EL27978 UNDIPPA PROJECT

ANNUAL REPORT
For the period 1/11/2010 to 31/10/2011

CENTRAL AUSTRALIAN RARE EARTHS PTY LTD

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From a report by Longbow Geological Services Pty Ltd
Executive Summary

EL27978 is located near Alice Springs within the Aileron and the adjacent Irindina Provinces of the Arunta Region. The Nolans, Holsteins, Mount Mary, Blue’s Folly and Mount Finnis rare earth element (REE) prospects are located in this part of the Northern Territory and potential exists to locate similar, new prospects within CARE’s exploration licences.

During the first year of tenure work consisted of a reconnaissance field trip to the tenement and a comprehensive review of all previous exploration and technical data.
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1.0 Introduction

The Undippa Project consists of one tenement, EL27978, which covers 204 km$^2$ and lies within the Arunta Region, northeast of Alice Springs.

1.1 Location and Access

The licence straddles the main road to the Harts Range and can be accessed by driving north from Alice Springs on the Stuart Highway for approximately 75 km and then northeast on the Plenty River Highway to just past Mud Tank, then to Alcoota and the Engenela Community to the north. From there access is via station tracks.

The main road marks the geological divide with the Harts Range to the south and Alcoota is located in the centre of the northern part of the licence.

The Ongewa Creek flows through the centre of the licence area.

Figure 1: Location and Geological Setting of CARE’s Northern Territory Projects

CARE ELs shown with blue outline. The Lander Yard Project is the more western licence EL27927 – while the more eastern Undippa Project consists of EL27978. The location of other REE element projects, the Mud Tank Carbonatite and the Mordor Intrusive Complex are shown. Metamorphic complexes shown in orange with sedimentary basins in yellow. Modified after Thompson (1995).
1.2 Tenure

EL27978 was granted to Strategic Resource Management Pty Ltd on 1 November 2010, for a term of six years. It was subsequently transferred to Central Australian Rare Earths Pty Limited.

2.0 Geology

2.1 Regional Geology

The Arunta Region covers about 200,000 km² in central Australia and has undergone a prolonged and complex geological history with several major periods of geological activity concentrated in the Palaeo-Mesoproterozoic and Palaeozoic from near 1900Ma. It comprises variably deformed, greenschist to granulite facies, metamorphosed sedimentary and igneous rocks. Several high grade metamorphic events coupled with mountain building orogenies have almost completely altered the rocks. The project is in the Aileron Province of the Arunta Region, which consists of:

- A basal Lander Package (1880-1840ma), which makes up about 60% of the north, centre, and west of the region
- The Ongeva Package (1810-1800ma) in the south-east, of unknown relationship to the Lander Package
- An unnamed sandstone unit above the Lander Package, with a maximum depositional age of 1820-1800ma
- The Reynolds Package, which is unconformable on the Lander Package and the unnamed sandstone (Geoscience Australia, 2009)

Within the Undippa Project area granitoid gneiss is less dominant than in CARE’s EL27927 area and the dominantly sedimentary rocks within EL27978 have been metamorphosed to higher grade amphibolite and granulite facies.

2.2 Local Geology

To the north of the main east-west Plenty River Highway there is poor outcrop with recent alluvial cover or Tertiary aged Waite Formation cover consisting of chalcedonic limestone, sandstone, mudstone and minor sandy conglomerate. To the south, Quaternary aged alluvium, including in Ongewa Creek which dominates the southern half of the licence, overlie Early Proterozoic Irindina Gneiss of the Harts Range Group comprised of mainly garnet-quartz-plagioclase gneiss; quartz-feldspathic gneiss; amphibolite; gneiss; marble, rare biotite gneiss; sillimanite gneiss and pegmatite. (Migmatite, mafic granulite and garnetiferous mafic granulite).

The Mordor Igneous Complex is located to the south of EL27978 and is a highly potassic alkaline suite considered highly prospective for REE mineralisation. Alkali feldspar syenite–quartz alkali feldspar syenite–shonkinite rocks and surrounding country rocks appear to be the most prospective for REE.

At Blueys Folly, located approximately 45km to the southeast, allanite occurs as a primary igneous mineral in a pegmatite swarm, which has plug-like to lenticular subvertical bodies and sheet-like apophyses that intrude the surrounding amphibolite facies metamorphic rocks which can also contain allunite. Other allanite-bearing pegmatites are common in the region and provide an exploration target.
2.3 Rare Earth Mineralisation

EL27978 is located in the Arunta region, where numerous REE deposits and mineralised areas are known, with few prospects having been fully evaluated. Most prospects occur within the Irindina Province and adjacent areas in the south-eastern part of the Arunta Region. These REE prospects appear to be related to REE-enriched pegmatite or granite emplacement, with an associated hydrothermal REE-rich fluid-related event resulting in replacement or vein systems.

The timing of these REE deposits appears to be broadly associated with the Palaeozoic Alice Springs Orogeny. A regional REE fluid-flushing event appears to have occurred in the Arunta during the Alice Springs Orogeny while the source of the REE may be related to regional-scale mantle metasomatism. Carboniferous aged carbonatites and/or kimberlites might be present in the surrounding regions.

