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**RAINBOW RARE EARTHS**

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**UNLOCKING  
SECONDARY  
SOURCES OF  
RARE EARTHS**

**121  
Presentation**

**February 2024**



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# RAINBOW RARE EARTHS

## UNIQUE INVESTMENT OPPORTUNITY



### PHALABORWA BASE CASE<sup>1,2</sup>

NPV<sub>10</sub>  
US\$627m

IRR  
40%

EBITDA  
US\$192m

Margin<sup>3</sup>  
75%

Payback  
<2 years



**CRITICAL MINERALS:** Demand for rare earth elements (REEs) will rise significantly to meet decarbonisation; urgent need for non-China supply



**STRATEGIC ASSETS:** Responsible rare earth production from secondary sources: near-term production in South Africa and earlier stage project in Brazil - US\$50m project investment commitment from the US DFC via TechMet



**ROBUST ECONOMICS:** Phalaborwa PEA demonstrates strong returns in all pricing scenarios, low capital intensity (US\$295.5m) and expected to be one of the lowest cost producers of separated rare earth oxides globally



**INNOVATIVE TECHNOLOGY:** Proprietary RE oxide separation process is simpler, more environmentally friendly and cheaper than traditional processes



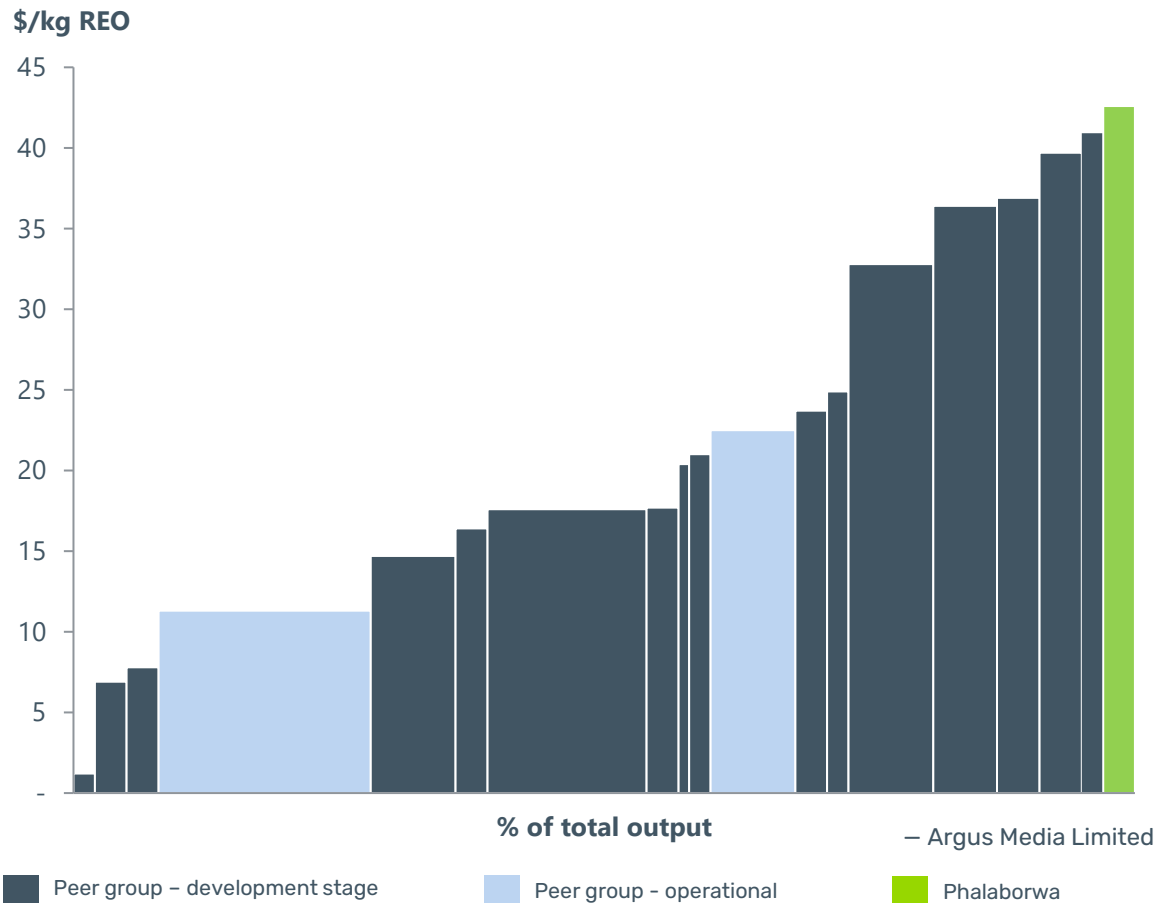
**EXPERIENCED TEAM:** Proven history of delivery

1. All figures based on base case using US\$110/kg Nd; US\$112.50/kg Pr; US\$340/kg Dy; US\$1,875/kg Tb  
2. NPV and IRR calculations are both post tax  
3. EBITDA operating margin

# HIGHEST MARGIN GLOBAL RARE EARTH DEVELOPMENT PROJECT DUE TO LOWER OPERATING AND COST PROFILE THAN TRADITIONAL MINING PROJECTS



