

My Graduate Journey with GSSA

Joanne Ciancio

Graduate Geologist | GSSA



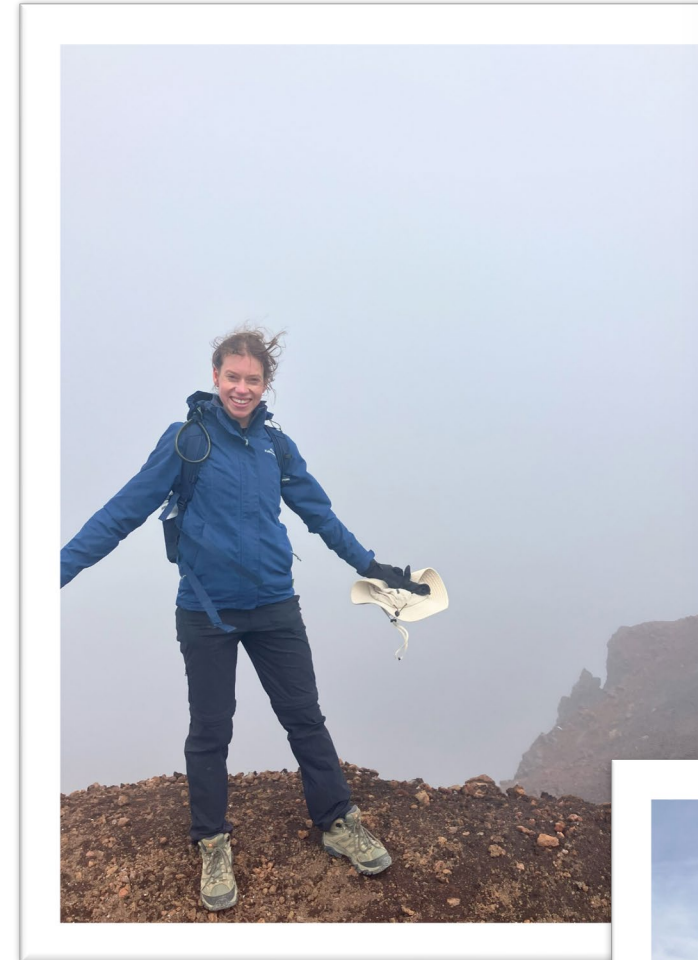
**GEOLOGICAL
SURVEY OF**
South Australia

DISCOVERY DAY



Introduction

- **Bachelor of Science in Geology** - University of Adelaide 2023
- **Summer vacation work** - Santos Ltd
- **Honours degree** in Geology - University of Adelaide 2024 – **Tate Award** recipient for honours thesis *'Interpreting Diapir-influenced strata and palaeoenvironments adjacent to the Worumba Diapir; using sedimentology and REE geochemistry'*
- Geological research assistant **Adelaide University** 2024-2025
- Commenced **Graduate Geologist** position with the GSSA in April 2025 within the Mineral Systems and Resources Team



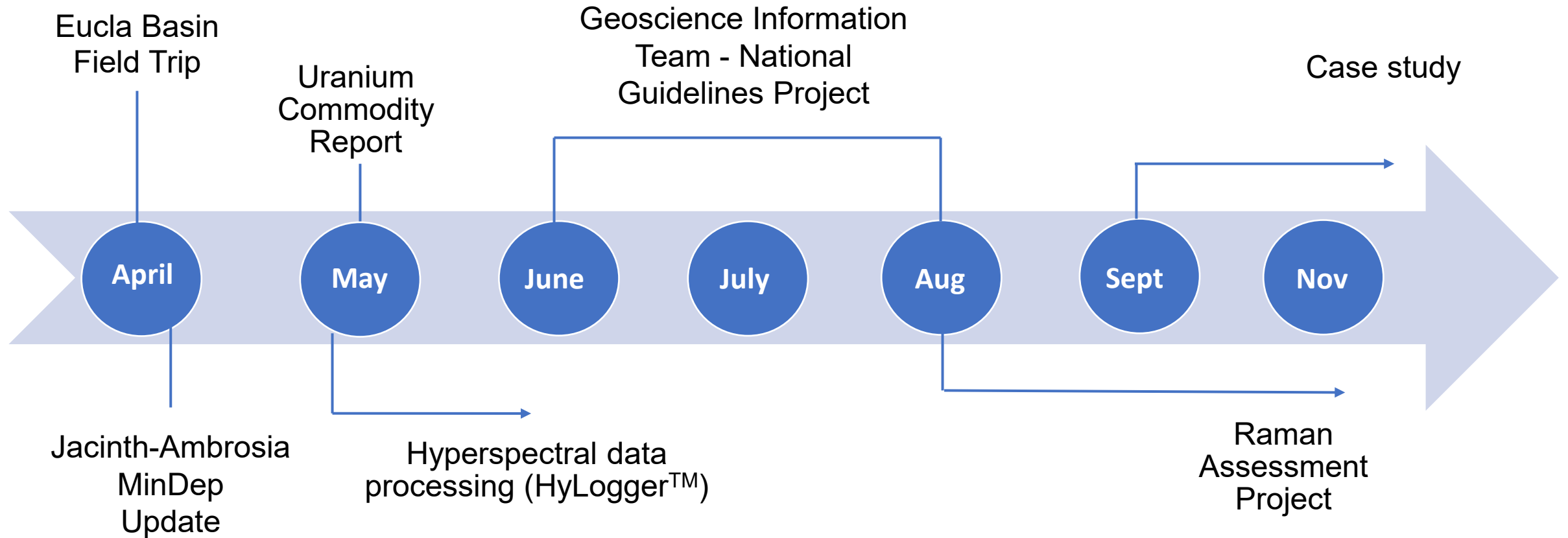
Layers of Time: Interpreting Diapir-
Influenced Strata &
Palaeoenvironments adjacent to the
Worumba Diapir using Sedimentology
& REE Analysis

Thesis submitted in accordance with the requirements of the University of
Adelaide for an Honours Degree in Geology

