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Operator: Rum Jungle Resources Ltd

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Tenement: [EL 30223](#)

Project Name: Brunchilly Phosphate

Report Title: [Partial relinquishment report for EL30223, Brunchilly Phosphate Project](#)

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Target Commodity: Rock Phosphate

Date of Report: 26/09/2015

Datum/Zone: GDA94/ Zone 53

250K map sheet: Helen Springs SE5310

100K map sheets: Brunchilly 5760, Munkaderry 5860

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SUMMARY

The Brunchilly Phosphate Project consists of three contiguous exploration licences, including EL 30223. After an assessment of the previous drilling by Vale and an in-house waterbore study by Rum Jungle Resources, it has been decided that the southeastern portion of the Brunchilly Project area has been adequately tested for phosphate. Voluntary partial relinquishments are being made to both EL 30223 and EL 30224. Eighty blocks are being relinquished from EL 30223 taking it to 156 blocks.

INTRODUCTION

The Brunchilly Phosphate Project consists of three contiguous tenements: ELs 30222, 30223 and 30224.

Location

The Brunchilly Project is located approximately 90 km northeast of Tennant Creek at the nearest point and 235 km northeast of Tennant Creek at the northeastern-most corner. The Brunchilly project is located on the Helen Springs (SE53-10) 1:250,000 and Brunchilly 5760, and Munkaderry 5860 1:100,000 map sheets. [Figure 1](#) is a map of the granted project ELs.

Access and Logistics

Access to the tenements is via the Stuart Highway and 72 km north from Tennant Creek then east of Attack Creek for 26 km on the Brunchilly Station access road ([Figure 1](#)). Internal access is good.

