



Advancing the **Julia Creek Project**

Gold Coast Investment Showcase, 21-22 June 2023

"We would like to acknowledge the Wunumara people as Traditional Owners and their custodianship of the lands on which QEM operates its Julia Creek Project.
We pay our respects to their Ancestors and their descendants, who continue cultural and spiritual connections to Country.
We recognise their valuable contributions to Australian and global society."

Disclaimer

QEM Limited ACN 167 966 770 (QEM or the Company) is the issuer of this presentation. The issue of this presentation is intended only for the person or entity to which it has been transmitted.

Limited Responsibility for Information

This presentation contains forward-looking statements. Those forward-looking statements reflect views held only as at the date of this presentation. Any such statement is subject to inherent risks and uncertainties. Actual events or results may differ materially from the events or results expressed or implied in any forward-looking statement, and such deviations are both normal and to be expected. Recipients must make their own assessment about the likelihood of a matter, about which a forward-looking statement is made, occurring. QEM makes no representation about the likelihood of a matter, about which a forward-looking statement is made, occurring. QEM and its directors, employees, agents, advisers and consultants: give no representation or warranty to a recipient of this presentation as to the accuracy or completeness of the statements contained in this presentation or in relation to any other matter; and to the full extent permitted by law, disclaim responsibility for and have no liability to a recipient of this presentation for any error or omission in or for any statement in this presentation.

Reliance on presentation

A recipient of this presentation must make their own assessment of the matters contained herein and rely on their own investigations and judgment in making an investment in QEM. This presentation does not purport to contain all of the information a recipient of this presentation requires to make an informed decision whether to invest in QEM. Specifically, this presentation does not purport to contain all the information that investors and their professional advisers would reasonably require to make an informed assessment of QEM's assets and liabilities, financial position and performance, profits, losses and prospects. Recipients of this presentation should make investment decisions based on their own investigations and not this presentation.

No Recommendation

The information in this presentation is not a recommendation to acquire shares in QEM and does not constitute financial advice. Any person who intends to acquire shares must conduct their own investigations, assessment and analysis of QEM and its operations and prospects and must base their investment decision solely on those investigations (including reviewing the Company's announcements available on www.asx.com.au) and that assessment and analysis. Prospective investors should consult their own legal, accounting and financial advisers about an investment in QEM.

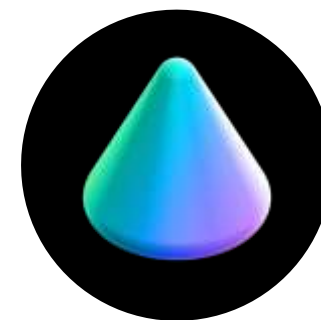
Competent Persons and Qualified Estimator Statements

The information in this announcement that relates to exploration results, mineral resource and contingent resource estimates for the Company's Julia Creek Project was first reported by the Company in its IPO prospectus dated 20 August 2018 and supplementary prospectus dated 12 September 2018 (together, the "Prospectus") and the subsequent resource upgrade announcements ("Resource Upgrades") dated 14 October 2018 and 7 April 2022. The Company confirms that it is not aware of any new information or data that materially affects the information included in the Prospectus and Resource Upgrades, and in the case of estimates of Mineral Resources and Contingent Resources, that all material assumptions and technical parameters underpinning the estimates in the Prospectus and Resource Upgrades continue to apply and have not materially changed.

QEM Limited is focused on the exploration and development of the **Julia Creek Project**, a unique world class critical minerals resource.

Julia Creek Project

QEM seeks to develop a World-Class Vanadium and Oil Shale Project



Multi Commodity

Vanadium
Transport Fuel



Sovereign Supply

Fuel Security
High Purity V_2O_5



Unique Process

Renewable Power
Green Hydrogen



Globally Significant

Vanadium Resource
Critical Mineral

The QEM Board draws upon decades of experience in the resources sector ensuring that the Company is best placed to capitalise on the vast opportunities afforded from the **Julia Creek Project**.

Experienced Team

Led by a team of successful and invested professionals, with proven record of project development



Tim Wall

Chair

- Senior Executive of multiple ASX 100 companies
- Director and Principle of TJW Energy, Senior Advisor ANZ – Oil and Gas at DSS+
- Former MD BP Refinery (Bulwer)
- Former President Global Manufacturing at Incitec Pivot Ltd (ASX:IPL)



Daniel Harris

Non - Executive Director

- Over 40 years of global vanadium experience
- Director of US Vanadium LLC (USA), Australian Vanadium Limited (ASX: AVL)
- Former CEO positions with Atlantic (ASX: ATI) Atlas Iron (ASX: AGO) ex VP EVRAZ plc. - Vanadium Assets



Gavin Loyden

Founder and Managing Director

- QEM Founder
- Identified & acquired QEM's Julia Creek resource
- Over 10 years experience in mining industry
- Responsible for QEM's project development



David Fitch

Non - Executive Director

- President & CEO Class1 Nickel (Canada) (CSE:NICO)
- Director of BioCentral Laboratories Ltd
- QEM's largest shareholder
- Former Chief Operating Officer of the Fitch Group

Corporate Snapshot

QEM Limited

Shares on Issue

135.4m

Share Price 16/06/23

\$0.18

Cash at 31/03/23

\$1.236m

Options on issue

250k Exp 01/05/25 @ \$0.20

5.6m Exp 12/08/25 @ \$0.345

5,850,000

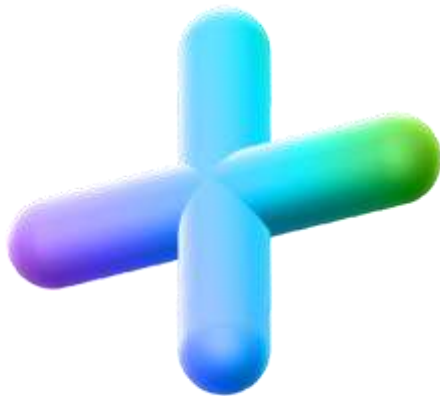
0.18 AUD

-0.01 (-5.26%) ↓ year to date

16 June, 3:40 pm AEST • Disclaimer



Open	-	Mkt cap	24.37M	52-wk high	0.24
High	-	P/E ratio	-	52-wk low	0.16
Low	-	Div yield	-		



\$27.1m

Market Cap (16/06/23)



Director Support

Management alignment with public shareholders

67.8%

Top 20 Shareholders

32.2%



Australia's Vanadium Deposits



Vanadium

Critical Mineral



World Ranking

Resources
2 (31%)

Production
0 (0%)



Operating Mines
0



Production
0 kt V (0%)



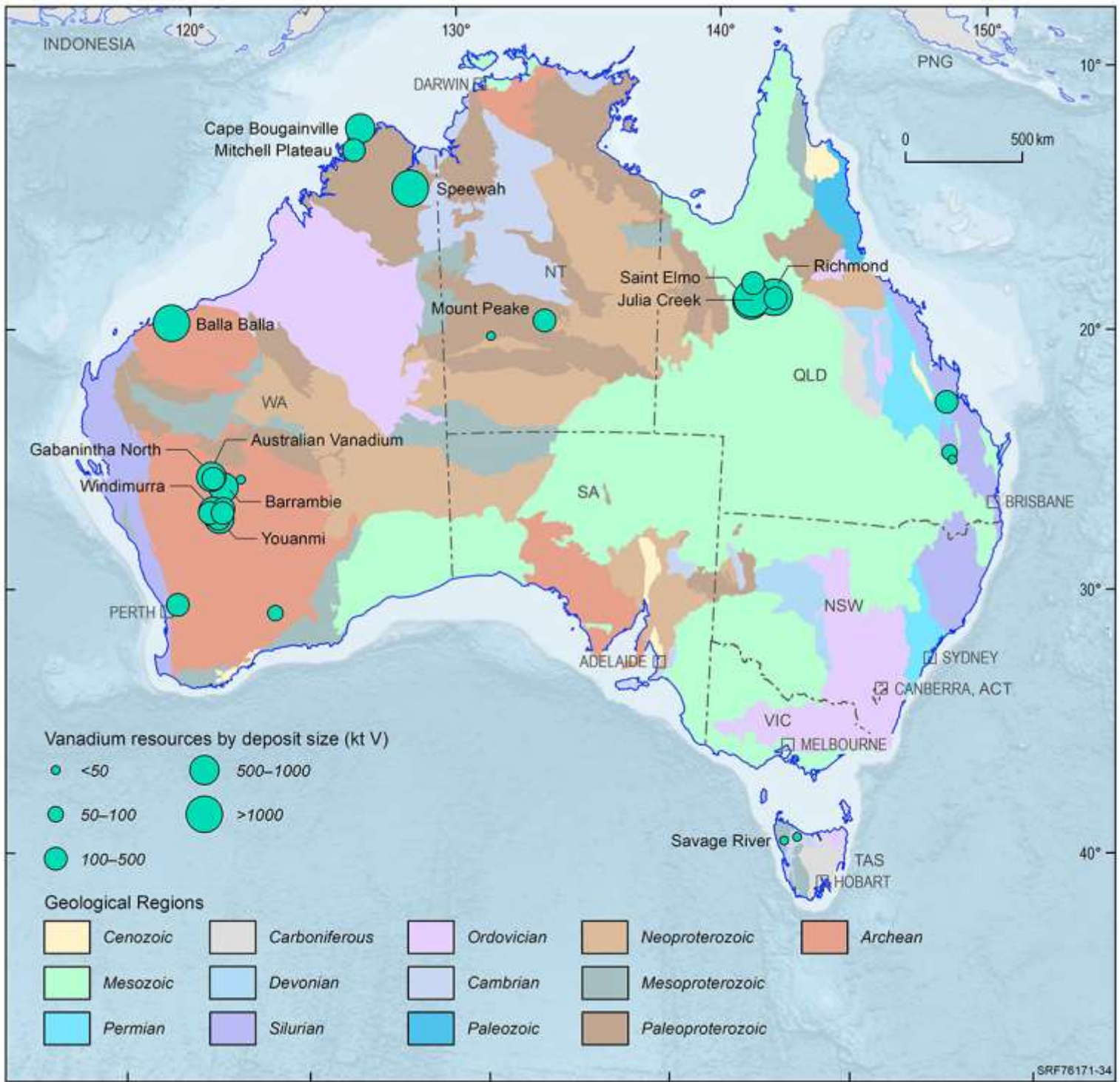
Export Income
\$0 (0%)



