



# Heron Resources Limited

## ASX Release

31 July 2014

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## Kalgoorlie Nickel Project 20ktpa Scoping Study Results

### Confirms Potential for Robust Long Life Project

Heron Resources Limited (**Heron** or the **Company**) is pleased to report that the update to the previously announced April 2014 Scoping Study based on an increase in scale to deliver approximately 20Ktpa of contained nickel in concentrate has been completed for the Kalgoorlie Nickel Project (**KNP** or the **Project**). The 20Ktpa Scoping Study has delivered excellent technical and financial results, with highlights including:

- Confirms the potential for the KNP to be developed as a large scale, very long life mine using the Carbon Friendly Nickel Production (**CFNP**) sulphuric acid leaching and recycling process developed by Simulus Engineers (**Simulus**)
- Based on the JORC 2012 compliant Mineral Resource of approximately 795.6M tonnes at 0.70% nickel and 0.048% cobalt, an initial mining inventory of 123.8M tonnes has been modeled at a Leach Feed Grade of 1.16% nickel and 0.06% cobalt, with a Production Target of 683,600 tonnes of nickel in concentrate over a 35 year mine life
- Significant scope to increase the Production Target: Based on the total mining inventory from the 2010 Pre-feasibility Study, the project could be in production for more than 50 years or be scaled up further
- Processing rate of 2.0Mtpa for annual production averaging 19,500 tonnes nickel and 900 tonnes cobalt, with an average production over the first 10 years of 20,200 tonnes of nickel, shipped as Mixed Hydroxide Product (**MHP**)
- Capital costs of \$660 million inclusive of a 10% contingency, confirming a low capital intensity of US\$13.82 per annual pound of nickel production compared to a traditional HPAL process route of around US\$40 per annual pound
- Total revenue (including by-product credits) of A\$12.6 billion and pre-tax net cash flow of A\$4.3 billion over the initial 35 years of operation – based on a nickel price of US\$9.00 per pound (A\$/US\$: 0.90)
- C1 cost over the first 10 years of operation of US\$3.71/lb Ni and US\$4.27/lb Ni over the 35 year mine life, comparable to the current cost of the established Ravensthorpe HPAL project but at a much lower initial capital cost
- C3 cost of US\$5.90/lb nickel over the initial 35 year mine life
- The KNP provides significant exposure to long-term, low cost, nickel production in a highly stable and mining orientated jurisdiction. This revised Scoping Study represents a significant step change in the economics of these types of nickel laterite projects
- Significant leverage to the nickel price, with an increase in the nickel price assumption of US\$1.0/lb increasing the pre-tax project net cash flow by approximately A\$1.4 billion

#### ASX:HRR

Issued Shares	253M
Share Price	\$0.145
Market Cap	\$36.7M
<b>Cash (June 2014)</b>	<b>\$32.9M</b>
<b>Investments</b>	<b>\$ 3.4M</b>
<b>Convert Note</b>	<b>\$ 1.3M</b>
<b>Total C+I</b>	<b>\$37.6M</b>



### **Cautionary Statements**

*In accordance with the ASX listing rules, the Company advises the Scoping Study referred to in this announcement is based on lower-level technical and preliminary economic assessments, and is insufficient to support estimation of Ore Reserves or to provide assurance of an economic development case at this stage, or to provide certainty that the conclusions of the Scoping Study will be realised. The Production Target referred to in this announcement is partly based on Indicated Mineral Resources (being 73%) and on Inferred Mineral Resources (being 27%). There is a low level of geological confidence associated with Inferred Mineral Resources and there is no certainty that further exploration work will result in the determination of Indicated Mineral Resources or that the production target or preliminary economic assessment will be realised.*

*Forecast financial information provided in this announcement is based on the Production Target disclosed herein. The Company has concluded that it has a reasonable basis for providing the forward-looking statements included in this announcement. The detailed reasons for this conclusion are outlined throughout this announcement and in particular in the Appendix headed "Disclosure of Additional Assumptions". However, the Company cautions that there is no certainty that the forecast financial information derived from the Production Targets will be realised.*

*In relation to the Mineral Resources on which the Production Target is based, the information is extracted from the report entitled "Updated Mineral Resource Estimate, KNP" created on 18 October 2013 and is available to view on [www.heronresources.com.au](http://www.heronresources.com.au). The company confirms that it is not aware of any new information or data that materially affects the information included in the original market announcement and that all material assumptions and technical parameters underpinning the estimates in the market announcement continue to apply and have not materially changed. The company confirms that the form and context in which the Competent Person's findings are presented have not been materially modified from the original market announcement.*

