

OFFICIAL

# AUSTRALIA MINERALS

REALISE THE OPPORTUNITY

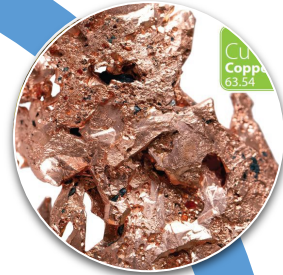
## **Next generation geology: uncovering South Australia's critical minerals and energy resources**

Dr Carmen KRAPP

Geoscience Lead | Manager Mineral Systems & Resources  
Geological Survey of South Australia | Department for Energy and Mining



# South Australia – Your partner of choice



## World Class Resources:

- Copper, Gold
- Critical Minerals – Graphite, HMS, REE
- Iron Ore – Magnetite
- Uranium



## Government backed:

- World's best-practise regulation
- Low sovereign risk
- Ports/Transport
- Northern Water Project



## First Class ESG:

- 100% Renewable Energy by 2027
- Carbon Capture and Storage CCS
- Indigenous Engagement
- Circular Economy

# South Australia – Your partner of choice



## HOT off the press

Fraser Institute Annual Survey of Mining Companies, 2025

### South Australia is ranked

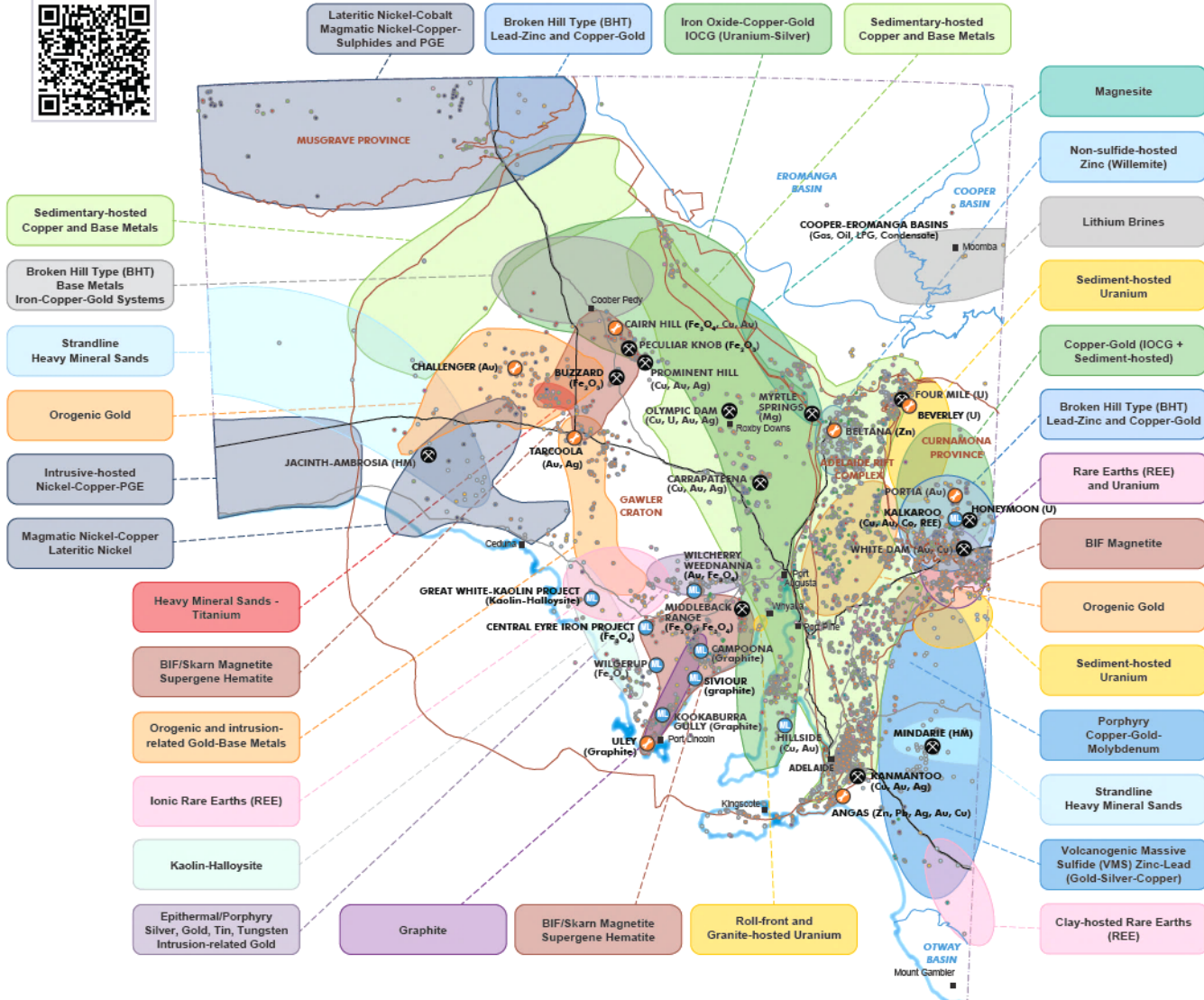
- **1<sup>st</sup> Best Practices Mineral Potential Index**  
→ *this comes off the back of positive copper developments, top geoscience with benchmarked new geological discovery mapping and public drilling campaigns*
- **3<sup>rd</sup> Geological data base**
- **4<sup>th</sup> Investment Attractiveness Index**
- **5<sup>th</sup> in regime that encourages investment by a system that doesn't bring uncertainty concerning administration, interpretation and enforcement of existing regulations**
- **6<sup>th</sup> Trade Barriers**
- **10<sup>th</sup> for socio-economic and community development conditions**

