

# SEG 2022 Conference: Minerals For Our Future

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## **Deciphering Conglomerate-host Gold Mineralisation in Moto Greenstone Belt, Congo Craton, DRC: Implication for Gold Exploration**

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The giant Karagba-Chauffeur-Durba (KCD) gold deposit and its associated peripheral gold deposits are located within the Neoarchean Moto Greenstone Belt in the Kibali district in the northeastern portion of the Congo Craton, Democratic Republic of Congo. These gold deposits have been defined as orogenic-type gold deposits with mineralisation mainly controlled by structure, through which hydrothermal fluids have transported and precipitated gold, notably in the local Banded Iron Formations (BIF) where chemical trapping mechanisms are expected to control gold siting and tenors. Although volumetrically-important for their role as host lithologies, less altered clastic sediments (mainly conglomerates), have received less scientific and exploration attention, despite displaying high gold grades in places (i.e.,  $>100 \text{ g.ton}^{-1}$ ). To fill this knowledge gap, we present a comprehensive characterisation of conglomerate-host gold in the Kibali gold district, considering samples from KCD, Sessenge, Gorumbwa, Kombokolo, Agbarabo, and Rhino deposits. This investigation considered an extensive data set comprising polished samples from several boreholes, over nine million gold assay values distinguished according to host lithology, microscopic studies of 3824 individual gold grains, and mineral chemistry using Scanning Electron Microscope analyses on 397 gold grains. The identified gold grains show a variety of morphological forms with some notable variations in their mineral chemistry. Textural associations range between attachment to sulphide mineral surfaces, inclusions within sulphides, and as discrete grains showing only random association with the silicate gangue. Over 53% of all mineralised core intersections comprise conglomeratic lithologies, emphasising this unit's importance as an essential gold host and highlighting the importance of renewed scientific interest in the reasons for its endowment. These reasons will be discussed in the context of regional geology, the host rock's physico-chemical properties, and the implications for exploration paradigms within the broader KCD area.