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ASX Symbol

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Kalgoorlie Nickel Project Feasibility Study Update

Ardea Resources Limited (**Ardea** or the **Company**) is pleased to present a progress report regarding its ongoing Definitive Feasibility Study (**DFS**) at the Kalgoorlie Nickel Project (**KNP**) Goongarrie Hub.

The current DFS programs are specifically independent of throughput and product material, with these parameters being dependent upon the future Strategic Partner requirements.

Ardea's Managing Director, Andrew Penkethman said:

*"The Feasibility Study for the Kalgoorlie Nickel Project - Goongarrie Hub has been focussing on Material Types to allow the mineralisation to be matched to the High Pressure Acid Leach (**HPAL**), Atmospheric Leach (**AL**) and Neutraliser circuits, maximising resource utilisation from a well understood and proven hydrometallurgical flow-sheet. Critically, the Ardea flow sheet is based on technology that is being successfully utilised at existing operations.*

Plant feed which in previous schedules was stockpiled for late project, lower throughput processing, is now designed to feed the AL circuit contemporaneously with mining and is expected to result in increased nickel-cobalt production.

The most significant recent R&D outcome is from the current bench-scale metallurgy program. Initial results show very encouraging separation of mineralised clay from magnesite neutraliser by simple screening. Subject to current confirmatory metallurgical research, the clay is geochemically suited as an AL feed, providing the opportunity to expand the AL circuit with minimal additional cost.

Of note, the AL circuit will require a larger acid plant which given the highly exothermic nature, generates substantial steam which will be used to generate electricity and process heating for the site. This system enables off-grid energy production without fossil fuels and facilitates a material de-carbonising of the project.

In terms of ESG, the proposed KNP - Goongarrie Hub flowsheet is a bench-mark for nickel-cobalt production.

The total KNP Mineral Resource Estimate is now 830Mt at 0.71% Ni and 0.046% Co (5.9Mt nickel, 380kt cobalt¹). This is a world-significant asset located in an infrastructure-rich location, with independent assessment as the best operating jurisdiction in the world.

Ardea continues to receive a high level of interest from groups wanting to secure sustainable and ethical nickel-cobalt offtake. Offtake remains linked to the Strategic Partner process and working with Ardea to complete the DFS, secure project development funding and building a globally significant battery minerals business. With the increase in corporate activity relating to the Strategic Partner process, Ardea has appointed a full-time CFO, Rebecca Moylan who we welcome to the Ardea Team.

As always, we thank all of our stake holders and in particular the Shire of Menzies and City of Kalgoorlie Boulder and their Communities for their ongoing support of the Kalgoorlie Nickel Project."

¹ ASX release 16 June 2021.



1. BACKGROUND

In previous releases to the ASX, Ardea has provided updates on KNP resource definition and affirmed its intention to participate in the high-growth Lithium Ion Battery (**LIB**) market through the production of either Mixed Hydroxide Precipitate (**MHP**) intermediate or a refined Precursor Cathode Active Material (**PCAM**) product.

The Feasibility Study for the KNP - Goongarrie Hub has been focussing on Material Types to allow the mineralisation to be matched to the High Pressure Acid Leach (**HPAL**), Atmospheric Leach (**AL**) and Neutraliser circuits, maximising resource utilisation from a well understood and proven flow sheet.

The purpose of this summary is to elaborate on the current feasibility work streams and the underlying factors for these enhancements.

With the significant increase in financial, corporate and legal requirements around the KNP Strategic Partner process, notably since the awarding of Major Project Status for the KNP in March 2022, Ardea needed to expand the responsibilities of the CFO position and move from a part-time to full-time role. The transitioning from our 2017 IPO part-time CFO/Company Secretary Sam Middlemas to full-time CFO Rebecca Moylan is underway. Rebecca has a diverse range of commercial and financial experience, including international exposure, the specific financial and corporate experience with accounting qualifications as now required by Ardea. Sam's excellent strategic input will be on-going for Ardea and the KNP, through him continuing his role as Company Secretary.