# South Australia's Mineral and Energy strengths

DOWNLOAD THE MAP

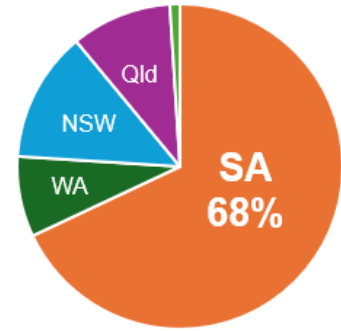


## South Australia's Major Exploration Models

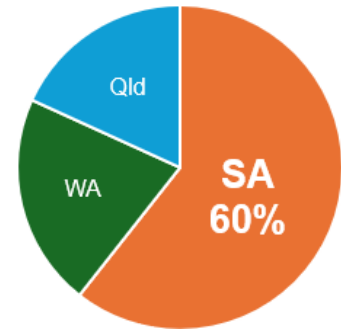


- Multi-commodity mineral systems
- South Australia hosts: 68% of Australia's copper and 60% Australia's graphite resources\*
- High-quality magnetite, feedstock for DRI and Green Iron manufacture
- Largest Uranium deposit in the world and 4<sup>th</sup> largest Uranium producer globally
- Proven Critical Minerals resources:
  - Graphite
  - Rare-earths
  - Cobalt
  - Heavy Mineral Sands
  - Titanium
  - High-purity Alumina
  - Magnesium

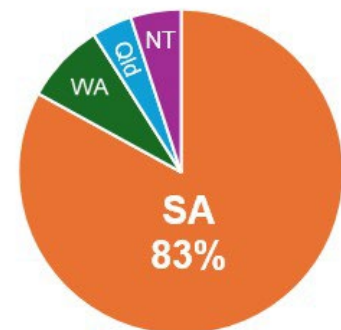
COPPER in AUSTRALIA



GRAPHITE in AUSTRALIA



URANIUM in AUSTRALIA



\* [Australia's Identified Mineral Resources](#)  
[Geoscience Australia](#)

# South Australia's pre-competitive work programs



## Copper & Gold

- Iron-Oxide Copper Gold (IOCG)
- Sedimentary Cu



## Uranium & Rare Earths

- Palaeochannel-hosted
- IOCG-contained



## Battery Minerals

- Variety of deposit styles
- Graphite, lithium, nickel, cobalt, manganese, alumina, tin, tantalum, magnesium, vanadium



## Magnetite

- Green Steel strategy



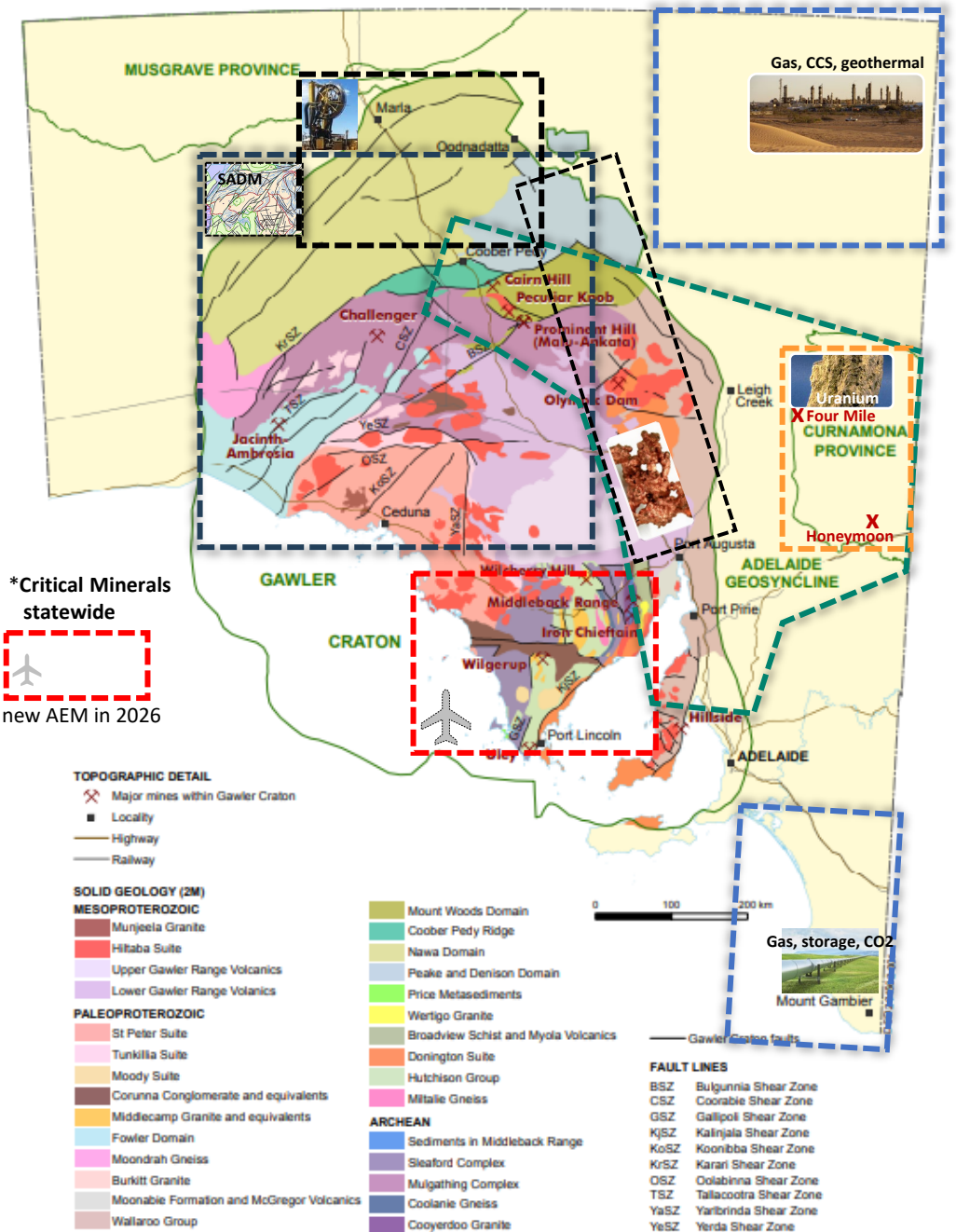
## Hydrogen

- Natural Hydrogen + Helium
- Subsurface hydrogen storage



## Energy resources

Natural gas and oil, Carbon capture and storage CCS, Food grade natural CO<sub>2</sub>, Geothermal energy



# SARIG

South Australian Resources Information Gateway

*Delivering pre-competitive geoscience and innovated data tools that enable data-driven exploration and discovery*



**SARIG** map

Delivering  
geological,  
geospatial data  
and GIS tools

REVIVE



**SARIG** explore

Visualise,  
interrogate to gain  
data-driven  
insights

IMPROVE



**SARIG** catalogue

Connect to  
geoscience data  
packages, 3D models  
and publication APIs

DELIVER



**SARIG** core

Digital access and  
visual intelligence to  
SA's physical  
geoscience footprint

