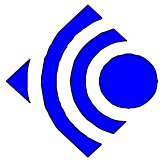

Cameco Australia Pty Ltd

Exploration Licences EL 5061 & EL 5062

Deaf Adder Project – Northern Territory

Annual Report for Period 27th May 1999 to 26th May 2000

CONFIDENTIAL

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SUMMARY

In 1999, two drill holes were completed in the southern portions of the two exploration licences EL5061 and EL5062. Both holes were abandoned in Kombolgie Sandstone. They failed to reach the targeted horizon due to drill equipment limitations. Other exploration during 1999 consisted of detailed sampling and prospecting over anomalous sites identified from the compilation of previous exploration results.

Detailed airborne magnetics and radiometrics were undertaken from the Stretch prospect in the north to the Spectre prospect in the south to aid drill targeting at Spectre and to investigate uranium anomalism at the new Slime prospect. A surface gravity survey was also undertaken to help define structure and lithological variations across major structures, while also aiding in the definition of the sandstone geometry and basement lithologies.

Initial phase follow-up of anomalies generated from multi-spectral analysis was completed incorporating PIMA, multi-element geochemistry and physical property measurements.

The main objective of the exploration program is to discover economic U mineralisation. The Kombolgie Sandstone is analogous to the Athabasca Sandstone of Canada where high-grade U mineralisation occurs along structures at the base of the sandstone.

Emphasis for the 2000 program will be designed to test the thickness of the Kombolgie Sandstone unit in the western portion of EL 5062 and at the drill hole DAD-0006 location by diamond drilling. Other work may consist of additional sampling, mapping and ground geophysical surveys. The remainder of the proposed program will be largely a low impact data collection exercise involving airborne geophysics, helicopter assisted rock-chip and stream sampling, grid preparation, ground geophysical surveys, geological mapping and prospecting.

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1 INTRODUCTION

The Deaf Adder project is a uranium exploration project owned and operated by Cameco Australia Pty Ltd (Cameco). The prime objective of the project is to discover economic U mineralisation within a geological environment similar to deposits in the Athabasca basin of Canada and associated with the Kombolgie basin of the Northern Territory.

The objectives of the work completed by Cameco during the 3rd year of the Exploration Licences were:

- To characterise the stratigraphy, structure, alteration and uranium mineralisation potential within regions sampled by diamond drilling. These objectives were to be achieved by evaluating features identified megascopically and by using physical properties, reflectance spectroscopy (PIMA) and geochemistry;
- To further evaluate anomalous areas delineated by multi-spectral analysis of existing data collected during the 1st and 2nd year of the tenements;
- To continue with regional and detailed geological mapping and prospecting;
- To use remote sensing techniques such as airborne and ground geophysical surveys to delineate sub-surface features (structure, lithology, alteration etc.).

The two exploration licences, EL5061 and EL5062, cover a total of 2,369 km^2 near the south-west margin of Arnhem Land, approximately 150km north-east of Katherine.

Location Map

Routine sampling and prospecting during the 1997 exploration program led to the discovery of significant radioactivity within the Kombolgie Sandstone formation at the Flying Ghost (Prospect Location Map). After preliminary evaluation of an airborne survey flown during August 1997, two additional areas of radioactivity were defined (Casper-Banshee and Stretch, as shown on the Prospect Location Map). Geochemical analysis of samples collected from Flying Ghost and Casper-Banshee contained elevated gold (Au) and U values.

During 1998, a small diamond drill program was completed at the Flying Ghost prospect. A total of 1603 m was drilled in five holes. Extension of radioactivity below surface was unsuccessful; however, valuable technical and stratigraphic information was obtained during the program. Aerial photography, detailed airborne geophysics, regional sandstone sampling, diamond indicator sampling and detailed and regional mapping was also completed. At the conclusion of the program, regional sampling on a one-kilometre scale was achieved over the extent of the Kombolgie Sandstone. A first pass geological mapping over the entire project area was achieved. Two new areas of radioactivity were delineated at Spectre and Writer areas.

In 1999, two drill holes were completed in the southern portions of the two exploration licences. Both holes were abandoned in Kombolgie Sandstone. They failed to reach the targeted horizon due to drill equipment limitations. Other exploration during 1999 consisted of detailed sampling and prospecting over anomalous sites identified from the multispectral analysis of existing datasets.

Project Location Map

Prospect Location Map

1.1 Location

The Deaf Adder Project is located at the southwest margin of Arnhem Land in the Northern Territory approximately 100 km southeast of the Ranger uranium mine. The tenements are situated along the southeast margin of Kakadu National Park.

The location of the exploration base camp at Mann River is indicated on the Prospect Location Map. This site is within EL5061 and lies adjacent to a waterhole near the headwaters of the Mann River.

The base camp was established in August 1999 and was occupied for approximately two months (August and September). A temporary base camp was established at the Spectre prospect from early October until the end of October to complete the final drill hole. The base camp consists of two demountable buildings, an ablution block, air-conditioned office and kitchen caravans with up to 15 sleeping tents. Electric power generation was supplied by a 20-kVa diesel powered unit and a small diesel-driven pump was used to obtain water from the Mann River which is 750 m away. The temporary base camp at the Spectre prospect consisted of the mobile caravans and tents only with bottled water trucked in as the smaller water supply was unsuitable for drinking or cooking. Four-wheel-drive passenger vehicles were used for personnel movements between Darwin and the camp, and for provisions obtained from Katherine and Darwin. Regular food supplies were picked up from Katherine. A 7-tonne truck was used to deliver fuel drums and mobilise and demobilise camp equipment.

A Rotor Services helicopter (206 Jet Ranger and/or Long Ranger) was on site at all times for transporting personnel to work areas.

It was necessary to upgrade the pre-existing track, which extends 160 km northeast from Eva Valley to the Mann River exploration camp. The Traditional Owners have named the track Bat guyangguyang.

