



(ASX:ABX)

# Ionic Adsorption Clay Rare Earths in Tasmania

## Mines and Money Connect – Melbourne

### Mark Cooksey

Managing Director and CEO

15 June 2023

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Prices for aluminium fluoride (AlF<sub>3</sub>) were sourced from Asian Metals, China Customs and verified by comparison with prices from Bloomberg. The price actually achieved will depend upon market conditions at the time of sale.

## Competent Person Statement

The information in this presentation that relate to Exploration Information and Mineral Resources are based on information compiled by Ian Levy who is a member of The Australasian Institute of Mining and Metallurgy and the Australian Institute of Geoscientists. Mr Levy is a qualified geologist and a director of ABx Group Limited.

Mr Levy has sufficient experience, which is relevant to the style of mineralisation and type of deposit under consideration 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. Mr Levy has consented in writing to the inclusion in this report of the Exploration Information in the form and context in which it appears.

# Board of Directors

## Hon Paul Lennon AO (Chair)



- Premier of Tasmania 2004-2008
- Deputy Premier and Minister for Infrastructure, Energy & Resources 1998-2004
- Principal Paramul Pty Ltd 2009-

## Dr Mark Cooksey (Managing Director and CEO)



- More than 20 years with Rio Tinto and CSIRO
- Worked closely with aluminium and other metal industries
- Significant experience in commercialising new technologies and processes
- PhD in Chemical & Materials Engineering

## Ian Levy (Director)



- Previous CEO of ABx
- 30 years of senior management experience across multiple commodities, including WMC and Pancontinental Mining
- Previously CEO of Allegiance Mining, Chair of Dynasty Metals Australia, and Director of Gloucester Coal
- Member of JORC for 11 years (4 years as Vice Chairman) and Federal President, Australian Institute of Geoscientists

## Ken Boundy (Non-Executive Director)

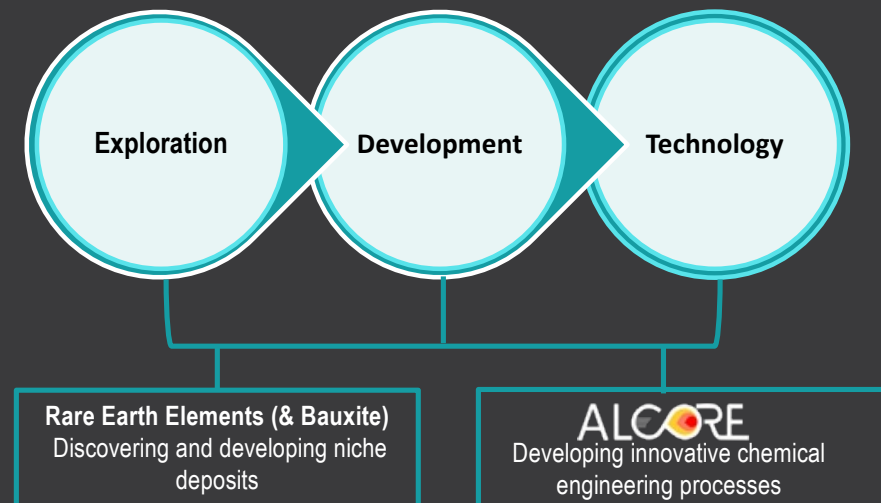


- 20 years leading companies and divisions in wine, food, building materials and tourism industries
- Chair and Non-Executive on 21 private and public boards
- Executive experience in corporate development, M&A and marketing



