



# Top End Minerals Ltd

ABN 48 124 943 728

31 January 2017

Manager Companies  
Australian Securities Exchange  
Level 6, 20 Bridge Street  
Sydney NSW 2000

*By E-Lodgement*

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## REPORT FOR THE QUARTER ENDED 31 DECEMBER 2016

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- **Completion of technical due diligence on Lashio Zinc Refinery (LZR) Myanmar – completed 30 January 2017**
- **Program to conduct a scoping study on the zinc rich Namtu slag dumps has commenced – slags are potentially a significant long-term feedstock for LZR**
- **TND also assessing other substantial lead, zinc opportunities in Shan State, Myanmar, including advanced projects and potential high quality exploration tenements to strengthen portfolio**

Cornerstone Resources (Myanmar) Limited (**CRML**) is a zinc metal producer whose major assets are the Lashio Zinc Refinery (**LZR**) and the Longh Keng zinc mine.



Cornerstone Zinc Refinery, Lashio, Northern Shan State, Myanmar



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**TND** holds an option to purchase 60% of the total issued share capital of **CRML** and is currently carrying out due diligence on **CRML** and its assets.

During the quarter **TND** commissioned Mining & Process Solutions Pty Ltd of Perth, (**MPS**) to carry out technical due diligence on the **LZR**. This work was successfully completed and announced to the ASX on 30 January 2017.

The technical study was undertaken in order to identify any risks associated with the plant construction, site condition and process used at the **LZR**.

The Company is pleased with the overall results and the conclusions of the technical due diligence and is proceeding with Corporate Due Diligence and Financial Due Diligence on **CRML**. This work is scheduled to start in February 2017.

In addition to this work the Company has commenced a program to conduct a scoping study on the zinc rich Namtu slag dumps. The slag dumps of the Namtu smelter complex in the Northern Shan State of Myanmar are in close proximity to the **LZR** and are a significant potential feedstock for the **LZR**.

A two stage study of the Namtu slag has commenced. The phases of study are as follows:

## **Stage 1**

Site visit to coordinate sampling of the slag heaps for metallurgical investigation. Preparation of a metallurgical test plan.

## **Stage 2**

Metallurgical testing, process design and preparation of scoping study capex and opex estimates.

**MPS** has been commissioned to carry out these studies.

Following successful completion of these studies and exercise of **TND's** option for the purchase of 60% of the total issued share capital of **CRML**, **TND** intends to proceed with plans to consider an expansion of the capacity of the **LZR** to 18,000 metric tonnes of refined zinc per annum. The plans will include consideration of the design, permitting for and construction of a fuming plant to process approximately



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150,000 metric tonnes of zinc slag per annum in order to provide sufficient feedstock for the refinery.

The Namtu slag dumps should provide a reliable long term source of feedstock for the **LZR** whilst the Company undertakes exploration activities at the Long Keng mining concession to potentially discover additional ore bodies.

In addition the company is currently investigating other substantial lead, zinc opportunities in the Shan State including advanced projects as well as potential high quality exploration tenements.

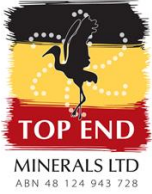
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Top End Minerals Ltd (ASX: TND) is a diversified mineral explorer, which controls through farm-in arrangements with Merlin Diamonds Ltd (ASX: MED), and in its own right, one of the largest portfolios of highly prospective exploration tenements in the Northern Territory, Australia. The Company has mineral rights other than diamonds for the farm-in tenements and holds all mineral rights for two tenements held in its own name.

In October 2016, TND announced the proposed acquisition of High Grade Long Keng Zinc Mine and Lashio Zinc Refinery in Myanmar.