EVOLVE

# SARIG map – delivering geological, geospatial data and GIS tools



## > 800 spatial layers

- Tenement applications and production: Mining Act 1971, Energy Resources Act 2003, Hydrogen and Renewable Energy Act 2023
- South Australia projects: major mines, quarries and projects and commodities
- Geology: surface, solid, regolith, basins and paleodrainage
- Geophysics: seismic, magnetic, gravity, radiometrics, magnetotellurics and passive surveys
- Drilling, stratigraphy, geochemistry and core scanning
- Land access, renewable energy and infrastructure

▪ Core Library – online register (core, samples, thin sections) and request for inspections

▪ GIS tools – search, query, identify, printing

▪ Custom geochemistry downloads

▪ Downloads – spatial and textural formats

# SARIG explore – visualise, interrogate to gain data-driven insights



- Information and data focused dashboard and platforms
- Microsoft Power BI
- ESRI Story Maps

### South Australian National Drilling Initiative Northern Gawler Dashboard

Project Drillholes: 7 | Total Drilling Depth(m): 2,309 | Completion Date: Tuesday, 25 February 2025

Project progress: The 7th drillhole has been submitted to Core Library

Drillhole: NDING\_01 | Method 1 and Method 2: COILED TUBING

Method from Depth: 0.00 | Method to Depth: 482.95

Commencing in October 2024, the Northern Gawler NDI provides new insights into the geological history of the Eromanga and Arkaranga basin sediments through to the crystalline basement.

This project will provide constraints to the geological events which have shaped northern South Australia and will provide critical context for determining the mineral potential of the region.

Drillhole Name	Maximum Depth (m)	Elevation	Method1	Method2	Core Length	Lithology	Stratigraphy	Year	Month	Day
NDING_01	332.85	250	COILED TUBING	DIAMOND	2.85	Y	Y	2024	October	15
NDING_02	313.10	250	COILED TUBING	DIAMOND	3.1	Y	Y	2024	October	26
NDING_03	266.00	250	COILED TUBING	DIAMOND		Y	Y	2024	November	14
NDING_04	482.85	263	COILED TUBING	DIAMOND	1.1	Y	Y	2024	December	14

### Major mineral projects and mining activities

Total projects: 79 | Total major mines: 30 | Total quarries: 11 | Total developing projects: 38

Name	Project	Company	Commodity
Asiapas	Major Mines	Iccramin Australia Limited	Zinc (Zn), Lead (Pb), Silver (Ag), Gold (Au), Copper (Cu)
Beltana	Major Mines	Parkroy Limited	Zinc (Zn)
Beverley	Major Mines	Hemphill Resources P/L	Uranium (U308)
Bussell	Major Mines	Park Iron Mines Pty Ltd	Hematite (Fe2O3)
Calm Hill	Major Mines	Cu-Silver Mining Australia Pty Limited	Magnetite (Fe3O4), Copper (Cu), Gold (Au)
Campana	Major Mines	Archer Materials Limited	Graphite
Carapostena	Major Mines	BHP Group Pty Ltd	Copper (Cu), Gold (Au), Silver (Ag)
Central Eye Iron Project	Major Mines	Iron Road Limited	Magnetite (Fe3O4)
Challenger	Major Mines	Barton Gold Holdings Ltd	Gold (Au)
Four Mile	Major Mines	Dunbar Resources P/L	Uranium (U308)
Grant White	Major Mines	Andromeda Metals Limited	Kaolin Halloysite
Hillside	Major Mines	Bea Minerals Ltd	Copper (Cu), Gold (Au)
Honeycomb	Major Mines	Ross Energy Ltd	Uranium (U308)
Jacinto/Ambarosa	Major Mines	Iuka Resources Limited	Heavy Minerals (HM)
Kalkaroo	Major Mines	Harallah Resources Limited	Copper (Cu), Gold (Au), Cobalt (Co), Rare Earth Elements (REE)
Karramoon	Major Mines	Hillgrove Resources Limited	Graphite
Kockaburra Gulf	Major Mines	Lincoln Minerals Limited	Graphite
Leigh Creek	Major Mines	Flinders Power Partnership	Coal
MacDiarmid Range	Major Mines	DMRC Mining	Hematite (Fe2O3), Magnetite (Fe3O4)
Magnetite	Major Mines	Murray Zinc Pty Ltd	Heavy Minerals (HM)
Myrtle Springs	Major Mines	MS Minerals Pty Limited	Magnesium (Mg)
Olympic Dam	Major Mines	BHP Group Olympic Dam Operations Pty Ltd	Copper (Cu), Uranium (U308), Gold (Au), Silver (Ag)
Pesulter Knob	Major Mines	Southern Iron Pty Ltd	(Au), Silver (Ag), Hematite (Fe2O3)
Purla	Major Mines	Beaumont Gold & Copper Pty Ltd	Gold (Au)
Prominent Hill	Major Mines	BHP Group Pty Ltd	Copper (Cu), Gold (Au), Silver (Ag)
Silverton	Major Mines	Beaumont Resources Limited	Graphite

Development status: Advanced Exploration 5.8%, Approved 6.53%, JORC Resource 27.85%, Feasibility Studies 12.61%, Operating 24.05%, Care and Maintenance 11.9%

### Discovery Trails

Basement to Gawler Range Volcanics

Basement rocks of various type and age underlie the southern margin of the Gawler Range Volcanics. Basement include rocks of Neoproterozoic Shearford Complex and Peter Pan Supersuite, Broadway Schist and Wire Dam Dolerite, Moonable Formation and Corinna Conglomerate.

