

# **ASX ANNOUNCEMENT**

23<sup>rd</sup> October 2023

# **CORRECTION TO ANNOUNCEMENT: SCOPING STUDY UPDATE**

The ASX Announcement entitled "Scoping Study Update" on 17 October 2023 has been amended as follows:

## HIGHLIGHTS

- A more detailed explanation of comparable nickel laterite projects referred to in paragraph 4 of the 17th October 2023 announcement with respect to key metrics (such as deposit type, location, JORC Resources and recoveries). A disclaimer with respect to this comparison is also included in the Annexure below the table of selected comparable nickel laterite deposits.
- A more detailed reference is provided for the precursor cathode active material (pCAM) pricing premium also referred to on paragraph 4 on page 1 of the 17 October ASX Announcement as well as a more detailed explanation of pCAM and its role in the production of lithium-ion batteries.
- A more detailed explanation of the delay in the Scoping Study is included and expands on the explanation provided in paragraph 5 of the 17 October 2023 announcement.

#### **BODY OF TEXT**

• A reference is included for the JORC Resource statement in paragraph 2 and the 78m @ 46.4 g/t Sc result referred to in paragraph 3.

This announcement is authorised by the Board of Directors.

- END -

Chris Hansen

Managing Director & Chief Executive Officer Greenstone Resources Limited





# **ASX ANNOUNCEMENT**

23<sup>rd</sup> October 2023

# **SCOPING STUDY UPDATE**

- In April 2023 The Mt Thirsty Joint Venture partners Greenstone Resources Ltd (ASX: GSR) (50%) and Conico Ltd (ASX: CNJ) (50%) appointed a specialist team of independent consultants to undertake an updated Scoping Study for the Mt Thirsty Project (JORC Resource 66.2 Mt @ 0.06% cobalt; 0.43% nickel and 0.45% manganese).
- This Scoping Study is assessing several optimisations, including the adoption of HPAL and production of Precursor Cathode Active Material (pCAM), a high-value product made of cobalt, nickel, and manganese.
- pCAM is an essential constituent used in the manufacturing of high-performance lithium-ion batteries.
- Addition of pCAM and HPAL to the Mt Thirsty project could transform project economics:
  - pCAM typically receives a ~50% pricing premium over intermediatory products such as MHP and MSP given its added value, use and demand in application for battery manufacturing<sup>1</sup>
  - Comparable HPAL projects typically receive Co and Ni recoveries of 90% and 92%, respectively (Appendix A)
- The updated Scoping Study and associated project economics were initially expected for completion in early-mid July 2023 however, high levels of workflows experienced by metallurgical consultants (including the acquisition of one of the metallurgical consultants by a US listed company in July 2023) engaged in the testwork and the completion of the study have resulted in unforeseen delays in the completion of the study. The MTJV Partners now anticipate this study to be completed and released to the market by mid-late November 2023.

The current Scoping Study is incorporating a number of previously identified project optimisations, in particular the adoption of High-Pressure Acid Leaching (**HPAL**) and the addition of a cathode precursor plant to produce a Precursor Cathode Active Material (**pCAM**).

The Mt Thirsty Co-Ni-Mn-Sc project is located 16 km north-northwest of Norseman, Western Australia (50% Greenstone Resources, 50% Conico Limited) and is supported by a network of existing infrastructure (road, rail, port, and power). The Project hosts the Mt Thirsty cobalt-nickel-manganese-scandium deposit, with a current JORC Resource of **66.2 million tonnes @ 0.06% cobalt; 0.43% nickel and 0.45% manganese** (see ASX Announcement: GSR 26/4/2023). A Pre-Feasibility Study (**PFS**) was previously completed on the existing resource of **26.9Mt at 0.126% cobalt**, and **0.54% nickel** (see ASX Announcement: GSR 20/02/2020).

Drilling in 2022 identified scandium within the resource, of up to **78 metres @ 46.4 g/t Sc from 3 metres (see ASX Announcement: GSR 23/1/2023)**, which was previously untested for. Scandium oxide currently attracts a price of A\$1,415,400/t<sup>2</sup>, and may provide a valuable by-product revenue stream.

