NUPOWER RESOURCES LTD
ABN: 91 120 787 859

AILERON PROJECT

EL25325 YAMBAH

ANNUAL REPORT FOR PERIOD ENDING 16th JANUARY, 2012

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SUMMARY

EL25325, comprising of 327 blocks, was applied for by Arafura Resources on 21/04/06. The area was selected by Arafura Resources NL because of the potential for secondary sandstone hosted type uranium mineralisation in unconsolidated Cainozoic basin sediments of the Burt Basin, derived by erosion of adjacent uraniferous basement granites and gneisses.

The license was granted on 17 January 2007 and transferred to NuPower Resources Ltd in 14 March 2007 as a result of the demerger of Arafura’s uranium assets into the newly formed company focussed on uranium.

The Yambah tenement is underlain by basement rocks of the Aileron Province comprising greenschist to granulite facies metamorphic rocks with protolith ages in the range 1865-1710 Ma. It forms part of the North Australian Craton and is geologically continuous with the gold-bearing Tanami and Tennant Regions to the north.

The Arunta Basement in this region is further subdivided into the Central and Southern Provinces by the Redbank Thrust Zone, a major north dipping crustal-scale northwest trending structure. Yambah lies north of the Redbank Thrust Zone in the Central Zone where it is underlain by metamorphic rocks of Division 1 of the Arunta Block comprising units of the Strangways Metamorphic Complex that were deformed, metamorphosed and intruded locally by megacrystic syntectonic granites during the Strangways Orogeny around 1760-1750Ma. Rocks of the Strangways Metamorphic Complex include, felsic and mafic granulites, cordierite granulite, quartzo-feldspathic gneiss, amphibolites, cordierite-garnet gneiss, calc-silicates and biotite-sillimanite gneiss of the Yambah Granulite, Ingula Migmaitite Suite, Erontonga Metamorphics, intruded by granites of the Wuluma Granitoid, Enbra Granulite and Cadney Metamorphics.

The Harry Creek Deformed Zone along the southern boundary of the license separates these rocks from interlayered mafic granulites and garnet gneisses of the Adla Granulite and layered granitic rocks, garnet biotite gneiss, feldspar augen gneiss, amphibolite and quartzose gneiss of Division 2 of the Arunta Block. Minor outcrops of retrogressed greenschist facies rocks in shear zones are also present.

Basement rocks of Yambah are covered extensively by unconsolidated sediments of the Cainozoic Burt Basin beneath the Burt Plain, that is an extensive flat feature roughly 50km by 25km in size representing the modern day expression of the Late Tertiary land surface developed on Tertiary lacustrine sediments of the Burt Basin (Neoproterozoic-Palaeozoic Ngalia Basin sediments are thought to be absent beneath Yambah, and the basin is thought to rest directly on crystalline basement of the Arunta Complex) that are of interest to NuPower for their potential to host secondary uranium deposits.

The stratigraphy of the intermontane Cainozoic basins of the southern NT region is generally poorly known due to a lack of outcrop, strong weathering overprints, the paucity of drillholes and a lack of attention paid to the ‘cover’ overlying crystalline basement.

Early drilling in the Sixteen Mile Basin to the southeast of the tenement indicated considerable thicknesses of probable Tertiary sediments including carbonaceous shales, but it is later stratigraphic drilling by both the BMR (now Geoscience Australia) and the NTGS during the late 1970’s and early 1980’s that has provided the majority of the information on the Cainozoic succession.

The relatively small Hale Basin was explored extensively for coal (lignite) and sedimentary uranium during the late 1970’s and early 1980’s and is considered to be the best known Cainozoic basin in the NT.
A two-fold stratigraphic subdivision has been defined that broadly corresponds with the observed pattern of Cainozoic sedimentation elsewhere in southern Australia, and comprises a restricted, fluvial palaeochannel dominated Palaeogene succession (Hale Formation) overlain by a more widespread, dominantly lacustrine Neogene succession (Waite Formation).

Deposition of the Cainozoic sediments was episodic and punctuated by hiatuses during which prolonged periods of weathering resulted in the formation of well-developed weathered profiles. Three weathering events which affected Arunta basement rocks and the overlying Tertiary succession have been recognised.

Weathering Event A occurred during the Late Cretaceous to Early Tertiary (Palaeocene) when a trizonal profile was developed in basement rocks over a widespread area of the Arunta Region and at the base of surrounding Tertiary basins.

Following uplift and partial truncation of the deeply weathered basement rocks, sedimentation in the surrounding Tertiary basins began in the Palaeocene with deposition of thick colluvium including fanglomerates flanking the ranges. This was followed by alluvial and lacustrine sand, silt and clay (locally carbonaceous) and lignite of the Lower Hale Formation in the Ti-Tree and Burt Basins during the Early to Middle Eocene.

