PARTIAL RELINQUISHED REPORT ON
EL24549 ALLAMBER 1 PINE CREEK
NORTHERN TERRITORY

FOR THE PERIOD
23 SEPTEMBER 2005 TO 22 SEPTEMBER 2015

TENEMENT HOLDER: ELEMENT 92 PTY LTD

Pine Creek SD52-08 1:250,000 Geological Map Sheet
Pine Creek 5270 1:100,000 Geological Map Sheet
McKinley River 5271 1:100,000 Geological Map Sheet

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Distribution: NT Department of Resources Element 92 Pty Ltd (Thundelarra Exploration Ltd)
SUMMARY

Exploration Licence 24549 is located about 30 km NE of Pine Creek, Northern Territory. Element 92 Pty Limited (a wholly owned subsidiary of Thundelarra Limited) purchased the Licence from Atom Energy Limited/Excelsior Gold Limited in 2012. EL 24549 was granted on 23/09/2005 and will expire on 09/05/2015. In August 2015, Element 92 Pty Ltd decided to voluntary relinquished 23 of the 41 blocks forming EL24549. This report covers exploration activities undertaken on the relinquished blocks of EL 24549.

The project area is located within the central part of the Pine Creek Orogen (PCO) which is a tightly folded sequence of Palaeoproterozoic rocks, 10km to 14km in thickness, laid down on a rifted granitic Archaean basement during the interval ~2.2-1.87Ga. In the project area, rocks of Masson Formation, Mundogtie Sandstone, Mt Bonnie Formation along with members of Cullen Batholith (Allamber Springs, Frances Creek, McCarthy’s and Minglo granites) are exposed. During the Top End Orogeny (1870 – 1780 Ma), the sequence was tightly folded and pervasively altered with metamorphic grade averaging greenschist facies to phyllite.

Part of the relinquished ground was covered by a large radiometric/magnetic survey which was flown by Thompson Aviation in September 2012 for Element 92, moreover the project area was explored by desktop study. However no geochemical sampling or drilling was undertaken over the surrendered part of the Licence. Relinquished part of the Licence mainly covers rocks of the Minglo and Frances Creek Granites where no mineralisation of significance has been found. As a result of that, 23 blocks of the Licence were relinquished.

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Any information included in the report that originates from historical reports or other sources is listed in the "References" section at the end of the document.

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1. INTRODUCTION

Exploration Licence 24549 is located about 30 km NE of Pine Creek, Northern Territory (Figure 1). Element 92 Pty Limited (a wholly owned subsidiary of Thundelarra Limited) purchased the Licence from Atom Energy Limited/Excelsior Gold Limited in 2012. EL 24549 was granted on 23/09/2005 and will expire on 09/05/2015. In August 2015, Element 92 Pty Ltd decided to voluntary relinquished 23 of the 41 blocks forming EL24549. This report covers exploration activities undertaken on the relinquished blocks of EL 24549.

2. LOCATION AND ACCESS

EL 24549 is located about 175 km SSE of Darwin and approximately 30 km NE of Pine Creek (Figure 1). The tenement can be approached by roads and tracks leading off the Kakadu Highway. It can also be accessed from the Mary River Homestead Road which leads off from the Kakadu Highway. Vehicle access within the tenement is possible by station tracks which may be impassable during wet season.

3. TENEMENT DETAILS

EL 24549 was applied for by Imperial Granite and Minerals Pty Limited on 17 January 2005, and was granted on 22 September 2005 for a period of 6 years. It originally had 136 graticular blocks with an area of approximately 451.7 km². The tenement changed hands in 2008 and was purchased by Excelsior Gold Limited/Atom Energy Limited. In 2009, Element 92 Pty Ltd, acquired uranium exploration rights. In 2012, Element 92 purchased the tenement along with other assets in the Allamber area. The licence has been subjected to reduction twice leaving behind 41 blocks in November 2013. Element 92 decided to relinquish another 23 blocks in August 2015, these blocks are listed in Table 1 and displayed in Figure 1.
Table 1: List of relinquished blocks on EL24549.

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Figure 1: Location of Project Area, relinquished blocks are illustrated in red.
1.0 GEOLOGICAL SETTING

The project area is located within the central part of the Pine Creek Orogen (PCO) which is a tightly folded sequence of Palaeoproterozoic rocks, 10km to 14km in thickness, laid down on a rifted granitic Archaean basement during the interval $\sim 2.2$-$1.87$Ga (Ahmad et al. 1993). The sequence is dominated by pelitic and psammitic (continental shelf shallow marine) sediments with minor inter-layered tuff units. Pre-orogenic mafic sills of the Zamu Dolerite intruded the sequence prior to regional metamorphism and deformation.

During the Top End Orogeny (1870 – 1780 Ma), the sequence was tightly folded and pervasively altered with metamorphic grade averaging greenschist facies to phyllite. The Cullen intrusive event introduced a suite of fractionated calc-alkaline granitic magma into the sequence in the period $\sim 1.85$-$1.78$Ma. These high temperature I-type intrusives induced strong contact metamorphic aureoles ranging up to (garnet) amphibolite facies to more extensive biotite and andalusite hornfels facies.

Figure 2 shows geology of the project area where lithologies of Namoona Group (Masson Formation), Mount Partridge (Wildman Siltstone, Mundogie Sandstone), South Alligator Group (Koolpin Formation, Gerowie Tuff and Mt Bonnie Formation) and Finniss River Group (Burrell Creek Formation) are exposed. These meta-sedimentary sequences have been intruded by members of the Cullen Batholith and Zamu Dolerite at places (Bajwah, 1994).

