ASX announcement

11 October 2021

Uranium Exploration Assets: Appointment of Managing Director

Argonaut Resources NL (ASX: ARE) (*Argonaut* or the *Company*) is pleased to announce the appointment of Mr Simon Mitchell as Managing Director of Argonaut's uranium subsidiary, Orpheus Minerals Ltd (*Orpheus*).

Argonaut has acquired a substantial package of prospective uranium exploration licences in South Australia and the Northern Territory (Figure 1). Argonaut holds these assets via a 100% held, unlisted public company, Orpheus. Argonaut plans to list Orpheus on the Australian Securities Exchange later this year.

Highlights

Appointment of Managing Director

- Mr Simon Mitchell has been appointed as Managing Director of Orpheus Minerals Ltd, an unlisted public company that holds Argonaut's uranium exploration assets.
- Mr Mitchell's expertise is very well suited to leading an ASX listed uranium exploration and development company.
- Mr Mitchell was General Manager of Business Development, responsible for mergers and acquisitions, corporate and project financing, and strategy of uranium developer and explorer, Toro Energy Ltd, from 2006 to 2013.
- Mr Mitchell is currently Managing Director of Southern Gold Ltd and will depart from this role in late October 2021.

Initial Public Offering

- IPO preparations are proceeding.
- The Argonaut board is considering:
  - ¬ an entitlement offer of Orpheus shares to Argonaut shareholders as part of the IPO process; and
  - ¬ a potential in-specie distribution of Orpheus shares to Argonaut shareholders (subject to statutory escrow provisions).

Uranium Exploration Assets

- Argonaut, via Orpheus, has assembled a package of prospective, uranium exploration projects in South Australia and the Northern Territory.
- Orpheus has 100% ownership or a clear pathway to 100% ownership of all related mineral titles.
  - ¬ Orpheus holds a 100% interest in three granted exploration licences and three exploration licence applications.
  - ¬ Orpheus has executed option agreements to acquire 100% of one granted exploration licence and one exploration licence application.

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Appointment of Managing Director

Mr Simon Mitchell has been appointed as Managing Director of Orpheus Minerals Ltd. Orpheus is an unlisted public company that holds Argonaut's uranium exploration assets.

Mr Mitchell is a geologist and finance executive by training who has a significant history working in uranium and precious metals exploration and development, capital markets, and investment banking. Accordingly, his expertise is very well suited to leading an ASX listed uranium exploration and development company.

Mr Mitchell was General Manager of Business Development, responsible for mergers and acquisitions, corporate and project financing, and strategy for uranium developer and explorer, Toro Energy Ltd, for seven years from 2006 to 2013. Simon has worked with numerous other companies including Aurora Gold, North Flinders Mines (ultimately Normandy NFM) and Commonwealth Bank. He negotiated acquisitions that led to the consolidation in ownership of the Wiluna uranium mine and was the lead executive in the takeover by Toro of Nova Energy. Mr Mitchell is currently Managing Director of Southern Gold Ltd, a role he will depart from on 29 October 2021.

"The Argonaut board is very pleased to welcome Simon Mitchell to his new role as Managing Director of Orpheus Minerals. I am confident that his project acquisition, uranium mine development and capital markets experience will augur well for Orpheus' future success."
Patrick Elliott, Chairman, Argonaut Resources.

