

ASX: ORP



2025 GENERAL EXPLORATION UPDATE

UNLOCKING TOMORROW'S ENERGY TODAY

DECEMBER 2025

orpheusuranium.com



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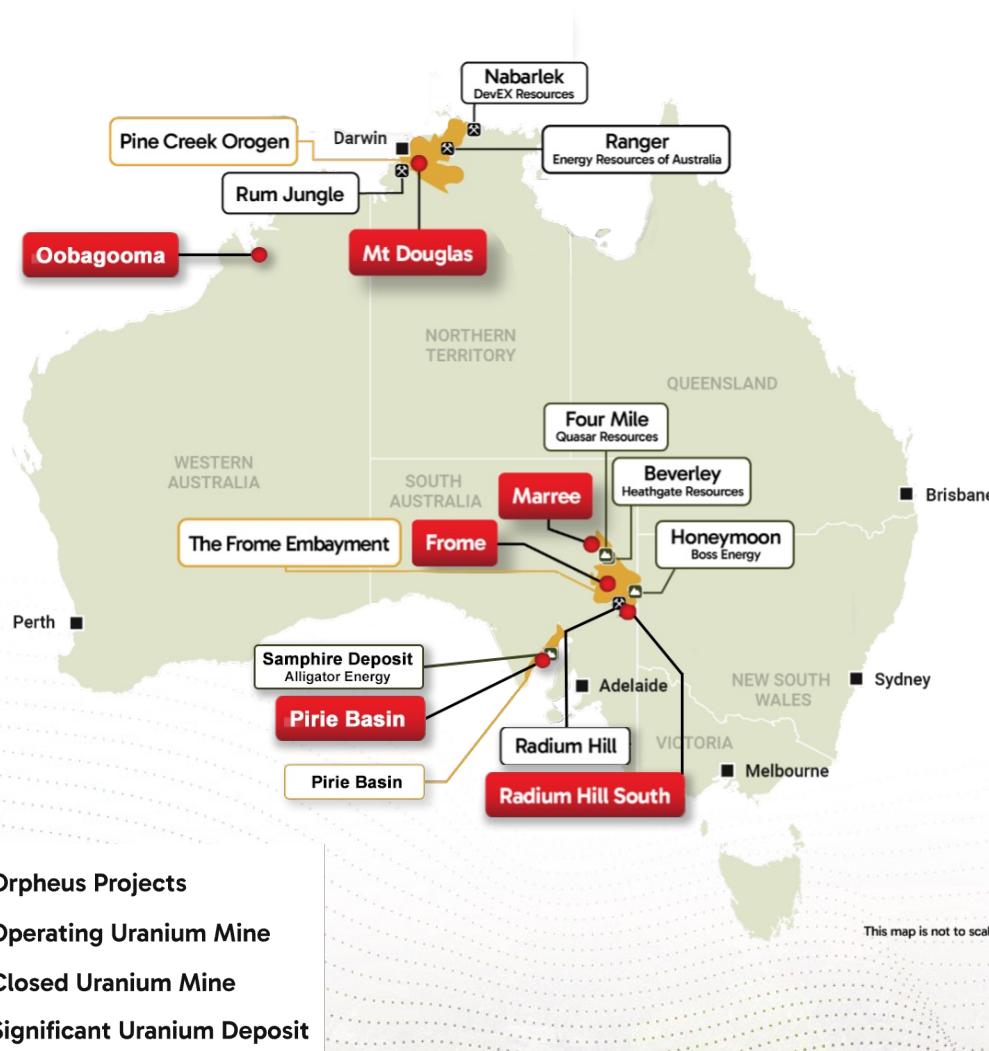
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This Presentation contains third party data relating to the industries, segments and markets in which the Company operates or aims to operate (Industry Data). This information has been prepared using publicly available data. The Industry Data includes third party market data, estimates and projections. There is no assurance regarding the accuracy of the Industry Data, and the Industry Data has not been independently verified by the Company.

Competent Person Statement

Sections of information contained in this report that relate to Exploration Results were compiled or reviewed by Mr Clinton Dubieniecki BSc (Hons), who is a Member of the Australian Institute of Geoscientists, Member of Australian Institute of Mining and Metallurgy, and is a full-time employee of Orpheus Uranium Limited. Mr Dubieniecki has sufficient experience which is relevant to the style of mineral deposits under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the 2012 edition of the "Australasian Code for Reporting of Mineral Resources and Ore Reserves". Mr Dubieniecki consents to the inclusion in this report of the matters based on this information in the form and context in which it appears.

Major Investment Highlights



2025: A Focus on Portfolio Development

- ✓ Developed **technically intelligent** team with **uranium** experience at **world-class uranium operations**
- ✓ **Acquisition** of **Pirie Basin Uranium Project**, adjacent to, and geological synergistic with known Samphire Uranium deposit
- ✓ **Strategic development** of project portfolio to **promote long-term value** with **geological relevant tenure**, through acquisition of **Oobagooma Project, Western Australia**
- ✓ **Established three Native Title Mining Agreements (NTMAs)**, enabling access for core South Australian projects, including **landmark Adnyamathanha agreement** (Frome project)
- ✓ **Continued advancement** of **Northern Territory projects**, focussing on **Mt Douglas** which is prospective for **unconformity-style mineralisation**
- ✓ Advancing 100% owned, market-leading uranium exploration tenure. **A true uranium explorer**

Major Investment Highlights



2026: Advancing The Portfolio

- ✓ Progress **South Australian projects** to secure required regulatory approvals and enable **decision to drill on Frome, Pirie Basin & Radium Hill South projects** for sedimentary-style Uranium
- ✓ Advance **Mt Douglas project** to decision to drill stage, targeting **high-grade unconformity-style mineralisation**
- ✓ Complete **Oobagooma sale agreement**, continue development of geological and resource modelling alongside land access agreements
- ✓ Continued refinement of **portfolio including project generative assessments of geologically relevant tenure and projects, rationalisation to maintain a balanced portfolio**
- ✓ Position the Company for success through **drill discovery and/or growth in the Uranium market with a high-quality, advanced portfolio**

Orpheus Uranium Project Pipeline



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AS AN INDUSTRY,
WHEN WE EXPLORE FOR URANIUM,
WE DISCOVER URANIUM!

