



Cameco Australia Pty Ltd

**EXPLORATION LICENCE EL734
ARNHEM LAND WEST JV
PARTIAL SURRENDER REPORT**

CONFIDENTIAL

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SUMMARY

This report describes exploration work undertaken within the 88 surrendered blocks of Exploration Licence 734 over the five years of tenure between 1996 and 2001. The tenement is located in northeastern Arnhem Land and was granted in May 1996.

PNC Exploration (Australia) Pty Ltd on behalf of the Nadjinem Joint Venture partners, PNC Exploration (Australia) Pty Ltd, Cameco Australia Pty Ltd, and the Nadjinem Aboriginal Corporation, managed the exploration programs between 1996 and 1999. Cameco acquired management in 2000.

The focus of the exploration strategy is the discovery of unconformity-related uranium deposits. The nearby economic deposits at Ranger, Jabiluka, Koongarra and the now depleted Nabarlek Mine serve as models for this strategy. The presence of gold, palladium and platinum in these deposits plus the economic gold-platinum resource at Coronation Hill in the South Alligator Valley, indicates an additional potential for this deposit style.

Exploration work undertaken included an airborne survey, reconnaissance geological mapping, ground follow-up of airborne anomalies, stream geochemical sampling including bulk sampling for diamonds and RAB drilling.

De Beers Australia Exploration Limited (DBAE), formerly Stockdale Prospecting Limited, entered into a farm-in arrangement with the AWJV and carried out reconnaissance exploration for diamonds in defined areas.

There were no results of significance from the limited amount of exploration work completed. Several airborne radiometric anomalies were identified and followed-up and a low order BLEG gold anomaly was located within Nimbuwah basement adjacent to dolerite. The latter did not warrant further investigation.

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1. INTRODUCTION

This report details exploration work completed within the relinquished blocks of Exploration Licence 734 (EL734) during the five years of tenure from the 13th May 1996 to the 12th May 2001. The tenement was explored concurrently with two adjoining tenements, EL's 5890 and 5891.

Exploration is subject to the terms of consent documentation dated 1st March 1996 agreed with the Northern Land Council in accordance with the *Aboriginal Land Rights (Northern Territory) Act*. As required by the agreement, the Work Programs for each year were cleared at meetings of the Liaison Committee.

PNC Exploration (Australia) Pty Ltd ("PNC") as operator carried out the Work Programs on behalf of the Nadjinem Joint Venture, a joint venture between the Arnhem Land West Joint Venture partners, PNC and Cameco Australia Pty Ltd, and the Nadjinem Aboriginal Corporation. Commencing 1st April 2000, Cameco Australia Pty Ltd has assumed management of the project.

1.1. Location and Access

EL734 is located in western Arnhem Land and is wholly within Aboriginal land immediately to the north of the now rehabilitated Nabarlek mine. The Oenpelli-Maningrida road, which traverses the tenement, has provided access to some of the work area.

[EL 734 Location Plan 2001](#)

1.2. Tenure

On granting, the original area of the tenement covered 920 square kilometres of which 67.5 square kilometres were designated as restricted zones following a site survey undertaken by the Northern Land Council. Tenure was granted on 13th May 1996 for a period of six years.

Under the Mining Act a 50% reduction in area is required on each anniversary commencing 13th May 1998 unless a waiver is obtained from the Department of Mines and Energy. Such waivers were granted in years three and four and for partial reduction of the tenement by 43 blocks in year 5 (15.6%). For the current year, a partial reduction of 88 blocks (38%) has been applied for which will leave an area available for exploration of 481.5 square kilometres.

[EL734 Relinquished Blocks 2001](#)

1.3. Personnel

Several PNC geologists and field crew undertook fieldwork. Aboriginal traditional owners were employed as field assistants.

Contractors and consultants used were:

- Airborne surveys by Geoterrex.
- Transport and track work by Wildman River Stock Contractors, Darwin.
- RAB drilling by Century Drilling, Batchelor.
- Analytical work by ALS, Brisbane and Chemnorth, Darwin.
- Diamond sampling by consultant Ed Manning of Diamond Exploration Consultants.
- Processing of and observations on diamond samples by Western Laboratories and Klaric Exploration Services respectively, Perth.
- Helicopter assisted activities by Rotor Services, Darwin.

