# Annual Report – Year 5

# Exploration Licence 27175

28th September 2013 to 27th September 2014
Northern Territory, Australia

***Holder:*** **Merlin Diamonds Limited**

***Operator:*** **Merlin Diamonds Limited**

***Reporting Period:*** **28th September 2013 to 27th September 2014**

***Sheet Reference:*** **Wallhallow (SE53-07) & Bauhinia Downs (SE53-03) 1:250,000**

***Due Date:*** **27th October 2014**

| | |
|---|---|
| Author: | M Kammermann |
| Date: | 27th October 2014 |
| Copies To: | Dept. of Mines and Energy - NT<br>MDL |

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## SUMMARY

*This annual report outlines exploration activities undertaken by Merlin Diamonds Limited (MDL) on Exploration Licence 27175 between the 28th September 2013 and 27th September 2014. This period represents Year Five of the License.*

*Exploration Licence 27175 is situated on the Wallhallow (SE53-07) 1:250,000 geological mapsheet and the Lancewood (6163) 1:100,000 topographic mapsheet in the Northern Territory. It is located around 120 kilometres south of Borroloola and is accessed via existing unsealed tracks leading from Kiana Station.*

*Due to funding constraints the proposed exploration program was not undertaken during the reporting period.*

*The Company's exploration on a nearby licence (EL25676) has identified that chromites are entrained within alluvial material that may be derived from a distal (ie secondary) source. When the results from EL25676 and EL27175 (and another of the Company's Licences EL27750) are considered in a regional sense it is evident that the chromites may be part of a dispersion trail originating from EL25676. To validate this hypothesis it is necessary to excavate costeans and obtain samples of alluvial material within EL27175 and EL27750.*

## 1.0 INTRODUCTION

This annual report outlines exploration activities undertaken by Merlin Diamonds Limited (MDL) on Exploration Licence 27175 between the 28th September 2013 and 27th September 2014. This period represents Year Five of the Licence.

## 2.0 LOCATION AND ACCESS

Exploration Licence 27175 is situated on the Wallhallow (SE53-07) 1:250,000 geological map sheet and the Lancewood (6163) 1:100,000 topographic map sheet in the Northern Territory. It is located around 120 kilometres south of Borroloola and is accessed via existing unsealed tracks leading from Kiana Station. A Licence location map is provided as Figure 1.

## 3.0 LICENCE DETAILS

EL 27175 consists of 17 blocks and was granted to MDL on 28th September 2009 for six years. During the previous reporting period MDL relinquished a further 8 blocks with 9 remaining. Licence details for EL27175 are outlined in Table 1 below.

