
David Esser

August 2012
EXECUTIVE SUMMARY

This annual report describes the work carried out on EL25710 up to the 13th August 2012. EL25710 is located over the south-western end of the Murphy Inlier, NT and is held in Joint Venture between Murphy Uranium Pty Ltd, which is a wholly owned subsidiary of Lyell Resources Limited (Lyell) and Japan Oil, Gas and Metals National Corporation (JOGMEC). In December 2011 100% ownership of Murphy Uranium Pty Ltd was transferred to Lyell Resources Ltd from Bondi Mining Ltd (Bondi). The Murphy project area has the potential to host unconformity style and sandstone hosted style uranium deposits, similar to those located in the Alligator Rivers Uranium Field at the northern end of the McArthur Basin and the Westmoreland deposit approximately 100km to the east of the project area, respectively.

Exploration during the 2011-2012 field season comprised an environmental audit and drill hole rehabilitation.
1 INTRODUCTION

Murphy Uranium Pty Ltd, is the holder of EL25710. The licence is located west of the Westmoreland Uranium Field and forms part of Bondi’s Murphy Project, targeting uranium deposits about the Murphy Inlier in the Northern Territory. The Murphy Project initially comprised ELs 24694, 24841, 25708, 25709, 25710, 26138, 26139, 26140, 27379, 27728, 27729 and 27730, currently the project comprises EL’s 24841, 26138 and 26139. Refer to Figure 1 for the location map.

Figure 1: Location Map showing Murphy Project

This annual report covers all the exploration work carried out within EL25710 up to 13th of August 2012. Exploration during the 2011-2012 field season comprised an environmental audit and drill hole rehabilitation.
2 LOCATION & ACCESS

EL25710 are located approximately 130km west of the NT-QLD border and 170km south east of the McArthur River mine in eastern NT, as shown in Figure 2. The licence covers two 1:250,000 map sheets; Wallhallow and Calvert Hills. Access is via the Barkly Highway from Mt. Isa, to the Barkly Roadhouse, then via the Tablelands Highway to the Calvert Hills Road. Access around the project area is via graded station roads and tracks. An alternative access can be gained via Cape Crawford to the north via the Tablelands highway, or from the east by the Calvert Hills Rd which crosses the border near Wollogorang.

![Figure 2: Tenement Location Map](image-url)
3 TENEMENT DETAILS

Gold FX Pty Ltd (a wholly owned subsidiary of the Canadian company, Buffalo Gold Limited) originally applied for EL25710 and they were acquired from them by Murphy Uranium Pty Ltd who were a 100% owned subsidiary of Bondi Mining Limited (Bondi). In December 2008 a Letter of Agreement was signed between Bondi and Japan Oil, Gas and Metals National Corporation (JOGMEC) wherein JOGMEC can earn a 51% undivided interest in the project by funding AUD $3 million in exploration over four years. In December 2011 Bondi merged with World Titanium Resources Ltd (WTR) and Murphy Uranium Pty Ltd was sold to Lyell resources Ltd. Murphy Uranium are the operators of the exploration program. Tenement details are shown below in Table 1.

Table 1: Tenement details

<table>
<thead>
<tr>
<th>Exploration Licence No.</th>
<th>No. Sub-Blocks</th>
<th>Area (km²)</th>
<th>Grant Date</th>
<th>Surrender Date</th>
<th>Current Annual Expenditure Commitment</th>
</tr>
</thead>
<tbody>
<tr>
<td>EL 25710</td>
<td>104</td>
<td>340</td>
<td>29/8/2007</td>
<td>13/8/2013</td>
<td>$ 5,000</td>
</tr>
</tbody>
</table>
Figure 3: EL 25710 Block identification Map
4 REGIONAL GEOLOGY

The Murphy Project area is located on the western end of the Murphy Inlier. The inlier is referred to as the Murphy Tectonic Ridge and represents a belt of lower Proterozoic basement that separates the middle Proterozoic McArthur Basin to the north and the middle Proterozoic Lawn Hill Platform - South Nicholson Basin to the south. Refer to Figure 4. The oldest rocks in the region are the lower Proterozoic Murphy Metamorphics, which form the basal unit of the Murphy Inlier, and consist of isoclinally folded greenschist facies metasediments; typically quartz-feldspar-mica schists and gneiss with minor graphitic units. The Murphy Metamorphics form the core of the Murphy Tectonic Ridge and only outcrop in the NT portion of the inlier. The Cliffdale volcanics unconformably overlay the Murphy Metamorphics and are made up of a series of felsic volcanic and volcanioclastic rocks. The Cliffdale volcanics are only found at the eastern end of the inlier. Both the metamorphics and volcanics are intruded by granites and adamellites of the Nicholson Granite Complex which constitutes the majority of the rocks found in the inlier.