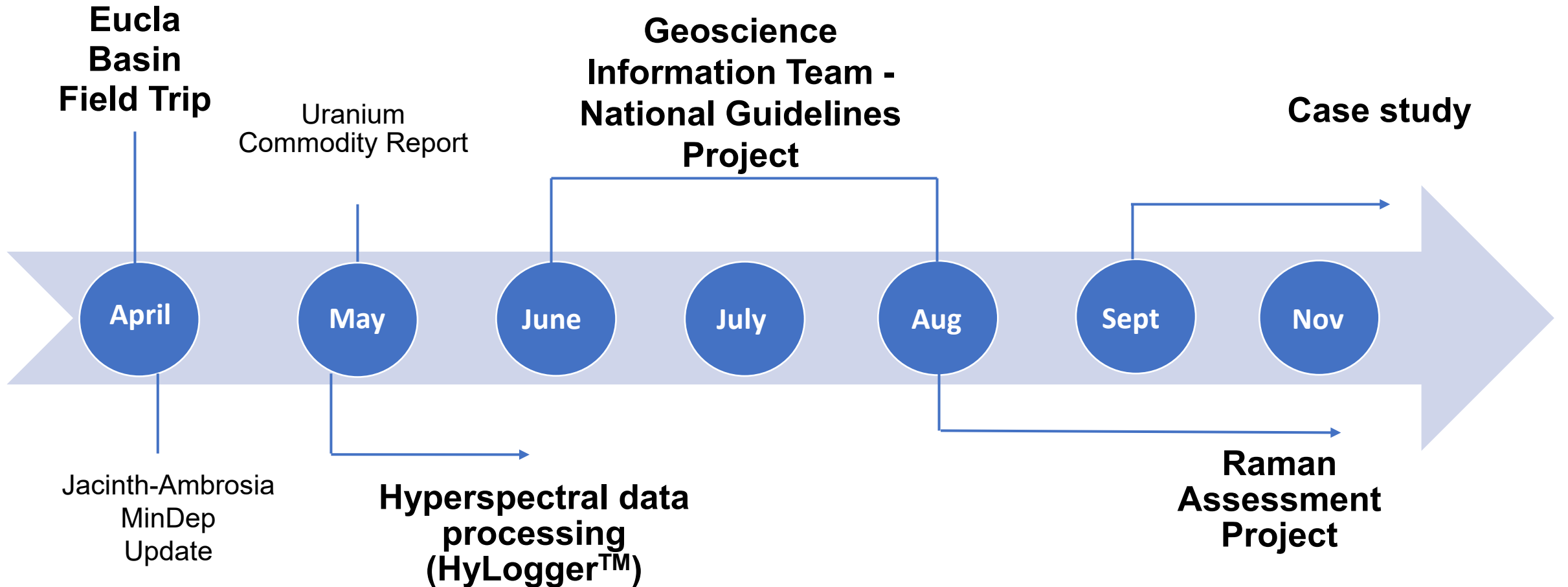
Joanne Weissgerber
November 2024



Journey so far



Journey so far





92
U
Uranium
238.02

URANIUM

Critical mineral potential of South Australia

Geological Survey of South Australia



Uranium Critical Mineral potential of South Australia

Geological Survey of South Australia,
Department for Energy and Mining

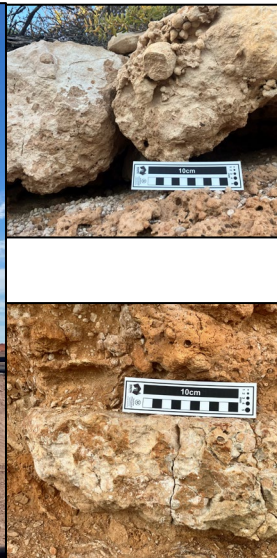
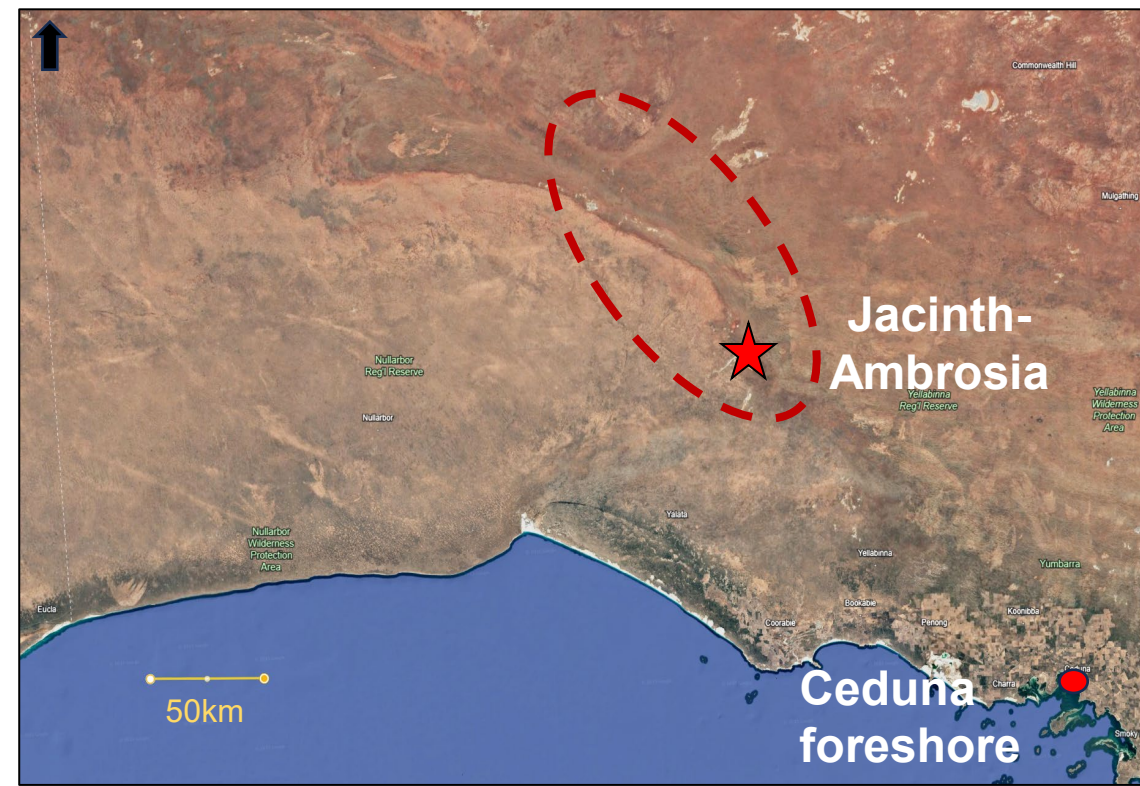
July 2025



QR code to Uranium webpage

Eucla Basin Field Trip

- Learning from experienced geologists about the Eucla Basin and paleovalleys
- Comparison of mine cross-section and field stratigraphy
- Overview of the value chain:
Exploration → Mining → Production





SA Geodata MINDEP Database - Mineral Deposit Advanced Search

[Mineral Deposit Quick Search](#)

Mineral Deposit Details

Deposit Name Discovery Year From To

Deposit Type Deposit Status

Commodities Commodity Species

Mineral Deposit Geology

Geological Province Mineral District Name

Lithology Stratigraphic Unit

Mineralogy Relationship to Host Rock

Local Ore Control

Mineral Deposit Reference

Document Reference Type Document Reference Number

Historical Document (Mine Summary Card)

