



# Positive metallurgical results from Koppamurra

## Highlights

- Mineralogical analysis and metallurgical testing on samples from the Red Tail and Yellow Tail resource in the Koppamurra Project continue to deliver positive results.
- Mineralogical analysis identified that the rare earth elements Lanthanum (La), Neodymium (Nd), Praseodymium (Pr), Samarium (Sm), and Terbium (Tb) are highly distributed to Lanthanite minerals hosted in clay (<20µm in size) at Koppamurra.
- Metallurgical testing using various extraction techniques and test conditions demonstrated rare earth extraction of up to 68% of the valuable rare earth oxides used in high strength magnets. (Neodymium  $\text{Nd}_2\text{O}_3$ , Praseodymium  $\text{Pr}_6\text{O}_{11}$ , Dysprosium  $\text{Dy}_2\text{O}_3$  and Terbium  $\text{Tb}_4\text{O}_7$ ).
- Commenced mineral processing tests aimed at rejecting non target minerals and optimising metallurgical extraction of magnet rare earth minerals to finalise the process flowsheet for Koppamurra.

Australian Rare Earths Limited ([ASX: AR3](#)) ('AR3' or the **Company**) is pleased to announce the following update on the development of the metallurgical processes to extract rare earth elements (REEs) from samples collected at the Koppamurra Project in the south-east of South Australia.

Between December 2021 and March 2022, mineralogical analysis and metallurgical testing was conducted in conjunction with ANSTO, University of Toronto, SGS Lakefield, and ALS Brisbane with advisory assistance by KYSPLYMet and Inception Group (now WGA).

### Mineralogical Analysis

The Koppamurra resource is recognised as a clay hosted REE deposit, characterised by a combination of ionically adsorbed, acid soluble and refractory rare earth minerals. A representative composite sample was produced from 36 drill holes across a high-grade subset of the Red Tail and Yellow Tail resource.

Mineral identification and liberation analysis was undertaken by ALS Brisbane using Mineral Liberation Analyser (MLA) and Extended Liberation analysis (XBSE) techniques. The analysis identified fine grained intergrowths of Lanthanites, rare earth carbonate minerals hosted in clay and with Geothite-Limonite. La, Nd, Pr, Tb and Sm were distributed mainly in Lanthanite-(La).

A supplementary mineralogical study was conducted by SGS Lakefield on a separate composite sample, using various techniques including Xray Diffraction (XRD), TESCAN Integrated Mineral Analyzer (TIMA-X), Electron Probe Microanalysis (EPMA), and Time of Flight Secondary Ion Mass Spectrometry (ToF SIMS). A portion of the

For personal use only



REE-Y was estimated to be structurally bound, or interstitial, to the clays. Concentrations of adsorbed REEs were indicated by ToF SIMS, and refractory phase REE minerals identified by TIMA and SEM-EDX.

Figures 1 and 2 illustrate that the valuable REEs report to the minus 20micron size fraction, thereby providing excellent particle liberation for subsequent metallurgical extraction.

