. The GPS information is displayed along the top of the video image.

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3. AIRBORNE GEOPHYSICAL EQUIPMENT

The primary airborne geophysical equipment includes three high sensitivity cesium vapour magnetometers and an XDS VLF-EM system. Ancillary support equipment includes a tri-axial fluxgate magnetometer, digital camera, CD recorder, radar altimeter, barometric altimeter, GPS receiver with a real-time correction service, and a navigation system. The navigation system comprises a left/right indicator for the pilot and a screen showing the survey area, planned flight lines, and the real time flight path. All data were collected and stored by the data acquisition system. The following provides summary and detailed equipment specifications:

Aircraft	King Air 90
Equipment:	
Magnetometers	CS-2 Cesium Vapour
VLF-EM	Terraquest XDS
3-axis Magnetometer	Billingsley Magnetics TFM100-LN
GPS Receiver	Trimble AG132
Radar Altimeter	King KRA 10A
Barometric Altimeter	Sensym Model LX18001AN
Navigation	AgNav Inc. P151
Tracking Camera	NTSC video recorded in jpeg format
Magnetic Specifications:	
Lateral Sensor separation	16.12 metres
Longitudinal Sensor separation	10.78 metres
Mag Output Sample Rate	10 Hz (20 Hz available with noise increase)
4 th difference noise envelope	0.10 from tail stinger
FOM index (Tail)	<1.5 nT
Sensitivity	0.001 nT

3.1. EQUIPMENT SUMMARY

3.2. SURVEY AIRCRAFT

Horizontal Gradiometer Equipped King Air 90



The Beech King Air 90 is an ideal platform for carrying out an airborne geophysical survey in these demanding environmental conditions. It is IFR equipped with twin PT6-20 turbines that will ensure reliability at both high ferry speed and slow survey speed. It is equipped with the long-range tanks capable of carrying approximately six hours of fuel.

1. Aircraft Specifications

and the second sec	
Manufacturer	Beechcraft
Model	King Air 90
Registration	N87V
Ownership	Dynamic Aviation.
Range	5.4 hours / 1100 n miles
Cruise Speed	200 Knots, 370 Km/hr
Survey Speed	288 Km/hr
Climb	1,220 ft/min
Climb sustained	~ 500 ft/min
Fuel	Jet A with cold weather additive
Fuel Consumption	60 us gal/hr 227 litres/hr
Oil Consumption	3 liter/hr

2. Aircraft Modifications

The aircraft has three seats to accommodate the pilot, co-pilot and operator, the rest have been removed. It is equipped with long-range tanks, heavy-duty tires, cargo door and full avionics.

The aircraft has been extensively modified to support a tail stinger and two wing tip extensions. The transverse separation between the wing tip magnetic sensors is 16.12 meters and the longitudinal separation to the tail sensor is 10.78 meters. Considerable effort has been made to remove all ferruginous materials near the sensors and to ensure that the aircraft electrical system does not create any noise.

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3.3. Survey Equipment and Specifications:

Data Acquisition System	Records digital data from all sensors (including GPS, MAG, and altimeter)
Model	RECON handheld PC
Manufacturer	Trimble
Memory Card	512 M CF card
Software	SDAS by Kroum VS Instruments Ltd.
Video recording	Stealth computer via USB capture device

1. Data Acquisition System

2. Magnetics:

Three high resolution cesium vapour magnetometers, manufactured by Scintrex Ltd., are mounted in a tail stinger and two wing tips extensions; the aircraft has a transverse separation of 16.12 metres and a longitudinal separation of 10.78 metres. The magnetic system is fully compensated post flight for aircraft manoeuvre noise

Sensor Type	Cesium Vapour
Model	CS-2, CS-3
Manufacturer	Scintrex Ltd.
Resolution	0.001 nT counting at 0.1 per second
Sensitivity	+/- 0.005 nT
Dynamic Range	20,000 to 100,000 nT
Fourth Difference	0.02 nT
Recorded Sample Rate	0.1 seconds
Noise Envelope	0.10 nT (Tail Mag)

3. Compensation Sensor

The fluxgate tri-axial magnetometer (which is used for compensation of aircraft motion) is mounted in midsection of the tail stinger and monitors aircraft manoeuvre and magnetic interference.

