Leichhardt

Anmatjira Range, Arunta Region

Annual and Final Report for EL 29758 for the period 25 July 2013 to 4 February 2016

Tenement Holders: Crossland Nickel Pty Ltd and Essential Mining Resources Pty Ltd

P Melville
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Summary

Exploration Licence 29758, Leichhardt, is situated approximately 200 km northwest of Alice Springs. Tenure was granted for a period of 6 years on 25 July 2013 to Crossland Nickel Pty Ltd and Panconoz Pty Ltd., a subsidiary of Pancontinental Uranium Corporation of Canada. The interests of Panconoz were acquired by Essential Mining Resources Pty Ltd (EMR) in late 2015; EMR is now joint venturing with Crossland.

The Operator of the licence was Crossland Strategic Metals Limited. The prime purpose of applying for this licence was to increase the size of the company’s potential REE-bearing ground in the region.

This report covers the period for the operational years commencing 25 July 2013 to the surrender date of 4 February 2016. There were no exploration activities carried out on the tenement from the previous anniversary (2015) to the surrender date.
Bibliographic Data

**Report Title**  
Annual and Final Report for EL 29758 for the period 25 July 2013 to 4 February 2016

**Author**  
Paul Melville

**Project Name**  
Leichhardt

**Tenement Number**  
EL 29758

**Tenement Holder**  
Crossland Nickel Pty Ltd (56.28%), Essential Mining Resources Pty Ltd (43.72%)

**Operator**  
Crossland Strategic Metals Ltd

**Commodities**  
Uranium, REE

**Tectonic unit**  
Arunta Region

**Stratigraphic Units**  
Anmatjira Granite, Lander Rock Formation,

**1:250 000 MapSheet**  
Mount Peake - SF53-05, Napperby - SF53-09

**1:100 000 MapSheet**  
Mount Peake, Anningie, Reynolds Range, Tea Tree

**Keywords**  
Arunta Region, Reynolds Range, Anmatjira Range, Uranium, REE
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1 Introduction

This report covers both operational Year 3 (25 July 2015 to 4 February 2016) and the term of the licence (remaining blocks) from the date of grant on the 25th July 2013. No exploration activities have been carried out since grant of the tenement.

Exploration Licence 29758 Leichhardt when granted was centred approximately 250 kilometres north northwest of Alice Springs and 95 kilometres west northwest of Ti Tree. The tenement was mostly within the Mount Peake (SF53-05) 1:250,000 geological map sheet. The area is quite remote but there are indications of station tracks and fence lines into the area. The southernmost section of the EL was within the Napperby 1:250,000 sheet. See Figure 1 for location.

Figure 1  Location map of original Leichhardt  EL 29758

2 Tenure Details

EL 29758 was granted to Crossland Nickel Pty Ltd and Panconoz Pty Ltd on 25 July 2013 for a period
of six years. The licence comprised 210 sub-blocks, an area of approximately 652 square kilometres. Crossland Nickel Pty Ltd is a wholly owned subsidiary of Crossland Strategic Metals Limited; Panconoz was a wholly owned subsidiary of Pancontinental Uranium Corporation of Canada until Pancon transferred its entire interest to EMR in late 2015. The Operator of the licence was Crossland Strategic Metals Ltd., formerly Crossland Uranium Mines Ltd.

In late July 2015, Crossland reduced the area of the EL from 210 to 16 sub-blocks. See Figure 2 below. In November 2015, notification was received from DME re. Partial Cancellation (Loss of Block penalty) imposed for two consecutive years of underspend. Crossland had already decided to surrender the licence and that process was eventually completed in early 2016.

![Figure 2](image.png)  
*Figure 2  Map of EL 29758 showing remaining licence area (in yellow) at time of Surrender*

### 3 Regional Geology and Mineralisation

**Geology**

The region is covered by the Napperby and Mount Peake 1:250,000 geological map series. The remaining blocks of the licence are within the Mesoproterozoic Arunta Inlier, covered by the
northeastern portion of the Napperby sheet. The Palaeozoic Ngalia Basin is located 25 km to the south and the Palaeozoic Georgina Basin 50 km to the northeast. The Arunta Inlier consists of metamorphosed sedimentary rocks and igneous bodies that have been intruded by various granites. For the geological framework of the region please refer to Figure 3 on page 9.

