Cameco

Cameco Australia
EXPLORATION

Beatrice

Northern Territory

Annual Technical Review

CONFIDENTIAL

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Period:	3 July 2012 to 2 July 2013

EL 24291
EL 26796

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Target commodity:	Uranium
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Map Sheets:	1:250K Alligator River SD5301 1:100K Howship SD5572
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SUMMARY

The Beatrice project comprises two exploration licences (EL 24291 and EL 26796), located in western Arnhem Land, approximately 250 km east of Darwin. The project exploration licences were granted to Cameco Australia Pty. Ltd. (Cameco) on 04 July 2008. The Beatrice project tenements (EL 24291 and EL 26796) were granted amalgamated technical and expenditure reporting status by Northern Territory Department of Resources (now the Department of Mines and Energy) on 09 November 2011. The approved and allocated group reporting ID is GR 043/09.

The focus of Cameco's exploration strategy in Arnhem Land is the discovery of unconformity-related uranium deposits. The archetype unconformity-style uranium deposits are found in the Athabasca Basin of northern Saskatchewan, Canada. The prospective nature of the Alligator Rivers region is demonstrated by the presence of nearby deposits at Ranger, Jabiluka, Koongarra, and the now depleted Nabarlek Mine. The presence of gold, palladium and platinum in these deposits and the economic gold-platinum resource at Coronation Hill in the South Alligator Valley, indicates an additional potential for this deposit style. These major deposits appear to have a common position relative to the base of the Kombolgie Subgroup i.e. the Paleoproterozoic unconformity, or to its erosional margin, and serve here as exploration models.

The Beatrice project is considered to be prospective for uranium mineralisation because of the proximity to the unconformity between metasedimentary packages and the overlying Kombolgie Subgroup, and association of chlorite and hematite altered breccia with fault structures. In addition, alternative mineralisation styles are also present in the area, such as the shear-zone hosted mineralisation at the Beatrice prospect.

The exploration program for the reporting period consisted of one helicopter-supported drillhole, BTDD0001. The drillhole intersected intervals of granitoid gneiss and granitoid with porphyritic texture from the top of the drillhole until 77.4 m, granitic gneiss from 77.4 – 95.7 m and equigranular biotite-rich granodiorite from 95.7 m to the end of the drillhole at 206.8 m. Structural disruption is limited to several sheared intervals within biotite-rich granodiorite. There is no evidence of strong hydrothermal alteration or elevated radioactivity.

Eligible exploration expenditure Cameco Australia Pty Ltd for EL 24291 and EL 26796 during the reporting period was $337,193 and $0 respectively.

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INTRODUCTION

The Beatrice project comprises two exploration licences (EL 24291 and EL 26796), located in western Arnhem Land in the Northern Territory, Australia.

The 2012 exploration activities consisted of helicopter-supported diamond drilling with one drillhole, BTDD0001, completed. Contractors used during the operating period to complete the exploration activities include:

- Winmax Drilling Pty. Ltd., East Victoria Park, WA
- Jayrow Helicopters Pty. Ltd., Darwin, NT

Title History

ELs 24291 and 26796 were granted on 04 July 2008 for a tenure period of six years. At the time of grant, the total area covered by the two licences was 356.99 km^2 (131 sub-blocks), comprising 337.21 km^2 (121 sub-blocks) on EL 24291 and 19.78 km^2 (10 sub-blocks) on EL 26796.

In May 2011 a waiver of reduction was submitted to the Department and subsequently approved on 29 July 2012. In June 2012 another waiver of reduction was submitted to the Department and also approved.

Exploration has been conducted by Cameco Australia Pty. Ltd. (Cameco) over EL 24291 and EL 26796 for five of the six years of tenure, with one year remaining ending 03 July 2014. Cameco is the tenement holder and sole operator of both tenements.

Location and Access

ELs 24291 and 26796 are non-contiguous exploration licences located in western Arnhem Land in the Northern Territory of Australia (see Figure 1). The project area is centred about 260 km east of Darwin, 230 km northeast of Katherine, and 45 km east of Jabiru.

The tenements are located on map sheets:

1:250,000: Alligator River (SD-5301)

1:100,000: Howship (SD-5572)

1:50,000: Mount Howship (5572-4)

There are no current access tracks to the area and the tenements are only accessible by helicopter.

Exploration in the 1970s was via a track that was constructed from the Nabarlek mine site through the East Alligator River valley to the Beatrice prospect. This track no longer exists.