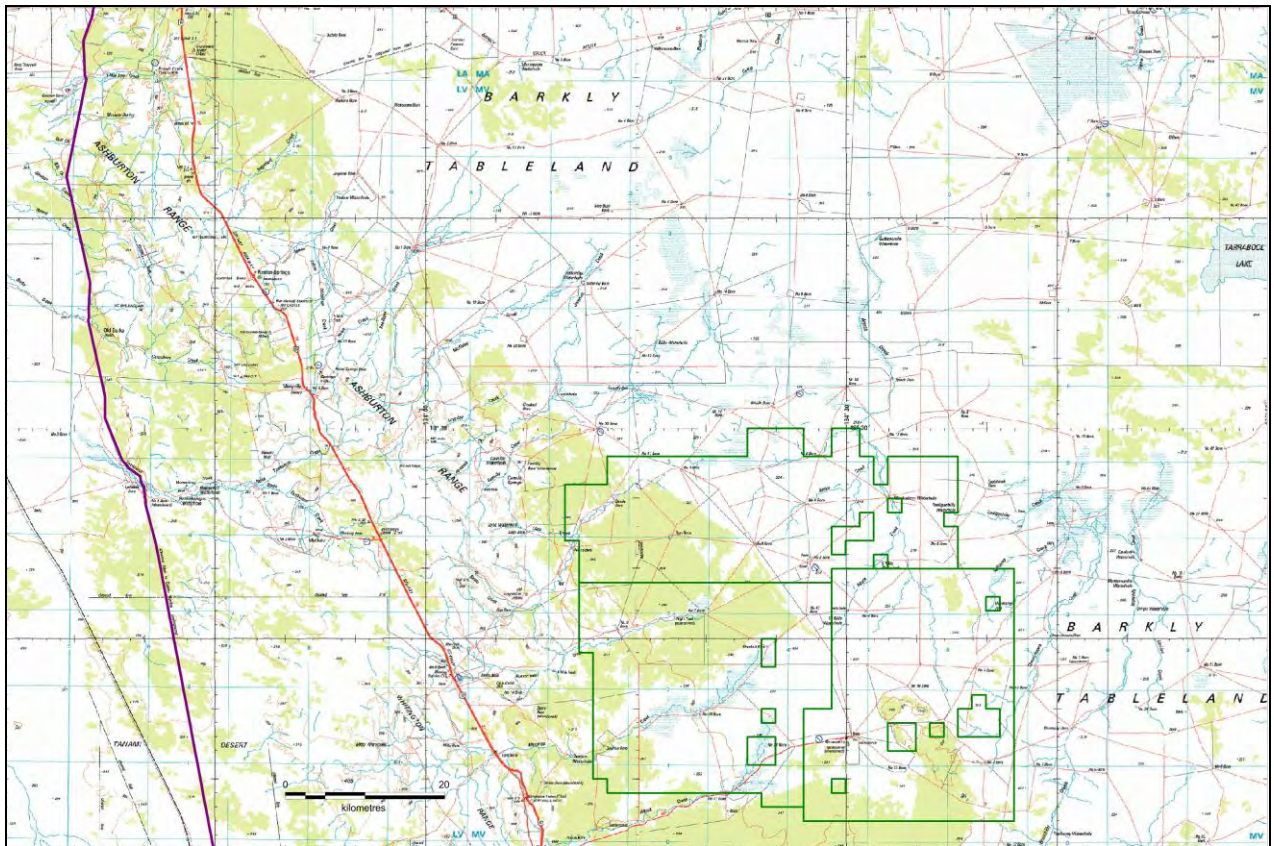


Figure 1. Access to, and in, the Brunchilly Project area. The area shown corresponds to the Helen Springs 250K sheet. Note the proximity to the sealed Stuart Highway (solid red), gas pipeline (purple) and the railway west of the project area.

Climate

The Brunchilly region is semi-arid with annual rainfall of 420.8 mm. The climate is characterised by distinct wet and dry seasons with the majority of rain falling between November and March ([Figure 2](#)). The predominant wind direction is from the east.

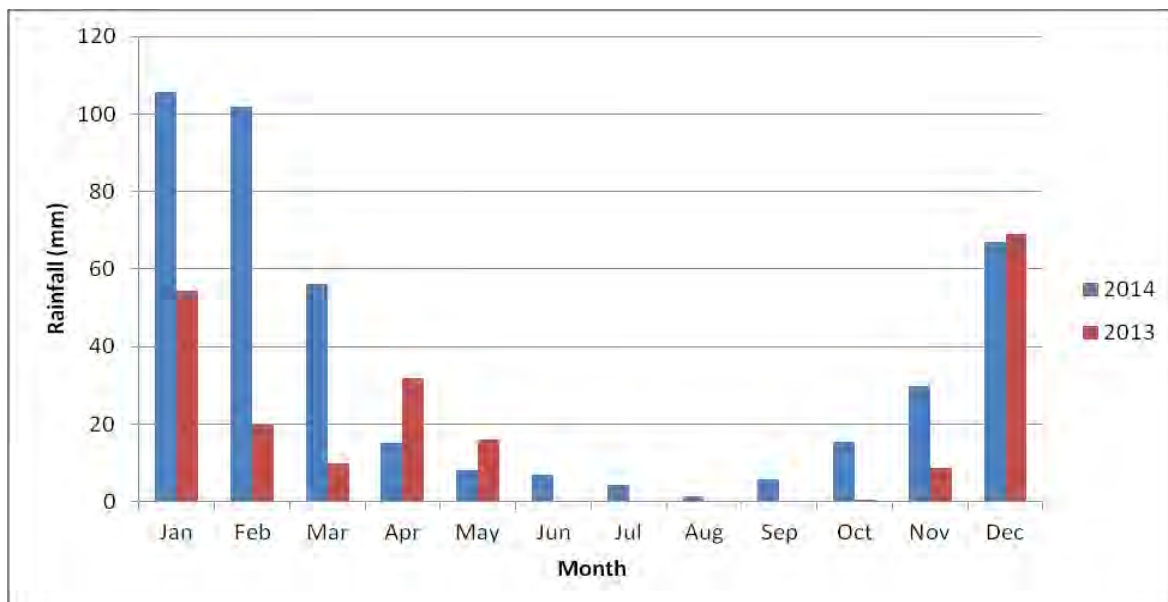


Figure 2. Average rainfall for the project area.

The average monthly relative humidity at 9 am (derived from data from 1957 - 2010) fluctuates between 35 to 65 percent with an average of 47 percent (Figure 3). The average monthly relative humidity at 3 pm is about 18 to 41 percent lower than the 9 am recorded humidity.

