
**Long Lake uranium deposit, north-central
New Brunswick: a granite-hosted uraniferous polymetallic
vein system in the Canadian Appalachians**

DAVID SHINKLE AND DAVID LENTZ
*Department of Geology, University of New Brunswick, P.O. Box 4400,
Fredericton, NB, E3B 5A3 <david.shinkle@unb.ca>*

The Long Lake polymetallic vein-type uranium deposit is located in north-central New Brunswick, approximately 31 kilometres northeast of Plaster Rock. The uraniferous veins are hosted by late-to post-Acadian granites of the Lower Devonian North Pole pluton and occur in hydrothermally altered and highly brecciated, northwesterly-trending fractures. The centre of the mineralization is associated with an area of the pluton that is coincident with high airborne radiometric eU, eTh, and eK anomalies and a strong negative (less than -48 mgals) Bouguer gravity anomaly. The uranium mineralization is commonly associated with chalcedony (jasperoid) veins, although

there is a significant amount of uranium present in the highly altered granites surrounding these siliceous veins. Furthermore, there are economically significant amounts of other elements present, such as copper, lead, zinc, molybdenum, bismuth, tungsten, tin, antimony, indium, silver, and gold.

The North Pole pluton was emplaced at shallow depths, discordantly into the metasedimentary rocks of the Miramichi Anticlinorium, late in the tectonomagmatic sequence. In terms of petrology, the North Pole pluton consists of three, probably comagmatic phases; biotite granite (older phase); biotite-muscovite granite; and quartz-feldspar porphyry granite (youngest phase). Existing petrochemical data for the North Pole pluton suggest that it is an 'S-type' and to a lesser extent an evolved crustal 'A-type' granite. Based on geochemical data from the area, the uranium is likely derived predominantly from the two younger phases of the pluton.

Exploration of the Long Lake area dates back to 1956 when the Anthonian Mining Corporation, followed by COMINCO, began a nine-year effort to develop the prospect, consisting of geochemical, geophysical, and drilling surveys (33 holes totaling 4040 m) in the Cheavers Lake region. In 1963, three holes were drilled by Consolidated Mining and Smelting after conducting soil and electromagnetic surveys southwest and northeast of the Anthonian work. Canadian Occidental Petroleum's involvement in the area began in 1971 (2 holes, totaling 305 m), but was abandoned from 1974 to 1978, then reactivated in 1979 to 1982 (24 holes, totaling 3011 m). Their three year mapping, trenching, and drilling campaign yielded grades up to 3440 ppm U over 0.15 m from drill core, and 8800 ppm U from float. The area was staked again in 1983 by Kidd Creek Mines to evaluate tungsten and molybdenum anomalies delineated by a federal government silt survey. Finally in 1986, CEGB Exploration (Canada) Ltd. obtained a grade of 5420 ppm U from a boulder when they staked sixty claims over favourable geological and geochemical targets.