Cameco Australia Pty Ltd

EXPLORATION LICENCES EL22784 AND 22785

MURALIDBAR PROJECT

NORTHERN TERRITORY

FINAL REPORT

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Authors:	Enos Mudinzwa, Geologist
Contact Details:	PO Box 35921 Winnellie NT 0821 Ph. 08 8947 3477
Email for further technical details:	enos_mudinzwa@cameco.com.au
Email for expenditure:	ratih_sagung@cameco.com.au
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Tenement manager:	AMETS
Copies:	Cameco Australia Pty Ltd (1) DRDPIFR - Minerals and Energy (1) Northern Land Council (1)

SUMMARY

Muralidbar is a uranium exploration project covering exploration licences EL 22784 (29 blocks) and EL 22785 (74 blocks), covering a total area of 255.28 km², which were granted to Cameco Australia Pty Ltd (Cameco) on 29th August 2005. The project is located approximately 250 km east of Darwin.

Cameco relinquished 4 of the 29 blocks from EL 22784 and 19 of the 74 blocks from EL 22785 in August 2008.

Exploration work conducted on the Muralidbar project during the four years of tenure comprised regional outcrop and stream sediment sampling, Tempest and HyMap hyperspectral surveys. 95 outcrop samples were collected from 2006 to 2009, to determine alteration patterns, background geochemistry and to delineate uranium anomalies as an indicator for potential uranium mineralisation. 29 stream sediment samples were collected in 2007.

The best uranium result from the outcrop and stream sediment sampling was 62.3 ppm U_3O_8, from sample MD064004, a weathered basalt sample collected at the Saratoga airborne radiometric anomaly in southern portion of EL 22784. Samples with uranium content between 1 and 40 ppm U_3O_8 are associated with weathered volcanic rocks, laterite or ferruginous gravel, with one exception being MD060001. Sample MD060001 is of ferruginous Cretaceous sandstone from the Saratoga anomaly area and returned 19.8 ppm U_3O_8. The elevated uranium content is interpreted to relate to scavenging of uranium leached from the volcanic rocks.

The TEMPEST survey conducted in 2007 failed to identify any electromagnetic response and is attributed to a lack of graphite within the basement rocks. The HyMap hyperspectral survey identified several targets characterised by strong or potentially interesting spectral signatures. No hyperspectral anomalies of clear hydrothermal origin were identified in the survey.

There have been no encouraging results returned from the exploration work carried out in the Muralidbar tenements to date. Cameco Australia surrendered Exploration Licences 22784 and 22785 on 28th August 2009.

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Cameco Australia
Muralidbar Project

EL's 22784 & 22785
2006 - 2008 Work Areas
1:250K AGSO Geology

Compiled by: GEO 31/5/2008
Scale: 1:55000
Coord. System: AMG Zone 53 (AGD 66)
Figure

Outcrop Sample Locations

- 2006 samples
- 2007 samples
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INTRODUCTION

Muralidbar project (ELs 22784 and 22785) is a uranium exploration project located in western Arnhem Land, Northern Territory, and is operated by Cameco Australia Pty Ltd (Cameco). The Muralidbar tenements were granted to Cameco on August 29, 2005, for a period of six years. When granted, the project consisted of 103 blocks covering a total area of 328.42 km².

The Muralidbar project is located on Aboriginal Land and the exploration programs were carried out under the terms of consent documentation agreed with the Northern Land Council (NLC) pursuant to the Aboriginal Land Rights (Northern Territory) Act 1976.

The project area is underlain by basement rock units of the Nimbuwah Complex, which are unconformably overlain by Kombolgie Subgroup sandstone. The basement rocks and the Kombolgie Subgroup are intruded by sills and dykes of the Oenpelli Dolerite. Favourable structures and hydrothermal alteration occurs in the region with several uranium occurrences identified in the surrounding project areas, indicating a favourable mineralising and alteration event.

The prime objective is to discover economic 'unconformity style' uranium mineralisation by targeting geological settings similar to the known deposits of the Alligator Rivers Region, Northern Territory, and the concealed high-grade deposits of the Athabasca Region, Saskatchewan, Canada.