2. RESOURCES

The Goongarrie Hub is located 70km northwest of the mining city of Kalgoorlie-Boulder and is Ardea's most advanced project, within the broader KNP. The Goongarrie Hub includes the Goongarrie deposits from south to north, Scotia Dam, Big Four, Goongarrie South and Goongarrie Hill, along with Highway some 30km to the north and Siberia North, approximately 10km to the southwest (Figure 1).

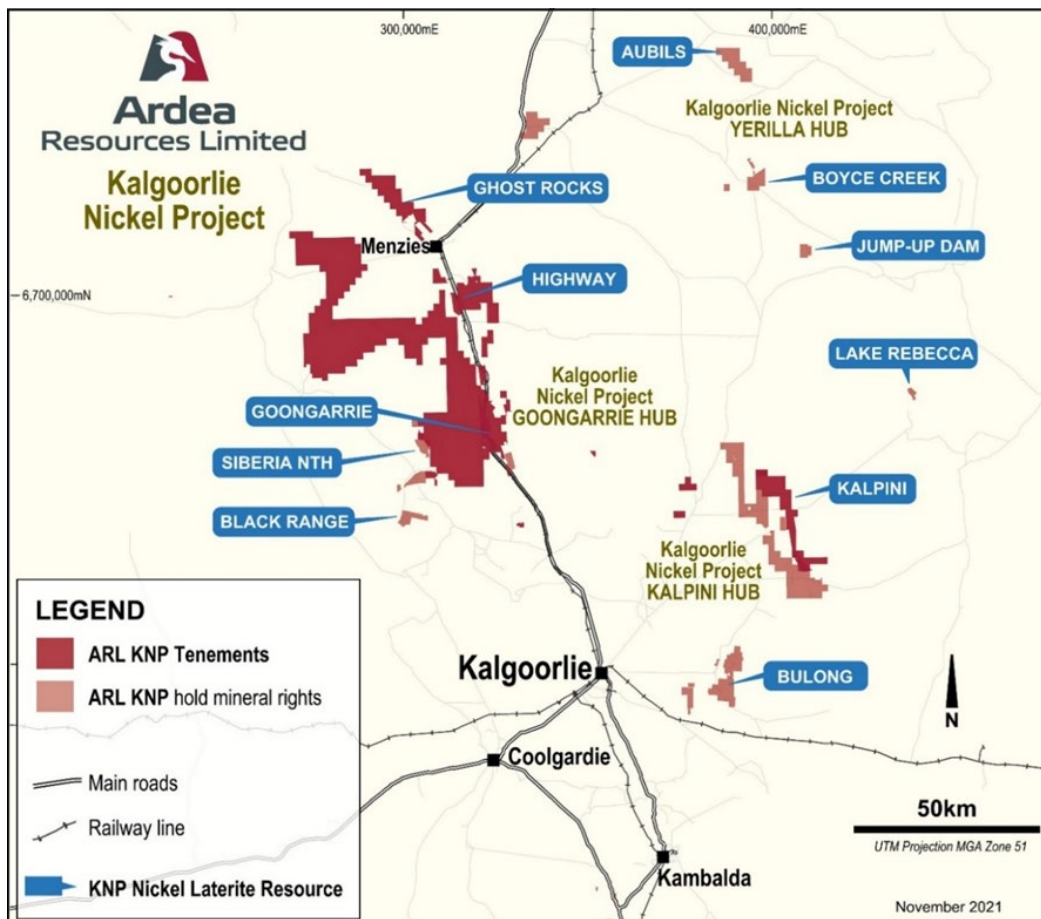


Figure 1: KNP location and infrastructure plan centred around the Goongarrie Hub. Projection GDA94 MGA94 Zone 51.



Historic and current Ardea drilling over the Goongarrie Hub includes:

- 4,088 RC holes for 197,430m for resource estimation.
- 128 core holes for 7,961m for verifying RC drilling, resource estimation and metallurgy test work.
- 100 sonic holes for 4,634m for resource estimation and metallurgical test work.
- 2 Calweld holes by Vale Inco for 50m for metallurgical pilot run samples.
- 4 mud rotary holes by Ardea for 296m for hydrogeology aquifer pump tests.