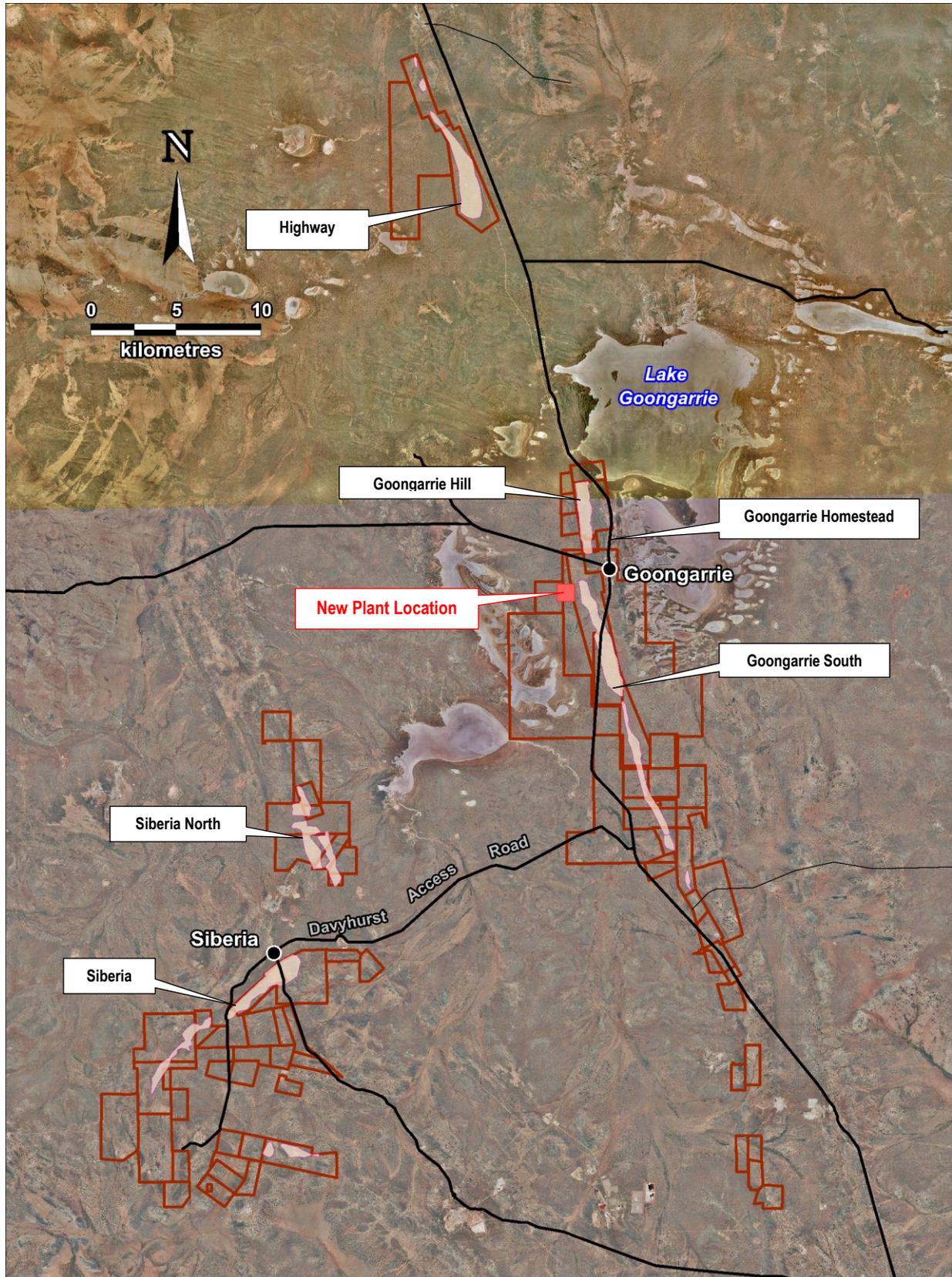
*In relation to the Vale Inco 2009 Prefeasibility Study and Heron 2010 PFS Revision referenced in this announcement, information is extracted from the announcement entitled "Vale Delivers Strong KNP Pre-Feasibility Report" released on 9 February 2009 and from the announcement entitled "Completion of Kalgoorlie Nickel Project PFS Revision" released on 16 February 2010 which are available at [www.heronresources.com.au](http://www.heronresources.com.au). The Company confirms that it is not aware of any new information or data that materially affects the information included in the original market announcement and, in the case of estimates of Mineral Resources or Ore Reserves, that all material assumptions and technical parameters underpinning the estimates in the relevant market announcement continue to apply and have not materially changed. The Company confirms that the form and context in which the Competent Person's findings are presented have not been materially modified from the original market announcement.*

*In relation to the Heron 2014 10Ktpa Scoping Study referenced in this announcement, information is extracted from the announcement entitled "Simulus Scoping Study results - Step Change for KNP" released on 8 April 2014 and from the announcement entitled "Simulus Scoping Study Clarification" released on 22 April 2014 which is available at [www.heronresources.com.au](http://www.heronresources.com.au). The Company confirms that it is not aware of any new information or data that materially affects the information included in the original market announcement and, in the case of estimates of Mineral Resources or Ore Reserves, that all material assumptions and technical parameters underpinning the estimates in the relevant market announcement continue to apply and have not materially changed. The Company confirms that the form and context in which the Competent Person's findings are presented have not been materially modified from the original market announcement.*



**Kalgoorlie Nickel Project (Heron 100%)**

*Schematic showing deposits, proposed plant location and infrastructure*





### **20Ktpa Scoping Study Overview**

Following the successful completion of the April 2014 10Ktpa Scoping Study, Heron has now completed the follow on work which was foreshadowed to consider the impact of scaling up the proposed project to provide an annual production of approximately 20Ktpa tonnes of contained nickel in Mixed Hydroxide Product.

