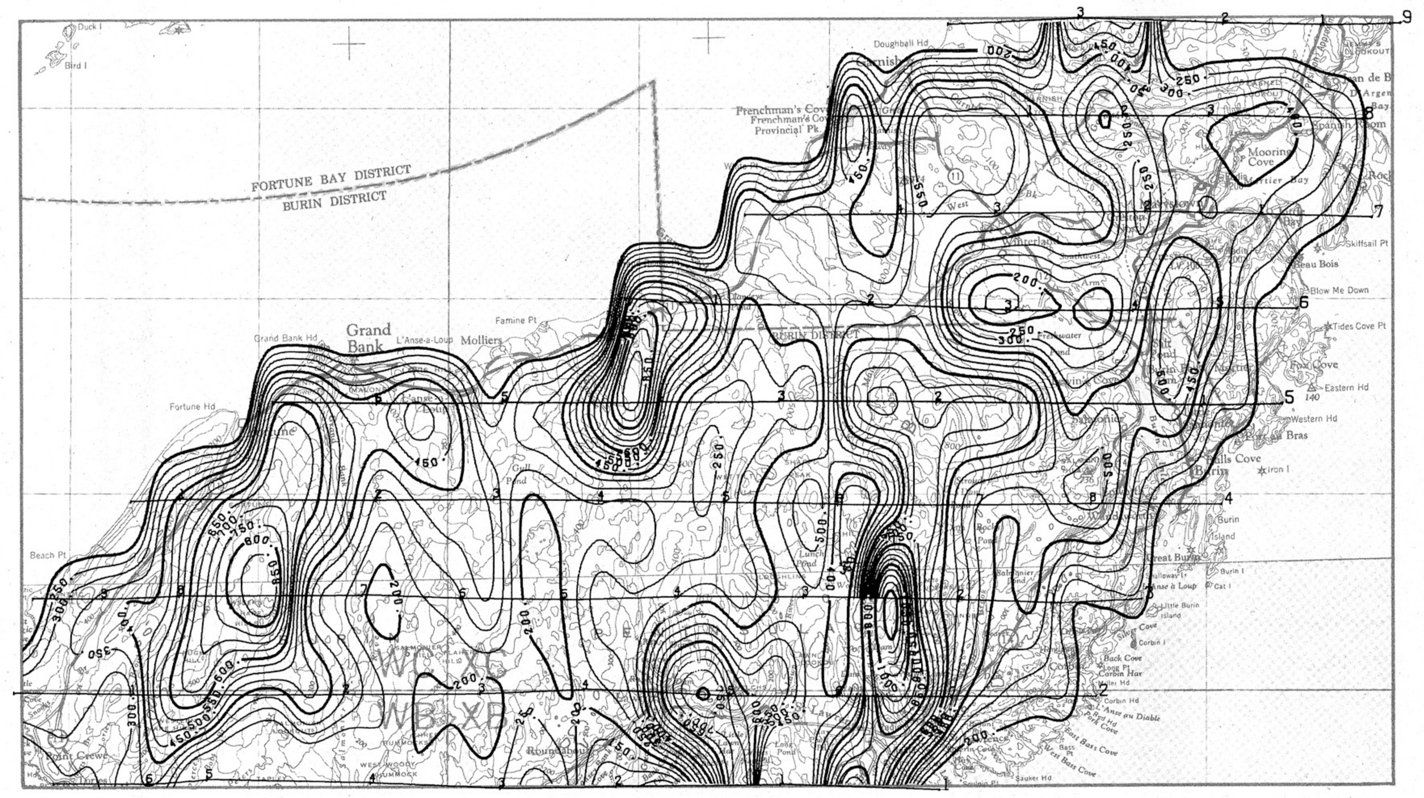