The northern margin of the Murphy Inlier is unconformably overlain by the Westmoreland Conglomerate, which is the oldest unit in the middle Proterozoic Tawallah Group, and marks the base of the southern portion of the McArthur Basin. The Westmoreland Conglomerate is made up of four sub-units;

(i) A basal volcanic derived (sourced from the underlying Cliffdale volcanics) conglomerate-breccia that grades up into a pebbly quartz sandstone;

(ii) An upward fining, coarse to medium grained ferruginous sandstone;

(iii) A coarse polymictic conglomerate and minor pebbly sandstone, which can be reverse faulted directly on the Cliffdale Volcanics; and

(iv) A porous, crossbedded, coarse grained quartz sandstone, with minor conglomerate bands and laminated tuffaceous siltstone in the lower part.

The Seigal Volcanics lie conformably on top of the Westmoreland Conglomerate and consist of massive and amygdaloidal tholeiitic basaltic lavas with minor interbedded siltstones and sandstones. A thin shale bed is commonly found at the base of the Seigal Volcanics and marks the hiatus between deposition of the Westmoreland Conglomerate and the start of volcanism. The middle to upper Tawallah Group consists of interbedded sediments and volcanics. Sediments and volcanics of the McArthur Group lie unconformably over the Tawallah Group.

The southern margin of the Murphy Inlier is unconformably overlain by several belts of Lawn Hill Platform in addition to sediments of the south Nicholson Basin, which unconformably covers the Lawn Hill Platform successions. A thin unit of coarse sandstone and conglomerate, the Wire Creek Sandstone, marks the base of the Lawn Hill Platform in places and is conformably overlain by the Peters Creek Volcanics; a massive sequence of alternating basalt, rhyolite and rhyodacites with minor sediments. Both units can be found lying unconformably on the Murphy Inlier and are considered equivalents to the Tawallah Group in the McArthur basin. The Peters Creek Volcanics are unconformably covered by
the Fickling Group, a sequence of conglomerates, sandstones, siltstones and dolomites. The Fickling Group belongs to the Lawn Hill Platform and in the area of the Murphy Inlier is unconformably covered by shallow marine sediments of the South Nicholson Basin referred to as the South Nicholson Group. This group is also found lying unconformably over the western end of the Murphy Inlier or over the Benmara Beds, which can lie unconformably between the South Nicholson Group and the Murphy Metamorphics. The Benmara Beds are also a middle Proterozoic Tawallah Group equivalent and consist of a mixed rhyolite, trachyte, sandstone and conglomerate package.

Figure 4: Simplified Regional Geology

Phanerozoic cover consists of mostly early to middle Cambrian sediments and basalts, and Cainozoic sediments. Outcropping of Proterozoic rocks in the project area suggests that within EL 25710 the Phanerozoic cover is not thick, although the airborne magnetics suggest that the Cambrian Georgina Basin limestone and Antrim Plateau Basalt become thicker to the west.

Structurally, the region is cut by a dominantly NW trending series of faults and joints paralleling the Calvert fault. Possible NNW trending extensions of the Emu Fault also pass through the west side of the region under the Phanerozoic cover. A second set of NE trending faults can also be seen paralleling the structural trend of the Murphy Tectonic Ridge. Both sets of faults commonly consist of high angle normal and reverse faults whose intersection appears to form structural blocks displaying horizontal movement and/or tilting. Lateral movement is also common in the NW trending structures. Numerous mafic,
commonly doleritic, dykes parallel the faulting and are thought to be cogenetic with the mid Proterozoic volcanics of the Tawallah Group.