Mapsheet Location

Map 250K Map 100K

SA Geodata Database Reference

Deposit Number Site Number

Geographic Search Extent

MGA Top Left Easting Northing Zone Bottom Right Easting Northing

or

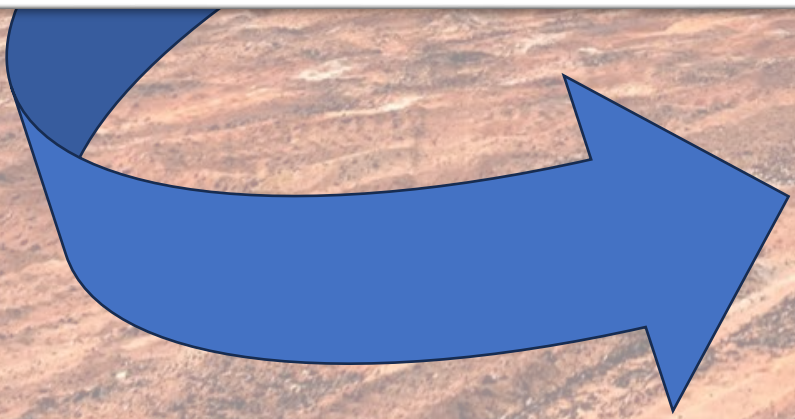
Lat/Long Top Left Longitude Latitude Bottom Right Longitude Latitude

SA Geodata - Database Information Downloads

[Explanation of the Stratigraphic Map Symbol and GIS code system](#)

Version: 2.0.6

MinDep



SA Geodata Database - Mineral Deposit Details

Deposit Number: 8344 Deposit Name: JACINTH Deposit Type: Deposit Status: Active Mine

- [Details](#)
- [Location](#)
- [Geology](#)
- [Commodities](#)
- [References](#)
- [Historical Documents](#)

Deposit Synonyms AMBROSIA; EUCLA; JA; JACINTH; JACINTH AMBROSIA; ML 6315

Mineral District OOLDEA RANGE HMS

Deposit Summary 2 classic beach placer deposits. Drilling identified a resource (2013) of 123Mt @ 7.7%HM for contained 5.2Mt HM @ 51% Zr, 4% Rt, & 27% ilmenite. Production 2009-14 ~44.3Mt ore at 7.7%HM for >1.6Mt zircon, .200,000t rutile, >750,000t ilmenite. Production in 2023 was 346 Kt of heavy mineral concentrate with reserves of 44 Mt @ 2.6%

Deposit Description The Jacinth deposit is a heavy mineral sand deposit, consisting predominantly of zircon, along with rutile and ilmenite. Jacinth is the southernmost deposit of the Jacinth-Ambrosia mine, which developed on two separate classic stacked beach placer deposits. These formed on the western, basinward side of the Ooldea barrier system, with heavy mineral concentrating on a prograding beach complex in a J-shaped bay. Exploration drilling commenced in 2004, with delineation of the deposit and regional exploration activities between late 2004 and early 2005. Resource drilling over the Jacinth deposit began in 2006 with production commencing in 2009. Primary production is zircon-rich heavy minerals including rutile and ilmenite. Jacinth has been mined from south to north (in two main pits), with mining of the northern deposit completed in September 2022. Mining operations are currently focused on the Ambrosia deposit, 3 km to the north of Jacinth. The southern deposit, Jacinth trends N~ to S and has dimensions 3.5 km long, by 300-900 m wide EW, with a gentle W dip. The heavy minerals occur within a broad envelope ~40m thick, with the highest grade in a zone ~6m thick near the base of the eastern Eucla Basin margin. This is interpreted as aggradations of beach swash zone deposits that extend basinward over surf zone sands, with portions later reworked into overlying younger beach deposits or aeolian backshore dunes. Average ore zone thickness is 20 m with an average overburden thickness of 7 m. The ore is hosted within the Ooldea Sand and occurs along the Ooldea Barrier/Range. Detrital zircon dating has identified the Madura-Coompana and Musgrave Province as the primary source areas for the barrier sands that host the heavy minerals.

Discovery Year ? 2004

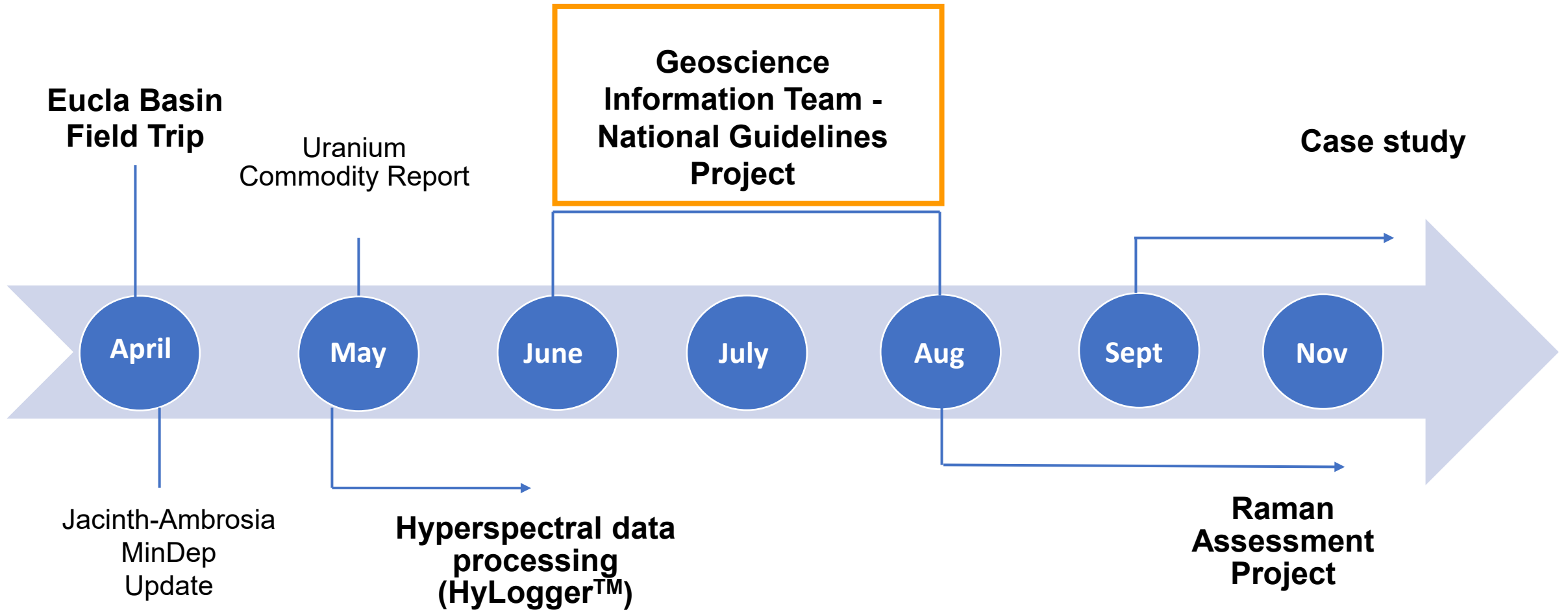
Commodities Heavy Minerals

Ore Minerals Ilmenite, Rutile, Zircon

Gangue Minerals Clay mineral

Mineral Deposit Images
No images loaded

Journey so far



National Guidelines Project

Geoscience Information Team

Australian Guidelines for the Submission of Digital Mineral Exploration Data

- Liaising with geophysicists to include new sections
- Communicating with representatives from interstate
- Gaining industry advice

