

MAJOR STRUCTURAL CONTROLS ON THE B-ZONE ORE BODY,
HEATH STEELE MINES, NEWCASTLE, NEW BRUNSWICK

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On the basis of tonnage and economic importance, Heath Steele Mines is the second largest base metal massive sulphide deposit in the Bathurst mining camp of northern New Brunswick. The exact structural and stratigraphic relationships between the five main sulphide lenses (B, E and ACD zones) are not known (to date) principally because of a lack of adequate exposure, an absence of useful marker horizons and intense polyphase deformation. In an attempt to open up more ground for exploration, a study has been initiated to establish the geological setting of the zones to aid correlation of the stratigraphy and structure across the mine property as a whole.

Detailed mapping around the B-zone has established that the mine stratigraphy, including the sulphide lenses, is much simpler than previously recognized. Metasedimentary rocks (turbidites?) predominate in the stratigraphic footwall whereas metavolcanic rocks ("porphyries") occupy the hangingwall. Any metavolcanic rocks in the structural footwall reflect repetition of hanging wall rocks due to F_1/F_2 folding. In general the sequence youngs north and is metamorphosed to greenschist grade.

Using this stratigraphy and regional airborne EM patterns it can be shown that the B-zone orebody lies on the north limb of a tight, WNW(?) plunging F_2 antiform. A systematic shallowing in F_2 fold plunges, both from top to bottom (in a topographic sense) and east to west, is attributed to a variation in orientation of the pre- D_2 surface. It is suggested that the inferred geometry of the pre- D_2 surface, as well as the distribution of the mine stratigraphy, is consistent with a recumbent F_1 fold. An axial surface foliation (S_1) related to the recumbent fold is documented in the hinges of F_2 folds only since, on morphology at least, it cannot be distinguished from S_2 - both are transposition foliations enhanced by metamorphic differentiation. The main foliation at the mine is thus referred to as a composite foliation (S_1/S_2).

Although younger deformations are documented at Heath Steele Mines they do not appear to have a significant effect on ore distribution. Even so, their relative ages are a matter of debate since unequivocal overprinting relationships have not been observed. It is suspected that microscopic data will be necessary to resolve this problem.