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Report ARU-11/005

ANNUAL REPORT FOR YEAR ENDING 10 JANUARY, 2011
EL 27337 (SHEPPARD), BURT PLAIN,
NORTHERN TERRITORY, AUSTRALIA

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INTRODUCTION

Background

The Reynolds Range area is prospective for numerous styles of mineralisation with U, Au, As, Sb, Ag, Fe, Sn, Ta, W, Mo, Cu, Pb, Zn, Ni, REE, P, Th and talc occurrences known in the region. Of these, Arafura Resources is principally interested in exploring for economic REE mineralisation. The Burt Plain project area is proximal to Arafura's Aileron-Reynolds project region, lying to the south of the ranges.

Several companies conducted exploration activities in EL 23671, adjacent to EL 23571, and failed to realise the potential of the world-class Nolans Bore REE deposit, which now has a defined total resource of 30.3 Mt @ 2.8% REO, 12.9 % P_2O_5 and 0.44 lb/t U_3O_8 [see Goulevitch (2008) for details]. This is encouraging because the Nolans Bore- type REE mineralisation may occur elsewhere in the region.

Elevated levels of phosphate-hosted rare earth elements (REE's) mineralisation was discovered 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. Total REE levels of 5-7% were reported from selected grab samples of apatite which crop out sporadically within an area some 1000 x 800 metres in extent around the Bore. A distinct ground-radiometric response correlates closely with this area of apatite development.

The prospective REE host rocks of the Aileron Province within the Burt Plain tenements are almost completely overlain by relatively shallow Tertiary cover and therefore has been essentially overlooked since modern exploration started in the district in the early 1970's. Therefore different exploration techniques will be required for discovery than those employed at the Nolan's deposit. The Burt Plain area is located within the western edge of the key northwest-trending structural zone that hosts the Nolan's deposit and is also transacted by strongly-developed east-northeast-trending shear zones. These structural intersections represent the key prospective targets for the Burt Plain tenements as they represent a similar structural framework as that developed at Nolan's Bore.

Location and access

The Burt Plain tenement EL 27337 (Sheppard) is located approximately 90km north-northwest of Alice Springs along the western side of the Stuart Highway, between 15 and 35km south-southwest of the Aileron Roadhouse, in the central-southern part of the Northern Territory (Figure 1).

Access to the tenement is restricted, with only two established station tracks. Northern access is gained by the Sheppard Bore track that turns off the Stuart Highway, approximately 20km south of Aileron Roadhouse. The bore is approximately 4km southwest of the highway and access beyond this point is achieved by walking or by forging new 4WD tracks, however, this is made difficult by zones of dense Mulga growth. Southern access is achieved via second station track located approximately 35km south of the Aileron Roadhouse. At the Aileron Station Water Bore #2, located approximately 10.5km west of the highway, the track branches to the north and then continues to the west-northwest along the southern tenement boundary. As with the north, access to the tenement is by newly forged 4WD tracks and then by foot.

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Topography and drainage

The dominant topographic feature is the Hann Range, that traverses the northern part of the tenement (Figure 1). The remainder of the tenement is dominated by gentle, south sloping, densely mulga vegetated, colluvial and sheetwash plains that transition to sandy, grevillea-dominated, plains of the southwest with low-relief, northwest-trending paleo sand dunes. This general environment is punctuated by modest relief (<20m) outcrops of metamorphic rocks surrounding 330300mE, 7469500mN in the central east and 325100mE, 7462600mN in the south. A pronounced west-northwest-trending ridge of quartz and hematite extends from 333300mE, 7472100mN to 328200mE, 7473400mN, in the central east of the tenement. Outcrop is rare away from these outcrop zones and total tenement outcrop exposure is less than 5%.

Drainage is restricted to sheetwash, other than a single ephemeral stream located in the central northeast around 328900mE, 7474800mN.

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, but both frequency and amount are erratic.

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TENURE

Mining/Mineral Rights

Exploration Licence EL 27337 (Sheppard) is 100% held by Arafura Resources Limited (ACN 080 993 455). EL 27337 (81 sub-blocks, 256.36 km2) was granted in 11 January 2010 for a period of six years to expire 10 January 2016. EL 27337, together with EL 27335 and EL 27336, are part of Arafura's Burt Plain Project (Figure 1).

This is the first year of tenure for these titles.

Land Tenure

The land tenure under EL 27337 is Perpetual Pastoral Lease PPL 1097 (Aileron).

- 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

Arafura Resources has negotiated and executed an Exploration Agreement with the Central Land Council (on behalf of registered Native Title Claimants). ELs 27335, 27336 and 27337 are subject to this agreement. As a result, there are no Native Title impediments to continued exploration on these tenements other than holding appropriate consultations, avoiding activity on identified sacred sites and paying agreed amounts of financial compensation.

In December, 2003, an Introductory Meeting was held at Nolan's Bore with members of the relevant Native Title groups. A further meeting with CLC officers and relevant Native Title groups was held at Aileron on 31 March, 2006, where a number of Aileron-Reynolds project tenements were confirmed as part of the Exploration Agreement.

Should mining eventuate, a mining compensation agreement will have to be negotiated both with the holder of the pastoral lease in accordance with the Mining Act, and also with the registered Native Title Claimants in accordance with the Right To Negotiate provisions of the Native Title Act. A mining tenement can only be granted where an appropriate Native Title agreement is emplaced.

The terms of the Exploration Agreement provide for continuation of exploration on the area of the proposed mining tenement while the mining agreement is being negotiated with the registered Native Title Claimants.

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Site Clearances

Under the terms of the Exploration Agreement, Arafura must provide all relevant details of its proposed exploration activities to be conducted on EL 27337. The CLC must advise if clearances are necessary and then, if required, conduct clearances and provide details of exclusion zones as advised by the Native Title holders. Under the Exploration Agreement, the CLC is required to provide all necessary Scared Site Clearances and details of the exclusion zones to allow exploration activities to progress in a timely manner.

