

## A history of quartz veining, deformation and gold mineralization at the Ovens, southern Nova Scotia

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The Ovens Anticline is a kilometre-scale, northeast-trending (055°) chevron fold with an interlimb angle of  $\leq 40^\circ$ . Where the anticlinal structure has been examined the rocks consist of a mixed package of greenschist facies slate and metasandstone (70:30 ratio approximately) within the lowermost part of the Ordovician Halifax Formation of the Meguma Group. Folding occurred primarily by flexural shear and flexural slip. Preliminary investigation of the Ovens area indicates a history of pre- to syn-folding veining with related Au mineralization in the hinge zone. Three distinct sets of mineralized veins have been recognized:

- (i) Tightly buckled, pre-folding, bedding-concordant veins;
- (ii) A steep, conjugate vein set (strike sub-perpendicular to the fold hinge) and related subhorizontal veins;
- (iii) Flexural-slip, bedding-parallel veins which occur along bedding-parallel slip surfaces across which discordant veins (Type ii veins) are offset.

In terms of the chronology of vein emplacement, Type (ii) veins are observed to cross-cut Type (i). Although Type (iii) veins generally transect Type (ii) veins, mutually cross-

cutting relationships locally occur. These relationships imply that whereas Type (i) veins are clearly early relative to the other veins, Types (ii) and (iii) are more closely related in time.

The conjugate (Type ii) and flexural-slip bedding-parallel veins (Type iii) are volumetrically the most significant, whereas the early bedding-concordant veins (Type i) are relatively insignificant. Based on sightings of native gold the majority of the mineralization is noted to occur in vein Types (ii) and (iii). Therefore, based on the volume of vein types observed and the knowledge that previous mining focused on bedding-concordant veins, we speculate that previous mining at the Ovens was focused on flexural-slip bedding-parallel veins (i.e., Type iii versus Type i).

The distinction of an early set of buckled bedding-concordant veins from chronologically later flexural-slip bedding-concordant veins at the Ovens invites a reassessment of bedding-concordant veins at other Meguma-hosted Au occurrences where the bedding-concordant veins have been considered to be the dominant hosts for gold mineralization.