

# **Open File Envelope**

## **No. 12,004**

**EL 3646**

**MOUNT ALECK**

### **SECOND PARTIAL SURRENDER REPORT FOR THE PERIOD 6/11/2007 TO 5/11/2009**

Submitted by  
Copper Range (SA) Pty Ltd  
2010

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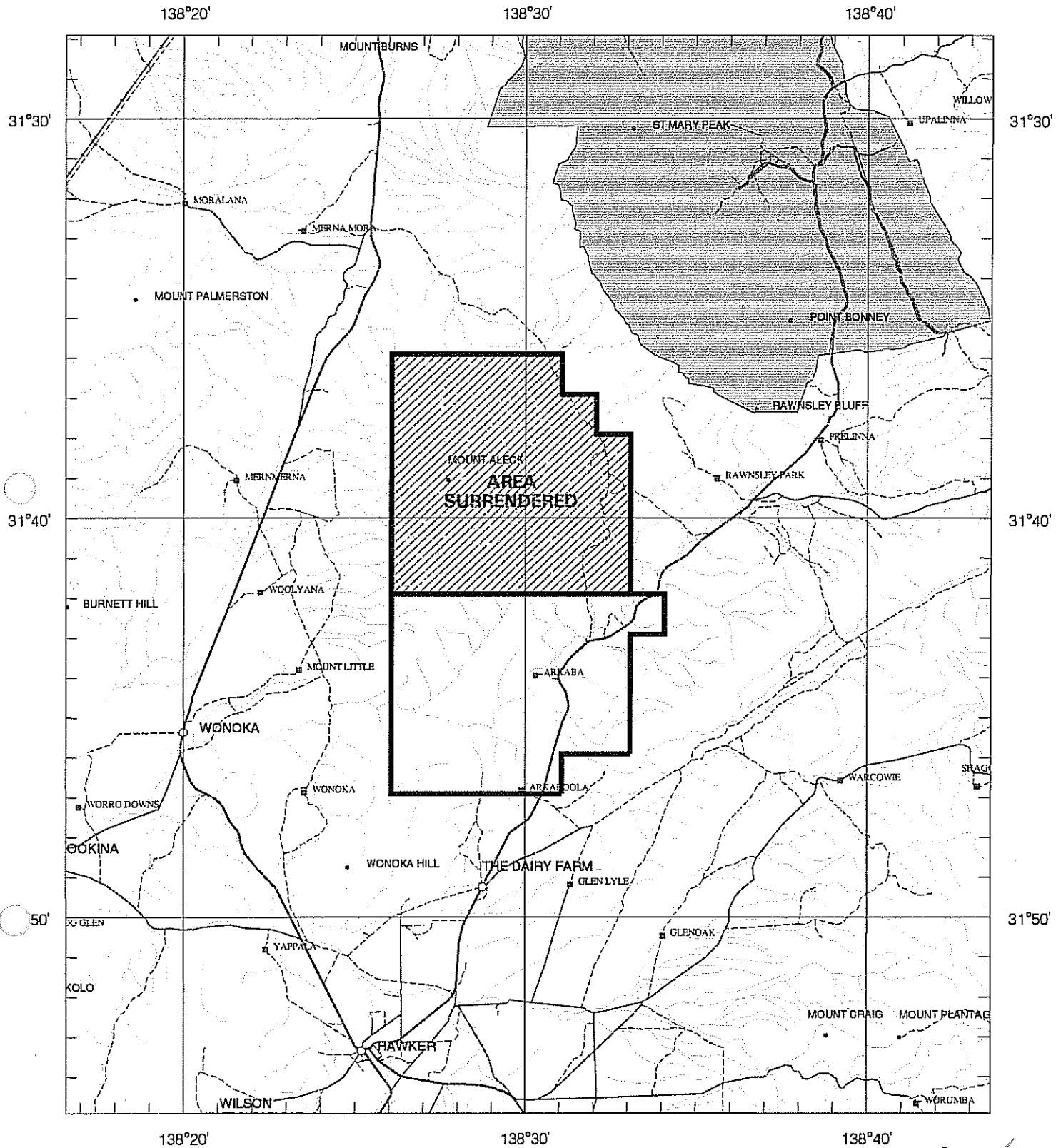
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**Government of South Australia**  
Primary Industries and Resources SA

