EL28276

GRAVE HOLE CREEK

Northern Territory, Australia

Annual and Final Report
for the period 30 March 2011 to 12 April 2013

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Commodity: Phosphate, Base Metals, Uranium

1:250,000 Maps: SF53-12, Tobermorey, SF53-16 Hay River
1:100,000 Maps: 6452 Toko, 6451 Adam
SUMMARY

The Marqua Project in the Northern Territory is located 400km east of Alice Springs and 300km southwest of Mount Isa (Figure 1). The area is highly prospective for minerals, with known occurrences of phosphate, base metals and uranium.

Rox Resources Limited now holds two Exploration Licences in the area, EL28275 and EL28611.

This report covers the surrendered EL28276 from 30 March 2011 to 12 April 2013 the date the final surrender was effected.

Previous exploration of the adjacent area (EL28275) has identified five phosphate prospects over a strike length of 30 km with outcrops grading up to 39.4% P₂O₅ along the phosphorus bearing Cambrian age Thorntonia Limestone. These prospects occur near the southern extent of the Georgina Basin, which is rapidly becoming Australia’s major hard-rock phosphate province.

After field mapping and prospecting, and finding the area not prospective for phosphate or base metal mineralisation, the remaining portion of EL28276 was surrendered.

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1. Tenement Details
1 INTRODUCTION

Rox Resources Limited’s (“Rox”) Marqua Project consists of tenements EL28275 and EL28611. The tenement area now covers an area of approximately 667 km² that is primarily prospective for phosphate.

This report summarises Rox’s exploration activities over the surrendered EL28276 for the period 30 March 2011 to 12 April 2013.

2 LOCATION AND ACCESS

The Marqua project area is located approximately 500 km by road east of Alice Springs, and is southeast of the Marqua Station homestead with good road access 40 km off the Plenty Highway and a network of established minor roads and station tracks (Figure 1).

![Figure 1: Marqua Project Location](image)
3 TENURE

EL28276 was granted to Rox Resources Limited on 30 March 2011 as shown below. Rox voluntarily surrendered 50% of the Tenement area on 20 June 2012, and after further consideration surrendered the remaining portion of the tenement on 12 April 2013. The remaining portion is shown in Figure 2 below.

Table 1: Tenement Details

<table>
<thead>
<tr>
<th>Tenement</th>
<th>Registered Holder</th>
<th>Interest</th>
<th>Grant Date</th>
<th>Expiry Date</th>
<th>Area (sub-blocks)</th>
<th>Current Annual Rent (incl. GST)</th>
<th>Current Annual Minimum Expenditure</th>
</tr>
</thead>
<tbody>
<tr>
<td>EL 28276</td>
<td>Rox Resources Limited</td>
<td>100%</td>
<td>30 March 2011</td>
<td>29 March 2017</td>
<td>177</td>
<td>$3,927</td>
<td>$54,250</td>
</tr>
</tbody>
</table>

There are no Native Title Claims over the tenement area, which comprises the Marqua and Tobermorey pastoral stations. A meeting was convened for any interested Aboriginal parties on the tenements before exploration work commenced, but no parties attended. Previous heritage site locations were obtained by a search of the AAPA Register and were avoided during exploration.

Figure 2: EL28276 Remaining Area (unshaded)
4 GEOLOGY

4.1 Regional Geology

The project area is part of the southern Georgina Basin, comprising Neoproterozoic to Cambro-Ordovician platform cover of sedimentary rocks (dominantly sandstone, shale, limestone, dolostone) overlying the Precambrian basement of the Northern Australian Craton. This Precambrian basement is exposed along major fault systems on the southern margin of the basin.

The Northern Territory Geological Survey (NTGS) has recognised the mineral potential of the southern Georgina Basin and recently prepared a comprehensive review of both government and private exploration undertaken, and has now developed applicable ore genesis models (Dunster et al., 2007).

Since the 1960’s, the basin has been considered prospective mainly for Mississippi Valley Type (MVT) lead-zinc mineralisation. More recently, however, the potential for other commodities in a variety of geological settings has been investigated, and the basin is now regarded as having potential for several styles of base-metal mineralisation.

The area is considered to have potential for Cambrian limestone hosted phosphate. Prospective units within the Georgina Basin include the Middle Cambrian Beetle Creek Formation of the eastern basin, its stratigraphic equivalent in the south, the Arthur Creek Formation, and the underlying Thorntonia Limestone which is recognised basin-wide. Prospective ground for phosphate rock within these Middle Cambrian units occurs along the basin margins and adjacent to basement highs within the basin interior.

4.2 Local Geology

EL28276 is located in the structurally complex south-eastern portion of the Georgina Basin, which is comprised of basement granitoids, Neoproterozoic tillites and arkosic sedimentary rocks, overlain by Cambrian and Cambro-Ordovician limestone, dolostone, shale and clastic sedimentary rocks of the Toko Syncline.

These units have been disrupted by multiple folding and faulting events. Faulting generally trends northwest and individual faults have been locally offset by later northeast trending faults. Part of the regionally significant Toomba Fault Zone lies in the tenement and segregates a structurally complex zone dominated by arkosic sediments to the southwest from limestone, dolostone and sandstone of the Toko Syncline to the northeast (Figure 3).
4.3 Geological Model For Phosphate

The processes responsible for the formation of high-grade marine phosphate rock deposits (known as phosphorite if it contains greater than 15% $P_2O_5$) are the subject of some uncertainty. It is recognized that regions favourable to large-scale phosphate deposition occur along ocean margins where deep upwelling currents rich in phosphate are trapped within relatively shallow lagoons and embayments.

