

## **Use of cover sequence geochemistry from regional and mineralisation-associated datasets to understand element transport mechanisms**

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Discovering new deposits to meet metal demand is becoming increasingly difficult as surficial mineral deposits have mostly been discovered and exhausted. Exploration has now moved into buried terranes. Therefore, we need to develop new technologies and protocols that will decrease the costs and increase the efficiency of exploration for mineralisation that is overlain by extensive cover sequences.

We have limited understanding of the processes responsible for variable geochemical and mineralogical signatures within cover sequences and their relationship to any underlying mineralisation. The aim of this project is to further understand these processes through regional investigation of the Bulldog Shale throughout the Eromanga Basin, Australia, which has been considered a potential sample media for mineral exploration. Regional geochemical data have been collected to define geochemical background and show encouraging results of elevated metal content in the Bulldog Shale and bounding formations.

At a smaller scale, preliminary results show that the Bulldog Shale and the Cadna-Owie Formation overlying known Iron Oxide Copper Gold (IOCG) mineralisation (Prominent Hill) preserve elevated concentrations of identified IOCG pathfinder elements (e.g. Cu, Zn, Ce, La, Ba, Mo, W). Moreover, these elements appear to be transported by fluids and adsorb on clays.

Further investigations into the geochemical interactions between the Bulldog Shale and both the underlying (Cadna-Owie Formation) and overlying formations, and into the behaviour of trace elements in this formations will be used to understand processes involved in the development of geochemical signatures within the sedimentary cover.