Cameco Australia Pty Ltd

Exploration Licence EL 5892

GOOMADEER PROJECT
PARTIAL SURRENDER REPORT

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SUMMARY

This report describes exploration work undertaken within the 36 surrendered blocks of Exploration Licence 5892 over the four years of tenure between 2000 and 2004. The tenement is located in northwestern Arnhem Land and was granted in July 2000.

Cameco Australia Pty Ltd carried out exploration on behalf of the Arnhem Land West Joint Venture, a joint venture between Cameco Australia Pty Ltd (Cameco), PNC Exploration (Australia) Pty Ltd (PNC) and the Mangingburru Aboriginal Corporation. PNCs involvement in the JV ceased in early 2002.

The focus of the exploration strategy is the discovery of unconformity-related uranium deposits. The nearby economic deposits at Ranger, Jabiluka, Koongarrra 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 during the period includes airborne surveys (fixed wing) and geological reconnaissance mapping. Six Rotary Air Blast (RAB) drill holes and four outcrop samples are located within the relinquished portion.

Geological interpretation and reconnaissance has shown that most of the relinquished land is comprised of low prospectivity Nimbuwah Complex granitoids intruded by late phonolitic dykes and overlain by Cretaceous to recent unconsolidated to semi-consolidated sands and sediments.
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INTRODUCTION

This report describes program activities carried out within the 64 relinquished blocks of Exploration Licence 5892 (EL 5892) during the three years of tenure from 25th July 2000 to 24th July 2003.

This work was conducted on behalf of the Arnhem Land West Joint Venture, a joint venture between Cameco Australia Pty Ltd (Cameco), PNC Exploration (Australia) Pty Ltd (PNC) and the Mangingburru Aboriginal Corporation. Since the Exploration Licenses are located on Aboriginal Land the exploration program was carried out under the terms of consent documentation agreed with the Northern Land Council pursuant to the Aboriginal Land Rights (Northern Territory) Act 1976.

Cameco Australia Pty Ltd (“Cameco”) as operator carried out the Work Program for the Mangingburru Joint Venture, in conjunction with exploration of the adjoining EL 2858 under the ‘Goomadeer Project’. PNC no longer has an interest in the tenement, having sold their assets and withdrawing from uranium exploration in Australia.

Location and Access

Exploration Licence 5892, which is part of the Goomadeer project, is located in northwestern Arnhem Land. The tenement is centred approximately 80 km northeast of the rehabilitated Nabarlek mine site and 130 km northeast of Jabiru. This tenement is situated immediately east of the Cameco operated King River Project.

The principal access is via the Oenpelli – Maningrida road that traverses the tenement west to east. Several subsidiary tracks service outstations in the region, for example Mamadawerre. Much of the country is flat lying with mostly woodland vegetation and can be accessed by four-wheel drive vehicle. Access to sandstone plateau country in the southeast corner of the tenement is by foot or helicopter.

Location Map

Tenure

EL5892 was granted on the 25th July 2000 for an initial period of six years. On granting, the total area covered by the licence was 806 km² with 109.5 km² excluded from exploration. On July 24 2002, 44 blocks were surrendered, and 64 blocks were surrendered on July 24, 2003. 36 Blocks were surrendered on July 24, 2004 representing 27% of the retained tenement, with Cameco retaining 96 blocks. A partial waiver of reduction was filed with the DME, as the tenement reduction does not fulfil the 50% requirement as stated in Section 26(1) of the Act.

EL5892 Relinquished Blocks 2004

Personnel

Two Cameco geologists and a traditional owner undertook the fieldwork.

Contractors and consultants used were:

- Airborne surveys by UTS, Perth.
- Helicopter assisted activities by Jayrow, Darwin.
Physiography

Much of the topography on the tenement is relatively flat lying and covered by savannah woodland. Several localised outliers of Kombolgie sandstone are present in the eastern half including a larger, heavily dissected mass in the southeastern corner, which marks the northern limit of the Arnhem Land plateau country in the region.