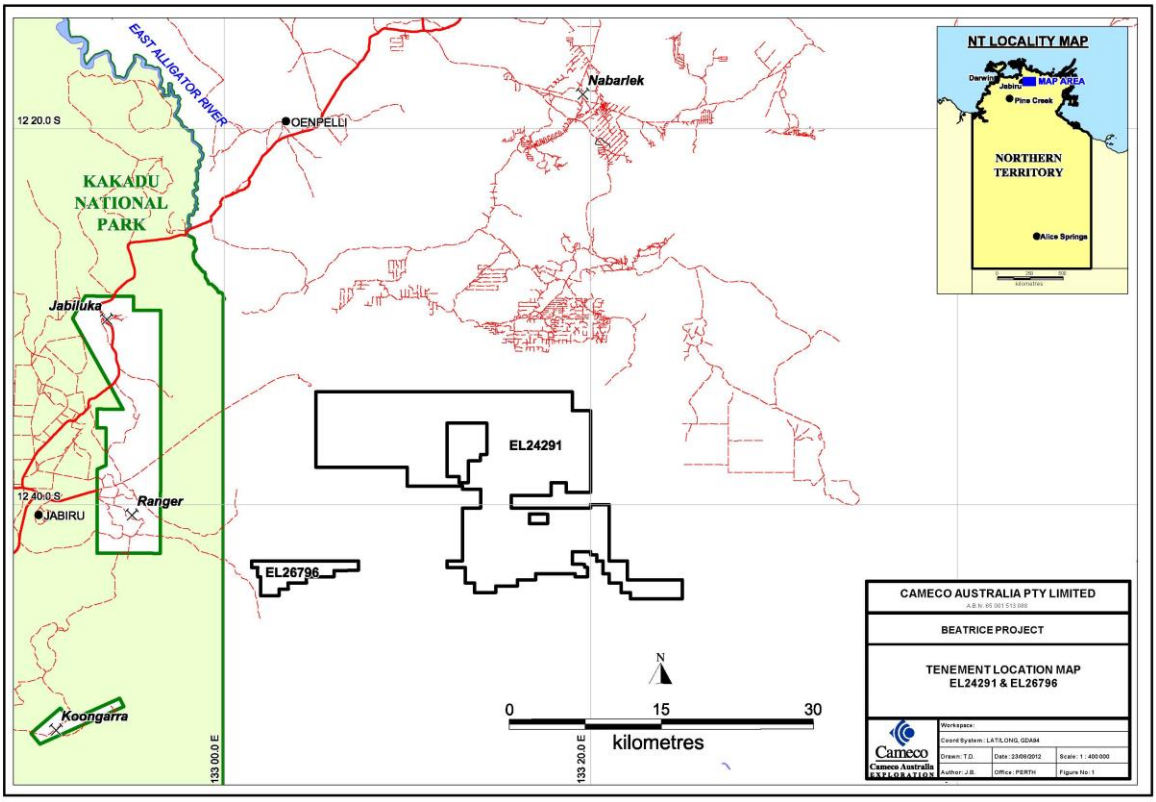

Figure 1. Beatrice Tenement Location Map

Physiography

The topography of the southern portion of EL 24291 is dominated by deeply jointed Kombolgie Subgroup sandstone plateau, bisected on the eastern side by the southeast trending East Alligator River. The sandstone can form local escarpments up to 80 m high. The northern portion of the tenement has high sandstone escarpments to the east and west, with smaller rounded hills in the central area.

Vegetation varies with geology and topography but generally consists of eucalyptus scrubland, isolated remnants of monsoonal forest confined to deep gorges, and grassland dominating the northern central hills.

EL 26796 is dominantly covered by Kombolgie Subgroup sandstone with deeply incised valleys. A creek bisects the northeastern portion of the tenement. A small area in the northwestern corner comprises undifferentiated Cenozoic sediments.

Regional Geology

The regional geology of Arnhem Land has been systematically and intensely studied and described in detail since 1946, including work from the Bureau of Mineral Resources (BMR) (1972 – 1988), the Northern Territory Geological Survey (late 1990's to 2008), Geoscience Australia (2004) and many previous reports for Cameco Exploration Licences in the western Arnhem Land area. Studies included geological mapping and reconnaissance, as well as regional-scale and deposit-scale

metallogenic research. Only a brief summary and overview of the geology is provided in this report. The regional geology section is largely based on the work by Needham (1998 and 1990), and Needham and Stuart-Smith (1980). Information that is not based on these references is indicated below.

The Beatrice project area is located at the northeastern margin of the Neoarchean and Paleoproterozoic Pine Creek Orogen, which has been subdivided into the Nimbuwah Domain of the Alligator Rivers region.

The Bureau of Mineral Resources (now Geoscience Australia) completed 1:250,000 geological maps of the Pine Creek Orogen between the 1940s and 1960s, following the discovery of uranium at Rum Jungle, near Batchelor. The Alligator Rivers region was systematically mapped by the BMR and the Northern Territory Geological Survey between 1972 and 1983. This later work produced 1:100,000 geological maps and reports for the region from Darwin to Katherine to the Alligator Rivers region (refer to Figure 2).

