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# The next power in rare earths

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## Critical Minerals: Exploration Update

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April 2024



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ASX: PEK

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All referenced announcements are available to view at:

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This presentation is authorised for release by the Company’s Chief Executive Officer.

# Executive summary

## Critical minerals exploration programme is targeting the multi-commodity potential of the Ngualla deposit

<b>Objectives</b>	<ul style="list-style-type: none"><li>• Primary focus remains on the Ngualla Rare Earth Project</li><li>• Longer-term potential for Ngualla to be a multi-commodity project supplying a suite of critical minerals</li></ul>
<b>Growing importance of critical minerals</b>	<ul style="list-style-type: none"><li>• Essential to the green energy and technology transition</li><li>• Rising concerns around security of supply</li></ul>
<b>Programme overview</b>	<ul style="list-style-type: none"><li>• 4,200m of exploration drilling across Northern Zone and Breccia Zone</li><li>• Assay of existing trench samples from Breccia Zone</li><li>• Development of a geological model for the Northern Zone</li><li>• Preliminary testwork on phosphate rock from Northern Zone</li></ul>
<b>Results</b>	<ul style="list-style-type: none"><li>• Extension of mineralised area for phosphate, niobium and rare earths within Northern Zone</li><li>• Major high-grade fluor spar discovery within the Breccia Zone</li><li>• Confirmation of suitability of phosphate from Northern Zone as a direct application fertilizer</li></ul>
<b>Next steps</b>	<ul style="list-style-type: none"><li>• Further fieldwork including the potential for further drilling</li><li>• Flowsheet development and metallurgical testwork</li><li>• Advancement of discussions with strategic parties aligned to offtake and low capital development options</li></ul>

# Ngualla Rare Earth Project ... remains Peak's primary focus

The Ngualla Project is one of the largest and highest grade undeveloped rare earth deposits in the world, with significant exploration and development upside

## High-grade Ore Reserve<sup>1</sup>

- TREO - 4.80% and NdPr - 1.02%

## Multi-generational

- 214Mt Mineral Resource and initial 24 year life<sup>1</sup>

## Low radionuclides<sup>1</sup>

- U - 15 ppm and Th - 53ppm

## Compelling project economics<sup>2</sup>

- NPV<sub>8%</sub> of US\$809m and IRR of 30.8%

## Significant exploration upside

- Includes fluorspar, niobium and phosphate

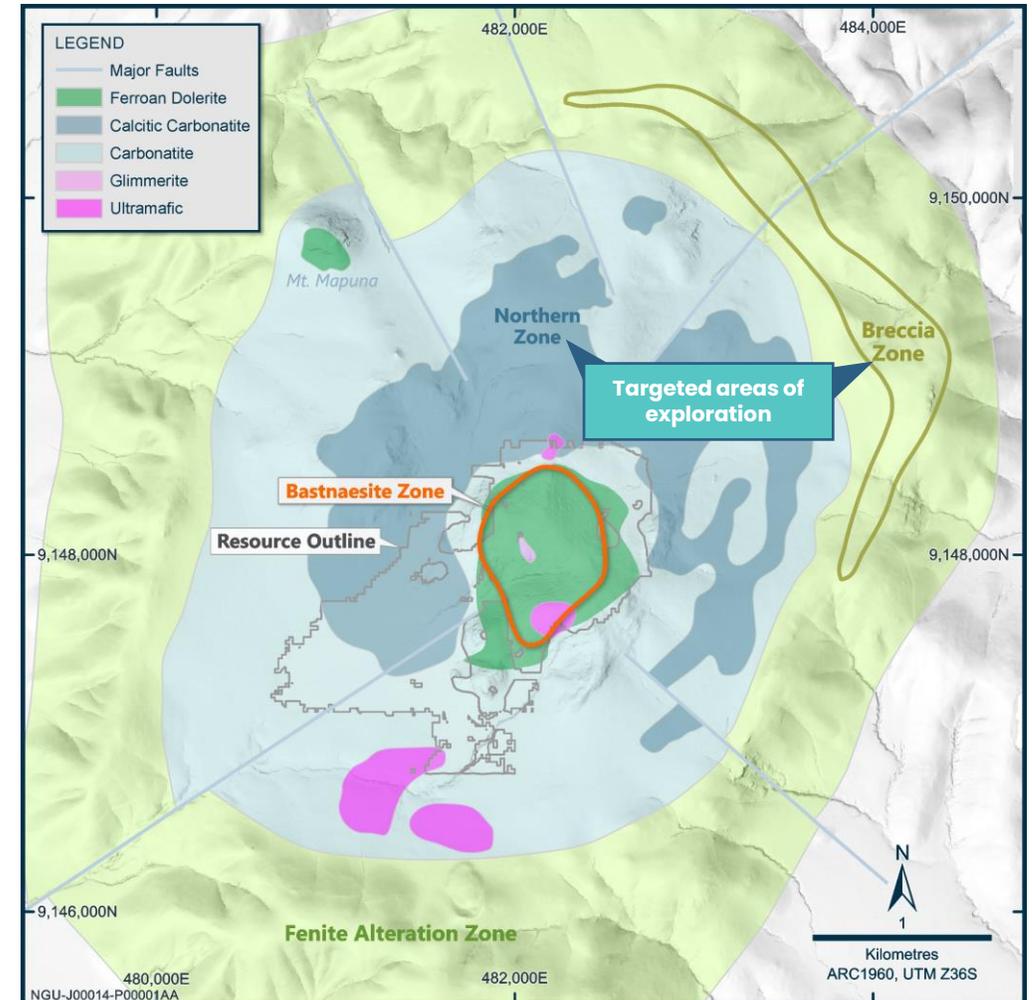


# Critical minerals exploration ... the potential for a multi-generational and commodity project

## Critical minerals exploration programme targeting highly prospective areas of the Ngualla deposit

### Critical minerals exploration programme ... key rationale

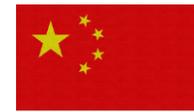
- ✓ **Broader Ngualla deposit remains largely unexplored**  
Historical focus on the rare earth project
- ✓ **Supports discussions with strategic parties**  
Strong appetite from parties for supply of other commodities from Ngualla
- ✓ **Growingly favourable commodity backdrop**  
Attractive market fundamentals for phosphate, niobium and fluorspar
- ✓ **Accelerated development pathway with key licences in place**  
Peak's SML covers other commodities associated with rare earths at Ngualla
- ✓ **Opportunity for low cost, parallel projects**  
Ability to utilise shared infrastructure with rare earth project



