NORTHERN MINERALS LIMITED

AMADEUS BASIN PROJECT

Partial Surrender Report

Exploration Licenses EL26920

OPERATED BY

NORTHERN MINERALS LIMITED

Partial Surrender Report

NUMBER: XXXXXX

NAME: AMADEUS BASIN PROJECT

ACTIVITIES: EXPLORATION

DUE DATE: 18th June 2013

PREPARED BY: R Jewson

DATE: 15th June 2013

COMMODITY: Phosphorite, base metals, Rare earth elements

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1. SUMMARY

E26920 forms part of the Amadeus Basin Project. The project comprises the tenements EL26920, 27016, 27017, 27018, 27019, 27020, 28530 & 28531, and is located approximately 65km to the east of the township of Alice Springs, in the Northern Territory. The project covers an area of 1445.33km².

Northern Minerals Limited is targeting Cambrian aged phosphorite deposits, base metal and Rare Earth mineralisation within the Amadeus Basin project. The Todd River Dolomite, which outcrops throughout the tenements, is considered to be a potential host for economic phosphate mineralisation.

2. INTRODUCTION

Several phosphate occurrences have been recorded within the Cambrian sediments of the Amadeus Basin. All major Australian phosphate deposits occur in the world-class Georgina Basin, a sedimentary Cambrian phosphorite province. The Cambrian Todd River Dolomite which outcrops in the north eastern margin of the Amadeus Basin is noted to contain significant phosphatic occurrences.

A literature review has also found reports of Cambrian phosphorite occurrences within the (Middle Cambrian) Tempe Formation (Late Cambrian – Ordovician) Pacoota Sandstone and (Early Cambrian) Todd River Dolomite, all of which are located in the central and eastern portion of the Amadeus Basin. The Todd River Dolomite is of Cambrian age and is considered the most prospective unit for hosting phosphate mineralisation.

This report details the exploration activities conducted by Northern Minerals Limited across the surrendered portions of EL26920 that were surrendered on the 19th of March 2013.

3. LOCATION & ACCESS

The Amadeus Basin Project is located approximately 65km to the east of the township of Alice Springs in the Northern Territory (Figure 1).

Access to the tenements is via the sealed Ross Highway and Numery Road which crosses the Ross River several times and is impassable after heavy rain. Graded gravel tracks provide limited access within the tenement areas. The Project is located within close proximity to existing rail and road infrastructure (Figure 1).
4. TENURE

EL26920 was granted on the 20th of April 2009 with an original area of 214 blocks covering a total land area of approximately 610km². A fourth year reduction of 107 blocks on the 19th of March 2013 has resulted in a total of 107 blocks being retained.

### TABLE 1: TENEMENT SCHEDULE

<table>
<thead>
<tr>
<th>Project</th>
<th>Tenement</th>
<th>Relinquished Blocks</th>
<th>Retained Blocks</th>
<th>Partial Relinquishment Date</th>
<th>Grant</th>
<th>Expiry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amadeus Basin Project</td>
<td>EL26920</td>
<td>107</td>
<td>107</td>
<td>19/03/2013</td>
<td>20/4/2009</td>
<td>19/04/2015</td>
</tr>
</tbody>
</table>

![FIGURE 2: TENEMENT PARTIAL RELINQUISHMENT](image)
5. REGIONAL GEOLOGY

The Project lies within the northeast portion of the elongated Proterozoic Amadeus Basin and is located within the Alice Springs 1:250,000 map sheet, number SF 53-14.

The Amadeus Basin is a large east-west trending intra-cratonic Basin of Late Proterozoic to Carboniferous aged marine and continental sediments. These sediments were derived from the surrounding early to mid Proterozoic granites and metamorphic rocks of the Arunta Block to the north and Musgrave Block to the south.

Sedimentary lithologies include dolostone, limestone, shale, sandstone, siltstone, quartzite, evaporite, diamicite and conglomerate. The rocks are deformed by broad folding and faulting. The main trends are east-west, while faulting is both normal and thrusting styles. The Amadeus Basin is generally unmetamorphosed, although minor highly deformed rocks interleaved with basement in the northeast and southwest are greenschist to amphibolites facies.

