

Geology and Mineral Occurrences of the Faribault Brook Area, Cape Breton Island, Nova Scotia¹

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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, and hence the Cheticamp area potentially has 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). Subsequent geochronological work in the 1990s in the area showed that at least some of the metasedimentary and metavolcanic rocks of the JBMS could be Late Neoproterozoic, and similar in age to the ca. 550 Ma Cheticamp Pluton. However, no new mapping or petrological studies had been undertaken since then to assess the significance of these new age data. During the summer of 2007, an area of ~180 km² that included all of the known mineral occurrences in the Faribault Brook area was mapped at a scale of 1:20 000, and geophysical data were incorporated in constructing 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 core storage facility at Stellarton. 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, whereas the Barren Brook schist is coarser grained and has a higher quartz content. The Corney Brook schist is higher grade and includes metasedimentary and meta-igneous units; it may be similar to or part of the Pleasant Bay Complex. The contact between the Dauphinee Brook schist of the Jumping Brook metamorphic suite and the Cheticamp Pluton is intrusive, at least in part, rather than a nonconformity or fault as suggested in some earlier interpretations, based on recently exposed outcrop. Hence at least part of the Jumping Brook Metamorphic Suite is older than ca. 550 Ma. However, felsic porphyry that hosts mineralization at some locations (e.g., Galena Mine) is Silurian based on published U-Pb (zircon) ages. Similar lithology is observed at the Mountain Top Adit where it seems to be extrusive rather than intrusive as at the Galena Mine occurrence.

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