



QEM Limited Innovative Energy Solutions

ASX: QEM

INVESTOR PRESENTATION
August 2019



Innovative Energy Solutions



Transport Fuels

QEM aims to provide innovative and environmentally friendly solutions that are important to our energy future. The Company seeks to assist with the current fuel security issue facing Australia, by producing liquid fuels for the domestic market.



Hydrogen

QEM sees hydrogen as an important part of Australia's energy mix into the future and is investigating ways of transitioning to hydrogen production.



Vanadium Pentoxide

QEM also aims to become a leading supplier of high quality vanadium pentoxide to both the nascent energy storage sector and the Australian steel industry.

Key Figures



Over
1.7 Bt

V2O5 @ Ave 0.34%

589 MMbl @ Ave 64L/t

JORC Inferred resource making it one of the largest ASX listed Vanadium resource in Australia.

Up to
0.74%

V2O5 In High Grade Intercepts

High grade intercepts up to 0.74% V2O5.

Up to 88.9 L/t oil content

Up to
3x

Beneficiation Upgrade

Beneficiation: Studies show up to 3x upgrade available.

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"), released to the ASX on 17 October 2018. The Company confirms that it is not aware of any new information or data that materially affects the information included in the Prospectus, 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 continue to apply and have not materially changed.

Investment Highlights



Unique World Class Resource

- Unique world class resource with the potential to deliver innovative energy solutions, through the production of energy fuels and vanadium pentoxide
- Globally significant JORC (2012) Inferred Resource **1,700 Mt @ 0.34% V₂O₅**
- High-grade intercepts up to 0.74% V2O5
- Oil content up to 88l/t

Management that Delivers

- Team includes highly successful and experienced mining professionals, with proven track record of mine development globally

Growth Focused

- Development of the resource through exploration, evaluation and development
- Offers investors exposure to advantageous by-product in the form of oil

Simple and Clean Structure

- New ASX listed entity, with a clean capital structure and low overheads
- Simple capital structure
- Compares favourably with other listed Vanadium companies

Global Vanadium Deficit

- Supply squeeze: global vanadium consumption expected to exceed supply by ~2,198t in 2019.
- Focus offers leverage to rising vanadium prices and new applications in energy storage



Globally Significant Resource



QEM's Julia Creek Vanadium Resource is one of the Largest on the ASX

Company	ASX Code	Project Name	Location	Resource Mt	V205 %	Resource Type	V205 MT
King River Copper	KRC	Speewah Project	Wyndam Port, North West WA	4,712 Mt	0.30%	Measured, Indicated, Inferred	14.10 Mt
Horizon Minerals	HRZ	Richmond Project	Richmond / Julia Creek, QLD	2,579 Mt	0.32%	Inferred	8.25 Mt
QEM Limited	QEM	Julia Creek Project	North West QLD, Australia	1,763 Mt	0.34%	Inferred	5.99 Mt
Tando Resources	TNO	SPD Project	South Africa	612 Mt	0.78%	Inferred	4.59 Mt
Neometals	NMT	Barrambie Project	Barrambie, WA	280 Mt	0.45%	Indicated and Inferred	1.26 Mt
Australian Vanadium	AVL	Australian Vanadium Project	Murchison Province, WA	184 Mt	0.76%	Measured, Indicated, Inferred	1.39 Mt



Drilling at QEM's Flagship Julia Creek Project - May 2019

Capital Structure



Clean Capital Structure and Shareholder Alignment

ASX Symbol: QEM	
Shares on Issue	100 million
Market Cap (24 July 2019)	\$11m
Share Price (24 July 2019)	\$0.11
Cash (as at 30 June 2019)	\$3.928m


Major Shareholders	
Directors	26.50%
Greenwich Global Pty Ltd	19.70%
SkipTrak Pty Ltd	4.49%



IPO Completed and Listed on the ASX
\$5m IPO in October 2018



Liquid
~40% free float.