EDR
8,110 kt V (▲ 10%)



Ore Reserves
2,948 kt V (▲ 75%)



Source: Geoscience Australia – Australia's Identified Mineral Resources 2022

Drilling Results JORC Upgrade

One of the world's largest single vanadium resources



Vanadium Resource

Indicated JORC Resource increased by 64% to 360Mt V₂O₅



2,490Mt

Inferred @ Ave V₂O₅ ore content of 0.31%



360Mt

Indicated @ Ave V₂O₅ ore content of 0.29%



Oil Resource



626MMbbl's

3C 626 MMbbl's (SPE-PRMS) (recoverable @ 90%)



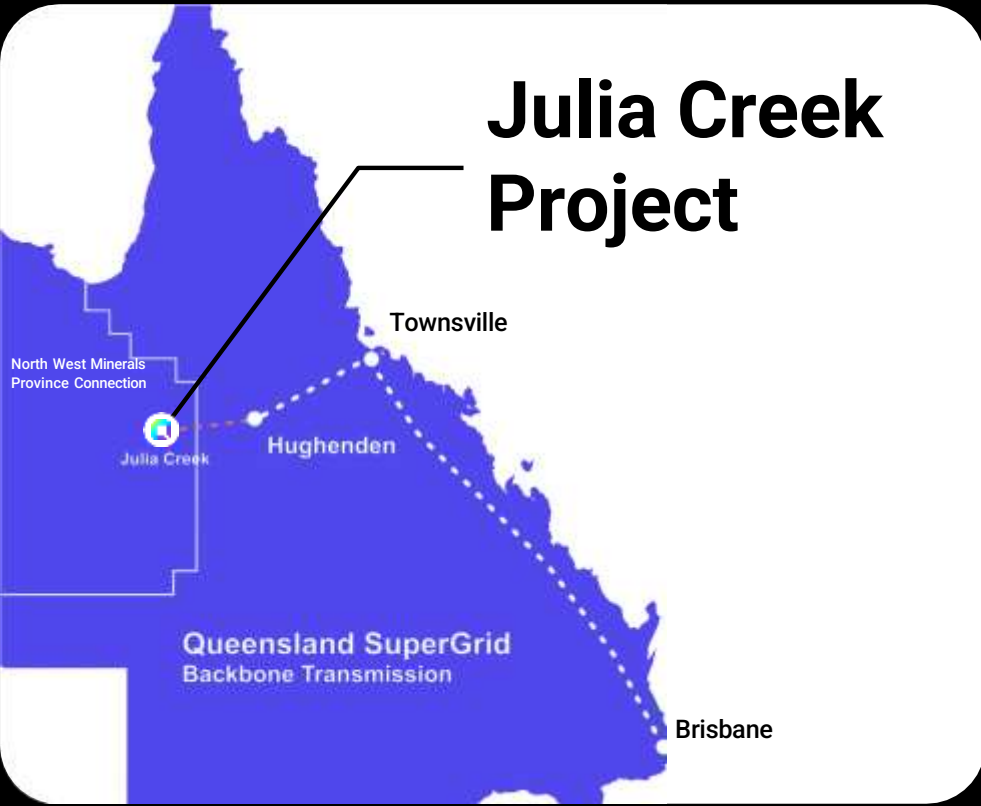
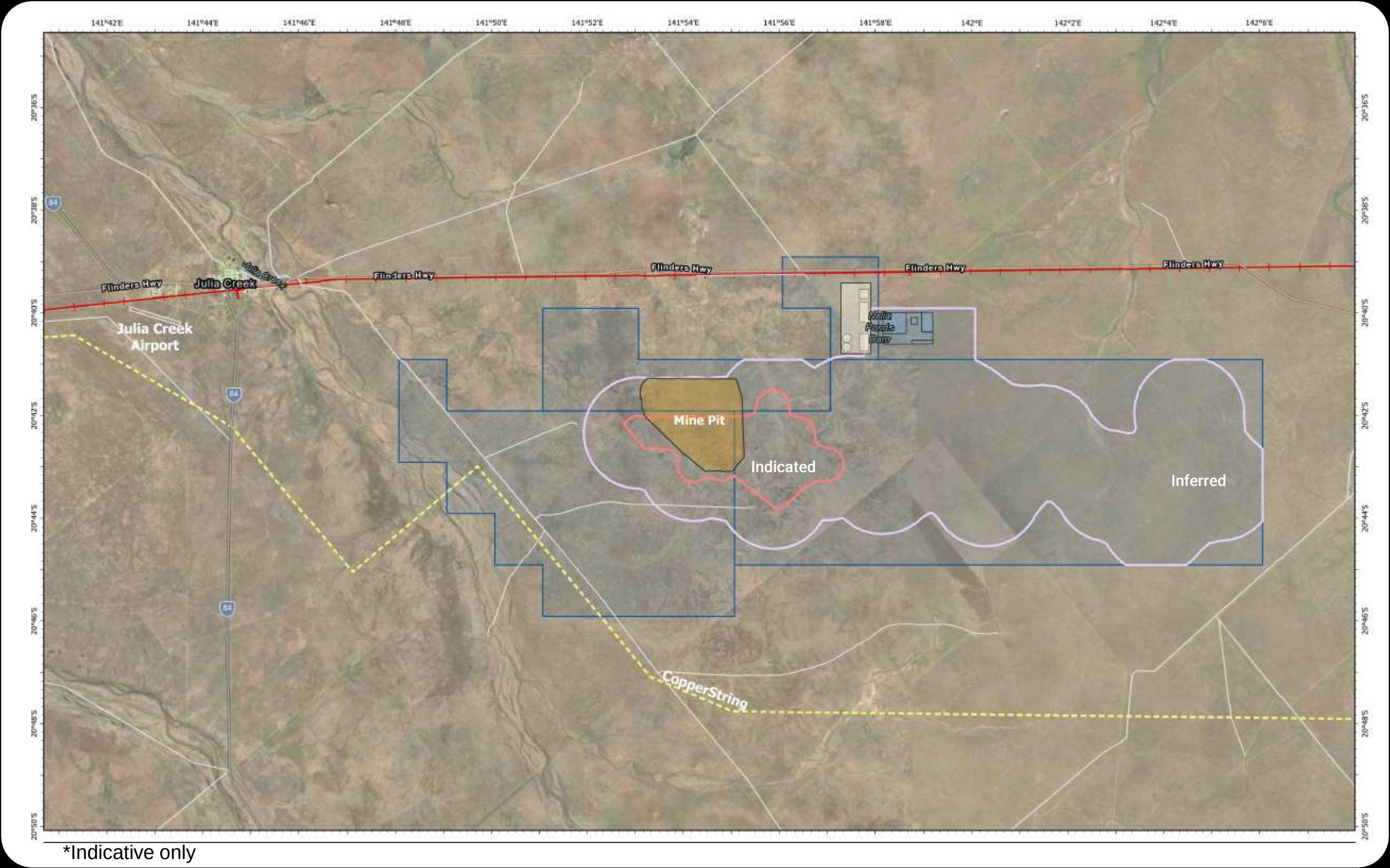
71MMbbl's

