

**The Illiance Valley Trend, Northern B.C: Implications for Silver-bearing
Mineralization in the Golden Triangle**

by

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Abstract

The geology of the Kinskuch property in northwestern British Columbia consists of a succession of folded volcanic and sedimentary rocks of both the Upper Triassic Stuhini Group and the Lower to Middle Jurassic Hazelton Group. The 6 km long, north-south trending, Illiance Valley shear zone hosts a series of Pb-Zn-Ag veins that together comprise the Illiance Valley Trend. The veins are developed within moderate to intense quartz-sericite-pyrite alteration of the host-andesite lapilli tuff. Samples were taken along drill hole locations, representing 1.6 km of strike length, to (1) compare the paragenesis, alteration, and tectonic setting to other Ag-Zn-Pb deposits, and (2) classify the Illiance Valley Trend as either a metasedimentary Pb-Zn-Ag vein deposit or a Cordilleran vein deposit. Metasedimentary Pb-Zn-Ag vein deposits are considered to form in extensional basins, where deep crustal faults act as fluid pathways for metamorphic-derived fluids. Cordilleran Pb-Zn-Ag deposits are spatially and genetically associated with Au-Cu-Mo porphyry deposits, and they are representative of fluid evolution caused by increased wall rock interaction along the flow path. Based on optical microscopy and scanning electron microscopy (SEM), three distinct stages of hydrothermal activity were identified. The first stage (pre-ore stage) comprises quartz, sericite, and pyrite, an assemblage that defines the pre-mineralized alteration of the host lapilli tuff. Mineralization (ore stage) is related to the second hydrothermal event and consists of pyrite, chalcopyrite, galena, barite, tetrahedrite-tennantite solid solution, and Fe-poor sphalerite hosted within quartz-ankerite veins. The final stage (post-ore stage) of hydrothermal activity is defined by the presence of quartz-ankerite veins that cross cut all previous mineral phases. Whole rock trace element geochemistry of the host lapilli tuff is consistent with an arc-related tectonic setting. Based on paragenesis, alteration style, host rock, and tectonic setting, the Illiance Valley Trend is classified as a Cordilleran Pb-Zn-Ag vein deposit. A possible genetic relationship is between the Illiance Valley Trend and the proximal Big Bulk porphyry prospect, which shows similar alteration style and vein orientations, and contains polymetallic veins that cross cut earlier porphyry stocks.