1.2 Tenure

The project permits comprise 2,369 km^2 within Exploration Licences EL5061 and EL5062 which were granted on May 27th 1997, and an additional 3,750 km^2 of Exploration Licence applications subject to negotiation with the Aboriginal Traditional Owners (Project Location Map).

Annual reporting for the granted tenements EL 5061 and EL 5062 is due within one month of the anniversary date (due no later than June 27th, 1999). The first statutory 50% surrender occurs at the end of the third year of exploration (May 27th, 2000). The Northern Territory Department of Mines and Energy (NTDME) have waived this requirement until the end of the 4th year of exploration. The expenditure commitment for 1999 was $750,000.

Current Land Status

1.3 Regional Geology

The Deaf Adder tenements lie on the Arnhem Land Plateau, which forms the western margin of the Palaeoproterozoic McArthur Basin, and comprises undeformed sediments of the Katherine River Supergroup. These platform fluviatile and shallow marine sediments unconformably overlie the strongly deformed and metamorphosed sedimentary successions of the Pine Creek Basin which host the major unconformity-related U deposits of the Alligator Rivers Region.

The nearest exposure of the prospective Pine Creek Basin succession occurs within the Gilruth Inlier some 5km northwest of EL5061. Older basement to the Pine Creek Basin successions, the Archaean Nanambu Complex, is exposed only in the general vicinity of the Alligator Rivers U deposits.

The thickness of the McArthur Basin platform cover in the Deaf Adder tenements is uncertain but estimates range from 300m in the west and north-west areas, near the Gilruth Inlier, to as much as 1,000m in the south-east.

1.4 Structure

It has been regarded by many that the key mineralising structures in Arnhem Land, are second order reverse faults, which form dilation zones in conjunction with major strike slip fault systems within a compressional domain. Conversely, similar dilation zones could be associated with normal faults in an extensional tectonic domain (Regional Structural Map).

Regional Structural Map

Extensional basin tectonics was responsible for the formation of the Palaeoproterozoic Barramundian sequences (Pine Creek Basin) and the Kombolgie Subgroup cover sequence (McArthur Basin). Between these two extension phases, a compression phase (Barramundi-Top End Orogeny) gave rise to multiple deformation and metamorphism of the Barramundian sequences and late tectonic granite intrusion.

In West Arnhem Land, steep 320°-340° (reverse?) faults such as the Khyber Pass Fault are linked to the major east-west (070°) trending strike slip fault systems in a regional sense. The Caramal U Prospect is situated near the intersection of these structures. The Khyber Pass Fault which, based on radiometric evidence, can be considered a fertile structure in terms of mineralising fluid flow. Results to date from PNC Exploration at King River also emphasise the importance of the 340° structural trend, particularly at Black Rock.

Within this framework, it is worth considering the main structural elements of the Deaf Adder tenements in South West Arnhem Land and how they relate to known U occurrences.

On a local scale, two conjugate fault sets predominate at Deaf Adder, 340°-070° and 310°-030° (Regional Structural Map). The Kub-O-Wer Fault, a 340°-350° trending right-lateral (dextral) fault displaces the 070° structures between 1-2 km. The 310° Bulman Fault, and a major parallel structure in the far northeast of EL5061, also exhibit dextral movement, displacing the 030° structures up to 2 km. A 295° fault that controls the outcrop of metamorphic basement in the Gilruth Inlier northwest of EL5061, is most probably a reverse fault.

1.5 Local Geology

The Deaf Adder tenements predominantly comprise outcrops of undeformed platform sediments of the Katherine River Group representing the basal portion of the McArthur Basin. Recent mapping by the NTGS and AGSO on the adjacent Milingimbi 1:250,000 map-sheet has renamed the lowermost sequence, previously called the Kombolgie Sandstone, as the Kombolgie Subgroup. This subgroup has been further subdivided into three units, the lowermost Mamadawerre Sandstone (Phe), the middle Gumarrimbang Sandstone (Phl) and the upper Marlgowa Sandstone (Phr). The McKay Sandstone, previously overlying the Kombolgie Sandstone, is now incorporated as a member within the upper Marlgowa Sandstone.

Locally within the project area, the Kombolgie Subgroup is represented by the Gumarrimbang and Marlgowa Sandstone units which are separated by a ferruginous (lateritic) horizon called the Gilruth Volcanic Member (Phkg). This unit was intersected during the 1998 and 1999 drill programs. True thicknesses of up to 14 m of clay-sericite-leucoxene altered, porphyritic, basaltic rock were encountered.

1.6 Previous Explorers

Historically, U exploration in this region has concentrated on the South Alligator Valley, 50km to the west, and the Pine Creek Basin 100 km to the north. The project area, which falls largely on the Mt. Evelyn 1:250,000 map-sheet remains essentially unexplored.

Fieldwork associated with the BMR mapping of the Mt. Evelyn map-sheet was carried out in 1954-58, with work on the Gilruth 1:100,000 map-sheet being carried out in 1973-74. The NTGS has advised that they have recommenced geological mapping and data compilation on the Mt. Evelyn map-sheet area in mid 1998.

The adjoining 1:250,000 map-sheet to the west, Mt. Marumba, was originally mapped in 1962, however, compilation of new work by AGSO (1993-4), and by NTGS (1994-95) on the Milingimbi map-sheet, is complete and has been released.

Broad spaced regional airborne radiometric-magnetic surveys were carried out by the BMR (now AGSO) and Queensland Mines Ltd between 1970-80, however the data

quality is limited. There is no record of any ground follow-up work associated with these early surveys.

More recently in 1995, the NTGS acquired airborne radiometric and magnetic data for the Mt. Marumba and Milingimbi map-sheet areas to assist with the geological compilations.