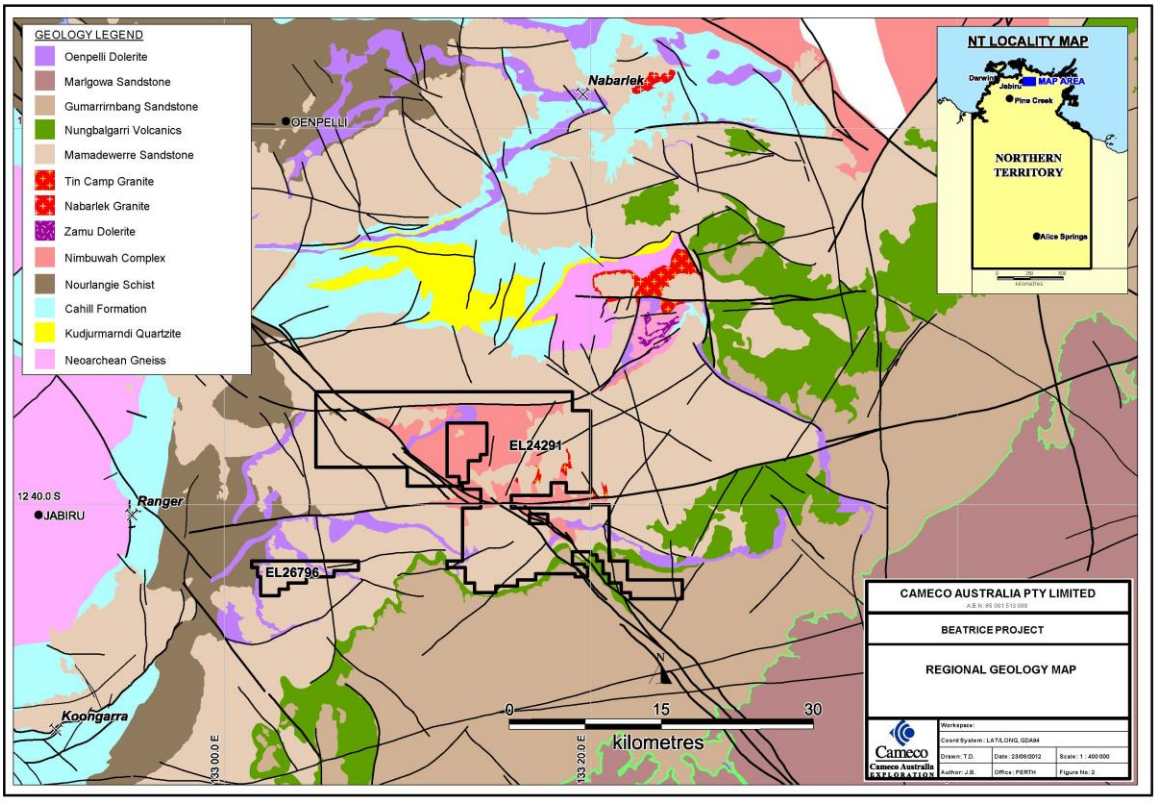

Figure 2. Regional geology of the Beatrice Project area

The oldest exposed rocks in the Alligator Rivers region are part of the Neoarchean (ca. 2,500 Ma) Nanambu Complex. The complex consists of paragneiss, orthogneiss, migmatite, and schist forming dome-like structures that are unconformably overlain by Paleoproterozoic metasedimentary and metavolcanic rocks, which were originally included in the Pine Creek Geosyncline. Recent collaborative research work by the NTGS and Geoscience Australia indicates that SHRIMP U-Pb age dating of an area of previously mapped as Myra Falls Metamorphics outcropping within the Myra Inlier is Neoarchean in age (Hollis et al., 2009a). Age dating of quartzofeldspathic gneiss samples has yielded two age groups 2.67 – 2.64 Ga and 2.53 – 2.51 Ga (Hollis et al., 2009b). Gneiss with ages

dated at 2.53 – 2.51 Ga is informally named as 'Kukalak Gneiss' and gneiss with age dated at 2.67 – 2.64 Ga is informally called the 'Arrarra Gneiss' (Hollis et al., 2009a).

Paleoproterozoic lithologies in the Alligator Rivers region are amphibolite facies psammites assigned to 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 Neoarchean basement highs, with gneissic variants thought to pass transitionally into paragneiss of the Nanambu Complex.

The Cahill Formation of the Namoona Group conformably overlies the Kudjumarndi 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, overlain by pyrite-garnet-bearing carbonaceous schist, quartz-feldspar-mica gneiss, and minor amphibolite.