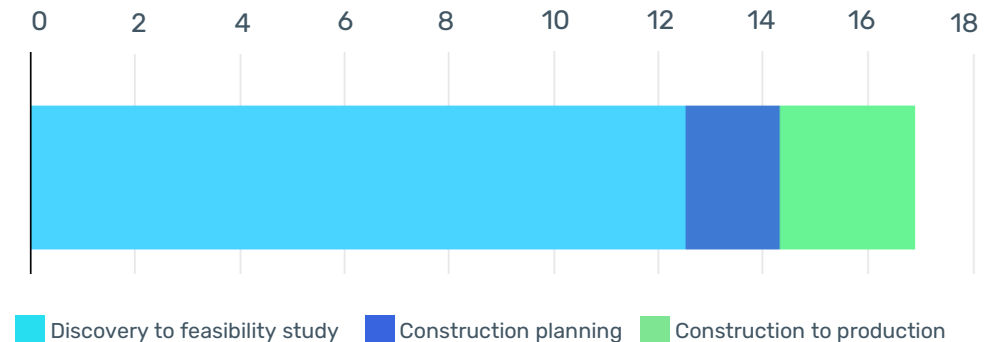
Argus Media analysis of expected operating margin per kg of REO production based on 2022 average REO prices<sup>1</sup>



## PHALABORWA HAS HIGHEST MARGIN DUE TO LOW INHERENT COST BASE

- No primary mining, crushing or grinding costs
- Many development projects have complex challenges to overcome including low grades, high levels of radioactivity and environmental complications
- High capex associated with complex processing
- Long lead time for mines to be brought into operation

## GLOBAL AVERAGE LEAD TIMES FROM DISCOVERY TO PRODUCTION



Source: IEA, The Role of Critical Minerals in Clean Energy Transitions, March 2022

# RARE EARTH ELEMENTS

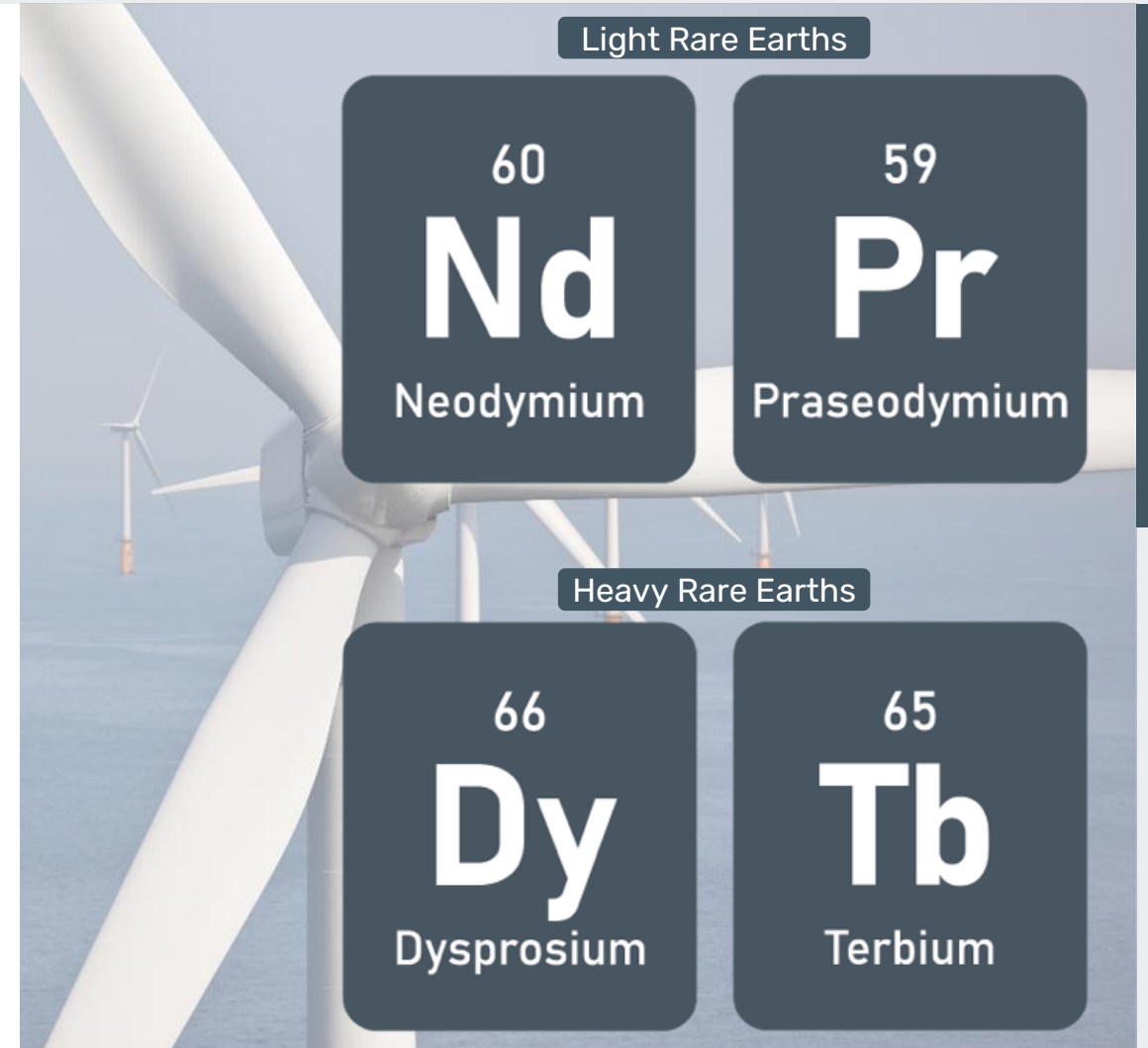
## ESSENTIAL FOR GLOBAL DECARBONISATION

### CRITICAL BUILDING BLOCKS TO REACH NET ZERO

- Rare earth elements (REEs) are a group of 17 elements
  - NdPr, Dy and Tb are used for permanent magnets and account for ca. 95% of global consumption by value<sup>1</sup>
- Essential components for:

|   |   |  |                              |  |                                   |
|---|---|--|------------------------------|--|-----------------------------------|
| <p>Electric Cars</p> <p>Pr Nd Tb Dy</p> | <p>Wind Turbines</p> <p>Pr Nd Tb Dy</p> | <p>Smart Phones</p> <p>Pr Nd Tb Dy</p> | <p>Speakers</p> <p>Pr Nd</p> | <p>Computer Drives</p> <p>Pr Nd Dy</p> | <p>Defence</p> <p>Pr Nd Tb Dy</p> |
|---|---|--|------------------------------|--|-----------------------------------|

