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## 1.0 Summary

EL 24467 is part of Northern Mining Limited's Finke project in Central Australia and is considered prospective for sandstone-hosted and Tertiary remobilised uranium and massive Mn mineralisation. In the second year of tenure, a reconnaissance trip was undertaken to EL 24467 to check uranium anomalies identified from the wide-spaced radiometric data and to plan logistics for future work. No drilling was undertaken.

## 2.0 Introduction

EL 24467 'Horseshoe Bend' is located 150 km south of Alice Springs. The best access is from the Stuart Highway through Idracowra Station, though the Old South Road does traverse the tenement (Figure 1). EL 24467 is part of the Finke Project, along with EL 24503, which adjoins to the southwest. This report covers all work completed on EL 24467 in the second year of tenure.

## 3.0 Tenure

EL 24467 was granted to Lockett Consulting Services Pty Ltd (90%) and Imperial Granite and Minerals Pty Ltd (10%) on 7 September 2005. Agreement to transfer the tenement to Northern Mining Limited was completed during the first year of tenure. Northern Mining Limited relinquished 250 blocks from the eastern portion of the tenement at the end of the second year of tenure.

The tenement comprises 250 blocks all within NT Portion 659, which is part of the Horseshoe Bend perpetual pastoral lease.

Tenement	Ten no.	Blocks Granted	Blocks Relinq.	Blocks Retain	Grant Date	Expiry Date
Horseshoe Bend	24467	500	250	250	7 Sept 2005	6 Sept 2011

**Table 1:** Tenement details

## 4.0 Geology/Prospectivity

The Finke Project covers the southern part of the Amadeus Basin; a large intracratonic basin with a complex Neoproterozoic to Carboniferous depositional history. The project area is dominated by Palaeozoic Finke Group sediments and the northeast-trending Black Hill Range (Neoproterozoic Winnall Beds). These sediments are overlain by Quaternary alluvial outwash, colluvium and aeolian sand, including abundant north- to northwest-trending sand dunes. Some minor Tertiary sediments are shown on the 1:250,000-scale geological map (Wells *et al.*, 1969), though subsequent work by mineral exploration companies has highlighted a greater extent of such outcrop. The ephemeral, south-flowing Finke River meanders through the eastern part of the project area.

The Finke Project area is prospective for sandstone-hosted uranium mineralisation in the Finke Group sediments, particularly the Polly Conglomerate and Langra Formation. The lack of modern exploration and the extensive shallow aeolian cover greatly enhances the prospectivity of the area. Analysis of public-domain (NTGS) radiometric data also reveals uranium anomalies coincident with table-top hills capped by silicified lacustrine carbonate sediments. These uranium anomalies are not associated thorium anomalies.

Previous exploration within EL 24467 has focussed on sandstone-hosted uranium mineralisation and has been limited to:

- Groundwater analysis,
- Airborne magnetic and radiometric surveys,
- Ground reconnaissance of exposed geology, and
- 14 RAB holes in the Palaeozoic succession.

Anomalous uranium results were obtained from water derived from bores penetrating the Polly Conglomerate (basal Finke Group), and is consistent with other uranium results across the southern Amadeus Basin. RAB drilling results suggest that the Langra Formation is most prospective, although no mineralisation was delineated.

In Northern Mining's First Annual Report (2006), it was reported that in 2004, a rock sample of the Winnall Beds south of Horseshoe Bend Station and within EL 24467 returned 52.45% Mn, 0.8% Fe and 0.68% Pb. This result is incorrect and refers to a sample collected in 1940 by a station worker and analysed by Broken Hill Propriety (BHP) Limited in Newcastle. The sample returned 52.45% Mn, 0.78% Fe, 0.068% P and 11.75% insolubles (see Appendix 1 for correspondence). The sampling site has never been rediscovered and no other manganese has been reported in the area.

## **5.0 Northern Mining Limited Work**

### *5.1 Year 1*

In the first year of tenure, work on EL 24467 was limited to producing the prospectus for Northern Mining Limited. This work involved a major desktop study by an independent geological consultant, and included compilation and interpretation of public-domain geophysics. No field work was undertaken.