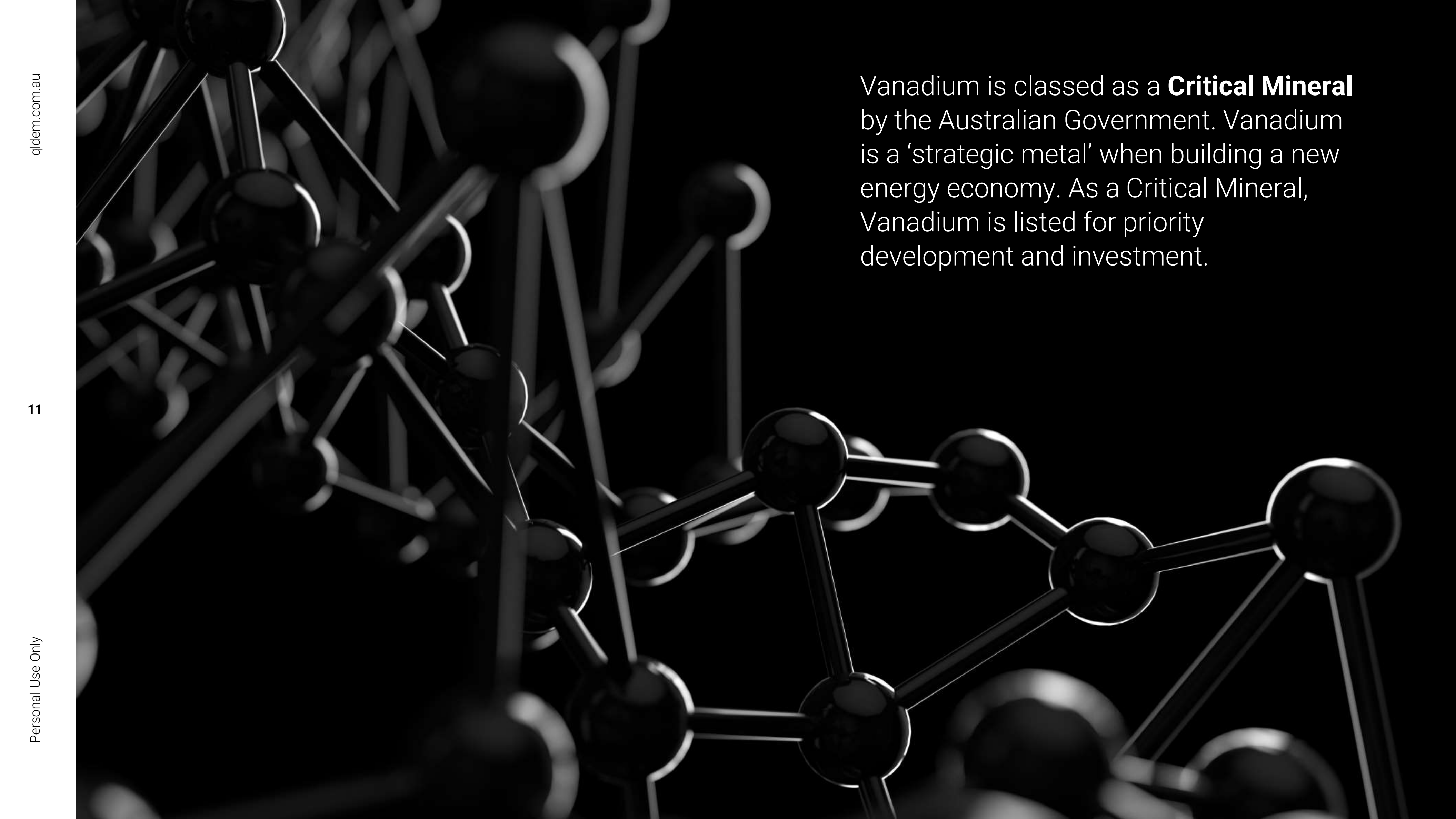
2C 71MMbbl's (SPE-PRMS) (recoverable @ 90%)

Source: QEM ASX Announcement 7 April 2022

Julia Creek Project Location

4 Exploration Tenements Covering 249.6km² in the Julia Creek Area, North-Western Queensland





Vanadium is classed as a **Critical Mineral** by the Australian Government. Vanadium is a 'strategic metal' when building a new energy economy. As a Critical Mineral, Vanadium is listed for priority development and investment.

Vanadium Uses

Vanadium - The Versatile Element



Improves Tensile Steel Strength

Most widely used alloy to strengthen steel (HSLA.) in construction, automotive, aerospace, rail, shipping, tools, drilling and more.



Lowers CO₂ emissions

In steel-Lowers CO₂ emissions by 185 million metric tons annually.

- Texas A&M University



Supports Fuel Efficiency

High strength-to-weight ratio makes vanadium a critical component in the automotive industries. In 85% of all vehicles by 2025. Henry Ford first used in Model – T.



Vanadium Uses

Vanadium - The Versatile Element



Durability and Weather Resistance

Vanadium alloys are naturally durable to extreme temperature and corrosion, making it irreplaceable in the aerospace industry. Suitable for hydrogen storage and pipes (reduces failure due to hydrogen embrittlement).

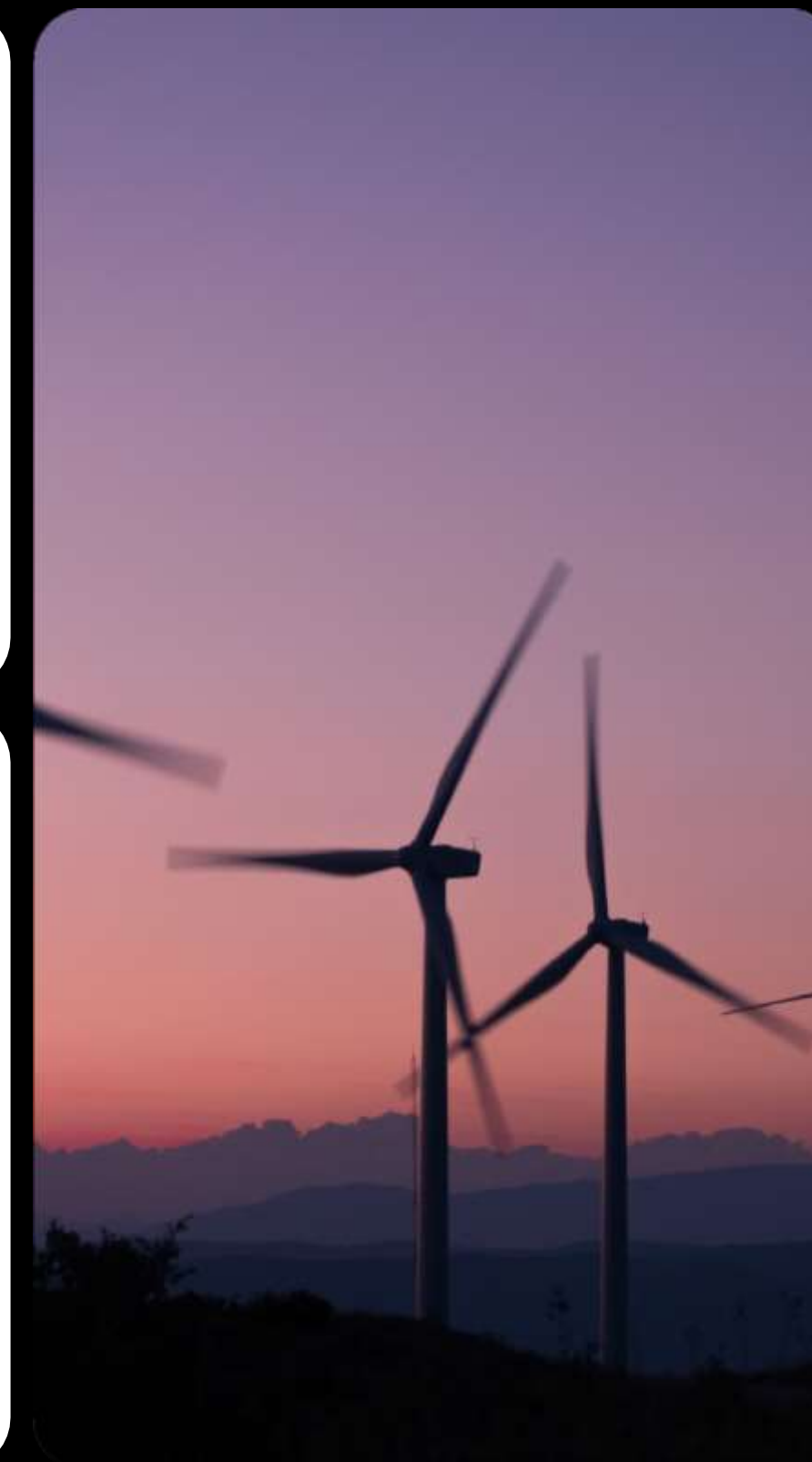


Chemical and Catalysts

Catalysts, 'Smart Glass', sulphuric acid production, ceramics, dyes, cathodes for lithium batteries.

Renewable Energy Storage

Vanadium Redox Flow Batteries (VRFB) are the preferred solution for large scale energy storage globally. Produces 78% less CO₂ than Li-B - Cradle-to-gate, with recycling and renewables.



