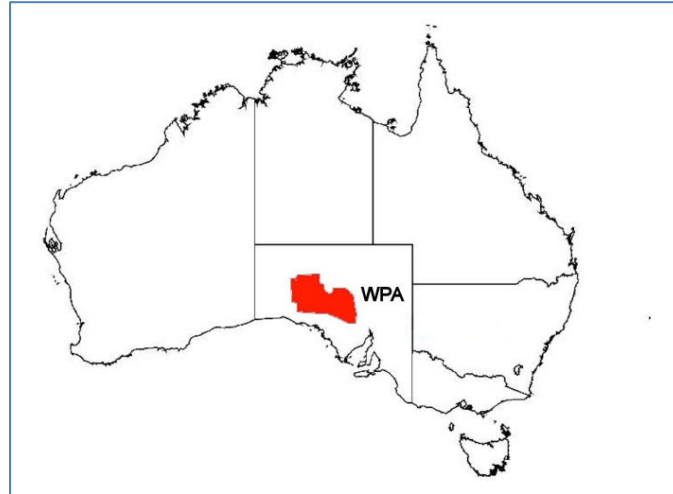


## **FAA- Site # 2: Gawler Craton-South Australia-Australia**

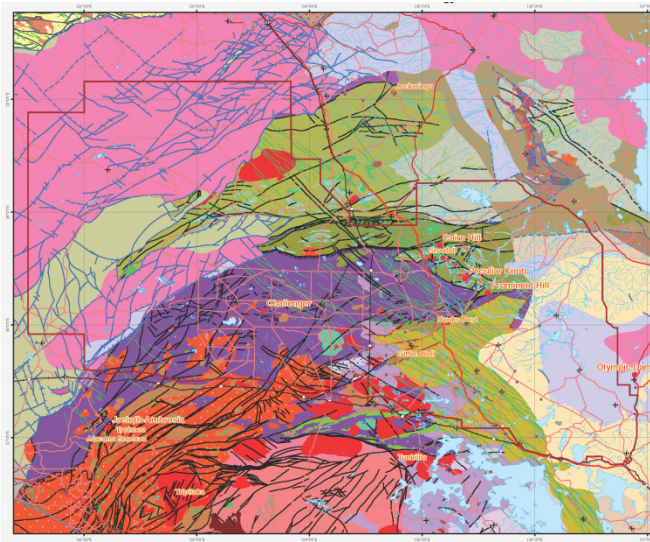
The Gawler craton in South Australia hosts the world's most richly endowed iron oxide copper-gold (IOCG) ore province, the Olympic IOCG Province, containing the supergiant Olympic Dam copper-gold-uranium-silver deposit, and the major Prominent Hill, Carrapateena and Wirrda Well IOCG deposits (Fig. 1). Much of the craton is covered by Neoproterozoic sedimentary rocks, meaning that geophysical techniques play a critical role in defining geology and deposit detection. As part of a state and federal initiative, the Woomera Prohibited Area, a military test range which lies adjacent to Olympic Dam and covers several other IOCG deposits, has been the focus of a major geoscience program to assist industry to continue to explore and discover new deposits in what is deemed to be high priority terrain. These data sets form the core materials for this project site.



**Fig 1: Location of the Woomera Prohibited Area, South Australia**

## **Geological Summary**

The Olympic IOCG (iron oxide copper-gold) Province (Fig. 1) occurs along the eastern margin of the Gawler craton nucleus where oxidised, A-type granitoid plutons of the 1595 to 1575 Ma Hiltaba Suite were emplaced into an accreted Palaeoproterozoic terrane, and where mafic volcanic rocks of the lower Gawler Range Volcanics are most abundant. This magmatism comprises the central part of a diachronous corridor of bimodal I-, A-and



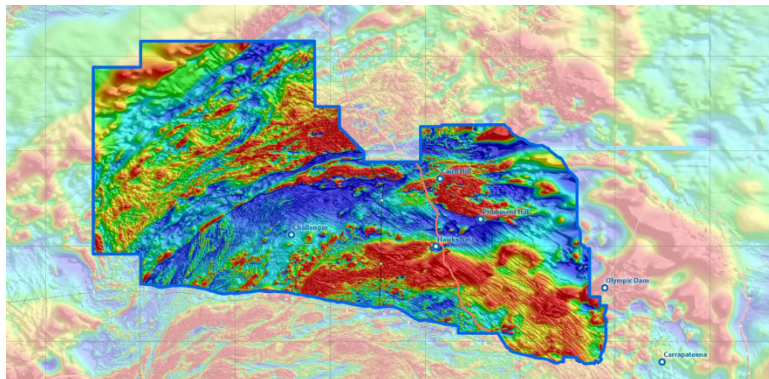
**Fig 2.Solid geology map of WPA (from Wise et al. 2013).**

subordinate S-type intrusions that extends across the Gawler and Curnamona cratons, and was emplaced in a distal continental retro-arc setting during amalgamation of the North and South Australia cratons. IOCG mineralisation mostly formed during a short lived episode of N-NW-S-SE extension that approximately coincided with eruption of the Gawler Range Volcanics (ca. 1595 to 1590 Ma), but was preceded and followed by more protracted N-SE to N-NW-S-SE contraction. The deposits were emplaced along E-NE to NE trending extensional faults near their intersections with major N-NW to NW trending faults in the hanging wall of first-order terrane boundary faults, such as the Elizabeth Creek and Pine Point Fault Zones. (from Hayward and Skirrow 2010)

### **Geophysical Summary**

Included in the geophysical data set are the following:

- gravity, airborne magnetics (Fig. 3), radiometrics, MT and seismic
- numerous derived products and interpretation from the above surveys
- Remote Sensing data (ASTER) with derived products



**Fig 3. Aeromagnetic coverage over WPA**

### **Other Data**

Geochemical, topographic and drilling data are available in the archive. There are also a variety of professional papers on the geology of the area and deposits contained and adjacent to the WPA.

### **Exploration Challenge**

For IOCG targets, consider effort has been expended at testing co-incident magnetic and gravity highs. Explorers now understand that the mineralization seldom occurs in the maximum of the two parameters but more commonly along their gradients. Also, the genetic model for IOCGs is still evolving and this has implications for the target footprint that can be expected to mapped with geophysics (Hitzman 2014).

### **Data Source Acknowledgments**

The data has been provided by the Government of South Australia, Department of State Development.

### **Preference Projection**

MGA Zone 53 (GDA 94)

## **References**

Hayward, N. and Skirrow, R.G., 2010 - Geodynamic Setting and Controls on Iron Oxide Cu-Au ( $\pm$ U) Ore in the Gawler Craton, South Australia; in Porter, T.M., (ed.), Hydrothermal Iron Oxide Copper-Gold & Related Deposits: A Global Perspective, v. 3 - Advances in the Understanding of IOCG Deposits; PGC Publishing, Adelaide

Hitzman, M, 2014, Mineral Exploration Geophysics for the Future -A Mineral Exploration Geologist's View; Society of Exploration Geophysicists 2014 Conference, Mining Committee lunch, Denver CO, Oct, 29, 2014.

Wise, T.W.; Irvine, J.A.; Katona, L.F.; Michael, U.A.; Tyne, E.D.; Rowett, A.I.; Davies, 2013, The South Australian Atlas of Geoscience and Mineral Exploration data – Woomera Prohibited Area within the Gawler Craton; prepared by DMITRE Mineral Resources Division, Government of South Australia