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EL 3147 / 4245

OOLDEA

FOURTH PARTIAL SURRENDER REPORT AT LICENCE EXPIRY/RENEWAL, FOR THE PERIOD 19/11/2003 TO 1/4/2014

Submitted by
Cristal Mining Australia Limited
2015

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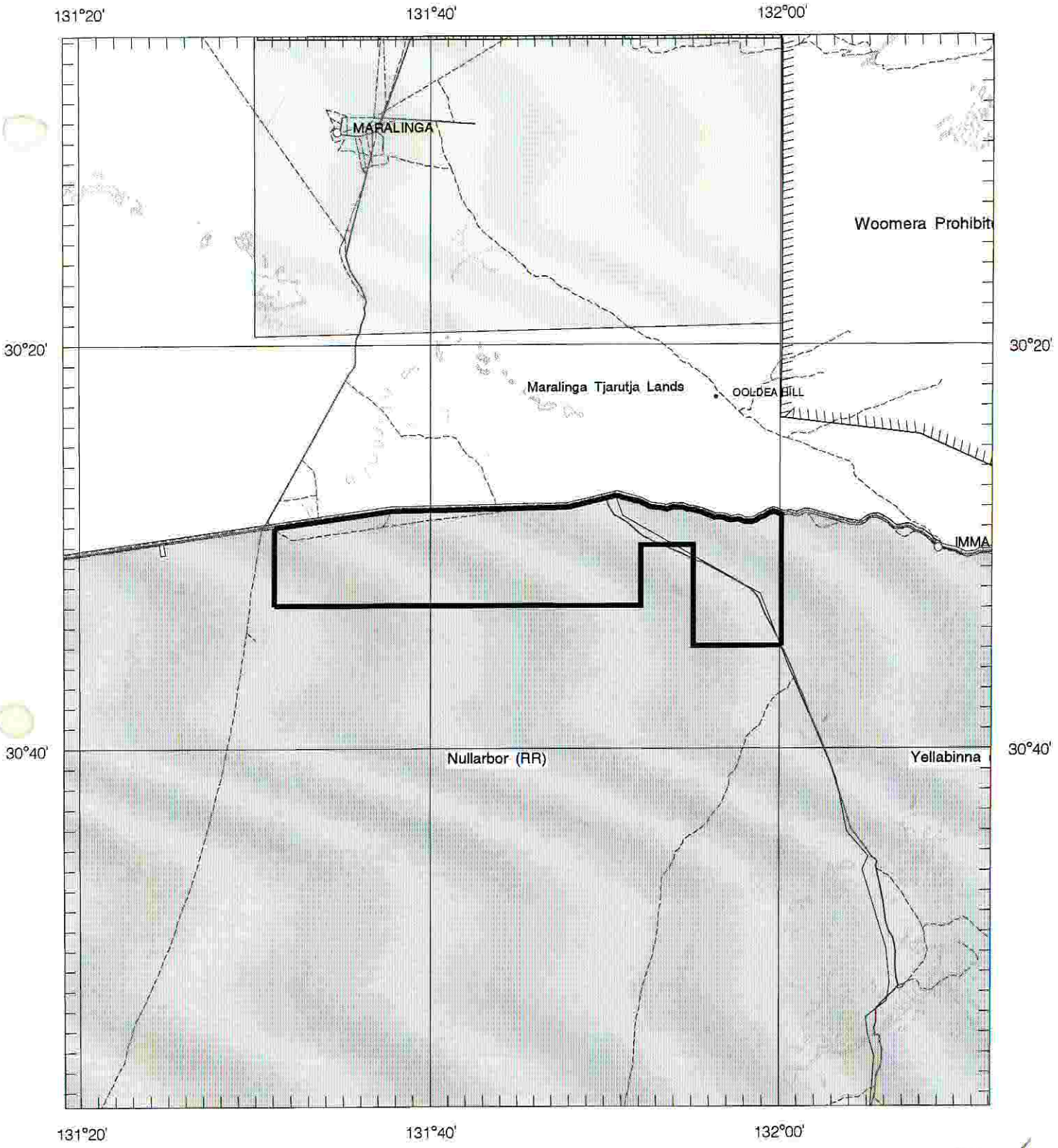
Government of South Australia
Department of State Development

SCHEDULE A



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LICENCE GRANTED IN : DATUM AGD66

GDA GEOCENTRIC DATUM OF AUSTRALIA

APPLICANT : **RED METAL LTD**

FILE REF : **30/02** TYPE : **MINERAL ONLY** AREA : **401** km² (approx.)

