



# ACQUISITION OF HIGH-GRADE RARE EARTHS PROJECT IN THE NT'S EMERGING CRITICAL MINERALS PROVINCE

Creating a Diversified Critical Minerals Company

Acquisition Presentation | May 2024

ASX:DES | [desotoresources.com](https://www.desotoresources.com)

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## Competent Persons Statement

The information in this report that relates to exploration results is based on and fairly represents information and supporting documentation prepared by Ms Bianca Manzi.

Ms Manzi is an employee of the company, is a member of the Australian Institute of Geoscientists and has sufficient experience of relevance to the styles of mineralisation and types of deposits under consideration, and to the activities undertaken to qualify as Competent Persons as defined in the 2012 Edition of the Joint Ore Reserves Committee (JORC) Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. Ms Manzi consents to the inclusion in this report of the matters based on this information in the form and context in which they appear.

# Why Desoto?

An emerging diversified critical minerals explorer



## Exposure

Critical Minerals & Precious Metals  
Exposure

**Focus on Rare Earth Elements  
(REE) & Manganese**

## Value

\$6.0M Cash Reserves  
89M Shares Issued

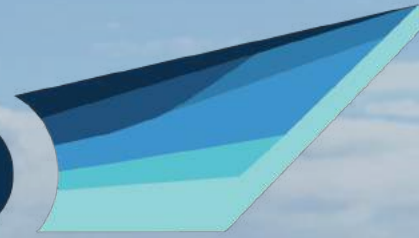
**Low Enterprise Value**

## Team

**Proven Discovery Team:**

Discovered 5.4Moz Bankan  
Gold Project





## DES Capital Structure

**88.9m**

Shares on Issue

**\$8.5m**

Market Cap  
(Fully diluted)

**80.05m**

Options

**\$2.5m**

Enterprise Value  
As of 29th May 2024

DeSoto Resources  
Nd/Pr Project



Pine Creek

NORTHERN  
TERRITORY

Arafura Resources  
Nd/Pr Project



Alice Springs

Gas Pipeline  
Railway  
Highway

# High-Grade REE Acquisition

DES acquires Spectrum REE Project within existing Fenton Project

## Spectrum Project: Introduction

### Historic and High-Grade REE Discovery

50m @ 1.55% TREO, incl. 12m @ 4.51% TREO (14.9% Nd/Pr)\*

### Large and untested EM Anomaly

Potential for a large base-metals mineralised system

### 2024 Work Program

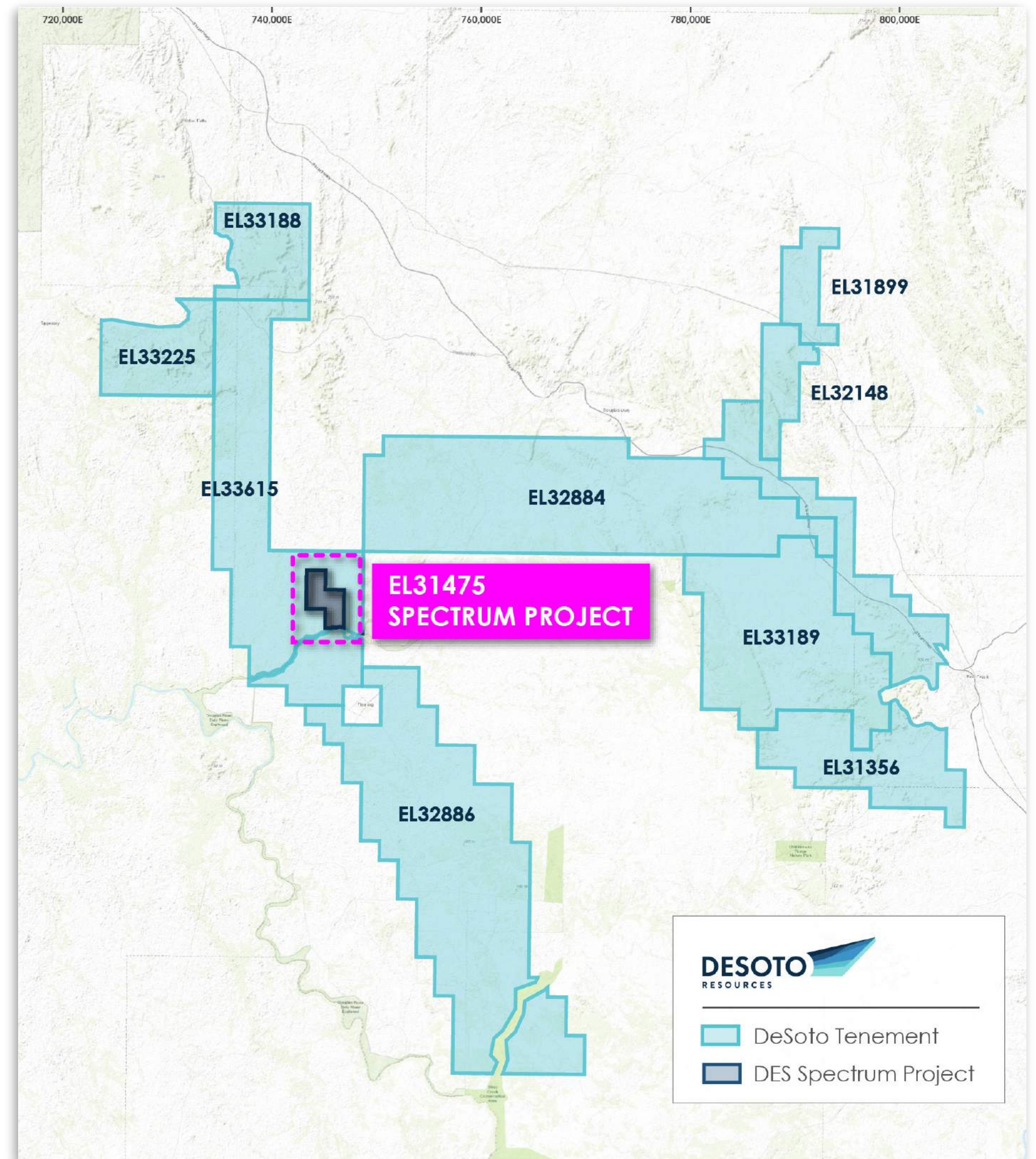
\$2.0 million to be spent testing REE and EM anomalies

### Investment thematic

Acquisition creates a diversified precious metals and critical minerals Company with access to major roads and ports less than 2 hours from Darwin



ASX:DES



\*ASX Announcement: Acquisition of high-grade rare earths project in the NT (29th May 2024)

# Board & Management

Technically-driven Board with a record of identifying globally significant mineral projects



**Paul Roberts**  
Non-Executive Chair

Paul Roberts has a long and successful history in mineral exploration management and mine geology both in Australia and overseas.

Paul was the founder of Predictive Discovery Limited (ASX:PDI), where he served as CEO between 2007 and 2021. Paul was the architect of PDI's business model and was responsible for assembling PDI's project portfolio and West African team.

Paul was responsible for discovery of the world-class Bankan Gold Project in Guinea, the Henty gold deposit and major extensions to the St Dizier tin deposit (both in Tasmania), as well as resource evaluations of the Kuridala copper deposit in North Queensland, the Bongara zinc deposit in Peru and various gold deposits in the Cue and Meekatharra districts in Western Australia.



**Chris Swallow**  
Managing Director

Chris Swallow was previously the CEO Of BPM Minerals (ASX:BPM) a Western Australian-focused gold and nickel explorer and has worked across a number of exploration Projects in Australia, Africa and North America.

Previously the Corporate Development Office for Predictive Discovery (ASX:PDI), Chris was part of the team which developed the Bankan Project into West Africa's most exciting gold discovery.

Chris is also currently a Non-Executive Director of Lord Resources (ASX:LRD) and a partner at Modena Ventures, an ECM firm based in West Perth, which supports early-stage start-up's, ideas and companies, delivering bespoke financing solutions for founders, entrepreneurs and companies.