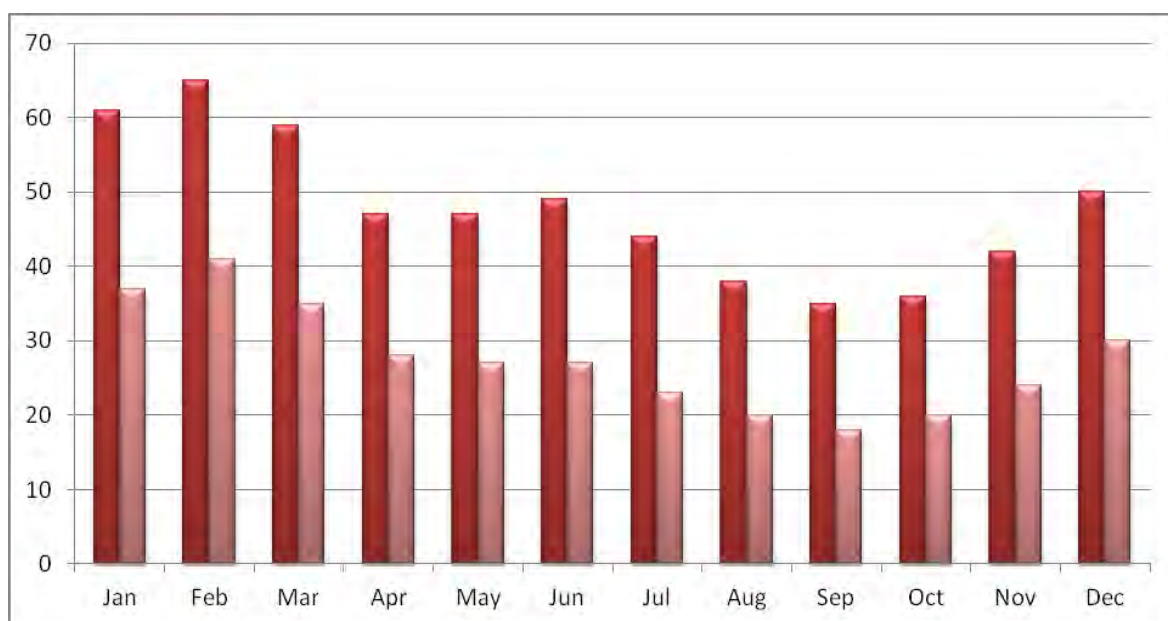


Figure 3. Mean monthly relative humidity (%) at 9am (Red) and 3pm (Pink) at Brunette Downs, NT (BOM 2013).

Physiography, Topography and Surface Hydrology

The Brunchilly Project consists of two physiographic divisions, differentiated on the basis of their topography and superficial deposits.

'Sand plains' with a superficial cover of red sand, supporting spinifex and low trees and shrubs occur in the westernmost third of the Brunchilly Project. These sand plains occur (within the Brunchilly project) to the east of the Ashburton and Whittington Ranges and the grassy downs to the east, on a surface sloping gently away from the ranges.

'Downs country, with swamps and lakes' occurs on the easternmost two thirds of the Brunchilly Project. The downs country is lower than nearby areas of sand plain and the ranges. It is largely covered by black soils supporting Mitchell and Flinders grass.

The project straddles both, and is peripheral to, the Davenport Murchison Ranges (DMR) and Mitchell Grass Downs (MGD) bioregions, which are further described below.

Mitchell Grass Downs: Lies over the Georgina and Dunmarra Basins containing sedimentary rocks which are overlain by soils with predominantly cracking clays. The vegetation is predominantly *Eucalyptus microtheca* low open-woodland with Bluebush (*Chenopodium auricomum*) sparse-shrubland understory and Mitchell Grass (*Astrebla*) grassland on the Barkly Tableland.

Davenport Murchison Ranges: Comprises low but rugged rocky hills formed from folded volcanics, sandstone, siltstone and conglomerates. Soils are generally shallow lithosols but fine grained alluvial soils occur in the valleys and surrounding plains. Vegetation includes hummock grasslands and low open woodlands dominated by eucalypt and Acacia species (Baker et al., 2005).

