

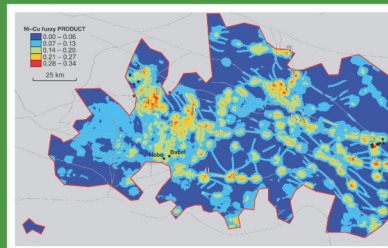


Department of
Mines and Petroleum

REPORT
117

MINERAL SYSTEMS ANALYSIS OF THE WEST MUSGRAVE PROVINCE: REGIONAL STRUCTURE AND PROSPECTIVITY MODELLING

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Centre for EXPLORATION
TARGETING

Geological Survey of Western Australia



Report 117: Mineral systems analysis of the west Musgrave Province: regional structure and prospectivity modelling

This Report presents a multi-commodity prospectivity analysis of the west Musgrave Province, based on modelling by the Centre for Exploration Targeting (CET) at the University of Western Australia, based in turn on a new interpretation of the 3D geometry and timing of major structures and the architecture of subsurface stratigraphy in the west Musgrave Province. The majority of preserved major structures in the west Musgrave Province appear to have originated during the c. 1085–1040 Ma Giles Event or before, although many of these were subsequently reactivated during the Petermann and Alice Springs Orogenies. All primary and derived data sets were combined in a mineral system analysis using a knowledge-based, or 'fuzzy', logic framework to assess prospectivity. The mineral prospectivity analysis was carried out for magmatic nickel–copper, magmatic platinum group elements (PGE), orogenic and intrusion-related gold, iron-oxide–copper–gold (IOCG), tin–tungsten, and surficial uranium mineral systems. Analyses of this type carry many uncertainties; however, our analyses map the most favourable areas for these deposit types on a conceptual basis. The results pick out several zones of relatively high-prospectivity for each deposit type.

The USB contains:

- GSWA Report 117 as a PDF
- Appendix tables with input parameters for predictor maps (PDF)
- Appendix predictor maps used for mineral prospectivity analysis — provided as spatially located raster (GeoTIFF) files
- ESRI ArcGIS files including:
 - crustal-scale faults
 - geology and geochemistry
 - basic topographic data
- Prospectivity maps — provided as spatially located raster (GeoTIFF) files

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