

## **Contrasting Styles of Polymetallic Sulphide Mineralisation of the Whim Creek Belt, Pilbara Craton, Western Australia**

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The meso-Archaeon Whim Creek Belt hosts polymetallic sulphide resources at Whim Creek, Salt Creek and Mons Cupri. These are commonly cited as type examples of Archaeon VHMS deposits. Using this model, sedimentary packages adjacent to interpreted felsic source rocks are attractive exploration targets for further mineralisation.

In order to characterise a mineral deposit, it is necessary to fully define the geology of the host rocks. The Whim Creek Belt contains a bimodal volcanic and volcanoclastic rock-dominated succession, overlain unconformably by a younger succession of mixed volcanoclastic and siliciclastic provenance. It is the younger succession that hosts the three deposits. Characteristic trace element signatures suggest that felsic rocks of the older succession could not have sourced mineralising fluids. In addition, SHRIMP U/Pb geochronology shows a significant time gap between the two successions.

The Whim Creek deposit is characterised by a stratabound ore body with abundant stringer mineralisation and is hosted by a thick shale sequence. It shows many of the features of a VHMS deposit. In contrast, Mons Cupri shows crosscutting relationships to host volcanoclastic conglomerate and its emplacement is interpreted to have been controlled by km-scale faults. It shows features similar to an epithermal-type deposit. The origin and geological history of these deposits is clearly more complex than the current model. New data is presented that illustrates the geological controls on the mineralisation of the Whim Creek Belt.