Geology of the Burnthill Granite and its Associated Sn-W-Mo Mineralization

H.E. MacLellan
New Brunswick Department of Forests, Mines and Energy
Fredericton, New Brunswick E3B 5H1

R.P. Taylor
Carleton University, Ottawa, Ontario K1S 5B6

The Burnthill Granite in the Miramichi tectonostratigraphic zone of central New Brunswick contains two major mappable phases: (a) coarse-grained equigranular to porphyritic biotite granite in the north, and (b) medium- to fine-grained equigranular biotite granite in the south. Exposed contacts between these two phases are gradational over distances of up to 500

meters. Ubiquitous miarolitic cavities indicate a high level of emplacement. The main phases are cut by late-stage felsic dykes that exhibit variable mineralogy and include biotite-, muscovite-, and garnet-bearing varieties. Muscovite occurs in all of the intrusive phases, where its modal distribution increases with decreasing grain size; it is predominantly a late-stage alteration product of feldspar and biotite, but in the fine-grained intrusive phases it may be of magmatic origin.

Sn-W(-Mo) mineralization is developed in fissure veins in the southern part of the granite and adjacent country rocks. Quartz is the major gangue. The mineralogy at the Burnthill and McLean Brook South deposits includes wolframite, cassiterite, molybdenite, arsenophyrite, pyrite and a variety of fluorine- and beryllium-bearing minerals. A complex paragenetic sequence includes a high temperature oxide facies, a well-developed intermediate-temperature sulfide facies and a poorly-developed low-temperature carbonate facies. Zinc-poor stannite of the sulfide facies has partially replaced cassiterite at McLean Brook South. Quartz fissure veins at the Tin Hill and McLean Brook North showings are mineralized with cassiterite and wolframite and are sulfide-poor, mineralogically simple systems.