Field investigations during the four years of tenure focused on tenement-wide reconnaissance, rock sampling and geophysical surveys. 124 geochemical samples were collected during the period of tenure. No encouraging results have been obtained from exploration work conducted in the Muralidbar project area. Cameco surrendered Exploration Licences 22784 and 22785 on 28th August 2009.

Location and Access

EL 22784 and 22785 are located in western Arnhem Land, Northern Territory on the Millingimbi (SD-5302) 1:250 000 scale topographic map sheet and the Goomadeer (5673) 1:100 000 scale topographic map sheet. The tenements are centred approximately 90 km north-east of Jabiru and 35 km south-east of the now rehabilitated mine site at Nabarlek (Figure 1). Access is either by air to the Nabarlek or Mamadawerre airstrips, or by road via the Arnhem Highway to Jabiru and then via Cahill's Crossing and unsealed roads towards Mamadawerre outstation.

Figure 1: Muralidbar Project (EL 24784 and 24785) Location Map

The remote and rugged nature of the sandstone covering most of the Muralidbar tenements resulted in all exploration activities being helicopter supported. Helicopter access was based from a semi-permanent exploration camp located on Tin Camp Creek, named 'Myra Camp'. Road access to Myra Camp is via the Arnhem Highway to Jabiru and bitumen road to Cahill's crossing, then by dirt road via Oenpelli and Nabarlek.

Tenure

EL 22784 and EL 22785 (Muralidbar project) was granted to Cameco on 29th August 2005 for an initial period of six years with an original area of 103 blocks covering a 328.42 km². Currently the project consists of 80 blocks for and area of 255.28 km^2.

The Muralidbar project is located within an Arnhem Land Aboriginal Reserve and is subject to an Exploration Consent Deed with the Northern Land Council (NLC) on behalf of the Traditional Owners. Muralidbar contains areas that are sensitive or have cultural and/or social significance to the Traditional Owners, 'No Go Areas', and are excluded from exploration access (Figure 1).

Cameco relinquished 4 of the 29 blocks from EL 22784 and 19 blocks of the 74 blocks from EL 22785 in 2008 (Figure 2). Cameco surrendered EL 22784 and EL 22785 on 28th August 2009.

Figure 2: 2008 Muralidbar Relinquished areas

Regional Geological Setting

The Muralidbar project area is located within the eastern margin of the Neoarchaean and Palaeoproterozoic Pine Creek Orogen, in the Nimbuwah Domain of the Alligator Rivers region (Figure 3).

Figure 3: Simplified geology of the Pine Creek Orogen showing the location of selected mineral deposits (after Pirajno and Bagas, 2008)

This section is largely based on the work by Needham (1988, 1990), and Needham and Stuart-Smith (1980). Information that is not based on these references is indicated below.

The Bureau of Mineral Resources (now Geoscience Australia) completed 1:250 000-scale geological maps of the Pine Creek Orogen between the 1940s and 1960s following the discovery of uranium at Rum Jungle. The Alligator Rivers region was systematically mapped by the Bureau of Mineral Resources and the Northern Territory Geological Survey between 1972 and 1983. This later work produced 1:100 000-scale geological maps and reports for the region from Darwin to Katherine to the Alligator Rivers region.

Figure 4: NTGS 1:250, 000 Regional Geology

The oldest exposed rocks in the Alligator Rivers region are included in the Neoarchaean (ca. 2500 Ma) Nanambu Complex. The complex consists of paragneiss, orthogneiss, migmatite, and schist forming domical structures that are unconformably overlain by Palaeoproterozoic metasedimentary and metavolcanic rocks, which were formerly included in the Pine Creek Geosyncline. Palaeoproterozoic rocks in the Alligator Rivers region are amphibolite-facies psammites assigned in the Mount Howship Gneiss and the Kudjumarndi Quartzite. These formations are included in the Kakadu Group and are probably correlatives of the Mount Basedow Gneiss and

Munmarlary Quartzite, respectively (Ferenczi et al., 2005). The group appears to on-lap Neoarchaean basement highs, but gneissic variants are also thought pass transitional into paragneiss of the Nanambu Complex.

