

GENETIC MODEL FOR SUSTUT COPPER DEPOSIT IN  
TRIASSIC VOLCANICLASTIC ROCKS, CENTRAL BRITISH COLUMBIA

by

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ABSTRACT

*Takla Gp.*  
Host of the Sustut copper deposit 230 miles (370 km) northwest of Prince George, is a 2300 feet (700 m.) thick sequence of volcanoclastic rocks of the Upper Triassic Savage Mountain fm. striking northwesterly and dipping about 20 degrees to the south. The unit is mostly agglomerate and volcanic breccia with local discontinuous and thin layers of tuffaceous rocks. Fragments in the unit are mainly basic to intermediate volcanic rock. Five relatively common types of fragments are recognizable as being derived from underlying rock units.

Copper minerals, mainly chalcocite, bornite, chalcopyrite and native copper, are epigenetic and occur with quartz, epidote and carbonate in veinlets and in tabular zones parallel to bedding. Pyritized rock surrounds some copper-bearing tabular zones and pyrite is present rarely in some veins. Veins are negligible in total volume of mineralized rock and formed mainly by open space filling; both open space filling and metasomatism were operative to variable degrees in tabular mineralized zones. A crude vertical zoning is apparent in some tabular zones, where the idealized sequence from margin to core is: pyrite-chalcopyrite-bornite-chalcocite-native copper. Most tabular zones show neither the complete sequence nor a perfectly symmetric distribution of zones about a native copper core, and in some cases there is no semblance of a zonal distribution of ore minerals.

It appears that prior to mineralization some porous and permeable tabular zones within an otherwise impermeable sequence were interconnected at least in part by small, open fracture systems. This network provided a passageway for fluids derived from below and from which pyrite, copper minerals, epidote, quartz and calcite were precipitated during a single phase of mineralization.

~~Tertiary~~ plutons?  
Tertiary

Mineral deposition was apparently affected by rock-fluid reactions: some tabular zones have undergone extensive replacement, especially epidotization, and others formed by infilling of interstices among grains; some zones contain concentrations of copper minerals with economic potential, others are essentially devoid of copper minerals.

In concert with Harper (1977) we speculate that the ore fluid and copper were derived from below, perhaps in part by dehydration metamorphic reactions in underlying basaltic and andesitic flow rocks.

— on Tertiary plutons?

Silver relationship?

Digenite? or chalcocite?