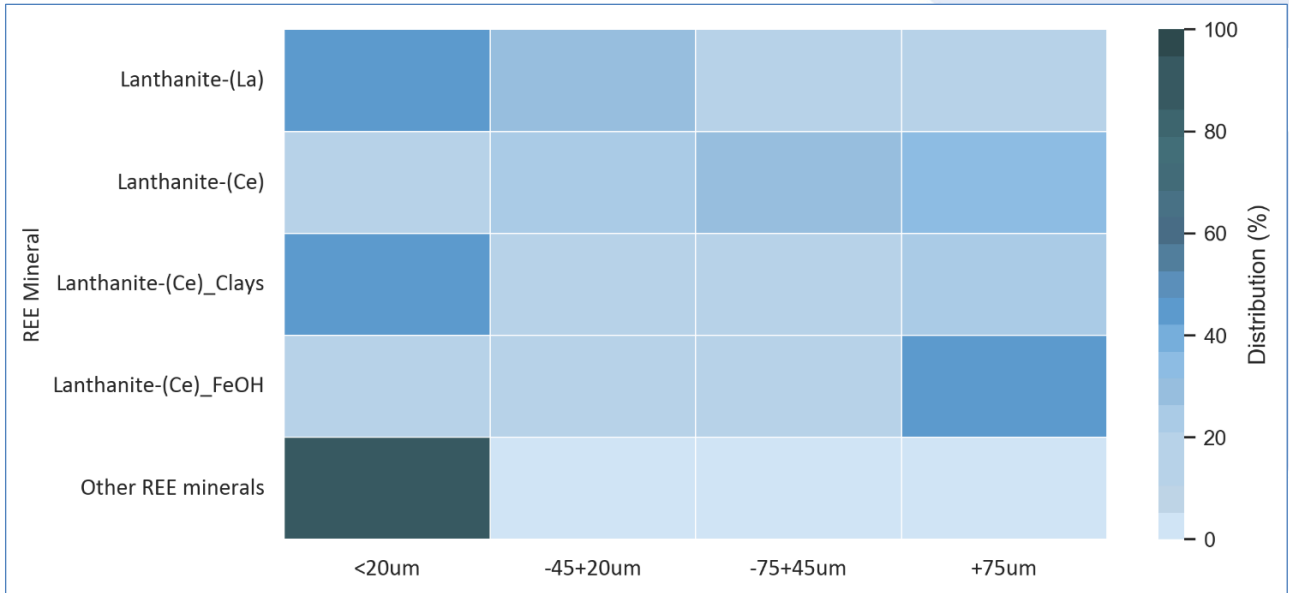


Figure 1: Distribution of rare earth minerals by size fraction and mineral type



Figure 2: Sample fractions by size, clockwise from top left -20µm, +20µm -45µm, +45µm -75µm, and +75µm

The distribution of rare earths minerals, expressed as an oxide, is illustrated in Figure 3, including the high value REEs needed for high strength permanent magnet production.