Key points of the proposed acquisition are:

- Option acquired to purchase 60% interest in Cornerstone Resources (Myanmar) Ltd (CRML) which holds the Long Keng Zinc Mine and Lashio Zinc Refinery in Myanmar for US\$43 million.
- Nine-month option agreement in place with CRML's major shareholders, China's Datong Industrial Co and Yandal Investments, for US\$500,000 up front non-refundable deposit.
- Long Keng tenement covers 8 square kilometres of highly prospective ground and hosts two surface outcrops of high-grade smithsonite with a historical Inferred Resource of 170,000 tonnes at an average grade of 37 % Zinc for a total contained metal content of 63,000 tonnes, reported in 2000 under the JORC Code 1999 Edition (Annexure 1).
- CRML has mined part of the Long Keng resource and has processed the material at its 100%-owned Lashio Zinc Refinery since commissioning in February 2015. The amount of remaining resource in situ and in stockpiles will be determined during the option period.
- The Lashio Zinc Refinery has a capacity of 10,000t of LME (99.99% Zinc) refined zinc per annum with plans to scale up capacity to 18,000t of refined Zinc per annum.
- Lashio is the only modern Zinc refinery plant within Myanmar's highly prospective Shan Plateau zinc and base metal province.



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- Significant opportunity exists to acquire other significant zinc and base metal assets and exploration tenements in Myanmar.
- Potential for nearby Bawdwin mine and Namtu smelter complex slag dumps (unclassified historical resource of 2.3 Mt at 17% Zinc reported in 1987) to supply long term feedstock to Lashio Zinc Refinery should access to these be negotiated.
- Recent changes in Myanmar's political landscape and lifting of US and EU sanctions make TND's entry very timely.
- Mark Creasy's Yandal Investments to invest A\$500,000 in TND as part of transaction
- In addition A\$2.2 million placement completed by Triple C Consulting to fund the non-refundable deposit, provide working capital for activities in Myanmar and fund exploration of TND's highly prospective Northern Territory Zinc project.

## Details

TND has acquired an option to purchase a 60% interest in CRML. CRML is a pure zinc producer that owns the Long Keng Zinc Mine and tenement in addition to owning the Lashio Zinc Refinery, located in the Shan State of Myanmar, a highly mineralised region of the country.

TND has reached agreement with CRML's major shareholders, China's Datong Industrial Co and Mark Creasy's Yandal Investments, to secure a nine-month option through the payment of a non-refundable deposit of US\$500,000. The purchase price for 60% of CRML is US\$43 million. As part of the transaction, Yandal Investments has committed A\$500,000 and Triple C Consulting has arranged a A\$2.2 million placement in TND, that will give the Company the necessary financial flexibility to complete payment of the non-refundable deposit, fund in-country activities in Myanmar, fund exploration of TND's highly prospective Northern Territory Zinc project, and provide working capital.

Together with major Chinese partner, Datong, TND has a unique opportunity to acquire significant zinc and other base metal assets within the country. Following changes in Myanmar's political landscape and the recent lifting of US and EU sanctions, Myanmar has the potential to be a major attraction for mining investment due to its significant geological setting and untapped potential. TND's move to acquire a 60% interest in CRML with its producing assets and cash flow gives it a unique advantage and potential for growth in a highly prospective jurisdiction.

## **About Cornerstone Resources (Myanmar) Ltd (CRML)**

CRML is a private company owned jointly by Australian and Chinese shareholders and has been operating in the resource sector in Myanmar since 1999. It is pure zinc company at present. CRML shareholders and management have substantial experience operating in Myanmar and a proven and successful track record in country.



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CRML's major projects are the Long Keng Mine and tenement and the Lashio Zinc Refinery in central Myanmar (see figures 1-4 below). Long Keng is situated 450km north east of Yangon. The mining lease covers 8km<sup>2</sup> and hosts two high grade Zinc outcrops, Hill 1 and Hill 2. A historic Inferred Resource of 170,000 t at 36.8% Zn was reported in 2000 under the guidelines of the 1999 edition of the JORC Code, making Long Keng one of the highest grade zinc deposits in the world.