Alignment
Management alignment with public shareholders.

The Team



Led by a team of highly successfully and experience mining professionals, with proven track record of mine development



John Foley
Chairman

- Extensive experience as current Chairman of; Precious Metal Resources Limited (ASX: PMR), Citigold Corporation Limited (ASX: CTO) and Carbon Credit Corporation (C3).



Daniel Harris
Non-Executive Director

- Accomplished mining executive with 37+ years in all aspects of the resources sector, particularly in vanadium.
- Current independent Director Australian Vanadium (ASX:AVL), also former CEO & COO positions with Atlantic (ASX: ATI), Former Director of Atlas Iron (ASX: AGO)



David Fitch
Executive Director

- Experienced in strategic planning, commercial negotiations and business operations.
- Formerly the COO and major shareholder of the Fitch group,
- Director of BioCentral Laboratories.
- Largest shareholder of QEM.



Scott Drelincourt
General Manager & Geologist

- A qualified geologist with over 14 years' experience in all facets of the resource and mining industry
- Significant experience in prospect generation, greenfield and brownfield exploration, mining development and mining operations.

Julia Creek Project



Opportunity for a World-Class Vanadium & Oil Shale Mine

Key Facts

- Julia Creek Project **comprises 4 exploration permits EPM25662, EPM25681, EPM26429 & EPM27057**
- Advanced exploration stage and drilling demonstrates ore depth from 37m to 104m
- Close to all infrastructure and services including road, rail, water, gas, telecommunications and fibre optic cable

Resource

- **2018** Upgrade of total JORC Inferred resource by 35% to 1,700 million tonnes (does not include pending drill results or the additional of EPM27057)
- V2O5 @ 0.34% and oil content 64l/t.
- Scoping study completed in July 2016 (vanadium resource only)
- Oil component- **589MM Barrels 3C Contingency**
- These figures do not include the addition of EPM27057.