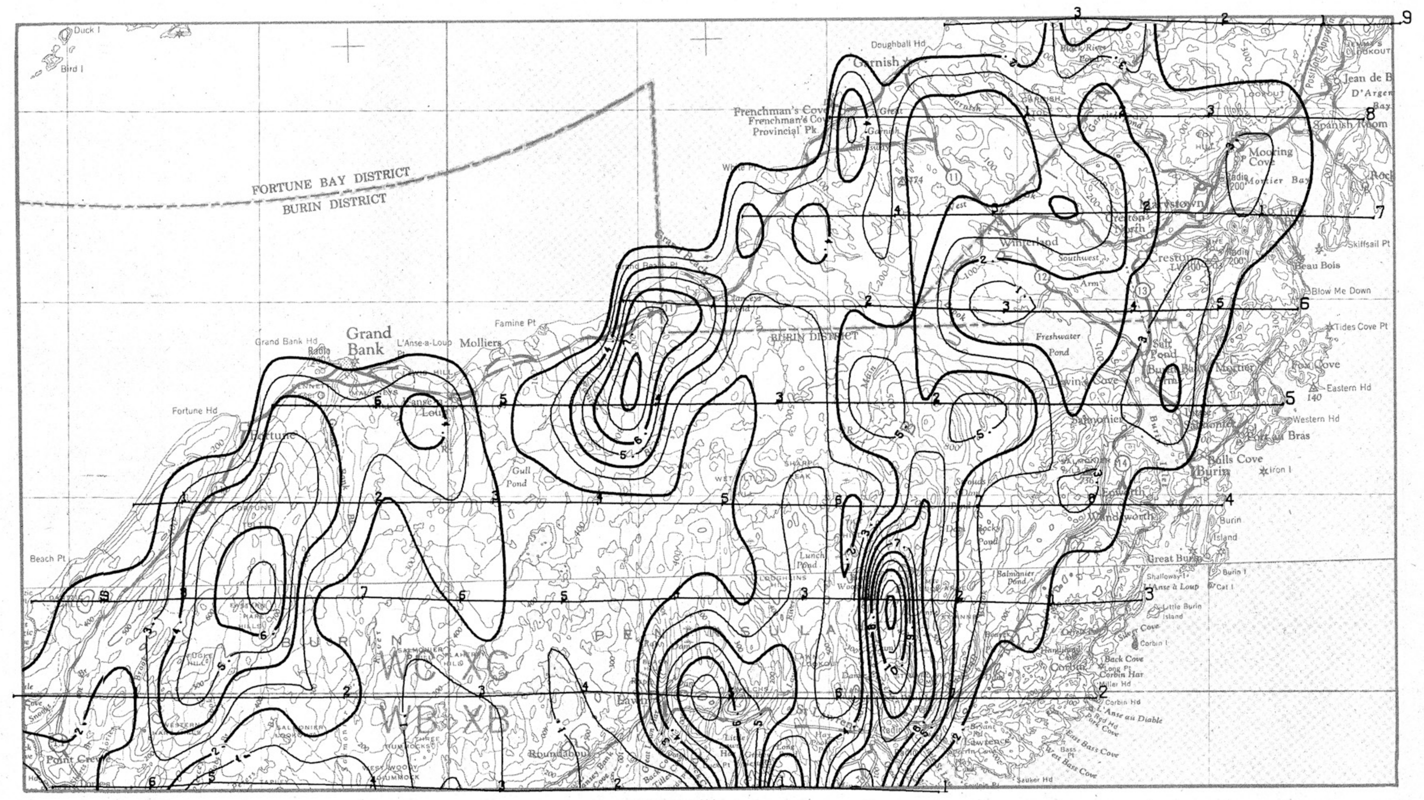