The 2000 resource estimate was based on historical 1950's drilling (15 drill holes at Hill 1 and 10 drill holes at Hill 2) and additional surface sampling (Annexure 1). It was not possible to validate the 1950's assay data except by surface sampling that confirmed the zinc grade range. A topographic survey of the outcropping mineralisation was completed to provide an upper surface of the resource. The resource was estimated using a sectional polygonal method. A total of 17 drill holes completed by CRML in 2001-2003 were focused on exploration rather than resource validation. Five holes intersected high-grade zinc mineralisation of similar tenor to the resource estimate.

The Long Keng deposit has been partly depleted by mining, mainly subsequent to Datong's investment in CRML in 2012. The material mined by CRML was stockpiled for processing at the Lashio Zinc Refinery which was commissioned in February 2015. The Lashio Zinc Refinery is situated 700 km north east of Yangon and has current capacity of 10,000t refined Zinc per annum with an average 99.99% Zinc grade. Plans to increase capacity to 18,000t refined Zinc per annum are currently under discussion. CRML reports that about 50,000t has been processed since commissioning and that 100,000 t of material is stockpiled at Lashio.

Investors are cautioned that the Company has not yet completed a work program to determine the remaining resource or assess the extent of mining depletion. A resource update for the deposit and stockpiles will be a priority during the option period.

## **Significant future upside and expansion potential**

In addition to the potential exploration upside at Long Keng, CRML's proximity to the former world class Bawdwin mine and Namtu smelter complex with its zinc-rich slag dumps (unclassified historic resource reported in 1987 as 2.3 Mt averaging 17% Zn) provides an opportunity for the Lashio Zinc Refinery to source additional feedstock for the long term. Previous studies suggest that the slags can be treated to recover a zinc oxide product suitable for refining into zinc metal at the Lashio Zinc Refinery.

There is also the possibility for an additional source of feed for the Lashio refinery from the Bawdwin concentrator and flotation plant after it has been upgraded. In the 1900's the Bawdwin lead, zinc and silver mine was the largest of its kind in the world. The mine and smelter fell into neglect following WW2 and through successive military governments. The mine was privatised in 2002, however it has underperformed and is currently in a state of disrepair despite its obvious potential.



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## ARNHEM LAND BASE METALS PROJECT

### *Top End Minerals (EL26206 100% non-diamonds; EL30051 100% all minerals)*

An MMI-M™ soil geochemical sampling program was conducted in the previous quarter at the Company's flagship project, the Arnhem Land Base Metals Project. Over 100 samples comprising 4 orientation lines were sampled over the previously defined gravity anomaly and rock chip sample zinc-lead results at the Mainoru Prospect. Over 250 infill grid samples were also taken and were to be submitted pending positive results from the initial 4 orientation lines. The purpose of the MMI-M™ sampling program was to see if the gravity anomaly would also return anomalous results of zinc and lead as did previous nearby surface rock chip samples.

Results for the 4 orientation lines were positive with a zinc and lead anomaly seen to correlate with the highest Bouguer gravity readings. For a full description of the MMI-M™ results please see the Company's announcement dated 30 July 2015 on the Top End Minerals Ltd website [www.topenminerals.com](http://www.topenminerals.com).

The positive anomalous zinc and lead results have warranted the submission of the remaining infill grid MMI-M™ samples and also a further program of MMI-M™ sampling to the south and west to find the limits of the known anomaly. A drilling program is expected to follow pending receipt of all approvals.

An Aboriginal Areas Protection Authority (AAPA) Certificate was recently received for EL26206. The certificate has reported numerous Sacred Sites and associated Restricted Work Areas (RWA's) which prevent access to significant portions of the company's targeted exploration areas. The Company is working with the AAPA to get further clarification on the impact of these RWA's and the process required to gain access for future exploration programs. The Company has spoken to AAPA and is awaiting a response to its latest discussions.

