



GEOLOGICAL SURVEY OF CANADA
AIRBORNE RADIOACTIVITY MAP
DISTRICT OF MACKENZIE
NORTHWEST TERRITORIES
SOA.B.C.F.G.H.
URANIUM POTASSIUM RATIO

Airborne gamma-ray spectrometry data collected by the Geological Survey of Canada in the District of Mackenzie, N.W.T., in the summer of 1972 are presented as 7 contour maps and profiles along 45 flight lines. A geological map of the area, compiled by J. McMillan and showing the location of the survey flight lines, accompanies this Open File Release.

Airborne radioactivity measurements were made using a Thorium spectrometer, with 15, 22.86 cm by 10.16 cm NaI(Tl) detectors, flown at a mean terrain clearance of 120 metres and 150 knots. Uranium, thorium and potassium counts were measured over 2.5-second intervals; integral counts over 0.5-second intervals. Each uranium and potassium measurement relates to the element concentration in the uppermost 30 centimetres of a surface roughly 250 metres wide and 380 metres along the flight line.

The data have been corrected for background, height variation and Compton scattering. The computer program used to produce the contour maps and profiles are described by R. L. Grady, 1972, "Airborne Gamma Spectrometry Data Processing Manual", GSC Open File No. 109.

Values given on the maps and profiles represent counts per 2.5 second interval (Integral counts per 0.5 second). For this survey an approximate ground concentration can be obtained using the following relation:-
1 ppm Uranium = 21 counts
1 ppm Thorium = 9 counts
1 ppm Potassium = 137 counts

With the aid of 10 km flight line spacing, data along the flight lines were averaged over 25 points (14 km) and the effect of background count rates over 1400 was removed to allow the production of contour maps of Integral, Uranium, Thorium and Potassium. The highest regional radiometric concentration relates to coarse porphyritic granites of the Great Slave Province. The highest regional radiometric concentration relates to coarse porphyritic granites of the Great Slave Province. The highest regional radiometric concentration relates to coarse porphyritic granites of the Great Slave Province. The highest regional radiometric concentration relates to coarse porphyritic granites of the Great Slave Province.

The integral, uranium, thorium and potassium contour maps all show similar patterns with high levels of radioactivity west of the Shanty fault zone in the Bear Geological Province, and lower levels east of the fault. The Shanty fault zone is a major geological feature of the Great Slave Province. The highest regional radiometric concentration relates to coarse porphyritic granites of the Great Slave Province. The highest regional radiometric concentration relates to coarse porphyritic granites of the Great Slave Province.

The unsmoothed profiles show more detailed information and show several anomalies: a few hundred feet wide, within the Shanty zone of mineralization. For example, on Flight Line 2 west, between fiducials 6 and 7, an increase in uranium occurs with a high U/P ratio and a U/P value of 1.25 (U/P concentration ratio = 0.5).

Similar type anomalies (high uranium, U/P and U/P) occur on:
Flight Line 3 west near fiducial 3
Flight Line 10 west near fiducial 13
Flight Line 22 east near fiducial 1
and Flight Line 45 west between fiducials 8 and 9.

Several less prominent anomalies of this type, such as:
Flight Line 20 west near fiducial 11
Flight Line 20 west between fiducials 13 and 14
and Flight Line 20 west between fiducials 4 and 5
may also be significant.

A second type of anomaly, characterized by high uranium and thorium values, with little increase in the U/P ratio, can be seen on:
Flight Line 21 west east of fiducial 1
Flight Line 25 east between fiducials 4 and 5
and Flight Line 25 west between fiducials 5 and 6.

Airborne Radioactivity Survey 1972
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Scale 1:250,000
1:250,000
1:250,000
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