Method

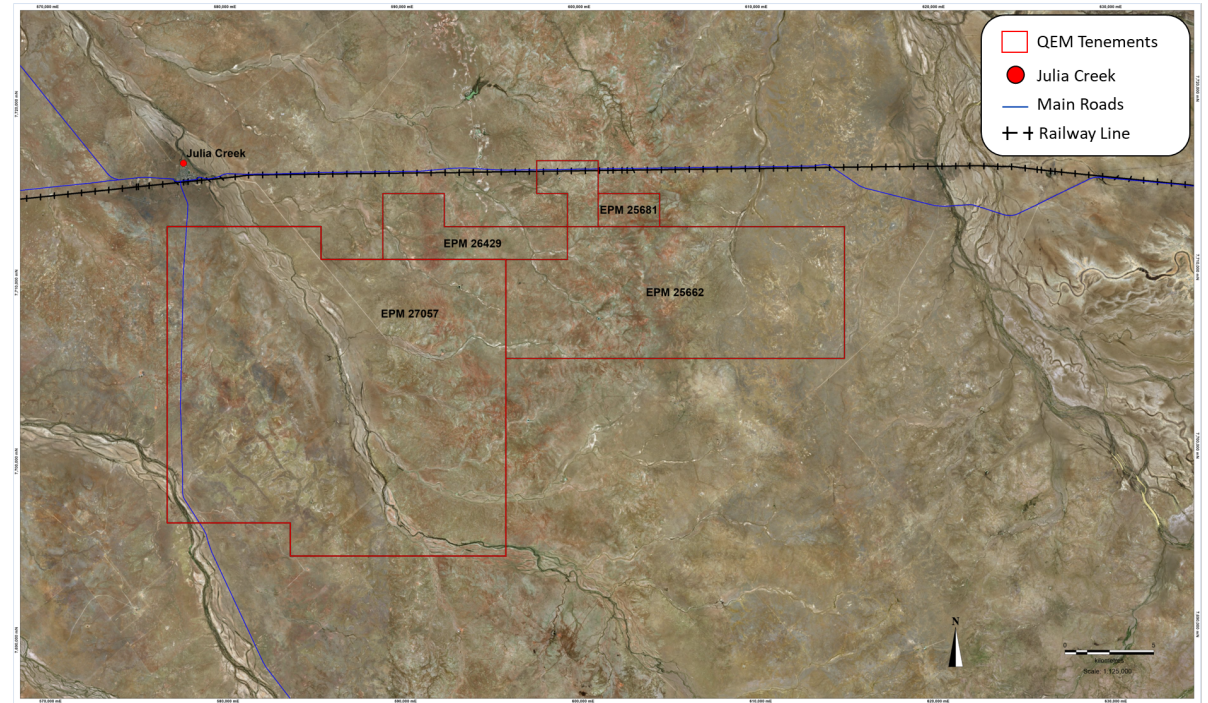
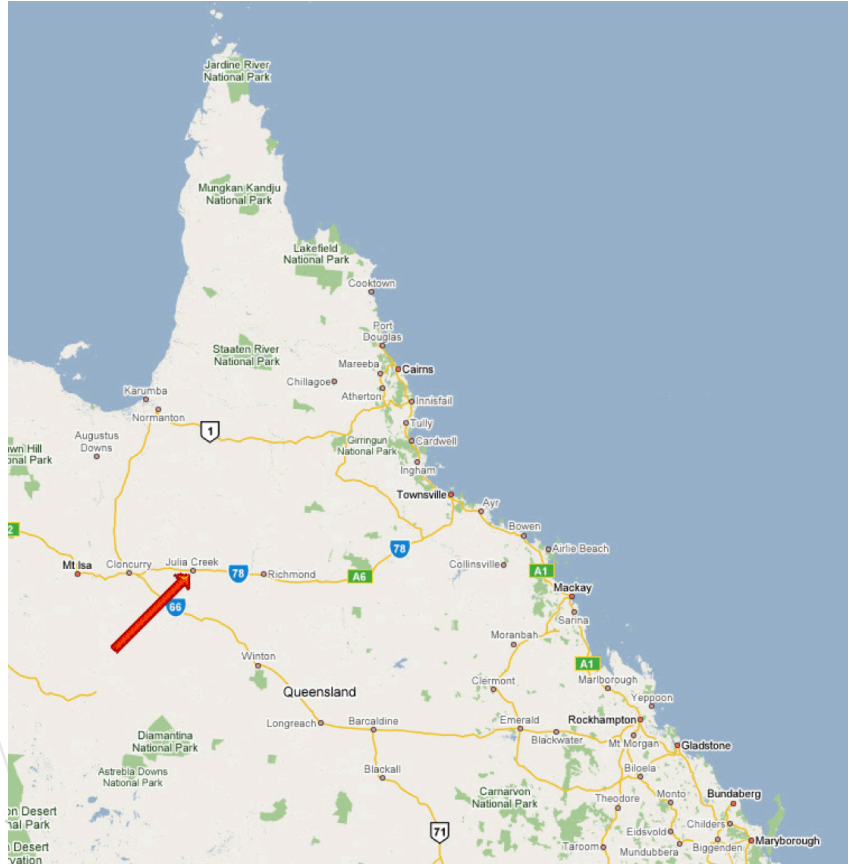
- Deposit is shallow with favorable strip ratios as low as 2:1
- Given the resources are near surface – **QEM intends to pursue development of a standard open cut method.**
- Preliminary V2O5 extraction studies showed up to 3x V2O5 content increase through simple beneficiation.
- Detailed process studies are currently underway in the USA and Australia for extraction of both hydrocarbons and vanadium.
- Extraction methods being investigated are safe and environmentally friendly.



Julia Creek Project Location



Wholly-owned Exploration Tenements Covering 496km² in the Julia Creek Area, North Western Queensland



Project Infrastructure

Queensland Government is spending millions to make mining more accessible



- A new plan, announced June 2019, included \$80m towards reducing freight charges on the Mount Isa Line and \$30m towards building a new container terminal at the Port of Townsville.



