



December 2021 Quarterly Report

Boss delivers on strategy to prepare for uranium production while growing inventory

Quarterly Highlights

- Significant progress made in preparation for re-start of Honeymoon uranium project in South Australia
- Front-end engineering work more than 50% complete, high-voltage power connection agreement executed, and 100% of Piping and Instrumentation Diagrams now finalised
- New wellfield design optimised, which better addresses in-ground resource improving leach efficiency
- Project Execution Plan approved for Honeymoon's restart; This outlines the objectives, processes and strategies to be employed by the Company's personnel (Owner's Team) and appointed EPCM contractors, together forming the integrated Project Team
- Geophysical phase of Boss' Accelerated Discovery Initiative program completed, with successful passive and seismic reflection exploration surveys
- Resource growth drilling underway to test new targets as part of plan to increase the inventory and forecast production rate
- Share capital consolidated at ratio of one-for-eight, reflecting Boss' ongoing strategy to generate increasing ownership of its stock among leading global institutional investors
- Boss' inventory of 1.25Mlb of U_3O_8 has a current spot market value of US\$57.04M (A\$79.22M). Boss paid US\$30.15/lb for this inventory in March 2021 for a total cost of US\$37.68M (A\$49.69M). This represents a book profit of A\$29.53M
- In addition to this windfall, the inventory is of immense strategic value to Boss on several levels as it increases flexibility in project funding and offtake negotiations with customers in preparation to re-start production
- In a sign of the increasing strength of the uranium market and Honeymoon's status in the industry as a credible near-term producer, Boss received several requests for tender proposals during the quarter from three countries with nuclear energy
- "We have a two-pronged strategy for creating shareholder value. This involves preparations for the start of production and cashflow, which will make Boss Australia's next uranium producer, and growing the uranium inventory." – Boss MD Duncan Craib

FOR FURTHER INFORMATION PLEASE CONTACT:

Boss Energy Limited
ABN 38 116 834 336

Suite 3, Churchill Court
234 Churchill Avenue
Subiaco WA 6008

Duncan Craib - Managing Director/ CEO
+61 (08) 6263 4494

Paul Armstrong – Public Relations
+61 (08) 9388 1474

ASX: BOE; OTCQB: BQSSF

www.bossenergy.com

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Boss Energy (ASX: BOE; OTCQB: BQSSF) is pleased to report on the strong progress it made in the past quarter towards its goal of being Australia's next uranium producer at its Honeymoon Project in South Australia.

Following release of the highly successful Enhanced Feasibility Study for Honeymoon in June 2021, Boss has rapidly advanced key workstreams in preparation for a Final Investment Decision (FID).

Boss is undertaking multiple work streams in line with its strategy to ensure Honeymoon is as close as practicably possible to re-starting production once the Company determines that the uranium price makes it commercially desirable to do so.

Boss Managing Director Duncan Craib said: "Our latest outstanding progress demonstrates why Honeymoon is set to be Australia's next uranium producer.

"Our strategy is aimed at ensuring Boss can move from a Final Investment Decision into execution and production as rapidly as possible.

"This will enable us to capitalise on a rising uranium price at an opportunistic time."

In parallel, Boss is accelerating development of its exploration strategy with a staged approach that has significantly expanded the global JORC resource at Honeymoon from 16.57Mlbs to 71.67Mlbs (~433% increase) since project acquisition in December 2015¹.

During the quarter, Boss started exploration drilling as part of its strategy to continue growing the inventory and forecast production rate.

The drilling program will start testing highly promising targets identified by the recently completed geophysical programs using seismic reflection surveys.

Initial drill results are expected to be released to the ASX in the coming weeks.

Engineering process on track and Project execution plan approved

The critical planning tool of Front-End Engineering Design (FEED) studies are more than half complete and remains on target to finish in the March quarter, 2022. This will allow detailed design to commence immediately after an FID is made.