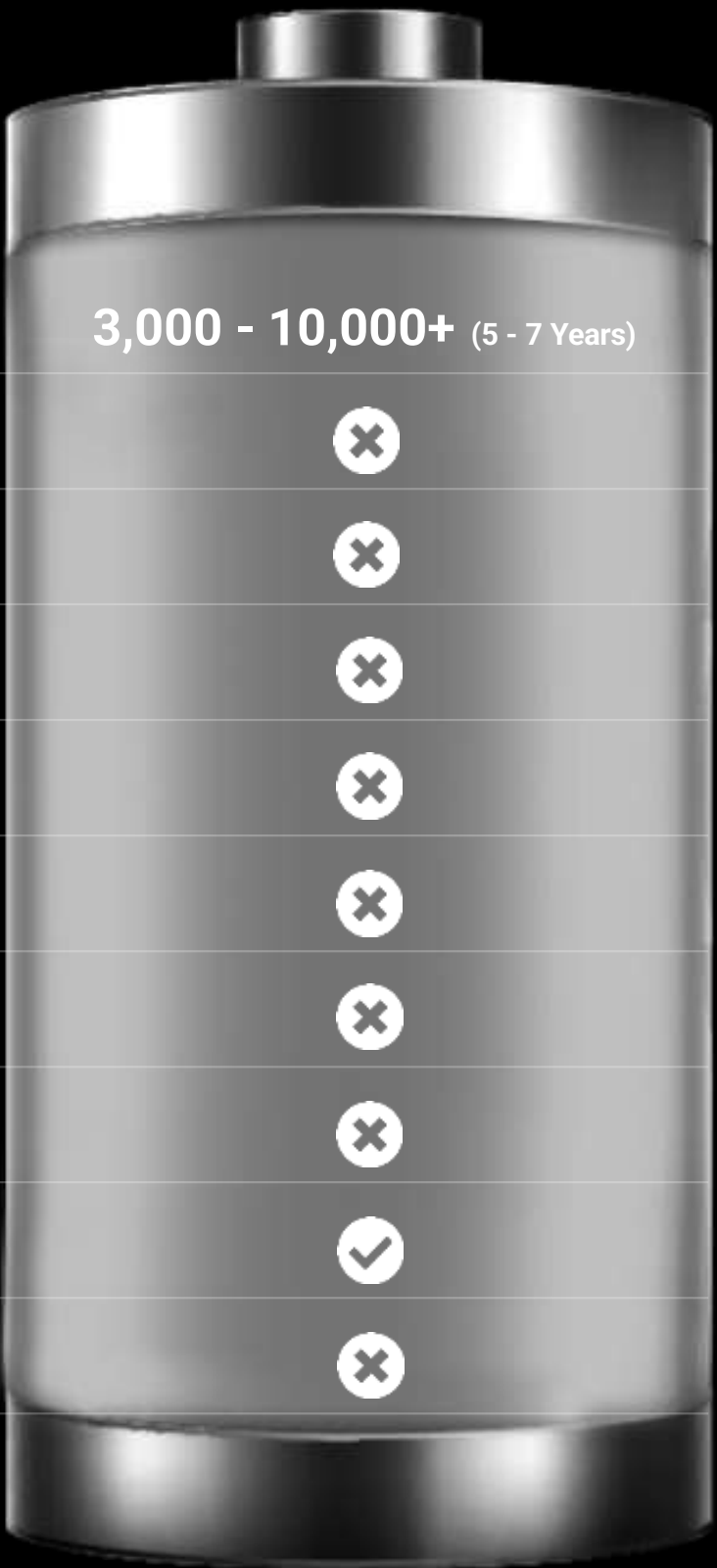
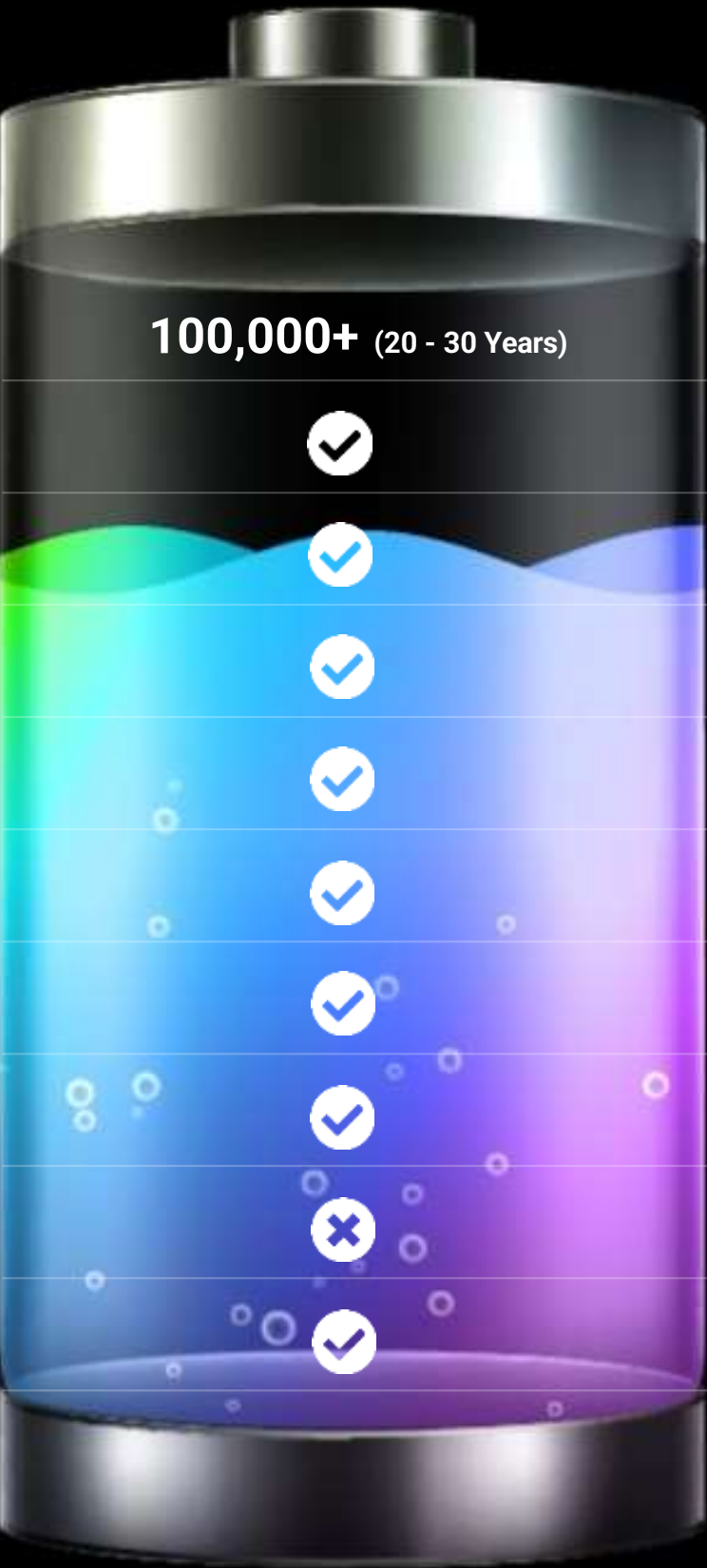
Renewable Storage

Building a Renewable Future with Vanadium Redox Flow Batteries (VRFB)



Vanadium

Lithium



Number of Cycles	
Low Self Discharge (Stays Charged)	✗
Low Environmental Footprint	✗
Highly Expandable	✗
Generates Low Level of Heat	✗
Charges and Discharges Simultaneously	✗
Can Release Energy Instantaneously	✗
Suitable for Connection to Power Grid	✗
Small Footprint	✓
Can be Completely Recycled	

Source: energyandcapital.com

Vanadium Global Production

Market Set for growth

Market expected to reach

\$2.36 Billion

in 2025 at CAGR of 10.2%

VRFB demand expected to equate

~23% of vanadium market

by 2030 currently only ~ 4%

Global Production 2022

112,515 MTV

or approx. 200,000tpa V_2O_5 equivalent.

Australia holds

31% of undeveloped

global reserves BUT has no domestic production – YET!

Source: Geoscience Australia

Vanadium Listed as

Critical Mineral

in Aust, US, EU and Japan

Global Vanadium demand

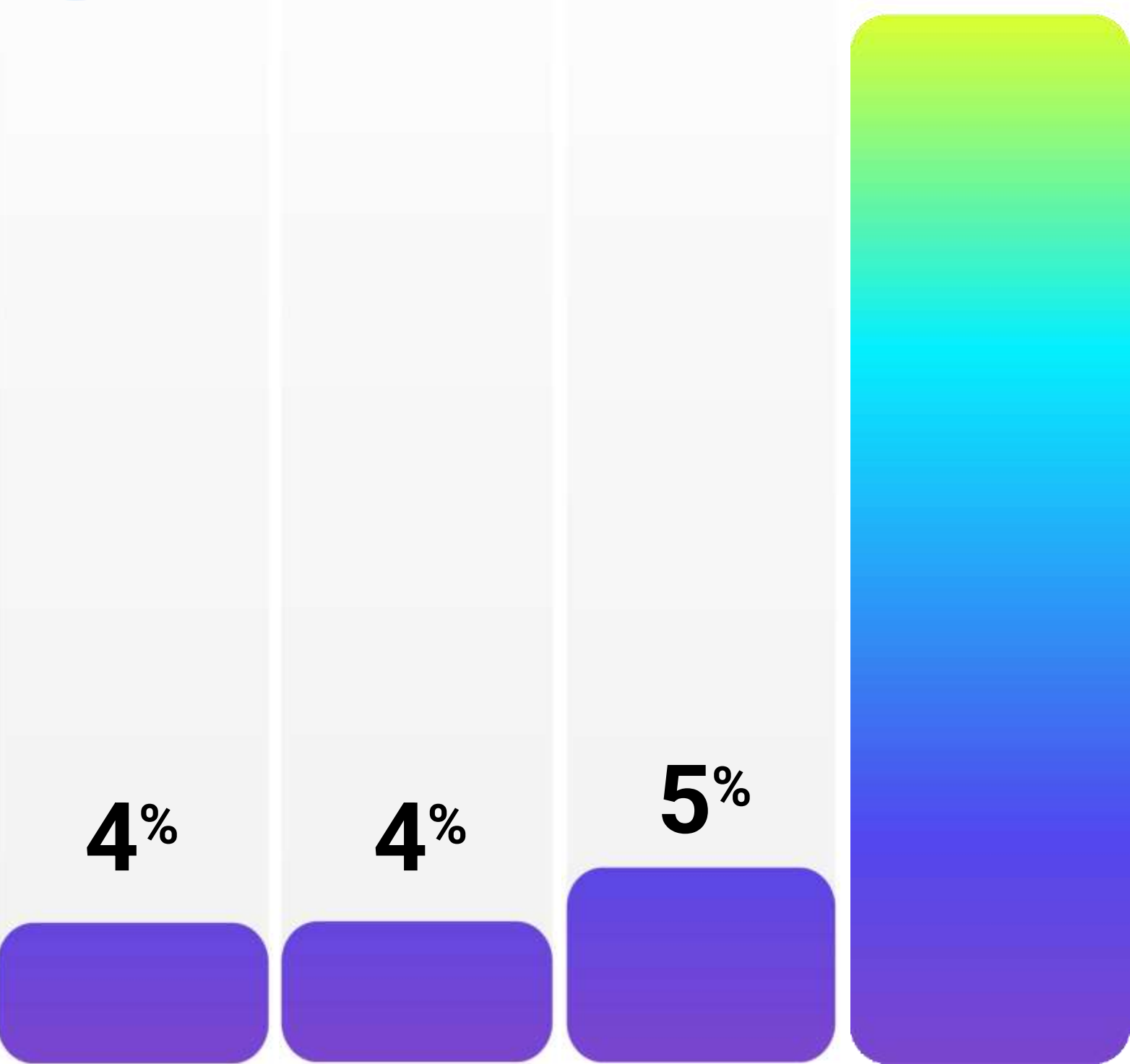
100% Increase by 2030

This is due to the growing demand for Vanadium Redox Flow Batteries (VRFBs) – Vanitec, 2022.