# Ngualla's critical mineral endowment

The potential to supply a suite of complementary key critical minerals

## Critical mineral status<sup>1</sup>



	EU	US	Australia	Canada	China	India	Japan	South Korea
Light rare earths (Nd, Pr)	✓	✓	✓	✓	✓	✓	✓	✓
Heavy rare earths (Dy, Tb)	✓	✓	✓	✓	✓	✓	✓	✓
Fluorspar	✓	✓	✓	✓	✓		✓	
Niobium	✓	✓	✓	✓		✓	✓	✓
Phosphate	✓					✓	✓	

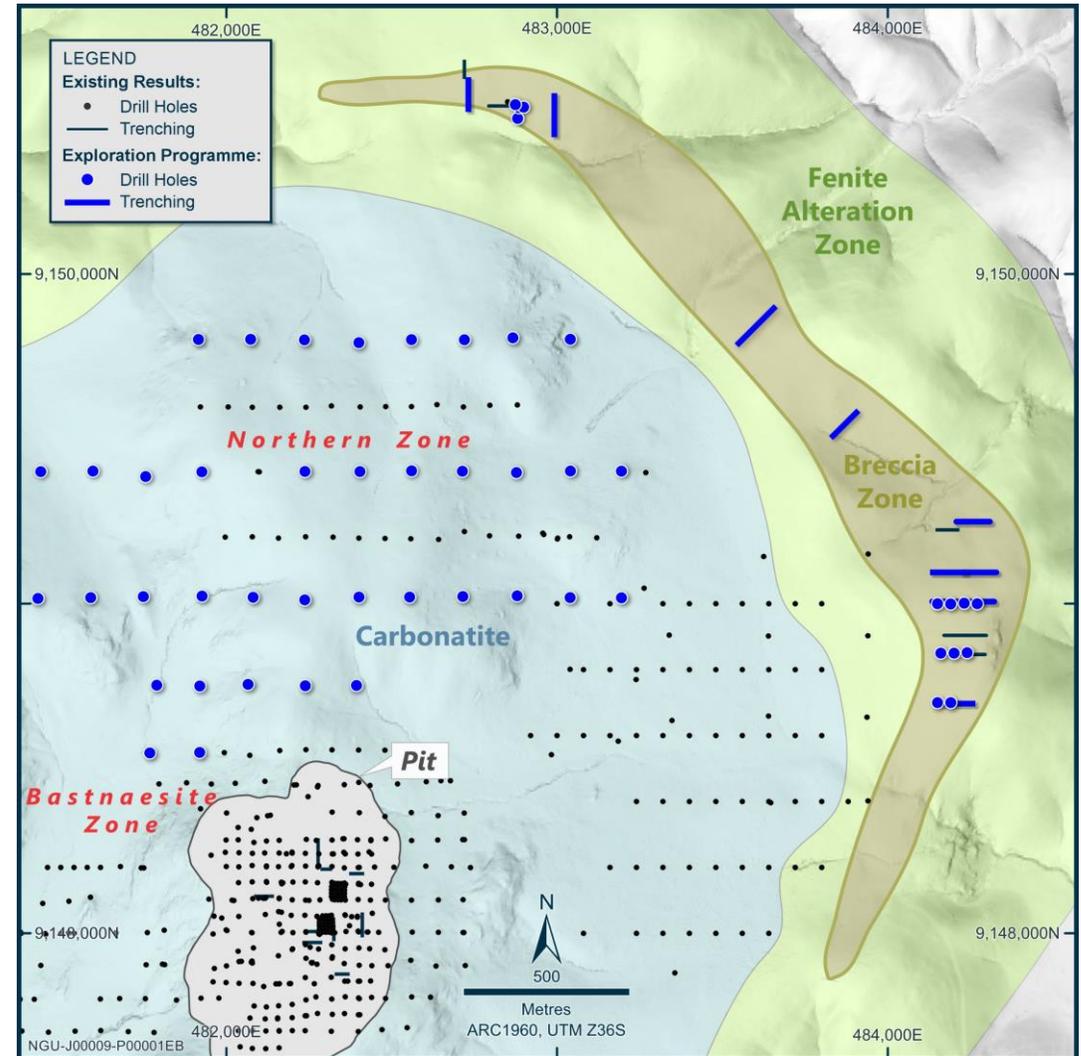
# Critical minerals exploration programme ... status update

## Exploration activities advanced at both the Breccia Zone and Northern Zone including 4,200m of additional RC and DD drilling

### Progress to date

- Appointment of Head of Exploration, Patrick Odhiambo
- Development of geological model for Northern Zone (SRK)
- Assay of 344 trench samples from Breccia Zone
  - Confirmation of widespread fluorapatite mineralisation at surface
- 57 drill holes for 4,200m completed and assayed<sup>1</sup>
  - Widespread phosphate mineralisation across Northern Zone
  - Major high-grade fluorapatite discovery within Breccia Zone
- Bioavailability analysis of phosphate from Northern Zone
  - Confirms potential use as direct-application fertiliser

	Northern Zone	Breccia Zone	Total
<b>RC</b>	44 holes / 3,104m	11 holes / 885m	55 holes / 3,989m
<b>DD</b>	-	2 holes / 211m	2 holes / 211m
<b>Total</b>	44 holes / 3,104m	13 holes / 1,096m	57 holes / 4,200m



# Exploration Focus

## Northern Zone



# Ngualla's multi-commodity potential ... Northern Zone

## Widespread and high-grade phosphate mineralisation<sup>1</sup>

### Overview

- ~0.7km<sup>2</sup> area, located 2km North of the Bastnaesite Zone
- Mineralisation currently open in northern and eastern directions
- Widespread, high-grade phosphate mineralisation at surface
- 'High' bioavailability - supports use in fertiliser applications
- Extensive rare earth and niobium mineralisation
  - Elevated levels of higher-value heavy rare earths (terbium and dysprosium)