Weathering Event B, apparently restricted to the Hale Basin, occurred prior to the Middle Eocene, and resulted in lithification and formation of a second ferricrete profile.

Deposition of sandstones of the Upper Hale Formation took place during the Late Eocene that were subsequently overprinted by Weathering Event C marking widespread exposure and surficial weathering in response to a prolonged period of non-deposition during the Oligocene.

Climatic amelioration during the Early Miocene rejuvenated the palaeodrainage systems and led to the deposition of fluvial sands at the base of the Waite Formation. A change from fluvial to lacustrine sedimentation then followed during the Middle to Late Miocene with the accumulation of over 300 meters of limestone, sands, muds, and sandy conglomerate in localised depocentres.

Towards the ranges, the Waite Formation interfingers with, and is conformably overlain by a succession of oxidised colluvial material shed from the ranges in response to neotectonism during the (?Late) Pliocene, recognised as a broadly coarsening upwards alluvial fan succession throughout the region. This unit is informally referred to as the Napperby Formation and comprises a succession of oxidised and haematitic, clayey sands, sandy clays and minor conglomerates.

Overlying these sediments are unconsolidated Quaternary sediments including quartz sands, silts, red earths and clayey and sandy soils that record a complex history of deposition, erosion and redeposition due to climate changes and gentle tilting. Large outwash fans from the northern side of the MacDonnell Ranges have formed alluvial plains and overbank deposits alongside sandy drainage channels. The formation of calcretes, particularly within drainage channels and atop the Waite Formation, was widespread during the Quaternary.

NuPower carried out an airborne electromagnetic (AEM) survey in June-July 2007 over the western two-thirds of the area as part of a larger survey of NuPower’s tenements in the Aileron region, designed to explore for buried palaeochannels at the base of and within the Cainozoic sedimentary package as potential hosts for secondary uranium. Concurrently water from station stock water bores was sampled and assayed for a suite of major and trace elements the results of which are expected to assist with targeting potential sites of uranium accumulation within the palaeochannel systems.

Final results from the AEM survey show that the technique successfully identified sections of several major palaeochannels in the license area and interpretation and modelling of the results
has been completed, revealing that the Tertiary palaeodrainage is far more extensive and better developed than previously thought. Shallow palaeochannels draining northwards off the MacDonnell Ranges occur in the eastern part of the tenement, whilst more substantial palaeochannels occur in the west of the tenement and form part of the eastern half of the Burt Basin.

NuPower also participated in the NTGS collaboration regional gravity survey over the Central Arunta region, for which the data is available.

NuPower completed four rotary mud drillholes for a total of 504m on Yambah in 2008 using the 2007 AEM data to assist in siting the holes. Tertiary sediments were intersected in all holes, thereby validating the airborne EM data. No significant reduced horizons were intersected in the ‘Canteen’ palaeochannel developed on Yambah. Relogging of Mistake Bore indicated anomalous gamma and whilst situated outside the margins of the Canteen Palaeochannel, one hole was drilled to investigate this anomaly that intersected anomalous gamma within sediments. This drill hole was later logged using a Prompt Fission Neutron (PFN) tool which indicated that no significant amounts of anomalous uranium was present.

Groundwater assays from station bores and NuPower drill holes reported previously, were found to be erroneous. These samples have been re-assayed and reported again in the 2010 annual report.

No work was done in 2011.
INTRODUCTION

BACKGROUND

Basement rocks of the Reynolds, Yalyirimbi and Strangways Ranges contain elevated background levels of uranium and thorium and have been explored for gold, base metals, rare earth elements and uranium. Success came with the discovery of elevated levels of rare earth elements hosted by massive fluorapatite in the Nolan's Bore area by PNC Exploration (Australia) Pty Ltd in 1995 (Thevissen, 1995). This occurred during follow-up of an airborne radiometric anomaly as part of that company’s uranium exploration program along the Reynolds Range.

As far back as 1972 it was recognised that while these rocks may host primary deposits of uranium, they also provided a potential source of uranium for secondary uranium deposits. The products of the weathering and erosion of these rocks throughout the Cainozoic have accumulated in flanking basins as thick sequences of unconsolidated material and provided a potential host for the precipitation of uranium from solution in meteoric groundwaters sourced from the upstanding ranges and percolating through these basinal sediments.

Arafura Resources, with this target model, also recognised the potential of the Cainozoic basins in the Aileron region on the flanks of the uraniferous basement rocks for secondary sandstone-hosted uranium deposits and applied for and was granted a number of exploration licenses here, including EL25325, Yambah that covers part of the Burt Basin.