The previously released PFS employed atmospheric leaching as the extraction method, resulting in lower metal recoveries and was also completed during a period of subdued commodity prices, which understated the Project's potential to provide a low-cost, ethical and sustainable source of cobalt and nickel outside of the Democratic Republic of the Congo and Russia. Since the completion of the PFS in early 2020, a number of project optimisation opportunities

www.greenstoneresources.com.au

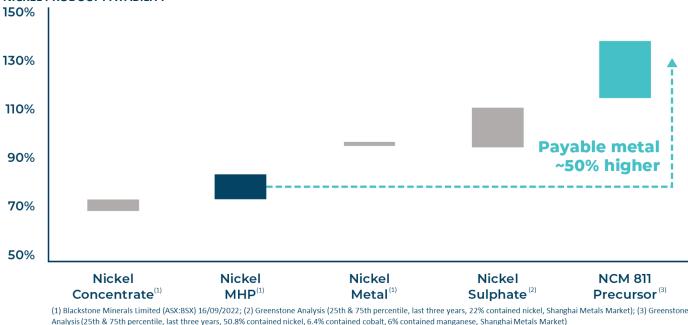


have subsequently been identified which may have a material impact on the Project economics, including the adoption of HPAL and the production of a pCAM product.

# PRECURSOR CATHODE ACTIVE MATERIAL (PCAM)

A precursor cathode active material (pCAM) is a substance that is used in the production of cathode materials for lithium-ion batteries, which are commonly used in electric vehicles. A pCAM is typically composed of a combination of cobalt, nickel, and manganese, along with other chemical additives that help to improve the performance and stability of the battery. Cathode materials are one of the key components of lithium-ion batteries required to decarbonise the global economy, as they determine the performance characteristics of the battery, such as energy density, power density, and cycle life.

The Mt Thirsty cobalt-nickel-manganese-scandium project is uniquely positioned containing all three of the principal constituents to produce the preferred 811 nickel-cobalt-manganese pCAM product (eight parts nickel, one part cobalt, and one part manganese). Importantly, the adoption of pCAM provides the ability to produce a significantly higher value product which typically receives a ~50% pricing premium over the intermediatory product (MHP / MSP) the Project was previously envisaged to produce (Figure 1). As such the production of pCAM has the potential to increase both payable metal content and as a result also increase revenue.



# NICKEL PRODUCT PAYABILITY

FIGURE 1: Illustration of nickel product payability vs metal spot price.

# **SCOPING STUDY**

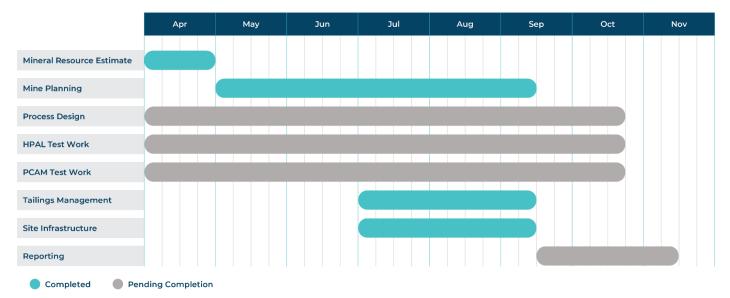
A team of independent consultants has been engaged to undertake a Scoping Study at Mt Thirsty, including Simulus Pty Ltd (Simulus) and WSP Australia Pty Limited (WSP).

Simulus is a leading hydrometallurgy and mineral processing services group that specialises in metallurgical testwork, process simulation, engineering studies and the development of hydrometallurgical flowsheets. Simulus bring extensive HPAL experience having been involved in the assessment, development, design, commissioning, or operation of 22 nickel projects over the past 19 years.



WSP is a full-service mining consultancy with a global team of over 4,400 dedicated mining professionals covering geology, resource estimation, mining, processing, and environmental. WSP's mining team (formally Golder Associates) have extensive experience with the Mt Thirsty project, having previously undertaken the most recent mineral resource estimates and tailings design. As part of the Scoping Study, WSP will be undertaking an updated mineral resource estimate, mine design, tailings management plan and associated site infrastructure design.

The Scoping Study is already underway and is now expected to be completed by mid-late November 2023 (Figure 2).



# INDICATIVE SCOPING STUDY TIMELINE

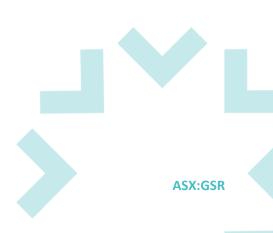
FIGURE 2: Indicative Scoping Study project timeline to completion.

This announcement is authorised by the Board of Directors.