Sensitive Areas

EL 27335 and EL 27336 are close to the Ti-Tree Water Control District which is a designated sensitive area. According to the Northern Territory of Australia Water Act as in force at 14th of January, 2004, subsection 7, mining and petroleum activities are permissible as according to the *Mine Management Act*.

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GEOLOGICAL SETTING

Regional Geology

The Arunta Region contains more than 200 000 km^2 of metamorphic rocks in the southern parts of the NT and has been subdivided into three distinct geological regions by the NTGS, the Ailerion, Warumpi and Irindina Provinces (Figure 2). The Arunta Region is unconformably overlain by sediments of the Neoproterozoic to mid-Palaeozoic Ngalia, Georgina, Amadeus and Wiso Basins.

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 rock units in this region 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.

Most of the exposed Aileron Province was metamorphosed to greenschist or lower amphibolite facies conditions during the 1740-1690 Ma Strangways Orogeny, with an apparent localised abundance of 1810-1700 Ma igneous activity and deformation in parts. The central-southern parts of the Aileron Province preserves an east-west zone of granulite facies metamorphic rocks associated with the Strangways Orogeny. Regions of the Aileron Province have also been subject to younger (1640-1500 Ma) periods of magmatism and localised 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 Stafford Event. This Event is thought to be responsible for the development of localised(?) deep-marine basins in the Arunta Region, as opposed 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).

The Warumpi Province in the south and southeast of the Arunta Region (Figure 2) contains a younger package of metasedimentary and volcanic rock types with protoliths in the range 1690-1600 Ma (Scrimgeour *et al.,* 2003). The Province was variably metamorphosed in the 1640 Ma Leibig Orogeny, 1570 Ma Chewings and the 1150 Ma Teapot Events.

Unmetamorphosed Neoproterozoic to Palaeozoic marine and terrestrial sedimentary rocks of the Georgina, Ngalia and Amadeus Basins surround and unconformably overly the Arunta Region. Contemporaneous Neoproterozic to Cambrian strata of the Harts Range Group (Buick *et al.,* 2001, Maidment *et al.,* 2004, Buick *et al.,* 2005) are also caught up within the eastern parts of the Arunta Region in the newly 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 chronological, 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,

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2005, Close *et al.,* 2005, Hussey *et al.,* 2005).

Figure 2: Geological Regions of the Northern Territory (Ahmad & Scrimgeour 2004)

Geochronological and metamorphic studies have shown that the rocks of the Harts Range Group in the Irindina Province are variably metamorphosed to transitional granulite facies in the (480-450 Ma) Ordovician Larapinta Event. This high-grade event is followed by lower-grade Devonian to Carboniferous deformation and granite and pegmatite intrusion. Interestingly, the high-grade Larapinta Event appears to have had little influence on the thermal history of the surrounding rocks of the Aileron Province, and apart from rare exceptions appears to be largely restricted to the Irindina

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Province (Maidment 2004, Close *et al.,* 2005, Hussey *et al*., 2005, Claoué-Long and Hoatson, 2005).

Many of the fault bounded contacts between the various units within the Arunta and surrounding regions 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.

Localised carbonatite occurs at Mud Tank (730 Ma), Mt Bleechmore and also in the Casey Inlier area in the central and southern parts of the Aileron province. The carbonatite ages the latter two regions are unknown but it is conceivable that both are about 730 Ma. A small potassic alkaline igneous complex, the Mordor Igneous Complex that has lamphyrophyric affinities (Barnes *et al.,* 2008) was emplaced in the southern-central parts of the Aileron Province at 1132 Ma (Clauoe-Long & Hoatson, 2005).

Local Geology

(Modified after McGilvray 2006)

STRATIGRAPHY

Palaeoproterozoic

The Lander Rock beds are the oldest known outcropping rocks in the 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. Major outcrops occur in the Lander River Valley north of the Reynolds Range and in the vicinity of Harverson Pass (Figure 3). The metamorphic grade varies from lower greenschist facies 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, Claoue-Long 2003, Claoue-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 is sub-divided into four stratigraphic units (Buick *et al.* 1999). The basal Quartzite Unit, the Mt. Thomas Quartzite, is a mature orthoquartzite that unconformably overlies the Lander Rock Package in the northwest of the Reynolds Range (Figure 3). The unit varies in thickness from ~200 metres to 550 metres cropping out along the length of the range. The lower units 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 the intruding Napperby Gneiss (metagranitoid). The 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).

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The Pelite Unit which was previously part of the Pine Hill Formation achieves a minimum thickness of 500 metres to 600 metres. 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. The unit achieves a maximum thickness of about 250 metres to 300 metres along the length of the Reynolds Range except in the central part where the maximum thickness is only 20 metres. The unit occurs as a series of lenses within the Pelite Unit dominated by interlayered limestone and dolomite locally intercalated with pelites and psammites. Stromatolites and sedimentary structures, *i.e.* climbing ripples, are preserved where rocks are metamorphosed at a regional low grade (Buick *et al.,* 1999).

