Combined Annual Report for the Period
15 Nov 2007 to 14 Nov 2008

EXPLORATION LICENCE NUMBERS 25956, 25957 AND 25958

BEETALOO PROJECT

Tenement Holders: Beetaloo Uranium Pty Ltd ACN 010 117 601
(Subsidiary of Callabonna Uranium Ltd)

Submitted by: Callabonna Uranium Ltd

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Callabonna Uranium Limited via its subsidiary Beetaloo Uranium Pty Ltd is exploring ELs 25956, 25957 and 25958 for sandstone-hosted uranium, ideally in a configuration permitting in situ leach mining. A number of potential host horizons have been identified including Cretaceous channel sands and conglomerates, sands within the Cambrian Top Springs Limestone and Proterozoic hydrocarbon reservoirs (Jamison, Moroak and Bessie Creek Sandstones).

The Cretaceous sequence is favoured as a target because it is known to contain channel sands and conglomerates based on mapping by Stockdale geologists. The overall setting seems to be somewhat similar to that of the Texas Gulf which hosts several economic sandstone-hosted deposits. Shallow Proterozoic targets need to be defined, before they can be considered of interest.

Work carried out in year 1 of the tenements has been confined to an assessment of previous exploration (both for minerals and for hydrocarbons) and of regional geophysical datasets. Plans for a field program were put on hold due to the adverse state of the market and the postponement of plans to float the company on the Australian stock market.
INTRODUCTION

Beetaloo Uranium Pty Ltd is a 100% owned subsidiary of Callabonna Uranium Ltd and holds a 100% interest in Exploration Licences 25956, 25957 and 25958, which form the Beetaloo Project. The project is managed by Callabonna Uranium Ltd.

Callabonna is exploring for uranium hosted in reservoir sands associated with gas and oilfield structures. The first year’s exploration program involved desktop review of historic data, existing geological and geophysical data and GIS studies.

Figure 1. Project Location Map

TENURE

Exploration licence 25956 and 25957 were granted on 15 November 2007 for a period of six years. Exploration licence 25958 was granted on 14 February 2008 for a period of 6 years (Table 1). The three tenements cover a continuous area of 1,260 sub-blocks (more than 4,128 sq km).
<table>
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<tr>
<th>Tenement</th>
<th>Granted</th>
<th>Expiry</th>
<th>Sub-Blocks</th>
<th>Area Sq Kms</th>
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*Table 1. Tenement Details*

**NATIVE TITLE**

Three Native Title Claims exist over the Beetaloo project area (Table 2). No negotiations have begun with Native Title holders. In accordance with the Native Title Act 1993 and the Northern Territory Mining Act, Callabonna Uranium Ltd will initiate Native Title negotiations before we commence on ground exploration.

<table>
<thead>
<tr>
<th>Name</th>
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<th>NNTT Number</th>
<th>Registration Date</th>
<th>Overlapping Beetaloo ELs</th>
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<tr>
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<td>DC01/59</td>
<td>9-Nov-01</td>
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<tr>
<td>Newcastle Waters</td>
<td>NTD6008/01</td>
<td>DC01/8</td>
<td>26-Feb-01</td>
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<td>Daly Waters</td>
<td>NTD6071/01</td>
<td>DC01/71</td>
<td>15-Jan-02</td>
<td>EL 25957 &amp; EL 25959</td>
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*Table 2. Native Title Claims over the Beetaloo Project*

**LOCATION & ENVIRONMENT**

The Beetaloo Project is located centrally in the northern part of the Northern Territory within the Georgina Basin and Beetaloo Sub-basin. The project area is located around the town of Daly Waters and 250 kilometres SE of Katherine. The tenements can be accessed via the Stuart, Buchanan and Carpentaria Highways and numerous minor roads and unpaved tracks. The Alice Springs Darwin Railway Line parallels the project area 50 kilometres to the west. In the sub-tropical dry monsoonal climate, average temperatures range from 19° to 34° Celsius and average rainfall ranges from 4mm a month during the dry season to 140mm a month during the wet season. The land is flat to gently undulating plains covered by Eucalypts and grasslands. A majority of the land is covered by pastoral leases where the primary land use is cattle grazing.