AUSTRALIAN GUIDELINES FOR THE SUBMISSION OF DIGITAL MINERAL EXPLORATION DATA

VERSION 5.0 – AUGUST 2025

Prepared by

Government Geoscience Information Committee (GGIC)

on behalf of the

Geoscience Working Group (GWG)



Australian Government
Geoscience Australia



**Department of Energy, Mines,
Industry Regulation and Safety**



Government of South Australia
Department for Energy and Mining



AUSTRALIAN GUIDELINES FOR THE SUBMISSION OF DIGITAL MINERAL EXPLORATION DATA

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National Guidelines Update

2 main goals:

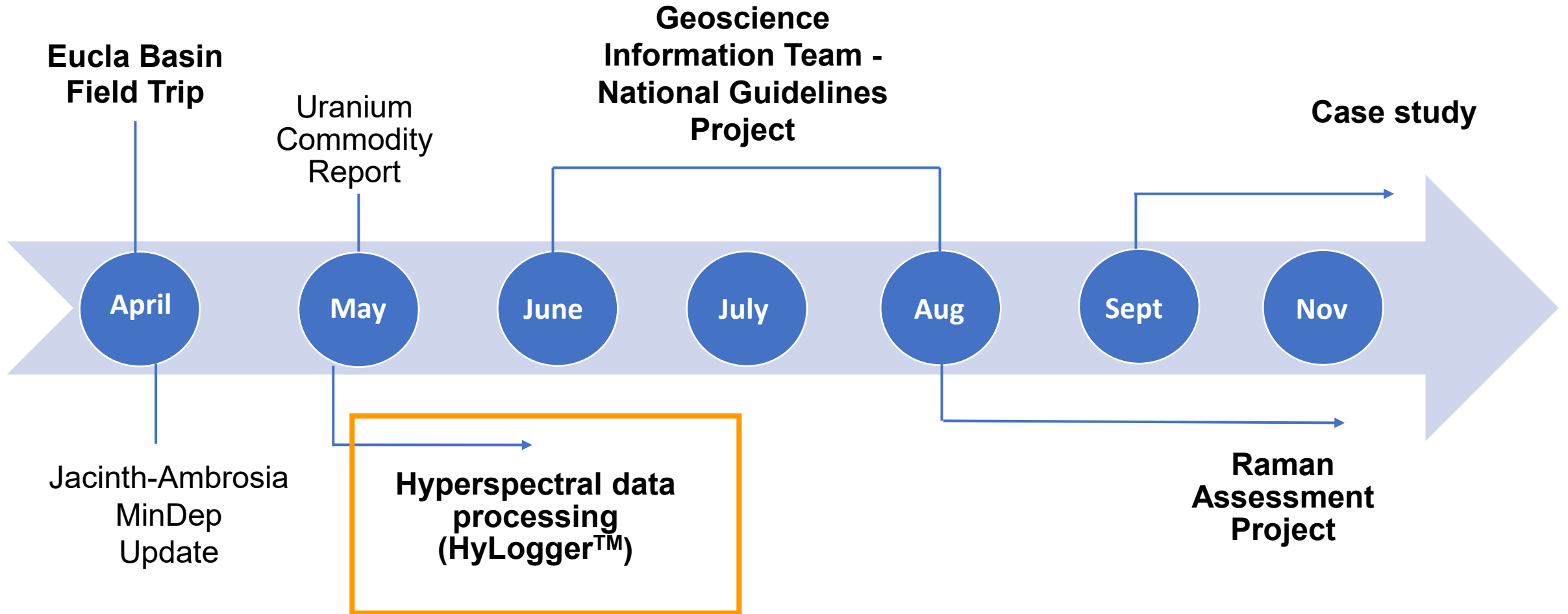
- Making it easier for industry to submit their exploration data
- Receiving more of the data we need in a standard format

Outcomes include

- **New templates** to cover new data types
- Key deliverable to be added into data import tool
- First draft completed in October 2025

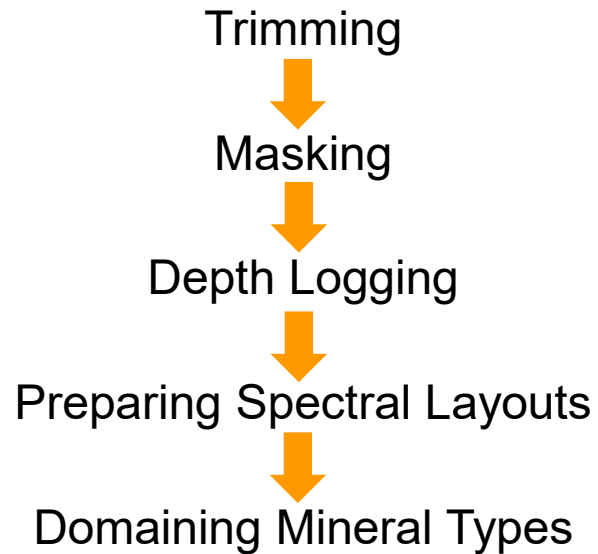
More information will be available closer to release (2026)

Journey so far

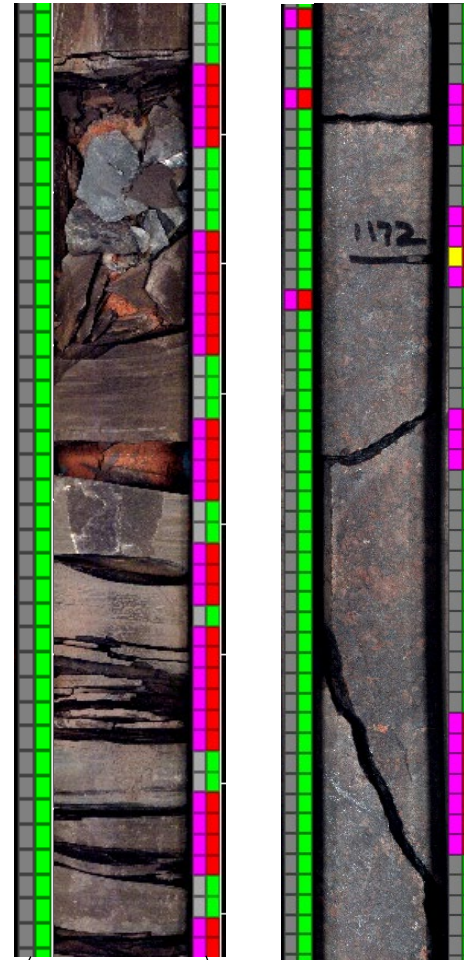


HyLogger data processing

TSG Processing Workflow (Level 1)