- Shearford Complex Basement to GRV
- Shearford Complex and Peter Pan Supersuite Basement to GRV
- Peter Pan Supersuite Basement to GRV
- Gleoput Granite Basement to GRV
- Gleoput Granite Basement to GRV

### South Australia Discovery Mapping Project

Geological Survey of South Australia

Get started

SA Geology (1st edition)

Digital Explanatory Notes (DEN)

SA Geology Web Services

### South Australia's strategic critical minerals

Total projects: 29 | Total major mines: 13 | Total developing projects: 16

Project name	Project	Commodity	Company	Company link	Status	Mineral deposit link
Alford East	Mining Projects	Copper (Cu), Gold (Au), Silver (Ag)	Thor Energy P/L		JORC Resource	
Angas	Major Mines	Zinc (Zn), Lead (Pb), Silver (Ag), Gold (Au), Copper (Cu)	Teramin Australia Limited		Care and Maintenance	
Azabona	Mining Projects	Heavy minerals (HM)	Iuka (Buck Basin) Pty Ltd		Assessment	
Calm Hill	Major Mines	Magnetite (Fe3O4), Copper (Cu), Gold (Au)	Cu-Silver Mining Australia Pty Limited		Care and Maintenance	
Campana	Major Mines	Graphite	Archer Materials Limited		Mt. granted (PEPR pending)	
Carapostena	Major Mines	Copper (Cu), Gold (Au), Silver (Ag)	BHP Group Pty Ltd		Operating	
Elzabeth Creek	Mining Projects	Copper (Cu), Cobalt (Co), Silver (Ag), Zinc (Zn)	Coss Minerals Ltd		Feasibility Studies	
Fremantle Doctor	Mining Projects	Copper (Cu), Gold (Au), Silver (Ag)	BHP Group Pty Ltd		JORC Resource	
Hammehead	Mining Projects	Kaolin halloysite	Andromeda Metals Limited		JORC Resource	
Jacinto/Ambarosa	Major Mines	Heavy minerals (HM)	Iuka Resources Limited		Operating	
Karramoon	Major Mines	Copper (Cu), Gold (Au)	Hillgrove Resources Limited		Operating	
Kaundra	Mining Projects	Copper (Cu)	Envo-Copper/Teramin Australia Ltd / BHP Group Pty Ltd		JORC Resource	
Khamon	Mining Projects	Copper (Cu), Gold (Au)	BHP Group Pty Ltd		JORC Resource	

Status: JORC Resource 31.02%, Care and Maintenance 16.34%, Operating 27.59%, Advanced Exploration 3.45%, Mt. Granted (PEPR pending) 6.9%, Feasibility Studies 17.24%

# SARIG catalogue – connect to geoscience data packages, geological maps, 3D models and publications API



- Access to past and present industry exploration annual reporting
- Search across all geoscience data, maps, models and publications/reports.
- Spatially enabled catalogue
- Cloud to Cloud delivery for high volume transfer of geoscience data
- International Standard metadata and catalogue (ISO) API (full catalogue is machine readable via CSW)
- South Australian vocabulary service

SARIG catalogue

Home Search Records FAQs Vocabularies SARIG map

SOUTH AUSTRALIAN RESOURCES INFORMATION GATEWAY  
A place to find, access, share and connect to geoscientific information

Search catalogue

Search 16K records by keyword

BROWSE BY TYPE OF RECORD

- Service 12
- Model 34
- Map 69
- Document 15,26
- Dataset 847
- Application 6

EXPLORE BY CATEGORY

- Exploration
- Energy
- Geology
- Geophysics
- Environment
- Spatial

EXPLORE BY COLLECTION

- Departmental publications  
Produced by SA's Department for Energy and Mining
- Mineral exploration company reports  
Governed by the Mining Act 1971 and Mining Regulations 2020 of SA
- Mineral mining reports  
Governed by the Mining Act 1971 and Mining Regulations 2020 of SA
- Legislation and guidance  
To regulate and aid in resource exploration and production in SA
- Exploration initiatives  
Reports that were funded by a SA Government grant in aid of exploration
- Geoscience reports and publications  
SA geoscience and resource sector news

DRAW TO SEARCH BY AREA

Location SA Clear selection Search this area

Advanced Map Search: Use the SARIG Map for advanced GIS map features such as spatial layers:

