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Geochemistry and alteration at the Hermes and Central Bore gold prospects, Peak Hill District, WA

ABSTRACT

The timing of gold mineralisation within Proterozoic terranes is complex and often controversial. Deposit scale studies that determine the relative timing of gold mineralisation with respect to deformation and metamorphism, when correlated to regional deformation histories and compared to other deposits, can provide important insight into the regional timing of gold mineralisation. The Hermes gold deposit and Central Bore gold prospect, owned by Alchemy Resources, are located in the Bryah-Padbury domain within the Proterozoic Capricorn Orogen, Western Australia. The timing of gold mineralisation with respect to regional metamorphism and deformation events within the Bryah-Padbury domain is poorly constrained. The aim of this study is to constrain the nature and timing of gold mineralisation for the two areas and compare with other deposits in the Peak Hill district.

The Hermes gold deposit is hosted within the Peak Hill Schist, an enigmatic tectono-stratigraphic unit at the tip of the Archean Marymia Inlier. Gold mineralisation is hosted dominantly within meta-sedimentary rocks at the contact between meta-sedimentary rocks and meta-mafic rocks. Visible gold is within quartz veins that are folded and metamorphosed and gold mineralisation is interpreted to have occurred pre to syn D_1 deformation in the Bryah-Padbury Basin, similar to the Peak Hill gold deposit.

The Central Bore gold prospect is hosted within a deformed meta-granite of probable Archean age. Gold mineralisation is late in the structural history and is associated with base metal-bearing extensional quartz veins and late feldspar-quartz-pyrite veins synchronous with

D₃ folding. Gold mineralisation at Central Bore potentially correlates with late gold and base metal mineralisation at the world-class Plutonic gold deposit that is associated with extensional deformation related to the unroofing of the Archean basement to form the Marymia Inlier. Alternatively, it may correlate with the D₃ extensional phase of deformation within the Marymia Inlier, contemporaneous with early extension within the Capricorn Orogen.

Based on the correlation of gold mineralisation at the Hermes gold deposit and the Central Bore gold prospect with the regional deformation history and the timing of gold mineralisation in other deposits there may be three different ages for mineralisation in the region – an Archean gold mineralisation event, an early Proterozoic gold mineralisation event, and a later Proterozoic gold and base metals mineralisation event.