Titleholder: Central Australian Phosphate Pty Ltd (formerly Central Australian Phosphate Limited)

Operator: Rum Jungle Resources Ltd

Tenement Manager: Complete Tenement Management

Tenement: EL 24726

Project Name: Ammaroo Phosphate

Report Title: Partial relinquishment report for EL 24726, 11 sub-blocks dropped at renewal and split, Ammaroo Phosphate Project

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Target Commodities: Rock Phosphate

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250K map sheet: Elkedra SF53-07

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SUMMARY
The Ammaroo Phosphate Project is located 240 km southeast of Tennant Creek. The project covers 280 km of strike of the highly prospective southern Georgina Basin. The project area contains the Ammaroo Phosphate Deposit, which is currently Australia’s largest JORC phosphate resource, the satellite Ammaroo South resource and the Rockhole prospect, and significant greenfields potential. The overall Ammaroo Phosphate Project including EL 24726 is in pre-feasibility. An ML application is in place over part of the JORC resource on EL 24726. EL 24726 is in three parts, the western of which contains the eastern part of the main Ammaroo JORC Resource. EL 24726 is being renewed. As part of that process, it needs to be split into two or more, such that each is less than the mandatory 250 sub-blocks. This report describes an accompanying voluntary reduction of EL 24726 from 294 sub-blocks overall to 240 and one or two new ELs. The 11 sub-blocks being relinquished from the main body of EL 24726 either contain or impinge on AAPA sites and/or CLC sites of cultural significance or have been tested by drilling. The only work conducted on the areas relinquished is five RC holes (ARC246-250) with a maximum depth of 51 m for a total of 174 m, drilled by Central Australian Phosphate during 2011. These holes were drilled to check for phosphate in mapped Arthur Creek Formation between the historic phosphate exploration drillhole VAM P3 and the former Tosca Turquoise (Cu-Al phosphate) Mine. This historical mine is now covered by the Putyenge Scared Site. The best hole was ARC246 which intersected an average of 8.68% P₂O₅ from 15 m to 19 m including one metre from 17 m to 18 m at 10.1% P₂O₅. This did not appear to be continuous along strike and is between two cultural exclusion zones, so is was not worth pursuing in isolation. In any event, any possible continuation or increase in prospectivity away from the Putyenge Sacred Site is on ground still held by Rum Jungle Resources or its subsidiaries.
INTRODUCTION
The Ammaroo Phosphate Project tenements are located 280 km northeast of Alice Springs and 240 km southeast of Tennant Creek, on the Barrow Creek SF53-06, Elkedra SF53-07, Bonney Well SF53-02 and Frew River SF53093 1:250,000 mapsheets. Rum Jungle Resources has been exploring for Cambrian rock phosphate in this area since 2009 resulting in the discovery of Barrow Creek 1 and the Ammaroo South deposits. Rum Jungle Resources also acquired the Arganara Phosphate deposit on EL 24726, which is contiguous with Barrow Creek 1, by taking over Central Australian Phosphate. The two largest flagship deposits have been combined into Australia’s largest rock phosphate resource now called Ammaroo Phosphate.

LOCATION, ACCESS AND LAND USE

Location
EL 24726 is located in the middle of the Ammaroo Phosphate Project on the Elkedra 53-07 250K and straddles the boundary of four 100K sheets; namely Elkedra, George Creek, Ammaroo and Sandover.

Figure 1. Ammaroo Project location and granted titles including Fertoz JV. The areas to be relinquished from EL 24726 are shown as red polygons. The pink polygons are ML applications. Green shaded polygons are some of the other areas being relinquished in this round. Not all have been actioned by DME.
**Access and Logistics**

Access to the project area is via the sealed Stuart Highway and the partly sealed Plenty and unsealed Sandover Highways from the south and the Taylors Road / Murray Downs road from the north. Access within the project area is limited to various station and exploration tracks (Figure 2). Construction of Rum Jungle Resources’ exploration tracks and line clearing are generally done by the local pastoralist or a Tennant Creek based earthmoving contractor. The 20-person Rum Jungle Resources’ Ammaroo base camp and fly-camps are used for exploration. Bores are used for drinking water. A medical clinic is located at the Ampilatwatja Aboriginal Community. Fuel is carted from Alice Springs on an as-needs basis. The nearest airstrips are at Ampilatwatja and Ali Curung. The Rum Jungle Resources’ Ammaroo base camp has an emergency helipad and JetA1 and AvGas.

