

Epigenetic, structurally-controlled polymetallic (Cu-Ag ± Pb ± Au ± Zn) mineralization at the Bridal Veil and associated showings, Gander Lake Subzone, northeastern Newfoundland, Canada

HAMISH SANDEMAN¹ AND CAMERON PEDDLE²

1. Geological Survey, Newfoundland and Labrador Department of Natural Resources, St. John's, Newfoundland and Labrador A1B 4J6, Canada

2. Department of Earth and Atmospheric Sciences, University of Alberta, Edmonton, Alberta T6G 2R3, Canada

The Bridal Veil and associated showings immediately north of Gander Lake in the Gander Lake subzone (NTS 2D/15) are hosted by chlorite- to biotite-grade psammite, less common semipelite and rare pelite of the Jonathon's Pond Formation (JPF), Gander Group. Compositional layering dips shallowly to the west-northwest and is parallel to a composite, regional S_{1-2} transposition foliation. The JPF hosts S_0 - S_1 - S_2 - parallel, fine-grained metadiabase sills/dykes now consisting of chlorite-albite-actinolite-magnetite schist. Mineralized zones are ≤ 5 m thick, intensely quartz-veined and silicified topographic ridges occurring in northwest-dipping, subparallel psammite horizons separated by ~ 900 m across strike. Preferential silicification of psammite was coincident with at least three generations of quartz veins; the first set pre- and the second two syn- to post- D_3 regional deformation. Narrow (≤ 5 cm) remnant muscovite ± biotite semipelite horizons in altered psammite contain sinuous, mm-scale septae of chalcopyrite ± galena ± sphalerite in quartz, minor chlorite, albite and sericite. Chalcopyrite is variably altered to goethite. Samples of the silicified zones have variable anomalous metal concentrations, with up to 8.9% Cu, 19.5 % Pb, 218 ppm Ag and 723 ppb Au, and weakly anomalous Bi, Sb, Mo and Sn. The youngest, rectilinear, sulphide-poor quartz veins form conjugate riedel shears. These late veins are typically anomalous in the same metals as the psammite, but at lower concentrations. Collectively the three quartz vein generations were developed in a biotitegrade, NE-trending (065), steeply -dipping (86°) shear zone, likely of Acadian (Middle Devonian) age. The Bridal Veil showing represents a Cu-Ag ± Pb ± Au -bearing shear zone-hosted epigenetic mineralized zone with granitophile metal associations suggestive of a fluid contribution from an S-type igneous source.