



PALADIN ENERGY LTD

Titleholder	Paladin NT Pty Ltd
Operator	Paladin Energy Ltd
Tenement Manager/Operator	Paladin Energy Ltd
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1 SUMMARY

The Angela Uranium Project is located approximately 25km south of Alice Springs and consists of a single Exploration Licence (EL25758) encompassing the Angela and Pamela uranium deposits.

Exploration Licence 25758 was granted over an area of 21 blocks on 3 October 2008. The licence is currently registered to Paladin NT Pty Ltd (100%).

Cameco Australia Pty Ltd operated and managed the Project until August 2011 when Paladin Energy Ltd took over management of the Project.

The Northern Territory Government made an announcement on 28 September 2010 that it would not support the development of a mine at Angela, therefore a substantially reduced program has been undertaken during the current and recent reporting periods.

Exploration Licence 25758 was renewed at the end of the initial term for two years expiring 2 October 2016. An application to renew EL25758 was lodged over the full 21 blocks prior to expiry and renewal and has been granted for a further period of two years expiring 2 October 2018.

Activities undertaken during the tenement year were limited to off-ground studies including hyperspectral analysis and subsequent interpretation of 740 laboratory pulps. The acquired spectra were then reviewed by a hyperspectral consultant.

2 INTRODUCTION

The Angela Uranium Project (the Project) comprises both the Angela and Pamela uranium deposits located approximately 25 km south of Alice Springs in the Northern Territory.

Cameco Australia Pty Ltd (Cameco) and Paladin Energy Minerals NL were 50:50 partners in the Angela-Pamela Project over EL 25758, which was granted on 3 October 2008.

Exploration drilling commenced in 2009 and continued through into 2010 with the Project being operated and managed by Cameco under the Cameco/Paladin Joint Venture agreement.

Paladin Energy Ltd assumed the role of operator and manager in August 2011.

The Angela Project Joint Venture was dissolved during 2013 and Cameco's 50% interest was transferred to Paladin NT Pty Ltd, a wholly owned subsidiary of Paladin Energy Ltd (Paladin).

Location

Exploration Licence 27578 is located approximately 25km south of Alice Springs, and straddles the Old South Road, the historic Ghan Railway Line, the Old Telegraph Line and the Central Australian Railway (see **Figure 1**).

The historic Ghan railway line is not currently operational. The Central Australian Railway passes through the tenement on the western extremity. This railway line is in operation and passes the Brewer Industrial Estate just north of the licence.

Apart from the abovementioned, the only existing infrastructure is a minor gravel road passing through the centre of the licence in a northeast-southwest direction that extends south to the No.3 Dam. This road crosses a subsidiary track running in an east-west direction that comes off the Old South Road and continues west to the Stuart Highway.