### **Overview**

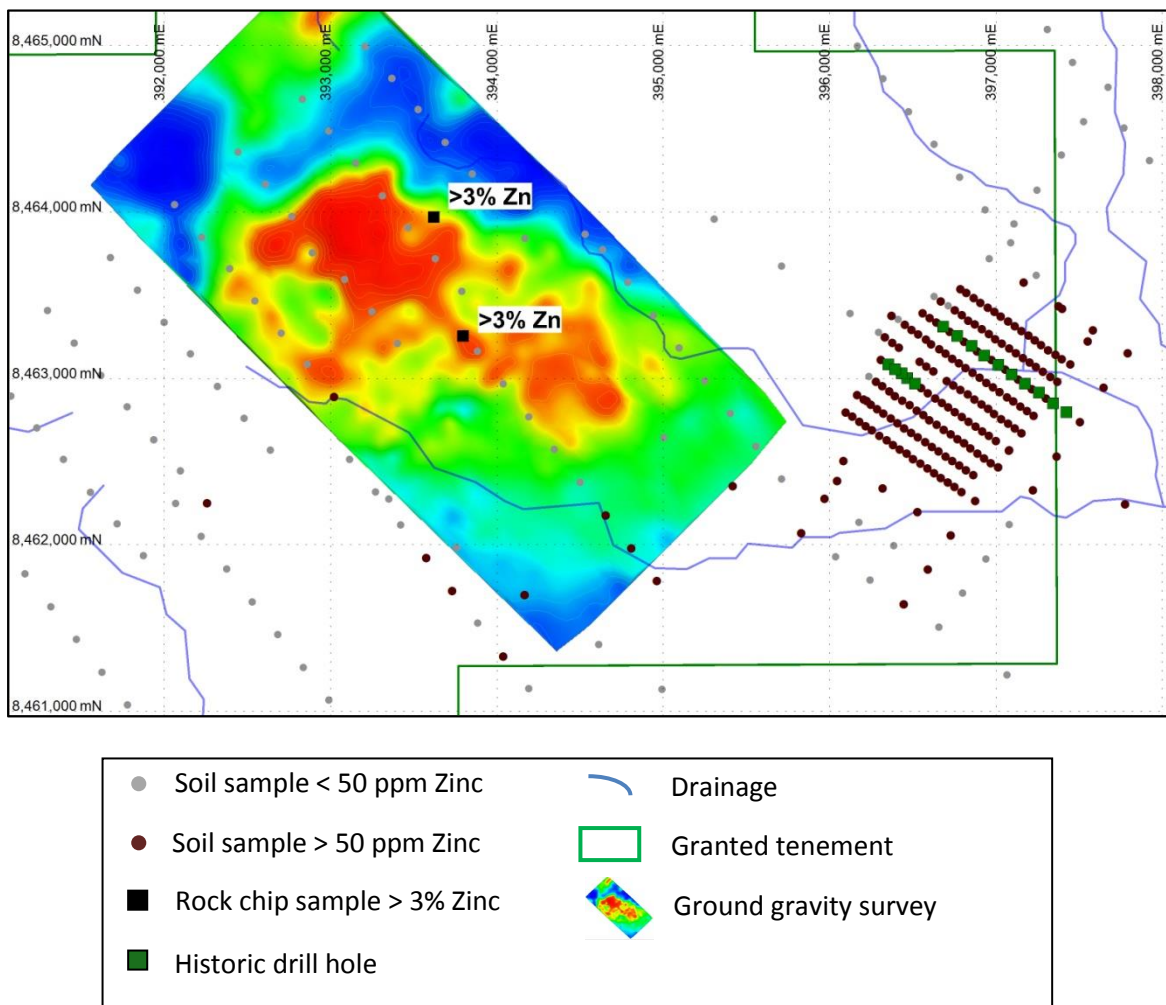
The Company's base metal project is located in Arnhem Land and comprises granted tenements EL26206 and EL30051. In 2013 a ground gravity survey was completed over an area defined by surface mineralisation with rock chips reporting >3% zinc. The gravity survey identified a 0.8 milligal residual gravity anomaly that is spatially associated with the mineralised area. Preliminary modelling of the gravity data indicates the potential source to be within the upper 150m. Review of historical sampling data has further supported the target as a mineralised body and identified new target areas within the region. The recent MMI-M™ results strengthen the geological interpretation of a potential zinc and lead mineralised body within the zone of anomaly.

