

## From the Mineral Inventory Files The Bezanson Lake Mineral Target

Discovery of the greisen-hosted East Kemptville Sn-Zn-Cu-Ag deposit in southwest Nova Scotia (*Nova Scotia Minerals Update*, v. 29, no. 4) was an example of a collaborative effort involving several exploration techniques. Till geochemistry, airborne radiometric geophysical surveys, geological mapping and prospecting all played a role in discovery of this world-class tin deposit and the Southwest Nova Scotia Tin Domain (*The Geological Record*, v. 3, no. 3). The area is underlain by highly evolved granitic intrusions termed “specialized granites,” which are coincident with pronounced anomalies in airborne gamma-ray radiometric surveys for equivalent uranium (eU) and also the equivalent uranium/equivalent thorium ratio (eU/eTh). Lastly, the blanket of glacial till over the area contains a very pronounced geochemical Sn anomaly, as well as common highly mineralized and hydrothermally altered boulders of greisen and metasomatized granite.

The Bezanson Lake area, north of Chester, is another contact zone of the Devonian-Carboniferous, peraluminous South Mountain Batholith (SMB), which has a similar coincidence of mineralization indicators (Fig. 1). The Nova Scotia Department of Mines and Energy carried out a multidisciplinary study there in 1988 as part of the SMB mapping project. This work was published in 1989 (Open File Report 89-027) and highlights the coincidence of favourable geology (i.e. specialized granites), strong eU/eTh anomalies, and the presence of numerous glacial till, boulder and bedrock samples mineralized with a granophile element suite consisting of Sn, W, F, Li, As, Cu, Zn and Ag. Figure 1 presents a summary of these data. The SMB locally consists of four granitic units that intrude the Cambro-Ordovician Meguma Supergroup metasedimentary rocks. The Sherwood monzogranite and the Spectacle Lake leucomonzogranite are coarse-grained, megacrystic, biotite-bearing units that are the earliest (i.e. oldest) and least chemically evolved

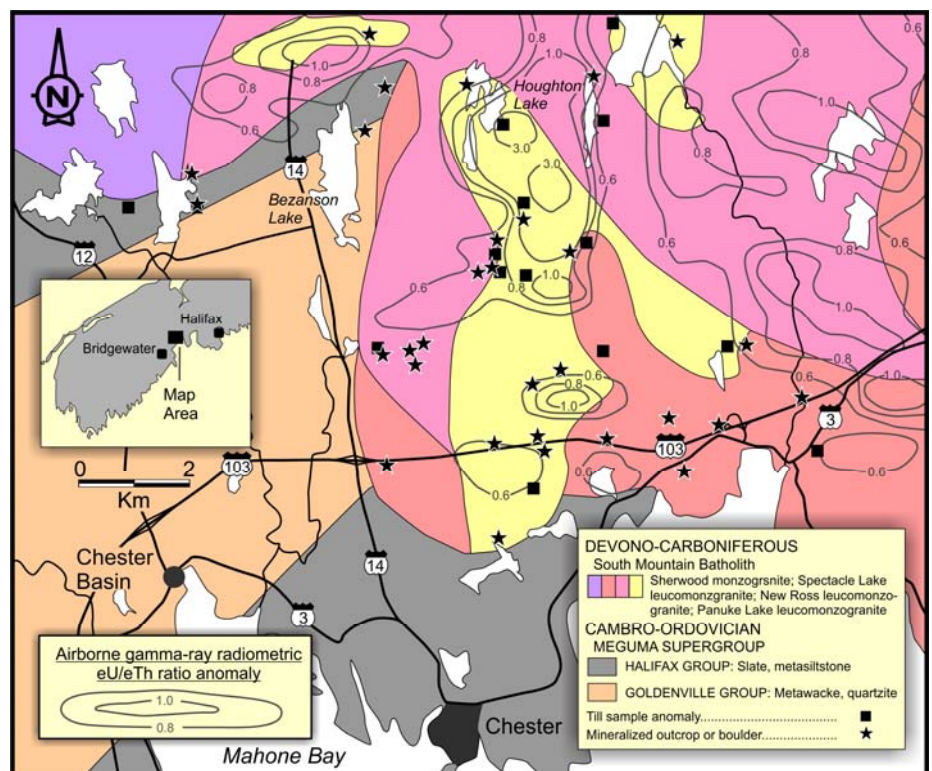
phases of the SMB in this region. Intruding these units are the New Ross and Panuke Lake leucomonzogranites, which are medium- to fine-grained, muscovite-dominant, late-stage granitic phases. The Panuke Lake phase typically occurs as protuberances and embayments within the New Ross, suggesting that it is a highly evolved, lateral gradation of the New Ross unit. The Panuke Lake phase, in particular, displays the strongest indications of metasomatism, hydrothermal alteration and mineralization.

Mostly locally derived glacial tills blanket the Bezanson Lake area. Till samples collected and analyzed as part of the SMB mapping project showed a strong clustering of anomalies in areas underlain by the Panuke Lake unit, in particular the area south of Houghton Lake. In these tills, significant levels of Sn, W, As, Cu, Pb and Zn were obtained, similar in magnitude to those reported from till surveys in the East

Kemptville area. Litho-geochemical sampling at Bezanson Lake returned numerous mineralized boulders and outcrops with up to 0.4% Sn, 0.2% W, 0.33% Cu, 0.42% Zn, F commonly between 0.5-1.0%, and Li up to 852 ppm.

The eU/eTh data derived from 1978 federal government gamma-ray radiometric surveys show a close correlation of the specialized Panuke Lake granite, frequency of mineralized boulders and till geochemical anomalies with areas of elevated eU/eTh. This association of indicators is identical to that found at East Kemptville, and suggests that Bezanson Lake also has a very high potential for granophile element deposits. Unlike East Kemptville, however, which has undergone significant exploration, the Bezanson Lake area has received only cursory exploration. Evidence suggests it deserves a lot more.

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**Figure 1.** Geology of the Bezanson Lake area showing the results of till and litho-geochemical sampling, and airborne gamma-ray radiometric eU/eTh ratio anomalies.