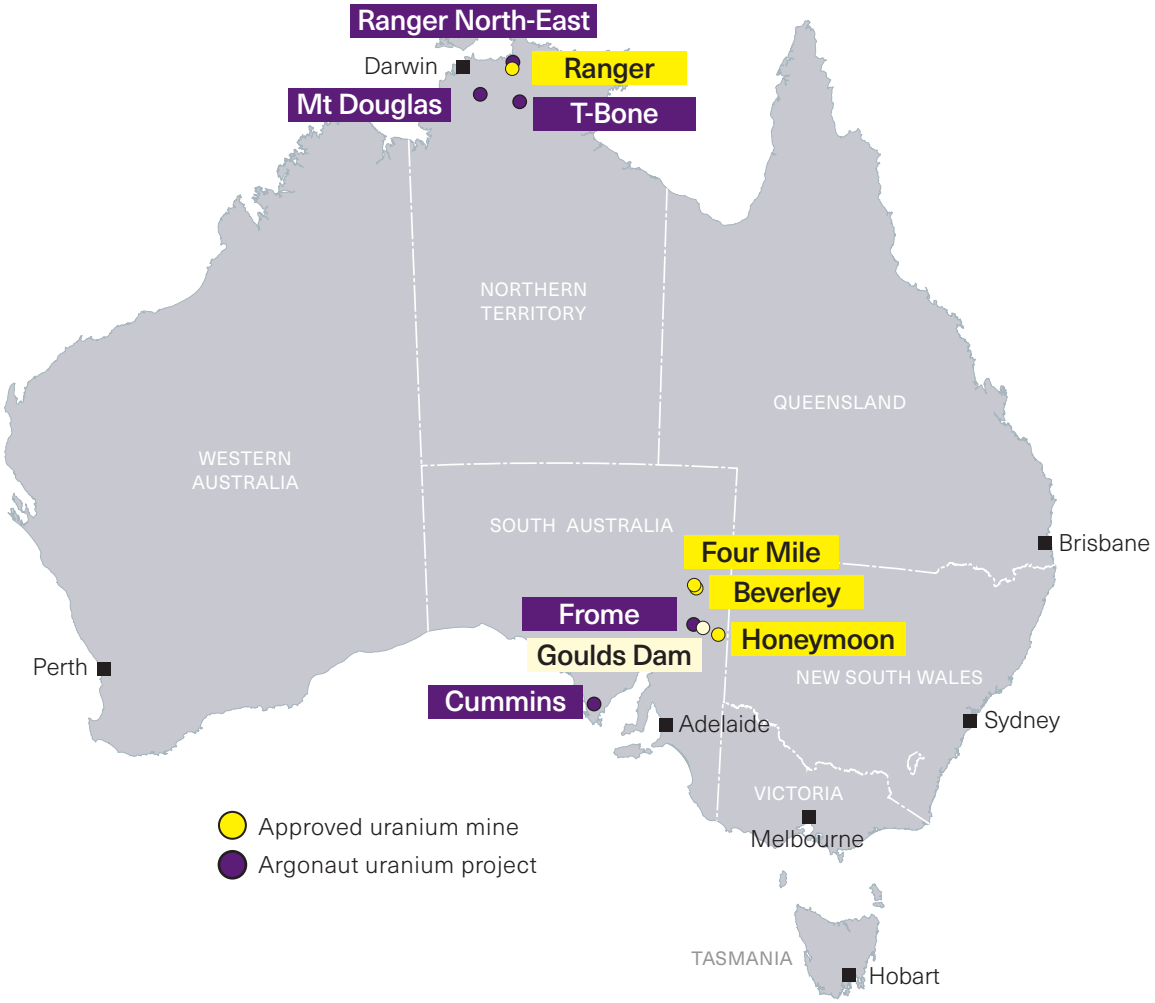

Figure 1 *Location map of Orpheus Minerals' uranium assets.*

Uranium Exploration Assets

Highlights

South Australia

- South Australian uranium exploration projects are sandstone-hosted, roll front uranium targets.
- These projects have potential for in-situ recovery (ISR) production.
  - ¬ Frome project:
    - » 2,894km^2 tenement package;
    - » advanced exploration with drill-ready targets; and
    - » nearby to existing producing uranium mines at:
      - – Honeymoon (Boss Energy Ltd) and
      - – Beverley/Four Mile (Heathgate Resources).
  - ¬ Cummins project:
    - » 953km^2 tenement;
    - » multiple uranium targets; and
    - » shallow, drill-ready paleochannel targets.

Northern Territory

- Hard rock, unconformity related uranium targets.
  - ¬ Mount Douglas project:
    - » 601km^2 tenement package;
    - » drill-ready targets.
  - ¬ Ranger North-East:
    - » 64km^2 tenement;
    - » uranium anomaly adjacent to Ranger uranium mine and Jabiluka (Energy Resources of Australia); and
    - » located outside Kakadu National Park.
  - ¬ T-Bone:
    - » 230km^2 tenement; and
    - » prospective uranium anomaly on a major structure that hosts other deposits.

Argonaut, via Orpheus, has assembled a package of prospective, uranium projects in South Australia and the Northern Territory that are either 100% held or secured via an option to acquire 100%. Projects were chosen following a systematic review of uranium deposit-styles and available projects. The review covered uranium opportunities available for application in South Australia or Northern Territory where the majority of permitted and all operating Australian uranium mines are located. Three of the five projects selected were on open ground and were secured via application to the relevant department. The Mount Douglas project was purchased via a two-stage payment of $80,000 (paid in 2021) and $120,000.

South Australian Projects

South Australia hosts four out of six approved Australian uranium mines: Olympic Dam, Beverley, Four Mile and Honeymoon. Three of these mines are nearby to the Frome project. Uranium production at these existing, nearby mines is by in-situ recovery, a process that avoids mass excavation of rock.

Frome Project, SA

- Substantial landholding of 2,894 square kilometres covering:
  - ¬ a network of sandstone paleochannels containing groundwater that drains from uranium-bearing granite source rocks (Figure 3);
  - ¬ existing drilling with downhole gamma logs that defines 12 line-kilometres of “redox fronts” within thick sandstone units; and
  - ¬ two walk-up, high priority drilling targets plus at least six early-stage drilling targets.
- The Frome project is nearby to the Honeymoon, Four Mile and Beverley uranium mines and is immediately adjacent to the Goulds Dam uranium deposit (Figure 2).
- Argonaut will base exploration works on the “two fluids” model for uranium roll front deposits (Figure 4).