The key areas of work undertaken as part of the 20Ktpa Scoping Study were:

1. Re-estimation of processing plant capital for the increased scale;
2. New estimates for infrastructure and services capital (previously scaled from 2010 Heron PFS Revision);
3. Additional two-stage leach and acid recovery testwork on representative ore types;
4. Sourcing of updated mining and beneficiation cost quotations; and
5. Consideration of mine planning options.

The Scoping Study, which was managed by Heron and involved external consultants including Stimulus Engineers, builds on the Vale Inco and Heron Prefeasibility Studies released to the market on 9 February 2009 and 16 February 2010 respectively and the 10Ktpa Scoping Study released to the market on 8 and 22 April 2014, all of which are available at [www.heronresources.com.au](http://www.heronresources.com.au).

### **Kalgoorlie Nickel Project Background**

The KNP, located in a 150km radius north and east from Kalgoorlie, Western Australia, has a total nickel laterite Mineral Resource of approximately 795.6 million tonnes (Mt) grading 0.70% nickel and 0.048% cobalt. Vale Inco farmed in to the KNP between 2005 and 2009, expending \$34.5 million to deliver a valuable Pre-Feasibility Study (PFS) data set comprising some 95,000 metres of drill data, a JORC-compliant Mineral Resource estimate, and detailed geo-metallurgy modelling. The Vale Inco PFS was of a very high quality and has provided the key source data for subsequent studies.

Prior to the current 20Ktpa Scoping Study, there have been three previous feasibility assessments on the KNP:

- **Vale Inco 2009 Prefeasibility Study (PFS):** HPAL flow-sheet, 2.50 million tonnes per annum (Mtpa) leach feed, pre-production capital costs of A\$2.1 billion for 22.2 thousand tonnes per annum (Ktpa) nickel production in MHP, operating costs (C1) of US\$4.54/lb of nickel;
- **Heron (with consultants) 2010 PFS Revision:** HPAL flow-sheet, 3.75Mtpa leach feed sourced from high grade beneficiable ore, pre-production capital costs of A\$2.8 billion for 36.7Ktpa nickel production in MHP, operating costs (C1) of US\$4.17/lb of nickel; and
- **Heron (with consultants) 2014 10Ktpa Scoping Study:** CFNP flow-sheet, 1Mtpa leach feed, with pre-production capital costs of A\$356 million for 10ktpa nickel production in MHP, and operating costs (C1) of US\$3.56/lb of nickel.

All of these studies accessed ore from only four of the 15 separate KNP deposits, confirming there remains significant potential for the KNP to deliver a longer mine life and/or an increase in the nickel Leach Feed Grades through more aggressive screening.

### **Stimulus CFNP Technology**

With the Atmospheric Leach and recycling requirement for the KNP flowsheet, Heron retained Stimulus and its related company CFNP to undertake sulphuric acid-based bench-scale hydrometallurgical testwork on various KNP ore-types. The Stimulus technology seeks to change the KNP economics through the recycling of a large component of the sulphuric acid, thereby vastly reducing the amount of neutralizing agents required in nickel hydrometallurgical processing. For the KNP, the technology was combined with an atmospheric leach approach, to derive substantial savings in capital compared to a traditional HPAL hydrometallurgical flow sheet.

Initial bench-scale testwork on three representative samples from KNP deposits showed nickel recoveries under atmospheric leaching of between 94-97% for clay-rich and saprolite ore types and 85% for the iron-rich limonite ore types. Acid recoveries for initial bench-scale tests were up to 70%, combining membrane recovery, iron sulphate hydrolysis and magnesium sulphate calcining. These results were released to the market on 2 December 2013.

The outcomes for the Stimulus 10Ktpa Scoping Study were released on 8 April 2014. The 10Ktpa Scoping Study comprised process design criteria, process flow diagrams, a mass balance, a capital and operating cost assessment (for the processing plant only), and recommendations for future optimization work. An independent peer review of the study was completed on 18 March 2014, confirming the favorable capital and operating cost estimates from the study. A revised