For personal use only

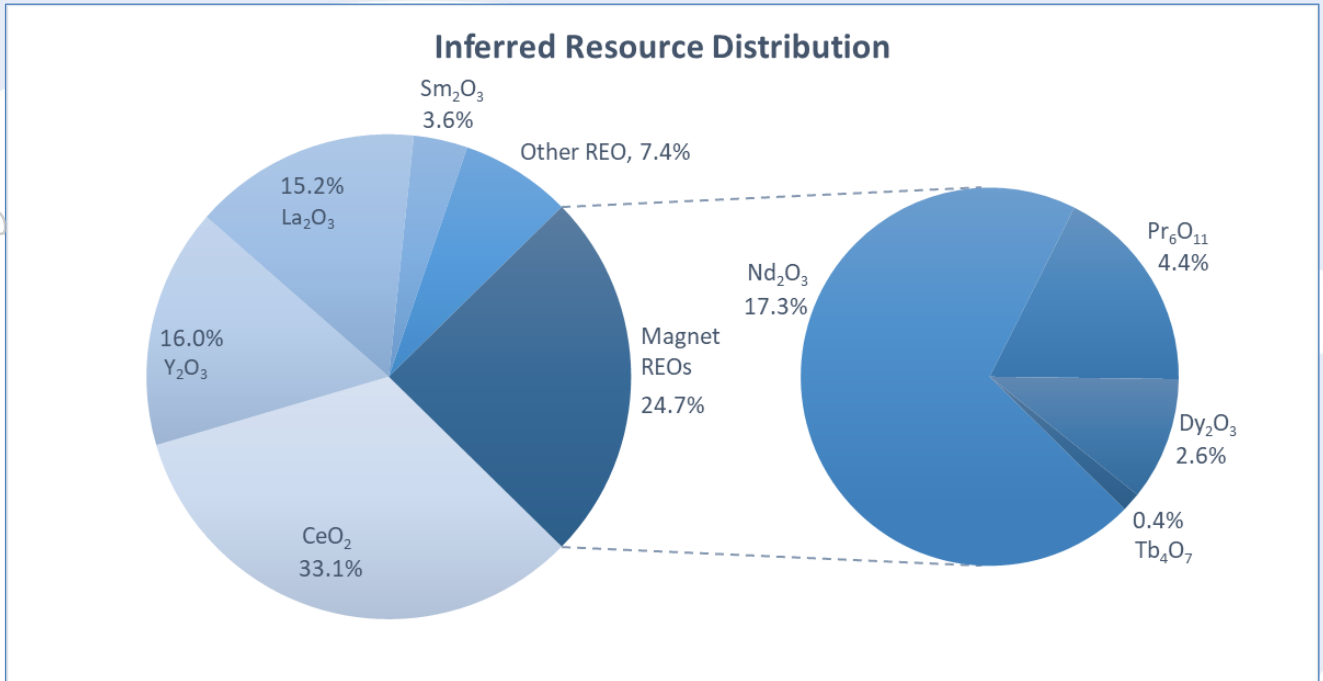


Figure 3: Rare Earth Oxide (REO) distribution within the Koppamurra inferred resource

The mineralogical analysis also indicates the potential for beneficiation to reject gangue minerals prior to metallurgical extraction. Testing is currently underway at Bureau Veritas and will commence soon at SGS Lakefield upon receipt of samples.

### Metallurgical Testing

Metallurgical testing was conducted at ANSTO in Sydney and the University of Toronto on composite samples collected from Koppamurra. Both research facilities have extensive experience in rare earth metallurgical testing on samples from many deposits worldwide, including China where there is a predominance of clay hosted rare earth deposits and operating facilities.

Figure 4 illustrates metallurgical extraction of REEs from ten drill hole composite samples. Despite varying head grades (270ppm to 1500ppm), extraction between 44% (median) and 68% (maximum) were achieved for the magnet REEs. These results are based upon sulphuric acid as the lixiviant (the liquid used to extract the metal from the minerals), at ambient temperature and pH 1. Hydrochloric acid was also tested, showing an approximate 5-10% increase (i.e., 67% to 77%) in extraction compared to sulphuric acid.