Current Vanadium Demand **87%**

Source: Vanitec



Energy Storage

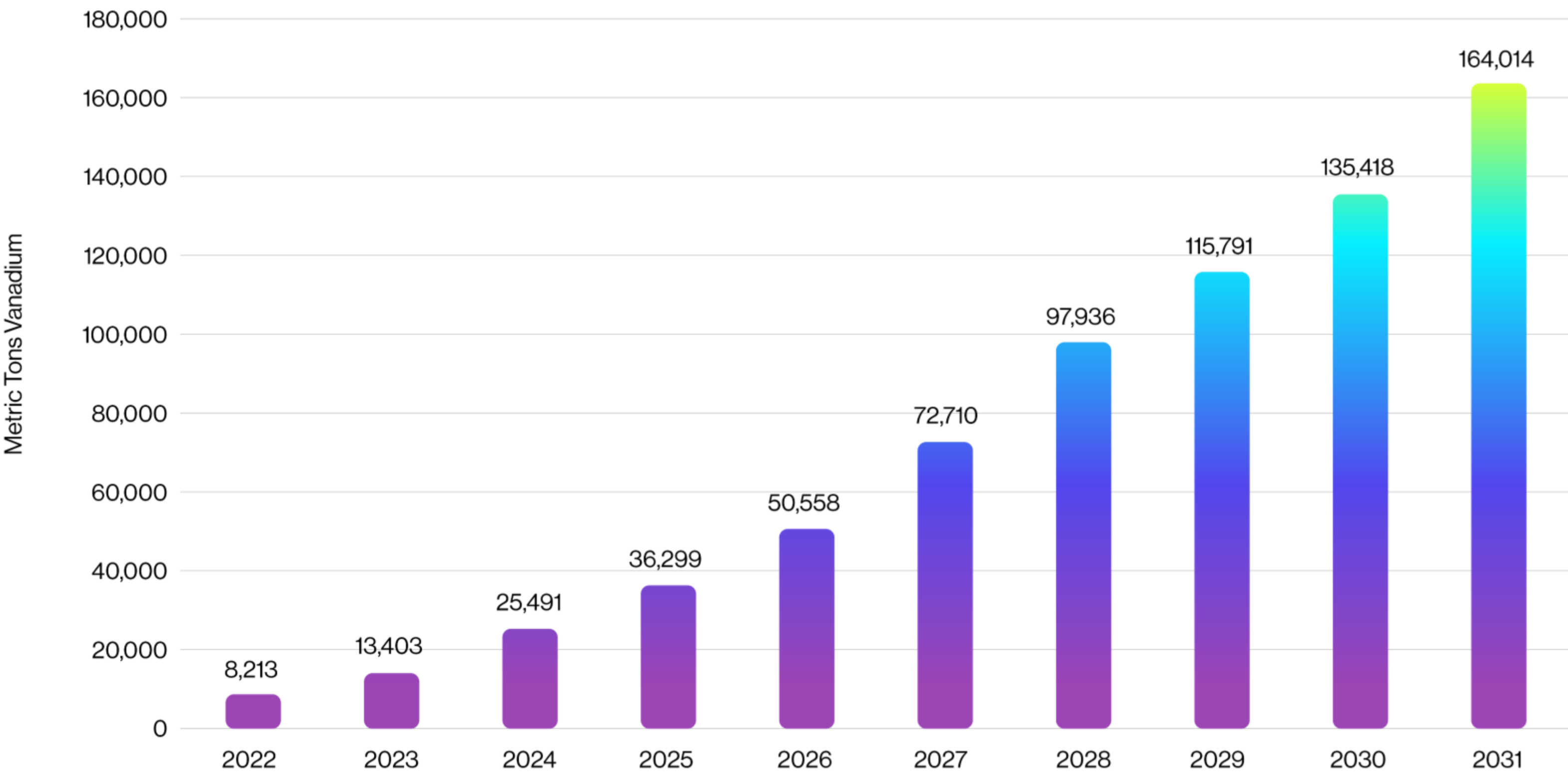
Chemicals

Aerospace Alloys

Steel

VFRB Market Forecasts

Vanadium for VRFB forecast to grow at an average compound rate of 41% YOY to 2031



Source: Guidehouse Insights: White Paper Identifying Market Opportunities and Enablers Q2 2022, for Vanitec.

Note: QEM is a full member of Vanitec.

Fuel Security

Running on Empty

- Fuel imports at **93%**, adding **\$30B** to Australia's trade deficit
- Australia now highly exposed to supply shock
- Australia's obligation as a member of the International Energy Agency (IEA) – Minimum 90 days supply - Non-compliant since 2012.
- COVID-19 has further exposed Australia's lack of resilience in this area

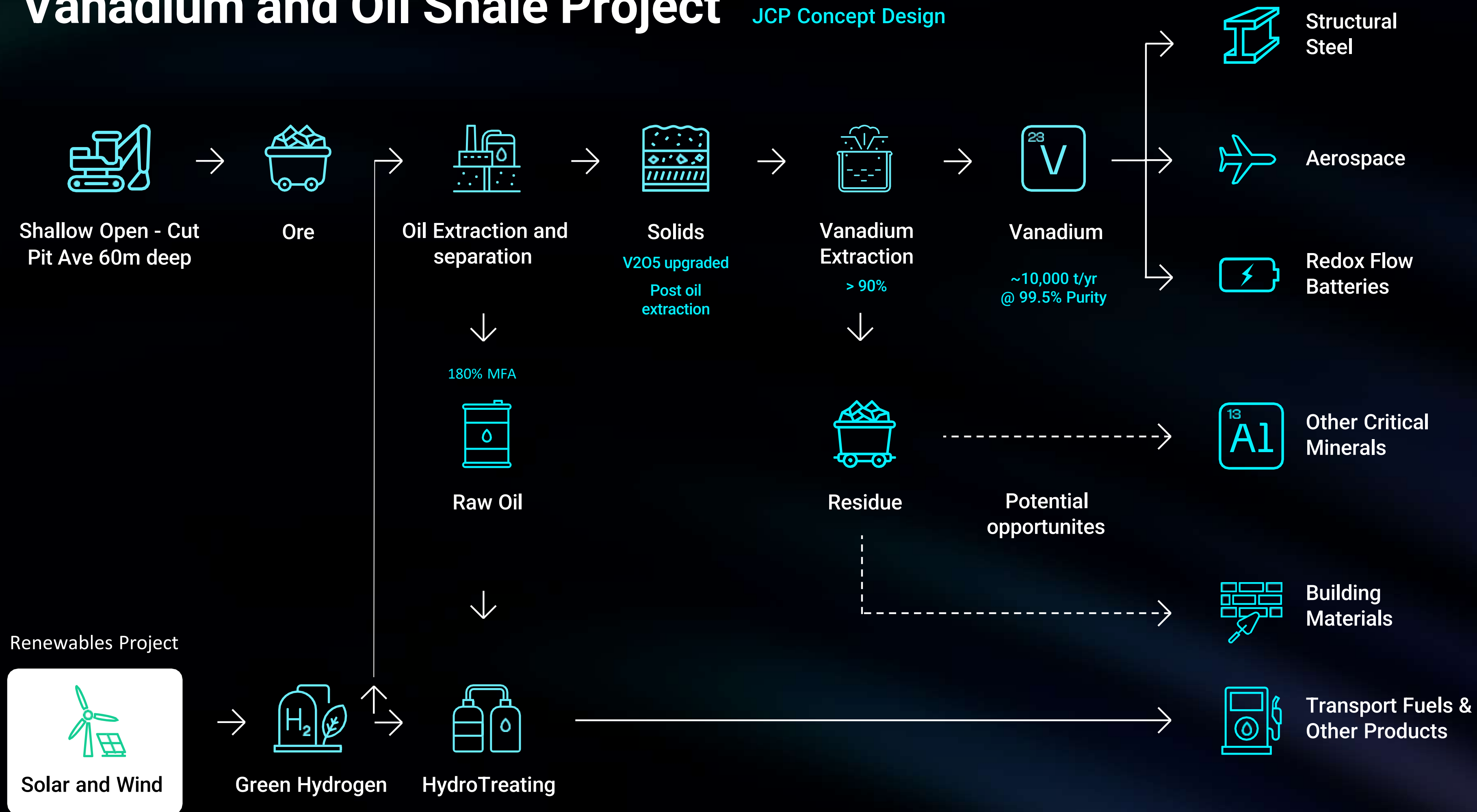


We consider this an opportunity!



