



ABN 63 111 306 533

## QUARTERLY REPORT TO SHAREHOLDERS

for the three months ended  
30 June 2019

### ASX Code - EME

For further information,  
contact:

Shuqing Xiao  
Energy Metals Limited

Telephone: 61 8 9322 6904  
Facsimile: 61 8 9321 5240  
Email: [enquiry@energymetals.net](mailto:enquiry@energymetals.net)  
Level 2, 28 Kings Park Road,  
West Perth WA 6005

PO Box 1323  
West Perth WA 6872

This report and further  
information are available on  
Energy Metals' website at:

[www.energymetals.net](http://www.energymetals.net)



## HIGHLIGHTS

### Bigrlyi JV Project (NT)

Preliminary vanadium mineralisation model  
confirms significant vanadium-mineralised halo.

Metallurgical optimisation test-work gives best-  
case extractions of 77% vanadium and 99%  
uranium.

### Walbiri and Malawiri JV Projects (NT)

Energy Metals' interest in Walbiri and Malawiri JVs  
increases to 77.12% and 76.03%, respectively,  
following dilution of JV partner's interest.

### Ngalia Regional Project (NT)

Tenement reduction and consolidation plan  
finalised.

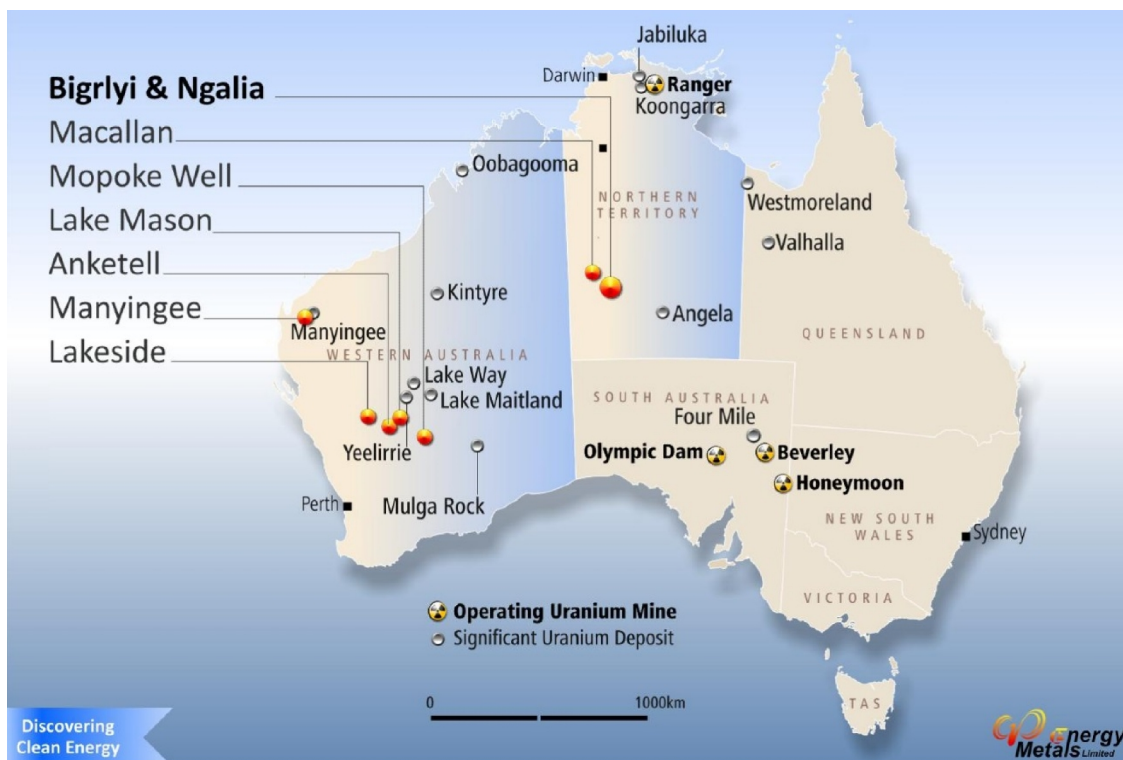
## FINANCIAL

Energy Metals had approximately \$17.68M in cash  
and 209.7M shares on issue at 30 June 2019.

Shuqing Xiao  
Managing Director  
30 July 2019

## INTRODUCTION

Energy Metals (EME) is a dedicated uranium company with eight exploration projects located in the Northern Territory (NT) and Western Australia covering over 2,700 km<sup>2</sup> (Figure 1). Most of the projects contain uranium mineralisation discovered by major companies in the 1970's, including the advanced Bigryli Project (NT).