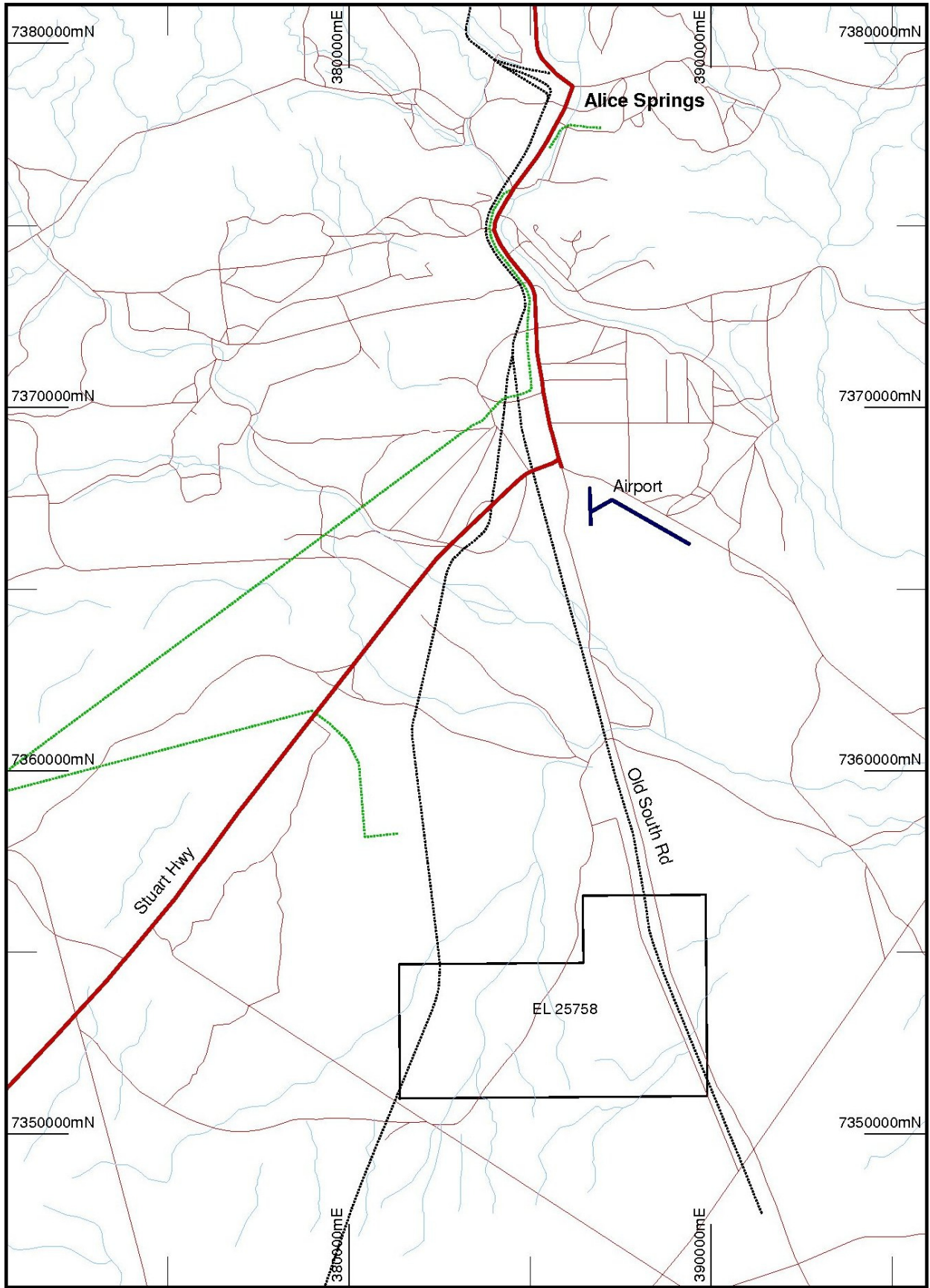


Figure 1 - Location of EL2578

Tenure

Uranerz Australia Ltd worked extensively on the Angela deposit between 1972 and 1983. In 1990 the company requested the ground be Reserved from Occupation (RO) pending an improvement in the uranium price.

Following a review of all ROs in the Northern Territory, the intent to revoke the RO for the Angela-Pamela area was publically announced and subsequently enacted.

Cameco and Paladin Energy Minerals NL subsequently submitted an Exploration Licence application covering the Angela and Pamela uranium prospects south of Alice Springs for a total area of 37.67km². On 3 October 2008, Exploration Licence 25758 was granted to the Cameco Australia Pty Ltd (50%) / Paladin Energy Minerals NL (50%) Joint Venture for a period of six years expiring on 2 October 2014.

Following grant of EL 25758, Paladin Energy Minerals NL transferred its 50% interest to Paladin NT Pty Ltd, a wholly owned subsidiary of Paladin Energy Ltd.

Paladin assumed the role of operator and manager of the Project in August 2011 and Cameco's 50% interest in EL25758 was transferred to Paladin NT Pty Ltd during 2013.

Exploration Licence 25758 was renewed at the end of the initial term for two years expiring 2 October 2016. An application to renew EL25758 was lodged over the full 21 blocks prior to expiry and renewal has been granted for a further period of two years expiring 2 October 2018.

3 GEOLOGICAL SETTING

Regional Geology

The Angela and Pamela deposits are hosted within the Undandita Sandstone Member of the late-Devonian to early-Carboniferous Brewer Conglomerate. The Brewer Conglomerate is the youngest geological unit within the Amadeus Basin and was deposited as a wedge-shaped, molasse deposit in a foreland basin setting in response to southwards thrusting of the Arunta Block (to the north) over the Amadeus Basin.

Continued deformation during the latter stages of the Alice Springs Orogeny subsequently deformed the Brewer Conglomerate, producing a series of broad, east-west trending, doubly-plunging synclines within the Amadeus Basin.

Uplift occurred along the northern margin of the Amadeus Basin and progressed from west to east through the later stages of the Alice Springs Orogeny. The lower part of the Undandita Sandstone Member was derived from Upper Proterozoic to Lower Palaeozoic sediments of the basin. With increasing uplift in the Alice Springs Orogeny, the Lower Proterozoic granitic and gneissic Arunta Complex to the north became exposed and contributed increasingly to the upper parts of the Undandita Sandstone Member, providing an intrastratal source for uranium.

