

### **The Magmatic-Hydrothermal Evolution of the Camp Creek Cu-Mo-(Au-Ag) Porphyry Deposit, British Columbia, Canada**

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New high-precision geochronology data constrains the timing of magmatism and hydrothermal mineralization at the Camp Creek Cu–Mo–(Au–Ag) porphyry deposit in British Columbia, Canada. Camp Creek is hosted by diorite-to-monzonite phases intruded into mafic volcanic and volcanosedimentary rocks of the Late Triassic Stuhini Group. These phases are difficult to distinguish due to similar mineralogy and limited cross-cutting relationships. Previous U-Pb zircon ages suggest magmatism from ca. 94–87 Ma associated with diorite porphyries at Camp Creek, followed by subaerial volcanism at ca. 85–80 Ma (Simmons, 2004).

CA-ID-TIMS zircon ages indicate rapid emplacement of intrusions at ca. 86.9–86.2 Ma over ~700 kyr. These results distinguish three intrusive phases interpreted as pre-mineral (PY), syn-mineral (PX), and late (PZ) porphyries. Additional LA-ICP-MS zircon ages constrain post-mineral dykes to two younger magmatic episodes at ~70–60 Ma and ~55–50 Ma. Hydrothermal mineralization is constrained by molybdenite Re–Os geochronology at  $86.6 \pm 0.36$  Ma, overlapping with emplacement of the syn-mineral PX intrusion. Mineralization occurs mainly within PX and adjacent Stuhini Group host rocks as chalcopyrite-molybdenite-quartz veins. The lowest preserved strata of the overlying Windy Table volcanics erupted at ca. 82.7 Ma, indicating that uplift and erosion of the porphyry system had initiated by this time.

Many porphyry deposits in the northern Canadian Cordillera formed during a Late Triassic–Early Jurassic arc-related mineralizing event associated with the Quesnel and Stikine terranes (Logan and Mihalynuk, 2014). The Late Cretaceous age of Camp Creek highlights a younger, less common porphyry-forming event, comparable to the giant Pebble Cu-Au-Mo and Huckleberry Cu-Mo deposits. These results suggest the Camp Creek porphyry system formed during a short-lived magmatic episode lasting <1 Ma. Rapid uplift and partial erosion were followed by burial beneath Windy Table volcanic strata, indicating a dynamically evolving magmatic-tectonic environment in northern British Columbia.