## Delivering materials for a cleaner future

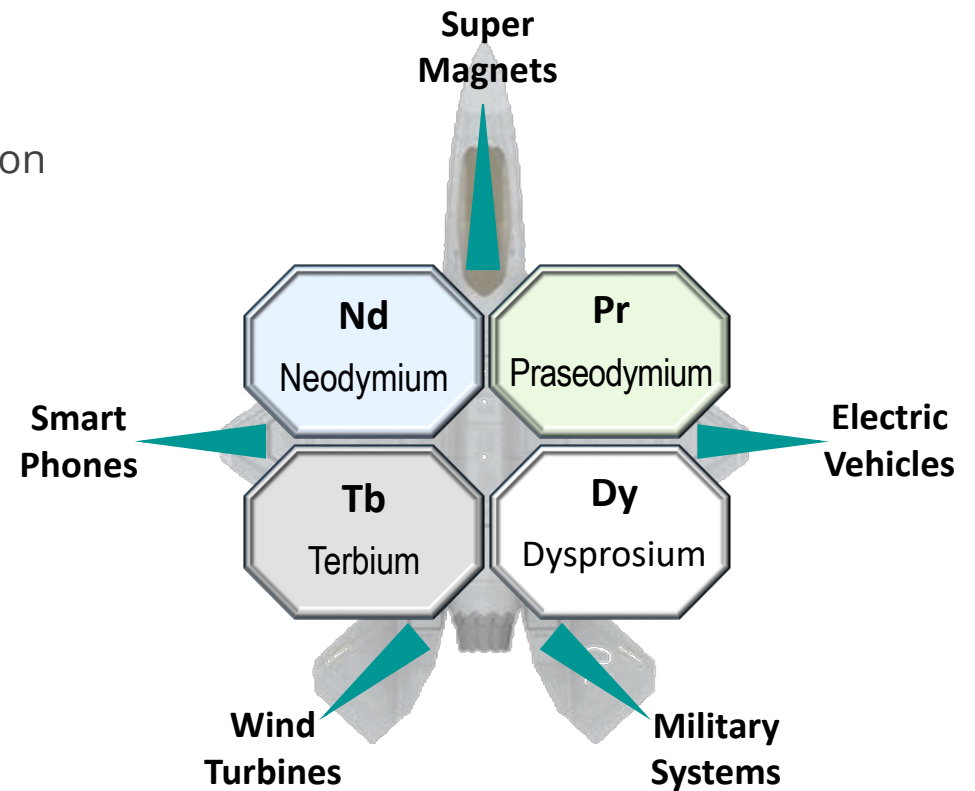
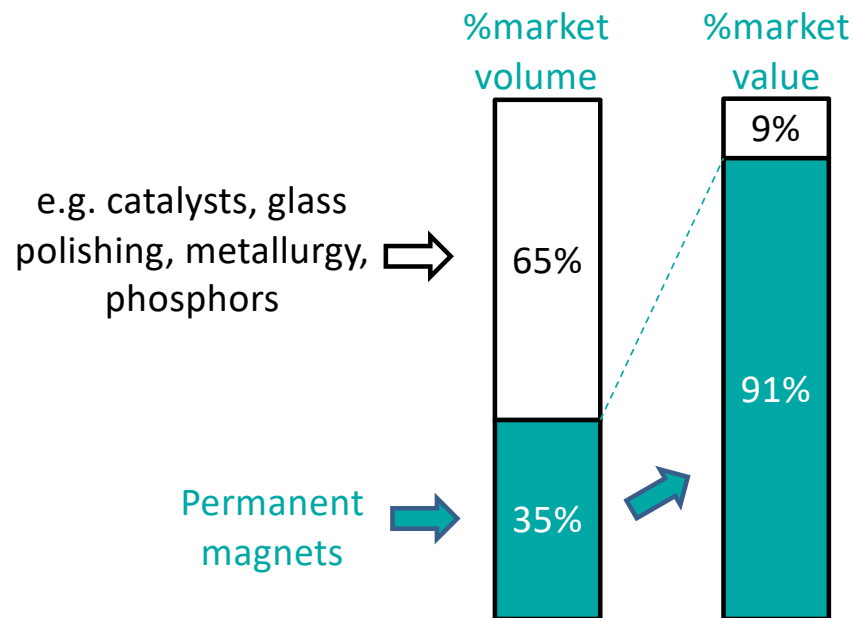
1. Discovering and developing an ionic adsorption clay rare earth project in northern Tasmania
2. Establishing a plant to produce hydrogen fluoride and aluminium fluoride from recycled industrial waste, to replace imports (ALCORE)
3. Mining and enhancing bauxite resources for the cement, aluminium and fertiliser industries



Expanded version of presentation available at [www.abxgroup.com.au](http://www.abxgroup.com.au)