1.7 Previous Exploration by Cameco

Cameco commenced a systematic technical evaluation of the project area in 1996 following the successful negotiation of an access agreement with the NLC on behalf of the Aboriginal Traditional Owners. This technical evaluation comprised data acquisition, examination of Landsat TM and SPOT imagery and preparation of an exploration proposal by WJ Fraser (Cameco Australia Pty Ltd Report R97-03).

The proposed exploration program comprised broad spaced lithogeochemical rock chip sampling (1x10km) and regional stream sediment geochemistry (85 sites approved by the NLC). The exploration proposal was subsequently modified in early 1997 to incorporate a detailed fixed-wing airborne magnetic-radiometric survey contracted to World Geoscience (WGC), Perth, WA.

The exploration objective in 1997 was to develop a lithogeochemical database for the Kombolgie Subgroup cover sequence. This data set would be used as a basis for definition of alteration systems associated with unconformity-style U mineralisation (from expertise gained in the Athabasca Basin area of Saskatchewan, Canada).

In the early stages of the 1997 exploration, an area of anomalous radioactivity and alteration was discovered within the Kombolgie Sandstone. This discovery and its potential significance for future exploration strategy indicated the need to focus on the evaluation of this prospect type. This was achieved by implementing a program of detailed grid based geological mapping, spectrometrics and lithogeochemical sampling and semi-regional orientation stream-sediment sampling.

The results of this detailed work were used to re-assess other similar radiometric anomalies detected by the 1997 airborne survey.

In addition to the detailed grid-based work, routine ground checking of selected radiometric anomalies and regional lithogeochemical sampling was completed.

Secondary U mineralisation was located in two widely separated areas of strong radiometric anomalism, the Flying Ghost and the Casper-Banshee anomaly group. Geochemically these occurrences are spatially associated with strongly elevated Au values (up to 236.5 ppm), where the gold is restricted to goethitic alteration along fractures. In general, the uranium is associated with clays within zones of intense fracturing in the Kombolgie Sandstone, and may represent a leakage from a primary uranium source at depth. Both anomalies also contain significant areas of surficial enrichment and dispersion of uranium (within goethitic patches) that has enhanced their airborne radiometric signature.

In the Stretch area, intense structurally related radioactivity over a 1 km-strike length appears to be thorium (Th) dominant but still warrants further evaluation.

In 1998, the exploration program objectives were to complete the regional grid spaced lithogeochemical sampling over the exposed Kombolgie Sandstone as well as completing the airborne radiometric anomaly follow-up. Finalise regional geological mapping, conduct a drill program at the Flying Ghost prospect targeting unconformity style uranium mineralisation, and conduct a sampling program covering the Banshee-Casper and Stretch prospect areas.

The 1998 lithogeochemical sampling in continuation with the 1997 exploration program completed the regional sampling coverage of the Kombolgie Sandstone, achieving a sample density of one sample per 2 km^2. Airborne radiometric anomaly follow-up was completed, with two new areas identified, namely Spectre and Writer prospects. Detailed sampling programs were completed at Banshee-Casper, Spectre, Writer and Phantom areas. Satellite imagery and aerial photography was used together with small traverses to complete a first pass regional geological map at 1:50,000 scale. Smaller scale mapping was completed at the Banshee-Casper and Spectre prospects.

The diamond drill program at the Flying Ghost prospect failed to reach the basement stratigraphy below the Kombolgie (depth of 794 m exceeded the capacity of the drill). Intersections of the Nungbalgarri and Gilruth volcanic members clearly established the stratigraphic location within the Kombolgie. The volcanic contacts are variably radioactive and altered. Silicification and structure (stress/shearing) within the Kombolgie occurs at both the upper and lower contacts with the Nungbalgarri volcanic unit. Elevated geochemistry is associated with the volcanic horizons (contacts) and locally within the Kombolgie related to facies variations. Kandite clay species have been identified by PIMA to occur stratigraphically beneath the Gilruth horizon (narrow 3 to 5 m unit) and at depth possibly indicative of basal sandstone.

2 1999 EXPLORATION PROGRAM

The Summary of Exploration Work table itemises work completed during 1999. The Summary of Expenditures table is the expenditure statistics itemised by work and exploration license. The Areas of 1999 Exploration table displays the 1999 exploration work areas.

Geophysics undertaken during 1999 consists of an airborne survey over the southern part of EL5062, regional ground gravity and ground gravity at the Spectre Prospect. Detailed down-hole geophysics was undertaken on DAD-0006 to assist with characterising physical properties. All available digital data has been submitted with this report.

Summary of Exploration Work Completed during Reporting Period
Summary of Expenditures Cameco Australia Pty Ltd
Areas of 1999 Exploration

2.1 Airborne Geophysics

During July, Universal Tracking Systems Pty. Ltd. (UTS, http://www.uts.com.au/) conducted a detailed airborne geophysical survey collecting magnetic, radiometric and DTM (Digital Terrain Model) data totalling 5772 line km's. This survey was flown at a terrain clearance of 30m with lines flown north south at 50m intervals. The aim of this survey was to aid geological mapping, further delineate areas of mineralisation and assist with further target generation. Coverage includes the Spectre, Writer and Stretch prospects. Although acquisition was undertaken by UTS, processing was subcontracted to Pitt Research Pty. Ltd. (http://www.pitt.com.au/) who undertook MNF (Minimum Noise Fraction) noise reduction of the radiometrics prior to standard processing.

Airborne Geophysical Survey Logistics Report by UTS

Airborne Magnetics – TMI (Total Magnetic Intensity) with 1VD (Vertical Derivative)
Airborne Radiometrics – Total Count
Airborne Radiometrics – K (Potassium)
Airborne Radiometrics – U
Airborne Radiometrics – TH (Thorium)
Airborne Radiometrics – Red, Green, Blue = U, TH, K
Airborne DTM

The detailed airborne data has been useful for geological interpretation. Data acquired by UTS includes the Slime prospect which was identified during the 1999 field program. Airborne data was integrated into the multi-spectral anomaly identification and follow-up program discussed in Section 2.5. In particular, 38 new airborne radiometric anomalies were identified according to the ratio of uranium squared over thorium. Of these, 298 were followed up and are discussed in Section 2.6.3.

