Tertiary weathering and the formation of supergene/oxide gold resources in the Cobar region, NSW, Australia

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Primary polymetallic sulfide deposits with zones of supergene-enriched gold occur in the Cobar Mining Field in northwestern New South Wales.

Through the Early-Mid Tertiary the Cobar terrain was subjected to chemical weathering under humid climatic conditions. The resulting profiles show considerable ferruginisation, particularly near the surface, but there is controversy as to whether these represent "lateritic" remnants or the products of concomitant ferruginisation and erosional stripping. Variable leaching of base metals and concentration of gold occurred over mineralised zones during this period. This produced easily exploitable gold-enriched oxide zones over primary copper-gold deposits (e.g. New Cobar deposit) and in some cases generated significant new gold resources from large volumes of once overlying and now eroded low-grade polymetallic mineralisation (e.g. McKinnons gold deposit).

Subsequent change to a more arid climate, continued erosional stripping and deposition of transported materials led to superimposed chemical changes in the regolith and contained mineralisation, clastic dispersion of gold and masking of primary and secondary deposits.

Historically, exploration focus in the Cobar region has been on high-grade oxide ore and deep primary mineralisation. Lower grade but near surface and metallurgically amenable supergene gold mineralisation represents a potentially important gold resource in the region.