# Permanent magnets

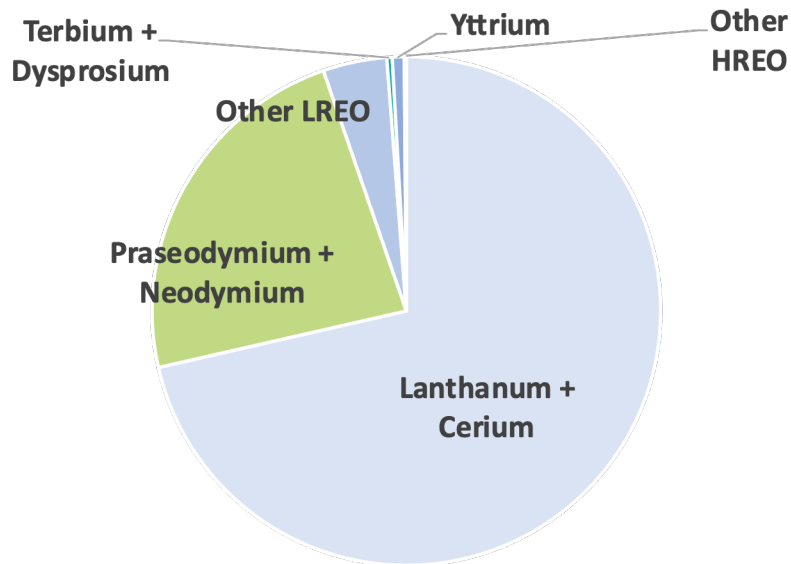
- Essential for electric vehicles and wind turbines
- Represent over 90% of value of rare earths consumption
- Forecast to grow at 7% per year to 2040



Source: Rare Earth Industry Association (<https://www.global-reia.org/about-rare-earth/>)

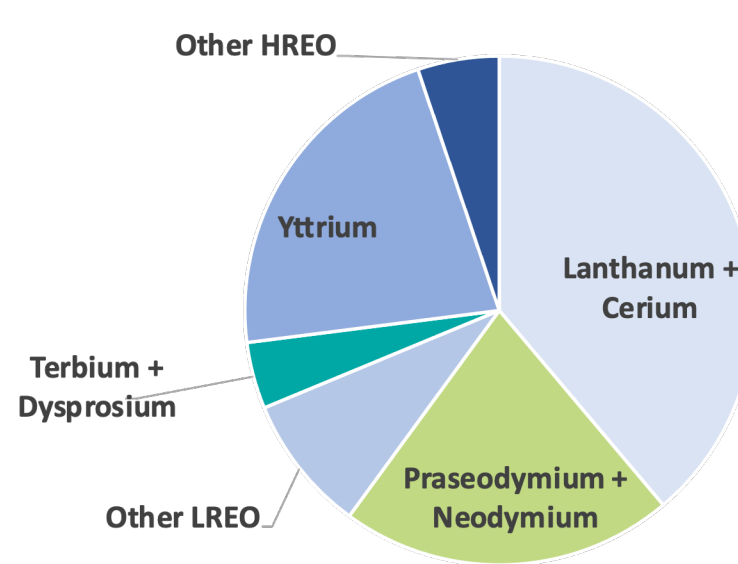
# Ionic adsorption clay (IAC) rare earth deposits

- Currently only mined in southern China
- Less complex processing: lower costs and shorter time to production
- Contain much higher proportion of higher value, heavy rare earths



Hard rock: Mount Weld (Lynas)

Source: D.J. Packey and D. Kingsnorth, Resources Policy, 48(2016) 112-116.