Boss has also approved the Project Execution Plan (PEP) for Honeymoon's restart, which outlines the objectives, processes and strategies to be employed by the Company's personnel (Owner's Team) and appointed EPCM Engineer. This plan will also establish a framework to ensure that project expectations and key performance indicators are met.

Piping and Instrumentation Diagrams 100% finalised

Completion and lock of designs of Piping and Instrumentation Diagrams (P&ID's) is now 100% finalised (95 diagrams).

Over the past 6 weeks the final P&ID layouts for Wellfield Infrastructure, Water Treatment Plant and general water services were completed.

¹ Refer to ASX: BOE announcement dated 25 February 2019. Refer Appendix 1 for Honeymoon JORC 2012 Resource.

Connection Service Agreement Executed

Taking another key step in its strategy to re-start production at Honeymoon, Boss has executed a high voltage connection service agreement with Essential Energy, a statutory state-owned corporation established under the Energy Services Corporations Act 1995 (New South Wales).

Securing power supply is a primary requirement for any mine development. Power supply for the Honeymoon Mine is via overhead transmission line from the national electricity grid via Australia's oldest mining town Broken Hill, located 65km to the south-east, and nearby Cockburn. Honeymoon's fortunate geographical location ensures security of power will be provided by the national grid.

Upgrading Honeymoon's nameplate production to 2.45 Mlbs U_3O_8 required the negotiation of a new high voltage connection agreement, where additional transformers and other voltage control equipment are required at the connection and destination points.

Wellfield Design Optimisation

Honeymoon's wellfields have been planned over the mineable resource. Wellfield pattern radii are varied to suit the orebody morphology and achieve an economic wellfield development cost-per-pound of uranium.

A detailed review of the high-grade Historic Wellfields has revealed that of the existing near-mine Wellfields A B and C, only 28% (0.7 Mlbs) of the total uranium resource was produced.² The findings show that the previous wells were constructed with standard water supply well technology which failed to accurately target the mineralised horizons. The primary reason for the incomplete leaching of the basal sand resource is that wellfields had been constructed using methods applicable to agricultural water supply wells. Such designs comprised PVC Pipe installed to the top of the approximate mineralisation. The well was then drilled to depth and a stainless-steel mesh screen was telescoped into the approximate position of the mineralisation (Figure 1).

Honeymoon's wellfields are now designed with a very precise production zone that directs the injected leach solution into contact with the target ore horizons. The opening between the well and the ore horizon is precisely cut (under-reamed) out of a sealed PVC bore casing. This well design is standard In-Situ Recovery technology used globally, representing a significant enhancement over the previous the previous wellfields (Figure 2).

² Estimates extracted from the Resource Block Model reported in Boss Energy ASX Release 25 February 2019.

