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<th>Arafura Resources Limited</th>
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<td>Kelvin Hussey</td>
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<td><a href="mailto:kelvin.hussey@arafuraresources.com.au">kelvin.hussey@arafuraresources.com.au</a></td>
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INTRODUCTION

Background

There are numerous known mineral occurrences in the Aileron-Reynolds Range area, including REE, U, Au, As, Sb, Ag, Fe, Sn, Ta, W, Mo, Cu, Pb, Zn, Ni, P, Th and talc. Of these, Arafura Resources is principally interested in discovering REE mineralisation to complement their nearby Nolans Bore project. The Burt Plain project area lies to the south and southeast of the Aileron-Reynolds Range project and appears to cover the same rocks but under shallow cover.

Several companies explored the nearby Nolans Bore area, yet failed to identify the exposed world-class Nolans Bore REE deposit until 1995 [total 2008 resource of 30.3 Mt @ 2.8% REO, 12.9 % P₂O₅ and 0.44 lb/t U₃O₈; Goulevitch, 2008]. This is encouraging because Nolans Bore-type mineralisation may have been overlooked elsewhere in the area, especially where the geology is covered.

Based on the regional magnetic data, the host rocks to the Nolans Bore REE deposit appear to extend to the south and southeast under relatively shallow cover. These area are considered to be highly prospective and so Arafura Resources pegged the tenements of the Burt Plain Project, including EL 27335 “Coppock” and EL 27336 “Connor”, which are reported here. Due to the area being almost completely overlain by shallow cover the tenement areas have not had any mineral exploration. However, the cover also requires different exploration techniques than those that discovered the Nolans Bore deposit.

Location and access

EL 27335 (Coppock) and 27336 (Connor) lie ~50 km southeast of the Nolans Bore deposit and ~80 km north of Alice Springs (Figure 1). EL 27335 is cut by the Stuart Highway about 45 km south of the Aileron Roadhouse, whereas the southeastern border of EL 27336 is cut by the Plenty Highway (Figure 1). The Darwin to Alice Springs railway passes immediately east of EL 27336 (Figure 1). Despite the proximity of major roads, access around both tenements is still restricted to station tracks. Some parts of the tenements are covered by open sand plains and can be accessed by newly forged tracks, however, dense vegetation is quite common and this significantly reduces easy access.

Topography and drainage

Both EL 27335 and 27336 are dominated by flat, undulating, red sandy soil plains with low relief (Figure 1). The dominant topographic feature is Mount Byrne which forms a significant hill in the upper northern part of EL 27335 (372,000mE, 7,474,000mN). There are no significant drainage systems within either tenement.

Climate

The climate is characterised by long hot summers and short mild winters. Temperatures regularly exceed 40°C in summer with rare frosts in winter. The average rainfall is about 280 mm, most of which falls between October and March.
TENURE

Mining/Mineral Rights

Exploration Licences EL 27335 (Coppock) and EL 27336 (Connor) are 100% held by Arafura Resources Limited (ACN 080 993 455). Both tenements were granted on 1 December 2009 for a period of six years and will expire 30 November 2016. Initially, EL 27335 comprised 50 sub-blocks (157.79 km$^2$) and EL 27336 comprised 37 sub-blocks (117.0 km$^2$), but both were reduced at the end of the second year of tenure such that they now comprise 25 and 18 sub-blocks, respectively.

This report covers the second year of tenure for these titles.

Land Tenure

EL 27335 and 27336 are both within the Aileron Pastoral Lease (PPL 1097; Figure 3).

- Aileron Station, PPL 1097 – NT parcel 00703 is owned by Mr Garry Dann of Aileron Station (Waite River Holdings Pty Ltd), (phone 08 8956 9705, fax 08 8956 8535).

Native Title

There are no registered Native Title Claims over the tenements. However, Arafura Resources has negotiated and executed an Exploration Agreement with the Central Land Council for other projects in the area and it is hoped that EL 27335 and 27336 will be added at the next Exploration Agreement meeting. Preliminary discussions indicate there are likely to be no Native Title impediments to exploration on these tenements other than fulfilling the terms of the existing Exploration Agreement, such as holding appropriate consultations, avoiding identified sacred sites and paying agreed amounts of financial compensation.

Sensitive Areas

EL 27335 and 27336 are close to the Ti-Tree Water Control District which has been designated as a sensitive area. According to the Northern Territory of Australia Water Act (14/01/2004), subsection 7, mining and petroleum activities are permissible as according to the Mine Management Act.
GEOLOGICAL SETTING

Regional Geology

The Arunta Region covers more than 200 000 km$^2$ of the southern Northern Territory and has been subdivided into three geological provinces; Aileron, Warumpi and Irindina. The Arunta Region is unconformably overlain by sediments of the Neoproterozoic to mid-Palaeozoic Centralian Superbasin, which has been dissected into the Amadeus, Georgina, Ngala and Wiso Basins (Figure 2).

The Aileron Province predominantly consists of Palaeoproterozoic sedimentary and igneous rocks that have undergone greenschist to granulite facies metamorphism. The majority of the preserved metasedimentary and igneous rocks in the project area were deposited or emplaced prior to the 1740-1690 Ma Strangways Orogeny (e.g. Scrimgeour 2003, Hussey et al., 2005, Claoué-Long et al., 2008a, 2008b). This event appears to have affected the entire Aileron Province to some degree, as opposed to the Mesoproterozoic 1595-1570 Ma Chewings Event that appears to be localised within the central and southern(?) parts of Aileron Province (e.g. Hand and Buick, 2001, Fraser, 2004). The 1800 Ma Stafford and 1790-1770 Ma Yambah Events also appear to be present throughout the Aileron Province, with extensive bimodal igneous activity, associated sedimentation and localised Low Pressure-High Temperature metamorphism.

