

## ASX ANNOUNCEMENT

15<sup>th</sup> March 2012

# Metallurgical results deliver another significant milestone on Northern Minerals Browns Range Pathway to Production

- Latest testing indicates techniques that are well understood in the Australian mining industry can produce a high grade mineral concentrate
- Rare earths oxide distribution of the concentrate typical of xenotime mineralisation - high proportion of Heavy Rare Earth Oxides (HREO)
- High recoveries of Y<sub>2</sub>O<sub>3</sub> (>80%) using magnetic separation as the primary beneficiation technique followed by simple flotation
- Variability study delivers successful results at a broad range of Total Rare Earth Oxides (TREO) feed grades; namely ~0.25%, ~0.50% and ~1% TREO.
- Production of a bulk sample of high grade concentrate (33% TREO) to be made available to potential off-take partners as part of ongoing sales and marketing discussions
- Initial operating costs studies complete, indicating encouraging project economics

Northern Minerals (ASX: NTU) is pleased to advise further positive results from metallurgical testwork at its Browns Range project in Northern WA.

The results underline the effectiveness of a simple processing method with a high recovery from the xenotime mineralisation at Browns Range.

It confirms the Browns Range mineralisation can be processed using a relatively simple, low cost flow sheet to produce high grade concentrates of 33% Total Rare Earth Oxides (TREO). Mineralogical examination (SEM/XRD) of the concentrate confirmed that xenotime is the main rare earth mineral. The xenotime occurs as liberated single crystals or as composites with quartz.

The metallurgical work was completed by Perth-based testing company Nagrom processing Reverse Circulation (RC) bulk drill samples from the recently completed program at the Wolverine, Gambit and Area 5 North prospects

The WHGMS unit used in this program is a 500mm carousel single pulsed magnet (SLon type) run at the following settings

WHGMS500 Settings	
Feed % Solids	20%
Matrix	1mm
Field Strength	10000G
Carousel Speed	1.7rpm
Jig Pulse	300
Feed Rate L/min	2.86
Feed Time	80-30min

Source: Nagrom Testwork Synopsis



Northern Minerals Managing Director George Bauk said the results continued to build confidence in the Browns Range project as it moves through scoping and feasibility studies, and toward planned production in 2015.

“We have now completed a significant number of metallurgical tests relatively early in the development of this project in order to identify any potential issues in the beneficiation flow sheets,” he said.

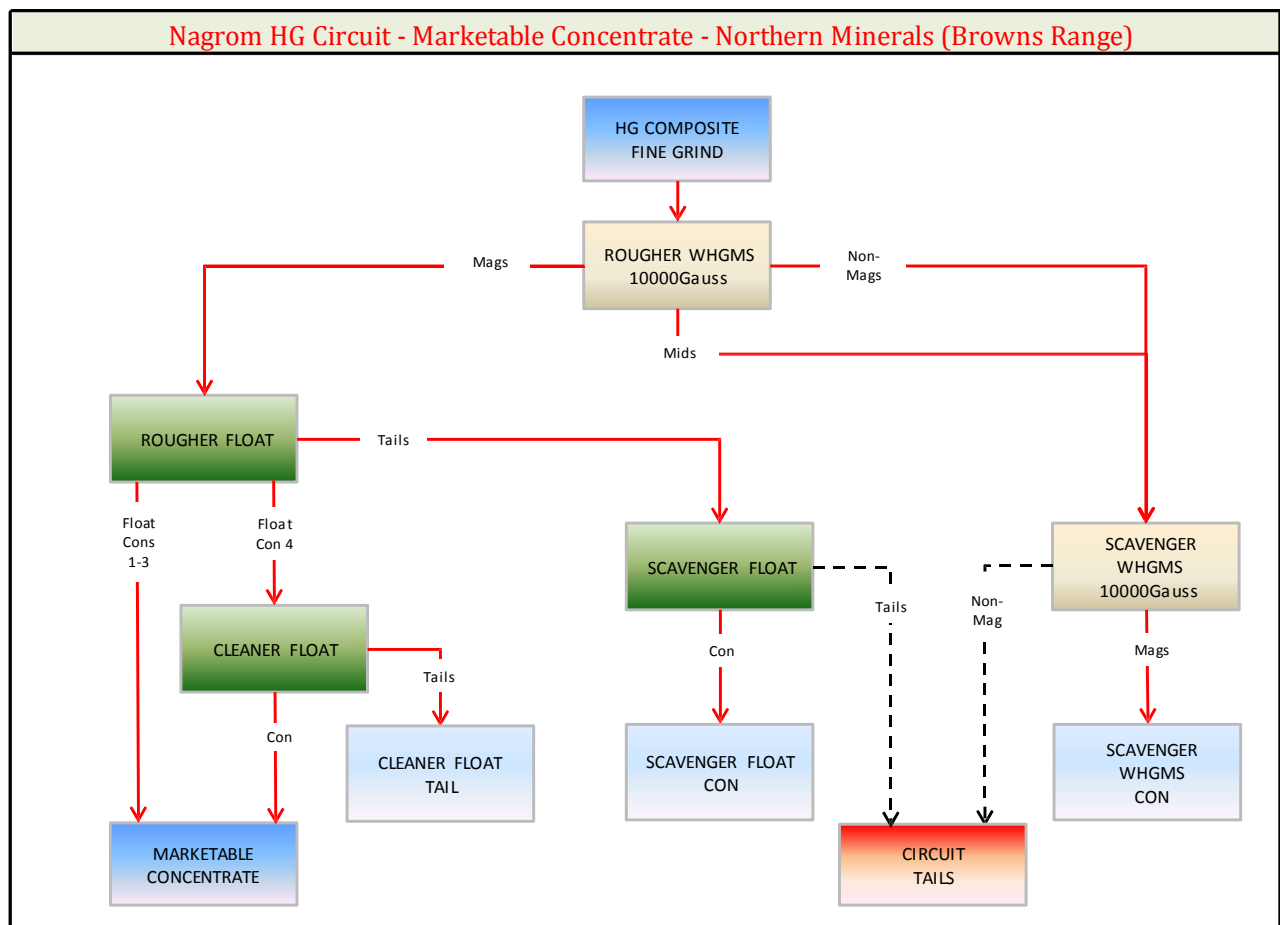
“The results have been very encouraging, indicating that we can produce a high grade mineral concentrate using magnetic separation as the primary beneficiation technique followed by simple flotation; techniques that are well understood in the Australian mining industry..