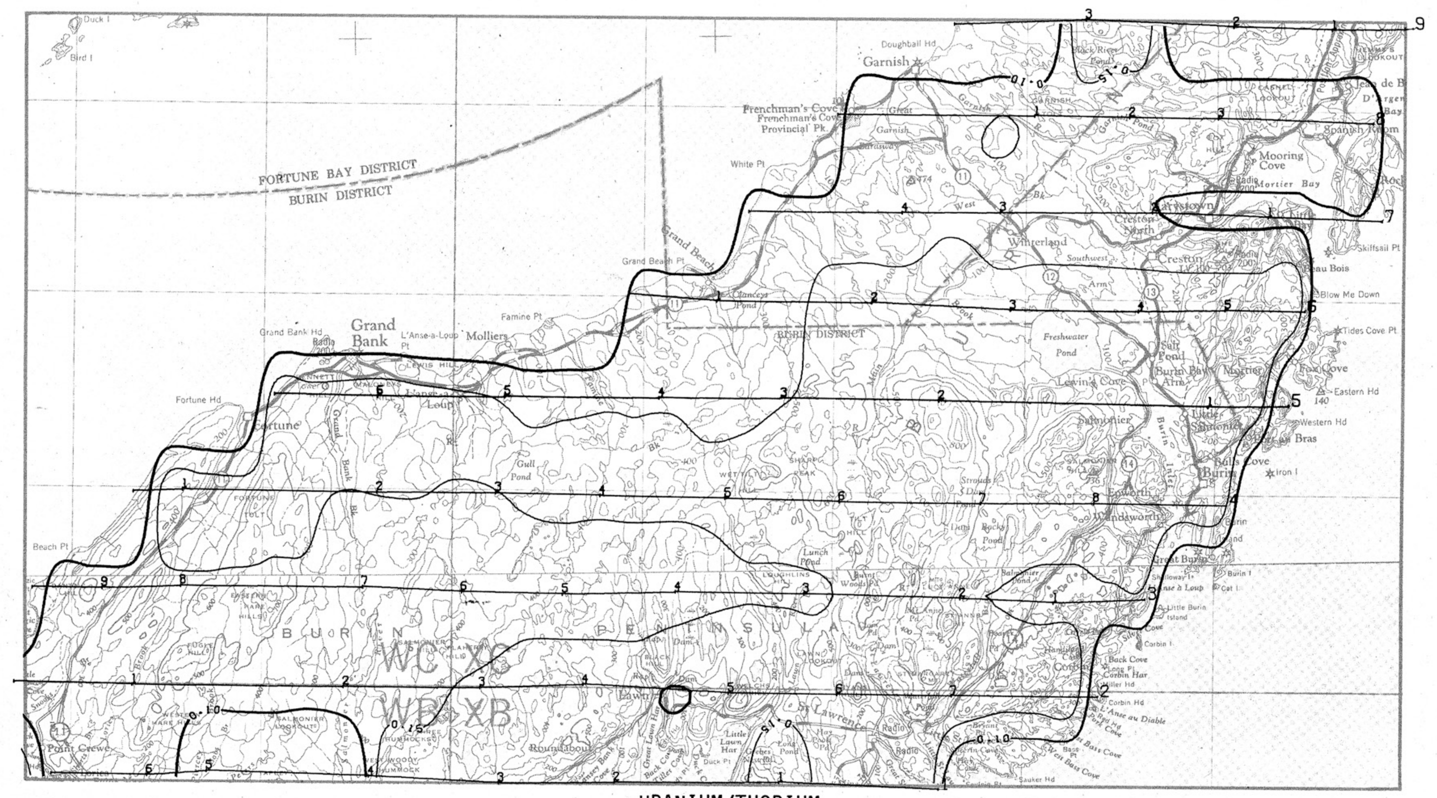