Julia Creek Resource Overview



Summary of Mineral Resources as at 31 May 2018									
Resource Class	Strat Unit	Mass (Mt)	Average Thickness (m)	In situ Density (gm/cc)	V2O5 (wt%)	Cu (ppm)	Mo (ppm)	Ni (ppm)	Zn (ppm)
Inferred	CQL	811	3.39	2.12	0.38	242	247	226	1329
	OSU	454	1.77	2.10	0.31	241	146	193	1221
	OSL	445	1.81	2.13	0.29	223	127	170	1098
Total		1700		2.12	0.34	237	190	203	1241

Note: The total resource tonnage reported is rounded to reflect the relative uncertainty in the estimate and component horizons may not sum correctly.

Summary of Contingent Oil Shale Resources as at 31 May 2018								
Resource Class	Strat Unit	Mass (Mt)	Average Thickness (m)	Total Moisture wt%	Oil Yield (L/tonne)	Oil Yield LTOM	MMBarrels (insitu-PIIP)	MMBarrels 3C
Contingent	CQL	811	3.39	8	62	63	298	268
	OSU	454	1.77	10	72	74	191	172
	OSL	445	1.81	10	63	65	165	149
Total		1700		9	64	67	654	589

Notes:

The estimate uses a minimum cut-off oil yield of 40 L/tonne, rounded down to nearest million tonnes.

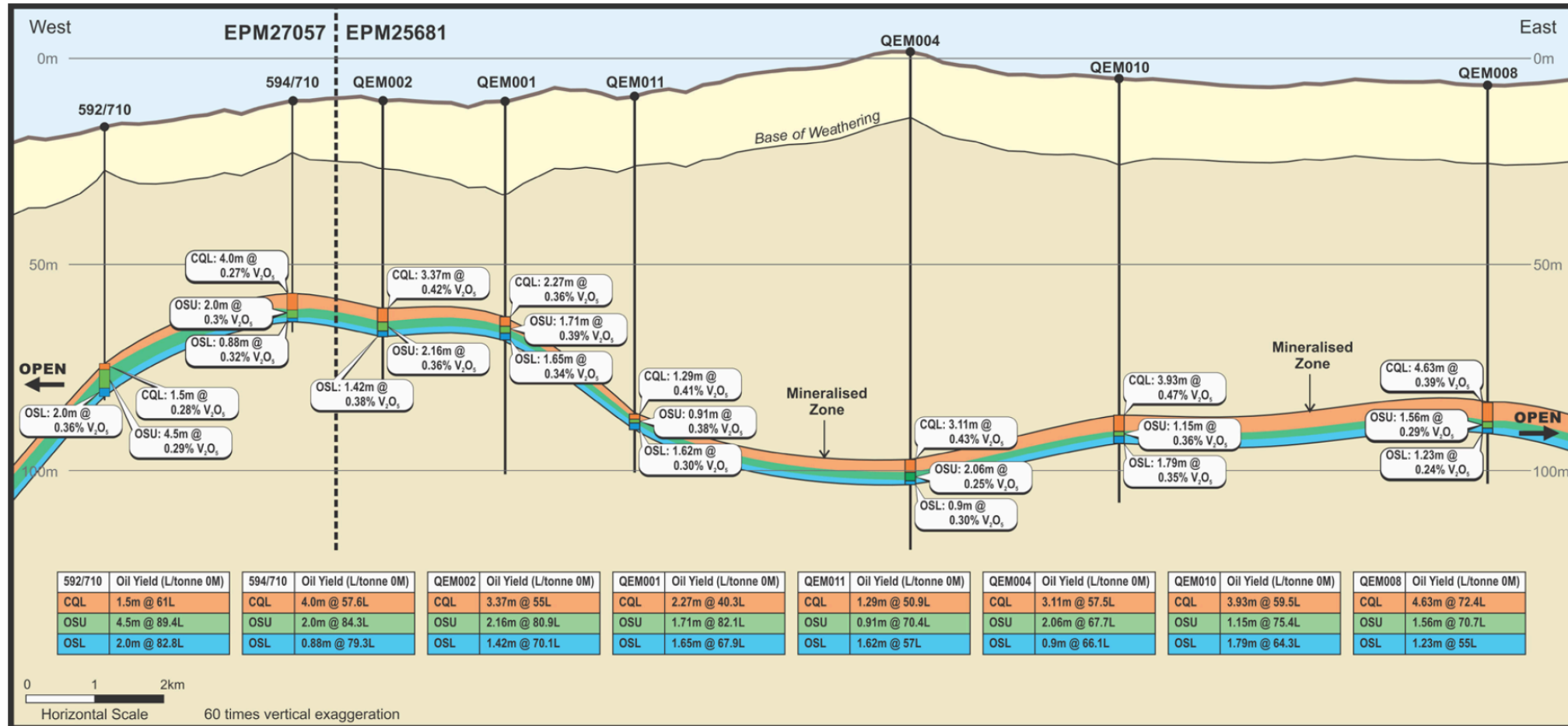
The total resource tonnage reported is rounded to reflect the relative uncertainty in the estimate and component horizons may not sum correctly.