### Prospective commodities



Phosphate



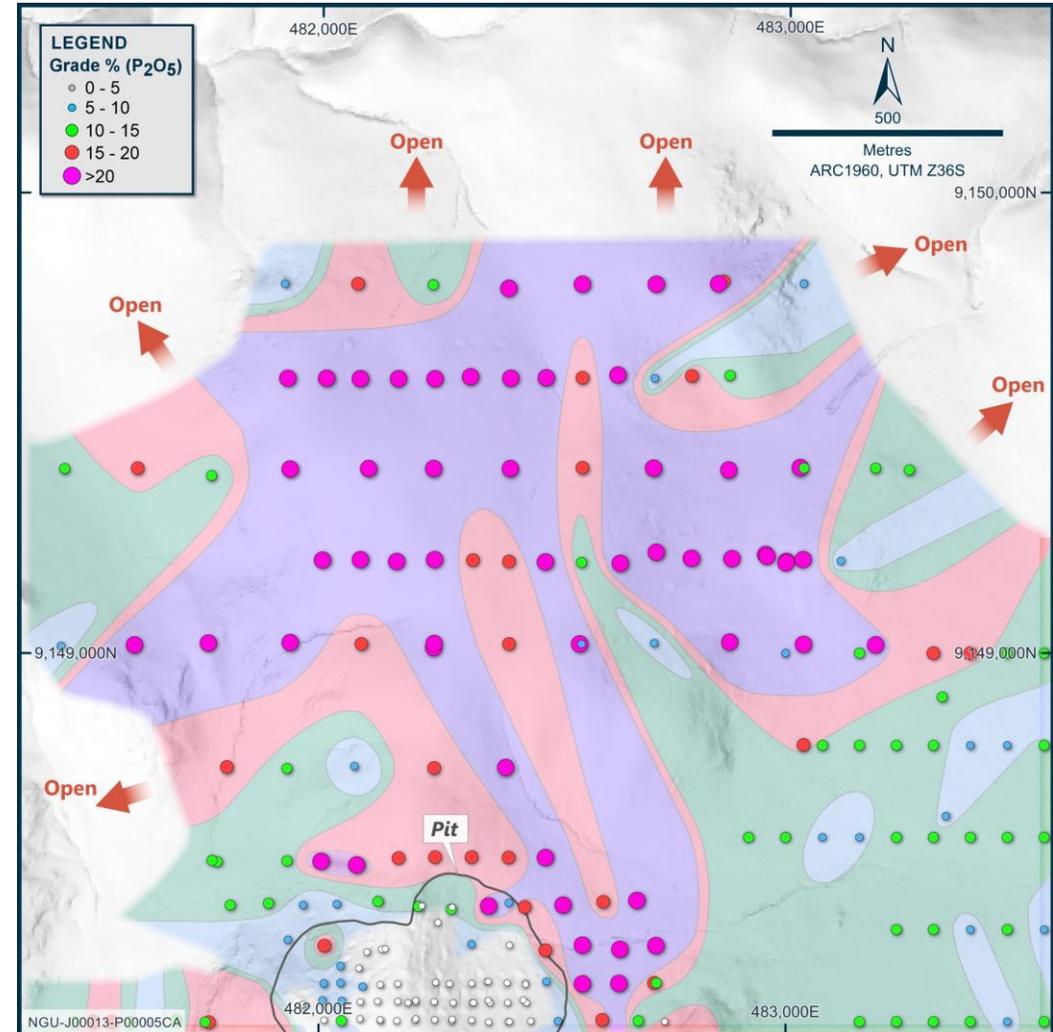
Rare Earths



Niobium

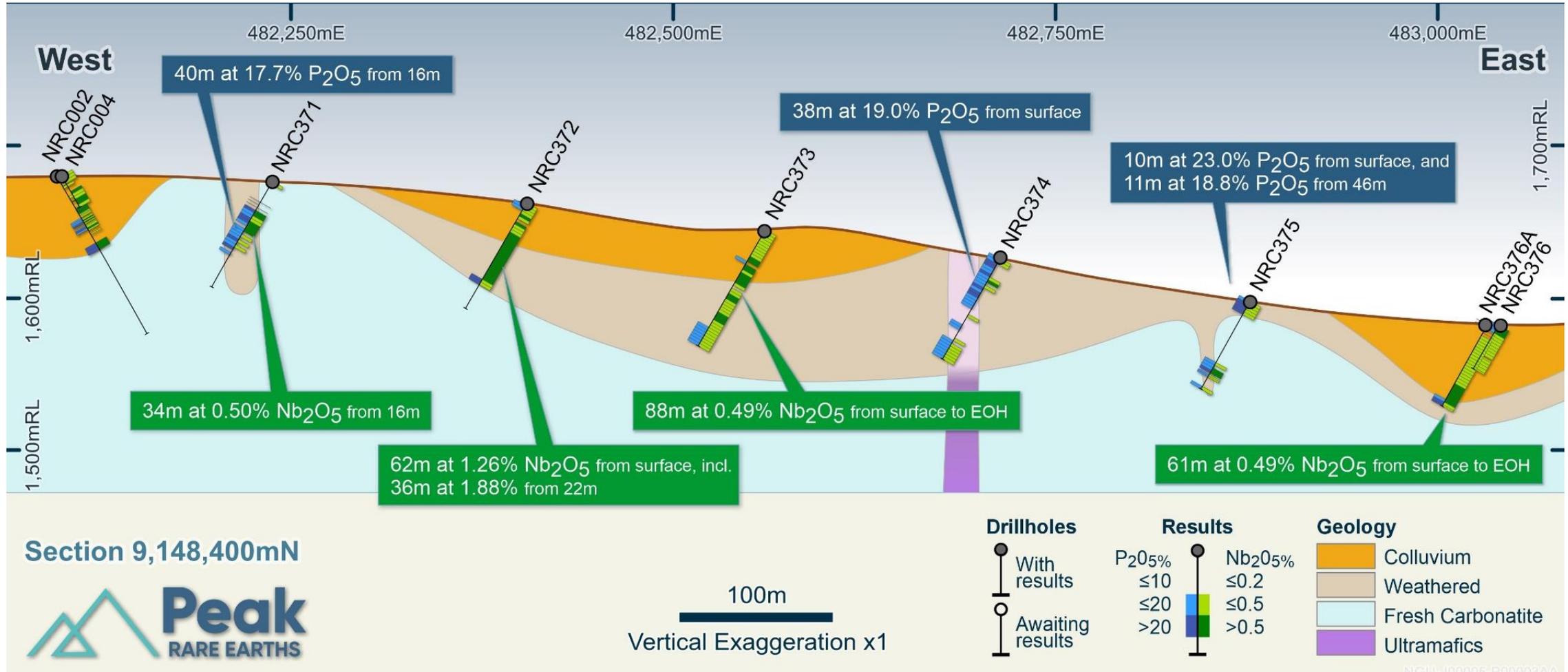
### Drilling summary (to date)