The Brewer Conglomerate was deposited as a series of coalescing alluvial fans developed on the southern flanks of the proto-MacDonnell Ranges by southwards draining, braided fluvial channels fed into a large-scale, generally east-west trending, longitudinal drainage system. Depositional environments are interpreted to be environments including braided fluvial channel, abandoned channel, to overbank and possibly lacustrine settings.

Stream gradient decreased away from the ranges (southwards) and the Brewer Conglomerate interfingers with, and passes laterally into, the finer-grained, more distal Undandita Sandstone Member. The Brewer Conglomerate reaches a maximum thickness of 3000 m within the Missionary Syncline, 15km southeast of Alice Springs where the largely oxidised Undandita Sandstone Member contains a wedge of reduced sediment between regionally planar upper and lower redox boundaries. Uranium mineralisation is concentrated at these redox boundaries.

Project Geology

Uranium mineralisation at the Angela and Pamela deposits is hosted within the Undandita Sandstone Member which ranges from fine- to coarse-grained lithic arenite, and from medium- to coarse-grained lithic arkose, intermixed with subordinate conglomerate and pebbly sandstone horizons, and thin, poorly developed limestone and mudstone units deposited under waning flow conditions and within abandoned channels. Most of the mineralisation is hosted by medium to coarse grained feldspathic lithic arenites, which although finer, are better sorted.

Mineralisation is considered to have been emplaced during the early-Carboniferous (during diagenesis) and has been preserved by extensive calcite cementation of the host rock. Structural deformation during the Alice Springs Orogeny has subsequently folded and exposed the mineralisation at surface. The main Angela I mineralisation crops out near the eastern margin of the licence, close to the Old South Road, and dips ~9° to the west. Mineralisation is known to extend westwards for at least 5km to depths of ~900m.

The target in the area is sandstone hosted uranium mineralisation formed at geochemical (redox) boundaries by deposition of uranium from groundwater. Redox boundaries in the upper part of this reduced zone typically show uranium accumulations. The major accumulations are located in irregularities or steps, mainly on the upper regional redox boundary in the Missionary Syncline. These accumulations were previously identified in the Angela area (Borshoff & Faris, 1990).

4 PREVIOUS EXPLORATION

Historical Exploration

Uranerz explored the Alice Springs Project (which extended across the current EL25758) for over 10 years from 1972 to 1983 and the tenements were held until 1990. The following summary is adapted from Uranerz reports as detailed in the Bibliography.

A detailed airborne radiometric survey over the tenements was carried out in 1973 and airborne spectrometry located three anomalies. Trenching and drilling of these anomalies in 1973-1974 led to the recognition of the Angela and Pamela prospects. In 1974, shallow vacuum drilling on a regional grid, together with reconnaissance mapping indicated that these prospects were regionally located along the boundary between oxidised and reduced sandstones.

From 1974 onwards exploration was divided into two broad phases; the first involved diamond/percussion drilling of the known mineralised bodies to test size, grade and establish mineralisation controls; the second involved regional exploration along the reduced zone and its margins. Detailed drilling at the Angela and Pamela prospects in 1974-1975 defined the main outline of the mineralisation. Ore resources for the part of the Angela I deposit that was drilled amounted to about 1500t U₃O₈. From 1975 to 1977 percussion drilling was carried out along strike of the upper or northern margin of the reduced zone to test the potential of mineralisation at depth in the zone between the Pamela and Angela prospects. The redox boundary was tested by holes drilled

approximately 500m apart to a maximum depth of 150m. Drilling was continued southwest from the Angela I deposit.

In 1978 recalculation of ore resources based on results of the latest investigations confirmed a resource of 1,500t U₃O₈ using a cut-off of 500 ppm over 2m for the Angela I deposit, and it was also concluded that considerable resources could occur further down-dip and in separate zones immediately north and south of the Angela I deposit. Detailed drilling of the Angela I deposit in 1979 indicated a 30-40m change in the stratigraphic level of the redox boundary with which the mineralisation is associated. This “step” marks a complex zone of stacked oxidised and reduced lobes and tongues. In plan, this multi-lobed zone plots as a distinct east-west trend.

Drilling between the Angela I deposit and the Pamela prospect delineated a group of spatially and genetically related step zones containing inter-digitated mineralisation. These are referred to as Angela II, Angela III and IV prospects. Close-spaced drilling at 10 m intervals on the 800W section over the Angela I deposit provided detailed lithology but hole-to-hole lithological correlations could not be demonstrated.

In 1980, the eighth year of project operations, the Angela I deposit was confirmed over a 4,900m strike length and remained open to the west at depth. Infill percussion and diamond drilling upgraded the integrity of defined resources. Angela II-IV satellite prospects were defined as thinner ore zones with similarities to the Angela I deposit. The Angela V satellite prospect was delineated as a new ore zone south of Angela I, similar to the Angela II and III prospects.