The Nolans REE prospect is currently the largest known REE deposit in the Arunta Region with an estimated resource of about 30Mt@2.8wt% rare earth oxides. Nolans is a geologically unique deposit, which has world-class characteristics in size and grade of REE, phosphate, U and Th. Apatite-hosted REE-P-U(-Th-F) mineralisation at Nolans is distributed over an area of approximately 150 hectares within a kilometre radius of the bore. Primary mineralisation occurs predominantly in a series of sub-parallel tabular zones of massive fluorapatite (Ca5(PO4)3(F,OH)) or as a stock-work of fluorapatite ± allanite ± carbonate veins and associated calc-silicate alteration. The massive zones dip steeply.
(65°-90°) to the NNW, are up to about 75m thick, and extend laterally and at depth over tens to several hundreds of metres (Hussey, 2003). They are hosted primarily within gneissic granite assigned to the Mount Boothby Orthogneiss (MBO), and also by the Lander Rock Beds (LRB) and pegmatites.

Other REE occurrences in the Arunta region include Blue’s Folly, Mount Finniss, Holsteins and Mount Mary, Quartz Hill and the Entia pegmatite group.

The potential for significant replacement or pegmatite-hosted REE deposits is high in the Arunta Region where abundant REE-rich pegmatite swarms occur. There is also some potential for REE mineralisation associated with currently unrecognised carbonatites and alkaline igneous complexes and for supergene or lateritic enrichment deposits.

REE can also be found in alteration halos, faults and vein systems associated with the emplacement of carbonatites and alkaline rock types as well as other extrusive alkaline volcanic rocks and as supergene enrichment/lateritic deposits developed on carbonatites and or alkaline igneous rocks. The Mud Tank Carbonatite Complex and the Mordor Igneous Complex are occur in the Arunta Region as well as alkaline pegmatites and associated granitic rocks. The Mud Tank Carbonatite Complex is near 10km to the west of the Undippa licence while a possible carbonatite dyke has been recognised near Mount Bleechmore approximately 20km to the northwest. Little is known about this deeply weathered rock. The presence of an individual carbonatite complex in the Arunta Region would favour the existence of additional complexes emplaced at that time on similar structures as carbonatite complexes tend to cluster in both space and time along suitable structures. Apart from being buried beneath transported or residual cover, it may simply be a problem of recognising them amongst the complexly deformed and metamorphosed rocks of the Arunta Region. The MTCC is deformed and has been stretched into an elongate shape with weakly to strongly developed foliation/layering.

3.0 Previous Rare Earth Exploration

Most exploration within the Undippa Project area was for gold, base metals, diamonds, gemstones, uranium and industrial garnet. A few open file reports mention testing for carbonatite including work by Kewanee Australia in the early 1970s and by CRAE in JV with Hillrise Properties in the late 1970s. The Clarence River Finance Group in the early 1990s considered rare earths while pegmatites were considered for various styles of mineralisation including W by Kewanee Australia in the early 1970s.

Although the Northern Territory geochemical and drilling database may not be complete due to various reporting inconsistencies, only a few rock chips, stream samples and no soil samples are reported for the Undippa area. The stream samples were not assayed for REE or associated elements and no anomalies for those elements are therefore apparent. Rock chips collected by PNC (Australia) in the early 1990s, as part of a uranium search, were assayed for a suite of elements. The sampling returned anomalous values for Ce, La, Ba and Th in a sample (5308480) located in the eastern part of the licence area and slightly elevated Ba, Ce and Th in an iron rich sample (5302784) on the eastern edge of the central part of the licence.

4.0 REE Potential

The Undippa Project area is within a region known to contain REE enriched rocks and there is potential to locate more sources in the area with high enough grade and size to form economic concentrations. Datasets appear to provide some evidence for the prospectivity of the Undippa Project area.
The licence is adjoined on its eastern side by fossicking reserves for garnet and mica. Pegmatite, possibly REE enriched, could be a source of these minerals in the Undippa Project area. The combined radiometrics and magnetic image shown suggests that a major near east-west trend that passes through the Mud Tank Carbonatite Complex continues through EL27978, where it kinks to a more southeast strike. As structure is known to be important in the emplacement of the types of rocks that will host REE enrichment, it is encouraging that structural trends through known enriched rocks continue into the Undippa Project.

![Figure 3: Undippa Licence and combined radiometrics - magnetics](image)

**Figure 3: Undippa Licence and combined radiometrics - magnetics**

EL27978 shown in blue outline and Mud Tank shown to the west. Plenty River Highway in purple. Northern Territory geological survey data set.

### 5.0 Exploration during current year

During the first year of tenure work consisted of a reconnaissance field trip to the tenement and a comprehensive review of all previous exploration and technical data.

### 6.0 Program for Year 2

The program for the next 12 months is aimed at generating targets using a combination of ground geophysics, geochemistry and surface sampling, with a budget of $50,000.

### 7.0 References