RC:	DD:	Total
75 holes / 5,584 m	2 holes / 190m	77 holes / 5,774 m



# Ngualla's multi-commodity potential ... Northern Zone

## Widespread and high-grade phosphate mineralisation<sup>1</sup>



1. Refer to announcement 'Further Northern Zone Exploration Assay Results' on 4 March 2024 for cross-section overview

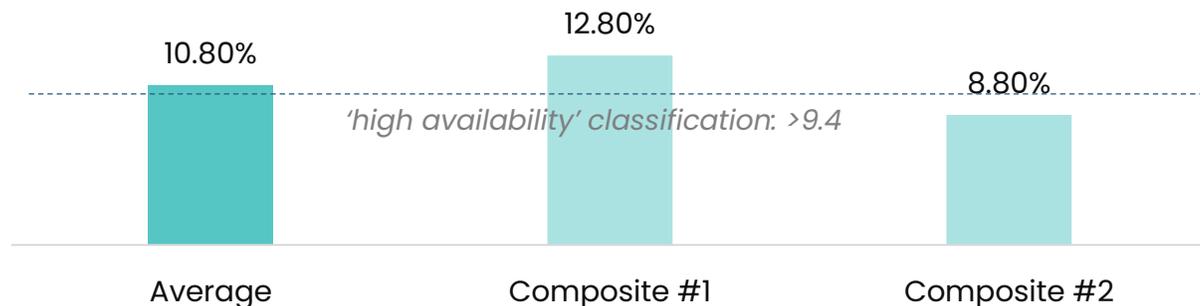
# East African fertiliser market ... a near-term opportunity

## Bio-availability tests confirm the suitability of Ngualla phosphate for use as a direct application fertiliser

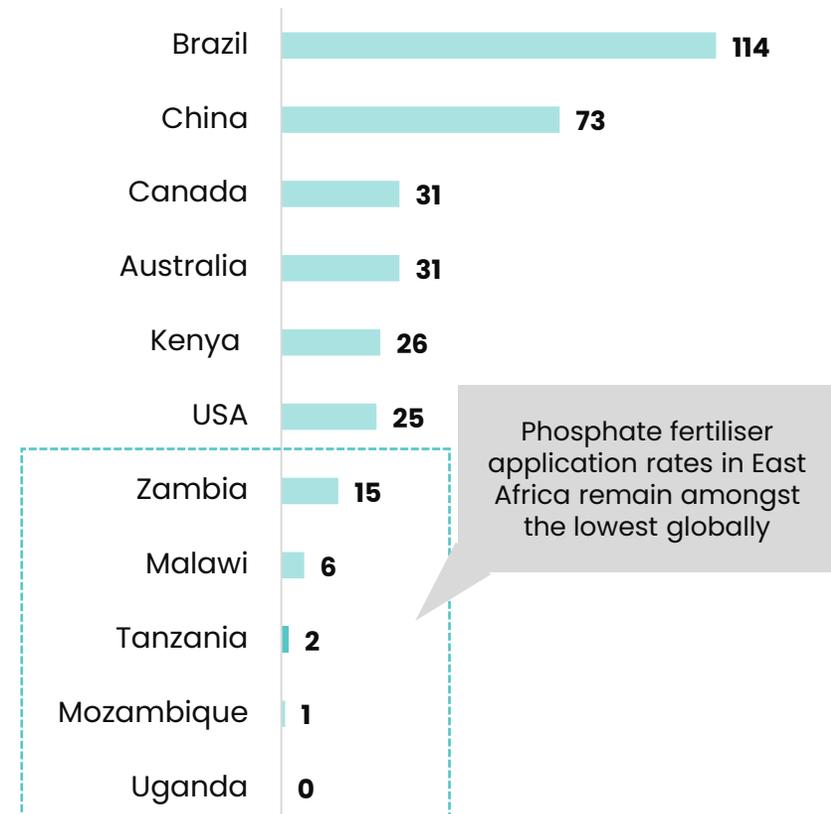
### Overview

- Phosphate rock is a key source of phosphorous to agricultural sector
  - Phosphorous is one of three essential nutrients used in fertilisers
- Phosphate prices have increased by a **CAGR of 65% over the last 3 years**<sup>1</sup>
  - Growing global focus on agricultural yields and food security
- Phosphate use within East Africa remains **amongst the lowest globally**
- Bioavailability tests have confirmed suitability of Ngualla phosphate as a potential direct application fertiliser<sup>2</sup>