All prospects have good potential down-dip to the west. Exploration in 1981 concentrated on establishing the style, continuity and potential of the Angela prospects, flanking the Angela I deposit. A data review was carried out, which included recalculation of all gamma log eU₃O₈ values using the high-resolution deconvolution methodology. Regional sedimentological studies established a sedimentary history for the basin, which led to improved genetic concepts for redox processes and allowed a better evaluation of prospectivity.

Investigations in 1982 were confined to re-logging drill core and data studies of prospects in the East Missionary Syncline. Detailed re-logging allowed more meaningful sedimentological profiles to be constructed. Correlation of sedimentary features was achieved using downhole resistivity logs. Ore distribution profiles from deconvolved down-hole gamma logging were compiled.

Data studies showed individual lenses of ore are related to a regionally continuous 30m stratigraphic sandstone package with a prominent coarse-grained basal unit.

In 1983, Uranerz completed a pre-feasibility study that indicated the Alice Springs Project, comprising the Angela and Pamela deposits, would not be economically viable at the prevailing and predicted short to mid-term uranium price and the project was placed on care and maintenance. In 1990, Uranerz, applied to the Northern Territory Government to have the project area converted to a Reservation from Occupation (RO) to protect the resource.

Previous Exploration

Work conducted on EL 25758 during year ended **2009** included a drilling program comprising 103 diamond holes for 10,333 metres with 16,684 metres of RC pre-collars and 8 geotechnical holes. All holes were probed for gamma and resistivity. A total of 1,924 samples were sent for assay.

During the **2010** reporting year a total of 59 percussion pre-collared diamond holes were drilled for 5,683 metres with downhole gamma and resistivity probing conducted on all holes. Geochemical analysis was conducted on a total of 1,948 samples.

Activities on the project were scaled back during the **2010 - 2011** reporting period following NT Government's announcement that it would not support the development of a mine at Angela. Work included drilling of 3 rotary mud holes for 690 metres and baseline environmental studies.

Work conducted during the **2011 – 2012** reporting period was restricted to completion of the baseline studies, environmental management and rehabilitation monitoring.

Work completed during the **2012 - 2013** reporting year was limited to completion of the proposed rehabilitation program in order to obtain a Certificate of Closure in respect of Authorisation No. 0493/01. All holes from the 2009, 2010 and 2011 programs were rehabilitated and a report was submitted to the Department of Minerals and Energy in October 2013.

During the **2013 – 2014** reporting year work completed included an audit of all drill core, completion of a comprehensive review of all technical work, re-logging of selected core, thin section preparation, creation of an updated 3D geological model and completion of rehabilitation, including work under previous tenure as requested by Mining Compliance Division.

Activities undertaken during the 2014-2015 tenement year were limited to off-ground studies including investigation into geochemical signatures and mineral mapping at Angela, compilation of historic optical microscopy and XRD analysis of 26 samples

5 2015/2016 PROGRAM

Activities undertaken during the tenement year were limited to off-ground studies including hyperspectral analysis and subsequent interpretation of 740 laboratory pulps. The acquired spectra were reviewed by a hyperspectral consultant and the conclusions of the work included:

- The SWIR band is dominated by montmorillonite which is consistent with previously acquired XRD
- Only extremes in carbonate concentration register small SWIR spectral contributions
- An attempt at grouping clay mineral combinations failed to yield anything meaningful
- Samples that had 'white mica' and not chlorite or kaolinite as part of the spectra are generally nearer surface and their presence is likely to be related to surface weathering processes
- Dominant VNIR mineralogy and the associated redox interpretation differs from the visually logged redox interpretation and may be a better and more consistent way to collect redox interpretation information

Please find attached as Appendix 1 an internal report entitled ***aiSIRIS Results from Angela Terraspec Work*** which summarises the results of the work conducted.

AiSIRIS results and Spectra data are provided as Appendices 2 and 3.

6 REHABILITATION

No rehabilitation work was conducted during the reporting period.

7 COMMUNITY RELATIONS

No community consultation activity occurred in the period from October 2015 to October 2016 as no exploration work was planned or conducted.

8 EXPENDITURE

Eligible expenditure for the reporting period on EL25758 totalled \$19,099 and is detailed in the Mineral Exploration and Mining Expenditure Form (Form 17 under the *Mineral Titles Act 2010*) which was lodged on 31 October 2016.

9 2016 - 2017 PROPOSED WORK PROGRAM AND BUDGET

The Angela tenement is currently subject to divestment negotiations and the proposed program and budget for the forthcoming year has been limited to a reconnaissance visit and data review and program planning by the incoming party.

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