

Alkali Metasomatism and Mineralization in the Upper Devonian-Lower Carboniferous Volcanic Rocks of the Byers Brook Formation and Co-genetic Hart Lake-Byers Lake Granite

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Upper Devonian-Lower Carboniferous (ca. 355-360 Ma) felsic volcanic rocks of the Byers Brook Formation are found in the eastern Cobequid Highlands of Nova Scotia. The basal portion of the ca. 7 km thick formation is intruded by the ca. 360 Ma Hart Lake-Byers Lake Granite, and the upper portion is transitional with overlying basalts of the Diamond Brook Formation. Proximal to the basal granite-volcanic contact in the Debert Lake area, a ca. 10 km² region of intense alkali metasomatism is recognized and accompanied by anomalous concentrations of rare-earth elements (REEs), Y, Th, Nb, Ta, Sn, W, Bi, Mo, Zn and Ag. The Debert Lake area was intensely explored by Gulf Minerals Ltd. between ca. 1976 and 1980, although not for REEs or other rare metals. Only relatively recently has the area seen renewed exploration by Capella and Alpha Uranium Resources for various commodities and, as such, the nature and origin of this mineralization and alteration are not well understood. I will highlight some of the more intriguing geochemical anomalies and discuss current and future avenues of research that may lead to a better understanding the mineralization in the Debert Lake area and the geology and metallogeny of the Cobequid Highlands.

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