



<b>Titleholder</b>	Minemakers Australia Pty Ltd
<b>Operator</b>	Minemakers Australia Pty Ltd
<b>Tenement</b>	EL29849 (Dalmore Downs)
<b>Project name</b>	Partial Relinquishment Report for period ending 19 March, 2015
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<b>Corporate author</b>	Minemakers Australia Pty Ltd
<b>Target commodity</b>	Phosphate
<b>Date of report</b>	30 March 2015
<b>Datum/Zone</b>	GDA94, Zone 53
<b>250,000 mapsheet</b>	Alroy and Ranken
<b>100,000 mapsheet</b>	Wonarah and Ranken
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## ABSTRACT

EL29849 is located approximately 235 km ESE Tennant Creek and immediately north of the Barkly Highway on the Alroy and Ranken 1: 250,000 and the Wonarah and Ranken 1:100,000 map sheets in the Northern Territory. The tenement occurs within the central western part of the Georgina Basin where flat-lying, phosphate-bearing Cambrian sediments have been deposited. The lower part of this sequence, the Gum Ridge Formation, is considered prospective for phosphate mineralization overlying either carbonates or basalts of the Middle Cambrian. The tenement was formed by the amalgamation of two tenements in early 2013. A total of 10 RC drill holes and an airborne electromagnetic survey were conducted on a pre-amalgamated tenements, with patchy or low grade phosphate mineralisation encountered. Since 19 March 2013, when EL29849 was granted, no work has been completed. A partial relinquishment of the areas that were deemed to be peripheral to the major Wonarah phosphate depocentres was made in March 2015.

## CONTENTS

1.	INTRODUCTION.....	1
2.	LOCATION .....	1
3.	TENURE AND TITLE HISTORY .....	1
4.	GEOLOGY .....	5
	4.1 Deposit style and model .....	5
	4.2 Regional Geology .....	5
	4.3 Local Geology .....	6
5.	WORK COMPLETED.....	9
6.	CONCLUSIONS.....	9
7.	RECOMMENDATIONS .....	9
8.	REFERENCES.....	10

## FIGURES

<i>Figure 1: Location of EL29849 .....</i>	2
<i>Figure 2: Historical work completed .....</i>	6
<i>Figure 3: Location of EL29849 in the Barkly Sub-Basin of the Georgina Basin.....</i>	8
<i>Figure 4: Regional Stratigraphic Column .....</i>	8
<i>Figure 5: Schematic Regional Geology Section.....</i>	8

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## **1. INTRODUCTION**

This report describes exploration activities on the relinquished part of EL29849, part of Minemakers Australia Pty Ltd's (MAPL) Wonarah Project.

MAPL is a wholly owned subsidiary of Minemakers Limited which listed on the ASX on 10 October 2006. Exploration is aimed at the discovery of economic phosphate deposits proximal to the Alice Springs-Darwin railway and associated with shallow marginal sediments at the western edge of the Georgina Basin.

## **2. LOCATION**

EL29849 is located approximately 235 km east-southeast of Tennant Creek in the Northern Territory (Figure 1). The tenement lies on the 1:250,000 Alroy SE5315 and Ranken SE5316 and the 1:100,000 Ranken 6258 and the Wonarah 6158 map sheets.

Access to the project is via the Barkly Highway, the main paved freight link between Queensland and the Northern Territory. The nearest town is Camooweal in western Queensland, approximately 180 km to the east. Access within the tenement is via a network of dozed tracks suitable for 4WD only through other tenements within the Wonarah project.

## **3. TENURE AND TITLE HISTORY**

EL29849 comprising 83 blocks (229 km<sup>2</sup>) was granted on 19 March 2013 to Minemakers Australia Pty Ltd for a period of six years. The tenement was reduced to 41 blocks (114 km<sup>2</sup>) on 19 March 2015.

EL29849 was formed by the amalgamation of two former Minemakers' tenements, EL26451 and EL28233, which were surrendered on 19 March 2013 (Figure 2).

EL29849 is located on NT Portion 773, Perpetual Pastoral Lease 988 Dalmore Downs.

Exploration drilling programs were authorised by the Department of Resource Development, Primary Industries, Fisheries & Mines (Mining Management Plan): Wonarah Project Authorisation 0413-01, 0413-02, 0413-03, 0413-04 and 0417-02.

