

## **Alteration halo and lithogeochemistry of the Pine Cove orogenic gold deposit, Baie Verte Peninsula, Newfoundland, Canada**

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The Pine Cove orogenic Au deposit is hosted in a volcano-sedimentary sequence and gabbro sills of the Snooks Arm Group, Baie Verte Peninsula. The deposit is primarily hosted in gabbro sills and footwall strata consisting of high-Ti tholeiitic basalts, tuffs, greywacke, and hematitic mudstone. Hanging wall rocks consist predominantly of transitional to calc-alkaline tuffs and volcanoclastic turbidites. Lithogeochemistry suggests that footwall rocks correlate with the Venam's Bight Formation and hanging wall rocks correlate with the older Bobby Cove Formation, both of the Snooks Arm Group, indicating an overturned stratigraphic sequence.

Gold mineralization occurs with disseminated pyrite contemporaneous with quartz-calcite ± albite breccia-veins that occur along contacts between gabbro sills and footwall strata. Two distinct alteration assemblages are identified at Pine Cove: proximal sericite-rutile and distal epidotetitanite. A less consistently-developed spatially intermediate alteration zone consists of carbonate as pervasive groundmass alteration, porphyroblasts, and within veins. The alteration halo may extend as much as 100s of metres from ore, but is asymmetric due to proximity to the brittle-ductile Scrape Thrust fault, which truncates the lower part of the deposit.

Alteration and mass balance calculations for the alteration associated with the Pine Cove deposit shows enrichments in CO<sub>2</sub>, K<sub>2</sub>O, S, Rb, W, In, Pb, Bi, Te, Se, Cs, and Ba, and depletions in As, Sb, and locally Na<sub>2</sub>O, similar to orogenic Au deposits globally.