

CHAPTER 8 Kanmantoo Trough

AC Burt

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KANMANTOO TROUGH SUMMARY

Age

Sedimentation — Early Cambrian, ~526–514 Ma.

Deformation — Delamerian Orogeny, Middle Cambrian to Early Ordovician, 514–485 Ma.

Prospective commodities

Ag–Pb–Zn, Cu–Au, Au, Ni–Cu–PGE, Mo, diamonds, construction materials, slate and dimension stone.

Major exploration models

- SEDEX — Sediment-hosted hydrothermal volcanogenic exhalative Ag–Pb–Zn±Au deposits within greywacke.
- VHMS — Volcanic-hosted Ag–Pb–Zn massive sulphide deposits in Truro Volcanics equivalents from the Padthaway Ridge to the Nackara Arc (Fig. 8.1).
- Cu–Au feeder systems to SEDEX and VHMS mineralisation.
- Cu–Au mineralisation associated with Delamerian Orogeny granitoids e.g. Palmer (PG), Anabama (AG) and Bendigo Granites (BG) (Fig. 8.1).
- Fault-related gold mineralisation — potential along crustal-scale faults e.g. Teal Flat and Kangaroo Island Shear Zones (TFSZ and KISZ, Fig. 8.1).
- Ni–Cu–PGE and PGE mineralisation within layered and zoned ultramafic–mafic intrusives (e.g. BHGC, Fig. 8.1).
- Molybdenum mineralisation related to Delamerian granitoids.
- Diamond potential of lamprophyre and kimberlite plugs and dykes.

Geology

Predominantly immature clastic sediments were deposited in the Kanmantoo Trough during the Early Cambrian as a result of the last of several phases of rifting in the Adelaide Geosyncline. Deposition closely followed mafic volcanism of the Truro Volcanics and equivalents in the eastern Mount Lofty Ranges and Murray Basin basement, particularly in the Padthaway Ridge. Three transgressive–regressive sequences were deposited before the onset of the Delamerian Orogeny in the late-Early Cambrian. Syn- to post-tectonic felsic and mafic intrusions intrude the sedimentary sequence and are spatially related to higher grade metamorphic zones in the Fleurieu Arc, Padthaway Ridge and Glenelg River regions. Metamorphic grade ranges from greenschist to amphibolite facies.

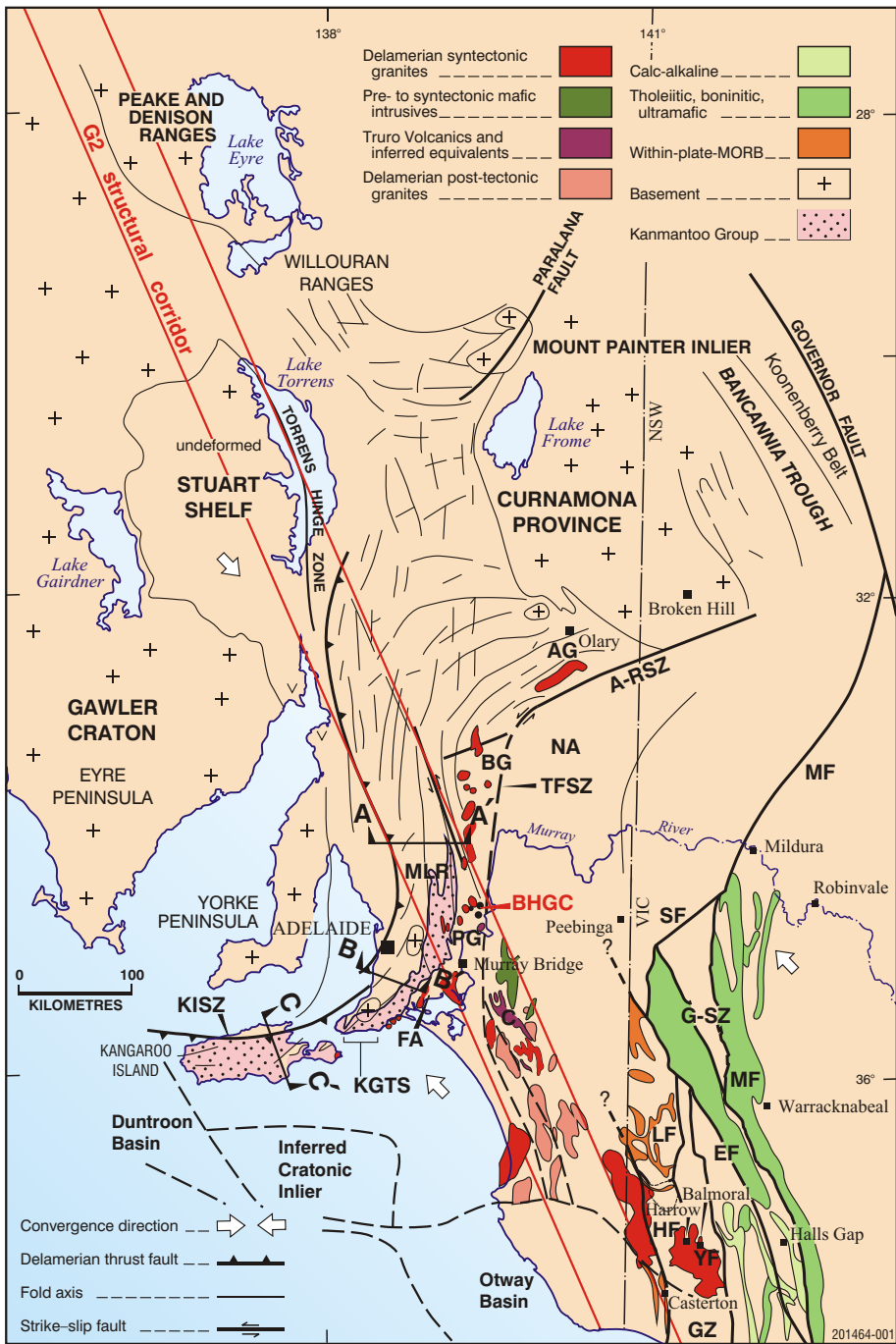


Figure 8.1 Extent of the Kanmantoo Group relative to other Kanmantoo Group equivalent sequences from the Koonenberry Belt, New South Wales, to the Glenelg River Zone, Victoria. Modified from Preiss (1999), with addition of simplified tectonic–structural element for western Victoria from Vandenberg et al. (2000). Letter codes — FA: Fleurieu Arc, KISZ: Kangaroo Island Shear Zone, KGTS: Kanmantoo Group Type Section, MLR: Mount Lofty Ranges, NA: Nackara Arc, TFSZ: Teal Flat Shear Zone, BHGC: Black Hill Gabbroic Complex, AG: Anabama Granite, BG: Bendigo Granite, A-RSZ: Anabama–Redan Shear Zone, PR: Padthaway Ridge, C: Coonalpyn, Truro Volcanics equivalents and possible boninite, GZ: Glenelg Zone, G-SZ: Grampian–Stavelly Zone, HF: Hummocks Fault, YF: Yarramyliup Fault, EF: Escondida Fault, SF: Skreity Fault, MF: Moyston Fault.