

### **Late Au-Bearing Quartz - Carbonate Veins System Overprinted the Base Metal Skarn Mineralization in the E44 Deposit, Northparkes District, NSW**

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The E44 Au-Cu-Zn-Pb deposit is located in the Junee-Narromine Belt of the Macquarie arc, 26 km NW of Parkes, NSW. E44 consists of mineralized skarn and Au-bearing IS epithermal veins hosted by the Goonumbla Volcanics. E44 is one of numerous mineralized occurrences that have been discovered in the Northparkes district, which formed during the Late Ordovician to early Silurian (Wells et al., 2021; this study). Alkaline Cu-Au porphyry deposits, epithermal Au systems, skarn prospects at E6, E7, and E44, and unmineralized lithocaps at Nash's Hill occur in the district (Coke et al., 2007).

E44 skarn includes precious and base metals in andraditic skarn lenses hosted in calcareous and andesitic volcanoclastic units (Jones, 1991). CMOC's exploration drilling identified Au-bearing carbonate and Cu-bearing veins that cut the skarn. The skarn system is ~15 m thick and ~300 m long and comprises patches of galena-sphalerite overprinting andraditic-magnetite skarn. Proximal skarn grades to medial andradite-calcite-epidote and distal epidote-chlorite skarn zone, with minor andradite-calcite patches developed in the overlying mafic to intermediate Goonumbla Volcanics. An unmineralized recrystallized marble zone, up to 20 m thick, occurs below the garnet skarn. Quartz-crustiform calcite-chalcopyrite-pyrite-galena-sphalerite and quartz-calcite-pyrite-chalcopyrite epithermal veins with Au and Te crosscut the skarn deposit and contain significant precious metal assays. Post-mineralized calcite-fluorite vein stage overprinted both systems. A widespread white mica alteration zone has been identified at depth in the E44 system, affecting the volcanic and intrusive rocks containing copper mineralization in veins. At considerable depths (~350m) to the NW of E44, deep drilling intersected the Cu-Au-Mo-K-feldspar-quartz cemented Two-Thirty magmatic hydrothermal breccia complex (Wells et al., 2021), implying proximity to a porphyry Cu-Au centre.