Drainage within the tenements is dominated by ephemeral creeks - Attack Creek, Brunchilly Creek, Bullcamp Creek, Chow-Chowra Creek, Lirri-Lirri Creek, and Tooliganbilly Creek that drain into Tarrabool Lake to the north east or Lake Sylvester and Copella Lake to the east. The inner basin of Tarrabool Lake occurs outside the Project area (approximately 20 km northeast of the northeasternmost corner of tenement), however in exceptionally wet years the Tarrabool Lake floods and the extent of the flooded area (the outer basin) may extend into the Brunchilly project area. During these exceptionally wet years, Lake Tarrabool joins with Eva Downs Swamp to the north (both outside the tenement area) and together they cover an area of over 2,750 km².

Flora and Fauna

Flora

Vegetation communities within the project area are *Astrebla* low tussock grassland, with smaller pockets of *Chenopodium* open chenopod shrubland and *Eucalyptus* low open woodland. *Parkinsonia aculeata*, an introduced weed, is known to occur within the north east portion of Lake Tarrabool and may also occur within the Brunchilly project area.

Fauna

No fauna species covered by the EPBC Act 1999 have been recorded in surveys completed within the Brunchilly Project.

In 1993, an exceptionally wet year when Lake Tarrabool was flooded, a single Yellow Chat (*Epthianura crocea*) was recorded outside of the tenement area (at Lat: -18.59855, Long: 134.84121).

The Australia Bustard (*Ardeotis Australis*) has been recorded within the Brunchilly Project tenements. This species is not considered to be vulnerable, endangered or critically endangered under the EPBC Act, however it is considered vulnerable by the NT Government and is protected by the Territory Parks and Wildlife Conservation Act 2009.

A search of the Australian Government Department of the environment, water, heritage and the areas website, 'Protected Matters Search tool' identified 3 threatened species and 8 migratory bird species within a rectangular search area encompassing the tenements. These species may also occur within the tenements, however birds listed as migratory or marine are most likely to be located in the vicinity of Lake Tarrabool or within Lake Sylvester and Corella Lake further east. The search tool indicates that it is likely that the Mulgara (a small marsupial carnivore in the genus *Dasyurus*) is likely to occur within the tenement area, however it has not been recorded on the tenements to date.

HISTORY OF TENURE

EL 30223 was applied for on 13/12/2013 and granted 15/10/2014 as 250 blocks. On 25/02/2015, EL 30223 was voluntarily reduced by 14 blocks, taking it from 812.75 km² to 767.24 km² or 236 blocks. The relinquished blocks covered AAPA sites.

A further voluntary reduction of another 80 blocks is being reported here. This will take EL 30223 to 156 blocks or 62% of the original area at grant.

EXPLORATION AND PROJECT RATIONALE

The Brunchilly Project is being explored for Cambrian rock phosphate.

REPORTING UNDER THE MINERAL TITLES ACT

The Brunchilly phosphate Project has group technical reporting as GR355 for the period 15/10 to 14/10, but DME requires individual partial relinquishment reports.

GEOLOGICAL SETTING

Regional Geology

The Brunchilly 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 Georgina Basin is contiguous with the Wiso Basin to the west.

The Brunchilly Project covers a sequence of Cambrian sedimentary rocks of the Georgina Basin which unconformably overlie basement composed of rocks of the Early Proterozoic Hatches Creek and Warramunga Groups and their equivalents.

The Georgina Basin rocks show complex facies relationships and no single stratigraphic column can be provided for the Georgina Basin. Figure 4 shows the schematic stratigraphic relationship of formations across the Wiso Basin and Georgina Basins. Stratigraphic locations of phosphate occurrences are also identified (Khan et al., 2007). The Undilla Sub-Basin sequence has been sourced from Kruse and Radke (2008) and the southern Georgina Basin after Dunster et al (2007).