- END -

Chris Hansen

Managing Director & Chief Executive Officer Greenstone Resources Limited





## **APPENDIX A**

# Nickel Deposits and High-Pressure Acid Leaching (HPAL)

Owner	Nico Resources Ltd (ASX: NC1)	Sunrise Energy Metals Ltd (ASX: SRL)	Greenstone Resources (ASX: GSR); Conico Limited (ASX: CNJ)	
Ownership	100%	100%	GSR: 50%. CNJ: 50%	
Market Capitalisation	\$34m	\$66m	GSR: A\$10.9m, CNJ: 5, CNJ: \$6.3m	
Project	Central Musgrave	Sunrise	Mt Thirsty JV	
Location	Western Australia	New South Wales	Western Australia	
Ore Type	Laterite	Laterite	Laterite	
JORC Resources	216 Mt @ 0.91% Ni & 0.07% Co, for 1,954 kt Ni & 154.4 kt Co	101 Mt @ 0.59% Ni & 0.13% Co, for 593 kt Ni & 133 kt Co	66 Mt @ 0.43% Ni, 0.06% Co, & 0.45% Mn, for 283 kt Ni, 40.5 kt Co & 296.2 kt Mn	
Measured	37.6 Mt @ 0.98% Ni & 0.075% Co, for 368 kt Ni & 28 kt Co	39.9 Mt @ 0.75% Ni & 0.15% Co for 299 kt Ni & 59 kt Co	N/A	
Indicated	130.9 Mt @ 0.91% Ni & 0.072% Co, for 1193 kt Ni & 94.6 kt Co	47 Mt @ 0.55% Ni & 0.12% Co for 259 kt Ni & 58 kt Co	30.2 Mt @ 0.51% Ni, 0.1% Co, & 0.69% Mn, for 154.7 kt Ni, 29.3 kt Co, & 207.8 kt Mn	
Inferred	47.1 Mt @ 0.83% Ni & 0.07% Co, for 392 kt Ni & 31.8 kt Co	14.2 Mt @ 0.24% Ni & 0.11% Co for 35 kt Ni & 16 kt Co	36.1 Mt @ 0.36% Ni, 0.03% Co, & 0.25% Mn, for 128.3 kt Ni, 11.3 kt Co, & 88.4 kt Mn	
Project Stage	Pre-Feasibility	Definitive Feasibility	Scoping Study (pending)	
Nickel Recoveries	0.92	0.926	tba	
Cobalt Recoveries	0.89	0.912	tba	
Source	ASX Announcement 19/9/2023	ASX Announcement 25/6/2018	ASX Announcement 26/4/2023	

Nickel is found in both lateritic and sulphide deposits, with laterites being formed through the prolonged chemical and mechanical weathering of a parent ultramafic rock in wet, warm, tropical environments.

High pressure acid leaching is a process used to typically extract nickel, cobalt, manganese and scandium from laterite orebodies. During the HPAL process, the laterite ore is mixed with sulfuric acid and subjected to high temperatures and pressures in an autoclave vessel. The acid dissolves the metals from the ore, forming metal sulfate solutions, which are then subjected to a series of chemical and physical processes to separate and purify the respective metals. The primary benefit of HPAL is the ability to quickly leach nickel and cobalt from laterite ores.

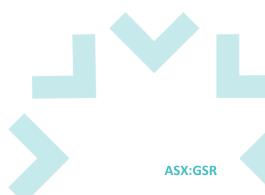
The above table compares key metrics of two other Australian laterite projects owned by ASX listed companies (Nico Resources and Sunrise Energy Metals) that are contemplating the use of High-Pressure Acid Leach ("HPAL") technology in the extraction of nickel from lateritic ore bodies.

### DISCLAIMER

Both Nico Resources and Sunrise Energy Metals are seeking to extract nickel and cobalt metals from lateritic ore bodies. To the Company's current knowledge, there appears to be no material geological distinctions between these deposits and those located at Mt Thirsty that would



lead to materially different metallurgical responses. However, the Company wishes to emphasise that until it has completed the required metallurgical test work, there can be no certainties regarding the achievement of metal recoveries returned in the mining studies undertaken by Nico Resources and Sunrise Energy Metals. Materially lower metal recoveries compared to other nickel laterite projects including those outlined in the table above could have adverse effects on the financial metrics, and therefore the viability of the Mt Thirsty Project. Recoveries of metals from nickel laterite ores are dependent on a number of variables including grind size, acid consumption, residence time and mineralogical variability of lateritic profiles. Potential investors should be aware of these uncertainties and consider them when evaluating the investment potential.





## **RESOURCES & RESERVES**

The Mt Thirsty Joint Venture (MTJV) is located 16 km North-Northwest of Norseman, Western Australia (50% Conico, 50% Greenstone Resources Limited).

The Project contains the Mt Thirsty cobalt-nickel oxide deposit with a JORC Resource of 26.9Mt at 0.126% cobalt, and 0.54% nickel. A Pre-Feasibility Study (PFS) of the Project was completed and announced to the ASX on 20 February 2020. In addition to the Co-Ni-Mn oxide deposit, the Project also hosts nickel sulphide mineralisation potential, and scandium has been found within the resource, which was previously untested for.

