

Abstract – Textural characteristics and chemical composition of chlorite from the Guichon Creek Batholith, south-central British Columbia

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The Upper Triassic Guichon Creek batholith is located within the Canadian Cordillera as part of the Intermontane Belt, and has surface area of approximately 1,000 km². The batholith hosts the Highland Valley Copper calc-alkaline porphyry district, which comprises 5 known mineralized centres: Bethlehem, J.A., Highmont, Lornex, and Valley. Chlorite forms as an alteration byproduct of primary minerals in porphyry copper deposits via hydrothermal fluid flow from a magmatic source and interaction between meteoric water and wallrocks. At Highland Valley, chlorite occurs either as part of the main and proximal sodic-calcic alteration assemblage (albite-chlorite-epidote±actinolite ± diopside ± garnet) or with the generally more distal white mica-chlorite-prehnite assemblage. Characteristics of chlorite such as colour, structural composition, and chemical composition vary due to cation substitution, which is directly affected by temperature, pressure, and bulk rock composition. Petrographic observations and geochemical compositional tests (EMP) of chlorite collected from the medial to distal areas of the Guichon Creek batholith were conducted to evaluate the textural and chemical variations as a function of distance to mineralized centres for different styles of alteration. Chlorite associated with sodic-calcic alteration displays anomalous blue birefringence, showing a more Fe-rich composition, as opposed to green chlorite which indicates Mg-rich composition. These petrographic observations and geochemical data will enhance the description of the alteration facies and their distribution at HVC, and can potentially be used to vector towards Cu mineralization. *NSERC-CMIC Footprints Exploration Project Contribution #119*