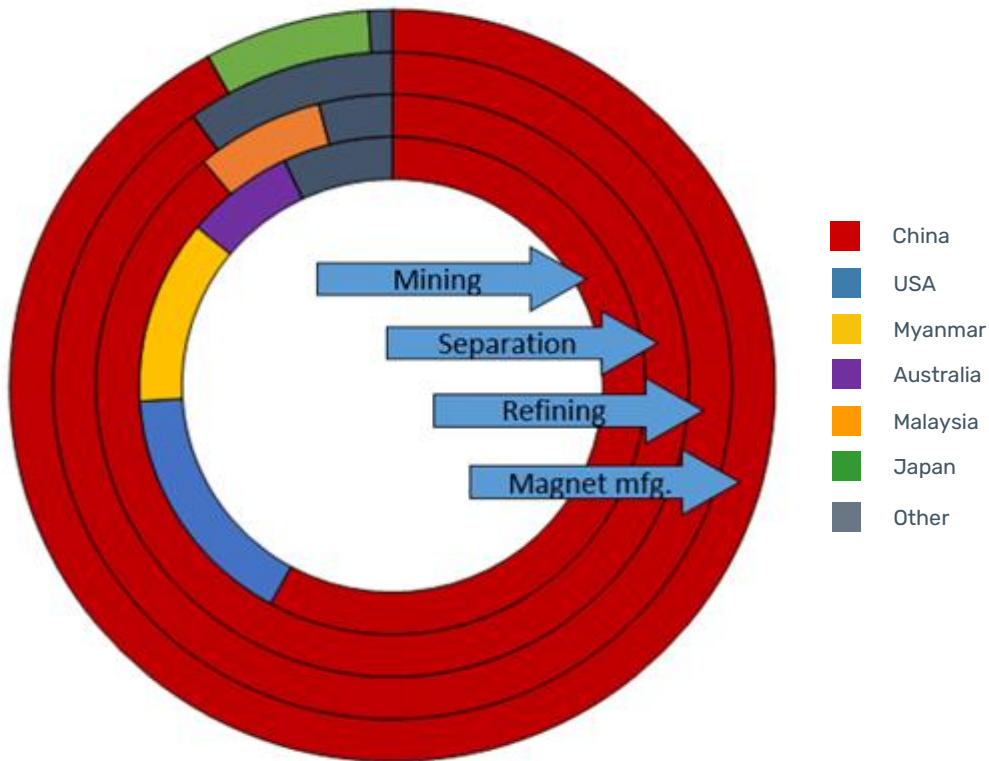
- Rare earth permanent magnets' competitive advantage is their very high strength to weight ratio and performance under high temperatures
- Global net zero GHG emissions will require unprecedented levels of critical minerals, incl. REEs (forecast CAGR of ca. 10%<sup>1</sup> for rare earth permanent magnets from 2022 to 2033)



# MAJOR CENTRALISATION OF SUPPLY CHAIN CURRENTLY

## URGENT NEED TO DEVELOP DIVERSE AND ETHICAL SOURCES OF SUPPLY

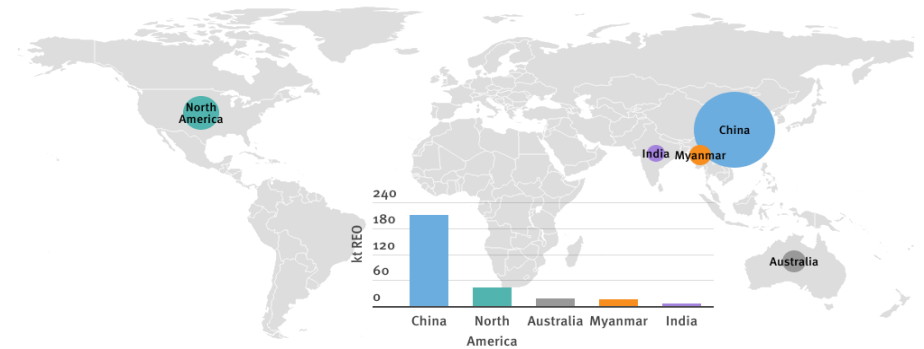
Geographical concentration of supply chain stages for sintered NdFeB magnets



Source: US Department of Energy Report: Rare Earth Permanent Magnets: Supply Chain Deep Dive Assessment, 2022

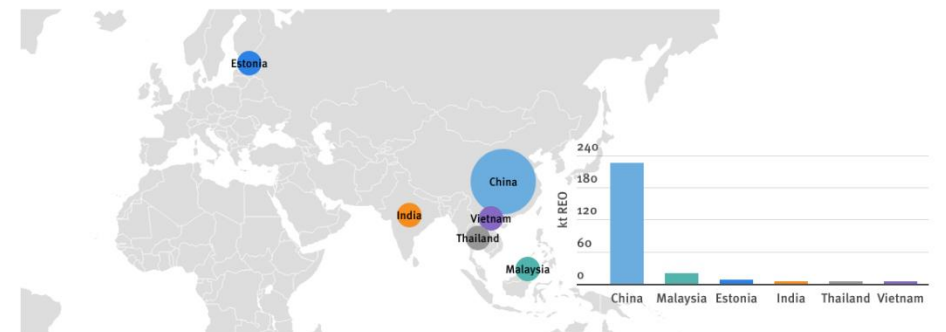
REE mine supply is currently 60-70% dominated by China  
 'Heavy' REE (Dy & Tb) mine supply is +90% dominated by China