The Early Cambrian basal deltaic sediments of the Arumbera Sandstone underlie the lower Cambrian Todd River Dolomite which itself is overlain by the Giles Creek Dolomite and subsequently the Chandler Limestone. The siltstone, shale and limestone Shannon Formation is overlain by Goyder Formation which is subsequently overlain by the Pacoota Sandstone. The sediments of the Larapinta Group can be separated into the Carmichael and Stairway Sandstones which are overlain by the cross-bedded Mereenie Sandstone. The valleys floors and creek lines primarily consist of Quaternary and Tertiary aged transported sediment cover.

Historical reports describe Cambrian phosphorite occurrences within the (Early Cambrian) Todd River Dolomite, (Middle Cambrian) Tempe Formation (Late Cambrian – Ordovician) and Pacoota Sandstone, all of which are located in the central and eastern portion of the Amadeus Basin.

Phosphate in the Amadeus Basin is confirmed with historic Broken Hill Pty Ltd (BHP) drilling intercepting 6m @ 22.8% P₂O₅ composed of calcareous silty sandstones associated with minor limestone, chert and ferruginous siltstone in the Todd River Dolomite. Sporadic values of up to 5% P₂O₅ also occur in the overlying red siltstone.

Historical drilling (PD2) has also intercepted the Todd River Dolomite and returned assay values of 4.13% P₂O₅ @ 30-32m and 1.28% P₂O₅ @ 32-34m.

The Amadeus basin also contains sandstone-type uranium deposits, and gold at White Range in the Arltunga Nappe Complex. Minor base metal and small-scale mines are also present. BHP, CRA, MIM and other companies have explored the north-western part of the basin for base metals and evaporites. Extensive uranium exploration has been undertaken. More than thirty wells have been drilled to investigate petroleum in a 170000km² area.

Significant rock chip results up to 1.66% TREO from the Hale River Project (Kidman Resources 150kms East of Alice Springs) in 3.5km of outcropping carbonate-rich veins in dykes located in the Arunta complex, to the south-east of the project area, are of note given Northern Minerals strategic focus on Heavy Rare Earths exploration.
FIGURE 3: E26920 PROJECT GEOLOGY
6. EXPLORATION ACTIVITIES

To date exploration work completed by Northern Minerals Limited within the relinquished portion of the tenure to date has been a review of the previous completed historical exploration work and compilation of all publicly available government data sets including geological and geophysical data, and reconnaissance geological mapping. An Aboriginal sacred site desktop study/inspection was also carried out through the Aboriginal Areas Protection Authority (AAPA).

Exploration completed in the first three years of tenure includes:

**a. DATA COMPILATION AND REVIEW**

A detailed review of previous work has been completed on all available data relevant to the EL areas which was compiled into GIS format using MapInfo/Discover software. The data include topographical, cadastral, geological, geophysical, geochemical and drill hole information sourced from NT government agencies and reports of historical exploration activities. The data was interpreted to identify exploration target areas for follow-up geological reconnaissance mapping, surface geochemical sampling where appropriate, and drill target areas.

**b. SACRED SITE INSPECTION**

An Aboriginal sacred site database inspection through the Aboriginal Areas Protection Authority (AAPA) was carried over the Project area. The inspection comprised a search of all recorded sacred sites within the Project area on the AAPA register.

**c. GEOPHYSICAL DATA COMPILATION**

All available government geophysical data over the north eastern Amadeus Basin has been acquired for processing and interpretation. The data has been processed by Resource Potential to produce several new images, and has been compiled into (GIS) MapInfo format. The data has been interpreted by Northern Minerals Limited geologists to identify potential exploration target areas for follow-up geological reconnaissance mapping and surface geochemical sampling. A Regional radiometric (U) plan outlines numerous radiometric anomalies throughout the Project area (Figure 3).

**d. RECONNAISSANCE GEOLOGICAL MAPPING**

A reconnaissance fieldtrip was made to the project in August 2011. Several prospective phosphate horizons (Todd River dolomite) and base metal geochemical anomalies were investigated.

Historical geochemistry has been compiled into thematic maps in Mapinfo to assess regional mineralisation prospectivity.
7. CONCLUSIONS & RECOMMENDATIONS

The initial reconnaissance exploration activities that have been conducted across the surrendered portions of tenure have determined that the relinquished areas are less prospective for hosting substantial accumulations of mineralisation.
8. REFERENCES

Alice Springs (Second Edition), NT 1:250,000 Geological Series Explanatory Notes, Sheet SF/53-14
