



2012-13 Annual Report – EL28565

**EL28565**  
**ANNUAL EXPLORATION REPORT**

**Reporting Period**  
**15/09/2012 – 14/09/2013**

Tanami 1:250,000 Sheet SE 51-15

Breaden 1:100,000 Sheet 4859

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**TITLE PAGE & BIBLIOGRAPHIC DATA SHEET**

**Project Name:** Browns Range Project

**Tenement Numbers:** EL28565

**Tenement Operator:** Excalibur Mining Corporation

**Tenement Holder:** Crestline Enterprises

**Report Type:** Annual Exploration Report

**Report Title:** Annual Exploration Report

**Report Period:** 15/09/2012 – 14/09/2013

**Author:** Robert Jewson

**Date of Report:** November 2011

**1:250,000 map sheet:** Tanami (SE 52-15)

**1:100,000 map sheet:** Breaden (4859)

**Target Commodity:** Au, PGE, Base Metals, REE

**Keywords:** Literature Review, Geological Mapping, Exploration Target Generation,



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## **ABSTRACT**

**Location:** EL28565 is located in the Western Tanami Desert within the Supplejack Downs pastoral lease.

**Geology:** The project area covers the eastern extent of both the Palaeo Proterozoic Tanami Complex and lower-mid Proterozoic sediments of the Birrindudu-Victoria Basin.

**Work Done:** During the reporting period an extensive compilation of previous exploration activities was conducted. The process involved the acquisition of all available historical reports, digitising of relevant data and interpretation.

**Results:** The project compilation has outlined a number of targets requiring follow up ground truthing.

**Conclusions:** Systematic geochemical sampling and detailed geological mapping is proposed to identify targets warranting further investigation.



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## 1. INTRODUCTION

This report details activities undertaken by Excalibur Mining Corporation Ltd at the Browns Range Project (EL28565) during the reporting period 15<sup>th</sup> September 2012 to 14<sup>th</sup> September 2013.

## 2. LOCATION & ACCESS

EL28565 is located in the Western Tanami Desert within the Supplejack Downs Pastoral Lease, and sits ~5km east of EL25207 which Excalibur manages through a joint venture with Palace Resources. The Tanami mine is approximately 78km south, Supplejack Downs is approximately 24km to the east, Birrindudu is approximately 90km to the north- north- west and Halls Creek is approximately 240km to the north west. The project is covered by the 1:250,000 map sheet of Tanami (SE 52-15) and the 1:100,000 map sheet of Breaden (4859).



FIGURE 1 SATELITE IMAGERY

The Supplejack Homestead is approximately 800 km north-west of Alice Springs via the largely unsealed Tanami Road. Supplejack can also be accessed via the Tanami Road from Halls Creek to the north-west in Western Australia and via Kalkarindji and Lajamanu from the north

All access roads to Supplejack Homestead are unsealed and sometimes closed in wet weather. The project area is approximately 60 km west of the homestead via station tracks and overland.

