

## **Geologic Controls on Mineralization at Khoemaçau's Zone 5 Cu-Ag Deposit, Kalahari Copper Belt, North West District, Botswana**

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The Khoemaçau and Boseto Copper Projects are strata-bound, sediment-hosted copper-silver deposits located in North West Botswana, within the northeastern portion of the Kalahari Copper Belt (KCB). The KCB forms part of the Damaran Pan African Mobile Belt that is host to a number of copper-silver deposits and mining operations in Southern Africa. Recent exploration has led to the recognition that Khoemaçau's Zone 5 deposit is both large and high grade.

The lower D'Kar Formation is host to the majority of the high grade copper showings (>1% Cu) and is part of the Ghanzi Group Sediments, which include the Kuke, Ngwako Pan, D'Kar and Mamuno Formations that were deposited in an intra-cratonic rift basin during the Neoproterozoic. Mineralization is defined as an early stage strata-bound, redox boundary that was upgraded to economic levels by a later stage, hydrothermal fluid flow and trap environment associated with a major folding event. Fold development occurred at high crustal levels during the Damaran Orogeny and was accompanied by southeast thrusting. Both regionally and locally, the structural pattern exhibits a series of major northeast trending, doubly plunging anticlines that have repeated the stratigraphy and mineralization over hundreds of kilometers.

Khoemaçau Copper Mining's Zone 5 deposit is located on the southeast limb of a northeast - trending regional anticline. The Zone 5 deposit has a current strike length of 4.2 km and dips at 56° to the southeast over an average thickness of 20 m. Economic mineralization evolved during progressive deformation, particularly during fold amplification. Multistage reactivation of bedding plane shears, veins and breccias indicate that permeability was maintained during hydrothermal fluid flow. Mineralization is hosted within vein shears in the hanging wall sequence of the D'Kar sediments. The sequence consists of alternating basal carbonates (marl and limestone) with overlying silts and sandstones. High grade mineralization that averages approximately 2% Cu and 20 gpt Ag is subparallel to bedding and typically crosscuts host-rock assemblages. The mineralized sequence is sandwiched between two competent, thick sandstone units. Mineralization has been intersected at the base of the Kalahari Sands to a known down dip extension of 1,200 m vertically below surface. The deposit remains open downdip and along strike.

Copper sulphide mineralization is typically zoned both vertically and to a lesser extent, laterally. Lower grade sulphide mineralization consists of fine-grained disseminated sphalerite, galena and pyrite occurring several metres into the hanging wall D'Kar stratigraphy. Disseminated chalcopyrite and chalcocite occur directly above and below the ore. High grade mineralization consists of massive bornite with accompanying chalcopyrite, chalcocite, and silver. The mineralization is largely vein hosted within an extensive system of quartz and quartz carbonate (Cu-Fe-sulfide) shears. Within more competent units, shearing is replaced by brittle deformation, generally in the form of brecciation.