Rare earth mine production, 2022



Separated rare earth oxide supply is +90% dominated by China

Rare earth separation capacity, 2022



Source: Argus Media Ltd

## STRONG LEADERSHIP TEAM

WITH TRACK RECORD THROUGH PROJECT DEVELOPMENT TO PRODUCTION



### EXPERIENCED MANAGEMENT AND TECHNICAL TEAM TO DELIVER PHALABORWA AND PROJECT PIPELINE

- CEO George Bennett established MDM Engineering which delivered multiple processing plants and feasibility studies under his tenure
- Technical Director Dave Dodd worked alongside George at MDM Engineering after a long career delivering multiple mine developments
  - At MDM, George and Dave delivered two REE studies, being Lofdal in Namibia and Ngualla in Tanzania
- Technical team: Chris Le Roux and Roux Wildenboer have extensive experience in REE processing and project development
- Chairman Adonis Pouroulis, is a mining entrepreneur; extensive experience across Africa and a long-term strategic vision for growth
- CFO Pete Gardner is a Chartered Accountant with +15 years in the mining sector (development and producing assets)



# RECOVERY OF MAGNET RARE EARTHS FROM PHOSPHOGYPSUM STACKS

## ONE OF THE LOWEST COST RARE EARTH PROJECTS IN DEVELOPMENT TODAY



Total Resource<sup>1</sup> of 30.4 Mt at 0.44% TREO

Production of ca. 1,850t of NdPr, Dy, Tb annually

Project life of ca. 14 years



Rainbow has an 85% interest in Phalaborwa, with an option to reach 100%

The Mineral and Petroleum Resources Development Act, 2002 in South Africa does not apply to the Phalaborwa project, so a mining right is not required to extract the minerals from the gypsum stacks; accordingly, there are no black economic empowerment requirements

- Resource comprises two stacks of phosphogypsum, the by-product of phosphoric acid production
- Project is largely permitted and positioned in an established mining town – available skills and infrastructure
- Low capital intensity: capex of **US\$295.5 MILLION** significantly below that of a traditional hard rock rare earth mining project; US\$50 million committed by the US International Development Finance Corporation (DFC) via its holding in TechMet
- Operation will perform environmental clean-up of acid water on site and sale of benign gypsum by-product will see full rehabilitation of site
- Preliminary Economic Assessment (PEA) in 2022 confirmed robust economics; Definitive Feasibility Study (DFS) now underway and due for completion in 2024

OpEx<sup>2</sup>

**US\$/kg 33.86**

Highest basket price of any project ex China<sup>3</sup>

**US\$/kg 175.89<sup>4</sup>**

Phalaborwa project



# ADVANTAGES OF CIX / CIC TECHNOLOGY OVER TRADITIONAL SX

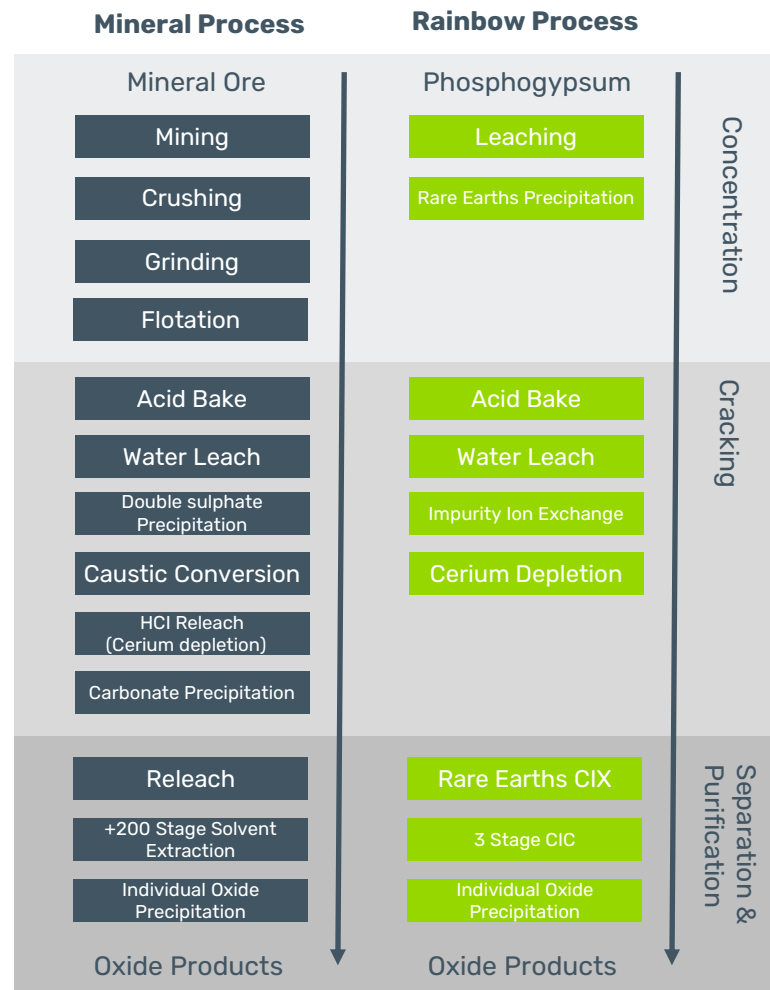
## SIMPLIFIED PROCESS LEADING TO COST AND ENVIRONMENTAL BENEFITS



Rare Earth SX separation battery in La Rochelle, France; just one small fraction of overall process

### Solvent Extraction (SX)

- Uses toxic and flammable solvents and diluents
- Typically requires hundreds of separate stages
- Large footprint