![Map of the project area](image)

**Figure 2. Access to the Ammaroo Project area from Alice Springs in the south.**

**Climate**

The climate is described as arid tropical by Baker et al 2005. The year is notionally divided into two main seasons, a short, hot summer featuring the bulk of the annual rainfall and a longer mild to cold and dry winter. These two dominant seasonal patterns are separated by short (1-2 months) transitional periods. The summer rains are somewhat influenced by the monsoonal rain patterns from the north, particularly cyclones which cross the Western Australian coastline.

Rainfall figures over a 30 year period (1981 – 2010) indicate an annual average rainfall of 383 mm (BOM 2012). However, rainfall is highly variable and unpredictable and annual records range from 86.4 mm to 914 mm. As shown below, much of 2010 and the start of 2011 were atypically wet while the rainfall for 2012 was more typical (Figure 3).
The average monthly relative humidity at 9 am (derived from data from 1988 - 2010) fluctuates between 31 to 52 percent with an average of 42 percent (Figure 4). The average monthly relative humidity at 3 pm is about 11-21 percent lower than the 9 am recorded humidity.

The mean monthly maximum and minimum temperature over a 30 year period (1981 – 2010) indicate that the summer temperatures can fluctuate between 21 and 38 degrees Celsius and the winter temperatures can flux between 7 and 27 degrees Celsius. Sub-zero temperatures occur occasionally during July and August and there have been instances of surface water freezing at night. Figure 5 shows the mean monthly maximum and minimum temperatures recorded at Ali Curung.
Physiography, Land Systems, Flora and Fauna

The project is located in the Tanami Bioregion. This bioregion is comprised mainly of red sand plains with underlying rock strata occasionally exposed as hills and ranges. The sand plains are vegetated with mixed shrublands of Acacia, Eucalyptus or Hakea over Triodia hummock grasslands. On the ranges, Acacia shrublands occur over hummock grasses. This bioregion contains many plant taxa that are endemic to the region or the Northern Territory and several flora and fauna species that are of conservation significance.

Using the system devised by Perry, the area contains two major land systems; the Alinga and Singleton. The Alinga Land System can generally be described as a system of undulating plains interspersed by low rounded ridges with shallow stony soils, red earths and red clayey sands. The land system is dominated by Acacia aneura (Mulga) or Acacia georginae (Gidgee) woodlands over short grasses and forbs. On shallow stony soils, sparse shrublands occur over Triodia sp (Spinifex). The Singleton land system includes red sands forming undulating plains and sand rises, separated by moderately wide, flat swales. Alluvial flats and drainage floors may also be present. Vegetation is dominated by sparse shrublands over Triodia (Spinifex), with Acacia woodlands also being present.

The project has been the subject of several baseline fauna and flora surveys commissioned by Rum Jungle Resources. These, a Threatened Species Report, and a report on weed species have been provided with MMPs and are not repeated here. These topics are dealt with even more comprehensively in the NOI.

Land Use

The area is sparsely settled. The largest permanent habitations are the indigenous communities at Ampilatwatja (population approx. 500) and Ali Curung (population quoted variously as 960 or 535 of which over 95% are Indigenous persons). The dominant Aboriginal languages spoken are Warlpiri and Alyawarr with English as a second or third language.

The exploration licences within the project cover parts of the following pastoral leases:

- Derry Downs Station, NT Portion 1289, PPL 1107. Owned by DA and CM Weir, Ammaroo PMB 154 Alice Springs NT.
- Elkendra Station, NT Portion 3431, PPL 1000, via Alice Springs, NT 0870. Owned by Roy Driver, via Tennant Creek 0861.
- Ammaroo Station NT Portions 749 & 1290, PPL 1105. Owned by DA and CM Weir, Ammaroo PMB 154 Alice Springs NT.