“It is most encouraging that we were also able to achieve successful results across a broad range of feed grades from each prospect comprising ~0.25%, ~0.5% and ~1% TREO.” Mr Bauk said.

As part of the testing process, Northern Minerals has also produced a 10 kg sample of concentrate which it will provide to potential off-take partners as part of its ongoing sales and marketing discussions.

The sample was produced using a relatively un-optimised magnetic and flotation flowsheet, to produce a concentrate with 33% TREO.

Below is a block flow diagram of the HG circuit.



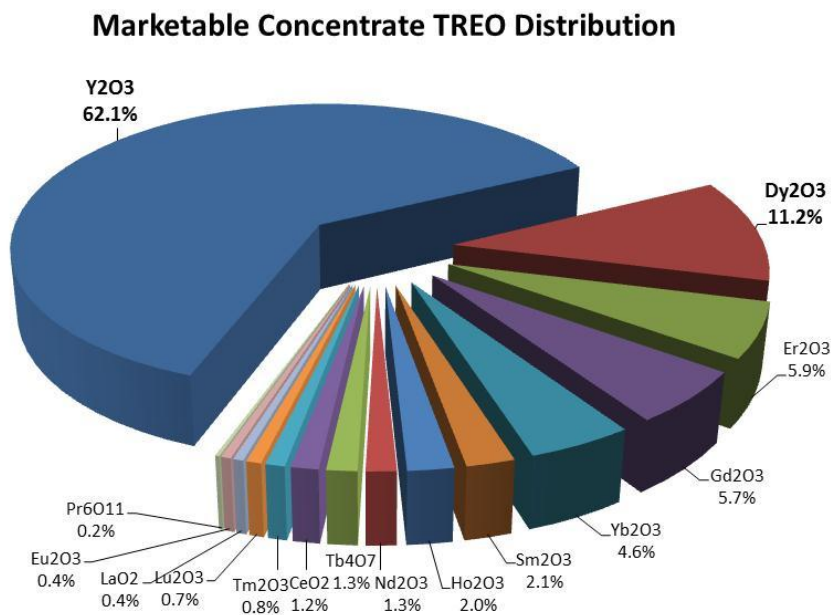
Source: Nagrom Testwork Synopsis

Key findings from the Nagrom summary report are provided below:

- The characterisation magnetic response tested -212 +106  $\mu\text{m}$  fractions with head grades ranging from 0.1% to 1.1%  $\text{Y}_2\text{O}_3$ . The test delivered concentrates from 0.4% to 7.8%  $\text{Y}_2\text{O}_3$  with the recovery of  $\text{Y}_2\text{O}_3$  ranging from 77% to 97%.
- Flow sheet elements of magnetic and flotation beneficiation were tested on feeds ranging from 0.1% to 1.8%  $\text{Y}_2\text{O}_3$ . The tests delivered concentrates from 6.1% to 31.1%  $\text{Y}_2\text{O}_3$  with the recovery of  $\text{Y}_2\text{O}_3$  ranging from 48% to 74%.
- The composite feed derived from these test samples delivered a primary circuit REO concentrate with the following characteristics:
  - TREO grade 33.8%