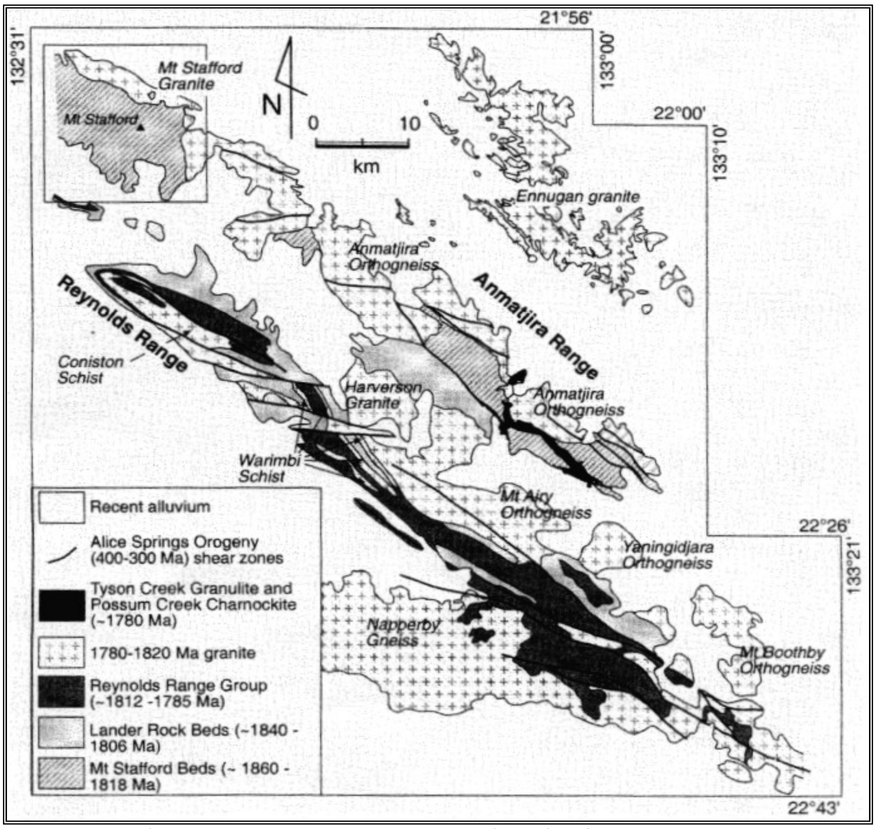

Figure 3: Generalised geology of the Reynolds Range Region (modified after Stewart, 1981). Magnetic data indicates that the bulk of the regions covered by recent alluvium are underlain by granite/granitic gneiss (*from* Hand & Buick 2001).

Neoproterozoic

Ngalia Basin rocks were deposited between the Neoproterozoic to the Late Carboniferous (Wells & Moss, 1983). The rocks are an important component of the adjacent EL 24548, but do not occur in EL 23571.

Tertiary

Cainozoic sediments occur in sedimentary basins outside of EL 23571 and will not be discussed in this report.

Geological research in Tertiary basins, (Senior *et al.,* 1995), has defined three weathering events which affected Arunta igneous and metamorphic basement rocks and lacustrine and fluviatile Tertiary sedimentary rocks. The weathering events will be discussed herein.

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Weathering Event A 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 metres thick that grades into a multicoloured mottled zone up to 10 metres thick. The mottled zone is overlain by a ferruginous zone up to 8 metres thick (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 affects the upper part of the Ambalindum Sandstone Member immediately beneath the Delaney Mudstone Member in the Hale Basin, located in the eastern part of the NTGS Alice Springs 1:250,000 Geology Map Sheet. The upper part of the Ambalindum Sandstone Member is friable and yellow, having a mottled appearance in parts. The weathering event occurred prior to the Middle Eocene. Little evidence exists outside of the Hale Basin for this weathering event (Senior *et al.,* 1995).

Weathering Event C affects the upper part of the Tug Sandstone Member of the Hale Formation in the Hale Basin. The weathering event preceded deposition of the Waite Formation in the Waite Basin, or equivalents of the Waite Formation.

Quaternary

Further uplift in the Reynolds Region, and northern Arunta Region has resulted in deposition of red earth and alluvium from uplifted areas and continued movement of colluvium down present-day hill-slopes. Calcrete has precipitated along stream channels, evaporites have formed in playa lakes, and sand plains and Aeolian dunes have developed in low lying areas (Stewart, 1981).

IGNEOUS ROCKS

Palaeoproterozoic

Based on recent high precision 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 existence of 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, and
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-assisted SHRIMP U-Pb dating by Worden *et al.,* (2008) and Rubatto *et al.,* (2006). Rubatto *et al.,*

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(2006) also determined that the LP/HT metamorphism at Mount Stafford occurred between ~1795 and 1805 Ma.

The second slightly younger igneous suite appears to be about 1770-1785 Ma and probably reflects the Yambah Event in this region. The suite mainly outcrops 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 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 by the NTGS identifies the Yambah Event (1785-1770 Ma) and the Stangways Orogeny (about 1740-1690 Ma). All published literature still refers to the historic usuage 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 highlighted in Figure 4. 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 meta-pelites adjacent to the Warimbi Scist 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

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porphyroblasts in anorthite-bearing marbles adjacent to the Coniston Schist also give maximum temperatures of 550°C (Buick & Cartwright, 1994). Contact metamorphic blasts surrounding the Warimbi Schist contain straight or gently curved internal foliations defined by muscovite-quartz±biotite. Curved inclusion trails indicate the growth of the contact metamorphic assemblages occurred during deformation. Inclusion trails are reported to show systematic changes in orientation defining gentle folds. 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 (Figure 5). Meta-pelitic rocks of the Reynolds Range Group are transformed from phyllites to andalusite±cordierite-bearing schists to migmatitic granulites (Dirks *et al,.* 1991; Hand & Dirks, 1992; Williams *et al.,* 1996 & Buick *et al.,* 1998). The metamorphic field gradient is summarised by Hand and Buick (2001) by the metamorphic zones: muscovite-chlorite±biotite; texturally stable Strangways Orogeny andalusite and cordierite; first appearance of sillimanite and; stable co-existence of cordierite-spinel assemblages.