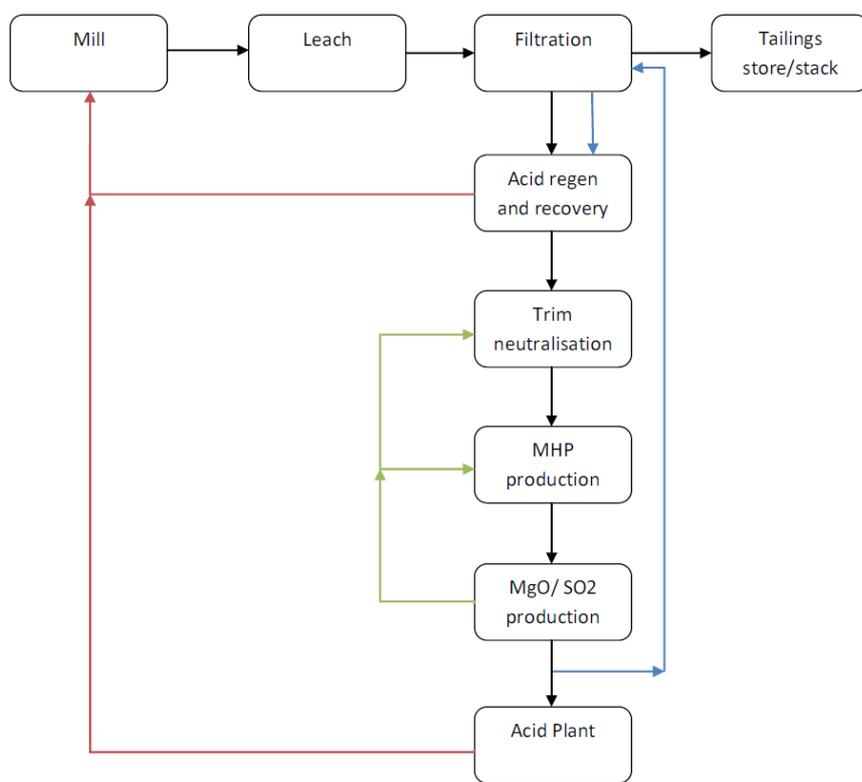


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20Ktpa Scoping Study was commissioned by Heron to consider the increase in scale to 20Ktpa annual nickel production, and the scope was extended to incorporate revision of the capital estimates for infrastructure and services. The final report was received from Simulus on 29 July 2014.

The **KNP Optimised Flow-sheet** as designed by Simulus can be summarised as follows:



→ Main process  
 → Recovered water  
 → Recovered magnesia  
 → Recovered/regenerated acid

### Milling

Single stage crushing, beneficiation and scrubbing, followed by milling.

### Leaching

Atmospheric leach (4-6 agitated tanks).

### Acid recovery

Two stages of membrane recovery and medium pressure autoclave for iron removal and supporting plant.

### Trim neutralization

Neutralization tanks (SO<sub>2</sub> and magnesia based).

### MHP production

Precipitation tanks, thickening and filtration, bagging and storage.

### Supporting processes

Raw and process water supply and distribution, power, acid production, water recovery and magnesia regeneration, ancillary processes.

### **20Ktpa Scoping Study Outcomes**

The 20Ktpa Scoping Study mining inventory of 123.8M tonnes has been modeled based on the mine plans optimised for the 2010 Heron PFS Revision, and scaled to provide a 35 year mine life with a leach feed rate of 2Mtpa. These are based on the JORC 2012 Resources disclosed to the market on 18 October 2013. The Company confirms that the Mineral Resources underpinning the Production Target have been prepared by a Competent Person in accordance with the JORC 2012 Code. All Resources are held on granted Mining Leases which are 100% held by Heron.

The mining rate commences at approximately 12.4Mtpa, and averages 13.0Mtpa over the initial 35 year mine life, with a strip ratio of 2.68:1. The mining inventory is based on a majority of Indicated Resources (73%), with Inferred Resources comprising approximately 27% of total feed.

The mill feed grades of 0.85% nickel and 0.05% cobalt are improved through screen beneficiation at 75 microns to give a Leach Feed Grade of 1.16% nickel and 0.061% cobalt, and giving a Production Target of 683,600 tonnes of nickel and 32,000 tonnes of cobalt in MHP over the modeled 35 year mine life.

Work undertaken by a consultant concluded that on existing Measured and Indicated Resources alone, the project could support an initial 25 year mine life at around the 2Mtpa leach feed production rate, and with a significantly reduced strip ratio of 1.71:1. However, whilst the much improved strip ratio of the 25 year mine plan relative to the 2010 mine plan suggests very good potential for future improvements to the mine plan, the Company considered the scaled 2010 Heron PFS Revision mining plan to be of higher accuracy (being PFS versus Scoping Study level) as well as better facilitating



comparisons with previously published results. Hence the 20Ktpa mine plan incorporates some Inferred Resources, comprising approximately 27% of the total mining inventory.

Mining is by truck and shovel, with minimal drill and blast required (mainly for the surficial lateritic hard cap of the ore body). Ore is transported to the ROM pad by mining trucks (for shorter distances) and by dedicated haul trucks (for longer distances). A dedicated haul road is assumed between Highway (early years of the mine plan) and the plant site, whilst for Siberia (later years of the mine plan) it is assumed that the gazetted shire road and Goldfields Highway will be used. Mining, haul, rehandle and beneficiation cost estimates have been updated using data from external contractors and consultants as well as based on earlier study estimates.

