PARTIAL RELINQUISHMENT REPORT EL24463

Walbiri

NGALIA REGIONAL PROJECT

6 February, 2006 to 21 February, 2019

EL24463_2019_P_01.pdf

1:250K Map Sheet: Mount Doreen SF52-12
1:100K Map Sheets: Doreen 5153, Yuendumu 5253

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6 March 2019

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SUMMARY

Exploration Licence EL24463 (Walbiri) is part of the 100% owned Energy Metals Ltd (EME) Ngalia Regional Project situated approximately 360km northwest of Alice Springs and 50km southeast of the Bigrlyi Uranium Project (Kerr & Liu, 2015).

EL24463 was granted on 6 February 2006. A third partial reduction (reducing the EL by 16 sub-blocks) was approved on 21 January 2019. This report covers exploration activities that occurred on the surrendered area during Energy Metals period of tenure.

Mt Eclipse Sandstone, often under sand cover, occupies most of the tenement area; there are small areas of granitic and metamorphic basement of the Aileron Province in the north, and Cambrian units of the Ngalia Basin in the northeast. EL24463 covers approx. 54% of the Walbiri uranium deposit, which has total resources of 7,037 tonnes U₃O₈, together with parts of the smaller Sundberg and Hill One satellite resources.

Exploration work on the relinquished blocks over Energy Metals’ period of tenure included an aerial geophysical radiometric and magnetic survey with interpretation in 2007, a high-resolution helicopter radiometric and magnetic survey in 2014, field reconnaissance and a project review in 2015. Following the assessment in 2015, part of the original tenement was relinquished.

A further review occurred in 2017 following a gradient array induced polarisation (GAIP) survey which suggested that prospective stratigraphy was not present. Furthermore, no significant uranium anomalies were identified in the 2014 radiometric survey over the Nama syncline in the south, an area which is predominantly outcrop and sub-crop. A significant uranium anomaly in this area is expected to have a readily identifiable signature.

Ten historic diamond and percussion holes drilled to the south of the present surrender area intercepted “red” and/or “mottled” facies of the Mt Eclipse Sandstone, which is generally considered too oxidised to contain mineralisation, and no anomalous radioactivity was found.

Recent prospectivity evaluation of the ground on EL24463 has shown that it is unlikely uranium mineralisation is located within the relinquished areas; accordingly the ground has been surrendered.
INTRODUCTION

The Ngalia Regional project comprises nine 100% Energy Metals (EME) owned exploration licences located in the Ngalia Basin, between 180 and 350 km northwest of Alice Springs in the Northern Territory (Figures 1 & 2). These ELs are located near the Bigryli uranium deposit (ELR 46-55) and in the case of EL24463 cover part of the Walbiri deposit, the remainder being located on ELR45.

EL24463 (initially 81 graticular blocks located southeast of the Bigryli resource area) was granted on 6 February 2006 for a term of six years and was subsequently renewed for three periods of two years. Six blocks were surrendered on 8 January 2016 and 18 blocks on 6 February 2018. An application for surrender of an additional 16 blocks was approved by the DPIR on 21 January 2019. This report covers the latest partial relinquishment.

![Diagram showing Project Location Plan](image-url)
Geology and Physiography

The tenement area borders the northern margin of the Ngalia Basin with prominent outcrop of the Palaeozoic Djalamarra Formation, Walbiri Dolomite and Yuendumu Sandstone flanking the northern boundary and Mt Eclipse Sandstone towards the south, which is host to the Walbiri uranium deposit (Figure 3).

Broad scale folding within the licence area has disturbed the strata forming a series of synclines and anticlines with east-west axes. The most northerly of these, the Mount Eclipse Syncline, is asymmetrical and faulted against the basement rocks in the far north of the licence area (Pope, 1984). Prominent geomorphological features within the tenement include the Walbiri Range, which are dominantly east-west trending hills, and lower relief country to the south. Within EL24463, there are no significant exposed areas of granitic basement outcrop other than lateritic cap rock in the far north. The Mt Eclipse Sandstone is the primary target for uranium mineralisation in the Ngalia Basin.

The first surrender area situated in the northwest of EL24463 (Figure 3) is predominantly quaternary cover consisting of soils, colluvium & alluvium sheetwash which likely overly beds of Walbiri Dolomite in the southern portion and mesoproterozoic basement of the Southwark Granite Suite in the north.

The second northeast surrender area (Figure 3) predominantly contains outcropping Mt Eclipse Sandstone in the east with subcropping Mt Eclipse amongst quaternary...
cover in the west. The northern boundary of the second area is mapped on the 250k Mount Doreen map sheet as Cambrian Bloodwood Formation and Walbiri Dolomite which underly the Mt Eclipse Sandstone.