MAPL obtained sacred site clearances through the Central Land Council: Sacred Site Clearance Certificate C2009-003, C2010-032 and C2012-094. Although the land of EL28233 falls under the jurisdiction of the Northern Land Council, MAPL obtained sacred site clearances through the Central Land Council as they are responsible for the majority of Wonarah tenements south of the Barkly Highway (Sacred Site Clearance Certificate C2012-094).

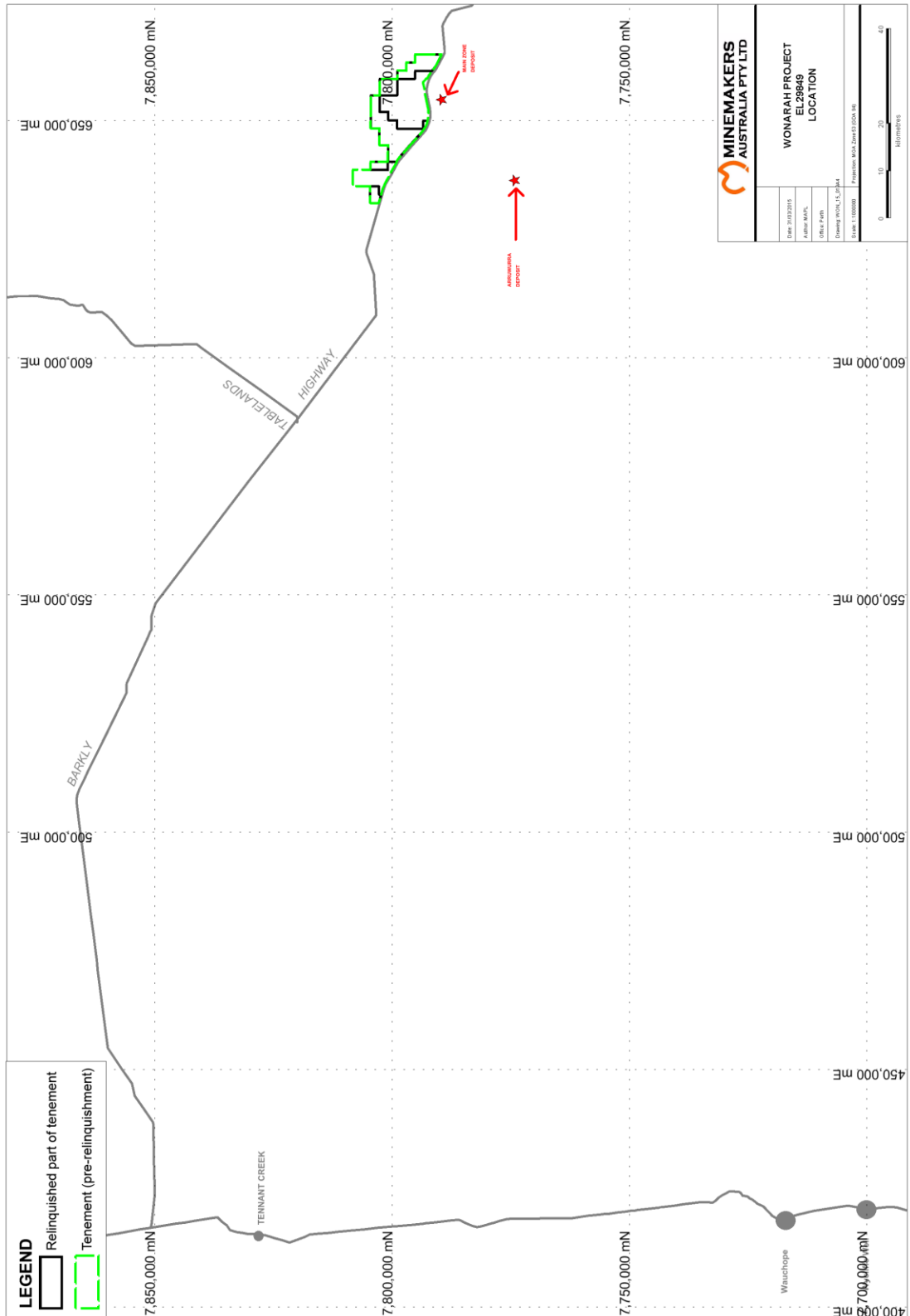


Figure 1: Location of EL29849.

Minemakers commenced fieldwork in 2008.

