GROUP ANNUAL REPORT GR328

ELRs 41, 45-55 & 31319

BIGRLYI JV PROJECT
MALAWIRI JV PROJECT
WALBIRI JV PROJECT

PERIOD ENDING 17 NOVEMBER 2018

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Commodities: Uranium, Vanadium

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

SUMMARY

The Bigrlyi JV project includes eleven granted Exploration Licences in Retention (ELRs 46 to 55 & 31319 inclusive) located 390 kilometres (by road) northwest of Alice Springs. The project is a Joint Venture between Energy Metals Limited (EME) with an interest of 72.4% (operator), Northern Territory Uranium Pty Ltd (NTU) with 20.8% and Southern Cross Exploration NL with 6.8%. Tenements ELR41 (Malawiri JV project) and ELR45 (Walbiri JV project), which are separate Joint Ventures with NTU, are also included in GR328. NTU was previously owned by Paladin Energy Ltd, however, in December 2016 NTU was acquired by Optimal Mining Ltd, a private Sydney-based company.

Due to the depressed uranium market and consequent budget restrictions, the Bigrlyi project continues to be on a ‘care and maintenance’ footing with minimum exploration works conducted during the current period. The highlight for 2018 was the advancement of the Malawiri project (ELR41) to JORC (2012) mineral resource status, with estimation work finalised during the period. A maiden resource estimate for the Malawiri uranium deposit was announced to the ASX on 14 Dec 2017.

Other exploration undertaken for the period 18 November 2017 to 17 November 2018 included:

- Uranium-series disequilibrium study completed at Anomaly 4 & 15;
- Uranium-series disequilibrium study completed at Anomaly 2;
- Vanadium mineralisation study initiated;
- Review of previous metallurgical test-work at Bigrlyi completed with recommendations for advancement of the project to include co-recovery of uranium and vanadium;
- EME Database update work progressed;
- In-fill AEM survey data received over ELR41 in conjunction with Geoscience Australia’s *Exploring for the Future Program*;
- AAPA sacred site survey completed on ELR45 with a new Authority Certificate issued.

Despite the global downturn in uranium and poor market conditions, Energy Metals remains committed to the discovery and definition of additional uranium resources within its Joint Venture projects and its wholly owned Ngalia regional tenements. Further exploration and development work on the Bigrlyi Joint Venture above minimum levels is dependent on an improvement in uranium market conditions.

INTRODUCTION

Energy Metals’ flagship project is the Bigrlyi uranium deposit. Bigrlyi is a sandstone-hosted uranium-vanadium deposit located on the northern margin of the Ngalia Basin approximately 400 km northwest of Alice Springs (Taylor & Schmid, 2017). The deposit was discovered in 1973 and drilling programs were conducted in the mid-1970s to define an initial resource. This exploration phase ended in the early 1980s due to the uranium mining policies of the Government at the time and economic factors. Exploration was restarted by Energy Metals Ltd in 2005 and a JORC compliant resource of 9,570 tonnes of U_3O_8 for a 500ppm U_3O_8 cut-off grade was subsequently delineated (June 2011). The Bigrlyi project comprises eleven granted Exploration Licences in Retention and is operated as a Joint Venture between Energy Metals Limited (EME) with an interest of 72.4% (operator), Northern Territory Uranium Pty Ltd (NTU) with 20.8% and Southern Cross Exploration NL (SXX) with 6.8% (note: an update to the JV partners beneficial interests in the project was announced to the ASX on 14 November 2018).

The Bigrlyi uranium–vanadium deposit is hosted in the Carboniferous-age Mt Eclipse Sandstone. The host rock is an arkosic sandstone > siltstone > mudstone package composed of detritus derived from weathering and erosion of a granitic source region dominated by the Carrington Suite, which comprises much of the Arunta basement terrain to the north of Bigrlyi (Schmid et al., 2012). Mineralisation occurs mainly near the contacts between the informally-defined 'Unit C' (reduced, grey sandstone), and the underlying 'Unit D' (mottled sandstone) and the overlying 'Unit B' (oxidised sandstone, siltstone and mudstone) of the Mt Eclipse Sandstone (Fidler et al, 1990; Taylor & Schmid, 2017).

There are three main ore bodies at Bigrlyi which occur over a strike length of about 10km. From west to east these are termed Anomaly-2 (A2), Anomaly-4 (A4) and Anomaly-15 (A15). Deposit A2 contributes approximately 10% of the uranium in the project, while the other 90% is split approx. 2:1 between A4 and A15 respectively. All the uranium mineralisation at A2 occurs within a deep weathered zone which extends to at least 80 m below the surface, while 5-10% of the uranium in A4 and A15 is in weathered (carnotite) zones at depths <20 m. The lithologies present in A2, A4 and A15 are similar, with the only significant lithological difference being weathered versus unweathered.

ELRs (formerly ERLs) 46-55 were granted on 18 November 1988. The licences were renewed for five-year periods in 2003, 2008, 2013 and again in 2018 (Figures 2 & 3).

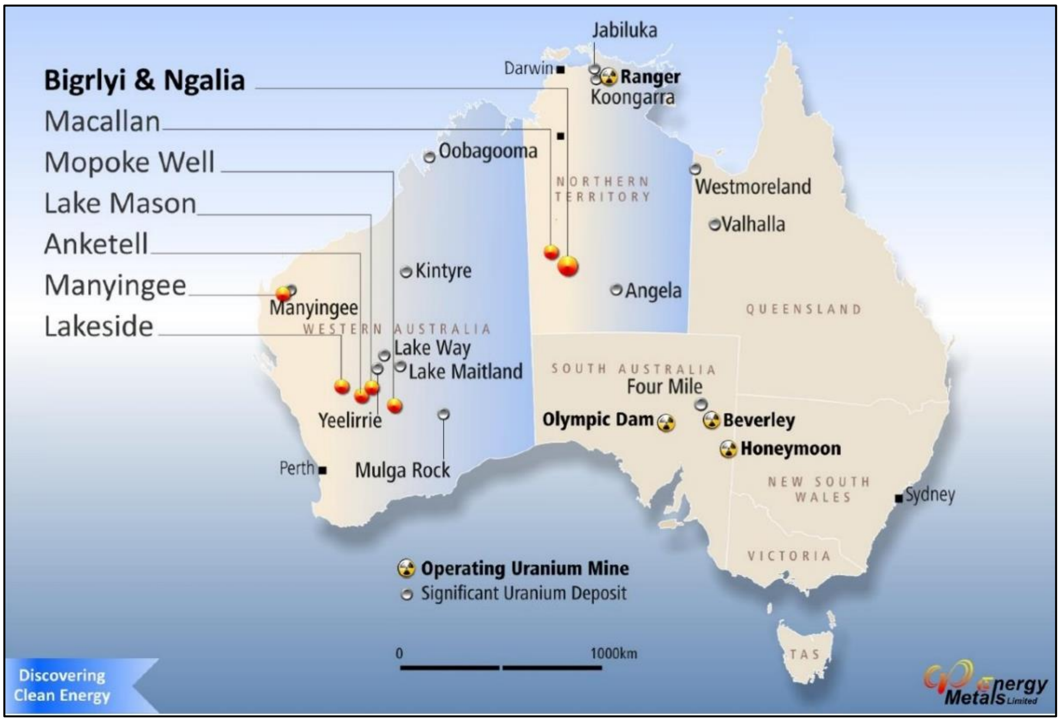

Figure 1: Location of the Bigrlyi Project (NT).

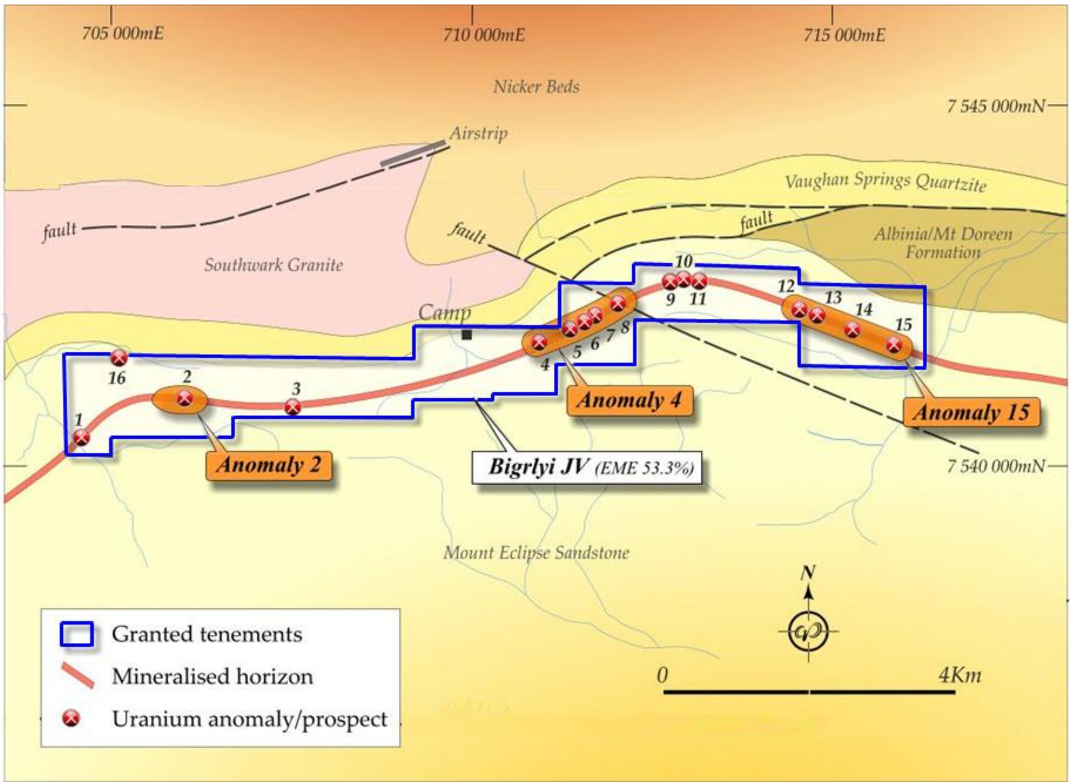

Figure 2: Bigrlyi JV project (NT) comprising 10 contiguous ELRs 46-55 (blue outline).

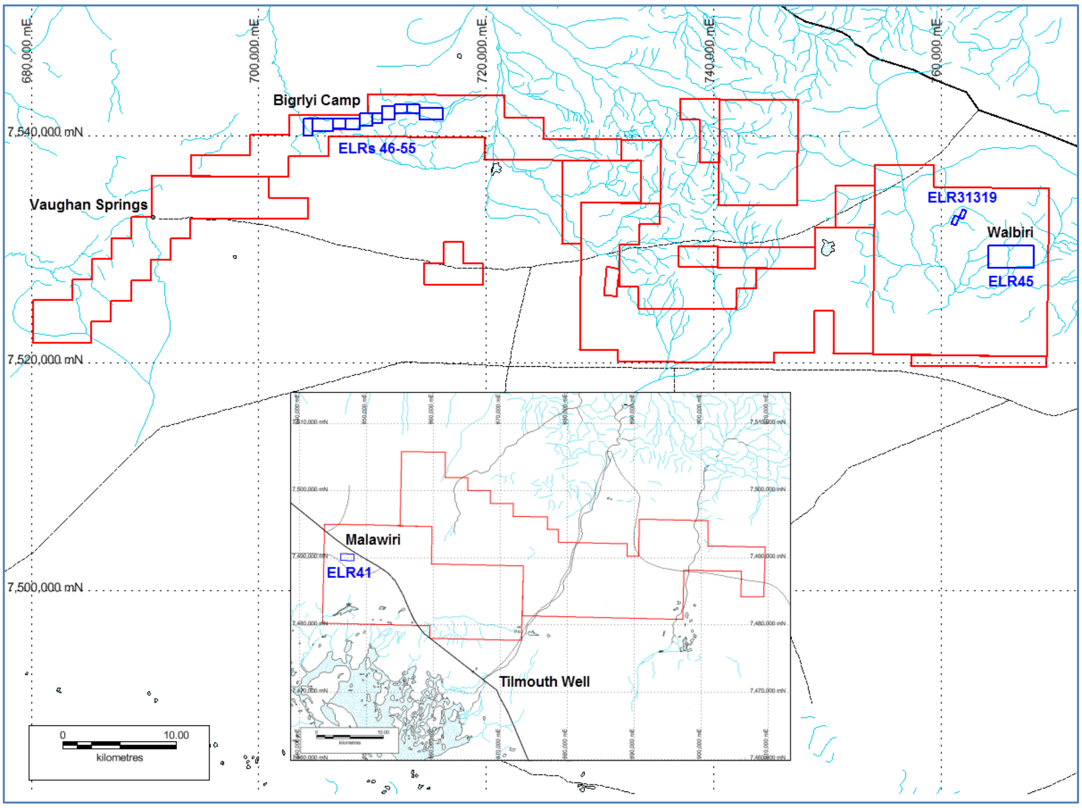

Figure 3: Bigrlyi JV (including Sundberg ELR31319), Walbiri JV and Malawiri JV (inset) tenement map (ELRs in blue; Energy Metals' Ngalia Regional tenure in red as at December 2017).

ELR41 (Malawiri JV) was granted on 18th July 2014 for a period of five years and is a joint venture between NTU (47.9%) and EME (52.1%) with Energy Metals as the operator. ELR41 covers the Malawiri uranium deposit and is embedded within the surrounding tenement EL24451, which is part of EME's Ngalia Regional project (Figure 3). The Malawiri deposit is located on the southern margin of the Ngalia Basin 30km northwest of Tilmouth Well and was discovered in 1980 (Figure 3). The deposit is a tabular, sandstone-hosted, Bigrlyi-style deposit located within steeply-dipping Carboniferous Mt Eclipse Sandstone beds; mineralisation occurs as stacked tabular bodies controlled by both sedimentary facies and redox zonation features. The mineralisation is characterised by high grade zones >10,00ppm eU_3O_8 over widths of 1-10m hosted in partially oxidised, coarse to very coarse, arkosic sandstone. An unusual characteristic compared to other deposits in the Ngalia Basin is that mineralisation is associated with hematite, likely the result of a late oxidation event, which is similar to the Angela-Pamela deposit in the Amadeus Basin.

ELR45 (Walbiri JV) was granted on 18th July 2014 for a period of five years and is a joint venture between NTU (58.1%) and EME (41.9%) with Energy Metals as the operator. ELR45 is embedded within the greater EL24463 (Figure 3) of the Ngalia Regional project and lies approximately 55km ESE of the Bigrlyi uranium deposit. Approximately 46% of the Walbiri uranium deposit lies within ELR45 (JORC resource of 3,226 tonnes of U_3O_8) with the remainder located within EME's wholly owned adjacent tenement EL24463 (3,811 tonnes of U_3O_8). The Walbiri deposit is a tabular, sandstone-hosted, Bigrlyi-style deposit but differs from Bigrlyi in that mineralisation is shallowly-dipping within Carboniferous Mt Eclipse Sandstone beds. The original Walbiri uranium occurrence was the first discovery of sandstone-hosted uranium mineralisation within the Ngalia Basin in 1971.

Two historical Mineral Claims South tenement applications (MCS329-330) dating from 1976 were converted to Exploration Licence EL30145 (granted on 8th August 2014). The tenement covers part of the historic Sundberg uranium deposit, first explored in the 1970s and located along strike northwest of the Walbiri uranium deposit. Following 2015 resource estimation work at Walbiri and Sundberg, EME converted EL30145 to an exploration licence in retention. ELR31319 (Sundberg) was granted on 22 June 2017 for a period of five years. A request for the addition of ELR31319 to amalgamated reporting group GR328 was accepted on 26/06/2017. In year one the first reporting period for this title is 15/06/2017 – 17/11/2018.