2.2 Ground Gravity

During September, Haines Surveys Pty. Ltd. undertook 530 gravity readings using 500m and 100m station spacing. All gravity data was terrain corrected by the contractor using an airborne DTM to approximate topography.

Gravity Logistics Report by Haines Surveys Pty Ltd

Gravity Terrain Corrections Report by Haines Surveys Pty. Ltd.

Four regional traverses of gravity were conducted along two orientations with a line spacing of 1km and station spacing of 500m. The aim of this survey was identify lithological changes within the basement and in particular, to extrapolate basement information obtained from the 1999 drilling. One set of lines was orientated west east over the interpreted Kub-O-Wer fault and close to the 1999 drilling. The second set was orientated north-northwest to transect the regional gravity gradient, lithological change and possible west east structure (identified from magnetics).

Regional Bouger Gravity

Regional Lines 1000 and 1020 were surveyed west east and show a low of at least –8 mgal to the east with a moderate high of 4mgal in the middle of the line. Lines 2000 and 2020 were surveyed in a north-northwest direction and show a gravity high (26mgal) to the north with a low (-6mgal) in the middle of the line. Hole DAD-0006 was drilled within 1km of the southern most regional lines.

A semi-detailed gravity grid was also conducted at the Spectre Prospect using 500m lines and 100m stations. The purpose of this survey was to determine if there is a density contrast associated with the Spectre Fault (which is orientated northwest) and to determine whether there is a density contrast related to secondary U mineralisation.

Spectre Bouger Gravity

The Spectre prospect gravity is strongly dominated by a gradient increasing from 2 mgal in the south to 10mgal in the north. The residual gravity response (1st order removed) shows a contrast relating to the mapped north-north west fault, with a higher response to the north. In contrast, the magnetic data shows several high frequency magnetic dykes to the north of the interpreted fault with an overall decrease in magnetic amplitude. A possible interpretation of this is that the Nungbalgarri Volcanics is shallower to the south, accounting for increased magnetics. To the north of the fault basaltic sills within the Mckay Formation result in high frequency magnetics with an increase in density.

2.3 Down-Hole Geophysics (DAD-0006)

Extensive down-hole geophysics was conducted on DAD-0006 to assist with characterising lithologies, which was the primary aim for drilling (refer to Section 2.7). This work was undertaken as an alternative to petrophysics completed in previous years. Surtron Geophysics Pty Ltd surveyed the NQ part of the hole, however, probing could not be continued into the BQ section of drilling and was terminated at approximately 1050m depth. Parameters recorded are magnetic susceptibility, density, total count radioactivity, resistivity, velocity, calliper and temperature. Of the resistivity measurements, the main information is contained in the medium (55 inch) guard recording 0-40000 ohmm and normal (64-inch) guard recording 0-2000 ohmm. Since the hole is highly resistive, the medium probe is most useful with the normal tool useful in conductive zones.

Spontaneous potential was also requested, however, the survey could not be undertaken due to equipment failure. The sonic tool was also damaged in transit, however, a rough estimate of velocity was possible using a single receiver with assumptions about the tool's positioning and fluid travel time.

DAD-0006 Down-Hole Geophysics Plot

Down Hole Logistics Report by Surtron Geophysics Pty. Ltd.

2.3.1 Correlation with In-house Readings

The magnetic data does not correlate well with the hand held susceptibility readings, apparently due to temperature and pressure drift, which is normal for the tool. The main area of difference is in the low count sandstone (to a depth of 750m) where magnetic susceptibility starts at $.5x10^{-3}$ SI and decreases to $-.5x10^{-3}$ SI. In this zone the hand held susceptibility readings remain more realistically less between 0 and $.2x10^{-3}$ SI. In addition, the probe data shows noise of $+/-.3x10^{-3}$ SI. Hand held density measurements calculated using a simple dry weight and length measurements show reasonable correlation with the down hole probe density results.

2.3.2 Results

Since significant mineralisation is not present in DAD-0006, a comparison cannot be made between U and the parameters measured. As expected, the gamma response is a good discriminator of lithologies as is the magnetic susceptibility readings. In particular, high gamma response clearly defines the Mckay Formation and high magnetics clearly defines the volcanic and intrusive lithologies (including some variation due to flows). The resistive response shows variations within the lithologies, which partially correlate with silicification and flow changes; however, comparison with the SiO_2 content is difficult due to the regularity of samples (approximately 5m). Variations in density were less instructive and could not further divide lithologies.

It is intended that modelling tests be conducted to determine the applicability of seismic as a geophysical method for exploration.

DAD-0006 Down-Hole Geophysics Summary

2.4 Geological Mapping

The aim of the geological mapping was to further understand the structural complexities within the Deaf Adder tenements. Mapping was carried out across most of the tenements with particular attention paid to the northern area around the Spectre prospect. At this stage, a possible thrusting environment is being proposed in and around the Spectre prospect, however we are currently waiting on a final report for the project to either confirm or deny this hypothesis.

On a regional scale, the focus was on the large-scale lineaments that stretch across the entire tenements to see if there was any evidence of structural offset associated with them. Information regarding these structures will also be discussed in the outstanding report.

The Slime prospect was the only area mapped in detail, which is discussed in the following section.

