



(ASX:ABX)

Delivering Materials for a Cleaner Future

5 May 2024

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Prices for aluminium fluoride (AlF₃) 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 report 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.

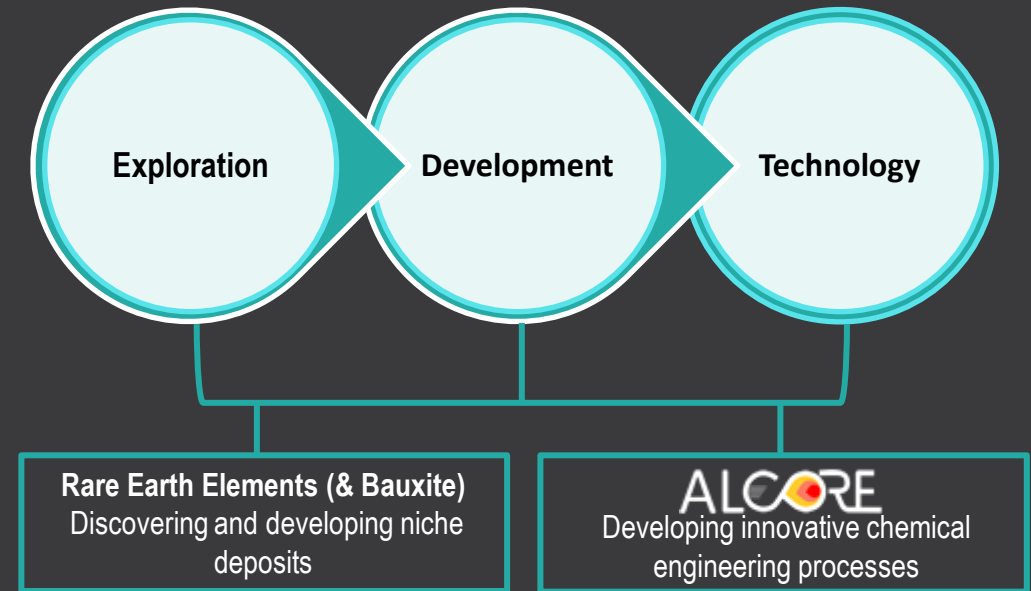
Mr Levy has sufficient experience, which is relevant to the style of mineralisation and type of deposit under consideration and to the activity, which he is undertaking to qualify as a Competent Person as defined in the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral 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.

Delivering materials for a cleaner future

- Creation of an ionic adsorption clay rare earth project in northern Tasmania
- Establishment of a plant to produce hydrogen fluoride and aluminium fluoride from recycled industrial waste, to replace imports (ALCORE)

Legacy business

- Mining and enhancing bauxite resources for cement, aluminium and fertiliser production



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)



- 30 years of senior management and geological experience with multiple commodities, including at WMC and Pancontinental Mining
- Previously CEO of Allegiance Mining and Director of Gloucester Coal
- Member of JORC for 11 years (4 years as Vice Chairman) and Federal President, Australian Institute of Geoscientists

Joycelyn Morton (Non-Executive Director)



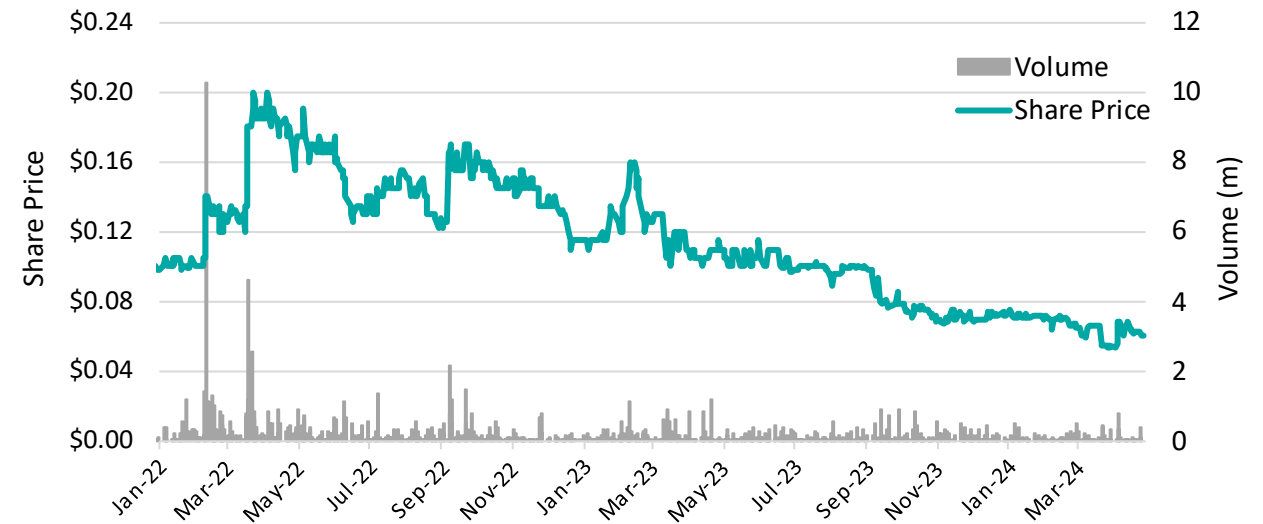
- Over 30 years' experience as an executive and director with Australian and international listed companies, including Argo Investments, ASC and Snowy Hydro
- Chair of the Audit, Risk and Compliance Committee for multiple boards
- Fellow and Life Member of CPA Australia, and former National President

Corporate Overview

ASX code: **ABX**

Listed	Issued shares	Options	52-week range	Average daily volume (3 months)	Market cap (@\$0.06)	Cash @ 31 Mar 2024	Shareholders
24 Dec 2009 @ \$0.20	250.0m	14.9m	\$0.053- \$0.115	105,000	\$15m	\$5.6m*	2,432

Major Shareholders	Shares	%
Peter Palan and Clare Palan	9.5 m	3.8
Afron Pty Ltd	7.4 m	3.0
Shareholders Mutual Alliance	7.0 m	2.8
HSBC Custody Nominees	6.1 m	2.4
Justevian Pty Ltd	5.8 m	2.3
Yarraandoo Pty Ltd	5.6 m	2.3
Top 20 shareholders	73.9 m	29.5
Remainder	176.2 m	70.5



Resources: **52 million tonnes rare earths and 130 million tonnes bauxite**

*Including \$5.2m held in trust



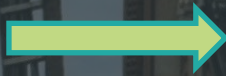
ESG

- ABx Group has commenced disclosing environmental, social, and governance (ESG) metrics, using the internationally accepted Stakeholder Capitalism Metrics developed by the World Economic Forum
- ABx Group has subscribed to Socialsuite’s reporting platform to assist with monitoring and disclosing progress¹
- It is intended to Announcment a baseline ESG disclosure report during the December quarter



¹ ABX ASX Announcement, 12 October 2023

Segments



Rare earth discoveries in northern Tasmania



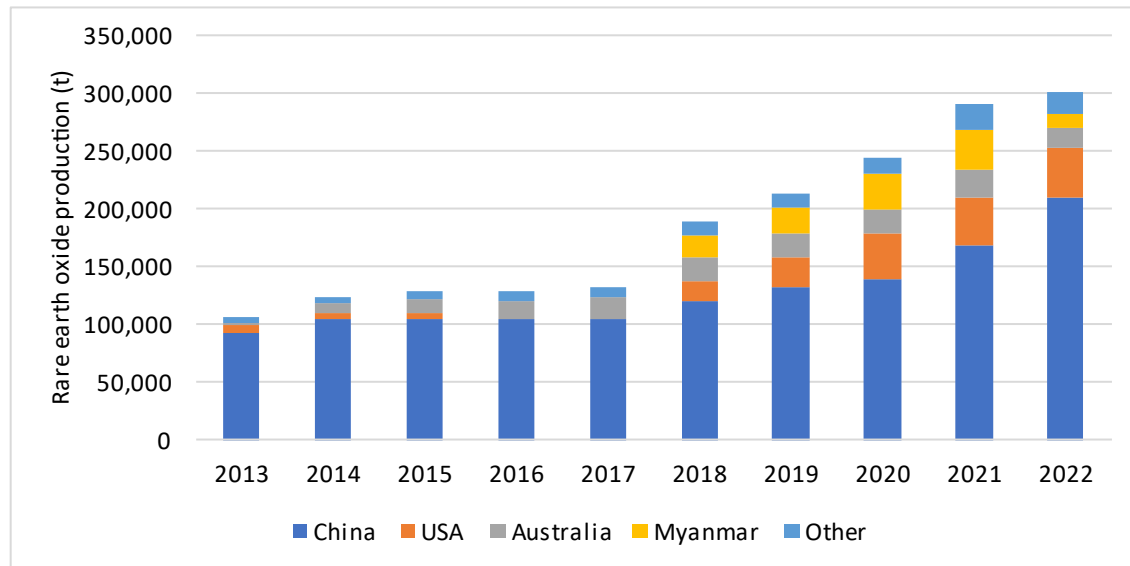
ALCORE Aluminium fluoride production technology