The third surrender area in the south of EL24463 consists dominantly of Mt Eclipse sandstone outcrop and subcrop, in places with a thin colluvial sheet wash or sand plain cover. In the eastern portion of the relinquished area there are patches of low-lying outcropping Mt Eclipse Sandstone which comprise part of the Nama Syncline. The central portion of the area is dominated by an N-S trending creek system and alluvial overflow south of Sandstone Bore (Figure 3).

![Figure 3: Map showing three surrender areas of EL24463 (16 sub-blocks – area shown in pink stripe) in relation to topographic features, prospects and the retained area (in blue). Red stars: S = Sundberg deposit; W = Walbiri deposit; H = Hill One deposit.](image)

**WORK COMPLETED FROM 6TH FEBRUARY 2006 TO 21ST JANUARY 2019**

**2007 Airborne Geophysical Survey**

An airborne geophysical survey, providing radiometric, magnetic and topographic data, was conducted over Energy Metals’ Ngalia Regional tenements in September 2007 by GPX Airborne (Saul, 2008). A total of 14,932 line kilometres was flown. The data were processed by Southern Geoscience Consultants (SGC), who meshed the new data with previous company survey data. SGC were subsequently contracted to interpret the imagery in terms of structural and radiometric features.
The imagery and structural interpretation by SGC have previously been reported - refer EL24463_2017_P.

**2014 Radiometric and Magnetic Helicopter Survey**

The Ngalia Basin high-resolution airborne survey was flown across four non-contiguous areas on EL’s 24453, 24463 and 24451 from 25th November to 4th December 2014 using Daishsat’s Robinson R44 helicopter system.

The surveys were flown over or close to the Dingo’s Rest, Camel Flat, Coonega, Walbiri South and Malawiri prospects. A total of 7,915 line-kilometres were flown with a line spacing of 50 m; details of the survey are summarised in Tables 1 and 2 below, Figure 4 shows survey areas in relation to the surrendered blocks.

**Table 1: Specifications for the airborne survey blocks flown in the Ngalia Basin**

<table>
<thead>
<tr>
<th>Date of Survey</th>
<th>25 Nov – 4 Dec 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Areas Surveyed</td>
<td>Coonega, Dingos Rest, Malawiri, Walbiri</td>
</tr>
<tr>
<td>Survey Type</td>
<td>Airborne magnetics, radiometrics and digital elevation</td>
</tr>
<tr>
<td>Survey Height</td>
<td>30 m</td>
</tr>
<tr>
<td>Line Spacing</td>
<td>50 m</td>
</tr>
<tr>
<td>Line Direction</td>
<td>140-320 (Coonega), 000-180 (other areas)</td>
</tr>
<tr>
<td>Tie Line Spacing</td>
<td>500 m</td>
</tr>
<tr>
<td>Total Line Kilometres</td>
<td>7,915 km</td>
</tr>
<tr>
<td>Datum</td>
<td>Geocentric Datum of Australia (GDA94)</td>
</tr>
<tr>
<td>Aircraft Type</td>
<td>Robinson R44 Helicopter (VH-DTZ)</td>
</tr>
<tr>
<td>System Set-up</td>
<td>Boom (stinger) mounted magnetometer, crystal pack in cockpit</td>
</tr>
<tr>
<td>Magnetometer</td>
<td>Geometrics Cs vapour magnetometer assembly, G823B with precision Kroum KMA4 counter</td>
</tr>
<tr>
<td>Base Magnetometer</td>
<td>Billingsley TFM100G2 vector magnetometer</td>
</tr>
<tr>
<td>Spectrometer</td>
<td>Two Geometrics portable proton precession base magnetometers</td>
</tr>
<tr>
<td>Radar Altimeter</td>
<td>Model RSX-4 16L integrated gamma detector &amp; spectrometer</td>
</tr>
<tr>
<td>Climatic Observations</td>
<td>Model PT200 allied signal (Bendix-King) KRA-405B radar altimeter</td>
</tr>
<tr>
<td>Positional Information</td>
<td>Vaisala barometric and temperature/humidity module</td>
</tr>
<tr>
<td>On-board Computers</td>
<td>Novatel OEMV-1G, 32 channel GPS &amp; GLONASS Receiver</td>
</tr>
<tr>
<td></td>
<td>ZDAS Acquisition and navigational control module</td>
</tr>
</tbody>
</table>
Table 2: Survey line numbers and final line kilometres for the Ngalia Basin aeromagnetic surveys