HISTORICAL WORK (1974 - 2005) – BIGRLYI DEPOSITS (ELR'S 46-55)

Mineral Resource Estimates and Metallurgical Test Work

The Bigrlyi project was the subject of a sectional resource estimate by previous project manager Central Pacific Minerals NL (CPM) in 1983 and a total uranium resource for Bigrlyi of 0.8 Mt averaging 3.43 kg/t U_3O_8 for 2,770 tonnes of contained U_3O_8 was delineated (Table 1). This included 127,000t averaging 4.19 kg/t U_3O_8 at Anomaly 15 and 420,000t averaging 3.53 kg/t U_3O_8 at Anomaly-15 Extended (now collectively referred to as Anomaly-15).

A geostatistical study of the Anomaly-15 mineralisation (including the former Anomaly-15 Extended prospect) was completed during 1997/1998 (Pope 1997, 1998). Geological block models were constructed for Anomaly-15, constrained to significantly mineralised horizons and ordinary kriging used for block grade interpolation.

The *in-situ* uranium resource at Anomaly-15 was estimated at 623,400 tonnes at an average grade of 3.21 kilograms U_3O_8 per tonne based on a block grade cutoff of 2000ppm U_3O_8 (2.0 kg/t). The total resource was classified according to the JORC Code (at that time, AusIMM, 1996) into measured and indicated categories.

Table 1: Summary of the Historical Uranium Resource Estimate

Uranium Resource (0.1 kg/t U_3O_8 cut-off)

Resource Classification	**Tonnes** (000's)	**Grade** (kg/t U_3O_8)	**U_3O_8** (Tonnes)
Measured	587	3.72	2,180
Indicated	193	2.52	485
Inferred	29	3.61	105
TOTAL	**809**	**3.43**	**2,770**

Rounding may cause computational discrepancies

Compilation of a drill hole and assay dataset for the Bigrlyi project was initiated by previous managers CPM in 1997.This dataset was progressively expanded by Resolute Limited with drill hole collar and assay data for Anomaly 4/5 compiled during 2002; data from Anomaly 6, 7 & 8 was added during 2003 and data from the intervening drilling between Anomalies 8 and 14 was entered in 2004.

In 2005 and 2006, historical data and results from the re-assaying program were validated and incorporated into a new digital database, with resource consultants Hellman and Schofield ("H&S") providing independent advice on modelling methods, geo-statistics and wireframe modelling of the mineralisation domains.

Wireframe models were constructed using 100ppm U_3O_8 and 500ppm V_2O_5 contours. Resources estimated by H&S using ordinary kriging are summarised below at various cut-off grades:

Table 2: 2006 Initial Indicated and Inferred Mineral Resource Estimates

Cut Off (%)	**Tonnes**	**U_3O_8 (%)**	**V_2O_5 (%)**	**U_3O_8 (kt)**	**V_2O_5 (kt)**
0.20	655,000	0.33	0.28	2.15	1.80
0.15	1,067,000	0.27	0.25	2.86	2.71
0.10	**1,835,000**	**0.21**	**0.22**	**3.80**	**3.99**
0.05	3,763,000	0.14	0.17	5.6	6.3

Energy Metals considers that the 0.05% lower cut-off grade best approximates the economic cut-off grade considering the style (sandstone-hosted), comparison with other operations, and location of the resources. Most of the resources lie within 200m of the surface and are considered potentially accessible via open-pit mining.

The resource estimates were based on the interpretation of 459 historic drill holes consisting of 222 percussion and 237 pre-collared diamond holes. Drill holes are nominally spaced at between 20-50m along strike in the main resource areas of Anomalies 15, 2, 4 and 7 increasing to nominal 200m spacing in peripheral areas. Assays were derived from predominantly chemical methods (XRF) in significant ore zones, and calibrated radiometric methods in surrounding and less significant zones.

Despite no vanadium resources having been calculated at Bigrlyi, a review of the vanadium potential of the uranium resource was made in 1990 (Fidler, 1990). It was concluded that under the then prevailing economic conditions, vanadium was approaching being mineable in its own right (excluding non-economic complications). Extraction tests were completed in 1991, 1992 and 1993 (Fidler, 1992a

& 1992b) together with leach-residue studies (Pope, 1994) and identification of vanadium and uranium distribution in minerals using the electron microprobe (Pope 1995).

In the primary zone, uranium was found to occur as uraninite and coffinite, whereas the vanadium occurs in montroseite and a similar Fe-Ti-V-oxide mineral occurring both as aggregates and cement, and vanadium-bearing clay minerals.

PREVIOUS WORK BY EME (2005 - 2017) AT THE BIGRLYI PROJECT (ELRs 46-55)

Historical and previous works sections appearing in previous GR328 reports have been summarised below. For more detailed information refer to the 2017 GR328 report (GR328_2017_GA_01).

Acquisition and Commencement of Exploration

In 2005 EME acquired the Bigrlyi Project and re-commenced exploration work. Initial work included preparation of a Radiation Management Plan, disposal of degraded samples and construction of a security fence around the existing core farm. The major access tracks at Bigrlyi were also graded. Database compilation was initiated with hard & electronic copy received from previous managers CPM. Surveying of ELR boundaries & collar pickups was completed by licenced surveyors. Construction of the 26-person Bigrlyi exploration camp began in 2006 and a program of re-assaying and rehabilitation of historic drillcore was initiated. A start-up drilling program, comprising 58 aircore and 45 RC holes was completed at Bigrlyi in the first 12 months.

Exploration at the Bigrlyi Project (2006 - 2017)

During the period 2006 to 2017 significant exploration works were undertaken at the Bigrlyi project. The following points outline EME's achievements:

- Collation of regional geophysical datasets- In 2007-2008, public-domain airborne magnetic and radiometric data, mostly at 100m line-spacing, covering the Bigrlyi project area were re-processed and merged with available regional data by Southern Geoscience Consultants to provide variety of regional magnetic and radiometric products for anomaly targeting purposes.
- Geophysical surveys- A small helicopter-supported RepTEM survey was completed over the project area in 2008.
- Digital photography and DEM generation- A digital aerial photographic survey over the Bigrlyi project area was undertaken by Fugro Spatial Solutions Pty Ltd in July 2011 at a pixel resolution of 10cm.
- Routine downhole gamma probing surveying- Downhole in-rod and in some cases open-hole gamma probing was carried out on all RC and diamond holes. Rod attenuation factors were determined and all probes used for this work were calibrated at the Department of Water, South Australia test pits. The gamma probe data was processed by consultant geophysicist David Wilson of 3D Exploration Pty Ltd to produce down-hole eU_3O_8 values, which were checked against chemical assay data.
- Routine Uranium & Vanadium assaying- For routine assay work, mineralised RC drill spoils and diamond half-core samples were submitted to ALS Laboratory Brisbane for geochemical analysis of uranium and vanadium principally by the XRF pressed-powder method. Highly mineralised samples containing >1% U and >0.1% V were analysed by the four-acid digestion/ICP-OES method. The QAQC scheme involves the insertion of one internal standard for every 20 field/RC samples and one blank and duplicate for every 20 RC

samples. Post-2013, assay for Ca by the four-acid digestion/ICP-OES method was routinely undertaken to enable estimation of whole-rock carbonate content. Mineralised RC metre intervals and diamond half-metre intervals were selected on the basis of gamma log 100ppm eU_3O_8 cut-off values. Generally the interval selected for assay was 5m above and below mineralisation.

- Portable XRF elemental analysis- Semi-quantitative XRF elemental analysis of selected sample pulps and RC cuttings was undertaken in the period 2007-2010 using a portable NITON XL3t 800 series analyzer. In 2011, mineralised intervals of diamond core submitted for metallurgical testwork purposes were analysed every 50cm downhole for 32 elements. This information was principally used to assist in the selection of core samples and composites for metallurgical testwork.
- Socio-Economic Study- A final report on the socio-economic conditions of Aboriginal people likely to be affected by the proposed Bigrlyi mine project, was prepared by Stanley Consultants Pty Ltd in 2011.
- Database Validations- In 2012, a review of historic drilling data from the late 1970s and early 1980s was completed in conjunction with JV partner Paladin Energy, including validation of the assay and downhole gamma data. Data for some 1,144 drill holes was revisited and revalidated, with emphasis on holes within the Anomalies 4 and 15 resource areas.
- Geotechnical Assessments- As part of an initial economic study in 2007, preliminary geotechnical analysis work was undertaken by Peter O'Bryan & Associates (POA) providing constraints for pit and underground design work. A further assessment of underground and open pit mining at Anomalies 4 and 15 was undertaken by POA in 2011 involving geotechnical logging of diamond core from within the resource areas. Rock mass conditions were considered to be favourable for longhole open stope underground mining operations.
- Rehabilitation 2012-2015- Rehabilitation of all drill sites, with the exception of a number of erosion-prone hillside drill pads at A15, was completed by end 2012 with a comprehensive rehabilitation report was submitted to the Department in March 2013. In August 2015, Energy Metals completed rehabilitation earthworks program at the A15 hillside drill pads and a number of other erosion-prone sites. The rehabilitated sites are subject to on-going checks to monitor the progress of rehabilitation.
- Database validation & upgrades- In 2017 Micromine/Geobank consultants were contracted to perform an audit of EME's databases including the Bigrlyi and Walbiri/Malawiri databases. Subsequently EME developed and commenced a plan to reconcile and migrate the data into a single database together with an update of the Geobank model and SQL version. This work is ongoing.
- Drilling- refer next section.
- Resource estimations- refer next sections.
- Scoping and Pre-feasibility Studies- refer next sections.

Drilling

A total of 52 holes for 11,508.5m were drilled in 2006, comprising 5,839m RC and 5,669.5m of NQ2 diamond core. Diamond drilling includes tails and holes from surface where access was restricted. Numerous anomalous and significant intervals of mineralisation were intersected. These intercepts extended known resources and gave the company a better understanding of the geology. Main drill targets investigated included the important Unit C/D and Unit B/C contacts. A significant increase in resources was estimated in early 2007.

For the 2007 field season one RC and one diamond rig were mobilised to site in April. At the completion of the field season (early December 2007), some 279 holes for 53,999.2m were drilled on the Bigrlyi Project. This total comprised 42,827m of RC and 11,172.2m of diamond drilling.

Approximately 75% of the holes drilled in the 2007 program intersected anomalous or significant mineralisation.

The database was subsequently updated in preparation for the updated resource modelling and estimation in 2008.

In the 2008-9 period, an RC and diamond drilling program was designed to both extend shallow resource positions and test depth extensions at the A4 and A15 deposits. A total of 67 RC holes for 8,118m were drilled, targeting;

- C/D horizon west of A4 – 20 holes for 1,830m
- “Grade control” pattern at A15 – 10 holes for 1,260m
- “Grade control” pattern at A4 – 3 holes for 306m
- Follow-up drilling at A3-A4 defined zone – 13 holes for 1,293m
- Potential mineralised horizons between A10 and A15 - 11 holes for 2436m
- RC precollars for metallurgical testwork - 10 holes for 993 m

In addition, 9 diamond holes for 750m, including 5 wedges, were drilled for metallurgical sampling. Parent holes were of HQ diameter while tails were NQ.

In 2009-10, a total of 27 RC holes for 6,152m were drilled:

- Targeting mineralised positions defined late in 2009 and potential extensions to the previously defined scoped pits – 16 holes for 4,164m
- Hydrology – 7 holes for 1,422m
- RC precollar for Underground Geotechnical – 2 holes for 196m
- RC precollar for A4 pit extension – 1 hole for 319m
- RC precollars for metallurgical testwork - 1 hole for 51 m

In addition, 22 diamond holes and diamond tails for 3,589m, were drilled for metallurgical sampling, geotechnical investigation and testing the extension of predesigned pits. Geotechnical and metallurgical holes were of HQ diameter while tails were NQ.

- Metallurgy – 5 holes for 388m
- Geotechnical – 10 holes for 2043m
- Exploration tails– 7 holes for 1157m

In the 2010-11 period, a total of 116 holes were drilled, including RC, RC precollar with diamond tail, and diamond core holes from surface. RC drilling totaled 13,789m and diamond drilling totaled 4,629m during the reporting period. In summary there were:

- 65 RC holes for exploration purposes (resource extension and infill drilling) totaling 11,429m
- 19 RC pre-collars to diamond core holes for a total of 2,360m (note: tails on 3 precollars were not drilled before the end of the reporting period).
- 9 NQ Diamond core holes for exploration and underground resource extension purposes totaling 2,001m.
- 18 HQ Diamond core holes for metallurgical (variability) and geotechnical testwork totaling 1,329m.
- 21 PQ Diamond core holes for metallurgical (pilot plant) testwork totaling 1,299m.

In the 2011-12 period, a total of 19 drill holes for 3,144.8m, including 2,342m RC and 4 diamond tails for 802.8m were drilled on Anomalies 2, 3 and 4 during the reporting period. This work comprised:

- Anomaly 2 - Four RC holes for 417m testing the eastern extent of mineralisation (BRC11162 to BRC11165)
- Anomaly 3 - Eight infill RC drill holes for 872m (BRC11154 to BRC11161)
- Anomaly 4 - Three RC holes with diamond tails (499m precollar and 379.8m tails for 878.8m) (BRC11150 & BRC11151, BRC11153) as part of geotechnical studies
- Anomaly 15 – Three geotechnical holes (RC precollar with diamond tails) for 814m (391m precollar and 423m tails (BRC11146 & BRC11147, BRC11149). And one infill hole (BRC11148) for 163m; diamond tail yet to be drilled.

All RC drilling (5¼ inch diameter) was carried out by Arrinooka Drilling Pty Ltd using a Schram T685 rig while the HQ diamond tails were completed by Hodges Australia Drilling Pty Ltd using a Vickers Keough VK600.

All holes were gamma probed and if warranted, geochemically sampled (excluding the geotechnical holes).

Due to the depressed uranium market and consequent budget restrictions, no exploration or resource drilling has been conducted at the Bigrlyi project in the reporting periods from 2013 to present.

Resource Estimations

The 2006 resource model was used to compile a preliminary scoping study on the economics of the deposits for uranium and vanadium mining and processing on site. Full data is included in the 2007 Annual Report.

For the purpose of listing requirements of previous Joint Venture partner Paladin Energy Limited, an NI 43-101 first time resources document was produced by resource consultants Hellman & Schofield Pty Ltd ("H&S"). Data is included in the 2007 Annual Report.

In 2011, H&S completed resource estimates for Bigrlyi incorporating the results of all drilling up until 2010. The resources were estimated at various cut-off grades using the Multiple Indicator Kriging (MIK) method to estimate uranium resources and Ordinary Kriging (OK) to estimate vanadium resources (Table 3).

At a cut-off grade of 500ppm U_3O_8 the Bigrlyi resource totaled 21.1 million pounds (Mlb) of U_3O_8 and 19.7 Mlb of V_2O_5, with 66% of the contained uranium metal (or 6,360t U_3O_8) reporting to the Indicated Resource category, compared with 60% in the July 2010 MIK resource estimate.

Table 3: 2011 Mineral Resource Estimates at 500ppm U3O8 cut-off

Resource Category	Tonnes (Millions)	U_3O_8 (ppm)	V_2O_5 (ppm)	U_3O_8 (t)	V_2O_5 (t)	U_3O_8 (Mlb)	V_2O_5 (Mlb)
Indicated	4.7	1,366	1,303	6,360	6,100	14.01	13.36
Inferred	2.8	1,144	1,022	3,210	2,900	7.08	6.33
Total	7.5	1,283	1,197	9,570	8,900	21.09	19.69

Tonnes are metric (2204.62 pounds); figures may not total due to rounding.