The Cahill Formation of the Namoona Group conformably overlies the Munmarlary Quartzite. The lower part of the Cahill Formation (informally referred to as the Lower Cahill Formation) hosts the Nabarlek, Ranger and Jabiluka uranium deposits. The Lower Cahill Formation consists of a structurally lower calcareous marble and calc-silicate gneiss, which is overlain by pyritic, garnetiferous and carbonaceous schist, quartz-feldspar-mica gneiss, and minor proportions of amphibolite.

The informally named Upper Cahill Formation is psammitic and consists of feldspar-quartz schist, quartzite, lesser proportions of mica-feldspar-quartz-magnetite schist, and minor proportions of metaconglomerate and amphibolite. The Cahill Formation is magnetic and significantly so at the base of psammitic unit in what is informally known as 'hangingwall sequence'. The magnetic characteristic of this unit is due to the presence of mafic sills or magnetite and it is a useful characteristic used to distinguishing the Cahill Formation from surrounding less magnetic rocks (Kendall, 1990). Mafic sills and dykes assigned to the Goodparla and Zamu dolerites intrude the Upper Cahill Formation.

The Nourlangie Schist overlies the Cahill Formation and consists of argillaceous to quartzose phyllite and quartz-mica schist that locally contain garnet and staurolite.

The supercrustal rocks of the region are structurally complex, having been affected by at least three deformation event before deposition of the late Palaeo- to Mesoproterozoic Kombolgie Subgroup (Thomas, 2002). The rocks have also been locally migmatisation during the ca. 1847-30 Ma Nimbuwah Event. In addition, there is a broad trend of increasing grade from southwest to northeast in the Nimbuwah Domain. This gradient is thought to reflect the synchronous emplacement of ca. 1865 Ma granites in the Nimbuwah Complex.

The Kombolgie Subgroup is the basal unit of the late Palaeo- to Mesoproterozoic Katherine River Group of the McArthur Basin (Sweet et al., 1999a, b). The subgroup consists of sandstone units called the Mamadawerre Sandstone, Gumarrirnbang Sandstone, and Marlgowa Sandstone, which are divided by thin basaltic units called the Nungbalgarri Volcanics, and Gilruth Volcanics. The Mamadawerre Sandstone has a minimum age of ca. 1700 Ma, which is the minimum age of the intrusive Oenpelli Dolerite. Detrital zircon SHRIMP data from the GA OZCRON database constrain the maximum age of the sandstone at ca. 1810 Ma.

The Oenpelli Dolerite is the most pervasive mafic intrusive suite to affect the Alligator Rivers region and is the youngest Proterozoic rock unit exposed. It intrudes various units Neoarchaean and Palaeoproterozoic units, and the Kombolgie Subgroup, forming magnetic sills, dykes, lopoliths, and laccoliths. The Oenpelli Dolerite has a SHRIMP U-Pb baddeleyite date of 1723 ± 6 Ma (Ferenczi et al., 2005), however, geochemical and geophysical data suggest several phases of intrusion throughout the region. These intrusive events had a pronounced thermal effect within the Kombolgie Subgroup, with the promotion of fluid flow and aquifer or aquitard modification. Localised effects in the sandstone include silicification, desilicification, chloritisation, sericitisation, and

pyrophyllite alteration. A characteristic mineral assemblage of prehnite-pumpellyite-epidote has formed in the quartzofeldspathic basement rocks adjacent to the intrusions.

Deformation since deposition of the Katherine River Group includes transpressional movement along steep regional-scale strike-slip faults and possibly some shallow thrusting. These regional faults follow a pattern of predominantly north, northwest, north – northwest and northeast strikes, giving rise to the characteristic linearly dissected landform pattern of the Kombolgie Plateau. Another significant set trends east-west and includes both the Ranger and Beatrice Faults.

The Bulman Fault Zone is a principal regional feature and is considered to represent a long-lived deep crustal structure, with a large lateral component in rocks of the PCS. However, it appears that post-Kombolgie displacements along this and other faults have not been great, because the Arnhem Land Plateau is essentially coherent and offsets along lineaments are generally minor. Field investigations of many interpreted 'faults', including those with a marked geomorphic expression, show no displacement, and are best described as joints or lineaments (Thomas 2002).