### Bioavailability of Ngualla phosphate



### Phosphate fertiliser use (kg) / hectare of cropland<sup>3</sup>

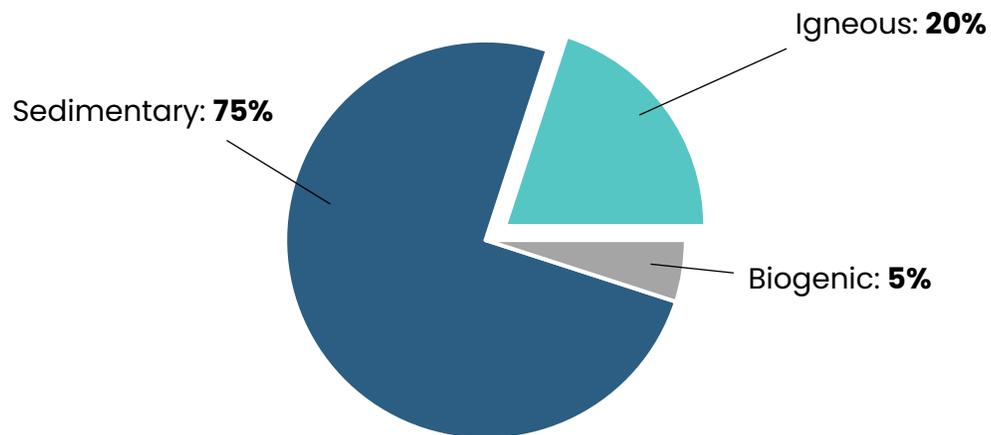


# LFP batteries ... a longer-term opportunity for Ngualla phosphate

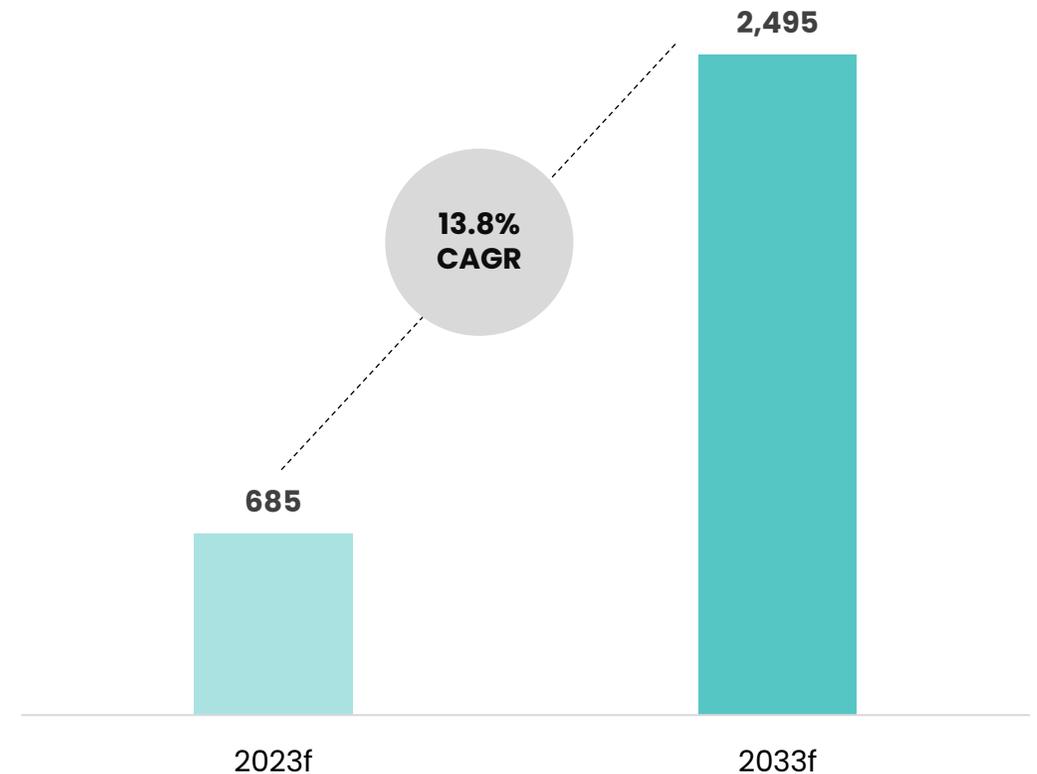
## Low levels of heavy metals and deleterious elements support the longer-term use of Ngualla phosphate in PPA production

### Overview

- Lithium Iron Phosphate (LFP) the fastest growing battery technology
  - Forecast to be the dominant battery technology by 2032<sup>1</sup>
- LFP cathodes require purified phosphoric acid (PPA)
- As an igneous deposit, Ngualla is ideally suited as a feedstock for PPA production given its low levels of heavy and deleterious elements
  - Only 20% of the world's phosphate reserves are igneous<sup>2</sup>



### Global LFP cathode active material (Mtpa)<sup>3</sup>



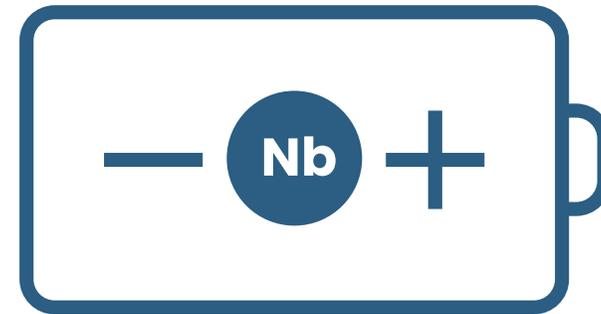
# Niobium ... an emerging critical mineral

## Rapidly growing use as a performance additive within lithium-ion batteries

### Overview

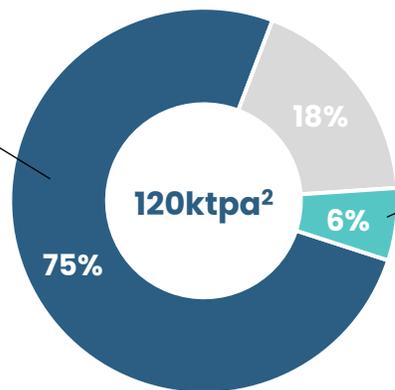
- Key additive in steel production and fabrication
  - **\$9kg** worth of niobium can reduce car mass by **100kg** and improve fuel efficiency by **5%**<sup>1</sup>
- Emerging use as an additive to lithium-ion batteries
  - Improves **energy density** and **charge times**
- Strong global appetite for new and independent sources of supply
  - two Brazillian mines account **for 83%<sup>2</sup> of global production**

### Niobium-enhanced batteries<sup>3</sup>



- ✓ Charge times of **<10 minutes**
- ✓ Lifespan **10x** traditional lithium-ion batteries
- ✓ **1.5x** energy density compared to lithium-ion batteries

CBMM



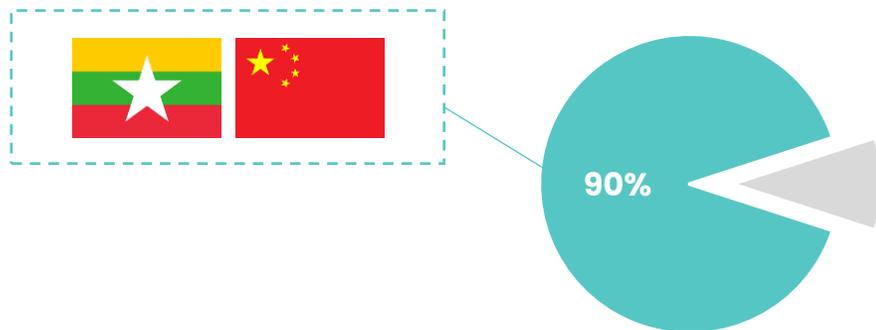
CMOC

# Heavy rare earths ... further development upside

## Rare earths within the Northern Zone have elevated levels of higher-value terbium and dysprosium

### Overview

- Heavy rare earths (terbium and dysprosium) have key magnetic and heat resistivity properties
  - **Used to improve high-temperature performance of permanent magnets in EVs and wind turbines**
- Growing supply constraints
  - China and Myanmar collectively account for **90% of global production<sup>1</sup>** of heavy rare earths
  - Concerns around ESG practices associated with in-situ leaching