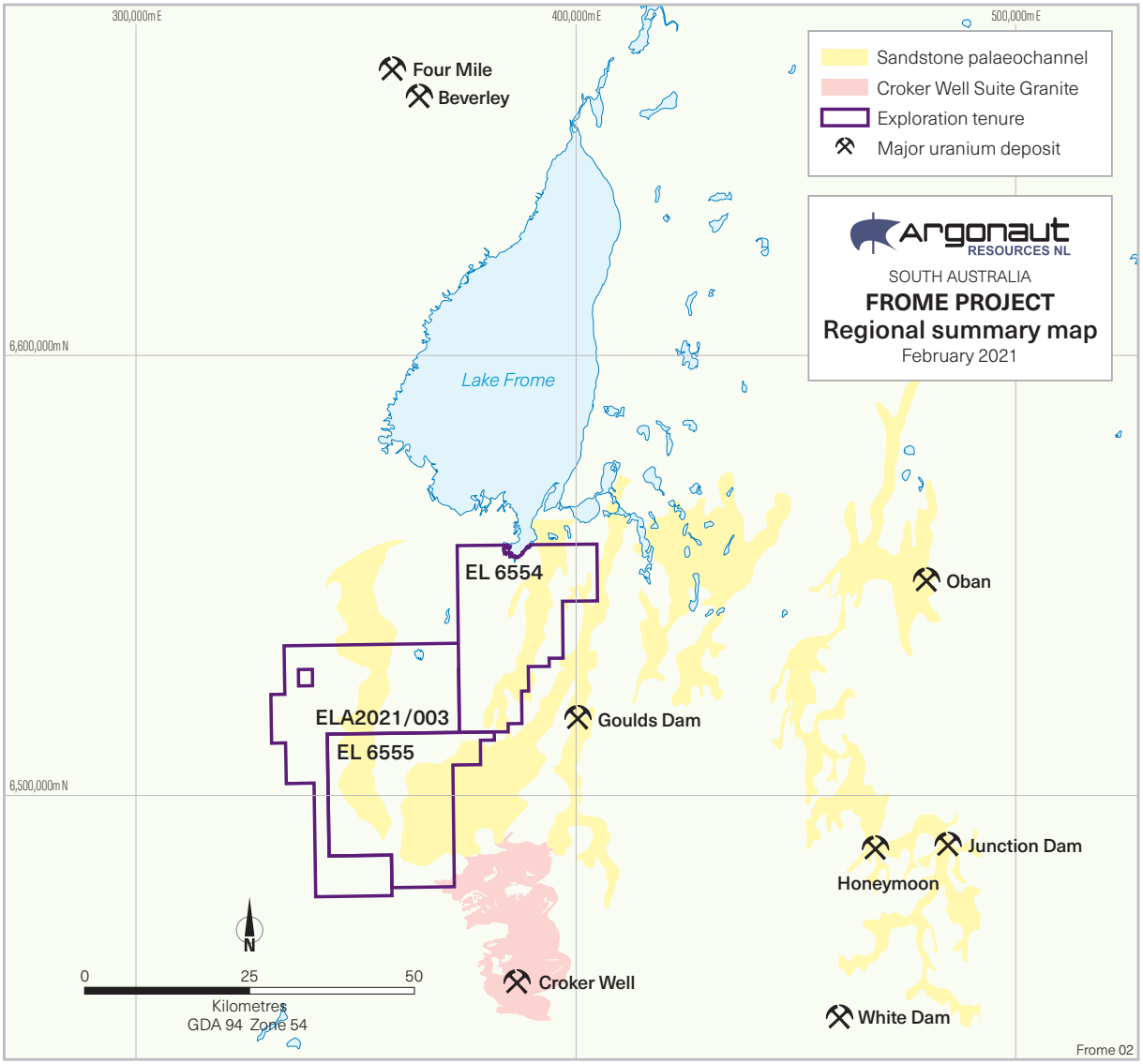

Figure 2 *Frome project tenement location and major uranium deposits.*

The Frome project involves three prospective exploration licences in the Frome Embayment area of South Australia, which is arguably the most prospective region in Australia for sandstone-hosted uranium deposits. Importantly, the area is nearby to existing, licenced uranium production sites. The area around Lake Frome hosts the Beverley and Four Mile deposits in the northwest and the Honeymoon, Goulds Dam and Oban deposits in the southeast (Figure 2).

Prospectivity

These licences cover sandstone-bearing paleochannels that contain groundwater that drains from uranium-bearing granites. Previous drilling of these paleochannels confirms the presence of excellent sandstone aquifers at or near the base of the channels. These sandstone aquifers are 4m to 20m thick (typically 10–12m) and contain the necessary permeable coarse sands.

These basal sandstones have been shown to contain both oxidised, uranium-bearing zones and reduced zones. Work by Orpheus has confirmed 12 kilometres of "redox front" within paleochannels along which high priority exploration is necessary. Redox fronts are chemical boundary that can concentrate uranium into potentially economic deposits.

Argonaut is applying the "two fluids" model for uranium roll front deposits (Figure 4) which involves oxidised, uranium bearing groundwater (Fluid 1) flowing along the permeable sandstone units until it encounters reducing groundwaters which have leaked upwards through faults from deeper, hydrocarbon-bearing aquifers (Fluid 2). The interface of these fluids creates a redox front that can trap and concentrate uranium.