### **Further Target Areas**

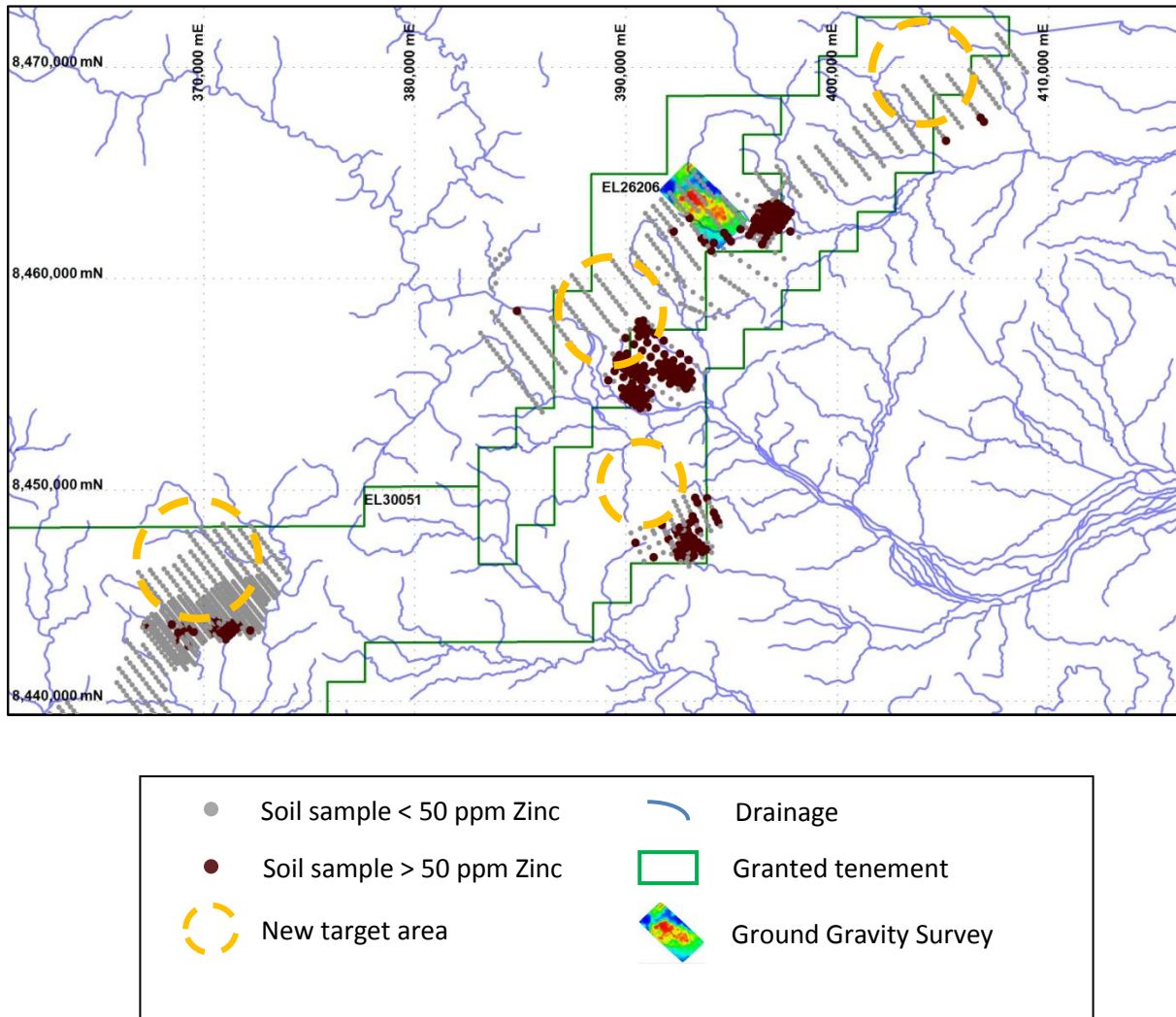
The Company's residual gravity anomaly is associated with an area defined by surface rock chip mineralisation. Previous explorers collected conventional soil samples and rock chip samples over this area but did not encounter mineralisation identified by the Company's geologist. It is evident on Figure 2 that the conventional soil samples exhibit no response over the mineralised area but do show a response down slope from the mineralised area.

