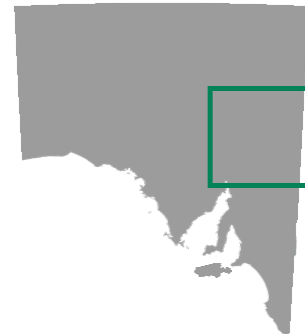




## Exploration release areas Batch 1 – Curnamona and North-East



This ERA release includes the prospective Paleoproterozoic–Mesoproterozoic Curnamona Province with overlying and adjacent basins hosting a range of commodities.

### Geological setting

**Basement:** Paleoproterozoic–Mesoproterozoic Curnamona Province

**Basins (Neoproterozoic):** Adelaide Rift Complex and Coombalarnie Platform

**Basins (Cambrian-Cenozoic):** Arrowie Basin, Eromanga Basin, Murray Basin, Lake Eyre Basin

**Paleochannels:** Paleogene and Neogene

### Curnamona Province

The Curnamona Province is a large, near-circular area of Paleoproterozoic to Mesoproterozoic rocks in the northeast of South Australia, partially extending into western New South Wales. The province lies east of the Archean to Mesoproterozoic Gawler Craton from which it is separated by a Neoproterozoic to Cambrian rift and sag basin complex. The Curnamona Province is largely obscured by younger Cambrian to Cenozoic sedimentary rocks, particularly in the central and northern region. Outcrops are restricted to a series of inliers predominantly within the Olary–Broken Hill region in the south and the Mount Painter and Mount Babbage Inliers in the north-west.

The Willyama Supergroup comprises greenschist to granulite facies metasedimentary rocks with lesser bimodal meta-volcanic intercalations deposited between ~1720 and 1640 Ma. This formed part of an extensive late Paleoproterozoic basin complex at the eastern margin of Proterozoic Australia, with the ~1695 Ma volcanoclastic Hores Gneiss of the Broken Hill Domain hosting the giant Pb-Zn-Ag Broken Hill Deposit in western New South Wales.

No basal unconformity or basement to the Willyama Supergroup is known. The oldest exposed rocks are the Curnamona Group in the Olary Domain comprising commonly albitised, fine to medium-grained, shallow-water siliciclastic metasedimentary rocks. Felsic and mafic lavas and volcanoclastic intercalations range in age from 1716 to 1710 Ma (U–Pb CA-TIMS ages on volcanic zircons).

The Olarian Orogeny, involving major crustal shortening with overall northwest-directed tectonic transport, commenced by ~1620 Ma and was accompanied by high-temperature



low-pressure metamorphism, increasing in grade from greenschist facies in the centre of the Curnamona Province to granulite facies at Broken Hill in the southeast.

The Ninnerie Supersuite was generated late in the deformation history of the Olarian Orogeny, producing vast quantities of granites and felsic volcanic rocks, and minor mafic to intermediate magmatic rocks. The supersuite comprises four suites, three of which are exposed at the surface. Exposed units include muscovite-biotite granites of the Bimbowrie Suite (Olary Domain), biotite-muscovite, biotite-only and sodic granites of the Crocker Well Suite, and felsic granites and volcanic rocks of the Coulthard Suite in the Mount Painter Inlier. The fourth suite comprises unexposed basaltic and dacite-rhyolite volcanic rocks in the Benagerie Ridge, Mudguard Domain. Basaltic lavas are interlayered with sedimentary rocks, which could be equivalent to mafic lavas and lacustrine sedimentary rocks of the lower Gawler Range Volcanics in the Roopena Basin. Felsic lavas of the Benagerie Volcanic Suite are equivalent to the upper Gawler Range Volcanics, displaying both geochemical and temporal affinity (precise U–Pb zircon geochronology magmatic ages of ~1586 Ma for both units). The Crocker Well Suite is associated with uranium mineralisation in the western Olary domain, and volcanic rocks and sub-volcanic intrusions in the Mudguard Domain are prospective for iron oxide-copper-gold (IOCG) mineralisation.

The Willyama Supergroup is partially overlapped and overlain by the Cambrian Arrowie Basin, Mesozoic marine and glacial sediments of the Frome Embayment, and by Cenozoic sediments of the Callabonna Sub-basin. In the Eocene, palaeochannels were eroded into the basement rocks. Eocene channel deposits and Miocene lacustrine sediments are both host to significant uranium mineralisation derived from adjacent uraniumiferous basement rocks. Uranium has been extracted by in situ recovery at Beverley, Four Mile and Honeymoon.

