

ABSTRACT

The Ounce lode system occurs in the Hyde-Macraes shear zone about 60km to the north of Dunedin. The deposit is contained within and is deformed by a complex shear zone which strikes northwesterly and dips shallowly to the northeast. An economic gold and scheelite mineralisation zone of about 20m thick is present within the shear zone. From observations of structures within the shear zone a hinterland-dipping duplex sub-class of thrust system is recognized. The duplexes are a compressional feature but extensional sites are developed. Dilatation jogs provide optimal sites for mineralisation. A westerly thrusting direction is recognized for the Ounce lode system. Gold and tungsten occur within reef complexes consisting of quartz reefs and silicified schists. The deposit is hosted by a turbidite sequence of Torlesse affinity which has been metamorphosed to the chlorite sub-zone of the greenschist facies.

Fluid inclusion homogenisation temperatures gave a minimum trapping temperature of 150 ± 10 °C and the arsenopyrite geothermometer indicated that mineralisation occurred at around 340 ± 30 °C. Gold is seen as blebs of native gold in pyrite and arsenopyrite. Tungsten occurs as scheelite in small fracture veinlets which are developed extensively in more psammitic lithologies as a result of decreasing temperatures. Gold deposition has occurred by a series of complex redox reactions between the ore-bearing fluids and the graphitic wall rocks.

The Hyde-Macraes shear zone mineralisation conditions have not been well constrained. From structural and geochemical analysis it is suggested that mineralisation was deposited from metamorphic fluids at a depth of about 7 ± 1 km.