EL 24726 impinges on all three stations.

The area supports an active beef cattle industry and stocking numbers vary seasonally. Cattle are generally not seen near the Ammaroo Phosphate Resource because of a lack of both surface and ground water. In contrast, Ali Curung has irrigated market gardens using the plentiful groundwater there.
Aboriginal Sites of Significance

A Native Title Claim (NTD 6069/01) Tribunal No. DC01/69 that covers the entire project area was lodged on 19/12/2001.

Before it began any on-ground work on EL 24726, NuPower Resources (later Central Australian Phosphate) undertook an inspection of the AAPA Register of Sacred Sites.

An Exploration Agreement between NuPower Resources Ltd and the Central Land Council (CLC -representing the Native Title Holders of the land) was signed between both parties on 11th July 2008. This agreement covered two Exploration licences EL 24726 and former EL 25664. Various generations of site-specific Clearance Certificates have been issued beginning with a survey covering the Limestone Bore area issued on 13 July 2010. In subsequent surveys, Sacred Sites have been retrospectively located by the CLC in areas previously given approval. Another Site of Significance, originally thought by Traditional Owners to be on the adjacent Rum Jungle Resources’ EL, was found to actually be on EL 24726.

In mid 2013, Rum Jungle Resources assumed responsibility for all previous NuPower/ Central Australian Phosphate agreements with the CLC. An on-country meeting for the greater Ammaroo Project was held on 09/10/2013.

Prior to the partial relinquishment described in this report, there were at least a dozen Cultural Sites as determined by either the CLC and/or AAPA affecting 28 sub-blocks of EL 24726.

One area of Aboriginal Significance of particular relevance to this report covers the former Tosca Turquoise (Cu-Al phosphate) Mine and surrounds. In February 1993, the historical mine was covered by several Alyawarre Scared Sites recognised by the AAPA and/or CLC and a substantial surrounding buffer. This area is collectively called Putyenge. This site also extends onto another EL in the project and it is anticipated that that the whole area of Cultural Significance will be dropped.

As per CLC agreements, the exact locations and significance of all Cultural Areas are kept confidential and are not shown on any maps in this report. However, the Putyenge Site is on public record elsewhere.
**Heritage Sites**

A search of the NT Heritage Register held by NRETAS shows no Declared Heritage Sites in the area covered by this report.

**Mineral Titles Act**

EL 24726 was part of the reporting group GR 104 but will revert to standalone reporting when the other EL in the group is surrendered later in the year.

**Mining Management Act**

The NT Mining Management Act (MMA) allows for different reporting groups to the NT Mineral Titles Act (MTA). Under the MMA, EL 24726 is part of the amended Ammaroo Authorisation which has recently been approved by DME in Alice Springs. It will have to be amended again after the split of EL 24726.

**WorkSafe**

As part of an NT-wide move by Worksafe to improve its monitoring and inspections of exploration and mining projects, Worksafe required Rum Jungle Resources to redo its Safety Management System and update its Risk Management Plans for each project including Ammaroo. Consultants Switched on to Safety were engaged to completely update Rum Jungle Resources WHS&E. The most recent Worksafe inspection of the Ammaroo project was undertaken in March 2014.

**HISTORY OF TENURE**

Exploration license EL 24726, formerly called “Arganara”, was applied for by Arafura Resources Limited on 12th May 2005 and granted on 1st April 2008 as 1,374 km². It was part of their Ni-PGE-Au exploration portfolio around the Kurinelli Goldfield. EL 27726 was transferred to NuPower Resources Limited on 3rd April 2008 as a result of the demerger of certain uranium assets from Arafura and the formation of the new company. NuPower was targeting uranium, but had done little on the ground until late 2010 after Rum Jungle announced the discovery of phosphate on the adjacent title. NuPower then swapped to phosphate exploration. EL 24726 was reduced in 2010 and again in 2011, to 294 sub-blocks or 939.6 km². It was then in three parts. An ML application covers part of EL 24726 over the current JORC Resource.