**EXPLORATION RATIONALE**

Due to the recent growth and interest in nuclear energy, the price of uranium has improved creating a
resurgence in brownfield and greenfield uranium exploration. The target is a sandstone type deposit that is amenable to the environmentally benign and relatively low cost in-situ leach technique. The area was chosen because of geological similarities to the Texas Gulf region which hosts several significant uranium deposit, reconnaissance sampling suggesting elevated uranium background in some aquifer units in the region (Bravo, 2007) and complete absence of previous exploration for uranium.

**EXPENDITURE**

Callabonna has spent over $25,000 on the Beetaloo Project in the first year of the project. Under the Exploration Licence agreements Callabonna was required to spend a minimum of $78,700 per tenement, however due to extenuating circumstances Callabonna was unable to meet the minimum expenditure commitment. Callabonna Uranium Ltd is in the process of becoming an ASX listed public company. Much of the period was spent raising seed capital and preparing for an Initial Public Offering (IPO). Due to the recent economic crisis and drop in uranium spot price, Callabonna has postponed its IPO until early 2009. After listing, Callabonna will be able to focus on funding and exploring the Beetaloo Project.

**GEOLOGICAL SETTING**

**Basin Architecture**

The Beetaloo Basin is best defined by gravity data (Fig. 2). Its northern boundary is a sharp NW-SE trending gravity gradient, while its southern boundary is more irregular and diffuse. In addition to the NW-SE trend there is clearly a north-south component to the basin, exemplified by the Daly River Arch, which is terminated on its eastern side by another prominent gravity gradient. The Daly River and Arnold Arches appear to have been influenced by pre-existing major crustal zones of weakness and were emergent during deposition of the major petroleum source rocks (Velkerri and Kyalla Formations; Silverman et al., 2008). Smaller structural highs trending in a more east–west direction are evident in seismic data and occur throughout the basin. These appear to be formed by compressional strike-slip fault systems that parallel outcropping late-stage faults in the McArthur Basin. High resolution seismic data show that faults generally do not penetrate the uppermost Proterozoic.

Figure 2 illustrates a greatly increased thickness of Cambrian rocks within the basin, typically in the range 200 – 400m, compared to the northern margin where Cambrian rocks have been largely stripped. Cretaceous rocks form a thin veneer over the entire basin (Fig. 3 & 4). At the northern extremity of the basin, thickness varies is less than 30m, while in the interior of the basin thickness varies from 50 – 120m. This thickness variation could indicate that substantial movement on the major NW-SE basin-bounding fault occurred during or after deposition of the Cretaceous rocks.
Basin Fill

Much of the following account of the Proterozoic fill of the Beetaloo Basin is from Silverman et al. (2008), whereas descriptions of Palaeozoic rocks are from petroleum well completion reports.

Proterozoic meta-sediments of the Roper Group outcrop to the north and south of the basin, but thicken to as much as 10km within it (Fig. 4). The Bessie Creek Sandstone is the one of the oldest units intersected, typically at depths of 370 to 970m in the tenement area (Walton-2). In Altree-2 it is 400 m thick, typically fine-to very fine-grained and is light to medium to dark gray in colour. In Broadmere-1 pyrite and “dessicated hydrocarbon” are present as are “very hematitic” intervals, suggestive of migration of oxidised hydrothermal fluids and possibly variable redox conditions.

The Velkerri Formation is a “starved basin” deposit and an excellent hydrocarbon source rock. TOC levels commonly exceed 4% and occasionally reach 8%. It occurs at a depth of 259m in Walton-2. A feature of this unit is frequent strong petroleum odours during drilling and live oil and gas “bleeds”.

The Velkerri Formation is a coarsening upward succession dominated by greenish, organic-poor shale present in the lower and upper portion of the formation and the organically richest portions near the middle. The shoaling-upward succession into the Moroak Sandstone likely represents a basin-wide deltaic progradation and an increase in depositional environmental energy. In the organic-rich zones, the lithology becomes a thinly laminated shale of “brownish-black” colour. Eventual shallowing into the overlying Moroak Sandstone represents a higher-energy environment, probably the result of some basin-filling event such as regional deltaic progradation.