This is possibly due to the topography and sampling medium forming a down slope trap for the zinc in soil samples. Previous explorers drill tested the down slope zinc soil anomaly, which returned sub-economic mineralisation.

This observation of surface mineralisation and an associated down slope soil anomaly is considered significant given that additional zinc soil anomalies were defined by previous explorers within the Company's tenements (Figure 3). Carbonate-hosted zinc deposits typically occur in extensive districts often covering several hundred, and in some cases several thousand, square kilometres and the Company considers these additional soil anomalies as high priority targets that could host additional mineralised areas.



**Figure 2. Gravity survey and sampling data showing down slope soil anomaly**



**Figure 3. Further Target Areas**

## REGIONAL EXPLORATION

The majority of the Company's exploration licences are held under application and are located on Aboriginal Land. These licences are at various stages of progression through the Aboriginal Land Rights Act. Through an ongoing review of historical exploration reports and publically available geoscientific data the Company continues to identify those licences considered to be of higher prospectivity. These include several licences in north-eastern Arnhem Land, which fall within an area described by the Northern Territory Geological Survey in 2013 as the '*hottest untested exploration play in the NT*'. Significant potential exists in this area for various styles of sediment hosted base-metal deposits particularly in the northern part of the basin, which is a direct analogue of the Pb-Zn endowed Batten Trough and is effectively unexplored. The licences are also considered prospective for gold, uranium and other commodities making them highly attractive and a valuable Company asset.





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The Company holds several licences located in western Arnhem Land closer to the East Alligator River uranium deposits (Ranger, Jabiluka, Koongarra, and Nabarlek). These licences contain historic uranium mineralisation and are considered prospective for unconformity-type uranium deposits near the base of the Kombolgie Sandstone.

## ***Proposed Work Program***

On EL 26206 and EL 30051, the Company has made contact with representatives of the traditional owners seeking a meeting to discuss access to the tenement. The Company has been advised by Aboriginal Areas Protection Authority that a meeting can be held within the next 4 weeks to gain the approvals for the next stage of the exploration program.

Following the receipt of the necessary approvals, the Company intends to:

- engage a geophysicist to further understanding of the ground gravity data, including depth to target plus projected areal extent;
- conduct a further MMI soil geochemical survey to confirm actual drill targets; and
- conduct a drill program on the identified targets.

The Company anticipates that the cost of this exploration will be in the vicinity of \$500,000. At all stages of the program, the Company will assess the results to-date to determine the next steps in the exploration of these tenements.

In respect to the regional exploration, the Company continues to progress the discussions with the relevant parties in order to procure the grant of the tenements so that exploration can be undertaken.

The Company also intends to look for further exploration interests to complement its existing exploration activities.