### Heavy rare earth uses



**Control rods within nuclear reactors**



**Electric Vehicles**



**Military applications**



**Wind turbines**

# Exploration Focus

## Breccia Zone



# Ngualla's multi-commodity potential ... Breccia Zone

## Recent drilling supports potential of a globally significant fluorspar deposit

### Overview

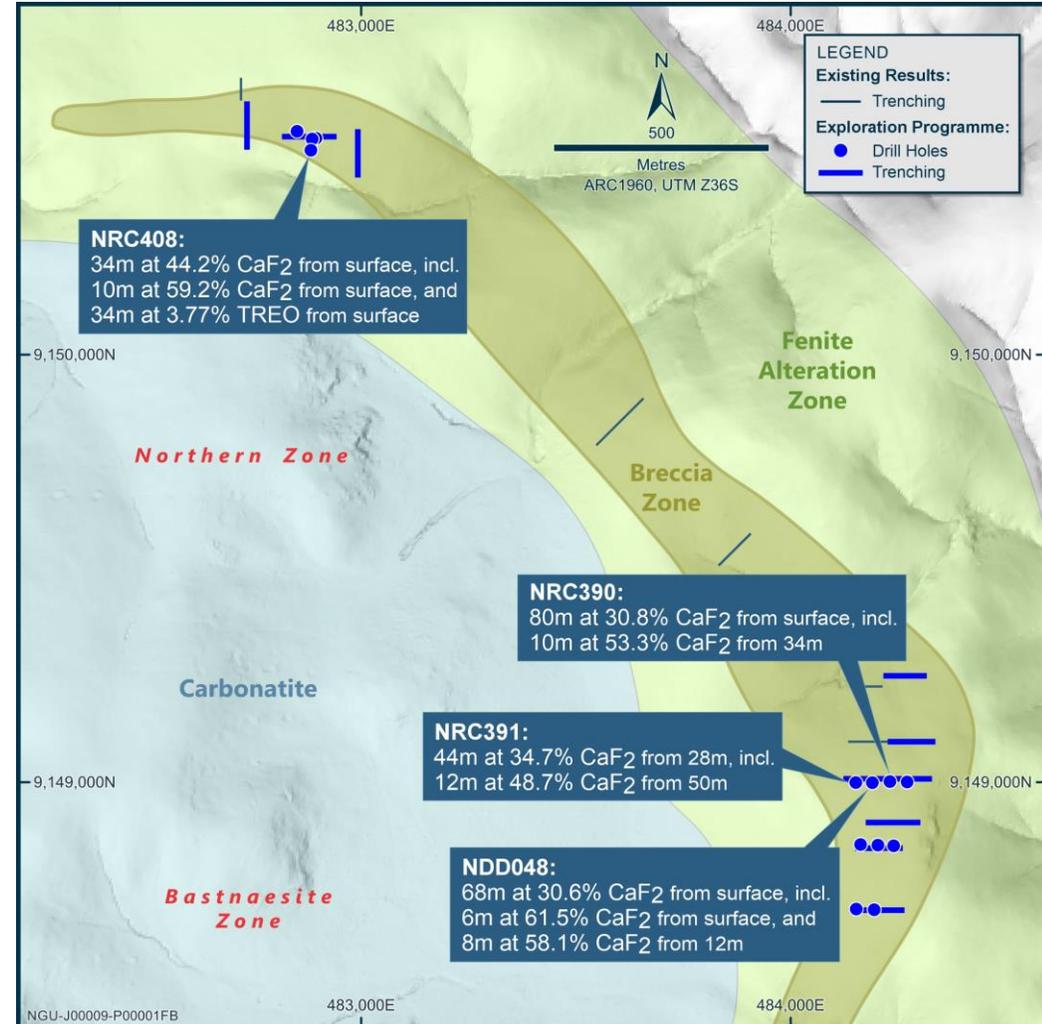
- ~0.4km<sup>2</sup> area, located 2km North-East of the Bastnaesite Zone
- 3.7km extent, with mineralisation currently open in all directions
- Trenching has confirmed widespread mineralisation at surface<sup>1</sup>
- Recent drilling assays have confirmed thick, high-grade intercepts of fluorspar in southern and northern Breccia Zone<sup>2</sup>
  - Central Breccia Zone remains only lightly tested
- Rare earth / niobium mineralisation associated with fluorspar in the northern Breccia Zone