*Figure 1 – Location of Energy Metals Projects*

Energy Metals is well placed to take advantage of the favourable outlook for uranium as nuclear power continues to play an increasing role in reducing global carbon emissions.

Importantly Energy Metals is one of only five companies that currently hold all the required permits and authorities to export Uranium Oxide Concentrates (UOC) from Australia. The Company has completed its first shipment of UOC and is negotiating with Australian uranium producers to enable further shipments from Australia for resale, primarily to major Chinese utility China General Nuclear Power Group (CGN), ultimately Energy Metals' largest shareholder.

China Uranium Development Company Limited, Energy Metals' largest shareholder (with 66.45% of issued capital), is a wholly owned subsidiary of CGN. As of 31 December 2018, the installed capacity of CGN's operating nuclear generating plants was 24,300MWe from 22 nuclear power units with six other power units of 7,430MWe capacity under construction in various locations across China. Additionally, CGN is one of only two companies authorised by the Chinese government to import and export uranium.

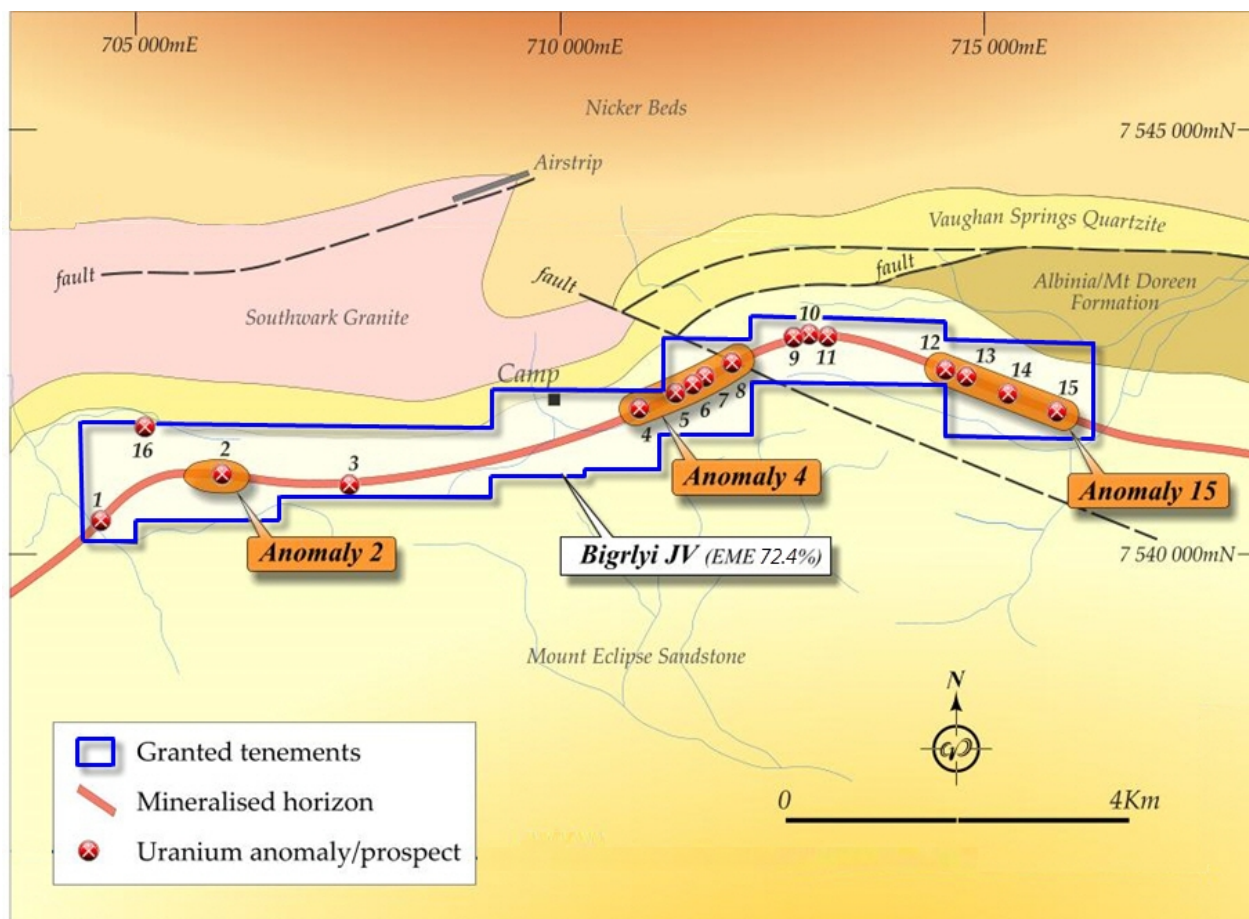
This unique relationship with CGN gives Energy Metals direct market exposure as well as access to significant capital and places the Company in a very strong position going forward.

