

Geology of the Chapais area (32G15-200-0101)

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Abstract

The Chapais area (32G15-200-0101) was mapped at a scale of 1/20,000 in the summer of 2009. The two main objectives of this mapping project carried out under the « Copper Plan » were to: a) investigate the potential for VMS deposits to the south of Chapais and the Kapunapotagen shear zone, in the Obatogamau and Waconichi formations; and b) reinterpret the geology of the area located between the Chapais mining camp and Lac Laura. This area is mainly underlain by Archean volcanic and sedimentary rocks of the Roy Group, sedimentary rocks of the Opémisca Group, and mafic to ultramafic intrusions. The stratigraphy of the Roy Group in this area is characterized by three mafic to felsic volcanic cycles, represented by the Chrissie (first cycle), Obatogamau and Waconichi (second cycle), and Gilman and Blondeau (third cycle) formations. Zircons recovered from a rhyolite of the upper member in the Chrissie Formation yielded a U-Pb age of 2791.4 ± 3.7/-2.8 Ma (David, 2010). The Roy Group is unconformably overlain by metasedimentary rocks of the Opémisca Group, with the Daubrée and Stella formations. The Roy Group is also intruded by comagmatic gabbro sills of the Cummings Complex, and by the post-tectonic Opémisca and Presqu'île felsic plutons.

The main S2 schistosity, steeply dipping and trending E-W to WNW-ESE, constitutes the axial plane of isoclinal F2 folds. Reverse shear zones trending E-W to WNW-ESE (e.g., Kapunapotagen) produce repetition of stratigraphic units and are characterized by a transformation of volcanic rocks into sericite-chlorite schists and by ankerite alteration. Oblique sinistral movement along ENE- to NE-trending shear zones (Gwillim and Chibougamau Copper) results in a shift, to the WNW, of the S2 schistosity, F3 folding of F2 axial traces, as well as oblique movement along E-W to WNW-ESE-trending shear zones. NE- to N-trending faults (generally sinistral movement) are the result of a brittle deformation event (D4).

A potential for base metal and gold-rich stratiform sulphide deposits associated with volcanic rocks (VMS) is recognized in three volcanic cycles of the Roy Group, particularly: a) associated with exhalite layers in the upper member of the Chrissie Formation to the south of Chapais, b) at the base of felsic rocks in the Queylus Member, where transitional mafic volcanic rocks similar to those recognized at the Lemoine mine and the Selco-Scott deposit, occur; and c) along the contact between rhyolites of the Blondeau Formation and the Bourbeau Sill (e.g., lens 8-5 at the Cooke mine). Lode gold occurrences are found in the vicinity of the Cooke mine and Lac Laura, and are associated with the Chibougamau Copper shear zone. Opémisca-type vein copper occurrences are found in faults cutting across the Ventures Sill in fold hinges.

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