

AIRBORNE GAMMA-RAY SPECTROMETRY PROFILES
NOVA SCOTIA (N.T.S. 11D, 11E, 11F-C, 11K, 21H)

Data collected with the G.S.C. high sensitivity airborne gamma-ray spectrometer system during the fall of 1976 on cross-country reconnaissance flights are presented as stacked profiles at a scale of 1:250,000, showing total count, equivalent uranium, equivalent thorium, and potassium concentrations, and eU/eTh, eU/K, and eTh/K ratios.

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 500 feet and 190 km/hr.

Potassium is measured directly from the 1.46 MeV gamma-ray photons emitted by potassium-40, whereas uranium and thorium are measured indirectly from gamma-ray photons emitted by daughter products in their decay chains. Uranium is monitored by means of gamma-ray photons at 1.76 MeV from bismuth-214, and thorium, from 2.62 MeV photons emitted by thallium-208. The energy windows used are as follows:

Total Count		0.41-2.81 MeV
Potassium	⁴⁰ K	1.37-1.57 MeV
Uranium	²¹⁴ Bi	1.66-1.86 MeV
Thorium	²⁰⁸ Tl	2.41-2.81 MeV

Uranium, thorium and potassium counts were measured over 2.5-second intervals, total counts over 0.5-second intervals. The data have been corrected for dead time, ambient temperature changes, background radiation, spectral scattering and deviations of terrain in clearance from the planned survey altitude. The computer programs used to produce the profiles are described by R.L. Grasty, 1972 "Airborne Gamma Spectrometry Data Processing Manual", G.S.C. Open File No. 109.

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 Spectrometry Calibration Facilities, G.S.C. Paper 74-18, pp. 69-71).

The conversion factors used are approximately those listed below.

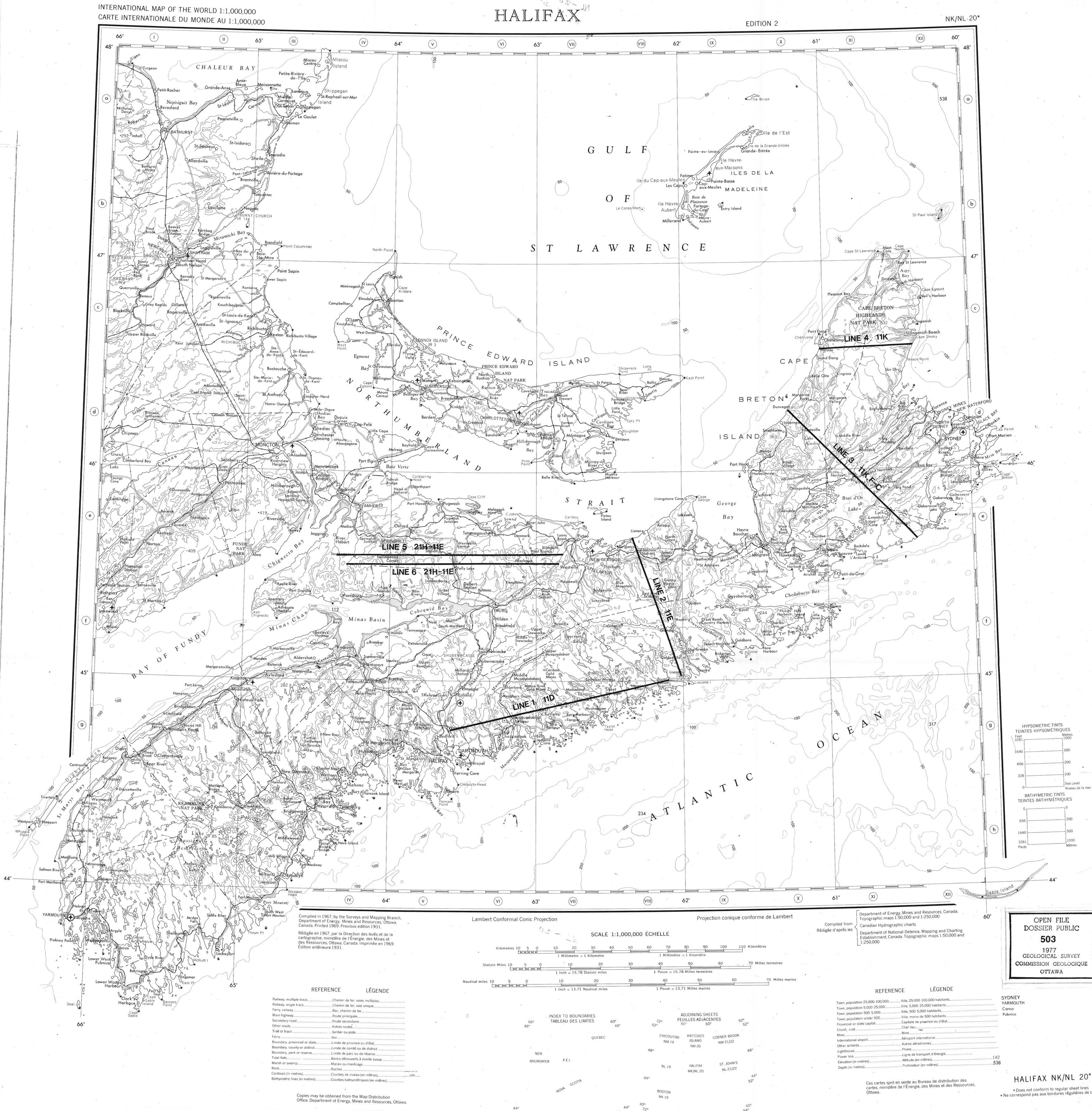
Total Count	1 ur	= 166 c.p.s.
	1 %K	= 80 c.p.s.
	1 ppm eU	= 10 c.p.s.
	1 ppm eTh	= 7 c.p.s.

Total count measurements are presented as units of radioelement concentration (ur), as defined in International Atomic Energy Agency Technical Report Series No. 174.

Airborne Gamma-Ray Spectrometry Survey 1976

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