THE GEOLOGY AND
MINERALISATION OF THE
E31 COPPER-GOLD PROSPECT,
GOONUMBLA, N.S.W.

BY

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Mark Arundell
ABSTRACT

The E31 copper-gold prospect is one of several porphyry or porphyry related prospects that occur adjacent to the Northparkes Mines site in the Goonumbla district of central N.S.W.

The prospect is hosted by trachyandesitic lavas, volcaniclastic breccias and volcaniclastic sandstones which have been intruded by a biotite monzonite at depth. Intrusive breccias are recognised associated with monzonite dykes intruding the volcanic sequence. A post mineralisation low angle north dipping fault terminates occurs adjacent to the contact of the monzonite with volcanics.

Three major stages of hydrothermal alteration and veining are recognised. Pre-mineralisation biotite alteration was the first phase. Extensive K-feldspar flooding and vein style alteration was associated with bornite and chalcopyrite mineralisation. Sericite-carbonate (± chlorite) alteration with pyrite ± chalcopyrite was associated with minor faults and shears. Regional low grade metamorphism, localised albitisation, and late stage carbonate veinlet alteration have also been recognised.

Detailed analysis of geochemical data indicates that Cu/Au mineralisation is associated with Ag, Te, Hg, and Se. An asymmetric Zn and Mn "halo" anomaly occurs in the hanging wall of the mineralisation which could be used as a vector to the mineralisation. Geochemical discrimination of lithological units has identified subtle differences between the monzonite above and below the low angle fault.

Analysis of sulphur isotopes of the E31 prospect indicates that the sulphur associated with the mineralisation was derived from an oxidised magmatic source. The range of the data for bornite and chalcopyrite at the E31 prospect are broadly similar to the values from E26N and E48 but overall the numbers are lower. Isotopic zonation may be present within the prospect but given the small size of the prospect and the limited number of samples collected, zonation has not been determined.
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