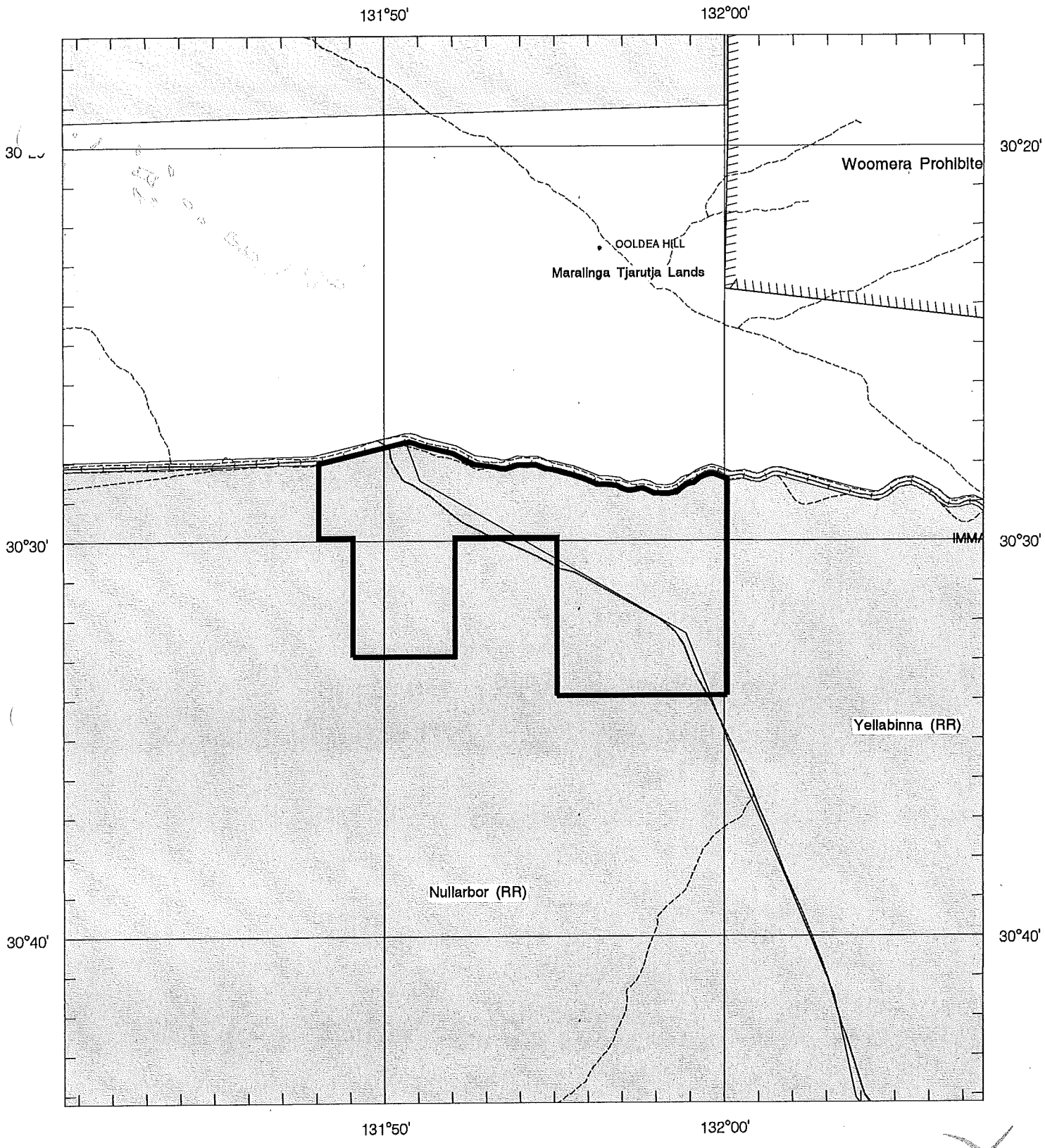
1:250000 MAPSHEETS : **OOLDEA BARTON**

LOCALITY : **OOLDEA AREA - Approximately 250 km northwest of Ceduna**

DATE GRANTED : **19-Nov-2003** DATE EXPIRED : **18-Nov-2004** EL NO : **~~3147~~**

EXPIRED

SCHEDULE A



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LICENCE GRANTED IN : DATUM AGD66

GDA GEOCENTRIC DATUM OF AUSTRALIA

APPLICANT : **RED METAL LTD**

FILE REF : **408/08** TYPE : **MINERAL ONLY** AREA : **148** km² (approx.)