### **Mineral prospectivity**

Known mineral occurrences within the Curnamona Province are dominated by copper, gold, uranium (and thorium), lead, zinc and industrial minerals (feldspar and barite). Notable mines and projects include Broken Hill lead–zinc–silver (NSW), [Beverley](#), [Four Mile](#) and [Honeymoon](#) uranium mines, [Portia](#) and [White Dam](#) gold mines, [Kalkaroo](#), [Mutooroo](#) and [North Portia](#) copper-gold-cobalt projects, and numerous copper-gold, lead-zinc and uranium prospects.

Similarities in temporal, lithological and alteration characteristics between the Willyama Supergroup and Queensland's Calvert and Isa superbasins, as well as contemporaneous magmatism to the adjacent eastern Gawler Craton, is regarded as a strong indicator of mineral prospectivity for large sediment-hosted and magmatic-hydrothermal mineral systems seen in those world-class mining districts. In particular, the deposit styles iron oxide copper-gold, sediment-hosted copper and lead–zinc.

The Curnamona Province is one of the most prospective regions in the world for uranium discoveries as demonstrated by active and historic sediment-hosted in situ recovery (ISR) operations of Beverley, Four Mile and Honeymoon deposits, metamorphic-related historic [Radium Hill](#) mine and igneous- and shear zone-hosted [Crocker Well](#) prospect.



Considerable potential exists for further discovery of sediment-hosted uranium within paleochannels and sand sheets, both proximal to known uranium-rich source rocks and distal basinal settings (Kazakhstan-type). Uranium in early Cretaceous glacial sediments recognised around the margin of the Eromanga Basin are also potential host-rocks as demonstrated at the Four Mile deposits.

### Prospective commodities

- Metals: Cu, Au, Zn, Pb, Ag, U, REE, Sn, W
- Energy minerals: U<sub>3</sub>O<sub>8</sub>, thorium, yttrium, REE
- Industrial minerals: limestone, dolomite, barite, vein-silica, beryl, garnet and fluorite, manganese oxide, barite, wollastonite, feldspar, corundum, regolith kaolin and clay (brickmaking and refractory)
- Construction materials: road making material (limestone, dolomite, quartzite, sandstone, gneiss), dimension stone (granite)
- Gem: andalusite, beryl

### Major exploration models

- Sediment-hosted U
- Sediment-hosted Cu±Au–Mo
- Vein, eluvial and placer gold
- Iron oxide copper gold (IOCG)
- Broken Hill-type Pb–Zn–Ag
- Shear- and breccia-hosted U–REE
- Intrusion-related Sn and W
- Regolith deposits including kaolin and REE

### Possible

- Mt Isa-style Pb–Zn–Ag and Cu
- LCT-type pegmatite

## Adelaide Superbasin

The Adelaide Superbasin comprises Neoproterozoic to Cambrian sedimentary and volcanic units deposited in a rift basin developed between the Gawler Craton and Curnamona Province. The Adelaide Superbasin hosts numerous metallic mineral deposits, both stratabound and structurally controlled, and most of South Australia's industrial and extractive minerals. Copper mineralisation is widespread and predominantly of the stratabound sedimentary copper model, with local structural controls commonly key in localising mineralisation. Numerous gold deposits have been identified, with historic mining



centred around reefs and alluvial fields such as the [Waukaringa](#), [Teetulpa](#) and [Mannahill](#) goldfields of the Nackara Arc.

### Prospective commodities

- Metals: Cu, Au, Pb, Zn,
- Industrial minerals: barite, magnesite, talc, kaolin, phosphate
- Construction materials: road making material (limestone, dolomite, quartzite), carbonate aggregate

### Major exploration models

- Sediment-hosted copper ( $\pm$  cobalt)
- 'Oxide' copper (leachable)
- Vein gold (various styles including Telfer)
- Reduced-shale-hosted Pb–Zn

## References and recent publications

### Copper-Gold

- [Characteristics of Curnamona Cu–Au systems and the Carrapateena IOCG deposit. Hydrothermal alteration styles and their implications for IOCG exploration](#)
- [Delamerian Project – Phase 1 data release](#)

### Gold

- [Review of gold mineralization in the Nackara Arc](#)

### Uranium

- [Uranium and uranium mineral systems in South Australia – Third edition 2015](#)
- [South Australian Uranium Occurrences Map \(revised 7th edition\)](#)
- [The Frome airborne electromagnetic survey, South Australia: implications for energy, minerals and regional geology](#)

### Critical minerals (REE)

- [Rare earth element \(REE\) potential of the Curnamona Province, South Australia](#)
- [Untapped critical minerals potential of Kalkaroo Cu-Au, Portia Au and Shylock Au deposits of the Curnamona Province](#)
- [Secondary prospectivity of South Australia's mine waste. Examples from Alma and Victoria \(Waukaringa Goldfields\) and Paratoo mines in the Nackara Arc](#)



