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Geology of the Lac Rohault and Lac Bouteroue area (32G08-200-0101 and 32G08-200-0102)

Patrice Roy¹ and Sandrine Cadéron¹

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Abstract

The area of the Lac Rohault (32G08-200-0101 QTS sheet) and Lac Bouteroue (32G08-200-0102 QTS sheet) was surveyed in 2004. This area is located approximately 65 km south of Chibougamau, in the Grenvillian Parautochthonous, near the Grenville Front limit.

The area is mainly composed of rocks with Archean protolith that were reworked during the Proterozoic. These rocks are intersected by Proterozoic gabbro dykes. In this area, the volcano-sedimentary units are more or less well preserved and form remnants or belts hosted by orthogneisses and felsic intrusions. The volcanic units are metamorphosed and appear as amphibolites and mafic gneisses. The volcanites have locally preserved their primary textures and structures which are similar to those of the Obatogamau Formation located west of the Grenville Front, in the Abitibi Subprovince.

The sedimentary units mainly appear as biotite-garnet paragneisses with hornblende at some places. The migmatitization of the paragneisses increases towards the south-east. Locally, in the eastern part of the area, the paragneisses contain horizons of conglomerate and wacke in which primary bedding is preserved. These lithologies are similar to those found within the Caopatina Formation, in the Abitibi Subprovince. Tonalitic gneisses, tonalites and quartz diorites are the major felsic intrusive lithologies of the area. One unit consisting of tonalite and quartz diorite is considered to be late in relation to the other Archean rocks due to its relatively massive aspect and cross-cutting relationships. This unit has been dated at 2703.9 ± 3.4 Ma, which is considered to be the minimum age for the Archean rocks of the area.

All the rocks of the area have been metamorphosed either to the mid-amphibolite facies or to the lower granulite facies. The metamorphism as well as the migmatitization increase towards the south-east. At least three deformation phases have been observed on the field. The regional foliation which developed during the Archean (S2) has been folded and transposed by the NNE-trending cleavage (S3) during the Proterozoic. A late cleavage (S4), WNW-ESE-trending, cuts the previous structures and produces undulating to open folds. The regional stretching lineation is constant with a SE trend and a moderate dip.

The horizon of volcano-sedimentary rocks located in the central part of the area represents the most promising area for mineral exploration. Among others, these rocks host an exhalite horizon located west of Lac Djebel which extend over several kilometres of length southward. The exhalite consists of chert, quartz-sericite schist and sulphide or oxide iron formations. The BDL showing is associated with one of these sulphide iron formation. Thin felsic to intermediate metavolcanite horizons are also associated with the exhalite. Moreover, metamorphosed hydrothermal alteration zones have been found within the horizon of volcano-sedimentary rocks located in the central part of the area. These alteration zones are characterized by anomalous grades in base and precious metals. Most frequently, the alteration zones consist of garnet, grunerite, clinopyroxene, epidote and scapolite. The geological background in which the BDL showing and alteration zones are found is particularly favourable for volcanogenic massive sulphides and gold exploration.