Production in the first full year following commissioning is expected to be approximately 12,300 tonnes contained nickel, rising to approximately 21,800 tonnes nickel in year 3. The life of mine average annual production is 19,500 tonnes of nickel and 900 tonnes of cobalt, which will be produced as MHP in a concentrate expected to run at about 38% nickel.

Capital costs have been re-estimated by Simulus to +/-30% accuracy both for the processing plant (an update to the 10Ktpa Scoping Study) and for the infrastructure and services capital including haul roads, gas and water supply, a rail siding and a tailings storage facility (previous estimates were Heron's, based on scaling the Heron 2010 PFS Revision). The total development capital is estimated at A\$660 million, including a 10% contingency. The estimates confirm a very low capital intensity of US\$13.82 per annual pound of nickel production compared to a traditional HPAL process route. Sustaining capital of approximately 4% of initial capital (A\$26.4 million) has been applied as an annual maintenance capital charge.

Processing is in accordance with the KNP Optimised Flow-Sheet described above. The fundamental flow sheet design is unchanged from the 10Ktpa design, but has been modified for the increase in scale. The metallurgical performance of the plant is supported by prior testwork released to the market on 2 December 2013, as well as by more recent testwork undertaken as part of the 10Ktpa and 20Ktpa Scoping Studies.

Leach residue slurry is filtered and the cake washed, then dry stacked for disposal. An initial tailings storage facility has been costed, though it is assumed that the majority of tailings will be backhauled and co-disposed with mine waste.

Plant operating costs are based on Simulus' estimates, updated from the 10Ktpa Scoping Study for the change in scale.

The resulting cost profile for the operation based on the Production Target provides initial C1 costs of US\$3.71/lb of nickel in concentrate produced over the first 10 full years of operation and US\$4.27/lb over the initial 35 year mine life. Importantly, the nickel price has only fallen below US\$4.30/lb for two quarters in the last 40 quarters (during the Global Financial Crisis in 2008), and has not fallen to US\$3.71/lb at all during that period. These costs are presented net of a 78% nickel payability and 65% cobalt payability, consistent with the previous studies, are based on an exchange rate of 0.90 A\$/US\$, and are net of cobalt by-product credits (at a cobalt price of US\$15.80/lb). The C1 costs are comparable to those currently being achieved at the operational Ravensthorpe HPAL nickel mine, but at a much reduced capital cost.

On a C3 cost basis (post capital, royalties and fixed costs) and using the same assumptions as described above, the operation averages costs of US\$5.90/lb of nickel in concentrate over the initial 35 year life of the mine.

For cash flow profiling, the Company has applied a flat US\$9.00/lb nickel price and a US\$15.80/lb cobalt price, and a flat exchange rate of 0.90 A\$/US\$. No inflation has been applied, and no leverage is assumed. With these assumptions, the KNP develops total revenue (including cobalt by-product credits contributing 7% of revenue) of A\$12.6 billion and pre-tax net cash flow of A\$4.3 billion over the initial 35 year life of the mine.

With this cash flow, payback of capital is expected to be during the fifth year of operations.

With its exceptionally long life and its large scale, the KNP net cash flows are highly leveraged to the nickel price. An increase in the assumed nickel price by US\$1.00/lb to US\$10.0/lb (cobalt increased to US\$17.60/lb) increases pre-tax net cash flow by A\$1.4 billion over the initial 35 year life of mine.



### **Project Funding**

The KNP is a world scale project of a type that has been developed around the world using conventional HPAL flow sheets. Typically, the developers of these projects are very large multinational companies. Whilst the projected capital costs of A\$660 million for the KNP have been very significantly reduced compared to a conventional HPAL flow sheet to a level where standalone project development by Heron becomes more feasible, Heron's funding strategy for the project anticipates the involvement of a majority joint venture partner.

As described in Heron's announcement of 2 July 2014, Heron has received strong in-bound interest from a number of parties considering the merits of partnering on the KNP, and has appointed KPMG Corporate Finance to coordinate the partnership process, which will focus on downstream nickel-cobalt end users from China, Japan and Korea. The process will develop interest from existing interested parties, as well as seeking out other potential partners, and will have a focus on those companies who can assist in taking the KNP through the feasibility stage into production.

The Company expects the process to be substantially concluded during 2014.