*NB – TREO: Total Rare Earth Oxides – Total of  $\text{La}_2\text{O}_3$ ,  $\text{CeO}_2$ ,  $\text{Pr}_6\text{O}_{11}$ ,  $\text{Nd}_2\text{O}_3$ ,  $\text{Sm}_2\text{O}_3$ ,  $\text{Eu}_2\text{O}_3$ ,  $\text{Gd}_2\text{O}_3$ ,  $\text{Tb}_4\text{O}_7$ ,  $\text{Dy}_2\text{O}_3$ ,  $\text{Ho}_2\text{O}_3$ ,  $\text{Er}_2\text{O}_3$ ,  $\text{Tm}_2\text{O}_3$ ,  $\text{Yb}_2\text{O}_3$ ,  $\text{Lu}_2\text{O}_3$ ,  $\text{Y}_2\text{O}_3$*

Of the total contained rare earths, the distribution confirmed a REO distribution typical of xenotime mineralisation, as shown in the chart below.



Source: Nagrom Testwork Synopsis

Mr Bauk said the next phases of the metallurgical program will focus on optimisation and preliminary investigations on down-stream processing.

“The processing model has not yet been optimised for the Browns Range product; so we will now be working on refining the flow sheet, based on our mineralogy studies, with a view to improving on the impressive results achieved to date,” Mr Bauk said.

### **Operating Cost Studies**

Northern Minerals has also completed an preliminary (order of magnitude) mill operating cost estimate on potential production at Browns Range as part of its scoping studies. Detailed mining costs will not be completed until a JORC resource estimate has been produced.

The company engaged Bateman Engineering to undertake the work, testing three potential production scenarios based on a nominal yield of 3,000 tonnes of contained TREO in xenotime concentrate per annum, at three different feed grades.

The high level results are summarised in the table below:

<b>Milling Operating Costs Only (±30%)</b>		
<b>Production target</b>	<b>\$/t of ore</b>	<b>\$/t concentrate (33% TREO)</b>
1,500,000 tpa @ 0.25%TREO	25	12,000
750,000 tpa @ 0.5%TREO	32	8,000
375,000 tpa @ 1%TREO	50	6,000

Mr Bauk said the study included indicative costs for labour, electrical power, process consumables, maintenance and site infrastructure..

“These are only early stage operating cost forecasts and will be refined as we move forward. However, the results to date indicate positive economics for the Browns Range project, in particular at the higher feed grades,” he said.

“Due to the simple processing model and relatively low capital expenditure to get the processing plant in place, our goal is to be in production by 2015.”

A brief video produced by Nagrom illustrating the test work will be available on our website from 16 March 2012.

NOTE :The desktop capital study and operating cost study was conducted by Bateman Engineering and the metallurgical test work and development of beneficiation flow sheets conducted by Nagrom following ongoing JORC resource drilling and metallurgical studies, to produce a conceptual flowsheet. At this stage the company has not yet estimated a JORC resource. Accordingly inferences to production should not be used as a basis for investment decisions about shares in the company.

### **Competent Person Declaration**

Metallurgical statements and analytical data presented in this report has been certified by Dr Slobodanka Vukcevic BSc(Metallurgy) MSc(Eng) Ljubljana, PhD Belgrade – Associate Professor (UWA). Dr Vukcevic has sufficient experience with the ore types under consideration and the metallurgical processing techniques employed in this study to qualify as a Competent Person as defined in the 2004 Edition of the ‘Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves’. Dr Vukcevic consents to the inclusion in the report of the matters based on her information in the form and context in which it appears.

**For more information:**

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## About Northern Minerals

Northern Minerals Limited (ASX: NTU) is focussed on development of rare earth elements (REE), with a large and prospective landholding in Western Australia and the Northern Territory.

The Company's flagship project is Browns Range, where it has a number of prospects with high value, heavy rare earth elements (HREE), in xenotime mineralisation. In particular, the mineralisation includes high levels of dysprosium and yttrium, which are in short supply globally. Following outstanding drill results in 2011, the Company is focussed on advancing Browns Range toward production, using a relatively simple and low cost processing flow sheet to produce a high grade concentrate. The Company is aiming to produce and deliver HREE in concentrate by 2015. Northern Minerals also has a HREE exploration program underway at the geologically similar John Galt project.

Northern Mineral's uranium and gold program is focused on the Gardiner-Tanami project and Gardner Range JV, which comprise 10,500 km<sup>2</sup> on the WA-NT border. The projects are located within the Tanami-Arunta region which is a world-class gold province, with several plus million ounce gold deposits. Uranium exploration is focused on high grade unconformity-related uranium targets. The area is compared favourably to the Alligator Rivers region in the NT which hosts the Ranger mine (Australia's largest operating uranium mine), and the Athabasca Basin in Canada, host to the world's highest-grade unconformity-related uranium deposits.

For more information, visit [www.northernminerals.com.au](http://www.northernminerals.com.au)