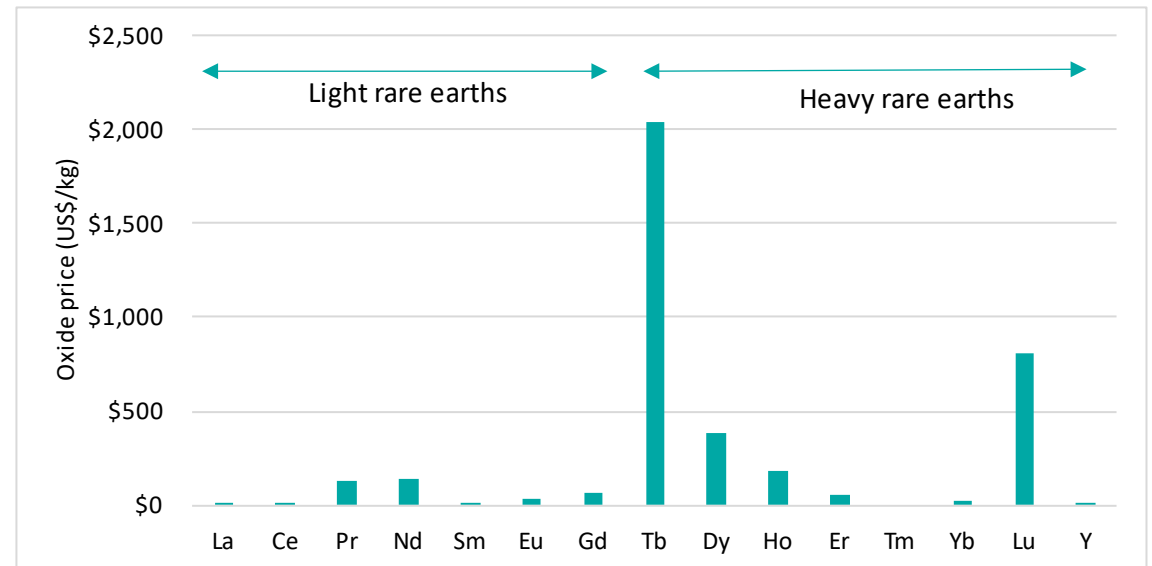
Bauxite operations in Queensland and Tasmania

Rare earths market

- 15+ rare earth elements (REEs) used in wide variety of applications, with demand growing rapidly
- China dominates rare earths markets, especially heavy rare earths such as Tb and Dy
- Prices of different rare earths vary significantly because:
 - Proportions of supply do not match proportions of demand
 - Rare earths difficult to substitute



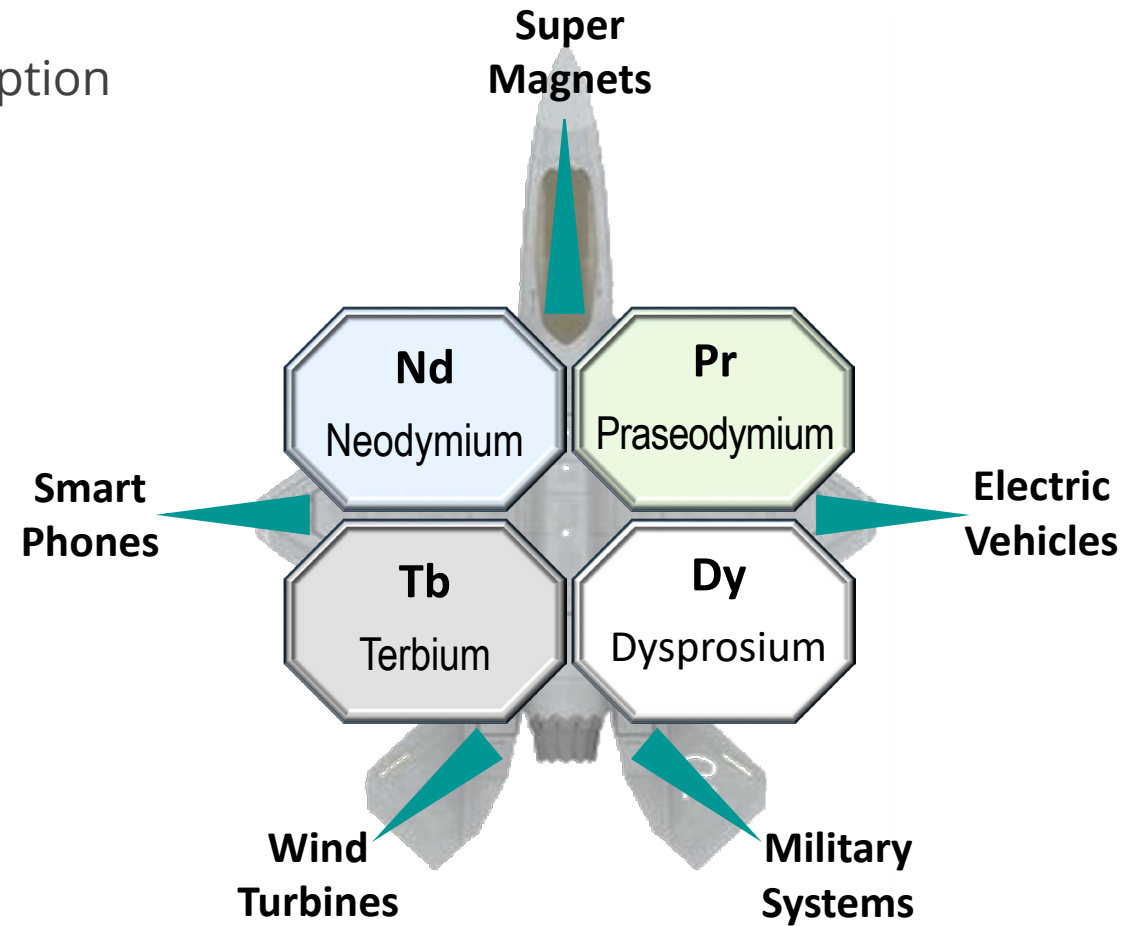
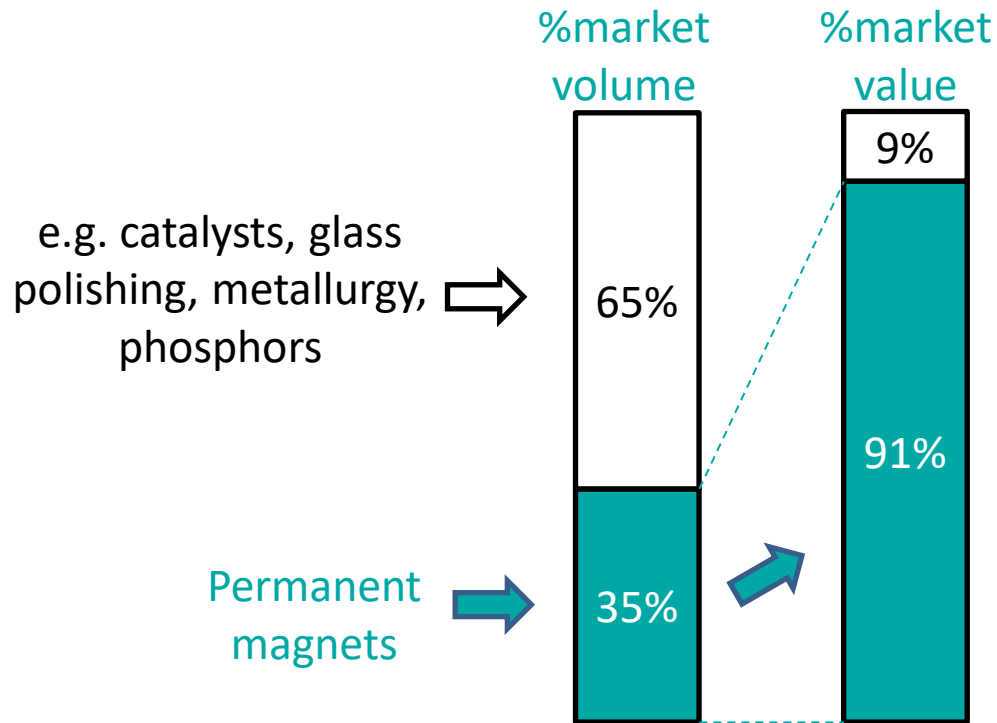
Source: USGS (excludes unregulated production in China)