Erosional remnants of flat-lying Palaeozoic Arafura Basin and Cretaceous Carpentaria Basin are present as a veneer throughout the coastal zone of the Top End. Various regolith components are ubiquitous as cover throughout much of the region.

Local Geology

The geology of the region can be divided into two geological domains, a north-western domain of crystalline basement, bounded from the McArthur Basin sedimentary succession to the south-east by the north-east-trending Goomadeer Fault (Figure 5). The project lies at the western extremity of the main surface expression of the Nimbuwah Complex, which occupies coastal plains and escarpment country west of the tenement, centred on King River. It is likely that the boundary between this complex and the high-grade metamorphics of the Pine Creek Orogen (i.e. the 'transitional zone' of the Nimbuwah Complex; Needham, 1988) is located immediately west of the tenement near a uranium occurrence known as the Steven's prospect.

Figure 5: Local Geology of Muralidbar Project

The transitional zone of the Nimbuwah Complex is represented by amphibolite to granulite facies pelitic to psammopelitic gneiss and migmatite of the Myra Falls Metamorphics. The recently released NTGS 500k scale GIS compilation for the Pine Creek Orogen specifies that these metamorphics belong to the Cahill Formation, based largely on geophysical character.

Sedimentary rocks of the Lower Kombolgie Subgroup (Sweet et al., 1999a) unconformably overlie (and obscure) basement in the central, southern and western parts of the tenement (Figure 5). The basal formation, the 100-250 m thick Mamadawerre Sandstone, forms a deeply dissected plateau surface. This area is composed largely of bare rock with sparse areas of shallow sandy soil supporting spinifex and scrub. Sandstone is quartzose to lithic and fine- to very coarse-grained

with a variety of fluviatile to shallow high-energy marine bedforms, including trough and planar cross-beds (Ojakangas, 1979).

The Mamadawerre Sandstone is unconformably overlain by the Nungbalgarri Volcanics. The Nungbalgarri Volcanics consist of multiple vesicular and amygdaloidal basaltic flows. The regional stratigraphic thickness of the volcanic unit is variable between 50 m and 130 m, however, it may also be locally absent (Carson et al., 1999).

The Gumarrirnbang Sandstone, which occupies approximately one third of the tenement (Figure 5), disconformably overlies the volcanics, is comprised of fine- to coarse-grained quartz sandstone with scattered pebbly units. Sedimentary structures include planar and trough cross-stratification, ripples and horizontal planar stratification, suggesting a proximal to distal fluvial braided stream and estuarine depositional environment (Sweet et al., 1999b).

Exploration Target

The focus of the Cameco exploration strategy is the discovery of unconformity-style uranium deposits. There is also additional potential for gold, palladium and platinum Coronation Hill-style deposits of the South Alligator Valley (SAV) region.

The major deposits in the area (Ranger, Jabiluka, Koongarra and Nabarlek) appear to have a common position relative to the base of the Kombolgie Subgroup i.e. Palaeoproterozoic unconformity, or to its erosional margin, and serve here as exploration models. Features such as down-faulted blocks of Kombolgie Sandstone (i.e. footwall blocks of reverse faults) are juxtaposed adjacent to the mineralisation at Ranger No. 3 orebody, are considered to be indicative of a favourable setting for the concentration of mineralising fluids within structurally disrupted unconformity settings.

The SAV and Rum Jungle-Waterhouse deposits also exhibit spatial relationships to Palaeoproterozoic unconformities. The SAV deposits tend to be more gold-enriched and are characterised by the presence of palladium and platinum selenides. The Sargents and Kylie styles of mineralisation, located south of Rum Jungle on the fringe of the Archaean Waterhouse Complex, have some similarities to the SAV with Au-PGE enrichments in association with uranium.

PREVIOUS EXPLORATION

Exploration in the Alligator Rivers region of the Northern Territory can be divided into two phases. The first phase of exploration commenced in 1970 and continued until September 1973 when a Federal Government moratorium on mineral exploration on Aboriginal Land halted exploration activities. Exploration in West Arnhem Land eventually recommenced in 1986 and in the Muralidbar Project area itself in 1997.