During the year ended January 2009 the following work was carried out:

- A RESOLVE airborne electromagnetic survey over the Wonarah Project completed by Fugro Airborne Surveys, Ontario, Canada. Two survey blocks (GEA3 and GEA7) were within (S)EL26451 (Figure 2). The purpose of the survey was to provide information that could be utilized to map the geology and structure of the survey area. The survey was completed using a RESOLVE multi-coil, multi-frequency electromagnetic system, supplemented by a high sensitivity cesium magnetometer. The data from these sensors was processed to create maps that display the magnetic and conductive properties of the survey area

During the year ended January 2011 the following work was carried out:

- In August 2010, a total of 9 reconnaissance exploration RC holes for 444 m (WNRC1552, WNRC1556, WNRC1559-1562, WNRC1566, WNRC1569-1570) were drilled

During the year ended January 2012 the following work was carried out:

- In July, 2011, one resource RC hole for 68 m (WNRC1616) was drilled
- Exploration activities site audit

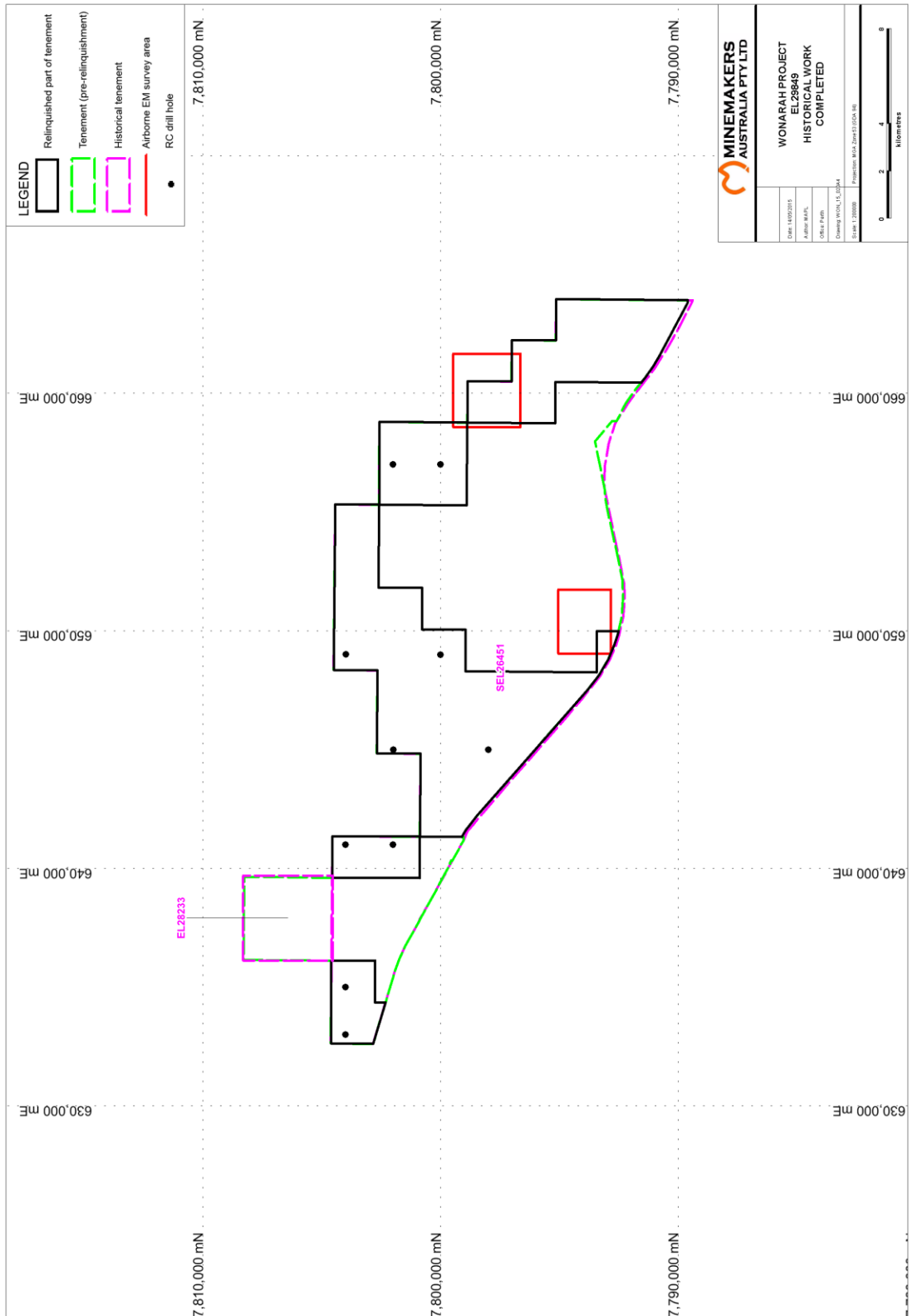


Figure 2: Historical work completed.