There are no 1C or 2C Resources as the current points of observation (drill hole spacing) of the oil shale grade is insufficient to place reliable confidence on both grade and thickness continuity required for 1C or 2C Resources.

Julia Creek Oil Yield



Cross Section the Julia Creek Oil Deposit.



Source: Measured Group

The estimation methodology used is deterministic. The estimation is based on grids constructed for unit structure, thickness and oil grade parameters

Petroteq Testwork



Successful preliminary Stage 2 test results for oil extraction and recovery

- On 17 July 2019, QEM announced successful results using Petroteq Energy Inc's technology, from Stage 2 test work carried out on the previous drill core sample.
- The test work undertaken by independent lab PRI Asphalt Technologies Inc, provided strong results, with total oil recovery up to 65% of the contained oil, from Julia Creek Project samples.
- With further optimisation by Petroteq, QEM is confident that recovery can be further increased.
- The residual material of approximately 20% of original mass (after oil recovery) was separated as a result of the Petroteq process, and this residual material contains the metals.
- The V205 is contained in the residual material only, as verified by PRI's laboratory analysis.
- These results warrant a bulk sample test in order to produce sufficient oil and V205 required to carry out API (petrology analysis) testing of the oil, and V205 extraction.
- The bulk sample testing will provide a result that is a better representation for the beneficiation of the V205.

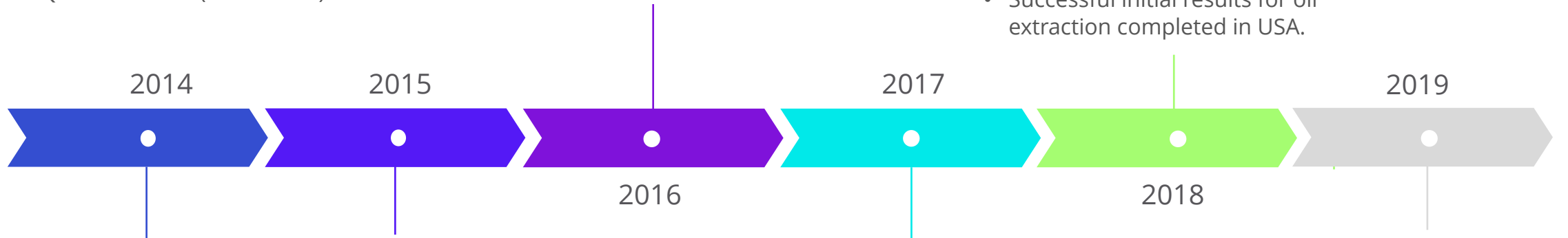
Project Milestones



Major Achievements for QEM to Date

- Scoping Study for vanadium only completed
- Initial financial modelling complete, showing strong potential for economic viability
- No Native Title
- Positive test results using supercritical water processing for hydrogen extraction from QEM's oil shale (ATSE Grant)

