

Central Newfoundland contains a collage of Ordovician and Silurian arc and non-arc volcanic rocks that are host to numerous base metal (Cu-Pb-Zn) deposits, most notably the volcanogenic massive sulphide mineralization, such as in the Buchans Group. However, other types of mineralization also occur throughout the region, in a variety of different tectonic settings. This study is focused on an area of copper sulphide mineralization adjacent to the north-west side of Hinds Lake, which was uncovered during the construction of the Hinds Lake emergency spillway in 1980, but has not been studied in detail. The study area is underlain by volcano-sedimentary rocks that are presumed to be Silurian in age, which have been tilted and displaced by normal faults. The exposed stratigraphic sequence consists of columnar-jointed basalt, which is unconformably to disconformably overlain by a siltstone/shale sedimentary sequence and then polymictic conglomerate. The topmost unit present a series of thickly-bedded, columnar-jointed to massive, rhyolitic volcanoclastic rocks.

Preliminary data indicate that the mineralization is both structurally and stratigraphically controlled. Mineralization is hosted by carbonate-quartz veins, with the Cu occurring predominantly within bornite, chalcopyrite and covellite. The mineralized veins have a strong preferred orientation and appear to be restricted to the upper portions of the columnar jointed basalt. As this horizon is only exposed within a section of the floor of the spillway, it is possible that the mineralized zone could extend laterally over a much larger aerial extent, buried beneath a felsic volcanic and sedimentary cover sequence only a few metres to tens of metres thick.

Future work will include (i) a determination of the paragenesis of the sulphide mineralization and the associated alteration; (ii) the geochemical analysis of representative whole-rock samples from the volcanic rocks; and (iii) the integration of field, petrographic, and geochemical data to produce a unified model for Cu mineralization.

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### Nature and distribution of copper mineralization in the Hinds Lake spillway, Howley area, central Newfoundland

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