

Syn-late Metamorphic Fluid Focussing in the Formation of Turbidite Hosted Gold-Quartz Veins in the Archean Yellowknife Basin, Slave Province, N.W.T.; A Meguma Analogue?

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Structural mapping of the Gordon Lake 'refold,' within the Burwash metaturbidite formation of the Yellowknife Supercrustal Basin, has delineated at least three deformational events (D1, D3, and D4) and four veining episodes. Early upright isoclinal folds (F1) are transected by a regional N-W trending cleavage (S3). This cleavage has a strong vertical stretch lineation (L3) which is syn-metamorphic, and is probably related to granite emplacement tectonics. The S3 cleavage and a crenulation cleavage (S4) are spatially related to the development of the 'refold.'

Based on past and present mining activities gold mineralization in the Burwash formation appears preferentially distributed in lower-greenschist-grade terranes. In the Gordon Lake region gold is associated with the syn- to post-D3 veins. Bedding-parallel veins formed early in the deformational history and are folded by the D1 and D3 events. Syn-D3 veins display brittle

fracture characteristics in the wackes, but are more abundant in the siltstones where they formed parallel to S3. Late-D3 horizontal veins cut the L3 lineation and are probably related to late extension parallel the vertical stretch. Syn-D4 veins lie parallel to the S4 crenulation cleavage. Concentration of late veining occurs within regions of crenulation in the core of the 'refold,' resulting in quartz brecciation zones.

The Meguma Terrane of Nova Scotia and its gold-bearing quartz veins represent a similar, but younger, geological setting of metaturbidites intruded by granites. A protracted history of folding and veining has resulted in the formation of spatially superimposed early bedding-parallel, late sub-parallel and discordant quartz veins. These veins have a similar mineralogy, and preference for lower grade greenschist environments. The most recent Nova Scotian mining activities have been concerned with these later sub-parallel veins that are associated with late fold

limb shearing and localized along anticlines, some of which are overturned.

In both metasedimentary environments the late vein concen-

tration is dependent on the availability of late metamorphic fluids, the presence of lithological contrasts and earlier formed rock anisotropies, and focussing by a late structural event.