The Moroak Sandstone is a potential hydrocarbon reservoir. The contact with the Kyalla Formation is conformable, whereas the contact with the Velkerri Formation (though less well defined) is probably unconformable. The Moroak Sandstone is at least 400 m thick in Elliott-1 and 100m in Ronald-1 and exhibits a cleaning upward and coarsening-upward trend, until the relatively rapid transition into the overlying Kyalla Formation. It consists of fine to coarse quartz sandstone, occasionally with anhydrite cement and commonly with authigenic silica cement. Pyrite is common in McManus-1. Porosities range from 6% to 19% and a DST yielded salt water at a rate equivalent to 3000 bbl per day.

The presence of anhydrite may be of great significance for uranium mineralisation because of the possibility that it participated in reactions to generate “sour gas” (H₂S) that could have migrated and reacted with oxidised uraniferous groundwaters to precipitate uranium and sulphides. This scenario is analogous to one model proposed to explain Texas Gulf uranium deposits (which interestingly were discovered during drilling of petroleum wells).
Figure 2: Bouguer gravity image of the Beetaloo Basin with petroleum wells (data from NTGS and gravity gradients ("worms")). Black numbers represent the thickness of Cambrian rocks. Yellow dots are mainly BMR holes for which minimal information is available.
Figure 3: Surface geology of the Beetaloo Basin, from GA 1:2.5 million scale mapping. Pale yellow is Tertiary veneer, pale green – Cretaceous and pale magenta – Cambrian. Proterozoic outcrop in grey. Numbers are thickness of Cretaceous sediments.
The Kyalla Formation is another potential petroleum source rock. It is a deep-water, low energy “starved basin” deposit with high organic content and varies in thickness from 170m (Ronald-1) to 730m (Jamison-1). The Kyalla Formation is dominated by gray and brown siltstone and claystone, with minor thin sandstones. Oil and gas shows are common with numerous reports of strong odours, and gas and oil “bleeds” typically in the siltier and sandier zones. In McManus-1, for example, gas flows ($C_1$ – $C_5$) were recorded during drilling, along with frequent oil stains. Organic content is generally less than 2% but occasionally exceeds 6% in the lower organic-rich zone. Silverman et al. (2008) conclude that the Kyalla Formation should have generated enormous volumes of hydrocarbons.

The Jamison Sandstone unconformably overlies the Kyalla Formation reflecting transition from quiet-water, reducing conditions of the latter to higher-energy (possibly fluvial) conditions of the Jamison Sandstone. It is approximately 100 m thick, but thickens to about 160 m in the eastern portion of the basin in Burdo-1. The Jamison Sandstone is light to medium gray, fine- to medium-grained, and moderately- to well-sorted. It coarsens upward overall, but contains a distinctive 10–20 m-thick zone of cleaner sandstone in the upper one-third. Above this cleaner sandy zone, the unit becomes shalier until it becomes indistinguishable from the overlying Hayfield Mudstone. Porosity and permeability are high (up to 12.4% and permeability up to 121 md in Jamison-1). Gas and minor free oil were recovered in a DST from Jamison-1.

The Proterozoic youngest unit is the Hayfield Mudstone, a regionally-extensive sequence of organic-poor shale and siltstone. It is approximately 400 m thick in the central part of the basin. Glaucocite is a common, but minor constituent, attesting to a marine origin. A sandy zone containing hydrocarbons occurs approximately 60 m above the transitional and conformable contact with the Jamison Sandstone. This zone was tested in petroleum wells Jamison-1, Mason-1 and Shortland-1 but recoveries were minimal.

Proterozoic rocks are unconformably overlain by undeformed Cambrian rocks. The unconformity is at a depth of between 200 and 300m in the tenement area (Figs. 5-7). Four units were intersected by petroleum wells in the tenement area. These are the Top Springs Limestone (aka Tindall Limestone), Antrim Plateau tholeiitic basalt (aka Nutwood Downs Volcanics), Cox Formation and the Bukalara Sandstone. The limestone is light brown to off-white blocky and hard. Sandstone and claystone were also described, though it is possible that these were caving from up the hole. The volcanic rocks are vesicular with zeolite infill and calcite-pyrite veins and chlorite were also recorded. Rocks of the Cox Formation underlie the Tindall
Limestone in McManus-1, namely 200m of green to gray claystone and siltstone with occasional interbeds of gray to brownish-red sandstone. The Bukalara sandstone in Walton 2 is 60m thick, and consists of a grey fine to medium-grained sandstone with laminae of olive green claystone. The Bukalara Sandstone was also cored in McManus-1, revealing grey, fine-grained, sandstone and siltstone. Abundance of pyrite and gray colour suggests that the unit is locally reduced. Visual porosity is generally low (<2%) but is estimated at up to 8% locally. In Walton-2 the Bukalara sandstone has an elevated gamma ray count (in places > 400 cps), conversely in McManus-1 it has a lower gamma-ray response than surrounding units.