Scoping Studies

A Scoping Study was conducted by former JV partners Paladin Energy Ltd in 2008. The study was conducted by mining engineer Andrew Hutson from Paladin Energy and was based on the resource announced by Energy Metals in March 2008.

Assumptions used in the study include a uranium (U_3O_8) price of US$75 per lb, a vanadium ($V_2O_5$) price of US$4 per lb and an Australian dollar rate of US$0.75. Other key assumptions include a treatment rate of 0.5Mt per annum, U_3O_8 and V_2O_5 metallurgical recoveries of 90% and 50% respectively and a 5% gross royalty.

For the purposes of the study, a mine plan involving six open pits at three deposits (A2/3, A4 and A15) was chosen. These pits range in size from 0.8Mt to 74.7Mt. The open pits included in the scoping study deliver a total of 4.93Mt to the Run-of-Mine (ROM) stockpiles at an average grade of 1,537 ppm U_3O_8 and 2,529 ppm V_2O_5, recovering 15.0M lbs U_3O_8 and 13.7M lbs V_2O_5 over ten years. Scheduled ROM tonnages were estimated assuming dilution and recovery of 5% and 95% respectively. The open pit operations are quite robust to changes in most costs, although the narrow nature of the resource lenses will require mining selectivity.

The study also assessed underground resource exploitation below conceptual pit designs using conventional decline access and stoping methodologies (principally Bench and Uphole Retreat stoping) with a minimum mining width of 4 metres. Utilising these parameters one underground mine was designed at A15, producing 0.48Mt ROM at 1,214 ppm U_3O_8 and 1,496 ppm V_2O_5 to recover an additional 1.2M lbs U_3O_8 and 0.8M lbs V_2O_5 over two years.

Pre-Feasibility Studies

In 2011, Energy Metals completed a Pre-Feasibility Study (PFS) that identified, on a conditional basis, the technical viability of the Bigrlyi project. Because the PFS includes market sensitive financial modelling details a copy the full report was not provided with the 2011 Annual Report but many of the relevant consultant's studies were provided under separate headings.

As part of the PFS a pit optimisation study was completed in early 2011 and used for the mining study. The PFS confirmed that mining the Anomaly-4, Anomaly-15 and Anomaly-2 deposits using a combination of open pit and underground mining and processing ore through a relatively simple acid leach circuit could provide positive cash flow over a mine life of approximately 8 years. The PFS used a base-case uranium oxide price of $US80/lb and an exchange rate to $US of 0.85.

The capital cost for the processing plant, camp, tailings storage facility and associated infrastructure is estimated to be $181M, including $20M contingency. The total operating cost is estimated at $160/t consisting of a processing Opex of $93/t and a mining Opex of $67/t of ore processed.

The mining is planned to be staged and has been scheduled to allow a constant mill feed rate of 0.5Mt per year, achieved by operating several open pits at the same time as underground development is progressed. The overall open pit cut-off grade is estimated to be 400ppm U_3O_8, while the underground cut-off grade is 1,000ppm U_3O_8.

The mining evaluation indicates there is additional upside potential resulting from favourable geotechnical conditions confirmed by this study. These include the use of steeper pit wall angles, which allow the open pits to be mined to a deeper level; and use of bench down underground mining or long hole open stopes, both lower cost mining methods.

The PFS has confirmed the following;

- Excellent metallurgical recoveries (>95%)
- Reasonable acid consumption (60kg/t)
- Excellent geotechnical conditions that could allow overall pit wall angles (excluding ramps) to be steeper than 55° (the PFS used 45°)
- Good underground conditions that could enable large open stopes and therefore lower mining costs
- Process and potable water located only 20km SE of the project
- In pit tailings storage allowing a lower environmental footprint
- Initial baseline studies identified no environmental impediments to development
- Capital Costs of $181M for the processing plant and associated infrastructure, including $16M for tailings storage and $89M for mining (including pre-production and sustaining capital)
- Processing operating costs average $93/t of ore processed
- Mining costs average $67/t of ore mined
- Total cash flow of $121M from a total revenue base of $979M (based on a US$80/lb U_3O_8)
- A mine life of approximately 8 years, producing around 10Mlb U_3O_8 over the life of the project.

A peer review of the study (excluding all financial considerations), undertaken by Paladin Energy's technical team, determined that the technical aspects of the study are essentially valid.

One key finding was that a substantial increase in the resource base that underpins the project, especially if those resources are amenable to open pit mining, is essential to improve project economics. Work is ongoing in the BJV tenements and regionally with the aim of increasing the resource base and also to advance the long lead items for a more detailed feasibility study.

GEOLOGICAL RESEARCH

A number of research programs have been conducted by internal and external consultants since 2006 as detailed below:

- Structural geology- Davis & Vanderhor Geological Consultants completed a brief study into the structural geology at Bigrlyi in 2006.
- Geochemical domaining studies 2011-Geological and geochemical studies have indicated that there are substantial variations in the proportion of calcium carbonate cement present in Bigrlyi ore zone sandstones along strike, with depth into the ore zones and within each Anomaly.
- CSIRO-JSU Ngalia Basin Mineral Systems Project- A total of 13,126 meters of Diamond core and 27,015 meters of RC chips were logged by the CSIRO Hychip/Hylog unit as part of the CSIRO-JSU Ngalia Basin mineral systems study in mid-2010 (Schmid et al., 2012).
- Geological Mapping- A program of geological mapping both at the deposit scale and at the outcrop scale was undertaken in 2011-2012 in conjunction with joint venture partners Paladin Energy. The purpose of the program was to assist in development of a detailed ore deposit model for Bigrlyi and to target new areas of prospective mineralisation.
- Geological Modelling- In 2011-2012, geological models for Anomalies 2, 4 and 15 were prepared by JV partner Paladin Energy using the Leapfrog Mining software package, using 250, 500 and 1500 ppm U_3O_8 cutoff grades.

- Spectrometer and Ground Magnetic Surveys- In 2012, ground radiometric and magnetic surveys were carried out in conjunction with JV partner Paladin Energy over Anomalies 2/3, 4 and 15.
- Geophysical Surveys – Gradient Array IP- Results of gradient array induced polarisation (GA-IP) surveys at Bigrlyi were reported in the 2013 Annual Report. The surveys were orientation surveys carried out over the A4 and A15 uranium deposits with an aim of determining the chargeability and resistivity signature and characteristics of known Bigrlyi-style ore bodies.
- Bulk Density Determinations- In 2013 bulk density measurements were carried out on 946 core samples and returned an average bulk density of 2.60 gcm-3 with minor differences between sandstones, siltstones and shales.
- Lead Isotope studies- An orientation soil geochemical lead (Pb) isotope study aimed at tracing radiogenic Pb as a vector to mineralisation was completed over A4 in late 2015.
- Mineralogical, geochemical & geometallurgical studies- refer section below.
- Metallurgical testwork- refer sections below.

Mineralogical, Geochemical and Geometallurgical Studies

A detailed mineralogical and geochemical study was carried out by Dr Paul Ashley of the University of New England in 2009.

Energy Metals engaged CSA Global Pty Ltd in mid-2010 to determine the key geological controls on the uranium-vanadium mineralisation at the Bigrlyi project.

A variety of work was completed during 2011-2012 reporting period in collaboration with Paladin Energy and included:

- Interpretation and analyses of 5,000 Hychips spectra from 25 RC holes and 1,929 spectra from 7 diamond holes was completed by AusSpec International to supplement and confirm the interpretation of results from the CSIRO-JSU Ngalia Basin mineral systems study in 2010.
- Twenty-two samples were submitted to CSIRO Adelaide for quantitative mineral abundance by XRD, and the results were compared to previous spectral work.
- A revision of data from three uranium ore composite samples originally submitted to ALS/Ammtec for QEMSCAN analysis was undertaken. Quartz and feldspar content was found to be approx. 70% and 15%, respectively, with chlorite, biotite, muscovite and kaolinite accounting for about 15%. The main uranium-bearing minerals are coffinite, uraninite and carnotite while vanadium occurs as montroseite, carnotite and V-clays. Although the liberation of the uranium minerals increases towards finer-grained fractions, the uranium minerals are generally poorly liberated from the host rocks.

Metallurgical Testwork

Various metallurgical testwork programs were conducted at the Australian Nuclear Science and Technology Organisation (ANSTO) at Lucas Heights Technology Centre, Sydney in the period 2007 to 2011.

A number of acid leach tests were conducted using a range of variables (grind size, acid addition, pH, and ORP and leach time) to optimise acid leach conditions. Important observations from this work include:

- Uranium extraction was rapid under all conditions tested, with leaching essentially complete within 8 hours;

- The rate of uranium extraction was largely independent of leach acidity over the range of conditions tested, whereas acid consumption decreased markedly at higher pH;
- Leaching at a lower pH increases vanadium extraction;
- Leaching at a lower controlled ORP (low oxidant consumption) did not significantly decrease the extraction of uranium or vanadium;
- A coarser grind decreases acid consumption considerably, without a decrease in uranium extraction. However much of the vanadium is locked in gangue minerals and not accessible without fine grinding.

Based on this analysis optimum leach conditions (pH 1.8, 50ºC, ORP=450 mV, coarse grind size) yielded extraction rates of 94-95% uranium and 45% vanadium.

The viability of alkaline leaching as an alternative process route was also investigated. Alkaline leaching (24 hours) on fine grind sizes extracted 93% of uranium but only 21% of vanadium. ANSTO notes that the higher cost of alkali versus acid reagents necessitates maximum recovery by recycling, which can result in the build-up of contaminants and issues with water balance. There is also greater potential for vanadium contamination of the uranium product in an alkaline flowsheet.

As Bigryli ore is amenable to both acid and alkaline leaching, a key outcome of the testwork was that a good understanding of the carbonate content or the ore and its likely variations needs to be developed. The acid requirement is a key factor in deciding between acid and alkaline leaching.

As part of a leach optimization and bulk leach testwork study, a series of 1kg sub samples of a composite of core drilled during 2010 were used for leach testwork. The optimal conditions were determined to be P_{80} = 105 micron, 30-35C, 550 mV, FA = 3 g/L, slurry density 55-60 wt% for 12 hours. These conditions were used in the bulk leach testwork. A single bulk leach (30kg) sample of ore was crushed and milled at ANSTO and the leach was conducted at optimal conditions specified above. Results of the leach testwork were considered to be positive and resulted in a residue uranium grade of between 30 – 50ppm U_3O_8, from the head grade of around 1500ppm, for a leach recovery of around 96 – 97%.

ENVIRONMENTAL BASELINE STUDIES

Environmental baseline studies for the project were initiated in 2009 with appointment of independent consultant Environmental Earth Sciences as project manager. These studies covered radiation, air quality, flora/fauna, soil, archaeological/heritage and groundwater. Installation of a remote weather station and scoping study visits by various consultants were undertaken and are outlined as follows:

- Radiation baseline study- A radiation baseline study over areas proposed for open pit mining, tailings storage, plant construction and other proposed mine infrastructure was completed in 2012.
- Air quality and dust monitoring study- Baseline air quality monitoring was undertaken across the project site using one high volume air sampler (HVAS) for PM_{10} monitoring, and four dust deposition gauges (DDG).
- Flora & Fauna Baseline Studies- An initial flora and fauna baseline survey (cool weather) was completed in June 2010 and finalized in 2011. A warm weather survey aimed at providing baseline information on reptile and amphibian fauna as well as rodent presence was completed in 2014 (Taylor & Liu, 2015).
- Hydrological & Hydrogeochemical investigations- A preliminary hydrogeological investigation was conducted in 2010 at the Bigrlyi project area. As part of the Bigrlyi project environmental

baseline studies, hydrogeochemical data for a number of surrounding water bores were obtained on a semi-regular basis.

- Radiation Baseline Monitoring-Results of the dust deposition and radon/thoron gas monitoring program have been previously reported (Taylor & Liu, 2015). Alpha particle readings from deposited dust were mostly below the minimum detectable levels (MDL) and typical of unmineralised windblown dust. Radon/thoron concentrations were in all cases <100 Bq/m^3 and generally within the range 10 to 30 Bq/m^3, typical of background levels for continental regions in open air sites.
- Weather Data Capture- As part of continual environmental monitoring EME established a WeatherMaster2000 weather station at the Bigrlyi Camp. The station has been in use since 2010, however, there have been some breaks in data acquisition due to problems such as battery deterioration and limited memory capacity. Weather station data tabulation is ongoing.

DPIR ENVIRONMENTAL AUDIT & INSPECTIONS

DPIR Environmental Compliance Audit 2016

The Mining Compliance Division in the Department of Primary Industry and Resources (DPIR) conducted a routine environmental audit at the Bigrlyi project site in 2016. The intention of the audit was:

- To determine the current status of the operation;
- To identify any statutory non-compliance issues;
- To identify areas for improvement;
- To present the findings as non-judgemental feedback on the performance of EME as perceived by the audit team at the time of the audit;

The Audit team identified several non-conformances and made a number of observations. In the 2016-2017 period EME made significant progress in resolving minor issues and non-conformances. All issues have now been resolved.

DPIR Environmental Inspection 2017

In May 2017 mining officers from the DPIR visited the Bigrlyi project to inspect and monitor the progress of previous rehabilitation works; no significant issues, except for blow-out of some whoa-boys and track erosion at A15, were identified.

HISTORICAL WORK (1978 - 1982) AT THE MALAWIRI DEPOSIT (ELR41)

Exploration work in the Malawiri area was carried between 1978 and 1982 in a Joint Venture between Central Pacific Minerals NL, Urangesellschaft GmbH and AGIP, following discovery of the adjacent Minerva uranium deposit by AGIP.

Malawiri and Minerva are blind prospects covered by about 85m of Cenozoic sediments. The Mt Eclipse Sandstone is thinner in this part of the Ngalia Basin compared with the Bigrlyi area and is unconformably underlain by the Vaughan Springs Quartzite. At its base, the Mt Eclipse Sandstone is generally reduced and pyrite-bearing but the mineralisation tends to be associated with an oxidative hematitic overprint. Drilling has shown that the Mt Eclipse Sandstone beds are overturned at 70-80°N dip and occur within a tightly folded structure bound by a thrust fault. Early exploration models focussed on highs or flexures in the basement topography as defined by gravity traverses, however, this form of targeting did not allow precise location of prospective stratigraphy (rather it targeted adjacent fault-uplifted blocks of Vaughan Springs Quartzite bedrock (see Figure 4 right panel) and no geological model of undercover stratigraphy was available at the time.

Uranium mineralisation occurs in several strike-orientated, stacked shoots (Figure 4 left panel) which appears similar to that found at Bigrlyi. One notable exception is that the uraninite occurs in hematitic zones close to the redox boundary. In 1980 consultants estimated a resource for Minerva of 2,900t U_3O_8 at 1,600ppm U_3O_8.

The Joint Venture drilled a total of 20 pre-collared diamond core holes at Malawiri to test a concealed portion of the Mount Eclipse Sandstone. Drilling between 1979 and 1982 was carried out on seven sections and uranium mineralisation was intersected on three of the sections, in eight separate holes. The mineralisation is usually present in multiple narrow lenses with the uranium present as uraninite. The depth to the bedrock Mount Eclipse Sandstone below Cenozoic cover rocks is typically between 80 and 125 metres.

The adjacent Minerva Deposit was discovered by AGIP in 1977 and is currently owned by NTU. AGIP's exploration activities included a program of geological mapping, ground radiometric surveying, resistivity and gravity surveying, groundwater analysis and stratigraphic rotary drilling and percussion drilling, with ancillary downhole geophysical logging.

