ARGANARA PROJECT
EL 25664 Mt Alone

PARTIAL RELINQUISHMENT REPORT, AUGUST 2012

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Map Sheets:
1:250,000 Elkedra SF53-07
1:100,000 Elkedra 5955
1:100,000 George Creek 6055

Distribution
Department of Resources
NuPower Resources Ltd Darwin office
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SUMMARY

Exploration license EL25664, Mt Alone, was applied for by Imperial Granite and Minerals Limited on the 19th October 2006. The title was granted on 23rd August 2007. The license was then purchased by NuPower Resources from Imperial Granite and Minerals and NuPower became the effective owner on 12th December 2007. EL25664 forms part of the Arganara Project.

The project area lies within the southeastern part of the North Australian Platform Cover successions of the highly folded Proterozoic Hatches Creek Group of the Davenport Province, unconformably overlain by flat lying Palaeozoic sediments of the Georgina Basin. The geology of Mt Alone comprises mostly Hatches Creek Group consisting of shallow marine-fluvial sediments with interlayered felsic and mafic volcanics, intruded by felsic and mafic sills and granite plutons, one of which, the Elkedra Granite outcrops in the southern part of Mt Alone. The Hatches Creek Group and sills within it were initially folded about northwest trending axes into several major upright, open to tight synclines, anticlines and then subsequently refolded about northeast trending axes and faulted into a complex terrain of arcuate domes and basins during an orogeny dated between 1800-1650Ma. This deformation was accompanied by regional metamorphism to greenschist facies and occurred prior to emplacement of the Elkedra Granite. The sediments are represented by six formations of the Ooradidgee Subgroup, seven formations of the overlying Wauchope Subgroup and three formations of the succeeding Hanlon Subgroup with a total thickness of at least 10,000 metres. The group is typified by ridge-forming arenites separated by recessive sediments and volcanics. Widespread cross bedding, ripple marks, bedding planes with mudstone or siltstone pellets, rare stromatolites, and occasional pebbly-conglomeratic beds indicate that most sediments were deposited in shallow water. Sediments of the Wauchope Subgroup outcrop sparsely in the northern part of the relinquished areas.

Cambrian-Ordovician sediments are very limited in extent and confined to the flanks of the Whisky Camp and Rockhole anticlines in the relinquished area where they form mesas and plateaux. The Early-Mid Cambrian Andagera Formation ranges from 5-40m thick, shows marked lateral variations in thickness and lithology and typically forms mesas and hills. The main lithology consists of thick bedded to massive, poorly sorted, oligomictic cobble conglomerate of subangular to well rounded clasts up to boulder size of mostly silicified arenites sourced from local Hatches Creek Group rocks, with a sparse friable matrix of sand and granules. Crude cross beds with high angle foresets up to 20 degrees are common. The formation represents fluvial and scree deposits that formed fans and terraces flanking Proterozoic ridges. Limited in extent it occurs in the north and southeast of the project, but is absent from the relinquished areas.

Mid Cambrian-Lower Ordovician rocks, formerly mapped as Sandover Beds, are subdivided into four main units comprising the lowermost Arthur Creek Formation, overlain successively by Chabalowe, Arrinthunga and Tomahawk Formations. Only the lowermost Arthur Creek Formation is present in the project area, disconformably overlying the Andagera Formation and consisting of fossiliferous organic-rich calcareous and dolomitic siltstone, silty limestone and silty dolostone. The formation interdigitates laterally with the Chabalowe Formation to the west beyond the tenement. Thicknesses vary from 68m to 181m as reported from drill holes. The formation is generally flat-lying or has dips of 2-5 degrees to the south and southeast. Weathering is deep, the calcareous matrix is mostly leached and pyrite and carbon are oxidized leaving a whitish to yellow-brown siltstone and claystone. Chert (silification) is developed near surface and rarely at depth in the weathered zone. Outcrop is therefore poor comprising surface rubble of weathered or silicified siltstone. Two distinct facies have been identified; anaerobic and aerobic. The anaerobic facies from the deeper part of the basin consists of dark grey-black, finely pyritic, calcareous and dolomitic siltstone and calcareous mudstone with very fine millimeter-scale lamination. Carbonaceous content is very high and generally increases towards the base. The aerobic facies however is subtidal, highly fossiliferous, and bioturbated throughout with lower organic carbon content. Dark grey to black thinly laminated to wavy bedded calcilutite, dololutite, and fine grained
calcarenite and dolarenite are interbedded with light grey boiclastic and peloidal medium grained calcarenite and dolarenite. These rocks are absent form the relinquished area.

