

Apatite chemistry as a pathfinder for tungsten skarn deposits, Cantung District, Northwest Territories, Canada

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The Cantung District is home to one of the largest tungsten skarn deposits, the largest outside of Asia. The tungsten ores recovered from Cantung are some of the highest grade (1–3% WO₃), making it world class. The goal of the research is to determine if the chemistry of apatite in heavy mineral separates from surficial stream sediments and tills can be used to find hidden tungsten skarn deposits in the mineral apatite was identified by mapping polished 1 inch pucks containing coarse fractions on a Scanning Electron Microscope (SEM). The heavy mineral separates were gathered from upstream and downstream of the Cantung deposit along the Flat River valley, Northwest Territories. Minerals were identified, and representative compositional data was collected in both weight percentage and compound percentage. Based on the fourteen pucks analyzed forty-two apatite grains were located. Out of the forty-two grains three different types of apatite were located. This work was in preparation for the next step, which is to determine the trace element make-up of the apatite using laser ablation inductively coupled plasma mass spectrometry (LA-ICPMS). Apatite from the hydrous skarn phase at Cantung is uniquely characterized by elevated As, W, LREE, and Sr. Analysis of apatite from heavy mineral separates will determine if apatite with these features was introduced into the sedimentary record surrounding the deposit. [Poster]