### **Comparative Results**

The table below compares the current 20Ktpa Scoping Study with the previous 10Ktpa Scoping Study and to each of the Vale Inco 2009 PFS and Heron 2010 PFS Revision study outcomes:

<b>TABLE 1: SUMMARY STUDY OUTCOMES</b>				
<b>Parameter</b>	<b>Vale PFS January 2009</b>	<b>HRR PFS Revision February 2010</b>	<b>10Ktpa Scoping Study April 2014</b>	<b>20Ktpa Scoping Study July 2014</b>
Capacity Mtpa Leach Feed	2.5	3.75	1.0	2.0
Mine Life (years)	34	35	22	35
Average Ni Production tpa (in MHP)	22,200	36,700	10,000	19,500
Overall Opex US\$/lb Ni (C1 cost)	4.54	4.17	3.56	4.27
Pre-production Capex A\$M	2,102	2,834	356	660
Overall Capex US\$/annual lb Ni	40.45	36.10	14.54	13.82

### **Next Steps**

The Company is delighted with the technical and economic potential shown by the CFNP process as applied to the KNP and acknowledges Simulus' work. The CFNP process is a potential step change in nickel laterite processing and Heron is pleased to be at the forefront of this exciting technology. Key aspects of the process are retained under licence by CFNP and have significant potential earning capacity through adoption of the technology by other projects. A number of areas for optimisation have been identified for refinement during a proposed future BFS following completion of the proposed Demonstration Plant. Heron looks forward to the successful conclusion of the KNP partnership process which will facilitate progress on these studies.

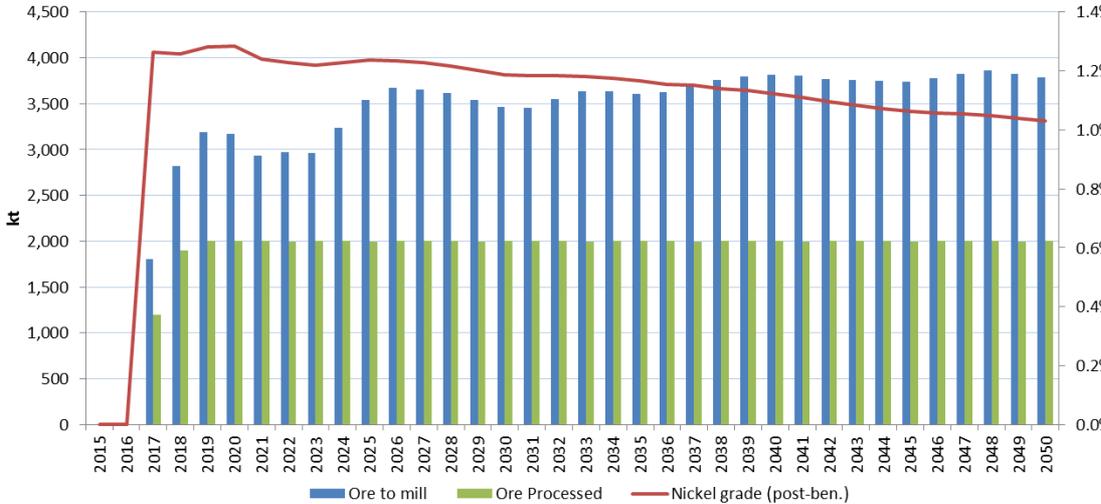
Ian Buchhorn  
Managing Director



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### Disclosure of Additional Assumptions

<p><b>Capital</b></p>	<p>A summary of the capital cost estimates (+/-30%) and inclusive of a 10% contingency is provided below:</p> <table border="1" data-bbox="335 392 1396 772"> <thead> <tr> <th>Item</th> <th>A\$m</th> </tr> </thead> <tbody> <tr> <td>Plant, buildings and equipment</td> <td>469.7</td> </tr> <tr> <td>TSF &amp; evaporation ponds</td> <td>11.8</td> </tr> <tr> <td>Gas supply</td> <td>18.2</td> </tr> <tr> <td>Water supply</td> <td>21.4</td> </tr> <tr> <td>Site infrastructure including haul roads</td> <td>16.8</td> </tr> <tr> <td>Construction costs including EPCM</td> <td>64.5</td> </tr> <tr> <td><b>Total</b></td> <td><b>660.0</b></td> </tr> </tbody> </table> <p>A maintenance capital charge of 4% p.a. has been applied to total capital (A\$26.4 million) on an annual basis to allow for plant maintenance.</p>	Item	A\$m	Plant, buildings and equipment	469.7	TSF & evaporation ponds	11.8	Gas supply	18.2	Water supply	21.4	Site infrastructure including haul roads	16.8	Construction costs including EPCM	64.5	<b>Total</b>	<b>660.0</b>
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<p><b>Resource and Mining Inventory</b></p>	<p>As disclosed in the body of the announcement, the mining inventory of 123.8M tonnes has been modelled based on the mine plans optimised for the 2010 Heron PFS Revision, and scaled to provide a 35 year mine life with a leach feed rate of 2Mtpa. The overall tonnes / grade profile for the mining inventory is illustrated below:</p>  <p>As disclosed in the body of the announcement, the mining inventory contains approximately 73% Indicated Resources and 27% Inferred Mineral Resources. At the current level of study, the Company is unable to ascertain precisely when the Inferred Mineral Resource material will be mined. However, it is likely to be mined throughout the 35 year life of the Project. With this proportion of Inferred Mineral Resources, Company modelling indicates that their inclusion is not the determining factor in project viability.</p>																
<p><b>Mining</b></p>	<p>The mining method is based on conventional open pit mining in benches with the use of diesel hydraulic excavators and front-end wheel loaders as the main equipment for loading off-highway rear-dump trucks. The pits typically comprise approximately 10m overburden waste, an ore thickness of 20-50m with a sharp lower ore cut-off. This facilitates waste back-fill, allows operation as a progressive strip mine, and minimizes the mine footprint.</p> <p>The majority (85%) of the material assumed to be free-digging with the remaining 15% (mostly a surface hard cap) requiring drilling and blasting. The integrated mine plan commences with mining at Highway and progressing to Goon Hill, Siberia North and Goon South. As noted, the mine plan encompasses only 4 of the 15 deposits in the KNP.</p> <p>A 3 month ore stockpile on the ROM pad has been assumed for blending purposes to facilitate the management of the Fe/Mg ratio into the processing plant.</p>																



