

**Geological and Geochemical Controls of Gold Mineralization in the West African Craton: A case study from the Kunche deposit, Wa-Lawra belt, NW Ghana**

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The Kunche deposit is one of the largest gold deposits discovered so far in the Wa-Lara Belt in NW Ghana and the eastern edge of the Paleoproterozoic West African Craton. Gold in Kunche is confined within N-NNW trending and steeply dipping  $D_{K1}$  anastomosing shear zone and Type-1 quartz veins. The gold can be inferred to have occurred around 2110- 2105 Ma and the ore body consists of a single lode with a strike length of 1.1 km. The ore zone is characterized by an alteration assemblage of calcite + chlorite + sericites + quartz + sulphides, which occupy an entire width of 20 to 150 m. Gold in the Kunche deposit is associated with arsenopyrite. Two types of gold occurrences have been identified in the Kunche deposit. (1) The invisible gold formed as nanoparticle or solid solution with the crystal lattice of the arsenopyrite and (2) the visible gold formed within the fractures formed in the arsenopyrites or in the quartz veins. SEM imagery on arsenopyrite reveals that the arsenopyrite carrying the gold mineralization was formed via hydrothermal processes. LA-ICP-MS show that the gold in Kunche is associated with trace elements such as Ag, Pb, Cu, and Zn.