

# SEG 2024 Conference: Sustainable Mineral Exploration and Development

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## **Assessing Structural Impact on Gold Mineralization Using Aeromagnetic, Radiometric Data Sets and Field Observations: AngloGold Ashanti Iduapriem Mine, Ghana**

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The impact of structures on gold mineralization at the AngloGold Ashanti Iduapriem Mine in southwestern Ghana was investigated by combining aeromagnetic and radiometric data sets with field observations. The geophysical data processing focused on delineating lithological boundaries and structures that may potentially influence gold mineralization within the mine. The application of enhancement filtering techniques to magnetic data, along with ternary radiometric imaging, facilitated the mapping of various lithologies belonging to the Tarkwaian Group and the Birimian Supergroup. The former group constitute the Kawere conglomerate, Huni sandstone, Tarkwa phyllites, gold-bearing Banket conglomerate, and greenstones ascribed to the Birimian Sefwi Group.

Three main deductions were made from this research: (i) the field observations indicate gold mineralization, primarily associated with the Banket conglomerates marked by distinctive sedimentological features such as preserved bedding, trough cross-bedding, and particulate gold along inter-grain boundaries, suggest a sedimentological control of gold distribution; (ii) the lineament analysis from the analytical signal and tilt derivative revealed two principal tectonic events, predominantly NW-SE and minor N-S trending regional structures, corresponding to the D1 and D2 deformational phases of the Eburnean Orogenic Event; and (iii) these structural transpositions which affected the primary sedimentary features, resulted in late-stage structures that appeared to have remobilized the earlier gold occurrences.