LOCATION AND ACCESS

The Yambah Exploration Licence is located 70 kilometres north-northwest of Alice Springs and 1200 kilometres south-southeast of Darwin by the Stuart Highway in the southern part of the Northern Territory of Australia (Figure 1). The centre of the area coincides with the junction of Plenty Highway with the Stuart Highway. It is bisected by the Sandover Highway and Alice Springs-Darwin Railway. Access to areas of interest in 2008 was from the Stuart Highway via the network of station roads and tracks linking the water bores.

CLIMATE AND VEGETATION

The region has a semi-arid continental climate. This following description is drawn from Stewart (1982):

“The climate is characterised by long hot summers when temperatures regularly exceed 40°C, and short mild winters. The average rainfall is about 280mm, most of which falls between October and March, but both frequency and amount are erratic.” (Stewart, 1982)

Vegetation throughout most of the area consists of tall mulga open shrubland with a woolybut open grassland understorey. This gives way in the northwest to hummocky grassland with a tall acacia sparse shrubland overstorey”. (Wilson et. al. 1991)

TOPOGRAPHY AND DRAINAGE

The western part of the license comprises a flat sandy plain rising gently eastwards from around 630m ASL to around 700m ASL east of the Stuart Highway, at the base of the Strangways Ranges. Elevations in the ranges exceed 1000m ASL. Creeks that rise in the Strangways Ranges and discharge westwards into the area include Burt and Ironwood Creeks.
LOGISTICS

Alice Springs (pop. 27,000) is serviced daily by jet aircraft from several Australian capital cities (Sydney, Adelaide, Perth and Darwin) and less regularly from Brisbane, Cairns and Broome. Because of its location mid-way between Adelaide and Darwin the town is also well serviced by road transport and interstate bus services.

The Stuart Highway and Adelaide-Darwin transcontinental railway corridor, passing through Alice Springs, bisect the area.

The natural gas pipeline from the Amadeus Basin (west of Alice Springs) to Darwin passes within 60 kilometres to the west of the area.

Alice Springs is the closest services centre, 70km by road via the Stuart Highway. The Aileron Roadhouse, located on the Stuart Highway with fuel and accommodation, lies 80km by road north of the license area.

The nearest station homesteads are Yambah in the eastern part of the area on the Stuart Highway, Bushy Park on the Plenty Highway and Aileron near the Aileron Roadhouse.

TENURE

Exploration Licence 25325 Yambah which comprised 327 graticular blocks covering 1,019 km² (Figure 2) was granted to Arafura Resources NL (ABN 22 080 933 455) on 17 January 2007 for a period of 6 years. It was transferred to NuPower Resources Ltd (ABN 91 120 787 859) on 14 March 2007 as a result of the demerger of the uranium assets from Arafura to NuPower.

Since the license was not subject to reduction at the end of Year 1 no blocks were relinquished and all 327 blocks were renewed for the second year of the license.

Scout drilling by NuPower has identified an extensive palaeochannel system prospective for uranium on Yambah which contains a thick Tertiary sedimentary fill. Drilling is incomplete, the entire area remains prospective and it was not possible to select any areas for relinquishment at the end of Year 2. A Waiver of Reduction was applied for and granted on 22/01/09.

At the end of year 3, 130 blocks were recommended for relinquishment, representing approximately 40% of the total area, (Figure 3). A letter to request a partial waiver of reduction was submitted on 12th February 2010, which was granted on 31st March 2010.

The license occupies the following perpetual pastoral leases:

- NT Portion 703 Aileron Station.
- NT Portion 641 Yambah Station
- NT Portion 687 Bushy Park
Figure 2 - EL24956, Yambah, Application Area
Figure 3 - EL24956, Yambah, Relinquishment Area
NATIVE TITLE

NuPower has conducted an inspection of the AAPA register of sacred sites. Several recorded sites of cultural significance occur in the Strangways Ranges on the eastern half of the Yambah tenement. No recorded sites occur over the Burt Plain on the western half of the tenement.

There are no registered Native Title Applications or Determinations over the land. Registered Indigenous Land Use Agreement DI2002/009 to Teck Cominco Australia Pty Ltd/Flinders Diamonds covers the extreme southeast part of the license.

An Exploration Agreement that includes the Yambah license has been negotiated between the Central Land Council (CLC) and NuPower Resources

Prior to NuPower commencing fieldwork, representatives of the CLC conducted a survey of the proposed drill sites. No significant cultural sites were found and the proposed sites were approved.
GEOLOGY

REGIONAL SETTING

The Yambah license (EL25325) is situated in the Aileron Province of the Arunta Region in the southern part of the Northern Territory (Figure 4).

Figure 4 - Geological Regions of the Northern Territory and EL25325

Deformed and metamorphosed Palaeoproterozoic orogenic rocks older than 1800 million years crop out as major tectonic units surrounded by younger rocks and essentially form the recognisable and inferred basement to the North Australian Craton. These Palaeoproterozoic rocks form the Pine Creek Orogen, Tanami Region, northern Arunta Province, and Tennant, Murphy and...
Arnhem Inliers. They include remnants of Archaean rocks, which have been dated at 2500 million years.