## NORTHERN TERRITORY

### **Bigrlyi Joint Venture (EME 72.39%)**

The Bigrlyi Joint Venture comprises 11 granted exploration licences in retention (ELRs), one granted EL, and several applications within the Ngalia Basin, located approximately 350km northwest of Alice Springs. EME operates the Joint Venture in partnership with Northern Territory Uranium Pty Ltd (NTU) and Southern Cross Exploration NL (SXX). The Bigrlyi Joint Venture tenements have been subject to significant exploration activity since discovery in 1973, including over 1,040 drill holes, metallurgical test-work and mining studies, with most work undertaken at the Bigrlyi project (Figure 2).

The Bigrlyi project is characterised by relatively high uranium grades, vanadium credits and excellent metallurgical recoveries. Further information is available in ASX announcements or from Energy Metals' website: [www.energymetals.net](http://www.energymetals.net).



**Figure 2 – Bigrlyi Joint Venture Project area showing simplified geology**

The historic Karins uranium deposit (Figure 3) is part of the Bigrlyi Joint Venture and a JORC-compliant resource estimate was released to the ASX in July 2015. In October 2015, a maiden JORC (2012) resource estimate was announced for the historic Sundberg deposit, also part of the Bigrlyi Joint Venture, and a satellite of the larger Walbiri deposit (Figure 3).

On 4 July 2019, Marenica Energy Ltd (ASX: MEY) announced a conditional agreement to acquire the assets of NTU (Energy Metals' JV partner) from current owner Optimal Mining Ltd.