Vanadium and Oil Shale Project

JCP Concept Design





Pilot Plant Progress

Bench scale pilot plant - Testing program and optimisation program underway

- **Pilot plant test program delivering exciting results**
- **>98% V_2O_5 extraction achieved using acid leaching***
- **>92% V_2O_5 extraction achieved using alkali leaching***

* QEM ASX Announcement February 28th 2023

- Oil yields (equivalent) **~180% of Modified Fischer Assay (MFA)****
- Petrology studies now underway to understand potential product suite
- Pilot is a proof of concept that enables QEM to maximise vanadium and oil recovery, using this proprietary extraction process

** QEM ASX Announcement December 6th 2022

De-risking the Project

Access to affordable, reliable and renewable energy is a key development pillar for QEM.

With the **\$5B CopperString network** proposed to run through the western portion of QEM's Julia Creek Vanadium and Oil shale project, clean renewable energy will power the project operations.



Renewable Power Update

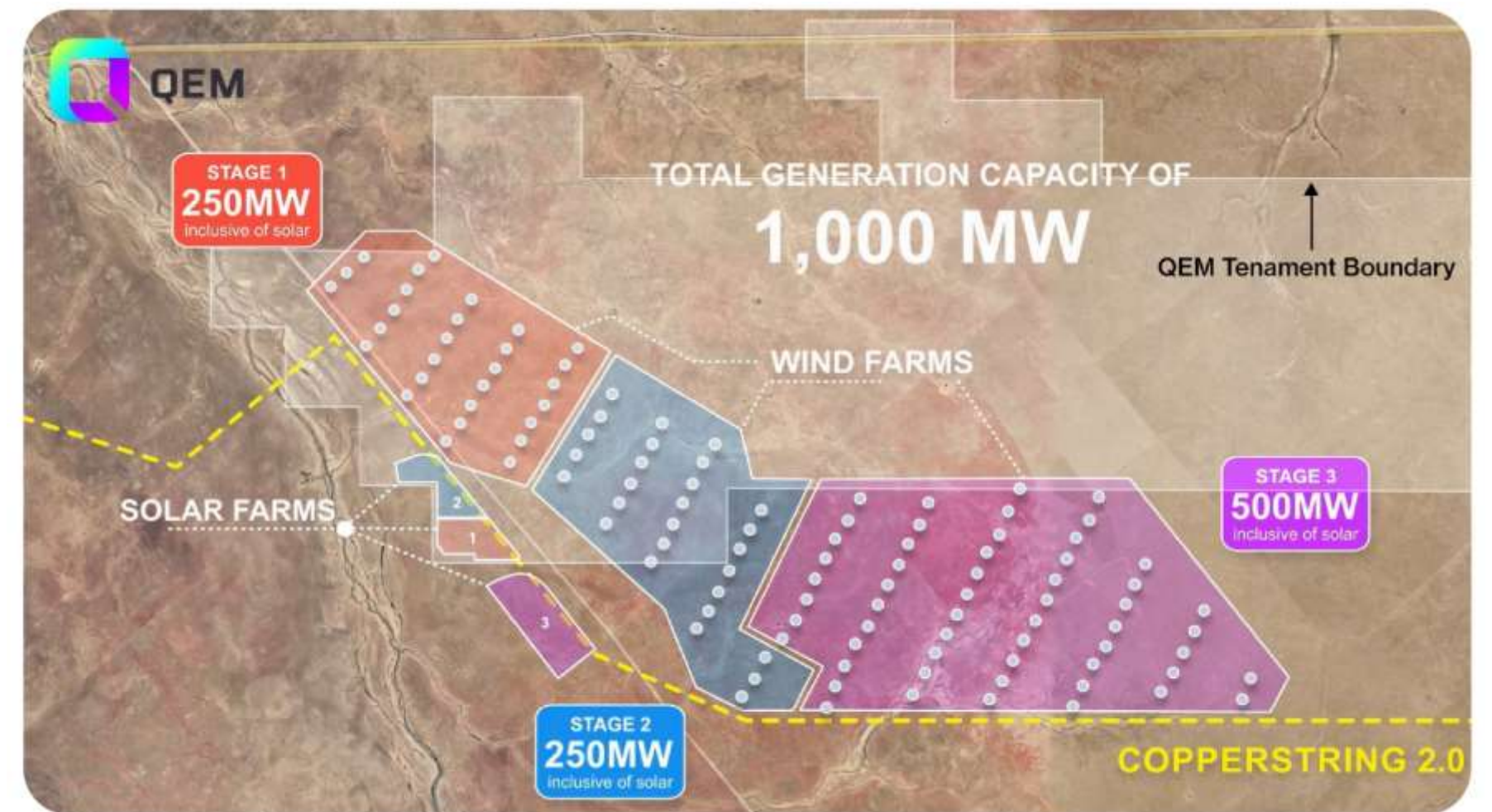
“Situated in the best co-located wind and solar resources in Eastern Australia” - AEMO

- Meteorological mast, SoDAR and solar monitoring instruments are transmitting data in real time to support the wind and solar modelling developed in the 2021 Pre-Feasibility Study
- Modelling for **250 MW, 500MW and 1GW**, hybrid solar/wind
- Julia Creek Project (JCP) proposed off taker for **renewable power**
- Strong appetite for large scale projects in the region **with interest shown from global project developers**
- The JCP will utilise this renewable power to generate Green hydrogen for processing and the project will have access to the NEM via the CopperString network



The Queensland government will deliver **CopperString** to provide affordable, renewable energy to open up the North West Minerals Province. The **1,100 kilometre \$5 billion** expanded CopperString project will be **100 per cent government owned**.

Source: Premier's Speech, Townsville 7 March 2023



SODAR and Solar equipment
installed on site at Julia Creek



160m Met Mast commissioned
on-site July 2022



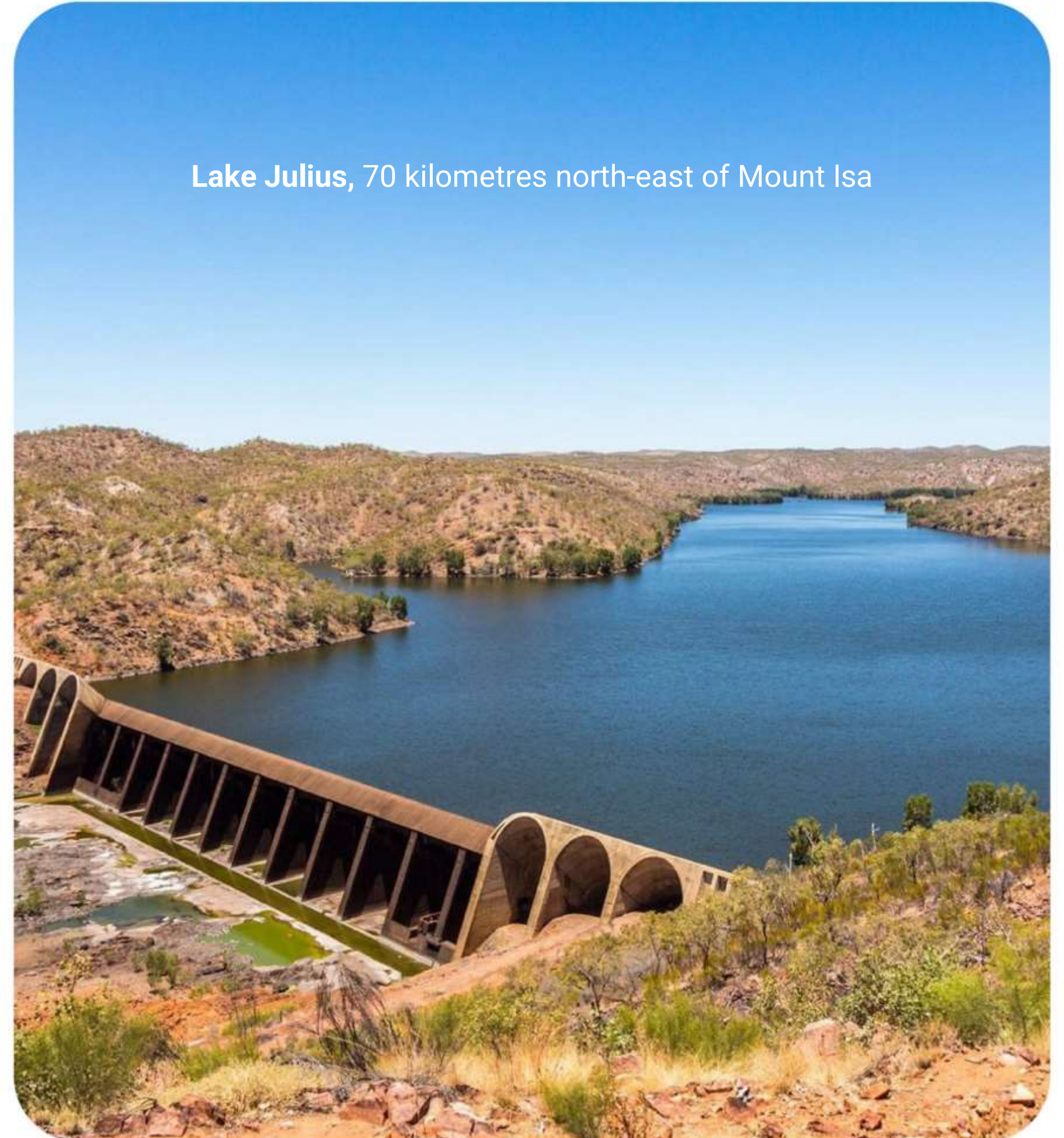
On site: McKinlay Shire CEO Trevor Williams, Qld Resources Minister Hon. Scott Stewart, QEM MD Gavin Loyden, Deputy Mayor Janene Fagan, QEM Project Coord. Lian D'Netto

Water Options

Water options study completed

- JCP's water requirement is estimated to be between 4 and 6 gigalitres/yr; Volumes will be refined through progressive engineering stages.
- Water options study recently completed, resulting in two viable options:
 1. The water supply options assessment explored seasonal water harvesting from the Flinders River.
 2. Potential for pipeline from Cloncurry, utilizing Lake Julius resource.
- However, QEM strongly supports a multi-user approach that will benefit not only mining but also other industries and users.
- Ground water use has been ruled out.