### Prospective commodities



### Drilling summary (to date)

RC:	DD:	Total
11 holes / 885 m	2 holes / 211 m	13 holes / 1,096 m



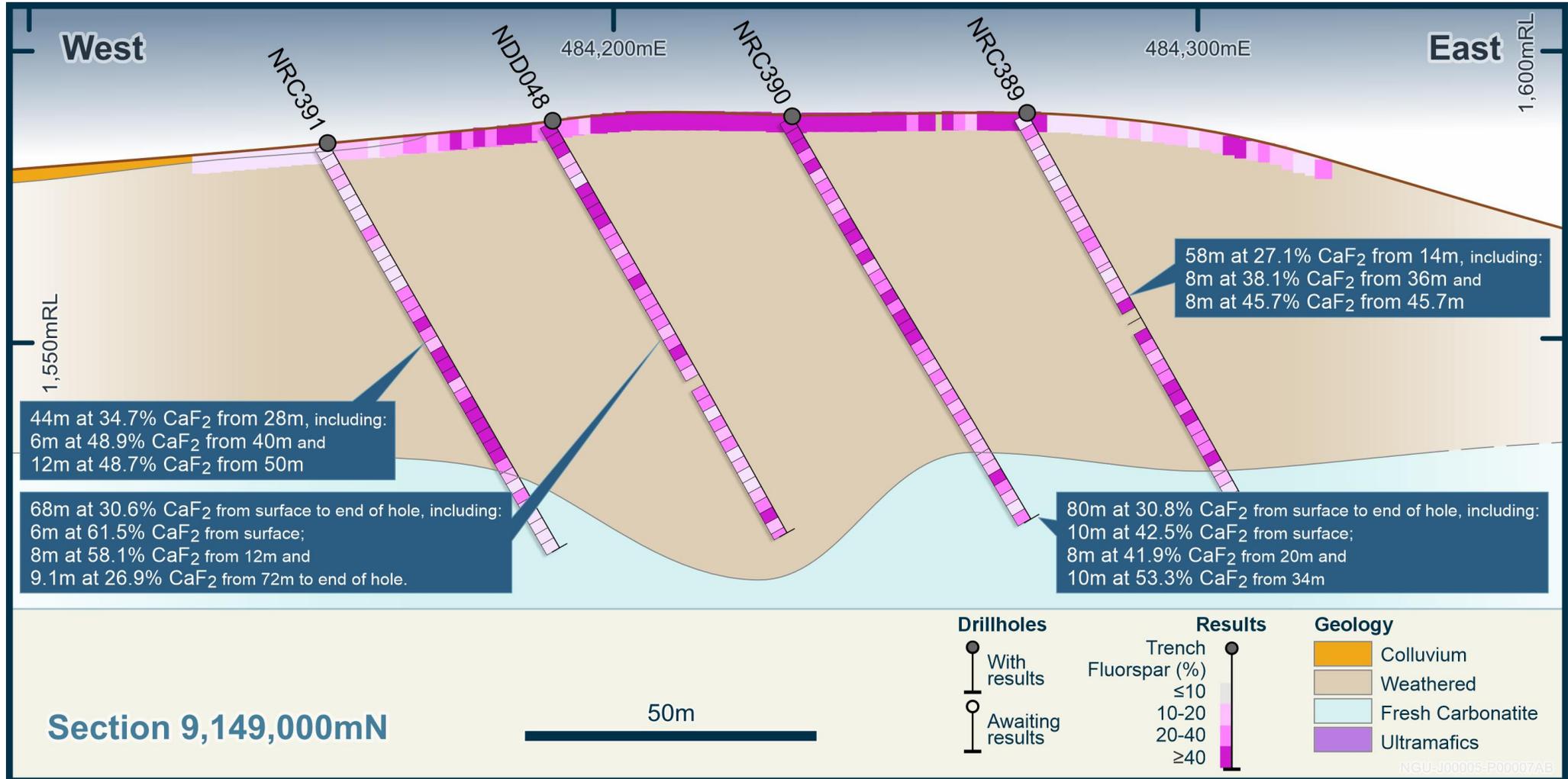
# Ngualla's fluor spar endowment

Visible fluor spar at surface prevalent across Breccia extent and distinct fluor spar bands within diamond drill core<sup>1</sup>



# Ngualla's fluorspar endowment

Thick, high-grade intercepts of fluorspar at surface across Breccia Zone extent

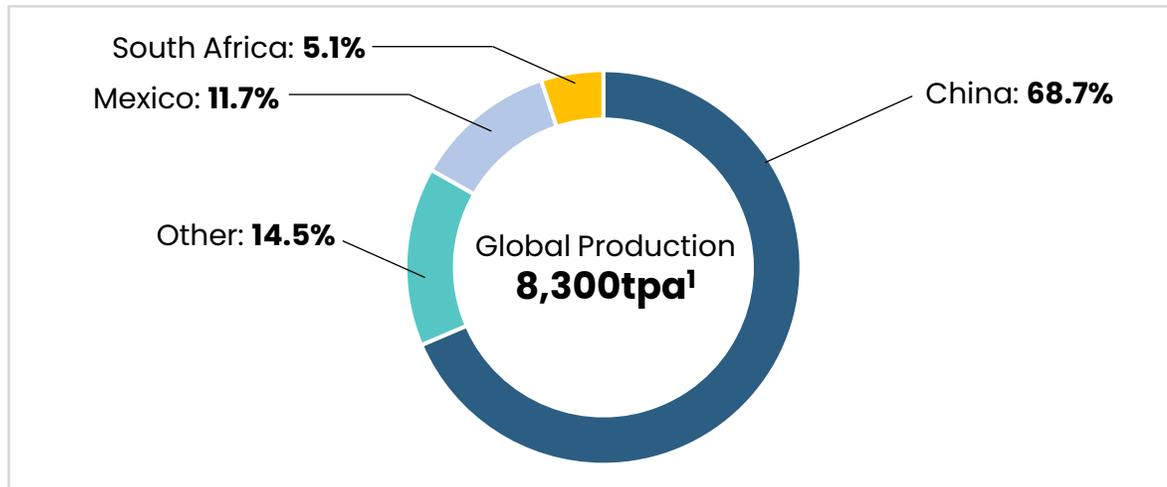


# Fluorspar ... the forgotten critical mineral

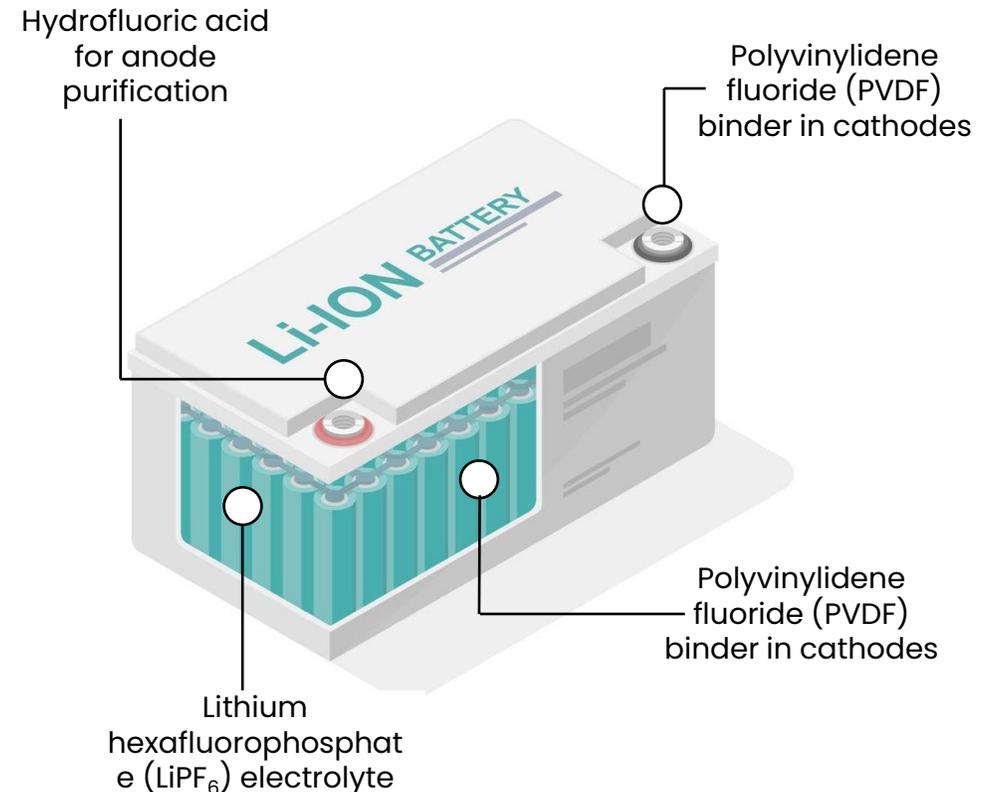
## Fluorspar a key input mineral in the green energy and technology transition