Period 1997-2001

1997-1998

Exploration activities included a helicopter-borne magnetic-radiometric geophysical survey (8,500 km), followed up by ground reconnaissance over 67 selected

radiometric anomalies (Alonso and Kastellorizos 1998). Selected samples were geochemically analysed.

1998-1999

Five helicopter-supported diamond drill holes (KBW01-05) totalling 1,278 m were drilled on EL3347 during the second year of exploration (Kastellorizos 1999). The aim of the program was to test the geological nature of the underlying basement, with a strong focus on the major structural zones. KBW04 intersected 174 ppm U_3O_8 in clay altered sandstone 60 m above the unconformity.

1999-2000

Five helicopter-supported drill holes (KBW06 to KBW10) for 1,359 m were completed (Fabray, Bisset et al. 2000) and NanoTEM ground EM traverses were carried out across the Daniel Fault. These lines show a number of offsets related to the fault.

A helicopter supported regional stream sediment survey and limited radiometric anomaly follow up was also carried out. Results were low-order and no further follow-up was conducted before the ground relinquishment (Ewington 2001).

The ground incorporating Muralidbar was relinquished during the forth year of tenure (Ewington, 2001).

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2005

Cameco was granted the Muralidbar tenements on 29th August 2005. Due to the granting of the tenements late in field season, Cameco could not arrange work program meetings or conduct any field based exploration activities during the reporting period.

Cameco was able to prioritise follow up areas as part of the work program scheduled for the following season.

2006

54 samples were collected from the Muralidbar project in 2006. The focus was on sampling the Daniel Fault which shows vertical offsets and has small radiometric anomalies along its length. No uranium anomalies were found beyond known ARAD anomalies in the Nungbalgarri Volcanics.

MD060004 returned the best result of 62.3 ppm U_3O_8 in Nungbalgarri Volcanics collected at the Saratoga airborne radiometric anomaly in the southern portion of EL 22784. The remaining samples returned uranium results between 5 and 40 ppm, dominantly from weathered volcanic rocks, laterite or ferruginous gravels. One exception is MD060001 which returned 19.8 ppm U_3O_8 in ferruginous Cretaceous sandstone collected at the Saratoga anomaly.

Refer to Figure 6 for the 2006 sample locations.

Table 1: 2006 Outcrop Samples descriptions

TEMPEST airborne EM and HyMap hyperspectral surveys were conducted in the Muralidbar tenements in 2006. The TEMPEST survey failed to identify any electromagnetic response, which can be attributed to graphite within the basement rocks. Rather, increases in conductivity are due to cover and also the Nungbalgarri Volcanic Member (towards the east).

The HyMap hyperspectral survey resulted in the identification of several targets characterised by strong or potentially interesting spectral signatures; no anomalies of clear hydrothermal origin were identified. The 2006 exploration program failed to identify high priority targets.

2007

The sampling program was designed to test uranium prospectivity of the anomalous clay zones interpreted from the hyper spectral and to conduct reconnaissance in areas that had not been previously explored. A total of 26 outcrop samples and 29 stream sediment samples were collected during the program. Sampling traverses were conducted in areas of anomalous clay zones in order to determine the validity of the Hymap interpretation. Strong illite signatures were identified at the base of the Gumarrirnbang Sandstone along the Daniel Fault.

Figure 6: Location of 2006 -2007 Outcrop Samples

Table 2: 2007 Outcrop and Stream sediment Sample descriptions

Sample MD073013 returned the best result of 21.8 ppm U_3O_8 in moderately hematite altered Nimbuwah Complex granite. MD073013 was collected proximal to the exposed clay altered unconformity with the overlying Mamadawerre Sandstone. Samples from the surrounding Mamadawerre Sandstone and basement Nimbuwah Complex granite did not enhance the uranium prospectivity of the area, and further follow-up work in the vicinity of MD073013 was not considered.

Stream sediment sampling carried out by the Kunbohwinjgu Joint Venture during 2000 identified anomalous U samples that were not fully assessed or followed up. 29 stream sediment samples were collected in 2007 to follow up on the previous work, but the results did not indicate any areas requiring further work.

All data can be found in the DATA directory accompanying this report.