# SCHEDULE A



SCALE 1:250 000  
 KILOMETRES 5 0 5 10 15 20 25 KILOMETRES

LICENCE GRANTED IN : DATUM AGD66



APPLICANT : **COPPER RANGE (SA) PTY LTD**

FILE REF : **92/06**

TYPE : **MINERAL ONLY**

AREA : **99 km<sup>2</sup> (approx.)**

1:250000 MAPSHEETS : **PARACHILNA**

LOCALITY : **MOUNT ALECK AREA - Approximately 120 km NNE of Port Augusta**

DATE GRANTED : **06-Nov-2006**

DATE EXPIRED : **05-Nov-2009**

EL NO : **3646**

# COPPER RANGE (SA) PTY LTD



## **PARTIAL SURRENDER REPORT to 5<sup>TH</sup> November 2009**

**EL 3646 – Mt Aleck**

<b>TITLE:</b>	PARTIAL SURRENDER REPORT FOR EL 3646 – Mt Aleck for the Period Ending 05/11/2009
<b>HOLDER:</b>	COPPER RANGE (SA) Pty Ltd
<b>OPERATOR:</b>	COPPER RANGE (SA) Pty Ltd
<b>1:250,000 SHEET:</b>	Parachilna SH54-13
<b>1:100,000 SHEET:</b>	Wilpena 6634 Hawker 6534
<b>AUTHOR:</b>	Mark Arundell
<b>SUBMITTED BY:</b>	Mark Arundell
<b>DATE:</b>	16 <sup>th</sup> April 2010
<b>KEYWORDS:</b>	Uranium, Arkaba Diapir, Mt Aleck, copper, barite radiometrics, Pound Subgroup, Bonney Sandstone, Wonoka Formation
<b>DISTRIBUTION:</b>	1. Copper Range (SA) Pty Ltd, Perth Office 2. Department of Primary Industries and Resources, South Australia

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## SUMMARY

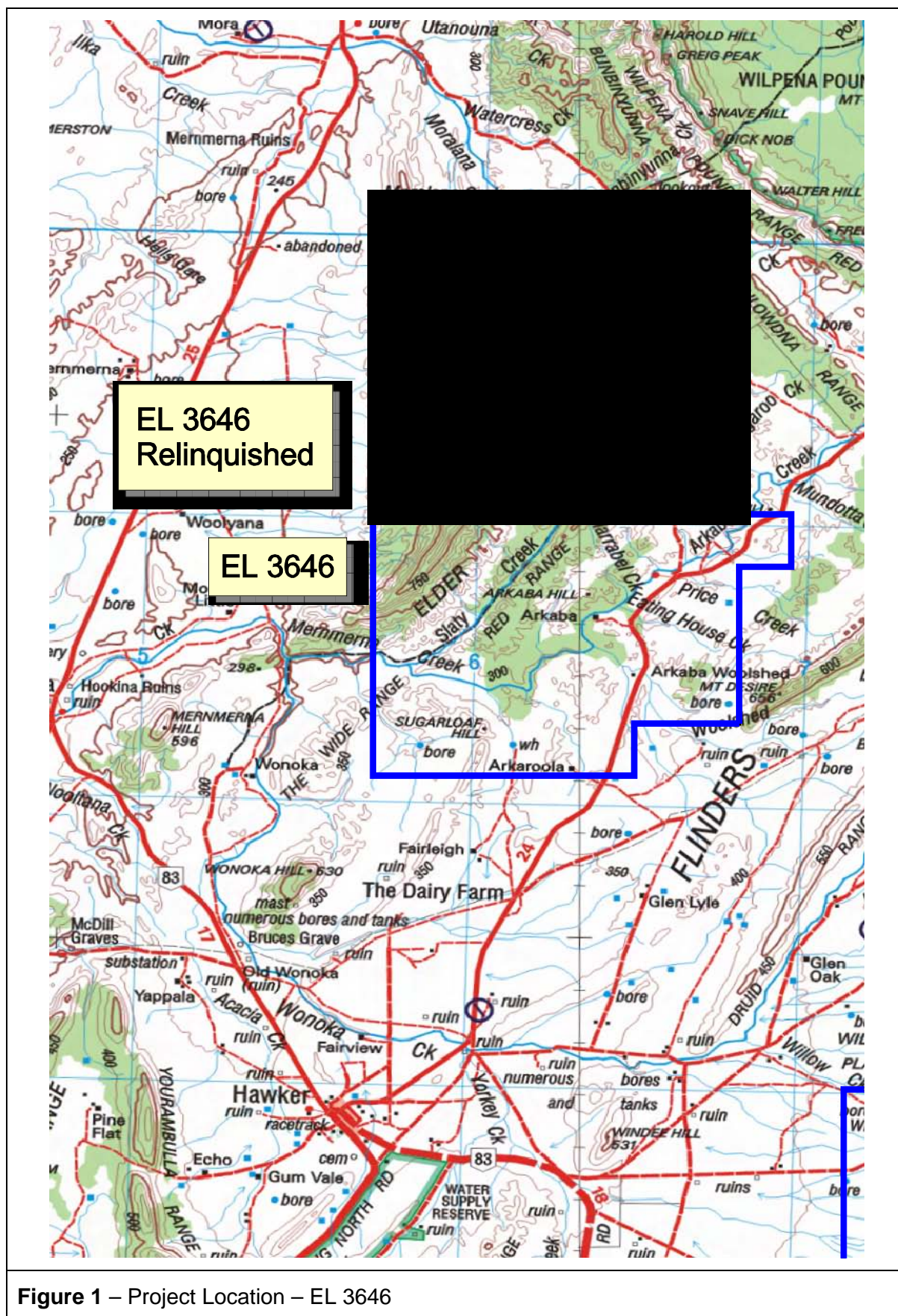
EL 3646 – Mt Aleck lies 20km to the north of Hawker in the southern Flinders Ranges (Figure 1). The EL was granted to Copper Range (SA) Pty Ltd on 06/11/2006. A partial reduction of the tenement was completed early in the reporting period.