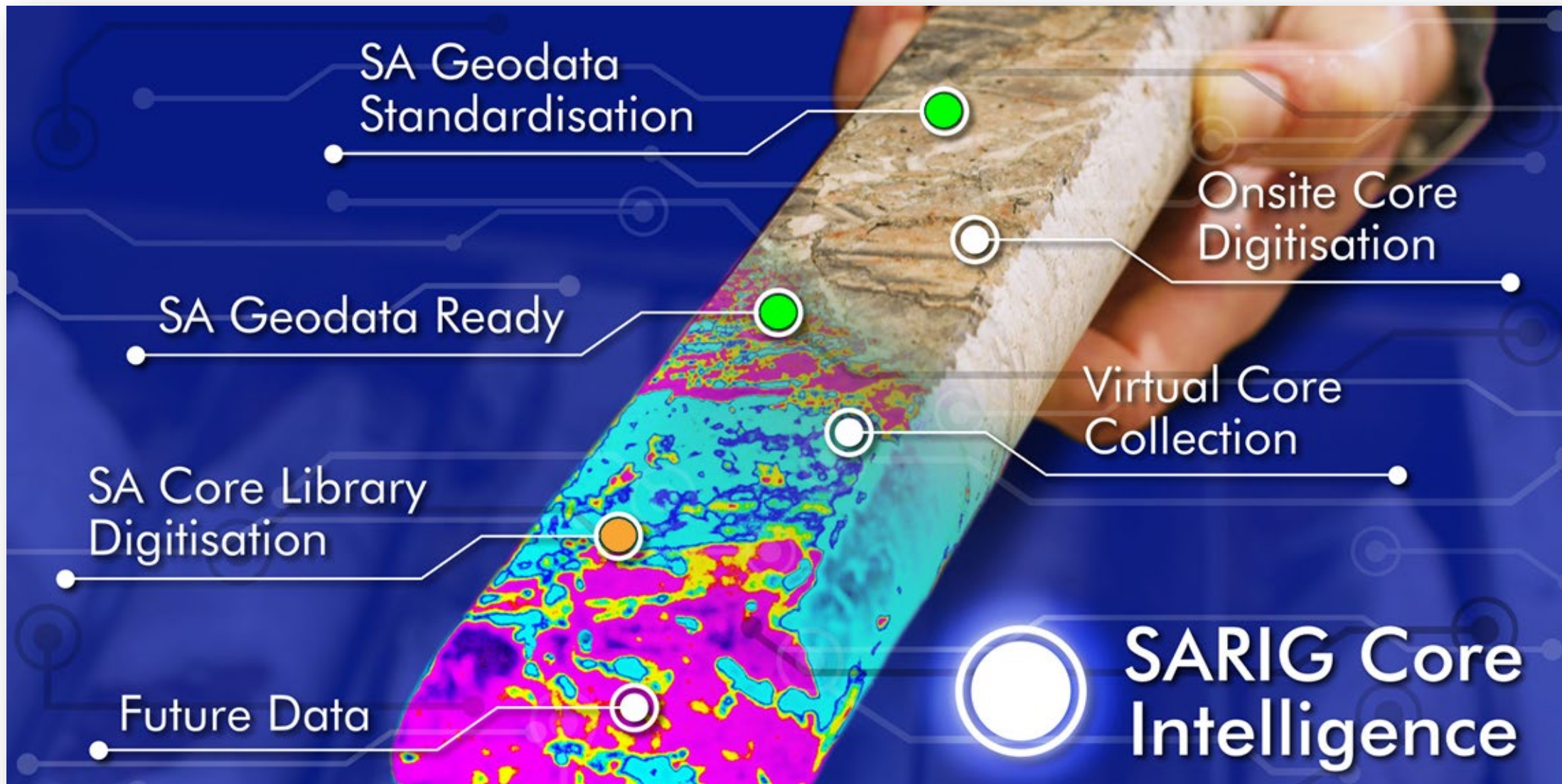
SARIG map

LATEST CATALOGUE UPDATES


- 2021 Cooper Basin 2Dcubed PrSTM Repro...  
Document 22 Jan 2024
- Investigation into the use of radon a...  
Document 22 Jan 2024
- Australia's first mining era...  
Document 22 Jan 2024
- Discovering stone walls in South Aust...  
Document 22 Jan 2024
- SA Geodata: moving forward with SARIG...  
Document 22 Jan 2024
- Mapping anticlines from the air...  
Document 22 Jan 2024

View all results

# SARIG core – developing an enriched digital core library



# SA Geology 1<sup>st</sup> Edition – Describing SA Geology in space and time




Government of South Australia  
Department for Energy and Mining

COLLECTION


## South Australia Discovery Mapping Project

Geological Survey of South Australia


[Get started](#)



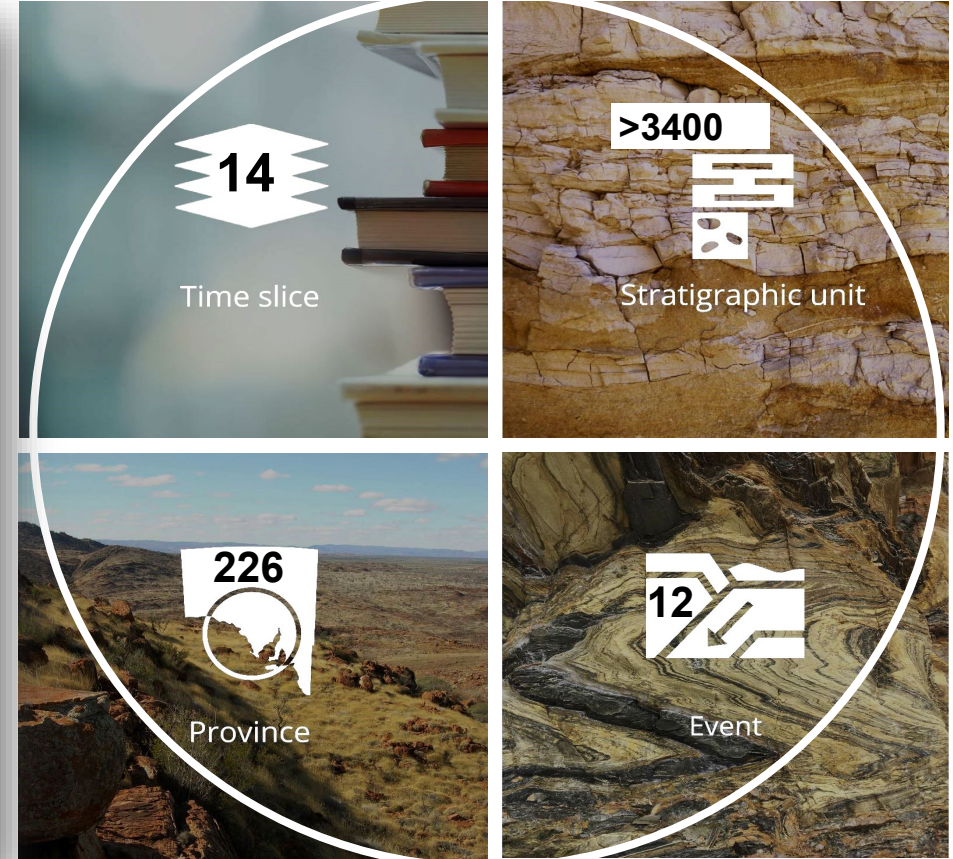
SA Geology (1st edition)



Digital Explanatory  
Notes (DEN)