To the south, the rocks of the North Australian Craton pass into the Central Australian Mobile Belts of the Proterozoic Orogens of the Arunta Region and Musgrave Block, consisting of granulite and amphibolite facies, metamorphosed sediments and mafic volcanics intruded by granitoids. In the southern Arunta Province, episodic igneous activity took place between 1880-1050 million years and deformation included a series of major tectonic events, including retrogressive metamorphism in the Proterozoic and Palaeozoic. These basement rocks are exposed in the Strangways Ranges in the easternmost part of the license and expected to lie at depth beneath unconsolidated Cainozoic sediments in the eastern part of the area.

Proterozoic-Palaeozoic basins form part of the North Australian Platform Cover and comprise mildly deformed, largely unmetamorphosed predominantly sedimentary successions unconformably overlying the Proterozoic Orogens. This includes the Ngalia and Georgina Basins in the Aileron region. These rocks are absent here.

A system of major west-northwest, east northeast and north-northeast trending dipping thrust faults and shear zones affects the Arunta Region. The associated shear zones can be up to hundreds of metres in width and extend for several kilometres, and are thought to have formed during the 400-300 Ma Alice Springs Orogeny (Cartwright et al., 1999). East-northeast structures underlie the Yambah region.

**LOCAL GEOLOGY**

**Pre-Cambrian-Proterozoic**

According to the web-site of the NTGS (December, 2004) basement rocks in the Aileron region comprise part of:

“... The Arunta Region, a complex basement inlier in central Australia that has undergone a prolonged history of sedimentation, magmatism and tectonism extending from the Palaeoproterozoic to the Palaeozoic. The Arunta Region can be subdivided into the three, largely fault bounded terranes with distinct geological histories: the Aileron, Warumpi and Irindina Provinces.

The Aileron Province comprises greenschist to granulite facies metamorphic rocks with protolith ages in the range 1865-1710 Ma. It forms part of the North Australian Craton and is geologically continuous with the gold-bearing Tanami and Tennant Regions to the north.

In contrast, the Warumpi Province comprises amphibolite to granulite facies rocks with protolith ages in the range 1690-1600 Ma, and is interpreted to be an exotic terrane that accreted to the southern margin of the North Australian Craton at 1640 Ma.

The Irindina Province in the Harts Range region comprises Neoproterozoic to Cambrian metasediments that formed in a major depocentre within the Centralian Superbasin. It underwent high-grade metamorphism and deformation during Ordovician (480 - 450 Ma)."

The Yambah tenement is underlain by basement rocks of the Aileron Province (Figure 5).

The Arunta Basement in this region is further subdivided into the Central and Southern Provinces by the Redbank Thrust Zone, a major north dipping crustal-scale northwest trending structure. Yambah lies north of the Redbank Thrust Zone in the Central Zone where it is underlain by metamorphic rocks of Division 1 of the Arunta Block comprising mafic to felsic granulites of the Strangways Metamorphic Complex that were deformed, metamorphosed and intruded locally by megacrystic syntectonic granites during the Strangways Orogeny around 1760-1750Ma. Rocks of the Strangways Metamorphic Complex include:

- Yambah Granulite: felsic and mafic granulites, cordierite granulite, quartzo-feldspathic gneiss and amphibolite.
- Ingula Migmatite Suite and Erontonga Metamorphics: quartzo-feldspathic gneiss, some mafic rocks, cordierite-garnet gneiss, intruded by granites of the Wuluma Granitoid.
- Enbra Granulite: mafic-intermediate granulites.
- Cadney Metamorphics: calc-silicate rocks and schistose biotite and sillimanite gneiss.

The Harry Creek Deformed Zone along the southern boundary of the license separates these rocks from interlayered mafic granulites and garnet gneisses of the Adla Granulite and layered granitic rocks, garnet biotite gneiss, feldspar augen gneiss, amphibolite and quartzose gneiss of Division 2 of the Arunta Block. Minor outcrops of retrogressed greenschist facies rocks in shear zones are also present.

**Figure 5 - Geology of the Aileron Region**

**Cainozoic**

**Regional Geology**

The southern NT forms a ‘basin and range’ province with Proterozoic and Palaeozoic rocks forming prominent ranges separated by broad valleys. Cainozoic sedimentary basins are widespread and well-developed within these intervening topographic depressions with at least twenty major basins known (Senior et al., 1995). The Yambah tenement covers portions of the eastern half of the Burt Plain (Figure 6).
The Burt Plain is an extensive flat feature roughly 50km by 25km in size that is the modern day expression of the Late Tertiary land surface developed on Tertiary lacustrine sediments of the Burt Basin.