Source: Adamas 2022 prices, in: Iluka Resources, Macquarie Australia Conference, 3-4 May 2023

Permanent magnet rare earths

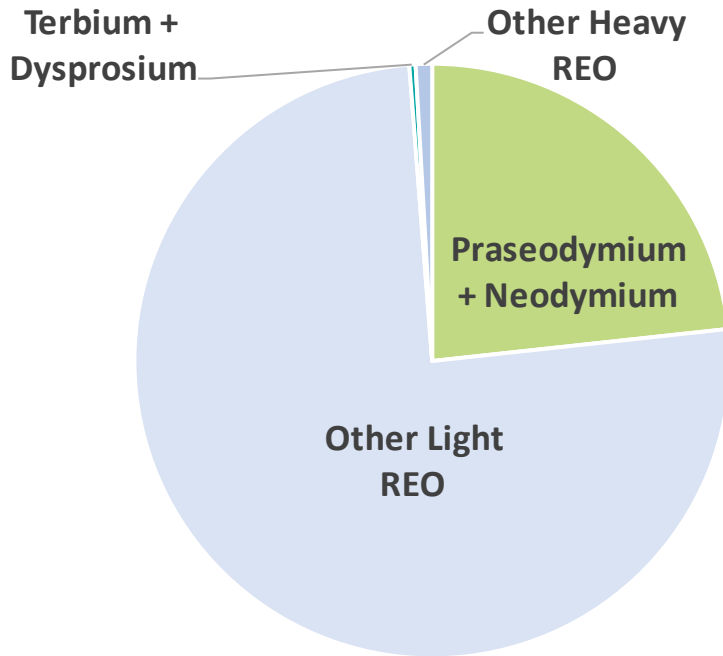
- Essential for electric vehicles and wind turbines
- Represent over 90% of value of rare earths consumption
- Forecast to grow at 7% per year to 2040



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

Ionic adsorption clay (IAC) rare earth deposits

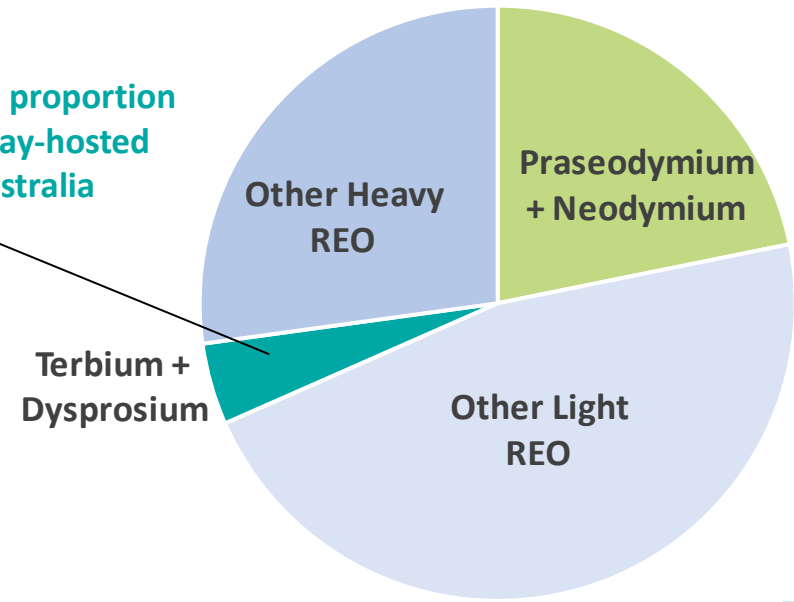
- Contain much higher proportion of higher value, heavy rare earths
- Historically only mined in southern China



Hard rock: Mount Weld (Lynas)

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

ABx has the highest proportion of Dy+Tb of any clay-hosted resource in Australia



Ionic Adsorption Clay **ABx** Group

Source: ABX ASX Announcement, 20 November 2023

Requirements for an ionic clay rare earth project

Mineral Resource

- Size
- Grade
- Mineralogy
- Strip ratio

Jurisdiction

- Regulatory approval
- Community support
- Government support
- Supply chain security

Infrastructure

- Transport
- Water
- Energy

Company Resources

- People
- Partnerships
- Finance
- Intellectual property

ABx rare earth discoveries in Tasmania

ABx is first company to discover rare earths in Tasmania

- Four discoveries spanning 100 km² (1)
- Newly granted tenements add over 450 km² (2)

Highest proportion of DyTb of any clay-hosted resource in Australia³

Highest ionic component reported in Australia, comparable to operations in China^{4,5}

