THE GEOLOGY AND MINERALIZATION OF THE ANTLER MINE
AND VICINITY, MOHAVE COUNTY, ARIZONA

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ABSTRACT

Generation of the volcanogenic massive sulfide ores of Boriana Canyon commenced approximately 1850 m.y. ago with the inception of tholeiitic bimodal volcanism in what appears to have been an intra-oceanic arc complex. Thin basalt-andesite flows on an unknown, presumably oceanic, basement were interspersed with subaerial outpourings of rhyolite tuff prior to deposition of a submarine felsic end stage marked by generation of chlorite and cognetic massive sulfides and chert precipitated onto the seafloor. The stratiform Cu-Zn-Pb bodies were then buried by coeval tuffaceous and later pelitic sediments.

During the Mazatzal Revolution from 1715 to 1660 m.y., the sedimentary and volcanic rocks were metamorphosed during a deformational event in which a weak foliation was imparted to the rocks. A second major northwesterly-directed compressional event resulted in development of strong northeast foliation, tight-to-isoclinal northeast trending folds, steeply plunging lineations, and chevron folds, all contemporaneous with batholithic activity. Anatexis of tuffaceous and pelitic material generated a granitic melt emplaced along northeast structures. Later recurrent north-northwest block faulting, possibly post-Precambrian, cut the metamorphic-plutonic complex.

This major metamorphic event obliterated all primary lithologic features. The chloritically altered wallrocks of the ore horizon were
converted to cordierite-anthophyllite assemblages, while the massive
sulfide bodies were plastically deformed. Petrochemistry reveals
the parentage of amphibolites to be basalt-andesite-dacite, biotite
schists to be rhyolite tuffs, and mica schists to be pelitic sediments.