Sensor Type	Fluxgate
Model	TFM100-LN or equivalent
Manufacturer	Billingsley Magnetics

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Description	Low noise miniature triaxial fluxgate magnetometer
Axial Alignment	> Orthogonality $> +/- 0.5$ degree
Accuracy	< +/- 0.75% of full scale (0.5% typical)
Field Measurement	+/- 100,000 nanotesla
Linearity	< +/- 0.0035% of full scale
Sensitivity	100 microvolt/nanotesla
Noise	< 14 picotesla RMS/–Hz @ 1 Hz

4. Flight Path Camera

Туре	Video (mounted in belly of aircraft)
Model	DFW-SX910
Manufacturer	Sony
Element	1/3 inch CCD
Lens	wide angle adaptor typically 4 mm, $\sim 60^{\circ}$ field of view

5. Digital Imaging System

Digital Imaging System	NTSC image logged onto Stealth computer
Model	USB 2000 video capture
Manufacturer	Zarbeco
Format	Images can be captured in JPEG.
Media	CD or DVD Disks

6. Radar Altimeter

Туре	Radar
Model	TRA-3500
Manufacturer	Free Flight
Accuracy	Plus or Minus 5% at 50 to 500 feet
Radar Output	Digital for pilot and data acquisition

7. Barometric Altimeter

Туре	Barometric
Model	LX18001AN
Manufacturer	Sensym
Source	coupled to aircraft barometric system

8. Data Acquisition

Data Acquisition	Recording only
Model	RECON Pocket PC
Manufacturer	Trimble
Operating System	Microsoft Windows Mobile 2003
Processor	Intel XKL 200 MHz, 64 MB RAM, 256 MB memory
Ports	Serial communication
Display	3.5" transflective colour, Up to 4 fields
Recording Media	internal flash memory cards
Recording Program	SDAS software by Kroum VS Instruments

9. Magnetometer Processor

Magnetometer Processor	Stand alone unit
Model	KMAG4
Manufacturer	Kroum VS Instruments
Input Range	3 ms – 10,000 ms
Sampling	10 ms - 1,000ms
Bandwidth	No input filtering
Resolution	0.005 nT
Ports	Two R232; one to GPS, one to DAS instrument time
Output	Instrument time, GPS and up to 4 magnetic fields in pT

10. Analogue Processor

Analogue Processor	Stand alone module – 2 modules per system
Model	KANA 8
Manufacturer	Kroum VS Instruments
Channels	Each module has 8 differential channels, 24 bit ADC
Video	Video overlay board
Serial Ports	CPU and GPS interfaces
Video Ports	In/out ports
Sampling	Selectable sampling for each input type as required
Analog Inputs	Radar & barometric altimeters, temp, VLF-EM, video

11. Navigation System

Navigation System	
Model	P151
Manufacturer	AgNav Inc.
Operating System	Windows
Microprocessor	CPU Pentium based
Ports	RS232 for all devices
Graphic Display	Colour Screen
Pilot Display	P202: position, left/right, navigational info

12. GPS Differential Receiver

GPS Differential Receiver	
Model	AG 132
Manufacturer	Trimble
Antenna	L1/L2
Channels	12
Position Update	0.2 second for navigation
Correction Service	Real time correction service subscription – Omnistar
Sample Rate	1 second
Accuracy	~ 3 meters

4. Base Station Equipment

4.1. BASE STATION MAGNETOMETER

The aircraft performed this survey on a one day mission and time and weight restrictions prevented setup of base magnetic station. The diurnal activity was monitored by the aircraft system while it was stationary on the ground. Ground magnetic data recorded by the Geological Survey of Canada for this period was downloaded.

5. TESTS AND CALIBRATIONS

5.1. MAGNETIC FIGURE OF MERIT

Compensation calibration tests were performed to determine the magnetic influence of aircraft maneuvers and the effectiveness of the aircraft compensation method. The aircraft flew a square pattern in the four survey directions at a high altitude over a magnetically quiet area and perform pitches (\pm 5°), rolls (\pm 10°) and yaws (\pm 5°). The sum of the maximum peak-to-peak residual noise amplitudes in the total compensated signal resulting from the twelve maneuvers is referred to as the Figure of Merit (FOM) index.

6. LOGISTICS

6.1. PERSONNEL

The contractor supplied the following properly qualified and experienced personnel to carry out the survey and to reduce, compile and report on the data:

Field:	Pilots Operator Geophysicist	Mike Bisono, Mike Palmiter Patrick Murphy Kendahl Pomeroy
Office:	Senior Geophysicist Geophysicist Manager	Allen Duffy Kendahl Pomeroy Charles Barrie

6.2. FIELD REPORTING

The aircraft flew in from Geraldton, Ontario on flight 614, on August 21, 2008 and did an FOM and started the survey. The aircraft was refueled at lunch. The survey was completed plus a second FOM on the second flight 615 in the afternoon.