For personal use only

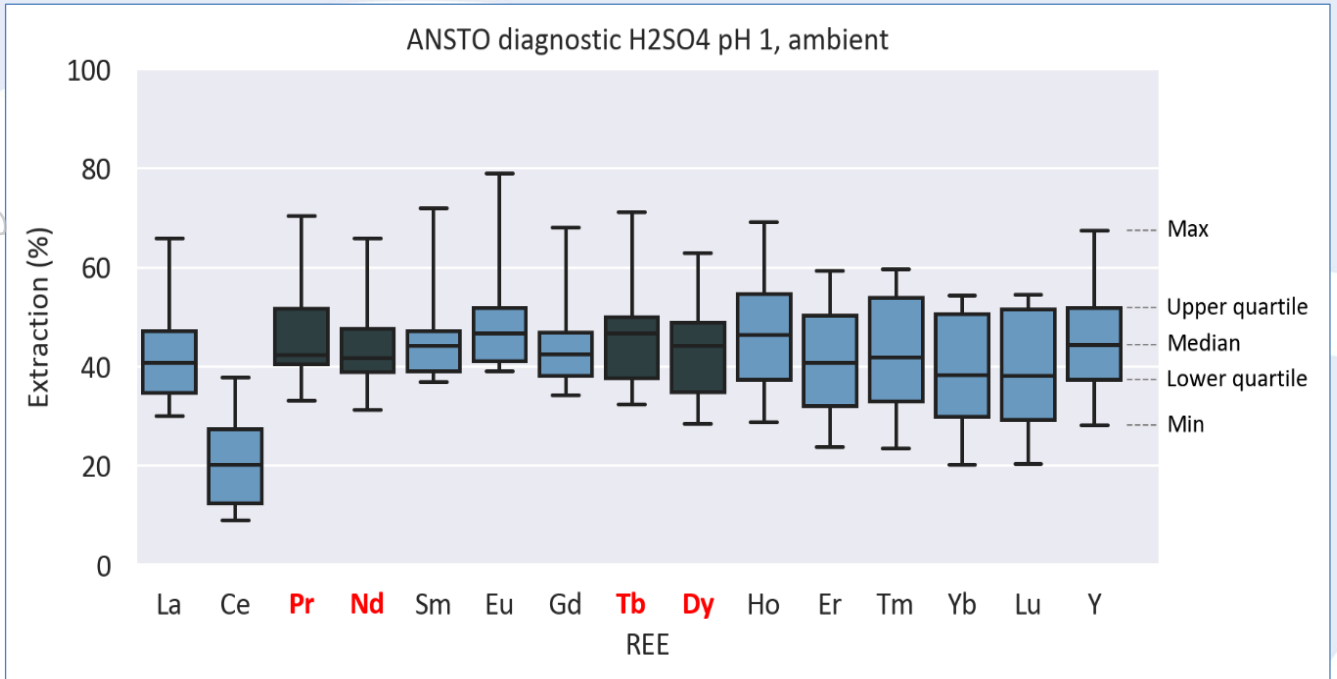


Figure 4: Extraction of REE using sulphuric acid

During testing, it was confirmed that the natural alkalinity of the mineral samples consumes acid needed for pH adjustment and REE extraction. Upstream mineral processing techniques are being evaluated to reduce the volume of acid consuming gangue minerals prior to metallurgical processing. The resultant decrease in acid consumption will support efforts to optimise the process flowsheet. Mineral processing techniques being investigated include scrubbing, cyclo-sizing, flotation, and magnetic separation. The work is being conducted at the world class SGS Lakefield research facility in Canada and supported locally in Adelaide at Bureau Veritas under supervision by KYSPLYMet.

Metallurgical tests are continuing at ANSTO and University of Toronto, examining pH levels between 1 and 4, to optimise extraction rates and levels versus acid consumption. The results will be utilised in the development of a final process flowsheet.

Commenting on these results, Don Hyma, Managing Director of Australian Rare Earths said:

*“The preliminary metallurgical test results are encouraging and aligned with our expectations for the uniquely clay hosted rare earth minerals discovered at Koppamurra. We are very fortunate to be working with world-class rare-earth metallurgists and testing facilities in our efforts to finalise a process flowsheet for the Project.”*

The Board of AR3 authorised this announcement to be released to the ASX.

For personal use only



**For further Information please contact:**

Mr Don Hyma  
Managing Director  
Tel: 1300 646 100  
E: [hello@ar3.com.au](mailto:hello@ar3.com.au)

Mr Rick Pobjoy  
Technical Director  
Tel: 1300 646 100  
E: [hello@ar3.com.au](mailto:hello@ar3.com.au)

**For Media and Broker queries contact:**

Jonathan van Hazel  
Citadel-MAGNUS  
Tel: 0411 564 969  
E: [jvanhazel@citadelmagnus.com](mailto:jvanhazel@citadelmagnus.com)

**Competent Person Statement**

*The information in this report that relates to metallurgical results is based on information compiled by Australian Rare Earths Limited and reviewed by Mr. James Davidson who is the Technical Director of Wallbridge Gilbert Aztec and a member of the Australian Institute of Mining and Metallurgy (AusIMM). Mr. Davidson has sufficient experience that is relevant to the metallurgical testing which was undertaken 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". Mr. Davidson consents to the inclusion in this report of the matters based on this information in the form and context in which it appears.*

**About Australian Rare Earths Limited**

Australian Rare Earths (AR3) is committed to the timely exploration and development of its 100% owned, flagship Koppamurra Project, located in South Australia and Victoria. Koppamurra is a prospective ionic clay hosted rare earth element (REE) deposit; uniquely rich in all the REEs required in the manufacture of rare earth permanent magnets which are essential components in energy efficient motors.

The Company is focused on executing a growth strategy that will ensure AR3 is positioned to become an independent and sustainable source of light and heavy REEs, playing a pivotal role in the global transition to a green economy.

For personal use only