2.4.1 Structure

2.4.1.1 Faulting

Numerous lineaments and fractures can be observed in the tenements, however relatively few show significant displacement of the Kombolgie Subgroup. Some of the major lineaments probably reflect older basement structures with minor post Kombolgie reactivation, a phenomenon noted elsewhere in Arnhem Land (Needham 1988, BMR Bulletin 224). Other lineaments are probably major joint sets. Only those structures where offsets have been noted, either on the ground or on aerial photographs have been mapped as faults on the Regional Structural Map. No actual fault planes were observed, and exposures of fault materials are relatively rare since erosion tends to occur preferentially along faults. Consequently, determining fault dips is very difficult. The more significant faults are as follows:

Spectre Fault: a major 125° trending fault, with large-scale brecciation and silicification mapped at the Spectre Prospect (see Section 2.3.3). Based on the displacement of the Kombolgie Formation / McKay Sandstone contact, which can clearly be seen on Landsat images, there is a sinistral strike slip movement of 14km along the Spectre Fault.

Stretch Fault: a 085° trending fault. There is a dextral strike slip offset of about 1km. A radiometric anomaly (Stretch Prospect) occurs along this structure in EL5062. No exposure of the fault has been observed.

Kub-O-Wer Fault: this is a major 170° structure which can be traced north of EL5062 as far as the Bulman Fault Zone, giving a total length in excess of 100km. Displacement on the fault is minor within the tenements, particularly in relation to the length, although further north the fault appears to truncate the Gilruth Basement Inlier. Aerial photograph interpretation, using the K5/K6 contact suggests a vertical throw of 5-10m near the northern boundary of EL5062, with the eastern block upwards. The horizontal displacement is equivocal with apparently dextral offset of the K5/K6 contact in the centre of EL5061 and dextral offset of the Stretch Fault. However, probable sinistral offset of the K6/M1 contact was mapped at the southern boundary of EL5061. The Kub-O-Wer Fault is interpreted as a major basement structure with only minor post Kombolgie reactivation.

Banshee Fault: a relatively minor north-south fault that can be traced for about 8km, however it is important since both the Casper and Banshee Prospects are located adjacent to the fault. There is a vertical throw across the fault of a few metres, (east side up) and negligible horizontal displacement. North of Casper, two small 110° and 135° faults intersect the Banshee Fault. Displacements along these two faults are small, but a triangular block bounded by the three faults has been tilted with bedding dips up to 35° in the centre of the block.

2.4.1.2 Folding

A gentle anticline was defined in the northwest corner of EL5061 during mapping of the Flying Ghost-Phantom area. The axis trends about 125°. Dips on the northeast limb are up to 17°, whereas on the southwest limb dips are gentler, typically about 5°. The anticline has a shallow plunge to 125°, as evidenced by closures on the lower Kombolgie units.

This fold is an extension, along the same trend, of an elongate basement dome structure at the Gilruth Inlier, located some 5km outside the northwest corner of EL5061. Dips are steep around the Gilruth Inlier, typically 50-80°, clearly the anticline mapped in EL5061 represents only the tail of this structure.

Away from the anticline, bedding dips are generally consistently to the southeast, of typically 2-5°, with the exception of some localised blocks that have been tilted by faulting. The best examples of the latter are associated with the Spectre Fault and the Banshee Fault (described above).

2.4.2 Slime Area - Geological Mapping

The Slime Grid was mapped over 2 days, using 100 x 100 m stations, which were marked out with flagging tape and aluminium tags. The geology was mapped along grid lines, recording data on graph paper. Outcrop and geological boundaries were traced between lines to complete the map. Data was later transferred to a transparent overlay then digitised.

The grid is centered on an upper portion of the Kombolgie Sandstone, which had previously been associated with the possible presence of chlorite in the sandstone. Upon more detailed ground checking of the area with scintillometers it was also found to be an area of anomalous radioactivity. Closer observation showed that the area was bounded to the north and to the south by injection breccias and dendritic fracturing filled with quartz and drusy quartz. Some of the drusy quartz veins exhibited strong red haematite staining and the presence of weathered sulphides were also detected in the sandstone. Several boulders at the north and south end showed evidence of shearing indicating there had been some degree of movement associated with the area. The 1:100 scale map shows the Slime Area in detail.

Slime Geology

2.5 Multi-Spectral Analysis

Datasets collected during the 1st two years of exploration on the Deaf Adder project were merged into one multi-spectral analysis exercise conducted internally by G. Zaluski et al[1] prior to the 1999 field season. The objective was to define both regional

[1] G. Zaluski, G, Beckitt, G. Otto, 1999, Selection and Evaluation of Radiometric and Geochemical Anomaly Targets for the Deaf Adder Project, Cameco Corporation

and anomalous trends using remote sensing, airborne geophysical, geological, geochemical and physical property parameters. The process was based on threshold grid values, thereby minimising the amount of "interpretation" required. Initially, considerable analysis was conducted to determine "background" and "anomalous" characteristics for the project, which included current prospects and areas of interest.

Each anomaly polygon was classified for prioritisation using the presence, abundance, absence, proximity to and lithology of existing samples. Incorporated into the analysis was an attempt to normalise data to interpreted lithology according to mapping completed during the 1998 field season. Four main types of anomalies were identified for follow-up (in decreasing importance):

- Airborne radiometric U^2/Th anomaly;
- U partial anomaly from geochemical grid;
- Geochemical/clay alteration halos with or without U anomalism; and
- Single element anomalies (very high concentrations of any element) of unknown origin.

2.5.1 Data Analysis

Geochemical sampling of the Deaf Adder Project shows distinct patterns reflecting the lithological variations of the project area. The Gilruth Volcanic Member and McKay Formation, show strong enrichment of most trace elements (including U) compared to the Kombolgie Sandstone. These lithological contrasts are responsible for most of the regional trends in the data. In contrast, geochemical halos associated with hydrothermal alteration may be very subtle compared to these lithological trends and accurate geological mapping is therefore necessary to interpret the geochemistry trends.

Regional clay patterns show a regional gradation from dominantly illite (with some dickite) in the stratigraphically lower, northwestern portion of the project to higher kaolinite and chlorite contents toward the southeastern, stratigraphically higher regions. Clay patterns around the known U prospects show increases in kaolinite and chlorite but also on a prospect scale, increased illite within broader illite lows. Trace elements which are associated with the U prospects include precious metals gold (Au), platinum (Pt), palladium (Pd), vanadium (V), selenium (Se), arsenic (As), rare earths (REEs), yttrium (Y), phosphorous (P) and lead (Pb).