*Table 1: Licence Details for EL27175.*

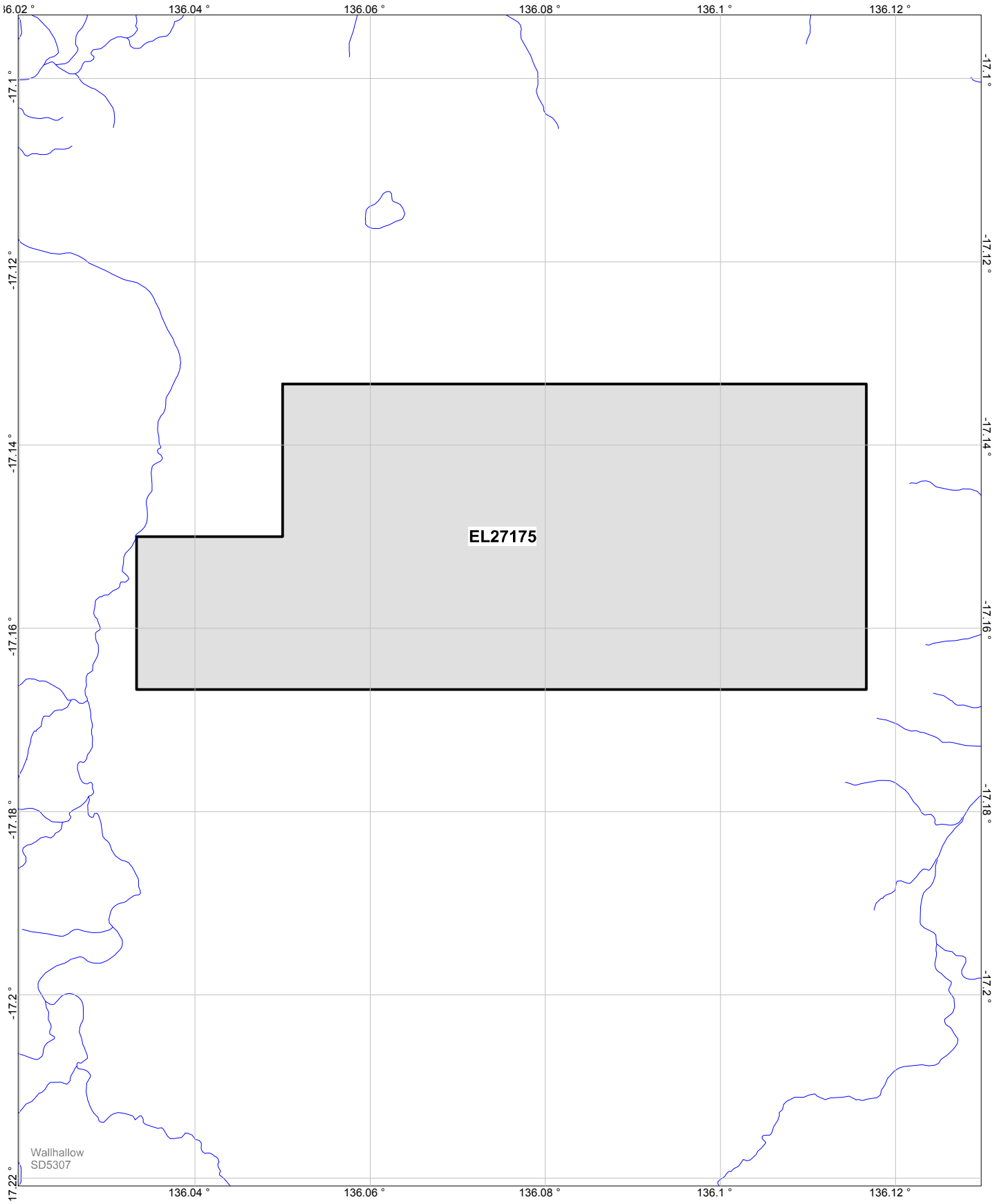
| Name | Status | Grant Date | Expiry Date | Blocks | Holder | Percentage |
|---|---|---|---|---|---|---|
| EL27175 | Grant | 28/09/09 | 27/09/15 | 9 | Merlin Diamonds Ltd | 100 |

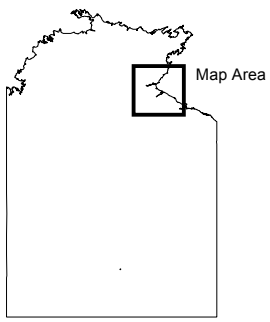
## 4.0 PHYSIOGRAPHY

### Geomorphology

EL27175 lies within and at the southern margins of the *Gulf Fall* physiographic division. The *Gulf Fall* contains north flowing drainages. A marginal scarp forms a drainage divide that separates the *Gulf Fall* from the *Barkly-Birdum Tableland* to the south where drainage flows southward. In this area the *Gulf Fall* division contains two sub-divisions namely the *Top Springs Erosion Surface* and the *Bukalara Plateau.*

The *Top Springs Erosion Surface* is generally flat at elevations of approximately 750 feet and contains outcrop of Top Springs Limestone, isolated outcrops of Cretaceous sediments, and Quaternary sediments on flat-lying areas and in drainages. The southern part of the sub-division becomes undulating and slopes up to the scarp of the *Barkly-Birdum*




**Legend**

Tenement

Drainage

| Merlin Diamonds Limited | |
|---|---|
| Date: 22/10/2013 | Figure 1<br>Location Plan |
| Author: | |
| Office: | |
| Drawing: | |
| Scale: 1:63360 | Projection: Longitude / Latitude (Australia GDA94) |

0 0.5 1 2

kilometres

*Tableland.*

The *Top Springs Erosion Surface* descends gently and merges with the *Bukalara Plateau* to the north. The plateau occurs approximately 30 feet below the *Top Springs Erosion Surface*. It is dissected by the Glyde River, Lancewood Creek and their tributaries, which has exposed the Bukalara Sandstone.

The *Barkly-Birdum Tableland* occurs on the southern side of the drainage divide at an elevation of approximately 1050 feet. It contains flat-lying Cretaceous sediments with an often well-developed laterite profile. Black soil plains occur where the ferruginous zone of the laterite profile has been eroded. The tableland represents the original Tertiary land surface.