<table>
<thead>
<tr>
<th>SURVEY AREA</th>
<th>Line Direction</th>
<th>Line Kilometres</th>
<th>Line Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Traverses</td>
<td>Ties</td>
<td>Traverses</td>
</tr>
<tr>
<td>Coonega</td>
<td>140-320</td>
<td>050-230</td>
<td>1016.7</td>
</tr>
<tr>
<td>Dingo’s Rest</td>
<td>000-180</td>
<td>090-270</td>
<td>636.5</td>
</tr>
<tr>
<td>Malawiri</td>
<td>000-180</td>
<td>090-270</td>
<td>4107.3</td>
</tr>
<tr>
<td>Walbiri</td>
<td>000-180</td>
<td>090-270</td>
<td>1430.0</td>
</tr>
<tr>
<td>Sub-totals</td>
<td>7190.5</td>
<td>724.6</td>
<td>Total</td>
</tr>
</tbody>
</table>

Figure 4: Surrender blocks of EL24463 (pink stripe) in relation to the 2014 helicopter magnetic and radiometric survey areas (red dash polygons).

The high-resolution magnetic and radiometric airborne survey data was acquired to enhance the subtle magnetic responses associated with essentially non-magnetic sediments, and highlight bedding trends and possible structures and deeper stratigraphic packages (under cover) not previously apparent in the geology and other available geophysical data. The survey results have led to improved interpretation and have provided better targeting of potential uranium mineralisation under cover.

At the survey block scale, there is clear evidence of folding (sometimes intense) of the sedimentary sequence across all four survey areas, and evidence of depositional unconformities and thrust faulting in places. Also apparent, is the overprint of more recent drainage systems which has remobilised near-surface magnetic material and thereby disrupted the magnetic response caused by bedding and other underlying...
features, which are of prime interest for uranium exploration. Figure 5 below depicts examples of these features in the Walbiri survey area.

In 2015 a detailed stratigraphic interpretation of the magnetic imagery was undertaken by EME geologists using Micromine software. The high-resolution imagery has approximately doubled the previous resolution allowing enhanced interpretation of magnetic linears and other features compared with the previous 2007 fixed wing airborne survey (also refer Figure 5).

Interpretation of the helicopter radiometric imagery was also conducted using the magnetic linears as a guide for areas of outcrop. It is noted that there are slightly elevated responses associated with the modern drainage systems, however, none are sufficiently anomalous to warrant follow-up. No anomalies were identified in the eastern portion of the surrendered area which is predominantly outcrop and subcrop of Mt Eclipse Sandstone of the Nama Syncline.

It should be noted that the survey area also covers tenement areas that are not part of the EL24463 relinquished area. However, to avoid the cost of excising these areas, the full data set has been provided to the DPIR for public release including the data covering parts or all of the following tenements: EL's 24453, 24463, 30002 and ELR 45 (refer Figures 5 & 6 below).
Figure 5: Magnetic imagery and interpretation over surrendered areas of EL24463, Regional TMI_RTP_1VD background with high resolution TMI_RTP_1VD overlay from 2014 helicopter survey. White thin lines = EME Interpreted magnetic linears, White Thick Lines = MD_Fold_Int_250K. Depositional unconformities and subsequent folding in the sedimentary bedding can be clearly seen in the eastern portion of the third southern surrendered area. The prominent feature is the ‘Nama Sycline’.
Figure 6: Radiometric imagery with magnetic interpretation over surrendered areas of EL24463, Regional RAD_U_RBW background with high resolution RAD_U_RBW overlay from 2014 helicopter survey. White thin lines= EME Interpreted magnetic linears, White Thick Lines= MD_Fold_Int_250K. There are no significant radiometric anomalies observed in the helicopter survey imagery in any of the relinquished areas. The eastern portions of the second north east and third southern relinquished area is predominantly outcropping however no significant radiometric anomalies exist.
Field Reconnaissance

In March 2015 field reconnaissance was carried out at a number of locations including the southern half of EL24463 and surrendered tenement EL30002. Approximately six locations were visited however only two fall within the surrendered area (refer Table 3 & Figure 7). The objective of the reconnaissance was to distinguish the rock type, stratigraphy and record structural and radiometric measurements for mapping purposes and to aid in in magnetic interpretation of folded and faulted stratigraphy. Generally, the magnetic interpretation correlates to what was measured in the field giving good confidence in the magnetic data.

Table 3: Field reconnaissance locations within the surrendered areas

<table>
<thead>
<tr>
<th>Prospect</th>
<th>Easting</th>
<th>Northing</th>
<th>Strike</th>
<th>Dip</th>
<th>RadEye cps</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walbiri South</td>
<td>760300</td>
<td>7525270</td>
<td>80</td>
<td>73</td>
<td></td>
<td>Sandstone, fine to medium grained, bleached white facies, quartz arenite,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>N80W/73S</td>
</tr>
<tr>
<td>Walbiri South</td>
<td>760305</td>
<td>7525362</td>
<td>80</td>
<td>75</td>
<td>20</td>
<td>Sandstone, medium grained, mottled white w/ hem blemishes, N80W/75S</td>
</tr>
</tbody>
</table>

Figure 7: Two field reconnaissance points fall within the surrendered area. The description of the data points is outlined in Table 3 above. Note: Four additional locations were visited on EL24463 just to the north & south of the surrendered area, sixteen locations were visited within and just outside EL30002 (surrendered in 2017).