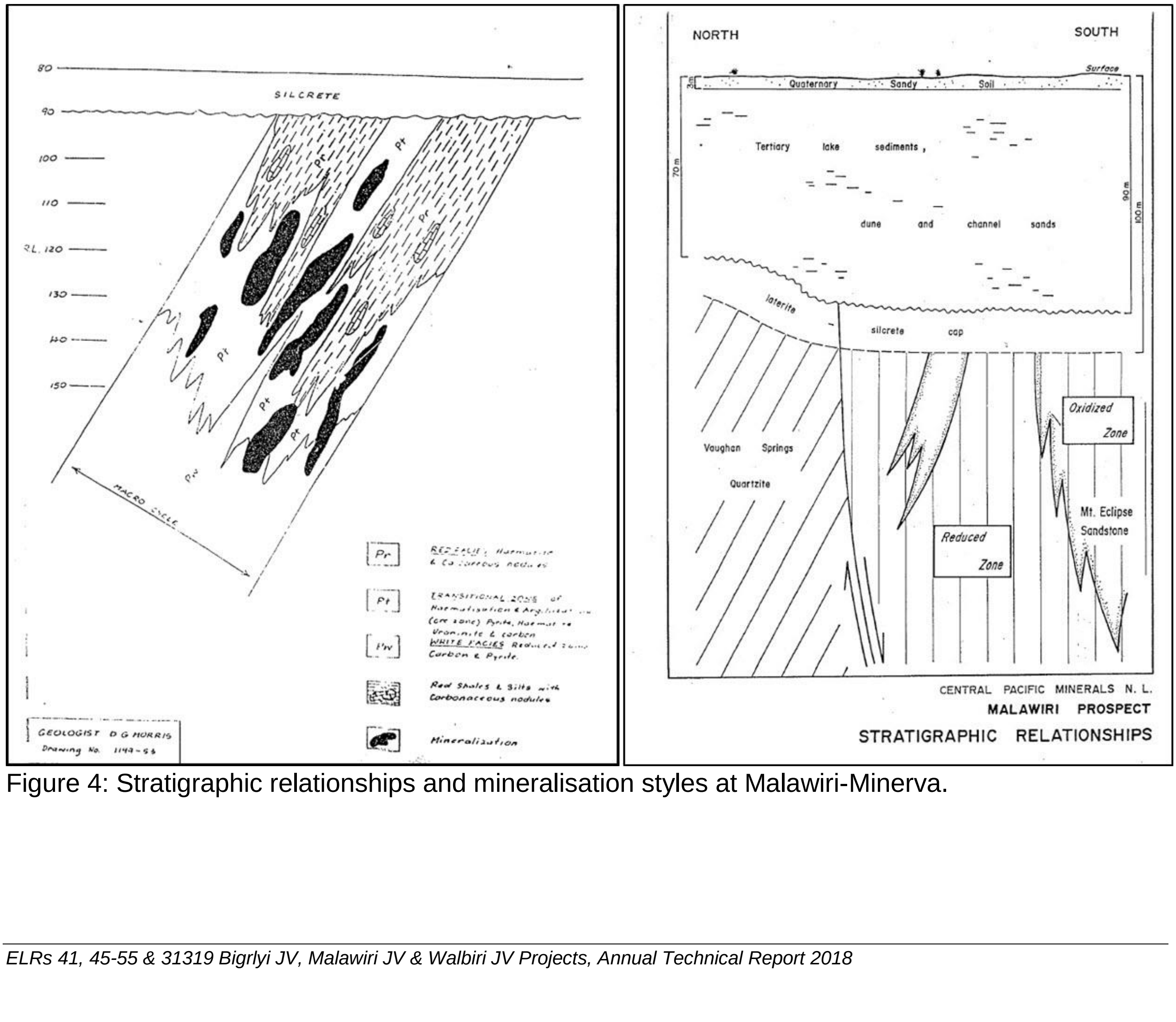

Figure 4: Stratigraphic relationships and mineralisation styles at Malawiri-Minerva.

PREVIOUS WORK BY EME (2014 - 2017) AT THE MALAWIRI DEPOSIT (ELR41)

Exploration work carried out by EME during the previous reporting periods are summarised below:

- Heritage site clearance from the AAPA and Traditional Owners;
- Database generation, historical data compilation and validation;
- Surveying of corner boundary pegs using DGPS;
- Airborne geophysical survey 2014 (magnetic and radiometric surveys);
- Historic core re-logging program;
- Geological and mineralisation models developed;
- Biogeochemical survey;
- Petrological studies and geochemical assay work by the CSIRO 2017;
- Scanning and reprocessing of historic gamma log traces by CSA consultants;
- Geophysical passive seismic survey- 2016 CORE initiative;
- Drilling program & rehabilitation- 2016 CORE initiative;
- Maiden resource estimation commencement- finalised December 2017, refer section; Work completed during the current reporting period, Malawiri Deposit (ELR41);
- Analytical test work & disequilibrium investigations- 2017;
- Airborne Electromagnetic (AEM) Survey- Geoscience Australia, refer section; Work completed during the current reporting period, Malawiri Deposit (ELR41).

HISTORICAL WORK (1971 - 1982) AT THE WALBIRI DEPOSIT (ELR45)

Walbiri and its satellite deposits are a tabular, sandstone-hosted, uranium-vanadium style of deposit similar to the nearby Bigrlyi deposit. Mineralisation is hosted in the Mt Eclipse Sandstone which is comprised dominantly of arkose, sub-arkosic sandstone and shale deposited in an ancient fluvial channel and alluvial fan system. At Walbiri, mineralisation is stratiform in nature and occurs within a number of semi-continuous lenses confined by shale bands; the dominant lens occurs immediately above a shale marker band termed the ‘C-shale’. Mineralisation is hosted in reduced, grey-green coloured, pyrite-bearing rocks typically near the interface with oxidised mottled or red-coloured rock units. Uranium tends to be variably distributed along strike and at depth probably due to both primary depositional features, including the abundance of detrital clay clasts and channel morphology, and the effects of later uranium remobilisation.

The first surficial carnotite mineralisation at Walbiri was found in shallow-dipping Mt Eclipse Sandstone in September 1971 by CPM geologists. Uranium exploration at Walbiri occurred over the period 1972 to 1976 with trenching and drilling of approximately 55 diamond core and/or percussion holes on wide spacings. CPM established a detailed stratigraphic column of the Walbiri prospect.

The last available historical resource estimate for the Walbiri deposit (non-JORC) was undertaken by the Australian Mineral Development Laboratories (AMDEL) in November 1976 using chemical assay data and employing geostatistical constraints. An estimate of 4,789 tonnes U_3O_8 was obtained for an average grade of 1,140 ppm U_3O_8 (cut-off grade not specified). An earlier, widely quoted historical “resource” for the Walbiri deposit of 690 tonnes U_3O_8 at a grade of 1,620 ppm was actually derived from a preliminary resource calculation for a single lens of mineralisation of 743m length and 113m width using a 1,000 ppm cut-off grade. Although this estimated tonnage is not indicative of the deposit as a whole, the estimate has been variously quoted as such over the intervening 40 years giving the impression that Walbiri was not a uranium deposit of significance.

AMDEL also conducted preliminary extraction tests on Walbiri core samples. U_3O_8 extractions of 99% were achieved at pH 1.5 with a low acid consumption of 5kg/tonne. The ores were found to be amenable to a conventional acid-leach process giving high U_3O_8 recoveries with acid consumption well within acceptable limits, further work may show some additional reduction in acid consumption, and leach time could almost certainly be reduced (AMDEL, 1976).

PREVIOUS WORK BY EME (2014 - 2017) AT THE WALBIRI DEPOSIT (ELR45)

Exploration work carried out by EME during the previous reporting periods included:

- Site clearance from the AAPA and Traditional Owners;
- Airborne geophysical survey (magnetic and radiometric surveys) partly covering ELR45;
- Database generation, historical data compilation and validation;
- Historical core re-logging program;
- 3D geological and mineralisation modelling;
- Petrological studies and geochemical assay work by CSIRO;
- Scanning and reprocessing of historic gamma log traces by CSA consultants;
- Resource estimation to JORC 2012 standard by CSA consultants (refer below);
- Revised AAPA certificate.

Walbiri Maiden Resource Estimate

On 27th October 2015 EME announced to the market a 7,456 tonne U_3O_8 maiden JORC resource at the Walbiri Deposit and two satellite deposits (Figure 5). Approximately 46% of the Walbiri uranium deposit lies within ELR45 (JORC resource of 3,226 tonnes U_3O_8) with the remainder located within EME's wholly owned adjacent tenement EL24463 (3,811 tonnes U_3O_8), Table 4.

The dimensions of the main Walbiri mineralised domain are approximately 3.6 km along strike with an average plan width of 300 m and maximum modelled plan width of 1,100 m. The total combined strike length of the Walbiri deposit and its two satellite deposits (Sundberg and Hill One) is 8.7 km (Figure 5). Stratigraphy and mineralisation dips between 10° and 18° to the SW and the width of the mineralised interval varies from 0.2m to 7.5m, averaging 1.3m thickness. Mineralisation extends from surface and plunges toward the SE with the deepest drill intercept being 230m below surface.

Uraninite and coffinite are the dominant uranium minerals in the sub-surface and they occur in close association with pyrite, ferroselite, and detrital-origin phyllosilicate minerals including biotite, clays and chromium-bearing chlorite. Walbiri and the satellite deposits are characterised by low levels of carbonate cement.

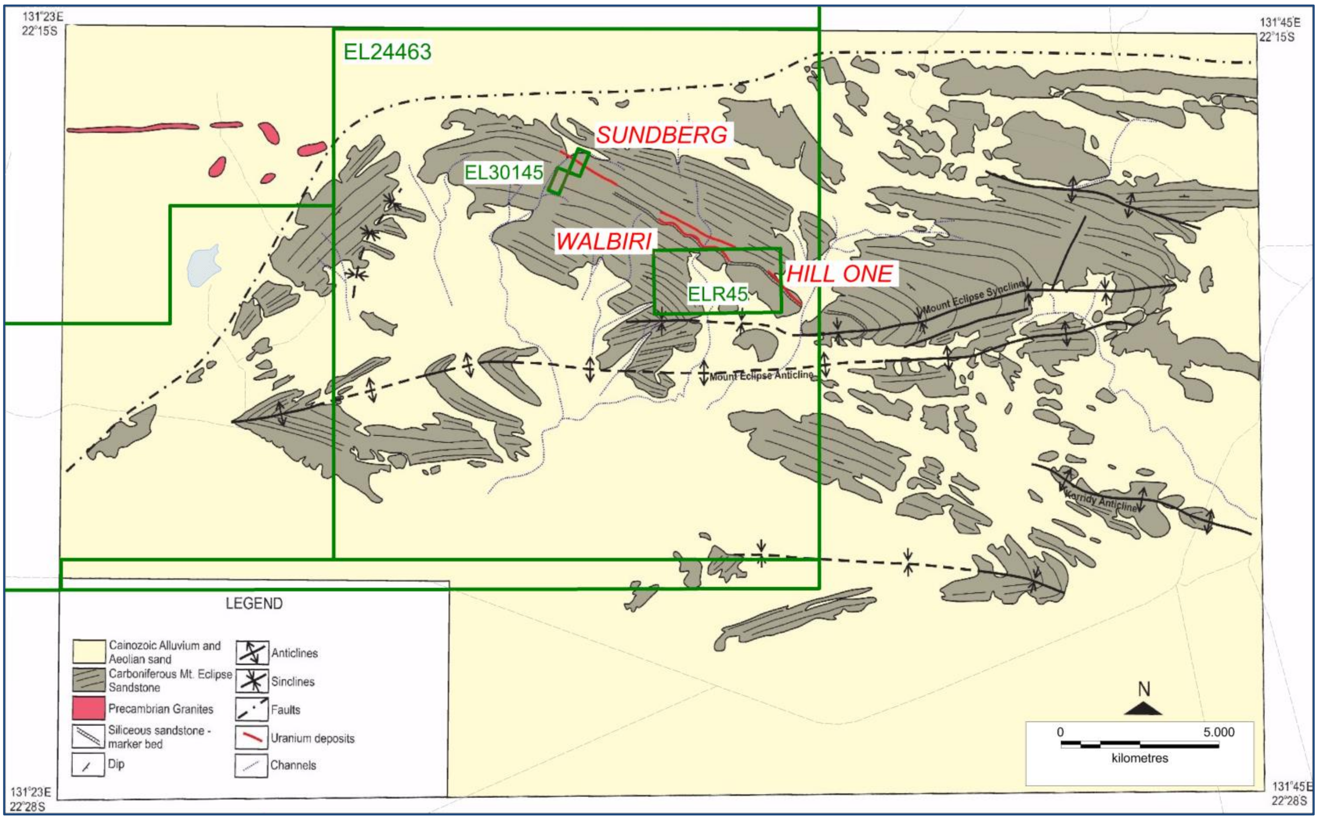

Figure 5: Location map showing the Walbiri, Sundberg and Hill One deposits in relation to tenement boundaries (green), outcropping sandstone (grey), surface mineralisation (red lines), bedding planes and syncline/anticline axes. Northern boundary of Ngalia Basin (dot-dash line) and drainages (blue) are shown.

Table 4: Estimate of Mineral Resources for the Walbiri and Satellite Deposits (Ngalia Basin)

Category	Deposit	Volume '000 m^3	Tonnes '000 t	Grade		Mineral Resources	
				U_3O_8 ppm	U %	U_3O_8 Mlb	U_3O_8 tonnes
Inferred	Hill One	192	494	321	0.027	0.350	159
Inferred	Walbiri	4,274	10,983	641	0.054	15.514	7,037
Inferred	Sundberg	391	1,005	259	0.022	0.574	260
Inferred	**Total**	**4,857**	**12,482**	**597**	**0.051**	**16.438**	**7,456**
Inferred	**Within ELR45**	**1,976**	**5,078**	**636**	**0.054**	**7.116**	**3,226**

Notes to Table 4:

1. *The Mineral Resources are for a 100% interest in the associated joint ventures and not the Mineral Resources attributable to the individual joint venture partners.*
2. *Mineral Resources are based on 200 ppm cut-off grade per resource block.*
3. *Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.*
4. *Mineral Resources are based on JORC-2012 definitions.*
5. *Mineral Resources are based on a bulk density of 2.56 t/m^3.*
6. *Rows and columns may not add up exactly due to rounding.*

HISTORICAL WORK (2017 - 2018) AT THE SUNDBERG DEPOSIT (ELR31319)

Sundberg (refer Figure 5) is an extension or satellite deposit of the much larger Walbiri deposit, and occurs along strike northwest of Walbiri. Following discovery of the prospect by CPM in the mid-1970s, the area was covered by Mineral Claim applications MCS329-330 in 1976.

During the period 1978-1980, ALCOA of Australia (Exploration Division) carried out exploration work on the adjacent tenement along strike immediately west of Sundberg. Exploration work comprised aerial photography, track etch and ground radiometric surveys, geological mapping, surface geochemistry and 25 rotary percussion & diamond drill holes. A number of prospective "grit horizons" were drill tested to target extensions of the Sundberg mineralised zone. Although radioactive anomalism was intersected in two holes, the mineralisation was considered to be too thin to warrant follow up work.

PREVIOUS WORK BY EME (2014 - 2018) AT THE SUNDBERG DEPOSIT (ELR31319)

Historical Mineral Claims MCS329-330 covering part of the Sundberg deposit were converted to Exploration Licence EL30145 under EME tenure and granted on 8th August 2014. In 2015 Energy Metals announced to the market a 7,456 tonne U_3O_8 maiden JORC resource at the Walbiri deposit and its two satellite deposits Sundberg & Hill One (Figure 5) (refer to section Walbiri Maiden Resource Estimate). Sundberg makes up 260 tonnes U_3O_8 or 0.574 Mlbs U_3O_8 of the total resource @ 259 ppm using a 200ppm cut-off and a Bulk Density of 2.56 t/m3.