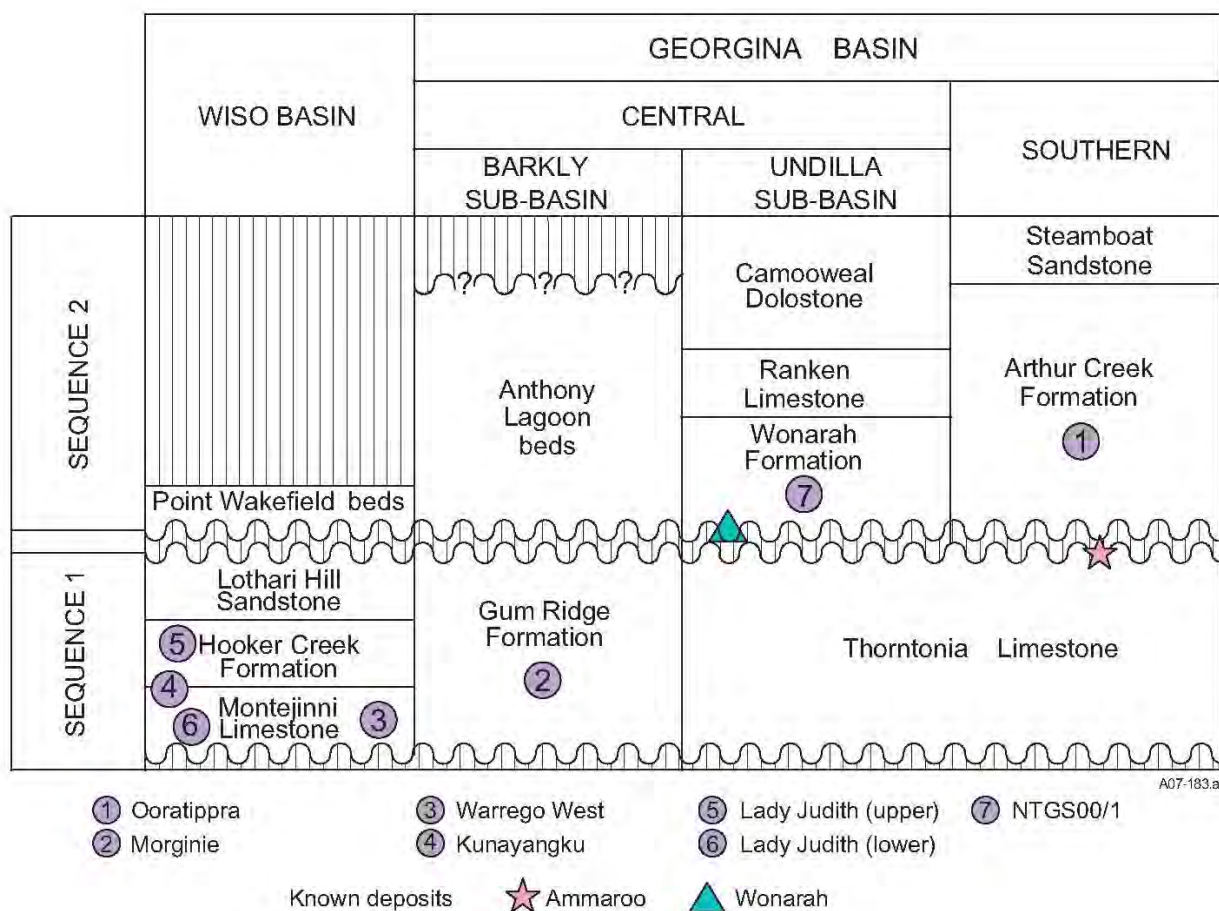


Figure 4. Schematic northwest to southeast stratigraphic transect across Wiso and Georgina Basins from Khan et al 2007. The stratigraphic assignment of several of the deposits is uncertain.

Local Geology

The 1:250,000 Helen Springs geological map indicates that Anthony Lagoon beds outcrop in the NW corner of the Brunchilly Project as well as along a small section of Brunchilly Creek and in the northern and southern portions of EL 30222 and EL 30223. Gum Ridge Formation has also been mapped, to the east of Brunchilly Homestead. A small amount of Pts (possible Tomkinson Creek Beds – Hayward Creek Formation) has been mapped to the west of Gum Ridge Formation approximately 6 km to the north west of Brunchilly Homestead.

Alluvial, aeolian and residual sediments of Cenozoic age blanket most of the remaining project area including almost all of the area being relinquished.

WORK ON RELINQUISHED PORTION

Rum Jungle Resources has undertaken an assessment of the previous work in the Brunchilly Project area and an in-house waterbore study. The relevant previous work consists of:

- a 2007 NTGS waterbore study in which selected chip samples from only a few bores were analysed for P_2O_5 in the laboratory
- a CSIRO waterbore study conducted for Vale which used a handheld XRF to test waterbore chips for phosphate (reported as weight-corrected P) in a wider selection of bores
- percussion drilling of numerous holes by Vale
- a soil sampling program by Minemakers, shown as pink dots in [Figure 5](#) below.