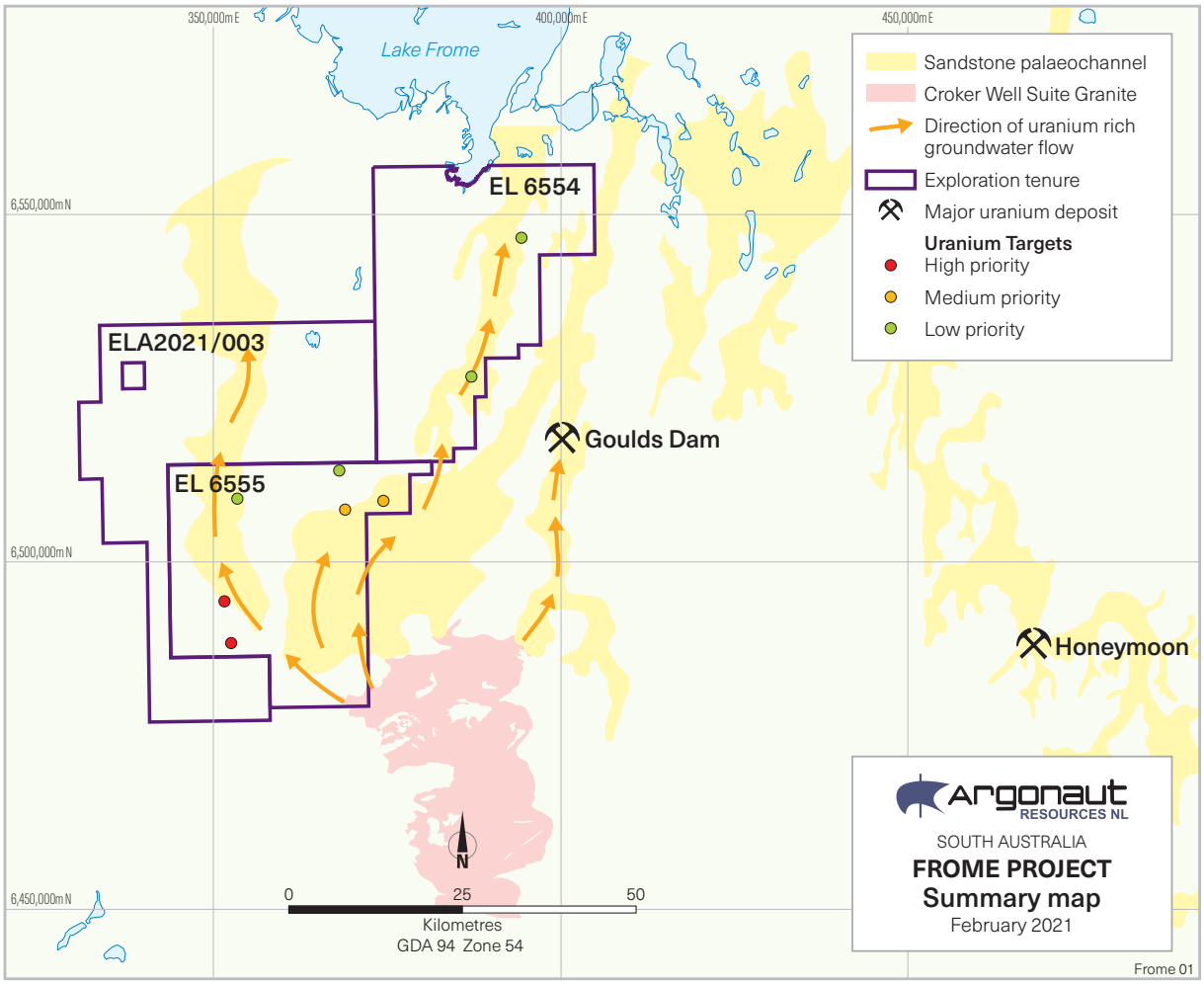

Figure 3 *Frome project licences with Eyre Formation sandstone palaeochannels – which have been shown to host uranium deposits – and the Crocker Well Suite granite which is a uranium-bearing source rock.*

