

**Gravity and Magnetics of the West Tamar District,**  
**Northern Tasmania**

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## Abstract

The West Tamar District of northern Tasmania is a region of diverse geology and complex structure. The area comprises an allochthonous block of Precambrian basement, the Badger Head Block, a Lower Palaeozoic thrust belt, and a large Tertiary graben, the Tamar Graben. A gravity survey was carried out in the area in order to model the subsurface geology and structure.

The residual Bouguer anomaly reveals some large and small scale trends. To the east steep symmetrical west and east directed gradients mark the down thrown block that is the Tamar Graben, whilst to the west a long, N-S trending, east-directed gradient marks the western boundary of the Badger Head Block and is considered to mark a major structure. An ultramafic complex near the centre of the study area causes a large negative anomaly due to its level of serpentinisation, whilst positive anomalies over the low density Badger Head Block suggest denser lithologies at depth.

Gridding and re-interpretation of pre-existing aeromagnetic data sets has enabled the complex faulting structure of the area to be outlined. Comparisons of faults inferred from the magnetics with a digital elevation model and local geology reveals that much of the present topography and outcrop geology is controlled by northwest and northeast trending faults. The northwest trending faults form the major structures in the region. The ultramafic complex is comprised of two main bodies, with a third inferred to branch west from the main body beneath the Badger Head Block.

Three structural cross sections have been created using forward modelling of gravity and magnetics. Two of the sections model east-dipping, thrust-bound packages of Lower Palaeozoic strata along the eastern part of their sections. The western sections are best modelled with Cambrian ultramafics and sedimentary rocks dipping west beneath the Neoproterozoic Badger Head Block.

The tectonic implications of the outcome of structural modelling are that a NE-directed thrusting event is inferred to have occurred during the Cambrian or Early-Middle Devonian prior to SW-directed thrusting in the Middle Devonian, which emplaced Palaeozoic strata in the Beaconsfield area into thrust fault-bound packages.

## Frontispiece



**Gravity Surveying at its logistical best.....**

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