SA Geology Web  
Services



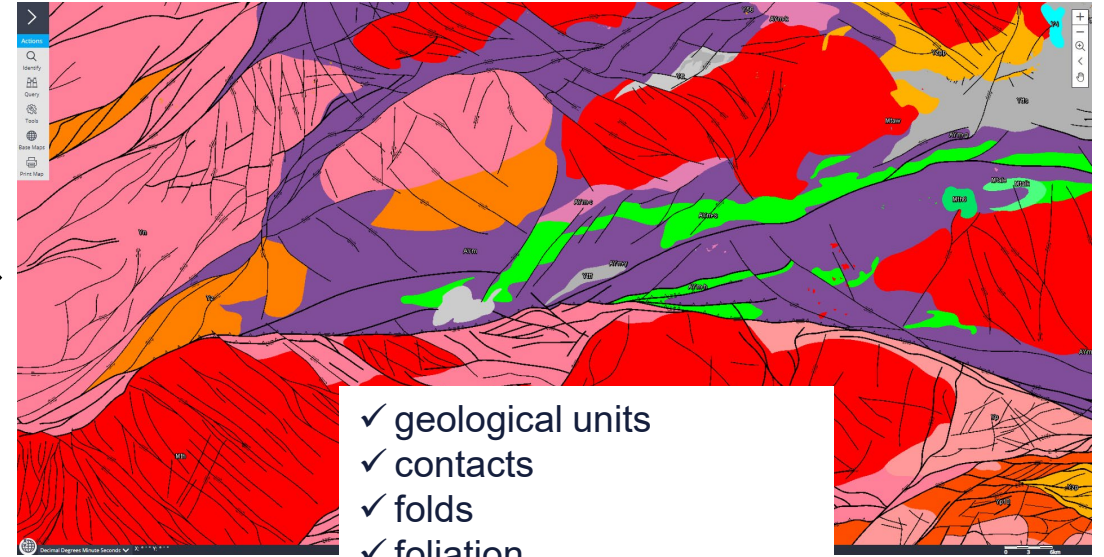
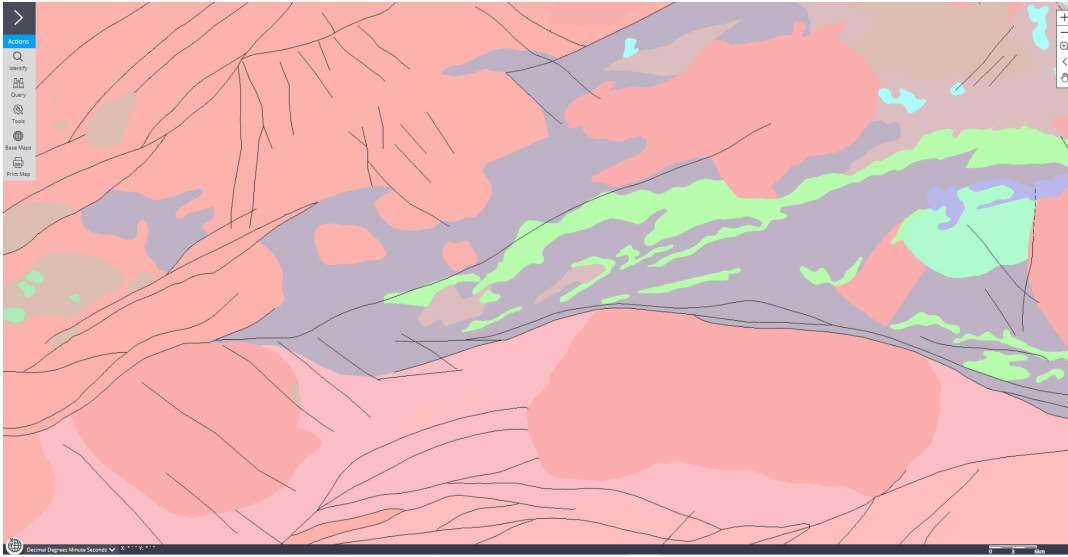
14  
Time slice

>3400  
Stratigraphic unit

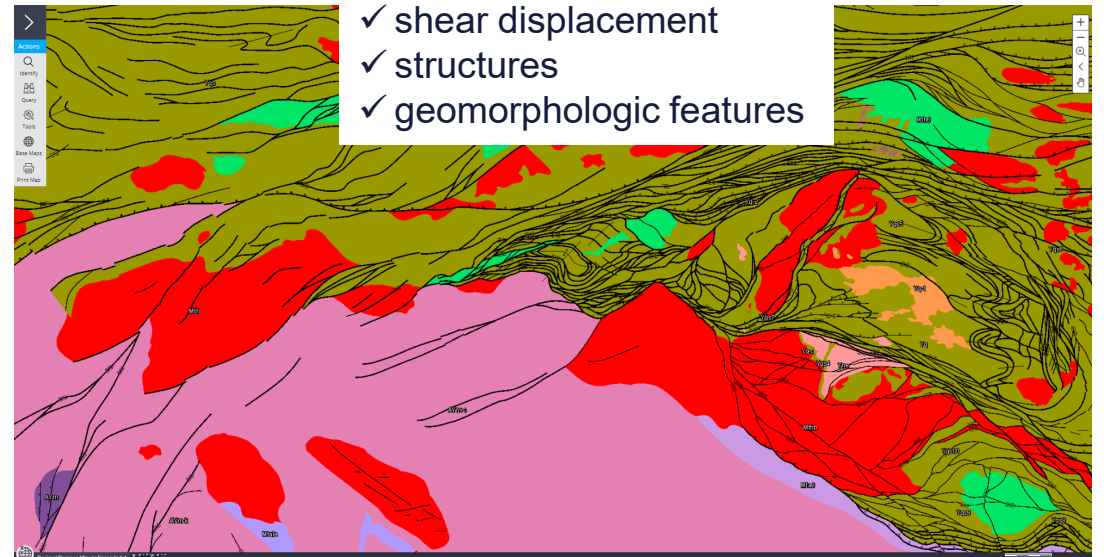
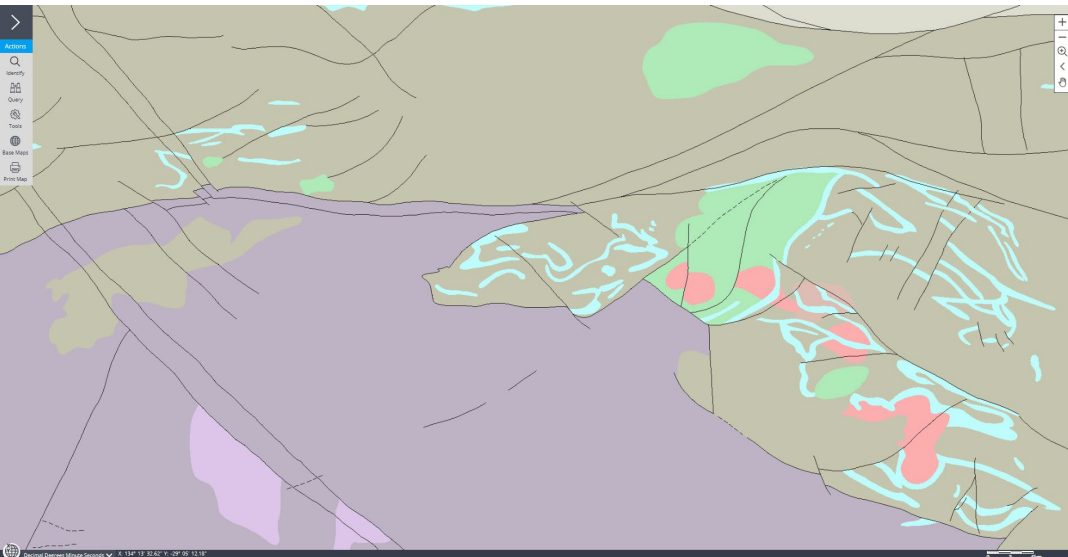
226  
Province