Business
Development
(incoming
Assets)
→

Greenfield Exploration

Mt Douglas
(NT)

Marree
(SA)

Mundaerno
(SA)

McArthur
(NT)

Advanced Exploration

Frome (SA)

Pirie Basin (SA)

Oobagooma* (WA)

Radium Hill South
(SA)

Exploration Target

JORC Resource

Producing
Assets
→

Project rationalisation routinely occurring to minimise unnecessary outgoings, and maximise portfolio value

DUAL STRATEGIC APPROACH: LEVERAGING DISTINCT URANIUM-SPECIFIC EXPERIENCE

Key South Australian Projects

Sedimentary-Style Mineralisation

● Pirie Basin Uranium Project

Over 40km strike of highly prospective Pirie Basin - adjacent to Alligator Energy's 18 Mlb. Samphire Uranium Project¹

● Frome Uranium Project

Located in a globally significant Callabonna Sub-Basin ~12km west of Boss Energy's 25 Mlb. Gould's Dam Uranium Deposit²

● Radium Hill South Uranium Project

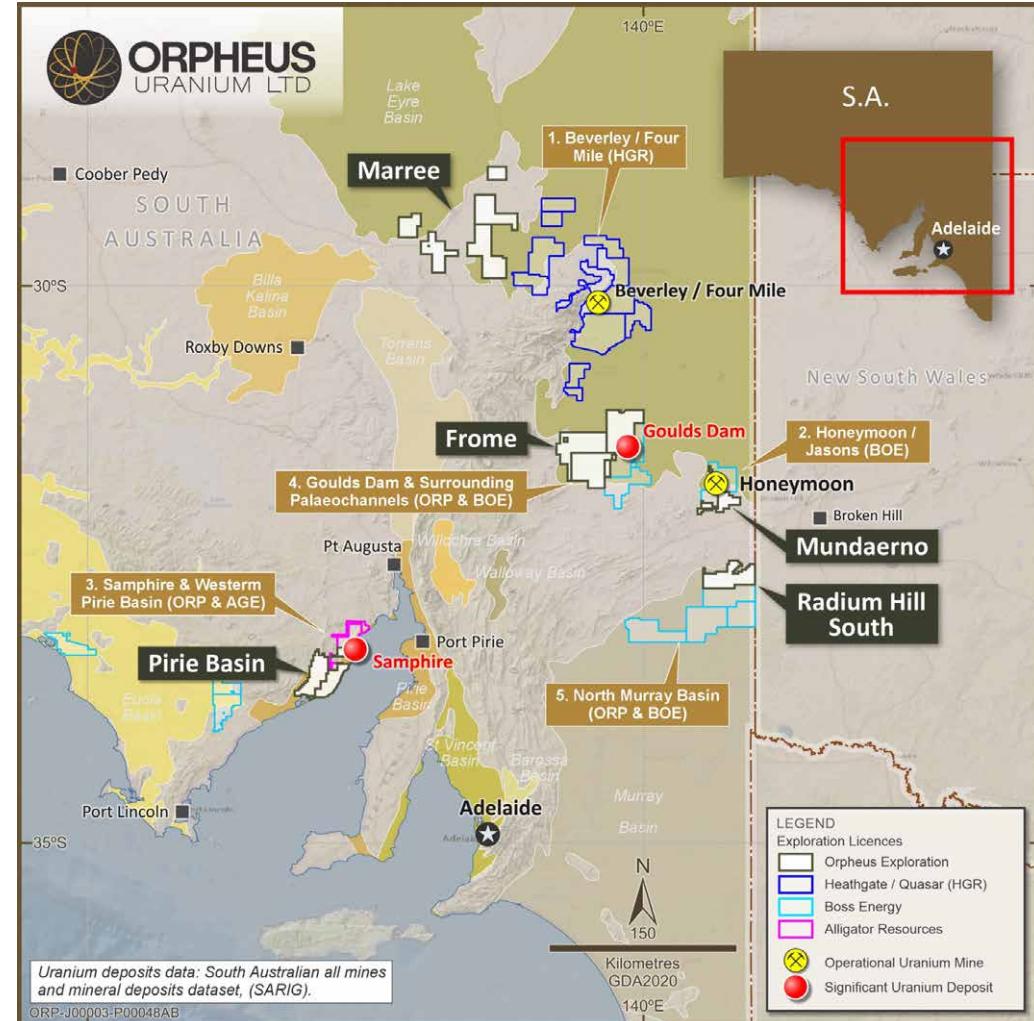
~20 km south of Radium Hill Uranium Field and hosts five uranium known occurrences

● Leveraging results of previous explorers' activities who halted due to changing market conditions

● Proximal to Existing and Developing Operations

Proximal to operations and developing **assets recently approved** for uranium mining or advanced-stage development activities in a jurisdiction that allows uranium mining

1. Samphire Uranium Project – Alligator Energy Limited ASX: AGE - Increased Mineral Resource Estimate and Upgrade of Indicated Resource for the Blackbush Deposit, Samphire U Project. (18.0 Mlbs. at an average grade of 676ppm U3O8). Refer to ASX: AGE announcement dated 06 May 2025



2. Goulds Dam Uranium Deposit – Resource - Boss Energy Limited ASX: BOE - Combined Indicated and Inferred Resource – Average Grade 523 ppm U3O8 with Contained 25 Mlbs. U3O8. Refer to ASX: BOE announcement dated 23 January 2024

