



GEOLOGICAL SURVEY OF CANADA
DEPARTMENT OF ENERGY MINES AND RESOURCES

AIRBORNE RADIOACTIVITY MAP

BLIND RIVER
ONTARIO
41J
INTEGRAL

Airborne gamma-ray spectrometry data collected during the summer of 1974, are presented (1) as contour maps of the integral count, the potassium, uranium and thorium concentrations, and the U/Th, U/K and Th/K ratios; and (2) as stacked profiles of the seven radiometric parameters plotted for each of the 33 flight lines.

The airborne measurements were made using a four window spectrometer, with twelve 22.86 cm x 10.16 cm NaI(Tl) detectors, flown at a mean terrain clearance of 120 metres and 190 km/hr. North-South flight lines were at 5 km line spacing, and the numbered flight lines are plotted on each of the contour maps.

Uranium, thorium and potassium counts were measured over 2.5-second intervals; integral counts over 0.5-second intervals. The data have been corrected for background, height variation and Compton scattering. The computer programs used to produce the contour maps and profiles are described by R.L. Grasty, 1972 "Airborne Gamma Spectrometry Data Processing Manual", GSC Open File No. 109. Values shown on the profiles represent counts per 0.5-seconds for the integral, and counts per 2.5-seconds for uranium, thorium and potassium. The maps are contoured in units of counts per 0.5-seconds for the integral, parts per million uranium and thorium, percent potassium, the concentration ratio for U/Th, and the concentration ratio $\times 10^4$ for U/K and Th/K.

The values for the radioelement concentrations shown on the contour maps are "average surface concentrations" over the area sampled or analysed by the airborne spectrometer. This area generally includes some outcrop, overburden and water in small ponds, streams and swamps. Consequently, the average surface concentrations as shown on the contoured maps are usually considerably lower than the concentrations in the bedrock. However, the radioelement distribution pattern shown by the contour maps reflects the distribution of the elements in the bedrock.

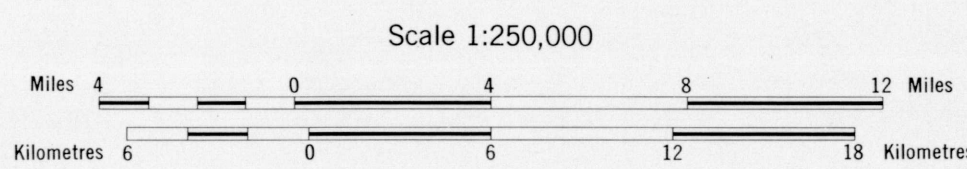
Factors for converting airborne measurements to element concentrations were determined by relating the corrected airborne count rates over test strips in the Ottawa area to the known ground radioelement concentrations (R.L. Grasty, and B.W. Charbonneau, 1974, Gamma-ray Spectrometer Calibration Facilities, GSC Paper 74-1B, pp. 69-71).

In order to produce the contour maps of integral count and radioelement distributions, data along the flight lines were averaged over seventeen 2.5-second counting intervals (approximately 2.2 km) and the effect of background count rates over the lakes were removed. Smoothing of the data for the ratio maps was accomplished by summing a minimum of 1000 counts for both elements before calculating the value of the ratio. This degree of averaging or smoothing is selected in order to (i) keep the smoothing to a minimum, i.e. have the smoothed values as close as possible to the original unsmoothed data, yet (ii) make the contouring grid dimension along the flight lines as large as possible, approaching the spacing between flight lines. Compromise between (i) and (ii) results in a rectangular grid (approximately 5 km E-W and 2 km N-S) of data used for contouring. As a result of these compilation procedures, contours in some cases may be distorted in a E-W direction, perpendicular to the flight lines. This sort of imperfection is difficult to avoid in contouring data on widely spaced flight lines. It does not detract from the value of the map as the product of a reconnaissance survey, indicating the regional radioelement distribution pattern, but one should not attempt to use these contour maps to pinpoint the precise location of exploration targets. More accurate locations of anomalies can be made using the data on the profiles.

Airborne Radioactivity Survey 1975
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Cartography by Geological Survey of Canada.



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