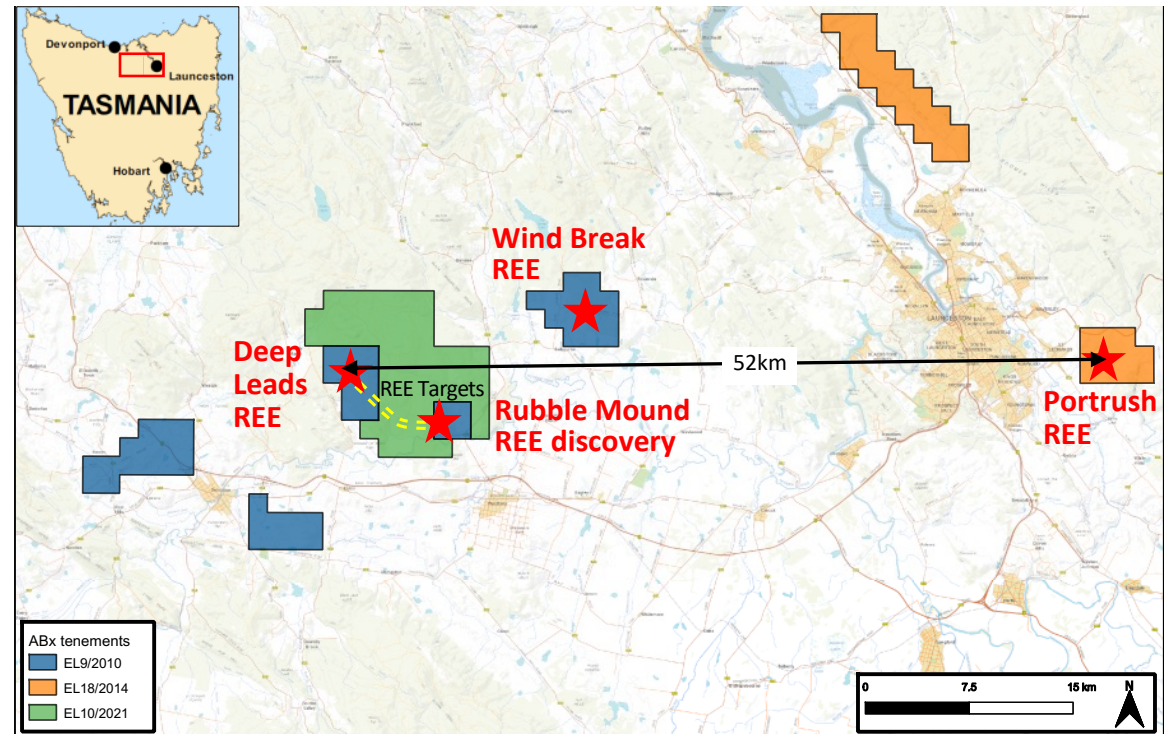
Ionic clay: Deep Leads<sup>1</sup>

ABx Group

# ABx rare earth discoveries in Tasmania

- ABx is the first company to discover rare earths in Tasmania
- Deep Leads and Rubble Mound have **highest reported extractions from any clay-hosted REE prospect in Australia:** they are ionic adsorption clays<sup>2</sup>

- Four discoveries spanning 52 km <sup>(3)</sup>
- Very low levels of radioactive elements (thorium and uranium)



