

# Crustal Architecture, 3D Geological Map and Mineralisation in the Tasmanides of Eastern Australia

**Project Code: T5**

**Project Leader: Dr Tim Rawling**

*Following the success of Stage 1 research in western Victoria, the T5 project addresses the fundamental crustal scale controls on localisation of major ore systems (Au and Base metals) in the Tasmanides.*

*The project team will construct a seamless 3D map of the Tasmanides (a regionally consistent structural, stratigraphic and intrusion architecture of the Tasmanides Orogen) to help explorers predict and discover new world class ore bodies in Southeast Australia.*

*The project will be staged in two parts:*

## **Part 1 (Year 1)**

- Data compilation
- Geophysical data processing
- Geological interpretation
- 2D GIS of basic architectural elements

## **Part 2 (Years 2 & 3)**

- Serial cross sections
- Geophysical modelling & inversion
- Revision of time-space plots
- Numerical modelling
- Construction of 3D map

## **Year 1 - Data Integration**

A wealth of public domain geological, geophysical, geochemical and mineral occurrence data exists for the region.

Data sets will be assembled into a coherent 2D GIS (e.g. MapInfo) and 3D platform (e.g. FracSIS). Geophysical processing will involve constraining the positions and intensity of potential field gradients ("worms") and geologically constrained inversions of selected regions.

Through close collaboration with partner and sponsor institutions, an interpretation of these GIS layers will be undertaken, focussing on the architecture of major faults, intrusions and regional geology. The spatial distribution of mineral deposits, categorised by major commodity, deposit style and resource size, will be merged within the interpreted geological architecture.

## **Years 2 & 3 - 3D Map Construction**

The construction of serial geological cross sections, with constraints from geophysical modelling (e.g. 3DWEG/Geomodeller) and seismic data will form the basis of the 3D map.

A revised time-space correlation chart will be constructed, incorporating new geochronology, and an analysis of controls on major mineral systems. These will be incorporated into the 3D model (focusing on the 3 key questions of fluid reservoirs, pathways & drivers, and migration/deposition).

## **Mineral System Research**

The minerals system research will integrate aspects of new developments in understanding Victorian orogenic gold

systems with other Lachlan mineral systems. In particular the project aims to increase our understanding of the fundamental controls on the location of two major ore deposits in the eastern Lachlan Orogen (Woodlawn and Hill End), and to develop mineral systems models for their formation and apply the findings to the wider Silurian-Devonian systems in the Eastern Subprovince of the Lachlan Orogen.

Key study areas:

- + Central & Western Victorian Goldfields (Stawell and Fosterville)
- + Woodlawn District
- + Captains Flat
- + Hill End
- + Regional Scale.

## **Numerical Modelling**

Targeted numerical fluid flow modelling will be undertaken during Year 3 in order to identify critical crustal scale geometrical elements and relationships related to mineralisation.

Numerical modelling will be undertaken by scientists at the University of Melbourne and CSIRO.

## **Partnerships with Industry**

Close partnerships with sponsors will ensure that the research is attuned to sponsor needs and produces outcomes and products that can be easily used to aid in discovery.



for more information contact

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