1:250000 MAPSHEETS : **OOLDEA BARTON**

LOCALITY : **OOLDEA AREA - Approximately 250 km northwest of Ceduna**

DATE GRANTED : **02-Apr-2009** DATE EXPIRED : **01-Apr-2010** EL NO : **4245**

EL4245 Ooldea

Partial Surrender Report

For the period ending 1st of April 2014

Ooldea SH52-12

Author: Jodi Reynolds
Cristal Mining Australia Limited

Report Date: 21/05/15

Licencee: Cristal Mining Australia Limited

ACN: 009 247 858

SUMMARY

This final report summarises work conducted on Exploration Licence (EL) 4245 Ooldea during the period from 2nd April 2009 to the 1st April 2014.

Exploration was focussed on the discovery of heavy mineral sand deposits (rutile, zircon, and ilmenite). These are hosted in mid to late Eocene coastal sands, deposited during seafloor spreading as Antarctica separated from Australia. Eustatic sea level changes, resulting in two marine transgressions which deposited marine clastics, provided the environment required for the deposition of heavy mineral sands.

Work conducted to date includes literature reviews, a field trip and an air-bourne geophysical survey. The final conclusion is that the area surrendered represents low prospectivity and further exploration will not be economically viable.

KEY WORDS: Eucla Basin, Gawler Craton, Strandlines, Heavy Mineral Sands, Rutile, Zircon, Ilmenite, Altered Ilmenite, Leucoxene, Titanium Minerals.

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1. INTRODUCTION

This report summarises the exploration activity that was completed on surrendered areas of exploration licence (EL) 4245 between the time of its grant in 2009 and the partial surrender of some areas of the tenement in 2014.

The target of exploration was accumulations of heavy mineral sands (rutile, zircon and ilmenite) in the Tertiary Eucla Basin sediments.

2. TENURE AND LOCATION

2.1. Tenure

Table 1. Tenement History

Tenement	Date Granted	Original Size (Km^2)	Operators	Commodities Sought
EL216	3/11/1975	1317	Dampier Mining Company Ltd	Coal, iron Ore
EL773	12/01/1981	1163	Amoco, Minerals Australia Co.	SedEx
EL1355	2/09/1986	858	BHP Minerals Pty Ltd	HMS
EL2308	4/04/1997	244	North Mining Ltd	Gold
EL3147	19/11/2003	148	Red Metal Limited (100%)	Copper, Gold.
EL4245	2/04/2009	82	Red Metal Limited	HMS
EL5492	2/04/2014	62	Red Metal Limited	HMS

2.2 Access and Location

EL4245 is located approximately 150km north of Nundroo in the Yellabinna Regional Reserve. Its northern boundary is the Trans-Australian Railway line.

2.3 Topography

In the northern part of the tenement the topography is dominated by the Quaternary aeolian sand dune ridges, lacustrine sediments and calcrete of the southern fringe of the Victoria desert, which on laps the flat level low shrub covered plain of the Eocene-Miocene Nullarbor Limestone in the southern part.

