

Granitoid-related mineral deposits, Antinouri Lake-Nicholas Dénys area, northern New Brunswick

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Felsic magmatism in the Antinouri Lake-Nicholas Dénys area, located about 15 km northwest of Bathurst, includes the Nicholas Dénys Granodiorite (381.0 ± 4 Ma), the Antinouri

Lake Granite (372.0 ± 4 Ma), quartz-feldspar porphyry (QFP) dykes including the Nigadoo Porphyry, and feldspar porphyry (FP) dykes. The QFP dykes are interpreted to be of

Late Devonian age, whereas the FP dykes are probably Early Devonian. Each intrusive phase has associated mineralization that, at least for the larger intrusive bodies, exhibits a distinct metal zonation.

The Nicholas Dénys Granodiorite contains significant Mo and minor Cu occurring in stockworks of fracture and quartz veins. Copper increases in abundance toward the edge of the stock and into the hornfels where W (as scheelite) becomes locally important. Outside of the Cu-W zone is a zone of stratabound magnetite-base-metal (Pb-Zn-Cu-Ag-Cd) skarn and vein deposits developed primarily within limestone of the LaVieille Formation. Outside of this base metal zone and, for the most part, the biotite hornfels aureole, are a number of massive, coarse-grained, As-base metal-Au veins. Sb and Cd are frequently enriched in the base-metal occurrences.

The Antinouri Lake Granite contains minor Mo, F, and Cu in quartz veins with thin sericitic rims. Minor greisenization occurs along the southern edge of this pluton. Within the biotite hornfels aureole, a number of contact metasomatic

deposits occur in limestones or calcareous argillites of Ordovician and Silurian age. These deposits are primarily Pb-Zn occurrences but may also contain Cu, Ag, Sn, Bi, Sb, and Cd.

The Nigadoo Porphyry and other QFP dykes are associated with Pb-Zn-Ag veins that, at depth, contain the granophile elements Sn, F, Bi, and W. These veins also grade laterally away from the dykes into Ag-rich zones. Some of these veins have historically been base-metal producers, e.g., Nigadoo and Keymet mines. The Nigadoo Porphyry, itself, contains elevated levels of the granophile elements and has good potential for endogranitic Sn at depth.

The FP dykes are of two types. The first type carries minor quartz phenocrysts, is magnetic, and contains disseminated pyrrhotite and/or chalcopyrite. Quartz-pyrite-Au veins are spatially associated with this type and veins may also grade into Pb-Zn-Ag veins away from the dykes. The second type contains miarolitic cavities and exhibits flow-banding. These dykes are commonly associated with arsenopyrite disseminations and stringers in metasedimentary rocks that also carry Au.