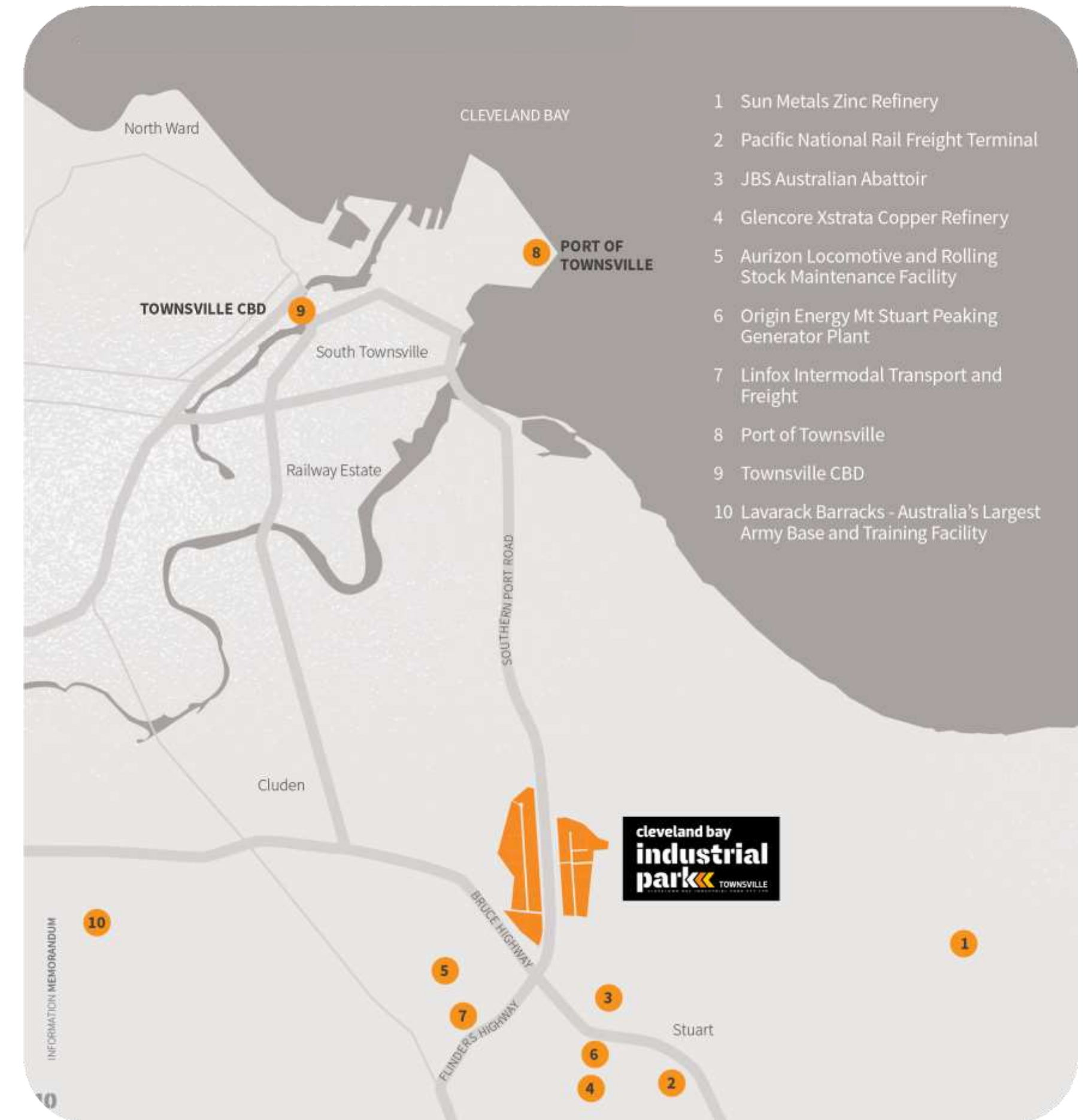
Lake Julius, 70 kilometres north-east of Mount Isa



Townsville QR-CUF Progress

Queensland Government support reach's \$75m for vanadium extraction demonstration plant

- On January 24th, the Qld Premier announced a substantial increase in funding from \$10M to \$75M for the construction of the Queensland Resources Common User Facility (QR-CUF).
- The project will be built at the Cleveland Bay Industrial Park in Townsville.
- The facility is intended to trial production processes for commercialisation, enabling prospective miners to begin producing mineral samples at scale.
- QEM has been involved in the design inputs for the project since its inception and will utilise the facility to demonstrate vanadium extraction processes at scale.
- The project has been granted a Prescribed Project Status, with project completion due in early 2025.



Ref: Cleveland Bay Industrial Park Information Memorandum September 2022

QEM secures vanadium-rich waste stream for conversion to battery electrolyte

Positive ESG outcomes for Queensland

- Sun Metals Corporation, a wholly owned subsidiary of the Korean metals giant, Korea Zinc, will provide QEM with vanadium-bearing spent catalyst from their refinery in Townsville.
- Circular Economy opportunity for QEM to upcycle Queensland industrial waste to battery grade vanadium pentoxide (V_2O_5)
- QEM plans to use the Queensland Government's \$75M Critical Minerals facility in Townsville to produce battery grade V_2O_5 from the spent catalyst

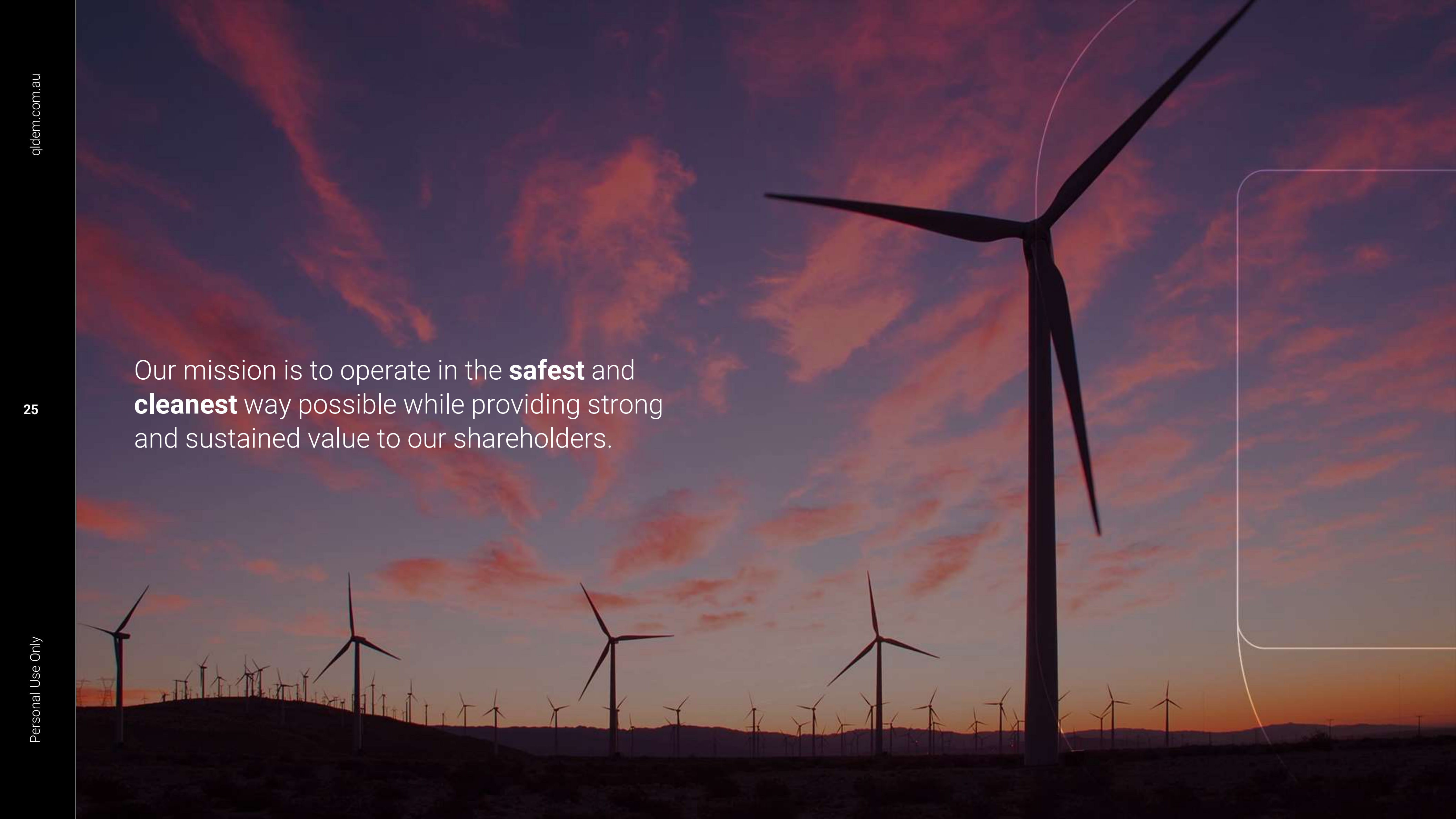
Image at Sun Metals offices, Townsville

DK Choi - Operations Director, Sun Metals

Joanne Bergamin - Communications Director, QEM Limited

Gavin Loyden - Managing Director, QEM Limited



A large-scale photograph of a wind farm at sunset. The sky is a deep purple and blue, with wispy clouds catching the low light of the sun, which is just below the horizon. In the foreground and middle ground, numerous wind turbines are silhouetted against the colorful sky. One turbine is particularly large and prominent on the right side of the frame, its three blades clearly visible. The ground is dark and appears to be a flat, open landscape. The overall mood is serene and emphasizes clean energy.