## More information

[Curnamona Province](#)

[Arrowie Basin and Adelaide Rift Complex](#)

[Eromanga Basin](#)

[Lake Eyre Basin](#)

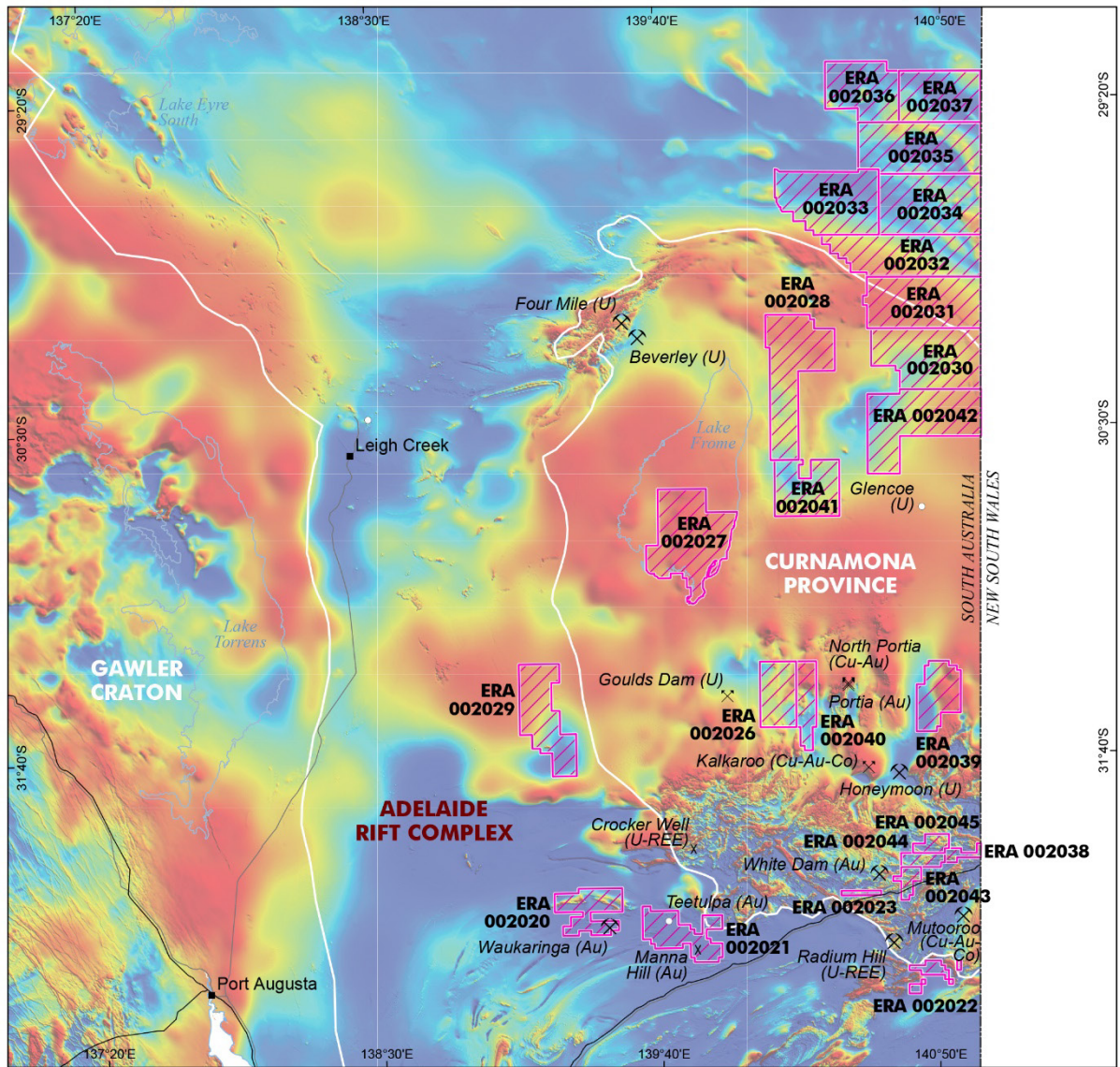
[South Australia major exploration models](#)

[South Australia mineral explorer's guide](#)

[Copper in South Australia](#)

[Uranium in South Australia](#)

[Gold in South Australia](#)



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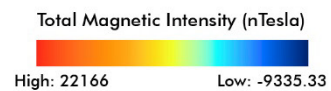