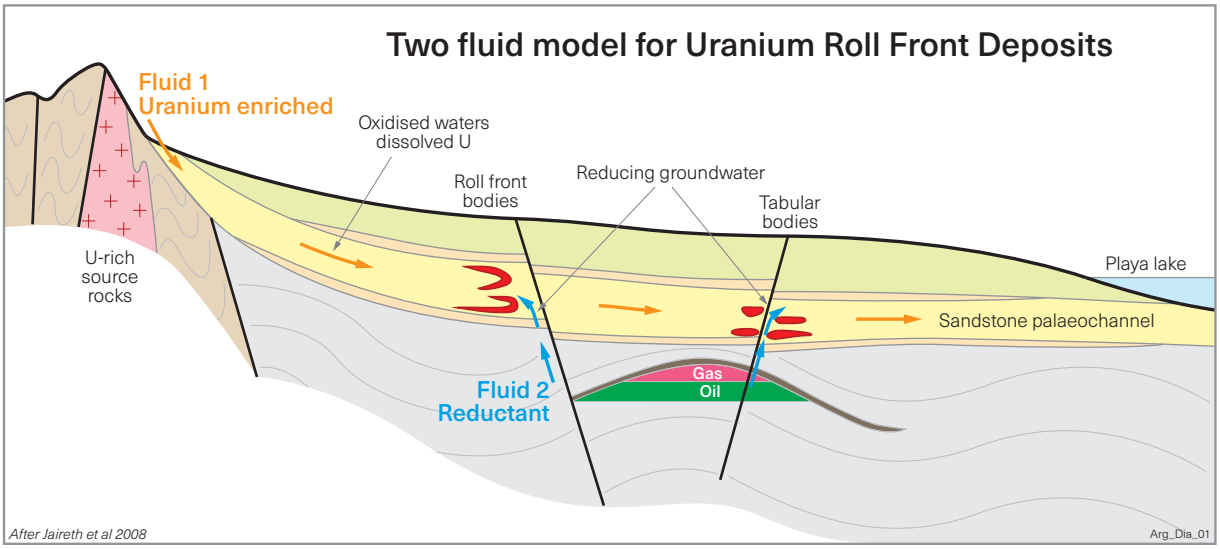

Figure 4 *Diagram showing Two Fluid model. Uranium is carried in oxidised groundwaters and reduced by hydrocarbons and/or H^2S released from the underlying hydrocarbons. Both roll–front and tabular ore bodies can result from the process. After Jaireth et al 2008.*

Tenure

Orpheus holds a 100% interest in two large exploration licences – both greater than 950 square kilometres and a third licence via an option, sale and milestone agreement (Figure 3). This agreement provides for the acquisition by Orpheus of a 100% interest of a third similarly large exploration licence, currently in the application stage (Figure 3). Frome project exploration licences are described in detail below.

Frome project exploration licences:

- EL6554, Frome Downs – 960km^2 – 100% Orpheus;
- EL6555, Curnamona – 947km^2 – 100% Orpheus; and
- ELA 2021/003, Erudina – 987km^2 – option to acquire 100%.

Cummins Project, SA

The Cummins project area is located on the southern Eyre Peninsula, South Australia. The area features Tertiary age paleochannels that have been demonstrated by historic drilling to contain concentrations of uranium. The paleochannels have upper and lower units that are similarly prospective. The upper unit is very close to surface and presents as a walk-up drilling target in urgent need of further drilling.

Uranium contained in these subsurface channels is interpreted to have been sourced from two adjacent uranium-bearing granites (Figure 5).

The Cummins licence area also contains prospective calcrete-hosted uranium targets and dissolved uranium in groundwater.

Prospectivity

Four distinct uranium exploration targets have been identified within the Cummins exploration licence (see figure 6, Targets A to D). These targets are:

Target A: upper paleochannel unit (20-30m depth) defined by a consistently high gamma ray response from wireline logs of historic drill holes.

Target B: lower paleochannel unit (60-70m depth) containing reduced, pyritic sands, also defined by gamma ray logs of historic drilling.

Target C: dissolved uranium in groundwater defined by a groundwater sampling program undertaken in the 1970s.

Target D: potential near-surface calcrete-hosted uranium deposits defined by unusually high uranium channel responses in a modern (2011) airborne radiometric survey.