Current views on the depositional and tectonic setting of the Aileron Province are based on recent geochemical, isotopic and igneous studies and the contained mineral systems. These favour a rifted continental crust or evolving backarc setting in the early parts of the depositional history [e.g. Hussey et al., 2005, Hoatson et al., 2005 Matthew Cobb (PhD student, Curtin University) pers. comm., 2005], with a prolonged tectonothermal convergent event in the Strangways Orogeny. Hussey et al. (2005) and Hoatson et al. (2005) argue for contiguous sedimentation and bimodal igneous activity during the Stafford Event. This Event is thought to be responsible for the development of localised(?) deep-marine basins in the Arunta Region, in contrast to contemporaneous subaerial to shallow-water volcanism and sedimentation in the adjacent Davenport Province.

The Aileron Province contains temporal equivalents of the gold-bearing Granites-Tanami and Tennant Creek Regions and regional aeromagnetic data suggest lateral continuity between these Regions. The Aileron Province is therefore regarded as part of the North Australian Craton, however, localised facies variations and differences in sedimentary environments are evident (e.g. Hussey et al., 2005).

Unmetamorphosed Neoproterozoic to Palaeozoic marine and terrestrial sedimentary rocks of the Georgina, Ngala and Amadeus Basins surround and unconformably overlie the Arunta Region. These basins, or at least the basal units, once comprised a single basin referred to as the Centralian Superbasin (Walter et al., 2000). Contemporaneous Neoproterozoic to Cambrian strata of the Harts Range Group (Buick et al., 2001, Maidment et al., 2004, Buick et al., 2005) are also considered as part of the Arunta Region in the recently defined Irindina Province (Scrimgeour, 2003). This revision and reinterpretation of the Arunta Region has significant geological implications and has come about largely as a result of several extensive geochronological, metamorphic and metallogenic studies in the eastern Arunta Region (eg Miller et al., 1998, Mawby et al., 1998, 1999, Hand et al., 1999a, b, Buick et al., 2001, Scrimgeour and Raith, 2001, Hussey 2003, Maidment et al., 2004, Buick et al., 2005, Claoué-Long and Hoatson, 2005, Close et al., 2005, Hussey et al., 2005).

Many of the fault-bounded contacts between the various units in the Arunta Region are attributed to the (390-300 Ma) Devonian-Carboniferous Alice Springs Orogeny. Most of the fault movements within the adjacent Georgina Basin also appear to be related to the Ordovician Larapinta Event and Devonian-Carboniferous Alice Springs Orogeny.

Of interest to REE exploration, carbonatites are known at Mud Tank (730 Ma), Mt Bleechmore and also in the Casey Inlier areas. Small potassic alkaline intrusions of the Mordor Igneous Complex have
Figure 4: Published 1:250,000-scale outcrop geology of project area showing limited outcrop in tenement areas.

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Figure 5: Project area shown over the regional magnetics (RTP image)
lamphyrophyric affinities (Barnes et al., 2008) and were emplaced in the southern-central parts of the Aileron Province at 1132 Ma (Claoué-Long & Hoatson, 2005).

Local Geology

(Modified after McGilvray 2006)

STRATIGRAPHY

Palaeoproterozoic

The Lander Rock beds are the oldest known outcropping rocks in the project area. The Lander Rock package is a suite of dominantly quartzose and pelitic sediments with a facies transition in the northwest, to alternating pelites and psammites, in the Mt Stafford Beds. At least some parts of the Lander Rock beds preserve sedimentary structures (Bouma sequences) indicative of sedimentation below storm wave base. Metamorphic grade varies from lower greenschist in the northwest of the Reynolds Range to granulite facies in the southeast. Minor sills or dykes of mafic rocks occur in the package. The timing of deposition of the Lander Rock Package is unclear although 1795-1806 Ma granite intrusives (Worden et al., 2008) and U-Pb SHRIMP detrital zircon ages provide a rough maximum estimate of 1806-1840 Ma (Vry et al., 1996, Claoué-Long 2003, Claoué-Long et al., 2005, Claoué-Long et al., 2008a). It is important to note that recent dating suggests the Lander Rocks beds can be divided into at least two stratigraphic units based on zircon provenance patterns and the presence of a younger zircon population in some areas (Claoué-Long 2003, Claoué-Long et al., 2005, Claoué-Long et al., 2008a).

The Reynolds Range Group unconformably overlies the Lander package and is sub-divided into four stratigraphic units (Buick et al. 1999). The basal unit, Mount Thomas Quartzite, is a mature orthoquartzite that unconformably overlies the Lander Rock Package in the northwest of the Reynolds Range. The unit varies in thickness from ~200 to 550 m and crops out along the length of the range. The lower beds with the Mount Thomas Quartzite are predominantly conglomeratic with minor pebbly arkose rocks. The upper intervals are pelitic and generally ferruginous. A lateral facies change occurs from the northeast to the southwest across the range from basal conglomerates into homogenous pelitic rocks. Relict sedimentary structures indicate a high-energy, intertidal depositional environment (Buick et al., 1999).

The Lower Calcsilicate Unit forms the basal unit of the group in the southern margin of the Reynolds Range. This unit can be age constrained as an equivalent to the Mt Thomas Quartzite and by cross-cutting relationships with the Napperby Gneiss (metamorphosed granite). The Lower Calcsilicate Unit is composed of finely layered, carbonate-poor calcsilicate rocks rich in clinopyroxene, plagioclase and grossular-andradite garnet locally interlayered with white quartzites and rare marbles. The unit is strongly metamorphosed and intensely deformed lacking sedimentary structures (Buick et al., 1999).

The Pelite Unit, which was previously part of the Pine Hill Formation, has a minimum thickness of 600 m. Pelitic rocks are interlayered with thin sheets of fine-grained siltstone and sandstone interpreted as storm deposits (Buick et al. 1999).

The Upper Calcsilicate Unit encompasses the previously defined Algamba Dolomite Member and the Woodforde River Beds and has a maximum thickness of about 300 m. The Upper Calcsilicate Unit occurs as a series of lenses within the Pelite Unit dominated by interlayered limestone and dolomite locally intercalated with pelites and psammitites. Stromatolites and sedimentary structures, i.e. climbing ripples, are preserved where rocks are metamorphosed at a regional low grade (Buick et al., 1999).
Neoproterozoic

The eastern end of the Ngalia Basin forms an east-west package of Neoproterozoic to the Late Carboniferous sediments that crop out between the Nolans Bore area and the tenements. The basin is much wider to the west, and only comprises a thin basal package in the project area (Figures 4 & 6).