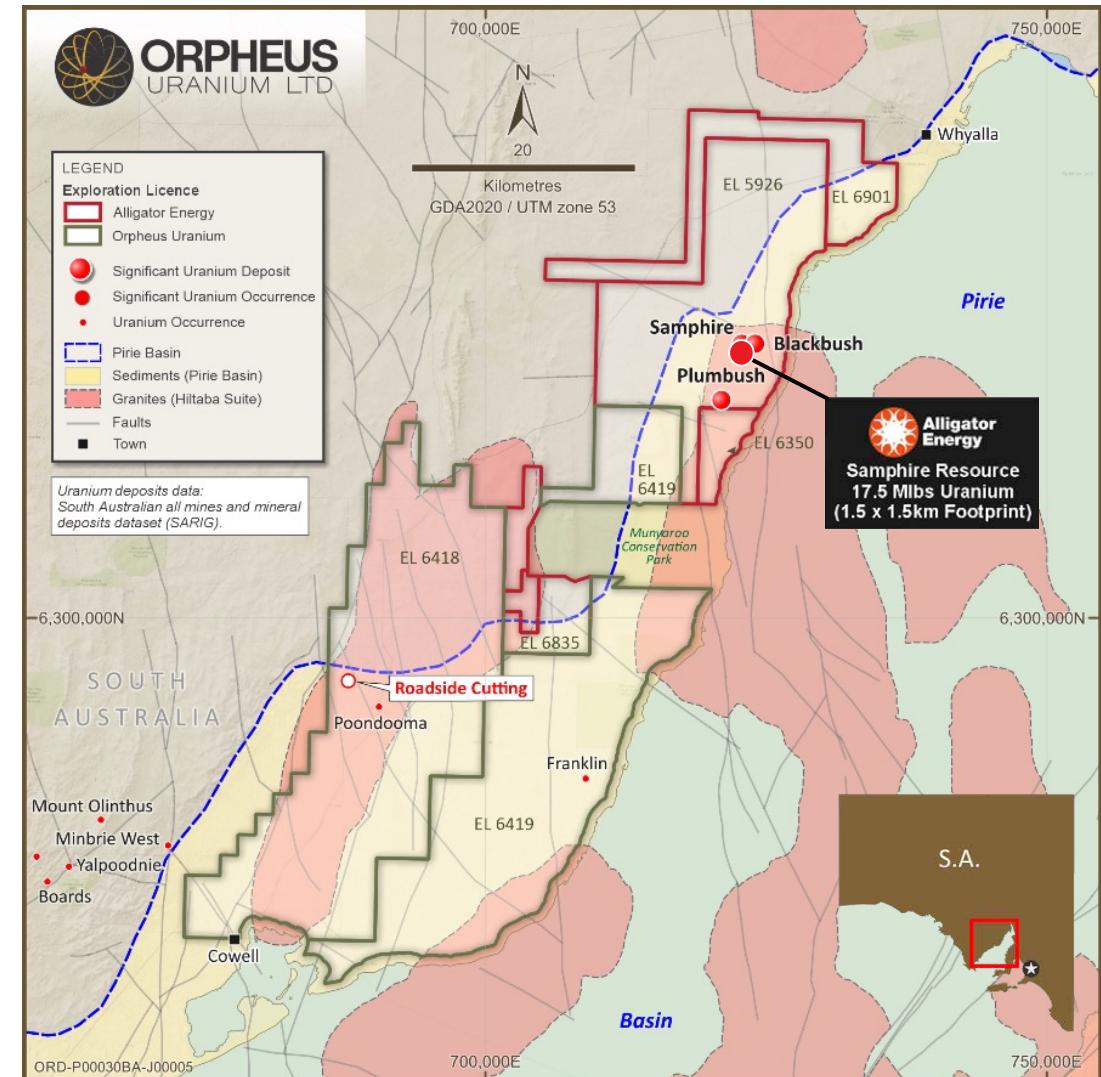
Pirie Basin Project

Advanced Exploration



FIRST TIME EXPOSURE TO URANIUM FOCUSED JUNIOR EXPLORER

- Over 40km strike of highly prospective Pirie Basin sediments which are host to the 18 Mlb. (U) Samphire Project & underlain by fertile granites
- Pirie Basin one of only two basins in South Australia to host sedimentary-style uranium deposits that have active advanced staged feasibility or producing in-situ recovery uranium projects
- Progressing the tenement transfer → regulatory requirement to enable Orpheus to undertake exploration activities on tenure
- Preliminary engagement with landholders/other key stakeholders being undertaken, to foster relationships for work upon tenement transfer



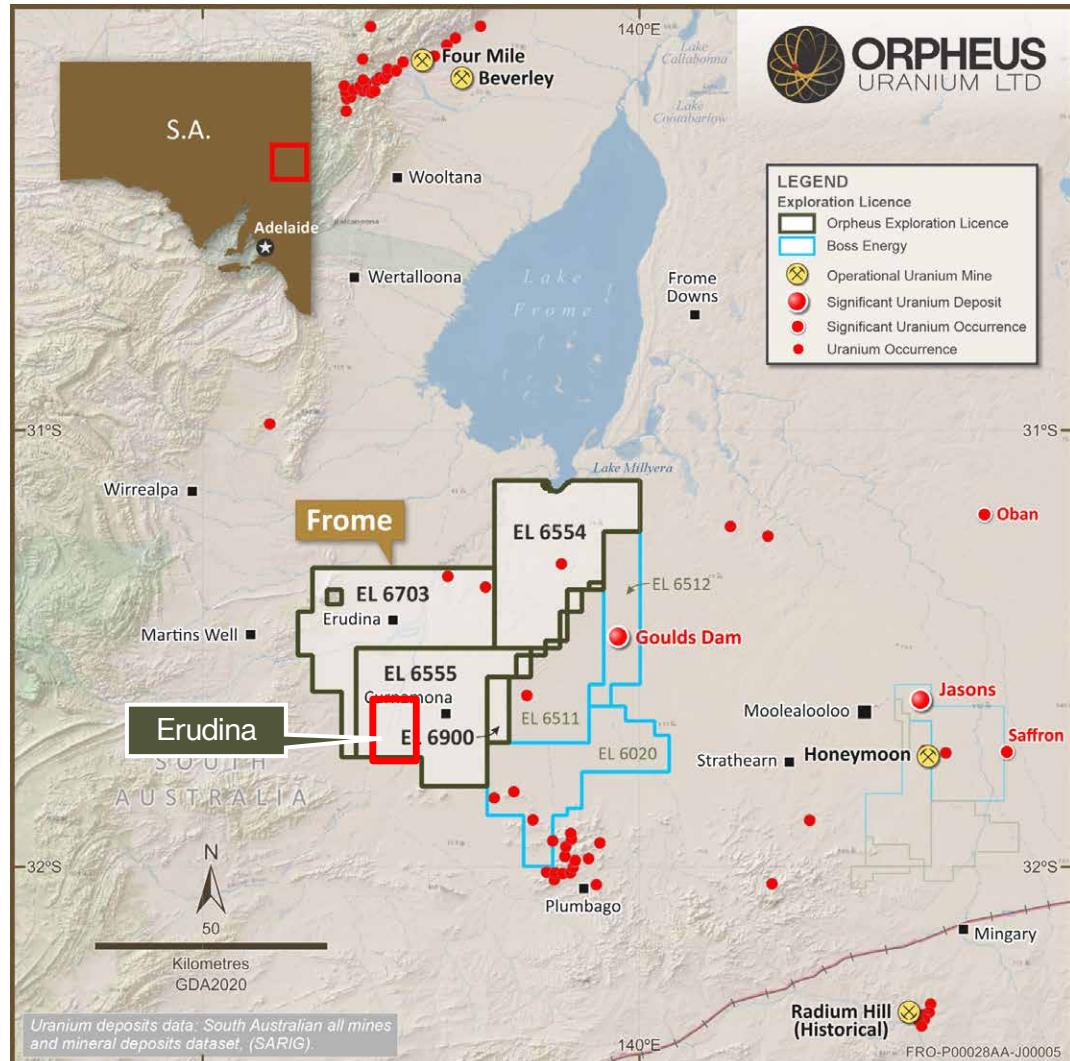
Frome Project

Advanced Exploration



MULTIPLE TARGETS IN MULTIPLE PALAEOCHANNEL SYSTEMS

- Over 50km strike of highly prospective and producing **Callabonna Sub-Basin** - proximal to/sharing geological synergy with 25 Mlb. Goulds Dam
- Mechanisms (**source, transport & trap**) for Uranium mineralising systems similar to regional deposit: **Peak uranium grades in fertile Namba and Eyre Formation sediments of >1,500ppm EqU.**
- LANDMARK NTMA ESTABLISHED** – Allows regulatory approvals. Heritage survey completed in 2024 - assessing requirements for follow up survey
- Ongoing engagement** with all stakeholders, including landholders, traditional owners and government → **Expecting to gain government endorsed 'Program for Environment and Rehabilitation' (PEPR) imminently**