The informally named Upper Cahill Formation is overall psammitic and consists of feldspar-quartz schist, quartzite, minor mica-feldspar-quartz-magnetite schist, metaconglomerate, and amphibolite. The Upper Cahill Formation contains a magnetic horizon that is significant at the base of the psammitic unit in what is informally known as 'hangingwall sequence'. The magnetic characteristics of this unit are due to the presence of mafic sills or magnetite and it is used for distinguishing the Cahill Formation from occasionally ambiguous surrounding less magnetic lithologies (Kendall, 1990). Mafic sills and dykes assigned to the Goodparla and Zamu Dolerites intruded the Cahill Formation prior to metamorphism.

The Nourlangie Schist overlies the Cahill Formation and consists of argillaceous to quartzose phyllite and quartz-mica schist with local garnet and staurolite porphyroblasts.

The supracrustal rocks of the region are structurally complex after having been affected by several deformation events before deposition of the late Paleo- to Mesoproterozoic Kombolgie Subgroup. The lithologies have also been locally migmatized during the ca. 1,847 ± 30 Ma Nimbuwah Event. In addition, there is a broad trend of increasing metamorphic grade from southwest to northeast in the Nimbuwah Domain. This gradient is thought to reflect the synchronous emplacement of ca. 1,865 Ma granites in the Nimbuwah Complex.

The Kombolgie Subgroup is the basal unit of the late Paleo- to Mesoproterozoic Katherine River Group of the McArthur Basin (Sweet et al., 1999). The subgroup consists of sandstone units known as the Mamadawerre Sandstone, Gumarrirnbang Sandstone, and Marlgowa Sandstone, which are divided by thin basaltic units, the Nungbalgarri Volcanics, and Gilruth Volcanics. The Mamadawerre Sandstone has a minimum age of ca. 1,700 Ma, which coincides with 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. 1,810 Ma.

The Oenpelli Dolerite is the most pervasive mafic intrusive suite to affect the Alligator Rivers region and is the youngest exposed Proterozoic unit. It intrudes various Neoarchean, Paleoproterozoic, and the Kombolgie Subgroup units, forming sills, dykes, lopoliths, and laccoliths, all with magnetic signatures. The Oenpelli Dolerite has a SHRIMP U-Pb baddeleyite date of 1,723 ± 6 Ma (Ferenczi et al., 2005). Geochemical and geophysical data suggests 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. Localized effects in the sandstone include silicification, desilicification, chloritisation, sericitisation, and pyrophyllite alteration. Locally, 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 shallow thrusting. These regional faults follow a pattern of predominantly north, northwest, and northeast strikes, giving rise to the characteristic linearly dissected landform pattern of the Kombolgie Plateau. Another significant structural trend strikes 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. 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 fault-like structures, including those with a marked geomorphic expression, show no displacement, and are best described as joints or lineaments.

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

Local and Project Geology

The Beatrice tenements lie to the south of the Myra Falls Inlier. EL 26796 is almost entirely Mamadawerre Sandstone, typically deeply jointed and faulted. Area in the northwest corner contains undifferentiated Cenozoic sediments (Figure 3). The northern part of EL 24291 is bisected by the east trending Beatrice Fault, to the north of which lies Mamadawerre Sandstone of the Kombolgie Subgroup, and to the south is the Beatrice Inlier. The Beatrice Inlier is comprised of outcropping Nimbuwah Complex gneisses and granites, intruded by Oenpelli Dolerite, and bounded to the southwest by the Bulman Fault Zone. Mamadawerre Sandstone overlies the remainder of EL 24291 (see Figure 3).