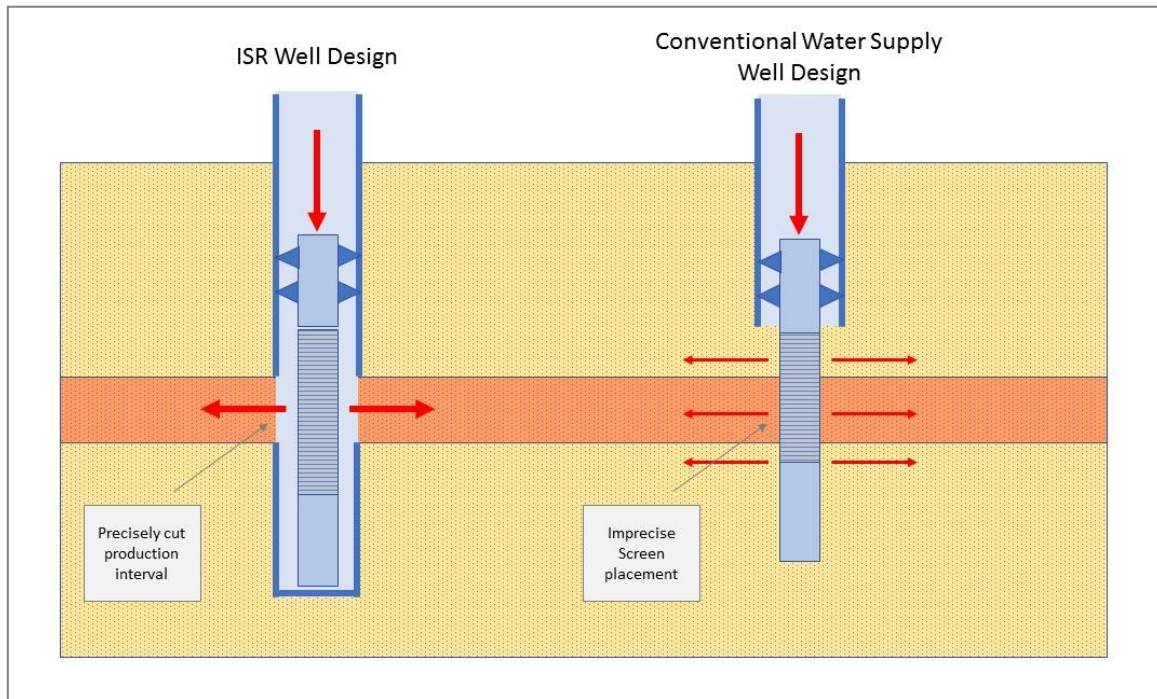


Figure 1: Specialist ISR Well Design planned for Honeymoon compared to the Agricultural water supply well construction used in historic wellfields A, B and C. Mineralisation is now mapped, resulting in precise screen intervals and improved fluid controls.

Screens will now be optimally placed across all uranium mineralisation with precise intervals, allowing uranium mineralisation to be mapped in detail before screened intervals are selected. A more consistent wellfield design will completely address the uranium mineralisation over the historic wellfield patterns A, B and C.

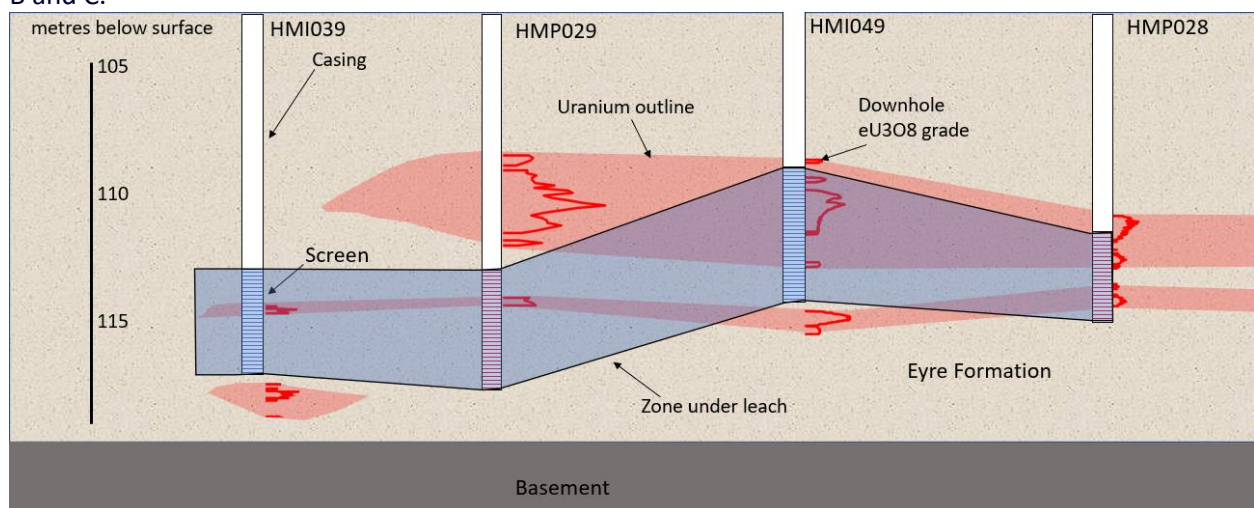


Figure 2a Historic Wellfield Design. Well screens and leached zone failed to address all uranium mineralisation.