12  
Event

# SA Geology 1<sup>st</sup> Edition



- ✓ geological units
- ✓ contacts
- ✓ folds
- ✓ foliation
- ✓ shear displacement
- ✓ structures
- ✓ geomorphologic features





# SA Geology 1<sup>st</sup> Edition

- 45 new geology spatial layers
- 14 Time slices – including polygon, structures, boundary, trendline
- Time slice tool – ability to slice through geological time scale with a slider bar
- Downloads – spatial formats for ESRI & MapInfo

## Easy access to new geology in GIS software & API

- GIS data package includes:
  - ESRI File Geodatabase
  - 45 spatial layers and symbology legend files
  - associated attribution tables with extensive detailed descriptions
- Web service API includes:
  - GeoSciML lite - IUGS CGI standard
  - **Machine readable**

The image shows two overlapping screenshots of the SARIG map application. The top screenshot displays the 'Map Layers' panel on the left, which lists various spatial layers available for display on the SARIG map. The bottom screenshot shows the 'SARIG catalogue' page for 'SA Geology geological units - 1st Edition', providing detailed information about the dataset, including creation and revision dates, a description, download options (PDF, SHP, TAB, GDB, KMZ), and links to download files in various formats.

**SARIG map** | Main Menu | SARIG catalogue

**Map Layers**

The map layers displays a list of all spatial layers available for display on the SARIG map and can be quickly filtered by the options provided below.

To activate a map layer on the map simply tap or select the check box.

To view map layer legend, metadata, access downloads go to the "Active layers" option on the above toolbar.

Search map catalog

All themes | New releases | CC BY | Expand/Collapse | CLEAR

▲ Timeslice - SA Geology 1st Edition

SA Geology 1st Edition - geological units

▲ Geology - SA Geology 1st Edition

Cenozoic time slice (0-64 Ma) - linear structures

Cenozoic time slice (0-64 Ma) - boundaries

Cenozoic time slice (0-64 Ma) - geological units

**SARIG catalogue** | Home | Search Records | FAQs | Vocabularies | SARIG map

Home > Search > SA Geology geological...

**SA Geology geological units - 1st Edition**

Created: 06 Jun 2025 | Revised: 06 Jun 2025

The identification and generation of new mineral exploration targets is increasingly data-driven, requires near real-time, integrated and high-quality digital geological data that aligns with machine learning and artificial intelligence...

**Downloads**

Name	Description	Download	Select
<a href="#">SA Geology geological units</a>		PDF (1.24 MB)	<input checked="" type="checkbox"/>

Add selected to my selected downloads | Download Selected (1.33 MB)

**Links**

Name	Description	Link
<a href="#">Download ESRI SHP file</a>	Download ESRI SHP file	<a href="#">SHP</a>
<a href="#">Download MapInfo TAB file</a>	Download MapInfo TAB file	<a href="#">TAB</a>
<a href="#">Download ESRI Geodatabase file</a>	Download ESRI Geodatabase file	<a href="#">GDB</a>
<a href="#">Download Google Earth KMZ file</a>	Download Google Earth KMZ file	<a href="#">KMZ</a>

About this record | Citation | Technical information | Attribute details

OVERVIEW

SPATIAL EXTENT

SHARE ON SOCIAL SITES

CONTACTS FOR THIS RECORD

# SA Geology 1<sup>st</sup> Edition

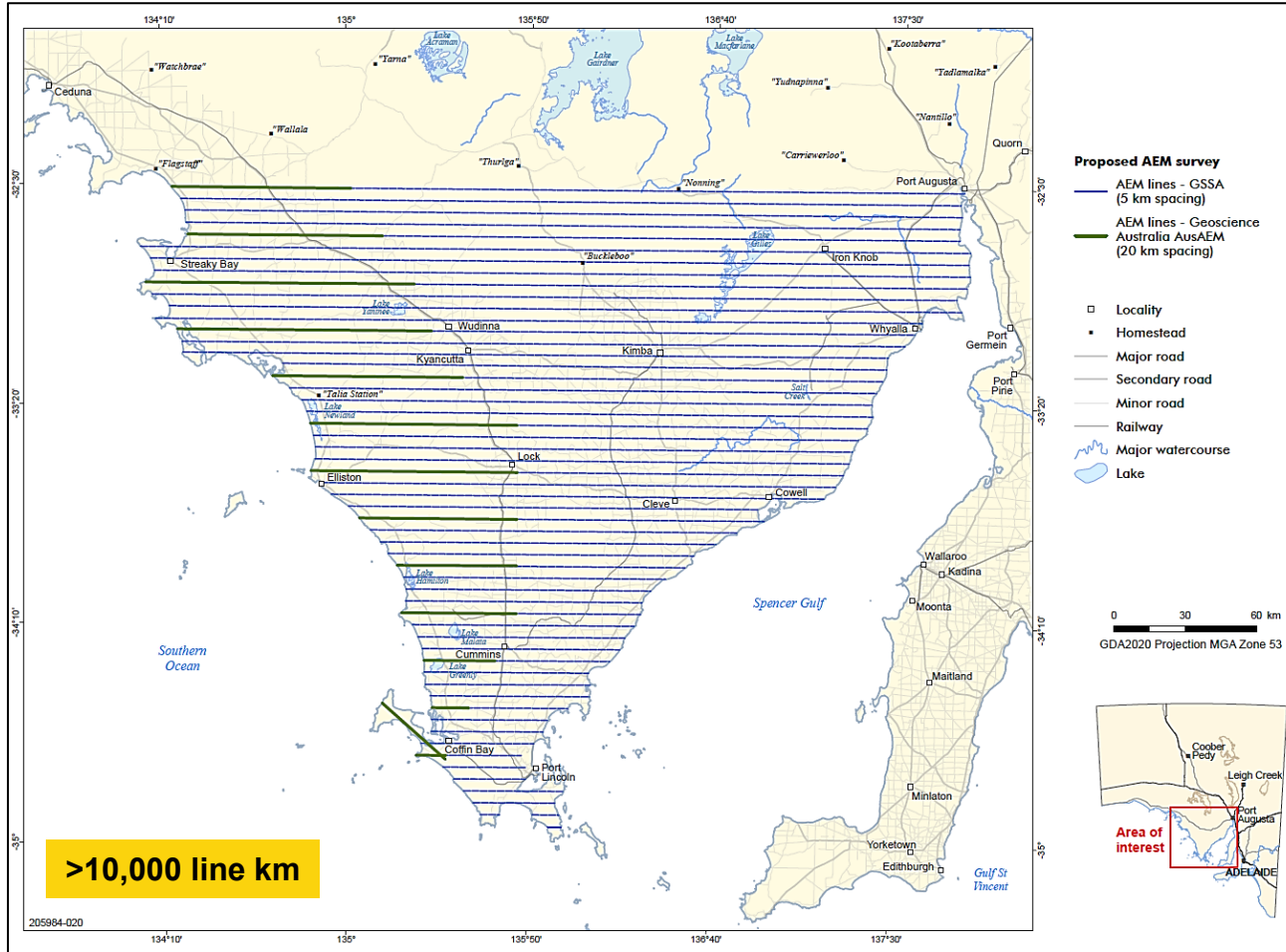
- Digital Explanatory Notes (DEN)
- DEN provides “google like” search and advanced search functionality of four interconnected note types:
  - Geological Provinces
  - Stratigraphic unit summaries
  - Events
  - Time Slices
- Search results \*.csv downloads and all DEN records can be downloaded as PDF templated report
- SARIG map layers and DEN notes fully integrated