Small stratabound disseminated lead – zinc ± copper occurrences, associated with carbonaceous units are found within both the McArthur and Lawn Hill Platform – South Nicholson Basins. Copper mineralisation occurs as unconformity related and breccia pipe occurrences in the region. The latter deposit type forms sub-economic deposits in the Redbank area (Figure 4) which were mined on a small scale in the post war era. Minor tin occurrences have also been found around the Nicholson Granite Complex.

The region is best known for the uranium deposits at Westmoreland (Refer to Figure 4); notably the Redtree deposit (12,600t U₃O₈), the Junnagunna deposit (5,300t U₃O₈) and the Huarabagoo deposit (3,000t U₃O₈). Mineralisation in these deposits occurs as sandstone hosted uranium within the upper sandstone unit of the Westmoreland Conglomerate, directly below the contact with the Seigal Volcanics, and shows a strong association with fault hosted mafic dykes and sills. Minor mineralisation is also found within other units of the Westmoreland Conglomerate and in shear zones at the unconformity between the Cliffdale Volcanics and Westmoreland Conglomerate. Clusters of minor uranium occurrences area can be found to the west and east of the Westmoreland area, along the northern margin of the Westmoreland Conglomerate. To date only minor unconformity type uranium mineralisation has been found at the unconformity between the Murphy Metamorphics and the Westmoreland Conglomerate.
<table>
<thead>
<tr>
<th>Era (Ma)</th>
<th>Formations</th>
<th>Legend</th>
</tr>
</thead>
<tbody>
<tr>
<td>1723</td>
<td>Gold Creek Volcanics</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Wollogorang Formation</td>
<td></td>
</tr>
<tr>
<td>1726</td>
<td>Settlement Creek Volcanics</td>
<td></td>
</tr>
<tr>
<td>1729</td>
<td>Sly Creek Sandstone</td>
<td></td>
</tr>
<tr>
<td></td>
<td>McDermott Formation</td>
<td></td>
</tr>
<tr>
<td>1850</td>
<td>Seigal Volcanics</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Westmoreland Conglomerate</td>
<td></td>
</tr>
<tr>
<td>&gt;1900</td>
<td>Clifford Volcanics</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nicholson Granite</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Murphy Metamorphics</td>
<td></td>
</tr>
</tbody>
</table>

**Figure 5: Stratigraphy of Murphy Inlier Region**
4.1 Structure and Tectonics

Cratonisation of the northern Australian orogenic domains during the Barramundi Orogeny was accompanied by the establishment of a fundamental framework of deep-seated NW, NNW to NNE and NE-trending crustal structures (Etheridge et al., 1987). It is widely speculated that these structures were reactivated and became the major controlling influence on the depositional geometry of succeeding basin phases and the localisation of subsequent deformation (e.g., Plumb, 1979; Etheridge and Wall, 1994; Rogers, 1996). The majority of models for the evolution of the McArthur Basin promote extensional tectonics, in which specific fault orientations acted as normal or ‘growth’ structures and others acted as accommodation or transfer structures during various stages of basin formation. The most influential aspect of McArthur Basin geology that has driven extensional models is the presence of significant volcanic and coarse grained clastic rocks at the base of the basin succession (Rogers, 1996).

The igneous rocks of the Westmoreland region are markedly bimodal with respect to silica content, a typical feature of intracratonic riftling. No rocks older than the Murphy Metamorphics are known east of the Westmoreland area, implying that the detrital sediments of the Tawallah Group were derived from either within or west of the Murphy Tectonic Ridge. The Tawallah Group is dominated by shallow-water marine sediments deposited on a regionally extensive platform.

Subsequent contractional reactivation of earlier ‘extensional fault systems’ is thought to have occurred at least three times during and after basin development (Plumb, 1994; Rogers, 1996).
5 SUMMARY OF PREVIOUS WORK

A comprehensive review of previous mineral exploration was carried out and an outline is presented here. Important information gained from this review includes the following;

First recorded work in the area was by Mount Isa Mines in 1956 and consisted of crude airborne radiometric surveys. The results of this work located the Westmoreland deposits and most likely all of the significant outcropping occurrences.