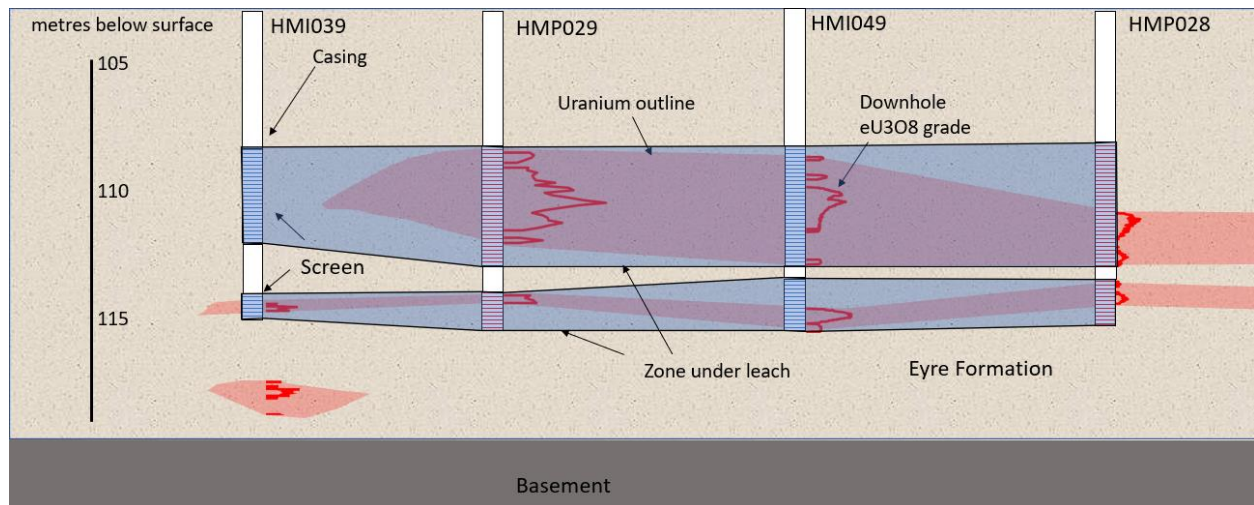


Figure 2b: Optimised Wellfield Design: Well Screens and leached zones completely address uranium mineralisation.

Resource Growth Drilling

The Company's focus on exploration is aimed at increasing Honeymoon's production profile and extending its mine life. The strategy is two-fold:

1. Targeting the greenfields exploration targets to further advance current identified zones of potential high-grade mineralisation; and
2. Upgrading the satellite JORC resources of the Jason's and Gould's Dam Deposits.