	<p>The mining cost assumptions are based on contract mining:</p> <table border="1" data-bbox="338 331 1394 663"> <thead> <tr> <th colspan="2">Mining Cost Assumptions</th> </tr> </thead> <tbody> <tr> <td>Mining A\$/t mined</td> <td>2.80 (based on 2t/bcm approximate density)</td> </tr> <tr> <td>Mining supervision A\$/t ore</td> <td>1.50</td> </tr> <tr> <td>Grade control A\$/t ore</td> <td>0.75</td> </tr> <tr> <td>ROM rehandle A\$/t ore</td> <td>0.75</td> </tr> <tr> <td>Haul cost A\$/t km</td> <td>Average 0.16</td> </tr> <tr> <td>Haul distance km</td> <td>Average 16 (minimum 4, maximum 27.5)</td> </tr> </tbody> </table> <p>The metal production rate is determined by the leaching capacity, with a variable ore mining rate based on the ore type and the mass recovery after beneficiation.</p>	Mining Cost Assumptions		Mining A\$/t mined	2.80 (based on 2t/bcm approximate density)	Mining supervision A\$/t ore	1.50	Grade control A\$/t ore	0.75	ROM rehandle A\$/t ore	0.75	Haul cost A\$/t km	Average 0.16	Haul distance km	Average 16 (minimum 4, maximum 27.5)		
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<p><b>Processing</b></p>	<p>Beneficiable ore and direct feed ore are separately stockpiled on the ROM pad. Beneficiable ore is fed from the crushing circuit into the beneficiation circuit. The output from the beneficiation circuit is blended with crushed ore sourced from the direct feed ROM stockpile and a blended feed is passed into the leaching stage of the processing circuit. Beneficiation costs have been assumed at A\$2.60/t beneficiable ore, comprising processing and reject rehandle components.</p> <p>The major elements of the processing cost assumptions are shown in the table below.</p> <table border="1" data-bbox="338 987 1394 1229"> <thead> <tr> <th>Processing Cost Assumptions</th> <th>A\$/t Leach Feed</th> </tr> </thead> <tbody> <tr> <td>Labour</td> <td>9.38</td> </tr> <tr> <td>Power</td> <td>9.13</td> </tr> <tr> <td>Reagents</td> <td>34.32</td> </tr> <tr> <td><b>Total</b></td> <td><b>52.83</b></td> </tr> </tbody> </table> <p>A general and administration charge of A\$9.14 million has been applied annually, including A\$5.77 million for processing / operations and A\$2.46 million for administration overheads. Maintenance consumables are captured in the maintenance capital charge.</p>	Processing Cost Assumptions	A\$/t Leach Feed	Labour	9.38	Power	9.13	Reagents	34.32	<b>Total</b>	<b>52.83</b>						
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<p><b>Metallurgical</b></p>	<p>Results of the metallurgical test work relating to the KNP Optimised CFNP Process were released to the market on 2 December 2013.</p> <p>Bench scale leach variability work is currently under way with the most recent atmospheric leach results achieving up to 89% nickel extraction and still increasing after 24 hours of leaching. Nickel extractions for two stage counter current atmospheric leach tests conducted as part of ongoing process optimisation were consistent with single stage leach tests.</p> <p>It is a current assumption that a mean nickel extraction of 85 % is achievable in atmospheric leach, with mean cobalt extraction of 75%. Further batch testwork plus detailed information of the ore types to be mined is required to improve confidence during the next stage of study on the assumed nickel extraction achievable.</p> <p>Recoveries are differentiated by ore type. For the purposes of this level of study, differences are limited to classification of ore into beneficiable (siliceous, predominantly goethitic) and direct feed (predominantly saprolitic) ores. Ramp ups in recovery are assumed over the first three years of operation, with steady state thereafter:</p> <table border="1" data-bbox="338 1800 1394 1995"> <thead> <tr> <th>Recoveries %</th> <th>Year 1</th> <th>Year 2</th> <th>Year 3</th> </tr> </thead> <tbody> <tr> <td>Ni Beneficiable ore</td> <td>79%</td> <td>81%</td> <td>83%</td> </tr> <tr> <td>Ni Direct feed ore</td> <td>85%</td> <td>88%</td> <td>89%</td> </tr> <tr> <td>Co (both types)</td> <td>71%</td> <td>74%</td> <td>75%</td> </tr> </tbody> </table>	Recoveries %	Year 1	Year 2	Year 3	Ni Beneficiable ore	79%	81%	83%	Ni Direct feed ore	85%	88%	89%	Co (both types)	71%	74%	75%
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Ni Direct feed ore	85%	88%	89%														
Co (both types)	71%	74%	75%														