## 4. GEOLOGY

### 4.1 Deposit style and model

Minemakers Australia is seeking to develop a large sedimentary phosphate deposit within the Georgina Basin. The Georgina Basin is an extensive late Proterozoic to early Palaeozoic basin that extends from northwestern Queensland through much of the eastern Northern Territory area and which hosts several large sedimentary phosphate deposits. A map representing the regional geological setting is presented in Figure 3.

Sedimentary phosphate deposits are restricted in their occurrence globally. The model for phosphate deposition requires upwelling, cold phosphate-saturated water depositing phosphate onto the continental shelf where the required narrow pH range is locally present. Co-deposition with carbonate occurs at slightly higher pH values. Carbonate deposition becomes dominant at higher pH. Post-depositional reworking and replacement of carbonate facies by phosphatic mineralisation is probably an important factor in upgrading phosphorite grades to economic levels.

### 4.2 Regional Geology

The Wonarah phosphate project is situated in the central western Georgina Basin, a large late Proterozoic to early Palaeozoic basin that extends from northwestern Queensland through much of the eastern Northern Territory.

Basement rocks in this part of the Georgina Basin are comprised of granites of unknown age. They are possibly correlates of the Palaeo-proterozoic rocks of the Tennant Creek region. Mesoproterozoic sediments and volcanics are overlain by the Early Cambrian Helen Springs Volcanics (formerly Peaker Piker Volcanics). A northeast-southwest trending basement high runs through the Wonarah project area.

Overlying Middle Cambrian sediments are divided into two basin-wide sequences. Sequence One deposited clastics, carbonates, organic shales and minor phosphorites during gradual transgression which was abruptly terminated by rapid regression. In the Wonarah region, basement highs are flanked by onlapping dolomitic rocks equivalent to the Thornton Limestone. An erosional unconformity is represented by the development of a karst surface.

Sequence Two deposited shallow clastics, carbonates, grainstones, peritidal phosphorites and phosphatic limestones in a transgressive tract system. At Wonarah dolostone, mudstone and phosphorite of the lower Middle Cambrian Upper Gum Ridge Formation overlie Sequence One rocks and basement highs. This formation contains major phosphorite mineralisation and is equivalent to the Beetle Creek Formation on the eastern Margin of the basin which hosts Phosphate Hill and Lady Annie-D-Tree phosphate deposits. The overlying Wonarah Beds are Middle Cambrian mudstone, siltstone and dolostones. Silcrete, ferricrete and calcrete regolith are extensively developed and large areas are covered by stabilised aeolian sand.