### *5.2 Year 2*

In the second year of tenure, a reconnaissance field trip was undertaken to EL 24467 to check the field expression of certain geological features and discuss logistics with the station owners at Horseshoe Bend. Two rockchip samples were collected of silicified Tertiary lacustrine carbonate sediments which coincide with prominent uranium anomalies in the wide-spaced radiometric data. These rockchips returned low, but slightly anomalous uranium results (Appendix 2), which suggests that the airborne anomalies are not measuring uranium directly, but possibly the daughter products derived from uranium decay. If so, uranium mineralisation may have been mobilised recently and so further work is required to identify local, favourable trapsites.

A covenant of \$55,000 was proposed for the second year, but only \$17,903 was spent. A number of expensive items (geophysical surveys, metallurgical testing) were not undertaken due to problems finding the relevant contractors.

Item	Expenditure
Salary/wages (incl consultants)	9,122
Vehicle costs (includes diesel)	385
Field support	4,000
Analyses (rockchips)	61
Travel	2,000
Administration (15%)	2,335
<b>Total</b>	<b>\$17,903</b>

**Table 2:** Expenditure on EL 24467 for second year of tenure.

### 5.2 Year 3 (proposal)

In the second year of tenure, an extensive field survey will be undertaken in the Finke Project. This will include extensive geological and regolith mapping, surface sampling and geochemical testing of water bores. A geophysical survey, probably gravity, will also be undertaken to better define targets under shallow cover. Further surveys to locate the manganese mineralisation will also be undertaken. If found, metallurgical testing will be immediately undertaken.

Item	Expenditure
Rockchip assays	\$8,000
Geophysical survey (gravity)	\$17,000
Metallurgical studies	\$6,500
Vehicles	\$7,500
Wages, consultants	\$9,000
Administration	\$7,000
<b>Total</b>	<b>\$55,000</b>

**Table 3:** Proposed expenditure for third year of tenure.

## 6.0 Environmental

No ground disturbing work was undertaken on EL 24467 during the first year of tenure.

## 7.0 Bibliography

CR1974-0028. EL745 Annual Report 1973. Le Nickel (Aust) Exploration Pty Ltd.

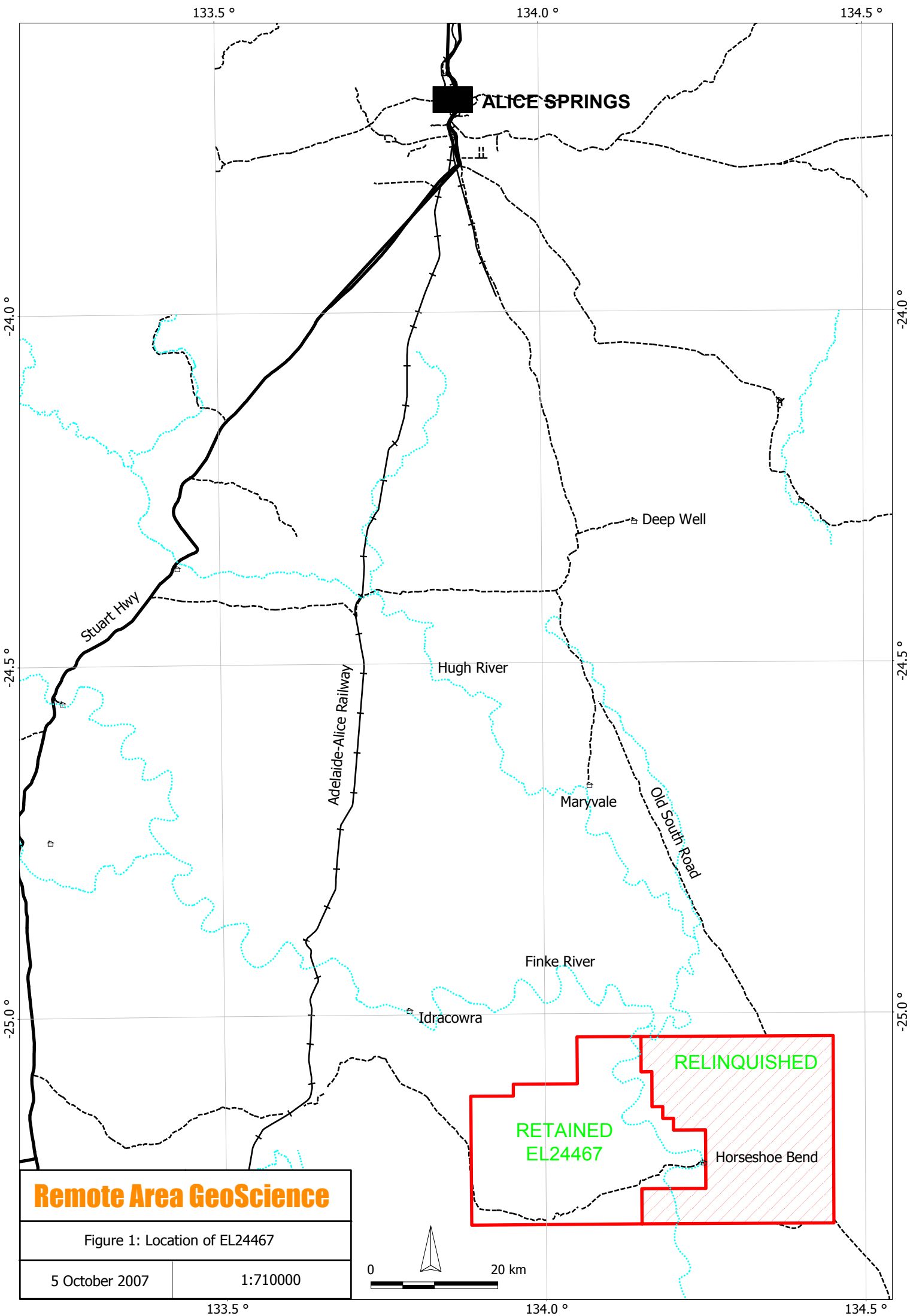
CR1974-0183. EL746 Annual Report 1973. Le Nickel (Aust) Exploration Pty Ltd.