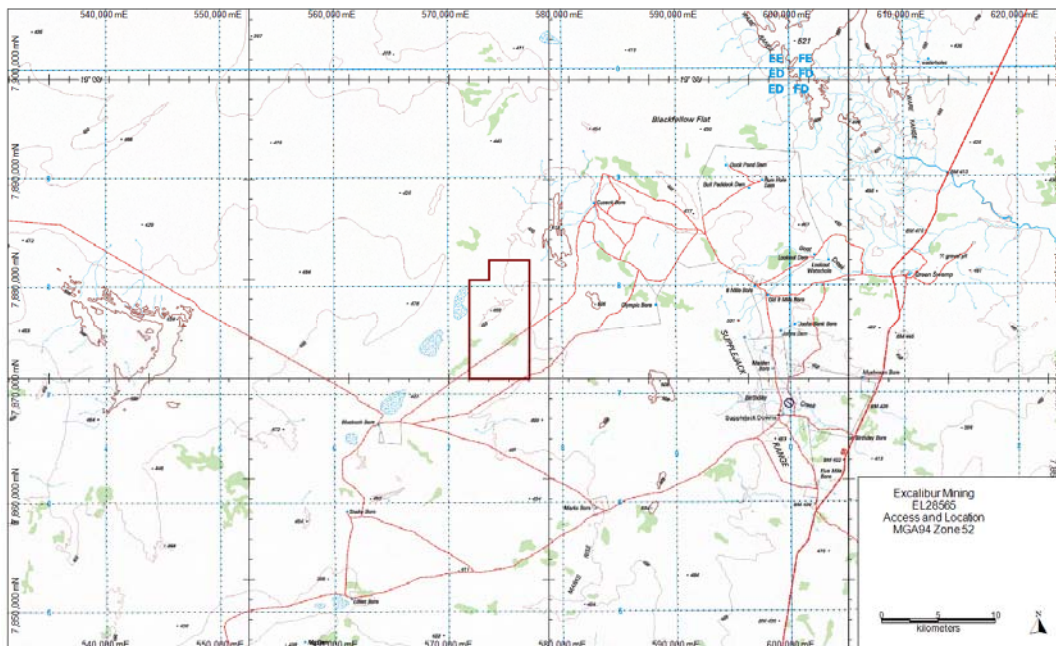


FIGURE 2 LOCATION AND ACCESS

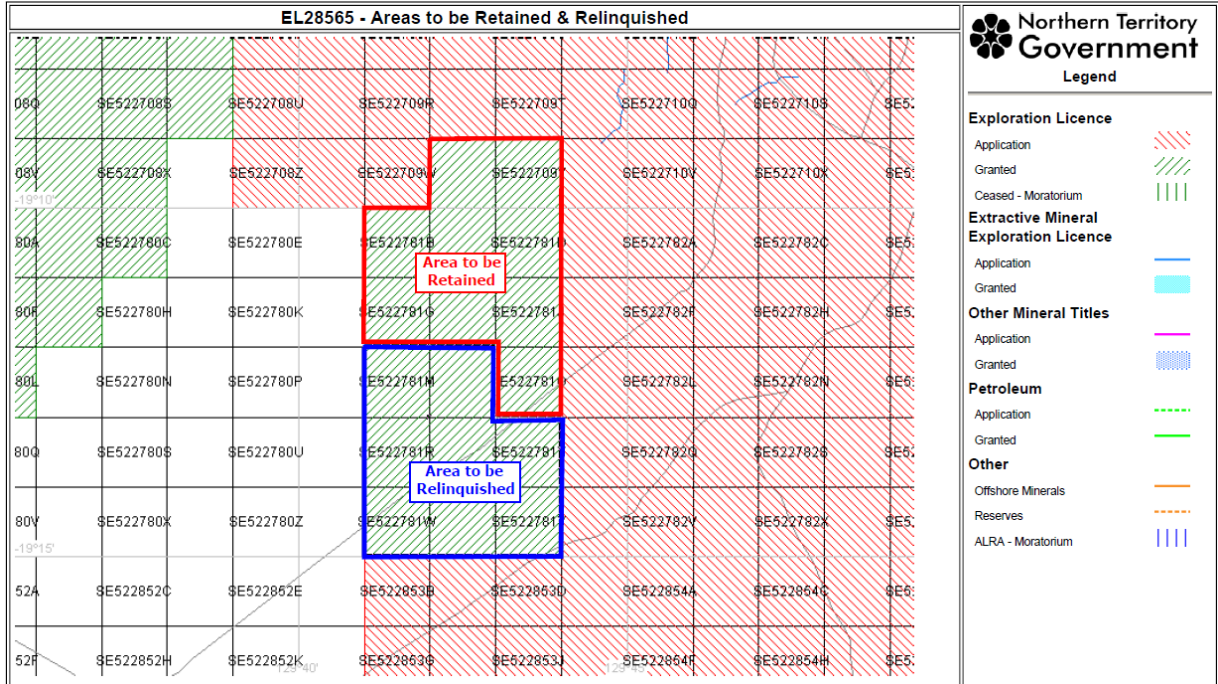
### 3. TENEMENT STATUS

The tenement is held by Crestline Enterprises and operated by Excalibur Mining Corporation. The tenement is live, and was granted on the 15<sup>th</sup> of September 2011, and covers an area of 55.14 km<sup>2</sup>.