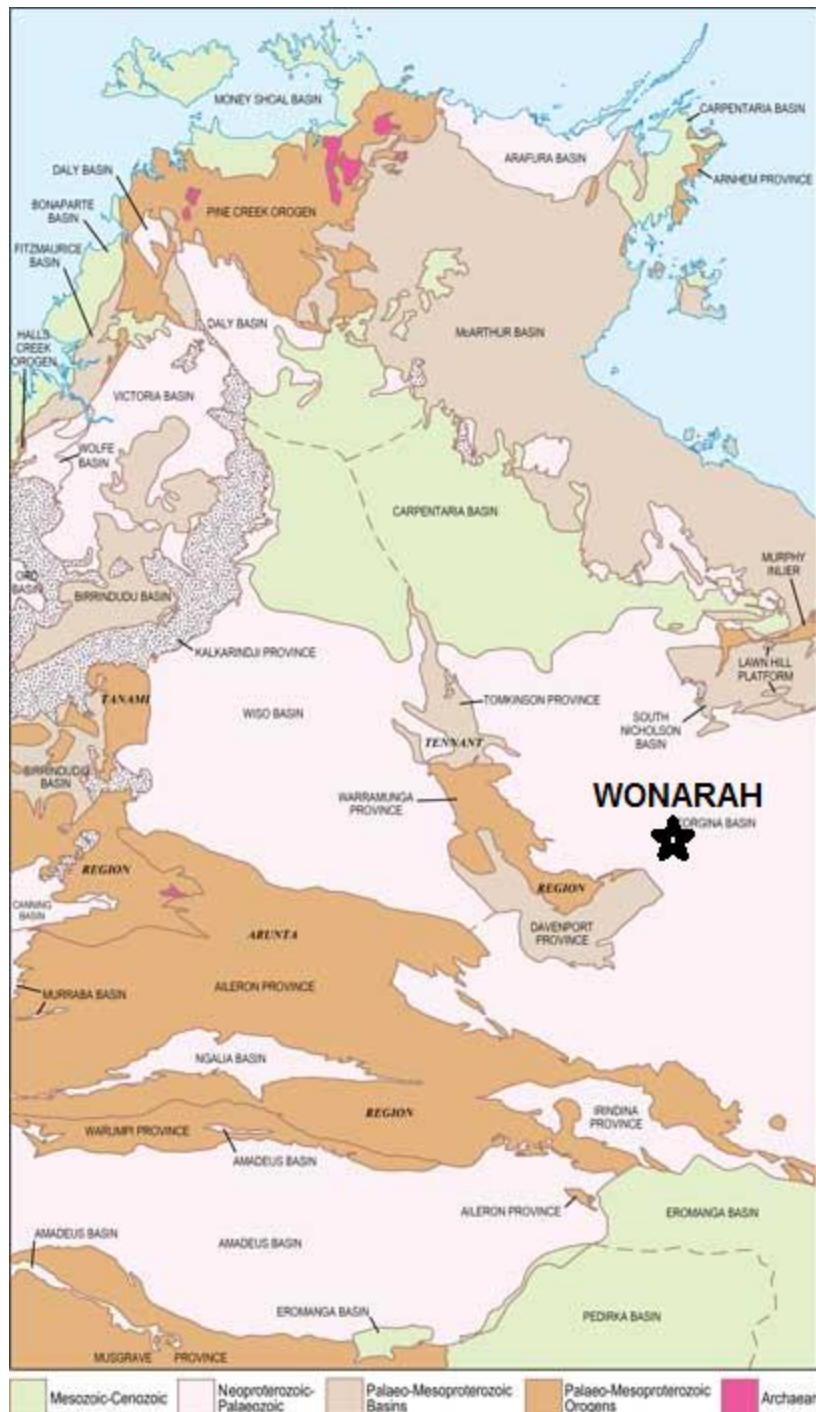


Figure 3: Regional geological setting (from the NTGS)

### 4.3 Local Geology

Basement in the Main Zone area is alkali feldspar granite of possible Palaeo-proterozoic age. These are overlain by the Helen Springs Volcanics. The top of the basalt is extremely weathered and a ferruginous and manganiferous duricrust is developed locally. Where less weathered, the basalt is vesicular, amygdaloidal and irregularly porphyritic. Dolomitic rocks of the Thornton Limestone equivalent are present above the basalt at the southeastern extremity of the Main Zone. To the east and the south the carbonate rocks are developed extensively.

The overlying phosphate-bearing Upper Gum Ridge Formation is divided into five main units: a basal, indurated high grade phosphorite; muddy to sandy, clay-rich transitional sediments; a chert breccia phosphorites; a mudstone phosphorite; and a convolute mudstone.

The basal Transitional Phosphorite is a laterally discontinuous high grade indurated phosphorite up to 3m thick developed throughout the eastern and southern part of the Main Zone.

The Transition Sediments (TUN) are laterally continuous, 4-6m thick and comprised of clay-rich mudstone and siltstone with minor phosphorite, dolomite, sandstone and basal epiclastic.

The Chert Breccia Phosphorite forms a distinctive, laterally continuous horizon, 1-10 m thick, and comprised of yellow, grey or pink, variably friable or indurated, low to high grade phosphorite with abundant dark grey chert. Chert averages 50-60%.

The Mudstone Phosphorite is the main phosphate-bearing unit at Wonarah and is comprised of 1-10m of yellow and pink mudstone phosphorite with trace to minor dark grey chert. The mineralogy is dominated by (carbonate)-fluorapatite –  $\text{Ca}_5(\text{PO}_4, \text{CO}_3)_3\text{F}$ . The MPH is variably friable or indurated with the indurated phosphorite typically being high to very high grade (30-40%  $\text{P}_2\text{O}_5$ ).