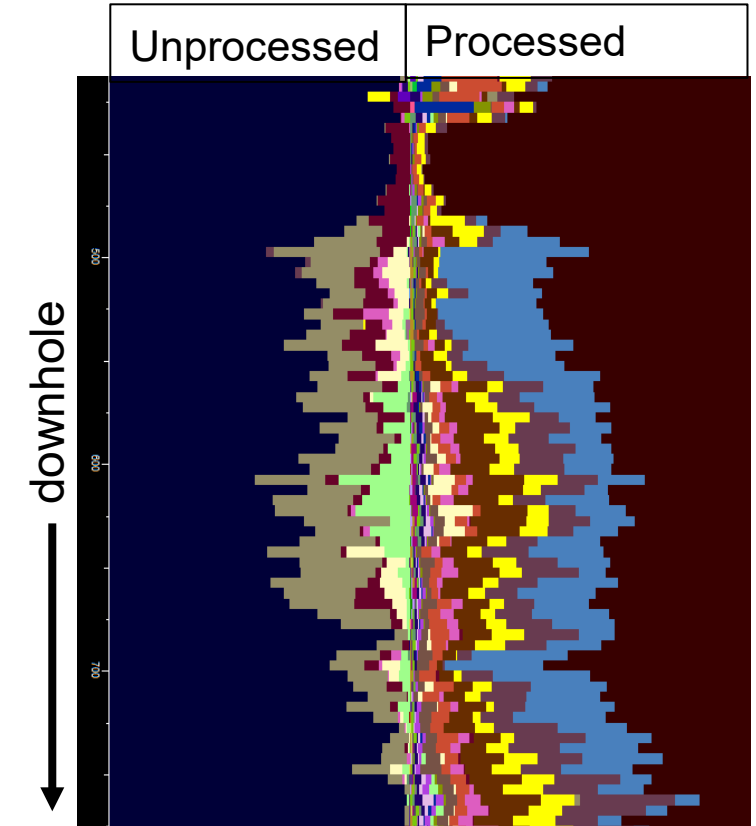


- ensures all representative core is visible
- improves accuracy of depths
- filters out errors in spectrum