6.3. BASE OF OPERATIONS

The main base of operations was at the Geraldton airport with mid-survey refueling at Cochrane; the ferry distance from Cochrane to the survey area is 145 kilometres.

6.4. ACCOMMODATION

Accommodations for the crew were the responsibility and cost of Terraquest. High speed internet was available and most of the time it was reliable.

7. Data Processing

7.1. DATA QUALITY CONTROL & PRELIMINARY PROCESSING

Throughout the data acquisition period, the data were monitored and reviewed thoroughly for quality control and tolerances on all channels by an infield geophysicist. This included any corrections to the flight path, making flight path plots, importing the base station data, creating a database on a flight-by-flight basis, and posting the data. All data were checked for continuity and integrity. Any errors or omission or data beyond tolerances were flagged for re-flight and the crew was notified, ready for their flight in the morning.

7.2. FINAL MAGNETIC DATA PROCESSING

In the first step the raw magnetic data was compensated for aircraft motion effects using data from the fluxgate sensor. The lateral magnetic gradient was calculated by subtracting the left wing sensor reading from the right wing sensor reading and dividing the resulting value by the tip-to-tip separation (16.12 metres), yielding the measurement expressed as nT/m. The longitudinal gradient was similarly calculated by subtracting the tail sensor measurement from the average of the wing-tip values normalized by the wing-centre to tail sensor separation (10.78 metres). Both gradients were "DC shifted" by subtracting the median value on a line-by-line basis and converted from aircraft-centric to survey grid orientation by selectively inverting (multiplying by -1) in the south and westbound directions. The gradient data was subsequently verified by generating a Reconstructed Total Field (RTF) grid using the Lateral and Longitudinal data grids as input. The RTF is a coherent, detailed and well leveled product but does not contain the low to lower-mid wavelength components; because the units are pseudo nT it should not be used for quantitative modelling.

In the final correction process, the compensated tail sensor magnetic data were corrected with standard tie-line intersection leveling. The intersections of traverse and control lines were calculated and the difference in observed magnetic values was attributed to diurnal variation. In some active areas, with steep magnetic gradients, the difference reflects not only diurnal, but also some error due to small inaccuracies in both horizontal and vertical position at the line intersection. If the implied diurnal correction at these intersections was inconsistent with adjacent diurnal indications, the indicated correction was ignored. The correction applied was a linear sloping datum connecting the interpreted diurnal value at each control line intersection. The vertical magnetic gradient was subsequently calculated from the final processed total magnetic field data grid (originating from the Tail Sensor). The finalized datasets were gridded with a grid cell size of 25 metres.

Total Magnetic Intensity



Vertical Magnetic Gradient



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Measured Lateral Gradient



Measured Longitudinal Gradient



7.3. FINAL RADIOMETRIC DATA PROCESSING

Radiometric data were collected but not requested by the client.

7.4. FINAL ELECTROMAGNETC DATA PROCESSING

The Terraquest XDS system produced good resolution and consistent results. The Terraquest XDS-VLF system is currently in the developmental stage and as such only basic processing has been performed on this data. The x, y and z components of the XDS-VLF-EM data in the range of 22.0 to 26.0 kHz (which include Cutler and Seattle transmitter signals), were inverted, normalized, mean leveled and micro-leveled. The data were gridded with a cell size of 25 metres and presented as contour plots of the Line Field coil, Ortho Field coil and Vertical Field coil.

XDS VLF-EM Line Field



XDS VLF-EM Ortho Field



XDS VLF-EM Vertical Field



7.5. LIST OF FINAL PRODUCTS

Two copies of the following colour maps were produced with a grid cell size of 25 metres, a scale of 1:20,000 and projection WGS84, UTM zone 17; the back ground is NTS topography:

- Map 1: Flight Path
- Map 2: Total Magnetic Intensity of Tail Sensor (nT)
- Map 3: Calculated Vertical Derivative of Tail Sensor (nT/m)
- Map 4: Transverse Magnetic Gradient (nT/m)
- Map 5: Longitudinal Magnetic Gradient (nT/m)
- Map 6 XDS VLF-EM Line Component
- Map 7: XDS VLF-EM Ortho Component
- Map 8: XDS VLF-EM Vertical Component
- Map 9: Digital Terrain Model
- Digital grid archives on CD-ROM in GEOSOFT
- All GEOSOFT MAP files used to generate the above listed final maps
- Digital Profile Archives on CD-ROM in GEOSOFT GDB format (compatible with 4.1 or higher)

8. SUMMARY

An airborne tri-sensor, high sensitivity magnetic and XDS VLF-EM survey was performed at 70 metre mean terrain clearance, 100 metre line intervals, 1,000 metre tie line interval, with data sample points at 6-8 metres along the flight lines. Diurnal activity was monitored by the stationary aircraft system before and after the flight; ground data was also downloaded from the GSC monitoring system.