**Dr Barry Murphy**  
Non-Executive Director

Dr Barry Murphy has had a highly successful career in mineral exploration, consulting and research. He is a Geoscientist with expertise in structural geology, geophysics, remote sensing and GIS analysis. He has significant base and precious-metal exploration experience in Australia, West Africa, Sudan, DRC, South America, Indonesia and Europe and he was a member of the Bankan Gold discovery team in Guinea.

Barry was part of the Predictive Discovery team (ASX:PDI) which discovered the Bankan Project in Guinea and supported the Project in its development.



**Bianca Manzi**  
Exploration Manager

Bianca Manzi is a Geologist with over 25 years' exploration and corporate management experience across a range of commodities including gold, nickel, PGE's, uranium, graphite, coal and magnetite in Australia and Africa. Bianca has significant experience taking grass roots exploration through to mine development.

Consulting to a number of ASX- listed Companies, Bianca has previously been a Non-Executive director of an ASX listed company.

Bianca was part of the Predictive Discovery team (ASX:PDI) which discovered the Bankan Project in Guinea.



**Nick Payne**  
Geology Manager

Nick Payne has over 25 years' experience as a Geologist with extensive exploration and mining experience in Australia, Canada and the USA. Experience in gold, iron ore, manganese, coal and lithium brines. Significant experience working as an exploration geologist in the Pine Creek region of the Northern Territory.

Also experienced in drilling technology, downhole sensor technology and geological software development, sales and marketing.

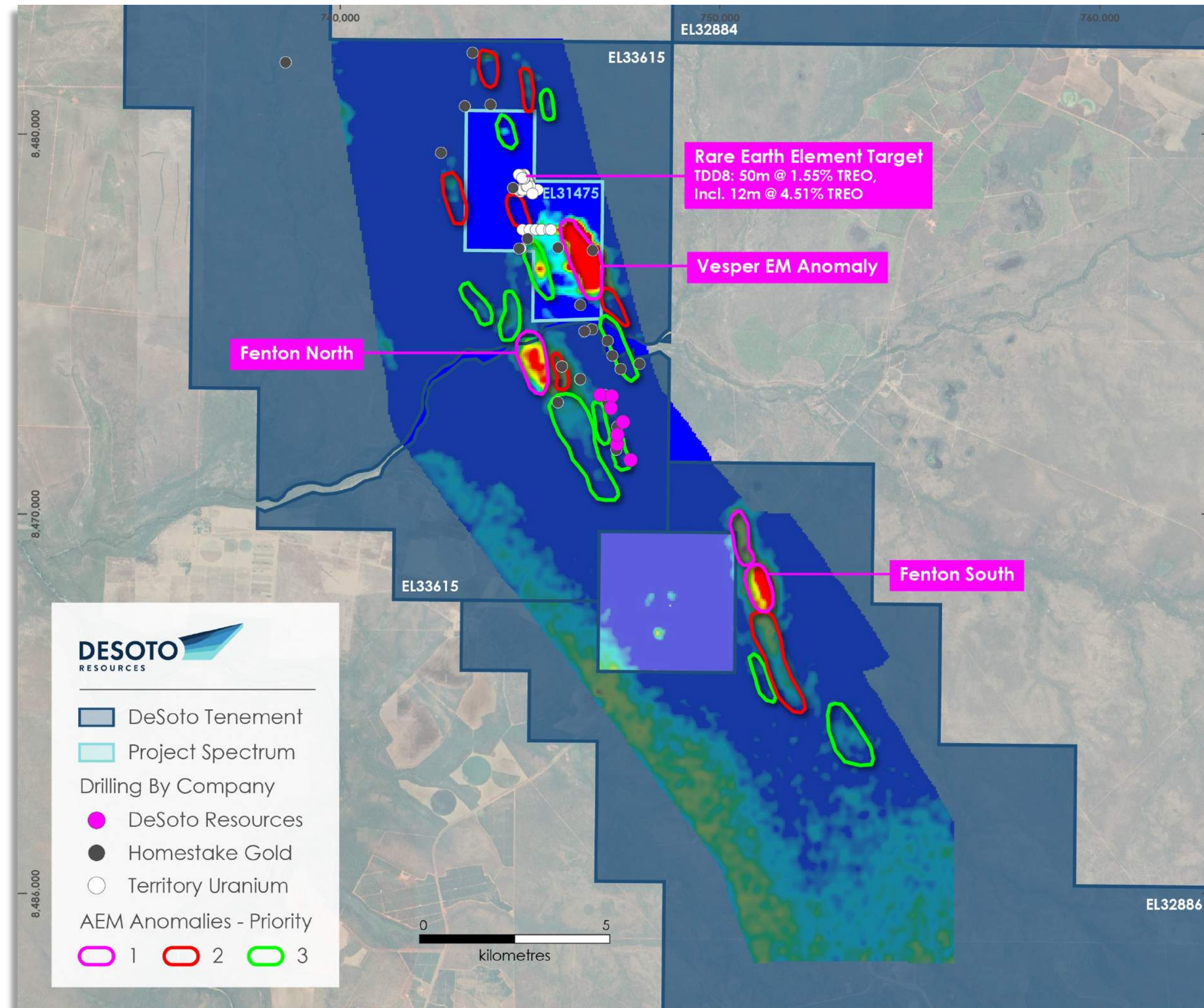
Member of the AICD, Australian Institute of Mining and Metallurgy and a Member of the Society of Economic Geologists.

# Spectrum Project

Discovered before Rare Earth Elements were "a thing"

## Project Background

- Strategically located inside the existing Fenton Project
- REE's discovered during historic uranium-focused drilling
- Drilling completed before REEs were recognised as a valuable critical mineral opportunity
- DES 2023 AEM survey highlighted the very strong Vesper anomaly near REE discovery



# Knock-out Exploration Targets

One strongly mineralised trend

## Quantum REE-Au-Ag Prospect

- High-grade REEs over 350m of strike
- Good widths (+20m intersections)
- Mineralisation open to the north and south