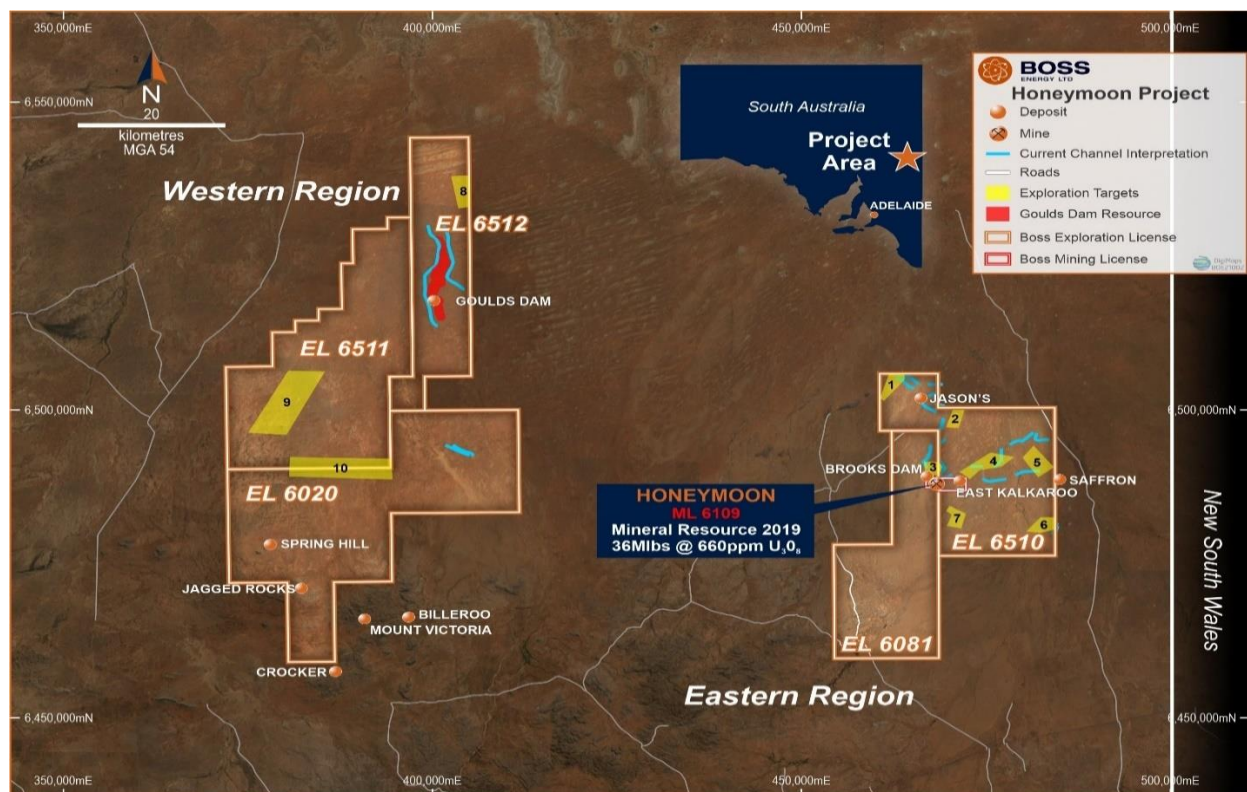


Figure 3: Boss' Honeymoon Uranium Project Tenements and Exploration Target Areas, South Australia.

On 2 November 2021, Boss announced the successful combination of passive seismic and trial surveys of the modern seismic reflection as the last step of geophysical data integration before mobilisation of drill rigs, with all new surface exploration information continuously integrated with all other available geoscientific datasets. This includes the collation of all AEM, magnetics, gravity and radiometric survey data, all available geochemical surface sampling data, and the comprehensive suite of 3D geological models created since 2018.

This combination of all datasets is critical to the ongoing development and progression of any exploration project. Resulting interpretations are being utilised to support the current ongoing 2021/2022 exploration field season, with continued introduction of innovative exploration alternatives for palaeovalley definition, smarter drill target generation, and the eventual growth of existing uranium JORC mineral resources (currently totalling 71.6Mlbs U₃O₈)³.

The first phase of exploration drilling, which as part of the Company's Accelerated Discovery Initiative, was undertaken in November and December 2021.

The Company looks forward to announcing initial drill results in the coming weeks.

Heritage clearance survey

A cultural heritage clearance survey was carried out within the Eastern Region tenements in late December 2021 with eight representatives from the Ngadjuri Adnyamathanha Wilyakali Native Title Aboriginal Corporation (NAWNTAC). The survey was designed to cover several key priority areas for future exploration and infill drilling, including the Jason's resource area, Brooks Dam, Brooks Dam North, Eaglehawk Dam and East Kalkaroo Extension.

Boss Energy would like to thank the Traditional Owners and all others involved in the organisation and execution of what was a very successful clearance survey.

ADI Grant

The Company's long-term regional investigation strategy had always included using new innovative methods for large-scale exploration. The first phase of the ADI program involving seismic surveying is now complete. Follow-up drilling will complete the requirements for the ADI \$275,000 exploration grant, which forms part of the Growth State Agenda that aims to accelerate mineral discoveries through innovative exploration and research projects in regional and frontier terrains throughout South Australia.

