

### **Integrated Exploration Approach Unlocks a Deep-Seated High-Grade Copper Mineralization in the Jervois Range, Northern Territory, Australia**

**Jalu Bias Firdausi**<sup>1</sup>, Atiqullah Amiri<sup>1</sup>, Salma Difa Masti<sup>1</sup>

<sup>1</sup>KGL Resources Limited, Brisbane, Australia

The Jervois region in the eastern Arunta Orogen, Northern Territory, is a significant Proterozoic base metal province, representing a high-priority target for copper-lead-zinc exploration. However, exploration remains challenging due to complex faulting and folding and lack of surface anomalies. This study integrates geological mapping, geophysical methods, drillhole data, and geochemical analysis to evaluate the economic potential of the deep-seated ore bodies.

Geophysics has played a critical role in exploration. Regionally, aeromagnetic and gravity surveys have defined major J-fold tectonic structures. At the deposit scale, induced polarization (IP) and resistivity have delineated mineralized zones, while Down-Hole Electromagnetic (DHEM) surveys have successfully identified mineralization at Rockface, Reward and Cox's Find.

The principal deposits—Rockface, Reward, and Bellbird—are subvertical stratabound, predominantly hosted in garnet-chlorite-magnetite schists, with lateral facies variations into quartz-tourmaline, banded epidote, and calc-silicate rocks. At Rockface, mineralization consists of massive chalcopyrite-pyrite in brecciated magnetite, while Reward and Bellbird feature galena-sphalerite boudins within skarn-like calc-silicates. Subsurface geochemical data suggest a metamorphosed SEDEX-style system overprinted by oxidized hydrothermal fluids of which fluid is essential in enhancing metal mobility and enrichment.

Drilling conducted in 2024 led to a 17.4% increase in resources and confirmed mineralization continuity along the key shear zones. Notably, hole KJD627D1 at Rockface intersected a brecciated sulphide-magnetite vein with 5.08 m at 6.74% Cu, 5.36 g/t Au, 18.41% Zn, and 8.42% Pb from 1013.05 m. Integrated analysis of geological, geophysical, and geochemical datasets have discovered the deep-seated high-grade copper mineralization, substantially increased confidence in ongoing target delineation, further establishing Jervois as a highly prospective area within the global copper supply framework.