NuPower became Central Australian Phosphate (CEN). During 2013, Rum Jungle Resources took over Central Australian Phosphate which became a wholly owned subsidiary and gave RUM control of the contiguous CEN titles in the Ammaroo Project.

As part of the renewal of EL 24726, it has to be reduced to less than or equal to 250 sub-blocks and/or split into two or more. The larger part of the previous three, which contains the JORC resource, will be retained as EL 24726 with the voluntary partial relinquishment of 11 sub-blocks as described here. It is anticipated that the other two parts of the EL in the northwest will be given a new EL number(s).
EXPLORATION AND PROJECT RATIONALE

The Ammaroo Project is being explored for rock phosphate, principally within the Arthur Creek Formation which hosts the Ammaroo Phosphate Resource and the Ammaroo South deposit. Exploration is directed at locating phosphate where it is shallow (low strip ratios), not entirely weathered (predictable rock properties amenable to mining), and highest grade and thickest (palaeo-coast and/or potentially draped over palaeo-highs). Rum Jungle Resources’ approach, which has worked successfully to date, is to initially undertake reconnaissance RC or air core drilling on existing tracks and fences. Samples are analysed in the field with a handheld XRF and potential phosphate is sent for laboratory analysis. Depending on success, follow-up drilling usually involves cleared drill lines and/or grid RC drilling.

Since the discovery of economic grades of phosphate in 2010, Rum Jungle Resources has moved to rapidly prove them up to JORC 2012 standard including a significant component in the Measured category. The company has also completed a Scoping Study and a Prefeasibility Study is underway.

GEOLOGICAL SETTING

Regional Geology

The Ammaroo Project is located in the Georgina Basin which contains the largest sedimentary rock phosphate deposits in Australia. The Georgina Basin includes rocks of Neoproterozoic to Devonian age, with Cambrian platform carbonate rocks dominating basin fill. The southern Georgina Basin is contiguous with the Wiso Basin to the west (Figure 8).
Figure 8. Rum Jungle Resources and subsidiaries phosphate holdings. The regional geological setting shows the Ammaroo Phosphate deposit on the northern “shore” of the connection between the southern Georgina Basin in NT and the Wiso Basin. Rum Jungle Resources has no holdings in Queensland portion of the Georgina Basin (not shown).

The southern Georgina Basin includes a thick sequence of Cambrian-Ordovician sediments, deposited within the Dulcie Trough and on the adjoining Elkedra Shelf. Work by previous explorers and NTGS identified an extensive area of shelf-facies marine carbonate and clastic sediments of the Middle Cambrian Arthur Creek Formation within the southern Georgina Basin (Figure 9). This area is prospective for sedimentary phosphate mineralisation.
Cambrian sediment outcrop is generally restricted to the north of the project area, along the flanks of the Davenport Range. Several formations contain very similar carbonate and recessive shale units that can be very difficult to tell apart without palaeontology and some published maps show incorrect formation assignation. Indeed, the outdated Elkedra published 250Kmap shows the Arthur Creek Formation as being partially laterally equivalent to the Chabalowe Formation and partially underlying it, whereas the actual Chabalowe Formation is laterally equivalent to the younger Arrinthunga Formation not the Arthur Creek Formation. The Chabalowe Formation can directly and conformably overlie the Arthur Creek Formation, but they are distinctly different ages, and this should be the relationship on the Elkedra mapsheet. The former Errarra Formation shown on published maps is now recognised as Red Heart Dolostone. In addition, it has recently been recognised that the so-called Thorntonia Limestone mapped over large areas of the Northern Territory is actually the older Hay River Formation.
and the former name should be restricted to its type area in Queensland. This change is yet to be reflected on any maps or publications.