Tertiary

At least three weathering events have affected the Arunta basement and overlying Tertiary sedimentary rocks (Senior et al., 1995). The most widespread and significant is the Palaeocene Weathering Event A developed a trizonal profile in the basement rocks over much of the Arunta Region and at the base of surrounding Tertiary Basins. The trizonal profile comprises a <10 m thick basal kaolinitic zone which grades into a <10m thick multicoloured mottled zone, which in turn is overlain by a <8 m thick ferruginous zone (Senior et al., 1995). The weathering profile is developed in basement rocks and the Mesozoic Hooray Sandstone and is overlain by Palaeocene sediments in Tertiary basins.

Weathering Event B and C are localised to the Hale and Waite Basins, respectively (Senior et al., 1995).

Quaternary

Uplift of the Reynolds Range and northern Arunta Region resulted in the deposition of red earth and alluvium from uplifted areas and continued movement of colluvium down present-day hill-slopes. This event led to many valleys filling with coarse detritus. Calcrete precipitated along stream channels, evaporites formed in playa lakes and sand plains and aeolian dunes were developed in low lying areas (Stewart, 1981).

IGNEOUS ROCKS

Palaeoproterozoic

Based on recent SHRIMP U-Pb dating of zircons in igneous rocks by the NTGS (Worden et al., 2008), granitic rocks of the Reynolds Range region can be subdivided into two age-related suites. The timing of these two igneous suites requires:

1. emplacement of the first granitic suite into the Lander Rock package,
2. uplift and erosion,
3. deposition of the Reynolds Range Group on to the early suite, and then
4. emplacement of the second igneous suite

The emplacement age of the first igneous suite is now well constrained at about 1795-1805 Ma (Worden et al., 2008). This suite crops out on the northern side of the Reynolds Range, is contemporaneous with LP/HT metamorphism and partial melts at Mount Strafford (the Stafford Event) and provides localised evidence for bimodal magmatism (in the Anmatjira Orthogneiss).

From southeast to northwest, the first granitic suite includes the Boothby Orthogneiss (1806 ±4 Ma, Worden et al., 2008), Yaningidjara Orthogneiss [1798 ± 4 Ma, Worden et al., 2008 which is within error of the 1806 ± 6 Ma age by Vry et al., (1996)], Mount Airy Orthogneiss (1799 ±3 Ma, Worden et al., 2008), Harverson Granite (1799 ±3 Ma, Worden et al., 2008), Anmatjira Orthogneiss [1798 ±3 Ma by Worden et al., 2008 and 1802 ±3 Ma by Rubatto et al., (2006) about 15 kilometres north of the first location near Mount Stafford]. Early SHRIMP U-Pb determinations on zircon from these igneous rocks by Collins & Williams (1995) are much less precise and are discounted in favour of more recent CL-

The younger igneous suite formed ca. 1770-1785 Ma and was probably related to the regional Yambah Event. This suite mainly outcrops in the Reynolds Range and further south, although the Possum Creek Charnokite [1774 ± 6 Ma, Collins and Williams (1995)] and the Tyson Creek Granulites in the Anmatjira Range are similar age. The age of the second igneous suite is typically poorly constrained with larger errors, particularly those in the Reynolds Ranges. These are all high level granites that contain metasedimentary enclaves and have a peraluminous geochemical signature. The assimilation of sedimentary units causes significant zircon inheritance issues making interpretation of magmatic zircon ages difficult (eg Smith 2001). The differentiation of some granitic units is unclear based on current published maps and careful remapping is needed.

The second igneous suite includes the Warimbi Schist [1785 ± 22 Ma, Collins & Williams (1995)], Coniston Schist [1780 ± 10 Ma, Smith (2001)] and Napperby Gneiss [1780 ± 10 Ma, Collins & Williams (1995)]. The Yakalibadgi Microgranite probably also belongs in this suite as do a number of undifferentiated granites and gneisses that intrude the Reynolds Range Group (see Stewart and Pillinger 1981).

**METAMORPHISM & STRUCTURAL GEOLOGY**

The Arunta Region was shaped by two major intervals of tectonism. The first major tectonic interval occurred during the Palaeo- to Mesoproterozoic, 1850-1560 Ma, and was associated with multiple episodes of regional medium to high temperature metamorphism and magmatism (Hand & Buick, 2001). The second major tectonic interval occurred in the early to mid-Palaeozoic, about 490 to 300 Ma, and was associated with north-south intraplate extension and subsequent north-south convergent deformation (Hand & Buick, 2001). Regional structures produced during each period of tectonism in the Reynolds Range Region are discussed by Hand & Buick (2001).

The first tectonic interval is defined by three main tectonic events, the 1805-1795 Ma Stafford Event, the 1785-1770 Ma Yambah Event, and the 1595-1560 Ma. Chewings Orogeny. There has been significant debate about the Strangways Orogeny in the Reynolds and Anmatjira Ranges. Historically the Strangways Orogeny was about 1780-1720 Ma however recent revision has split this into the Yambah Event (1785-1770 Ma) and Stangways Orogeny (about 1740-1690 Ma). All published literature still refers to the historic usage of Strangways Orogeny. The Yambah Event occurs in the Reynolds Range region and the affect of the Strangways Orogeny as newly defined needs to be resolved.

The Stafford Event is based on LP/HT metamorphism and igneous relationships in the Mount Stafford area. The first igneous suite noted above is coincident with the Stafford Event and includes the Harverson Granite. The Lander Rock Package around the Harverson Granite is characterised by the growth of andalusite and cordierite (Dirks et al., 1991; Vry & Cartwright, 1998). The contact metamorphic porphyroblasts overprint a biotite-quartz-muscovite foliation which indicates prior regional deformation to granite emplacement. In other parts of the northwest Reynolds Range, muscovite ± biotite-bearing greenschist assemblages, (Dirks et al., 1991), define a sub-vertical northwest-southeast trending foliation, (Stewart, 1981; Dirks & Wilson, 1990). Fold structures are truncated to the overlying Reynolds Range Group in an unconformity that dies to the southeast, indicating the Stafford Tectonic Event may have been localised in the northwestern part of the Reynolds Range, and Anmatjira Range, region (Hand & Buick, 2001).