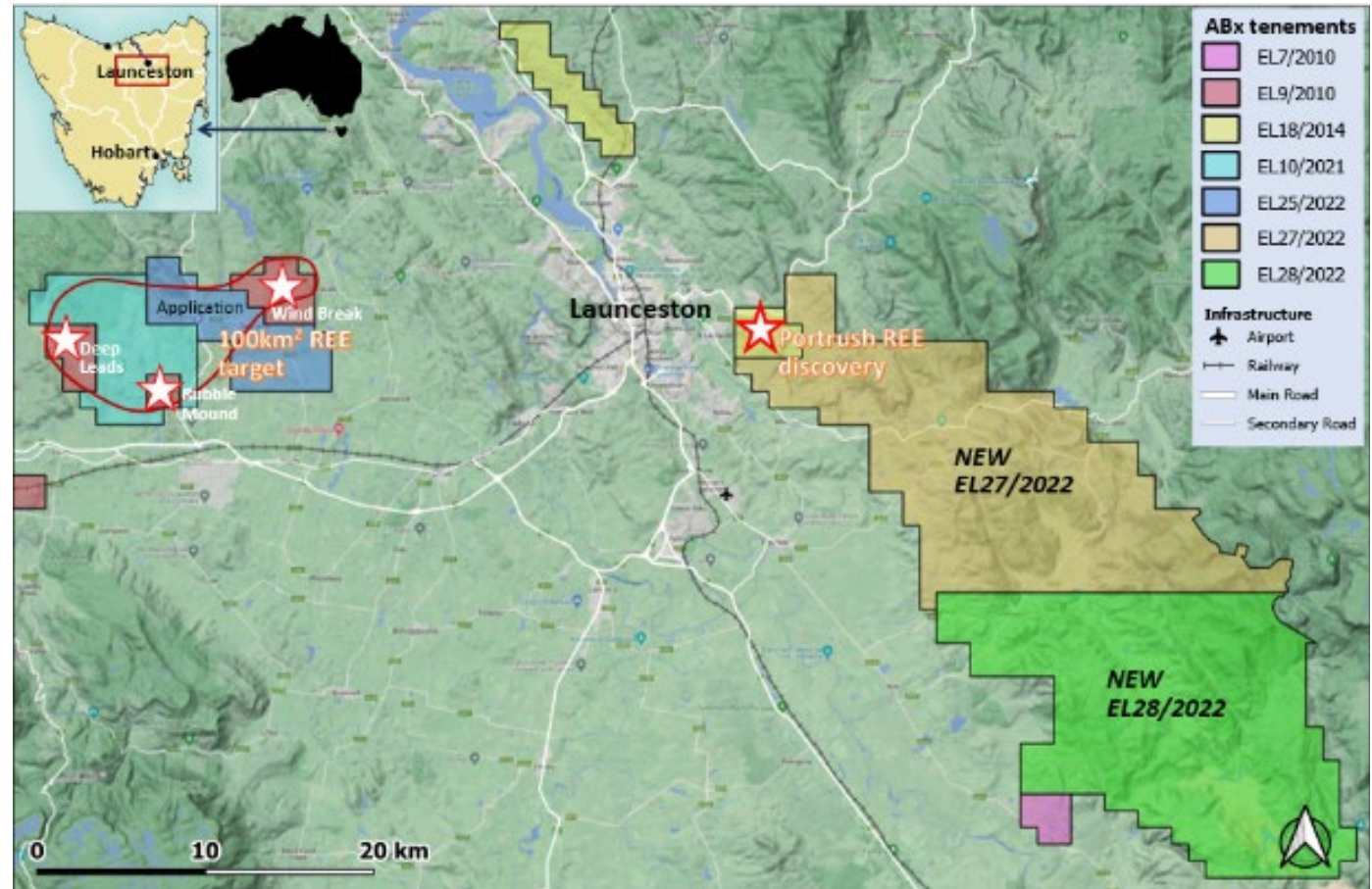
¹ ABX ASX Announcement, 16 March 2022

² ABX ASX Announcement, 26 September 2023

³ ABX ASX Announcement, 2 May 2024

⁴ ABX ASX Announcement, 31 May 2022

⁵ ABX ASX Announcement, 2 February 2023



Source: ABX ASX Announcement, 22 January 2024

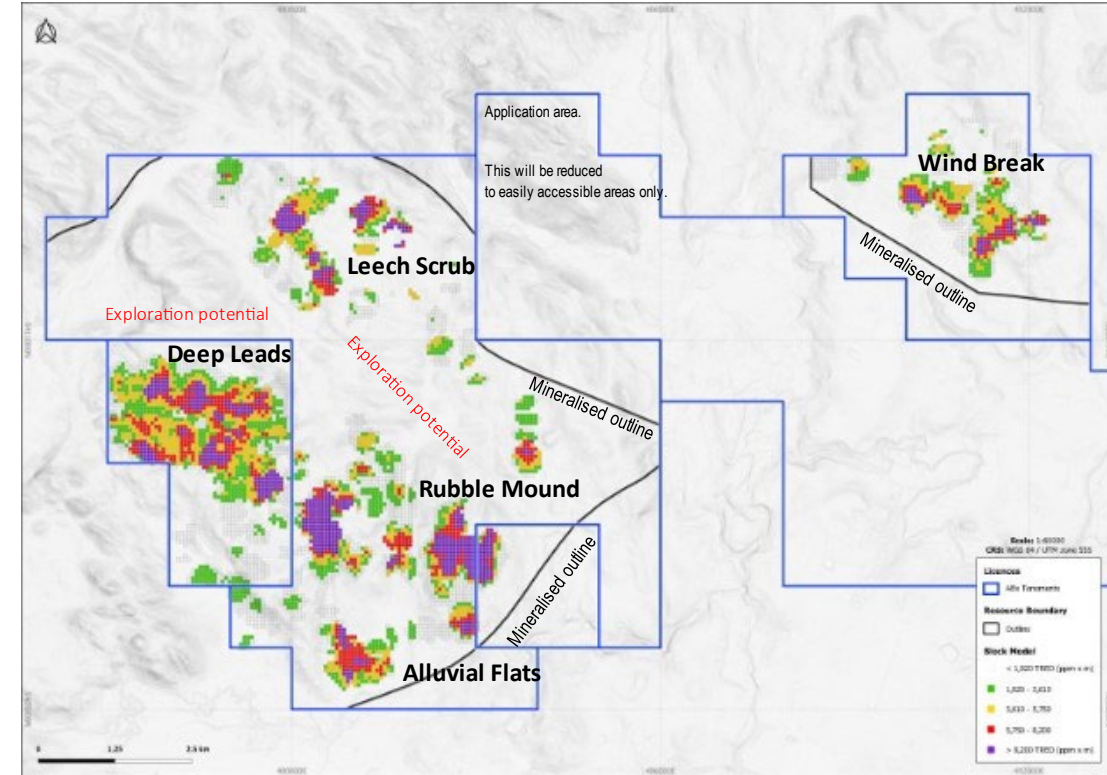
Rare Earths Resource Estimate

- Upgrade to 89 Mt announced May 2024¹
- Over 10-fold increase in 12 months

Size	Cut-off (ppm TREO-CeO ₂)	Mean TREO (ppm)	Mean TREO-CeO ₂ (ppm)	DyTb ³ (%TREO)
89 Mt ²	350	844	652	4.3%

Holes drilled	Metres drilled (m)	Metres assayed (m)	From (m)	To (m)
1,077	9,742	3,843	4.2	12.0

Resource based on only 29% of identified mineralised outline¹



Source: ABX ASX Announcement, 2 May 2024

¹ABX ASX Announcement, 2 May 2024

²41 Mt inferred, 42 Mt indicated and 6 Mt measured

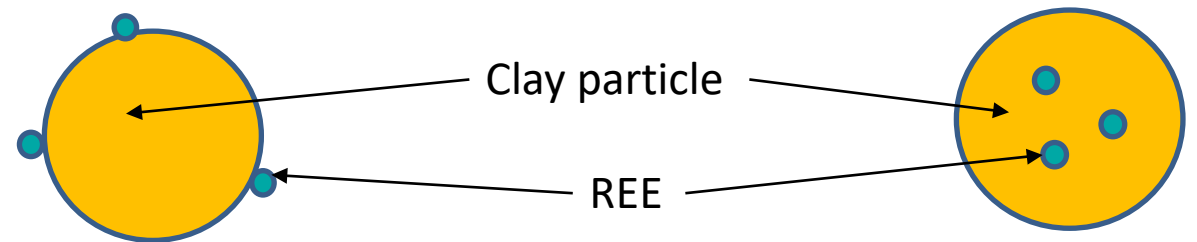
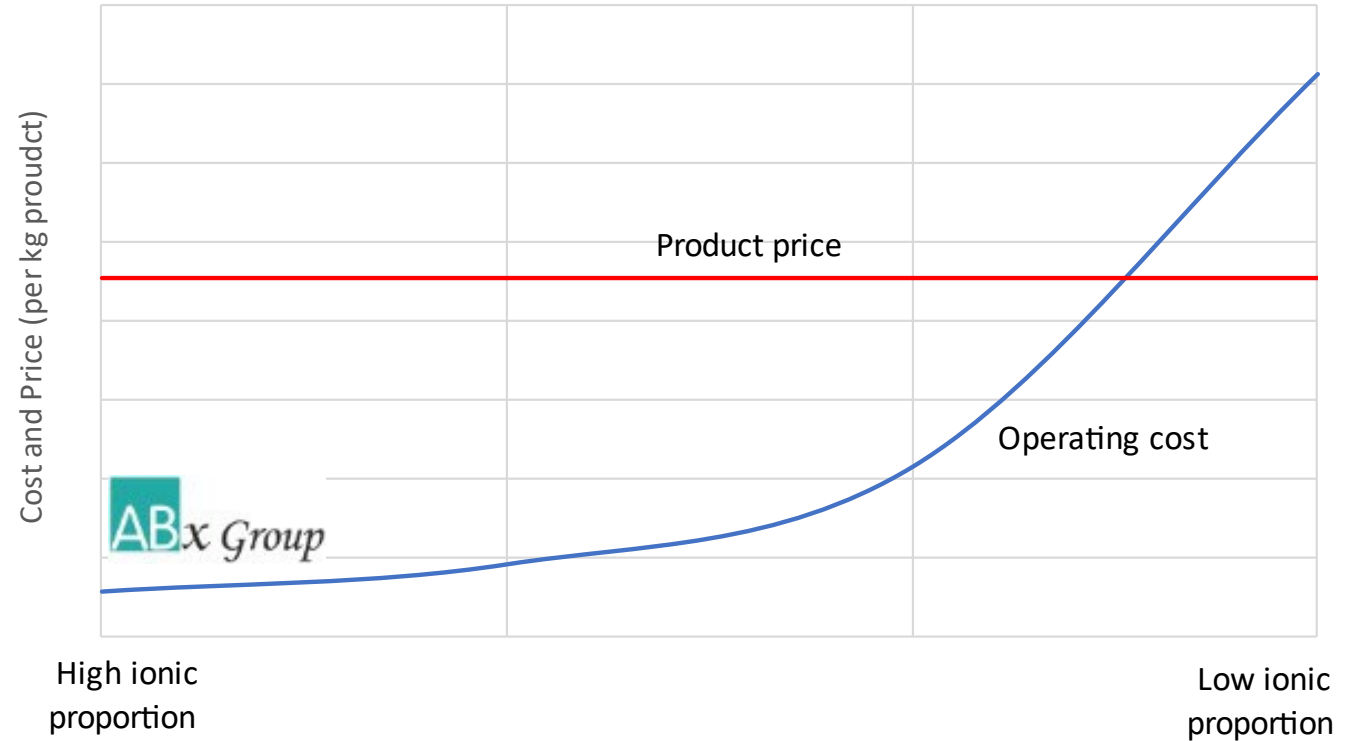
³DyTb = Dy₂O₃ + Tb₄O₇