The current Ardea resource review of the Goongarrie Hub concluded:

- A total of 4,322 drillholes for 210,371m of drilling has been completed across the Goongarrie Hub deposits primarily focused on Mineral Resource definition augmented with significant diamond and sonic drilling to verify the results from the RC drilling, provide material for metallurgical test work and samples for SG determinations.
- The RC drilling across the deposits is sufficient to define Measured and Indicated Mineral Resources capable of supporting the project development based on mining studies completed as part of the Ardea PFS in 2018 (ASX release 28 March 2018) and an Ardea internal mining optimisation study completed in 2019.
- 228 diamond and sonic drill holes for 12,595m of drilling provide broad confirmation of the mineralisation tested with RC drilling and an abundance of material for metallurgical test work, Material Type characterisation and SG measurements.
- Material Types can be clearly differentiated as amenable to either HPAL or AL circuit. Where the allocation is at all equivocal, current bench-scale test work at ALS metallurgical laboratory suggests HPAL is the preferred option.

The Ardea review supports that there is minimal, if any requirement for further drilling to upgrade the Goongarrie Hub Mineral Resource Estimate (**MRE**) of 561Mt at 0.68% nickel and 0.044% cobalt (ASX release 16 June 2021).

Current independent mineral resource reviews of the Goongarrie Hub may form a view that some infill drilling is required, presumably to upgrade specific proposed pit areas from Indicated to Measured JORC Code (2012) status for conversion to Proven and Probable Reserve.

3. PROCESS REVIEW

At the instigation of the leadership group, a “cold eye” flowsheet review was commissioned. This revealed the following opportunities:

- Increased resource utilisation through inclusion of an Atmospheric Leach (AL) stage.
- Improved overall process continuity and stability.
- Reduced reagent costs.
- Reduced energy consumption.
- Lower Green House Gas emission intensity.
- Reduced water consumption.

These were supported by process initiatives that included:

- Utilisation of in-pit mineralised neutraliser, with screening of crushed in-pit saprock at 75 microns generating 23% Fines for potentially expanding AL production volumes and 77% “run-of-mine” magnesite neutraliser (termed “Scats”).
- Atmospheric leaching of serpentine-type mineralisation, initial tests at ALS successful.
- Expanding production volumes to allow for twin parallel HPAL autoclaves for a combined 3Mtpa throughput.
- Water treatment and recycling.
- Matching the acid, steam, and power circuits to maximise value-adding from the sulphur reagent.



A revised version of the SysCAD® metallurgical process model was generated and used for updating of mass balances, mechanical equipment lists and process flow diagrams. This was complemented by the in-house development of spreadsheet-based models, which were calibrated against the SysCAD® model and used for fast-turnaround process options analysis.

The process updates were announced in the 15 November 2021 ASX release, and incorporated twin HPAL autoclave trains, each treating 1.5 Mtpa dry goethite solids, and a single AL train, processing 0.5 Mtpa of nickel-bearing serpentine (it should be noted that these figures may alter in the course of a future optimisation process or in response to Strategic Partner requirements).

As per the current mass balance model, overall nickel and cobalt production is generated from approximately 3.5Mtpa plant feed to produce an MHP intermediate product. The underlying model assumptions are being checked in the current metallurgical test work program, which was announced to the ASX on 31 May 2021.

4. Process Test Work

Process test work to date has been summarised in previous ASX releases (31 May 2021, 16 June 2021, 15 November 2021, 25 January 2022, 11 March 2022).

The present round of work has focussed on step-outs from the baseline investigations conducted previously in the Vale-Inco 2005-2009 and Ardea 2017-2018 PFS work. These include:

- Leach feed cut size increased to nominal minus 212 microns (was 75 microns), to allow additional leach feed tonnes albeit at slightly lower leach feed grade.
- Gravity separation of ore preparation oversize for potential recovery of target heavy mineral by-products.
- Atmospheric leaching of high nickel grade serpentine saprolite mineralisation.
- Acid neutralisation using mineralised in-pit resources.
- Nanofiltration purification of feed and process water streams.
- Changes to engineering data, including materials of construction evaluation.
- Systematic carbon accounting.