**Geology**

The oldest rock unit that crops out in the Licence is the Paleozoic Top Springs Limestone. Although not mapped on the NTGS 1:250,000 Geological Mapsheet, basalt has been observed in outcrop and intersected in drill holes between overlying Cretaceous (Mesozoic) clays and underlying siltstones of possibly Tawallah Group (Proterozoic age). Mesozoic sediments are exposed in the scarp in the south of the Licence and also as outliers in the north where they unconformably overly the Top Springs Limestone. The limestone is covered by a thin veneer of residual sand probably derived from the eroding Cretaceous sediments to the south. More recent sands and gravels of Cainozoic age have deposited within active drainages and at the base of the scarp.

## 5.0 PREVIOUS EXPLORATION

**Other Explorers**

BHP explored the Licence and surrounding areas in the early 1990's for base metals and in the mid 1990's Ashton Mining joint ventured into the Licence and commenced systematic diamond exploration that involved extensive stream and loam sampling. This identified two areas where abundant chromites were recovered in loam samples. The areas were then followed up with airborne geophysical surveys and subsequent ground electromagnetics, magnetics and gravity, soil geochemical sampling and drilling of selected airborne anomalies. Despite intensive exploration efforts a source for the abundant chromite and

diamond distribution has not been identified.

**2009-2010**

Work completed during 2009-2010 included:

***Reverse Circulation Drilling***

Eleven reverse circulation drill holes for a total of 245m were drilled over a surface sample chromite anomaly to test for the presence of kimberlite. No kimberlite was intersected and drill spoil sent for heavy mineral processing also reported negative results.

***Rock and Loam Sampling***

Two rock samples and six loam samples were collected. The rock samples reported chemistry not indicative of kimberlite. The loam samples reported potentially kimberlitic chromites in three samples. The samples were not fused for microdiamond recovery.

***EM Survey***

A ground electromagnetic survey was completed for a total of approximately 25km over the area covered by the surface sample chromite anomaly. No discrete targets were identified.

**2010-2011**

During the 2010-2011 reporting period the following activities were completed;

***Zircon Helium Dating***

A portion of the concentrate from loam sample 09-028-005 (reported 4 potentially kimberlitic chromites) was submitted to the CSIRO for zircon helium dating of detrital zircons. The results are included in Table 2 and include a zircon lower age of 38 million years. This suggests a post-Cretaceous age igneous intrusive event as a possible source for the zircons. The apparent spatial association with potentially kimberlitic chromite suggests it is possible that the igneous event may be kimberlitic.

***Tenement Reduction***

During the reporting period MDL reviewed the historic and recent results, which concluded in 50% of the tenement being submitted for relinquishment. The area hosting the potentially kimberlitic chromites and Tertiary aged detrital zircons has been retained

for further exploration.

**2011-2012**

During the reporting period a total of 17 loam samples were collected and transported to Perth for processing and recovery of kimberlitic indicator minerals through the Company's laboratory. A total of 6 samples have been processed to date with all reporting chromites. Data is presented in Table 3. The remaining samples could not be processed due to timing of reporting and were to be completed during the next reporting period.