EXPLORATION PROGRAM: REPORTING PERIOD 2008 - 2009

The 2008 field program consisted of helicopter-supported outcrop sampling, mapping and reconnaissance based out of Myra Camp. The program collected a total of 15 rock samples. A summary of the work completed during the four years of tenure is given in Table 3. Refer to Figure 7 for the location map of the sample sites. A summary of the lithologies is given in Table 7.

Table 3: Summary for Exploration period 2006 - 2008

Figure 7: Location of Outcrop Samples

Outcrop sampling and processing was performed using Cameco standard methodology, as outlined in Appendix 1. This appendix details methodology used for reflectance spectroscopy, laboratory techniques and methods, and analysed elements. All samples were submitted to Northern Territory Environmental Laboratories (NTEL) in Darwin for geochemical analysis. The laboratory sample preparation, analytical methods and techniques and analysed elements can also be found within Appendix 1.

Appendix 1: Cameco Standard Outcrop Sampling and Processing Procedures

The following tables details the data and results from samples collected during the program. All data can be found in the DATA directory accompanying this report.

Table 4: Outcrop Sample Alteration

Table 5: Outcrop Sample TSA Clay Minerals

Table 6: Outcrop Sample Geochemistry Results

Table 7: Outcrop Sample Descriptions and Properties

The 2008 geological reconnaissance and outcrop sampling program focussed on sampling major lineaments and cross cutting structural features. Crosscutting structural features and lineaments were considered significant in the study because they act as pathways for ore bearing fluids.

The best uranium result in 2008 was gained from MD080505 with 1.5 ppm U_3O_8 in medium grained sandstone with irregular purple hematite altered zones. Samples surrounding MD080505 returned uranium results below 1 ppm U_3O_8 and are considered to be within expected background values of the Mamadawerre Sandstone. Illite is the dominant clay mineral in MD080505, and is not considered anomalous.

MD0803001 which was collected in the south eastern portion of EL 22784 within Gumarrirnbang Sandstone returned a uranium result below 1 ppm U_3O_8 which is considered to be within expected background values of the Gumarrirnbang Sandstone unit.

The 2008 exploration program failed to identify any targets which warrant further work.

CONCLUSIONS AND RECOMMENDATIONS

The results from exploration during the four years of tenure have been largely disappointing and have not increased the prospectivity of the Muralidbar project area. The first three years of exploration focused on the Daniel Fault system. The Daniel Fault system displays small radiometric anomalies and shows vertical offsets which were interpreted as possible pathways for ore bearing fluids. This common association of structures and uranium mineralisation is considered to be indicative of a favourable setting for the concentration of mineralising fluids.

Indications of potential uranium mineralisation along the Daniel fault have only been identified in ferruginous Cretaceous sandstone and weathered basaltic rock units and are interpreted to have resulted from the scavenging of uranium from meteoric waters and precipitation within Fe-oxides derived from weathering of the Nungbalgarri Volcanics into the Cretaceous Sandstone. Uranium mineralisation has also been attributed to enrichment by ferruginisation during weathering of the basaltic rock units. The majority of the samples collected from the Muralidbar project area returned uranium results between 1 and 40 ppm U_3O_8 which are considered to be within expected background values of the various stratigraphic rock units in the Muralidbar tenements.

The TEMPEST survey failed to identify any electromagnetic response within the basement rocks. Surface conductors proximal to the Nabarlek Deposit have been postulated to relate to alteration of dolerite and represent second order conductive targets; however no such strong conductors were identified within the Muralidbar survey area. The HyMap hyperspectral survey did not identify any clay anomalies that may be related to hydrothermal alteration.

The results from the various geochemical and geophysical surveys and subsequent follow-up sampling programs have revealed uranium mineralisation in the Muralidbar tenements to be related to Cretaceous sandstone and weathered basaltic rocks. No clear targets have been determined from the geochemical anomalies. Further work to ascertain the uranium prospectivity of the Muralidbar tenements is not warranted due to the lack of supporting evidence from geophysics, geochemistry and geological mapping.

Results from the exploration work have failed to increase the prospectivity of the project leading to the surrender of Exploration Licences 22784 and 22785 at the end of four years of tenure.

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