

METALLOGENETIC FRAMEWORK OF THE ISKUT RIVER DISTRICT NORTHWESTERN BRITISH COLUMBIA

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The Iskut River District is a relatively small (approx. 80x50 km) but economically significant portion of the coastal Cordillera of Canada. An Upper Triassic (Camian and Norian 235-209 Ma) to Middle Jurassic (Bathonian, 161-166 Ma) volcano-sedimentary and coeval plutonic suite comprises a portion of the Stikine suspect Terrane, a proposed island arc and back-arc complex, the volcano-sedimentary components of which are known as the Hazelton Group. Principal lithologies range from submarine sediments, submarine mafic to felsic volcanic and volcanoclastic rocks, to subaerial intermediate to felsic volcanic rocks; these are intruded by (a) Toarcian to Pleinsbachian (185-195 Ma) Texas Creek suite of granodioritic to alkali feldspar granitic composition, and locally potassium feldspar megacrystic, and (b) rare, small, olivine gabbro of unknown age. Other workers have proposed that the Hazelton Group accumulated in a basin, several hundred kilometers in width, separating two opposing subduction zones.

The Hazelton lithologies are host to a wide spectrum of mineral deposit types; at least eight differing styles of mineralization have been described in the Iskut River area alone. In many cases the showings, deposits and mines display a marked spatial relationship with intrusive rocks, while elsewhere exhibit stratiform and stratabound associations with volcano-sedimentary assemblages: (a) steeply dipping pipe- and lens shaped bodies of magmatic sulphides (Ni-Cu-PGE-Au), hosted by gabbro stocks (e.g. E & L deposit); (b) oxidized gold skarns (e.g. McLymont Creek); (c) large tonnage, low grade, porphyry-style Cu \pm Au, Mo, spatially associated with feldspar megacrystic intrusions (e.g. Red Bluff, Kerr); (d) possible porphyry-style, large tonnage, low grade gold-only deposits (e.g. at Sulphurets); (e) mesothermal (transitional) gold veins, also spatially associated with the Texas Creek intrusive suite (e.g. Snip); (f) possible epithermal (quartz, sericite, alunite, native sulphur) mineralization (e.g. Treaty Creek and possibly at Sulphurets); (g) stockwork/veinlet base metal, gold \pm Sb, Hg, As deposits (e.g. Eskay Creek 21A, SIB), (h) proposed volcanogenic base metal massive sulphides (e.g. Black Dog), locally precious metal-rich (e.g. Eskay Creek 21B). Most of the mineral deposits exhibit varying degrees of strain, with some displaying evidence for hydrothermal activity within a transpressional regime, i.e. syn-tectonic alteration and mineralization (e.g. Twin Vein, Snip Mine, West Zone, Sulphurets property).

The marked over-endowment of mineral resources in the Iskut River area is a consequence of intrusion of a specialized intermediate to felsic suite into a volcano-sedimentary lithological assemblage that acted as hostrocks for mineralization. The favorable, and perhaps relatively rare, geological environment of the Iskut River area may result from processes that are a consequence of opposing subduction zones in the Upper Triassic to Mid Jurassic beneath the Hazelton volcano-sedimentary basin. This also has implications for (a) the tectonic environment within which the igneous and sedimentary rocks accumulated, (b) the specialized suite of intrusive rocks, and (c) factors controlling mineralization.

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ABSTRACTS OF TECHNICAL PRESENTATIONS