**2012-2013**

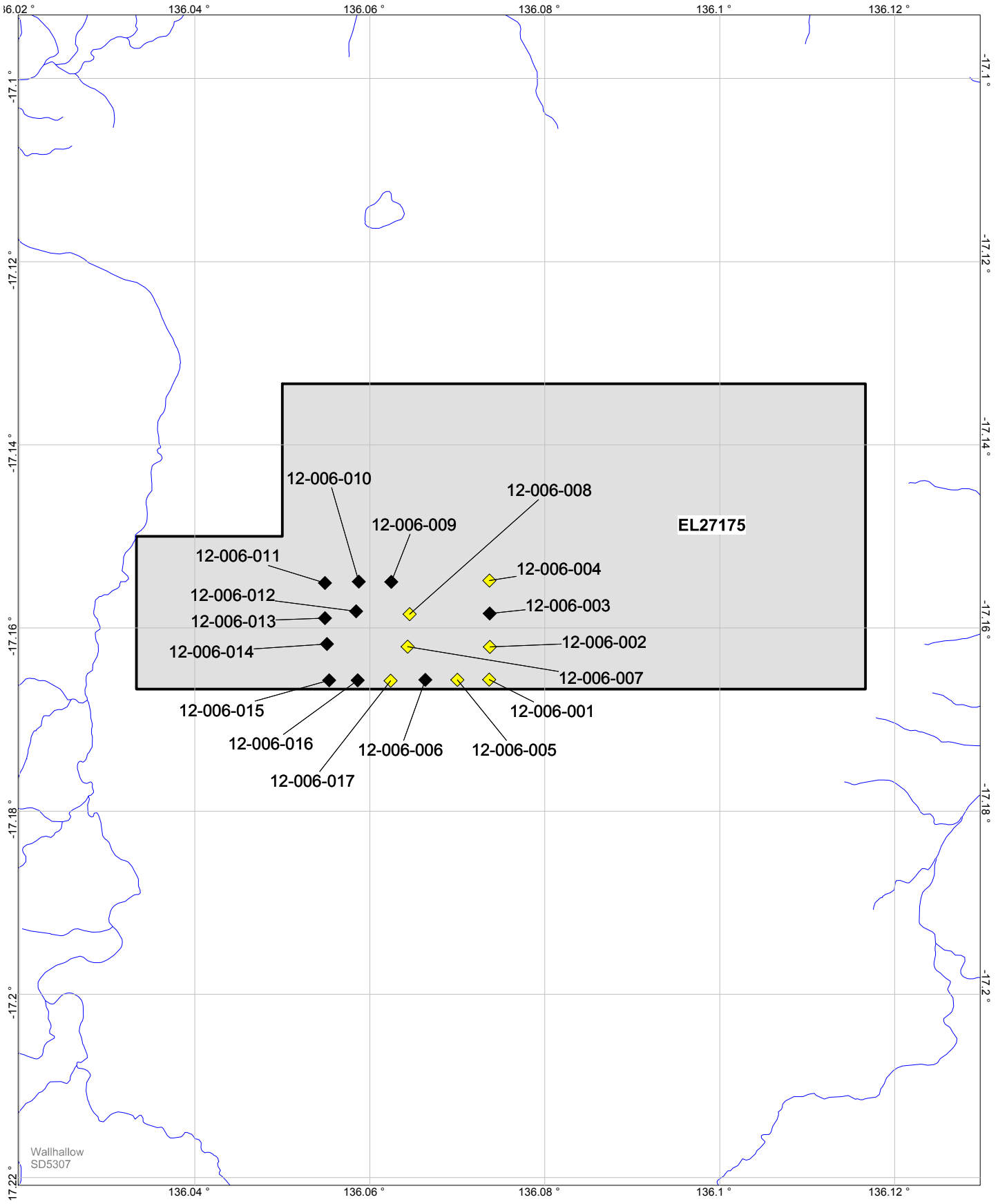
Work undertaken during the reporting period included the processing of the 9 remaining loam samples collected in the previous reporting period. The processed samples returned one positive chromite grain (12-006-017) with the rest of the samples all returning negative results. The results are shown on Table 4 and on Figure 2.

The chomites were described by a mineralogist as weathered, worn, corroded, cokey and potentially of kimberlitic origin.

## 6.0 EXPLORATION COMPLETED DURING CURRENT REPORTING PERIOD

Due to finding constraints the proposed exploration program was not undertaken during the reporting period.

The Company's exploration on a nearby licence (EL25676) has identified that chromites are entrained within alluvial material that may be derived from a distal (ie secondary) source. When the results from EL25676 and EL27175 (and another of the Company's Licences EL27750) are considered in a regional sense it is evident that the chromites may be part of a dispersion trail originating from EL25676. To validate this hypothesis it is necessary to excavate costeans and obtain samples of alluvial material within EL27175 and EL27750.




**Legend**

- Tenement
- Negative Samples
- Chromite Positive Samples
- Drainage

Merlin Diamonds Limited

Figure 2
Sample Location Plan

Date: 22/10/2013
Author:
Office:
Drawing:
Scale: 1:63360
Projection: Longitude / Latitude (Australia GDA94)

0 0.5 1 2
kilometres

## 7.0 EXPENDITURE STATEMENT

Expenditure for the reporting period amounted to $4,440 as per the attached Expenditure Statement.