Subsequently, EME converted EL30145 to an exploration licence in retention. ELR boundaries were surveyed by EME staff in March 2017 using a differential GPS (DGPS) system and ELR31319 (Sundberg) was granted on 22 June 2017 for a period of five years. This is the first full year of reporting under GR328 for this tenement.

WORK COMPLETED DURING THE CURRENT REPORTING PERIOD (18TH NOVEMBER 2017 – 17TH NOVEMBER 2018)

BIGRLYI PROJECT (ELRs 46 - 55 & 31319)

Camp Maintenance

Due to the depressed uranium market and consequent budget restrictions, the Bigrlyi project was placed on a care and maintenance footing in 2014 and only limited exploration and development works have been conducted since. In the 2016 to 2017 period, EME made significant steps in resolving minor issues and non-conformances identified in the June 2016 DPIR environmental compliance audit and issues in relation to the audit have now been addressed. As part of ongoing routine maintenance, the following tasks were completed during the current reporting period:

- New safety signage installed in significant areas;
- Firebreaks partially re-cleared with further work requiring heavy machinery;
- New fire extinguishers to replace those expired;
- Radiation monitoring equipment calibrations updated;
- Continuation of routine radiation & weather monitoring programs;
- Continuation of weed management program;
- Electrical testing, repairs and maintenance completed;
- First aid kits replenished;
- Security fencing and cameras established around major buildings;
- Pest and termite control program completed;

- Minor building repairs completed;
- Generators and cool room maintenance completed;
- Water and fuel systems maintained.

Results of Uranium-Series Disequilibrium Study at Anomaly-4 and Anomaly-15

In late 2017, four drill core samples and two pulp samples from the Bigrlyi Anomaly-4 & Anomaly-15 deposits were submitted to ANSTO and ALS laboratories for closed-can analysis and whole rock chemical assay, respectively, as part of an initial, modern uranium series disequilibrium study. In early 2018 the radiochemical results were received and are discussed here.

Radiochemical disequilibrium occurs in the uranium decay chain when geologically recent chemical processes disrupt the concentrations of one or more of the radioactive daughter isotopes. Disequilibrium is common in young, surficial, calcrete-style uranium deposits but should be less common in older deposits such as Bigrlyi. A common form of disequilibrium, often occurring as a result of weathering or ground-water leaching, is caused by the migration of the radioactive isotope Radium-226 away from mineralised host rock into its surroundings. This leads to formation of a radium halo around the uranium orebody. Separation of uranium from its radium daughter isotope has implications for the determination of equivalent uranium grades (eU3O8) by the downhole gamma probe method. This arises because probe measurements are dominated by contributions from gamma emitters in the Radium-226 decay chain. Where radium has migrated away from the orebody the gamma probe will under-report uranium grade, and where radium accumulates, the gamma probe will over-report grade. A correction factor known as the ‘radioactive equilibrium factor’ or REF = U_3O_8/eU_3O_8 = ^{238}U-activity/^{226}Ra-activity must be applied to equivalent uranium grades where disequilibrium is proved. For the Bigrlyi deposit a REF value of 1 has previously been assumed (i.e. the deposit is in radiochemical equilibrium) and this view has been supported by extensive cross-checks of gamma probe uranium grades against chemical assay data, although the two data-sets are not strictly comparable due to differences in sampling volumes.

Where disequilibrium is suspected it is desirable to undertake direct measurements of radiochemical equilibrium. This is usually done by the so called ‘closed-can’ method where a uranium ore sample is sealed in a container or ‘can’ to prevent escape of radon gas and the activity of daughter isotopes are measured by gamma spectrometry after elapse of a sufficient period (weeks) to allow for ingrowth of radon progeny.

In the 1970/80s previous Bigrlyi project owners, Central Pacific Minerals NL, undertook over 500 closed-can measurements on drill core samples at Amdel laboratories, Adelaide, to evaluate possible disequilibrium at Bigrlyi. The historical results returned an average REF value of 1.2 but with considerable scatter, +/- 0.3, and a hint that higher REF values may occur in near surface, high-grade samples. Due to a lack of consistency in the data no explicit REF correction has been applied historically to gamma probe data, and uranium grade determinations have since largely relied on chemical assay data.

Six high-grade mineralised samples from previous drilling at Bigrlyi Anomaly-4 and Anomaly-15 were selected for modern closed-can gamma spectrometric determination of uranium-series equilibrium at ANSTO laboratories, Sydney. Samples from a range of depths were selected to determine the effects of surface weathering within the deposits. Three samples were selected from nearer surface materials (weathered carnotite zone, <30m depth) and three samples were selected from depth (unweathered uraninite zone). Samples were split before being sent to the separate laboratories: core samples were quartered and pulps split. ALS conducted the geochemical assay of the samples and these results were reported in the last period (refer digital data file GR328_2017_GA_03).

The radiochemical results are presented in Table 5 and indicate that within error, unweathered Bigrlyi uranium mineralisation is in radiochemical equilibrium (REF values 1.0-1.1), thus confirming previous assumptions. The results also prove that the thorium (Th) and potassium (K) decay chains do not contribute significantly to total sample radioactivity. However, near-surface, carnotite-dominant mineralisation shows a variable state of uranium series equilibrium, ranging from in-equilibrium to slightly out of equilibrium to significantly out of equilibrium (low radium). This result likely reflects the variable nature of recent weathering processes and its effect on radium mobility.

Although the weathered zone at Bigrlyi only comprises a small proportion of the deposit as a whole, these results suggest that further investigations of radiochemical disequilibrium are warranted for weathered zone and oxidised samples and that an accurate “base of oxidation” surface should be established as part of a future deposit model revision.

Table 5: Determination of Radiochemical Equilibrium at Anomaly-4*

Drill Hole	Sample Depth (m)	Ore Mineral Zone	U_3O_8 assay (%)	Activity U-238 (Bq/g)	Activity Ra-226 (Bq/g)	Activity Th-232 (Bq/g)	Activity K-40 (Bq/g)	REF (U/Ra)	Results
BDD11138	87.1	Uraninite	9.57	1002	1040	<0.1	<2.1	1.0	Equilibrium
BDD11133	13.5	Carnotite	2.23	233	100	0.1	0.7	2.3	Disequilibrium
BDD11133	23.6	Carnotite	0.815	85.3	74	<0.1	0.8	1.2	Marginal Disequilibrium
BDD11140	9.5	Carnotite	0.786	82.3	73	<0.1	0.8	1.1	Equilibrium
B09066W1	113	Uraninite	7.98	836	870	0.1	<1.6	1.0	Equilibrium
B09066W1	137	Uraninite	2.68	281	250	0.1	0.9	1.1	Equilibrium

*A REF value in the range 0.9 to 1.1 is indicative of equilibrium within error (i.e. +/- 10%). BDD11140 is from Anomaly-15 and the other drill hole samples are from Anomaly-4.

Vanadium Price Increase During 2018

Of particular interest during the year was the substantial (approx. 300%) increase that occurred in vanadium price. The V_2O_5 price increased from approx. $10-12/lb in January to a peak of over $30/lb in November (currently $25/lb), refer Figure 6. The increase was largely due to changes in the specifications of high strength steels in China for which higher vanadium contents are now required.

The vanadium price is expected to be maintained at relatively high levels in the next few years due to increased demand in steel sector and in the developing battery metals sector (vanadium redox flow batteries). An additional factor in sustaining vanadium price is the long lead times required to ramp up production to meet demand since the world’s predominant vanadium resources are associated with vanadium-in-magnetite deposits, which are capital intensive and metallurgically difficult projects to develop.

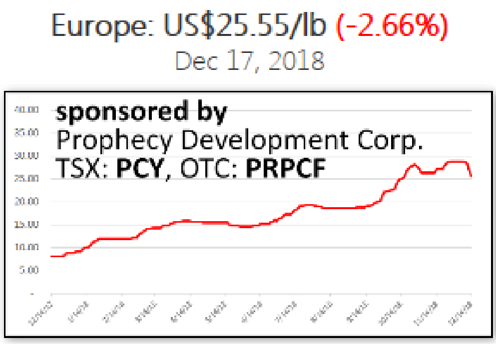

Figure 6: Vanadium price (USD/lb) charts for the 12 months to present (V_2O_5 flake product).

Defined vanadium resources at Bigrlyi are some 31Mlbs V_2O_5 (for a 250ppm U_3O_8 cut-off grade) located in relatively easily leachable minerals such as montroseite and vanadiferous clays. The recovery of vanadium could substantially improve the economics of the Bigrlyi project provided a metallurgical processing route can be identified that results in high recoveries of both uranium and vanadium from treatment of Bigrlyi ore. In addition, there is some exploration upside since with the historical focus on uranium, vanadium-rich parts of the Bigrlyi deposit have been underexplored providing scope for expansion of the current vanadium resource.

Vanadium Mineralisation Study

Recognising that recovery of vanadium is likely to enhance the economics of a uranium mining development at Bigrlyi, in late 2018 EME initiated a study of vanadium mineralogy, distribution and origin within the deposit in conjunction with CSIRO Mineral Resources Group researchers. Some preliminary work was completed during the period with the final results expected in early 2019.

Within the uranium resource at Bigrlyi the V_2O_5 to U_3O_8 ratio is on average around 1.2:1 (=V/U ~0.8) but V distribution is poorly defined in parts of the deposit located outside the uranium resource cut-off grade. Vanadium enriched zones occur as ‘halos’ both stratigraphically above, and less commonly, below U-mineralised intervals, with some areas known to be significantly vanadium enriched.

The Bigrlyi deposit shows many geological similarities with sandstone-hosted uranium-vanadium deposits of the Colorado Plateau, USA, where vanadium and uranium were historically co-mined for many years in the 1950s to 1970s. Just as in the Colorado Plateau deposits, some parts of Bigrlyi are known to be rich in vanadium and relatively poor in uranium. However, the factors that control vanadium distribution at Bigrlyi relative to uranium and its mineralogy and hence its prospects for metallurgical extraction are not well understood. Energy Metals has commenced programs to further investigate vanadium mineralogy and metallurgy at Bigrlyi. Some preliminary highlights of the vanadium mineralogical study program in cooperation with CSIRO, to date, include:

The significant vanadium-bearing minerals in the Bigrlyi deposit identified, these are:

- Montroseite (~44-76% V_2O_5);
- Mixed layer smectite-chlorite or corrensite (~5-20% V_2O_5);
- Fe-smectite (~2-12% V_2O_5);
- Vanadiferous illite/muscovite (~2-22% V_2O_5) and
- Vanadiferous, chloritised biotite (~1-10% V_2O_5).

Mineral FeO and V_2O_5 contents are negatively correlated as shown for the clays/sheet silicates below (Figure 7). Montroseite and vanadiferous clays are typically closely associated (Figure 8).

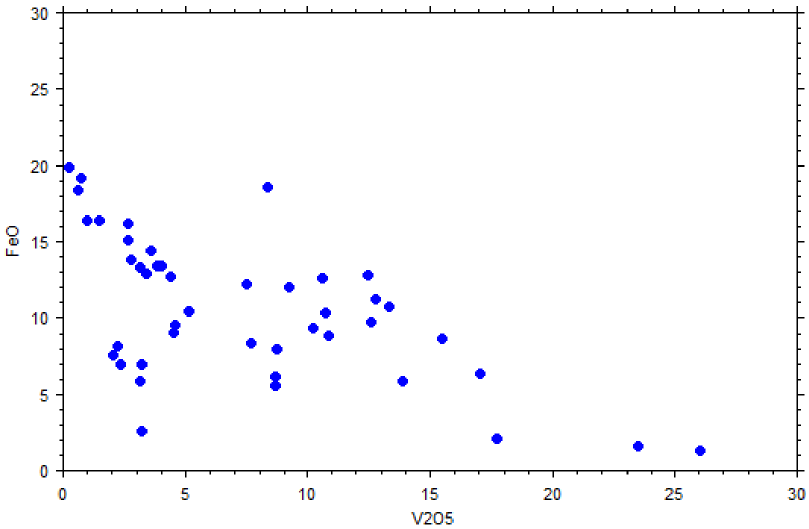

Figure 7: Fe-V compositional variation of Bigrlyi sheet silicate and clay minerals from vanadiferous intervals (wt% oxides).

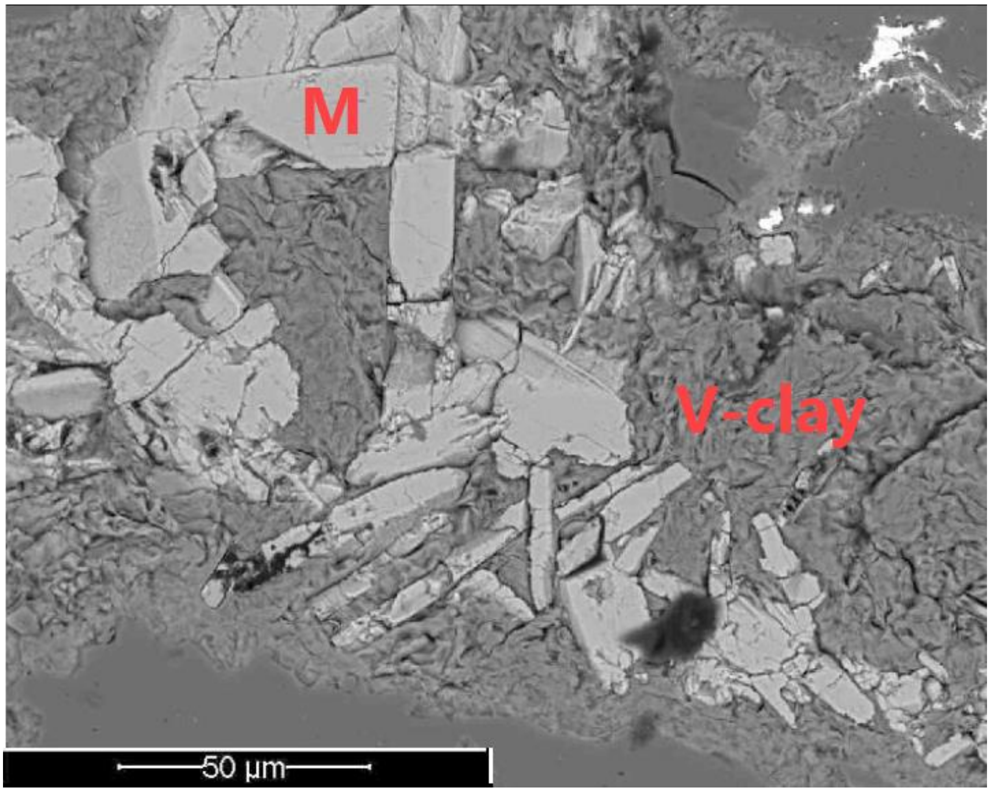

Figure 8: BPD320 136.15m SEM image showing blocky montroseite grains (pale grey = ‘M’) enclosed by vanadiferous clays ‘V-clay’.

Preliminary XRF elemental imaging studies of thin sections of vanadium-rich samples (Figure 9) show that vanadium is associated with a distinctive heterogeneous mixture of different kinds of clay-rich, detrital rip-up clasts (including mudstone, siltstone and clay-rich matrix-supported sandstone of various grain sizes). It is possible that these clasts formed in a separate source region and were later re-sedimented and incorporated into the Mt Eclipse Sandstone.