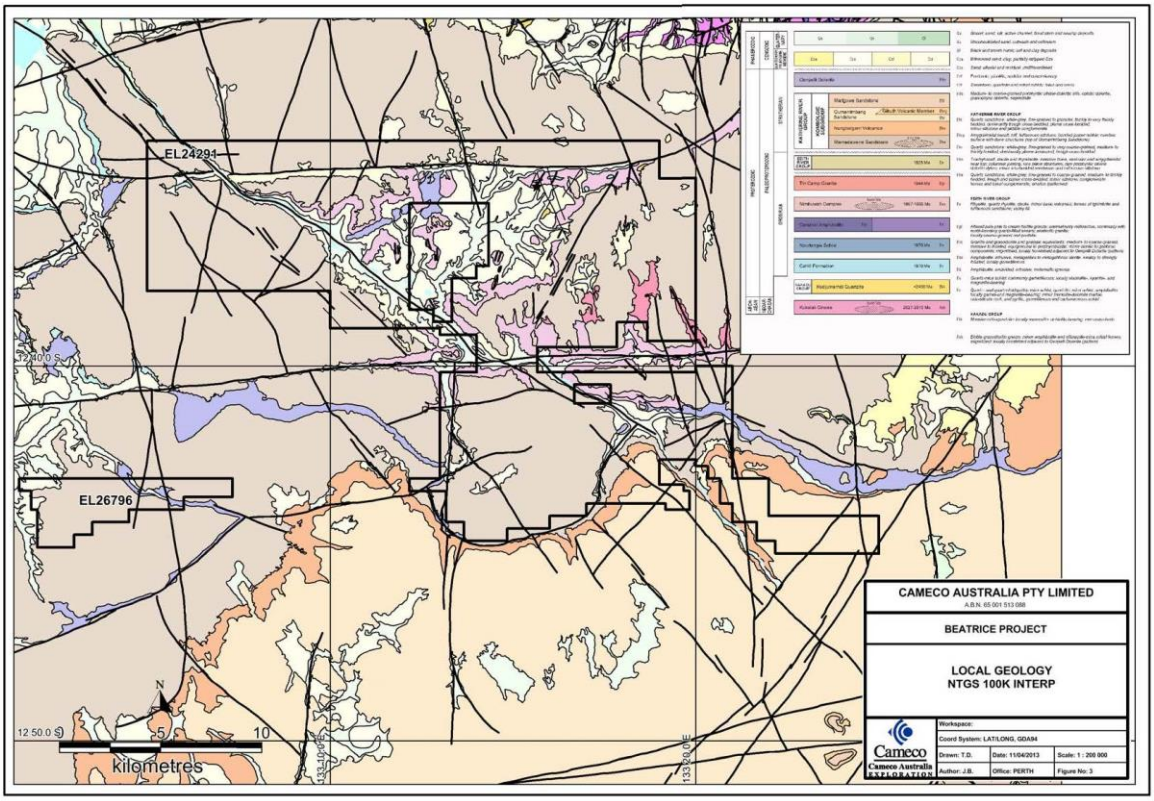

Figure 3. Beatrice tenement geology map

PREVIOUS EXPLORATION

Queensland Mines Limited

Limited exploration work was conducted by Queensland Mines Limited (QML) between 1970 and 1973 before the cessation of exploration in Arnhem Land with the introduction of the Aboriginal Land Rights Act in 1973. Mapping, airborne and ground radiometric and magnetic surveys in 1970 and 1971 led to the identification of the Beatrice prospect (Robinson 1971, Lockhart 1974).

In 1971 radiometric surveying and costeaning of the most anomalous zones at the Beatrice prospect was conducted, followed by topographic and surface geological mapping. Trenches at the prospect were bulldozed for mapping. A track was bulldozed from the west along the East Alligator River valley into the Beatrice Inlier to permit truck-mounted drill rig access. Diamond drilling in 1971 comprised eight drillholes for a total of 490.7 m. Low-grade secondary sooty pitchblende was intersected below the surface anomalies. Despite intersecting 7 m at 3.3% U3O8, at the completion of the program it was suggested that all prospective sites had been tested and there was no further exploration potential.

In 1973, a grid-based mapping, radiometric and soil-sampling survey was conducted over the Beatrice prospect. Lockhart (1974) noted that the mineralisation is restricted to an area of chloritised gneiss, spatially associated with a series of northeast trending quartz stockwork breccias. QML's exploration was curtailed in early 1973 by the Federal Government imposed moratorium on exploration pending a resolution of the issue of Aboriginal Land Rights, and no further on-ground exploration work was conducted by QML.

Reinterpretation of results by QML geologists in 1982 (Foy, 1982a) concluded that potential remained within the prospect area based on the intersections from the 1971 drilling. However, re-examination of drillcore failed to confirm the presence of the previously reported "sooty pitchblende". As a result, further drilling and surface investigations were recommended by Foy (1982b).

Cameco Exploration

Afmeco Mining and Exploration Pty Ltd (AFMEX) acquired the exploration licence application from QML in 1998 and formed part of the joint venture partnership between AFMEX (25% operating partner), Cameco (50%) and SAE Australia Pty Ltd (25%).

Following the dissolution of the joint venture agreement in 2003, the exploration licence application was transferred to Cameco. The original exploration licence application area (EL 24291) was split by non-consent areas as determined by an anthropological survey conducted prior to grant, forming the two non-contiguous licences EL 24291 and EL 26796. Grant of licence was given on 04 July 2008, for a period of six years.

2008 – 2009

The 2008 exploration program consisted of airborne geophysical surveys and helicopter-supported ground activities, comprising geological mapping, reconnaissance, and outcrop sampling.

Air photography over the Beatrice project area produced a digital image which was geometrically corrected to create an ortho-photograph and digital elevation model. Two airborne geophysics surveys were flown over the Beatrice project area. These were a helicopter-borne VTEM (time domain electromagnetic system) and magnetic data, and fixed-wing radiometric and total field magnetic surveys.

Ground investigations consisted of reconnaissance and sampling of the identified airborne radiometric anomalies, geological reconnaissance across the tenement, with focus given to the Beatrice prospect. Outcrop sampling returned a best assay result of 0.15% U_3O_8 in a strongly chlorite altered and sheared granite from the Beatrice prospect.