Downstream test work is planned to define the design criteria and integrate the new features into the overall flowsheet. The test work may if required, generate MHP sample for review by prospective customers and for evaluation of MHP refining options.

5. Preparatory Engineering

Changes to the flowsheet were formalised in engineering fundamentals such as:

- Work Breakdown Structure (WBS).
- Block Flow Diagrams (BFDs) upgraded.
- Process Design Criteria (PDC) upgraded.
- Metallurgical Mass Balance Model completed.
- Process Description upgraded.
- Process Flow Diagrams (PFDs) upgraded.
- Mechanical Equipment List (MEL) completed.
- Operational Financial Model completed (at nickel price of US\$19,500 per tonne).
- Site Green House Gas emissions model, and elemental carbon added to the standard 60 element analytical suite.
- Bulk Logistics Schedule completed.

These documents with input from a Strategic Partner will be used in communications with engineering design personnel to expedite the initial phases of the DFS.



Information Management modules have been developed, such as:

- Document Naming Procedure.
- Documents Register.
- Document Filing Structure.
- Agreements Register (includes all agreements from the Heron Resources Limited KNP ownership).
- Calculations Folder.
- Engineering Deliverables List.
- Required Studies List.
- Construction Infrastructure Register.
- Candidate Vendors List, from extensive industry engagements particularly since the awarding of Federal Government Major Projects Status (ASX releases 18 and 21 March 2022).
- Suppliers' Information.

The purpose of these modules is to record and retain information for later use and/or for communications with third parties.

In addition, stand-alone studies have been commissioned in advance of the more detailed DFS phase. These are intended to expedite the DFS schedule and level out the workload profile. The following studies have been conducted or are in progress:

- Tailings Management Review.
- Value Driver Sensitivity Studies.
- Major Equipment Sizing Study.
- Industry Best Practices Study.
- Heavy Haulage Logistics Road Route Study, specialist independent analysis, Esperance to Goongarrie.
- Operational ESG Review, consultant retained.
- Process Gap Analysis Study (completed by Wood Engineers, ASX release 25 January 2022).
- Site Sterilisation Study, Aircore drilling program designed, awaiting contractor scheduled for August 2022.
- Materials of Construction Study current.
- Project Risk Evaluation Study (IPA Shaping and Benchmarking Study), current.

Further studies have been identified for future implementation.

6. Ongoing Developments

Ongoing work fronts will be concerned with the following activities and relations.

- Strategic Partner selection, for fit-for-purpose throughput and downstream product. Timing of finalising the Strategic Partner selection is linked to the completion of the DFS, so that the Strategic Partner has the opportunity to have direct input into the project scale and end product specification.
- Confirmatory hydrometallurgical test work ongoing at ALS metallurgical laboratory, Balcatta.
- Detailed engineering.
- Local hydrogeology, contractor drilling programs and Ardea field crew ongoing work.
- Renewable energy options for the site, including carbon offsets.
- Vendor identification and qualification vetting.
- Suppliers and service organisations in the Eastern Goldfields region, liaise with Menzies, Kalgoorlie Boulder and Coolgardie industry groups.
- State and Local Government and government authority relations, with our regular meetings working up multiple “win-win” opportunities for both the Communities and Ardea.
- Peer enterprise co-operatives.
- Logistics planning.
- Ongoing plans – project management, construction, recruitment, organisational development.

Progress in these and other areas will be reported as milestones are achieved.



This announcement is authorised for release by the Board of Ardea Resources Limited.

