



3 DECEMBER 2014

SNOWDEN MINING'S SCOPING STUDY SUPPORTS COMPELLING ECONOMIC POTENTIAL OF THE YANGIBANA PROJECT

HIGHLIGHTS

- **Results provide confidence to advance the Yangibana Project into Pre-Feasibility Study**
- **Indicative pre-tax Net Present Value (NPV) of \$900 million to \$1.2 billion based on open pit mining at 1.0 million tonnes per annum (tpa) over a 15-year period**
- **Internal Rate of Return (IRR) of 62.5%**
- **Capex of approximately \$390m with payback within 1.6 years of start of production**
- **Scoping Study based on Yangibana production of approximately 2,700tpa of neodymium oxide, 750tpa of praseodymium oxide, 40tpa of dysprosium oxide and 70tpa of europium oxide**
- **Preliminary beneficiation test results incorporated into Study**
- **Metallurgical parameters for downstream processing based on similar deposits**
- **Current commodity prices used in the Scoping Study with no projected metal price escalation, and an exchange rate of US\$0.80**

INTRODUCTION

Hastings Rare Metals Limited (**ASX:HAS**) is pleased to announce positive results of an independent Scoping Study (Study) on its Yangibana Rare Earths Project in the Gascoyne Region of Western Australia, completed by Snowden Mining Industry Consultants (Snowden).

High Confidence Case (based on part of the current JORC Resources)

The Study shows potential for strong economic returns with an indicative NPV based largely on current Indicated Resources of \$295 million to \$360 million at a 10% discount rate over a 3.7-year operating mine life with a 1.6-year payback period from commencement of production.

Hastings Rare Metals Limited
ABN 43 122 911 399

ASX Code: HAS

Level 25, 31 Market Street
Sydney NSW 2000
PO Box Q128 Queen Victoria Building
NSW 1225 Australia

Telephone: +61 2 8268 8689
Facsimile: +61 2 8268 8699
admin@hastingsraremetals.com

Board and Management

Charles Lew (Chairman)
Anthony Ho (Non Exec Director)
Malcolm Mason (Non Exec Director)

www.hastingsraremetals.com



Expanded Case

Extrapolating the operation out over a total of 15 years, based on the reasonable assumption that resources of the same tenor as the current resources will continue to be defined by exploration, provides a NPV of \$900 million to \$1.2 billion at a 12% discount rate. The 12% discount rate reflects the risk profile of a longer mine life.

Hastings considers that this case is supported by an Exploration Target, as defined by the JORC Code, Clause 17, of between 11 and 12 million tonnes of plant feed at a grade of in the order of 0.6% to 0.8% total rare earths oxides. This target is conceptual, but is supported by the JORC resources and exploration results announced recently for the Frasers, Bald Hill North, Kane's Gossan, Hook, Lion's Ear, and Gossan prospects, by additional prospects defined by exploration drilling in the 1980s (Hook South, Yangibana South, Yangibana and Tongue), and by the surface expression of ironstones (the host to the rare earths mineralisation) both along strike from the prospects listed above and elsewhere within the Yangibana Project tenements. This Exploration Target is to be explored in the timeline previously announced.

Financial Summary and Assumptions

Following the success of drilling programmes at Yangibana North prospect and at seven additional targets, combined with early results from metallurgical/beneficiation test work, Hastings engaged Snowden to complete an independent Scoping Study of its Yangibana Rare Earths Project.

Hastings' initial efforts at Yangibana would be focussed on the production of separated (or combined if required by the customer) oxides of the rare earths neodymium (Nd), praseodymium (Pr), dysprosium (Dy), and europium (Eu). Additional rare earths might be considered at a later date when suitable markets and opportunities are identified.

To assess the potential of the various prospects, the Company has established a neodymium oxide-equivalent ($\text{Nd}_2\text{O}_3\text{-Eq}$) figure that simply represents the in-ground value of the other three target oxides (Pr_2O_3 , Dy_2O_3 , and Eu_2O_3) as their equivalent to Nd_2O_3 based on grade and current commodity prices.

Key parameters used in the Study are shown in Table 1.

For personal use only

Item	Units	Base Case	Expanded Case
Plant Throughput	Million tonnes per annum	1.0	1.0
Project Life	Years	3.7	15
Nd ₂ O ₃ -Eq production	Tonnes per annum	5,450	5,450
Nd ₂ O ₃ -Eq price assumption*	US\$/kg	60	60
Annual Gross Revenue	US\$m	327	327
Annual Operating costs	A\$m	117	117
Exchange Rate	A\$:US\$	0.80	0.80
Capital Cost	A\$m	390	390
Discount Rate	%	10	12
Payback after construction completed	Years	1.6	1.6

*With no projected metal price escalation

Table 1 – Yangibana Project Scoping Study, Key Project Parameters

Metal equivalent calculation

Hastings has applied the same metallurgical recoveries to praseodymium (Pr), dysprosium (Dy), and europium (Eu) as for neodymium, based on preliminary metallurgical studies of the ore, which indicate a metallurgical recovery in the order of 76.5% of the metal oxide for the four rare earths oxides of economic interest. This recovery has been applied to the geological block model fields for each element and the grade of each metal in the individual blocks multiplied by the assumed metal price, which is based on the 23 October 2014 spot prices for these oxides (Table 2).

