Geology and Mineral Occurrences of the Faribault Brook Area, Cape Breton Island, Nova Scotia

M. Tucker[1], S. M. Barr[1] and C. E. White

The Cheticamp area of western Cape Breton Island is located in the Aspy Terrane, part of the Ganderia realm of the northern Appalachian Orogen. Equivalent parts of Ganderia in Newfoundland and New Brunswick are well known for their mainly volcanic-hosted metallic mineral deposits, therefore the Cheticamp area could have similar deposits. Mineral occurrences (Zn, Cu, Pb, Fe, As, Au) around Faribault Brook, east of Cheticamp, have been exploration targets since the 1890s, and are hosted by rocks generally assigned to the Ordovician-Silurian Jumping Brook Metamorphic Suite (JBMS), a package of metasedimentary and mafic and felsic metavolcanic rocks. Subsequent geochronological work in the 1990s in the area showed that at least some of the metasedimentary and metavolcanic rocks could be Late Neoproterozoic, and similar in age to the ca. 550 Ma Cheticamp Pluton. No new studies had been undertaken since then to assess the significance of these new age data.

Hence this study was initiated in the summer of 2007. An area of ~180 km^2, which includes all of the known mineral occurrences in the Faribault Brook area, was mapped at a scale of 1:20 000, incorporating geophysical data to construct a revised geological map of the area. Recent trenches, not available to earlier workers, were examined, as well as all available drill core from the area in the Nova Scotia Department of Natural Resources core storage facility in Stellarton. Petrologic studies are in progress to better define the composition of rock units which host the mineralization, in combination with data from earlier work in the area.

Mineralization was observed in mafic and felsic metavolcanic units, as well as in associated metasedimentary rocks. Unit names follow as much as possible those established by earlier workers, and include the Faribault Brook metavolcanic unit, Dauphinee Brook schist, Barren Brook schist, George Brook amphibolite and Corney Brook schist. The Faribault Brook metavolcanic unit is mainly mafic flows with less abundant felsic flows and mafic tuff. The George Brook amphibolite appears to represent higher grade metavolcanic rocks. The Dauphinee Brook schist is fine grained and pelitic, and the Barren Brook schist is coarser grained and has a higher quartz content. The Corney Brook schist is higher grade and includes metasedimentary and metaigneous units; it may be similar to, or part of, the Pleasant Bay Complex.

The contact between the Dauphinee Brook schist and the Cheticamp Pluton is intrusive, at least in part, rather than a nonconformity or fault as suggested in some earlier interpretations, based on crosscutting relations observed in recently exposed outcrop. Therefore, at least part of the Jumping Brook Metamorphic Suite is older than ca. 550 Ma, although, felsic porphyry that hosts mineralization at some locations (e.g. Galena Mine) is Silurian, based on published U-Pb (zircon) ages. Similar felsic rocks observed at the Mountain Top Adit appear to be more flow-like than the intrusive felsic porphyry at the Galena Mine occurrence.

[1]Department of Earth and Environmental Science, Acadia University, Wolfville, NS B4P 2R6