

## **TECTONIC FRAMEWORK OF THE SOUTHERN MOUNT ISA PROVINCE**

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The North Australian Craton consists of a series of latest Archean to Paleoproterozoic cratonic blocks including a number of orogenic belts. The Mount Isa Province and the Tennant Creek-Davenport Province are two components of the North Australian Craton. They are interpreted to be adjacent in the undercover section of the southern Mount Isa Province. However, there is no current understanding of the tectonic architecture of this relationship. At best, conclusions drawn from studies of outcropping relationships can be extrapolated undercover.

This study uses recently collected magnetotelluric data, combined with deep crustal seismic, to directly investigate the relationship between the Mount Isa Province and the Tennant Creek–Davenport Region. The deep crustal seismic was collected along two orthogonal profiles capturing the relationship between the two regions, while the magnetotelluric data was collected in a regional grid over the junction between seismic lines, extending further west. The MT data was inverted before being jointly interpreted with the seismic data and available potential field data.

Magnetotelluric inversion shows a highly resistive mid to lower crust beneath the Mount Isa Province. In contrast, the mid to lower crust for the Ardmere May Downs domain (Tennant Creek-Davenport equivalent) is broadly conductive, with several discrete features. This is consistent with other MT data collected to the north and west of the project area and indicates significantly different geology or tectonic histories between the two domains. The seismic data shows a major west dipping fault which is likely to be a crustal suture between the two Provinces.