Annual General Meeting

On 24 November 2021, the Company held its Annual General Meeting for 2021. All resolutions were passed on a poll, including a share capital consolidation at a ratio of one-for-eight, reflecting Boss' ongoing strategy to generate increasing ownership of its stock among leading global institutional investors.

³ Refer to ASX: BOE announcement dated 25 February 2019. Refer Appendix 1 for Honeymoon JORC 2012 Resource.

Strong Balance Sheet

As at 31 December 2021, the Company held unrestricted cash and cash equivalents of approximately A\$18.31 million, which excludes a fully cash-backed environmental bond of approximately A\$8.92 million.

The Company also holds inventory of 1.25Mlb of U₃O₈, which has a current spot market value of US\$57.04 million (A\$79.22 million)⁴, and no long-term debt obligations.

The Company has no long-term debt obligations.

Uranium market analysis

At the end of December 2021, the spot price was US\$42/lb, a 40% increase since December 2020. During the second half of 2021, which saw the creation of the Sprott Physical Uranium Fund (SPUT), the spot price has experienced a high level of volatility. This continued during the December quarter.

The term price at the end of 2021 was \$45/lb, up around 22% from the end of 2020.

In 2022, Sprott will seek a US listing and if successful, will become the first physical uranium fund to trade in the US and will continue to reduce mobile inventory with a consequent impact on spot price.

In early January 2022, unrest in Kazakhstan raised questions about political stability and supply chain security and the potential impact on production.

Both spot and term prices rose during 2021, with the spot price reaching and overshooting the term indicator at various points since August. The term premium decreased and at several points disappeared temporarily. This encouraged utilities, which were previously delaying term contracting as low-cost spot and medium-term uranium appeared to be abundant, to seek supply in the term market and producers and developers have seen several medium to long term requests for proposals (RFPs) from utilities. We would expect to see the long-term price continue to move up as mobile inventory decreases and utility RFP's put pressure on supply from existing producers. As we have seen in the second half of 2021, sustainable spot price increases also put pressure on term prices and a Sprott listing in the US may be a catalyst for an upswing in spot and term prices.

Utilities are becoming more concerned about the price of long-term supply as new mines will be needed in the near term. But until recently, they have not been as concerned about security of supply. Corporate and geographic diversification of supply is likely to become more important in the utility purchasing process than in previous years. If there are near-term supply disruptions, the Honeymoon mine, which is based in South Australia, could be brought into production within a year from making the decision to proceed and offers geographic diversification in a stable environment in a state which has policies which are favourable to uranium development.

Key events during the last quarter of 2021 include:

- Improving long term nuclear prospects:
 - 2 new reactors started commercial operation bringing the total number of new reactors starting commercial operation during 2021 to six.
 - The Japanese government adopted a new energy policy to achieve net zero carbon by 2050 which recognises nuclear and renewable as sources of clean energy. The plan published in October keeps the target for nuclear power at 20-22% of the energy mix.

⁴ Inventory valued at a U₃O₈ spot price of US\$45.63/lb and an exchange rate of A\$1:US\$0.72 as at 19 January 2022.

- President Macron restated that France would build new nuclear reactors to meet net zero targets and reduce the nation's dependence on foreign energy supplies.
- Increased support for the inclusion of nuclear and natural gas in the EU's Green Finance Taxonomy. The final decision has been postponed until 2022.
- President Biden signed into law the \$1.2 trillion Infrastructure Investment and Jobs Act in November. This bill provides \$6 billion in DOE funding to support nuclear facilities that are under economic threat of early closure and appropriates \$2.4 billion of funding for SMRs and advanced reactors.
- Poland selected a site for its planned first nuclear power plant.
- Finland's Olkiluoto Unit 3 began initial operation in December – the first commissioning of a new nuclear plant in Finland in over 40 years.
- The premature shutdown of three nuclear plants in Germany. This closure removes over 4GWe of generation capacity for Germany's grid and will increase Germany's dependence on fossil fuels for baseload capacity.
- The continued tightening of available supply:
 - Primary supply remains tight as producer discipline is maintained. Kazatomprom extends production cuts into 2023, keeping production in 2023, 20% lower than previously planned Subsoil Use Contract levels and close to production levels seen in 2022.
 - Mobile inventory continues to decrease. Cameco purchasing from the market to fill existing contracts has reduced mobile inventory. The Sprott Physical Uranium Fund has acquired over 24m lbs U₃O₈ since August this year.
- Market concerns over the impact of the new covid variant OMNICON, which hit the headlines in December, on the global economy.
- Spot price volatility: since the inception of SPUT the market has seen a high level of volatility which is likely to remain a feature of the spot market while SPUT remains the dominant spot purchaser. Accordingly, the spot price is likely to fluctuate but the trend is upwards.