<p><b>Infrastructure</b></p>	<p>The location of the plant site and roads are subject to optimisation in future studies to maximise the project economics. The current study assumes all permits, licences and other approvals can be met for this infrastructure.</p> <p>Process water is assumed to be drawn from dedicated bore fields adjacent to the Siberia North deposit typically 20-30km west of the plant site. Previous Vale Inco PFS water studies indicate availability of sufficient water for the project. A capital allowance of A\$19.5 million has been provided for bore fields development. Borefield development costs include pricing for a total of 42 production bores, 84 monitor bores and 72 exploration holes for a total demand capacity of 600m<sup>3</sup>/h. Costs for bore pumps and raw water transfer pumps are included, allowance for 30km of piping from the Siberia North borefield to the processing plant, and factored allowances for instrumentation and civil/structural costs. A reverse osmosis plant is costed to generate suitable quality process water.</p> <p>Power consumption of approximately 20MW is assumed to be sourced both from the on-site acid plant and from turbines supplied by the GGT gas pipeline, which is approximately 30km to the east. A capital allowance of A\$18.2 million has been made for construction of a spur to connect into the gas pipeline.</p> <p>As per the Vale Inco PFS, it is assumed that rail of the finished MHP product to port in Fremantle or Esperance, bagged and shipped in sealed 20t containers. Established road and rail links the project to these two export ports. It is anticipated that a rail siding would be constructed immediately adjacent to the Goongarrie plant site, and a capital allowance of A\$4 million has been made for this together with the associated container reach stackers. However, for the purposes of the 20Ktpa Scoping Study, re-evaluation of the various factors affecting transport and logistics of the import and export materials such as port capacity, storage availability, rail capacity, handling requirements and risk of supply interruption has not been completed.</p>
<p><b>Economic</b></p>	<p>Unless otherwise stated, all cash flows are in Australian dollars, are undiscounted and are not subject to inflation/escalation factors, and all years are financial years. All cash flows are unleveraged (pre-finance) and are pre-tax.</p> <p>A flat exchange rate of 0.90 A\$ / US\$ has been employed.</p> <p>A flat real nickel price of US\$9.00/lb has been applied, along with a cobalt price of US\$15.84/lb. These prices are slightly above current spot prices of US\$8.69/lb and US\$15.08/lb respectively.</p>
<p><b>Marketing</b></p>	<p>There is a ready supply of customers who could take the concentrate produced by the KNP. These include local refineries as well as overseas parties, particularly in China, Japan and Korea. The scoping study assumes sale is on an FOB basis from the port of Kwinana or Esperance (with a A\$30/t charge for port transportation and handling) and is subject to a payability fraction estimated as 78% for nickel and 65% for cobalt. The payability assumptions are unchanged from the Vale Inco PFS and Heron PFS Revision studies.</p>
<p><b>Legal</b></p>	<p>All Resources which are the subject of the Production Target are held 100% by Heron on granted Mining Leases.</p>
<p><b>Environmental</b></p>	<p>Independent environmental assessments were undertaken as part of the Vale Inco 2009 PFS including extensive baseline environmental reviews (vegetation, terrestrial and migratory fauna, subterranean fauna, endemic species, hydrology review of the Goongarrie deposit, hydrology surveys of surface waters and lakes, flora and fauna survey studies, groundwater aquifers, highway/railway diversion corridors (not essential), and pit dewatering and disposal (to plant). As a result, no further environmental assessments have been undertaken as part of the recent Scoping Studies.</p> <p>It is assumed that mine overburden / mullock and tailings are to be dumped in exhausted pits (ore has a sharp basal contact), though a capital allowance has also been made for a dedicated tailings storage facility.</p>
<p><b>Social</b></p>	<p>The workforce for the Project is assumed to be sourced on a drive-in, drive-out basis from Kalgoorlie, 60-100km south of the Project. Kalgoorlie, with a population of 30,000, is an area of strong mining culture supplying personnel for a number of regional nickel and gold projects.</p>
<p><b>Governmental</b></p>	<p>Royalty rates have been confirmed with the WA Department of Mines and Petroleum and are based on Regulation 86 of the Mining Regulations 1981(WA). The current study assumes all other permits, licences, approvals and other regulatory requirements can be met.</p>