

Mineralization on Tillicum Mountain, Southeast British Columbia
(Abstract for 1989 Northwest Miners Convention Poster Session)

The Tillicum Mountain gold property of Esperanza Explorations Ltd. lies in the Arrow Lakes region of British Columbia, approximately 13 km east of the village of Burton and 30 km south of Nakusp. The property lies within the east trending Nemo Lakes belt, a five kilometer wide roof pendant in the Nelson Batholith. The property is underlain on the south by pelitic schists and gneisses of the Pennsylvanian to Triassic Milford Group (?), and on the north by Lower Jurassic Rossland Group. The Rossland volcanic rocks in the area have been correlated with the Elise Formation, and consists of augite-porphyry basalt flows, volcanoclastics, argillites, and hypabyssal feldspar porphyry sills. The rocks of the Nemo Lakes belt have undergone sillimanite-grade regional metamorphism; however, the metamorphic grade in the Tillicum Mountain area was lower and of greenschist to lower amphibolite grade. Regional metamorphism, early isoclinal and late open folding, three intrusive events, and faulting have brought about complex metamorphic and metasomatic overprinting relationships.

Two distinct gold-bearing zones spatially associated with feldspar porphyry sills and massive basalt flows have been extensively drilled to date. The Heino-Money Zone, with proven-probable reserves of 55,000 tons grading 1.04oz/ton, and the East Ridge deposit, with drill indicated and drill inferred reserves of 1.4 million tons grading 0.24 oz/ton. Gold occurs as fine to coarse disseminations and veinlets in structurally controlled, north-south trending zones within a sulfide-bearing calc-silicate assemblage of pyroxene, tremolite-actinolite, quartz, calcite, zoisite, clinozoisite, garnet, plagioclase, microcline, schöelilite, chlorite, and sphene. The sulfide assemblage consists of pyrrhotite, pyrite, arsenopyrite, sphalerite, galena, marcasite, chalcopyrite, gold, electrum, tetrahedrite, boulangerite, bismuthinite, native bismuth, bismuth tellurides, aurostibnite, and complex Pb-Sb-sulfosalts. Energy dispersive spectrometry during microprobe work possibly indicates a ubiquitous association of platinoid metals (Pt, Ir) with bismuth.

A number of models have been proposed for the origin of the gold bearing assemblage on Tillicum Mountain including gold skarn and gold associated with mesothermal veining. Field work, microprobe studies, and preliminary fluid inclusion studies indicate that the mineralization on Tillicum Mountain is largely a metamorphic event that maybe analagous to the mineralization in the Rossland District or the Southern Cross greenstone belt of Austrailia. A proposed mineralization model includes: 1) devolatilization and elemental leaching of the country rocks during metamorphism 2) migration of the metamorphic fluids across thermal gradients and into shear zones during uplift 3) deposition of the gold-bearing calc-silicates along structurally favorable sites. On Tillicum Mountain, the thick basaltic flows and feldspar porphyry sills of the Rossland Group acted as competent blocks during uplift and concentrated, and possibly ponded, the fluid along their margins. Deposition of gold and calc-silicates occurred in structurally favorably sites along the margins of these competent blocks.