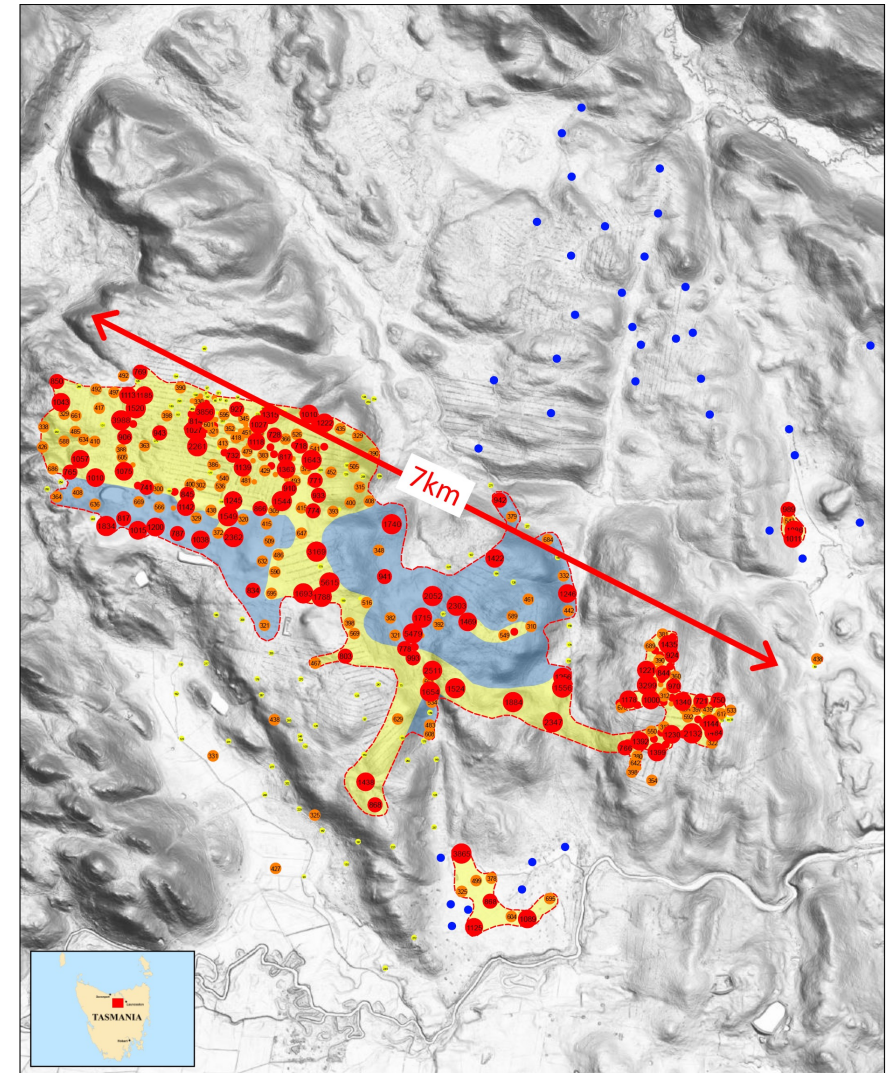
# Rare Earths Resource Estimate

- Announced 8 May 2023<sup>1</sup>
- Five-fold increase since maiden estimate in November 2022<sup>4</sup>

Size	Cut-off (ppm TREO-CeO <sub>2</sub> )	Mean TREO (ppm)	Mean TREO-CeO <sub>2</sub> (ppm)
21 Mt	250	770	585

Holes drilled	Metres drilled (m)	Metres assayed (m)	Thickness (m)
635	6,224	2,893	7.7

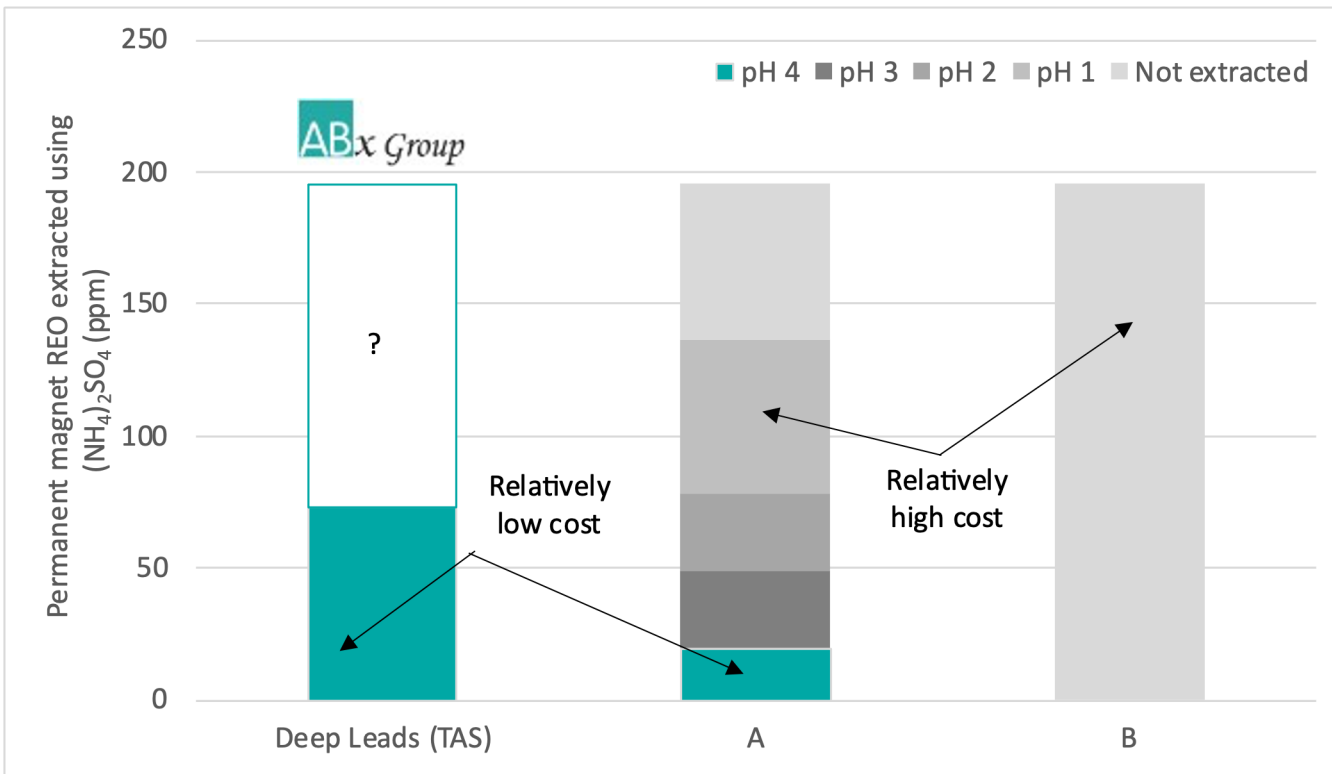
• Resource represented covers only 18% of total prospective area