### Overview

- Critical mineral status in China, US, EU, Canada, Japan and Australia
- Used in a range of industrial and high-tech applications:
  - Etching agent in semi-conductors
  - Texturisation agent in solar panels
  - Enrichment agent in uranium processing
- Strong appetite globally for new and independent sources of fluorspar

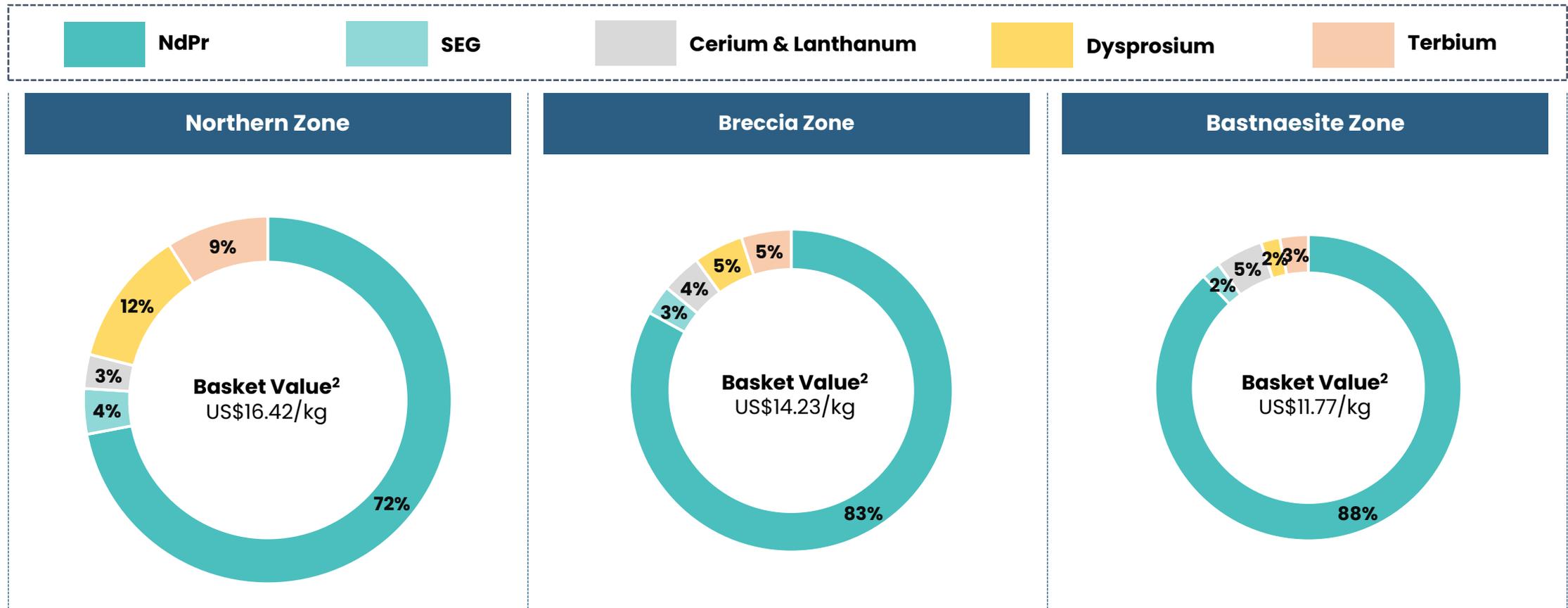


### Uses of fluoride (lithium-ion battery)



# Ngualla's broader rare earth potential

Attractive rare earth assemblages within Northern Zone and Breccia Zone with a higher representation of higher-value heavy rare earths (Dysprosium & Terbium)<sup>1</sup>



<sup>1</sup>Refer to announcement 'Major High-Grade Fluorspar Discovery' on 20 March 2024 for overview of rare earth assemblage results

<sup>2</sup>Based on spot prices as at 15 March 2024 (Asian Market) – Neodymium US\$48.7/kg, Praseodymium US\$48.7/kg, Lanthanum – US\$0.5/kg, Cerium – US\$0.5/kg, Samarium – US\$1.9/kg, Europium – US\$24.8/kg, Gadolinium – US\$22.5/kg, Terbium – US\$750.7/kg and Dysprosium – US\$254.4/kg

# Next Steps

## Exploration programme will prioritise phosphate and fluorspar opportunities in the short term

### Northern Zone (Phosphate)

- Update of geological model
  - Identification of high-grade mineralisation zones and preferential areas for development
  - Generation of additional drill targets
- Preliminary flowsheet development and metallurgical work
- Additional bioavailability testwork including evaluation of different areas of Northern Zone
- Further drilling and potential Maiden Resource estimate
- **Advancement of strategic discussions around offtake, beneficiation and low capex development options**

### Breccia Zone (Fluorspar)

- Additional fieldwork and mapping
  - Extension of trenches
  - Soil sampling programme across Breccia Zone extent
- Mineralogical analysis of diamond drill core
- Preliminary flowsheet development and metallurgical work
- Further drilling and potential Exploration Target
- **Advancement of strategic discussions around offtake, beneficiation and low capex development options**

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