**Extension drilling to target shallower repeats of REE mineralisation**

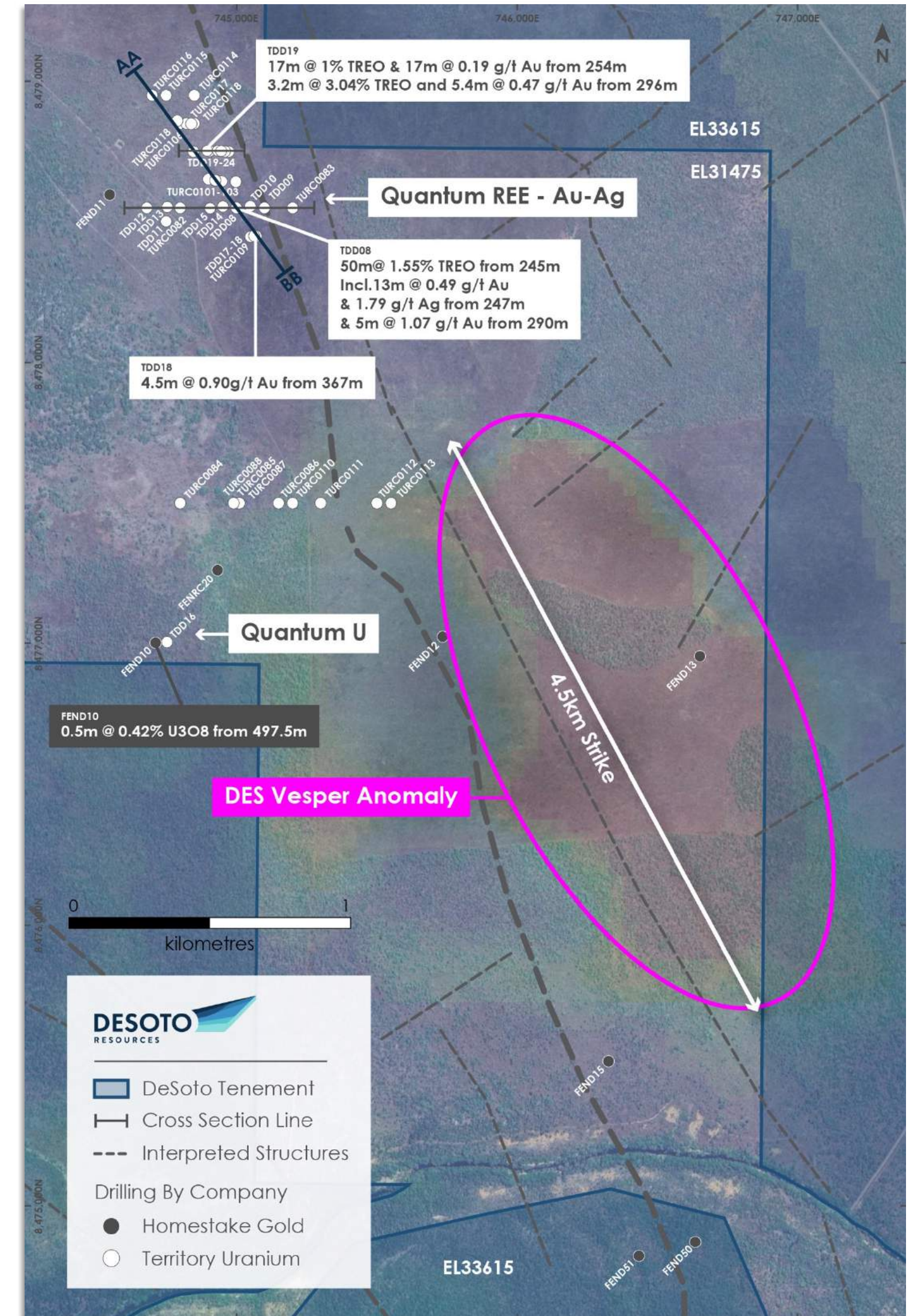
## Vesper Base-Metals Prospect

- located 1.5km from Quantum REE Prospect
- large 2km x 0.5 km untested semi-coincident Copper-Lead-Zinc geochemical and geophysical (EM and aeromagnetic) anomaly
- Best kind of exploration target, a large virgin geophysical target supported by soil geochemistry

**DES to complete first-pass and step-out drilling across the Vesper and Quantum Prospects respectively**



ASX:DES





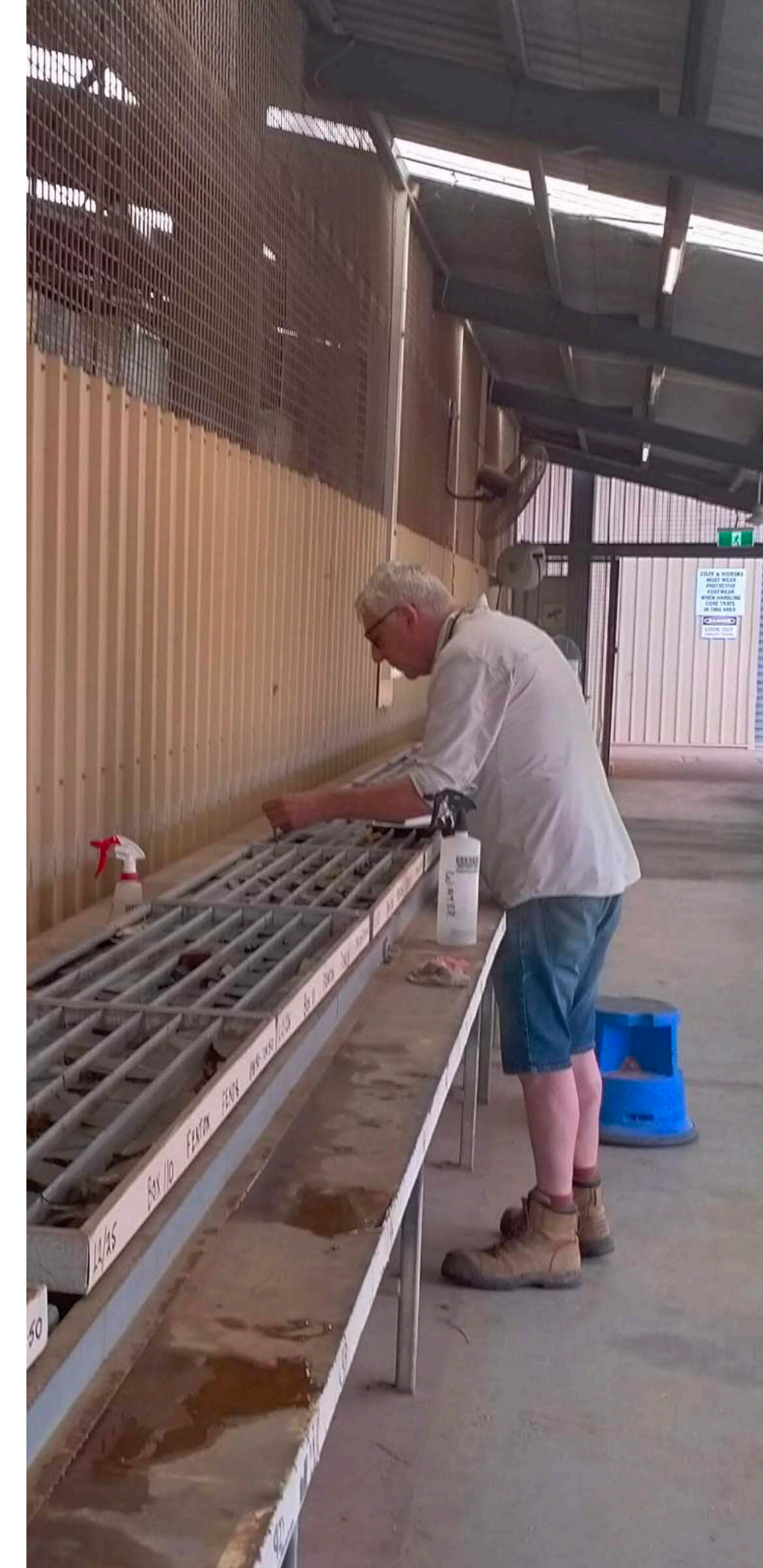
# Quantum, drilled for Uranium, intersected high-grade REE's

High-grade historic REE intersections present a strong walk-up exploration target\*



HoleID	TREO*	Au	Ag
TDD8	<b>50m @ 1.55% TREO from 245m incl. 12 @ 4.51% TREO from 246m</b> 32m @ 0.38% TREO from 389m	<b>13m @ 0.49 g/t Au from 247m</b> 8m @ 0.13 g/t Au from 277m 3m @ 0.75 g/t Au from 290m 2.8m @ 0.29 g/t Au from 305m	13m @ 1.78 g/t Ag from 247m 9m @ 1.3 g/t Ag from 277m 3m @ 0.73 g/t Ag from 290m 2.8m @ 1.5 g/t Ag from 305m
TDD9	2.3m @ 2.75% TREO from 374m	2m @ 0.28 g/t Au from 375m	16.2m @ 1.11 g/t Ag from 365m
TDD10	<b>21.9m @ 2.55% TREO from 276m incl. 9.2m @ 3.78% TREO from 288m</b>	2.8m @ 0.33 g/t Au from 206m 6.4m @ 0.38 g/t Au from 276m <b>11m @ 0.85 g/t Au from 286m</b>	<b>5.2m @ 73.50 g/t Ag from 225m</b> 17m @ 1.08 g/t Ag from 276m
TDD11	8.1m @ 1.4% TREO from 331m	4.2m @ 0.61 g/t Au from 330m	9.8m @ 0.79 g/t Ag from 330m
TDD12	1.6m @ 2.48% TREO from 354m	<b>1.6m @ 1.57 g/t Au from 324m</b>	<b>20m @ 5.42 g/t Ag from 102m</b>
TDD13	5.3m @ 1.58% TREO from 249m 6m @ 0.85% TREO from 306m	5.3m @ 0.56 g/t Au from 249m 3.2m @ 0.22 g/t Au from 261m 5.9m @ 0.21 g/t Au from 304m	19.6m @ 0.75 g/t Ag from 251m
TDD16			4.3m @ 6.66 g/t Ag from 275m
TDD18	4.5m @ 1.10% TREO from 367m	<b>4.5m @ 0.90 g/t Au 367m</b>	
TDD19	<b>17m @ 1.0% TREO from 254m incl. 1m @ 6.42% TREO from 254m</b> 3.2m @ 3.04% TREO from 296m	17m @ 0.19 g/t Au from 254m 5.4m @ 0.49 g/t Au from 295m	11m @ 1.00 g/t Ag from 261m 3.2m @ 0.79 g/t Ag from 296m
TDD20	8.3m @ 1.01% TREO from 297m <b>incl. 2.4m @ 2.97% TREO from 297m</b>	1.4m @ 0.31 g/t Au from 297m	12m @ 1.62 g/t Ag from 292m