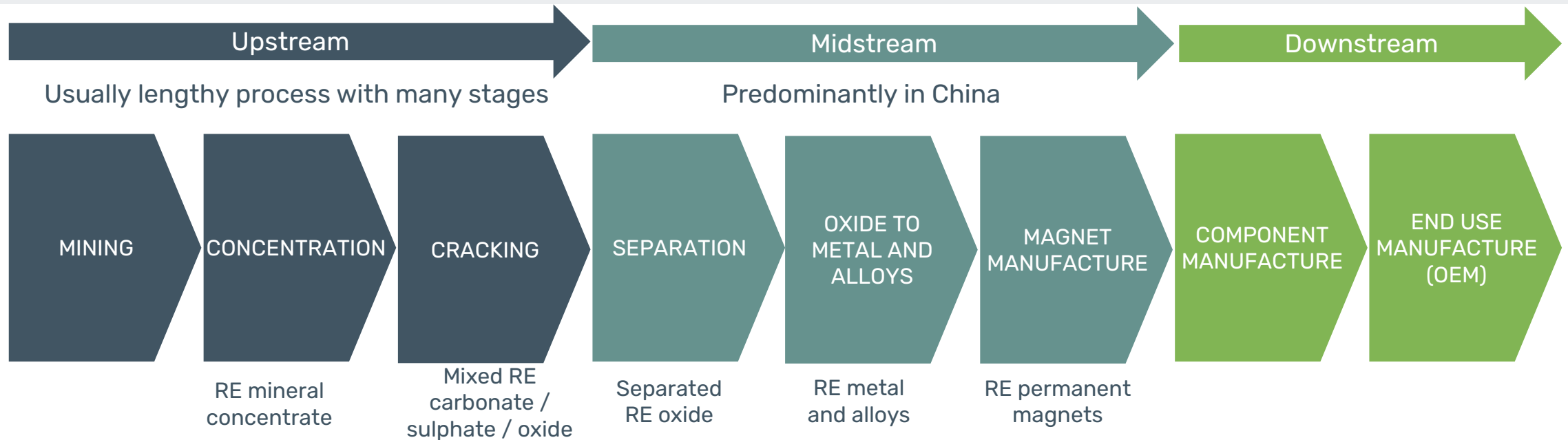
An example of a commercial scale CIX unit built by K-Tech

### Continuous Ion Exchange (CIX) / Continuous Ion Chromatography (CIC)

- Safer and more environmentally responsible
- Reduced capital and operating costs due to simplified flowsheet / plant process and smaller footprint
- Fast, efficient, and precise extraction of trace quantities of target materials from high volume streams
- K-Tech patented separation technology for rare earth oxides

# UNIQUE POSITION IN THE RARE EARTH MAGNET SUPPLY CHAIN

## ON TRACK TO DELIVER SEPARATED RARE EARTH OXIDES OF ALL FOUR MAGNET REES



Value chain

### RAINBOW RARE EARTHS

Resource already sitting at surface

CONCENTRATION (ALREADY 'CRACKED')

SEPARATION

Phalaborwa will deliver separated rare earth oxides using a proprietary separation technique

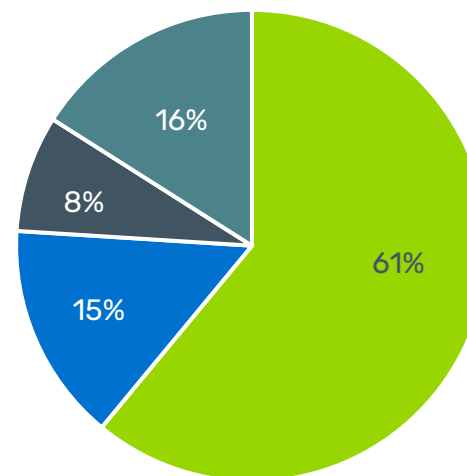
Flexibility to establish back-end plant process in the US could establish Rainbow as one of the first producers of separated RE oxides in the country

# PRELIMINARY ECONOMIC ASSESSMENT

## HIGHLIGHTED ROBUST ECONOMICS FOR THE PROJECT BASED ON SPOT PRICING AT OCTOBER 2022

| PEA Base Case Parameters          | Units   | Value |
|-----------------------------------|---------|-------|
| Treatment rate                    | Mt/a    | 2.2   |
| Production of NdPr, Dy, Tb oxides | t/a     | 1,848 |
| Life of operation                 | Years   | 14    |
| Capital cost                      | US\$m   | 295.5 |
| Opex per kg REO                   | US\$/kg | 33.9  |
| Basket price                      | US\$/kg | 137.9 |
| Revenue per tonne treated         | US\$/t  | 117.9 |
| Payback period (post tax)         | Years   | 2     |
| NPV <sub>10</sub> (post tax)      | US\$m   | 627.0 |
| IRR (post tax)                    | %       | 40    |
| Revenue per annum                 | US\$m   | 254.8 |
| Average EBITDA per annum          | US\$m   | 192.2 |
| EBITDA operating margin           | %       | 75    |

