KEY PROJECT UPDATE - APRIL 2022

Julia Creek Project

QEM is a Queensland company developing a critical minerals project utilising innovative and sustainable energy solutions.

PROJECT SUMMARY

- The Julia Creek Vanadium Project (the Project) is a vanadium and oil shale mining opportunity located in the North-West Minerals Province being developed by QEM Limited (QEM).
- The Project holds one of the single largest vanadium deposits in the world with 2,850 million tonnes of vanadium, with an average vanadium content of 0.31%.
- The ore body also comprises oil-bearing shales and is measured at 79 million barrels in-situ oil equivalent (PRMS 2018 2C) and 696 million barrels of oil equivalent (SPE-PRMS 2028 3C).
- QEM plans to develop a shallow-cut mine, processing facilities and infrastructure to produce three primary commodities including high purity vanadium pentoxide, fuel and/or hydrocarbon products, and power from renewables QEM intends to construct solar and wind farms to power the Project's industrial processes and to produce green hydrogen through a water electrolysis process.
- An updated preliminary site layout is provided in Figure 1.
- Once operating, the Project is forecast to produce 10,000 metric tonnes of high purity vanadium pentoxide per year, 250MW of renewable electricity installed capacity and approximately 6,000 barrels per day of transportation grade fuel.
- Green Hydrogen is a key element required to convert the oil into low sulphur transport fuels.
- Excess renewable energy generated could be supplied to the National Electricity Market (NEM) via connection to the proposed CopperString 2.0 transmission line.
- Water supply options for mining and hydrogen production are currently under investigation with the QLD Government.
- The Project boundaries extend from approximately 6 km to 37 km east of Julia Creek, adjoining the Flinders Highway in North Western Queensland and the Great Northern Railway line.
- Julia Creek is situated 655 km by road to the west of the Port of Townsville and 255 km east of the mining town of Mount Isa.

TRANSPORT FUELS TO MINIMISE NATIONAL SECURITY RISKS

- Australia's dependence on imported transportation fuels has also been highlighted as a national security risk. The proposed Project would provide opportunity to extract both oil shale and vanadium, while generating green energy for hydrogen production and potential sale to the market. This offers efficient and cost-effective processing technologies for production of oil, vanadium pentoxide, and green hydrogen while reducing Australian reliance on imported fuels.