Neoproterozoic-Palaeozoic Ngalia Basin sediments are thought to be absent beneath Yambah, and the basin is thought to rest directly on crystalline basement of the Arunta Complex.

The stratigraphy of the intermontane Cainozoic basins of the southern NT region is generally poorly known. This is attributed to a lack of outcrop and strong weathering overprints, the paucity of drillholes and a lack of attention paid to the ‘cover’ overlying crystalline basement. Knowledge of the distribution and extent of the Cainozoic has been largely gained through accidental intersections in water bores or in drillholes seeking mineralisation under cover.

Early (1933) drilling of Sixteen Mile Bore in what became known as the Sixteen Mile Basin (Figure 6) to the southeast of the tenement indicated considerable thicknesses of probable Tertiary sediments including carbonaceous shales (Hossfeld, 1954). Subsequent drilling around Sixteen Mile Bore in 1950, 1966 identified approximately 17m of clay with thin lignite seams from 145m (Edworthy, 1967). The presence of analcite suggests a shallow lacustrine environment, possibly a playa lake.

Limited stratigraphic drilling was undertaken in the southern NT region by both the BMR (now Geoscience Australia) and the NTGS during the late 1970’s and early 1980’s and these drilling programs have provided the majority of the information on the Cainozoic succession. The NTGS drilled 3 cored holes in the region around Sixteen Mile Bore in 1978, and 1981 that encountered carbonaceous material with one hole intersecting 51m of carbonaceous clay and thin lignite seams from 126m. Occurrences of lignite and carbonaceous Tertiary sediments were discussed by Wyche (1983).
The relatively small Hale Basin (Figure 6) was explored extensively for coal (lignite) and sedimentary uranium during the late 1970’s and early 1980’s and is considered to be the best known Cainozoic basin in the NT.
Senior et al. (1995) compiled a summary of the available information and defined a two-fold stratigraphic subdivision that broadly corresponds with the observed pattern of Cainozoic sedimentation elsewhere in southern Australia, and comprises a restricted, fluvial palaeochannel dominated Palaeogene succession (Hale Formation) overlain by a more widespread, dominantly lacustrine Neogene succession (Waite Formation), Figure 7.

Whilst the succession in the Hale Basin is relatively thin (<100m), it can considered to represent a generalised Tertiary stratigraphy for the southern NT, and despite being initially defined in separate, small and isolated Tertiary Basins, these formations are components of a much larger
Tertiary palaeodrainage system, the extent and size of which has until now been vastly underappreciated.

**Deposition and Weathering**

Deposition of Cainozoic sediments was episodic and punctuated by hiatuses during which prolonged periods of weathering resulted in the formation of well-developed weathered profiles (palaeosols and duricrusts). Senior *et al.* (1995) defined three weathering events which affected Arunta igneous and metamorphic basement rocks and the overlying Tertiary succession.

*Weathering Event A* (Senior *et al.*’s 1994, 1995) occurred during the Late Cretaceous to Early Tertiary (Palaeocene). A trizonal profile was developed in basement rocks over a widespread area of the Arunta Region and at the base of surrounding Tertiary basins. The trizonal profile consists of a basal kaolinitic zone up to 10 meters thick that grades into a multicoloured mottled zone up to 10 meters thick. The mottled zone is overlain by a ferruginous (ferricrete) zone up to 8 meters thick.

Following uplift and partial truncation of the deeply weathered basement rocks, sedimentation in the surrounding Tertiary basins began in the Palaeocene with deposition of thick colluvium including fanglomerates flanking the ranges. This was followed by deposition of alluvial and lacustrine sand, silt and clay (locally carbonaceous) and lignite of the Lower Hale Formation in the Ti-Tree and Burt Basins during the Early to Middle Eocene. Locally this includes a basal lacustrine green and grey pyritic mudstone, white mudstone and siltstone, and red iron oxide stained siltstone and siltstone.

*Weathering Event B*, recorded in the Hale Basin, occurred prior to the Middle Eocene, although there is little evidence elsewhere for this weathering event (Senior *et al.*., 1995). This resulted in lithification and formation of a second ferricrete profile.

Deposition of sandstones of the Upper Hale Formation took place during the Late Eocene and these sediments were subsequently overprinted by *Weathering Event C* marking widespread exposure and surficial weathering in response to a prolonged period of non-deposition during the Oligocene.

Climatic amelioration during the Early Miocene rejuvenated the palaeodrainage systems and led to the deposition of fluvial sands at the base of the Waite Formation. A change from fluvial to lacustrine sedimentation then followed during the Middle to Late Miocene and resulted in the accumulation of over 300 meters of fluviatile and lacustrine limestone, sands, muds, and sandy conglomerate in localised depocentres.