1.4. Physiography

Sandstone escarpment country of the Oenpelli Massif is present along the southern boundary of the licence area. The remainder of the tenement, including the relinquished area, consists of gently undulating sandy plains and thin remnants of lateritised Cretaceous sediments.

1.5. Tenement Geology

Relinquished portions of the tenement consist of the Paleoproterozoic Myra Falls Metamorphics in the west and Nimbuwah Complex in the east. Exposures of the Kombolgie Subgroup, also assigned a Paleoproterozoic age, outcrop along the southern boundary of the tenement. The Oenpelli dolerite intrudes the basement rocks as do a series of younger intrusives including the circular magnetic features, which are thought to be pipe-like mafic bodies. The latter were the focus of diamond exploration by De Beers on the tenement

Thin Cretaceous platform cover overlies Nimbuwah complex rocks in the east of the tenement.

1.6. Exploration Target

The main focus of exploration is the discovery of unconformity-related, vein-type uranium deposits. The nearby uranium deposits of Ranger, Jabiluka, Koongarra and Nabarlek serve as models for this exploration. Nabarlek is particularly appropriate as a model in view of the similar geological setting and close geographical proximity. The presence of economic gold in Jabiluka 2 and Koongarra plus the gold-platinum group elements with minor uranium mineralisation in a similar geological environment at Coronation Hill indicates additional potential for Au and PGE

mineralisation. The area is also considered to hold potential for kimberlite or lamproite hosted diamond deposits.

1.7. Exploration History

1.7.1. Union Carbide Exploration Corporation (UCEX)

The relinquished area was previously part of a much larger tenement held by Union Carbide Exploration Corporation, who carried out substantial exploration in 1970-1972, principally for uranium. They undertook a number of airborne surveys with much of the area flown utilizing a total count scintillometer. The western section of what is now EL734 was flown with a spectrometer and magnetometer. Hunting Geology and Geophysics compiled a photogeological interpretation. Follow-up of uranium and base metal anomalies was undertaken over the southern extension of the Dreadnought structure, now part of a 'no-go' area.

Union Carbide's exploration work was curtailed in early 1973 by a federal Government imposed moratorium on further exploration pending a resolution of aboriginal land rights.

2. EXPLORATION PROGRAM

Sampling conducted over the relinquished area of EL734 is depicted in the figure below. Similarly all data is recorded in the listed appendices.

[EL734 Work Completed 2001](#)

[RAB Drill Hole Location Data](#)

[RAB Drill Hole Logs](#)

[RAB Drill Chip Assay Data](#)

[RAB Drill Chip Magnetic Susceptibility Data](#)

[RAB Drill Chip PIMA Spectra Read-me](#)

[Stream Sediment Location and Assay Data](#)

[BLEG Location and Assay Data](#)

[Diamond Gravel Sample Location and Mineral Count Data](#)

[Geophysical Logistics Report by Geoterrex 1996](#)

2.1 PNC 1996 Field Season

Following grant of title in 1996, initial activities consisted of helicopter-assisted stream BLEG and bulk sampling for diamonds and some reconnaissance mapping and outcrop checking. Towards the end of the season, a regional fixed wing airborne survey was conducted.

A stream site was selected. A 30kg bulk sample of -1.6mm material was collected for diamond indicator analysis and a 5kg sample for BLEG and geochemical analysis at each site. Observations were made that high quality trap sites were absent due to the predominance of low gradient sand-choked drainages and that sample quality was moderate or poor to moderate.

The samples collected for geochemical analysis were divided into a 2kg component for BLEG, with the remainder being sieved to -80 mesh and analysed for a suite of elements including U, Th, Cu, Pb, Zn, As, Cd, Cr, Bi and P. This analysis was also utilised for environmental base line purposes.

The diamond sample processing procedure is described in Mackie, 1997.

Airborne magnetics-radiometrics-VLF was flown as part of the regional King River Project fixed wing survey. The aircraft was flown at a mean terrain clearance of 80 metres with survey lines at 200 metre intervals. Digital data is included with the present CD. One radiometric anomaly (U/Th) was identified and named NIM.