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CR1978-0005. Annual Report EL744, 745, 746 & 747. Finke district, NT. Nickel (Aust) Exploration Pty Ltd. (Benko, D. Afmeco Pty Ltd)(Compiles by MRW Garman).

CR1978\_0141. Final report EL1214. Agip Nucleare Aust. Pty Ltd.

Well, AT, Stewart, AJ, Skwarko, SK. 1969. *Finke 1:250,000-scale Geological Map (SG5306)*. Bureau of Mineral Resources.



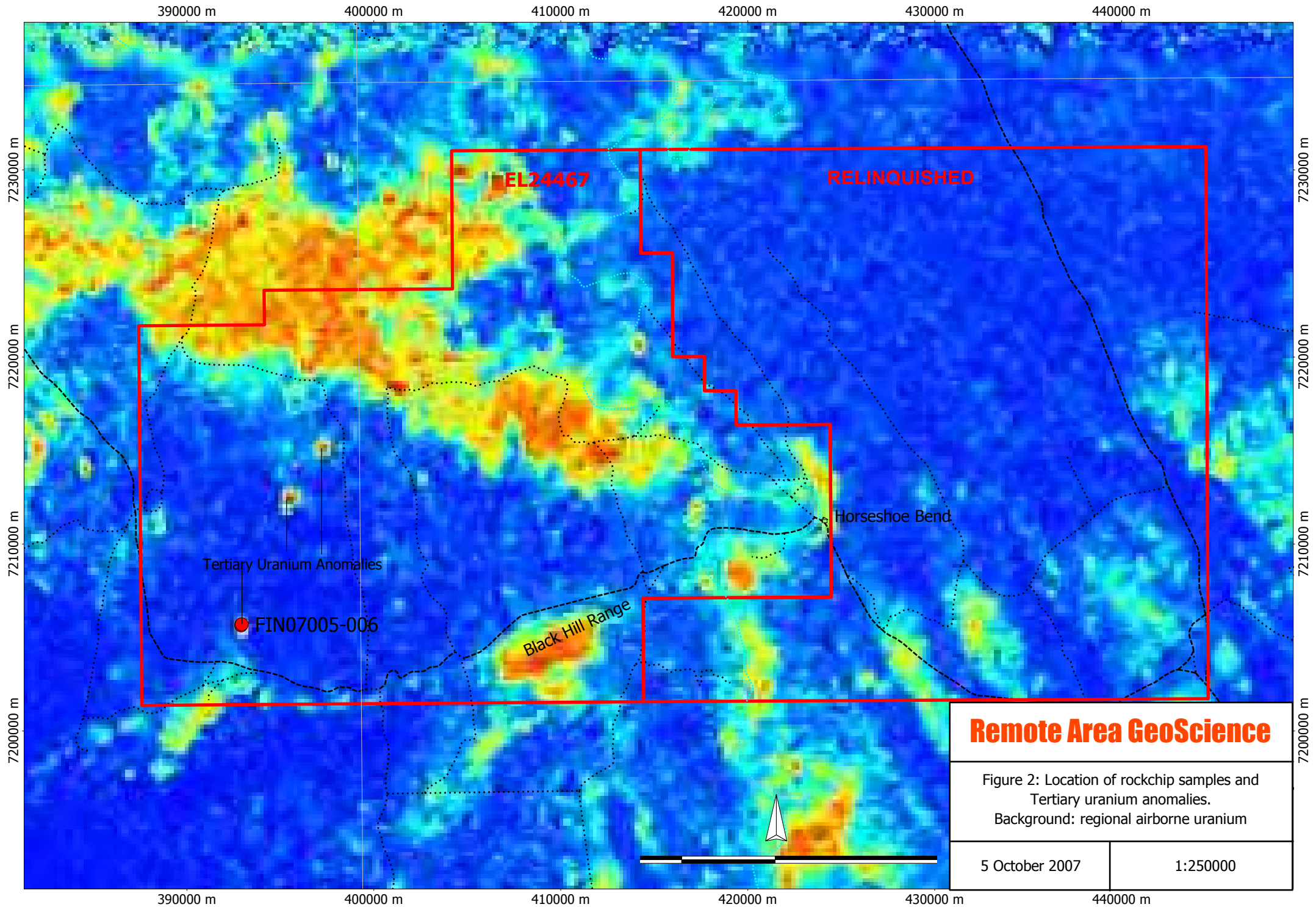
**Remote Area GeoScience**

Figure 1: Location of EL24467

5 October 2007

1:710000





**Remote Area GeoScience**

Figure 2: Location of rockchip samples and Tertiary uranium anomalies.  
Background: regional airborne uranium

5 October 2007

1:250000



Appendix 1

Historic correspondence relating to manganese

20th. August 1940.

Mr. A. R. Harvey,  
HORSESHOE BEED.  
Via RUMBALABA. N.T.

Dear Sir,

A few minutes ago, during my temporary absence from this office, someone called here and left a few pieces of rock which he said was Manganese Ore from you.

While I cannot be definite about it, the mineral certainly appears to me to contain Manganese, but it seems hardly heavy enough to be very rich in Manganese, and possibly contains considerable quantities of earthy matter as well as iron.

However, assumptions are not of much use, and the best thing is to have an assay made of it, and also to send some to the B.H.F. Company to ask if the material is of any use to them at present. But before sending samples either to Darwin or to