Radium Hill South Project

Advanced Exploration



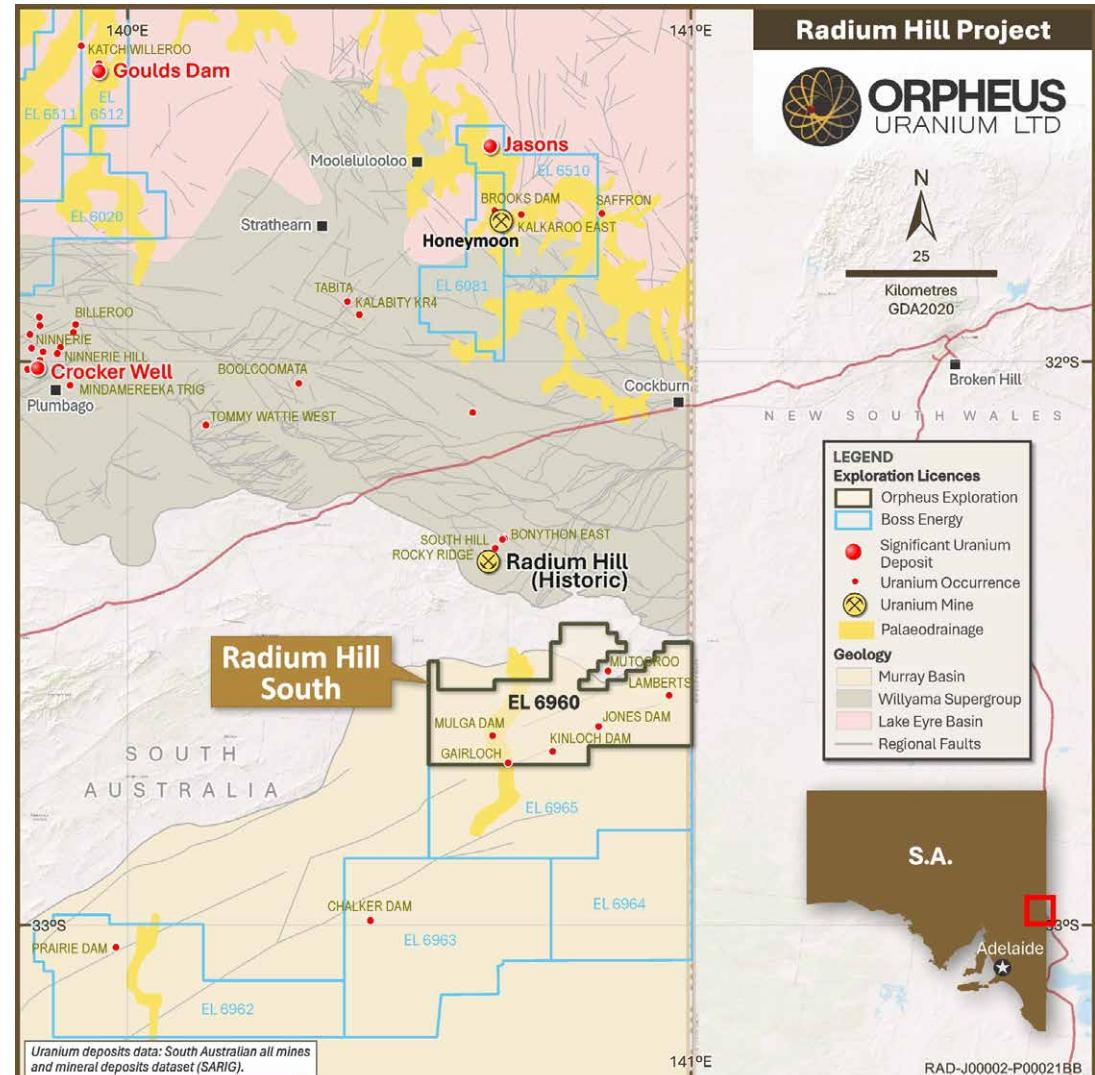
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FIVE EXISTING PROSPECTS READY FOR IMMEDIATE FOLLOW-UP

- ✓ Located ~20km south of the highly radiogenic region of the historic **Radium Hill Uranium Field** **2.6 Mlbs. @ 1,310ppm U₃O₈**
- ✓ Mechanisms (**source, transport & trap**) for **uranium mineralising systems**, with **evidence of uranium mineralisation** at shallow depths of ~80 to 110m
- ✓ **NTMA Established – Heritage survey completed** at selection of prospects throughout the tenement - **allows advanced stage exploration activities including drilling**
- ✓ Ongoing engagement with stakeholders, including government, landholders, and traditional owners → **Regulatory approval (PEPR) received**