There was a distinct hiatus in exploration between 1963-1970, reflecting a slump in the global demand for uranium; the post war proliferation of nuclear weapons had slowed and the nuclear power industry was still in its infancy.

A second wave of exploration commenced in the 1970’s as the demand for uranium for use in nuclear power stations increased. Many of the companies were also operating in the Alligator Rivers region, at the northern end of the Pine Creek fold belt, and much of their focus was on this area after the discovery of significant deposits at Jabiluka, Ranger, Nabarlek and Koongarra. The similarity between the two areas was known, however at this time the nature of the Alligator Rivers deposits was poorly understood and exploration was targeted toward roll front and sandstone hosted uranium deposits in both areas. By the time unconformity type uranium deposits were understood, uranium exploration restrictions were in place and work did not resume in the area until recently.

More detailed radiometric surveys have been carried out. This work has revealed many outcropping anomalies related to brecciation, quartz veining (silicification) and iron-metasomatism (feruginisation) associated with faulting in the Nicholson granite and Murphy Metamorphics. None of these anomalies appear to warrant follow-up work, however they indicate that processes associated with the formation of unconformity type uranium deposits have been active in the early Proterozoic basement.

The region has been explored for gold, basemetal (sedex type deposits) and kimberlite hosted diamonds by several major companies. No significant gold or basemetal discoveries were made. A large number of diamonds were recovered from Ashton’s Creswell prospect outside the licence and the area is currently under a ERL.

An airborne GEOTHEM survey carried out by BHP targeting unconformity U-Au-PGE deposits indicated the usefulness of input EM surveys in targeting unconformity uranium deposits under cover. In particular the ability to locate basement conductors related to graphite in fault zones or clay alteration. Part of the BHP survey covers the current EL.

The western covered region of the Murphy Inlier has the potential to host an unconformity type uranium deposit at depth

A list of the ATPs and ELs previously covering area about EL 24841 is provided in Table 2.
Table 2: Previous tenements over EL 25710

<table>
<thead>
<tr>
<th>Licence</th>
<th>Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATP 444</td>
<td>MIM</td>
</tr>
<tr>
<td>ATP 983</td>
<td>Carpentaria Exploration Company</td>
</tr>
<tr>
<td>ATP 3401</td>
<td>ESSO Australia</td>
</tr>
<tr>
<td>EL 122</td>
<td>Noranda Australia</td>
</tr>
<tr>
<td>EL 886 &amp; EL 887</td>
<td>T.W. Cawley and R.A. Weston</td>
</tr>
<tr>
<td>EL 1339</td>
<td>AAR Ltd/Otter Exploration “Coolibah” JV</td>
</tr>
<tr>
<td>EL 1427</td>
<td>Mines Administration/Otter Exploration “Bowgan Creek” JV</td>
</tr>
<tr>
<td>EL 1253</td>
<td>Mines Administration/Union Oil JV</td>
</tr>
<tr>
<td>EL 1234</td>
<td>Mines Administration/ESSO Australia JV</td>
</tr>
<tr>
<td>EL 2232</td>
<td>Amoco Minerals</td>
</tr>
<tr>
<td>EL 4392 &amp; 4438</td>
<td>Stockdale</td>
</tr>
<tr>
<td>EL 4352</td>
<td>Ashton Mining</td>
</tr>
<tr>
<td>EL 6836</td>
<td>Carpentaria Exploration Company</td>
</tr>
<tr>
<td>EL 7222 &amp; 7223</td>
<td>MIM</td>
</tr>
<tr>
<td>EL 8997, 8998, 9163 &amp; 9660</td>
<td>BHP</td>
</tr>
</tbody>
</table>
6 PREVIOUS EXPLORATION BY BONDI

6.1 Summary of Work Completed to August 2007

In summary, the work completed up to 28 August 2007 consisted of;

- A comprehensive review and assessment of previous mineral and diamond exploration work.
- An airborne EM and magnetic survey.
- A mineral assessment and target selection by Douglas Haynes Discovery Pty Ltd comprising:
  - Compilation of public domain geological, geochemical and geophysical data;
  - An interpretation of the geological and structural data for the region;
  - A geophysical and geochemical interpretation of available data, incorporating the airborne EM survey.
- Selection of potential target areas.