Cretaceous clays and silts unconformably overlie Cambrian rocks. In Walton-2 24m of “lateritic gravel” overlies 12m of greyish claystone. In McManus-1 the Cretaceous rocks are only 12m thick and logged as red brown to orange laterite, claystone and siltstone. No gamma logs were recorded in McManus-1 until 255m. Mapping of Cretaceous rocks by Stockdale geologists revealed a basal conglomerate separated from the underlying Antrim Plateau basalt by 1m of coarse sandstone. The conglomerate contains clasts of Proterozoic sandstone (presumably derived from the north-east) and weathered volcanic rock. Cretaceous sandstones contain mica and glauconite, the latter indicative of a reducing marine environment. Lithic fragments, clay and calcareous cement were also observed. Stockdale geologists concluded that the environment of deposition was nearshore and possibly swampy. This is reminiscent of host-facies to uranium deposits of Southern Texas, although belemnites in shales also record deeper water in the Beetaloo project area. A channel was observed to cut through shale and into underlying sandstone. This is of great significance for uranium exploration as such channels could host economic uranium.
Figure 5: Logs for McManus-1
Figure 6: Logs for Walton-2. GR – gamma-ray API units, RHOB – compensated formation density g/cc, CALI – caliper cm, SP – spontaneous potential – mV, LLD – Laterolog deep resistivity – ohm/m.
Figure 7: Lithologic log for Altree-2.
PAST EXPLORATION

**AP2781 COMALCO 1971**

Comalco targeting bauxite carried out a "comprehensive field programme including drilling and radiometric surveys". Detailed investigation was conducted on an airborne radiometric anomaly located outside the present tenement area. The anomaly was outlined on the ground using a scintillometer, which revealed counts of up to three times background associated with red, iron-rich soils. A total of 276 holes (i.e. including regional drilling) were drilled to a maximum depth of 20m. Downhole gamma measurements also revealed a similarly low tenor, again with a maximum of three times background. The anomaly thus proved barren of bauxite "or other economic minerals".

**EL3357 ABERFOYLE 1982-1983**

This tenement overlaps the easternmost portion of the project area. Aberfoyle's target was diamonds and 89 drainage gravel samples at 1 sample per 15km² were collected. No indicator minerals were found and the licence was relinquished in view of "remote" likelihood of finding kimberlite.

**EL4546 CRAE 1985**

This tenement also overlaps the easternmost portion of the project area. Work by CRAE consisted of "reconnaissance density" drainage gravel sampling. Chromites were found in some drainages, but no other indicator minerals. It was postulated that the chromites were derived from a mafic unit within the Cambrian Nutwood Downs Volcanics.

**EL4866 STOCKDALE PROSPECTING 1983-87**

Again the target was diamonds and again the location overlapped the easternmost portion of Beetaloo Uranium's project area. Four stream sediment samples were collected in 1983 yielding a single diamond. Forty follow-up samples were collected in 1986. A kimberlitic garnet was recovered from one, which lead to the collection of a further 21 samples. Sadly for Stockdale no diamonds or kimberlitic indicators were found in these samples. It was considered "unlikely" that a diamondiferous deposit could be found, and the source of the diamonds was thought to be within Cambrian or Cretaceous sediments. The tenement was relinquished.

**EL4548 CRAE 1986**

Work by CRAE consisted of "reconnaissance density" drainage gravel sampling. Chromites in six samples
and a single microdiamond were found outside the current tenement area. The chromites are thought to have been derived from a "sheet of volcanics" evident in regional (BMR) aeromagnetic data.

**EL6300 & 6301 STOCKDALE PROSPECTING 1989-1991**

The negative outcome of previous efforts didn't stop Stockdale from having a second bite at the cherry, although this time deposits of gold and palladium were also targeted. Five hundred stream sediment (heavy mineral) samples at 1 per 1.6 km² and 19 loam samples were collected along with 29 infill samples in 1989. Extra samples from the heavy mineral sample sites were analysed for a suite of 36 elements by XRF and in addition Au & Pd. Seven zones of anomalous Pb, Zn, Cu and Sn or W were identified and interpreted as originating in the Mid Proterozoic Nathan or Roper Groups. Raw data were not found.

