

Geological and fluid inclusion study of tin mineralization associated with the Wedgeport Pluton, Yarmouth County, Nova Scotia*

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Cassiterite and base metal sulphides occur in veinlets in the margin of the Wedgeport monzogranite, and vein and stratiform concentrations in metasediments which belong to the transition between the Goldenville and Halifax Formations (GHT) of the Meguma Group. The metasediments contain beds rich in calcareous concretions, metamorphosed to calc-silicate nodules.

Tin occurs in (1) rare detrital cassiterite grains, (2) stratiform sulphide-cassiterite replacement bodies in calcareous layers, (3) sulphide-cassiterite veinlets in metasediments with restricted chlorite alteration and (4) rare sulphide-cassiterite veinlets in greisenized monzogranite. The sulphide cassiterite veinlets exhibit a mineralogical zonation away from the pluton: Mo and W rich within 2 km of the pluton, Sn rich about 3 to 4 km away, to Pb and Zn rich about 4 to 7 km distant. Trace element background values of plutonic samples are lower than those usually associated with "specialized" tin-bearing granitoids. Alteration haloes around mineralization are limited, and therefore lithogeochemical exploration may be of limited

use. Background trace element contents of metasediments are similar to or lower than the average values found in the host metasediments of Cornish tin deposits.

Primary fluid inclusions in fluorite and quartz in greisenized veinlets within the pluton have moderate salinities and homogenize at ca. 295°C and those in quartz veinlets associated with base metals as far as 5 km from the pluton, homogenize at a slightly lower temperature. Different populations of secondary fluid inclusions throughout the area homogenize below 200°C. This is compatible with emplacement of the cassiterite mineralization following emplacement of the pluton and contact metamorphism, at pressures of 1000–2000 bars and temperatures of 400–500°C. The secondary inclusions have developed during a protracted and complex post-mineralization structural history which involves shearing events, and the intrusion of dykes in Triassic–Jurassic times.

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