Not all clays are created equal

Ionic proportion is king

- Chart shows illustrative relationship between ionic proportion and operating cost
- For low ionic proportion, reagent costs alone can be higher than product price

- Position on cost curve heavily dependent on proportion of resource that is ionic
- Industry processing experts indicate that low-cost processing can only be achieved for resources with high ionic proportion



Infrastructure

Transport

- <20 km to major highway
- <100 km to deepwater Bell Bay port

Labour

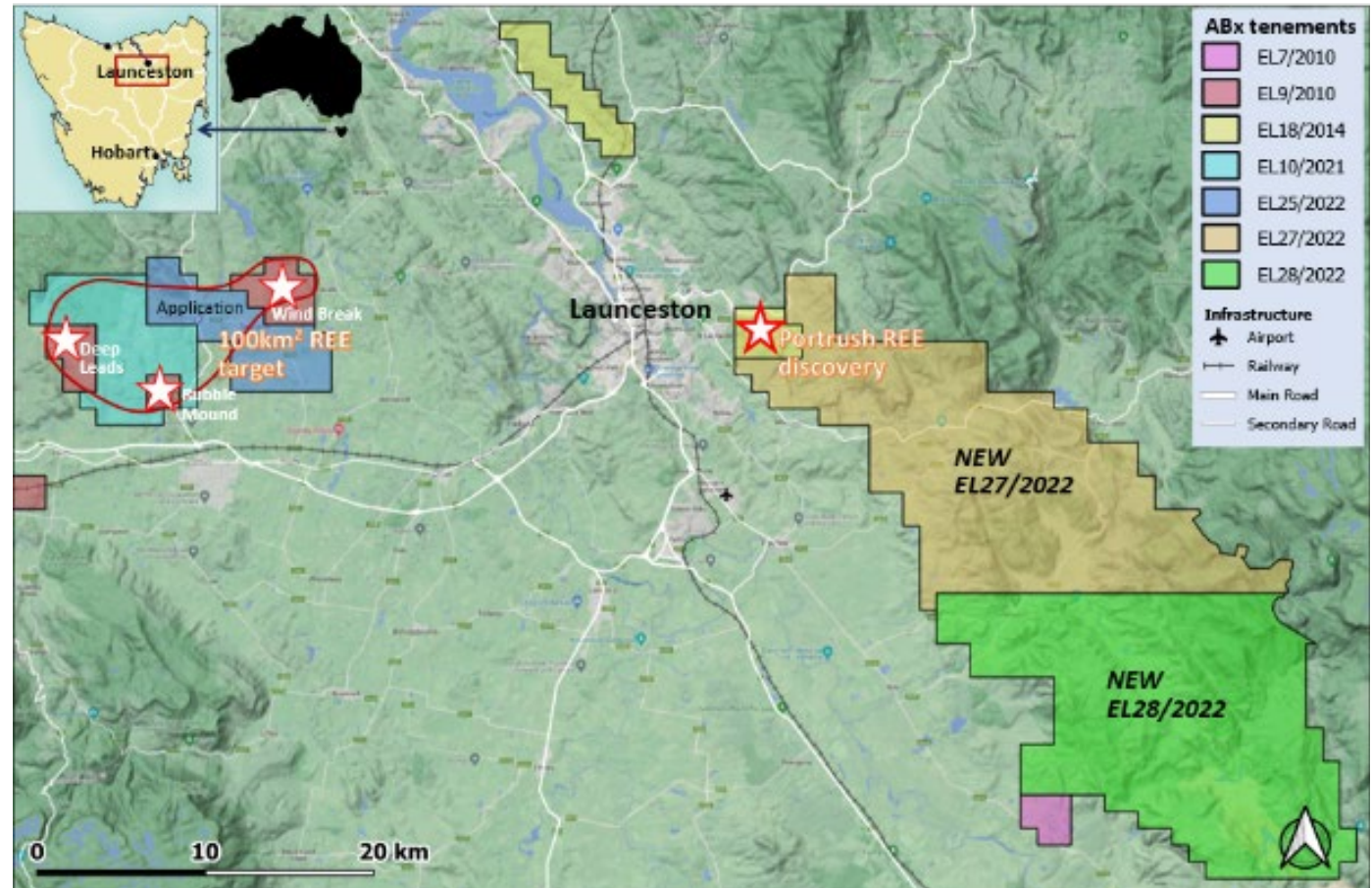
- <50 km to Launceston (pop 65,000)

Water

- High availability in Tasmania

Energy

- Close to major transmission lines



Source: ABX ASX Announcement, 22 January 2024

Jurisdiction

Australia

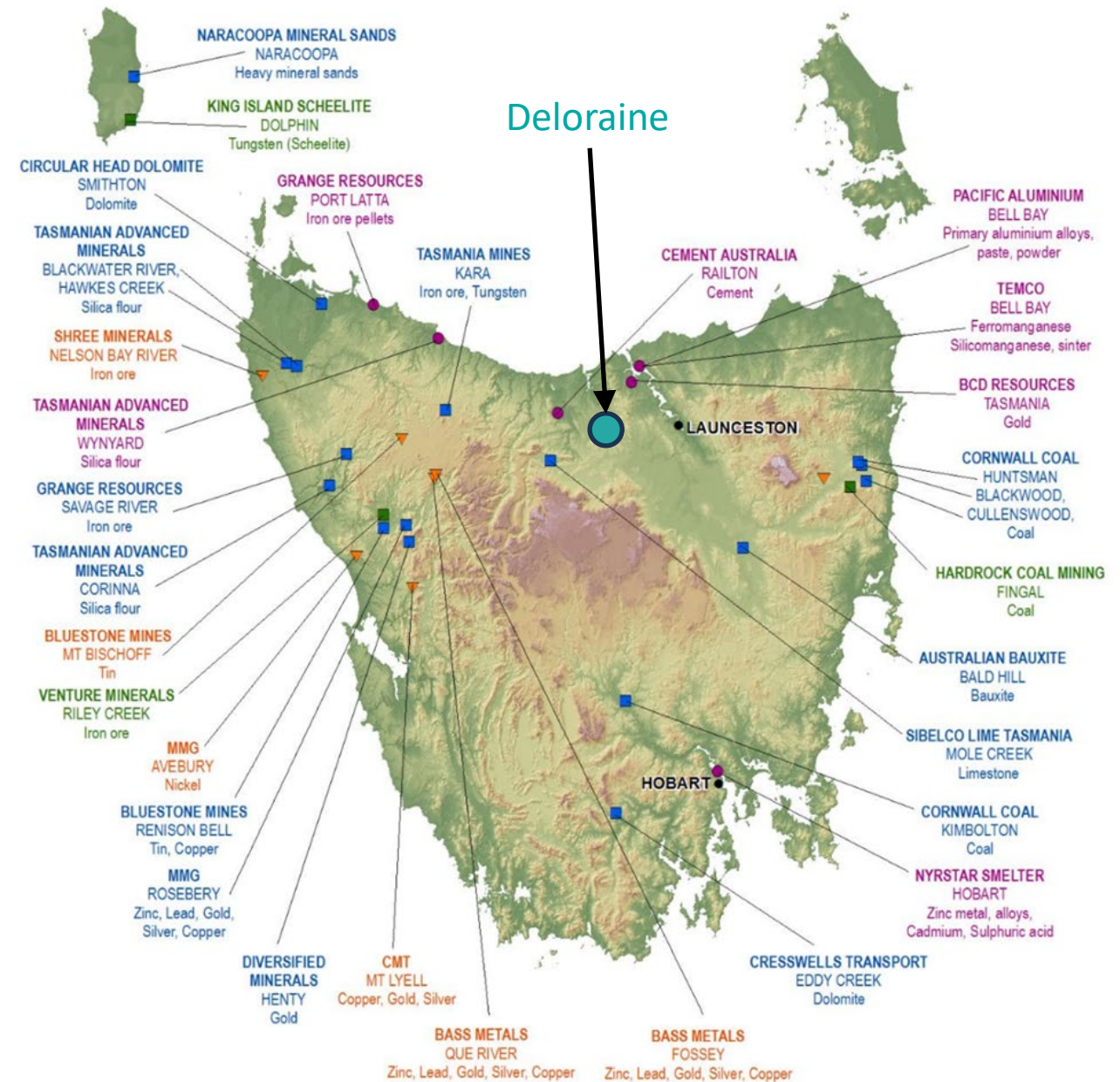
- NATO partner
- Major mining jurisdiction