\*ASX Announcement: Acquisition of high-grade rare earths project in the NT (29th May 2024)



N

8,478,950N

8,478,750N

8,478,550N

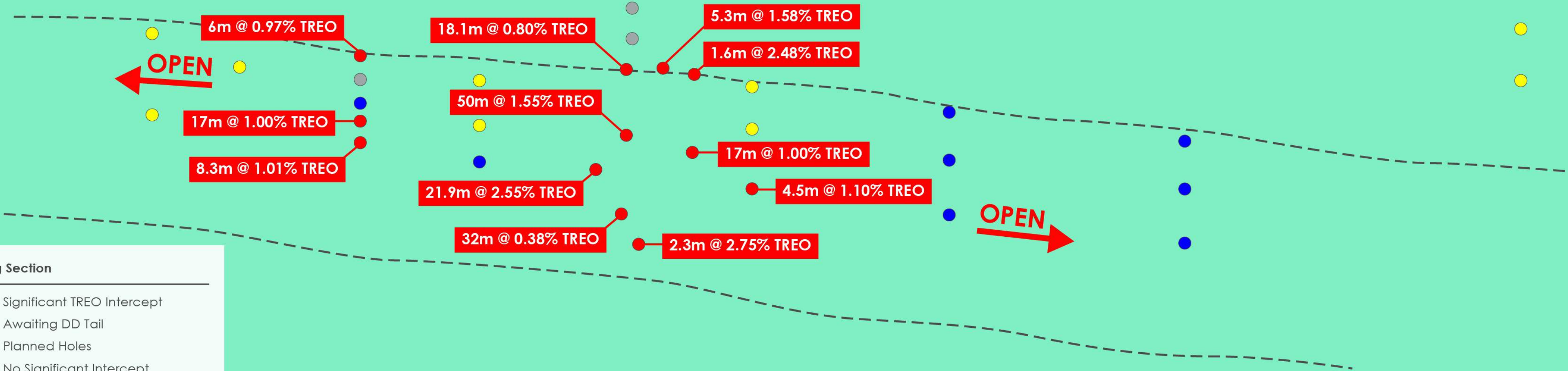
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# Quantum REE Project, open to the North and South

Exploration to target shallow REE repetitions with step-out and infill drilling

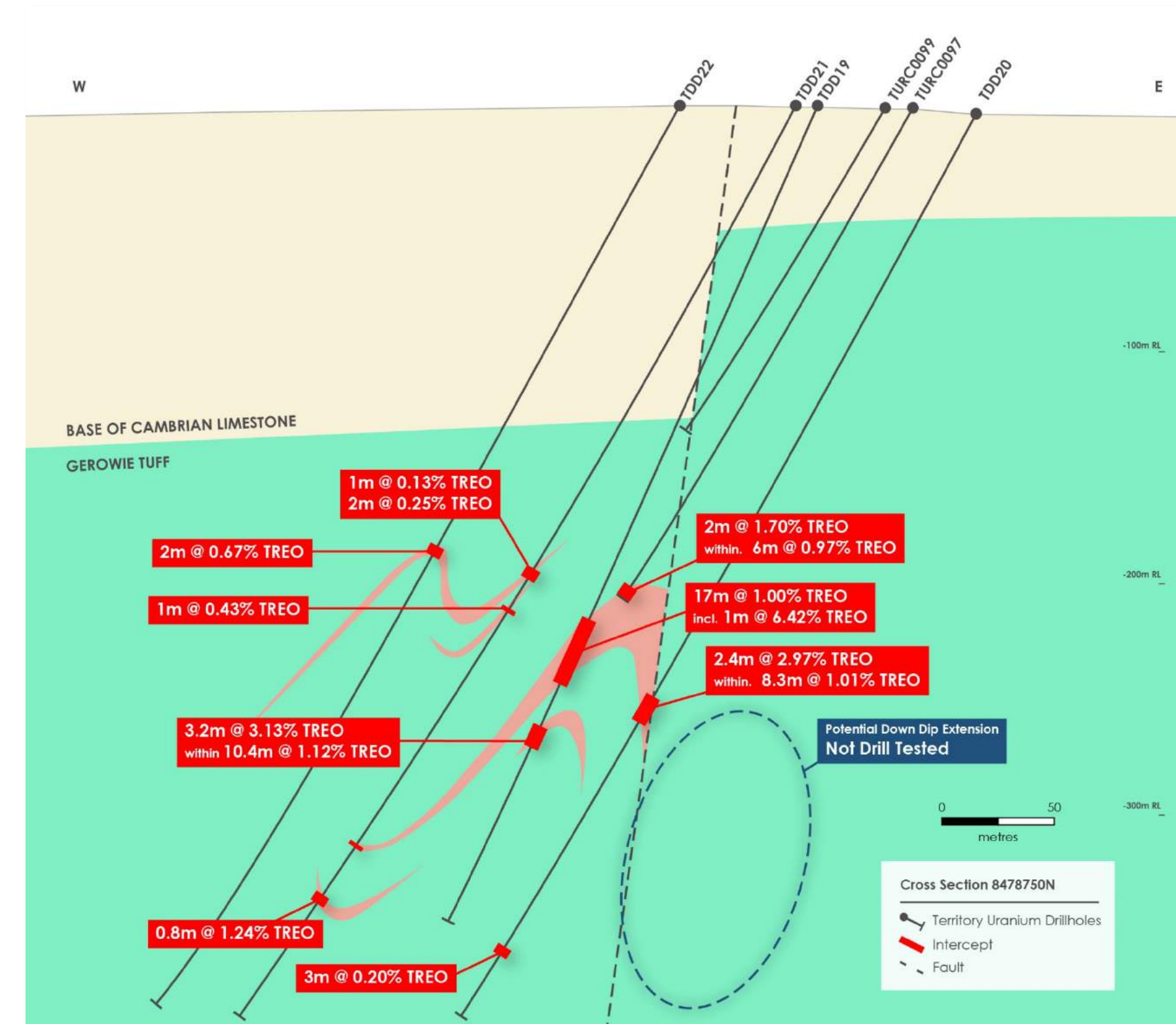
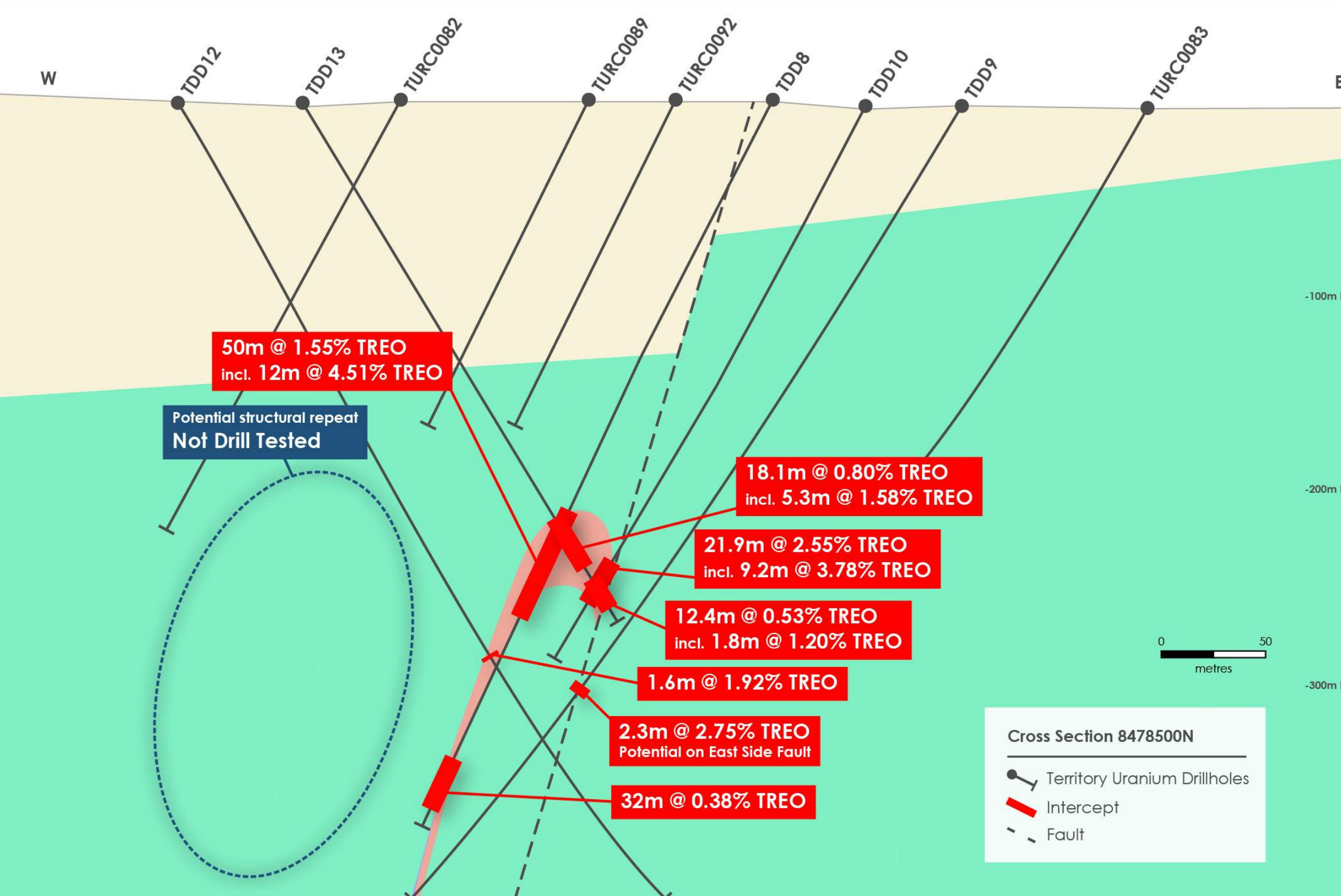


