

## **Structural Control on the Borden Gold Deposit in Chapleau, Ontario**

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### Abstract

The Borden gold deposit is located 20 km east of Chapleau, 180 km southwest of Timmins, within the Kapuskasing Structural Zone and Wawa subprovince of the Superior Province. The deposit is a low grade, bulk tonnage style hosting 4.3 million ounces at 1.03 g/t Au in upper amphibolite to granulite facies metamorphic rocks. The metamorphic minerals at Borden include biotite, muscovite, hornblende, sillimanite, garnet, kyanite, cordierite and pyroxene. Based on the abundance of aluminous metamorphic minerals, the protolith is inferred to be pelitic. At such high metamorphic temperatures, deformation is dominantly by ductile mechanisms although microfracturing of competent minerals is also possible. On the macroscopic scale, gold mineralization seems to be controlled by strain heterogeneity related to metamorphic grade and competency. Competent lithons (boudins?) of granulite facies rock appear to be surrounded by more ductile amphibolite facies gneisses and schists, suggesting polymetamorphism with retrograde amphibolite facies metamorphism after granulite facies metamorphism. Gold is typically observed in low strain rocks with weakly developed foliation and also in low strain rocks that are bordered by strongly foliated units. Gold mineralization has been observed at grain boundaries of quartz, within cleavage planes of biotite and associated with euhedral pyrite and anhedral pyrrhotite. This project will provide specific structural and microstructural parameters to guide further exploration and development of the mineralized zone at the Borden gold deposit.