EL 29044

COMBINED 2ND ANNUAL AND FINAL REPORT


Target commodities: Sn & Ta

By

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Abstract

Exploration License EL29044 was granted to GRIGM RESOURCES PTY LTD by NT Department of Mines and Energy on 5 April 2012 for a period of six years. After a careful review, the managing board of GRIGM RESOURCES PTY LTD has come to the decision to surrender all the rights and interests in for the authority after first stage exploration for about one and half years. This report summarises work carried out on EL29044 during the period 5 Apr. 2013 to 5 March 2014.

EL29044 license area is located in the northwest part of Central Domain of the Palaeoproterozoic Pine Creek Orogen. The area outcrop Finniss River Group Rocks. The area is considered to be prospective for tin and tantalum as the general geological setting in the area is comparable with that along the Byone Sn-Ta Pegmatite belt. The strategy is to locate pegmatite veins, try to find hidden granites, and explore for cassiterite-bearing greisen vein type ore deposits near the contact zone of granitic intrusions.

Work completed recently include:

1. Ground check of the magnetic anomalies in the southern part of EL29044;
2. Ground check of the mineral occurrences within the license area;

Ground check magnetic anomaly has failed to find any significant magnetic minerals and/or rock types that could cause the positive anomaly. Further work is needed to interpret the magnetic anomaly.

Field reconnaissance has failed to locate any primary outcrop of cassiterite-bearing pegmatite veins. Although the geological setting of the license area is very similar to that of the Bynoe Sn-Ta pegmatite belt, potential to find large scale Sn-Ta pegmatite in EL29044 might not be encouraging.

A few cassiterite-bearing pegmatite samples have been found among floating materials or abandoned mine waste, it might indicate there are some small scale pegmatite veins exist in the area. Handheld XRF analyze results on muscovite aggregates within these samples show that cassiterite, as well as tantalite could exist as fine-grained mineral in muscovite aggregates. Further survey work is needed to locate primary pegmatite outcrop.
Introduction

Exploration Licence EL29044 was granted to GRIGM RESOURCES PTY LTD by NT Department of Mine and Energy on 5 April 2012 for a period of six years. After a careful review, the managing board of GRIGM RESOURCES PTY LTD has come to the decision to surrender all the rights and interests in for the authority after first stage exploration for about one and half years. This report summarises work carried out on EL29044 during the period 5 Apr. 2013 to 28 February 2014.

Tenure details

EL29044, total of 14 units (Table 1), is located about 15km southwest of Darwin, accessing by Cox Peninsula Road and local 4WD tracks (Fig. 1).

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Geological Setting

Geologically EL29044 is located in the northwest part of Central Domain of the Palaeoproterozoic Pine Creek Orogen (Figure 2) (Ahmad M and Hollis JA, 2013).

The area outcrop Finniss River Group Rocks (Figures 2 & 3). The Finniss River Group represents a thick succession of sedimentary rocks of turbiditic origin (Ahmad M and Hollis JA 2013). In the central trough, these sedimentary rocks are generally finer grained and dominated by shale and...
sandstone/shale in contrast to the Batchelor Shelf, where conglomerate and sandstone are relatively more significant. The Finniss River Group is subdivided into the Burrell Creek and Tollis formations (Ahmad M and Hollis JA, 2013). Majority of the rocks outcrop in EL29044 are members of Burrell Creek Formation. Rock units trend (schistosity/lineation trending) NNE-NE, dip to west (Figure 3).

![Figure 3 General Geology around EL29044](image)

**Mineralization**

As shown in Figure 4, in northwestern portion of the Pine Creek Orogen, Sn-Ta-bearing pegmatite are present in a north-trending up-to-10 Km belt, extending from Bynoe Harbor to the Wingate Mountains. Another cluster of pegmatite is present in the Mount Shoobridge area (Ahmad M and Hollis JA,
2013). All occurrences are within the contact aureole of granites and most are hosted within Burrell Creek Formation.

According to Ahmad M and Hollis JA (2013), the pegmatite bodies are linear or lensoidal, and up to 10 m wide and 250 m long. Most are poorly exposed and extensively altered. Usually, the feldspar is completely decomposed to white kaolinitic clay and has been removed by erosion, leaving behind rubbly or boulder remnants of white massive quartz. Mine workings are confined to a depth of less than 25 m in heavily altered material.

Quartz, muscovite and feldspar are the most common gangue minerals and their distribution suggests a crude zonation, in which a broader zone of quartz + muscovite is followed by an intermediate zone of feldspar + muscovite + quartz. A massive quartz core is seen in some pegmatite.

Ore minerals include cassiterite, tantalite and columbite, occurring as coarse crystals or aggregates of crystals. Minor minerals include amblygonite, mintebrasite, wordite, augelite, rutile, ilmenite, magnetite, zircon and tourmaline.

![Figure 4 General geological setting of northern portion of Bynoe pegmatite belt, western Pine Creek Orogen (Ahmad M and Hollis JA, 2013)](image_url)
EL29044 is located near northern end of the Byone pegmatite belt (Figure 4 and Figure 5).

The licensed area has been considered to be prospective area for tin and tantalum as the general geological setting in the area is comparable with that along the Byone Sn-Ta Pegmatite belt, and the area is actually part of Byone Pegmatite belt (Figure 3 and Figure 4). There are already three tin occurrences, named as Jewellers Extended, Perseverance Extended and Perseverance, located at northwest part of the EL29044.