The Convolute Mudstone is a 1-10m thick unit of white, light grey and yellow clay-rich variably convolute mudstone with minor siltstone and fine sandstone interbeds. It generally contains minor (<10%)  $\text{P}_2\text{O}_5$ .

The Wonarah Beds overlie the Convolute Mudstone and are comprised of mudstone and siltstone with minor chert, the Hangingwall Mudstone. The Wonarah Beds thicken towards the east and south away from the basement high that defines the western fringe of the Main Zone. Dolomitic units, the Hangingwall Dolostone, are present east and south of the Main Zone.

Regolith is extensively developed throughout the Main Zone with silcrete and ferricrete present in most holes. Low silcrete ridges are prominent features. Colluvial and alluvial deposits are common and extensive stabilised aeolian deposits cover much of the regolith. The phosphatic units thin and peter out towards the basement high which trends in a northeast-southwest direction towards Arruwurra. To the east and south the phosphatic units, although still present with grade and thickness, are too deep to be of economic interest at this time.

A stratigraphic column and schematic section are presented in Figure 4 and Figure 5 respectively.

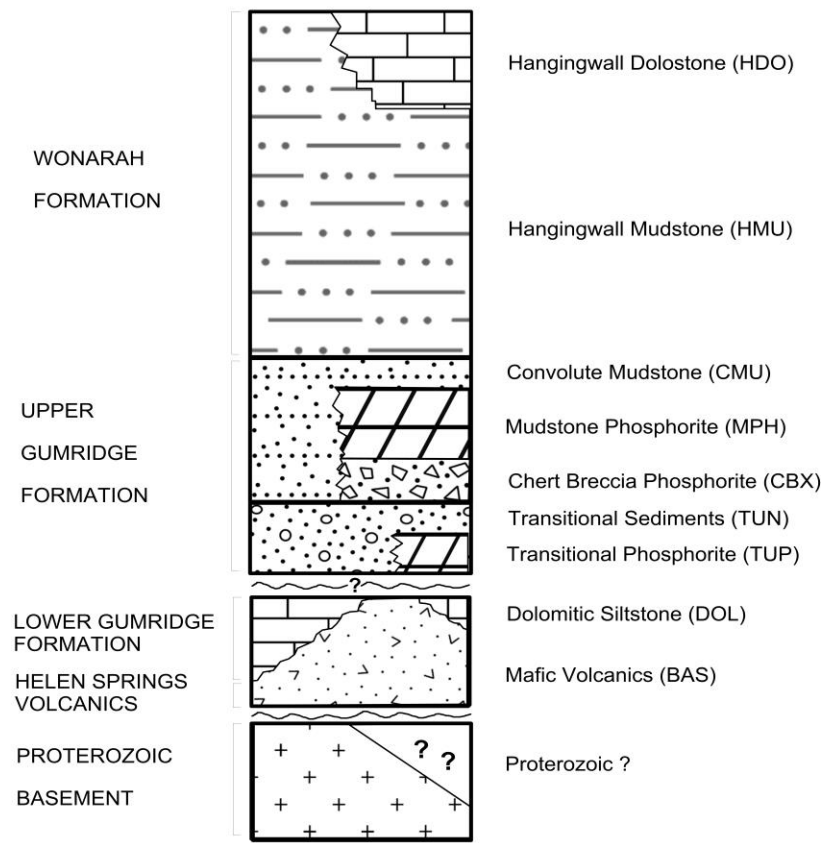


Figure 4: Regional Stratigraphic Column

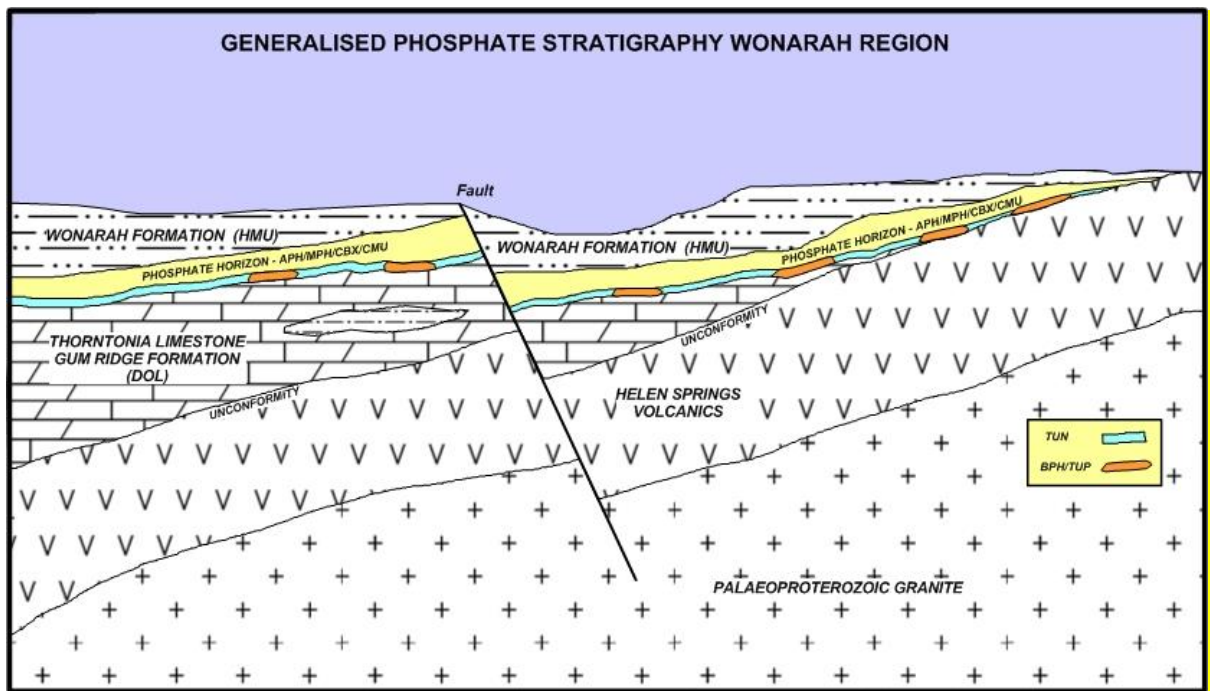


Figure 5: Schematic Regional Geology Section

## **5. WORK COMPLETED**

No work has been completed on EL29849 since it was granted in March 2013.

## **6. CONCLUSIONS**

Although phosphate mineralisation was intercepted in most of the holes drilled in the relinquished portion of the tenement, the mineralisation is either patchy or low grade. As the mineralisation is also peripheral to the main phosphate depocentres at Wonarah it was decided that these parts of EL29849 be relinquished.