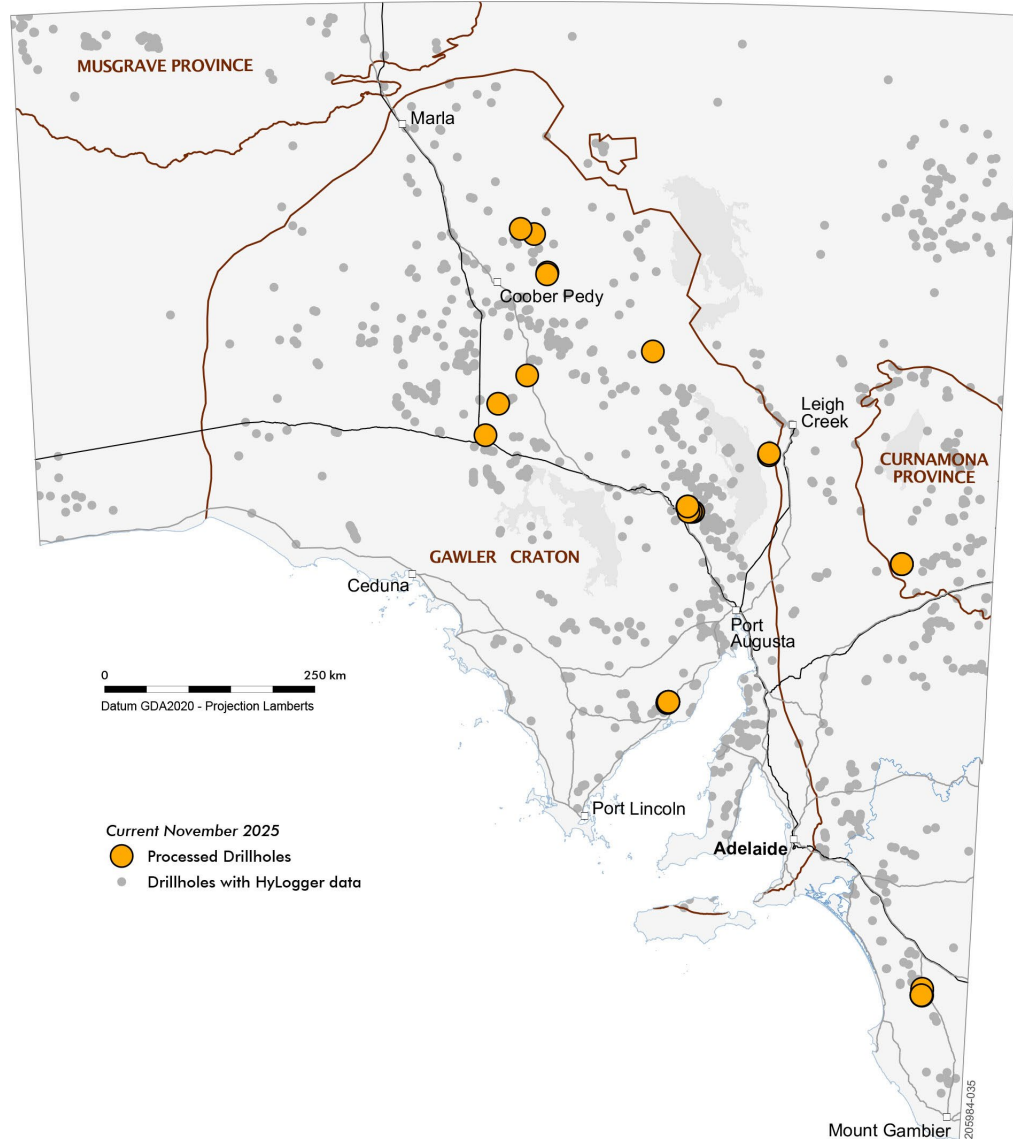


Unprocessed

Processed

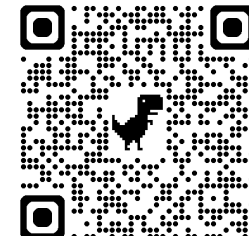


HyLogger data processing



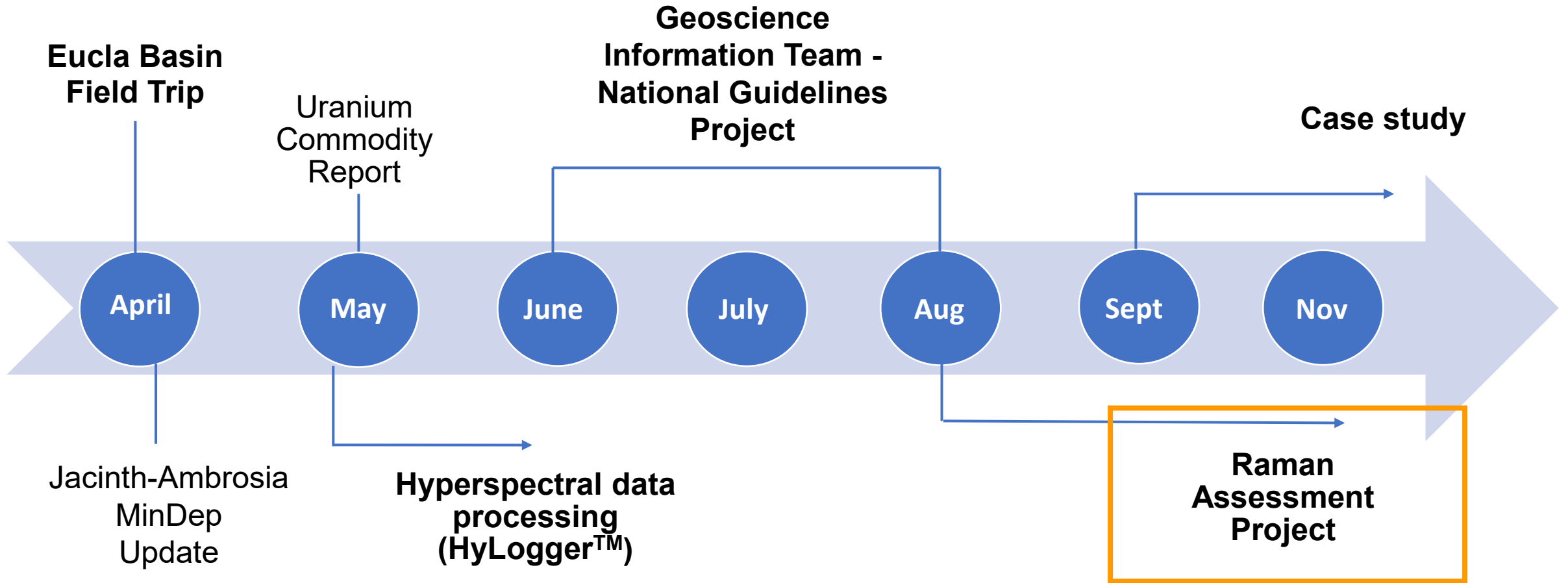
Projects it contributes to

- Eyre Peninsula
- National Drilling Initiative (NDI)
- Critical Minerals
- Legacy holes



QR code to HyLogger layer on SARIG

Journey so far



Raman Spectroscopy

Applications include

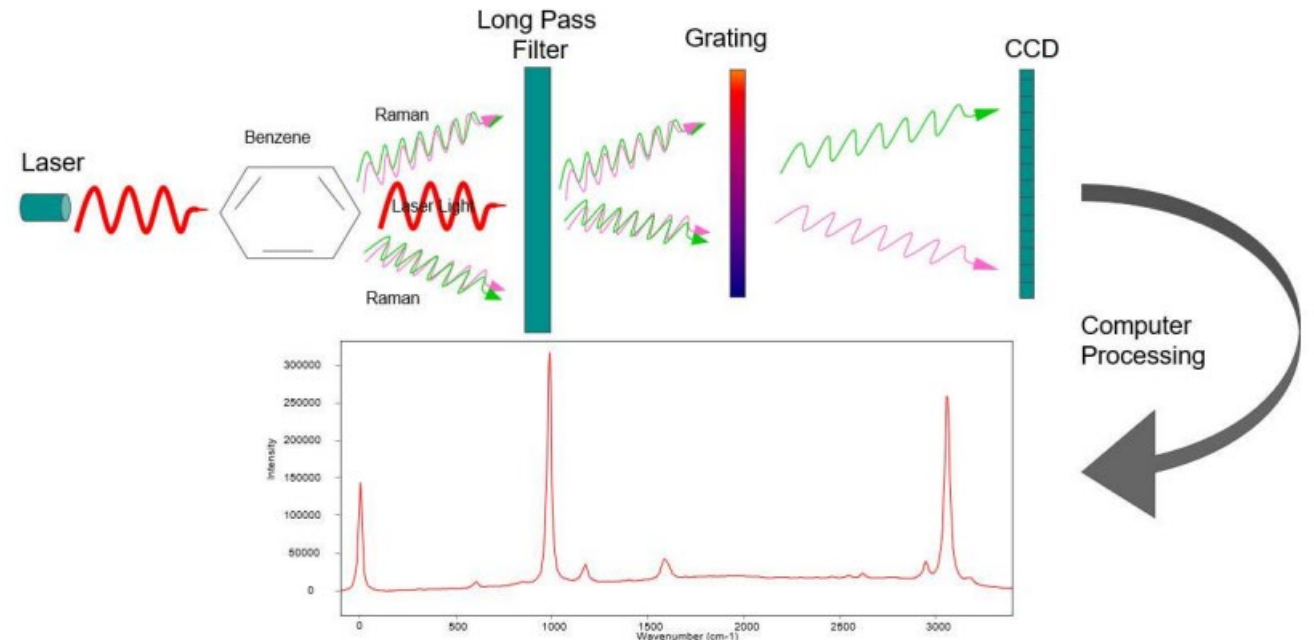
- Fluid inclusion studies
- Polymorph differentiation
- Thermometry
- Mineral speciation
- Mineral phase ID