INTEGRAL



THORIUM PPM



URANIUM/THORIUM

COMMISSION GÉOLOGIQUE DU CANADA
MINISTÈRE DE L'ÉNERGIE, DES MINES ET DES RESSOURCES

AIRBORNE RADIOACTIVITY MAP
BURIN PENINSULA
NEWFOUNDLAND

Part of 1 M

Airborne gamma-ray spectrometry data collected in late October, 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 9 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 meters and 190 km/hr. East-West 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 x 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. The survey was flown after several days of heavy precipitation, and absorption of gamma radiation by moisture contained in the overburden results in further reduction of the measured average surface concentration of radioelements.

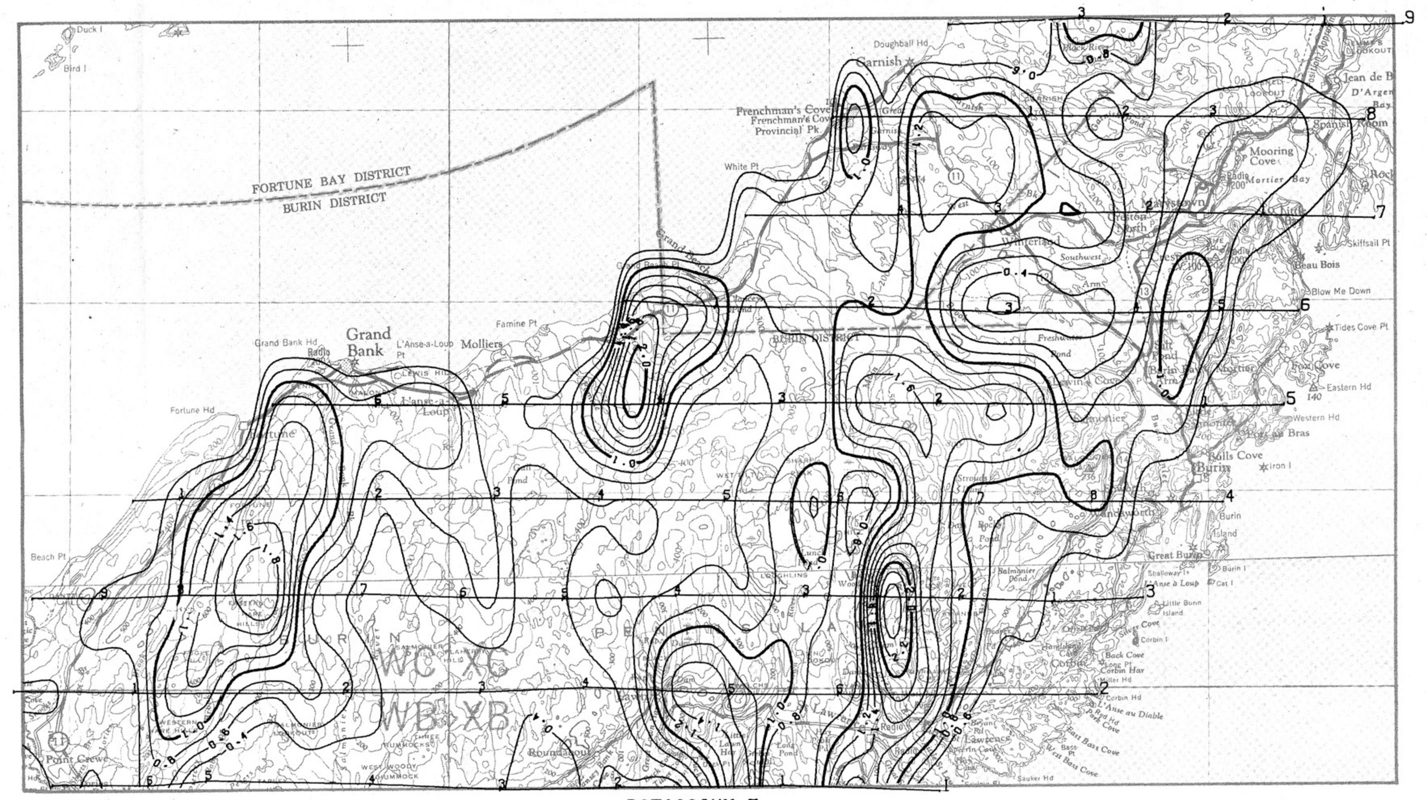
Factors for converting airborne measurements to element concentrations were determined by relating the corrected airborne count rates over test strips in the Ottawa area to the known ground radioelement concentrations (R.L. Grasty, and B.W. Charbonneau, 1974, Gamma-ray Spectrometer Calibration Facilities, 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). 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 N-S and 2 km E-W) of data used for contouring. As a result of these compilation procedures, contours in some cases may be distorted in a N-S direction, perpendicular to the flight lines. This does not detract from 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 location of exploration targets. More accurate locations of anomalies can be made using the data on the profiles.