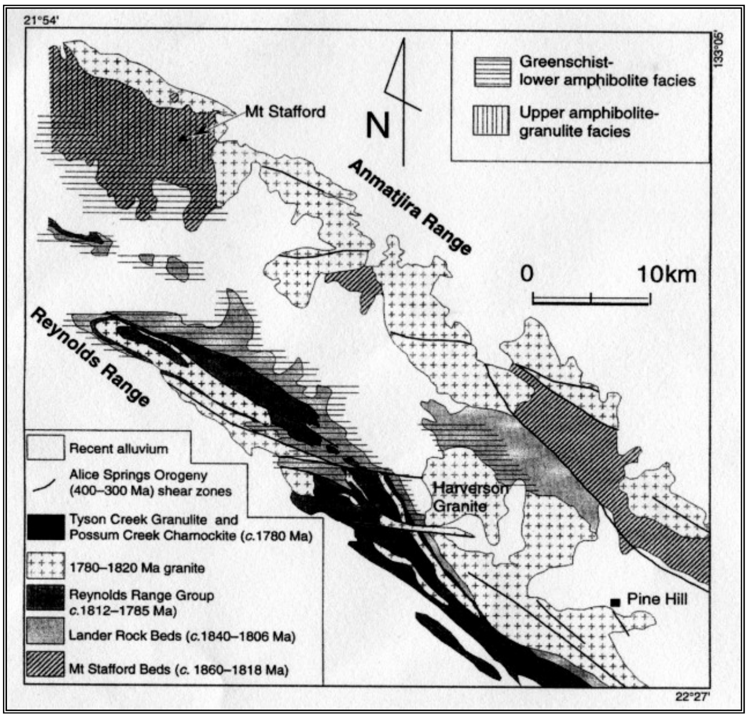

Figure 4: Regional distribution of metamorphism inferred to be associated with the Stafford Event (*from* Hand & Buick, 2001).

The higher grade regions of the Reynolds Range are further sub-divided by Hand and Buick (2001) based on the leucosome assemblages that formed during partial melting. Upper amphibolite regions show immediate upgrade of the sillimanite isograd, and volumetrically minor leucosomes are pegmatitic in character with simple mineralogies that reflect water-saturated melt (Buick *et al.,* 1998). At slightly higher grades leucosomes contain ilmenite-magnetite intergrowths that form via breakdown of biotite (Hand & Dirks, 1992). The highest grade granulite leucosomes contain cordierite and/or garnet or orthopyroxene and formed during fluid-absent dehydration reactions that consumed biotite and sillimimanite.

Partial melting assemblages overprint the gneissose layering suggesting 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

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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 aged at 1570 Ma (Hand *et al.,* 1995; Williams *et al.,* 1996), which confirms development of structures during the Chewings Orogeny (Hand & Buick, 2001).

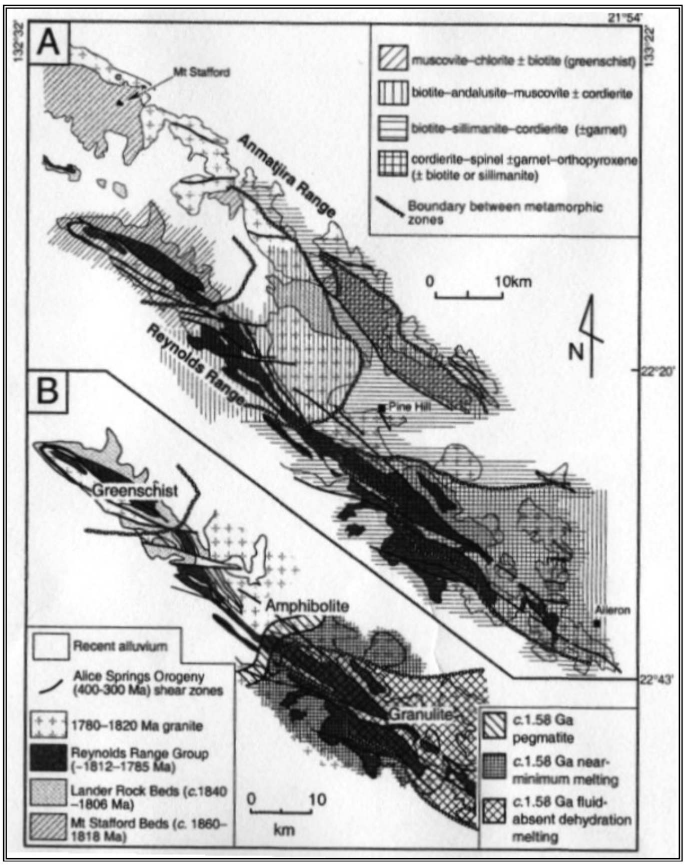

Figure 5: (a) Simplified geological map of the Reynolds Range Region showing the metamorphic zones associated with the 1595-1570 Ma Chewings Event. (b) Metamorphic zones in the Reynolds Range defined by the assemblages produced during partial melting. Assemblages in the near minimum melting zone include ilmenite-magnetite-bearing leucosomes in migmatised granite. In the granulite zone, leucosomes contain cordierite ± garnet ± orthopyroxene (*from* 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 (Figure 6) such that shear zones in the southwest of the Reynolds Range contain kyanite, staurolite and sillimanite-bearing assemblages in metapelite, (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 meta-pelite, with P-T conditions of 4 kilobars and 580°C (Xu *et al.,* 1994). In the central and northwest Reynolds Range the shear zoneas 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, with zones in the southeastern Reynolds Range up to 300m 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).