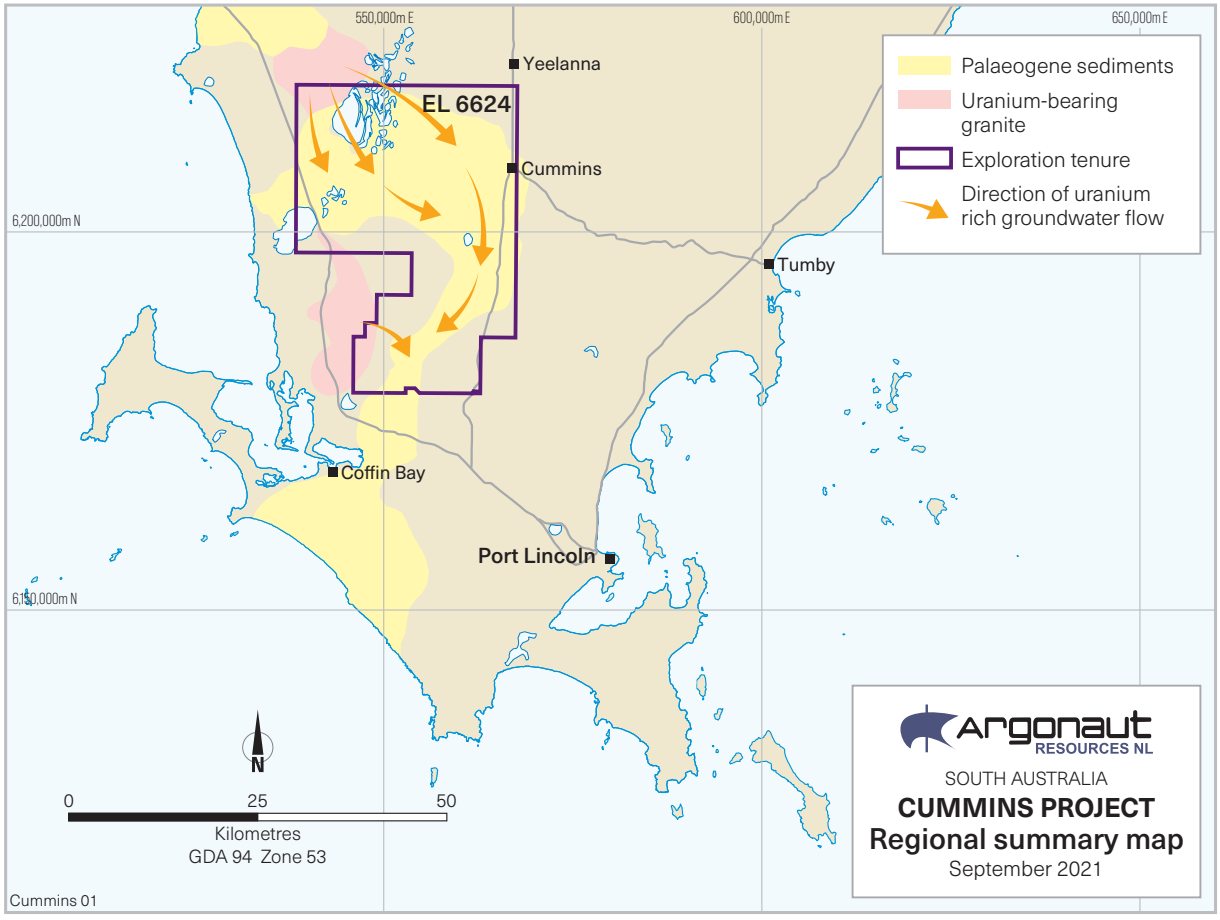

Figure 5 *The Cummins project licence showing palaeochannels with demonstrated uranium content within the area of the licence and the granite bodies which are interpreted to have provided the uranium source material.*