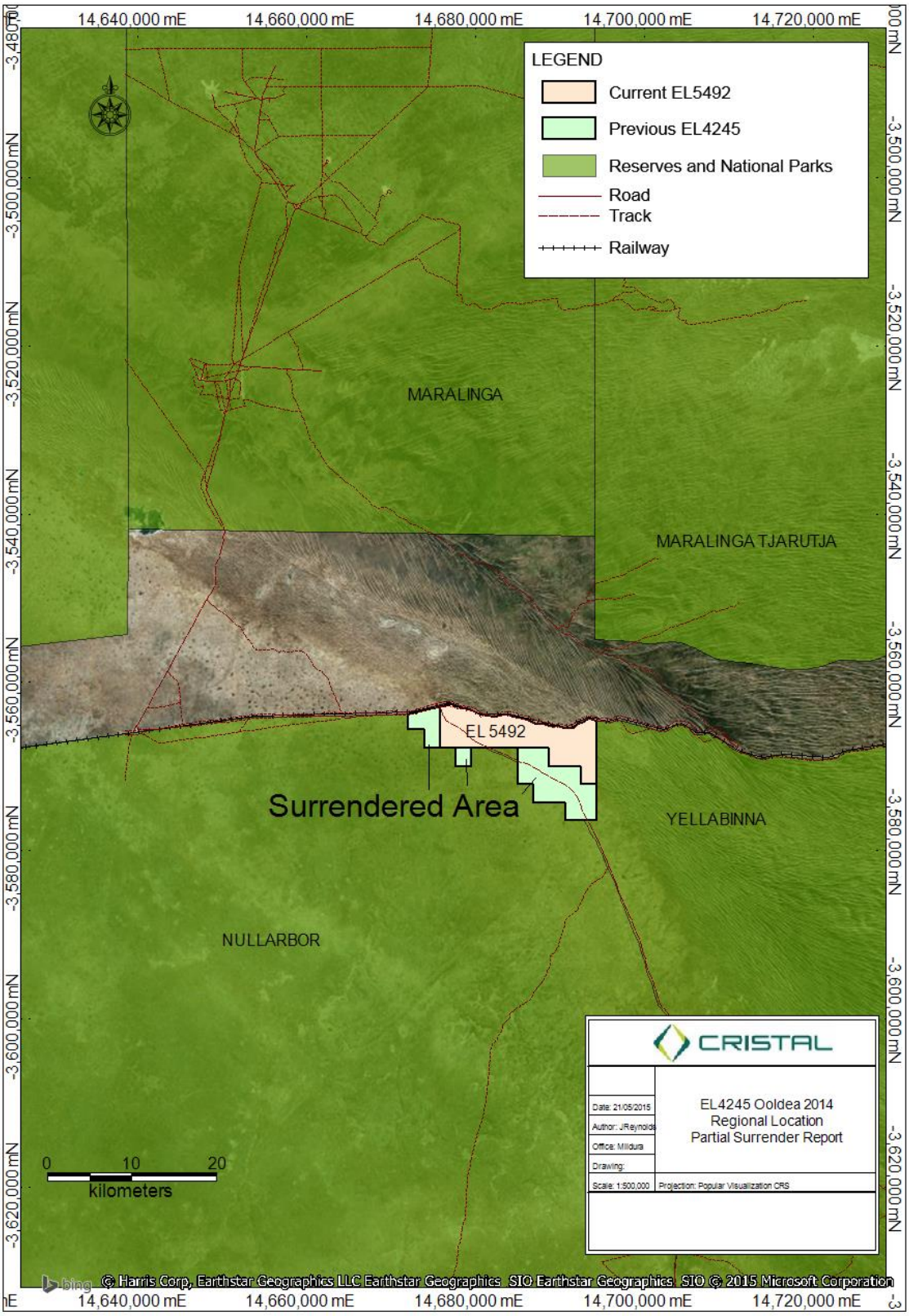

Figure 1: Location of EL4245 and EL5492 within the Eucla Basin

3. GEOLOGY

3.1. Regional Geology

Ooldea is situated in the mid north of the Eucla Basin, which contains a thick sequence (up to 300m) of Tertiary sediments overlying the Gawler Craton. The Tertiary sediments are the preserved system of Cainozoic coastal barriers, beach, shoreface and lagoon facies, which were formed as Antarctica was separating from Australia. As the basin developed, numerous paleo-channels drained areas of cratonic basement in the north, suppling vast quantities of sediment to the basin (Ferris, 1994) over a period of about 50 million years. Eustatic sea-level was an important control on the deposition and distribution of the Tertiary marine sediments, in particular two significant sea level transgressions during the mid to late Eocene.

This environment was perfect for coastal dune formation and the development of heavy mineral sand beach placers, several deposits of which have been discovered in the basin. The area has been prospected for heavy mineral sands since the 1970's, with successful drilling intercepts tending to occur in the upper part of thick barrier-dune sand bodies close to an erosional bedrock contacts (Hou et al, 2005). The Jacinth and Ambrosia deposits, for example, were discovered by Iluka in September 2004 and are situated in the Ooldea sand barrier.