The phosphate-rich waters lead to high levels of biological activity which results in the deposition of organic-rich sediments (black shales) within confined anoxic depositional centres. Phosphate liberated into interstitial and bottom waters, principally from the bacterial decay of organic matter, is believed to be responsible for the formation of phosphorites both by direct precipitation of phosphate minerals from solution and by replacement of siliceous and calcareous skeletal debris (forming coquinite phosphorites).

This process appears to occur near the water sediment interface at the transition between anoxic and oxic zones so that phosphorite deposits are typically laterally offset from black shale accumulations. Mechanical reworking of sediments may also play a significant role in the formation of some high-grade phosphorite deposits.
4.4 Geological Model For MVT Style Lead-Zinc

MVT (Mississippi Valley Type) style lead-zinc mineralisation is usually found in areas of platform carbonate rocks that have been subject to large deep seated crustal scale faulting where these structures may have penetrated to great depths in the Earth’s crust. Within the carbonate units Pb and Zn ions are mobilised and circulated with meteoric waters through the sediment pile. At the same time S ions are derived from decaying/decayed organic matter present in the carbonate rocks and also circulated. The metal cations (Pb and Zn) and the S anion can precipitate to form galena (PbS) and sphalerite (ZnS) in zones of relatively low pressure afforded by the deep seated structures, which also form a conduit to other precipitation zones (e.g. certain porous rock units within the carbonate pile).

An example diagram for the Canning Basin in Western Australia is shown in Figure 4. The Georgina Basin in the Northern Territory is believed to offer a similar geological environment.

Such favourable MVT deposition conditions exist in the Marqua area where potential host units the Arthur Creek Formation (with limestones and shales) and the Thorntonia Limestone exist, truncated by a number of major deep seated structures including the Toomba Fault. Indications of Pb-Zn mineralisation have been detected at the Boat Hill prospect which is located at the intersection of the Toomba Fault with the Thorntonia Limestone and Arthur Creek Formation.

![Figure 4: MVT Deposit Model](image)
5 ROX ACTIVITIES

5.1 Exploration Potential Review

The main work to have occurred over EL28276 comprised surface geochemical sampling by CRA Exploration in 1991, and drilling by Elkedra Diamonds in 2002-2006. Dunster et. al., 2007, comment that Irish-style and Manto style Pb-Zn deposits could be present in addition to MVT style Pb-Zn.

CRA Exploration prospected the Toomba Fault zone for gold and base metal mineralisation using a helicopter supported stream sediment survey (107 samples) where no drainage geochemical surveys had been undertaken previously. The stream sediment sampling effectiveness was severely hampered by poor drainage development and the presence of wide spread aeolian sand deposits in the drainages.

Elkedra Diamonds undertook rock chip and stream sediment sampling, RAB and RC drilling, primarily targeting diamond occurrences, although some examination of the manganese potential was also made. No significant results for Pb-Zn, U or P₂O₅ were reported from this drilling.

5.2 Regional Review

The tenement area of EL28276 seems to be primarily prospective for carbonate-hosted Pb-Zn mineralisation, although results to date have been inconclusive and not encouraging. The exploration model would involve remobilisation of basement and basin derived fluids along pathways associated with the Toomba and other faults into the carbonate sequences of the Nimaroo, Arrinthrunga, Marqua and Hay River Formations. Mineralisation would need to be detected by surface leakage of metals into soils, and would need to be identified through soil sampling using a variety of leaches, including aqua regia, MMI and other weak organic leaching agents.

There may also be some potential for the extension of the phosphate mineralisation present on the adjacent EL28275 to extend to the east onto EL28276. The phosphate bearing Thorntonia Limestone may occur at depth along the Toomba Fault zone as shown on the cross-section on the Hay River – Mt Whelan Special Geology map (1985). This would require prospecting along the Toomba Fault, and possibly stratigraphic drilling to establish the presence of Thorntonia Limestone and its depth.

Exploration for these target mineral groups would be aided by good resolution airborne magnetic and radiometric data, but the currently available 1km spaced NTGS magnetic and radiometric data is not suitable for mineral exploration.

Rox’s geological mapping and prospection have shown that the areas in the south of EL28276 are primarily underlain by Proterozoic Yardida Tillite which is not prospective for phosphate or base-metals. There are no uranium (Figure 5), potassium (Figure 6) or magnetic (Figure 7) features of interest.

The areas in the north of EL28276 contain younger cover rocks, and while potential exists for the phosphate-bearing strata to occur at depth, this depth would be beyond current economic limits. There are no uranium (Figure 5), potassium (Figure 6) or magnetic (Figure 7) features of interest.
Figure 5: Tenement and Surrendered area over Uranium Radiometrics
Figure 6: Tenement and Surrendered area over Potassium Radiometrics
Figure 7: Tenement and Surrendered area over Reduced to Pole Magnetics
6 CONCLUSIONS AND RECOMMENDATIONS

After further consideration the area of EL28276, previously retained as prospective for MVT style Pb-Zn hosted by carbonate rocks and also for phosphate hosted by the Thorntonia Limestone, has now been surrendered, since the targets are not compelling for either style of mineralisation.

7 REFERENCES