On the basis of the regional and prospect scale geochemical trends, the statistical correlations, and knowledge of unconformity U deposits within the Athabasca Basin and Alligator Rivers Uranium Field, a list of 19 geochemical "pathfinders" was created. This included $U_{partial}$, total LREEs (light rare earths), total HREEs (heavy rare earths), sum of base metals, V, Pb, $^{206}Pb_{proportion}$, Pt, Pd, Au, Y, As, Se, P, kaolinite (TSG)*, chlorite (normative), B (boron), illite (TSG)*, and muscovite (TSG)*. These were later used in the evaluation of the anomalies.

* Refer to section 2.6.1 for description

2.5.2 Anomaly Identification and Classification

Initially, sample information such as geochemistry, TSG* and MINSPEC* processed PIMA were gridded for comparison with airborne radiometric data, geology and Landsat-derived products (clay, Fe-oxide and silicification). In particular, airborne radiometric anomalies were identified according to the industry standard ratio of U^2/TH. Normalisation of the data was achieved by simplifying the 1:50,000 scale geology map by A. Mackie (1998[2]) into four units that were separately analysed:

* Refer to section 2.6.1 for description

- Gilruth Volcanic Member and sandstone within 500 m of it;
- Kombolgie Sandstone;
- Quaternary cover overlying the Kombolgie; and
- McKay Formation and overlying sediment cover.

"Anomalous" parameter values were identified according to thresholds determined by user input approximating the 90th percentile. The final output consisted of a series of GIS tables showing statistics for the parameters involved. In addition, several fields were added to assist evaluation and prioritisation of anomalies. Fields added were the number of current rock samples within each anomaly, lithology, previously identified radiometric anomaly information, presence of magnetic lineament, anomaly area and comments. Additional fields necessary for the categorisation of the anomalies were added later.

The main type of anomaly identified was that using airborne radiometrics U^2/TH ratio. However, since the Flying Ghost prospect does not have a strong airborne signature a further type was identified according to $U_{partial}$ anomalism. Geochemical alteration halo targets were identified to highlight possible alteration not necessarily relating to high surficial U concentrations. Single element geochemical anomalies of unknown origin were defined by the 97th percentile contour for the following 16 elements: Au, $^{206}Pb_{proportion}$, Pt, Se, Th, V, Y, REE+Y, As, Be (beryllium), Bi (bismuth), Dy (dysprosium), Eu (europium), Li (lithium), Pd, and Ce (cerium).

In total, 629 airborne radiometric, 42 $U_{partial}$, 225 alteration halo, and 143 single element anomalies were identified. A binary classification scheme was devised to sort these anomalies for follow-up, which is shown in the attached figures.

Airborne Radiometric Anomaly Classification

U Partial Anomaly Classification

Geochemical/Clay Alteration Halos Classification

[2] G Drever, G Beckitt, G Otto, D Rosewall, A Mackie, June 1998, Exploration Licences EL 5061 & EL 5062 Deaf Adder Project - Northern Territory, Annual Report for Period 27th May 1998 to 26th May 1999.

Single Element Anomalies Classification

Airborne Radiometric Anomaly Map

U Partial Anomaly Map

Geochemical/Clay Alteration Halos Map

Single Element Anomalies Map

2.6 1999 Anomaly Follow-up

The 1999 anomaly follow-up program was designed to follow up as many of the anomalies generated by the multi-spectral analysis as possible. A total of 605 follow-up "chip" samples were taken in 1999 representing 298 multi-spectral anomalies. The process was designed to hopefully identify characteristics associated with the anomalies that may indicate why these particular areas appeared as anomalies. Geomorphological, geological and radiometric parameters were recorded, and a digital photograph at each site was taken. The samples were systematically processed in camp. Lithological textures, alteration colours (Munsell), grain-size variations, petrophysical parameters (magnetic susceptibility) were routinely recorded.

Detailed Outcrop Sample Locations

Detailed Outcrop Sample Descriptions

2.6.1 Ground Follow-up

All the outcrop samples are routinely measured, using the PIMA II infrared reflectance spectrometer. This instrument measures the reflected energy from a sample in the short wave infrared (SWIR) region of the energy spectrum. The sampling area on the rock specimen that is measured is permanently marked. Multiple measurements are occasionally taken, particularly if variations in spectral features are noted. The spectra are converted to an ASCII format and processed using Cameco developed software called Minspec and The Spectral Geologist (TSG) developed by AusSpec International.

The Minspec program provides estimates of the mineral proportions of the minerals illite, chlorite, dickite, kaolinite, halloysite and dravite. The algorithm is effective for samples, within which these are the only minerals that have prominent absorption features in the short wavelength infrared. The classification can be problematic, as Minspec will force a mineral identification using poor spectra even if the minerals are not present in the sample. The program will always attempt to assign one of, or a mix of, the six minerals to the sample. Minspec also gives information on the peak wavelength positions of the AlOH absorption feature and the MgOH absorption feature. These wavelength positions provide information on the

compositional variations within mineral species, as mineral composition may vary systematically within alteration zones.

Minspec Reflectance Spectroscopy for Drill Core Samples

The Spectral Geologist (TSG) developed by AusSpec International is routinely used to process all spectral data. The SWIR spectra, once processed, provides mineral identification by software pattern matching algorithms using The Spectral Assistant (TSA), information on the degree of mineral crystallinity, and chemical composition variations within mineral groups. The program also allows the user to create scalars based on spectral features and parameters. This allows for quantifying crystallinity for smectite clays, and kaolinite, classifying chlorite species based on Mg and Fe absorption features among other things.