For further information regarding Ardea, please visit <https://ardearesources.com.au/> or contact:

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About Ardea Resources

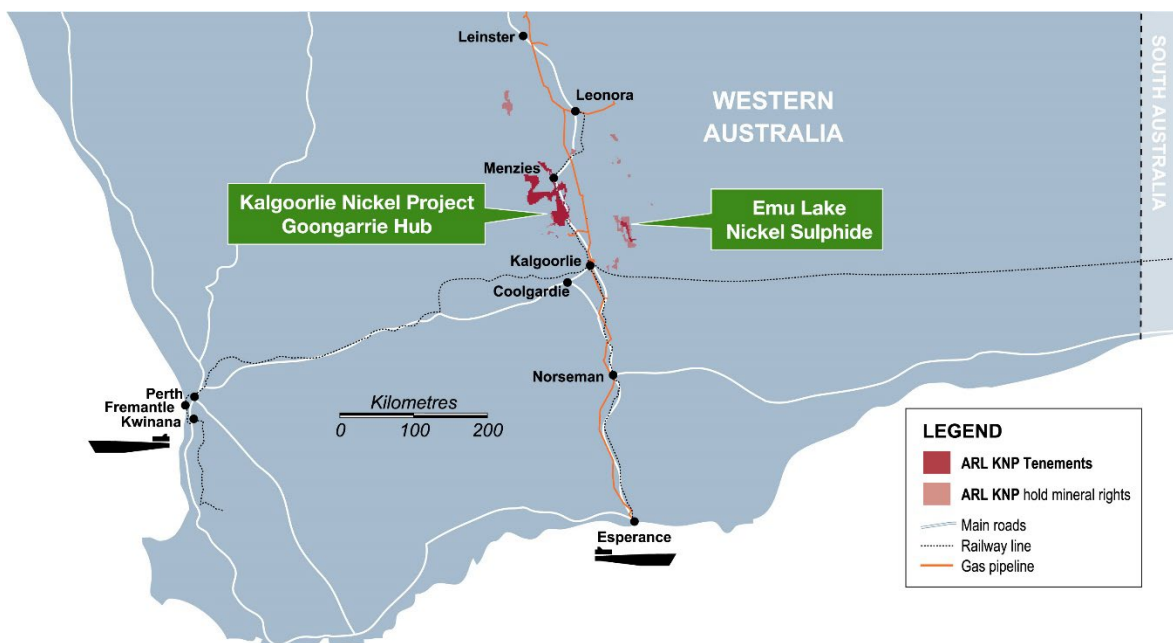
Ardea Resources (ASX:ARL) is an ASX-listed nickel resources company, with a large portfolio of 100%-controlled West Australian-based projects, focussed on:

- Development of the Kalgoorlie Nickel Project (KNP) and its sub-set the Goongarrie Hub, a globally significant series of nickel-cobalt and Critical Mineral deposits which host the largest nickel-cobalt resource in the developed world at **830Mt at 0.71% nickel and 0.046% cobalt for 5.9Mt of contained nickel and 380kt of contained cobalt** (Ardea ASX releases 15 February, 16 June 2021), located in a jurisdiction with exemplary Environmental Social and Governance (ESG) credentials, notably environment.
- Advanced-stage exploration at compelling nickel sulphide targets, such as Emu Lake, and Critical Minerals targets including scandium and Rare Earth Elements throughout the KNP Eastern Goldfields world-class nickel-gold province, with all exploration targets complementing the KNP nickel development strategy.

Ardea’s KNP development with its 5.9 million tonnes of contained nickel is the foundation of the Company, with the nickel sulphide exploration, such as Emu Lake, as an evolving contribution to Ardea’s building of a green, forward-facing integrated nickel company.

Put simply, in the Lithium Ion Battery (LIB) sector, the Electric Vehicle and Energy Storage System battery customers demand an ESG-compliant, sustainable, and ethical supply chain for nickel and other inputs. In the wet tropics, with their signature HPAL submarine tailings disposal and rain forest habitat destruction, an acceptable ESG regime is problematic. In contrast, the world-class semi-arid, temperate KNP Great Western Woodlands with its benign environmental setting is likely the single greatest asset of the KNP.

The KNP is located in a well-established mining jurisdiction with absolute geopolitical acceptance and none of the land-use and societal conflicts that commonly characterise nickel laterite proposals elsewhere. All KNP Goongarrie Hub production tenure is on granted Mining Leases with Native Title Agreement in place.