TABLE 1: TENEMENT STATUS

Tenement	Type	Status	Holder	Application Date	Grant Date	Expiry Date	Legal Area	Units
EL28565	Exploration License	Live	Crestline Enterprises Pty Ltd	17/01/2011	15/09/2011	14/09/2017	17	BL.

On the 12<sup>th</sup> of September 2013, a total of eight blocks were relinquished and nine blocks were retained.





## 4. REGIONAL GEOLOGY

The oldest rocks exposed belong to the Archaean Tanami Complex. They are tightly folded and generally cleaved sedimentary and volcanic rocks that have been regionally metamorphosed to lower greenschist facies. The Tanami complex comprises the Killi Killi, Mount Charles, Nanny Goat Creek and Nongra Beds. Because of tight folding, probably complex faulting and poor exposures especially near contacts, no sequence has been established within the complex. The thickness of the Tanami Complex is also not known. The Tanami Complex general forms undulating terrain with low rounded hills and strike ridges, many of which are covered with laterite or lateritic gravel, but includes scattered steep rocky hills and ridges up to 15m high.

The Killi Killi beds outcrop in the west mainly to the south and south east of the Killi Killi Hills. The most exposed are phyllitic to schistose greywacke. Acid volcanic interbeds are present south of Pingidijarra Hills and north of Jellebra Rock Holes.

Three main units recognised in the Mount Charles Beds are characterised respectively by chert, phyllite and basic volcanics. The first of these and the most widespread is commonly contorted into tight isoclinal folds. It includes local intercalations of basalt, as at the Tanami Mine Workings, and also gossanous bands consisting of kaolinite, quartz, hematite, goethite and limonite. Much of the chert may be silicified siltstone and shale. The second consists of phyllitic rocks some of which contain gossanous bands. The latter form prominent ridges in the Black Hills, and include Mount Charles and Mount Twigg. Some of the gossanous bands are known to be developed on black carbonaceous pyritic shales at depth. The third consists of amphibolite and basalt. Most of the amphibole represents basalt which has been thermally metamorphosed by granite.

Volcanics present in all units of the Tanami complex, are most abundant in the Nanny Goat Creek Beds, in which they include both acid porphyry, which may be ash flow deposits and basalt lava flows.

The Pargee Sandstone crops out in the west of the region as a north west trending belt up to 8 km wide. It consists of interbedded silicified sublithic, lithic, and quartz arenites, conglomerate and greywacke. The conglomerate characteristically contains pebbles and granules of jasper, and yellow and greenish chert which may have been derived from the Mount Charles Belt.



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Arenite and acid lava of the Mount Winnecke Formation are exposed in the north east of the region. They are intruded by the Mount Winnecke Granophyre. The Formation consists of uncleaved quartz feldspar porphyry from isolated low mounds, and is unconformable on the Tanami complex. The Gardiner Sandstone unconformably overlays the formation.

Flat lying white to grey silicified sandstone and minor siltstone and conglomerate cap in small mesas and buttes have been called Larranganni Beds. The main exposures of these beds are in the south, near Larranganni Bluff. The sandstone is commonly silicified, resembling silcrete. Weathered surfaces are commonly pitted probably through solution weathering. This indicated that some of the sandstone may be calcareous in chemistry. The beds are probably partly fluvial and partly lacustrine.

Tertiary laterite, silcrete and calcrete and Quaternary deposits cover large parts of the region. Flat topped roses capped by laterite are interpreted as remnants of the Tertiary Tennant Creek erosion surface. The cappings are the upper part of the weathering profile which is well exposed in breakaways and is especially developed on basalt of the Antrim Plateau volcanics.