- JORC (2012) Resource Upgrade to 1,700Mt @ 0.34% V2O5
- Daniel Harris joins Board of QEM as Non-Executive Director
- ASX Listed Q4 2018
- Successful initial results for oil extraction completed in USA.



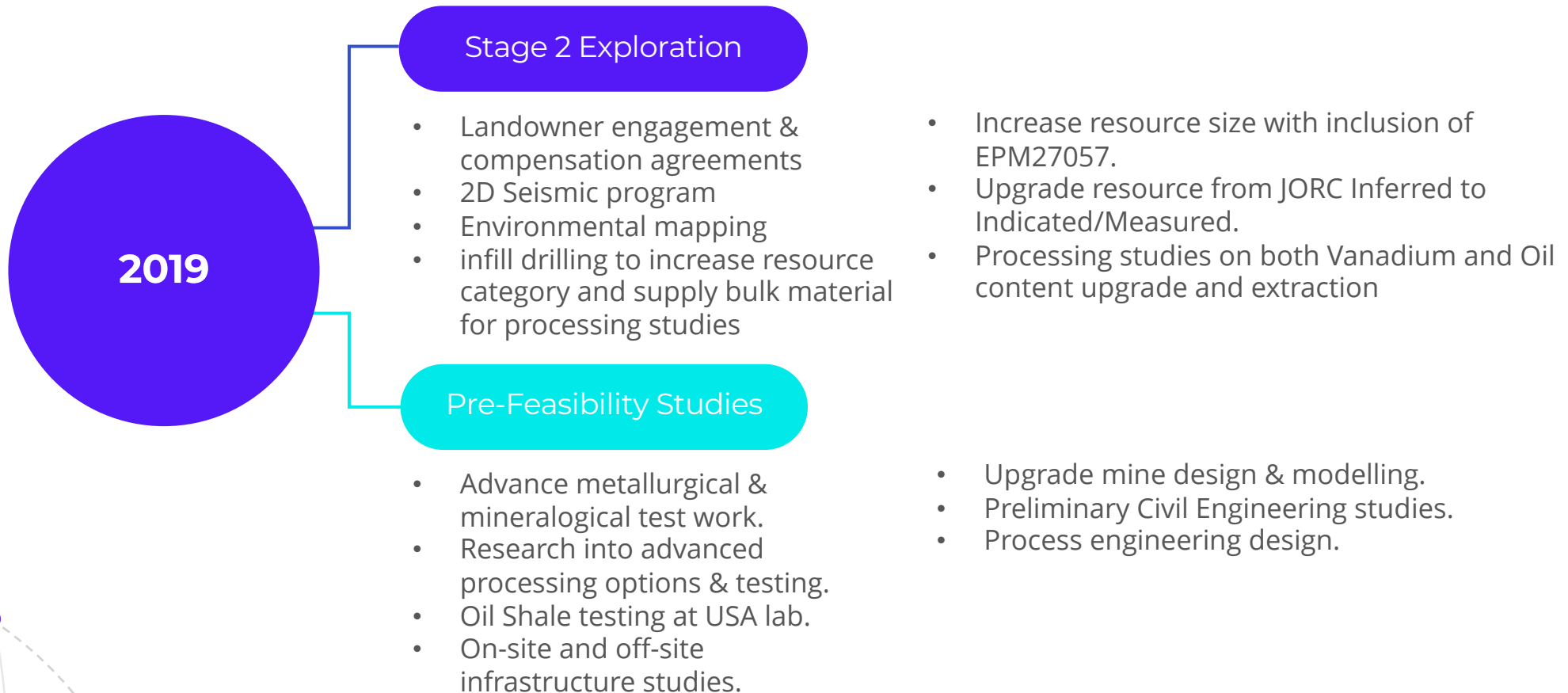
- Initial techno-economic report completed

- Granting of tenements EPM25662 and 25681
- Initial exploration complete with large JORC (2012) inferred resource target identified.