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CAUTIONARY NOTE REGARDING FORWARD-LOOKING INFORMATION

This news release contains forward-looking statements and forward-looking information within the meaning of applicable Australian securities laws, which are based on expectations, estimates and projections as of the date of this news release.

This forward-looking information includes, or may be based upon, without limitation, estimates, forecasts and statements as to management's expectations with respect to, among other things, the timing and amount of funding required to execute the Company's exploration, development and business plans, capital and exploration expenditures, the effect on the Company of any changes to existing legislation or policy, government regulation of mining operations, the length of time required to obtain permits, certifications and approvals, the success of exploration, development and mining activities, the geology of the Company's properties, environmental risks, the availability of labour, the focus of the Company in the future, demand and market outlook for precious metals and the prices thereof, progress in development of mineral properties, the Company's ability to raise funding privately or on a public market in the future, the Company's future growth, results of operations, performance, and business prospects and opportunities. Wherever possible, words such as "anticipate", "believe", "expect", "intend", "may" and similar expressions have been used to identify such forward-looking information. Forward-looking information is based on the opinions and estimates of management at the date the information is given, and on information available to management at such time.

Forward-looking information involves significant risks, uncertainties, assumptions, and other factors that could cause actual results, performance, or achievements to differ materially from the results discussed or implied in the forward-looking information. These factors, including, but not limited to, the ability to create and spin-out a gold focussed Company, fluctuations in currency markets, fluctuations in commodity prices, the ability of the Company to access sufficient capital on favourable terms or at all, changes in national and local government legislation, taxation, controls, regulations, political or economic developments in Australia or other countries in which the Company does business or may carry on business in the future, operational or technical difficulties in connection with exploration or development activities, employee relations, the speculative nature of mineral exploration and development, obtaining necessary licenses and permits, diminishing quantities and grades of mineral reserves, contests over title to properties, especially title to undeveloped properties, the inherent risks involved in the exploration and development of mineral properties, the uncertainties involved in interpreting drill results and other geological data, environmental hazards, industrial accidents, unusual or unexpected formations, pressures, cave-ins and flooding, limitations of insurance coverage and the possibility of project cost overruns or unanticipated costs and expenses, and should be considered carefully. Many of these uncertainties and contingencies can affect the Company's actual results and could cause actual results to differ materially from those expressed or implied in any forward-looking statements made by, or on behalf of, the Company. Prospective investors should not place undue reliance on any forward-looking information.

Although the forward-looking information contained in this news release is based upon what management believes, or believed at the time, to be reasonable assumptions, the Company cannot assure prospective purchasers that actual results will be consistent with such forward-looking information, as there may be other factors that cause results not to be as anticipated, estimated or intended, and neither the Company nor any other person assumes responsibility for the accuracy and completeness of any such forward-looking information. The Company does not undertake, and assumes no obligation, to update or revise any such forward-looking statements or forward-looking information contained herein to reflect new events or circumstances, except as may be required by law.

No stock exchange, regulation services provider, securities commission or other regulatory authority has approved or disapproved the information contained in this news release.

Compliance Statement (JORC Code 2012)

The metallurgy and industry benchmarking summaries are based on information reviewed or compiled by Mr. Michael Miller is a Member of the Australasian Institute of Mining and Metallurgy and Mr. Tiong of Engineers Australia. Messrs Miller and Tiong are full-time employees of Ardea Resources Limited and have sufficient experience, which is relevant to the style of operation under consideration. Messrs Miller and Tiong have reviewed this press release and consent to the inclusion in this report of the information in the form and context in which it appears. Messrs Miller and Tiong own Ardea shares.

The exploration and industry benchmarking summaries are based on information reviewed or compiled by Mr. Ian Buchhorn, who is a Member of the Australasian Institute of Mining and Metallurgy. Mr Buchhorn is a full-time employee of Ardea Resources Limited and has sufficient experience, which is relevant to the style of mineralisation and type of deposit 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 Exploration Results, Mineral Resources and Ore Reserves'. Mr Buchhorn has reviewed this press release and consents to the inclusion in this report of the information in the form and context in which it appears. Mr Buchhorn owns Ardea shares.