Low numbers of chromites and ilmenites were recovered in EL6300, but only in one sample were the compositions (as demonstrated by electron microprobe) of kimberlitic affinity. Kimberlitic garnet was also located in this sample. Follow-up sampling failed to excite, however. Possibly kimberlitic indicator minerals were found in 89 samples from EL6301, mainly chrome but it was concluded that it is "highly unlikely that a primary kimberlite is to be found in the relinquished area". A source of the kimberlitic indicator minerals was postulated within the Cambrian or Cretaceous sediments.

**EL7951 & 7592 FODINA MINERALS PL (MPI) & OMEGA OIL NL 1993**

The focus of this investigation was a gravity anomaly (Daly Waters prospect) thought to represent "a large accumulation of relatively dense sulphide-bearing carbonaceous shales". This concept appears to have been supported by sampling of oil well Sever #1 by Omega Oil which returned up to 3% Zn in the Velkerri Formation.

No expenditure appears to have been incurred within EL7951 and 7952, but some of the (limited) work carried out by the JV is relevant to the geological interpretation of the current project area. Seismic line MA91-600 of Pacific Oil & Gas was reprocessed to enhance resolution of shallow reflectors. A major growth fault was inferred to have been active during deposition of the Velkerri Formation. A small gravity survey was completed and a single drillhole (DWD-1) drilled to 596m. The hole intersected Cambrian limestone of the Montejinni Limestone (to 126m), basalt, sandstone and then reduced (green) siltstones and silty mudstones attributed to the Chambers River Formation. The target Velkerri Formation was thought to be at some depth below the base of the hole, and any sulphide accumulation therefore at uneconomic depths. Of interest, however, are very high gamma ray counts in the Chambers River Formation with several peaks in excess of 600 cps at 350m in a large interval of high background (300 cps). Rocks at this depth were logged as green and brown silty claystone or brown and green mottled siltstone cut by a fault breccia (pyrite & calcite) at 362m.
EL8273: ASHTON MINING 1993-1995

Forty-three gravel samples were collected, in areas thought to have been undersampled by previous explorers, but all returned a "negative" result. No work was carried out in year two of tenure and the licence was subsequently abandoned.

EL22340, 22742 & 22743: RTE & GRAVITY CAPITAL 2003-2005

These tenements were part of a six tenement package referred to as the Hodgson Diamonds Project. Rio Tinto Exploration (RTE) limited their work to a literature review and made the following conclusions:

- Diamond and indicator minerals are derived from sources associated with lateritised Cretaceous sediments
- Only the eastern part of the tenement block has been adequately sampled, however, surface sampling was regarded as poorly effective or ineffective
- Detailed geophysical surveys present a good opportunity for discovery of a kimberlite

Not surprisingly, therefore, a farm-in agreement was concluded with Diamond Mines Australia Ltd (DMA, 40% owned by Gravity capital). A Falcon airborne gravity gradiometer survey was flown in August 2003. Coverage did not extend to the current project area, and no work was done by the JV on the Beetaloo tenements.

EL23006, 23009, 23015, 23016, 23019: ASHTON MINING 2002-2004

Ashton reviewed previous exploration results but carried out no ground work. No insights from this review were publicised.

SUMMARY

This area appears to be unexplored for uranium, or at least there is no public domain documentation of uranium exploration. The overwhelming weight of investment in this area has been for diamonds and bauxite. Potential probably still exists for diamonds but will require more widespread application of airborne geophysical techniques such as gravity gradiometry.

Airborne radiometric data were acquired by Comalco, but given the age of this survey (1971) it is possible that it was not completely effective.
The company proposes an exploration program (subject to obtaining appropriate finance) to test the tenement areas which includes:

- Reprocessing existing seismic data (emphasizing shallow layers) and geological re-interpretation
- Reprocessing of existing airborne radiometric data to highlight subtle uranium anomalies
- Constrained inversion of potential field data with a view to better mapping key structures and identifying areas for field testing
- Radon gas surveying (and water bore sampling if appropriate) of target areas
- Drilling of anomalous areas
Anonymous, 1985, AMOCO Broadmere 1 Exploratory Well Completion report: Report to NTGS PR85/15b