The upper portions of the Waite Formation are regionally extensive, consisting largely of clay and dolomitic clays that reflect the widespread development of broad, shallow evaporitic lakes throughout southern Australia as the continent drifted further northwards and became progressively more arid and seasonal. These sediments are frequently capped by calcretised limestones and distinctive chalcedonic silcretes that form regionally widespread stratigraphic markers.

Towards the ranges, the Waite Formation interfingers with, and is conformably overlain by a moderately thick (<60m) succession of oxidised colluvial material shed from the ranges in response to neotectonism during the (?Late) Pliocene. A broadly coarsening upwards alluvial fan succession can be recognised throughout the region. This unit is informally referred to as the Napperby Formation and comprises a succession of oxidised and haematitic, clayey sands, sandy clays and minor conglomerates.

Overlying these sediments are unconsolidated Quaternary sediments including quartz sands, silts, red earths and clayey and sandy soils that record a complex history of deposition, erosion and redeposition due to climate changes and gentle tilting. Large outwash fans from the northern side of the MacDonnell Ranges have formed alluvial plains and overbank deposits alongside sandy
drainage channels. The Formation of calcretes, particularly within drainage channels and atop the Waite Formation, was widespread during the Quaternary.

PREVIOUS EXPLORATION

Previous exploration in the Yambah region has focussed on the potential of the basement rocks to host layered mafic-ultramafic intrusions containing Ni-Cu-Co and platinoid (Pt-Pd) mineralisation. Several companies have also recognised the potential of the Cainozoic sedimentary sequences for secondary uranium deposits derived by the erosion of the surrounding uraniferous basement rocks.

Kewanee Australia Pty Ltd EL805, 1970

Kewanee explored this area that partly overlapped the southern part of Yambah for Cu, Pb, Zn and any other economic mineralisation. They carried out a program of stream sediment sampling, undertook close-spaced geological traverse mapping and scintillometry and drilled a series of auger holes. Forty three geochemical samples were collected but results were not encouraging and the tenement was relinquished.

Planet Mining Co. Pty Ltd AP 2826 and EL58, 1970

This area, explored for base metals, was located east of the Stuart Highway between the eastern and western section of Yambah and overlapped slightly with the eastern section. It was originally covered by AP2826 in 1970 and later converted to EL58. It contains the Red Rock Bore Prospect which is a sub-economic copper prospect. Planet carried out extensive exploration including geological mapping, aerial photography, soil and rock chip sampling, Airtrace and IP geophysical surveys, trench sampling and diamond core drilling and generated an abundance of data. The tenement was relinquished in 1974.

CRA Exploration Pty Ltd A-P 2710, 1971, 1972

AP2710 straddled the Stuart Highway and covered part of the west and south central parts of the Yambah tenement was acquired to explore for Ni in ultramafic rocks on the basis of a BMR magnetic anomaly. Reconnaissance mapping and stream sediment sampling in the exposed eastern part of the area showed that magnetic anomalies here were derived from magnetic granulites and quartzites and there was no anomalous geochemistry.

At the end of 1971, CRA's exploration focus moved to sedimentary uranium and 26 water bores in the area were sampled and three were gamma logged. No significant water analyses were noted. One low level uranium anomaly was noted in the Canteen Bore but was not followed up. Stream sediment and soil samples were collected and analysed, but no anomalous values were found.

Ground magnetometer traverses were completed and 6 auger holes were drilled to depths ranging from <14ft to 72ft. Only silt, sand and gravel were encountered. Due to the lack of encouraging results, the tenement was relinquished in 1973.

C.R.A. Exploration Pty. Ltd. AP3382 and EL441, 1971

Originally granted as AP3382 for six months in 1971 and then applied for and granted as the slightly smaller area of EL441 in 1972, these tenements were located just west of the Stuart Highway and overlapped the western part of Yambah. CRA carried out a similar uranium exploration program over these tenements for secondary Tertiary basin sandstone hosted uranium. The area was relinquished in 1973.
Dampier Mining Company Limited EL1341, 1976

EL1341 overlapped the southeast part of Yambah. Dampier Mining explored the area for stratiform copper-lead-zinc mineralisation and carried out geologic traversing and rock chip samples. They considered that the mineralisation was low grade and small in size and relinquished the tenement in 1977.

Triako Mines NL EL1889, 1979

These two tenements overlapped the eastern part of Yambah and part of the western section. Triako carried out geological mapping, soil and rock chip sampling, an IP survey and drilled 5 diamond drill holes at the Red Rock and Harry's Bore base metal prospects but considered the results uneconomic and relinquished the ground.

C.R.A. Exploration Pty. Ltd. EL3541, 1982

This tenement overlapped the southeast part of the Yambah license. CRA conducted an airborne magnetometer survey, geochemical sampling for base metals and gravel sampling for micro-diamonds. The results were unsatisfactory and the tenement was subsequently dropped in 1983.