## 8.0 PROPOSED EXPENDITURE AND WORK PROGRAM FOR 2014-2015

Year 6 Exploration Program and Budget

The proposed program is in line with another Licence EL27750. It is proposed to excavate up to 15 costeans to determine the origin of the soil. Heavy mineral samples will also be collected to determine which soil horizons are chromite-bearing. This program will aim to determine whether the chromites recovered to date are potentially sourced from a distal location.

| | |
|---|---|
| Administration and Reporting | $2,000 |
| Backhoe hire and costeaning activity | $6,000 |
| Collection, transport and processing of 15 heavy mineral samples | $20,000 |
| Rehabilitation | $2,000 |
| **Total** | **$30,000** |

## 9.0 REFERENCES

Ashton Mining Limited (2000). Annual Report for EL7201 and EL7816. 26th February 1999 to 25th February 2000. ML Report No. 52445. NTGS Reference CR2000-0102.

Reddicliffe, T.H. (2009) Annual Report EL27175 for the period 23rd August 2008 to 22nd August 2009 Merlin Diamonds Limited, Ref: 09-033.

Reddicliffe, T.H. (2010) Annual Report EL27175 for the period 28th September 2009 to 27th September 2010, Merlin Diamonds Limited, Ref: 10-049.

Kammermann, M. (2011) Annual Report EL27175 for the period 28th September 2010 to 27th September 2011, Merlin Diamonds Limited, Ref: 11-068.

Kammermann, M. (2012) Annual Report EL27175 for the period 28th September 2011 to 27th September 2012, Merlin Diamonds Limited, Ref: 12-066.

Kammermann, M. (2013) Annual Report EL27175 for the period 28th September 2012 to 27th September 2013, Merlin Diamonds Limited.

*Table 2. 2010-2011 Zircon Helium Sample Results*

| CSIRO # | MDL # | Date analysed | He (ncc) blank subr | U (ppm) | uncert | Th (ppm) | uncert | Th/U | Age (Ma) | +/- (1 sigma) |
|---|---|---|---|---|---|---|---|---|---|---|
| 137523-1 | 09-028-006 | 3/09/2010 | 18 | 103 | 4 | 15 | 1 | 0.1 | 141 | 6 |
| 137523-2 | 09-028-006 | 3/09/2010 | 152 | 347 | 14 | 135 | 5 | 0.4 | 337 | 15 |
| 137523-3 | 09-028-006 | 3/09/2010 | 18 | 416 | 17 | 304 | 12 | 0.8 | 47 | 2 |
| 137523-4 | 09-028-006 | 3/09/2010 | 224 | 173 | 7 | 139 | 5 | 0.8 | 254 | 11 |
| 137523-5 | 09-028-006 | 3/09/2010 | 11 | 34 | 1 | 73 | 3 | 2.2 | 71 | 3 |
| 137523-6 | 09-028-006 | 3/09/2010 | 21 | 54 | 2 | 11 | 0 | 0.2 | 173 | 8 |
| 137523-7 | 09-028-006 | 3/09/2010 | 39 | 146 | 6 | 42 | 2 | 0.3 | 122 | 5 |
| 137523-8 | 09-028-006 | 3/09/2010 | 17 | 127 | 5 | 58 | 2 | 0.5 | 74 | 3 |
| 137523-9 | 09-028-006 | 3/09/2010 | 197 | 807 | 33 | 580 | 23 | 0.7 | 220 | 10 |
| 137523-10 | 09-028-006 | 3/09/2010 | 8 | 333 | 14 | 323 | 13 | 1.0 | 38 | 1 |

