

Scoping Study Summary

In November 2014 an independent Scoping Study of the Yangibana Rare Earths Project was completed for Hastings by Snowden Mining Industry Consultants (Snowden).

Two models were evaluated, one being a High Confidence Case based on defined JORC resources at the Yangibana North and Bald Hill South deposits, and the second being an Expanded Case based on the successful discovery of additional mineralisation with the same tenor as the current resources sufficient to establish an operation with a 15-year mine life.

Snowden's conclusions from its Study were:-

High Confidence Case

- 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.

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.

Financial Summary and Assumptions

The Study was based on Hastings' concept to produce and sell separated 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.

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

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

Mining

Snowden used the Company's Indicated Resources (prepared under the guidelines of the JORC 2012 by 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:** 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:** 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

It is planned that mined ore will be fed to a crushing plant for size reduction, prior to milling to reduce the feed to the required sizing for flotation processing.

At a plant throughput rate of 1.0 million tonnes per annum, the Scoping Study was based on a flotation plant that 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 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; and
- 70 tonnes per annum of europium oxide.

Capital Costs

Snowden 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 2 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 2 – Yangibana Scoping Study – Estimated Capital Costs

Operating Costs

The operating costs were based on contract mining and crushing and 90% processing plant availability. The Study assumes the sale of separate rare earths oxides at site. Table 3 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 3 – Yangibana Scoping Study – Estimated Operating Costs

Pricing

The Study is based on the then 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.

Cautionary Statement

The Scoping Study 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.