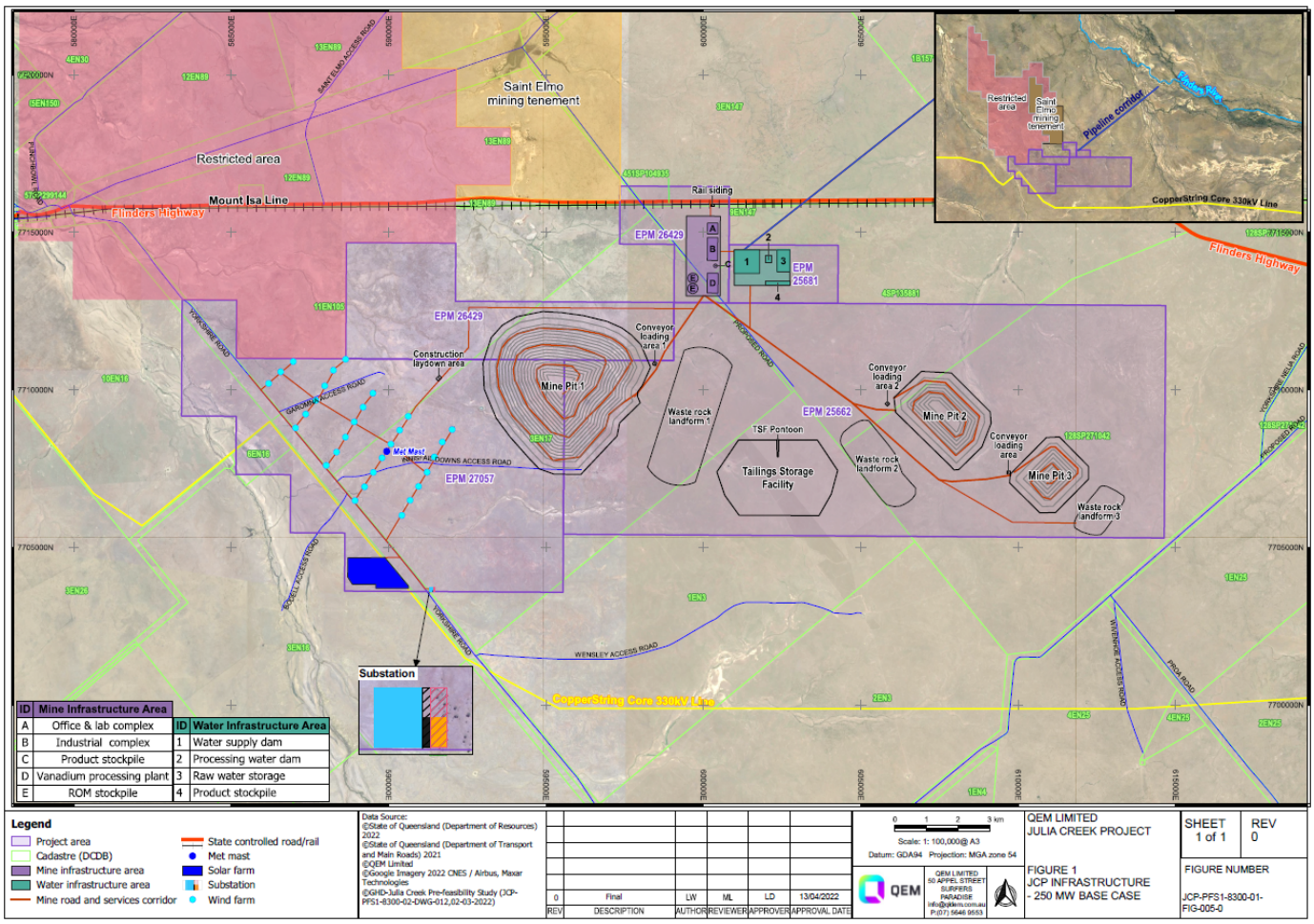


Figure 1: Peliminary Infrastructure Layout

CRITICAL MINERAL PROJECT IN THE NORTH WEST MINERALS PROVINCE

- The Project will produce high purity vanadium pentoxide, a critical component in redox flow batteries (safe, large scale grid level energy storage) and lightweight vanadium steel alloys, occurring in the resource-rich NWMP of Queensland.
- The Project is strategically important due to the role vanadium will play in achieving Australia's COP26 commitment to net zero emissions by 2050. It is consistent with the increasing global and regional focus on developing renewable energy sources, critical minerals and green hydrogen. These industries have all achieved strong State and Federal Government support
- The demand for vanadium is forecast to increase from 110kt to 580kt by 2040 creating a market growth of ~385%. Currently approximately 90% of vanadium is used to make high-strength, low alloy steel. However, there is rapidly growing demand for vanadium to supply Vanadium Redox Flow Batteries which can power large renewable energy sources such as wind and solar. The International Energy Agency anticipates wind and solar PV to make up at least 30% of the total installed power capacity by 2025.
- Although Australia has not yet commenced producing vanadium, Australia holds the third largest vanadium resource in the world and is perfectly positioned to capitalise on this growing demand.
- The Project has been identified by the Queensland and Australian Governments through inclusion in the Australia Critical Minerals Strategy and the Queensland Department of Resources New Economy Minerals initiative: There is an increasing global demand for critical minerals in the manufacture of renewables, technology, and infrastructure.
- The Project proposes to take advantage of the future supply deficit and future demands for vanadium required for a range of renewable technology, transport and infrastructure uses including construction of solar grid batteries, jet engines, car suspension, and building frames.

PROVIDING EMPLOYMENT AND BUSINESS OPPORTUNITIES FOR REMOTE COMMUNITIES

- The Project will support the liveability of the NWMP by attracting skilled workers and their families.
- Up to 1,300 construction jobs and over 300 permanent operational jobs will be generated across its renewables, hydrogen, vanadium mining and fuel processing activities.
- These figures are early estimates and require validation as the Project progresses through the study phases. Unskilled jobs will be created by the Project in roles such as security personnel, heavy machinery operators, maintenance providers, IT technicians and bus drivers.
- A higher worker population in Julia Creek will boost long-term demand for local businesses and services, creating new employment opportunities for local workers. Given that the renewable energy infrastructure will operate past the life of the vanadium mine, the economic impact on Julia Creek is expected to be multigenerational.
- QEM is committed to supporting local community through social engagement, Indigenous relations, long-term jobs, and training. The Project will continuously identify goods and services, such as workforce, fuel, transport, and procurement that can be provided locally.