Most pre-Cainozoic outcrops show evidence of ferruginisation or silicification. A thin calcrete crust is common over limestones, dolostones and basalts. Fans of poorly consolidated alluvial and colluvial gravel, dissected by active watercourses, have accumulated on the flanks of prominent sandstone ridges and mesas and are common at Mt Alone.

Quaternary colluvial sand, soil and gravel form gently sloping fans alongside ridges and hills are widespread throughout the relinquished area and are weakly incised by watercourses. Red earth soils form a mantle up to 10m thick over the mature deeply weathered plain in the centre of the relinquished area. The soils contain variable amounts of small ferricrete granules derived from lateritimised sandstone and siltstone of the Arthur Creek Formation underlying the soil. Alluvium and alluvial soils have also accumulated along watercourses and spread out over floodplains throughout the relinquished area. These floodplains are dissected by wide meandering channels of George Creek filled with sand and gravel.

NuPower was initially interested in the uranium potential on the basis of widespread airborne uranium and thorium radiometric anomalies identified by NTGS surveys associated with the unconformity between the Newlands and Treasure Volcanics of the Hatches Creek Group and the overlying Andagera and Arthur Creek Formation of the Georgina Basin. Limited reconnaissance field work of the western part of the license area has shown that it is underlain mostly by extensive alluvial deposits of George Creek and minor outcrop of the Hatches Creek Group. This is of no further exploration interests to NuPower and an area of 13 blocks was therefore selected for relinquishment.

A program of reconnaissance stream sediment sampling for gold and base metals was carried out in 2010 to follow up reports of gold anomalies from the Hatches Creek Group. BLEG, -80+200mesh and -200mesh samples were taken at each of 23 sites – 12 within the area to be relinquished. Only weak statistical multi-element anomalies resulted. No further work has been done and it has been decided to retain only that portion of the EL which is prospective for phosphate. Thirty four blocks have been relinquished and 17 blocks retained.
INTRODUCTION

The NuPower Resources Ltd Arganara Project comprises three tenements;

- EL 24726 Arganara (100% NuPower)
- EL 25664 Mt Alone (100% NuPower)
- EL 27987 Newlands Bore (100% NuPower)

This partial relinquishment report is concerned with EL 25664 Mt Alone.

BACKGROUND

Exploration License 25664 Mt Alone abuts to the west and north EL 24726 Arganara, also held by NuPower Resources Limited.

The Arganara tenement was originally applied for by Arafura Resources Ltd as part of its Ni-PGE-gold exploration program in the Kurinelli region focused on mineralisation in the Kurinelli Goldfield situated 140 kilometres SE of Tennant Creek. Gold was discovered at Kurinelli over 100 years ago but the region has been subjected to only limited, spasmodic attention since that time. Historical activity centred on gold mineralisation within quartz veins which characteristically occur within interlayered sandstone/siltstone (Rooney’s Formation) and conformable gabbro/dolerite of the Hatches Creek Group. The two main mines were the Kurinelli Mine and the Dempsey’s Choice Mine the combined production from which totaled about 400 ounces of gold. Current activity by local prospectors in the area is directed towards recovery of gold nuggets from shallow alluvial and colluvial deposits using metal detectors.

Arafura also held EL9709, formerly located in the headwaters of George Creek 160km SW of Kurinelli over the southern part of the current Mt Alone area, for the same basement rocks as those at Kurinelli and considered this area prospective for the same Ni-PGE mineralisation as at Kurinelli and Ni-Cu mineralisation similar to that at Barrow Creek. This area was subsequently relinquished following an unsuccessful regional soil sampling program.

Similar units of the Hatches Creek Group which host these styles of mineralisation also surround the former area of EL9709 and were taken up by Arafura under the Arganara application.

NuPower then acquired the Arganara tenement application from Arafura Resources during the demerger process of its uranium properties. During its regional assessment of this area NuPower noticed that uranium and thorium radiometric anomalies from the NTGS airborne data associated with sedimentary units of the Cambrian Georgina Basin where they directly overlie Newlands Volcanics of the Hatches Creek Group, extended westwards into EL 25664. The license was offered for sale to NuPower by the title holder and NuPower acquired the area for its uranium potential to compliment its Arganara property.