Appendix 5B disclosures

In line with its obligations under ASX Listing Rule 5.3.5, Boss notes that the only payments to related parties of the Company, as disclosed in the Appendix 5B (quarterly Cashflow Report) for the period ended 31 December 2021, pertain to payments for executive salaries, superannuation and non-executive director fees.

During the quarter ended 31 December 2021, the Company spent approximately \$974,000 on project and exploration activities relating to its Honeymoon Project. These activities included ongoing technical studies relating to completion of designs of P&ID's, wellfield design optimisation studies and preparation of the PEP and continued exploration activities including completion of the first phase of exploration drilling during November and December. In addition to these activities the Company continued to incur costs relating to the ongoing care and maintenance activities required at Honeymoon. The expenditure represents direct costs associated with these activities as well as capitalised wages which can be directly attributable to Honeymoon.

This ASX announcement was approved and authorised by the Board of Boss Energy Limited.

For further information, contact:

Duncan Craib

Chief Executive Officer

P: +61 (8) 6263 4494

E: boss@bossenergy.com

For media enquiries, contact:

Paul Armstrong

Read Corporate

P: +61 (8) 9388 1474

E: info@readcorporate.com

Appendix One:

Schedule of Mining Tenements

The following information is provided pursuant to Listing Rule 5.3.3 for the quarter ended 31 December 2021.

Tenement Name	Location	Licence Number	Interest
Yarramba	South Australia	EL6510	100%
South Eagle	South Australia	EL6081	100%
Gould's Dam	South Australia	EL6512	100%
Katchiwilleroo	South Australia	EL6511	100%
Ethiudna	South Australia	EL6020	100%
Gould's Dam	South Australia	RL83-85	100%
Honeymoon Mine	South Australia	ML6109	100%

There were no mining tenement acquisitions or divestments during the quarter.

Honeymoon's Mineral Resource (lower cut-off of 250 ppm U₃O₈)

Classification	Tonnage (Million Tonnes)	Average Grade (ppm U ₃ O ₈)	Contained Metal (Mkg, U ₃ O ₈)	Contained Metal (Mlb, U ₃ O ₈)
Measured	3.1	1,100	3.4	7.6
Indicated	18.4	630	12.0	25.5
Inferred	30.9	570	18.0	38.5
Total	52.4	620	32.5	71.6

Reference to previous ASX announcements

In relation to the results of the Enhanced Feasibility Study announced on 21 June 2021, the Company confirms that all material assumptions underpinning the production target and forecast financial information included in that announcement continue to apply and have not materially changed.

The mineral resource estimates in this announcement were reported by the Company in accordance with listing rule 5.8 on 25 February 2019. The Company confirms it is not aware of any new information or data that materially affects the information included in the previous announcement and that all material assumptions and technical parameters underpinning the estimates in the previous announcement continue to apply and have not materially changed.

Forward-Looking Statements

This announcement includes forward-looking statements. These forward-looking statements are based on the Company's expectations and beliefs concerning future events. Forward-looking statements are necessarily subject to risks, uncertainties and other factors, many of which are outside the control of Boss, which could cause actual results to differ materially from such statements. Boss makes no undertaking to subsequently update or revise the forward-looking statements made in this announcement, to reflect the circumstances or events after the date of this announcement.