Newcastle, it is necessary to have some rough idea of the width and length of the body from which the sample was obtained, and also information as to whether the sample sent is a fair average over the whole of the lode, or if not, then what size body does it represent. Also please say if the lode occurs on Crown Lands, *and the distance and direction from Rumbalaba*

If you can send along the information asked for by return mail, I hope to send the samples to Darwin and to Newcastle by next week.

Yours faithfully,

*MB*  
Actg. Min. Registrar

NCE/TP

Attention: Mr John  
Benger

26th August 1940.

The Works Manager,  
Broken Hill Proprietary Company,  
Port Waratah,  
NEWCASTLE. NEW SOUTH WALES.

Dear Sir,

By Packet Post there is being forwarded you a small package containing a few ounces of what is supposed to be **Manganese Ore.**

This ore was forwarded to this office from a resident of Horse Shoe Bend, Northern Territory, who states that it came from an orebody about three feet wide and about fifty yards long which is situated about 23 1/2 miles from the Rumbalara Railway Station, Northern Territory. He desires to know if it has any commercial value and if so approximately what it would be worth per ton. Rumbalara is 623 miles North of Quorn.

The writer is not very optimistic about the sample being of commercial value where it is, but possibly that particular ore may not have been tested before, and one never knows just what any ore contains until it has been tested.

