ANNUAL AND FINAL REPORT

ON EL 27650

MARY RIVER PROJECT

FOR THE PERIOD

27 MAY 2011 TO 24 MAY 2012

Tenement Holder: Element 92 Pty Ltd

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Element 92 Pty Ltd/Thundelarra Exploration Ltd
SUMMARY

Exploration Licence 27650 is located about 150 km SE of Darwin and about 25 km NE of Pine Creek in the Mary River area. It was granted to Element 92 Pty Ltd in 2010 for a period of 6 years. After a thorough review of the project area, EL 27650 was surrendered on 24 May 2012. This is the final and annual report on EL 27650.

The project area is located within central part of the Pine Creek Orogen which is a folded sequence of Palaeoproterozoic pelitic and psammitic sediments, with interlayered cherty tuff units. These rocks have been intruded by the late-orogenic Palaeoproterozoic granites, causing wide spread contact/thermal aureole which contains most of the gold and other mineralisation in the Orogen. Rocks of the South Alligator Group are exposed in the project area. During Top End Orogeny (1870 – 1780 Ma), rocks within the Pine Creek Orogen were metamorphosed and deformed, and granites were emplaced in the culminating stages of the Top End Orogeny. During deformation, Palaeoproterozoic rocks were folded, faulted and sheared. Folding is mainly tight to isoclinal with NW trending fold axis. At least five phases of folding is recognised and amongst these D3 is most conspicuous and considered significant for gold mineralisation.

During the reporting period, a technical review of the project area was undertaken utilising exploration data collected so far. Geological, geophysical and geochemical data did not reveal any mineral potential of the project area. As a result of that, EL 27650 was surrendered on 24 May 2012.
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1.0 INTRODUCTION

Exploration Licence (EL) 27650 is located about 150 km SE of Darwin and about 25 km NE of Pine Creek in the Mary River area. On 8 May 2011, EL 27650 along with other two tenements (EL 27648 and EL 27649) was granted combined reporting status and assigned group report no GR-2000/11. Thundelarra Exploration Ltd/Element 92 Pty Ltd are exploring the project area for uranium, gold and base metals mineralisation. On 24 May 2012, EL 27650 was surrendered, and this is final and annual report on the tenement.

2.0 LOCATION AND ACCESS

EL 27650 has been part of the Mary River Group and is located about 150 km SE of Darwin in the Mary River area (Figure 1). The project can be accessed via Stuart Highway up to Pine Creek which is located at a distance of 220 km. From here, Kakadu Highway leads towards east and at a distance of 4 km, Frances Creek Road leads to NE to the Frances Creek Iron mine. It is essentially a graded track which is sued to service the iron ore mine. From this turn off, a track leads to the project area which may not be passable during wet season. Within the tenements access can be achieved via station tracks. Alternatively, project area can also be approached via Mt Wells Road which is an unsealed road, and could be challenging during the wet season.

3.0 TENEMENT DETAILS

EL 24650 was applied for on 21 October 2009 and was granted on 27 May 2010 for a period of 6 years. EL 27650 along with other two tenements (EL 27648 and EL 27649) was granted combined reporting status and assigned group report no GR-2000/11. Company explored the EL for more than 2 years and found that EL 24650 has very little potential for commodities of interest, and therefore decided to surrender the tenement on 24 May 2012. Underlying cadaster is PPL 1111 and is held by Ban Ban Springs Pty Ltd.

The climate is semi-arid, tropical with a warm dry season from April to September and a hot wet season from October to March. The average rain fall is 1200 mm and most of which falls during wet season. Temperatures are highest in October – November with a mean 35 – 37°C. The Coolest months are June and July when mean maximum is 30 – 32°C and the mean minimum is 12 – 14°C.
Figure 1: Location of EL 27650 in the Mary River project
4.0 GEOLOGICAL SETTING

The project area is located within central part of the Pine Creek Orogen which is a folded sequence of Palaeoproterozoic pelitic and psammitic sediments, with interlayered cherty tuff units (Needham and Stuart-Smith (1984) and Needham et al. (1988). These rocks have been intruded by the late-orogenic Palaeoproterozoic granites, causing wide spread contact/thermal aureole which contains most of the gold and other mineralisation in the Orogen (Bajwah, 1994). Some uranium mineralisation is also confined to contact areoles. Less deformed Mesoproterozoic sedimentary and volcanic sequences unconformably overlie the Palaeoproterozoic rocks and is overlain by Cambrian-Ordovician lavas, sediments and Cretaceous strata. Cainozoic sediments, laterite and recent alluvium may cover parts of the Orogen lithologies.

