

Cargo Cu–Au System, NSW Australia: Characterisation of an Emerging Porphyry–Epithermal Discovery

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The Cargo Cu–Au system is an emerging porphyry–epithermal discovery within the Macquarie Arc of New South Wales, Australia. Mineralisation is hosted within an Ordovician submarine volcanic succession comprising basalt, andesite, trachyte and dacite, including a prominent dacitic quartz-eye porphyry dome complex. These volcanic units are intruded by fractionating mafic to intermediate phases including diorite, monzodiorite and monzonite. The calc-alkaline to mildly alkaline intrusive suite has been dated 460 and 470 Ma and is interpreted to be related to Ordovician arc magmatism.

Drilling confirms a vertically extensive Au-dominant mineralised system at Cargo. Key mineralised intersections in drilling across the Cargo field at Spur and Breccia west include; SPRCD062 which intersected 208.7 m @ 1.17 g/t Au from 514 m, including 38 m @ 3.61 g/t Au, demonstrating strong down-plunge continuity within the Spur corridor. At Breccia West prospect, BZD001 intersected 196 m @ 0.54% CuEq from surface, including 84 m @ 0.62% CuEq, hosted within hydrothermal breccias and porphyry-style alteration assemblages (Waratah Minerals Ltd. ASX announcements, 2025). Drilling results support the interpretation of a district-scale Cu–Au porphyry–epithermal system.

Observations from core logging, supported by petrography indicate a complex magmatic–hydrothermal system involving multiple intrusive phases and overprinting hydrothermal events. Mineralisation occurs in both intrusive and volcanic host rocks and is associated with quartz–carbonate–potassic veins and complex breccias containing pyrite and chalcopyrite. Quartz–carbonate veins locally contain coarse free gold. The spatial association of porphyry-style alteration, hydrothermal breccias and epithermal vein assemblages suggests telescoping of magmatic–hydrothermal environments during the evolution of the Cargo system.

Mineralisation at Cargo is related to a telescoped porphyry–epithermal system with potential for significant depth extent. Characterising this system provides new insights into porphyry–epithermal evolution within the Macquarie Arc and highlights exploration potential for similar systems across eastern Australia.