## 5. PROJECT GEOLOGY

The project area covers the eastern extent of both the Palaeo-Proterozoic Tanami Complex and lower-mid Proterozoic sediments of the Birrindudu-Victoria Basin.

Deformed granitoids and sediments of the 1800 to 1850 Ma Ware Group (sandstones, volcanoclastics) and the Killi Killi Formation comprise most of the Tanami Complex lithologies known to occur within the project area. These units are unconformably overlain by sandstones, grits and conglomerates of the lower Proterozoic (1700 to 1750 Ma) Birrindudu-Victoria Basin, including, Gardiner and Pargee Sandstone members.

Deposition in Birrindudu Basin began with sandstone transgressing over metamorphic and crystalline basement around 1.7 Ga. Transgression was associated with regionally extensive north-trending growth faults and volcanism, which may indicate rifting. The Birrindudu and Tolmer Groups represent the exposed section of this basin and may be up to 6,000 m thick locally. These units are dominated by coarse clastic sedimentary rocks with minor felsic volcanics (tentatively assigned to undifferentiated Birrindudu Group) and carbonate rocks and shale in the upper Tolmer Group.

The Gardiner Range Sandstone is a flat lying sequence starting with a basal conglomerate which passes upwards into a series of feldspathic sandstones and grits. The lower sandstone unit is overlain by a sequence of flaggy sandstones and grits.

Overlying the basal Birrindudu sediments are a thick package of predominantly siliclastic and carbonate rocks, with minor shales and muddy sediments.

Areas of the project, particularly those underlain by Lower Proterozoic rocks are covered by surficial deposits including alluvium and windblown sand. The plateau areas, which are underlain by the Gardiner Formation, are frequently capped by a silcrete layer of variable thickness. Such areas may have hindered exploration in the past by masking potential zones of mineralisation.

In the east of the project area are mafic volcanics and sediments assigned to the Cambrian Wiso Basin.