The red and yellow bores in the diagram below have >10% weight corrected P and between 5% and 10% weight corrected P (not P_2O_5) respectively from the CSIRO study.

The VG series of holes are the previous Vale drilling. In the assessment of Rum Jungle Resources, the Vale drilling density, depths and the lack economic phosphate intersected suggests that the potential of the southeast of the Brunchilly Project area has been adequately tested.

The black stars in [Figure 5](#) are the waterbores used in Rum Jungle Resources' study. The main objectives of this study were to identify the depth to prospective stratigraphy relative to basement and relative to the standing water level. The previous NTGS and CSIRO studies had been purely geochemical and ignored the possibility that any phosphate present might be below the watertable and therefore very difficult, if not impossible, to mine.

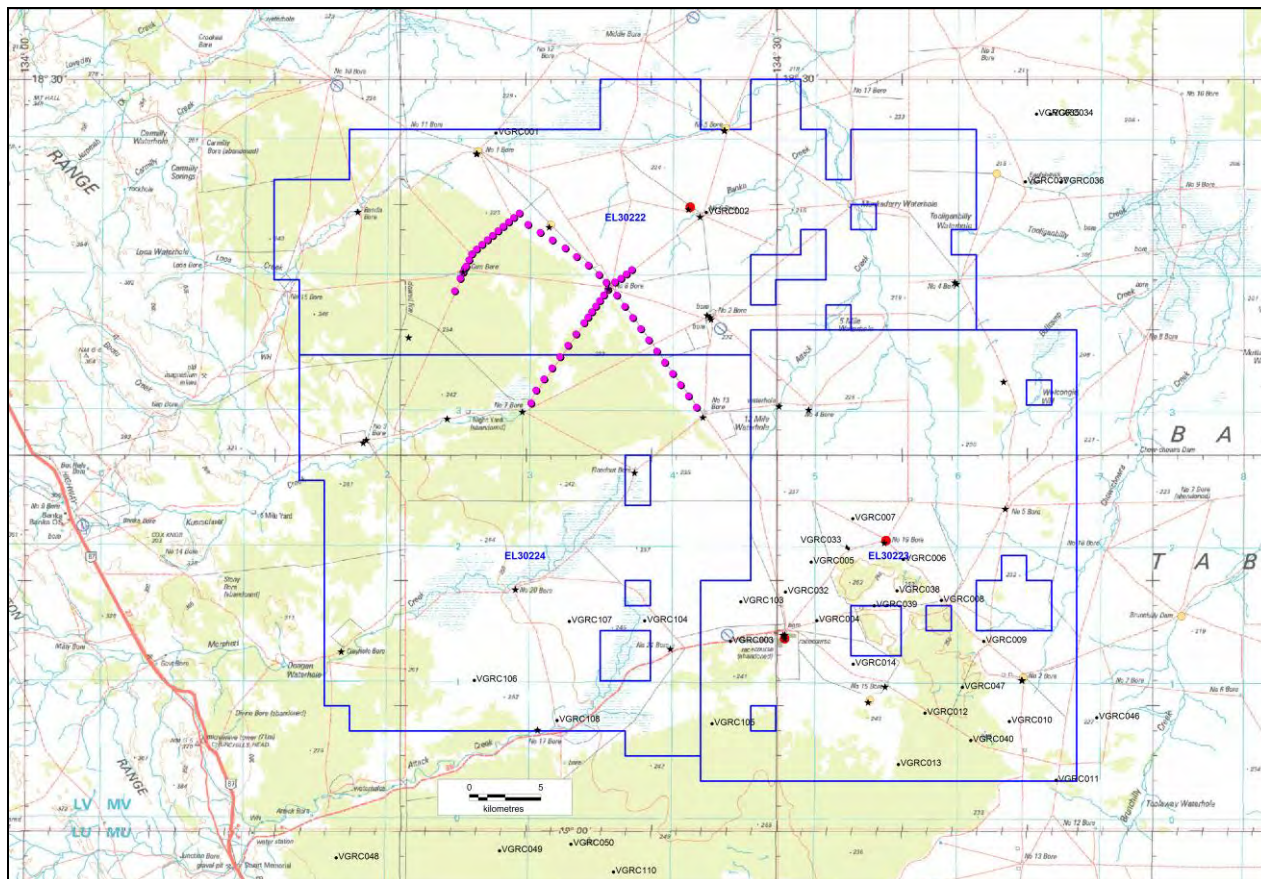


Figure 5. Previous work in the Brunchilly Project area. The symbols are explained in the text above.