### PHALABORWA MAGNET RARE EARTH OXIDE SUPPLY



■ Nd ■ Pr ■ Dy ■ Tb  
Phalaborwa magnet rare earth basket by value<sup>1</sup>

NdPr production<sup>2</sup>  
**ca. 1,750t**  
ca. 30% Lynas / MP annual output

Dy annual production<sup>2</sup>  
**ca. 60t**

Tb annual production<sup>2</sup>  
**ca. 20t**

# STRONG RETURNS IN ANY FORESEEABLE PRICING ENVIRONMENT

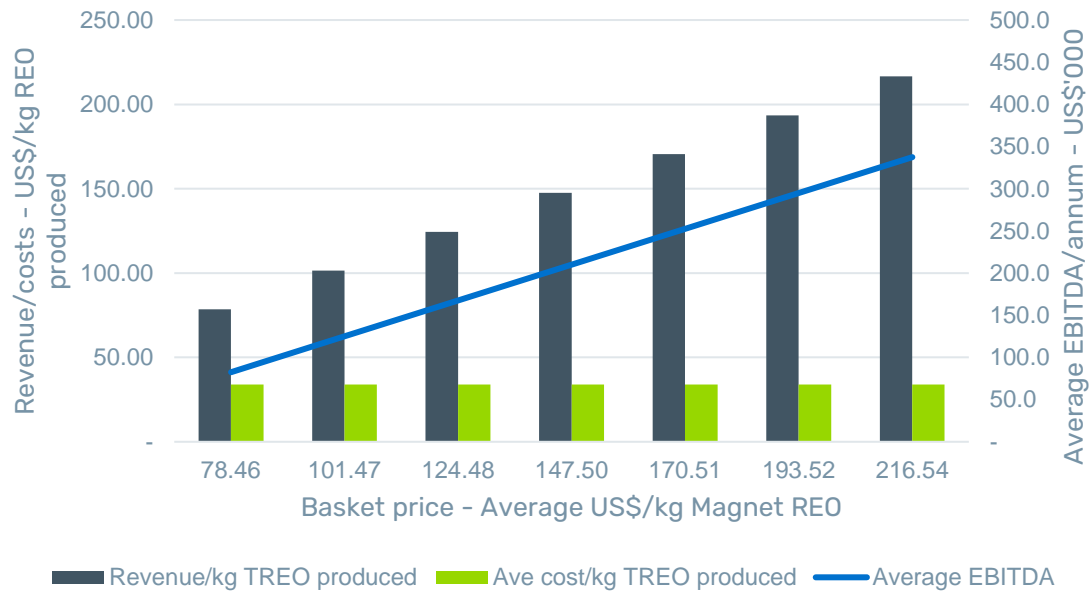
## ROBUST ECONOMICS VS TRADITIONAL RARE EARTH MINING DEVELOPMENT PROJECTS



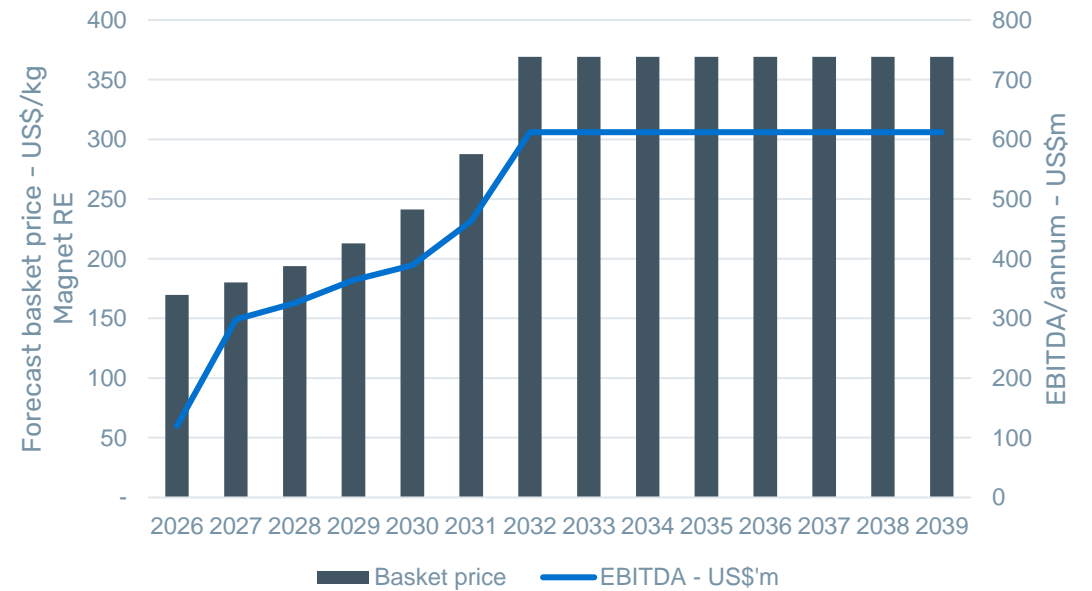
- Sensitivity analyses demonstrate robust EBITDA operating margins in all pricing sensitivity scenarios
- NPV insensitive to changes in operating costs; beneficial in inflationary environment

- Strong supply / demand fundamentals support expectations of long-term increase in magnet rare earths prices

### EBITDA SENSITIVITY TO PRICING



### SENSITIVITY TO MARKET FORECAST PRICING FROM WHEN PHALABORWA COMMENCES OPERATION<sup>1</sup>



<sup>1</sup>Source of forecast rare earth oxide pricing from 2026 to 2039: Argus Media Ltd

# US GOVERNMENT TO INVEST US\$50 MILLION VIA TECHMET SIGNIFICANT DE-RISKING OF PHALABORWA FINANCING



## Strong US Government interest – option to invest US\$50 million as part of the equity funding for Phalaborwa

- DFC US\$50 million funding commitment (to be invested via TechMet) announced at COP28
- Phalaborwa offers outstanding economic and ESG opportunities
- US Government interest at multiple levels confirmed by recent US Bipartisan Congressional Staff Delegation site visit

### Scott Nathan, CEO of the DFC:

*"The Phalaborwa Rare Earths Project being developed by Rainbow Rare Earths represents a compelling opportunity to extract and refine four critical minerals essential to both the green energy transition and economic security. DFC is pleased to be able to support this project which will remediate the effects of legacy mining activities, boost local economic growth, and diversify the critical minerals supply chain."*



Site visit for US Congressional Staff Delegation in December 2023

### Brian Menell, Chairman and CEO of TechMet:

*"Rainbow's Phalaborwa Project has an immensely exciting future and this funding gives it the potential to become one of the world's most environmentally friendly and low-cost rare earth projects anywhere."*