Radium Hill South Project: conducting the heritage survey



Marree Project

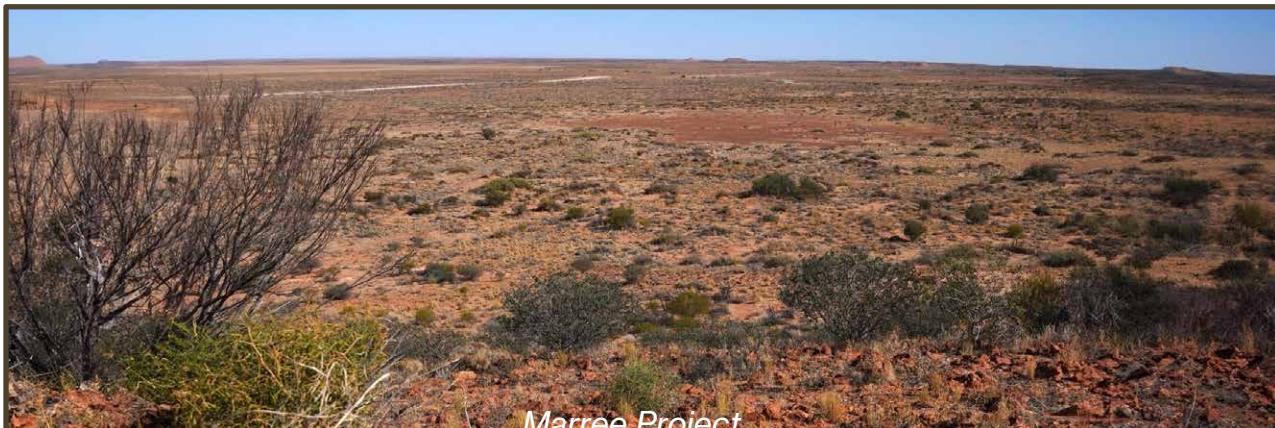
Greenfield Exploration



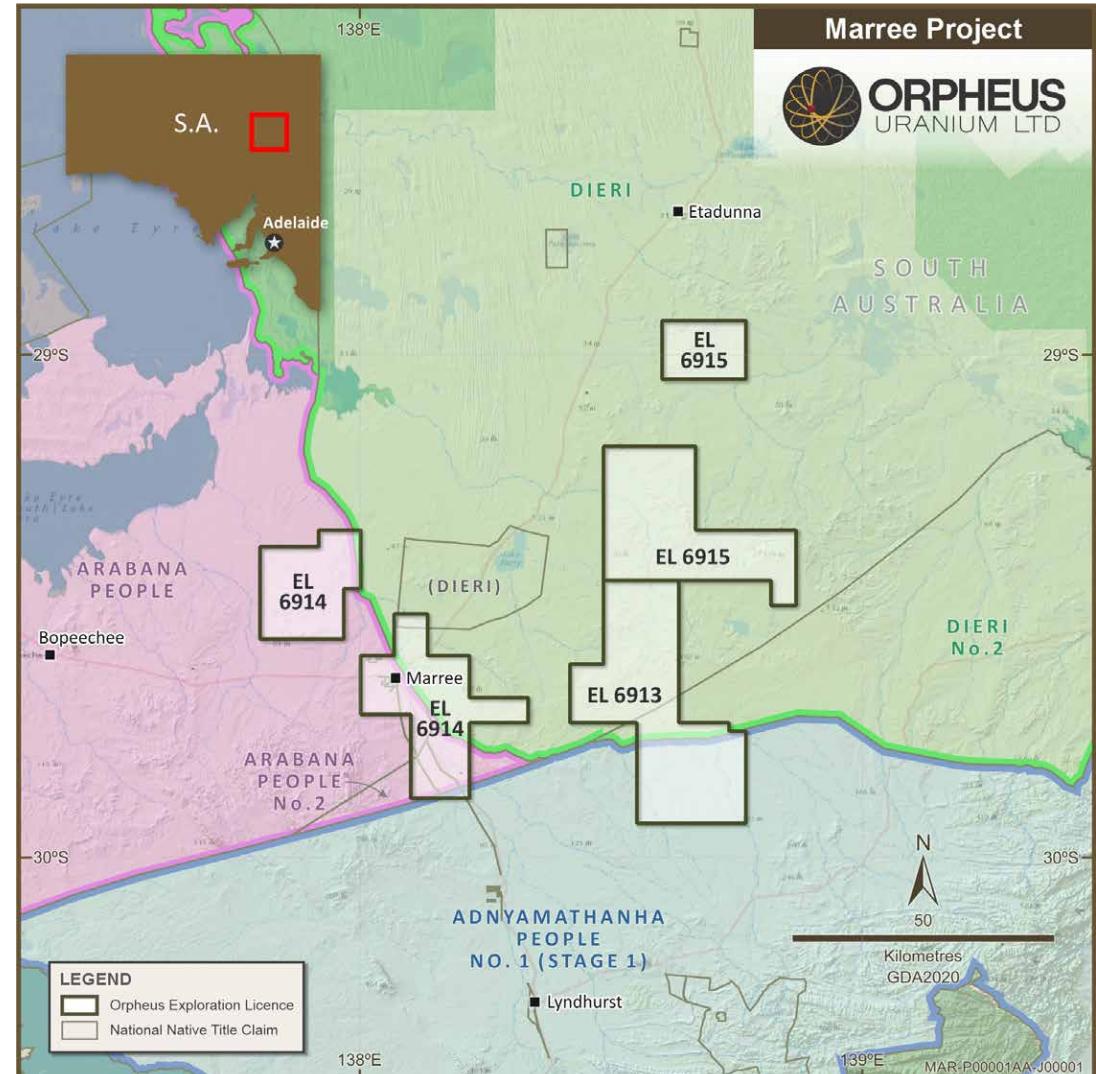
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REGIONAL EXPLORATION APPLYING KNOWN MINERALISING MODEL

- ✓ Early-stage exploration located to northwest of the Northern Flinders Ranges **Mount Painter Block**, which hosts some of **the most uraniferous surface and potential uranium source** rocks within Australia, if not globally
- ✓ NTMA Established (x2) with **Adnyamathanha** (blue) and **Dieri** (green) which allows ongoing exploration activities including drilling
- ✓ Continued geological modelling in comparison with regional known mineralising settings to refine target areas for future exploration activities
- ✓ Ongoing engagement with all stakeholders, including landholders, traditional owners and the government – preparation for nominated activities



Marree Project



Key Northern Territory Project

Unconformity and Vein style Mineralisation

Targeting the Pine Creek Orogen

“Australia’s economic Unconformity-Style mineral systems” - Significant region of historical production where Australia’s large, high-grade deposits are discovered

Mount Douglas – Key Project

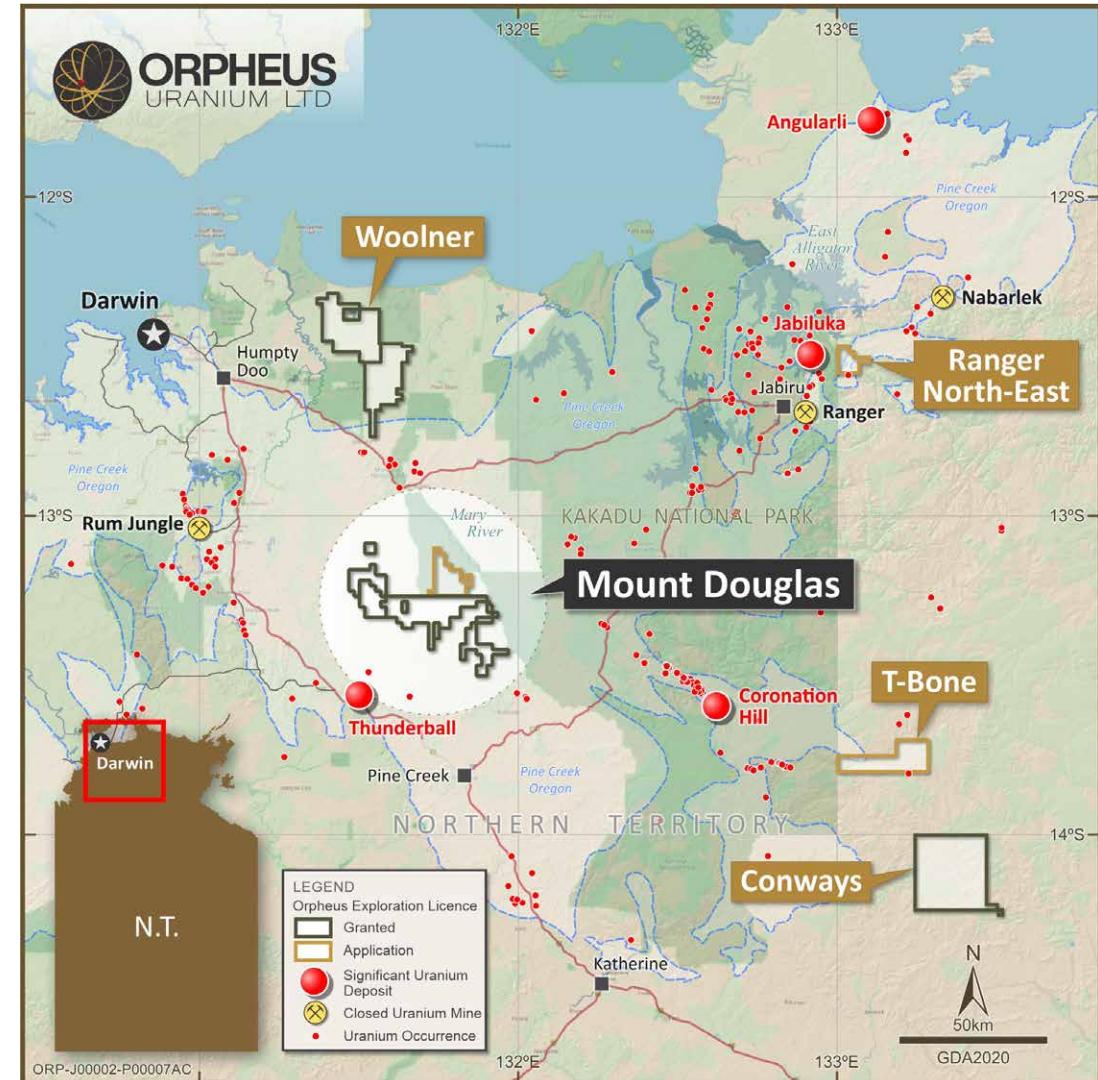
Exposure of Kombolgie Sandstone and geological synergy with nearby Thunderball Uranium Deposit

