

Revised stratigraphic nomenclature for the Bathurst Mining Camp, northern New Brunswick

R.A. Wilson¹, S.R. McCutcheon¹, L.R. Fyffe² and C.R. van Staal³

¹*New Brunswick Department of Natural Resources and Energy, Geological Surveys Branch, PO Box 50, Bathurst, New Brunswick E2A 3Z1, Canada*

²*New Brunswick Department of Natural Resources and Energy, Geological Surveys Branch, PO Box 6000, Fredericton, New Brunswick E3B 5H1, Canada*

³*Geological Survey of Canada, 601 Booth Street, Ottawa, Ontario K1A 0E8, Canada*

Volcanic and sedimentary rocks in the Bathurst Camp were emplaced in an ensialic back-arc basin built on the Gander passive margin of the Avalon composite terrane. During closure of the back-arc basin (ca. 445-425 Ma), the volcano-sedimentary pile was incorporated into an accretionary complex ("Brunswick subduction complex") that was thrust over the Avalon margin as a series of imbricate sheets or nappes. Volcanism occurred in at least three, probably widely-separated, sub-basins that are now tectonically juxtaposed. The rocks in the respective sub-basins/nappes have been assigned to the California Lake Group, Tetagouche Group, and Sheephouse Brook Group, each of which consists, essentially, of a dominantly felsic volcanic sequence overlain by mafic volcanic and sedimentary rocks.

The California Lake Group includes the Canoe Landing Lake, Spruce Lake, Mount Brittain and Boucher Brook formations. The Canoe Landing Lake Formation (ca. 470 Ma) consists of alkalic to tholeiitic basalts and minor sedimentary rocks, whereas the Spruce Lake Formation (ca. 471 Ma) comprises feldspar-phyric rhyolite, local quartz-feldspar-phyric rhyolite or crystal tuff, and sedimentary rocks. The Mount Brittain Formation (ca. 468 Ma) consists of lithic-crystal tuff, feldspar-phyric to aphyric rhyolite, and fine-grained sedimentary rocks containing thin tuff beds. The Boucher Brook Formation is composed mainly of shale and siltstone, with locally abundant alkalic basalt, minor comendite and rare limestone lenses containing Caradocian fossils.

The Tetagouche Group, in the core of the Bathurst Camp, includes the Nepisiguit Falls, Flat Landing Brook, and Little River formations. The Nepisiguit Falls Formation (ca. 469-471 Ma), spatially associated with many of the VMS deposits in the Bathurst Camp, consists of quartz-feldspar crystal tuff/tuffite, and local quartz-feldspar-phyric rhyolite and porphyry. Calcareous sandstone, siltstone, and minor conglomerate at the base of the Nepisiguit Falls Formation are assigned to the Vallée Lourdes Member, whereas the Little Falls Member consists of shale, locally tuffaceous siltstone, sandstone, volcanoclastic rocks, and minor crystal tuff. The Flat Landing Brook Formation (ca. 465-466 Ma) consists of aphyric to feldspar-phyric rhyolite and associated hyaloclastites, felsic tuffs, tholeiitic to transitional basalt, and local sedimentary rocks. The Little River Formation comprises alkalic basalt (ca. 457-464 Ma), locally graphitic shale, siltstone, feldspathic wacke and chert.

The Sheephouse Brook Group in the southern part of the Bathurst Camp, includes the Clearwater Stream, Sevogle River and Slacks Lake formations. The Clearwater Stream Formation consists of plagioclase-phyric dacitic tuffs, which, at ca. 478 Ma, constitute the oldest volcanic rocks in the Bathurst Camp, suggesting that they are related to the earliest stages of intra-arc extension. The Sevogle River Formation (ca. 466 Ma) comprises aphyric to feldspar-phyric rhyolite and minor sedimentary rocks, whereas the Slacks Lake Formation consists of alkalic to tholeiitic basalt, and dark grey, locally graphitic shale, chert, and comendite.