Contact metamorphic assemblages formed in the Reynolds Range Group around the granitic precursors of the Warimbi and Coniston Schists during intrusion of the second igneous suite at around 1785-1770 Ma (Collins & Williams 1995). Contact aureoles in pelites adjacent to the Warimbi Schist are andalusite and cordierite bearing. The stability of these assemblages indicate maximum P-T conditions of 550°C and 3.5 kilobars (Xu et al., 1994; Mahar et al., 1997). Scapolite porphyroblasts in anorthite-bearing marbles adjacent to the Coniston Schist also give maximum temperatures of 550°C (Buick & Cartwright, 1994). Contact metamorphic porphyroblasts surrounding the Warimbi
Schist contain straight or gently curved internal foliations defined by muscovite-quartz ± biotite. The orientation of folding is not clear but has been postulated as a southeast trending foliation based on findings in other parts of the Arunta Inlier (Hand & Buick, 2001; Goscombe, 1991; Collins & Sawyer, 1996).

The Chewings Orogeny produced a nearly continuous northeast-southwest transition in metamorphic grade from greenschist to granulite facies along the length of the Reynolds Range. Pelitic rocks of the Reynolds Range Group were transformed from phyllites to andalusite ± cordierite-bearing schists to grade from greenschist to granulite facies along the length of the Reynolds Range. Pelitic rocks of the Chewings Orogeny produced a nearly continuous northeast-southwest transition in metamorphic grade northwestern Reynolds Range, the axial surface fabric overprints approximately 1785 Ma contact metamorphic minerals.

Partial melting assemblages overprint the gneissic layering and suggest high-temperature metamorphism outlasted pervasive deformation (Hand & Buick, 2001). Granulite and upper amphibolite assemblages are aligned parallel to the axial surface of the regional, upright, southeast-trending, isoclinal folds (Hand & Buick, 2001). The upright folds reflect around 50% shortening and can be traced along the length of the Reynolds Range (Dirks & Wilson, 1990). Many of the macro-scale folds within northwest-southeast regional folds are doubly plunging (Stewart et al., 1980; Dirks & Wilson, 1990), which represents significant vertical extension (Hand & Buick, 2001). In the lower grade northwestern Reynolds Range, the axial surface fabric overprints approximately 1785 Ma contact metamorphic minerals.

In the Reynolds Range, the regional fabric has been deformed on all scales by conjugate, steeply-dipping shear and crenulation bands that, in geometry, represent conjugate kink bands (Dirks & Wilson, 1990; Hand & Dirks, 1992). The dominant kink set trends approximately east-west plunging between 0° and 70° east. The subordinate kink set trends approximately north-south and plunges to the north (Hand & Buick, 2001). Zircons from leucosomes within the crenulation bands have been dated at 1570 Ma (Hand et al., 1995; Williams et al., 1996), which confirms development of structures during the Chewings Orogeny (Hand & Buick, 2001).

Proterozoic structures in the Reynolds Range are heavily dissected by southeast- and east-trending shear zones associated with the 400-300 Ma Alice Springs Orogeny (Hand & Buick, 2001). Micaceous greenschist to lower amphibolite assemblages are dated to 330-300 Ma (Cartwright et al., 1999).

Collins and Teyssier (1989), interpret the overall geometry of the Reynolds-Anmatjira Ranges to have formed in a transpressional setting with a northeast-plunging lineation representing a component of sinistral movement during the Alice Springs Orogeny, resulting in juxtaposition of granulites against lower grade rocks in the southwestern Reynolds Range (Dirks et al., 1991).

The metamorphic grade of Alice Springs Orogeny structures increases to the southwest such that shear zones in the southwest of the Reynolds Range contain kyanite, staurolite and sillimanite-bearing assemblages (Dirks et al., 1991) with P-T conditions of 5-5.5 kilobars and 550-600°C. In the southeastern Anmatjira Ranges, the shear zones contain andalusite and staurolite assemblages in pelite, with P-T conditions of 4 kilobars and 580°C (Xu et al., 1994). In the central and northwest Reynolds Range the shear zones are associated with greenschist or lower-grade metamorphism (Dirks et al., 1991). Accompanying the increase in metamorphic grade is an increase in the number and width of the shear zones in the southeastern Reynolds Range up to 300 m wide (Hand & Buick, 2001).
Episodic mild uplift and warping consisting of limited upward doming of ranges and minor tilting continued through the Palaeozoic and Cainozoic to present day (Senior et al., 1995).

MINERALISATION

Relevant company reports and metallogenic research in the Reynolds Range region describe numerous mineral occurrences, including copper-lead-zinc, gold, tungsten, tin, tantalum, rare earth elements, mica, nickel, chromium, semi-precious stones, talc, iron and uranium.

Known deposits in the greater Reynolds Range area include the Nolans Bore REE-P-U deposit currently and Poseidon Gold’s Au-As-Sb gold mineralisation around the Sabre Prospect.
PREVIOUS INVESTIGATIONS

Relatively little exploration has been conducted within Arafura’s Burt Plain Project (EL 27335, 27336 and 27337, Figures 4-6). The tenements are extensively covered by Tertiary to recent sediments which have deterred past explorers. However, base metal discoveries (Red Rock Bore, Coles Hill, Native Gap) in outcropping areas near the tenements indicate some geochemical anomalism within basement. No REE mineralisation or related alteration have been reported within or surrounding the Burt Plain tenements.

The first significant exploration in the area was conducted by CRA Exploration in 1971 around the annular features at Mt Byrne with the interpretation of possible kimberlite or carbonatite intrusions. Five holes were drilled into four annular features encountering silicification and quartz veining but not satisfactorily explaining the features. Planet Mining discovered the Red Rock Bore Cu-Pb-Zn prospect in 1974 using Barrington AIRTRACE multi-element airborne system. The best drilling interval out of three holes was: 33 m @ 0.81 % Cu, 0.52 % Pb, 0.79 % Zn and 1 g/t Ag (DDH1). Triako Resources (1979 – 1980) extended the strike extent of the Red Rock Bore prospect using Rapid Reconnaissance Magnetic Induced Polarization, but follow-up drilling in two holes only returned a best intercept of: 9 m true-width @ 0.42 % Cu, 0.47 % Pb, 1.69 % Zn, 6.3 g/t Ag and 0.03 g/t Au (from 213-224 m, DDH4). Red Rock Bore has similarities to Mt Isa-type deposits.