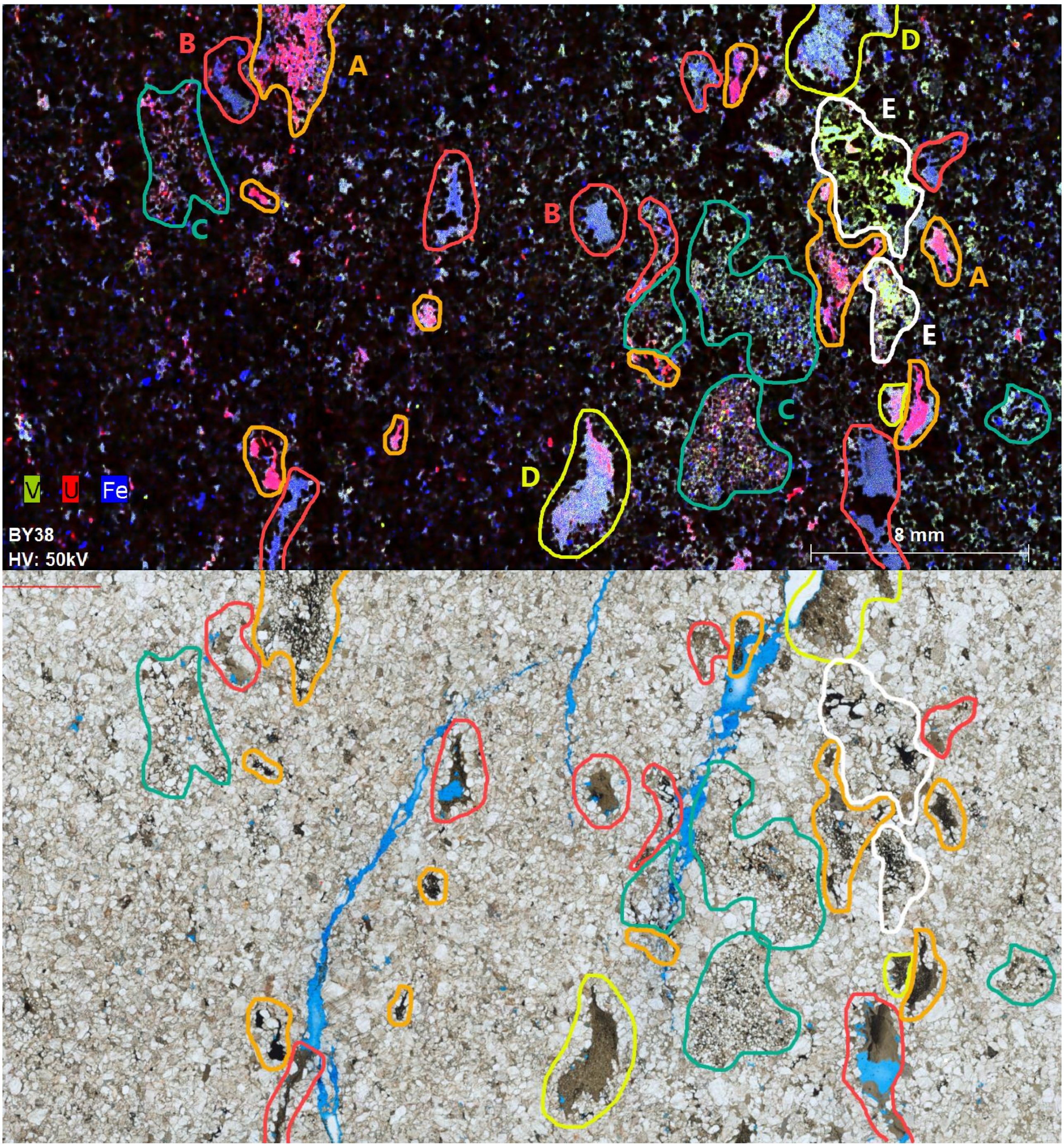

Figure 9: Top. RGB XRF elemental image of vanadium-rich core sample B07270-227m (V_2O_5 0.88%, U_3O_8 0.066%) categorised by element showing the V-U-Fe characteristics of various kinds of fine-grained rip-up clasts (mudstone, siltstone and clay-rich matrix-supported sandstone) present in the host sandstone. A(orange) – uranium-rich sandstone & mudstone; B(red) - Fe-rich mudstone; C(green) - clay-rich, fine-grained sandstone; D(yellow) - V-U-Fe enriched siltstone; E(white) - V-clay-rich sandstone both coarse & fine. Bottom. Same thin section but imaged under plain light. Blue stained areas are holes in the thin section (where soft, clay-rich material has fallen out during preparation of the section).

The observations question the assumption that V mineralisation took place in-situ by chemical processes in the host Mt Eclipse Sandstone and raises the possibility that vanadium enrichment occurred prior to Mt Eclipse sedimentation. The implication is that V (and associated U) may have a significant detrital-origin component in the Mt Eclipse Sandstone. This differs from the classic model which assumes in-situ chemical processes caused the reduction of dissolved, oxidised vanadium (V^{4+}, V^{5+}) in groundwaters to V^{3+}, which became fixed in clays and montroseite. Further work is ongoing.

As part of the vanadium study, the Pb-isotopic compositions of vanadium-rich intervals from selected drill cores at Bigrlyi were investigated. Several observations for further investigation were noted:

- High V/U intervals (>5) = V-enriched 'halos' above and below U-mineralised intervals were all found to have more radiogenic Pb than can be supported by the present amount of uranium in the samples (see Table 6 example for hole BPD345). This suggests uranium was significantly mobilised out of the halos (U loss) and/or that additional radiogenic Pb was added to the halos from elsewhere. Petrographic evidence for U mobility is expected to be seen in these samples. It is possible that U mineralised intervals were originally much wider and the U was stripped out during diagenesis leaving V.
- Unusually for Bigrlyi, the Pb-isotopic systems have been significantly disturbed for a large number of samples with high V/U. This type of 'disturbance' is common in Malawiri which has a late oxidation overprint but is generally not seen in Bigrlyi (at least in the U mineralised samples).
- Samples with disturbed Pb-isotope ratios correlate reasonably well with samples that show high percentages of inferred uranium loss – it is possible that these intervals were open to fluids, probably over significant time periods post-deposition, whereas the adjacent U and U+V mineralised intervals were not open to fluid-exchange and were preserved – but the scales are quite small with only 10s of cm between disturbed and undisturbed samples (see Table 6); it is possible that narrow zones of carbonate cement protected U mineralisation from later dissolution.

Table 6: Example of Pb isotopic data interpretation from Hole BPD345

Hole#	Depth from	U ppm	V ppm	Pb ppm	V/U	Pb-radio genic (ppm)	% radio genic Pb	U expected (ppm)	%U loss	Pb-isotope system
BPD345	169.9	18.8	132	16.4	7.02	2.8	17.2	66	249	disturbed
BPD345	170.1	16.5	236	22.6	14.30	8.3	36.7	193	1070	disturbed
BPD345	170.5	23200	806	1020	0.03	985.8	96.6	22925	-1	
BPD345	173.2	8560	1140	428	0.13	409.1	95.6	9515	11	
BPD345	174.35	849	5520	56.3	6.50	42.0	74.5	976	15	
BPD345	175.55	22600	10600	955	0.47	899.0	94.1	20907	-7	
BPD345	176	9.2	188	13.8	20.43	1.2	8.8	28	206	disturbed

Uranium-Series Disequilibrium Study at Anomaly-2

In the second half of the year further results were received ex ANSTO laboratories, Sydney, from an investigation of uranium-series disequilibrium in mineralised samples, this time from the oxidised Anomaly-2 deposit at Bigrlyi. This deposit differs from other Bigrlyi mineralised zones in that it is deeply weathered to a depth of 80-100m or more (carnotite zone) and therefore is likely to be susceptible to radiochemical disequilibrium. Previous results discussed above confirmed that within error, unweathered Bigrlyi uranium mineralisation (uraninite zone) is in radiochemical equilibrium.

As discussed, radiochemical disequilibrium occurs in the uranium decay chain when geologically recent chemical processes disrupt the concentrations of one or more of the radioactive daughter isotopes. A correction factor known as the ‘radioactive equilibrium factor’ or REF = U_3O_8/eU_3O_8 = ^{238}U-activity/^{226}Ra-activity must be applied to equivalent uranium grades where disequilibrium is proved. For the Bigrlyi deposit a REF value of 1 has previously been assumed.

Six mineralised rock pulp samples from previous drilling at Bigrlyi Anomaly-2 were selected for closed-can gamma spectrometric determination of uranium-series equilibrium at ANSTO’s laboratories in Sydney and for full multielement assay work at ALS (refer to digital data GR328_2018_GA_03_DownholeGeochem_a.txt). In addition, U and V as well as a number of selected elements (Ca, Fe, K, Pb) were assayed or re-assayed from adjacent intervals at ALS laboratories (refer to digital data GR328_2018_GA_04_DownholeGeochem_b.txt). All samples are from the oxidised carnotite zone at a range of depths.

The radiochemical equilibrium results are presented in Table 7 and indicate that the Anomaly-2 carnotite-dominant mineralisation shows a variable state of uranium series equilibrium. Half the samples being in-equilibrium and half significantly out of equilibrium by 20 to 50% (low radium) with no depth control or other obvious controls. This result likely reflects the variable nature of modern weathering processes and its effect on radium mobility.

Table 7: Determination of Radiochemical Equilibrium*

Drill Hole**	Sample Depth (m)	Ore Mineral Zone	U_3O_8 assay (%)	Activity U-238 (Bq/g)	Activity Ra-226 (Bq/g)	Activity Th-232 (Bq/g)	Activity K-40 (Bq/g)	REF (U/Ra)	Results
BRC11108	89	Carnotite	0.665	69.7	69	0.07	0.72	1.0	Equilibrium
BRC11109	36	Carnotite	0.22	23.1	23	0.09	0.71	1.0	Equilibrium
BRC11111	91	Carnotite	0.34	35.6	38	0.1	0.58	0.9	Equilibrium
BRC11112	65	Carnotite	0.211	22.1	15	0.09	0.69	1.5	Disequilibrium
BRC11114	91	Carnotite	1.158	121.2	98	0.06	0.61	1.2	Disequilibrium
BRC11114	122	Carnotite	0.246	25.7	22	0.05	0.81	1.2	Disequilibrium

* A REF value in the range 0.9 to 1.1 is indicative of equilibrium within error (i.e. +/- 10%).

** Refer to ASX release of 23 December 2011 for further information regarding these drill holes.

The results indicate that downhole gamma probe measurements will not accurately reflect uranium grade in parts of Bigrlyi Anomaly-2 – in fact gamma probe grades could understate uranium grades by up to 50% in places. The variable nature of the disequilibrium, and the absence of any obvious controls, indicates that grade information for mineral resource estimate purposes at Bigrlyi Anomaly-2 should be chemical assay based.

Metallurgical Review

In late 2018 a review of previous metallurgical testwork at Bigrlyi was undertaken by an external consultant. One of the important aims of the review was to investigate a way forward that would allow for the recovery of both uranium and vanadium and therefore support improved economics for the Bigrlyi project (a copy of the metallurgical review is provided in the digital data Appendix: GR328_2018_GA_08_BigrlyiProcessReviewFinal-Dec18.pdf)

Review of the available documents resulted in the following conclusions:

- The uranium, vanadium and carbonate grades vary widely over short distances (from ppm levels to several percent). This will make selective mining difficult and dilution of the feed to the plant will be inevitable. Testwork using scrubbing with classification, gravity separation, flotation and photometric sorting has not been successful in rejecting waste material.
- The ore is relatively soft and closed-circuit ball milling can be used to achieve the fine grind required (80%<75-150 µm) for liberation of the uranium and vanadium values.
- Drill cores and their composites have been used to develop process options for the Bigrlyi deposit. A large number of laboratory acid leaches and a much smaller number of alkaline leaches have been completed. Exceptionally good uranium extractions were achieved with both approaches. However, for acid leaching the acid consumption is variable and high.
- The settling characteristics of both acid and alkaline leach residues is poor, however filtration offers a better alternative for solid-liquid separation and washing. ANSTO found that the alkaline leach residue filtered 3 to 8 time more quickly than the acid leach residue.
- No experimental work has been done on the recovery of uranium or vanadium from the leach liquors. For the acid route it has been assumed that amine solvent extraction with sodium carbonate stripping followed by sodium diuranate (SDU) precipitation, acid digestion and hydrogen peroxide precipitation of uranium tetroxide will serve the purpose. For the alkaline route the pregnant liquor, after concentration by evaporation, proceeds directly to SDU precipitation.
- Vanadium is leached with the uranium to a similar extent (30-40%) under both acid and alkali conditions and steps need to be included in the process to ensure that it does not build up in the circuit or contaminate the uranium product. For recovery of the vanadium as a saleable product it would be desirable to increase the vanadium dissolution in the leach. For the acid leach this requires leaching at a much lower pH and significantly increasing the acid and oxidant consumption. For the alkaline route, leach testwork will be required to confirm that at higher temperatures and pressures, high vanadium extractions are possible.

If vanadium recovery as a co-product is to be pursued, further investigation as to whether acid or alkaline leaching is the most cost-effective process option is required. In addition, radiometric and/or X-ray Transmission (XRT) sorting could be viable methods as a means of rejecting barren material and upgrading the plant feed. Sorting technology could have a positive impact on project economics because it could either halve the size of the processing plant and reduce the capital outlay accordingly, or it could double the uranium and vanadium production rates so doubling the revenue stream (albeit for a shorter mine life) and decreasing the payback period.

Database Upgrade and Rebuild

During 2018 a substantial amount of work was completed on upgrading the EME exploration database as recommended in the 2017 database review. Highlights of these works include:

- Installation of a new server and database computer with update to current versions of Geobank, Micromine and SQL software.
- Reinstatement and configuration of the Geobank model with primary, foreign key & validation rules applied.
- Training provided to technical team on the processes of set-up, importation, validation & export of the database.

Some additional work is required to address minor issues (such as missing lithological log intervals in historical holes, ranking of output data, interval matching of gamma logs and assays etc.). Completion of this work by early 2019 will provide a greater degree of confidence and will ensure that the database is of the highest quality for proposed modelling work on the vanadium and uranium resources in 2019.

MALAWIRI DEPOSIT (ELR41)

Malawiri Maiden Resource Estimate

In late 2017 EME advanced the Malawiri project to JORC-compliant resource status with announcement of a maiden inferred-category mineral resource estimate of 542 tonnes U_3O_8. Details from EME's ASX announcement dated 14th December 2017 are summarised below and the Resource Report and associated data including wireframes and block model are included in the digital data Appendix (GR328_2018_ GA_07_EMEMalawiriMRE.zip)

Highlights

- Inferred resource of 542 tonnes U_3O_8 at 1,288 ppm (100ppm cut-off) obtained for the historic Malawiri uranium deposit, eastern Ngalia Basin, NT;
- High grade deposit hosted in Mt Eclipse Sandstone buried by 80 to 100 m of younger cover;
- Mineralisation style similar to EME's Bigrlyi deposit (though with a late oxidation overprint);
- Uranium potential of the undercover eastern Ngalia Basin (NT) is highlighted.