The metal equivalent block model was optimised by Snowden in its preliminary economic evaluation.

Metal oxide	Assumed commodity price (US\$/kg)	Indicative metallurgical recovery
Nd ₂ O ₃	59.50	76.5%
Pr ₂ O ₃	119.50	76.5%
Dy ₂ O ₃	340.00	76.5%
Eu ₂ O ₃	725.00	76.5%

Table 2 – Yangibana Scoping Study – Basis of Neodymium-Equivalents (Nd₂O₃-Eq)

Since metallurgical recoveries are the same for all targets, the calculation of neodymium equivalent (Nd₂O₃-Eq) grade is therefore:-

$$\text{Nd}_2\text{O}_3\text{-Eq grade} = (((\text{Nd}_2\text{O}_3 \text{ grade} + ((\text{Pr}_2\text{O}_3 \text{ grade} * (\text{Pr}_2\text{O}_3 \text{ price} / \text{Nd}_2\text{O}_3 \text{ price})) + ((\text{Dy}_2\text{O}_3 \text{ grade} * (\text{Dy}_2\text{O}_3 \text{ price} / \text{Nd}_2\text{O}_3 \text{ price})) + ((\text{Eu}_2\text{O}_3 \text{ grade} * (\text{Eu}_2\text{O}_3 \text{ price} / \text{Nd}_2\text{O}_3 \text{ price}))))))$$

For personal use only



Mining

Snowden has used the Company's Indicated Resources (prepared under the guidelines of the JORC 2012) as estimated by independent consultant CoxRocks Pty Limited with an average grade of 0.70% Nd₂O₃-Eq at a stripping ratio (tonne for tonne) of approximately 8.5; as the basis for its modelling of open pit mining operations at the Yangibana North and Bald Hill South Prospects. 10% dilution at zero grade has been incorporated in the pit optimisation with 100% mining recovery.

Mining costs were developed by Snowden based on industry standard drill and blast, load and haul costs.

The optimised pits are based on the proposed mining rate of 1.0 million tonnes per annum of ore.

The optimised pits extract:-

- **Yangibana North (70% owned):** 2.51 million tonnes of mineralisation (79% from Indicated Resources and 21% from Inferred Resources) with an average grade of 0.70% Nd₂O₃-Eq at a stripping ratio (tonne for tonne) of 9.2; and
- **Bald Hill South (100% owned):** 1.18 million tonnes of mineralisation (100% from Indicated Resources) with an average grade of 0.76% Nd₂O₃-Eq at a stripping ratio (tonne for tonne) of 3.78.

Processing

Mined ore will be fed to a crushing plant for size reduction, prior to milling to reduce the feed to the required sizing for the flotation processing.

Hastings has completed preliminary beneficiation test work with excellent results. These results have been incorporated into the Study. As a consequence, at a plant throughput rate of 1.0 million tonnes per annum, it is considered that a flotation plant can achieve an 80% reduction to 200,000 tonnes of concentrate with a recovery of 85% of the contained rare earths (i.e. loss of only 15% of contained rare earths).

The subsequent hydrometallurgical plant leaches the 200,000 tonnes per annum of concentrate to extract the target rare earths. The rare earths are then treated in a separation plant/refinery to produce individual or combined rare earths oxides products as specified by the customers.

All processes from crushing to milling, flotation to hydrometallurgy and separation are standard processes used within the rare earths industry. This further de-risks the project. All rare earths projects have unique characteristics that require specific methods to be

For personal use only



developed, but the Yangibana rare earths are hosted almost exclusively in the mineral monazite that has a long and well established history in commercial processing. A number of other projects are currently considering this processing route and this provides support to the plans.

The Company considers it reasonable that the conceptual processing route will achieve the recovery rates incorporated in the Study.

The conceptual Yangibana operation based on processing 1 million tonnes per annum of mineralisation will produce approximately:-

- 2,700 tonnes per annum of neodymium oxide;
- 750 tonnes per annum of praseodymium oxide;
- 40 tonnes per annum of dysprosium oxide;
- 70 tonnes per annum of europium oxide;

or combinations, or variants of the above as requested by customers.

Capital Costs

Snowden has established capital costs for the project based on industry standards for the basic equipment, milling and beneficiation sections, and by factoring costs available in the public arena from similar operations, that sums to a total estimated at \$390m. Table 3 provides a breakdown of these estimated capital costs.