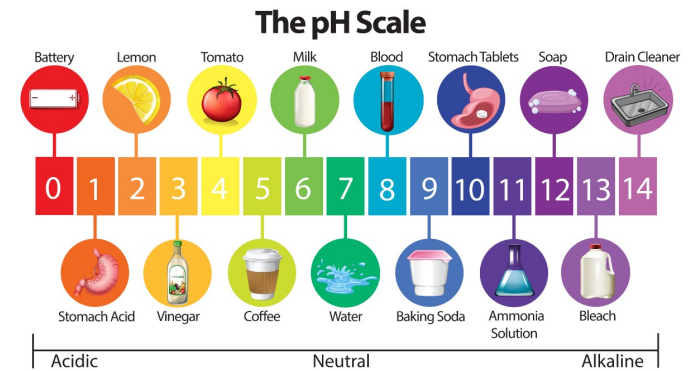


# Not all clays are created equal

## pH is king



- Deposits A and B are hypothetical (same grade)
- Processing cost increases significantly as pH decreases
  - Acid consumption
  - Impurity removal



Permanent magnet REO = Pr<sub>6</sub>O<sub>11</sub> + Nd<sub>2</sub>O<sub>3</sub> + Tb<sub>4</sub>O<sub>7</sub> + Dy<sub>2</sub>O<sub>3</sub>

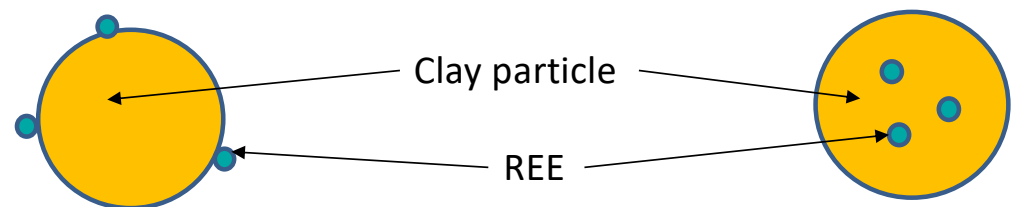
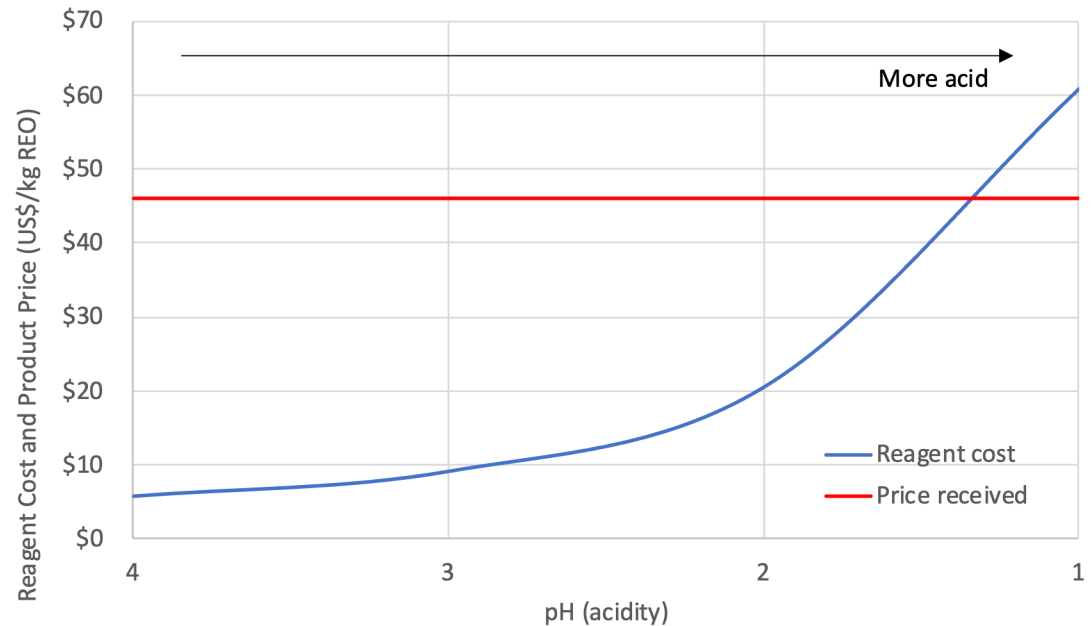
Source: ABX ASX release, 2 February 2023