In that locality, and probably 20 miles further East, bodies of Ochrous Earth occur, one of which bodies is being regularly mined, and the material railed south to the United Paint Co. Ltd. of Port Adelaide. The fact that over 500 tons of ochrous earth were despatched last year shows that the district contains some minerals of value and it is just possible that the sample being sent to you may prove to be more valuable than its appearance indicates.

If the sample is of interest to you, a reply would be appreciated.

Yours faithfully,

*N.C.B.*  
(N. C. BELL)  
ACTING MINING REGISTRAR.

23.5 miles  
x 16  
-----  
1410  
235  
-----  
376

NCB/TP

28th August, 1940.

The Director of Mines,  
D A R W I N. N. T.

MINERAL SAMPLES.

By airfreight there is being forwarded a small package containing two separate mineral samples. One of these samples is a piece of crystalline limestone from the Geologist (Mr. H. B. Owen), about which he is writing you direct.

The other sample is from Mr. A. R. Harvey of Horseshoe Bend and is assumed to be Manganese Ore. It came from a lode on Crown Lands at about 1½ miles south from Horseshoe Bend Station Homestead and about 23½ miles from Rumbalara. Mr. Harvey would like an assay made of its manganese contents, and wants to know whether it has any commercial value, and if so, what its value per ton would be.

Personally, I am not optimistic about it being of commercial value where it is, but appearances are sometimes deceptive and only by assay can its value be determined.

(N. C. BELL)  
ACTING MINING REGISTRAR.

TELEPHONES  
HAMILTON  
795/400  
P.O. Box 196

HEAD OFFICE:  
422 LITTLE COLLINS ST.  
MELBOURNE.

ALL COMMUNICATIONS  
TO BE ADDRESSED TO  
"THE MANAGER"

*The Broken Hill Proprietary Co. Limited.*

(INCORPORATED IN THE STATE OF VICTORIA)

IRON & STEEL WORKS.

*Newcastle*  
N.S.W.

TELEGRAPHIC ADDRESS  
"HENAYITE, NEWCASTLE"

CODES USED:  
BENTLEY'S ALGO  
MORSE & NEAL  
A.B.C. 5TH  
WESTERN UNION  
LIEBERG  
MASTER

9th September, 1940.

Mr. Norman C. Bell,  
Acting Mining Registrar,  
Northern Territory Administration,  
ALICE SPRINGS.

Dear Sir,

MANGANESE ORE:  
- - - - -

We are in receipt of your letter of the 26th ult., also sample of manganese ore which you forwarded under separate cover. This sample has been analysed as follows :-

<u>Insol.</u>	<u>Fe.</u>	<u>P.</u>	<u>Mn.</u>
11.75	.78	.068	52.45

We would advise that manganese ore of the above analysis is suitable for our requirements, but consider that the high cost of freight from Rumbalara would prevent the deposit being worked at present.

As requested, we enclose herewith Memorandum of the Price we pay for this mineral delivered our Works, Newcastle.

Yours truly,

*[Signature]*  
Acting Manager.

Recd

16  
vCB

Encl.  
Ch: CW.

THE BROKEN HILL PROPRIETARY COMPANY LIMITED  
(Iron & Steel Works)

MEMORANDUM OF PRICES

(Per ton of 2240 lbs)

WHICH WILL BE PAID FOR MANGANESE ORES DELIVERED AT THE WORKS OF  
THE BROKEN HILL PROPRIETARY COMPANY LIMITED,  
PORT WARATAH, NEWCASTLE.

Prices are based on Ores containing -

Not more than 8 % Silica  
" " " 4% Iron  
" " " .10% Phosphorus

PRICE LIST

Ore containing	40% Mn	£3/4/-	per ton)	
" "	41% "	£3/6/0	" "	} Fractions of units pro rata
" "	42% "	£3/8/-	" "	
" "	43% "	£3/10/-	" "	
" "	44% "	£3/12/-	" "	
" "	45% "	£3/14/-	" "	
" "	46% "	£3/16/-	" "	
" "	47% "	£3/18/-	" "	
" "	48% "	£4/-/-	" "	
" "	49% "	£4/2/-	" "	
" "	50% "	£4/4/-	" "	
" "	51% "	£4/6/-	" "	
" "	52% "	£4/8/-	" "	
" "	53% "	£4/10/-	" "	
" "	54% "	£4/12/-	" "	
" "	55% "	£4/14/-	" "	

The above prices are subject to the following deductions :-

For each 1% Silica above	8%	-	4d.	per ton	(fractions pro rata)
" " 1% Iron	"	4%	-	3/6d.	" " " "
" " .01% Phos.	"	.10%	-	1/-d.	" " " "

Settlements are based on Analysis of samples dried at 213 deg. Fah.

