

Exploration Through Cover: The Ernest Henry and E1 Discovery Case Studies, Cloncurry District, North West Queensland

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The Cloncurry district of North West Queensland is one of the most metalliferously endowed examples of Proterozoic crust on the planet and is host to numerous economically viable mineral deposits. Many of the deposits can be classified within the IOCG (Iron Oxide Copper Gold) category. However, because of the inherent variation between the deposits each example has different geophysical and geochemical signatures. Additionally, large areas of the highly prospective Eastern Succession are covered by variable thicknesses of Cenozoic and Tertiary sediments (up to 150 m+) resulting in a challenging exploration environment.

The Ernest Henry and E1 deposits were both initially targeted and discovered using geophysical techniques including magnetics, electromagnetics, induced polarization/resistivity and gravity. However, despite the relative proximity (<8 km) and similar host lithologies, their geophysical signatures differ significantly and their mineralization styles are markedly different. The discovery case studies will be presented with original geophysical datasets used for drill targeting.

Recent industry-led research projects into the paragenesis and formation of the deposits have enabled genetic links to be established between the two deposits and other mineral systems in the district. Increased understanding of the district ore systems and the potential fluid pathways (district 'plumbing') has enabled exploration efforts to more effectively target potential repeat occurrences under cover.

Geochemical trials using traditional acid digest and partial leach methods, completed prior to the pre-strip of the E1 deposits, also demonstrate that key pathfinder elements (including Cu, Au, Ag, Mo and Mn) can still effectively define targets through up to 30m of consolidated regolith. The use and application of emerging sample mediums including soil gas, biogeochemical and microbiogeochemical techniques will also be discussed.