Copper Range's interest in the Adelaide Fold Belt is predominantly focussed on exploration for copper, as near-surface oxide deposits and sediment-hosted stratiform sulphide mineralisation. However, EL 3646 was originally applied for to cover a uranium-channel radiometric anomaly that was apparent on the State GIS database. The EL covers this anomalous zone, several sites of old copper workings as well as a large portion of the Arkaba diapir.

A barite occurrence in the north of the tenement has been previously investigated and found to be a significant occurrence. Holowilena Ironstone outcrops in the south of the tenement were also subject to previous field investigations with a view to evaluating their iron ore potential.

Exploration during the period has consisted of a further brief follow up of areas of Holowilena Ironstone that had been previously sampled.

A reduction in the tenement area was sort over areas not considered prospective for iron ore.



## 1.0 INTRODUCTION

The Mt Aleck tenement covers Adelaidean sediments of the Umberatana, Wilpena and Hawker Groups that form an anticline to the south of the Wilpena Pound syncline (the north-easternmost part of the tenement abuts against the Wilpena National Park). Strike in the tenement is generally north. The anticline is cored by the Arkaba Diapir, displaying siltstones of the Curdimurka Group and dolomitic breccia of the Callana evaporite origin.

The outcropping Umberatana Group rocks predominantly comprise siltstones, shales and limestones of the Upalinna Subgroup (Sunderland and Etina Formations, Enorama Shale, Trezona and Elatina Formations). The Wilpena rocks are predominantly siltstones of the Brachina and Bunyerroo Formations, quartzites (Rawnsley Quartzite), sandstones (Bonney Sandstone) and Wonoka Formation shale. In the west of the tenement Cambrian Limestones of the Hawker Group outcrop. The Rawnsley and Chace Quartzites form steep ridges that gently curve around the western side of the tenement.

The uranium-channel radiometric anomaly occurs in the vicinity of the boundary between the Bonney Sandstone and the Wonoka Shale.

## 2.0 LOCATION AND ACCESS

The Mt Aleck tenement (EL 3646) is situated in the Southern Flinders Ranges (Figure 1). The tenement lies some 360km north of Adelaide, approximately 20km northeast of the town of Hawker and adjacent to southwest of Wilpena Pound National Park. The majority of the tenement falls within the property boundaries of Arkaba Station. Access to the tenement is off the main Hawker – Wilpena road, via the Arkaba 4WD track. Private access tracks do exist through locked gates into the western part of the tenement.

## 3.0 TENURE DETAILS

The Mt Aleck tenement EL 3646 was taken out by Copper Range (SA) Pty Ltd, a wholly-owned South Australian subsidiary of International Base Metals Ltd that was floated on the ASX as an independent company in December 2006. Tenement details are summarised in Table 1.

Tenement number	Date granted	Expiry date	Project name	Licensee and operator	Locality	Area km <sup>2</sup>	Area retained km <sup>2</sup>
EL 3646	06/11/06	05/11/09	Mt Aleck	Copper Range (SA) Pty Ltd	~ 40km NNE of Hawker	213	99

**Table 1.** Summary of tenement details



## 4.0 MINING HISTORY AND PREVIOUS EXPLORATION

### 4.1 Mining

Several old mines and prospects occur within EL 3646. Most of the workings are associated with the Arkaba diapir and consist of quartz/calcite lode/vein-style mineralisation with associated iron oxides.