*Table 3. 2010-2011 Sample Results Data*

| SAMPLE | TYPE | SIZE | SIEVE | DATUM | LONGITUDE | LATITUDE | RESULT | DIAMOND | CHROMITE | Chr_0.8mm | Chr_0.5mm | Chr_0.4mm | Chr_0.3mm | Chr_0.25mm | Chr_0.2mm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12-006-001 | LOAM | 80kg | 1mm | GDA94 | 136.073655 | -17.1656 | Pos | 0 | 2 | | | 1 | 1 | | |
| 12-006-002 | LOAM | 80kg | 1mm | GDA94 | 136.073738 | -17.1621 | Pos | 0 | 1 | | | | 1 | | |
| 12-006-003 | LOAM | 80kg | 1mm | GDA94 | 136.073717 | -17.1584 | n/a | | | | | | | | |
| 12-006-004 | LOAM | 80kg | 1mm | GDA94 | 136.073677 | -17.1548 | Pos | 0 | 2 | | | 1 | 1 | | |
| 12-006-005 | LOAM | 80kg | 1mm | GDA94 | 136.070007 | -17.1657 | Pos | 0 | 2 | | | | 1 | 1 | |
| 12-006-006 | LOAM | 80kg | 1mm | GDA94 | 136.066359 | -17.1657 | n/a | | | | | | | | |
| 12-006-007 | LOAM | 80kg | 1mm | GDA94 | 136.064336 | -17.162 | Pos | 0 | 3 | | 1 | 1 | 1 | | |
| 12-006-008 | LOAM | 80kg | 1mm | GDA94 | 136.06457 | -17.1585 | Pos | 0 | 4 | | 1 | 2 | | 1 | |
| 12-006-009 | LOAM | 80kg | 1mm | GDA94 | 136.062453 | -17.155 | n/a | | | | | | | | |
| 12-006-010 | LOAM | 80kg | 1mm | GDA94 | 136.058749 | -17.1549 | n/a | | | | | | | | |
| 12-006-011 | LOAM | 80kg | 1mm | GDA94 | 136.054886 | -17.1551 | n/a | | | | | | | | |
| 12-006-012 | LOAM | 80kg | 1mm | GDA94 | 136.058438 | -17.1582 | n/a | | | | | | | | |
| 12-006-013 | LOAM | 80kg | 1mm | GDA94 | 136.05488 | -17.1589 | n/a | | | | | | | | |
| 12-006-014 | LOAM | 80kg | 1mm | GDA94 | 136.055102 | -17.1617 | n/a | | | | | | | | |
| 12-006-015 | LOAM | 80kg | 1mm | GDA94 | 136.05536 | -17.1657 | n/a | | | | | | | | |
| 12-006-016 | LOAM | 80kg | 1mm | GDA94 | 136.058613 | -17.1657 | n/a | | | | | | | | |
| 12-006-017 | LOAM | 80kg | 1mm | GDA94 | 136.062393 | -17.1658 | n/a | | | | | | | | |

*Table 4. Updated 2010-2011 Sample Results*

| SAMPLE | TYPE | DATUM | ZONE | EASTING | NORTHING | RESULTS | DIAMONDS | CHROMITES |
|---|---|---|---|---|---|---|---|---|
| 12-006-001 | LOAM | GDA94 | 53 | 614188 | 8101805 | POSITIVE | 0 | 2 |
| 12-006-002 | LOAM | GDA94 | 53 | 614199 | 8102201 | POSITIVE | 0 | 1 |
| 12-006-003 | LOAM | GDA94 | 53 | 614199 | 8102605 | NEGATIVE | 0 | 0 |
| 12-006-004 | LOAM | GDA94 | 53 | 614197 | 8103001 | POSITIVE | 0 | 2 |
| 12-006-005 | LOAM | GDA94 | 53 | 613800 | 8101805 | POSITIVE | 0 | 2 |
| 12-006-006 | LOAM | GDA94 | 53 | 613412 | 8101807 | NEGATIVE | 0 | 0 |
| 12-006-007 | LOAM | GDA94 | 53 | 613199 | 8102209 | POSITIVE | 0 | 3 |
| 12-006-008 | LOAM | GDA94 | 53 | 613226 | 8102602 | POSITIVE | 0 | 4 |
| 12-006-009 | LOAM | GDA94 | 53 | 613003 | 8102992 | NEGATIVE | 0 | 0 |
| 12-006-010 | LOAM | GDA94 | 53 | 612609 | 8102998 | NEGATIVE | 0 | 0 |
| 12-006-011 | LOAM | GDA94 | 53 | 612198 | 8102982 | NEGATIVE | 0 | 0 |
| 12-006-012 | LOAM | GDA94 | 53 | 612574 | 8102640 | NEGATIVE | 0 | 0 |
| 12-006-013 | LOAM | GDA94 | 53 | 612195 | 8102559 | NEGATIVE | 0 | 0 |
| 12-006-014 | LOAM | GDA94 | 53 | 612217 | 8102247 | NEGATIVE | 0 | 0 |
| 12-006-015 | LOAM | GDA94 | 53 | 612242 | 8101809 | NEGATIVE | 0 | 0 |
| 12-006-016 | LOAM | GDA94 | 53 | 612588 | 8101806 | NEGATIVE | 0 | 0 |
| 12-006-017 | LOAM | GDA94 | 53 | 612990 | 8101797 | POSITIVE | 0 | 1 |