Microprobe high precision analysis

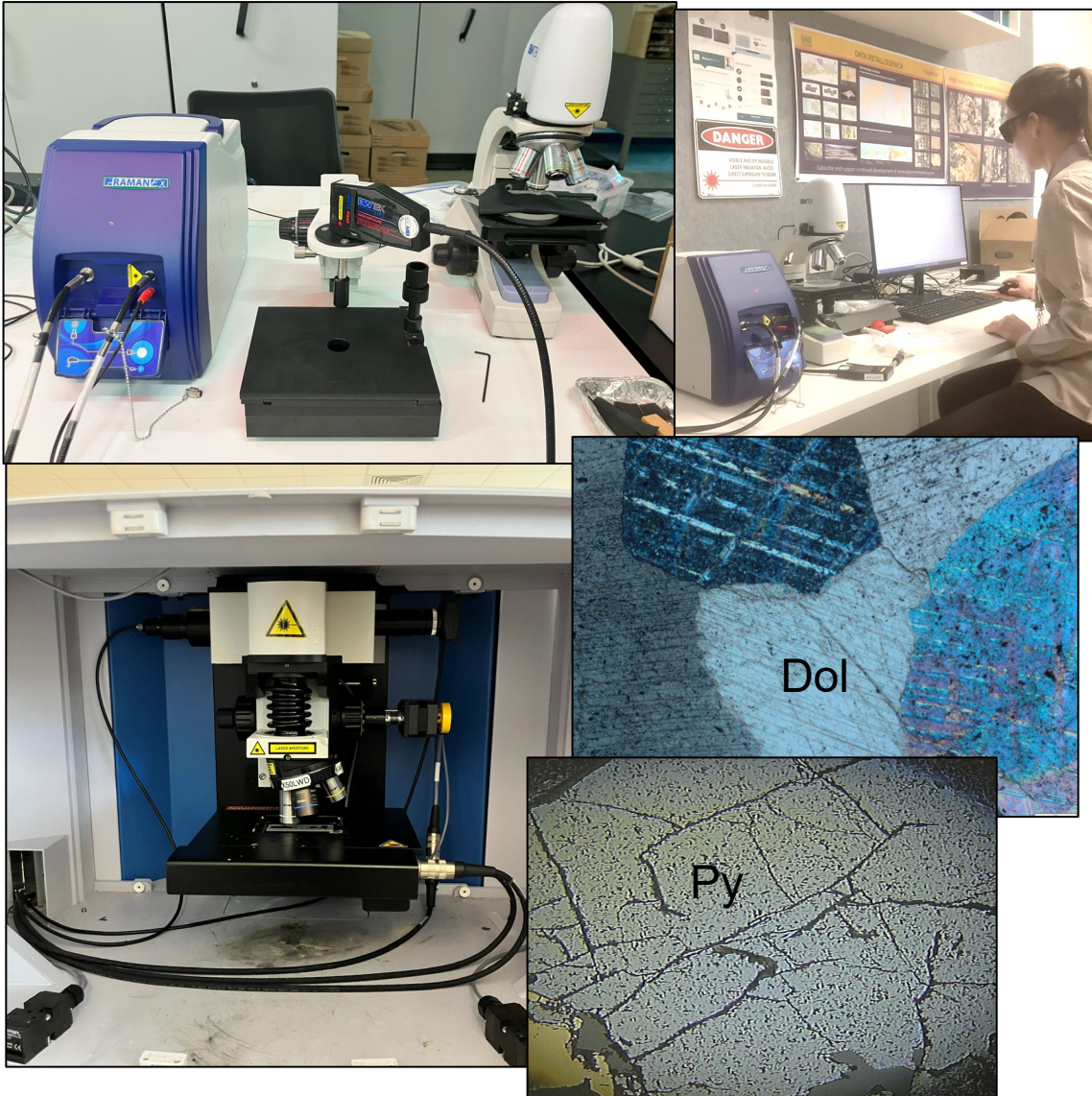
The Basics

- Spectrum reflecting molecular structure of the mineral
- ‘Raman scattering’ – a specific wavelength produces light related to the sample’s vibrational states

Basic Components of a Raman System



Raman Applications and Assessment

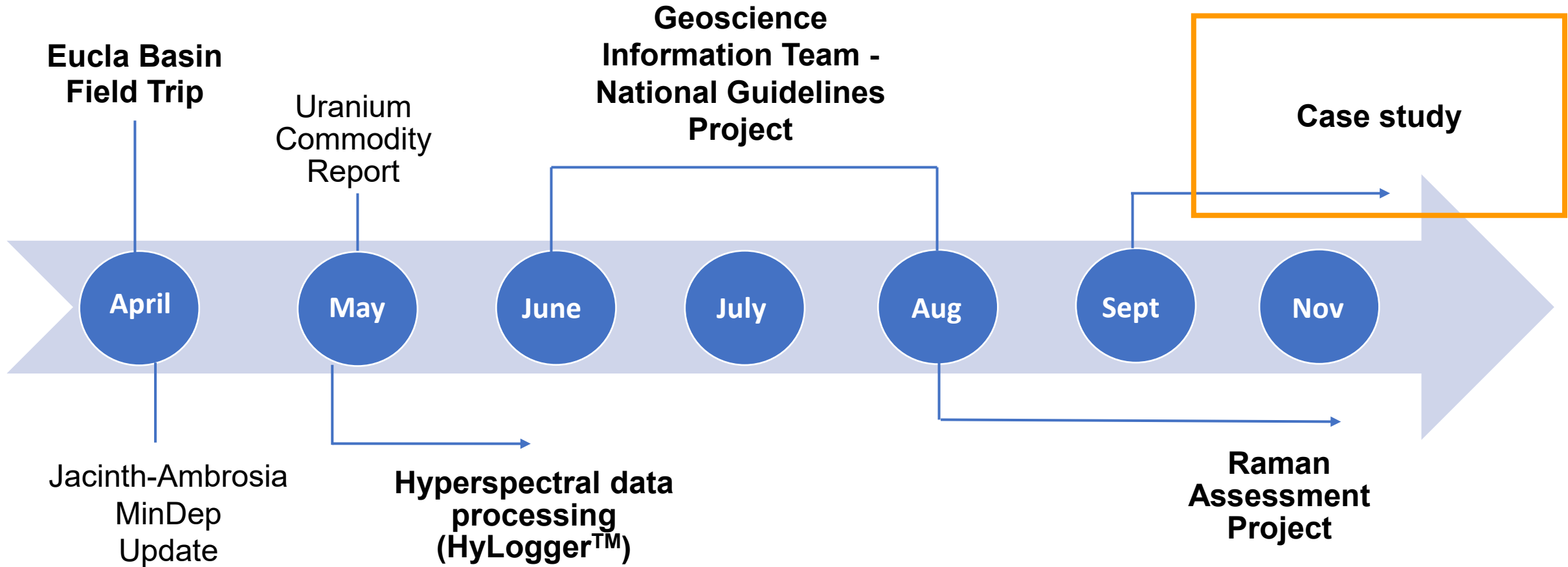


Raman Assessment Project

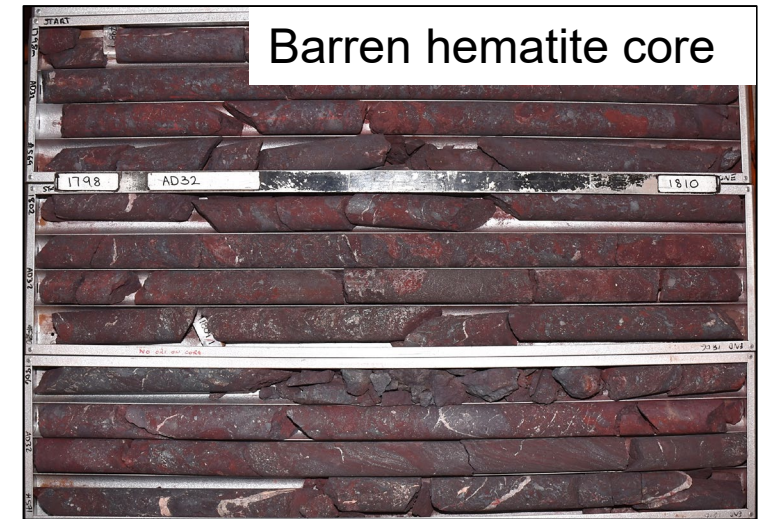
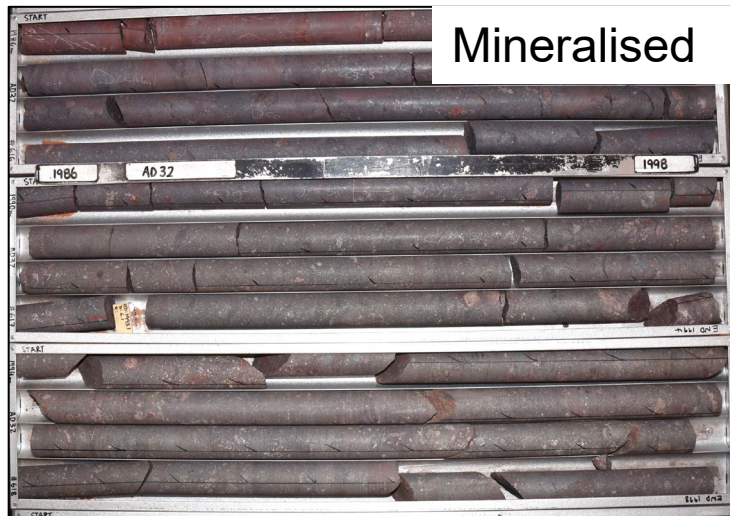
- Implementing Raman methodology into mineral system project workflow
- Validating minerals in thin section
- Working with Adelaide University
- Currently in the **data collection phase**