Current as at 16 April 2026

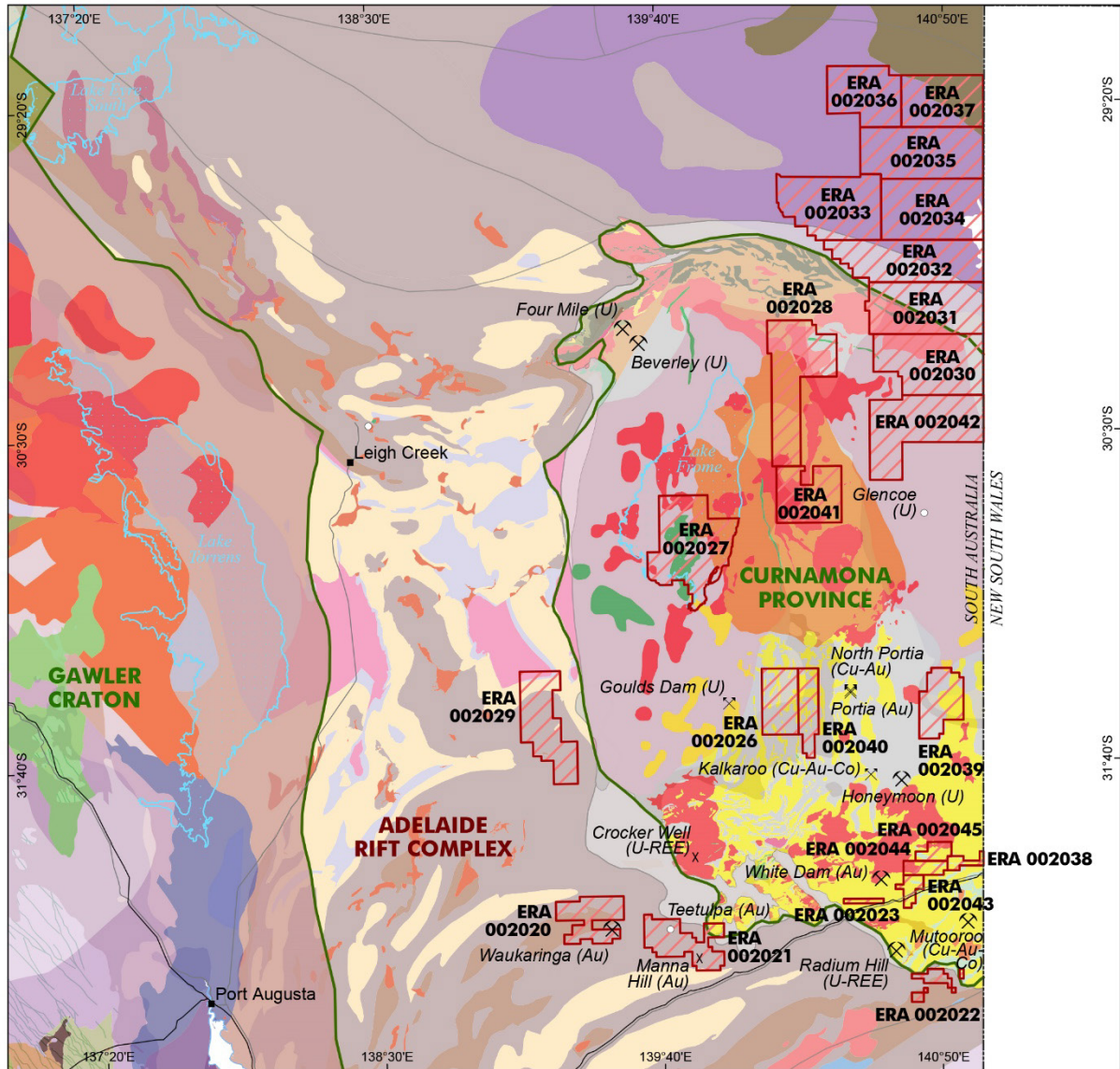
Relinquished Ground – Curnamona and North-East

**Mineral occurrences and mines**

- Occurrence
- Prospect
- Deposit - no mining
- Mine - metals and industrial minerals



Batch 1 relinquished ground on total magnetic intensity ([PDF 25 MB](#)).



206138-011



Current as at 16 April 2026

Relinquished Ground – Curnamona and North-East

**Mineral occurrences and mines**

- Occurrence
- Prospect
- Deposit - no mining
- Mine - metals and industrial minerals



GDA2020 : MGA Zone 54

Batch 1 relinquished ground on Archean to Ordovician solid geology ([PDF 1.8 MB](#)). Refer to [SARIG](#) for specific map units.