BLOCKS BEING RELINQUISHED

The eighty blocks being relinquished from EL 30223 are plotted below.

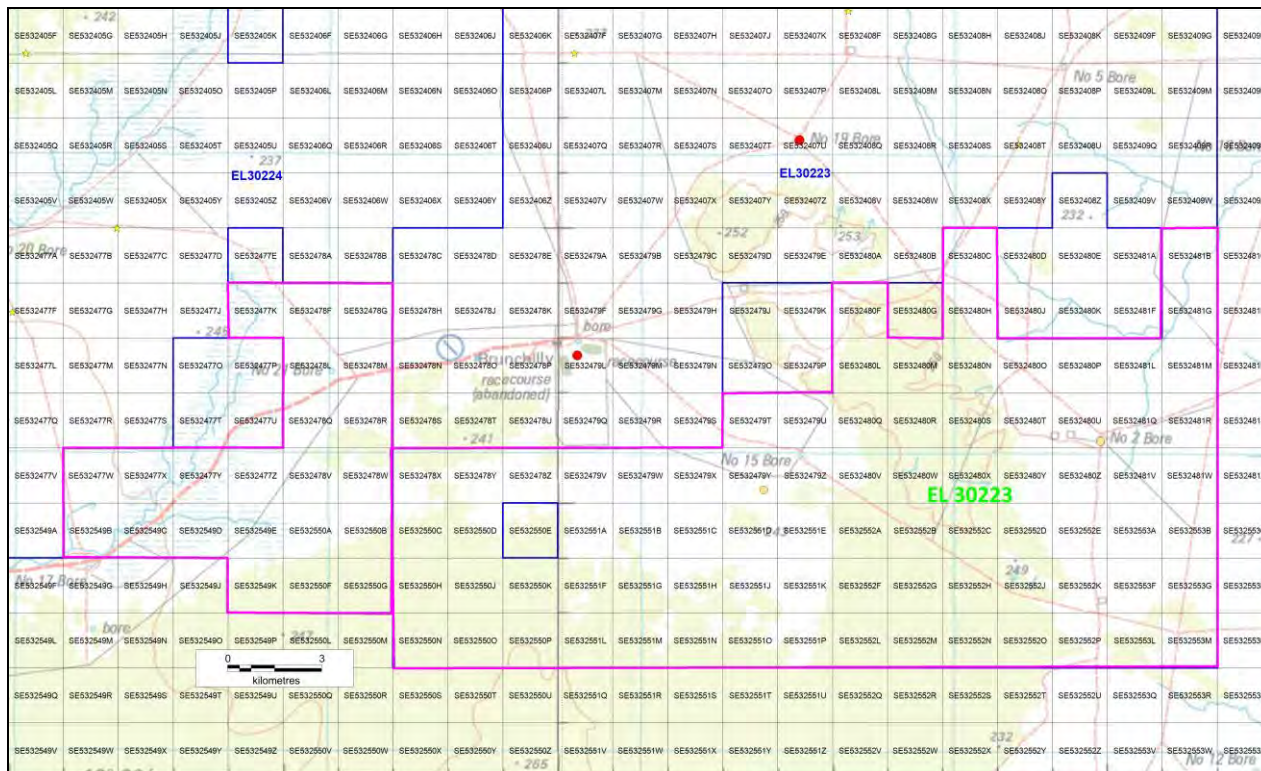


Figure 6. Block ID map of the area being relinquished from the Brunchilly Project outlined in pink, including 80 contiguous blocks from southeastern EL 30223.

CONCLUSIONS AND RECOMMENDATION

In the opinion of Rum Jungle Resources, the 80 blocks being relinquished from EL 30223 have little potential for economic grades of phosphate above the watertable.