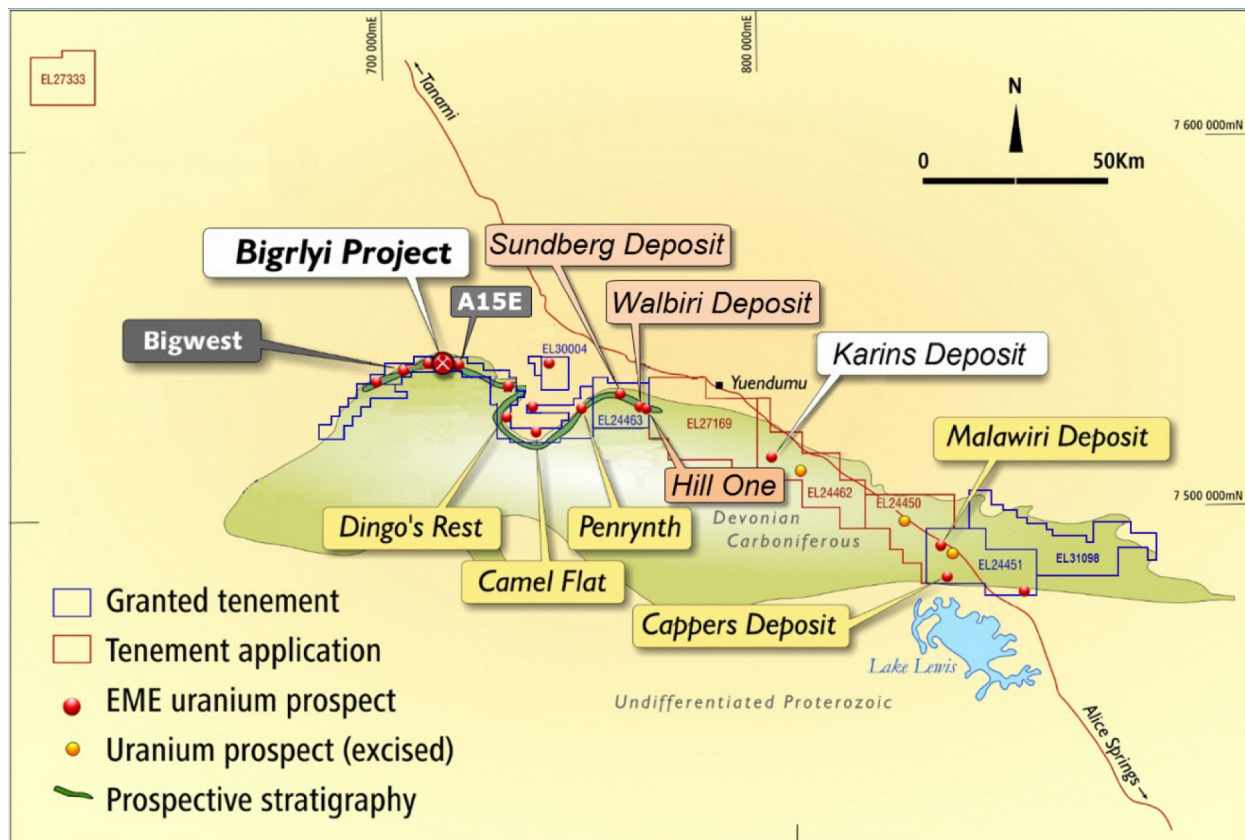


Figure 3 - Uranium deposits, occurrences and exploration target areas in the Ngalia Basin

### **Walbiri Joint Venture (EME 77.12%)**

ELR45, granted in August 2014, covers part of the historical Walbiri deposit and part of the Hill One satellite deposit (Figure 3). The project is a joint venture with Northern Territory Uranium Pty Ltd (NTU), with EME as the operator. In October 2015 an initial JORC (2012) mineral resource estimate was announced for the Walbiri deposit, confirming Walbiri as the third largest sandstone-hosted uranium deposit in central Australia after Angela and Bigrlyi.

As of 5 May 2019, NTU's interest in the project decreased from 58.1% to 22.88% following an agreed dilution of beneficial interest.

### **Malawiri Joint Venture (EME 76.03%)**

ELR41, granted in August 2014, covers the historical Malawiri deposit. The project is a joint venture with NTU with Energy Metals as the operator. A program of digitisation and reprocessing of historical gamma logs, core re-logging, and historical data compilation and verification was completed in mid-2015 and a small drilling program was completed in September 2016. In late 2017 EME advanced the Malawiri project to JORC-compliant resource status (refer ASX announcements of 27 September 2016 & 14 December 2017).

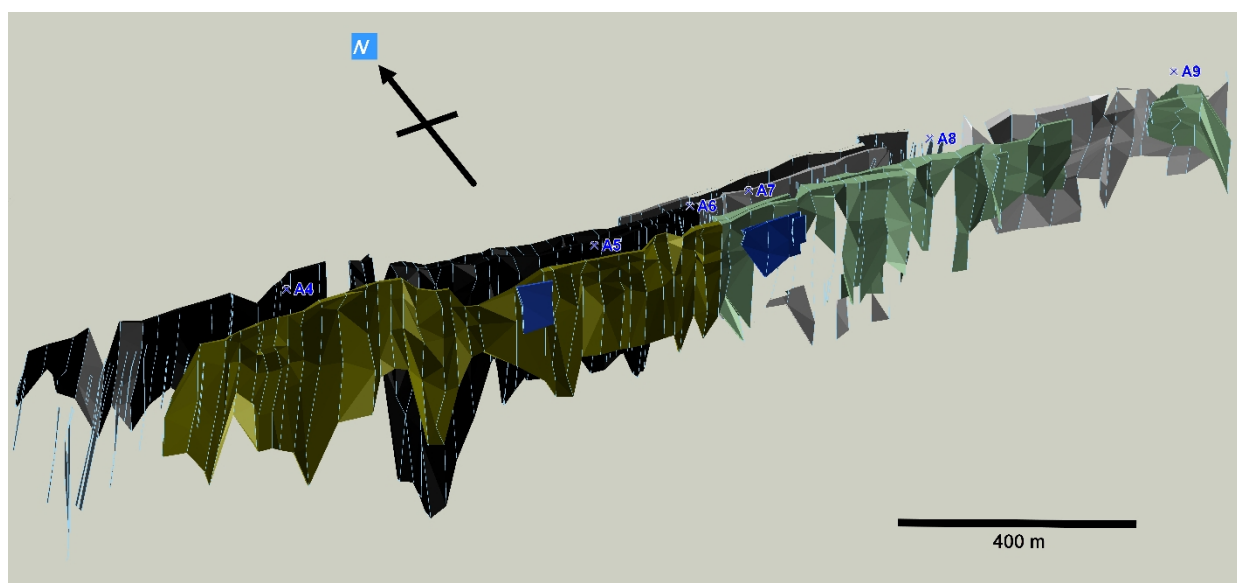
As of 5 May 2019, NTU's interest in the project decreased from 47.9% to 23.97% following an agreed dilution of beneficial interest.