TSA Reflectance Spectroscopy (Majors) for Detailed Outcrop Samples

TSA Reflectance Spectroscopy (Exotics) for Detailed Outcrop Samples

TSA Reflectance Spectroscopy (Majors) for Drill Core Samples

TSA Reflectance Spectroscopy (Exotics) for Drill Core Samples

2.6.2 Geochemical Techniques

All samples were sent to ChemNorth in Darwin and Pine Creek for multi-element analysis. In total, four separate methods were being used to analyse for 53 different elements. All geochemical data are included in the following Appendix.

Geochemistry For all Drill Core samples

Geochemistry For all Detailed Outcrop samples

2.6.3 Results

The multi-spectral data set has been processed by a variety of methods using a combination of software packages. Including multi-element geochemistry, reflectance spectroscopy, remote sensing and petrophysical measurements, there are in excess of 150 parameters recorded for each sample location. The anomalies that have been checked are presented in the following appendix.

Followed up Anomalies and Descriptions

Most of the anomalies generated that were followed up were explained after ground checking. Many of the resultant anomalies were attributed to lateritic areas, black soil plains or variations in the surrounding topography. Of the

other samples which were taken, only a few stand out as being anomalous in particular elements.

DA99C10282 showed elevated values for Au, Pt and Pd. DA99C10060, which was taken near the Slime prospect, assayed over 1000ppm uranium as well as being elevated in Bi and Mo. DA99C11392 returned 427ppm nickel and was elevated in Dy and B. DA99C15167 assayed over 500ppm strontium and DA99C10229, 0226 and 1282 were all elevated in Bi.

U x 100/ Zr Ratio for Detailed Outcrop Samples

U2 / Th Ratio for Detailed Outcrop Samples

Calculated SiO2 for Detailed Outcrop Samples

2.7 Diamond Drill Program

2.7.1 Contractor and Drill Equipment

Century Drilling completed the drill program using a UDR-1000 and a UDR-650 drill rig to complete DAD-0006 and DAD-0007 respectively. The drill and equipment was mobilised from Bachelor to the Mann River exploration camp by truck. Access to the drill areas was by road with the crews commuting between camp and drill site by Toyota Landcruiser.

2.7.2 Drill Targets

The first drill hole was designed to be used for stratigraphic purposes while the second drill hole was targeted at the site of anomalous radioactivity which was complemented by a silicified breccia/fault structure. The objective of the drill program was to determine if the radioactivity and structure mapped on surface was a surface expression of significant mineralisation at depth. The 1999 drill-hole location map shows the drilling areas and drill hole collars using the 1:50,000 scale geological mapping combined with structural mapping.

1999 Drill hole Location Map

2.7.3 Core Logging and Sampling Methodology

The drill core was geologically logged using Cameco's in-house UNILOG database program. The core was systematically logged measuring lithological, structural and alteration features. Results were displayed graphically using the GDM for Windows software program. A series of strip plots were used to display all features logged and measured. The explanatory notes for GDM plots table describes features represented by colours in the strip plots. The

Codes for Unilog Appendix lists the codes and parameters that were used during the logging process and the Unilog Drill Core Data appendix contains the entire drill hole log.

Explanatory Notes for GDM Plots
Codes for Unilog
Unilog Drill Core Data

Routine sampling was completed in every row of core. A representative 5cm-core sample was collected and halved using a core saw. One half was described (grain-size, Munsell colour, magnetic susceptibility, and competency-degree of silicification or de-silicification). The same sample was measured for spectral parameters using the PIMA II spectrometer. These samples are retained within the Cameco storage facility at the Darwin warehouse. The other half of the representative sample was used for lithogeochemical analysis (10m composites). The lithogeochemical analysis method and procedures are identical to those used for the outcrop samples.

2.7.4 Drill Hole Statistics and Results

A total of 2,260m of drilling in two holes was completed during the period August 29 to October 31, 1999 on the southern portion of EL 5061 and at the Spectre prospect. The Summary of Drill Program table is a summary of the drilling including collar co-ordinates and apparent depths to the tops of stratigraphic units. Details of each drill hole are described in the sections that follow.

Summary of Drill Program

2.7.5 DDH-0006

The hole was designed to be a stratigraphic hole that would intersect not only the McKay Sandstone but also hopefully, the unconformity and basement lithologies. The Figures are strip plots highlighting lithology, structure, alteration, geochemistry and PIMA parameters. Approximately 163m of McKay Sandstone were intersected at the beginning of the hole. The McKay Sandstone is elevated in most elements assayed for as well as having higher background values for magnetic susceptibility and down-hole gamma radiation. Small basaltic sills were intersected between 25-55m, with associated soft sediment deformation and what appears to be very small sandstone dykes. A narrow intersection of Gilruth volcanic unit was intersected at 527m (14m) and associated with a down hole probe peak of 580cps. At a depth of 763m, 229m of Nungbalgarri volcanics were intersected. The volcanics are generally elevated in most elements, particularly in Au, Pt, Pd, HREE and base metals. Radioactivity is associated with the upper contact (990cps) however, the lower contact at 992m was beyond the depth capability of the gamma logger. A small horizon of Mamadawerre Sandstone was intersected between 992m and 1013m showing a slight elevation in Uranium, although this can possibly be attributed to the close proximity to the overlying volcanics and the intrusive dolerite below.

This portion of sandstone is almost a quartzite, being very well silicified and exhibiting brittle fracture. At 1013m, the sandstone sharply contacts with an intrusion of Oenpelli Dolerite. This unit is quite massive and shows similar chemical characteristics to the volcanic horizon, however it does not exhibit the same elevated levels of Pt and Pd. The hole ended in silicified Kombolgie Sandstone.