**Long Section**

- Significant TREO Intercept
- Awaiting DD Tail
- Planned Holes
- No Significant Intercept
- Cambrian Limestone
- Gerowie Tuff
- Potential extent of mineralisation

# Quantum REE Project

Cross-sections highlight potential for down dip extensions and step out repetitions



\*ASX Announcement: Acquisition of high-grade rare earths project in the NT (29th May 2024)

# Quantum REE Mineralogy and Testwork

All-important mineralogy includes higher grade REE minerals within a favourable environment, suggests advantageous mineral processing options



## Limited metallurgy and testwork

- 5 samples from one drillhole (TDD8) revealed a robust hydrothermal vein and alteration system
- High concentrations of REE-rich bastnasite and allanite
- Very-low U+Th and very low U+Th/TREO ratios a positive
- Liberation test work suggested that a concentrate of +19% TREO could be produced
- REE mineralogy and mineralisation style are suggestive of a Mary Kathleen like Cu-U-REE skarn deposit
- Preliminary REE review completed for DES by Dr. Ross Chandler

## Takeaway

Much more exploration, many more drillholes and significant testwork required



# Vesper Prospect: the best EM anomaly on the Fenton trend

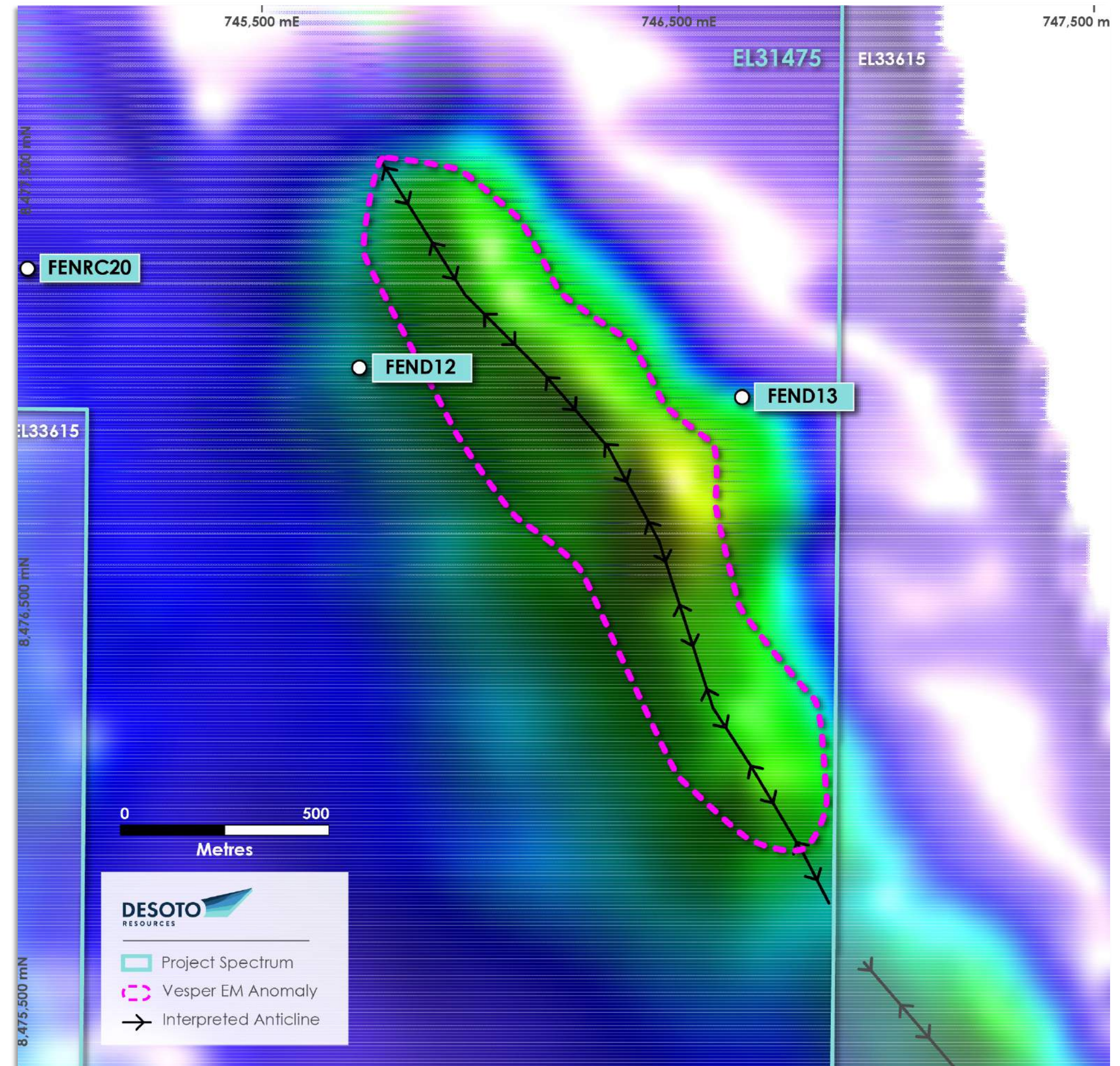
All the hallmarks of a large base-metals system