No diamond indicators were identified in the bulk sample. Similarly, the geochemical sampling failed to locate any anomalies.

2.2 PNC 1997 Field Season

The airborne radiometric anomalies were 'ground truthed' as part of a regional anomaly assessment. The anomaly environs / prospecting results are tabulated below:

Anomaly	GR101 Rank	GR101 max(cps)	EDA max(cps)	Struc- ture	Alter- ation	Mag dolerite	U/ Th			Noted_Features	Further_Work
							U	Th	K		
Nim 11	C	100					Y			Ferricrete, few to many pisoliths	
Nim 9	D		40					Y		Alluvium - sand, gravel patch, swamp sand silt	
Nim 17	D	20	25			Y	Y			Many to abundant pisoliths, scattered ferricrete	

A single saprolite sample was collected from the Dreadnought area and analysed, this had a moderate uranium value of 3.96ppm.

Hand auger sampling of 11 sites on the gridded Dreadnought anomaly indicated modest elevation of Au (1 – 5ppb) and U (10.2 – 37.6 ppm).

A RAB drilling traverse designed to investigate the interpreted geology was conducted east of Nimbuwah Rock. The traverse, which consisted of five holes over 4 kilometres, was commenced adjacent to the Maningrida road. Six samples were collected for geochemistry and analysed for Au, As, Ce, Co, Cu, Fe, Mg, Mo, Ni, Pb, Th, total U, labile U, Y and Zn.

2.3 PNC 1998 Field Season

Limited exploration work focused on stream sediment geochemistry and RAB drilling. Four samples were collected from streams located principally within areas of exposed basement rocks on the eastern side of the tenement. The sampling was part of a regional helicopter-assisted survey designed to cover the Nimbuwah Complex. Samples consisted of 50 to 100g of sieved material (-80 mesh) and were analysed for Au, As, Ce, Co, Cu, Fe, Mg, Mo, Ni, Pb, Th, total U, labile U, Y and Zn.

RAB drilling was restricted to 7 holes along the Maningrida Road. All were drilled adjacent to the road for access convenience and to minimise ground disturbance. The holes were part of a more extensive regional traverse of 2km spaced sites that followed the road to the tenement boundary. Three holes on the eastern end intersected basement gneiss beneath thick saprolite or Cretaceous sands. The remainder of the holes were terminated in flowing sands or damp clays.

The results of follow up prospecting along the Dreadnought structure are tabulated below:

Anomaly	GR101 Rank	EDA max(cps)	Struc- ture	Alter- ation	Mag dolerite	U/			Noted_Features	Further_Work
						U	Th	K		
Dreadnought	D	100	YYY			Y	Y	Y	N-S qtz vein shearing; minor U associated with ferricrete; elevated Cu, As, Au (9-41 ppb) along structure	

2.4 PNC 1999 Field Season

De Beers Australia Exploration Limited carried out close-spaced airborne magnetics in conjunction with loam and soil sampling over localised magnetic anomalies. These anomalies were initially defined during the King River regional airborne surveys of 1996. In addition, an anomalous stream sediment site, which contained possible kimberlitic indicators, was intensively resampled.

Nine anomalies, comprising a nominal 1 square kilometer in area, were flown at 30 metres flying height and 50 metre line spacing. All were subsequently ground checked with twenty soil samples (MMI geochemistry) and four loam samples being collected. In the vicinity of sample site BT5422, eleven very close spaced stream sediment samples were collected.

Results of the sampling indicated that the chrome spinels were not derived from a kimberlitic source and that no diagnostic kimberlite-related minerals occurred in either the loam or stream samples. The MMI geochemistry was similarly negative.

No uranium exploration work was carried out in the relinquished area by the joint Venture during the period. De Beers considered their results disappointing and made the decision to withdraw from the area.

2.5 PNC 2000 Field Season

Exploration activity was restricted to a regional heliborne DIGHEM electromagnetic-magnetic-radiometric survey that included ten blocks in the south west of EL734. A total of 168.2 line km was flown over the ten blocks, at 200 metre spaced east-west lines and a mean terrain clearance of 30 metres.

3. BIBLIOGRAPHY

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