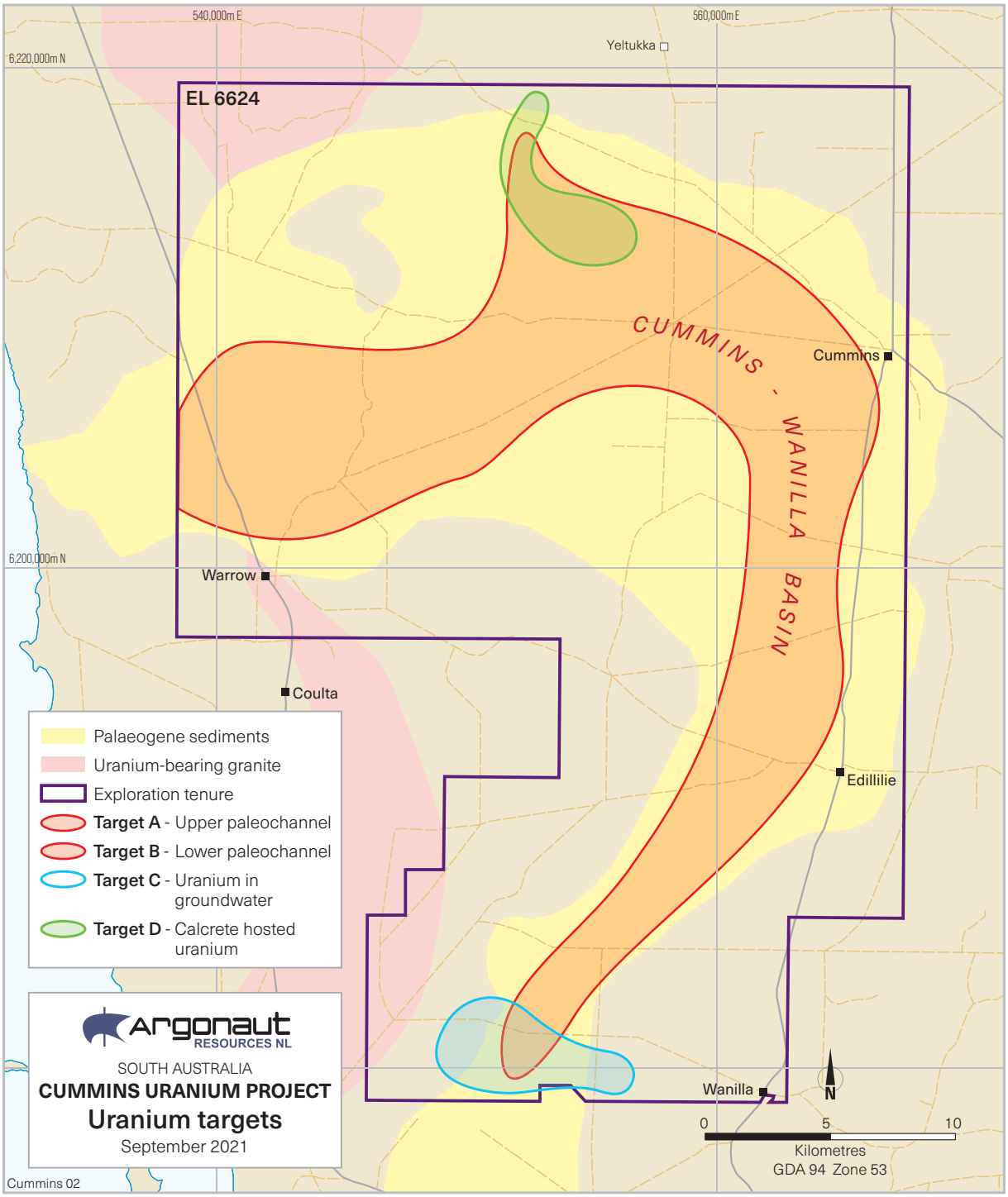

Figure 6 *Cummins uranium exploration project – target locations.*

Orpheus has developed exploration programs designed to test all targets and it plans to execute these programs following the successful completion of the proposed IPO.

Targets A and B relate to a sandstone-bearing paleochannel that contains groundwater that drains from uranium-bearing granites (Figure 6). Previous drilling of these paleochannels confirms the presence of sandstone aquifers within the channels. These sandstone aquifers contain the necessary permeable coarse sands and have been shown by gamma ray logging of historic drill holes to contain uranium.

Tenure

Option, Sale and Milestone Agreement

Orpheus holds its interest in the Cummins licence via an option, sale and milestone agreement. This agreement provides for the acquisition by Orpheus of a 100% interest of this large, recently granted exploration licence.

Cummins project exploration licence:

- Cummins, SA – sandstone-hosted roll front targets plus calcrete groundwater uranium targets:
  - EL 6624, Cummins – 953km^2 – option to acquire 100%.

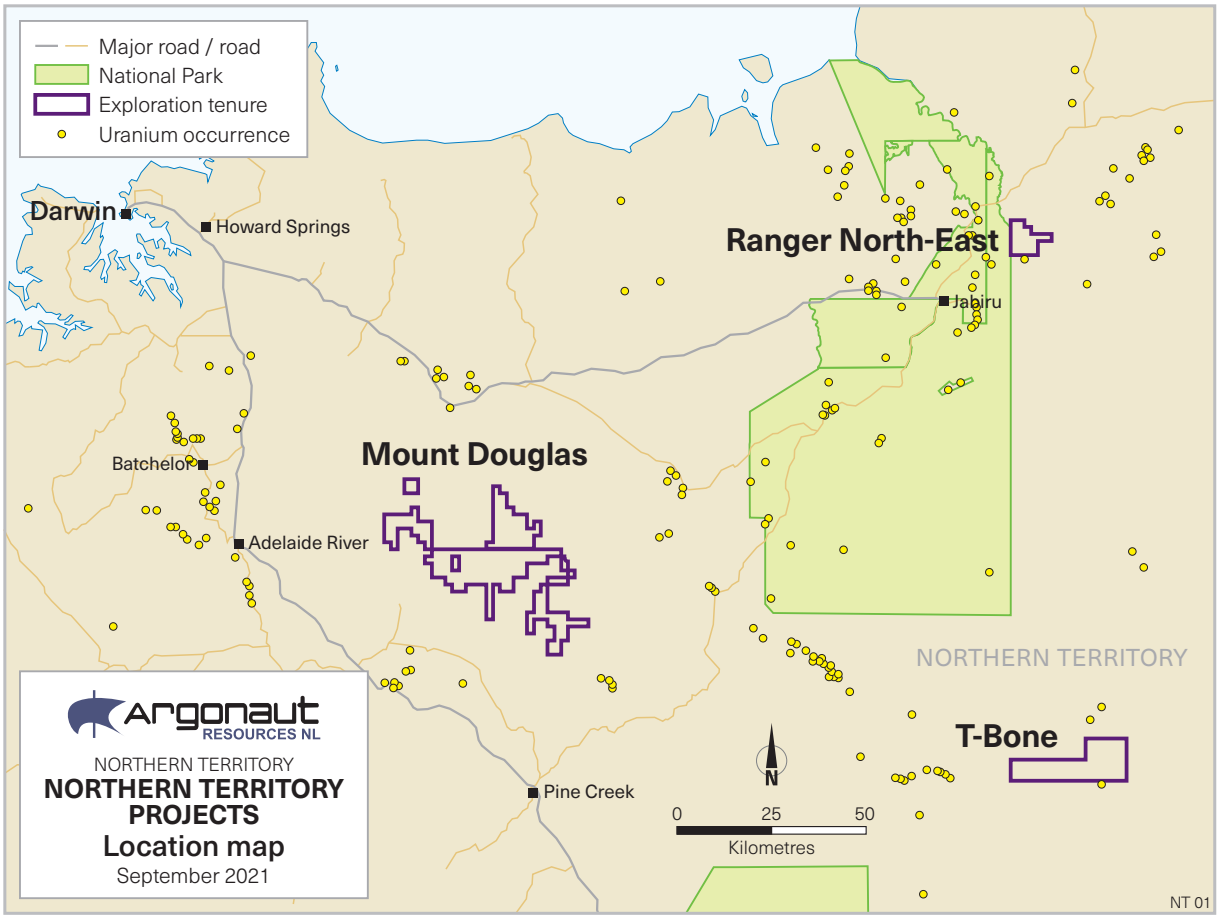

Figure 7 *Location of Orpheus Minerals uranium exploration projects in the Northern Territory.*