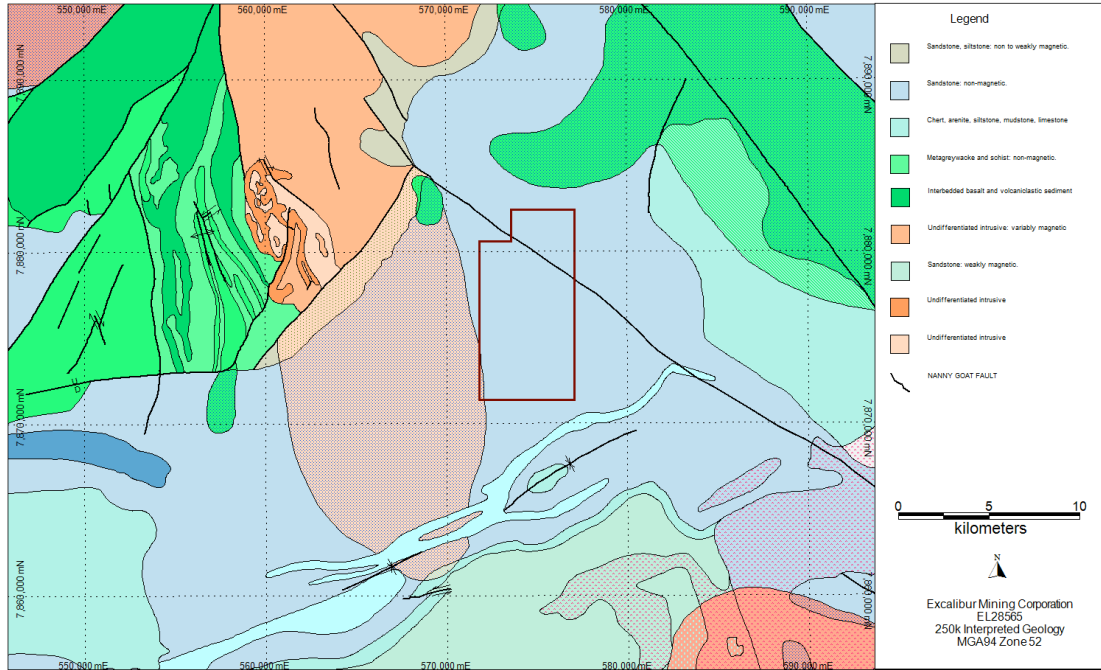


FIGURE 3 250K INTERPRETED GEOLOGY

## 6. HISTORICAL EXPLORATION

Uranium exploration was first carried out in the Tanami area in the 1960s by New Consolidated Gold Fields in the Killi Killi Hills. Mineralisation was discovered in radioactive conglomerates and sandstones in the basal part of mid Proterozoic Gardiner sandstone, unconformably overlying lithologies of the Tanami Complex (Killi Killi Formation). Assays up to 0.23% U<sub>3</sub>O<sub>8</sub> and 5% combined rare earth elements were returned from selected surface rock samples.

In the early 1980s the Mineral Reserves Group of Canada discovered polymetallic vein-related uranium-gold-nickel-copper mineralisation associated with autunite and metatorbernite mineralisation in the Gardiner Range (the Don Uranium Prospect, Morrison, 1985, Stocklmayer, 1987). Mineralisation occurs within structurally controlled chloritic shear zones close to the Tanami Complex-Birrindudu unconformity. Drilling encountered narrow widths with assays including 0.4 m at 1.7% U<sub>3</sub>O<sub>8</sub> and 2.0 g/t Au.

PNC Exploration (PNC) Australia's exploration of the Browns Range Dome area for unconformity style mineralisation was carried out from 1986 to 1990. Exploration activities include aerial photography, geological reconnaissance mapping, airborne geophysical interpretation, Landsat lineament and interpretation mapping, airborne magnetics and radiometrics, geological mapping and sampling for geochemistry and petrology, ground EM and magnetics, heliborne gravity surveys, ground magnetics, radiometric and radon surveys, as well as diamond and percussion drilling. A number of uranium prospects were located.

The main focus for uranium exploration was Area 15, where uraniferous chloritic shears were discovered. At Area 10, gossanous, radioactive quartz veins returned assays with uranium values up to 0.1% U<sub>3</sub>O<sub>8</sub> as well as elevated As, Cu and Pb values. Limited drilling at Area 10 returned inconclusive results.

Another prospect, Area 32 comprised a uraniferous linear anomaly 400 m long, 100 m wide in recent fluvial sands and clays, overlying the Gardiner sandstone, although the area was not conclusively tested.

PNC also located several other areas of uranium mineralisation, areas 19, 20 and 21. All have a spatial association with the Tanami Complex-Birrindudu unconformity.

Other historical exploration in the region for uranium has been limited, and has focused on targeting the unconformity between the Tanami Complex (Killi Killi Formation) and the Gardiner Sandstone. Other companies to have explored the area for uranium include WMC, Kratos Uranium and Sigma Resources.

The majority of exploration in the region occurred prior to 1983. Since then the area has been the subject of intensive exploration for gold, which has produced several discoveries and currently operating mines.



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## 7. EXPLORATION COMPLETED

During the reporting period a desktop analysis was conducted on the project and its surrounds. The projects historical exploration and mining were reviewed and evaluated for the effectiveness on the project and the historical targets reviewed. This has established a geological model of the project, and its surrounds to effectively work on the project moving forward.

The geophysics which have been taken over the project area was reinterpreted. The magnetics, radiometrics, thorium, uranium and digital elevation models were reprocessed. The geology of the area which has been mapped, has been compared to the reinterpretations for possible areas of mineralisation and follow up exploration for knowledge gaps and infill.

## 8. CONCLUSIONS AND FUTURE WORK PROGRAMME

The tenement has been reviewed and studied with the new historical data compilation. This has proved to show exploration targets for follow up exploration. Excalibur will begin with a soil sampling program which will be assayed for economic minerals. The results will be studied and an infill soil sampling program will be conducted on anomalous zones.



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