The strategy is to locate pegmatite veins, try to find hidden granites, and explore for cassiterite-bearing greisen vein type tin ore bodies near the contact zone of granitic intrusions.
**Work completed in the first 12 months** (April 5, 2012 to April 4, 2013)

Worked completed in the first 12 months please refer to the first annual report (Jiang Z and Lu J 2013). It can be summarized as follows:

1. A detailed review of the previous exploration work have been conducted, this has revealed that the title area could be prospective for tin, tantalum and niobium mineralization associated with pegmatite. Three Sn-Ta-Nb mineral occurrences located in the northwest area of the EL29044 have been mentioned in the previous reports. Previous explorations and mining activities had only carried out in a limited depth, generally less than 50 meters in depth;

2. Analyse the existing aero-geophysical images of the area. This has been proven to be helpful to understand substructures in the area. A series of aeromagnetic anomalies occur in the area in NNE direction with a small gentle positive aero-gravity anomaly at south;

3. Two reconnaissance trips have been undertaken to the area. Samples had been taken from the tin field and analysis of the samples returned good results.

**Work completed after April 5, 2013**

1. Ground check of the magnetic anomalies in the southern part of EL29044;

2. Ground check of the mineral occurrences within the license area;

**Results**

**Magnetic anomalies**

There are three magnetic anomalies within EL29044 (Figure 6), and they generally strike northeast. Of the three anomalies, the one located in the southern part of the license area is the strongest. A northwest extending line A-B is designed across the magnetic anomaly to check the possible cause.
As shown in Figure 7, the area outcrops Finniss River Group meta-sediments and meta-volcanic rocks. Schistosity strikes NNE. There are no significant magnetic minerals and/or rocks have been identified, but some limonite-bearing rocks have been located near the magnetic anomaly center. However these are mostly float rocks instead of outcrop. Attempt to locate gossans outcrop failed.

Topographic feature of the northeast extending magnetic anomaly is a northeast striking mountain crest (Figure 8), with northwest side very steep and southeast side slopes gentle. An intermittent river runs through northwest side of the crest. On the geological map (Figure 7, NT Geological Survey), there is a northeast striking fault that had been marked coincident with the river course. It is most likely that the gossans-like floating rocks were originated from weathering of the hydrothermal fluid altered rocks developed along fault zone.
Pegmatite veins identified in the area may indicate that the cause of the magnetic anomaly could be related to magnetic minerals associated with skarnization along contact zones of felsic intrusions.

Figure 7 Generalized geology setting of and around EL29044
Mineral occurrences in the license area

Numerous cassiterite-bearing pegmatite veins in the west of EL29044 license area had been recorded in NT Geologic Survey database. As shown in Figure 9, there are two old tin mines (or old diggings) located near northwest margin of EL29044, named as Perseverance and Perseverance Extend.

Field inspections have been carried out in attempt to locate these old mine diggings. Unfortunately, no primary cassiterite-bearing pegmatite vein outcrop has been found, as both mine-diggings have been abandoned for a long time. No other significant pegmatite outcrop has been found. A few cassiterite-bearing pegmatite float rock samples have been collected in the possible abandoned mine waste. These are quartz-muscovite pegmatite vein samples. Cassiterite is generally dark brown to black, grain size ranges from 1 mm to >15 mm. Two of the cassiterite-bearing quartz-muscovite pegmatites have been shown in Figure 10.

The cassiterite-bearing quartz-muscovite pegmatite samples have also been used for check tantalum concentration by handheld XRF. As no primary tin-bearing pegmatite vein outcrop has been found, the XRF analyze results may only be used to get a rough idea about tantalum concentration in pegmatite in
the license area. Analyses have been concentrated on spots where muscovite is the majority mineral in the sample, results are shown in Table 2.

Figure 9  Mineral occurrences in and around EL29044

Figure 10  Cassiterite-bearing pegmatite samples collected from abandoned mine wastes
Table 2  Handheld XRF analyze results of muscovite in cassiterite-bearing pegmatite

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* Instrument SN 510104; Model: DELTA Premium

Figure 11  Ta content in muscovite aggregates

Tantalum concentration in muscovite might be used to get an indication of tantalum concentration in the ore-forming fluid, as only a few samples are available and no visible tantalite has been identified. Figure 11 is Ta content of muscovite aggregates in cassiterite-bearing pegmatite samples. Ta is generally low, but with some exceptions, this may indicate very fine-grained tantalite exists in muscovite aggregates. Sn content of the same muscovite
aggregates shows the similar variation (Figure 12). High Sn content spot might be fine cassiterite grain in muscovite aggregates.

**Figure 12** Sn content in muscovite aggregates

**Conclusions and recommendation**

Ground check magnetic anomaly has failed to find any significant magnetic minerals and/or rock types that could cause the positive anomaly. Further work is needed to interpret the magnetic anomaly.

Field reconnaissance has failed to locate any significant cassiterite-bearing pegmatite vein outcrop. Although the geological setting in EL29044 is very similar to that of the Bynoe Sn-Ta pegmatite belt, the potential to find significant large scale Sn-Ta pegmatite in EL29044 might not be encouraging.

Although only a few cassiterite-bearing pegmatite samples have been found among floating materials or abandoned mine waste, it might indicate there are some small scale pegmatite veins exist in the area. Handheld XRF analyze results on muscovite aggregates within these samples show that cassiterite, as well as tantalite could exist as fine-grained mineral in muscovite aggregates. Further survey work is needed to locate primary pegmatite outcrop.

**References**