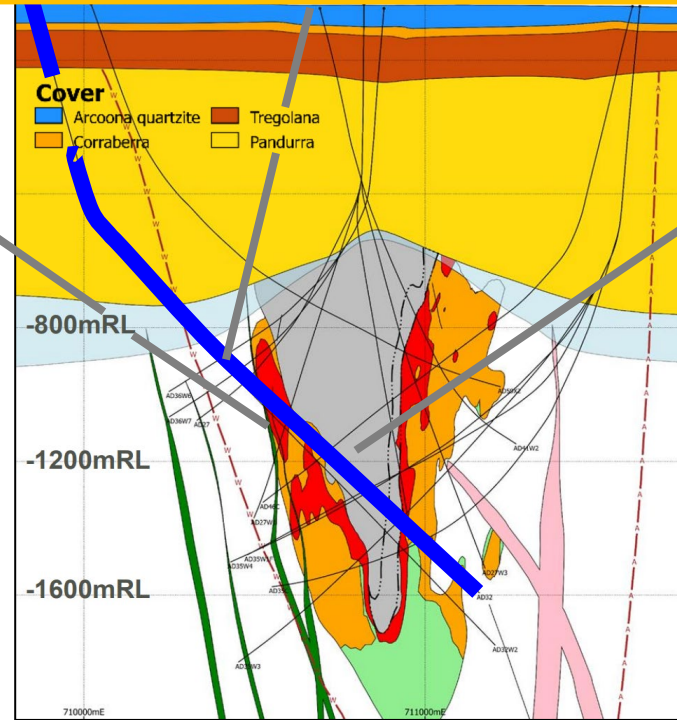
Journey so far

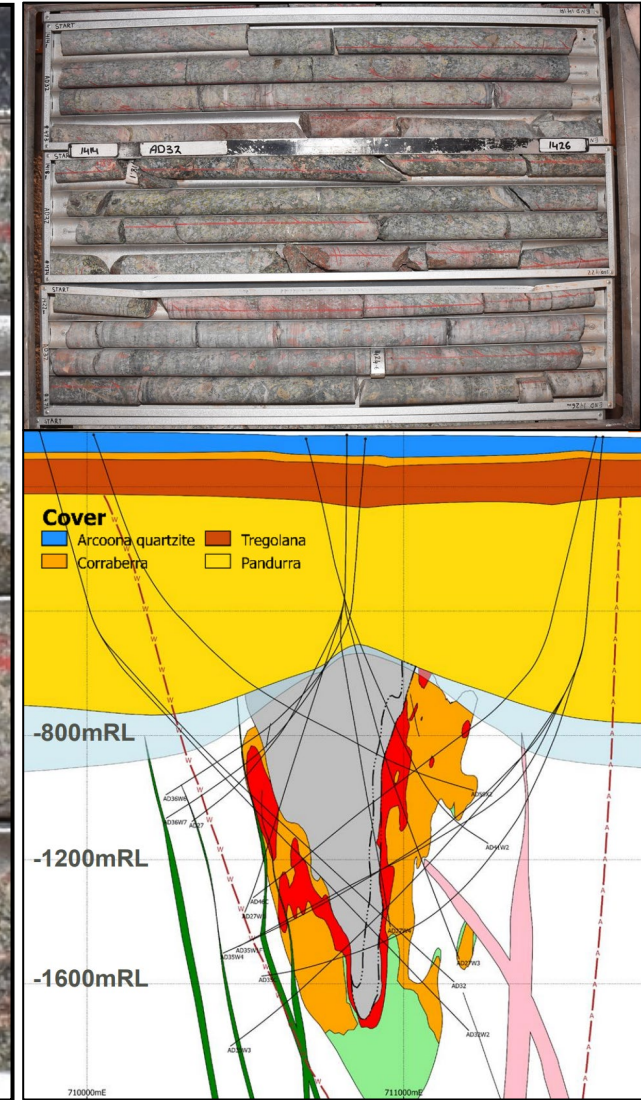


Future Project – IOCG / Oak Dam Case Study



- Looking at gradients in spectral mineralogy
- HyLogger scanning & processing (2026)





- Alteration minerals chlorite, sericite replacing plagioclase and biotite

Learnings

Additional learnings

- Industry engagement
- NEXUS workshops
- Core logging workshops
- Mindep – updating mineral deposit information
- pXRF training
- SA Geodata
- ArcGIS Pro
- Upskilling courses – project management
- Events i.e. Copper to the World

A screenshot of the SARIG SA Geodata MINDEP Database - Mineral Deposit Advanced Search interface. The interface is a web-based search tool with a blue header containing the SARIG logo and navigation links. The main content area is divided into several sections: 'Mineral Deposit Details' with fields for Deposit Name, Type, Commodities, Discovery Year, Status, and Species; 'Mineral Deposit Geology' with fields for Geological Province, Lithology, Mineralogy, Local Ore Control, Mineral District Name, Stratigraphic Unit, and Relationship to Host Rock; 'Mineral Deposit Reference' with fields for Document Reference Type, Number, and a checkbox for 'Historical Document (Mine Summary Card)'; 'Mapsheet Location' with fields for Map 250K and Map 100K; 'SA Geodata Database Reference' with fields for Deposit Number and Site Number; and 'Geographic Search Extent' with options for MSA, Lat/Long, and various coordinate input fields. At the bottom, there are links for 'Download list of codes and descriptions', 'Restore Coordinates from SARIG', 'Clear Form', and 'Search Database'. The footer includes the text 'www.sa.gov.au'.

Thank you

Acknowledgement of Country

As guests here on Kurna land, the Department for Energy and Mining (DEM) acknowledges everything this department does impacts on Aboriginal country, the sea, the sky, its people, and the spiritual and cultural connections which have existed since the first sunrise. Our responsibility is to share our collective knowledge, recognise a difficult history, respect the relationships made over time, and create a stronger future. We are ready to walk, learn and work together.



DISCOVERY DAY



Disclaimer

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