Project rationalisation

Ongoing assessment of regional NT projects within broader portfolio



Mt Douglas: Kombolgie Sandstone outcrop



Mt Douglas Project

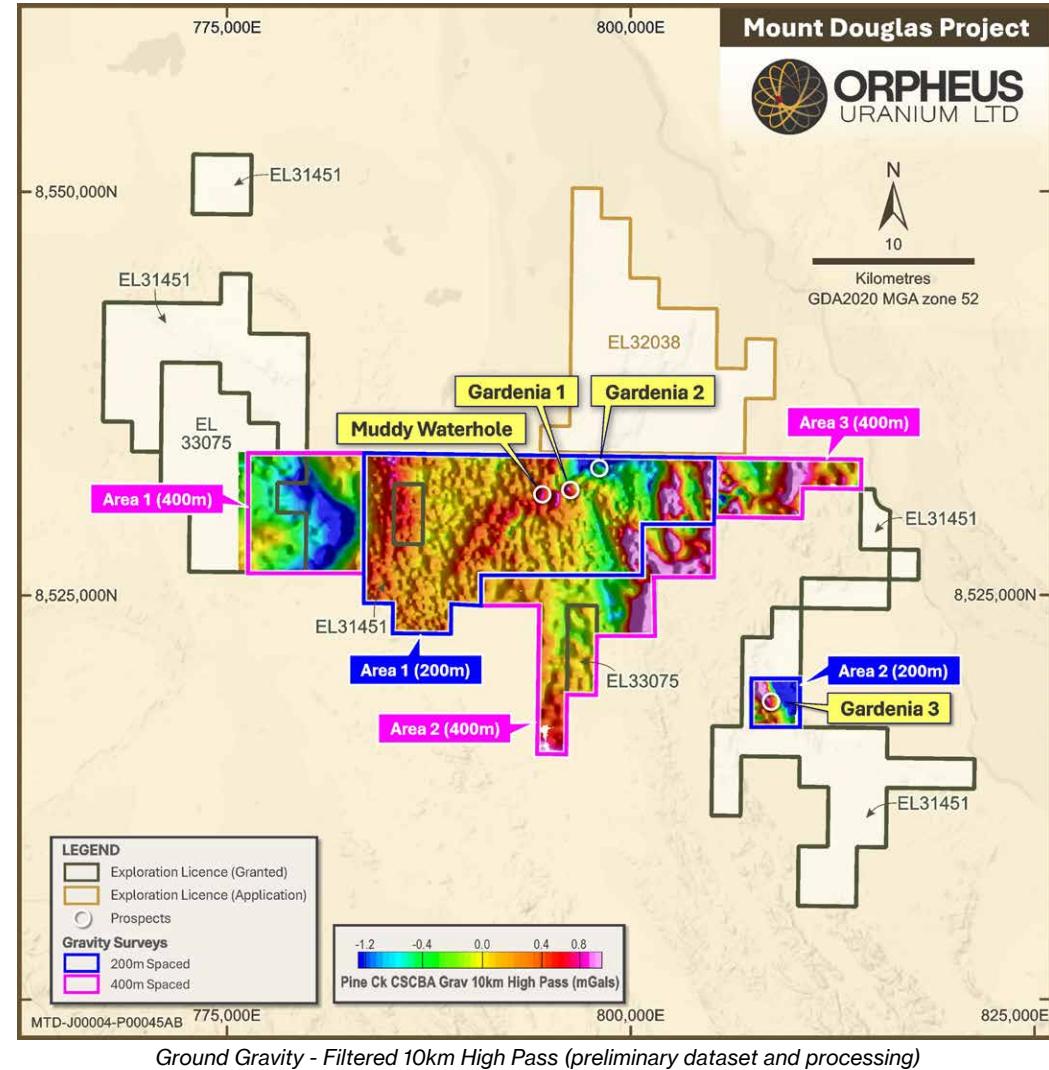
Early Exploration



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PROSPECTIVE FOR UNCONFORMITY AND VEIN-STYLE URANIUM MINERALISATION

- ✓ Evidence of **surficial radiometric anomalies** of up to **750ppm U** mapped throughout tenure and proximal to the overlying Kombolgie Sandstone
- ✓ **Geological synergy** with nearby **Thunderball Unconformity-Style Uranium Deposit** held by Patronus Resources (ASX: PTN)
- ✓ **Acquisition of high-resolution** NTGS co-funded **gravity data**, completed – survey results to **define and prioritise** **drill-ready unconformity-style uranium targets**, processing of dataset commenced
- ✓ **Heritage survey completed** over area(s) of interest, ongoing engagement with Traditional Owners over target areas
- ✓ **NT Government approved** **Mining Management Plan** (MMP) in place, enabling advanced-stage activities (delayed due to cyclone/wet season)



Key West Australian Project



Oobagooma Uranium Project³

Targeting “Sedimentary” redox-style mineralisation

Hosted within Yampi Sandstone of the Carboniferous Canning Basin

Limited Contemporary On-ground Exploration

Discovered in 1981 by Australian French Mining & Exploration Company (Afmeco), most recent drilling in 1983