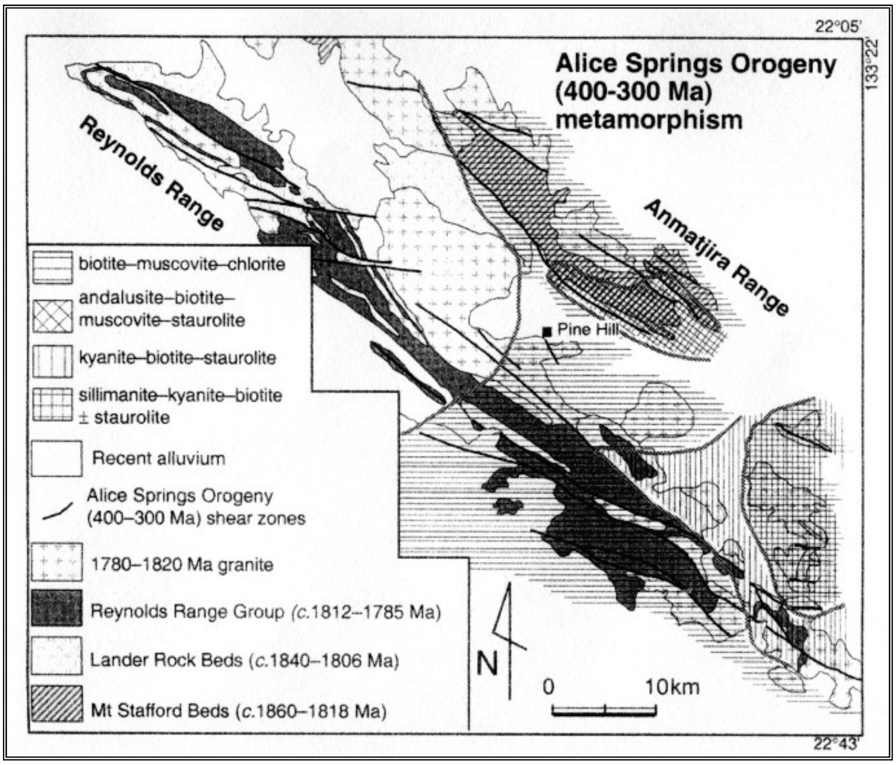

Figure 6: Metamorphic zones defined by mid-Palaeozoic metapelitic shear zone assemblages in the Reynolds Range Region (from Hand & Buick 2001).

MINERALISATION

Relevant company reports and descriptions of the Reynolds Range region by the NTGS describe numerous occurrences of mineralisation. These include copper-lead-zinc, gold, tungsten, tin, tantalum, rare earth elements, mica, nickel, chromium, semi-precious stones, talc, iron and uranium. A variety of mineralisation styles have potential in the Reynolds Range region but few mineralisation styles have proven prospective.

Prospective deposits known to present day include the Nolans Bore Rare Earth Element- Phosphate-Uranium deposit currently being investigated at the feasibility stage of activities by Arafura Resources within EL 23671 Aileron (Hallenstein and Goulevitch, 2008). In addition, Poseidon Gold discovered a zone of gold-arsenic-antimony mineralisation called the Sabre Prospect, located north of Mount Thomas. Further details of Poseidon Gold's findings and activities are contained in the 'Previous Investigations' section.

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PREVIOUS INVESTIGATIONS

Relatively little historic exploration has been conducted within the broader region of Arafura's Burt Plain Project (EL's 27335, 27336 and 27337, Figure 7) since serious regional exploration in the central Aileron Province was initiated in the 1960's. The three tenements are extensively covered by a veneer of Tertiary to recent sediments which has deterred past explorers, however, base metal discoveries (Red Rock Bore, Coles Hill, Native Gap) in outcrop zones peripheral to the tenements indicate at least some geochemical anomalism within basement rocks. No REE mineralization or alteration has been reported within or surrounding the Burt Plain tenements, however, several prospective structural zones in basement rocks under cover have not been targeted by modern exploration techniques.

The first significant exploration in the area was conducted by CRA Exploration in 1971 around the annular features at Mt Burne, thought to be possible kimberlite or carbonatite intrusive plugs. 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 base metal system has similarities to Mt Isa-type deposits, however, the best drilling interval out of three holes was: 33m @ 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, however, follow-up drilling in two holes returned a best intercept of: 9m true width @ 0.42% Cu, 0.47% Pb, 1.69% Zn, 6.3 g/t Ag and 0.03 g/t Au (from 213-224m, DDH4).

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 for massive sulphide base metal systems. They flew a series of airborne EM surveys, however, 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.

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Table 1: Summary of historic exploration.

Years	Tenement(s)	Exploration Company	Exploration Targets/Commodities	NT Department of Resources Open File Company Report(s)
1971	AP2435	CRA Exploration	Base metals diamonds	CR1971-0020
1971-1973	AP2710	CRA Exploration	Nickel, Uranium	CR1971-0026 CR1973-0002
1972	AP3382	CRA Exploration	Uranium	CR1972-0067
1972	EL441	CRA Exploration	Uranium	CR1972-0067
1973	AP3447	CRA Exploration	Uranium	CR1973-0031
1973	EL753	CRA Exploration	Uranium	CR1973-0121
1974-1975	EL58	Planet Mining	Base metals	CR1974-0078, CR1975-003
1977	EL1341	Dampier Mining	Base metals	CR1977-0139
1979-1980	EL1889	Triako Resources	Base metals	CR1979-0057, CR1979-0161, CR1980-0009, CR1980-0161
1983	EL3502	CRA Exploration	Base metals	CR1983-0152
1989	EL5557	Range Resources	Gold	CR1989-0356
1994	EL8117	Tidegate Pty Ltd	Nickel, Chromium, Gold	CR1994-0589
1994-1996	EL8320	Roebuck Resources	Base metals	CR1994-0827, CR1996-0201
2003	EL10252, EL10253	Gutnick Resources	Gold	CR2003-0064
2003-2005	EL22922, EL22923	Tanami Gold	Base metals, Gold	CR2003-0355
2006-2007	EL22923	Deep Yellow	Uranium	CR2006-0561, CR2007-0409
2008	EL10401	Tanami Gold	Gold	CR2008-0321

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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 350m) 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 cesium. 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.

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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 thickneses and magnesium / 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.

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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 it's 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 chareable, 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 magnetomtry 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.

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Range Resources EL 5557 (CR1989-0356)

EL5557 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 8177 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 smaples 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.

Hary'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 eo 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.

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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. Reconniassance 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.

Tanami Gold EL 22922 and EL 22923 (CR2004-0332, CR2004-0665, CR2004-0670, CR2004-0713, CR2005-0398, CR2005-0559, CR2006-0561, CR2007-0409, CR2008-0321)

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.

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EXPLORATION ACTIVITIES COMPLETED IN 2010

Comprehensive GIS data review

A full GIS review of all three Burt Plain tenements (EL's 27335, 27336 and 27337) was completed using geology (Figure 7), digital terrain model (Figure 1), Landsat 321, Ternary radiometrics (Figure 8), gravity (Figure 9) and RTP magnetic data (Figure 10) and results are summarized in Dow (2010).

