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# Pyrite textures and alteration minerals in the Timmins gold camp

**VICTORIA DEVLIN MCLOUGHLIN**[1], DANIEL D. GREGORY[1] AND EVAN HASTIE[2]

[1]University of Toronto
[2]Ontario Geological Survey

The Timmins gold camp (Ontario, Canada) is the largest Archean orogenic gold camp in the world. This still active camp has produced over 2,190 metric tons of gold and is located in the Abitibi greenstone belt (AGB) along the Porcupine-Destor fault system [1].

Like other orogenic gold deposits, the majority of the gold mined within the Timmins gold camp is in the form of free gold that cross-cuts quartz veins. The volume of free gold within the camp cannot easily be explained with gold transport via metamorphic fluids invoked in orogenic gold systems [2]. Pyrite is the main mineral host of gold. Textural and chemical study of gold concentrations in pyrite can reveal the evolution of gold within a deposit. Additionally, it can provide evidence for alternative gold transport processes that are able to transport gold at higher concentrations than metamorphic fluids (i.e., nanoparticles and polymetallic melts) [2,3]. However, because the majority of gold mined from the Timmins gold camp is in the form of free gold there is a lack of research into the relationship between pyrite and gold mineralization within the camp [4].

Here we present pyrite textures and associated alteration minerals identified in various deposits within the Timmins gold camp. By looking at deposits across the camp we will be able to determine potential common pyrite textures and generations of pyrite. This will help us to understand the evolution of gold at both the deposit and camp scale. Our presentation of alteration minerals will help to constrain hydrothermal events that have impacted the rock relative to the timing of pyrite, and therefore gold evolution [1,4].

References: [1] Dubé, B. et al. (2020) *in* Sillitoe, R.H., Goldfarb, R.J., Robert, F., and Simmons, S.F. eds., Geology of the World's Major Gold Deposits and Provinces, p. 53–80. [2] Hastie, E.C.G., Kontak, D.J., and Lafrance, B. (2020) *Economic Geology*, v. 115, p. 241–277. [3] Wu, Y.-F. et al. (2025) *Economic Geology,* v. 120, p. 1799–1821. [4] Stromberg, J.M. et al. (2019) *Ore Geology Reviews*, v. 104, p. 603–619.