The Masson Formation is the oldest rock unit which is exposed in the NE corner of EL 24549, and has been intruded by the Minglo Granite. It is a thick sequence of carbonaceous phyllite, slate, siltstone and dolomite. The dolomitic sediments are exposed towards the base of the formation. Some massive ironstone and muscovite-tremolite marble horizons are also present. The Masson Formation hosts significant uranium mineralisation in the south at Cleo’s, Twin and Dam. In addition, it also contains some occurrences of base metals mineralisation, including malachite-bearing schist at Hatrick.

Much of the relinquished part of the project area has at least 2 members of the Cullen Batholith. These are Minglo Granite and Frances Creek Granite (Figure 2).

The Palaeoproterozoic Allamber Springs Granite is one of the significant plutonic bodies, genetically related to gold, uranium and base metals mineralisation in the adjacent contact zone (Bajwah 1994). It is mainly massive and largely homogenous and even-grained, although porphyritic marginal variants occur in several restricted localities. Mafic inclusions in low abundances occur particularly towards the margin of the pluton. It crops out as expanses of bare rock, boulders and tors separated by alluvial flats.
Figure 2: Geological setting of the project area.
4. PREVIOUS EXPLORATION HISTORY

The project area has been explored since 1960’s when first edition geological map of the Pine Creek was produced, documenting the geology and mineral potential of the project area. Between 1987 – 1993, metallogenic study of the Pine Creek (1: 250,000) sheet was undertaken (Ahmad et al.,1993) which provided detail geological and geochemical investigations of part of the project area. Bajwah (1994) published a report on the Cullen Batholith which investigated details of petrological and geochemical characters of the members of the Cullen Batholith and its relation with gold, base metals and uranium mineralisation in the adjacent meta-sediments.

Total Mining Australia (formerly Minatome Aust Pty Ltd) carried out a reconnaissance survey of the Pine Creek Orogen in 1981-82, covering part of the project area. Anomalous radiation in the area led to the discovery of Cleo’s uranium deposits. The Cleo's group of uranium deposits/prospects (Figure 2) are located in the central of EL24549. EL 4414, covering the anomaly and surrounding area, was applied for on 12 August 1983 and subsequently granted in January 1984.

Total Mining Australia commenced exploration on EL 4414 in 1984. In 1987/88 a joint venture with PNC (Australia) Pty Ltd was formed and in 1988 the joint venture applied for Exploration Retention Lease 84 to cover the known uranium mineralisation at the Cleo, Dam and Twin prospects. This licence was granted on 16 December 1988 for a period of 5 years. The area of the licence was 300 hectares and it was granted on the grounds that ERL 84 contained an anomalous zone of possible economic importance.

The Twin and Dam uranium deposits were discovered in the mid 1980’s by Total Mining. From 1984 to 1988 Total Mining carried out an extensive exploration program which included geological mapping, ground radiometric surveys, soil radon (Alphacard) determinations, ground magnetic surveys, EM conductivity surveys, a stream sediment orientation survey, trenching and drilling. A total of 15,369m of drilling was completed in 367 holes and included 682m of auger drilling, 13,569m of percussion drilling and 1,118m of diamond drilling. Based on this drilling, Total Mining estimated the two deposits contained pre-resource mineralisation of 740 tonnes of U₃O₈.

Exploration activity was suspended when Total Mining’s French parent company withdrew from exploration in Australia and no uranium exploration has been carried out on the project since the late 1980’s.
Other anomalies, including Cleo’s East, Lunch Creek, Cliff, Theatre, Theatre East, Mercedes, Twin South, Dam North and Dam South anomalies were located by geophysical prospecting methods. Preliminary drilling to test these anomalies encountered only minor mineralisation, with hole ALL-P-353 intersecting 0.10m of 0.119% U₃O₈ at a depth of 20.2m.

In April 2007 Atom Energy Ltd (‘Atom’) acquired the tenement from Imperial granite and Minerals Pty Ltd and Robert Bruce Cleaver. Atom raised $10 million dollars and listed on the ASX on 26 June 2007. During 2007-8 Atom Energy Ltd carried out 5,291m of reverse circulation drilling in 88 holes. Of this 3,356m in 56 holes were drilled at the Twin Prospect and 1,192m in 32 holes were drilled at the Dam project. A further 580m in 9 holes were drilled at the Hill 20 (Cliff) prospect area, some 350m to the north of Twin. A second stage of drilling conducted in late 2008 comprised one diamond drillhole for 236m, located on the eastern margin of the Twin prospect.
5. EXPLORATION ACTIVITY ON RELINQUISHED BLOCKS

A large radiometric/magnetic survey was flown by Thompson Aviation in September 2012 for Element 92 as shown on Figure 3. All the geophysical data acquired over the relinquished blocks is displayed in Appendix I. The aim of this survey was allowed Element 92 to define exploration target, however no geochemical sampling or drilling was undertaken over the surrendered part of the Licence. Relinquished part of the Licence mainly covers rocks of the Minglo and Frances Creek Granites where no mineralisation of significance has been found. As a result of that, 23 blocks of the Licence were relinquished.

Figure 3: Magnetic survey by Thompson Aviation in 2012 over EL24549 relinquished blocks.
6. REFERENCES


Cotton, B., 2011, Photogeological Mapping at 1:40 000 Scale of the Pine Creek Regional Area 2, Northern Territory. Consultant Report for Element 92 Pty Ltd.

De Kever, N., 2010, Annual technical report on EL 24549 (Cleo’s Area), Pine Creek NT, 23 September 2009 to 22 September 2010. Element 92 Pty Limited Annual Report to NT Dept of Resources.