Significant historic drill-hole intercepts from reprocessed gamma logs include:

- 12.1m at 3,409 ppm eU_3O_8 from 164.6m in GCRD9
- 6.1m at 2,105 ppm eU_3O_8 from 183.1m in GCRD9
- 4.7m at 1,594 ppm eU_3O_8 from 189.0m in GCRD6
- 11.9m at 946 ppm eU_3O_8 from 229.8m in GCRD21
- 12.8m at 583 ppm eU_3O_8 from 126.2m in GCRD8
- 12.4m at 577 ppm eU_3O_8 from 189.2m in GCRD3

The historic Malawiri deposit is located 30 km by road from Tilmouth Well in the eastern Ngalia Basin (Figure 10). The deposit was discovered in 1980 by Central Pacific Minerals (CPM) following exploration at the adjacent Minerva deposit by AGIP. Historical exploration work, including the drilling of 22 exploration holes, was carried out by CPM in the period 1980 to 1982. EME acquired CPM's interest in the project in 2005, including all historical exploration records and drill core materials. In 2016, EME drilled a rotary mud/ diamond core hole at Malawiri, MARD004, between CPM drill lines where mineralisation was previously encountered. The purpose of the hole was to confirm the continuity and tenor of historically known mineralisation as well as provide core materials for geochemical and geotechnical test-work including bulk density.

The results of the 2016 drilling program, which were consistent with historical results, were announced to the ASX on 27th September 2016. A review of available data by EME's resource consultants CSA

Global Ltd confirmed that appropriate criteria were met to permit resource estimation work at Malawiri to proceed. No mineral resource estimate had previously been undertaken for the Malawiri deposit.

Exploration Results

Mineralisation at Malawiri is hosted in the Mt Eclipse Sandstone comprising coarse arkose and arkosic sandstone, with lesser conglomerate and shale. The Mt Eclipse Sandstone is unconformably overlain by 80 to 100m of relatively unconsolidated gravelly sands, silts and clays of the Cenozoic Whitcherry Basin (Figure 10). The Palaeozoic-Cenozoic unconformity is marked by a silcrete cap and an underlying zone of kaolinised sandstone (weathered Mt Eclipse). Mineralisation is stratiform in nature and occurs within a number of sub-vertically oriented, stacked, tabular lenses confined by conglomerate marker beds. Uranium mineralisation tends to be variably distributed along strike and at depth due in part to the effects of a late, oxidative uranium remobilisation event that also caused hematite overprinting.

The dimensions of the Malawiri mineralised domain (Figure 11) are approximately 400m along strike with an average plan width of 10-15m and a maximum modelled plan width of 35m. Stratigraphy and mineralisation dips sub-vertically and the width of the mineralised intervals varies from 0.3m to 12.6m, averaging 3.2m thickness. The mineralisation model extends from beneath the kaolinised sandstone unit at approx. 100m depth to 250m below surface.

Uraninite is the dominant uranium mineral in the sub-surface and it occurs in close association with pyrite and detrital-origin phyllosilicate minerals including biotite, clays and chlorite. Carbonate cement is pervasive in mineralised zones.

The downhole gamma probe was used as the primary analytical tool to measure eU_3O_8 grade. Drill core samples were assayed for uranium; however, these data were not considered to be sufficiently representative to be used in the resource estimation. Open file data from two historical AGIP holes were used to help constrain the along strike extension of mineralisation to the east.

Historically over 100 core samples were assayed by the so-called ‘closed-can’ method at AMDEL laboratories, Adelaide, to determine the extent of possible radiometric disequilibrium; the results provide evidence for the existence of radium mobility relative to uranium and indicate the deposit is not in radiochemical equilibrium. This observation has been confirmed by examination of comparative assay U_3O_8 data and gamma log eU_3O_8 data. Application of a disequilibrium correction (i.e. the Radioactive Equilibrium Factor or REF) was considered necessary to convert measured eU_3O_8 to actual U_3O_8 values.

Drill-hole information and gamma log data for all drill holes, including associated metadata and probe calibration records, were compiled from EME’s archives. Historical gamma logs were archived as a compilation of analogue printouts on paper charts; these were scanned at high resolution, digitised and converted to counts per second (cps) data at 10 cm intervals downhole. Using the calibration data and hole information the cps data were reprocessed to yield deconvolved eU_3O_8 values according to well established methods. A summary of the information used is provided in Table 8.

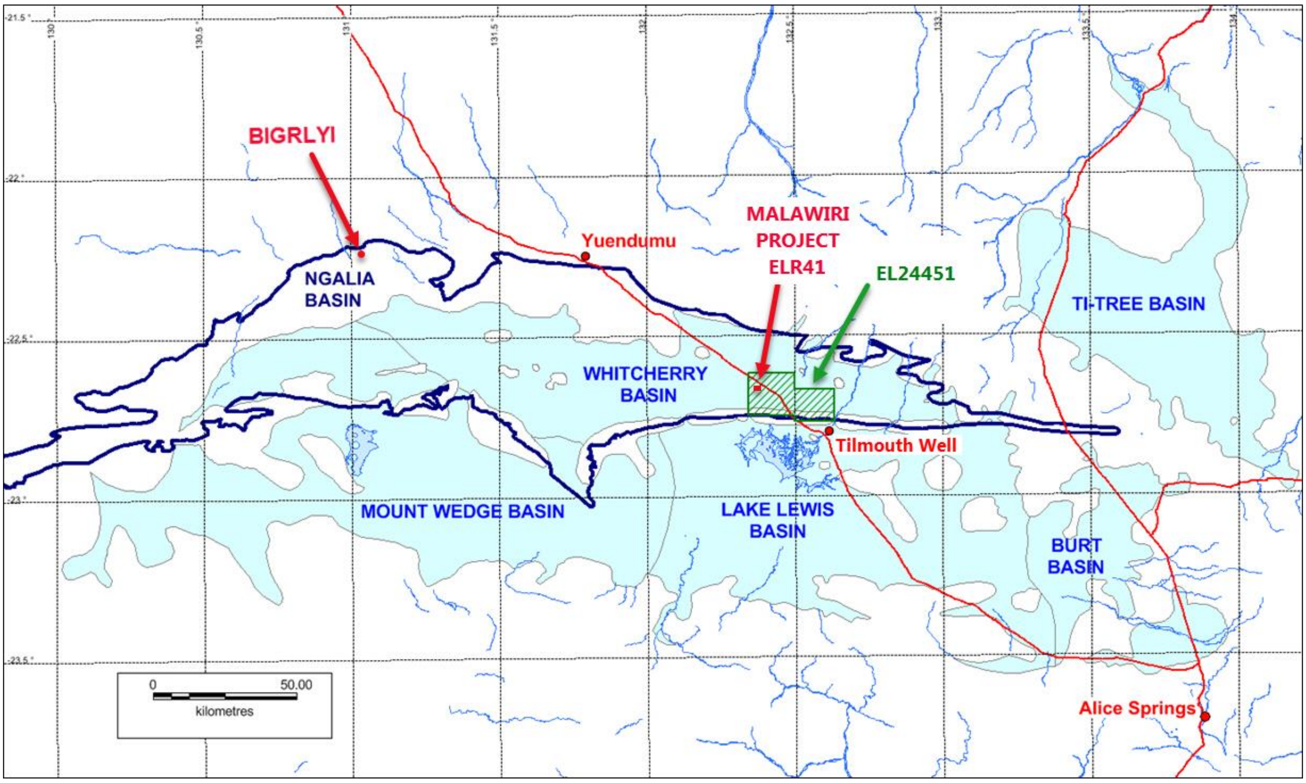

Figure 10: Map showing the location of the Malawiri Project on ELR41 in relation to EME's surrounding exploration licence 24451 (green hatch), Ngalia Basin outline (dark blue), overlying Cenozoic basins (light blue). The Bigrlyi uranium deposit, towns, main roads (red) and drainages (blue) are also shown.

Table 8: Database Summary of information used in the Resource Estimation

Category	Total
Number of drill holes	25*
Total metres drilled	5,550.05
Number of downhole survey records	106
Number of gamma logged intervals (at 10 cm)	50,289
Number of mineralised intervals based on 10 cm gamma-logging	36
Number of closed can assays used for REF estimation purposes	102
Number of intervals with lithological data	671
Number of samples with measured bulk density	217

*22 CPM drill-holes, 2 AGIP drill-holes and 1 EME drill-hole. The AGIP holes, drilled to the east of Malawiri, do not have available gamma logs and were used to constrain lithological continuity and the extent of mineralisation only.

Resource Estimation Procedure

Mineralised envelopes were interpreted and wireframed using downhole gamma log data. The downhole eU_3O_8 data was converted to U_3O_8 grade by application of REF corrections to account for radiochemical disequilibrium associated with radium mobility. The wireframes were constructed on the basis of a sectional interpretation in which the boundaries were extrapolated to half the nominal section spacing beyond the extents of current drilling. Using the digital lithological logs, digital models were also generated for the unconformity surfaces (Figure 11).

The downhole U_3O_8 data were composited over mineralised intervals of 0.5 m width; and statistical and geostatistical analyses were then performed. The block model was created and filled following application of a coordinate transformation to provide a constant orientation (flattening) of mineralised bodies for interpolation purposes. Because the distribution of uranium grades consists of several populations, the Multiple Indicator Kriging (MIK) method was used for interpolation of grades in the block model. The dimensions of the parent blocks were set at 2 x 0.125 x 2 m without sub-celling. An average bulk density of 2.45 t/m^3, as measured from Malawiri core samples, was used. The distribution of U_3O_8 grade values obtained is shown in Figure 12 and the resulting resource estimate, which is classified as inferred, is provided in Table 8 for 100 ppm U_3O_8 cut-off grade.

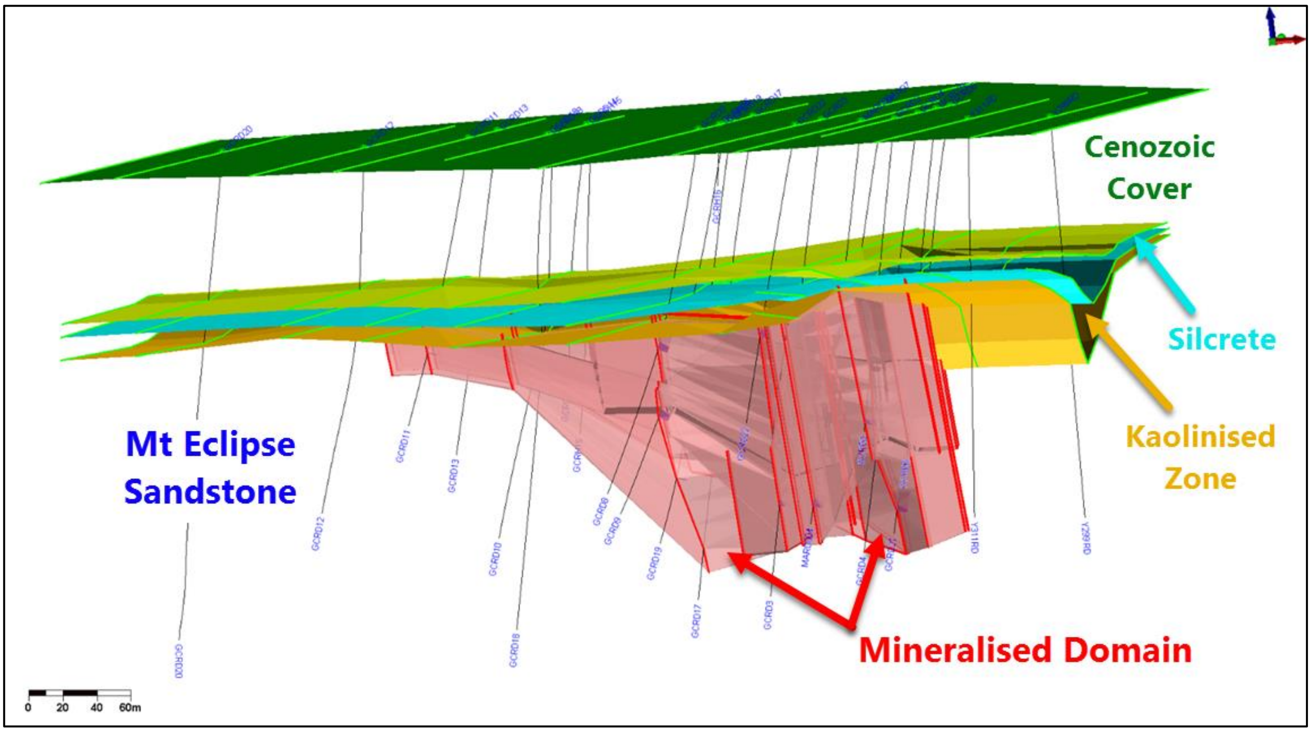

Figure 11: Wireframe models showing the mineralised domain and unconformity-related surfaces together with drill-hole traces.

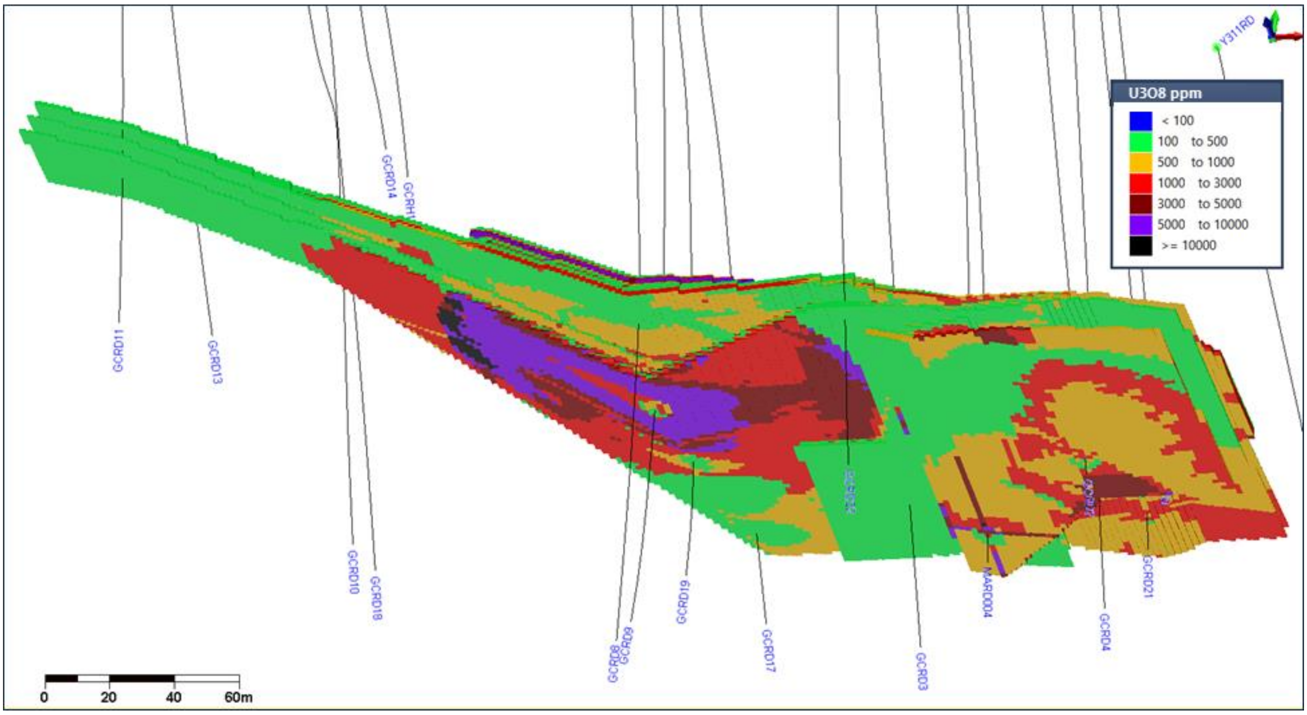

Figure 12: Distribution of U_3O_8 grade for the Malawiri deposit.

