Structure and veins of the Mooseland Gold District, Nova Scotia

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The Mooseland Gold District is one of over 60 similar lode gold deposits hosted by the Meguma Group. The deposit was discovered in 1858 and intermittently worked until 1934, with further exploration in the 1980s. Recent (2003) underground development by Azure Resources provides exposure which has allowed for observations of a section of the auriferous vein system.

The Mooseland vein array occurs in the hinge area and adjacent limbs of the Mooseland Anticline. This fold is a tight (interlimb angle of ~ 35E), steeply inclined, slightly plunging chevron structure within an interbedded sequence of metasandstone, metasiltstone and slate. Fold-related cleavage (S_1) includes a fine, continuous cleavage in slate and spaced cleavage in metasandstone. Oikocryts (mineral aggregates) and, locally, quartz pressure shadows on arsenopyrite, define a down-dip lineation within slate which records fold-related strain. A crenulation cleavage (S_2) locally deforms S_1 and a mineral foliation

defined by biotite within the matrix and orikocrysts is locally developed.

The majority of veins are stratabound, including saddle-reef, massive and laminated bedding-concordant and en echelon bedding-concordant arrays. Stratabound veins are generally confined to the slate-metasiltstone interval of sedimentary cycles. The main "belts", consisting of relatively thick intervals of slate-metasiltstone with multiple veins, may represent the top of sedimentary megacycles. A flexural shear origin for bedding-concordant veins is consistent with: (1) saddle-reef development, (2) down-dip striations within laminated bedding-concordant veins, (3) the geometry and shear sense of en echelon bedding-concordant vein arrays (4) confinement of stratabound veins to incompetent horizons (where flexural shear is focussed) and (5) the spatial relationship of all veins and their common occurrence with flexural-slip movement horizons.

Two sets of discordant veins are recognized within the deposit. Cross veins are roughly parallel to the ac plane of the anticline, and, locally the acute angle between a conjugate set of cross veins is bisected by the oikocryst lineation. Cross veins record various amounts of deformation and some are tightly folded with steep hinges. These observations are consistent with a syn-folding origin for cross veins. Cross veins generally cut stratabound veins. A distinct set of "angular" veins occur in the adjacent Little North Belt. These veins cut stratigraphy at a small angle and are strongly folded, but locally follow bedding-parallel veins, which are thickened by the angular vein. The enveloping surface of folded segments dip moderately to the south (less than bedding) and the fold hinges plunge moderately to steeply east. The fold geometry is interpreted to reflect oblique, sinistral, reverse shear parallel to bedding. The shear recorded by angular veins is inconsistent with the fold-related flexural shear recorded by bedding-concordant veins and its cause is unknown. Importantly, high gold concentrations occur where angular veins overlap bedding-concordant veins, allowing for the definition of ore shoot geometry.