Our mission is to operate in the **safest** and **cleanest** way possible while providing strong and sustained value to our shareholders.



QEM’s Commitment to ESG

QEM has adopted ESG framework developed by the World Economic Forum (WEF)

Environmental

- Low carbon footprint goal
- Proposed renewable energy sources
- Products such as V₂O₅ support Australia’s emission reduction targets

Social

- QEM supports local community – focus on youth, women’s and sporting programs
- QEM sponsors St Vinnies CEO Sleepout, St Vincent de Paul Society, Endeavour Foundation, National Breast Cancer Foundation, WIMARQ (Women In Mining and Resources Qld)

Governance

- Dedicated to corporate transparency
- Ethically sourced Critical Minerals – traceability and provenance
- Indigenous Engagement Strategy
- Socialsuite ESG Go reporting to disclose ESG data
- Carbonhalo GHG inventory assessment complete



QEM joins up with UQ as a new vanadium company hits ASX

BUSINESS

The University of Queensland has signed on with fledgling vanadium company QEM to improve the value and yields from the Julia Creek deposit and search for rare earths.

ASX Resources Quarterlies: This oil play is raking in the dollars

January 31, 2023 | Bevis Yeo **STOCKHEAD**

Queensland just made a \$75m move to become a critical minerals centre of excellence

January 26, 2023 | Christian Edwards **STOCKHEAD**

QEM's critical minerals project is clearing and it looks really bright

March 8, 2023 | Special Report **STOCKHEAD**

Queensland transmission line upgrade to enable battery and renewables manufacturing ambitions

By Jonathan Tourino Jacobo, Andy Colthorpe
March 7, 2023

QEM achieves highest vanadium extraction results to date from Julia Creek Project in Queensland

By Adam Drought 1 March 2023 | mining.com.au

Outstanding extraction tests put vanadium spotlight on QEM's Julia Creek Shale

February 28, 2023 | Special Report **STOCKHEAD**

QEM's critical minerals project is clearing and it looks really bright

BUSINESS



Queensland's premier Anastacia Palaszczuk with the QEM team.

QEM, University of Queensland Partner for Minerals Study at Queensland Project; Shares Rise 3%

12/14/2022 | 03:29am GMT

MarketScreener



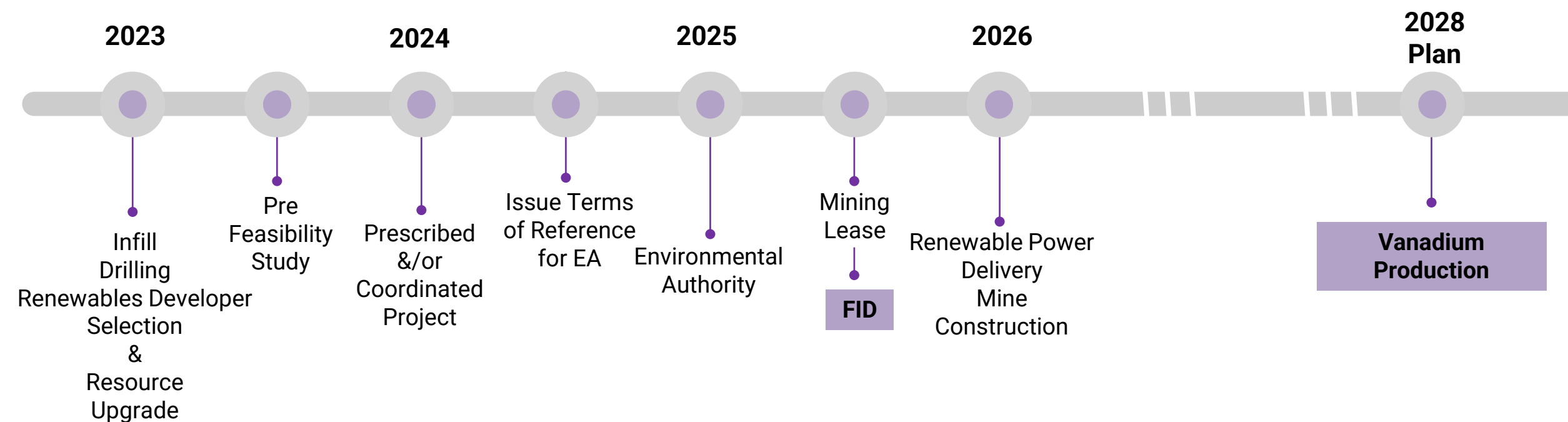


Right Project at Right Time

- **Multi Commodity Exposure** in high growth markets
 - Globally significant Critical Minerals opportunity
 - Fuel Security
 - Helping to meet Australia’s energy transition targets
- Unique proprietary extraction technology
 - Low market capitalization
 - Strong government support
 - **Tier 1 Mining Jurisdiction**



Project Development





Get in touch:

Gavin Loyden

Managing Director

gavin@qldem.com.au

Joanne Bergamin

Director, Communications & Sustainability

jbergamin@qldem.com.au

Call: + 61 7 5646 9553

Visit: qldem.com.au

Follow us: [!\[\]\(95b425611cbd2b8716a140cf67c81822_img.jpg\)](#) [!\[\]\(98475352b625a273242ad989dd0cabc3_img.jpg\)](#) [!\[\]\(116076dec7d8ea5879a528db6ccb1b4b_img.jpg\)](#)

Appendix:

Julia Creek Resource

Julia Creek Resource Overview

Queensland Government support reach’s \$75m for vanadium extraction demonstration plant



Resource Class	Strat Unit	Mass (Mt)	Average Thickness (m)	Insitu Density (gm/cc)	V ₂ O ₅ (Wt%)	Cu (ppm)	Mo (ppm)	Ni (ppm)	Zi (ppm)	Al (ppm)
Indicated	CQLA	127	3.16	2.41	0.24	161	132	121	763	4525
	CQLB	104	2.74	2.32	0.30	201	180	151	912	5756
	OSU	64	1.97	1.99	0.32	217	162	194	1012	49360
	OSL	64	2.05	1.95	0.32	206	143	182	1006	52759
Inferred	CQLA	698	2.52	2.42	0.23	156	136	120	810	2706
	CQLB	879	3.32	2.24	0.38	225	226	205	1197	5322
	OSU	458	1.92	2.02	0.31	229	150	189	1121	60505
	OSL	457	1.94	1.97	0.29	215	130	169	1051	59696
Total		2,850		2.21	0.31	203	167	169	1029	24304

Table 1: Summary of JORC Mineral Resource Estimate 31 March 2022

Note:

- 1. The estimate uses a minimum cut-off of 0.2% V2O5 for the oil shale units, and minimum cut-off of 0.15% V2O5 for the Coquina units.
- 2. The total resource tonnage reported is rounded to reflect the relative uncertainty in the estimate categories and component horizons may not sum correctly.

Julia Creek Resource Overview



Queensland Government support reach’s \$75m for vanadium extraction demonstration plant

Resource Class	Strat Unit	Mass (Mt)	Average Thickness (m)	Total Moisture (Wt%)	Oil Yield (L/tonne)	Oil Yield LTOM	MMBbls (in-situ PIIP)	MMBbls Recoverable
3C Contingent	CQLB	983	2.8	5.6	49.2	51.2	274	247
	OSU	522	1.8	5.6	74.6	78.8	221	199
	OSL	521	1.9	5.6	68.3	71	202	181
Total / Ave		2026		5.6	64	67	696	626
2C Contingent	CQLB	104	2.6	2.6	43.7	44.5	27	24
	OSU	64	1.9	9.5	79.4	83	28	25
	OSL	64	1.9	12.2	74.2	76	25	23
Total / Ave		2,850		8.1	66	68	79	71

Table 2: Summary of SPE-PRMS Oil Resource estimate 31 March 2022

Note:

- 1. The total resource tonnage reported is rounded to reflect the relative uncertainty in the estimate and component horizons may not sum correctly.
- 2. The 3C petroleum resource reported includes the 2C volumes, ie. They are cumulative not incremental as per the PRMS 2018 guidelines
- 3. An economic cut-off of 40l/tonne was applied prior to the calculation; it must be noted that the CQU and CQLA did not meet the >40l/tonnne for inclusion in the calculation. The 2C and 3C volumes reported here are unrisked.