Geological setting conducive to uranium mineralisation

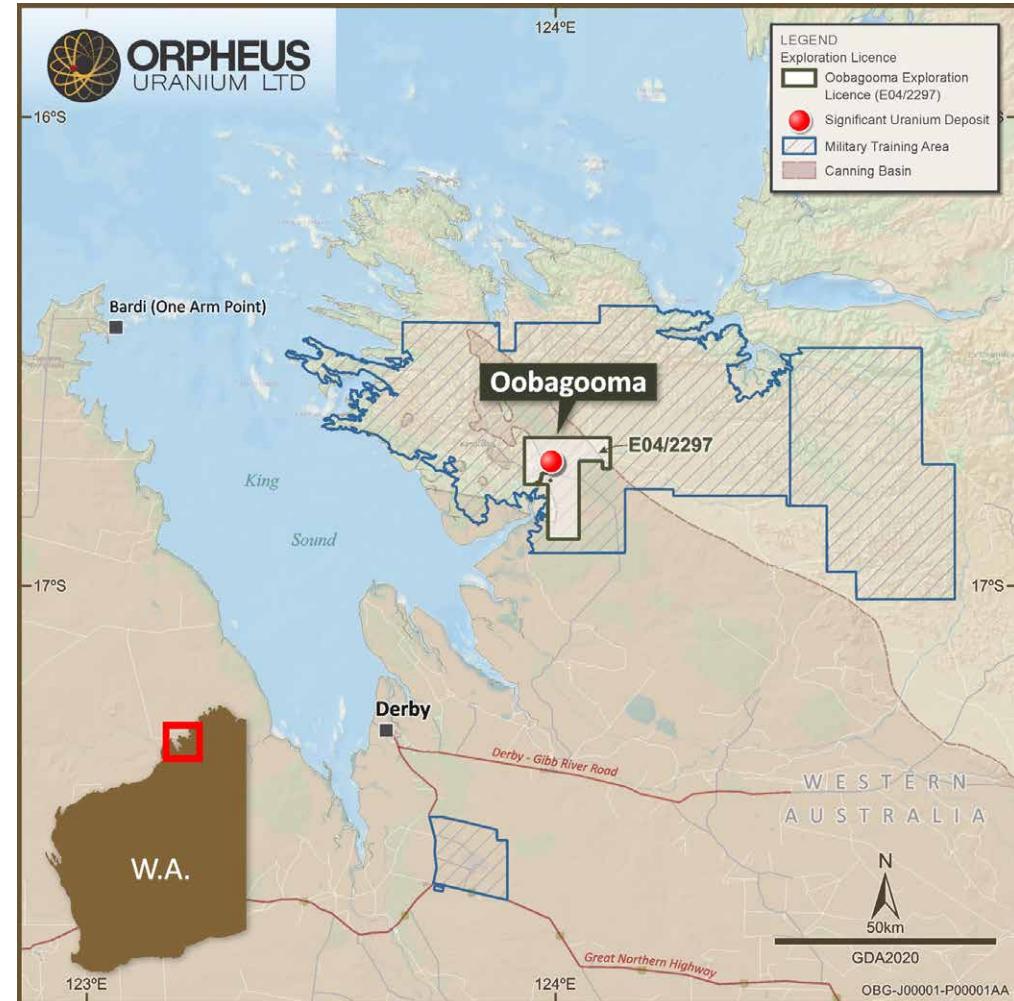
Evidence of mineralising source rocks, transport mechanism and geochemical trap sites

Elevated uranium grades – multiple holes with GT* > 1,000 (m x ppm)

Known uranium mineralisation extends over approximately 4 km of strike and 1.5 km width

Awaiting completion of sale agreement

Progressing conditions precedent considered standard for a transaction of this nature



3: Oobagooma Uranium Project – Orpheus Uranium Limited ASX: ORP - Acquisition of Oobagooma Uranium Project. Refer to ASX: ORP announcement dated 14 October 2025

Board and Management

Orpheus is led by a Board with decades of experience and current connections with all aspects of today's uranium industry.



Clinton Dubieniecki
Managing Director



Simon Mitchell
Chairman



Todd Williams
Non-Executive Director

Clinton is a trained geologist with over 18 years of experience and extensive exposure to the uranium sector. He has worked across the full value chain of uranium projects – from exploration through to resource development and production – with multinational companies including Orano, Uranium One, and most recently Heathgate Resources, where he spent nearly a decade contributing to the operation of the Beverly and Four Mile projects. Clinton joined Orpheus in May 2024.

Simon is a trained geologist with more than 35 years of experience spanning technical, financial, and corporate roles, including significant exposure to exploration and mine development. He spent over six years with uranium development company Toro Energy, and more recently has provided consulting services to several Canadian uranium companies, including NexGen Energy Ltd, developer of the world-class Rook I uranium project in the Athabasca Basin, Canada. Simon joined Orpheus in October 2023.

Todd is a trained geologist with more than a decade of experience across all aspects of mineral exploration. He is currently the Managing Director of Unico Silver and brings extensive uranium sector experience through his time with Power Minerals (formerly PepinNini). Notably, he was instrumental in vending the 'Big Lake' uranium project – recently recognised as Discovery of the Year – into Alligator Energy. Todd joined Orpheus in December 2023.

Exploration Team

The Orpheus exploration team has extensive uranium-specific expertise. Each geologist has experience across all stages of sedimentary-style uranium exploration and production at Australia's Beverley/Four Mile operation.



Isaac Lord
Senior Geologist



Jack Maughan
Lead Geodata Scientist



Chloe Reddaway
Project Geologist

Isaac is a geologist with five years of experience at Heathgate Resources, Australia's premier sedimentary-style (ISR) uranium producer. He has gained exposure across the full uranium value chain, from exploration through to production, with the past two years spent in the company's Resource Development department focusing on the Four Mile deposits. Isaac joined Orpheus in October 2026.

Jack is a geologist with 10 years of international experience across multiple sectors of the mining and exploration industry. He began his career with Heathgate Resources, contributing to successful exploration programs and production activities. Jack later gained experience in North America, including as a data scientist with BHP, before returning to Australia to consult to Heathgate and subsequently joining Data Rock as a data scientist. Jack joined Orpheus in May 2026.

Chloe is a geologist with two years of experience at Heathgate Resources, Australia's longest continuously operating sedimentary-style (ISR) uranium producer. She has worked across multiple geological departments, including uranium exploration and production, before contributing to regional exploration programs. Chloe joined Orpheus in June 2025.

Corporate Summary



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CAPITALISATION DATA

Shares on issue

281.7M

Share Price (11 December 2025)

\$0.042

Market Capitalisation

\$12.0M

Cash (30 September 2025)

\$3.07M

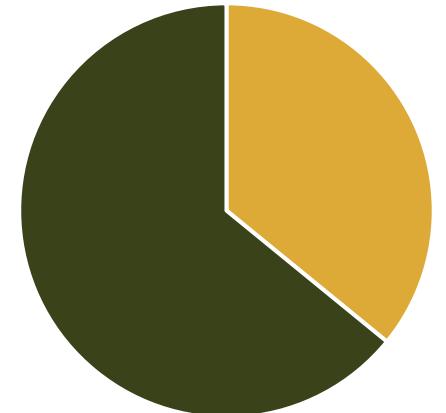
Liquid Assets (30 September 2025) *

\$0.64M

* Following the end of the quarter, Orpheus completed the sale of the remaining 3.2 million PSC shares for a total consideration of \$0.639 million

+ ORP holds 6.25M call options to acquire ordinary PSC shares at \$0.15 per share, expiring 11 April 2027

