

RECENT GEOLOGICAL DEVELOPMENTS AT THE BAGDAD PORPHYRY COPPER DEPOSITS,
EUREKA MINING DISTRICT, YAVAPAI COUNTY, ARIZONA

by

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Abstract

Cyprus Bagdad Copper Company and its predecessor companies have been operating at the Bagdad porphyry copper deposit for the last four decades. Mining and milling capacity of the present operation is 6,000 tons per day, and the deposit is now being prepared for production at a mining and milling rate of 40,000 tons per day. The expanded operation is scheduled to go on stream by December 1977.

The regional geology is characterized by a section of metamorphosed sediments which is intruded by felsic to basic intrusive rocks of Precambrian age. This Precambrian metamorphosed and igneous complex was intruded by a series of stocks, plugs, and dikes during the Laramide age. These intrusive bodies form a seven-mile-long belt along a N. 60°-70° E. trend. At present, the Bagdad stock is the largest and only productive intrusive body in this belt.

The Bagdad stock, which hosts copper-molybdenite mineralization, is a granodiorite-monzonite-quartz monzonite porphyry intrusion. Within this single major intrusive unit, separate intrusive rock units are recognized, although chemical, mineralogical, and age relationships are not completely known.

Hypogene sulfides consist of chalcopyrite and pyrite with a minor amount of molybdenite, which occur primarily in veinlets and microveinlets and, to a lesser degree, are disseminated in zones of pervasive alteration. A close relationship exists between certain silicate mineral assemblages and hypogene sulfide minerals.

Four major types of silicate alteration assemblages are biotite-albite-orthoclase-quartz-sericite, biotite-orthoclase-quartz-sericite, quartz-sericite-clay, and clay-chlorite-quartz-sericite. These silicate mineral assemblage zones are in part overlapping, vertically as well as laterally.

From the present data, it is hard to speculate on the pattern of concentric zoning of alteration, as typically observed in some porphyry copper deposits of the world. However, the Bagdad porphyry copper deposit exhibits certain similarities in regard to alteration and mineralization to most of the porphyry copper deposits of the southwestern United States.

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