Category	Cost A\$m
Mill and Beneficiation Plant	88
Hydrometallurgical and Separation Plant	250
Total Direct Capital Costs	338
Construction facilities/EPCM	52
Total Indirect Capital Costs	52
Total Capital Costs	390

Table 3 – Yangibana Scoping Study – Estimated Capital Costs

For personal use only

Operating Costs

The operating costs are based on contract mining and crushing and 90% processing plant availability. The Study assumes the sale of separate (or combined if required by the customer) rare earths oxides at site. Table 4 provides a breakdown of the estimated operating costs.

Category	Cost A\$/t ore mined
Contract Mining (\$3.50/t rock at Stripping/Ratio 8.46)	33
Contract Crushing	10
Milling and Beneficiation	40
Hydrometallurgical and Separation	27
General/Administration	7
Total Operating Costs	117

Table 4 – Yangibana Scoping Study – Estimated Operating Costs

Pricing

The Study is based on the current commodity prices for the four target rare earths – neodymium, praseodymium, dysprosium and europium, with no projected metal price escalation. Current commodity prices and those used in the Study are:-

- Neodymium Oxide US\$59.5/kg
- Praseodymium Oxide US\$119.5/kg
- Dysprosium Oxide US\$340/kg
- Europium Oxide US\$725/kg

Market

Hastings decision to focus its project evaluation on the four target rare earth is based on its evaluation of a number of recent publications relating to the comparative demand growth rates of the various rare earths. The industry is in consensus that the strong growth segment will be in permanent magnets area. Three of Hastings' target rare earths (neodymium, praseodymium, and dysprosium) are used extensively in this market segment. Europium is used in the phosphors market and there are indications that this market will continue to grow in the future.

The Company is confident that it will be able to achieve full market penetration for its four target rare earths oxides products.

Assessment of other rare earths comprising the Yangibana mineralisation will be undertaken at a later date and will only improve the economics of the operation.

For personal use only



Cautionary Statement

The Study referred to in this announcement is an indicative analysis subject to follow up Feasibility Studies. It is based on a low level technical and economic assessment, 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 conclusion of the Study will be realised.

* **TREO** is the sum of the oxides of the heavy rare earth elements (HREO) and the light rare earth elements (LREO).

HREO is the sum of the oxides of the heavy rare earth elements europium (Eu), gadolinium (Gd), terbium (Tb), dysprosium (Dy), holmium (Ho), erbium (Er), thulium (Tm), ytterbium (Yb), lutetium (Lu), and yttrium (Y).

CREO is the sum of the oxides of neodymium (Nd), europium (Eu), terbium (Tb), dysprosium (Dy), and yttrium (Y) that were classified by the US Department of Energy in 2011 to be in critical short supply in the foreseeable future.

LREO is the sum of the oxides of the light rare earth elements lanthanum (La), cerium (Ce), praseodymium (Pr), neodymium (Nd), and samarium (Sm).

For further information please contact:

Andy Border, General Manager Exploration +61 2 9078 7674
Guy Robertson, Company Secretary +61 2 9078 7674

About Hastings Rare Metals

- Hastings Rare Metals is a leading Australian rare earths company, with two JORC compliant rare earths projects in Western Australia.
- The Yangibana Project hosts JORC Indicated and Inferred Resources totalling 6.79 million tonnes at 1.52% TREO, including 0.35% Nd₂O₃ (comprising 3.96 million tonnes at 1.59% TREO Indicated Resources and 2.83 million tonnes at 1.43% TREO in Inferred Resources).
- The Brockmans (previously known as the Hastings) deposit contains JORC Indicated and Inferred Resources totalling 36.2 million tonnes (comprising 27.1mt Indicated Resources and 9.1mt Inferred Resources) at 0.21% TREO, including 0.18% HREO, plus 0.89% ZrO₂ and 0.35% Nb₂O₅.
- Rare earths are critical to a wide variety of current and new technologies, including smart phones, hybrid cars, wind turbines and energy efficient light bulbs.
- The Company aims to capitalise on the strong demand for critical rare earths created by expanding new technologies. It has recently completed a Scoping Study of the Yangibana Project to confirm the economic viability of the Project.

For personal use only



Competent Person's Statement

The information in this report that relates to Resources is based on information compiled by Simon Coxhell. Simon Coxhell is a consultant to the Company and a member of the Australasian Institute of Mining and Metallurgy. The information in this report that relates to Exploration Results is based on information compiled by Andy Border, an employee of the Company and a member of the Australasian Institute of Mining and Metallurgy. The information in this report that relates to metallurgical results is based on information compiled by Narelle Marriott, a consultant to the Company and a member of the Australasian Institute of Mining and Metallurgy.

Each has sufficient experience relevant to the styles of mineralisation and types of deposits which are covered in this report and to the activity which they are 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' ("JORC Code"). Each consents to the inclusion in this presentation of the matters based on his information in the form and context in which it appears.

Mr. Jeremy Peters, FAusIMM CP (Min, Geo) of Snowden Mining Industry Consultants consents to the issue of this announcement in the form and context in which it appears.

For personal use only