In the north of the tenement are the *Mount Ide Mine* (copper) and the *Moralana Barite Mine* that are associated with an occurrence of the Curdimurka Group (Callana). The Mount Ide Mine records that 8.5 tons of copper ore was extracted along with 170 tons of iron ore, from a calcite lode with iron oxide and low-grade copper ore.

The *Mine Hill Mine* was mined by the Kirwan Mining Company in 1861 – 1867. The mine occurs 4 miles NE of Arkaba Homestead. An E-W striking lode reportedly consisted of chalcopyrite, malachite, azurite and red copper oxide. Several tons were raised, quoted as '40% ore'. The *Arkaba Creek Prospect* was also worked by the Kirwan Mining Company at the same time. No other information is available about this prospect.

The *Muldana Prospect* consisted of a lode of ironstone, copper carbonates and copper sulphides and was worked between 1860 and 1869.

No information is available of the *Mount Desire Prospect*.

In 1902, it is recorded that 25 tons of ore was raised from the *Mora Mine*, with 3 tons at 26.5% Cu.

### 4.2 Past Exploration

Previous exploration in the area has been undertaken for several different commodities, including base metals, gold and diamonds. Table 2 shows a summary of previous Exploration Licences (EL) and Special Mining Leases (SML) that have infringed in some part on the current EL 3646.

#### 1970 – 1971 Electrolytic Zinc Co.

EZ undertook a regional stream sediment sampling programme predominantly between the Chace and Druid Ranges. They also employed several students from the University of Adelaide to map, assess and study the magnetic properties of the Arkaba Diapir. Geochemical anomalies were found to be associated with copper mineralisation in the diapir (derived from basic intrusions and dolomite), ochreous clays developed in the Parara Limestone, anomalously high base metal values in the Parachilna Formation and sparse galena mineralisation in the Parara Limestone. They considered that none of these occurrences constituted substantial mineralisation.

#### 1982 – 1983 BHP Minerals Ltd

BHP focussed on Mississippi Valley-type Zn-Pb deposits associated with Early Cambrian carbonates within the Mernmerna Syncline. At the Vanessa prospect, 28 stream sediment



samples and 147 soil samples on a 50m spaced grid were collected over sporadic minor surface barite, copper and zinc mineralisation in basal units of Wilkawillina Limestone associated with an E-W trending fault. Their analyses yielded low values.

### 1989 – 1991 CRA Exploration Pty Ltd

CRA were searching for diamonds and copper, plus gold, rare earth elements, niobium and phosphates associated with diapiric structures in the Arkaba-Worumba area. Stream sediment, gravel and rock chip sampling was undertaken with inspection of historic copper workings located within the diapirs. The results from sampling did not give any encouragement for further testing. An aeromagnetic anomaly located west of Brachina Gorge was investigated with ground magnetic traverses, but modelling suggested it was >400m deep. Some stream sediment sampling for diamonds was undertaken but failed to yield any indicator minerals.

### 2000 – 2001 Perylia Ltd

As part of Perylia's regional exploration in the Flinders Ranges, they undertook semi-regional soil, stream sediment and rock chip sampling in the Chace/Druid Range area in search of economic base metal deposits. Stream sediment sampling gave a peak result of 1215 ppm Zn, while follow up rock chip sampling gave peak values of 0.78% Zn and 310 ppm Cu. They determined that the style and tenor of observed mineralisation was not appropriate for follow up work.