The principal drainages are the north flowing Goomadeer River, which originates in the Arnhem Plateau and Jungle Creek, which appears to be fed by springs in the Cretaceous along the western side of the tenement.

Regional Geology

The geology within the relinquished portions of the tenement is interpreted to consist principally of Palaeoproterozoic Nimbuwah Complex, all of which is obscured by Cretaceous sediments and Cainozoic deposits. There may also be Oenpelli dolerites intruding the basement rocks. Several outliers of Kombolgie sandstone, which were declared as no-go zones, have also been surrendered.

Regional Structure and Geological History

The early Proterozoic rocks of the region have been affected by the Top End orogeny (1880 to 1780 Ma) this includes the initial Nimbuwah Event, or Barramundi Orogeny at about 1870 Ma. This produced a prograde metamorphic effect with associated tight folding and faulting. The various ‘domains’ exhibited a variability of deformation and metamorphic grade with the western and eastern margins of the Pine Creek Inlier (Litchfield Province and Nimbuwah domain respectively) exhibiting the most pronounced effects.

Major regional faults, which affect the early Proterozoic, have northwest (Bulman), north-north-west (Aurari) and northerly (Anuru, Goomadeer) strikes. Another significant set trends to the east and includes both the Ranger and Beatrice faults. The Bulman Fault Zone is the principal regional feature and is considered to represent a long-lived, deep crustal structure, which has exerted a large lateral component in rocks of the Pine Creek Inlier.

A more intense concentration of structures traverse the mid Proterozoic and younger rocks and include northwest, north, northeast and north trends. Both faulting and jointing, with local displacements ranging from a few metres up to 100 metres heavily dissect Kombolgie sandstone.

The Goomadeer project area occupies the northwestern extension of the Arnhem Shelf in the northern McArthur Basin. Deposition of the Mamadawerre Sandstone took place in an environment of extension and local basin formation with probable fault-controlled sedimentation. Rapid thickening and thinning of the sequence member units imply a volatile flow regime, as observed in extensional environments.

The widespread Oenpelli Dolerite intrusive event took place at about 1715 Ma. Localised effects in the sandstone include silicification, the introduction of magnesium-rich to intermediate chlorite and the formation of muscovite-illite. A characteristic mineral assemblage of prehnite – pumpellyite - epidote has formed in the quartzofeldspathic basement rocks adjacent to the intrusions.
Tenement Geology

Based on the most recent NTGS mapping (Milingimbi 1:250000 geological series), the oldest rocks within the tenements are Palaeoproterozoic Nimbuwah Complex. These basement rocks are overlain by remnants of the Kombolgie subgroup. With the exception of the Kombolgie sandstone, only isolated and very scattered outcrop is present within the project area.

The Nimbuwah Complex consists of gneiss, migmatite and various granitic intrusive phases. The most recent age determinations place the Nimbuwah within 1870-1850 Ma. The ‘complex’ has an I-type granite origin and is considered to be, in part, intrusive into Palaeoproterozoic metasediments. (Carson and others 1999).

Kombolgie Subgroup (formerly Kombolgie Formation), which comprises the lower units of the early Proterozoic Katherine River Group, overlies the basement rocks. The Mamadawerre Sandstone, the fluviatile basal unit of the Kombolgie, outcrops as several outliers, typically heavily dissected. The most southeasterly larger block is almost square in outline, being controlled by a series of linear NNE and WNW structures. The age of the Mamadawerre has been constrained between 1822 and 1720 Ma and is probably closer to 1800 Ma (Sweet and others 1999).

Cretaceous remnants outcrop in various parts of the tenement usually along the erosional fringes of lateritised tablelands. These remnants usually overlie Nimbuwah basement rocks.

