



AIRBORNE GAMMA-RAY SPECTROMETRIC MAP

Airborne gamma-ray spectrometry data collected in Nova Scotia during the summer of 1970, are presented:

- (1) as contour maps of the total count, the potassium, equivalent uranium and thorium, uranium concentrations, and the activity ratio of uranium isotopes;
- (2) as shaded profiles of the same radiometric parameters plotted for each of the 24 flight lines;
- (3) as contour maps and shaded profiles of four radionuclides, with scales 1:20,000 and 1:50,000 and 1:100,000, respectively, at mean terrain elevations of 500 feet and 100 feet. Contour interval 1000 feet each.

Resolution is measured directly from the 1.04 MeV gamma-ray peaks arising from potassium, uranium and thorium and measured indirectly from equivalent uranium and thorium equivalents in the decay chains of uranium and thorium. The uranium and thorium equivalent activity is measured from the 214Pb and 214Bi peaks in the decay chain of uranium and thorium. The mean terrain elevation is indicated by the contour lines.

Total Count	0.41-2.81 Mc/s
Potassium	0.80 - 1.23 (1.07) Mc/s
Uranium	0.1-0.4 - 1.66 (1.36) Mc/s
Thorium	0.2-0.8 - 2.52 (2.12) Mc/s

Uranium, thorium and potassium counts were measured over a 5-second period for each 100 m x 100 m cell. The data have been corrected for dead time, ambient temperature changes, background radiation, scattered radiation and detection of source geometry. The contour maps were plotted on a scale of 1:20,000. The shaded profiles were plotted on a scale of 1:50,000. The contour maps were plotted on a scale of 1:100,000. The mean terrain elevation is indicated by the contour lines.

The values for the radiometric concentrations shown on the contour maps are "average surface concentrations" that include average of the area and the standard deviation. The standard deviation is the square root of the sum of the squares of the standard deviations of the individual measurements. The standard deviation is the square root of the sum of the squares of the standard deviations of the individual measurements.

Factors for converting airframe measurements to ground concentrations were determined by relating the corrected airframe count rates over test areas in the Ottawa area to the known ground radiometric concentrations. The factors are: Potassium, 0.95; Uranium, 0.95; Thorium, 0.95. The conversion factors used are approximately those listed below.

Total Count	1.00 - 100 c.p.s.
1 c.p.s.	= 0.02 c.p.s.
1 ppm U	= 10 c.p.s.
1 ppm Th	= 2.0 c.p.s.

Total count measurements are presented as grids of radiometric concentration data, as defined by instrument flight-strip geometry. Subplot Report Series No. 176.

In order to produce the contour maps, data along the flight lines were average over constant 2-second operating intervals (approximately 2.5 m) and the effect of background radiation was subtracted out. The slope of contours is indicated by the contour lines.

(3) uses the contouring to a grid, i.e., the shaded values are on a grid. The contour interval is 1000 feet.

Comments between (1) and (2) results in a rectangular grid (approximately 2.5 m x 2.5 m) of data used for contouring. The contouring is done on a computer using the flight lines. This sort of method is difficult to describe in contouring maps and a good flight line, it has been determined from the value of the slope of the contour lines, but one should not rely on the contouring method for the precise location of radiometric targets. More accurate locations of anomalies can be made only by field data on the ground.

This project was carried out according to the standard procedures of the Geoscientific Information Research Program.

Airborne Gamma-Ray Spectrometry Survey 1970
 Research Geophysics Division
 Geological Survey of Canada
 800 rue de la Confédération, Québec, Québec G1K 8S5
 Catalogue No. G60-10-1/1-76

EQUIVALENT URANIUM ppm
ANNAPOLIS-SHELBURNE
 NOVA SCOTIA
 PARTS OF D.A.B. 230
 Scale 1:20,000