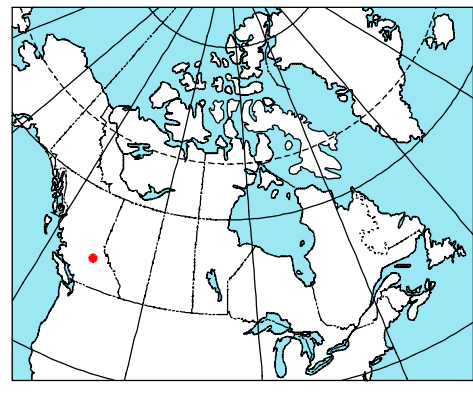


This airborne geophysical survey and the production of this map were funded by Richfield Ventures Corp.



Resources naturelles
Canada

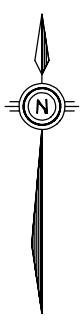


GEOPHYSICAL SERIES - NTS 93H/4, 93A/13 - WELLS
BRITISH COLUMBIA

URANIUM / POTASSIUM

Kilometres
Scale 1:50 000 - Échelle 1/50 000
0 1 2 Kilometres

Universal Transverse Mercator Projection
North Coordinate Zone: 18M
© Her Majesty the Queen in Right of Canada 2006
Proprietary universal transverse de Mercator
Projection de Mercator universelle zone méridienne 18M
© Sa Majesté la Reine en chef du Canada 2006
Digital Topographic Data provided by Geomatics Canada, Natural Resources Canada



OPEN FILE
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5289
GEOLOGICAL SURVEY OF CANADA
GÉOLOGIQUE SURVEY OF CANADA
2006
SHEET 4 OF 10
FOLIOLET 4 DE 10

Open file and product
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for release to the public
without restriction on
publication process.

Les données et produits
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publication de la GSC.



High Sensitivity Airborne Gamma-Ray Spectrometric and Aeromagnetic Surveys
Central British Columbia, 2004 - 2005

In 2004 and 2005, Fugro Airborne Surveys completed nine multi-sensor airborne geophysical surveys in the central region of British Columbia for the Geological Survey of Canada, the British Columbia and Yukon Chapter of Mines, Geological Survey of Canada, and the industry partners, including Serpent Resources Inc., Valeant Hill Resources Ltd (Richfield Ventures Corp), 2000 Resources Inc., and Armet Resources Ltd. The Geological Survey of Canada provided survey supervision and quality control. The purpose of the survey was to obtain quantitative gamma-ray spectrometric and aeromagnetic data. The surveys were flown over two seasons, from September 16 to November 17, 2004 and June 15 to August 6, 2005, using either 300-BL and 300-BL Helicopters, C-525C1, and C-119C.

Gamma-ray Spectrometric Data

The airborne gamma-ray measurements were made with an Eksplorium GR800 gamma-ray spectrometer using nine 102 x 102 x 406 mm (41 in.) crystals. The main sensitive area consisted of eight crystals (five volume 33.6 litres). One crystal (33.6 volume 4.2 litres), shielded by the main array, was used to detect scintillation in background radiation caused by atmospheric radon. The system constantly monitored the natural potassium peak for each crystal, and using a Gaussian peak-fitting algorithm, adjusted the gain for each crystal.

Potassium is measured directly from the 1460 keV gamma-ray photons emitted by ⁴⁰K, whereas uranium and thorium are measured indirectly from gamma-ray photons emitted by daughter products (²¹⁴Pb for uranium and ²¹⁴Pb for thorium). Although these daughters are far down their respective decay chains, they are assumed to be in equilibrium with their parents, thus gamma-ray spectrometric measurements of uranium and thorium are referred to as equivalent uranium and equivalent thorium, i.e. U_{eq} and Th_{eq}. The energy windows used to measure potassium, uranium and thorium are:

Potassium (K) 1300 - 1500 keV
Uranium (U) 80 - 1000 keV
Thorium (Th) 2410 - 2810 keV

Gamma-ray spectra were recorded at an electronic interval of 0.1 second (1000 counts) of 1200 or 600 depending on the survey area and an air speed of 125m/h. The total potassium, uranium and thorium window counts were derived from the recorded 200 channel spectra. During processing, the spectra were energy calibrated, and counts were accumulated into the windows described above. Counts from the radon detectors were accepted in a 1000 - 1460 keV window and radiation at energies greater than 3000 keV was recorded in the cosmic window. The window counts were corrected for dead time, and for background activity from cosmic radiation, the radioactivity of the aircraft and atmospheric radon decay products. The window data were then converted for spectral sensitivity to the ground, air and interference. Corrections for degradation of altitude from the principal flight altitudes and for variation of temperature and pressure were made prior to conversion to ground concentrations of potassium, uranium and thorium, using factors determined from flights over a calibration range near China.

