## Geological and geophysical interpretation of the Rawdon Fault, central Meguma Zone, Nova Scotia

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The Rawdon Fault is a regional-scale, northeast-trending structure that locally separates the Rawdon Block, comprising Cambrian-Ordovician metasediments to the south, and the Kennetcook Basin, comprising Carboniferous strata, to the north. Interpretation of seismic and gravity data and diamond-drilling constrains the Rawdon Fault as steeply dipping, with more than 2 km of apparent dip-slip (south-side-up) offset. A regional Bouger gravity low in the Kennetcook Basin adjacent to the fault is explained by the rotation to near vertical and thickening of low density evaporites. The Rawdon Block is dominated by the Meguma Supergroup, consisting primarily of the northeast-trending, slightly inclined (south) Rawdon Syncline ($F_1$ fold). A wide zone (>1 km) of fault-related deformation in the Rawdon Block, characterized by rotation of bedding and regional cleavage ($S_1$) from steep to shallow near the fault, is supported by modelling of aeromagnetic data. Locally, bedding and cleavage are folded into decimeter-scale, low amplitude, upright folds ($F_2$). Attached Horton Group strata and the unconformity with the Meguma Supergroup are similarly rotated. Bedding-parallel faulting, defined largely by graphitic zones in slate, is common with local development of a shear-related crenulation cleavage ($S_2$). Locally, $S_2$ defines a penetrative fabric which is roughly axial planar to $F_2$ folds. Striations, slickenfibres and crenulation vergence indicate northwest-directed movement, as do local south-dipping discordant brittle faults. Extensional quartz veins are perpendicular to crenulation lineation, suggesting a related origin.

Based on geological and geophysical data, the Rawdon Fault is interpreted as a steep reverse, with movement of the Rawdon Block to the northwest. Fault-related folding, of the fault propagation type, explains relative upward rotation of stratigraphy in the footwall (Kennetcook Basin) and downward rotation of bedding and cleavage ($S_1$) of the Rawdon Block. The age of faulting is constrained by geological relationships within the Kennetcook Basin including: (1) an angular unconformity of mid-Westphalian strata deposited on deformed Viséan strata, followed by (2) tilting of the mid-Westphalian and Viséan. This indicates the latest movement on the fault is post mid-Westphalian. In addition, the major (pre-middle Westphalian) deformation of the Viséan and older basin fill may also be related to the Rawdon Fault.