## JV Activities (June 2019 Quarter)

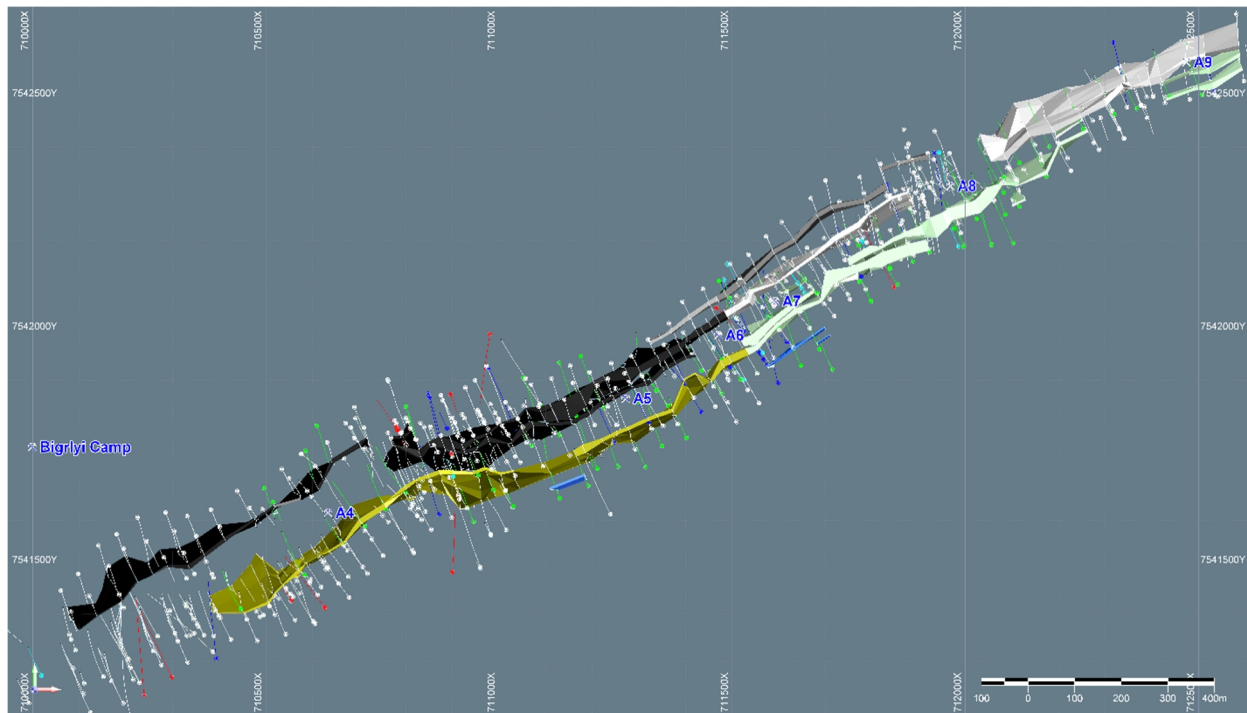
Energy Metals is committed to improving the economics of its flagship Bigrlyi project and this year has initiated a program to enhance the value of vanadium as a by-product commodity in a future Bigrlyi mining operation. Bigrlyi sandstone-hosted uranium-vanadium ores contain vanadium in various mineral forms that can be extracted by conventional acid leaching processes without the need for the extreme conditions required in the processing of more widely known magnetite-hosted vanadium. Bigrlyi uranium-vanadium ores are mineralogically identical to those of the Colorado Plateau district of the USA, which has a decades-long history of co-mining and co-recovery of uranium and vanadium; the extraction and recovery processes of uranium and vanadium from sandstone-hosted deposits are therefore well understood.

The predominant industrial use of vanadium, at present, is as a steel strengthening agent, however, the metal has growing future uses in energy storage technologies, particularly redox flow batteries, which is the technology of choice in medium-scale storage of photovoltaically-generated energy. Although the significant price rises in vanadium seen in the latter part of 2018 have not been sustained this year, demand is expected to grow in future years. The current vanadium price is \$US 8/lb  $V_2O_5$ , which is higher than the long-term vanadium price average and compares with the current uranium spot price of \$US25.70/lb  $U_3O_8$ .