A large radiometric anomaly identified in the northwest of EL 24291, sited within a shallow gully to the south of and parallel to the Beatrice Fault near the intersection with the Bulman Fault Zone returned elevated uranium results within sandstone, with a best assay result of 8.8 ppm U_3O_8 in hematite altered, fine-medium grained sandstone. This anomaly was named the Violet prospect.

2009 – 2010

Work conducted in 2009 consisted of an airborne radiometric and magnetic survey, an airborne hyperspectral survey, a ground-based sub-audio magnetic (SAM) survey over the Beatrice prospect,

five diamond core drillholes and 272 auger holes at the Beatrice prospect, and rock outcrop sampling in conjunction with reconnaissance mapping over the two licences.

Helicopter-supported drilling and other work were conducted at the Beatrice prospect from 27 May to 23 July 2009. Five diamond drillholes for a total of 730.5 m and 272 auger holes were completed. The diamond drillholes were completed at variable azimuths and dips as conditions and targeting warranted. All auger holes were completed adjacent to the Beatrice prospect, with a portable track-mounted machine and a detachable auger bit. Auger holes penetrated the top 1.2 m of the soil horizon, and samples were collected of the bottom of hole from the auger flyte.

In addition, during the 2009 – 2010 field season 105 ground stations were recorded, including 10 mapping points and 95 rock sample sites. On EL 24291, 98 sites were recorded with 9 mapping stations and 89 rock samples collected. Lastly, on EL 26796, 7 sites were recorded with 1 mapping station and 6 rock samples collected for geochemical analysis.

2010 – 2011

Work conducted in 2010 consisted of a ground-based resistivity survey, airborne electromagnetic (TEMPEST) survey and helicopter-supported activities that included diamond core drilling, geological mapping and outcrop sampling.

In total, 6 diamond core drillholes were completed at the Violet prospect for a total of 1,836.7 m. The most significant uranium intersection was intersected in BTD0278 with 20.6 m at an average grade of 850.6 ppm U_3O_8 from 30.1 to 50.7 m.

Outcrop sampling in conjunction with reconnaissance mapping were conducted across EL 24291 and EL 26796 with 234 sites recorded in total. On EL 24291, 217 sites were recorded with 164 mapping stations and 53 rock sample sites. Lastly, on EL 26796, 17 sites were recorded with 3 mapping stations and 14 samples collected for geochemical analysis.

2011 – 2012

Helicopter-supported tree leaf vegetation sampling was conducted over the Beatrice prospect to test this surface sampling technique over known uranium mineralisation. In total 18 samples were collected at a nominal spacing of 50 m in a northwest trending line. Results of the survey did not become available until after the reporting period, and are included in the 2012 – 2013 annual report.

During late June archaeology site clearances were completed for drilling target areas located on EL 24291 and EL 26796. As a result, 1 helicopter-supported drill site was prepared and poly-pipe waterline was laid out to for the drilling water supply.