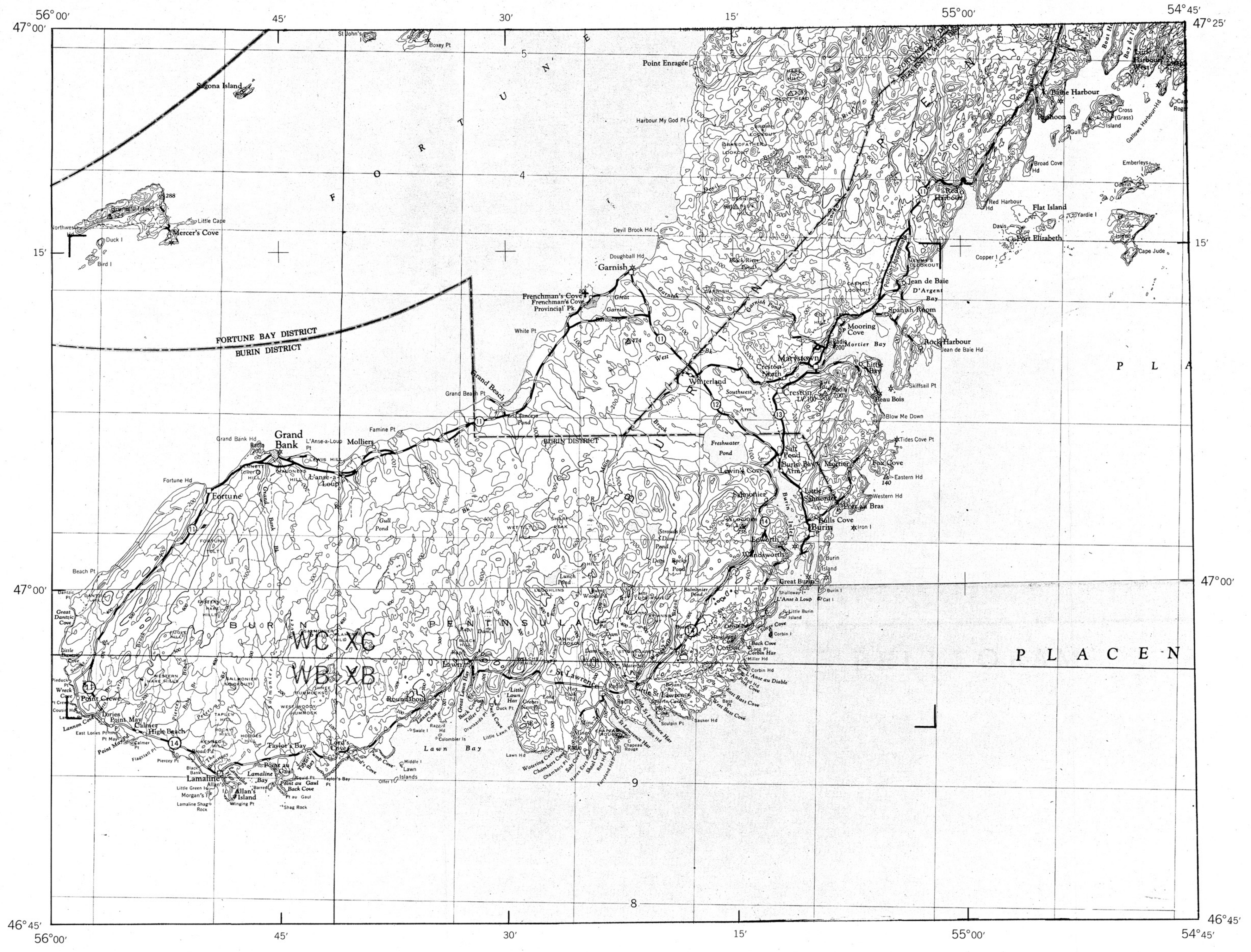
Airborne Radioactivity Survey 1975
K.A. Richardson
P.B. Holman
Resource Geophysics & Geochemistry Division
Geological Survey of Canada

Base Map Material supplied by Surveys and Mapping Branch.