# RESPONSIBLE PRODUCTION OF RARE EARTHS

## INTEGRATING STRONG ENVIRONMENTAL AND SOCIAL PRACTICES IN PHALABORWA'S DEVELOPMENT

### FOUNDED ON THE PRINCIPLES OF CIRCULARITY; RECOVERING RARE EARTHS FROM SECONDARY SOURCE



#### BROWNFIELD

- Phalaborwa is on an industrial site with legacy environmental issues
- Majority of environmental permits are in place and only require updating



#### REHABILITATION

- Rainbow will clean up legacy issues:
  - Neutralising acidic solution
  - Redepositing benign gypsum on lined stacks in accordance with IFC standards / Equator Principles
  - Sale of benign gypsum will deplete stacks



#### RECYCLING

- All process water needs will be met by neutralised water in ponds
- Certain key reagents<sup>1</sup> recovered from upfront leach process for use downstream
- Sulphuric acid from nearby plant waste stream



#### CLOSED-LOOP

- No water abstraction required for processing
- Any water discharged to the environment will be done so in line with regulations



#### REUSE

- Existing infrastructure can be repurposed and reused
- Potential for use of reclaimed, clean phosphogypsum in building and industrial sectors



#### RENEWABLE

- Exploring renewable energy options at Phalaborwa, including solar

### CREATING SOCIAL VALUE



#### COMMUNITY

- Different social context from a greenfield project in a remote location
- Transparent payment of taxes
- Commitment to prioritise local supply chain



#### PEOPLE

- Focus on Zero harm
- Phalaborwa expected to provide c. 275-300 direct jobs
- Commitment to prioritise local employment

# TIMELINE TO PRODUCTION

## DE-RISKS PHALABORWA PROJECT; UNLOCKS VALUE



**Q4 2022**

**Q1 2024**



### PROJECT PROGRESS

- PEA publication – Phalaborwa expected to be one of the lowest cost global producers of separated magnet rare earth oxides

### NEXT STEPS SUPPORTED BY POSITIVE PEA

- Workstreams underway to deliver DFS in 2024:
  - Front-end pilot plant with Mintek in Johannesburg: commenced operation in June 2023 and produced first mixed RE sulphate in Q3 2023; process further refined to produce a Ce-depleted mixed RE carbonate as optimal for back-end separation
  - Back-end pilot plant with K-Tech in Lakeland, Florida; operations are underway and first production of separated rare earth oxides due in the coming weeks
  - METC Engineering has commenced work on the DFS and managing the inputs from the various specialist consultants
  - Paragon Tailings advising on reclamation of the existing gypsum stacks and leading global gypsum experts Ardaman conducting test and design work for the new gypsum stacks
  - Resource update expected H1 2024 delivering additional project life due to higher bulk density
  - Environmental work: full ESIA workstreams underway by WSP Golder for the DFS and permitting
  - Letter of Intent signed with NEXUS for sale of gypsum by-product – demand estimated at 400 to 600 kt per annum to domestic and neighbouring markets

Project Development

# MULTI-ASSET RARE EARTH DEVELOPMENT COMPANY

## DIVERSIFIED PORTFOLIO WITH SHORT TO LONGER TERM OPPORTUNITIES





# MOU SIGNED WITH MOSAIC IN BRAZIL

## MAJOR OPPORTUNITY TO REPLICATE PHALABORWA



### UBERABA PHOSPHOGYPSUM STACK IN MINAS GERAIS

- Large phosphogypsum stack sitting at surface as a byproduct of phosphoric acid production
- Uberaba phosphate slurry feed is sourced from a hard rock carbonatite similar to the Foskor carbonatite mine that originally fed Sasol's phosphoric acid plant at Phalaborwa
- Ongoing phosphoric acid production is growing the stack annually
- MOU: Rainbow and Mosaic to collaborate on the development of a process flowsheet in order to extract the REEs from the stack, followed by a preliminary economic assessment
- Initial mineralogy test work complete; Rainbow and Mosaic currently undertaking further testwork
- Initial test work programme and PEA costs to be shared 50:50

### INITIAL ASSAY RESULTS

TREO grade @

**0.58%**

NdPr % of basket

**ca. 25%**

Included in basket

**Dy & Tb**

Results from SGS Laboratories in Toronto

# WHY RAINBOW?

## DRIVING VALUE FROM STRATEGIC SECONDARY SOURCES OF RARE EARTHS

### PHALABORWA UPSIDE FORECAST<sup>1</sup>

NPV<sub>10</sub>

US\$1.0bn

IRR

44%

EBITDA

US\$310m

Margin<sup>2</sup>

83%

### KEY TAKEAWAYS

- **Phalaborwa offers unique benefits** over traditional rare earth projects:
  - Expected to be the highest margin rare earth project in development today
  - Contains all four permanent magnet rare earths, incl. ‘heavies’ Dy and Tb
  - Highly cash generative even at lower rare earth prices
  - Project backed by the US Government further to DFC US\$50 million investment commitment via TechMet
- **Unique flow sheet and separation IP** – cheaper, safer and more environmentally friendly than traditional SX and can be applied to other phosphogypsum opportunities globally
- **Strategic advantage** – Rainbow expected to become one of the only producers of all four separated magnet rare earth oxides outside of Asia
- **Geographic diversification** – partnership with Mosaic on Uberaba in Brazil further de-risks Rainbow and represents a major opportunity to replicate Phalaborwa. Potential longer-term prospects via partnership with OCP in Morocco

1. Based on the long-term price forecasts received from Argus, with the first year of production assumed to occur in 2026 and prices assumed to remain constant from 2031 to the end of the project life  
 2. EBITDA operating margin

