



Cameco Australia Pty Ltd

**EXPLORATION LICENCE EL5890
ARNHEM LAND WEST JV
PARTIAL SURRENDER REPORT**

CONFIDENTIAL

Date: June 2001

Report No.: AW01-065890

Period: 13 May 1996 to 12 May 2001

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**Copies: Cameco Australia Pty Ltd, Master File
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SUMMARY

This report describes exploration work undertaken within the 73 surrendered blocks of Exploration Licence 5890 over the five years of tenure between 1996 and 2001. The tenement is located in northwestern Arnhem Land and was granted in May 1996.

Exploration was carried out by PNC Exploration (Australia) Pty Ltd on behalf of the Yok Joint Venture partners, PNC Exploration (Australia) Pty Ltd, Cameco Australia Pty Ltd, and the Yok Aboriginal Corporation. 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 over the period included an airborne survey, geological mapping and rock sampling, stream sediment sampling and ground follow-up of airborne radiometric anomalies.

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 obtained from the work carried out. Geological interpretation has shown that most of the relinquished land is comprised of low prospectivity Nimbuwah Complex granitoids.

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1. INTRODUCTION

This report details exploration work completed within the relinquished blocks of Exploration Licence 5890 (EL5890) 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 734 and 5891.

Exploration is subject to the terms of consent documentation dated 1 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 Yok Joint Venture, a joint venture between the Arnhem Land West Joint Venture partners, PNC and Cameco Australia Pty Ltd, and the Yok Aboriginal Corporation. Commencing 1st April 2000, Cameco Australia Pty Ltd has assumed management of the project.

1.1. Location and Access

EL5890 is located in northwestern Arnhem Land and is wholly within Aboriginal land to the north of the now rehabilitated Nabarlek mine. The Oenpelli-Gurig National Park road traverses the western side of the tenement providing good access. No established tracks exist to the east, however the nature of the topography allows reasonable traversing by four-wheel-drive vehicles. Where necessary a helicopter was used to facilitate sampling and other activities.

[EL5890 Location Map](#)

1.2. Tenure

On granting, the original area of the tenement covered 1188 square kilometers (355 blocks) of which 160.3 square kilometres was 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. A waiver has been required for years three, four and five, with the latter being the first year where land was surrendered. For current year (year 6) the number of blocks retained was 193 instead of the statutory 133. The retention is equivalent to 72.5% of the remaining ground or 645.4 square kilometers.

[EL5890 Relinquishment Area 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.
- 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.
- Petrographic work by Pontifex and Associates, Adelaide.

1.4. Physiography

The relinquished sections of the tenement consist predominantly of gently undulating sandy plains and thin remnants of lateritised and weathered Cretaceous sediments that form scattered tablelands. The principal drainage systems are those of King River and Birraduk Creek.

1.5. Regional 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 interpreted 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 at Coronation Hill in the South Alligator Valley, 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

The relinquished sections of the licence were previously part of a much larger tenement held by Union Carbide Exploration Corporation, who carried out substantial exploration in the period 1970-1972, principally for uranium. They undertook a number of airborne surveys with much of the area flown utilizing a total count scintillometer. Hunting Geology and Geophysics compiled a photogeological interpretation. Ground reconnaissance and mapping would have formed the principal activity.

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

A brief outline of the work conducted is stated below and shown in the accompanying figure. The collated data is included in the linked accompanying appendices.

[EL5890 Work Completed 2001](#)

[Stream Sediment Location and Assay Data](#)

[BLEG Location and Assay Data](#)

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

[Rock Grab Sample Location and Assay Data](#)

[Petrology Sample Location Data](#)

[Mineral Petrology Report](#)

[Geophysical Logistics Report by Geoterrex 1996](#)

2.1. PNC 1996 Field Season

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

One rock specimen was collected for petrographical study.

Five stream sites were sampled. A 30kg bulk sample of -1.6mm material was collected for diamond indicator analysis at each site in addition to a 5kg sample for BLEG and geochemical analyses. 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 for geochemical analysis were divided into individual 2kg components 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 samples 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. Three radiometric anomalies were identified and named BIR6W, BIR6 and BIR7.

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

2.2. PNC 1997 Field Season

Fieldwork comprised the collection of one pisolith sample, four rock chip samples and 13 auger samples. The latter were analysed for Au, Al, As, Ba, Ca, Ce, Cr, Cu, Fe, K, Li, Mg, Mn, Mo, Na, Ni, P, Pb, Rb, S, Sr, Th, Ti, U, V, Y, Zn, and Zr.

The rock samples were analysed for all the above elements (La in addition) except Li, Cr, Rb, Sr, S, and Zr. Only one (5905) was analysed for Pt and Pd.

Several outcrops were checked and mapped.

Eight rock specimens were collected for petrographic description.

Two of the airborne radiometric anomalies, BIR6w and BIR6 are considered to be due to lateritic weathering and ferricrete development on radiometric high background basement granite, beneath and/or within shallow Cretaceous sediment cover.

[EL5890 BIR6 Map Auger 2001](#)

The other, BIR7 was located in an extensive swampy area adjacent to Jungle Creek on a slight slope away from Cretaceous sediment cover. No specific radiometric high was found during prospecting.

2.3. PNC 1998 Field Season

As part of the regional geochemical evaluation of Nimbuwah Complex, a stream sediment sampling program was implemented. The program, carried out with the aid of a helicopter, comprised 52 samples. Each sample consisted of 50 to 100g of -80 mesh material and was analysed for Au, As, Ce, Co, Cu, Fe, Mg, Mo, Ni, Pb, Th, total U, labile U, Y and Zn.

No major uranium anomalies were located. Values were generally in the range 0.67 to 5.05ppm, 31 samples had values in the 1.5 to 4.74ppm range. The area is noted for the generally high radiometric background due to the prevalence of granitic outcrop with high K and Th content. The majority of the stream sediment uranium anomalies can be attributed to Cretaceous cover in contact with basement. Gold values ranged from less than detection limit (1ppb) to 22ppb, 45 samples were consistent with background, of the seven slightly anomalous samples, three are Cretaceous related and the other four are lithological / fault related.

2.4 PNC 1999 Field Season

Follow-up of the weak gold anomalies from 1998 consisted of seven stream sediment samples and 58 hand auger samples in three east-west traverses.

All samples were analysed for the same suite of elements as the previous year.

No repetition of the gold anomalies was noted, and no uranium anomalies were found.

In addition the auger sample line traverses were covered by ground magnetics survey along the lines, totalling 5 line Km. Magnetics delineated a northwest - southeast structural feature.

No further work was carried out.

2.5 PNC 2000 Field Season

No further work was carried out.

3.0 BIBLIOGRAPHY

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