An exploration hiatus extended from the early 1980’s until 1994 when Tidegate discovered the Native Gap Ni-Cr prospect hosted within an amphibolite plug close to where the Stuart Highway passes through a gap in the Hann Range. BLEG stream and soil sampling returned anomalous, albeit disappointing results, and the ground was dropped without drilling.

The most recent exploration was conducted by Tanami Gold in joint venture with Teck Caminco and BHP (2003 – 2008) in a search of massive sulphide base metals. They flew a series of airborne EM surveys, but the only conductor identified was too small and too low intensity to warrant follow-up drilling.

Minor uranium exploration was conducted from 2006 by Deep yellow and most recently NuPower Resources, however, no significant anomalism has been detected to date.
### Table 1: Summary of historic exploration.

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<td>Planet Mining</td>
<td>Base metals</td>
<td>CR1974-0078, CR1975-003</td>
</tr>
<tr>
<td>1977</td>
<td>EL1341</td>
<td>Dampier Mining</td>
<td>Base metals</td>
<td>CR1977-0139</td>
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<td>1983</td>
<td>EL3502</td>
<td>CRA Exploration</td>
<td>Base metals</td>
<td>CR1983-0152</td>
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<td>1989</td>
<td>EL5557</td>
<td>Range Resources</td>
<td>Gold</td>
<td>CR1989-0356</td>
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<td>1994</td>
<td>EL8117</td>
<td>Tidegate Pty Ltd</td>
<td>Nickel, Chromium, Gold</td>
<td>CR1994-0589</td>
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<td>2003</td>
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<td>Gutnick Resources</td>
<td>Gold</td>
<td>CR2003-0064</td>
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<tr>
<td>2003-2005</td>
<td>EL22922, EL22923</td>
<td>Tanami Gold</td>
<td>Base metals, Gold</td>
<td>CR2003-0355</td>
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<tr>
<td>2008</td>
<td>EL10401</td>
<td>Tanami Gold</td>
<td>Gold</td>
<td>CR2008-0321</td>
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</table>
CRA Exploration AP 2435 (CR1971-0020)

Northern quarter of Arafura’s EL 27335. Five circular features with annular structures drew CRA to the area based on the general proximity to a carbonatite occurrence described by the B.M.R. (Crohn and Gellatly, 1969). Reconnaissance field mapping identified north-trending quartz reefs and other siliceous outcrops within circular depressions and soil analyses showed kimberlite affinities with weak Ni, Co, Cr, Ti, Rb, Sr, P and some of the rare earths. Subsequent percussion drilling (five holes into four of the features for 350 m) intersected siliceous rocks only, mostly quartz and quartzite, however, a single hole RD3 intersected a zone of talc and mica schist that contained unusual quantities of tin and caesium. No correlation was observed between surface and subsurface geochemistry however, the source of the unusual anomalism was attributed to pegmatite which appear at shallow depths in other proximal areas. Annular surface features remained unexplained.

CRA Exploration AP 2710 (CR1971-0026)

CRA carried out exploration on a large tenement that extends from the southern boundaries of Arafura’s tenements EL 27335 and EL 27336 up to 70km SSE. Exploration focused on nickel, primarily a number of strong magnetic anomalies which were revealed by the 1965 BMR airborne survey. Geological reconnaissance investigations were carried out, however, it was concluded that the alluvium-covered magnetic anomalies are magnetic granulites and quartzites similar those exposed in the hills to the east of the tenement. Ultramafic rocks were not found and nickel prospects were discounted.

CRA Exploration AP 3382 and EL 441 (CR1972-0067)

AP 3382 and EL 441 occupied a triangular area immediately south of Arafura’s three Burt Plain tenements with only a very small fraction of the ground occupying the southwest of EL27335. The Tertiary and (?)Mesozoic sediments of the Burt Plain basin were explored to test the uranium potential of the basin. Work included seismic traverses to indicate the depth to basement around the edges of the basin, water bore sampling and ground-based radiometric traverses were conducted along station tracks. Weak radioactive anomalism was identified and is associated with scattered travertine outcrops, however, results showed no encouragement for further work.

CRA Exploration AP 2710 (CR1973-0002)

AP 2710 was adjacent and east of CRA’s tenements AP 3382 and EL 441 and extended from the southern limits of Arafura’s tenements EL 27335 and 27336 extending over 40 km south along the railway. Similar activity was carried out by CRA as on AP3382 and EL 441 (i.e. bore hole water sampling and radiometric sampling of station tracks and sporadic outcrops). No anomalous material was encountered and the tenement was dropped.

CRA Exploration AP 3447 (CR1973-0031)

This AP covers almost all of Arafura’s tenement EL 27337 and extends a further 20km west of EL27337’s western boundary. CRA conducted reconnaissance geological mapping around Mount Harris and southwest of Sheppard’s Bore where several outcrops zones exist. CRA also flew a single line airborne radiometric survey immediately west of Mount Harris. Radiation levels were generally low but Mount Harris and Sheppard Bore granites were about twice background levels. Mapping southwest of Sheppard Bore identified dominantly foliated granite and felsic gneiss with only minor non- foliated pink granite in a single outcrop. Quartz – hematite +/- pyrite veins are common,
however, anomalous radioactivity is associated with the granite, not the veins. No assay data for the veins was available at time of writing the report. The report has a good outcrop map of the Sheppard Bore area.

CRA Exploration EL 753 (CR1973-0121)

This EL covers exactly the same area as CRA’s AP 3447 and the report is effectively the same as well except that it presents results of rock chip samples collected during outcrop mapping. The report only presents U and Th results and it appears as though quartz – hematite +/- pyrite veins were not assayed for any other elements.

