

The Deer Cove mesothermal lode gold deposit, Baie Verte Peninsula, Newfoundland

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There are metallogenic, lithological, geochemical and tectonic similarities between the Mother Lode Gold District of California and the Baie Verte Belt associated with the Baie Verte-Brompton Line (BVBL) in the Newfoundland Appalachians. The boundary (suture) between the Humber and Dunnage zones of this orogen is defined by the BVBL which constitutes the most significant structure on the Baie Verte Peninsula. The Point Rouse Complex (PRC) is part of the Baie Verte Belt and consists of variably altered and deformed remnants of an ophiolitic suite; including ultramafics, gabbros and sheeted diabase dykes, and a cover sequence of mafic volcanic, volcanoclastic and sedimentary rocks. The Deer Cove Deposit is located within the PRC and consists of gold-bearing quartz veins in mafic volcanic and fragmental rocks and gabbro belonging to the cover sequence.

These mafic rocks structurally overlie serpentized and talc-carbonate altered ultramafic rocks. A listwaenite genetic model had been proposed for the mineralization which suggested that gold was derived from the ultramafic rocks during talc-carbonate alteration by external hydrothermal fluids and that the fluids migrated along fault planes to subsequently deposit the gold in the overlying mafic rocks. Newly derived geochemical data (K/Rb, K/Ba and Ba/Rb ratios) for altered wall rocks, however, are consistent with ore fluids having been derived from a crustal reservoir. ^{18}O and ^{13}C isotope ratios (-9.5 to -12.5 permil, and -8 to -4 permil, respectively) for carbonate separates are the same as those found in typical mesothermal lode gold systems; and the calculated ^{18}O ratios of the hydrothermal ore fluid are +4.5 to 8 permil.