#### Mt Thirsty Joint Venture Mineral Resources (50%)

			Grade			Contained Metal		
	Cut-off Grade (NiEq%)	Dry Tonnes (Mt)	Ni (%)	Co (%)	Mn (%)	Ni (kt)	Co (kt)	Mn (kt)
Mt Thirsty Main (MTTM)								
Indicated	0.25	30.2	0.51	0.10	0.69	154.7	29.3	207.8
Inferred	0.25	31.9	0.35	0.03	0.24	110.4	9.3	76.6
Total	0.25	62.1	0.43	0.06	0.46	265.1	38.5	284.4
Mt Thirsty North (MTTN)								
Indicated	0.25	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Inferred	0.25	4.2	0.43	0.05	0.29	17.9	2.0	11.8
Total	0.25	4.2	0.43	0.05	0.29	17.9	2.0	11.8
Total	0.25	66.2	0.43	0.06	0.45	283.0	40.5	296.2

Refer to ASX Announcement GSR 26/04/2023 for full details of the Mineral Resource Estimate.

#### **Competent Persons for the Mt Thirsty Cobalt Nickel Project**

Project and Discipline	JORC Section	Competent Person	Employer	Professional Membership
Mt Thirsty Geology	Exploration Results	Glenn Poole	Greenstone Resources	MAusIMM
Mt Thirsty Resource Estimation	Mineral Resources	Richard Gaze	Golder Associates Pty Ltd	MAusIMM
Mt Thirsty Metallurgy	Exploration Results and Ore Reserves	Peter Nofal	AMEC Foster Wheeler Pty Ltd trading as Wood	FAusIMM
Mt Thirsty Mining	Ore Reserves	Frank Blanchfield	Snowden Mining Industry Consultants Pty Ltd	FAusIMM

The information in this announcement which relates to Exploration Results and geological interpretation at Mt Thirsty is based on information compiled by Mr Glenn Poole an employee of Greenstone Resources Limited who is a Member of the Australasian Institute of Mining and Metallurgy. Mr Poole consents to the inclusion in the announcement of the matters based on their information in the form and context in which it appears.

The information in this announcement which relates to Mineral Resources is based on information provided to and compiled by Mr David Reid, a Competent Person who is a full-time employee of Golder Associates Pty Ltd, and a Member of the Australasian Institute of Mining and Metallurgy. Mr Reid has sufficient relevant experience to the style of mineralisation and type of deposits under consideration and to the activity for which he is undertaking to qualify as a Competent Person as defined in the JORC Code (2012 Edition). Mr Reid consents to the inclusion in the announcement of the matters based on his information in the form and context in which it appears.

The Company is not aware of any new information or data that materially affects the information presented and that the material assumptions and technical parameters underpinning the estimates continue to apply and have not materially changed. The company confirms that the form and context in which the Competent Persons' findings are presented have not been materially modified from the original market announcements.



## **DISCLAIMER & CAUTIONARY STATEMENTS**

The interpretations and conclusions reached in this announcement are based on current geological theory and the best evidence available to the authors at the time of writing. It is the nature of all scientific conclusions that they are founded on an assessment of probabilities and, however high these probabilities might be, they make no claim for complete certainty. Any economic decisions that might be taken based on interpretations or conclusions contained in this report will therefore carry an element of risk. This announcement contains forward-looking statements that involve several risks and uncertainties. These forward-looking statements are expressed in good faith and believed to have a reasonable basis. These statements reflect current expectations, intentions or strategies regarding the future and assumptions based on currently available information. Should one or more of the risks or uncertainties materialise, or should underlying assumptions prove incorrect, actual results may vary from the expectations, intentions and strategies described in this report. No obligation is assumed to update forward-looking statements if these beliefs, opinions, and estimates should change or to reflect other future developments.

#### **REFERENCES TO PREVIOUS ANNOUNCEMENTS**

In relation to the details of the PFS announced on 20/02/2020, Greenstone confirms that all material assumptions underpinning the production target and forecast financial information from the production target, as reported on 20/02/2020, continue to apply and have not materially changed. A proportion of the production target uses inferred mineral resources. There is a low level of confidence associated with inferred mineral resources and there is no certainty that further exploration will result in the determination of indicated mineral resources or that the production target itself will be realised.

The mineral resource estimates in this announcement were reported by the Company in accordance with ASX Listing Rule 5.8 on 26/04/2023. 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. 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.

The ore reserve estimate in this announcement was reported by the Company in accordance with ASX Listing Rule 5.9 on 20/20/2020. 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 estimate in the previous 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.