The Ooldea Sands are known to host deposits of heavy mineral sands. They are littoral to near shore marine deposits, commonly forming strand lines. Generally they are well sorted, fine to very fine quartz sands, occasionally iron oxide stained.

3.1. Local Geology

The Eucla Basin, the eastern margin of the officer Basin and the Tallaringa Trough all subcrop in the area of EL4245. While no exploratory drilling has been conducted by Cristal on EL4245, BHP Minerals drilled several holes beyond the eastern boundary of EL4245, on historic tenement EL1355, in 1986.

These holes were located south of the Trans Australia Railway, between Barton and Ooldea. The holes were relatively shallow, most reaching 20m in depth, while holes at

the western end of the traverse encountered basement at just 8 meters. Three major stratigraphic units were interpreted, incorporating drill data from adjacent EL's.

A carbonate and clay rich medium grained sand, quaternary in age and of Aeolian origin, comprises the surface unit. It is pale brown to buff colored and 2 to 4m in depth, forming east-west trending dunes.

Unit two is generally fine to medium grained, poorly sorted, clay rich, red brown to orange sand with some frosting. There are 3 distinct zones differentiated by clay content and degree of cementation, which are related to the topography of the Ooldea Sand Ridge and probably reflecting weathering effects. There is also significant bioturbation, including termite burrows in lithified layers. This is interpreted as the Ooldea Sand and is approximately 10 to 15m in depth.

The third unit is complex and comprises of fine to coarse grained iron-stained sandstone. Primary bedding structures were observed, often well sorted, along with a malleable clay with some lignite association (possibly the Pidinga Formation), silica cementation and a limestone layer interpreted as the shoreline facies of the Nullabor Limestone.

4. EXPLORATION

4.1. Previous Exploration

4.1.1. Dampier Mining Company Limited

Commodity targeted is Permian and/or Tertiary Coal and iron ore. A rough helicopter borne geological survey looking for basement outcrops was conducted in November 1975. The likelihood of prospective iron ore was quickly eliminated. 3 bore holes drilled in 1976 did not intersect coal measures.

4.1.2. Amoco Minerals Australia

EL773 was granted in January 1981. Shortly after which Amoco entered into a venture agreement with Duval Mining and Pioneer Concrete Services LTD. Exploration targeted stratiform base metal mineralisation of the sedimentary - exhalative or sabkha type, based on the McArthur River model, within the Cambrian carbonate and clastic sequence of the Tallaringa Trough near the Karari Fault Zone. A regional gravity survey was conducted in 1981 to define sub-basins within the Tallaringa Trough. Subsequent diamond drilling of 2 holes to 450 m did not intersect significant mineralization, although a pronounced barium and manganese association, averaging 340 ppm Ba and 390 ppm Mn, was noted.

4.1.3. BHP Minerals

Exploration for heavy-mineral sand in Tertiary sediments on the south-western flank of the Ooldea Range comprised geological reconnaissance and RC drilling (81 holes, total 1204 m). Up to 3% titaniferous heavy minerals were reported from drill samples.

4.1.4. North Mining

No work performed

4.1.5. Red Metal Limited

EL3147 was the precursor to EL4245. The target model was a high-grade Fe-Ox style Cu-Au in basement rocks or heavy mineral sand deposits in the overlying Eucla Basin sediments. Work included reprocessing of existing aeromagnetic data, a reconnaissance gravity survey and soil sampling over portions of the tenement.

4.1.6. Red Metal Limted (Cristal Mining Australia limited) 2009-2014

EL4245 was first granted on the 2nd April 2009, with the target commodity being HMS. Between 2009 and 2013 no on ground exploration was conducted, work focussed on reviewing data from previous programs completed within the Eucla Basin.

In July of 2013 Cristal notified DMITRE of its intention to conduct an airborne survey of EL 4245. In preparation for that survey Cristal conducted a site visit to the area within EL 4245 to speak to landholders and investigate the terrain in preparation of the survey which took place during late July 2013.

The survey was flown by UTS Geophysics Pty Ltd using a Cessna 206-H. The airborne survey was commissioned to collect both aeromagnetic and radiometric data. That data was received by Cristal in early October 2013 and then sent to Vector Research Pty Ltd in Perth for post-processing. The processed data was received from Vector Research in early January 2014.

(Mag-Rad data - see Government of South Australia Mineral Resources Website)

In 2014 the tenement was reduced from 82 to 62 km^2 and became EL5492.