# Not all clays are created equal

## pH is king

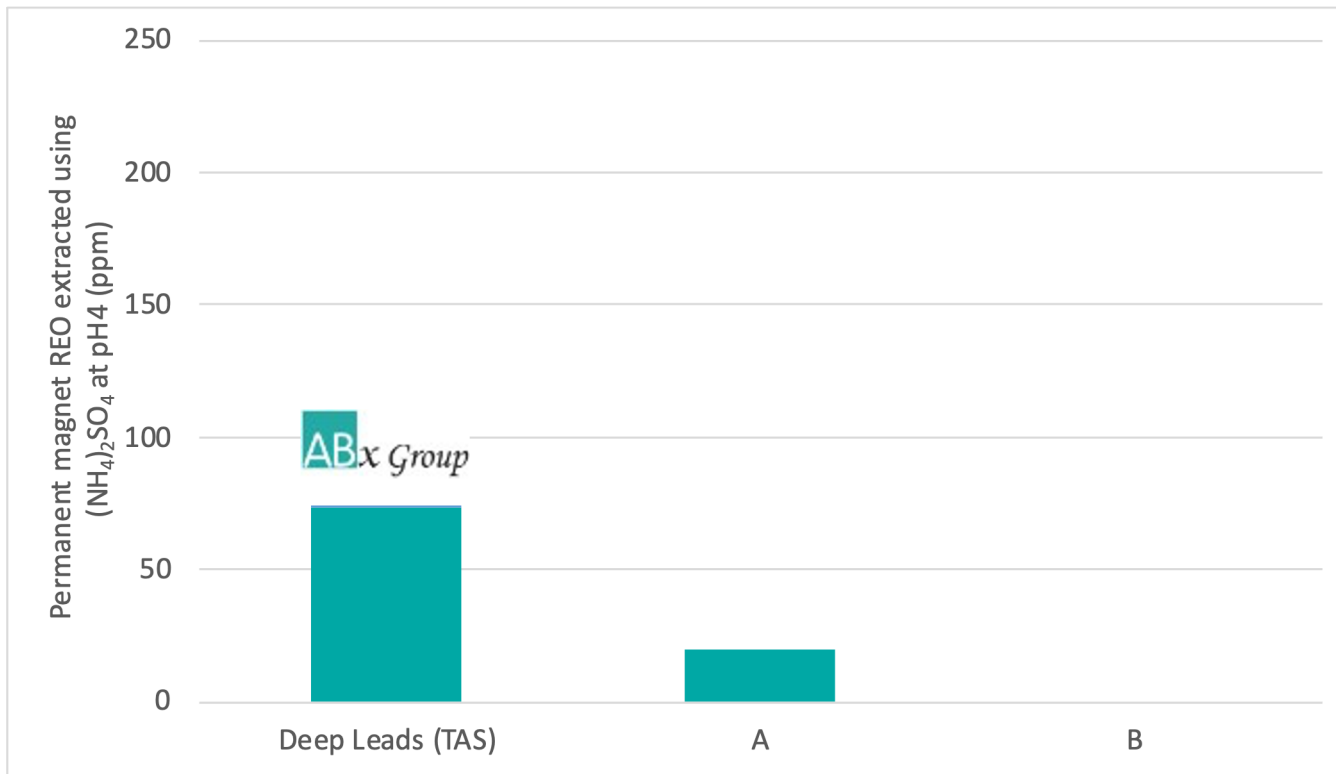
- Charts shows indicative reagent cost and product prices, based on published data
- As pH decreases, reagent cost alone can be higher than product price