Tasmania

- Extensive mining history: tin, copper, zinc, lead, gold
- Supportive regulatory environment

Deloraine region

- Mostly commercial forest plantations



Resources

People

- High calibre geologists and engineers, with experience in resource development, process development, and production
- ABx active in Tasmania since 2010
 - Excellent reputation with landholders, regulators and government
 - Mined bauxite 2015 to 2020, now fully rehabilitated
 - Mine lease application in progress for second bauxite mine

Ian Levy (geology)



- 30 years of senior management and geological experience with multiple commodities, including at WMC
- Previously CEO of Allegiance Mining and Director of Gloucester Coal
- Member of JORC for 11 years (4 years as Vice Chairman) and Federal President, Australian Institute of Geoscientists

Dr Mark Cooksey (chemical engineering)



- More than 20 years with Rio Tinto and CSIRO
- Significant experience in developing and commercialising new processes in minerals and metals industry
- PhD in Chemical & Materials Engineering

Dr Daniel Jewell (chemical engineering)



- 15 years in senior technical roles including at the University of Cambridge, CSIRO, and in industry
- Strong focus on extractive scale-up technologies for metal production for titanium, magnesium, & lithium
- PhD in Chemical Engineering

ABx ticks all the boxes for an ionic clay rare earth project

Highest proportion of DyTb of any clay-hosted resource in Australia

Highest ionic proportion reported in Australia, comparable to operations in China

Mineral Resource



Jurisdiction



Infrastructure



Company Resources



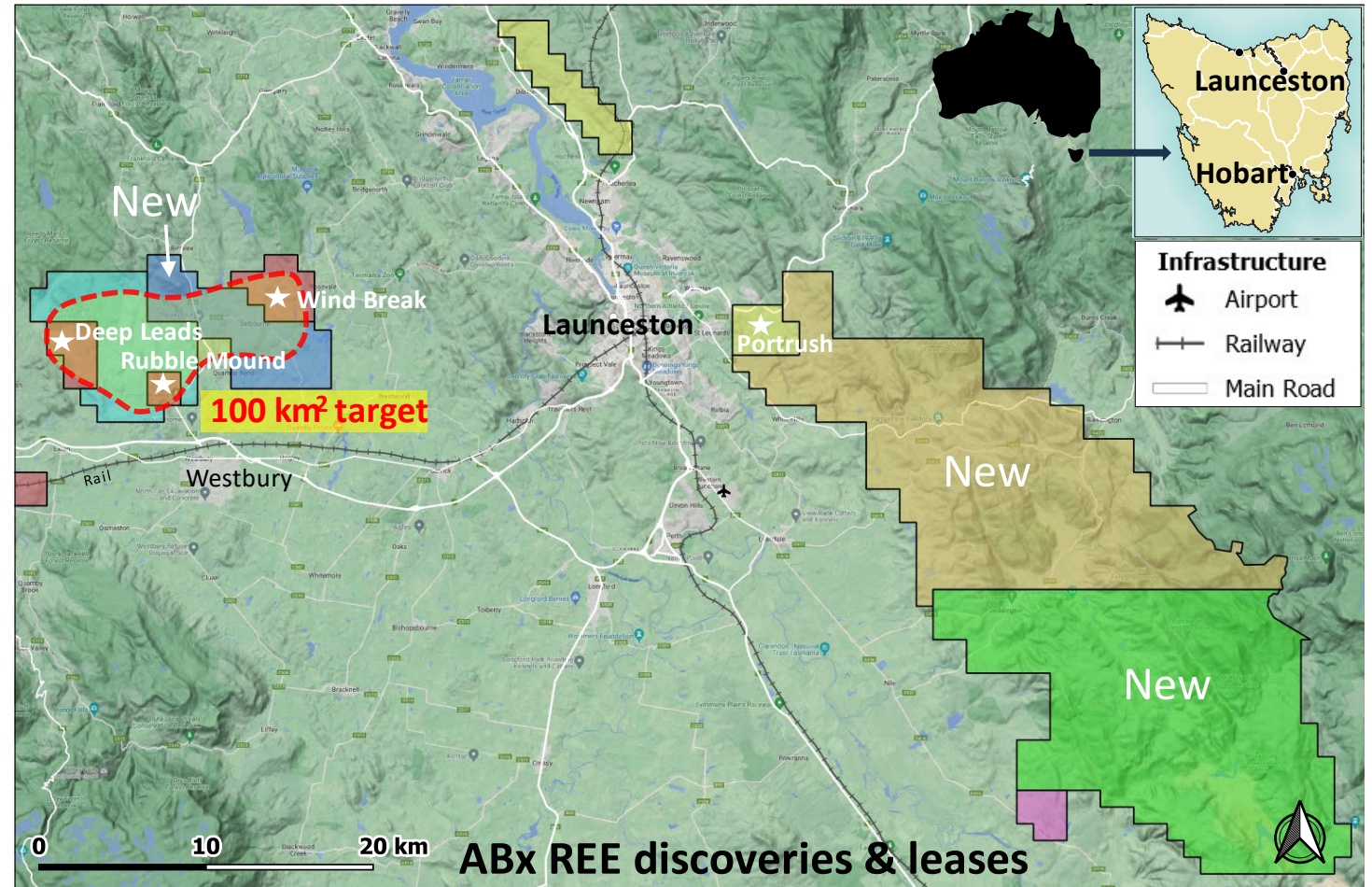
ABx rare earths strategy

Strategy

- Rapidly develop low-cost production of mixed rare earth carbonate (MREC)
- Sell MREC to third party refinery
- We operate only where welcomed

Plan

- Laboratory and pilot plant studies
- Estimate CAPEX and OPEX
- Customer engagement
- Exploration technology
- Exploration campaigns



Segments



Rare earth discoveries in northern Tasmania

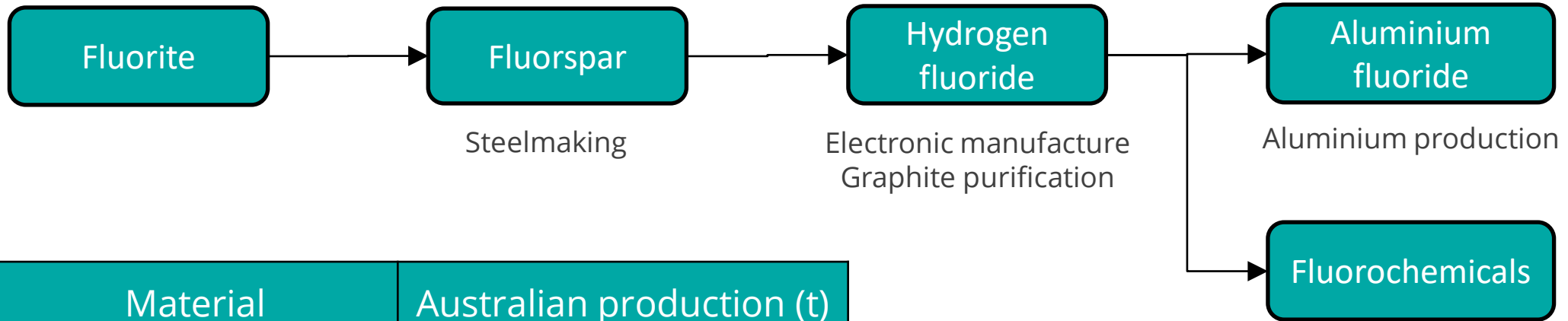


ALCORE Aluminium fluoride production technology



Bauxite operations in Queensland and Tasmania

Fluorine value chain



Material	Australian production (t)
Fluorite	0
Fluorspar	0
Hydrogen fluoride	0
Aluminium fluoride	0
Fluorochemicals	0?