RESOURCE UPDATE

- QEM has recently announced a significant upgrade in the confidence of the oil resource and an increase in the size and grade of the vanadium deposit.
- The JORC Resource is 2,850 million tonnes (360Mt Indicated, 2,490Mt Inferred) with an average vanadium content of 0.31%, making it one of the single largest vanadium deposits in the world. The vanadium-rich Toolebuc shales contain Contingent Resource of 79 million barrels in-situ oil equivalent and 696 million barrels of oil equivalent.
- Another resource drilling campaign is proposed for mid-2022 pending consultation. Further information can be sourced from QEM's ASX announcement dated 7 April 2022 – QEM Upgrades Julia Creek Resource.

  https://www.qldem.com.au/investor-centre/#asx (for all QEM ASX announcements)

PILOT PLAN SUCCESSFULLY DELIVERED

- QEM's vanadium and oil shale bech scale pilot plant has been successfully delivered to Melboune, Australia and will commence operation shortly.
- The pilot plant has been designed and developed to validate QEM s proprietry extraction process, ahead of a commercial demonstration plant.
- This pilot plant will also provide feedstock for the multi-user vanadium processing facility in Townsville to be funded by the Queensland Government.
- QEM is a founding member of the Queensland Vanadium Consortium which worked with State Government leading up to its November 2021 announcement of the provision of over $10m in funding to build a Townsville-based facility.
- Further information can be sourced from QEM s ASX announcement dated 6 April 2022 - Pilot Plant Successfully Delivered.

ENVIRONMENT, SOCIAL AND GOVERNANCE REPORTING

- QEM is committed to achieving tangible, positive ESG outcomes, and has engaged independent impact monitoring technology company Socialsuite to ensure it can effectively measure, monitor and report on its progress across ESG metrics, and commit to operating in the safest and cleanest way possible, while providing strong and sustained value to our shareholders.
- ESG reporting enables QEM to assess and further enhance the social and environmental initiatives they are already undertaking and forms the basis of QEM's purpose statement 'Developing a critical minerals project utilising innovative and sustainable energy solutions.'
- QEM has set its initial ESG baseline and a tailored action plan that can be sourced from QEM's ASX announcement dated 31st March 2022 - QEM proactively Adopts the Global Standard for ESG Reporting.