Potassium 57.3 cps/km (2000) 96.9 cps/km (2000)
Uranium 6.7 cps/km (2000) 8.4 cps/km (2000)
Thorium 16.7 cps/km (2000) 3.7 cps/km (2000)

Corrected data were filtered and interpolated to a 100m grid for the 1:250 000 scale maps and to a 50m grid for the 1:125 000 and 1:50 000 scale maps. The results of an airborne gamma-ray spectrometric survey represent the average surface concentrations that are influenced by varying amounts of surface vegetation, vegetation cover, soil moisture and surface water. As a result, the measured concentrations are usually lower than the actual bedrock concentration. The total air absorbed dose rate in microgray per hour was produced from measured counts between 470 and 2810 keV.

Magnetic Data

The helicopter was equipped with a Sorbus CS-2 cesium vapour magnetic sensor mounted in a 1000 ft high-precision single aerial dipole magnetometer system. The system collected magnetic data every 0.1 seconds with a noise level of less than 0.01 nT. Magnetic interferences caused by aircraft components were compensated using an INRA-MAGNETIC Magnetic compensation. Diurnal variations and GPS fluctuations were recorded using a Fugro CFI base station.

After editing the survey data, the intersections of traverse and control lines were determined and the differences in the magnetic values were compared, averaged and manually verified to obtain the surveying network. The International Geomagnetic Reference Field was calculated and derived using a final date of June 20, 2005 for western blocks and July 1, 2005 for eastern blocks and an altitude of 50 m. Differentially corrected GPS height for each data point, the corrected magnetic data was interpolated to a 50m grid using a minimum curvature algorithm. The first vertical derivative grid was calculated from the corrected total magnetic intensity grid using a FFT based frequency domain filtering algorithm.

Positional Data

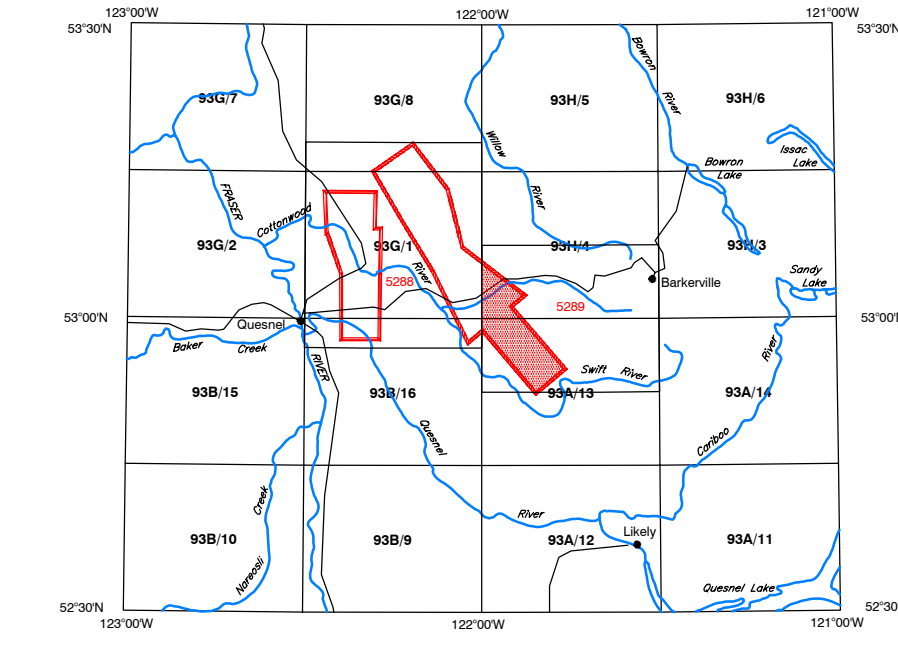
Line spacing and direction for survey and control lines were selected for each block to ensure the best intersection of line geometry. Real-time position was monitored by radio altimeter. Positional data were recorded using a 2-D real frequency Novatel Inertial system. GPS groundstation data were combined with airborne GPS data to produce differentially corrected positional data with an accuracy of 2 to 5 m.

Data Presentation

Colour levels and contours were calculated for each grid and combined with map surround information to create postscript plot files, which were plotted using HP DesignJet colour plotters.

Planimetric Symbols

Topographic Contour
Drainage
Road
Culture
Railway
Right Way, Road
1:10000
0 1000 2000



NATIONAL TOPOGRAPHICAL SYSTEM REFERENCE AND GEOGRAPHICAL MAP INDEX
SYSTÈME NATIONAL DE RÉFÉRENCE CARTOGRAPHIQUE ET INDEX DES CARTES GÉOGRAPHIQUES

Geographic Data
Geon: J.A. Chouin, R. Poth, J. Brown, R.M. Henry, B.J.A. and Baskin, J.L.
2006. Geophysical Survey of Canada, Open File 5289.
Scale 1:50 000.

URANIUM / POTASSIUM

WELLS

BRITISH COLUMBIA

93H/4, 93A/13