**Vanadium Mineralisation Modelling.** Modelling of uranium-vanadium mineralisation at the Bigrlyi deposit has previously been constrained by the uranium distribution resulting in vanadium resources being reported on the basis of uranium cut-off grades. However, it has been recognised since the 1990s that a larger halo of vanadium mineralisation surrounds uranium mineralisation and that parts of the deposit are significantly vanadium-rich, yet uranium-poor; these parts of the deposit have not been adequately modelled and are expected to contribute additional vanadium resources. During the quarter, a program to improve the vanadium mineralisation model was initiated using data from Energy Metals' recently upgraded and re-verified exploration database. Preliminary results of the vanadium mineralisation model are shown in Figures 4 and 5 for the Bigrlyi Anomaly-4 to Anomaly-9 corridor of sub-deposits (see Figure 2). The program is on-going through the year with further results expected next quarter.



**Figure 4. Newly developed vanadium wireframe model for the Bigrlyi Anomaly-4 to Anomaly-9 corridor constructed for a 100ppm  $V_2O_5$  cut-off. The vanadium mineralisation wireframes comprise a vanadium halo that fully encloses uranium mineralisation.**



**Figure 5. Plan view of the vanadium wireframe model for the Bigrlyi Anomaly-4 to Anomaly-9 corridor constructed for a 100ppm V<sub>2</sub>O<sub>5</sub> cut-off. Drill-hole traces are shown. Additional vanadium-mineralised lenses were identified and modelled both stratigraphically above and below known uranium-mineralised areas.**

**Metallurgical Test-work Results.** Last quarter EME commenced a study to consider the range of metallurgical processing options available for co-recovery of uranium and vanadium from Bigrlyi uranium-vanadium ores. Following discussions with metallurgists at the Australian Nuclear Science and Technology Organisation (ANSTO), Lucas Heights, Sydney, the parameters were established for a laboratory-based metallurgical test-work program to be conducted during the year. The main objective of the program is to optimise, with respect to acid concentration (pH) and other parameters such as redox potential (ORP) and temperature, the extraction of vanadium from a representative Bigrlyi uranium-vanadium ore. The results of an initial series of dilute (i.e. low slurry density) leach diagnostic tests, that will be used to establish the base parameters for further conventional acid leach tests, were received during the quarter and are presented in Tables 1 (test conditions) & 2 (diagnostic test results) below.

**TABLE 1  
Test Conditions of Diagnostic Leach**

Parameter	Test 1	Test 2	Test 3	Test 4	Test 5
Temperature (°C)	50	60	50	60	80
Time (h)	24	24	24	24	24
Slurry Density (wt%)	2	2	2	2	2
pH	1.8	1.2	1.2	1.5	1.7
ORP (mV)	500	600	550	550	550
Fe <sup>3+</sup> (g/L)	2	2	2	2	2

**TABLE 2**  
**Diagnostic Test Results**

Test	Temp (°C)	pH	Target ORP (mV)	Test* ORP (mV)	Extraction (%)	
					U	V
1	50	1.8	500	555	98.7	41.7
2	60	1.2	600	600	99.4	77.8
3	50	1.2	550	568	99.2	69.5
4	60	1.5	550	566	99.2	63.9
5	80	1.7	550	556	99.2	38.0

The results show that under all conditions uranium is 99% extractable and that a maximum of 77% of vanadium is extractable under conditions of pH 1.2, temperature 60°C, and oxidation-reduction potential of 600 mV. This is a substantial improvement on previous test-work which showed typical vanadium extractions around 40%. The extractability was found to be most sensitive to pH; a higher temperature test at 80°C was unsuccessful due to formation of the mineral jarosite, which interferes with vanadium extraction. The next stage of the test-work program will involve a series of conventional leach tests (i.e., tests at higher slurry densities) at or near the optimal extraction conditions of Table 2. Further results are expected next quarter.

### **Ngalia Regional Project (EME 100%)**

The Ngalia Regional project comprises twelve 100% owned exploration licences, applications and exploration licences in retention located in the Ngalia Basin, between 180km and 350km northwest of Alice Springs in the Northern Territory (Figure 3). The tenements are contiguous and enclose the Bigryli project as well as containing a number of uranium occurrences, including part of the historic Walbiri deposit and the Cappers deposit.