ENVIRONMENTAL IMPACT STATEMENT UPDATE

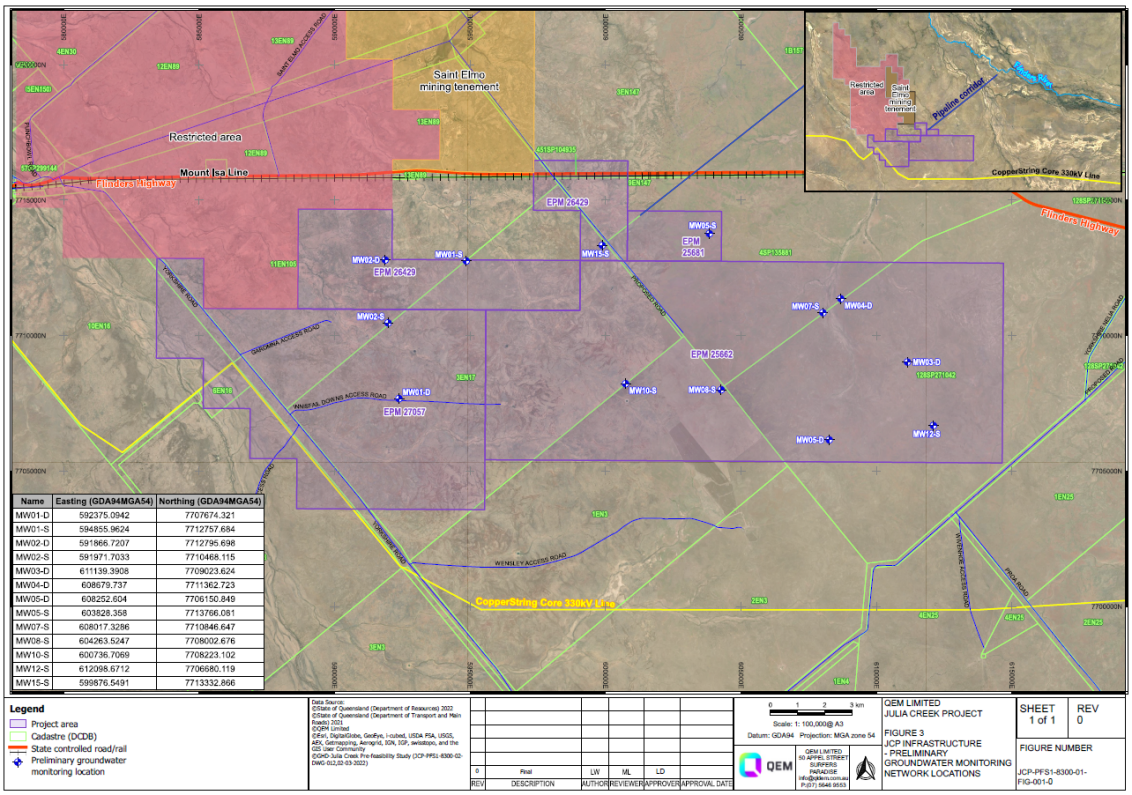
Ecology Baseline

- Epic Environmental is progressing the development of an Environmental Impact Statement, undertaking extensive baseline studies at Julia Creek. In order to understand impacts to environmental values, it is important to understand the baseline or existing state of the environment.
- In March 2022, Epic completed baseline ecology field surveys at the project site to generate a baseline list of species.
- The field surveys involved trapping for small mammals, bird surveys, vegetation studies and targeted searches for the Julia Creek Dunnart.
- No Julia Creek Dunnarts were found during the survey.
- Understanding the habitat values of the Project site is important to inform what impact the Project may have on habitat connectivity and fragmentation, species populations and biodiversity in general. A collection of photos from the field survey are provided in Figure 2.

Figure 2: Ecology Field Survey Photos (Epic Environmental, 2022)

Groundwater and Surface Water Baseline

- In mid-2022, groundwater monitoring wells are planned to be installed across the Project site so that the groundwater baseline environment can be further understood.
- Once installed the groundwater wells will be sampled every month to obtain a baseline dataset of physio-chemical parameters.
- Surface water samples will also be undertaken during the monitoring events.
- A preliminary map of proposed groundwater wells is provided in Figure 3.



Name	Easting (GDA94MGA54)	Northing (GDA94MGA54)
MW01-D	592375.0942	7707674.321
MW01-S	594855.9624	7712757.684
MW02-D	591866.7207	7712795.698
MW02-S	591971.7033	7710468.115
MW03-D	611139.3908	7709023.624
MW04-D	608679.737	7711362.723
MW05-D	608252.604	7706150.849
MW05-S	603828.358	7713766.081
MW07-S	608017.3286	7710846.647
MW08-S	604263.5247	7708002.676
MW10-S	600736.7069	7708223.102
MW12-S	612098.6712	7706680.119
MW15-S	599876.5491	7713332.866

Figure 3: Peliminary Groundwater Well Locations

ENGINEERING UPDATE

Drone Survey

- A drone survey is proposed to commence mid-May. It should not cause any disturbance to cattle, as a higher altitude fixed wing drone will be used rather than the rotor drone.
- The drone will fly at 300m above ground level is as loud as a whipper snipper at ground level (when standing next to it), so much quieter at altitude.
- The survey data will inform future engineering and environmental studies to support the progress of the project into its Feasibility Study.

Wind and Solar Baseline Information

- QEM is currently studying the viability of solar and wind farms to power the Project's mining operations, green hydrogen production on-site and minerals processing with an option of exporting to the NEM, through the proposed CopperString 2.0 330kV transmission line that runs through the Project area, should the opportunity present.
- To gain a better understanding of the of available solar and wind resources it is proposed to install a solar monitoring station and a meteorological mast in May.
- The location of the proposed meteorological mast is provided in Figure 1.

FURTHER INFORMATION

If you would like to register as an interested stakeholder please:

- Send your contact details to info@qldem.com.au
- Call us on +61 7 5646 9553

For more information on this project see https://www.qldem.com.au/project/