The main regional topographic feature is represented by a northwest trending corridor of fairly rugged country, which is controlled by a series of major parallel faults. In the south this area is referred to as the Anmatjira Range while the northern part is the Yundurbulu Range. The highest peaks of these ranges are formed by the more resistant Anmatjira Granite.

The regional stratigraphy is as follows:

- **Palaeoproterozoic**
  - Lander Rock Formation - variably metamorphosed sandstone and siltstone producing quartz-rich metasediments including muscovite-biotite schist, andalusite schist, sillimanite gneiss, cordierite gneiss. Hornfelsed rocks occur adjacent to intrusive granites.
  - Aloolya Gneiss - medium-grained granitic gneiss with tourmaline and garnet.
  - Yaningidjara Orthogneiss - coarse porphyritic granitic augen gneiss with mantled feldspars; some sillimanite-garnet orthogneiss.
  - Anmatjira Granite - Biotite granite, mantled k-feldspar megacrysts (rapakivi texture), tourmaline-bearing; also equigranular, seriate, porphyritic and orbicular textural variants.
  - Unnamed igneous mafic Intrusive.

**Mineralisation**

Various mineral occurrences have been discovered by past explorers. Within the Lower Proterozoic Lander Rock Formation, the following styles of mineralisation occur:

- Low sulphide gold-quartz veining
- Polymetallic copper-lead-zinc-gold veining
- Tin-tantalum bearing pegmatites
- scheelite veining

The varied geology hosts other deposit types including:
• Intrusive-related REE mineralisation that was identified within monazite-garnet gneiss rubble (Kojan, 1979). The trend of the mineralised zone extends along the Anmatjira Range; assays greater than 14% REE, 6.3% thorium and 0.1% uranium occur within the trend. Crossland applied for the licence to exploit possible alluvial concentrations derived from this anomalous unit.

• Uranium-bearing pegmatites associated with a Lower Proterozoic granitic intrusive.

The presence of the radiometrically anomalous rock types containing both uranium and thorium led Crossland to the region in search of Rare Earth Element (REE) mineralisation. The company proposed that it had an analogous geological and topographical setting to that on the it’s Charley Creek Project tenements, located 150 km to the south. The existence of large outwash channels into the flat open country to the north of the Anmatjira / Yundurbulu Range could possibly provide an environment for the concentration of an alluvial REE resource.

Figure 3  1:1 Million Geological Map of the Mount Stafford Project environs

4 Previous Exploration - Other Companies

Previous exploration within the region has been directed towards a number of commodities with a focus on uranium and gold. REE minerals, diamonds, tin and tungsten have also been sought.
In the late 1970s, Otter Exploration explored the region for uranium and other minerals. They located several radiometric anomalies, which are related to REE mineralisation.

Work was conducted by BHP Minerals in the early 1980's with the main target being diamonds. There was no encouragement from the sampling program. No ‘Indicator Minerals’ were found.

In the 1990’s Poseidon Gold Limited and North Flinders Mines Limited explored for gold to the south of the licence.

Arafura Resources NL also held ground in the Reynolds Range but did no fieldwork.

5 Work Completed – Crossland

There were no on-ground activities carried out by Crossland on the remaining blocks since grant of tenure.

Crossland’s ability to raise funds to service its expenditure obligations were severely curtailed from late 2011 due to the cessation of contributions from it’s then JV partner Pancontinental Uranium Corporation. Pancon’s situation was principally related to the global financial crisis. Over the life of the tenement, the company was able to raise minimal amounts of funding, which allowed it to continue with some activities on its flagship project, the Charley Creek REE resource. It was considered important to bring that project to a stage so as to make it attractive to a potential investor.

6 Conclusions

The very large reduction in the area of the licence in 2015 was undertaken to drastically cut the financial obligations and to retain what the company considered to be the area with most potential for an alluvial resource. The Charley Creek model was being applied where alluvial REE mineralisation is concentrated in the large outwash fans on the northern side of the MacDonnell Ranges. The Mount Stafford project followed a similar concept – that alluvial REE mineralisation could exist in the outwash channels to the north.

Following discussions with its new Joint Venture partner, the decision not to proceed with any further activities on the project area was made.
6 References