Figure 2 shows geological setting of the project area, where rocks of Mt Partridge Group (Wildman siltstone) and South Alligator Group are exposed. During Top End Orogeny (1870 – 1780 Ma), rocks within the Pine Creek Orogen were metamorphosed and deformed, and granites were placed in the culminating stages of the Orogeny. During deformation, Palaeoproterozoic rocks were folded, faulted and sheared. Folding is mainly tight to isoclinal with NW trending fold axis. At least five phases of folding is recognised and amongst these D3 is most conspicuous and considered significant for gold mineralisation.

Lithologies of the Wildman Siltstone are exposed in the southern part of EL 27650 (Figure 2). It predominantly consists of pelitic sediments and some sandstone (~10%). Stuart-Smith et al., 1987 divided the Wildman siltstone into two units – lower sequence and upper sequence. The lower sequence comprises carbonaceous phyllite, ironstone, siltstone and phyllite. At depth, most of the rocks are pyritic and carbonaceous. The lower sequence has produced significant tonnage of iron ore from several localities from Frances Creek iron field. The upper sequence contains silty phyllite siltstone and carbonaceous phyllite. In this sequence minor sandstone and rare dolarenite are also present. This formation has iron, gold, tin and base metal mineralisation.

Rocks of South Alligator Group are exposed within EL 27650 (Figure 2), and these are the Koolpin Formation and Gerowie Tuff. The Koolpin Formation mainly contains carbonaceous mudstone, siltstone, and limestone. Iron formation is mainly confined to the middle of the unit. Upper part of the formation mainly comprises carbonaceous mudstone along with minor siltstone and mudstone.

The Gerowie Tuff is mainly composed of siltstone, phyllite and tuff, Tuffs constitute about 25% of the formation and contains varying amount of curved or angular crystal fragments of
Figure 2: Geological Setting of the Project Area
quartz, alkali feldspar, and minor sphene, biotite and zircon in a matrix of devitrified glass shards (Ahmad et al.1993). In places, re-crystallised K-feldspar, sericite, chlorite, iron oxide and carbonates are also present. Many of the tuffaceous horizons range from 30-150 cm thick graded beds with laminated tops. These graded beds are interpreted as ashfall accumulations from a single eruption (Stuart-Smith, 1985). A number of gold, uranium and base metal deposits are associated with the rocks of the South Alligator Group.

5.0 PREVIOUS EXPLORATION HISTORY

EL27650 has been explored by several Governmental agencies and exploration companies with the aerial magnetic and radiometric survey along with geological mapping of the McKinlay (1:100,000) and Pine Creek (1:250,000) sheets by BMR in 1960’s. In 1970’s, Comalco Limited explored the area for alluvial gold deposits. Fifty samples were investigated and it was determined that source of gold was outside the tenement boundary.

Another investigation for uranium, gold and base metal mineralisation was undertaken on part of EL 27650 by Occidental Minerals Corporation of Australia in 1977. In September 1981, Aquitaine Minerals Pty Ltd carried out a systematic helicopter borne radiometric survey in the project area, targeting the Koolpin Formation and Gerowie Tuff (D’Auvergne and Miller, 1981). Ground investigations of radiometric anomalies showed that they were confined to the tuffaceous horizons of the Gerowie Tuff, clay pans and black soil and drainage alluvium.

Under EL 4500, part of EL 27650 was investigated for uranium (Fraser, 1987). It involved detailed airborne radiometric and magnetic survey. Anomalies found were checked by ground radiometric and magnetic survey. In addition, rock chip sampling, gravel and stream sediment sampling was undertaken without success and eventually EL 4500 was surrendered.

Under EL 6637, Magnum Gold NL explored northern part of EL 27650 for gold and base metals mineralisation (Milligan, 1992). Exploration program included drainage geochemistry, utilising the BLEG analyses method. Samples associated with the Koolpin Formation showed potential for gold mineralisation.