## Vesper the most exciting pure greenfields exploration in the Territory

- Large, shallow and untested EM and magnetic anomaly with supporting soil geochemistry
- located within 1.5km from the REE Spectrum prospect
- associated with historical MMI soil Cu-Zn-Pb geochemical anomalism
- 2km by 0.5km anomaly was detected by DES 2023 AEM survey
- well-defined “twin-peak” anomaly in mid to late time channels
- Potential Proterozoic Mary Kathleen-style Cu-U-REE skarn target

### Takeaway

Greenfields exploration prospect with enormous blue-sky potential



# Fenton Gold Project

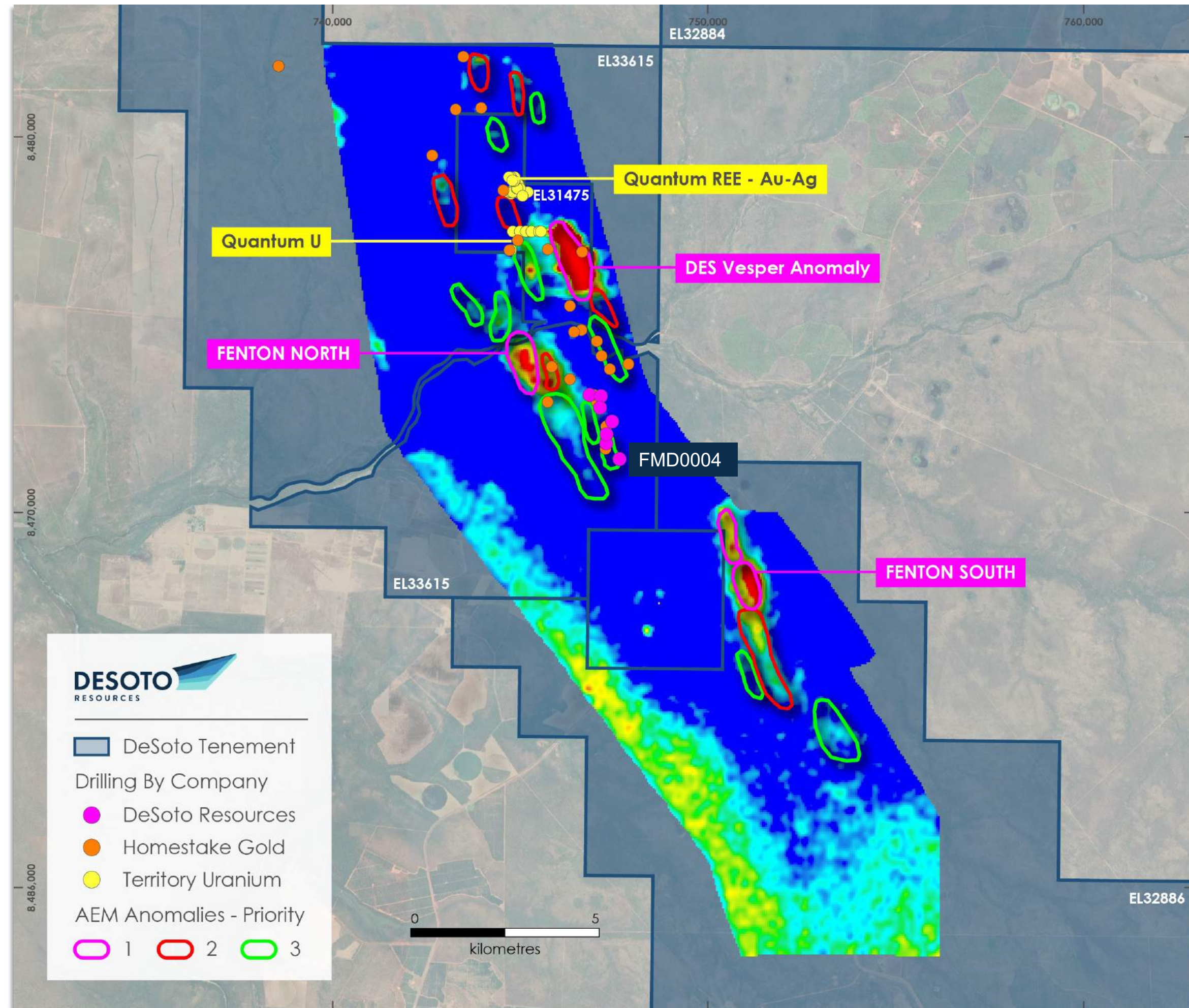
DES 2023 AEM survey dropping out numerous high-value targets

## Fenton High Priority Gold Targets

- AEM identified large EM anomalies in interpreted anticline positions at Fenton North and South – potential Cosmo Howley style gold targets under cover
- New targets untested by previous drilling
- 2023 drilling confirmed large gold system with all holes intersecting gold including 72m @ 0.43g/t Au incl. 5m @1.02g/t Au in FMD0004 to the south\*
- Two large new anomalies with ground EM planned to define drill targets

### Takeaway

Big system, under explored, gold in every hole



\*ASX Announcement: Drilling and Geophysics Confirm Scale of Fenton Gold System (29th Jan 2024)

# REE: Inelastic supply coupled with growing demand

## SUPPLY: Inelastic

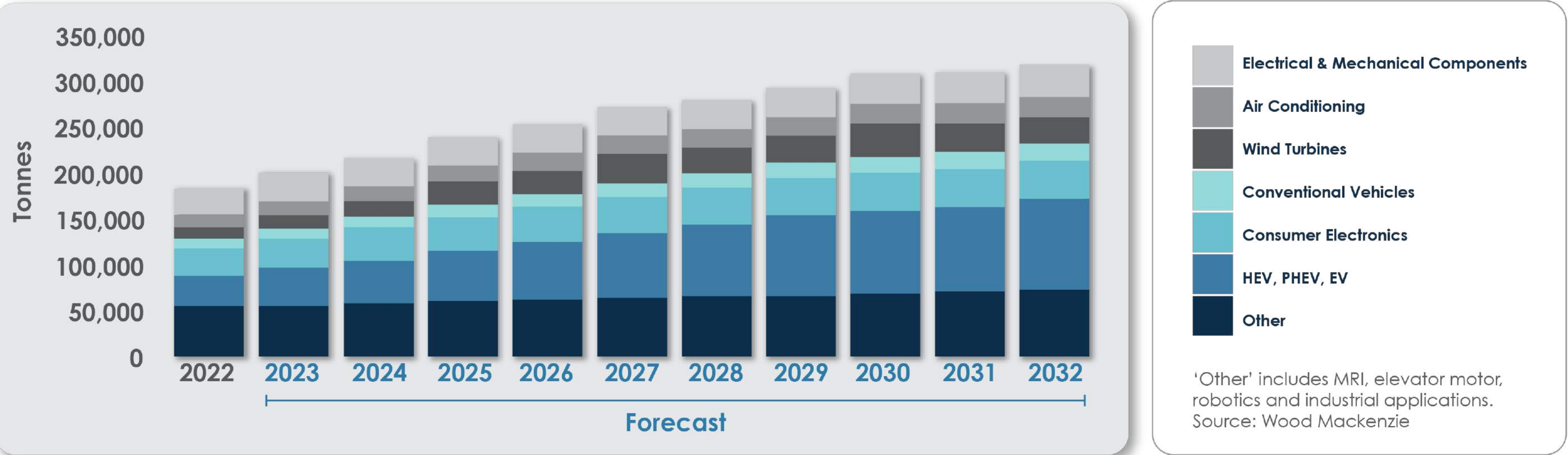
**Geographic Concentration:** Major supplies are centralised in limited regions, predominantly in China, creating challenges in scaling production globally.

**Operational Complexity:** Developing new mines and processing facilities is a multi-year, capital-intensive process requiring significant infrastructure.