DDH DAD-0006 Lithology Strip Plot
DDH DAD-0006 Structure Strip Plot
DDH DAD-0006 Alteration Strip Plot
DDH DAD-0006 Geochemistry Strip Plot
DDH DAD-0006 PIMA Strip Plot

2.7.6 DDH-0007

The hole was targeted on the main Spectre Fault, hoping to intersect any associated mineralisation at depth. The fault itself is expressed surficially as an extremely silicified breccia. Some strong surface anomalies are in the vicinity of the collar along with secondary uranium mineralisation. The hole exhibited strong fracturing throughout particularly towards the bottom of the Nungbalgarri volcanics horizon. Two small intersections of dolerite were encountered in the Marlgowa Sandstone. The first at 196m showed very strong fracturing and continued until 223m and the second from 441m to 452m was also highly fractured. Chemically both were very similar, particularly elevated in base metals, heavy rare earths and major oxides. A thin intersection of Mamadawerre Sandstone was encountered below the Nungbalgarri Volcanics at 963m. The sandstone was moderately fractured and contacted a fine grained mafic at 1009m which appeared to be the chilled margin of another intrusion of dolerite. Unfortunately, the drill broke down at this point and further drilling was not possible to fully investigate this intersection.

DDH DAD-0007 Lithology Strip Plot
DDH DAD-0007 Structure Strip Plot
DDH DAD-0007 Alteration Strip Plot
DDH DAD-0007 Geochemistry Strip Plot
DDH DAD-0007 PIMA Strip Plot

2.8 Other Studies

2.8.1 Petrographic Study by Pontifex

A total of 54 samples were submitted to Pontifex & Associates. The objective of the study was to document the characteristics of the mafic and sandstone samples in relation to the fluid-rock interactions in space and time.

Mineralogical Report No. 7961 by Pontifex & Associates

2.8.2 SRC Study of DDH DAD-0002 Drill Core

A suite of core samples from DDH DAD-0002 and 33 selected Kombolgie outcrop samples were submitted to Dave Quirt of the Saskatchewan Research Council (SRC) in Saskatoon, Saskatchewan Canada.

A total of 85 core samples spaced 8 to 10m apart were sampled throughout the 794m Kombolgie intersection including 120m of Nunbalgarri Volcanics. The selected Kombolgie samples include a traverse across the Flying Ghost prospect and specific samples from Stretch, Writer and Spectre. All PIMA spectra and processed Minspec and TSG data sets as well as the standard multi-element suite of ChemNorth analysis of each individual sample were included in the study.

The objectives of the study are as follows:

- Standard petrography assisted evaluation of the lithogeochemical characteristics of the Kombolgie stratigraphy (normative vs XRD vs PIMA).
- Characterise the sandstone lithofacies identified by Cameco.
- Characterise the diagenetic features, including silicification phenomenon, utilising petrographic methods. Objectives will be to rate degrees of diagenesis by petrographic methods with the objective of mapping these parameters (by GIS approaches). A rating scheme should be developed.
- Characterise any hydrothermal alteration.

SRC Kombolgie Sandstone Study

2.9 Stockdale Prospecting Ltd Diamond Exploration

The work completed over the exploration licences in 1999 consisted of the collection of 161 close interval, follow-up stream sediment samples around eight targets selected from the 1998 reconnaissance. Some of the follow-up was based on small airborne magnetic surveys flown on behalf of Stockdale during 1999.

The following is a progress report from Stockdale along with a link to some updated information. The completed annual report is still to follow. All available digital data has been submitted with this report.

Stockdale Prospecting Progress Report
Stockdale Prospecting Sample Locations Map by Stockdale Prospecting

During July and August, UTS (http://www.uts.com.au/) conducted detailed airborne magnetic surveys totalling approximately 197 line km's. The nine surveys were each 1x1 km's flown at 50m flight line spacing in a north-south direction. The surveys were designed to follow-up magnetic anomalies identified by previous magnetic data. One highly rated anomaly (DAD050) was re-visited and MMI geochemical samples were collected on a traverse over the target. A Dighem Helicopter EM anomaly (DEM001) selected from the Cameco "Flying Ghost" survey area was also field inspected and sampled with the collection of a combined loam sample and MMI geochemical traverse.

Airborne Geophysics Logistics Report by UTS

3 CONCLUSIONS

After the completion of the fourth field season, it is apparent that the Kombolgie Sandstone in the areas explored so far, is very thick and potentially difficult and expensive to explore. The results from the Slime prospect are certainly encouraging although the stratigraphic position of the area puts it high up in the Kombolgie Sandstone similar to where all of the previous drill holes were collared.

The roles of the two volcanic horizons is still not fully understood, however the petrographic work suggests that they may not have behaved as barriers to historical fluid flow as was previously thought. If the uranium bearing fluids have originated at depth, the volcanic horizons may still have scavenged uranium from solution thus preventing the uranium from expressing itself on the current surface.

Compilation of the multi-spectral data is an ongoing exercise and a fully detailed statistical analysis is still to be completed, however the initial work has shown that the process can identify even the most subtle of anomalies that would otherwise go unnoticed.

The diamond-drilling program has shown that the sandstone is quite thick and that we may need to move any future drilling towards the northwest of the tenements where the sandstone cover is possibly thinner. This is important, as there is currently no real understanding of the basement geometry within the tenements and as such, is hampering the ability to achieve good geophysical modelling.

4 RECOMMENDATIONS

Data collection is always an important ongoing process. It is recommended that further anomaly follow-up be completed during the 2000 field season along with additional detailed sampling.

Drilling should be directed to the northwest of the tenements so as to increase the chances of encountering basement geology. It is also recommended that the possibility of deepening DAD-0006 be investigated as the drilling equipment failed to achieve the desired depth.

Gravity surveys towards the northwest along with EM and seismic modelling on existing core should also be investigated.

Airborne PIMA using Stockdale Pty Ltd equipment would be a useful tool to help spectrally map large areas of the tenements quickly. This should be investigated before the onset of the dry season as the technique is highly dependent on there being little or no moisture in the atmosphere or on the ground.