A detailed account and assessment of the 2007 work has been presented in the 2007 Combined Annual Report (EL’s 25708, 25709 & 25710) by G. Tahan. This will not be repeated in this report.

6.2 Summary of Work Completed to August 2008

In the 2008 period, Bondi carried out programs designed to test some of the targets defined by the assessment of all the previous work to August 2007. Work comprised the following.

- Alpha Track Etch surveys
- RAB Drilling
- Downhole Radiometrics
- Hychip Survey report

A detailed account and assessment of the 2008 work has been presented in the 2008 Combined Annual Report (EL’s 25708, 25709 & 25710) by D. Esser and D. Stevenson. This will not be repeated in this report.

6.3 Summary of Work Completed to August 2009

In the 2009 period, Bondi carried out programs designed to test some of the targets defined by the assessment of all the previous work to August 2008. Work comprised the following.

- Alpha Track Etch Surveys
- Ionic Leach Soil Sampling
- Airborne Magnetic Survey
- Geological Interpretation of Airborne Magnetics
- RAB Drilling
- RC and Diamond Drilling
- Downhole Radiometrics
- Sampling and Assaying
A detailed account and assessment of the 2009 work has been presented in the 2009 Combined Annual Report (EL’s 25708, 25709 & 25710) by D. Hedger. This will not be repeated in this report.

6.4 Summary of Work Completed to August 2010

In the 2010 period, Bondi carried out programs designed to test some of the targets defined by the assessment of all the previous work to August 2008. Work comprised the following.

- Re-Interpretation of Airborne magnetic Data (Dr D. Haynes)
- Interpretation of the magnetic character of the covered rocks carried by Dr John Coggon of Mines Geophysical Services.
- Phase 2 regional drilling program: Two holes drilled on EL25710, MURD012 and MURD014 for a total of 665.9m

A detailed account and assessment of the 2010 work has been presented in the 2010 Combined Annual Report (EL’s 25708, 25709 & 25710) by D. Hedger. This will not be repeated in this report.

6.5 Summary of Work Completed to August 2011

On 6th October 2010 Fugro Airborne Services completed an Airborne Electo-Magnetic survey (AEM) comprising a total of 2,355 line kilometres covering the Murphy West target area (1,478 line km at 500m spacing), the UC19 area (624 line km at 300m spacing) and the UC 17 survey (253 line km).

An interpretation of the data from the AEM survey was completed in November (J. Coggon, 2010).

A detailed account and assessment of the 2011 work has been presented in the 2011 Combined Annual Report (EL’s 25708, 25709 & 25710) by D. Hedger. This will not be repeated in this report.
7 EXPLORATION IN CURRENT REPORTING PERIOD

7.1 Environmental Audit & Rehabilitation

The only exploration completed in 2011 was a five day environmental audit of all previous drilling and tracks by two field assistants. In particularly the field personnel located all previous drilling which included locating each RAB and RC hole and checking that:

- All rubbish was removed from the site (including PVC collar and plastic bags)
- The collar was removed and the hole plugged below surface.
- Any sump or excavation was backfilled and plastic liner removed.

In February 2012 another two man field crew from Arnhem Exploration Services completed rehabilitation of all outstanding RAB and aircore drill holes which remained to be rehabilitated. Refer to Appendix 1 for the report on the rehabilitation completed by Arnhem Exploration Services.

8 CONCLUSIONS

No further work is recommended on the tenement due partly to the depth to the Proterozoic basement (300 – 400m) and the cost of testing a target at these depths, and the lack of positive results from the exploration programs conducted. The tenement was totally surrendered on 13th of August 2012.

9 RECOMMENDATIONS

The younger Cambrian limestone and Antrim Plateau basalt make exploration for uranium mineralisation hosted within the Proterozoic sediments difficult and expensive as conventional electrical geophysics and soil geochemistry are not considered reliable in defining mineralisation or associated alteration under cover.

There are no recommendations at this point in time.
REFERENCES


APPENDIX 1:

“Report on Murphy Uranium drill site rehabilitation carried out on EL24694, 24841 & 25710 (February 2012)”