## DEMAND: Rising

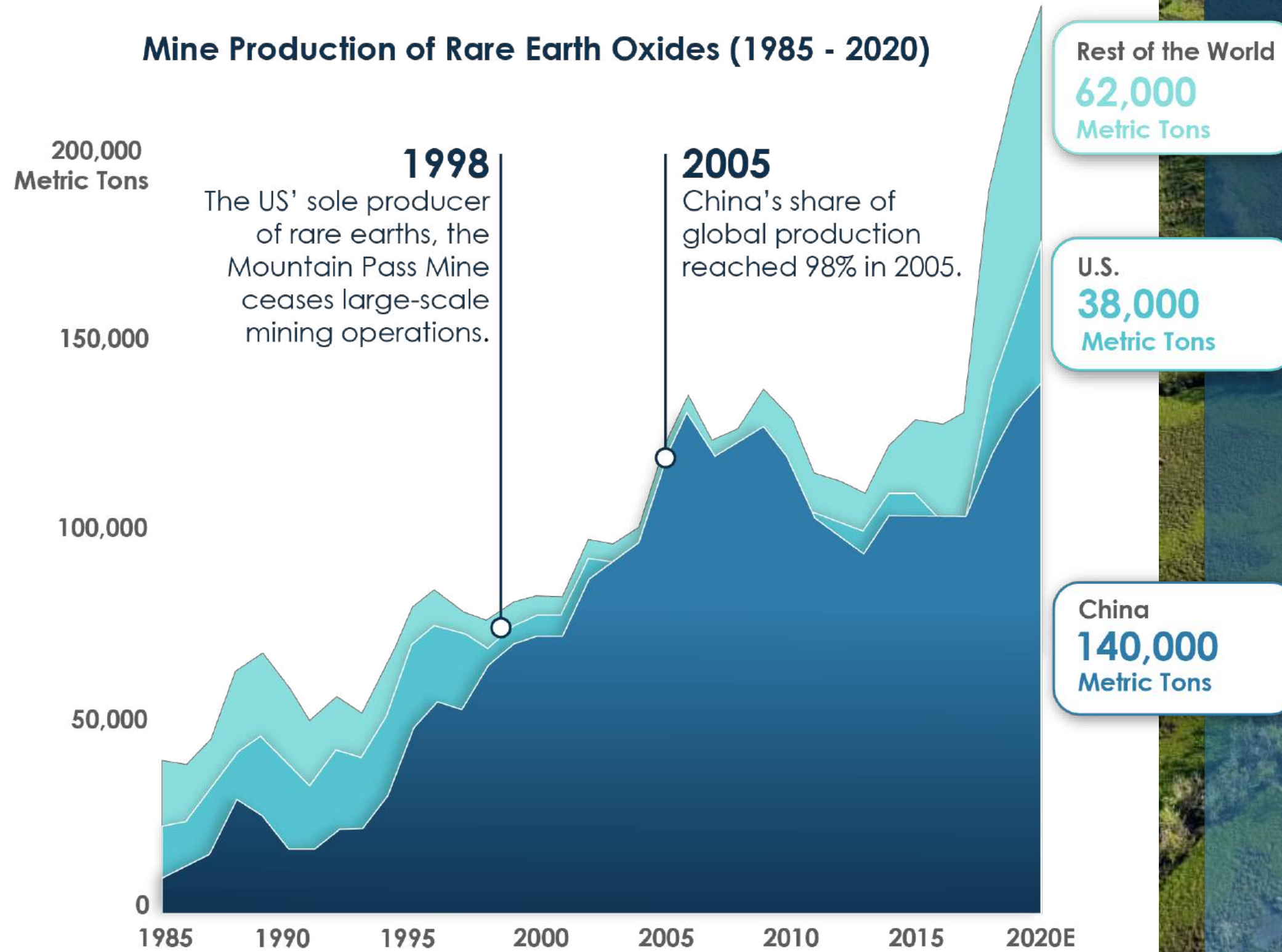
**Technological Advancements:** Significant growth in wind turbines, robotics, and electric vehicles is driving up the demand for rare earth elements.

Forecast NdFeB Magnet Consumption by Segment



# REE's: The ultimate critical and strategic minerals

Mine Production of Rare Earth Oxides (1985 - 2020)



Source: The Visual Capitalist

**Green Economy Policy Focus:** Competition in the green economy has become central to global policy making, aiming to capitalise on the economic benefits of the energy transition.

**Rare Earths Spotlight:** Due to their critical role in green technologies, including electric vehicles and wind power, creating unique market dynamics.

**China's Rare Earth Dominance:** Controls ~90% of all rare earth oxide production and almost 100% of significant heavy rare earths, using production and pricing advantages creating unique market dynamics.

**Ex-China Production:** China's monopolistic production and pricing tactics creates risks for supply disruptions and price volatility, showcasing the demand for rare earths production ex-China.

**Australia goes all in:** The Australian government and prominent Australian mining companies has shown support for multiple projects, aimed at enhancing the mining and processing capabilities for REEs and growing Australia's supply.

- \$840 million federal funding package: Supporting Arafura's Nolans project in the Northern Territory.
- \$75 million Queensland government facility: For processing vanadium and rare earths.
- \$1.25 billion Iluka Resources refinery: Rare earths processing facility in Western Australia.
- \$60 million Hancock Prospecting investment: In Arafura, contributing significantly to their capital raise.



# Manganese Sulphate Project

DeSoto now undertaking project due diligence in Brazil on advanced and greenfield Mn Projects

25  
Mn

## DES 12-month global search for high-grade Manganese

- Little systematic global greenfield manganese exploration
- DES undertaking a review of tropical belts with active lateritisation to achieve +40% MnO<sub>2</sub> grades for use in High Purity Manganese Sulphate Monohydrate (HPMSM)
- Desoto has undertaken a 12-month global review of manganese exploration opportunities, targeting underexplored areas
- Currently undertaking due diligence in Brazil
- Barrie Bolton, 30 years Mn experience and 18 years Managing BHP's exploration program for Mn, worldwide driving the Mn review
- DES also working with CSIRO on assessing HPMSM production flowsheets

### Takeaway

DES now has a several high-value Mn Projects under negotiation



# Manganese Sulphate Project

DES completing due diligence on Mn Projects suitable for HPMSM production

25  
Mn

## Upon Discovery, the Company will complete Resource and Feasibility Studies

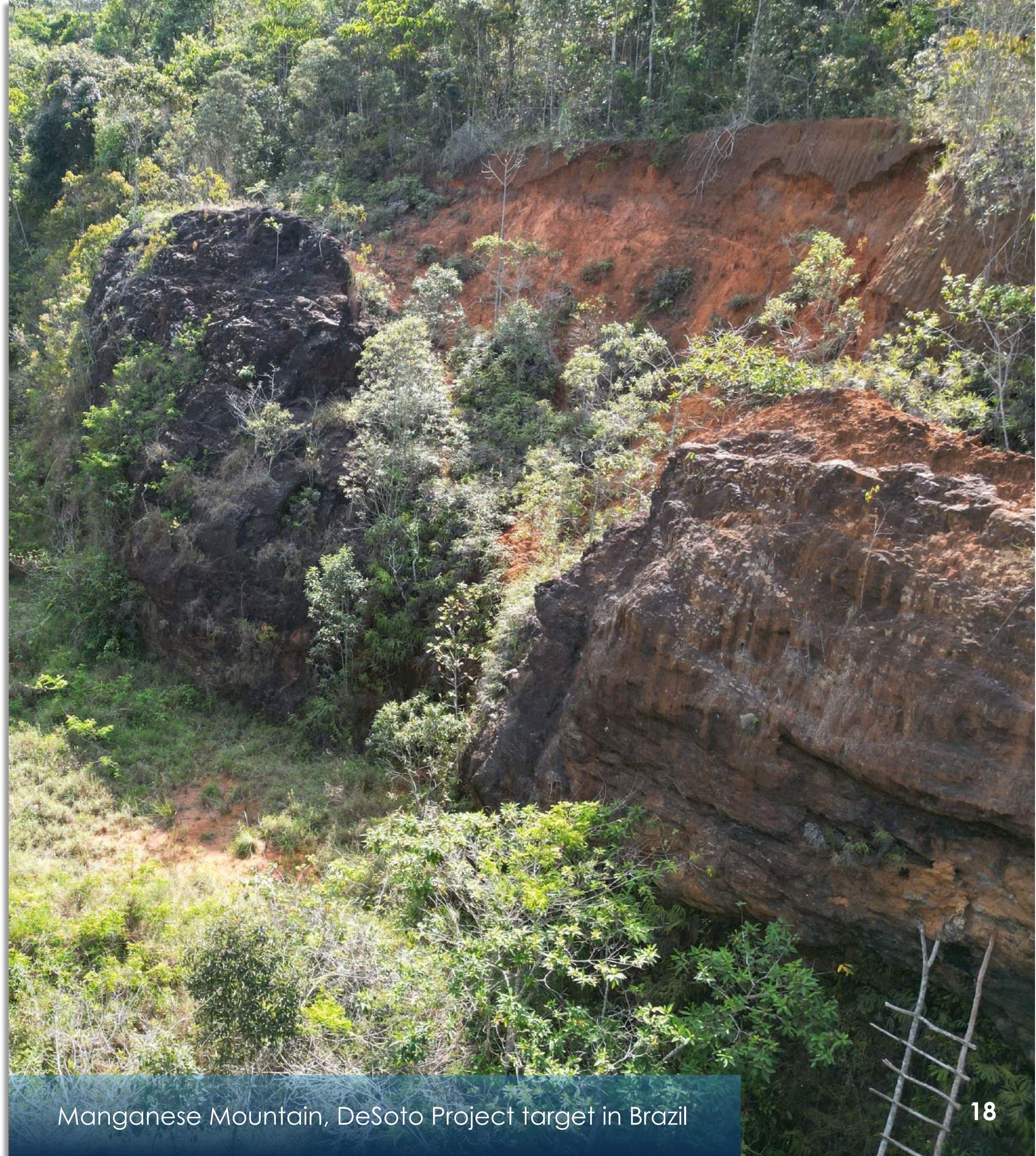
- Move quickly to drill out resource
- Undertake feasibility studies
- Align downstream HPMS opportunities
- Commence offtake discussions