C.R.A. Exploration Pty. Ltd. EL3502, 1982

EL3502 overlapped the western part of Yambah. CRA explored the area for carbonatite bodies, however their investigations (an airborne magnetometer survey) revealed 100m of Tertiary sediments overlying basement and they concluded that further investigations were not warranted as carbonatite mineralisation is typically low grade and normally mined as an open pit.

Negri River Corp. EL3496 1982

This tenement overlapped the eastern part of Yambah. Exploration was focussed on diamond exploration although base metals were of secondary interest. They carried out air photo and Landsat image interpretation and stream sediment and gravel sampling. The results were not sufficiently encouraging to retain the tenement and it was relinquished in 1985.

Metwell Pty. Ltd. EL4420, 1983

EL4420 overlapped the southeast corner of Yambah and was explored for gold and base metals. A program of rock chip, soil sampling, backhoe trench channel sampling and magnetic and scintillometer traversing was conducted followed by five diamond core drill holes and several shallow auger holes in areas of basement geology. There was no drilling of the Tertiary sediments. The tenement was relinquished in 1989.

McMahon Construction Pty Ltd EL5267 and EL5258, 1987

These EL's overlapped the south central and eastern parts of Yambah. McMahon carried out an E.M. 37 (Induced Polarization) survey to explore for large concealed sulphide bodies, the results of which showed only weak anomalies and the tenements were surrendered in 1989.

White Range Gold NL EL6832, 1990

EL6832 overlapped part of the north-eastern section of the tenement. Exploring for base metals White Range Gold completed a review of earlier work and carried out some geologic reconnaissance. The tenement was surrendered in 1991.
Stockdale Prospecting Limited EL7570, 1991

This tenement overlapped a minor part of the south eastern border of Yambah where Stockdale completed stream sediment, soil, rock chip and BLEG sampling for gold. The results were not encouraging and the tenement was relinquished 1992.

Aberfoyle Resources Limited EL7858, 1992

This tenement overlapped a small area of the southeast part of Yambah. Exploration was for base metals and Aberfoyle conducted a ground TEM survey over the Edwards Creek gossan. The tenement was relinquished in 1994.

Roebuck Resources NL EL8125, 1994

EL8125 overlapped parts of the western section and northeast sections of Yambah. The area was considered to be prospective for gold and base metals and following the interpretation of images of aeromagnetic data obtained from NT Dept of Mines and Energy Roebuck carried out a program of stream sediment sampling, ground magnetic traverses followed by RC, RAB and diamond core drilling. Results were disappointing and the tenement was relinquished in 1997.

Pasminco Exploration EL9208, 1995

EL9208 partly overlapped the central eastern part of the Yambah tenement. Pasminco considered the area prospective for lead-zinc mineralisation and conducted a program of geological mapping, stream sediment sampling and rock chip sampling. Results were disappointing and the tenement was relinquished in 1997.

NTDME Geophysical Surveys, 1997

Detailed aeromagnetic and radiometric surveys were completed in 1997 that included all of the Napperby 1:250,000 Sheet area as well as the northern half of the adjacent Hermannsburg 1:250,000 Sheet to the south. The survey was flown at a line spacing of 400 metres and a mean terrain clearance of 60 metres. All primary data and gridded data as well as some plotted products from this survey are available freely from the Department.

Tanami Exploration NL EL22761, 2002

This tenement overlapped the southeast corner of Yambah. Tanami explored the area for gold and base metals carrying out rock chip, soil and lag sampling. Results were disappointing and the tenement was relinquished in 2005.
NUPOWER EXPLORATION ACTIVITIES COMPLETED, YEAR 1, 2007

Recent exploration in South Australia has shown that airborne electromagnetic surveys (AEM) have been successful in identifying palaeochannel systems as potential host rocks for secondary uranium deposits. The entire extent of EL25325 was flown at 1km line spacing during Year 1, and final processed data was received that was reported previously (Rafferty, 2008). Although inversion and further processing of the data was planned the data has already identified significant palaeochannel systems thought the license aera.

A regional groundwater sampling program was commenced in 2007 that included EL25325, the results of which were intended to assist with interpretation and targeting of the palaeochannels. Eight bores were sampled, the results of which were reported previously (Rafferty, 2008)

NUPOWER EXPLORATION ACTIVITIES COMPLETED, YEAR 2, 2008

Inversion of the AEM survey data (reported previously, Higgins, 2009) for EL25325 showed two well-defined palaeochannels on Yambah that appear to be isolated from the Burt Basin to the west. These two palaeochannels area hereby named the ‘Canteen’ and ‘Mistake’ Palaeochannels (after Canteen and Mistake Bores).