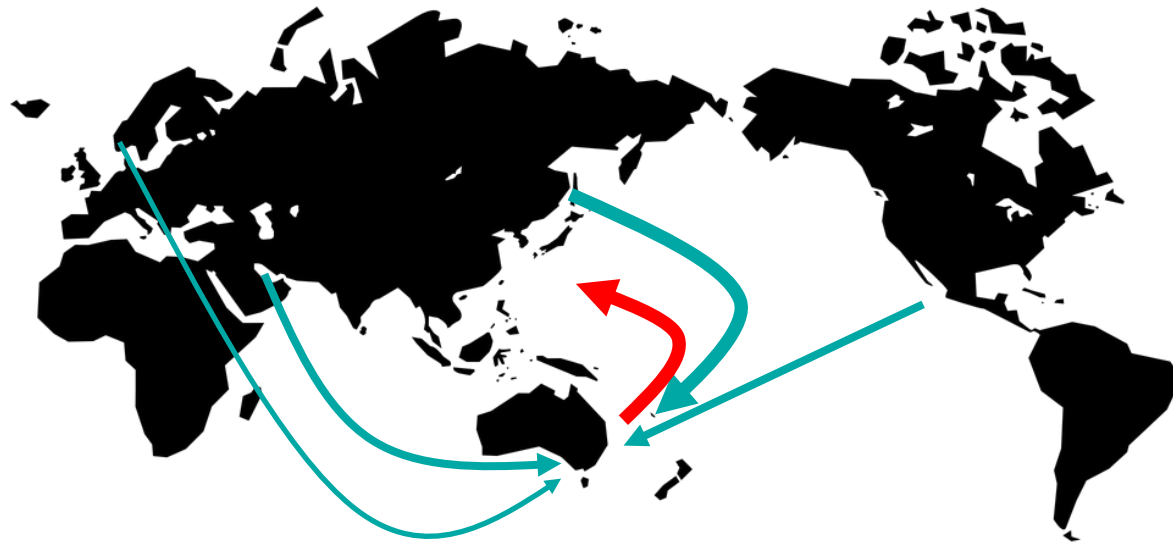
- Fluorine added to Australia's Critical Minerals list in 2023
- Fluorspar (calcium fluoride) is defined as a critical mineral by USA, Europe, Japan, Canada...

Aluminium fluoride from aluminium smelter waste

Aluminium fluoride (AlF_3): essential for aluminium smelting

- 1.2 million tonnes produced globally per year worth US\$1.5 billion (US\$1,000-1,800 per tonne)
- 50% produced in China, mainly for Chinese smelters
- Australia imports 100% of requirements, mostly from China

- Traditionally produced from high-cost fluorspar and alumina trihydrate
- Achievable specification – product purity risk is low
- Mature market – dozens of customers globally



Teal arrow → Aluminium fluoride Red arrow → Tapped bath

Current imports/exports

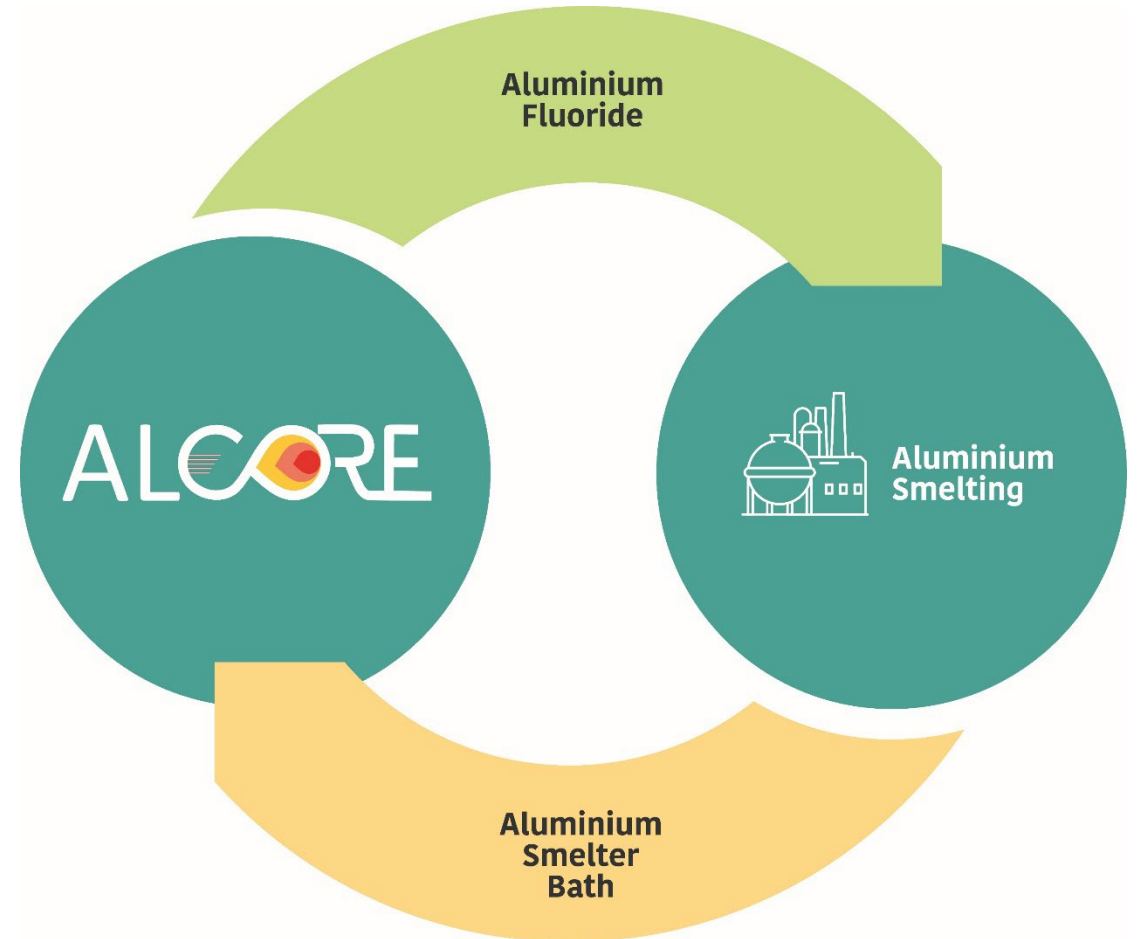
‘Tapped bath’: an aluminium smelter waste

- Fluorine is lost from smelter in ‘tapped bath’
- Only attractive market is new smelter construction; none in Australia
- Global market for tapped bath has moved into oversupply
- Tapped bath is a low-cost source of fluorine

ALCORE Process to produce aluminium fluoride

Exemplary illustration of circular economy

- ABx's 83%-owned refining technology subsidiary
- Developing processes to produce aluminium fluoride using¹:
 - Fluorine from tapped bath (an aluminium smelter waste)
 - Aluminium from dross (an aluminium smelter waste) or bauxite



¹ABX ASX Announcement, 7 June 2022

ALCORE Process economics

A rare opportunity that is financially, strategically and environmentally attractive

Scenario	AlF ₃ price (US\$/t)	FX rate USD:AUD	AlF ₃ price (A\$/t)	Estimated operating cost (A\$/t AlF ₃)	Estimated operating margin* (A\$/t AlF ₃)	Estimated EBITDA* (A\$m)
Baseline	\$1,220	0.75	\$1,630	\$1,250	\$730	\$15m
Optimistic	\$1,400	0.70	\$2,000	\$930	\$1,450	\$29m

*Includes revenue from co-products

- Based on long term aluminium fluoride prices and exchange rates, and estimated costs
- For 20,000 t/y aluminium fluoride (80% of Australian demand)

ALCORE Team

- High calibre chemical engineers, with extensive experience in development and commercialisation of novel processes
- Significant industrial experience in aluminium and fluorine industries