## HPMSM Production Profile

- For HPMSM production, Mn Carbonate may be preferable to Mn Oxide
- Environmentally, Mn Carbonate is preferable
- Market forecasts for HPMSM growth look very good
- Mn to follow a similar battery-led growth path to other cathode minerals

## Takeaway

DES to deliver a high-value Mn Project suitable for production of HPMSM



# Doubling down in the Territory and beyond

DES on the right side of the Lassonde Curve with EV/MC leveraged to exploration success and its strong cash balance



## RIGHT ACQUISITION

Spectrum delivers excellent exploration targets

## RIGHT COMMODITY EXPOSURE

REE, base-metal and Mn markets

## RIGHT JURISTITION

Spectrum 2 hours from Darwin

## RIGHT TEAM

Technically strong Board and team with industry-respected geologists and explorationists driving programs

### Takeaway

DES now a compelling exploration company with all the value creation ahead in the next 12 months



**For further information please contact:**

Managing Director

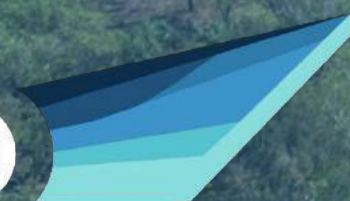
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**DESOTO**  
RESOURCES



# Right Geology & Mineralisation

## Pine Creek Region

### Geology

Hosted within the Pine Creek Geosyncline which is a mid-Proterozoic sequence of marine sediments intruded by a suite of granites

Regionally, known mineralisation primarily hosted within Pine Creek Shear

Pine Creek Project located on parallel structural corridor to the Pine Creek Shear Zone, partially under cover, known to be gold mineralised

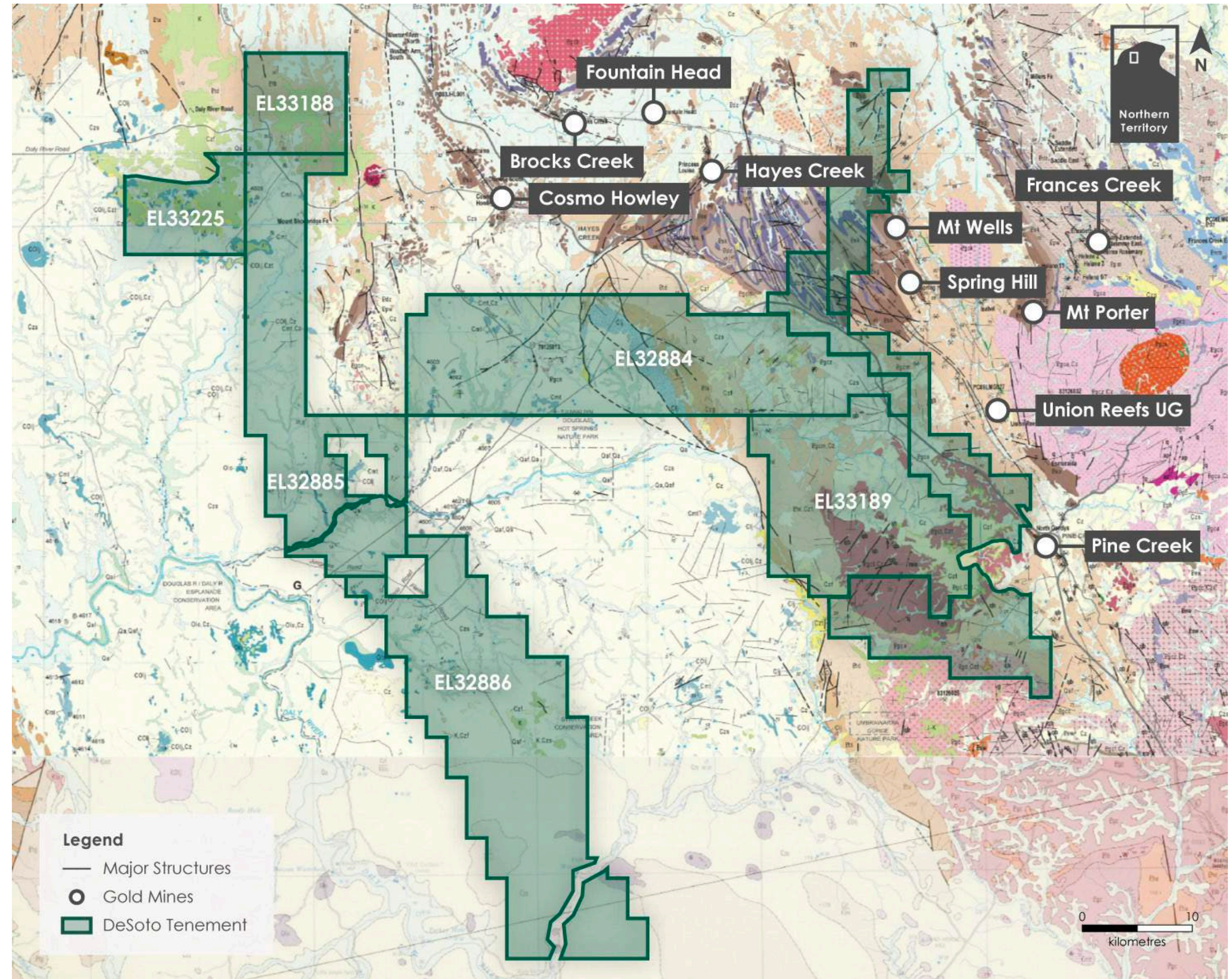
Gold mineralisation found in a number of the sedimentary units

Higher-grade deposits such as Cosmo Howley and Mount Porter are developed within BIF Formations of the Koolpin Formation and the Gerowie Tuff

Koolpin formation outcrops known within the Pine Creek Project and interpreted as gold host rock in FSZ drill core.

Cosmo Howley deposit similar to 40Moz Homestake Deposit, South Dakota

Region also contains small high-grade Cu-Pb-Zn VMS deposits



Company exploration licences held by wholly owned subsidiary (Mangusta Minerals Pty Ltd)