Ternary radiometric data confirm Landsat and 1:250,000 scale geological mapping showing almost complete cover over the three tenements (speckled light blue-green colours). There are a series of weak-moderate uranium, potassium and thorium anomalies on EL 27337 that correlate well to granite and gneiss outcrops shown on the 1:250,000 scale NTGS geology map. The only other area of significant outcrop is the Mt Burne area in northern EL 27335 which has a subtle uranium anomaly (blue colour).

Depth to basement of the Burt Plain project tenements was assessed by evaluating water bores. Twenty six water bores have been drilled within and in close proximity to Arafura's Burt Plain tenements (Table 2). Water bore use is mainly for stock on the Aileron Station but have also been drilled by railway and road companies, the BMR and the Army. Lithological logs have only been completed for 18 of the 26 bores, but is enough to get a rough guide to depth of cover sequences (average of 38.9m) and basement characteristics (mostly granite with subordinate gneiss and schist). Water bore lithological data is effectively restricted to the southern half of EL27336 and holes within and to the east of EL27335 (no water bores are located within EL 27337, Figure 1). Where information has been recorded, basement depths are variable over short distances. Depths to basement are typically shallow (0-20m) or relatively deep (50-100m) and so the average of 38.9m is possibly not representative. There doesn't appear to be any relationship between depth to basement and basement lithology.

The Burt Plain 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 (Figure 8). The abrupt northern edge to this anomaly is marked by the Hann Range that outcrops in the northern part of EL 27337 and extends east to just north of EL 27336. Analysis of airborne magnetic data indicates that two major structural systems (northwest- and east- east-northeast-trending) cut through several terrains indicating extensive development and probable old and deep origins of these structures (Figure 9). It is possible that these structures are reactivated normal and transverse structures active during extension of 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 carbonatite intrusive activity at the Nolan's Bore deposit. The appearance of carbonatites along this structural zone indicates that it has sampled the upper mantle / lithospheric mantle (i.e. very deep). Two other northwest-trending structures are identified west of Nolan's, however, these are not as well-developed and are not laterally continuous (they appear to be cut by the east-and east-northeast-trending structures). At this stage it is unclear if these structures have the potential to host carbonatites (i.e. tapped the upper mantle).

2010 Field Activities

GIS review identified key exploration targets consisting of discrete magnetic anomalies, which may be related to mafic intrusions and/or carbonatites, and zones of structural intersection that show similarities to the Nolan's Bore structural setting. Other targets include outcropping zones of quartz hematite and subtle radiometric anomalies that possible indicate the presence of REE mineralized / enriched veins (Figure 11).

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Biogeochemical Sampling

First-pass reconnaissance biogeochemical sampling and limited geological check mapping was conducted on Burt Plain tenement, EL27337, in June, 2010. Biogeochemical sampling is preferred over more conventional soil sampling on EL 27337 because it arguably ‘samples’ a larger subsurface soil zone due to extensive root development and also the thickly wooded nature of the tenement made transporting the soil auger too problematic (i.e. weighs +20kg).

A detailed analysis of work completed is presented in Dow, 2010b. 121 biogeochemical samples from 4 traverses (Appendix 1) and 10 multi-element rock chip samples (Appendix 2) were collected from the four key target areas identified from review of historical exploration data (Figure 11).

Analysis of biogeochemical samples, as detailed in Dow 2010b, resulted in the identification of several anomalous zones, relative to both background and mineralized Nolan's Bore samples (Table 3). All anomalies are associated with Mulga except Cd, Zn, Cu ± U on Traverse 3 that were identified by sampling *Eromophila*. Data comparison identified three distinct elemental signatures including:

1. REE ± P (Traverses 2 ± 1) Figure 12, 13
2. Base metals, Cd-Mo ± Zn-Cu-U ± S (Traverse 3) Figure 14
3. Cr-Ni ± Co (Traverse 4) Figure 15

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Table 2. Downhole information for water bores within and close to Arafura's Burt Plain tenements.

Bore Name	Bore #	Easting MGA94	Northing	Hole Depth	Depth to basement	Basement Lithology
Sheppard's Bore	RN001107	334578	7474781	57.92	No Data	No Data
Railway Bore	RN013546	377944	7477729	97	6	very weathered granite
Expectation #1	RN001104	360522	7466981	51.22	No Data	No Data
Expectation #2	RN001105	360522	7466981	60.97	No Data	No Data
Black Hill Bore	RN002011	372128	7463170	42.53	10	Blue grey broken quartz
Bardia Bore	RN001108	355826	7461710	43.29	No Data	No Data
Stock Bore Aileron	RN016801	375228	7456070	68.16	50	Granite
Roads Cased	RN014772	350708	7461087	46	9	Granite and broken quartz
Max Bore	RN012086	342271	7456420	25.3	No Data	No Data
Eclipse Bore	RN007476	345452	7452809	100	No Data	No Data
Roads Six Inch Bore	RN013318	354325	7456800	48	47	Clay
Roads Cased Bore	RN015237	354957	7455958	46	9	Granite and broken quartz
CDA Bore	RN013316	356827	7453727	135	93	Schist and granite
Railway Cased	RN013740	376018	7463123	70.1	9	Granite gneiss, dark w/ abun feld and qtz
Roads 80m Dry	RN015236	338128	7473320	80	0	Schist
Stock Bore Aileron #2	RN017892	341228	7459570	66	0	Sandy clay
Army Bore	RN001483	344712	7471508	101.83	No Data	No Data
Ghost Gum	RN001109	355995	7474223	45.73	No Data	No Data
BMR Alcoota #5	RN011388	366957	7474149	61	17	Musc biot fspar qtz rich schist and minor gneiss
BMR Alcoota #6	RN011389	368789	7475050	78	76	Sheared porphyroblastic biot gneiss
BMR Alcoota #7	RN011390	380642	7471315	122	120	Musc biot qtz fspar gneiss (fragments only)
BMR Alcoota #11	RN011393	380617	7467661	12	10	(sill-chl) biot qtz gneiss, biot and fspar gneiss
BMR Alcoota #10	RN011392	379679	7464012	6.1	4.6	Biot qtz gneiss and biot fspar gneiss
Adrail ASR89	RN017710	377938	7461790	83	79	Gneiss
Stock Bore Aileron #3	RN016800	377828	7459070	83	75	Granite
BMR Alcoota #9	RN011391	370500	7457679	85	85	Basement not intersected

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Table 3. List of anomalous elements for each traverse, sample numbers, assay values and anomalism cutoff levels. Note that all anomalies are from Mulga samples except Cd, U, Zn and Cu for Traverse 3 which are from Eromophila.