From the extent and size of the Burt Basin and its tributaries revealed by the AEM data, the palaeochannels under Yambah form part of a much more extensive regional palaeodrainage system. The Hann Range forms a prominent basement high to the north of the tenement whilst the Strangways Ranges form a similar high to the east. Minor to moderate sized palaeochannels drain the Hann Range to the south and southeast, and north off the MacDonnell Ranges into the Burt Basin. Palaeochannels are poorly developed in the southeast and eastern portions of the tenement and the Sixteen Mile Basin may be entirely separate from the Burt Basin.

During 2008 the NTGS conducted a helicopter-borne regional gravity survey over the central Arunta Region with survey points spaced 4km apart. NuPower contributed to the program in order to obtain more detailed, 2km spaced data, over its Aileron Project tenements, that included Yambah. Results were reported previously, (Higgins, 2009).

NuPower drilled 4 vertical rotary mud drill holes for 504m during Year 2 on Yambah to follow up the results of the AEM survey, (Higgins, 2009). The drilling encountered significant thicknesses of Tertiary sediments on Yambah, thus confirming the presence of the buried palaeodrainage system indicated by the 2007 AEM survey. Drilling indicated that a thick succession of oxidised clays, interpreted Waite Formation, rests directly on weathered crystalline basement. Kaolinitic and/or carbonaceous sands of Hale Formation were not intersected by drilling due to the shallower nature of the palaeochannel system.

The holes were logged with a downhole gamma probe, but there was no anomalous gamma in any of the holes.

Whilst the palaeodrainage system appears to be well-developed, the prospectivity of the Canteen and Mistake palaeochannels is reduced by the absence of sands and the oxidised nature of the Waite Formation. It was recommended that future efforts should focus on the northern regions of the tenement (particularly the Mistake Palaeochannel) where the palaeochannels may be more deeply incised and may contain reduced sands of the Hale Formation.

Further groundwater samples from 6 bores that included repeat samples from 5 of the bores sampled during Year 1, the results of which were reported previously, (Higgins 2009).

Nine groundwater samples were also taken from 3 of NuPower rotary mud drill holes. It was realised that the groundwater from a newly drilled hole would initially be contaminated but it was thought that this would re-equilibrate back to natural groundwater over time.
A series of samples was therefore taken from each drillhole to determine whether this had occurred and if the latest sample could be regarded as a sample of natural uncontaminated groundwater. These results were also reported previously, (Higgins, 2009).

NUPOWER EXPLORATION ACTIVITIES COMPLETED, YEAR 3, 2009

DRILL HOLE WATER SAMPLING

Four water samples taken from three of NuPower’s exploration drillholes, over the period August 2008 to October 2009 were reported previously, (Rafferty, 2010).

This furthered the work done to determine whether the groundwater had re-equilibrated to natural groundwater conditions over an extended period of time so that the latest sample could be assumed to represent natural groundwater, uncontaminated by the rotary mud drilling.

REHABILITATION

Rehabilitation of access tracks, drill sites and drill holes was completed in accordance with the NuPower Mining (Exploration) Management Plan Aileron Project – Part 2, June 2008 – June 2009, Reference Number 0425-02, and reported previously (Rafferty, 2010).

NUPOWER EXPLORATION ACTIVITIES COMPLETED, YEAR 4, 2010

There was no on-ground exploration work during the period.

Groundwaters sample assays from station bores and NuPower drill holes reported previously were been found to be erroneous due to laboratory problems. The samples from Yambah have been reassayed and results were reported in 2010.

NUPOWER EXPLORATION ACTIVITIES COMPLETED, YEAR 5, 2011

There was no fieldwork done during the period.

CONCLUSIONS AND RECOMMENDATIONS

Parts of EL25325 remains highly prospective for sandstone-hosted secondary uranium in palaeochannels and these areas have been retained.

Areas in the eastern part of the tenement where airborne radiometric anomalies overlie Strangways Metamorphic Complex basement outcrop have also been retained for reconnaissance exploration for primary uranium mineralisation.

The tenement is currently being appraised to determine if further work is justified by NuPower. This includes re-evaluation of all previous work, evaluation of water chemistry and of NuPower drill results. Limited fieldwork may also be done as part of this evaluation.
EXPENDITURE STATEMENT, YEAR 5, 2011

Expenditure details for Year 5, 2011, are given as an attachment in Appendix 1.

The Expenditure Covenant for Year 5 was $10,000. Expenditure on the tenement during the reporting period was $1508.19 and therefore the covenant was not satisfied and a request to vary the covenant was submitted.

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REFERENCES


WYCHE S. 1983 Coal and Lignite Occurrences in the Southern part of the Northern Territory. NTGS Tech Report GS83/1.
APPENDICES
APPENDIX 1 – EXPENDITURE REPORT