Planet Mining  EL 58 (CR1974-0078)

EL 58 is a small NE-trending rectangular box that touches the southeastern corner of Arafura’s EL 27335. Planet flew a Barrington AIRTRACE multi-element airborne system over an area of 340 km2 and detected several geochemical anomalies associated with magnetic features. It is unclear from the report what they were attempting to discover and only covered a small area southeast of Arafura’s EL 27335. The surveys successfully identified Cu, Pb and Zn anomalies at the Red Rock Bore Prospect.

Planet Mining  EL 58 (CR1975-0033)

Planet Mining undertook extensive work at the Red Rock Bore base metal prospect including geological mapping, soil sampling, ground magnetic, IP and diamond drilling. Mapping identified mostly soil cover but scattered outcrops of felsic and mafic gneisses, schists and amphibolites. Soil sampling identified Cu, Pb and Zn anomalies that broadly correlated well with the airborne magnetic anomaly and 5 costeans were dug to assist more detailed mapping and soil sampling. Ground magnetic confirmed the elliptical shape identified by the regional airborne survey. The IP survey revealed a system of chargeability and resistivity axes along the southern flank of which there occur strong magnetic, chargeability and resistivity gradients, probably related to the contact between mafic granulites and quartz-biotite-sillimanite gneisses. Three diamond holes were drilled and all intersected broad, low-grade Cu, Pb and Zn zones including:

DDH1: 100 feet @ 0.81% Cu, 0.52% Pb, 0.79% Zn and 1.07 dwts / Ag
DDH2: 40 feet @ 0.41% Cu, 0.67% Pb, 0.53% Zn, 0.22% Ni and 3.63 dwts / ton Ag
DDH3: 60 feet @ 0.23% Cu, 0.51% Pb, 1.22% Zn, 0.2% Ni and 2.73 dwts / ton Ag

Mineralization of sphalerite, chalcopyrite and galena is closely associated with quartz, clinopyroxene and garnet-rich rocks which are products of high-grade metamorphism of calcareous pre-cursors. Four additional holes were recommended based on a correlation between an IP positive axis and Cu, Pb and Zn anomalies. However, given this is the final report it remains unclear if these holes were ever drilled.

Dampier Mining  EL 1341 (CR1977-0139)

The upper northwest corner of EL 1341 only just overlaps the southeast corner of Arafura’s EL 27335 and extends approximately 50km east and 18km south. A number of base metal occurrences are associated with small lenses of banded magnetite quartzites within units of highly metamorphosed granulite / amphibolites facies rocks. Rocks include meta-igneous, now mafic granulite of variable thicknesses and magnesiun / aluminium-rich rocks, possibly of sedimentary parentage. The origin of the strataform magnetite quartzite associated mineralization was thought to be sedimentary / exhalative or could have been remobilized and concentrated during various stages of folding and metamorphism from igneous rocks. All mineralization encountered was low grade and of limited areal extent.
Triako Resources EL 1889 (CR1979-0057)

Triako’s tenement EL 1889 is approximately the same size and shape as EL 1341 (Dampier Mining) except was located approximately 10km north and so its northwestern corner occupies the lower third of Arafura’s EL 27335. Triako pegged this ground in order to follow-up Planet Mining results at Red Rock Bore. Triako assigned the base metal mineralization to the Oonagalabi-type (i.e. Mt Isa, Broken Hill, Einasleigh – Georgetown etc) and considered a 100mT @ 10% combined Cu, Pb, Zn as a best-case discovery scenario. Obviously deposit classification has progressed significantly since the 1970’s and these deposits would be separated into different deposit classes (i.e. Broken Hill-type, Sedex / Mt Isa-type etc). Triako undertook data review and compilation and recommended further work including deepening and extending costeans, detailed mapping, shallow percussion drilling, ground magnetic and an IP survey.

Triako Resources EL 1889 (CR1979-0161)

At Red Rock Bore Triako extended RRMIP (Rapid Reconnaissance Magnetic Induced Polarization) surveys past those conducted by Planet Mining, demonstrating that IP anomalism exists over and along strike from known strataform mineralization. Significant new anomalous zones were intersected and shallow percussion, possibly deeper diamond drilling was proposed to test new anomalies.

Triako Resources EL 1889 (CR1980-0009)

Further extensions to the IP and ground magnetic grid were conducted including 12.25 line kilometres of IP (25m readings on 100m spaced lines) and 10.6 line kilometres of proton precision magnetometer. Results indicate a strongly magnetic, poorly polarised conductor, 200m wide, extends for at least 700m in an east-west direction. Flanking this conductor to the north and south are strongly chargeable, relatively resistive and weakly magnetic zones up to 150m wide.

Mapping indicates that the major conductor lies under or within a sequence of vertically foliated biotite-sillimanite-quartz-feldspar gneiss. A deep magnetic body is envisaged. A total of 156 soil and bedrock chip channel samples have been collected at the prospect to date with the maximum 2m bedrock assay of 385 cu, 1538 Pb and 1160 Zn.

Triako Resources EL 1889 (CR1980-0161)

Two diamond drillholes were completed to test the interpreted deep magnetic target (DDH4, 300m) and lateral strike continuation (DDH5, 150m). DDH4 intersected low-grade mineralization between 213 – 224m (9m true width @ 0.42% Cu, 0.47% Pb, 1.69% Zn, 6.3 g/t Ag and 0.03 g/t Au). DDH5 failed to intersect any mineralization but did successfully demonstrate that the IP anomaly is related to disseminated mineralization.

CRA Exploration EL 3502 (CR1983-0152)

EL 3502 occupied a rectangular box that terminates against the southern boundaries of Arafura’s tenements EL27335 and EL27336 and extends 15km south (no overlap with Arafura’s tenements). CRA conducted a close-spaced (300m) airborne magnetometry survey to better define prominent magnetic response in the extreme NW section of the Alice Springs 1:250,000 map sheet. Modelling indicated high amplitude response have a dipolar wave length in excess of 1,000m and more typical of magnetite-bearing granulites than carbonatite as previously suspected. Modelling and review of water bore data indicate a source greater than 100m deep and CRA subsequently relinquished this ground.