- Project implementation Study & Process Design Report
- Positive metallurgy & beneficiation testing
- Acquisition of EPM 26429 – granted Feb 2017
- Addition of Daniel Harris to the team as Chief Advisor
- MOU signed with Petroteq Energy Inc USA

- Petroteq activation and optimisation
- Seismic Survey & 5 hole drilling
- Acquisition of EPM 27057 increasing the project to 496sq km
- Petroteq results demonstrate extractability of crude oil

2019 Strategy



Fuel Shortage

Running on Empty



- Australia is an island nation that depends heavily on imported fuel — and our stockpile is critically low. The Government's Australian Petroleum Statistics published in November 2018 said this would amount to 21 days of petrol for automobiles, 18 days of diesel and 20 days of aviation fuel. (ABC News 23/01/2019)
- This is clearly in contravention of Australia's obligation as a member of the International Energy Agency (IEA) to hold at least 90 days of supply.
- A review of the transport energy policies of 75 countries globally reveals Australia is alone in its total reliance on “market forces” to ensure secure access to transport fuel — critical to the functioning of society and the economy. Australia is critically exposed to disruption in the supply of transport fuels Australia's combined dependency on crude and fuel imports for transport has grown from around 60% in 2000 to over 93% today.
- QEM considers this an opportunity. Advances in processing technologies of oil shale have been rapidly developing over the last few years and although the use of oil shale for energy goes back for generations, these advancements have now made processing oil from shale commercially viable and profitable.
- QEM is currently investigating a number of these environmentally friendly extraction technologies, which will allow the company to produce liquid fuels from the Julia Creek resource, initially and provide the flexibility to potentially move toward hydrogen production in the future.





Uses of Vanadium

Vanadium - The Future of Energy Storage

Improves Tensile Strength

Most widely used alloy to strengthen steel and alloys

Supports Fuel Efficiency

High strength to weight ratio makes vanadium a vital component in the automotive and aerospace industries

Weather Resistance

Vanadium alloys are naturally durable to extreme temperature and corrosion

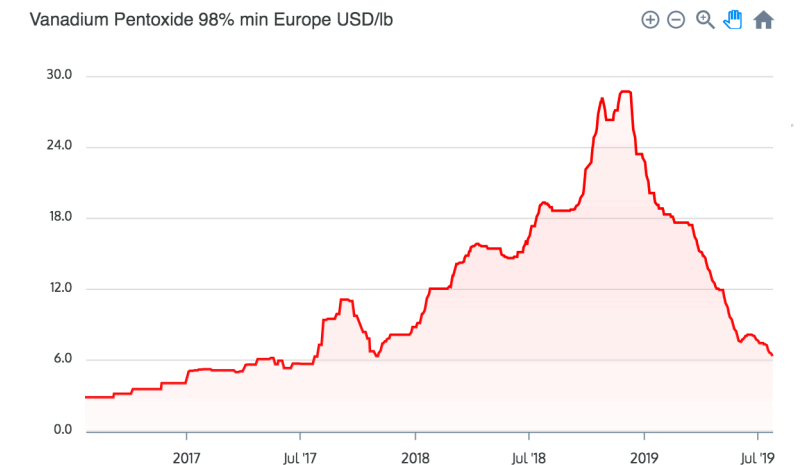
Renewable Energy Storage

Vanadium Redox Batteries are the preferred solution for large scale energy storage globally.