Nine of the twelve Ngalia Regional exploration licences have been granted; the three remaining applications (ELs 24450, 24462 and 27169) are located on Aboriginal Freehold (ALRA) land and Energy Metals is negotiating access agreements with the Traditional Owners through the Central Land Council (CLC) (Figure 3).

A number of high priority targets have been identified on the 100% owned tenements and Energy Metals is undertaking a program of systematic evaluation of these prospects, some of which were originally discovered in the 1970s. In February 2014, EME announced maiden resource estimates for the Bigwest, Anomaly-15 East and Camel Flat satellite deposits and in October 2015 EME announced inferred JORC resources for the historical Walbiri, Sundberg and Hill One deposits (Figure 3).

### **Activities (June 2019 Quarter)**

During the quarter, a program of tenement reorganisation and consolidation was finalised resulting in a reduction of EME's holdings of exploration ground in the Ngalia Basin and environs from approximately 3,100 km<sup>2</sup> to 2,600 km<sup>2</sup>. The tenement reorganisation has the dual aims of cost savings and allowing EME's exploration activities on the Ngalia Regional project to be

focused on the most prospective areas. The reorganisation involved the amalgamation of the eastern part of EL31821 with the adjacent title EL24463 to create new amalgamated title EL32113 (Table 3). Additional programs for 2019 include:

- Continuation of a geophysical targeting program for undercover prospects in the eastern Ngalia Basin with a final report expected from EME's geophysical consultants next quarter;
- A geochemical investigation of historical, regional drill core samples that may not have previously been assessed for vanadium potential due to low uranium contents.

### **Macallan (EME 100%)**

The Macallan project comprises a single exploration licence application (ELA27333), located 460 km NW of Alice Springs and 140 km from Bigrlyi. The tenement covers a strong 3km-wide bullseye radiometric anomaly. The Macallan anomaly lies within the Wildcat Palaeovalley, an ancient valley system that drains into Lake Mackay to the southwest. The Macallan anomaly most likely represents a surficial accumulation of uranium minerals associated with the Wildcat palaeodrainage system, although other explanations are possible.

ELA27333 lies on land under Aboriginal Freehold title and access is subject to negotiation with the Traditional Owners and the CLC. The negotiation period has been extended until October 2019 and the CLC are currently reviewing EME's comments on a draft exploration agreement.

## **WESTERN AUSTRALIA**

### **Manyingee (EME 100%)**

The Manyingee project comprises retention licence application R08/3, underlying tenement E08/1480 and exploration licence application E08/2856, which are located 85 km south of Onslow. The project is located adjacent to mining leases containing Paladin Energy's Manyingee resource, a stacked series of buried, palaeochannel-hosted, roll-front uranium deposits. In November 2016 EME announced an initial JORC (2012) Mineral Resource Estimate for the Manyingee East uranium deposit, which is located up-channel of Paladin's Manyingee deposit.

Law firm Gilbert+Tobin were appointed earlier in the year to assist Energy Metals with landholder objections to grant of the Manyingee title applications. An affidavit was lodged with the objector's solicitor on 12 April 2019. The objections are expected to proceed to Warden's Court hearings over the coming months.

### **Mopoke Well (EME 100%)**

The Mopoke Well project is located 55km west of Leonora on retention licence R29/1. The project contains the historic Peninsula uranium prospect hosted by calcretised sediments associated with the Lake Raeside drainage system. A JORC (2004) mineral resource estimate was released to the ASX in March 2013.

There was no activity during the period.



### **Lakeside (EME 100%)**

The Lakeside project is located in the Murchison district 20km west of Cue on retention licence R21/1. This project was acquired to follow up previously discovered surficial uranium mineralisation at Lake Austin associated with calcrete and saline drainages. Following completion of aircore drilling programs, a JORC (2012) mineral resource estimate was released to the ASX in June 2014.

There was no activity during the period.

### **Anketell (EME 100%)**

The Anketell project is located 50km west of Sandstone on retention licence R58/2 and comprises surficial calcrete-style mineralisation discovered by Western Mining (WMC) in 1972. Following completion of aircore drilling programs, an initial JORC (2004) mineral resource estimate was released to the ASX in July 2009.

There was no activity during the period.

### **Lake Mason (EME 100%)**

The Lake Mason project is located 25km north of Sandstone on retention licence R57/2 and comprises shallow carnotite mineralisation hosted in calcrete and calcareous sediments associated with the Lake Mason drainage system. A JORC (2004) mineral resource estimate was released to the ASX in December 2010.