Summary

The Mineral Resources are summarised in Table 8 for a 100ppm U_3O_8 cut-off grade:

Table 9: Estimate of Mineral Resources for the Malawiri Deposit as at 14 December 2017

Category	Volume, '000 m^3	Kilotonnes	Bulk Density, t/m^3	Grade U_3O_8 ppm	U_3O_8 tonnes	U_3O_8 Mlb	U%	U, t
Inferred	172.0	421.3	2.45	1,288	542	1.20	0.109	460

Notes:

1. *The Mineral Resources are for a 100% interest in the associated joint venture and not the Mineral Resources attributable to the individual joint venture partners.*
2. *Mineral Resources are based on 100 ppm cut-off grade per resource block.*
3. *Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.*
4. *Mineral Resources are based on JORC-2012 definitions.*
5. *Mineral Resources are based on a bulk density of 2.45 t/m^3.*
6. *Calculations and unit conversions may not yield exact figures due to rounding.*

The Mineral Resources have been classified and reported in accordance with JORC (2012) requirements.

AEM Survey Completed over Eastern Ngalia Basin

An 883 line-kilometre, in-fill, airborne electromagnetic survey was flown in conjunction with Geoscience Australia's *Exploring for the Future Program* over parts of EL24453 and EL31098 in the eastern Ngalia Basin in 2017 with data products received from GA in June 2018 (Figure 13). The in-fill survey covered ELR41, which represents a minor part of the total in-fill area. The main aim of the survey was to detect buried palaeochannel-related sites prospective for uranium mineralisation.

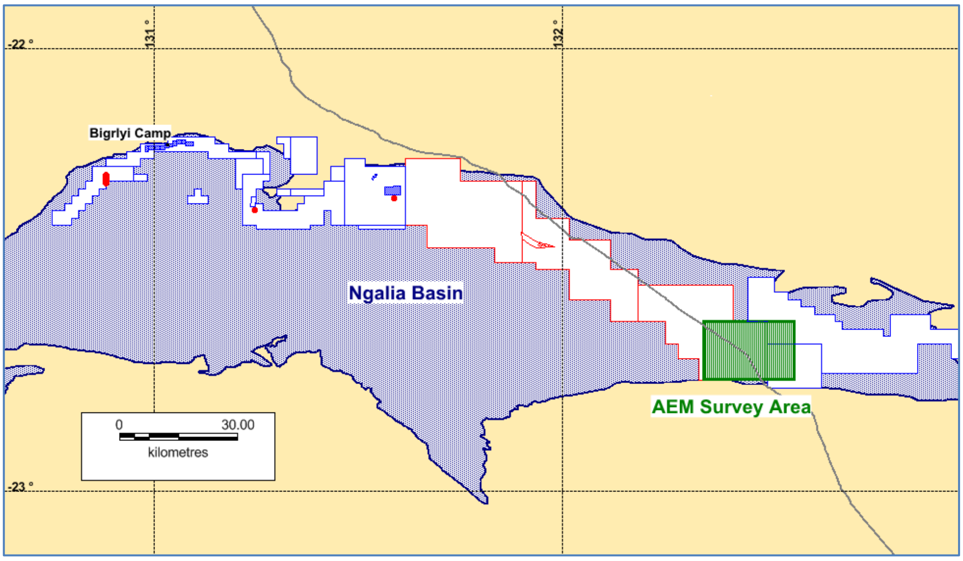

Figure 13: Location of aerial electromagnetic (AEM) survey (green) flown in conjunction with Geoscience Australia.

During late 2018, EME's geophysical consultants reprocessed the new data and integrated it with previous company EM survey data to create a series of preliminary enhanced AEM conductivity images as a function of depth in the eastern Ngalia Basin. However, no palaeochannel-like features or new targets were identified on ELR41 although several significant palaeochannel-like features were identified to the south (see AEM example image shown in Figure 14).

Owing to small size of ELR41 in relation to the full survey area and the significant costs involved in extracting small parts of the GA data package, the survey data and results of the AEM data reprocessing, once finalised, will be reported as part of group technical report GR070 (Ngalia Regional project).

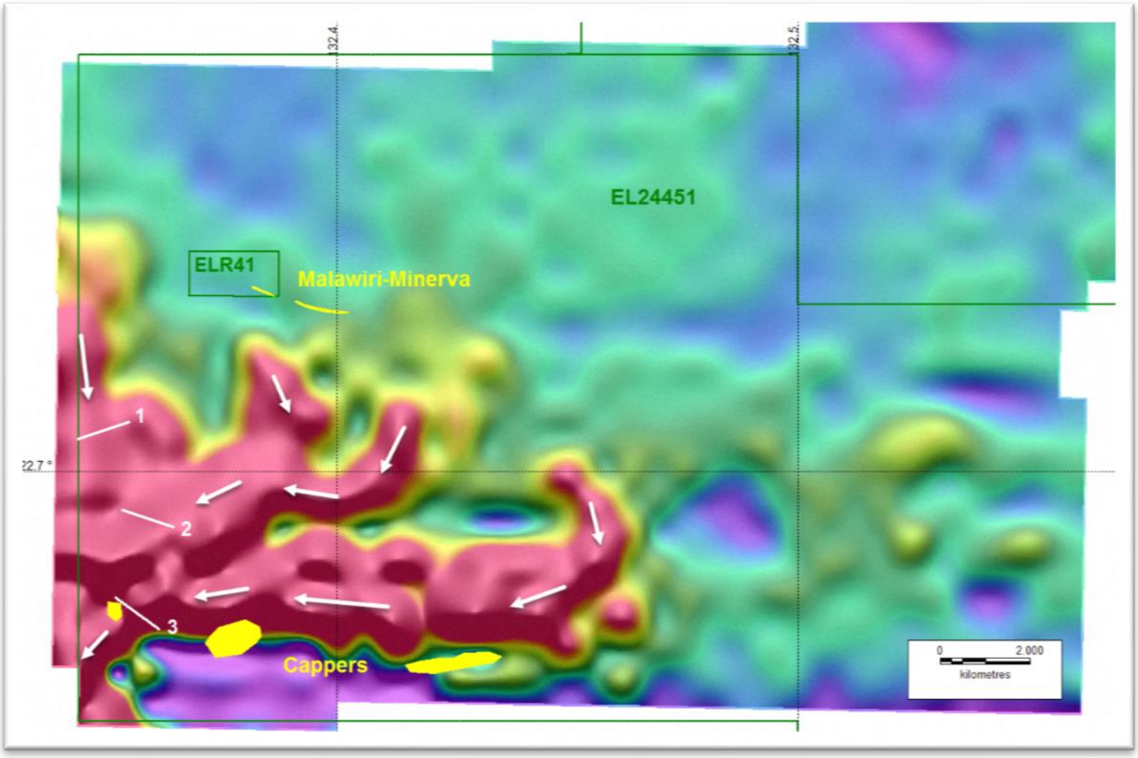

Figure 14: Preliminary enhanced AEM conductivity imagery for a 30-40m depth slice over southwest part of EL24451 including ELR41 (red = highly conductive, blue/purple = low conductivity) showing conductive palaeochannel-like features of several kilometres length inferred to drain from the north and east (arrows). Yellow outlines show Cappers calcrete uranium mineralisation (surficial) and Malawiri-Minerva sandstone-hosted uranium mineralisation (buried). Lines 1 to 3 are from a 2018 ground-penetrating radar survey on EL24451 to be reported as part of the GR070 annual technical report.

WALBIRI DEPOSIT (ELR 45)

Following resource estimation work in 2015, a refinement of proposed exploration drill-hole locations was carried out in late 2016. In March 2017, EME submitted an application to the Aboriginal Areas Protection Authority (AAPA) for a variation to Authority Certificate C2014/128 to cover the proposed drilling works on ELR45. During the previous reporting period an AAPA sacred site ground survey was completed and a new authority certificate C2017/110 (Variation to C2014/128) outlining conditions was issued on 8th December 2017. No on-ground work occurred at the Walbiri project (ELR45) during the current reporting period.

SUNDBERG (ELR31319)

Following the issue of ELR31319 (Sundberg) no new work has been completed on this deposit.

WORK PROPOSED FOR 2019

Activities planned for 2019 include:

- (i) Formulation of joint venture budgets in accordance with the JV agreements;
- (ii) Continuation of the Bigrlyi database update;
- (iii) Finalisation of the Bigrlyi vanadium mineralogy project;
- (iv) Remodelling and re-wireframing of the Bigrlyi deposit mineralisation, with particular emphasis on vanadium mineralisation, in preparation for an update of the mineral resource estimate (ELRs 46-55).
- (v) Implement recommendations of the 2018 metallurgical review including a plan to undertake a small testwork program to optimise dual recovery of vanadium and uranium;
- (vi) Review available hylog spectral mineralogical data and multielement geochemistry to create a spatial model for carbonate distribution in the deposit with the aim of assessing acid versus alkaline leach options;
- (vii) Interpret AEM results from the eastern Ngalia Basin and develop a plan for a trial, deep-sensing IP geophysical survey on ELR41;
- (viii) Ongoing camp maintenance, radiation monitoring and site rehabilitation monitoring.

These projects are subject to approval by the Bigrlyi joint venture partners.

CONCLUSIONS AND RECOMMENDATIONS

Because of the present state of the uranium market and consequent JV budget limitations, exploration work undertaken in the current reporting period was set at a minimum level. Significant exploration tasks completed during the period included estimation of a maiden mineral resource at the Malawiri prospect (ELR41) and receipt of final data for an in-fill AEM survey flown over ELR41 and surrounds in conjunction with Geoscience Australia's regional AEM program. A security fence was erected around the main buildings at Bigrlyi camp and routine maintenance and monitoring tasks were carried out.

An update of the Bigrlyi project database is 90% complete and associated deposit remodelling work is scheduled for completion by end 2019. This will lead to a future update of the Bigrlyi mineral resource estimate to JORC (2012) standard. Due to the recent increase in vanadium price, EME is actively revisiting the vanadium potential of the Bigrlyi deposit and a mineralogical/petrological study and a metallurgical review with emphasis on vanadium recovery were initiated during the year.

Additional work, subject to budgetary constraints, will involve optimisation of various technical aspects of the project including small metallurgical testwork programs building on the Bigrlyi project Pre-Feasibility Study of March 2011. In the longer term, positive results from this work combined with improved market conditions may lead to a decision to advance the project to a Definitive Feasibility Study (DFS) stage.

A drilling program at the Walbiri deposit, in particular its southern extension on ELR45, is planned in the medium-term subject to budgetary constraints.

REFERENCES

AMDEL, 1976: Walbiri ore reserves, CPM internal report RNT158 (November, 1976).

Deutschman, A., Dunbar, P., Liu. J. 2011: Annual Report ELR's 46-55. Period Ending 17th November 2012.

Dunbar, P., Taylor, W. & Yang, X. 2011: Annual Report ELR's 46-55. Period Ending 17th November 2011.

Dunbar, P. & Yang, X. 2011: Annual Report ERL's 46-55. Period Ending 17th November 2010.

Deutschman, A., 2010: Annual Report ERL's 46-55. Period Ending 17th November 2009.

Burn, N.R., 2009: Annual Report ERL's 46-55. Period Ending 17th November 2008.

Hughes, L., 2007: Annual Report ERL's 46-55. Period Ending 17th November 2007

Dudfield, L.G., 2006: Annual Report ERL's 46-55. Period Ending 17th November 2006.

Dudfield, L.G., 2005: Annual Report ERL's 46-55. Period Ending 17th November 2005.

Fidler, R.W., 1990: Annual Report ERL's 46-55. Period Ending 17th November 1990. CPM Report No. NT273.

Fidler, R.W., 1992a: Annual Report ERL's 46-55. Period Ending 17th November 1991. CPM Report No. NT276.

Fidler, R.W., 1992b: Annual Report ERL's 46-55. Period Ending 17th November 1992. CPM Report No. NT279.

Fidler, R.W., Pope, G.J., & Ivanac, J.F., 1990: Bigrlyi Uranium Deposit, in: *Geology of the Mineral Deposits of Australia and Papua New Guinea (Ed. F.E. Hughes),* pp 1135-1138.

Fordyce, I.R., (1982) Annual Report for EL 1624 Gidyea Creek Period ending October 1st 1981. CR1982-101.

Jordan, D., Kerr, S., Liu, J. & Taylor, W. 2014: Annual Report ELR's 46-55. Period Ending 17th November 2013.

Jordan, D., Kerr, S., Liu, J. & Taylor, W. 2015: Annual Report ELR41, Malawiri Deposit. Period Ending 17th July 2015.

Jordan, D., Kerr, S., Liu, J. & Taylor, W. 2016: Annual Report ELR's 46-55. Period Ending 17th November 2015.

Jordan, D., Liu, J. & Taylor, W. 2016: Annual Report ELR's 46-55. Period Ending 17th November 2016.

Jordan, D. & Taylor, W. 2017: Group Annual Report GR328, ELR's 41, 45-55 & 31319. Period Ending 17th November 2017.

Kerr, S., Liu, J. & Taylor, W. 2015: Annual Report ELR45, Walbiri Deposit. Period Ending 17th July 2015.

Long, S., Sdraulig, S., Hardege, L. & McLeish, J., 2008: The radioactive content of some Australian drinking waters. ARPANSA Technical Report 148, 28pp.

Pope, G.J., 1993: Annual Report ERL's 46-55. Period Ending 17th November 1993. CPM Report No. 282.

Pope, G.J., 1994: Annual Report ERL's 46-55. Period Ending 17th November 1994. CPM Report No. 285.

Pope, G.J., 1995: Annual Report ERL's 46-55. Period Ending 17th November 1995. CPM Report No. 289.

Pope, G.J., 1997: Annual Report ERL's 46-55. Period Ending 17th November 1997. CPM Report No. 1885.

Pope, G.J., 1998: Annual Report ERL's 46-55. Period Ending 17th November 1998. CPM Report No. 2288.

Pope, G.J., 1999: Annual Report ERL's 46-55. Period Ending 17th November 1999. CPM Report No. 2459.

Pope, G.J., 2000: Annual Report ERL's 46-55. Period Ending 17th November 2000. CPM Report No. 2606.

Pope, G.J., 2002: Annual Report ERL's 46-55. Period Ending 17th November 2001. CPM Report No. 2703.

Pope, G.J., 2003: Annual Report ERL's 46-55. Period Ending 17th November 2003. CPM Report No. 29713.

Pope, G.J., 2004: Annual Report ERL's 46-55. Period Ending 17th November 2004. QERL Report No. 3087.

Schmid, S., Foss, C., Hill, J., Quigley, M., Schaubs, P., Cleverley, J. and Robinson, J., 2012. JSU Ngalia Basin Uranium Mineral System Project, Record 2012-003 (Northern Territory Geological Survey).

Schmid, S. (2015) Uranium occurrences characterisation in the Ngalia Basin, NT (CSIRO Report, EP: 151655)

Taylor, W. & Liu, J. 2015: Annual Report ELRs 46-55, Bigrlyi Project, Period Ending 17 November 2014

Taylor, W. & Schmid, S. 2017: Bigrlyi uranium-vanadium deposit. In: Phillips, G. N. (ed), Australian Ore Deposits, 864 p. (The Australasian Institute of Mining and Metallurgy): 571- 574.

DIGITAL DATA APPENDICES

GR328_2018_GA_02_DrillCollars.txt
GR328_2018_GA_03_DownholeGeochem_a.txt (Bigrlyi A2 Disequilibrium)
GR328_2018_GA_04_DownholeGeochem_b.txt (Bigrlyi A2 Geochem)
GR328_2018_GA_05_QAQCGeochem_a.txt (Bigrlyi A2 Disequilibrium)
GR328_2018_GA_06_QAQCGeochem_b.txt (Bigrlyi A2 Geochem)
GR328_2018_GA_07_EMEMalawiriMRE.zip
GR328_2018_GA_08_BigrlyiProcessReviewFinal-Dec18.pdf
GR328_2018_GA_09_FileListing.txt