Intrusive rocks, which occur in the region other than the Nimbuwah granitoids include extensive sills and lopoliths of Oenpelli dolerite and several generations of younger crosscutting dolerite. NTGS mapping has identified only one outcrop of Oenpelli dolerite within the tenements. This is located in the southeastern corner of EL5892, occupying an east west structure within Kombolgie sandstone. Maningkorirr Phonolite is interpreted to intrude the Nimbuwah Complex rocks, with several RAB drill holes in the western portion of the tenement intersecting phonolite and Nimbuwah Complex granitoid rocks.

A variety of quaternary surficial materials cover much of the region.

EL 5892 Geology Map

Exploration Target

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.

Previous Exploration

EL 5892 was initially explored for uranium by Union Carbide Exploration Corporation in 1971 and 1972 as part of A to P 2543. Exploration consisted of airborne magnetic and radiometric surveys with follow-up sampling and geological mapping. Total Mining Australia Pty Ltd was the original applicant for EL 5892. Prior to that, a section of the tenement was included in EL 144, which was explored for uranium by the Ormac Aboriginal JV (Ocean Resources / McIntyre Mines) in the early 1970’s.
EXPLORATION PROGRAM ON SURRENDERED AREA

Summary of Completed Work By Year

2000-2001 Field Season

The 2000-2001 field season work program consisted of flying a fixed-wing magnetic, radiometric and DTM (digital terrain model) survey over the tenement area.

2001-2002 Field Season

A helicopter assisted regional reconnaissance program was conducted in order to follow-up and ground truth the airborne survey results. No outcrop of Palaeoproterozoic rocks or anomalous readings from prospecting activities was noted. Cretaceous sediments and recent alluvium/colluvium are the dominant units noted in these areas. Estimations of sediment thickness trends indicate that there is a higher degree of overburden in the northern region where the majority of the released ground lies.

One sample was taken as part of the regional sampling program within the relinquished blocks.

2002-2003 Field Season

A helicopter assisted regional reconnaissance program was conducted during the 2003 field season. Further follow-up and sampling of radiometric anomalies was completed, in conjunction with identifying and sampling exposed outcrop of Nimbuwah Complex basement rocks within the extensive areas of Cainozoic sand cover.

During early August 2002, a 341 km² hyperspectral survey was flown over the outcropping Kombolgie Sandstone within the Goomadeer project. The survey, consisting of five north-south flightlines, covers the portion of the exploration tenement containing exposed Kombolgie Sandstone.

2003-2004 Field Season

An airborne electromagnetic survey (TEMPEST) was flown in November 2003, and covered the sandstone portion of the tenement. TEMPEST is a high-powered time-domain system with a broad bandwidth, which enables good resolution of variations in resistivity and penetration through relatively thick sandstone. A small portion of the Tempest survey was included in the relinquished areas of the tenement.

Relinquished Exploration Data

All geophysical digital data covering the blocks relinquished has been submitted on CD with this report.

All work completed on the relinquished portion of EL5892 is displayed in the following figure.

EL5892 Work Completed Location Plan
Outcrop Sampling

Outcrop sampling coverage of the relinquished portion of EL5892 was completed over two years. Completed Work Location Plan shows the location of the four outcrop samples collected from within the relinquished blocks. During 2002, regional coverage of the sandstone, for the determination of background geochemistry, alteration, lithology and clay speciation, was completed with one sample, GD02B10013, occurring within the relinquished area. In 2003, a more regional program was completed with the aim of identifying and sampling any outcrop within areas mapped as Cainozoic sand cover, and also to sample Nimbuwah Complex granitoid rocks. Three samples from this program are located within the relinquished portion. One of these samples, GD03C10206 was coincident with an airborne radiometric anomaly, however sampling of the minimal outcrop exposure did not identify anomalous U in the granitoid rocks. The radiometric anomaly was identified as a small swampy floodplain.

No further work is recommended for these relinquished areas. All data shown in the following tables is included within the data directory of this report.