OFFICIAL

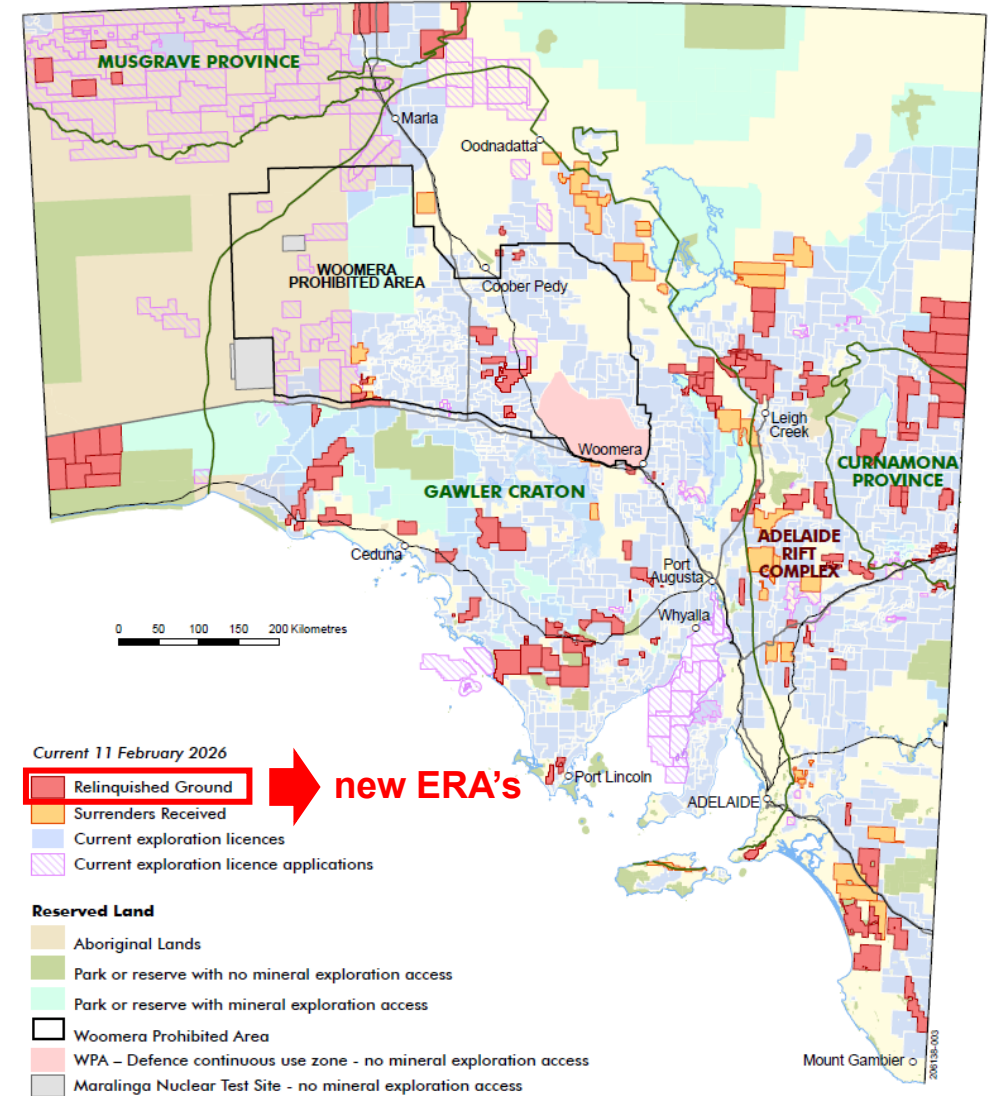
The image shows a composite of three screenshots from the SARIG catalogue website. The top screenshot is the homepage, featuring a search bar with the text 'Search Digital Explanatory Notes' and a search button. Below the search bar, there is a brief description of the DEN system and a 'BROWSE BY DIGITAL EXPLANATORY NOTE' section with four icons: Stratigraphic unit, Time slice, Province, and Event. The middle screenshot shows a search for 'Gawler Craton' with filters for Province, Commodity, and Events. The search results show '2 Provinces found' and a detailed entry for 'GAWLER CRATON'. The bottom screenshot is a detailed view of the 'GAWLER CRATON' entry, including a map of the craton, a list of time slices, and a detailed description of the geological features and history of the craton.

# Upcoming 2026

## Eastern Eyre Peninsula Airborne Electromagnetic (AEM) Survey in collaboration with Geoscience Australia



## NEW Exploration Release Areas (ERAs)



<https://www.energymining.sa.gov.au/industry/minerals-and-mining/exploration/public-notice/exploration-release-areas-eras>

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REALISE THE OPPORTUNITY

## **Next generation geology: uncovering South Australia's critical minerals and energy resources**

Dr Carmen KRAPP

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Government  
of South Australia  
Department for  
Energy and Mining