- Position on cost curve heavily dependent on pH required to achieve significant extraction
- There is a threshold pH below which the production cost is likely to be higher than revenue



## Not all clays are created equal

'Desorbable grade' varies enormously



Permanent magnet REO = Pr<sub>6</sub>O<sub>11</sub> + Nd<sub>2</sub>O<sub>3</sub> + Tb<sub>4</sub>O<sub>7</sub> + Dy<sub>2</sub>O<sub>3</sub>

- If only consider extraction at pH 4 ('desorbable grade'), then deposits are very different

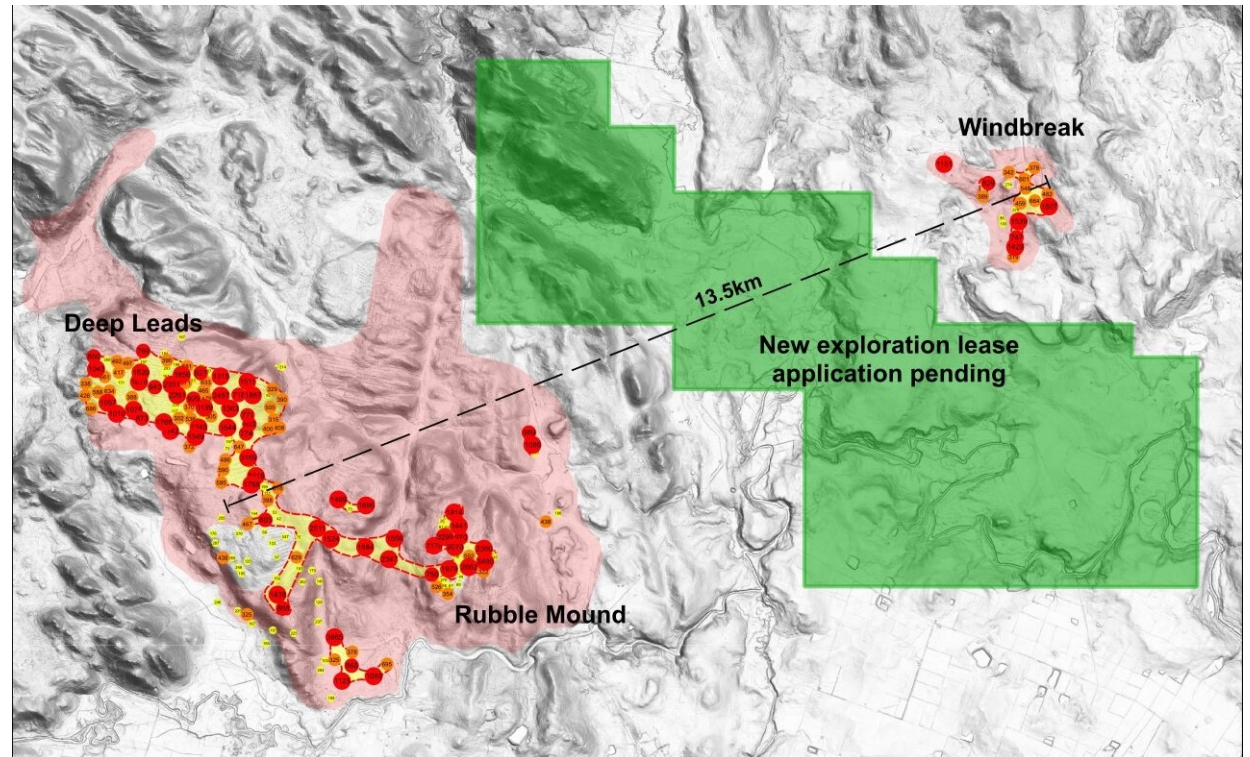
# ABx rare earths strategy

## Strategy

- Rapidly develop low-cost production of mixed rare earth carbonate
- We operate only where welcomed

## 2023 Plan

- Further investigations of metallurgical processing steps and conditions
- Estimate CAPEX and OPEX
- Deepen engagement with potential customers
- Enhance ABx's exploration technology to find more rare earths
- Further drilling campaigns





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# Reference Information





## References

<sup>1</sup>ASX release 8 May 2023

<sup>2</sup>ASX release 2 Feb 2023

<sup>3</sup>ASX release 16 March 2022

<sup>4</sup>ASX release 23 November 2022