Traverse #	Elevated Element	Sample #	Level (ppb)	Anomalism Cut-off
1	La	ARA0712, ARA0724	721, 760	+500ppb
	Nd	ARA0710, ARA0712, ARA0713, ARA0724	330, 505, 356, 488	+350ppb
	K	ARA0711, ARA0717, ARA0722	12434, 11116, 8213	+11000ppm
	Th	ARA0704, ARA0707	43, 26	+30ppb
	Fe	ARA0704, ARA0705	201, 210	+150ppm
2	La	ARA0741 - ARA0754, ARA0758-ARA0760, ARA0765	768, 972, 728, 591, 789, 639, 609, 559, 622, 744, 486, 534, 455, 528, 504, 706, 900, 571, 532	+500ppb
	Nd	ARA0741 - ARA0754, ARA0757 - ARA0760, ARA0763, ARA0765	671, 857, 606, 537, 737, 595, 509, 463, 553, 609, 441, 477, 375, 393, 407, 410, 567, 704, 427, 356, 410	+350ppb
	Ho	ARA0741, ARA0742, ARA0745, ARA0759	15, 20, 17, 15	+15ppb
	Th	ARA0741, ARA0762, ARA0763	38, 35, 42	+30ppb
	Cr	ARA0761A	1.4	+1ppm
	Co	ARA0742	0.09	+0.08ppm
	Ca	ARA0760	18190	+16500ppm
	Fe	ARA0762	215	+150ppm
	Mn	ARA0749, ARA0762	262.2, 237.1	+220ppm
	Ba	ARA0750, ARA0759	50.89, 69.72	+50ppm
	Na	ARA0771, ARA0772, ARA0774, ARA779A, ARA0786, ARA0790	127, 106, 103, 134, 112, 103	+90ppm
	P	ARA0742, ARA0744	936, 971	+950ppm
3	K	ARA0771, ARA0780, ARA0784, ARA0790	11493, 11053, 11342, 11681	+11000ppm
	Th	ARA0766, ARA0769	34, 31	+30ppb
	Mo	ARA0771, ARA0772, ARA0774, ARA0777A, ARA0784, ARA0791	1.06, 2.05, 0.86, 0.83, 0.69, 0.51	+0.5ppm
	S	ARA0782	1143	+1400ppm
	Ca	ARA0786, ARA0789, ARA0790	19469, 21598, 18321	+16500ppm
	Mn	ARA0780	276.8	+220ppm
	P	ARA0773, ARA0780, ARA0781, ARA0784	1003, 1020, 995, 1009	+950ppm
	Cd	ARA0775, ARA0776, ARA0777B	342, 179, 227	+20ppb
	U	ARA0775, ARA0776, ARA0777B	33.5, 21.6, 24.2	+10ppm
	Zn	ARA0775, ARA0776, ARA0777B	19.5, 14.9, 15.4	+2ppm
	Cu	ARA0775, ARA0776, ARA0777B	14, 12, 90	+50ppb
4	Cr	ARA0808, ARA0810 - ARA0815	1.3, 1.5, 1.1, 1.8, 1.2, 2.8, 1.8	+1ppm
	Co	ARA0814	0.09	+0.08ppm
	Ni	ARA0800, ARA0814	2, 2.3	+1.6ppm
	Mn	ARA0816, ARA0822	246, 220.3	+220ppm
	Ba	ARA0803, ARA0807, ARA0818, ARA0819A	83.2, 73.7, 92.27, 90.23	+50ppm

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Rock chip analysis

Rock chip assays produced almost no anomalous samples (Appendix 2). Sulphide-bearing, silicified rocks from extensively-developed quartz ± hematite crackle breccias systems (Figure 11) are devoid of any mineralization as was the magnetite-bearing pegmatite discovered along Traverse 1 (Figure 11). The two laterite samples, collected near the northwestern end of Traverse 4 (Figure 11), have elevated Cr ± Ni values (Appendix 2).

Data Interpretation

Rare Earth anomalism on Traverse 1 is broadly spatially associated with an elongated, northeast-trending magnetic anomaly. Discovery of float and possible subcrop of feldspar-magnetite-mica-tourmaline pegmatite and quartz-magnetite material within the central and southern parts of the magnetic anomaly indicate that the magnetic anomaly is probably related to a magnetite-bearing pegmatite. Interestingly, magnetite-bearing pegmatites are also observed within the mineralized parts of the Nolan's Bore system. The northern edge of the magnetic anomaly is bound by a large-scale, northeast-trending structure (interpreted from aeromagnetic data) that hosts the quartz ± hematite crackle breccia ridge northeast of Traverse 1 (Figure 11) and links the southern edge of the magnetic anomaly below Traverse 2. Traverse 2 lies adjacent to the intersection of this structure and a significant northwest-trending structure (black circle, Figure 11).

Traverse 2 REE ± P anomalies are spatially related to a discrete, circular magnetic high. The absence of base metal anomalism here possibly indicates that this magnetic feature could be related to a magnetic carbonatite pipe rather than a mafic intrusion. There is a chance that the low magnetic signature surrounding the magnetic high has been affected by hydrothermal alteration. Sampling to date is restricted to the magnetic high.