The data were subjected to final processing to produce the following 1:20,000 scale colour maps, with grid cell size of 25 metres, NTS topographic underlay and projection WGS84 UTM zone 17: a) total magnetic intensity and calculated first vertical derivative of tail sensor, b) measured transverse and longitudinal magnetic gradient, c) XDS VLF-EM Line, Ortho and Vertical Components, and d) flight path digital terrain model.

All data have been archived as Geosoft database (GDB) plus all MAP and GRID files used to make the maps.

Respectfully Submitted,

Charles Barrie, M.Sc. Vice President Terraquest Ltd.

9. APPENDICES

9.1. APPENDIX I - CERTIFICATE OF QUALIFICATION

I, Charles Barrie, certify that I:

- 1) am registered as a Fellow with the Geological Association of Canada and work professionally as a geologist,
- 2) hold an Honours degree in Geology from McMaster University, Canada, obtained in 1977,
- 3) hold an M.Sc. in Geology from Dalhousie University, Canada, obtained in 1980,
- 4) am a member of the Prospectors and Developers Association of Canada,
- 5) am a member of the Canadian Institute of Mining, Metallurgy and Petroleum,
- 6) have worked as a geologist for over twenty five years,
- 7) am employed by and am an owner of Terraquest Ltd., specializing in high sensitivity airborne geophysical surveys, and
- 8) have prepared this operations and specifications report pertaining to airborne data collected by Terraquest Ltd..

Markham, Ontario, Canada

Signed



Charles Q. Barrie, M.Sc. Vice President, Terraquest Ltd.

9.2. APPENDIX III – FIGURE OF MERIT

FOM INDEX :N87V - FLIGHT N87V617 21 AUG 2008 (B287) / BASE:GERALDTON, C

FOM TEST #1 - SET "B"										
MAG 1										
DIR	TRAV	LINE	PIT	PITCH ROLL YAW		ROLL			Р	
	FLG		MAX	MIN	MAX	MIN	MAX	MIN		
NE (4)		9050	0.08	-0.11	0.36	0.04	0.04	-0.26		0.19
NW (1(*	9060	0.06	-0.08	0.05	-0.05	0.08	-0.05		0.14
SW (3)		9070	0.09	-0.08	0.06	-0.04	0.08	-0.08		0.17
SE (2)	*	9080	0.04	-0.10	0.09	-0.06	0.13	-0.03		0.14
									SUM	0.64
									FOM	2.06
							FOM	TRAVERS	SE ONLY	0.82

	MAG 2									
DIR	TRAV	LINE	PIT	СН	ROLL		YAW			Р
	FLG		MAX	MIN	MAX	MIN	MAX	MIN		
NE (4)		9050	0.09	-0.12	0.31	0.08	0.00	-0.29		0.21
NW (1(*	9060	0.06	-0.08	0.11	-0.13	0.13	-0.10		0.14
SW (3)		9070	0.09	-0.08	0.09	-0.07	0.11	-0.09		0.17
SE (2)	*	9080	0.04	-0.13	0.10	-0.07	0.17	-0.04		0.17
									SUM	0.69
									FOM	2.42
	FOM TRAVERSE ONLY							1.16		

	MAG 3									
DIR	TRAV	LINE	PITCH		ROLL		YAW			Р
	FLG		MAX	MIN	MAX	MIN	MAX	MIN		
NE (4)		9050	0.04	-0.11	0.27	0.02	0.00	-0.19		0.15
NW (1(*	9060	0.03	-0.03	0.01	-0.02	0.03	-0.02		0.06
SW (3)		9070	0.04	-0.04	0.03	-0.03	0.03	-0.04		30.0
SE (2)	*	9080	0.01	-0.09	0.08	-0.02	0.09	-0.02		0.10
									SUM	0.39
									FOM	1.25
							FOM	TRAVERS	SE ONLY	0.45

9.3. APPENDIX II - DAILY LOG

August 21, 2008

Weather:	clear, flyable
Flight	N87V-614 and 615
Comments:	start and complete survey, perform 2 FOM's