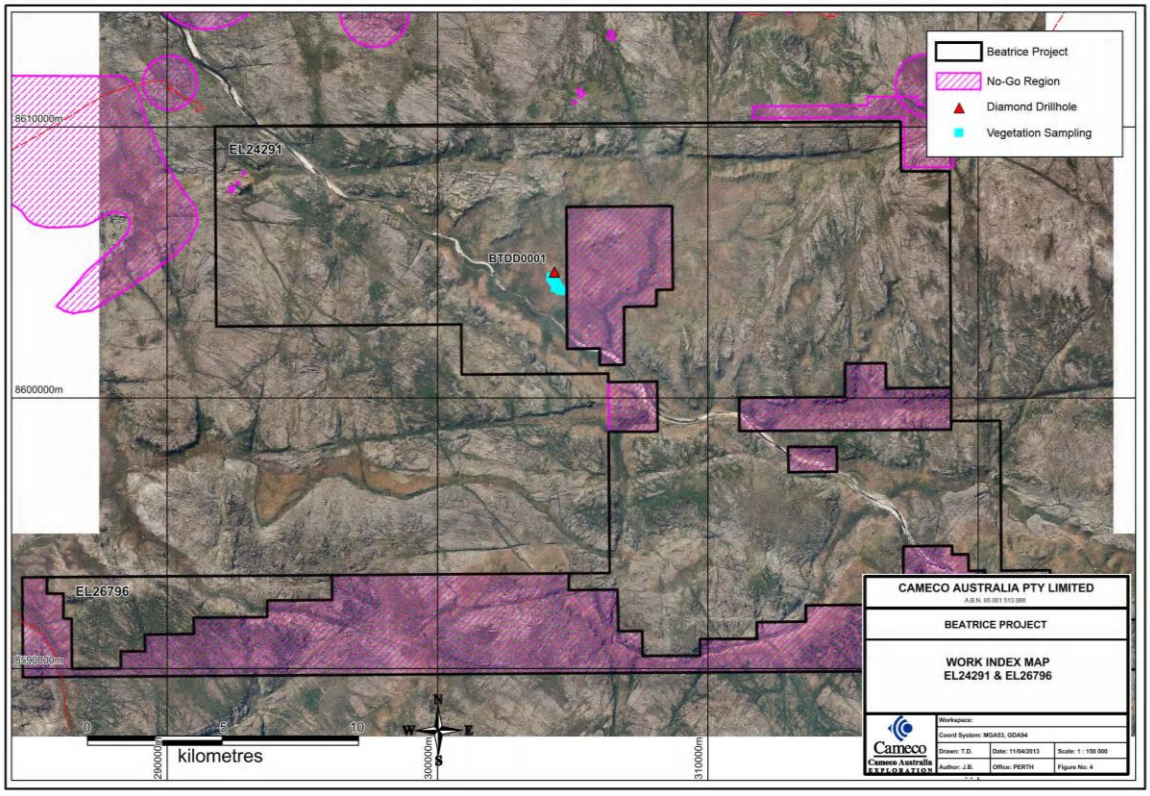

Figure 4. Exploration program activities for the 2012 – 2013 reporting period

2012 – 2013 EXPLORATION PROGRAM ACTIVITIES

Drilling Campaign

Diamond drilling was the focus of exploration activities for the reporting period and additional desktop studies were completed after the field season. During July – August 2012, one diamond core drillhole, BTDD0001, was drilled to 206.8 m. The drillhole targeted an interpreted steep north-trending structure in a previously untested area ~500 m north of the Beatrice prospect. Nearby surface sandstone samples returned U values up to 21.4 ppm. BTDD0001 was collared at 8604657 N, 304317 E (MGA94-53) at an azimuth of 270° and a dip of -60°. Radioactivity is background throughout the drillhole.

All drillholes were geologically logged using Cameco's internal logging codes, listed in Appendix 1. Full geological logs and drillhole location information are included in digital format in Appendix 2.

Drillhole ID	Prospect	Azi (°)	Dip (°)	Total Depth (m)	Date Started	Date Completed
BTDD0001	Beatrice	270	-60	206.8 m	8 Aug 2012	20 Aug 2012

Table 1. Summary of 2012 drilling

Downhole Gamma Probing

Downhole gamma logging was conducted within rods and is included in digital format in Appendix 2. There was no anomalous radioactivity intersected in BTDD0001.

Downhole Geochemistry

A total of 22 samples from drillcore were collected for geochemistry analysis in 2012. All samples collected for geochemistry were sent to Northern Territory Environmental Laboratories (NTEL) for analysis for the standard Cameco Australia suite of elements as outlined in Appendix 3. All samples were prepared by crush, mill, digest and analysed at NTEL according to the methods described in Appendix 3. All analytical geochemistry results for Beatrice project for 2012 are included in digital format in Appendix 2.

All geochemical results in samples from the Beatrice project passed the following Cameco quality control procedures:

1. Checking of the laboratory's accuracy and precision in the analysis of U, Ag, Al_2O_3, As, Ba, Be, Bi, CaO, Ce, Co, Cr, Cu, Dy, Er, Eu, Fe_2O_3, Ga, Gd, Hf, Ho, K_2O, La, Li, Lu, MgO, MnO, Mo, Nd, Ni, P_2O_5, Pb, Pr, Rb, S, Sc, Se, Sm, Tb, Th, TiO_2, Tm, V, W, Y, Yb, Zn, and Zr (all reported in ppm) via the use of three matrix matched certified geochemical standards (at the insertion rate 5% or approximately 1 in 20 samples) of differing U content (with average U concentrations of 4.76 ppm, 5.2 ppm and 42.18 ppm);

2. Monitoring the laboratory's ability to repeat results on analyses of sub-sets of the powdered sample via monitoring of the laboratory's analytical duplicates (lab duplicate insertion rate was 10% or approximately 1 in 10 samples) for the entire standard Cameco analytical element suite as given in Appendix 3, and including loss on ignition (LOI).

In 2012 no blanks were used to test for cross-contamination during the laboratory sample preparation process due to the lack of availability of a blank with element concentrations low enough so that such a test could be adequately accomplished.

Downhole Reflectance Spectroscopy

During the 2012 drilling campaign 41 data points were collected for reflectance spectroscopy analysis from BTDD0001. These readings were taken using an ASD Terraspec3 spectrometer which captures data in the visible to near infrared (VNIR) and short-wave infrared (SWIR) spectral regions. The reflectance spectroscopy data is included in digital format in Appendix 2.