Northern Territory Projects

Most of the historic uranium production in the Northern Territory has been from the Alligator Rivers Uranium Field. The Alligator Rivers field contains unconformity-related uranium deposits that locally contain more than 100,000 tonne contained U_3O_8, with grades generally in the range 0.2-2% U_3O_8. These deposits, which include Ranger, Jabiluka, Koongarra and Nabarlek, are typically hosted close to the unconformity at the base of the MacArthur Basin.

In January 2021, production at the Ranger uranium mine ceased after 40 years. The Ranger mine produced over 132,000 tonnes of U_3O_8.

Mount Douglas, NT

The Mount Douglas area covers several geological settings that are significantly prospective for deposits of gold, base metals and uranium. These targets have received less attention than surrounding areas during historic exploration efforts due to thin sedimentary cover of the rocks favourable for mineralisation. The area covers portions of the drainage of the Margaret River (part of the Adelaide River system), and the McKinlay/ Mary Rivers catchments. The licence areas are centred about 130 kilometres southeast of Darwin (Figure 7) and extend south from the Rustlers Roost Mine near Mount Bundey.

Propectivity

Mount Douglas features a recent discovery of outcropping uranium-bearing rocks near the base of the Kombolgie Sandstone. Surface sampling return assays of 750 to 1,000ppm uranium, possibly the highest uranium values yet obtained around the Mount Douglas Outlier. These unconformity-related uranium deposits are the most important uranium deposit styles in the Northern Territory.

The discovery was made as a result of a detailed airborne radiometric survey that became available in recent years. This uranium discovery clearly warrants follow-up drilling to test the extent of mineralisation. Orpheus has plans to drill at Mount Douglas shortly after the proposed IPO.

Tenure

The Mount Douglas project was purchased by Orpheus via a two-stage payment of $80,000 (paid in 2021) and $120,000.

- Mount Douglas, NT – unconformity-related uranium covered by one granted licence and one licence application.
  - ¬ EL31451, Mount Douglas – 474km^2 – 100%; and
  - ¬ ELA32038, Mount Douglas – 127km^2 – 100%.

Ranger North-East, NT

The Ranger North-East uranium exploration project is located within the Alligator Rivers Uranium Field, nearby to the Ranger and Jabiluka uranium deposits in the Northern Territory. The project area is covered by a single exploration licence application held by Orpheus.

Prospectivity

The Ranger North-East application area features an unconformity-style, hard rock uranium target defined by a strong radiometric (uranium/thorium) anomaly. Geologically, the anomaly sits at the base of the Kombolgie sandstone unit which is prospective for uranium in this area, and is at the intersection of a major northwest trending fault and an intersecting east-northeast structure.

Open file records show limited historic exploration at the site.

Tenure

Orpheus holds a 100% interest in an exploration licence application.

- Ranger North-East, NT – Ranger-style unconformity related targets, Alligator Rivers Uranium Field.
  - ¬ ELA32446, Ranger North-East – 64km^2 – 100%.

T-Bone, NT

The T-Bone uranium exploration project is located northwest of Katherine, within the South Alligator Valley Mineral Field which contains the Coronation Hill uranium deposit. The Coronation Hill mine produced 26,000 tonnes of uranium ore at 2.6kg/t U_3O_8 during the 1950s and 1960s.

Prospectivity

The T-Bone area is defined by uranium/thorium radiometric anomaly that sits on a regional, northwest striking fault zone. Orpheus has identified a possible unconformity-style uranium target beneath alluvium to the north of this structure.

No significant uranium exploration has been undertaken at the target area and Orpheus has plans for a grassroots exploration program at the site following the licence grant and the potential IPO.

Tenure

Orpheus holds a 100% interest in an exploration licence application.

- T-Bone, NT – South Alligator Valley Mineral Field – unconformity related targets near Coronation Hill deposit:
  - ELA32445, T-Bone – 230km^2 – 100%.

About Argonaut

Argonaut Resources NL is an Australian Securities Exchange listed exploration and development company focused on the Murdie copper project in South Australia and copper development at the Nyungu copper-cobalt deposit at the Lumwana West project in North-western Zambia.

This report is authorised for release by:

Lindsay Owler
Director and CEO

Argonaut Resources NL

Sections of information contained in this report that relate to Exploration Results were compiled or supervised by Mr Lindsay Owler BSc, MAusIMM who is a Member of the Australasian Institute of Mining and Metallurgy and is a full-time employee of Argonaut Resources NL. Mr Owler holds shares and options in Argonaut Resources NL, details of which are disclosed in the Company's 2021 Annual Report. Mr Owler 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 Owler consents to the inclusion in this report of the matters based on his information in the form and context in which it appears.