Outcrop Sample Locations
Outcrop Sample Physical Properties and Descriptions
Outcrop Sample Alteration and Structural Measurements
Outcrop Sample Geochemistry
Outcrop Sample PIMA TSG Measurements

RAB Drilling

Six RAB drill holes are located within the relinquished portion of EL5892. These drill holes were completed in 2002, as part of a regional program to determine basement lithologies below Cretaceous cover. Of the six drill holes, four of the holes penetrated Nimbuwah Complex granitoids, one hole was drilled into Maningkorrir Phonolite and one hole was abandoned within Cretaceous sediments. The data from the drilling is shown in the following drill logs, graphical strip plots and data sheets. All relevant data is contained within the data directory of this report.

GDR0001 Log
GDR0001 Strip Plot
GDR0002 Log
GDR0002 Strip Plot
GDR0003 Log
GDR0003 Strip Plot
GDR0004 Log
GDR0004 Strip Plot
GDR0006 Log
GDR0006 Strip Plot
GDR0007 Log
GDR0007 Strip Plot

RAB Drill Collars
RAB Drill Rock Types
RAB Drill Alteration
RAB Drill Geochemistry
RAB Drill Pima TSA
Airborne Geophysics

Airborne Geophysical and Hyperspectral Coverage

Airborne Radiometric and Magnetics

During July 2001, Universal Tracking Systems Pty Ltd (UTS) conducted an airborne magnetic, radiometric and DTM (digital terrain model) survey over the Goomadeer project (EL 2858 and EL 5892) totalling 5563 line kilometres. The survey was conducted at a flying height of 60m and at 200m spaced east-west flight lines. The primary aims of the survey were to locate any surface uranium enrichment worthy of ground truthing and to acquire data useful for future geological mapping.

Airborne Geophysics Logistics Report by UTS

Hyperspectral

During early August 2002, a hyperspectral survey was flown over the outcropping Kombolgie Sandstone within the Goomadeer project. The survey was conducted by De Beers utilising their HyMap MkI system, an airborne multi-spectral scanning instrument designed to map minerals and identify alteration. Cameco is utilising the instrument as an aid in locating alteration patterns associated with unconformity-style uranium deposits. It is hoped that the system will identify and map variations in clay types in the sandstone such as kaolinite, illite, dickite, halloysite and iron and magnesium chlorites as well as silicification.

The survey, consisting of five, north-south flightlines, covers the portion of the exploration tenement containing exposed Kombolgie Sandstone and totals 341 km$^2$.

Hyperspectral HyMap MkI Logistics Report by DeBeers

Hymap Mk I airborne hyperspectral scanner data collected over the Goomadeer project of northwestern Arnhem Land has identified and mapped the distribution of clay minerals within the Mamadawerre Sandstone. The general stratigraphic distribution of clays noted at Goomadeer is similar to that observed in other surveyed areas of northwestern Arnhem Land.

TEMPEST

Fugro Airborne Surveys Pty Ltd (Fugro) were contracted in 2003 to undertake an airborne electromagnetic TEMPEST survey at various locations within Arnhem Land including Goomadeer. The flight line spacing was 200 m and flying height was 120 m, totalling 942 line km. TEMPEST is a high-powered time-domain system with a broad bandwidth, which enables good resolution of variations in resistivity and penetration through relatively thick sandstone. In addition, the airborne platform allows electromagnetic data to be acquired over areas where ground geophysics is impractical due to rugged topography. The survey was flown with the aim of providing 3-D electromagnetic data to assist with the identification of structure/alteration and to infer the depth to the unconformity below sandstone.

Only small portions of the TEMPEST survey are located within the surrender area, consequently only the located data has been submitted with this report.
CONCLUSIONS AND RECOMMENDATIONS

The limited outcrop within the relinquished portions of EL 5892, and the interpreted unfavourable Nimbuwah Complex granitoid basement rocks in the area do not encourage further exploration efforts. The U prospectivity within the relinquished portion of the tenement is considered to be low. Any further exploration would require regional RAB drilling, or the like, in order to test the lithologies lying beneath sand and Cretaceous cover, and would prohibitively expensive.
BIBLIOGRAPHY