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**RAINBOW RARE EARTHS**

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**APPENDIX**



# KEY SHAREHOLDER INFORMATION



## BOARD SHAREHOLDINGS AND MAJOR SHAREHOLDERS (>3%)

| Shareholder                     | Holding as at 24 Jan 2024 |
|---------------------------------|---------------------------|
| Adonis Pouroulis                | 14.0%                     |
| TechMet                         | 11.9%                     |
| George Bennett                  | 6.2%                      |
| Caden Holdings Limited          | 5.9%                      |
| Shawn McCormick                 | 1.5%                      |
| Alexander Lowrie                | 1.1%                      |
| Atul Bali                       | 0.7%                      |
| Darryll Castle                  | 0.1%                      |
| J Peter Pham                    | 0.1%                      |
| <b>Total Board shareholding</b> | <b>23.7%</b>              |

## INFORMATION AS AT 24 JANUARY 2024

| Ticker | Market | Market cap | Share price | Shares in issue | Brokers            |
|--------|--------|------------|-------------|-----------------|--------------------|
| RBW.L  | LSE    | US\$104.2m | 13p         | 630m            | BERENBERG / STIFEL |

## SHARE PRICE (GBP) - ONE YEAR



# EXPERIENCE BOARD AND EXECUTIVE MANAGEMENT

## EXTENSIVE EXPERIENCE ACROSS MINING, AFRICA, CAPITAL MARKETS, INTERNATIONAL AFFAIRS



**ADONIS POUROULIS**  
NON-EXECUTIVE CHAIRMAN

- Mining engineer: an entrepreneur whose expertise lies in the discovery, exploration and development of natural resources across Africa including diamonds, precious/base metals, coal and oil and gas.
- Founder of Rainbow and Petra Diamonds (LSE:PDL); Founder and Director of Chariot Oil & Gas (AIM:CHAR) and Founder of Pella Resources Limited



**SHAWN MCCORMICK**  
INDEPENDENT NON-EXECUTIVE DIRECTOR

- International affairs specialist
- + 25 years of political and extractive industries sector experience having served in The White House as Director for African Affairs on the National Security Council (Washington)
- Previously Political Affairs Director of BP (London) and VP of TNK-BP (Moscow)



**ALEXANDER LOWRIE**  
INDEPENDENT NON-EXECUTIVE DIRECTOR

- Investment banker with 13 years' experience and previous director roles at Deutsche Bank and RBS
- Co-founder of Telemark Capital LLP
- Significant market experience: IPOs and primary and secondary equity offerings



**J PETER PHAM**  
INDEPENDENT NON-EXECUTIVE DIRECTOR

- Scholar and practitioner of International Affairs; >20 years of experience in Africa
- First-ever United States Special Envoy for the Sahel Region until 2021 with the personal rank of Ambassador; previously as US Special Envoy for Great Lakes Region
- Distinguished Fellow at the Atlantic Council
- Member of the Board of the Smithsonian National Museum of African Art in Washington, DC, as well as Non-Executive Director of Africell Global Holdings



**ATUL BALI**  
INDEPENDENT NON-EXECUTIVE DIRECTOR

- Corporate CEO and board member with extensive experience in tech, government contracting and regulated industries; Chartered Accountant
- Currently advisor to several high-growth technology companies, Chairman of the Football Pools and non-executive director of Everi Holdings Inc (NYSE:EVRI)
- Previously held divisional CEO or President positions with IGT (NYSE), Aristocrat (ASX), and Real Networks (NASDAQ), as well as a venture capital firm



**GEORGE BENNETT**  
CEO

- 25 years in finance and management, including as partner in stockbroking/advisory firms in SA
- Former CEO of Shanta Gold Ltd, successfully listed on LSE in 2005
- CEO and Founder of MDM Engineering, listed on LSE in 2008; responsible for delivering multiple process plants and feasibility studies. Sold after 8 years to Foster Wheeler for US\$120 million
- Seed-funded and raised initial capital for OreCorp Ltd as non-executive director, now ASX listed



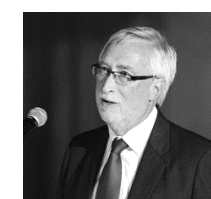
**DARRYLL CASTLE**  
NON-EXECUTIVE DIRECTOR

- COO for TechMet<sup>1</sup>
- Civil engineer; +30 years experience across company leadership, project/operational delivery and transformation, technical planning and implementation, fund management, business development and governance roles.
- Extensive career as an exec in mining globally, incl. running operations across Africa



**PETE GARDNER**  
CHIEF FINANCIAL OFFICER

- Qualified Chartered Accountant; +15 years' experience in mining industry leading finance teams across Africa/developing nations
- Former CFO of Amara Mining plc (up to acquisition by Perseus Mining Ltd), Chaarat Gold, Piran Resources and Alexander Mining



**DAVE DODD**  
TECHNICAL DIRECTOR

- 45 years of extractive metallurgy experience
- Metallurgical Project Consultant
- BSc (Hons) Chemical Engineering (1974)
- Fellow of Southern Africa Institute of Mining & Metallurgy



**ALBERTO BRUTTOMESSO**  
PROJECT DIRECTOR - PHALABORWA

- Mechanical Engineer
- +30 years' experience in project management delivering 80 multidisciplinary mining, water treatment and infrastructure projects to date across the African continent
- Management of projects in gold, diamonds, chrome, platinum and uranium, including extensive experience in the delivery of processing plants
- Proven track record of delivering total turn key projects within budget and on time

1. TechMet is a strategic shareholder in Rainbow with the right to nominate 1 director to the Rainbow Board for so long as it holds at least 10% of the issued shares in the Company

**RAINBOW RARE EARTHS**



**THANK YOU**

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