*The information in this report that relates to exploration results is based on information compiled by Dr DS Tyrwhitt who is a Fellow of the Australasian Institute of Mining and Metallurgy. Dr DS Tyrwhitt is a consulting geologist employed by DS Tyrwhitt & Associates Pty Ltd. Dr DS Tyrwhitt has 50 years experience in the industry and has more than 5 years experience which is relevant to the style of mineralisation being reported upon to qualify as a Competent Person as defined in the 2012 Edition of the "Australasian Code of Reporting of Exploration Results, Mineral Resources and Ore Reserves". Dr Tyrwhitt consents to the inclusion in the report of the matters based on the information in the form and context to which it appears. Attached is a copy of the Company's Mining Exploration Entity Quarterly Report in accordance with Listing Rule 5.3.*



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**Table 1. Top End Minerals Limited Tenement Holdings**

Tenement	Project	State	Holder	Status	% Interest (Start of Quarter)	% Interest (End of Quarter)
EL10189	Merlin Orbit	NT	Merlin Operations Pty Ltd	Granted	100% (non-diamonds)	100% (non-diamonds)
EL10230	Arnhem Land	NT	Merlin Diamonds Limited	Application	100% (non-diamonds)	100% (non-diamonds)
EL26206	Arnhem Land	NT	Merlin Diamonds Limited	Granted	100% (non-diamonds)	100% (non-diamonds)
EL28066	Arnhem Land	NT	Merlin Diamonds Limited	Application	100% (non-diamonds)	100% (non-diamonds)
EL28067	Arnhem Land	NT	Merlin Diamonds Limited	Application	100% (non-diamonds)	100% (non-diamonds)
EL28068	Arnhem Land	NT	Merlin Diamonds Limited	Application	100% (non-diamonds)	100% (non-diamonds)
EL28069	Arnhem Land	NT	Merlin Diamonds Limited	Application	100% (non-diamonds)	100% (non-diamonds)
EL28070	Arnhem Land	NT	Merlin Diamonds Limited	Application	100% (non-diamonds)	100% (non-diamonds)
EL28071	Arnhem Land	NT	Merlin Diamonds Limited	Application	100% (non-diamonds)	100% (non-diamonds)
EL29398	Arnhem Land	NT	Merlin Diamonds Limited	Application	100% (non-diamonds)	100% (non-diamonds)
EL29399	Arnhem Land	NT	Merlin Diamonds Limited	Application	100% (non-diamonds)	100% (non-diamonds)
EL29400	Arnhem Land	NT	Merlin Diamonds Limited	Application	100% (non-diamonds)	100% (non-diamonds)
EL29401	Arnhem Land	NT	Merlin Diamonds Limited	Application	100% (non-diamonds)	100% (non-diamonds)
EL29402	Arnhem Land	NT	Merlin Diamonds Limited	Application	100% (non-diamonds)	100% (non-diamonds)
EL29403	Arnhem Land	NT	Merlin Diamonds Limited	Application	100% (non-diamonds)	100% (non-diamonds)
EL29407	Arnhem Land	NT	Merlin Diamonds Limited	Application	100% (non-diamonds)	0%
EL29408	Arnhem Land	NT	Merlin Diamonds Limited	Application	100% (non-diamonds)	0%
EL29409	Arnhem Land	NT	Merlin Diamonds Limited	Application	100% (non-diamonds)	0%
EL29410	Arnhem Land	NT	Merlin Diamonds Limited	Application	100% (non-diamonds)	0%
EL29411	Arnhem Land	NT	Merlin Diamonds Limited	Application	100% (non-diamonds)	0%
EL29412	Arnhem Land	NT	Merlin Diamonds Limited	Application	100% (non-diamonds)	0%
EL29413	Arnhem Land	NT	Merlin Diamonds Limited	Application	100% (non-diamonds)	0%
EL29414	Arnhem Land	NT	Merlin Diamonds Limited	Application	100% (non-diamonds)	0%
EL29567	Arnhem Land	NT	Merlin Diamonds Limited	Application	100% (non-diamonds)	100% (non-diamonds)
EL6532	Arnhem Land	NT	Rio Tinto Pty Ltd	Application	100% (non-diamonds)	100% (non-diamonds)
EL30051	Arnhem Land	NT	Top End Minerals Limited	Granted	100%	100%
EL30154	Arnhem Land	NT	Top End Minerals Limited	Application	100%	100%