

Geology of the Lac Magin (33G09), Colline Captel (33G15) and Lac Fontay (33G16) region, Baie-James, Québec

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Abstract

A geological survey at a scale of 1:50,000 was carried out in 2010 in the Lac Magin (33G09), Colline Captel (33G15) and Lac Fontay (33G16) region in the eastern part of the La Grande 3 Reservoir. The mapped region comprises Archean rocks belonging to the La Grande Subprovince, Proterozoic dykes assigned to the Lac Esprit, Senneterre and Mistassini dyke swarms, and the Proterozoic sedimentary basins of the Sakami Formation. The La Grande Subprovince comprises the Langelier Complex (tonalite and diorite gneiss, tonalite; 2788 to 3360 Ma), the Poste Le Moyne Pluton (tonalite and diorite; 2881 ±2 Ma), the Guyer Group (basalt, felsic to intermediate tuff, iron formation; 2806 to 2820 Ma), the Magin Formation (new wacke unit and conglomerate), the Mintisch Formation (new unit of amphibolitized basalt, rhyolite, wacke and iron formation; 2847 Ma), the Griault Belt (amphibolite and paragneiss) and the Pie Belt (new unit of basalt and felsic to intermediate tuff). Also found are intrusions considered to be late tectonic, including the Moly Intrusion (new unit of tonalite and granodiorite dated at 2746 Ma) located in the transition zone between the La Grande and the Bienville Domain, the Bezier Suite (monzodiorite-granodiorite, 2674 ±12 Ma), the Fontay Pluton (granodiorite, granite and tonalite) and the Vieux Comptoir Granite (granite and pegmatite; 2618 ±2 Ma). Felsic, intermediate, mafic and ultramafic intrusions are also present in the region. Most of the Archean rocks experienced amphibolite facies metamorphism; however, the volcano-sedimentary rocks of the Mintisch Formation underwent partial melting, indicating that metamorphism reached granulite facies, and those of the Pie Belt display evidence of greenschist facies metamorphism in places.

The Archean rocks of the region are generally highly deformed and affected by several types of folds. Deformation is the result of at least four phases of Archean ductile deformation and three phases of Proterozoic brittle deformation.

Known showings and those discovered during our work demonstrate the significant discovery potential of the region for polymetallic deposits and gold deposits. The principal occurrences of mineralization are present in volcano-sedimentary sequences of the Guyer Group and the Mintisch Formation. Mineralization occurs in gold-bearing iron formations, volcanogenic alteration zones (Cu-Zn-Ag-Au), and deformation and/or shear zones. Also present is a vast porphyry complex carrying Mo-Cu-Ag mineralization in the Lac Fontay region (33G16).

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