Traverse 3 base metal anomalies are spatially related with a discrete circular magnetic high with peak anomalies coincident with the peak magnetic high. The magnetic signature is similar to the nearby Native Gap Ni-Cr mafic intrusive system (11km east-northeast). Traverse 3 biogeochem anomalism indicates a distinct magmatic signature and it is presumed that the traverse is underlain by a mafic intrusion. The area is dominated by a broad, flat, shallow sheet-washed plain that is virtually devoid of dense mulga tress unlike the rest of EL27337. This was the only place on the tenement that *Eromophila* was observed and these healthy plants were flush with vibrant foliage and covered in red flowers. Mulga typically has low base metal uptake and the absence of Mulga at this location potentially reflects elevated base metal concentration in soils sourced from a subsurface mafic intrusion. No outcrop was identified along the traverse.

Traverse 4 base metal anomalism is centered over a discrete, circular magnetic high that has a lower intensity tail that extends towards the southwest. Poorly-developed pisolitic lateritic material is observed towards the northwestern end of the traverse and two rock chip samples collected show elevated Cr ± Ni anomalism. Base metal anomalism in laterite and biogeochem samples indicate a common link, possibly to a subsurface mafic intrusion.

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FORWARD PROGRAM 2011

Exploration planned for 2011 (Figure 16) includes:

1. 100 x 50m spaced soil sampling survey over the Traverse 3 intrusive system (131 samples).
2. Biogeochemical sampling immediately surrounding the Traverse 2 REE anomaly (71 samples).
3. Wide-spaced (500 x 100 and 1000 x 100m spacing) biogeochemical sampling over the broad structural intersection zone within the central south of the tenement (167 samples).
4. Two new traverses to test the central north structural zones (76 samples).
5. Grid-based outcrop/subcrop/float mapping surrounding soil and biogeochemical traverses.

Rock chip results and biogeochem sampling from Traverse 1 strongly suggest that the magnetic anomaly is related to an unmineralized, magnetite-bearing pegmatite. The low magnetic signal structural zone to the north of the magnetic high shows low-level REE anomalism but not enough to warrant further work. Although magnetite-bearing pegmatite is observed at Nolan's, it makes more sense to test the broad structural zone further to the southwest. No further work is recommended at this anomaly.

A distinct, regional low-level REE ± P anomaly has been detected along Traverse 2. This anomaly falls within a broader zone of structural intersection between northeast- and northwest-trending structures (black circle, Figure 11). The size of the structural intersection zone (50km^2) and resolution of magnetic data make specific targeting problematic. Eight wide-spaced, 100m sample spacing biogeochem traverses are proposed to assess a range of different magnetic subtleties, to cover the key interpreted structural zones and to close-off identified anomalous zones, albeit at wide-spacing (238 samples, includes 71 samples immediately surrounding the REE anomaly and 167 samples over the broader area, Figure16). Infill biogeochem samples can be completed once the size of the anomaly is determined.

On Traverse 3, soil sampling is required to acquire hard assay data to confirm biogeochem anomalism and to delineate potential drill targets. A 100 x 50m soil survey is proposed over the peak part of the magnetic anomaly (131 samples, 700 x 600m area, Figure 16). The spacing could be enlarged to 100 x 100 to further reduce costs, however, this will compromise data interpretation and selection of drillhole targets. Access to this area is reasonable, however, a 1km track may need to be forged with a loader to get through the dense Mulga that surrounds the open plain at the target area.

The anomalous zone discovered along Traverse 4 is similar to, but less well-developed, than the Traverse 3 anomaly. This target should only be sampled with proven success from Traverse 3.

The central northern part of EL27337 lies along the northern edge of a large, east-west-trending regional-scale gravity high and new structural targets have been identified within this region. The location of a reversely magnetized magnetic low to the west and Native Gap to the east of the Traverse 3, all interpreted to be mafic intrusions, indicate that this zone is potentially cut by a deep-seated, east-west-trending structure. Targets 5 and 6 have been selected because they lie within zones of intersection of several orientations of second-order structures (Figure 16). These two areas have a similar structural setting to Nolan's bore with a dominant northwest-trending structure cut by east-northeast and west-northwest-trending second-order structures. Traverses 5 and 6 are biogeochem reconnaissance lines to test the REE anomalism of these structural zones (76 samples).

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SUMMARY

Despite a similar structural and geological framework to the Nolan's Bore deposit, EL 27337 remains significantly underexplored due to widespread, shallow cover and poor access. Several targets were identified using RTP aeromagnetic data and assessed in June 2010 with reconnaissance biogeochemical sampling traverses (113 samples) and limited rock chip sampling. Initial testing indicates the presence of mafic intrusions beneath Traverse 3 and 4, a magnetite-bearing pegmatite along Traverse 1 and a possible carbonatite system beneath, and surrounding Traverse 2. The tenement has two key zones of structural intersection that remain untested.

Planned exploration activities for the 2011 field season include infill biogeochem sampling around the Traverse 2 REE anomaly, wide-spaced reconnaissance biogeochem sampling within the southern structural intersection zone, detailed soil sampling over the Traverse 3 base metal – magnetic anomaly and two reconnaissance biogeochem sample traverses along the northern structural intersection zone. Exploration for outcrop, subcrop and float zones will accompany these exploration activities to get a better sense of tenement geology.

The Burt Plain tenements cover a large area (>500km2) of extensively developed but reasonably shallow sedimentary cover. The tenements are possibly in quite prospective terrain as it is interpreted that the southeastern extension of the Nolan's Bore structure passes through some of the tenements. However, it is difficult to develop specific exploration targets due to the low quality magnetic and gravity data currently available. We have identified several targets that can be evaluated during regional reconnaissance field visits, however, detailed and thorough exploration of these tenements will require the acquisition of detailed magnetic data to facilitate exploration under cover. Some of the key under cover structural targets could be tested with grid-based biogeochemical sampling, however, the size of the tenements and the broad targets means that target refining and program design would greatly benefit from detailed magnetic data. Ideally, no grid-based biogeochemical sampling or drilling would commence until after acquisition and interpretation of detailed airborne magnetic.

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