Range Resources EL 5557 (CR1989-0356)
EL 5557 is a long, skinny E-W trending tenement that runs through the top quarter of Arafura’s EL 27337 to the top fifth of EL 27335. Range Resources acquired the ground to explore for gold, thought to be hosted within hematitic quartz reefs. Veins cut both the granitic basement and the overlying Vaughan Springs Quartzite along the southern side of the Stuart Bluff Range and the Hann Range. Gold had been reported in reefs back to 1954, however, subsequent exploration in 1965 revealed pyrite and specular hematite at depth and some minor fluorite but no gold or base metals. Central Pacific Minerals drilled six holes in pyritic quartz-hematite breccias with associated IP and/or magnetic responses in the Stuart Bluff Range, but detected no gold or anomalous copper. It appears as if Range did not complete any field work.

**Tidegate PTY LTD EL 8117 (CR1994-0589)**

EL 8117 covers almost all of EL 27336, the northeast corner of EL 27337 and extends up to the southeastern extension of the Nolan’s Bore shear. Tidegate explored Native Gap (Ni, Cr), Harry’s yard amphibolites, Aileron shear zone and Aileron gold reefs.

The Native Gap Ni-Cr prospect is located about 2.5km east of the Stuart Highway, approximately 20km south of Aileron. The prospect was discovered in the 1960’s and further explored by NTGS geologist Jim Morlock in 1973. Assays of rock chip samples collected by Morlock showed highly anomalous Ni and Cr values in a circular body of amphibolite (500m diameter) intruded by pegmatite (no gold assaying was done). Interpretation of AGSO (BMR) regional airborne magnetic data speculates that the amphibolite is part of a large ultramafic intrusion on the southern side of the Hann Range. Tidegate collected nine loam BLEG samples, nine soil/sediment samples and five rock chip samples from the amphibolites exposure and surrounding contacts. Gold values in BLEG ranged up to 1.05ppb Au with moderately anomalous Ni and Cr values. Tidegate dropped the ground after these disappointing results.

Harry’s Yard amphibolites body was found to be mainly sheared and altered meta-gabbro with possible komatiite “Spinifex” textures, intruded by pegmatite and quartz veins on the perimeter. Nineteen loam BLEG, nineteen soil/sediment samples and three rock chip samples were collected on the intrusion, however, gold values were considered not to be anomalous and no further work was recommended.

The Aileron shear zone was discovered in 1939 and prospecting was abandoned in 1940 after the recovery of a single ounce (approx 6 g/t Au dirt) from quartz-pyrite veins. Veins form lenticular bodies up to 30m long and 1.5m wide. McMahon Construction Pty Ltd and Lindsay Johannsen in 1990 briefly explored the prospect who sent a small consignment to Tennant Creek for processing (no data for gold grades or recovery). Tidegate collected four grab samples in January, 1994 from quartz vein and sheared granite with fresh sulphides, however, all gold results were below detection (0.008ppm Au) and no significant As, Ag or base metal values were detected (except Co, up to 104ppm). A reconnaissance BLEG loam and drainage survey was carried out along the shear zone westerly from Stuart Highway. Results were below level of interest in reasonably well-exposed country and the land was dropped.

**Roebuck Resources EL8320 (CR1994-0827)**

This tenement is very small and lies adjacent to the southern boundary of EL 27335. Roebuck acquired the ground because it thought that it represented a fold repetition of the strata that hosts the Red Rock Bore strataform base metal deposit. Geochemical sampling along the accessible southern boundary zone of EL 8320 returned anomalous Pb, C, As and Sn in soils transported from a more northerly source. Bedrock geochemical sampling was recommended to test subsurface stratigraphy for base metal and gold anomalism.

**Roebuck Resources EL 8320 (CR1996-0201)**
Roebuck entered into a JV arrangement with Pasminco Australia Limited whereby Pasminco became the project operator. Pasminco completed data review during the year and proposed ground magnetic and soil sampling over the Coles Hill North zone.

**Gutnick Resources EL 10253 EL 10252 (CR2003-0064)**

EL10253 occupies almost all of EL 27335 and extends west to, but doesn’t cover EL 27336. EL 10252 extends to cover all of EL 27336 and EL 27335. Gutnick Resources completed an orientation geochemical survey to determine the best method of sample collection and analysis. Also completed was a broad spaced stream sediment programme of 510 samples evening out to approximately 1 sample per 5 square kilometres. 21 samples returned gold values of >1ppb to a maximum of 6.15ppb Au and 12 samples contain >0.1ppm Ag with a maximum of 0.25ppm Ag. The exploration model was that of a hydrothermal style of Witwatersrand deposits. Reconnaissance rock chip sampling returned best gold and silver values of 25ppb and 5ppm respectively.

**Tanami Exploration NL EL 22923 (CR2003-0335)**

This tenement is quite large and covers the ground immediately east of EL 27335 and south of EL 27335 and EL 27336, however, no ground overlaps. Tanami were exploring in joint venture with Teck Cominco and BHP for polymetallic metamorphosed massive sulphide deposits developed at or near the contact of major bimodal volcanic sequences and overlying dominantly pelitic to calcareous sediments. In early 2002 the tenement was included in an Arunta-wide bedrock geological interpretation and geophysical targeting exercise conducted by consultant geophysicist Dr Jayson Myers. The exercise drew analogies between the Central Arunta region and the Eastern Succession of the Mt Isa region. Further to this study it was recognised that the tenement may potentially host IOCG deposits.

Exploration completed in 2002 consisted of moving-loop EM survey (23 line kilometres, 100m moving loop) over several magnetic targets. The moving-loop EM survey detected a weak conductor over one target which is interpreted as possibly representing a bedrock source, however, the intensity and size of the anomaly did not warrant follow-up drilling. The weak conductor is located immediately south of the EL 27335 tenement boundary.

**Tanami Exploration EL 22922 (CR2004-0084)**

Very large rectangular tenement south of EL 27337 and southwest of EL27336. The ground was acquired for the same reasons as EL 22923, however, review of MODAT or NTGS occurrence maps revealed nothing. No fieldwork was conducted and the full 185 blocks were considered unprospective for gold and were relinquished by the end of the first year.