There was no activity during the period.

## **CORPORATE**

Energy Metals remains in a strong financial position with approximately \$17.68 million in cash and bank deposits at the end of the quarter, forming a solid resource for ongoing exploration and project development.

**Table 3: Tenement Information as required by listing rule 5.3.3**

TENEMENT*	PROJECT	LOCATION	INTEREST	CHANGE IN QUARTER
<b>Northern Territory</b>				
EL24451	Ngalia Regional	Napperby	100%	-
EL24463	Ngalia Regional	Mt Doreen	100%	<b>Ceased</b>
EL31098	Ngalia Regional	Napperby	100%	<b>Partial Surrender</b>
EL31820	Ngalia Regional	Mt Doreen	100%	-
EL31821	Ngalia Regional	Mt Doreen	100%	-
EL32113	Ngalia Regional	Mt Doreen	100%	<b>Granted</b>
ELR31754	Ngalia Regional	Mt Doreen	100%	-
ELR31755	Ngalia Regional	Mt Doreen	100%	-
ELR31756	Ngalia Regional	Mt Doreen	100%	-
ELR46	Bigrlyi Joint Venture	Mt Doreen	72.39%	-
ELR47	Bigrlyi Joint Venture	Mt Doreen	72.39%	-
ELR48	Bigrlyi Joint Venture	Mt Doreen	72.39%	-
ELR49	Bigrlyi Joint Venture	Mt Doreen	72.39%	-
ELR50	Bigrlyi Joint Venture	Mt Doreen	72.39%	-
ELR51	Bigrlyi Joint Venture	Mt Doreen	72.39%	-
ELR52	Bigrlyi Joint Venture	Mt Doreen	72.39%	-
ELR53	Bigrlyi Joint Venture	Mt Doreen	72.39%	-
ELR54	Bigrlyi Joint Venture	Mt Doreen	72.39%	-
ELR55	Bigrlyi Joint Venture	Mt Doreen	72.39%	-
ELR41	Malawiri Joint Venture	Napperby	76.03%	<b>Change in beneficial interest</b>
ELR45	Walbiri Joint Venture	Mt Doreen	77.12%	<b>Change in beneficial interest</b>
EL30004	Ngalia Regional	Mt Doreen	100%	-
ELA27169	Ngalia Regional	Yuendumu	100%	-
EL30144	Bigrlyi Joint Venture	Mt Doreen	72.39%	-
ELR31319	Bigrlyi Joint Venture	Mt Doreen	72.39%	-
ELA24462	Ngalia Regional	Yuendumu	100%	-
ELA24450	Ngalia Regional	Yuendumu	100%	-
ELA27333	Macallan	Tanami	100%	-
MCSA318-328	Bigrlyi Joint Venture	Yuendumu	72.39%	-
MLNA1952	Bigrlyi Joint Venture	Yuendumu	72.39%	-
<b>Western Australia</b>				
E08/1480	Manyingee	Yanrey	100%	-
E08/2856	Manyingee	Yanrey	100%	-
R08/3	Manyingee	Yanrey	100%	-
R21/1	Lakeside	Cue	100%	-
R29/1	Mopoke Well	Leonora	100%	-
R57/2	Lake Mason	Sandstone	100%	-
R58/2	Anketell	Sandstone	100%	-

\* EL = Exploration Licence (NT); ELA = Exploration Licence Application (NT); ELR = Exploration Licence in Retention (NT); ELRA = Exploration Licence in Retention Application (NT); MCSA = Mineral Claim (Southern) Application (NT); MLNA = Mineral Lease (Northern) Application (NT); E = Exploration Licence (WA); R = Retention Licence (WA).

### **Competent Persons Statement**

*Information in this report relating to exploration results, data and cut-off grades is based on information compiled by Dr Wayne Taylor and Mr Lindsay Dudfield. Mr Dudfield is a member of the AusIMM and the AIG. Dr Taylor is a member of the AIG and is a full time employee of Energy Metals; Mr Dudfield is a consultant to Energy Metals. They both have sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which they are undertaking to qualify as a Competent Person as defined in the "Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves – The JORC Code (2012)". Dr Taylor and Mr Dudfield both consent to the inclusion of the information in the report in the form and context in which it appears.*

*This report references mineral resource estimates and/or related information that was prepared and first disclosed under the JORC Code 2004. It has not been updated since to comply with the JORC Code 2012 on the basis that the information has not materially changed since it was last reported.*