Overall, regional outcrops cannot directly be stratigraphically correlated with one another easily. The Mt Eclipse Sandstone consists of a series of alluvial fan deposits.
Alluvial fans are limited in size and vary in thickness and shape. Unless a detailed depositional environment study across the basin is conducted, it would be difficult to correlate stratigraphic packages and/or mineralised horizons.

**Project Review**

During 2015, the project was reviewed to identify areas of low uranium prospectivity with a view to surrender this ground before the next anniversary date. It was recommended that six blocks be surrendered north of the fault zone that bounds the northern margin of the Ngalia Basin. The application to surrender the ground was approved by the DME in January 2016.

In 2017, an area consisting of 18 blocks on EL24463 was targeted for surrender. Historically this area has been moderately explored (including 13 drill holes with no significant intercepts found) to the point where some indication for the existence of a significant anomaly would have been noted if mineralisation was present. There were no radiometric responses or anomalies of significance in an area of reasonable outcrop. Particularly important was the 2017 GAIP survey conducted 2km north of the relinquished area which failed to identify any extension of prospective beds onto the southern limbs of the Mt Eclipse anticline (leading to Nama syncline); therefore, Energy metals believed there was no justification for continuing to explore this southern area in the absence of any positive results. The 18 blocks of EL24463 were surrendered in January 2018.

In 2018/19 additional areas of EL24463 were recommended for surrender based on the evidence presented in 2017. The first area (‘1’ on Figure 8) in the northwest, which is predominantly cover, is underlain by basement and is not prospective for Bigrlyi or Walbiri-style uranium mineralisation. The second area (‘2’ on Figure 8) in the northeast is considered to be too low in the Mt Eclipse stratigraphy to contain mineralisation. The third area (‘3’ on Figure 8) in the south shows only weak radiometric responses in an area of significant outcrop/ and sub-crop.
Figure 8: Tenement outlines with magnetic image (top) & radiometric uranium image (bottom) as backdrop and surrender areas 1, 2 and 3 mentioned in the text (pink hatched areas).
Drilling Programs Review

Energy Metals did not conduct any drilling programs or other sampling programs on the relinquished ground during the period of tenure.

Historically, Central Pacific Minerals (CPM) drilled three holes in the Walbiri south area in 1974 to follow-up Track Etch anomalies (Anomaly 8 & 9) defined in the 1974 survey. The three holes (DWPH1-3) were drilled vertically and geophysically logged, however, no anomalous radioactivity was found (refer Figure 9).

Figure 9: Digital screenshot from report CR1977-0101 showing minor details of DWPH1-3 drilled in 1974 by CPM.

In 1978 AGIP drilled 10 stratigraphic percussion holes (ECP13-16, 20-25) in the area as part of the Emu Caves exploration program. No mineralisation was discovered with all drillholes intercepting red and or mottles facies of Mt Eclipse sandstone.

Figure 10: Extract of report CR1979-0064 showing available drill hole summary data collated in 1978 by AGIP.

The results of the historical drilling re-enforces the decision to relinquish the area.
Note: None of the historic data is in digital format except the scanned original exploration reports downloaded from NTGS digital library, MEX. EME has not located the historic drillhole collars in the field and has used location data from the NT strike website to plot the collars in GIS (accuracy +/- 200m).

CONCLUSIONS

Due to assessed low prospectivity for uranium mineralisation, 16 blocks consisting of: three blocks in the north western area, four blocks in the north eastern and nine blocks in the southern area of EL24463 was recommended for partial surrender. A total of 41 blocks are to be retained (see Figure 3); the partial surrender application was approved on 21st January 2019.

REFERENCES


Kerr, S. & Liu, J., 2016: Group Annual Report EL24453, EL24463, EL24533, EL24451, EL24804, EL24807, EL30002, EL30004 & EL30006, Ngalia Regional Project. GR070-09_2016_GA_01, Period Ending 6 February, 2016.
DIGITAL DATA

All digital data covering EME’s exploration activities on the relinquished ground has previously been reported to the NT DME/DPIR. Please refer to digital data files below for resubmission.

EL24463_2019_P_02_Aeromag.zip
EL24463_2019_P_03_Aerorad.zip
EL24463_2019_P_04_MagInterp.zip
EL24463_2019_P_05_Filelisting.txt