Cartography by Geological Survey of Canada.



POTASSIUM %



Scale 1:250,000

Universal Transverse Mercator Projection

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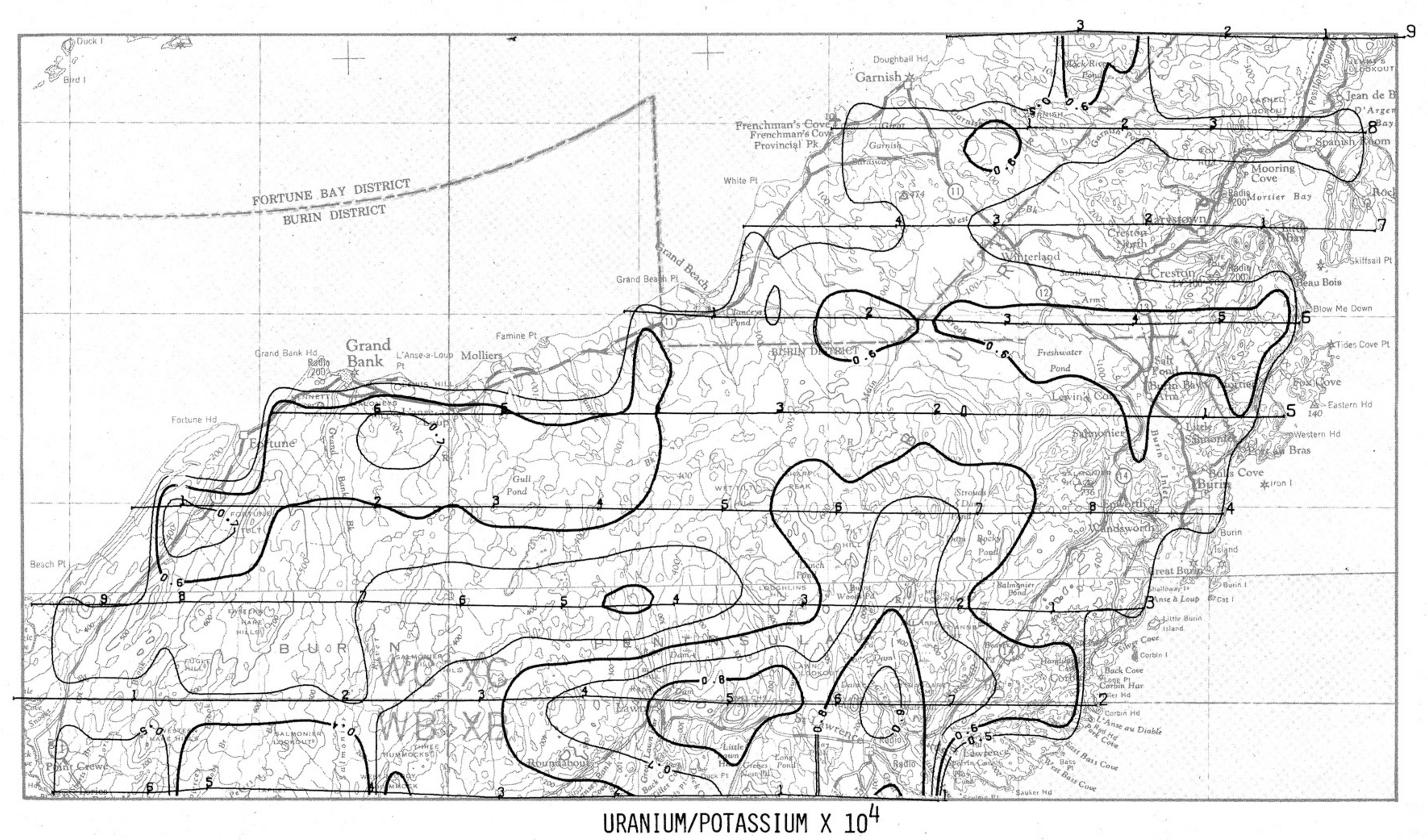
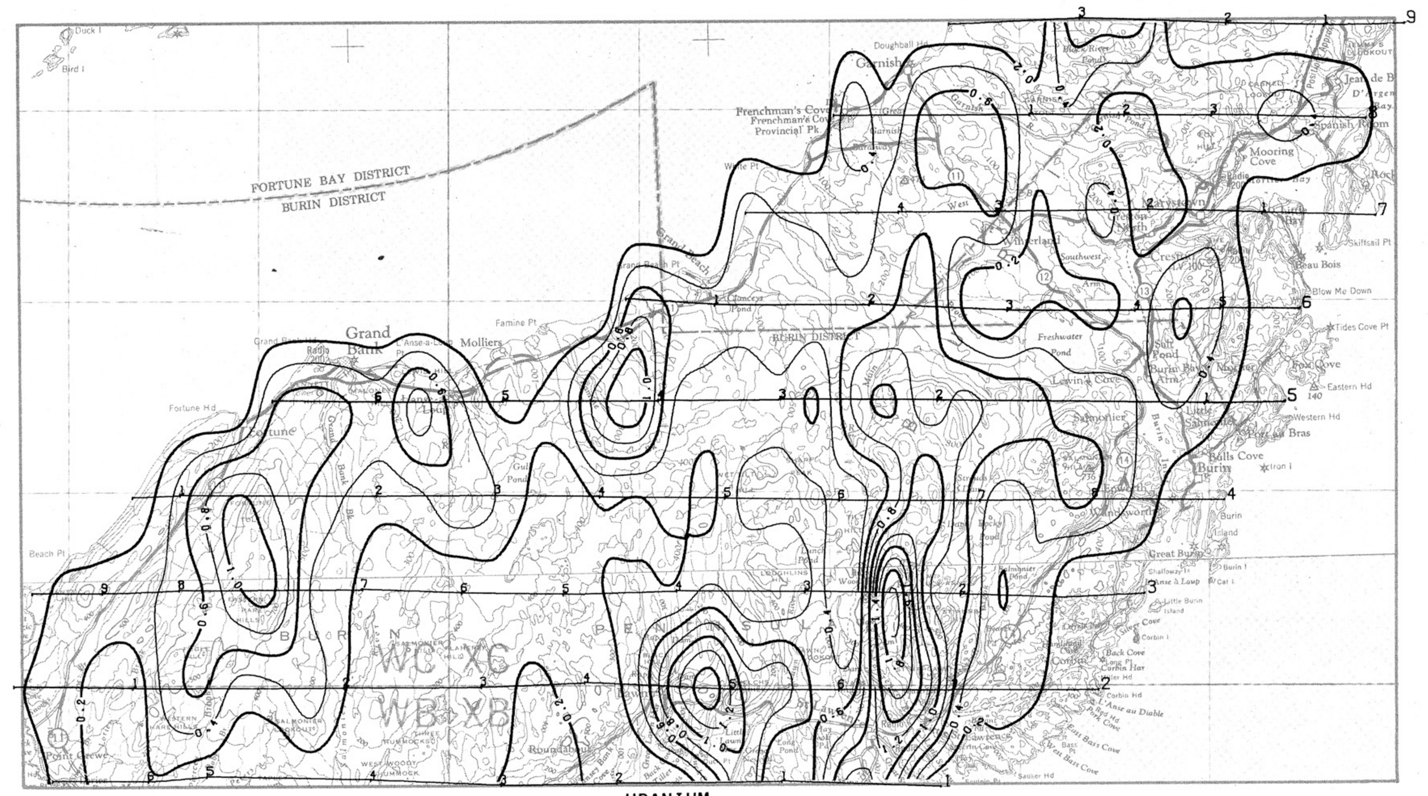
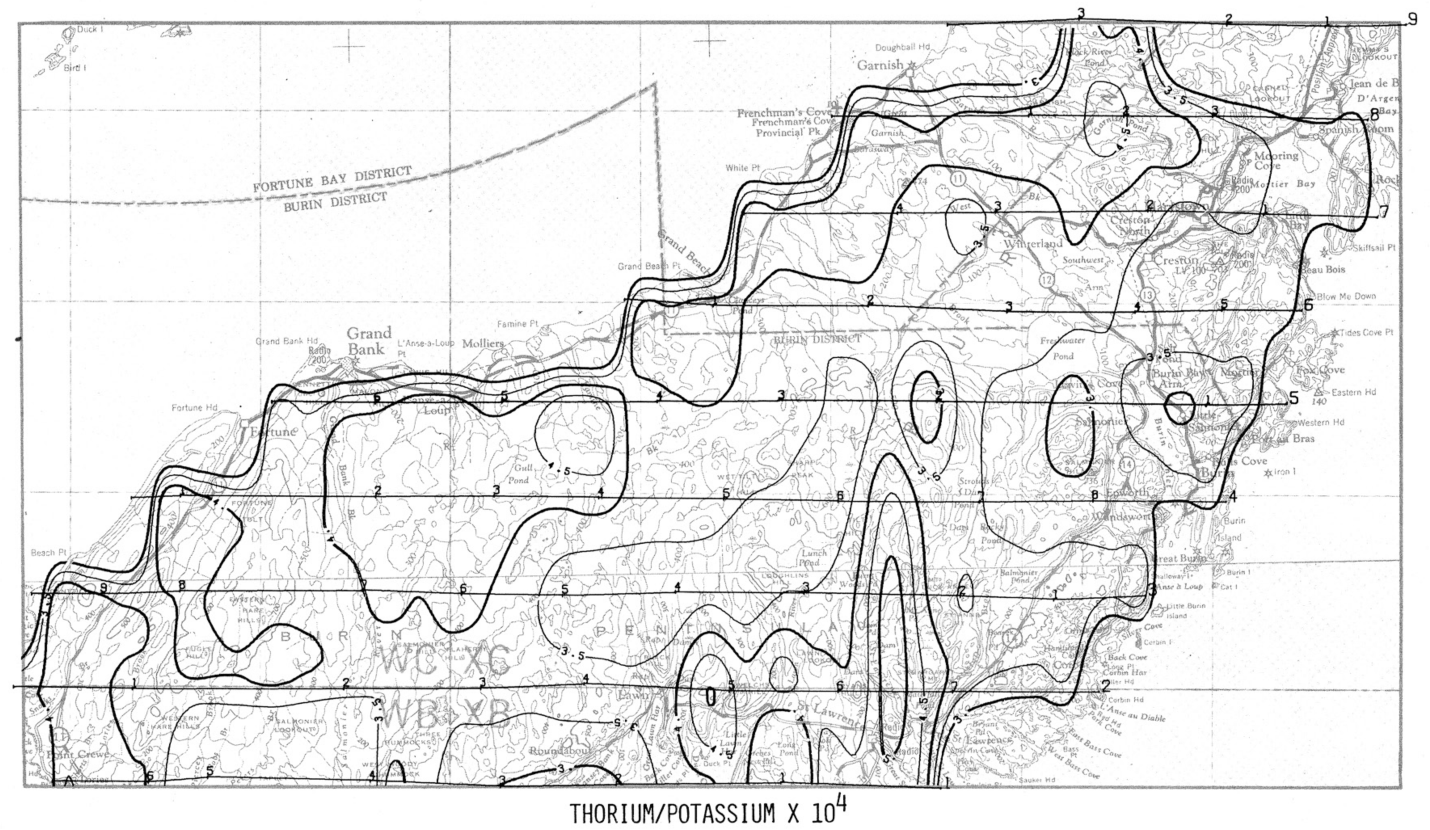


URANIUM/POTASSIUM X 10^4



URANIUM PPM



THORIUM/POTASSIUM X 10^4

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GEOLOGICAL SURVEY
OTTAWA