ASX: ORP Shareholder Spread

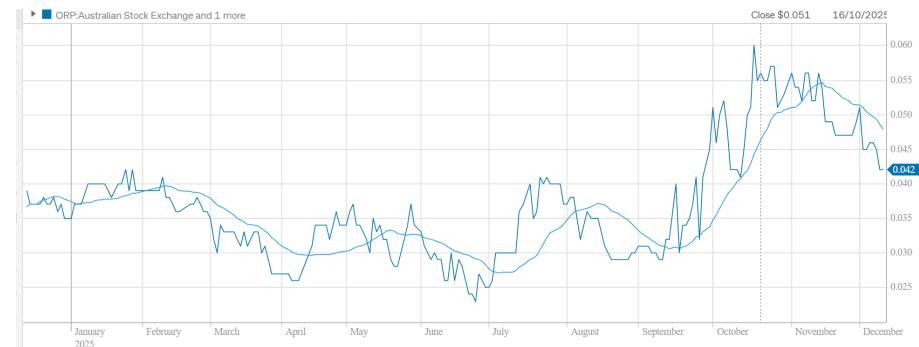


● **64.1%**
Top 20 Shareholders ● **35.9%**
Outside Top 20 Shareholders

BOARD & MANAGEMENT

Clint Dubieniecki – Managing Director & CEO
Simon Mitchell – Non-Exec Chairman
Todd Williams – Non-Exec Director
Richard Willson – Company Secretary

12 Month Share Price



5 Year Uranium Spot Price (USD/Lbs)

Fx = 1 USD = 1.51 AUD

Uranium (USD/Lb) **76.50**
(AUD/Lb) **115.27**



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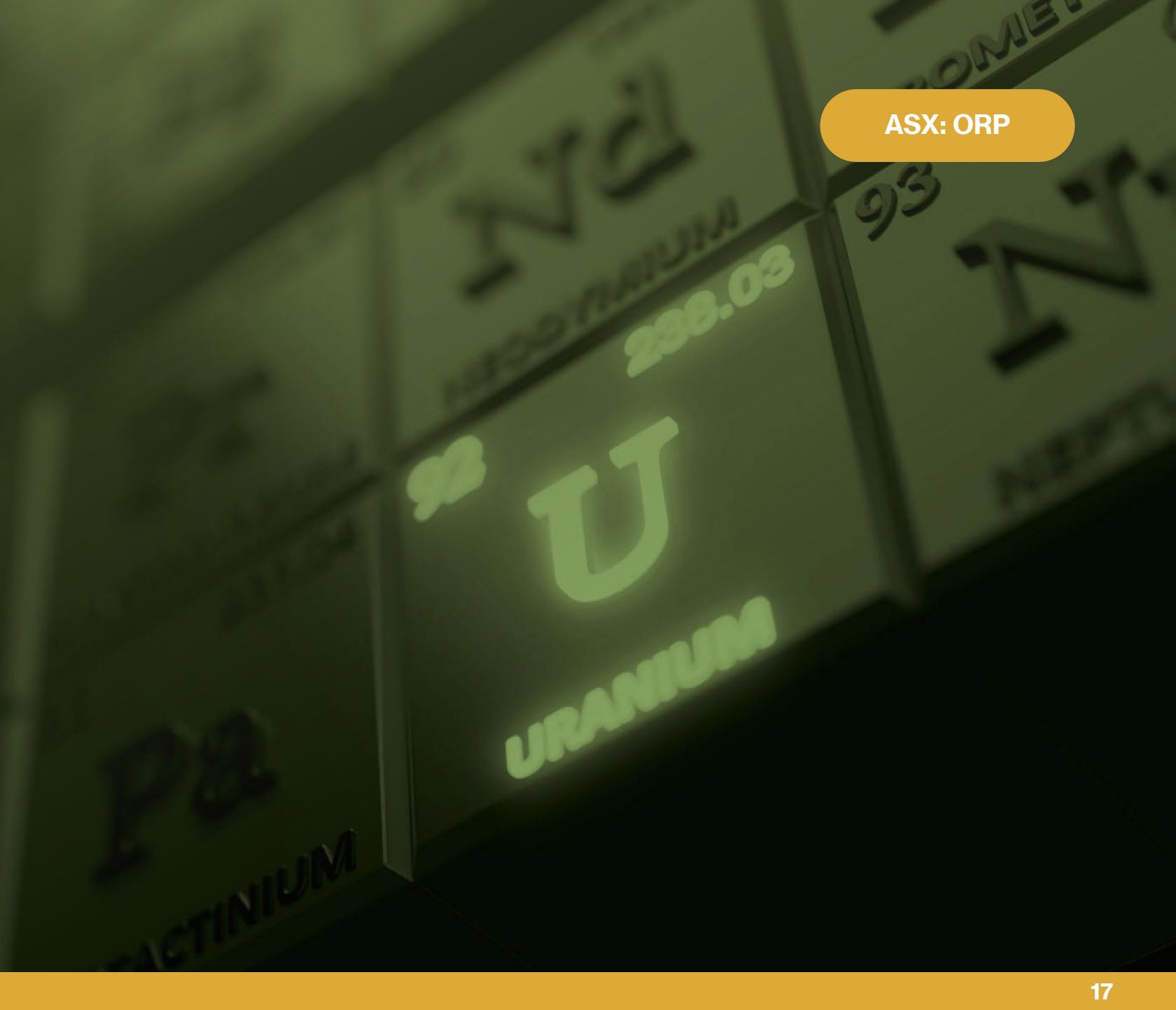
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Comparable Projects

Orpheus reports Mineral Resources of uranium mines, deposits or past production that it considers comparable to the style and location of uranium mineralisation in which it explores, as presented within this presentation, and listed in the table herein.

Project	Development Phase	Location	Company / Operator	Resource Classification	Average Grade (ppm U ₃ O ₈)	Contained Metal (Mlbs, U ₃ O ₈)	Source
Honeymoon Uranium Mine	Mine	Frome Embayment (Callabonna Sub-basin) South Australia	Boss Energy Limited ASX: BOE	Mineral Resource	660	36	Refer to ASX: BOE announcement dated 23 January 2024
Jasons Uranium Deposit	Resource			Inferred Resource	790	10.7	Refer to ASX: BOE announcement dated 23 January 2024
Goulds Dam Uranium Deposit	Resource			Combined Indicated and Inferred Resource	523	25	Refer to ASX: BOE announcement dated 23 January 2024
Saffron Deposit	Resource			Marmota Limited ASX: MEU	Inferred Resource	557	5.4
Radium Hill Historic Mine	Historic Mine	Curnamona Province South Australia	Areas reserved from the Mining Act, 1971 and Opal Act, 1995	Past production	1,310	2.6	Refer to https://minerals.sarig.sa.gov.au/MineralDepositDetails.aspx?DEPOSIT_NO=962
Crocker Well Deposit	Resource			Sinosteel Uranium SA Pty Ltd	Combined Indicated and Inferred Resource	281	11.7
Samphire Uranium project (Black bush)	Resource	Pirie Basin	Alligator Energy Limited ASX: AGE	Combined Indicated and Inferred Resource	676	18.0	Refer to ASX: AGE announcement dated 06 May 2025