## **7. RECOMMENDATIONS**

On the basis of the conclusions reached above, in conjunction with the aeromagnetics interpretation, part of the tenement was relinquished.

## 8. REFERENCES

**Fulton, R, (2013).** Annual and Final Report for EL26452 (Wonarah) for the period 09 January 2008 to 19 March 2013

**Fulton, R.L., Drummond, A, Hepburn-Brown, D. and Hitchcox, A. 2009.** Combined Annual Report on EL9979, SEL26451, SEL26452, EL26583, EL26584, EL26585, EL26586, EL26589 and EL26588. Wonarah Phosphate Project. Annual Report to 8<sup>th</sup> January 2009. Minemakers Australia.

**Fulton, R.L., Pellatt, A and Varley, R. 2010.** Combined Annual Report on EL9979, SEL26451, SEL26452, EL26583, EL26584, EL26585, EL26586, EL26589 and EL26588. Wonarah Phosphate Project. Annual Report to 8<sup>th</sup> January 2010. Minemakers Australia.

**Fulton, R.L., Pellatt, A and Varley, R. 2011.** Combined Annual Report on EL9979, SEL26451, SEL26452, EL26583, EL26584, EL26585, EL26586, EL26589 and EL26588. Wonarah Phosphate Project. Annual Report to 8<sup>th</sup> January 2011. Minemakers Australia Pty Ltd.

**Pellatt, A and Fulton R.L. 2012.** Grouped Annual Report (GR-097/09) for EL9979, EL24607, EL26185, EL26584, EL26585, EL26586, EL26589, EL28233, SEL26451 and SEL26452 (Wonarah Phosphate Project) for the period ending 8 January 2012. Minemakers Australia Pty Ltd.

**Pellatt, A and Fulton R.L. 2013.** Grouped Annual Report (GR-097/09) for EL9979, EL24607, EL26185, EL26584, EL26585, EL26586, EL26589, EL28233, EL26451 and EL26452 (Wonarah Phosphate Project) for the period ending 8 January 2013. Minemakers Australia Pty Ltd.