Biogeochemical Sampling (Tree Leaf Sampling)

A biogeochemical sampling survey was conducted at the Beatrice prospect as an orientation study over an area of known shallow uranium mineralisation. The aim of the biogeochemistry survey was to test the potential of eucalyptus trees to extract U and trace elements from groundwater and accumulate these elements in the leaves. The tree leaf sampling study was conducted during the

2011 – 2012 reporting period, but the analytical results were not received until October 2012. The results are included in digital format in Appendix 4.

The leaf sampling study targeted 2 tree species: the long-fruited bloodwood (*Corymbia polycarpa*) and Darwin stringybark (*Eucalyptus tetradonta*). The target sample media of the survey was large trees with mid-age leaves. All samples were ashed at 500°C, digested in nitric acid and analysed for 57 elements and Pb isotopes at the NTEL laboratory in Darwin. Dr. Steve Hill from the University of Adelaide led the sampling program, analyzed the results and later produced a comprehensive report that includes the sampling methodology, sample preparation and an analytical methodology comparison study. The complete report is included in Appendix 4. A total of 18 samples were collected for the orientation study with 16 samples of the long-fruited bloodwood (*Corymbia polycarpa*), one green plum and one sand palm.

CONCLUSIONS AND RECOMMENDATIONS

Future exploration may involve:

- GIS and geophysics data interpretation and processing
- Heli-supported diamond drilling (additional 1 – 2 drillholes)
- Mapping and surface sampling

Desktop studies and review of all available geophysical data have highlighted new areas of interest for exploration on the main Beatrice tenement, EL 24291. The presence of the Cahill Formation below the Kombolgie Subgroup sandstone cover has been confirmed in the area to the north of the Beatrice tenement. These findings warrant a more in-depth investigation of the area to the north of the Beatrice Fault. Specifically, the eastern section of the tenement has exploration targets where northwest trending structures intersect metasedimentary units of the Cahill Formation. As well, a second area on EL 24291 has been highlighted for its potential to host uranium mineralization. This area is located approximately 2.5 km to the southeast of the historic Violet prospect, to the south of the Bulman Fault. Analysis of the Resistivity Inversion (1D inversion of regional TEMPEST data) and new interpretation of the VTEM data suggest a significant uplift of the area south of the Beatrice Fault and the presence of Cahill Formation is highly possible. Refer to Figure 5 for areas highlighted for future exploration.

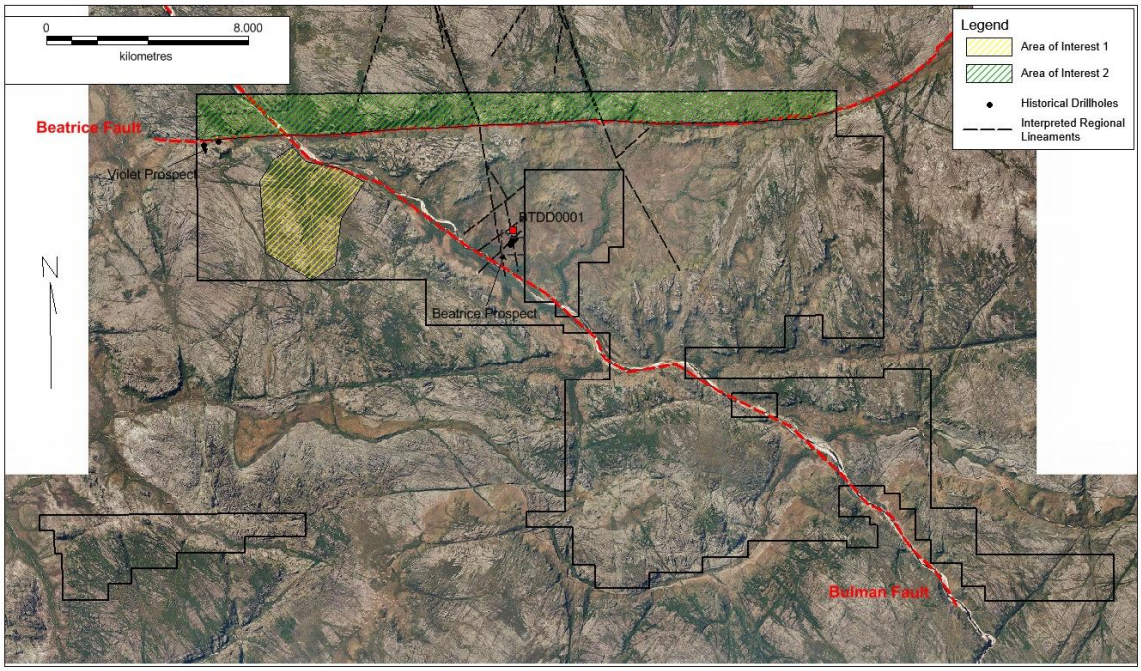

Figure 5. Areas highlighted for future exploration on Beatrice tenement (EL 24291)

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