Dr Mark Cooksey (Managing Director)



- More than 20 years with Rio Tinto (aluminium smelting) and CSIRO
- Significant experience in developing and commercialising new processes in minerals and metals industry
- PhD in Chemical & Materials Engineering
- Joined Alcore in 2020

Dr Xiao Liang (Principal Engineer)



- Over 15 years in chemical process innovation and intensification, including conceptual design, fundamental research, and process scale-up
- PhD in Chemical Engineering
- Joined Alcore in 2021

Vishva Patel (Process Engineer)



- 5 years experience as design engineer with SRF Limited (India); a specialty chemicals company, including with hydrogen fluoride
- Masters in Chemical Process Engineering
- Joined Alcore in 2023

ALCORE Technical progress

- Critical processing steps have been demonstrated in laboratory¹
- Bath pilot batch reactor commissioned in late 2023². Fluorine recovery:³
 - Single stage: 80%
 - Two stages: 88%
- For continuous pilot plant, technical requirements for oleum production module and bath reactor module finalised with two international suppliers⁴



Third run of bath pilot batch reactor under standard process conditions

¹ABX ASX Announcement, 24 October 2022

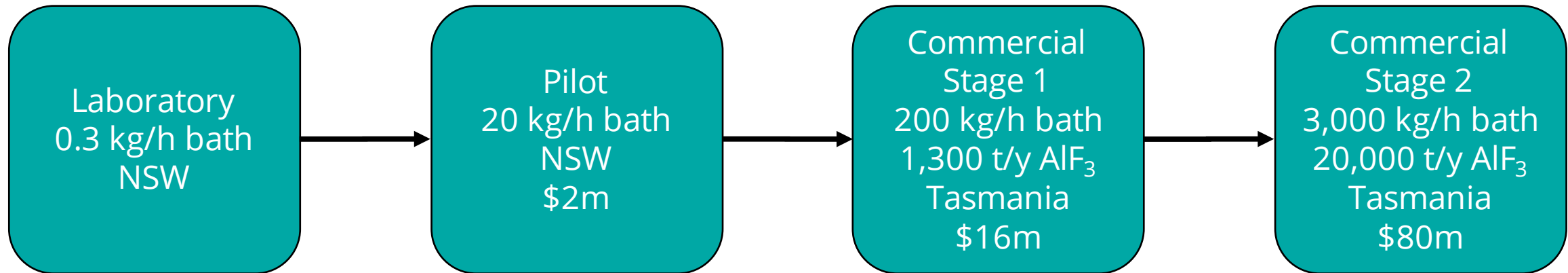
²ABX ASX Announcement, 8 November 2023

³ABX ASX Announcement, 4 April 2024

⁴ABX Quarterly Report to 30 September 2023, 31 October 2023

ALCORE Process scale-up

- Rigorous scale-up to reduce technical risk
- First aluminium fluoride plant planned for Bell Bay, Tasmania, near existing hydro-powered aluminium smelter. Planned production 20,000 t/y
- High potential for plants in other major aluminium smelting regions
- Potential expansion into other markets, including fluorine chemicals



← \$7.5m grant awarded¹ and \$5.7m instalments received² →

¹ABX ASX Announcement, 29 April 2022

²ABX ASX Announcement, 28 June 2023

ALCORE Technical plan

Reactor	Purpose	Status
Bath pilot batch reactor	<ul style="list-style-type: none"> • Confirm preferred reactor design • Demonstrate that can achieve high fluorine yield from bath • Produce metal sulfate residue suitable for further process development 	<p>Commissioned Oct 2023</p> <p>Positive results</p>
Bath continuous pilot plant	<ul style="list-style-type: none"> • Demonstrate quality of hydrogen fluoride produced at pilot scale • Determine design and operating parameters for commercial plant 	<p>Design and cost close to finalised</p>



Illustrative images

Segments



Rare earth discoveries in northern Tasmania



ALCORE Aluminium fluoride production technology



Bauxite operations in Queensland and Tasmania

ABx bauxite operations

Sunrise Bauxite project

Queensland



¹ ABX ASX Announcement, 28 February 2022

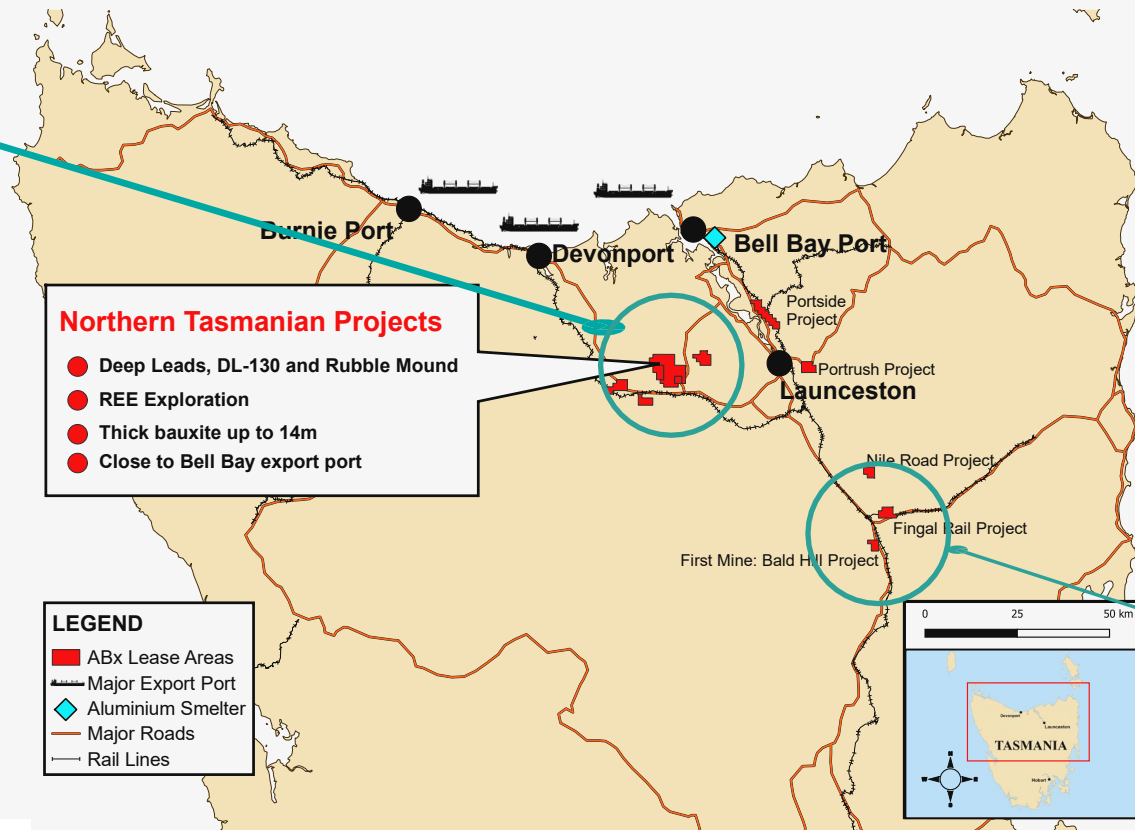
² ABX ASX Announcement, 18 June 2018; 14 Mt inferred and 23 Mt indicated

- 50:50 joint venture with Alumin Pty Ltd, an Australian special purpose vehicle company associated with our strategic marketing partner, Rawmin India¹. ABx is operator
- Mining lease application on the Binjour deposit (37 million tonnes resource²), 115km southwest of Bundaberg Port.
- Alumin will contribute up to \$18m (for 49.9% equity), which is anticipated to fund mine and port development
- Negotiations continuing with multiple potential offtake partners
- Production planned to commence H2 2025
- Full production anticipated to be 1.5 mt/y

ABx bauxite operations

Northern Tasmania

✓ Environmental Effects Report for DL130 reviewed by EPA¹



- Five-year cement-grade bauxite supply agreement signed with Adelaide Brighton Cement Limited¹
- Mining planned to commence in Q3 2024²
- Bauxite mining at DL130 may accelerate development of the Deep Leads REE discovery

✓ First mine at Bald Hill fully rehabilitated

¹ABX ASX Announcement, 11 September 2023

²ABX Quarterly Report to 31 December 2023, 31 January 2024



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