The percentage of Moisture in excess of 1% in samples as taken being deducted from the weight.

Payment to be made on Railway weights; or in case of shipments, the outturn weight of parcels shall be determined by the B.H.P. Co's. Weighbridge.

Sampling shall be done at our Works, but if seller desires representation, every facility will be afforded; and assays may be made, exchanged and agreed as usual.

These prices are subject to change at one week's notice, unless otherwise agreed upon.

THIS COMPANY RESERVES THE RIGHT TO REFUSE TO ACCEPT DELIVERY OF ANY CONSIGNMENTS ASSAYING BELOW 40% Mn.

To ensure prompt attention, all communications should be addressed to the Manager, Broken Hill Proprietary Company Limited., Box 196 P.O., Newcastle.

Manager.

NEWCASTLE:

27th August, 1940.

CH:GW.

Recd  
27/8/40  
MA



NORTHERN TERRITORY OF AUSTRALIA.

ASSAY CERTIFICATE.—MINES BRANCH.

Report of Sample Submitted..... by *Gov-Geologist Alice*  
 Sample Marked..... *A Harvey Springs*  
 No. of Bags..... Darwin.....  
 Assayed for *CaCO<sub>3</sub> Mg — MnO*..... Registered No. *4474/5*

This Sample of Ore contains

<i>4474</i>	<i>CaCO<sub>3</sub></i>	<i>55.0 %</i>	} <i>Crystalline being limestone from Strangways Range at abt 14 miles South of Mt Pfitzner</i>
	<i>MgO</i>	<i>nil</i>	
<i>4475</i>	<i>MnO</i>	<i>65.3 %</i>	<i>Manganese ore from near Horseshoe Bend (see also Analysis by RHPB)</i>

*MB  
17 SEP 194*

*S. Bourke* Government Assayer.

NCE/TP

17th September, 1940.

Mr. A. R. Harvey,  
Horseshoe Bend,  
VIA RUMBALARA.

Dear Sir,

MANQANESE ORE.

By last train mail a letter arrived from the Acting Manager, Broken Hill Proprietary Company Limited at Newcastle in which was mentioned the results of analysis of the sample of manganese ore which you sent to me.

Your sample contained 52.45 per cent of manganese (that is, metal) representing about 83 per cent of manganese dioxide and is pure enough and quite suitable for use at their works if the distance were not so great and transport charges not so high. However, the information is useful and may come in handy at some future date.

Yours faithfully,

VCR

(N. C. BELL)  
MINING REGISTRAR.



## Appendix 2

### Rockchip sample results

MGA_E	MGA_N	ELEMENTS UNITS DETECTION METHOD	Au ppm	Ag ppm	As ppm	Ba ppm	Bi ppm	Cd ppm	Ce ppm	Co ppm	Cr ppm	Cu ppm	Fe %	La ppm	Mg ppm	Mn ppm	Ni ppm	P ppm	Pb ppm	S ppm	Th ppm	U ppm	V ppm	Zn ppm
			0.01	1	5	2	10	1	0.01	1	2	1	0.01	0.01	20	1	1	20	5	10	0.01	0.01	2	1
			B/SAAS	A/OES	A/OES	A/OES	A/OES	A/OES	A/MS	A/OES	A/OES	A/OES	A/OES	A/MS	A/OES	A/OES	A/OES	A/OES	A/OES	A/OES	A/MS	A/MS	A/OES	A/OES
FIN07005	392894	7205645	X	X	X	141	X	X	4	3	9	13	1.23	1.25	805	196	6	707	51	634	0.36	5.45	5	248
FIN07006	392927	7205712	X	X	X	167	X	X	5.93	2	11	23	0.98	1.7	1634	200	6	951	51	362	0.47	7.99	6	262