EL 22922 and EL 22923 are large rectangular tenements that border the southern boundaries of all three of Arafura’s Burt Plain tenements. Tanami held the ground from 2002 until 2008 with the hope of discovering a large tonnage base metal deposit at the Red Rock Bore and / or Coles Hill systems. Very little exploration was conducted with the collection of 20 rock chip samples representing the sum of field work. In 2005 / 2006 Tanami joint ventured the ground out to Deep Yellow for sedimentary-hosted uranium exploration, however, Deep Yellow did not conduct any field activities. The ground was relinquished in 2008.
EXPLORATION ACTIVITIES COMPLETED IN 2010

Comprehensive GIS data review

A full GIS review of the Burt Plain project was completed using various public domain datasets (Figures 4-6). The tenements are located on the northern boundary of a substantial gravity high, thought to represent a major crustal feature, possibly a deep-seated mafic- to ultramafic intrusive complex. The abrupt northern edge to this anomaly is marked by the Hann Range (edge of Ngalia Basin) which outcrops in the northern part of EL 27337 and north of EL 27335 and 27336. Analysis of airborne magnetic data indicates that two major structural systems (northwest- and east-northeast-trending) cut through several terrains indicating extensive development and probable old and deep origins of these structures. It is possible that these structures are reactivated normal and transverse structures active during extension to form the Irindina Basin (northwest and east-northeast-trending respectively).

The northwest-trending system that defines the eastern edge of the gravity anomaly extends northwest into the Reynolds Range and is thought to be the primary structural control on the possible carbonatite intrusive interpreted to be responsible for the Nolan’s Bore deposit. This structural zone possible extends through the northeast quarter of EL 27336 and the central half of EL 27335 (Figure 5). At this stage it is unclear if these structures have the potential to host carbonatites (i.e. tapped the upper mantle).

To assist with exploration targeting, the depth to basement of the Burt Plain area was assessed by evaluating data from existing water bores. Twenty six water bores have been drilled within and in close proximity to the tenements (Table 2; Figures 4-6). Lithological logs were completed for only 18 of the 26 bores, but this is enough to get a guide of cover depth (average of 38.9m) and basement characteristics (mostly granite with subordinate gneiss and schist). Water bore lithological data are effectively restricted to the southern half of EL 27336 and holes within and to the east of EL 27335. Where information has been recorded, basement depths are variable over short distances. Depths to basement are typically shallow (0-20 m) or relatively deep (50-100 m) and so the average of 38.9 m is possibly not representative. There doesn’t appear to be any relationship between depth to basement and basement lithology.

2010 Field Activities

The GIS review indicated that the only basement outcropping on either EL 27335 or 27336 is the Mount Byrne area, where CRA geologists described several annular features which might be kimberlite or carbonatite intrusions. The area was the top field priority and was the main area visited during reconnaissance field work. Mount Byrne is characterized by three extensive, north-trending, milky quartz veins (up to 50 metres wide and several hundred metres long) that cut variably deformed orthogneiss. A single rock chip was collected near the Trig Point at Mount Byrne, however, assay results indicated no anomalous geochemistry. There appears to be a vegetation anomaly at the break in slope surrounding the base of Mount Byrne and the hills immediately to the north, possibly reflecting nutrient deficient soils. A series of minor pegmatites to the north near the break of slope were sampled because of the presence of moderate sericite alteration, but these rocks were also devoid of anomalism. A further day was spent on the combined tenements identifying all access tracks and assessing the distribution of calcrete outcrops and the relative density of vegetation.
Table 2: Downhole information for water bores within or close to the Burt Plain tenements (shown on Figures 4-6).

<table>
<thead>
<tr>
<th>Bore Name</th>
<th>Bore #</th>
<th>Easting MGA94</th>
<th>Northing MGA94</th>
<th>Hole Depth</th>
<th>Depth to basement</th>
<th>Basement Lithology</th>
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</thead>
<tbody>
<tr>
<td>Sheppard's</td>
<td>RN001107</td>
<td>334578</td>
<td>747478</td>
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<td>No Data</td>
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<td>Railway Bore</td>
<td>RN013546</td>
<td>377944</td>
<td>747772</td>
<td>97</td>
<td>6</td>
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</tr>
<tr>
<td>Expectation #1</td>
<td>RN001104</td>
<td>360522</td>
<td>746691</td>
<td>51.22</td>
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<td>No Data</td>
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<td>60.97</td>
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<td>No Data</td>
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<td>Black Hill</td>
<td>RN002011</td>
<td>372128</td>
<td>746317</td>
<td>42.53</td>
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<td>Bardia Bore</td>
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<td>Roads Cased Bore</td>
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<td>46</td>
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<td>Max Bore</td>
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<td>745372</td>
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<td>Railway Cased Bore</td>
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<td>376018</td>
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<td>66</td>
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<td>Army Bore</td>
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<td>No Data</td>
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<td>Ghost Gum</td>
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<td>RN011389</td>
<td>368789</td>
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<td>RN011393</td>
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<td>745767</td>
<td>85</td>
<td>85</td>
<td>Basement not intersected</td>
</tr>
</tbody>
</table>
2011 Field Activities

During the second year of tenure no field work was completed due to the enormous commitment to resource drilling at the Nolans Bore REE Project. Some target generation was completed and half of each tenement was surrendered.

FORWARD PROGRAM 2012

A detailed airborne geophysical survey is planned to facilitate robust geological interpretation of the region. It is anticipated that this will generate REE exploration targets. Such a survey was flown over EL 27337 in 2011 and more surveys are planned for 2012.

Biogeochemical sampling has proven effective on EL 27337 and at the Nolan’s Bore deposit. Dense vegetation and extensive recent covers over the Burt Plain tenements suggests this could be the most effective geochemical testing tool.

In addition to the airborne geophysical survey, planned exploration activities for 2011 includes:

1. 6, 1500m biogeochem traverses with 50m spaced samples on EL 27335 (180 samples)
2. 8, 1500m biogeochem traverses with 50m spaced samples on EL 27336 (240 samples)
REFERENCES/SOURCES OF INFORMATION


Andrew Drummond and Associates, Independent Consulting Geologists Report for Arafura Resources NL.


