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Mineralization Features of the Kencana Au-Ag-Te Epithermal Deposit, Gosowong Goldfield, Halmahera, Indonesia

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The Kencana mine is a low-sulfidation epithermal gold-silver type deposit. Located in the north-eastern extreme of the Indonesian archipelago on the island of Halmahera, it is straddled between the western island of Sulawesi and the island of New Guinea to the east. The island of Halmahera is split simply into the Western and Eastern Provinces, in which the Eastern Province is composed of Cretaceous ultramafics and ophiolites. Bounded by Tertiary limestones and andesite and basaltic rocks. Later Tertiary volcanic rocks of andesite, dacite and rhyolite form the main host of mineralization in the Gosowong District, and which is roughly the north-south striking ancient analog of the present Halmahera Arc, situated presently off the western coast. Kencana is a member of the Gosowong mining catchment, composed of numerous prospects and operating mines. The principle deposits being; Gosowong (mined out), Toguraci and Kencana. All of which are epithermal type mineralizations.

Kencana is composed of 3 principle ore veins; K1, K2 and K-link. This study focuses on the mineralization of the K1 vein. K1, strikes in a NW-SE direction, almost contiguous with the T-Fault, though the nature of this connection is unknown. The upper zones of the K1 vein are composed of crustiform colloform bands at 100-150m depth and Au grades in excess of 1000g/t. Below (150-200m), the vein is largely composed of hydrothermal breccia, initially of weakly banded to massive quartz, and a latter crustiform colloform quartz band. Cockade texture is common in this breccia, with host rocks of the Gosowong Volcaniclastics, typically showing strong chlorite alteration of the hematitic mudstones and andesites. Preliminary fluid inclusion microthermometry results indicate that the quartz crustiform banding has a principle temperature range of 240°C and a salinity range of 0.2 to 1.4 NaCl eq. wt%. Measured Au grades here reach 2000g/t, with the majority of the gold present as electrum (>70at.%) in the earlier stage massive quartz, with few tellurides (hessite being the most encountered). The crustiform band that follows the main mineralization event is composed of repeating bands of chalcopyrite (ubiquitous), hessite, petzite, sylvanite, electrum and stuzite. Base metals are composed of galena and Cd-rich sphalerite and a form of zincian-greenockite. The base of this vein is composed of sheeted quartz veins, locally amethystic, with an upper grade of 7g/t.