5. RESULTS AND INTERPRETATIONS

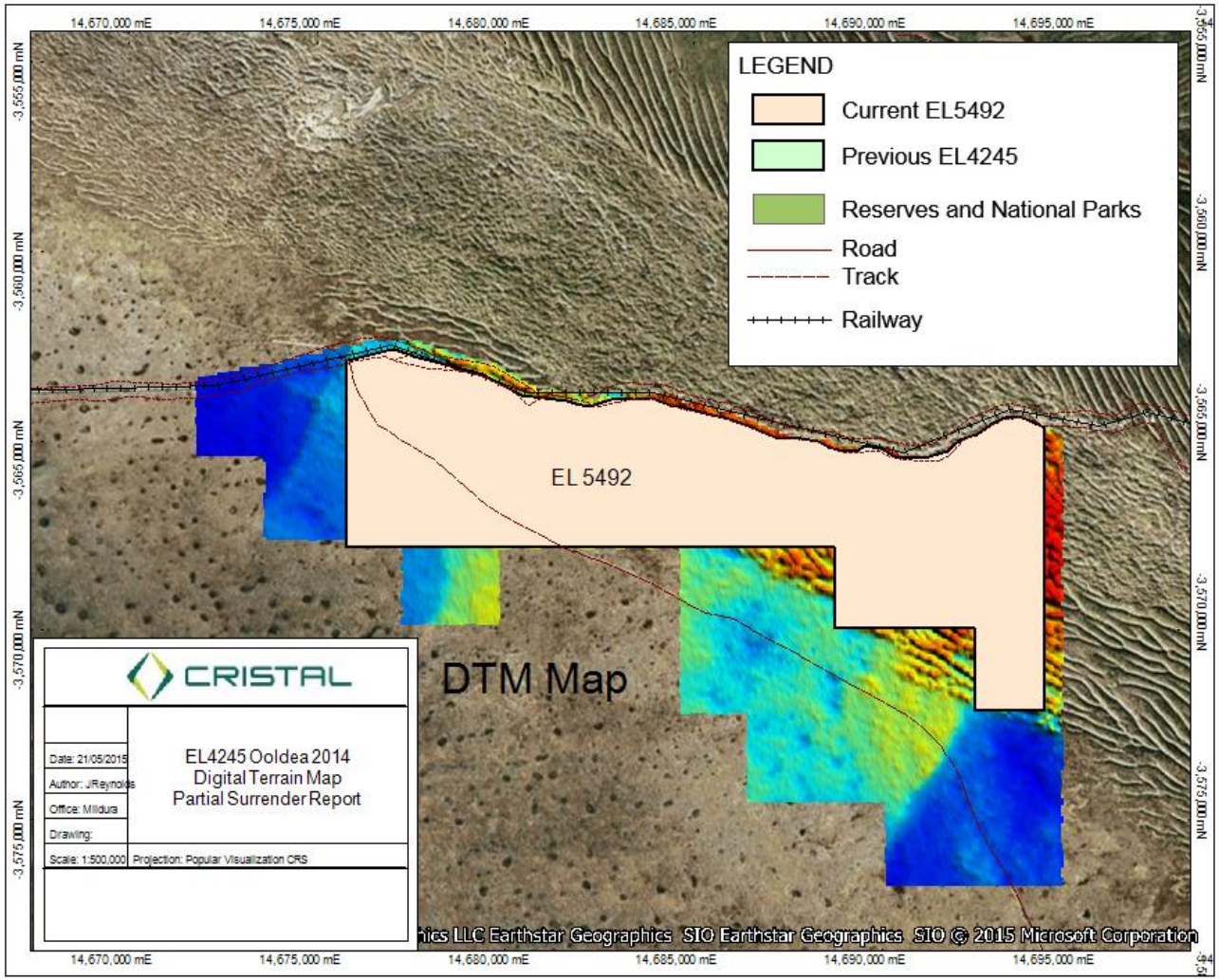

Figure 2. Digital Terrain Map

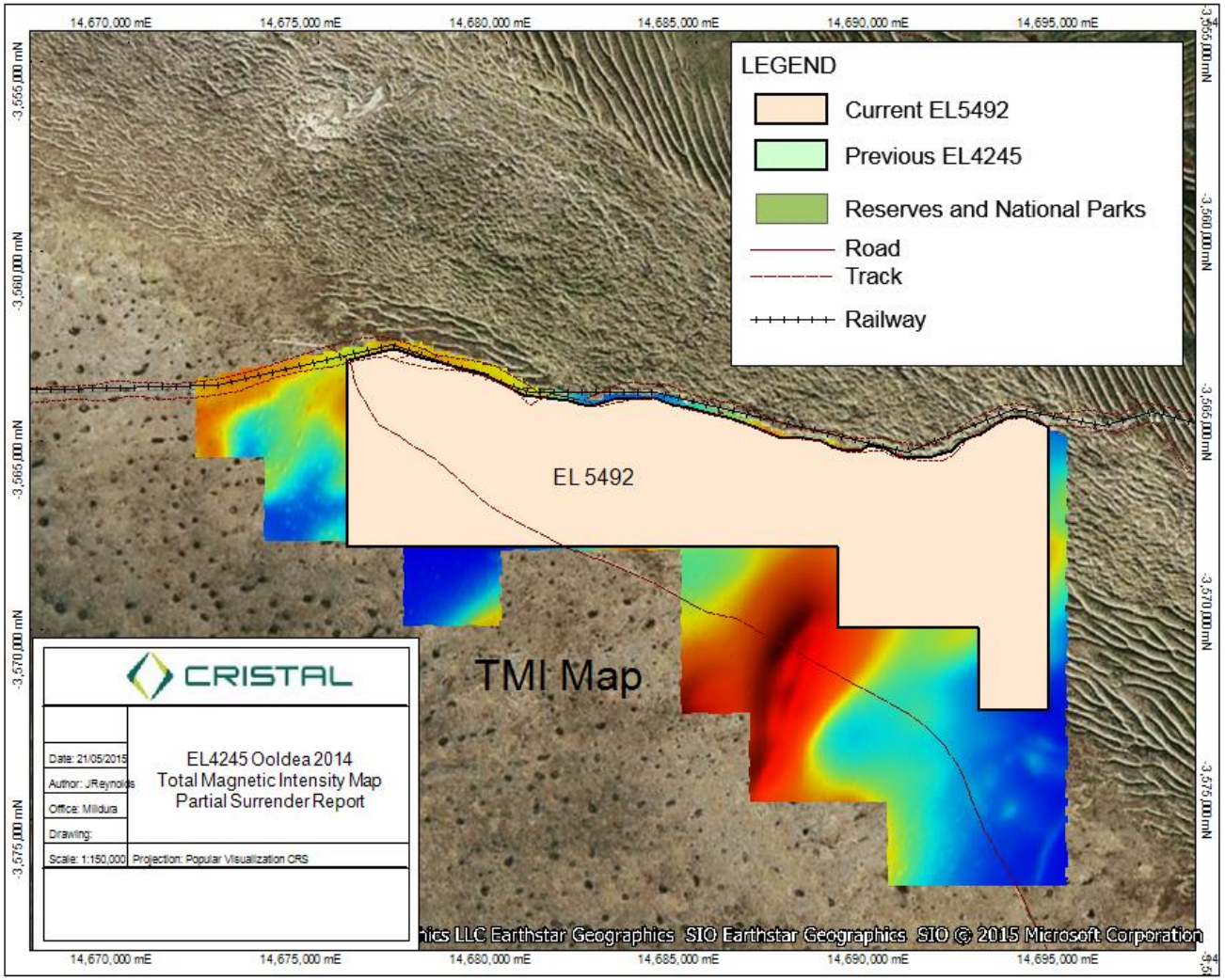

Figure 3. Total Magnetic Intensity map.

The targets within the Ooldea EL4245 were based predominantly on contrasting features on the DTM image and across all radiometric channels and ratio images provided by UTS.

The areas surrendered have been interpreted as outcropping Nullabor Limestone shelf devoid of an overlying beach sand unit.

6. CONCLUSIONS

In July of 2013 an airborne survey of EL4245 was conducted, collecting both aeromagnetic and radiometric data. That data identified features of the tenement which could potentially represent traps and or faults where HM may have been concentrated, while also reinforcing the view that the southern part of the tenement was unlikely to host an HMS deposit. Subsequently, the area deemed unprospective was surrendered and the remaining tenement area became EL5492.