Vanadium Outlook



- Vanadium demand is conservatively forecasted to grow at a compound annual growth rate of 5.6%, reaching 133,000t in 2025(~202,000t V2O5 equivalent).
- 30% p.a. Increase in Vanadium Consumption expected, resulting from new regulatory changes in China.
(Source: China Iron & Steel Research Institute (CISRI) & Metal Bulletin August 2018)
- Vanadium was added to the 'US Strategic Metals List' in 2018, illuminating the metals importance to that nations industry.
(Source: ROBERT GOTTLIEBSEN: The Australian, March 5, 2018)
- Global crude steel production reached 1,808.6 million tonnes (Mt) for the year 2018, up by 4.6% compared to 2017.
(Source: <https://www.worldsteel.org/media-centre/press-releases/2019/Global-crude-steel-output-increases-by-4.6--in-2018.html>)
- Global deficit forecast to increase to ~28,500t V₂O₅ in 2021 and ~39,300t V₂O₅ in 2023
(Source: Merchant Research & Consulting).
- Automotive – 6.81% growth in vanadium use. By 2025-85% of all cars will contain vanadium alloys.
(Source: Roskill 2017 report)



Renewable Energy Storage

Building a Renewable Future



Competitive Advantages:

- Vanadium redox flow batteries (VRFB's) are the most efficient battery technology for utility scale renewable energy storage, including wind and solar
- Higher levels of safety & stability with proven, reliability, scalability & durability
- Load levelling function, removing the need for expensive gas peaker plants
- Long term cost advantage over competitors
- The global VRB market size was assessed at USD \$142.1 million in 2017 and is anticipated to expand at a CAGR of 59.7% over the forecast for the period from 2018 to 2022
- Currently <9% only of vanadium supply is used for VRFBs, with this figure set to grow significantly over the coming years

Source: <https://www.energyandcapital.com/articles/the-best-thing-since-lithium/1531>
Mining Journal June 2018



Construction

Stronger, safer buildings

- Vanadium plays an essential role in providing high strength, cost-effective solutions in the steel industry
- Announced in February 2018, with implementation by the 1st of November 2018, China revised steel rebar standards to limit the use of inferior strength steels in its ever growing construction industry
- Due to these revised standards, global demand for vanadium is set to increase, with this development expected to add between 10,000t to 15,000t of vanadium demand, and signs of an increase in demand is already evident
- Vanadium demand is conservatively forecasted to grow at a compound annual growth rate of 5.6%, reaching 133,000t in 2025, and supply including all idle capacity and expansion of existing primary mines, predicted to grow at a CAGR of 3.7% to 111,000t in 2025.



Aerospace & Automotive

Vanadium and the future of transport



- Increased aircraft are required to service larger addressable air-travel market
- Both Boeing & Airbus both forecast annual global air traffic growth between 2016 and 2035 of nearly 5%. A titanium alloy containing 4% vanadium and 6% aluminium (Ti6Al4V) has been used extensively for blades, discs and casings of the compressors in many designs of the aero-engine gas turbine
- The development of new titanium alloys continues with the Vanadium component ranging from 8, 10 to 15%, which results in even higher strengths and the potential to make important contributions to weight reduction
Source: <http://www.nextsourcematerials.com/vanadium/about-vanadium/> Mining Journal June 2018
- Aerospace - 70,000 new aircraft on order from Boeing and Airbus alone.
(Source: The Australian, Friday, July 15 2016)
- By 2025, 85% of all cars will incorporate vanadium alloy to reduce weight
- Engine components such as crankshafts and connecting rods are highly stressed and must withstand many cycles. Vanadium micro-alloyed forging steels are widely used for these parts, as well as other applications in the chassis, drivetrain, suspension and valve springs. (source: Vanitec.org)

Contact

David Fitch

Executive Director

david@qldem.com.au

+61 (0) 400 631 608

www.qldem.com.au

Jane Morgan

Investor Relations

jm@janemorganmanagement.com.au

+61 (0) 405 555 618

www.qldem.com.au