Alluvial, aeolian and residual sediments of Cenozoic age blanket most of the remaining project area

**Local Geology and Prospectivity**

Within the overall project area, the Cambrian lithostratigraphy of the southern Georgina Basin includes units of the Shadow and Narpa Groups and two units are known to be phosphatic:

- mid-Cambrian Thorntonia Limestone (now Hay River Formation) – a limestone and dolostone unit with phosphorite beds
- mid-Cambrian Arthur Creek Formation – deep-water anoxic organic-rich shales overlain by shallow-water aerobic calc- and dolo-siltstones with phosphorite beds

To date, the Thorntonia Limestone (Hay River Formation) phosphorite is thought to be inferior to that in the Arthur Creek Formation in Rum Jungle Resources’ project area. In the opinion of Rum Jungle Resources, reports of phosphate in the Chabalowe Formation are erroneous and reflect the mismapping on published maps (see discussion above).

Drilling within the project area indicates that the Arthur Creek Formation target stratigraphy generally contains two distinct facies:

- an upper aerobic facies consisting of grey to brown siltstones, with minor brown chert bands or lenses; and
- a lower anaerobic facies consisting of dark green to black siltstones, with minor black chert bands or lenses.

The upper facies is the phosphate target and, where it is present, the lower facies serves as economic basement.
RESOURCES

**Main Ammaroo Resource**

The current JORC 2012 resource for the main Ammaroo Project is over a billion tonnes at 14% P₂O₅ using a 10% cut-off. This is outlined on Figure 11 above. The project is in pre-feasibility.

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*Figure 11. Local geology over EL 24726 with areas being relinquished outlined in red. The black polygons are the surface trace of the JORC phosphate resource.*
Ammaroo Resource estimates March 2014

Table 1. Ammaroo Phosphate Resource.

Ammaroo South is a satellite resource on EL 25185 approximately 70 km southeast of the main Ammaroo deposit. It is a JORC 2012 Inferred phosphate resource estimated at 70 Mt at 13% P 205 using a 10% cut-off.

Table 2. Ammaroo South Phosphate Resource.

SUB-BLOCKS RELINQUISHED

Some of the cultural sites and “no-go” areas as determined by the APA and CLC have been relinquished from EL 24726. Another area tested by drilling has also been dropped.

These reductions were originally requested from DME in June 2014, but was not actioned in TIS until 01/09/2014.

As shown in the figure below, eleven sub-blocks in four areas are being relinquished. After this and the split, EL 24726 is 240 sub-blocks or 766.67km², having been reduced from 294 sub-blocks (939.57 km²) previously and 1,374 km² at grant.
WORK ON RELINQUISHED AREA

Five RC holes (ARC246-50) with a maximum depth of 51 m for a total of 174 m were drilled by Central Australian Phosphate during 2011. These holes were drilled to check for phosphate in mapped Arthur Creek Formation between the historic phosphate exploration drillhole VAM P3 in the west and the former Tosca Turquoise (Cu-Al phosphate) Mine in the east. This historical mine is now covered by several Scared Sites recognised by the AAPA and/or the CLC and a substantial surrounding buffer collectively called Putyenge. Another, smaller, cultural exclusion zone lies to the west of the line of drillholes.

The best hole was ARC246 which intersected an average of 8.68% P₂O₅ from 15 m to 19 m including one metre from 17 m to 18 m at 10.1% P₂O₅. This did not appear to be continuous along strike and since it is between two cultural exclusion zones, was not worth pursuing in isolation. In any event, any possible continuation away from the Putyenge Sacred Site is still held by Rum Jungle Resources or its subsidiary.
CONCLUSION AND RECOMMENDATIONS
Some of the cultural sites and “no-go” areas as determined by the AAPA and CLC have been relinquished from EL 24726. Another area tested by drilling has also been dropped. The only work on the relinquished area was five drillholes by Central Australian Phosphate. These were between the buffer around a major named Scared Site and a smaller culturally sensitive site. Continuing work on EL 24726 will include the on-going prefeasibility study, progressing the ML applications, and a tenement rationalisation once all titles in the Ammaroo Phosphate Project are in the same company name.