ORE AND GANGUE MINERALS OF THE HERA AU-PB-ZN-AG DEPOSIT, COBAR BASIN, NSW

Angela Lay[1], Ian T Graham[2],Lachlan Burrows[3], Adam McKinnon[4], Karen Privat[5]*
School of Biological, Earth and Environmental Sciences (BEES), University of New South Wales (UNSW), Sydney, Australia, angela.lay@unsw.edu.au[1], School of Biological, Earth and Environmental Sciences (BEES), University of New South Wales (UNSW), Sydney, Australia, i.graham@unsw.edu.au [2], School of Biological, Earth and Environmental Sciences (BEES), University of New South Wales (UNSW), Sydney, Australia[3], Aurelia Metals Ltd, Nymagee,Australia[4], Electron Microscope Unit (EMU), University of New South Wales (UNSW), Sydney, Australia[5]

The Hera Au-base metal deposit, 5 km southeast of Nymagee, central New South Wales is on the eastern margin of the Palaeozoic Cobar Basin within the Lachlan Orogen. Discovered by Pasminco in 2001, the current total resource is 2.7Mt @ 4.1g/t Au, 34g/t Ag, 3.67% Pb and 4.86% Zn. The deposit occurs in a strongly altered and deformed sequence of shelf and turbiditic siltstones and fine-grained sandstones, members of the Nurri and Amphitheatre groups, with the majority of mineralisation occurring in the latter.

Ore minerals comprise pyrrhotite–sphalerite–galena ± chalcopyrite ± pyrite ± cubanite ±arsenopyrite±tetrahedrite±native Sb±gudmundite, gold and scheelite occurring as massive and disseminated sulfides in vein/breccia zones. The main sulfides have composition as follows: pyrrhotite 60.5wt% Fe and 38wt% S with traces of Co, Pb, Bi, Sb and Zn; sphalerite 56.4wt% Zn, 8.9wt% Fe, 33.5wt% S, and traces of Pb and Bi; galena 86.4wt% Pb and 13.4wt% S with traces of Fe, Bi and Zn. Major gangue minerals consist of quartz, chlorite, biotite, and muscovite, with minor carbonate, actinolite/tremolite, Ca-rich garnet and rare titanite and fluorite. Relatively coarse-grained albite-quartz-chlorite rocks were recently discovered however, their significance and emplacement mechanism is as yet unknown. The occurrence of skarn-like assemblages and albite-quartz-chlorite rocks suggests that at least some of the lodes at Hera differ significantly from typical sediment-hosted ‘Cobar-style’ deposit as previously suggested. This is also supported by field observations, petrographic analysis and XRD and shows that the host rocks have been metamorphosed to upper greenschist to lower amphibolite facies.