6.0 EXPLORATION YEAR ENDING 24 May 2012

During the reporting period, Element 92 Pty Ltd undertook a review of the geological, geochemical and geophysical data of EL 27650 to understand mineral potential of the project for further exploration. Some field fields were undertaken for ground-truthing.
During 2010 – 11 reporting period, part of EL 27650 was mapped, utilising 1:40000 aerial photographic cover and topographic, geological and structural interpretation was made with the help of remote sensing data. The main purpose was to add in our understanding of geological setting of uranium and gold mineralisation in the area. Figure 3 shows geological setting of the area based on recent geological mapping (Cotton, 2011).

**Geological Mapping**

EL 27650 is dominated by rocks of the South Alligator Group which are the Koolpin Formation, Gerowie Tuff and small amount of Mt Bonnie formation that is exposed in the south-western corner of the EL (Figure 3). They unconformably overly the Mount Partridge Group. These rock units are easily differentiated on all data sets (geophysical, air photos and imagery). The Koolpin and Gerowie Tuff form hilly terrain while the Mount Bonnie is largely recessive. There is a strong radiometric contrast between the K-anomalous Gerowie and the U-anomalous, low K & Th upper part of the Koolpin Formation. Also, the Koolpin Formation is intruded by the Zamu Dolerite sills which are poorly radioactive.

On regional scale, structure of the area is dominated by granite intrusions, open folding and a number of major fault structures. Granites intruded the strata with approximate concordant contact (Figure 3). Each forms a topographic rim which may be discontinuous, marked by contact aureoles.

D3 folding is prominent in all data sets and is responsible for the present disposition of strata. The folds have shallow to flat plunges and overall change in plunge from north to north-easterly may be observed. There are a large number of axial plane faults some of which can be accurately traced for tens of kilometres. They are more often than not dislocating synclinal axes. The strongest of these, which is confined to the Burrell Creek Formation, has a sinistral shift of around three kilometres (Cotton, 2011).
Figure 3: Geological and structural setting of the project area (Cotton, 2011)
**Geophysics**

Figure 4 shows TMI image of the project area where it appears flat and EL 27650 does not appear to have any magnetic anomaly which could be perused for further for exploration. The Minglo Granite intrudes the meta-sedimentary sequence in the south where contact zone around the granite body is clearly defined by magnetic rim (Figure 4). Magnetic character of the Masson Formation within EL 27648 and the Mundogie Sandstone within EL 27649 is well-defined (Figure 4). It may be noted that Masson Formation hosts significant uranium deposits (Cleo Group), and magnetic feature of the Masson Formation within the EL 27648 suggest evidence of hydrothermal activity and it should be tested for the presence of mineralisation. Similarly magnetic character of the Wildman Siltstone also signifies the metallogenic potential of meta-sedimentary sequence within EL 27649.

**Historical Geochemical Data**

A total of 87 soil samples were collected within EL 27650. These data have been captured in GIS environment by the Northern Territory Geological Survey. Author acquired the data set (Pine Creek 1: 500,000) from the NTGS and examined the assay data by MapInfo GIS software.

Graphical representations of rock chip and stream sediment surveys are shown in Figures 5. Quality of data varies from survey to survey and most of the meta-data information is not available. However, it does provide quantitative information about the prospectivity of the project area. All the geochemical data are given in Appendix 1.

These samples were collected during previous exploration programs mainly by CRA Exploration Limited. An -80 mm fraction were assayed only for Mn. Analytical techniques are not known along with other meta-header. Appendix 1 contains these assays in prescribed template. Please note that all available meta data headers have already been provided. It is not known why samples only for Mn were assayed. Mn values ranged from 33 – 5700 ppm with an average of 701 ppm. Mn is not a commodity of interest.

**7.0  CONCLUSION**

A thorough review of geological, geophysical and geochemical data shows that project area has no potential for commodities of interest (uranium, gold and base metals). Therefore, EL 27650 was surrendered on 24 May 2012.
Figure 4: TMI image of the project area
Figure 5: Historical soil data within EL 27650
8.0 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.