Lease	Holder	Start date	End date	Activities
SML 219	Electrolytic Zinc Co of Australasia Ltd	Aug 1968	Apr 1969	No info available
SML 302	Electrolytic Zinc Co of Australasia Ltd	May 1969	May 1070	No info available
SML 371	Exoil NL	Jan 1970	Jan 1971	No info available
SML 474	Burbank Exploration NL	Oct 1970	Sep 1971	No info available
SML 500	Electrolytic Zinc Co of Australasia Ltd	Nov 1970	Nov 1971	Stream sediment sampling, mapping
SML 583	Electrolytic Zinc Co of Australasia Ltd	May 1971	May 1972	No data available
SML 675	Comalco Ltd	Feb 1972	Apr 1972	No data available
EL 0727	BHP Minerals Ltd	Sep 1980	Sep 1982	Exploration of MVT Zn-Pb mineralisation. Stream sediment sampling.
EL 1084	BHP Minerals Ltd	Nov 1982	Oct 1986	Exploration of MVT Zn-Pb mineralisation. Stream sediment and soil sampling.
EL 1625	CRA Exploration Pty Ltd	Dec 1989	May 1991	Stream sediments, gravel and rock chip for mineralisation associated with diapir
EL 1639	CRA Exploration Pty Ltd	Jan 1990	Jan 1991	Exploration for metals assoc. with buried diapiric structure. Ground magnetics, stream sediments, gravel & rock chip sampling
EL 2534	Ory Pty Ltd	Jul 1998	Jul 1999	No info available
EL 2536	Flinders Diamonds Ltd	Aug 1998	Aug 2003	No info available
EL 2724	Allender, Inca Resources Pty Ltd, Lebrun	May 2000	May 2002	No info available
EL 2773	Perylia Ltd	Nov 2000	Nov 2001	Regional soil, stream sediment and rock chip sampling for base metals
EL 3063	Flinders Diamonds Ltd	Mar 2003	Mar 2005	No work performed

**Table 2.** Summary of previous work carried out in the Mt Aleck tenement area

## 5.0 EXPLORATION RATIONALE

Copper Range's initial targets in the Adelaide Fold and Thrust Belt are secondary near-surface oxide copper deposits that are structurally controlled, related to hydrothermal events focused along faults late in the deformational history of the region.

Copper Range is also exploring for epigenetic primary copper sulphides hosted by suitably porous or reactive strata and in dilatant sites adjacent to significant structures that cross cut stratigraphy. With this model in mind multispectral satellite imagery and airborne radiometric data have been used to identify zones of alteration that indicate appropriate stratigraphic horizons and substantial fluid movement. This method has generated targets that are not related to known mineralisation and have thus not generally been explored in the past.

However, the company's main interest in the Mt Aleck tenement is a uranium-channel radiometric anomaly that occurs approximately over the boundary between sandstone and quartzite of the Pound Subgroup and siltstone and shale of the Wonoka Formation. It is possible that uranium was precipitated from oxidised fluids on contact with reducing rocks.

In addition, Copper Range is evaluating the potential for iron ore targets within its tenements. In the Hawker area (including Mt Aleck tenement) these targets comprise mapped Holowilena Ironstone outcrops. However, initial field investigations have shown that these mapped outcrops are often just ferruginous sandstones with limited extent and low grade, hence low prospectivity.

## 6.0 REGIONAL GEOLOGY

Regionally, the area lies within the Adelaide Fold and Thrust Belt, which contains Neoproterozoic to late Cambrian sequences. Rock types recognised within this Precambrian, fault-bounded intracratonic trough are Neoproterozoic in age (1400 to 570 Ma) with terrestrial and marine clastic, chemical and glaciogenic sediments (Preiss 1987). These formations have been deformed and metamorphosed (generally to greenschist facies) by at least two major orogenic episodes: the Proterozoic Adelaide Fold Belt orogenic event and a later Early Palaeozoic Delamerian Orogeny (Preiss 1987). Following uplift caused by these deformations, erosion of the exposed older formations has taken place and younger Palaeozoic and Cainozoic sediments unconformably overly the Adelaidean sequences in places.

The Mt Aleck tenement covers Adelaidean sediments of the Umberatana and Wilpena Groups. The outcropping Umberatana Group rocks predominantly comprise siltstones, shales and limestones of the Upalinna Subgroup (Sunderland and Etina Formations, Enorama Shale, Trezona and Elatina Formations). The Wilpena rocks are predominantly siltstones of the Brachina and Bunyeroo Formations, quartzites (Rawnsley Quartzite), sandstones (Bonney Sandstone) and Wonoka Formation shale. In the west of the tenement Cambrian Limestones of the Hawker Group outcrop. The south-eastern section of the tenement contains a large part of the Arkaba Diapir, which comprises uplifted structurally complex sediments of the Callana Curdimurka Group in a brecciated matrix. The Rawnsley and Chace Quartzites form steep ridges that gently curve around the western side of the tenement.

## **7.0 WORK COMPLETED BY COPPER RANGE (SA) PTY LTD**

Exploration during the period has consisted of a further brief follow up of areas of Holowilena Ironstone that had been previously sampled.

No substantial field activities have been completed.

## **8.0 CONCLUSIONS**

- A reduction in tenement area was completed covering areas thought to have low prospectivity for iron ore mineralisation.

## 9.0 REFERENCES

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