EL25664 was applied for by Imperial Granite and Minerals Limited on the 19th October 2006 (Figure 2). The title was granted on 23rd August 2007 for a period of six years, comprising 176 blocks covering an area of 563 square kilometres. The license was then purchased by NuPower Resources from Imperial Granite and Minerals and NuPower became the effective owner on 12th December 2007.

NuPower was interested in exploring the radiometric anomalies at the unconformity between the Proterozoic Newlands and Treasure Volcanics of the Hatches Creek Group and the overlying Cambrian Sediments of the Georgina Basin for uranium, and the potential for phosphate mineralisation in the Cambrian sediments.
LOCATION AND ACCESS

Exploration license 25664 is located approximately 300 kilometres northeast of Alice Springs (Figure 1). Access from the south is north via the Stuart Highway from Alice Springs for approximately 70km, then eastwards on the Plenty Highway for 30km of sealed road and then generally northeastwards on the unsealed Sandover Highway for approximately 220km to Ammaroo Station. Access to the centre of the area is then a further 60km via the unsealed George Creek road from Ammaroo to Elkedra Station that bisects the license area.

Northern access to the area is via the unsealed road to Murray Downs station which leaves the Stuart Highway 150km south of Tennant Creek, via Ali Kurung for 55km and then the Davenport Loop Road that forks a short distance after Murray Downs Station.

Bush tracks, station bore roads and graded fence lines offer further limited access. 4WD access is also possible throughout most of the area although overall access is generally impossible through January to April as a result of scattered seasonal rainfall that disrupts passage on roads and tracks.

Airstrips for light planes are located at Elkedra, Ammaroo and Derry Downs Stations (now acquired by Ammaroo).
Figure 1 – EL25664, Mt Alone, Location of Arganara Project, NT
TOPOGRAPHY AND DRAINAGE

The license area is situated at the southeast end of the Davenport Ranges. Topography throughout Mt Alone is characterized by low relief rising from around 400-450m ASL to a spot height of 499m ASL at Mt Alone. Most of the area is drained by George Creek and its tributaries, the headwaters of which are located in the southern part of the area. This drainage assumes a northeasterly direction in the northern part of the area controlled by low rolling strike ridges. The southern part is also drained by the headwaters of Newlands Creek that flows eastwards. Both creeks flow for short periods during summer discharging into the Elkedra River. Permanent waterholes are present in the downstream part of George Creek in the northern part of the area. Topography in the south includes mesas formed by cappings of Cambrian sediments, especially conglomerate.

Station bores in the license area include Supplejack and Fitz Bores in the south and Whiskey Camp Bore in the north.

CLIMATE AND VEGETATION

The climate is mainly dry all year round with hot summers and cool to cold winters. Average annual rainfall for the Elkedra region, taken from the Ali Kurung and Barrow Creek Bureau of Meteorology weather stations ranges from 315-385mm most of which falls in the November to March period. Average minimum and maximum temperatures in summer are 24°C and 38°C degrees while corresponding winter average temperatures are 7°C and 24°C.

Vegetation in the exploration license comprises two main communities. The dominant type in the north is a low open Eucalyptus woodland with sparse Acacia shrubland and spinifex (Triodia spicata and Triodia pungens) hummocky grassland understory. This is replaced in the south with tall open Mulga shrubland with Woolybutt grassland understory and hummocky spinifex grassland with tall sparse Acacia shrubland overstorey.

TENURE

EXPLORATION LICENSE

Exploration license (EL) 25664 was applied for by Imperial Granite and Minerals Limited on the 19th October 2006 (Figure 2). The title was granted on 23rd August 2007 for a period of six years, comprising 176 blocks covering an area of 563 square kilometres. The license was then purchased by NuPower Resources from Imperial Granite and Minerals and NuPower became the effective owner on 12th December 2007.

A request to waive reduction was submitted on 22/07/09 at the end of year 2. This was denied on 11/08/09. Subsequently sixty bocks representing about 34% of the original area were recommended for relinquishment in a letter to the Department on 18/08/09. This was accepted on 04/09/09, reducing the license area to 116 blocks covering 371sqkm, (Figure 3).

A request to waive reduction was submitted on 27/7/10 at the end of year 3. This was denied on 01/09/10. Subsequently 13 bocks were recommended for relinquishment in a letter to the Department on 22/09/10, Figure 4).

A partial relinquishment letter was submitted on 22/08/11 at the end of year 4. This identified 52 blocks representing about 50% of the tenement area for relinquishment, (Figure 5).

This report details the voluntary relinquishment of a further 34 blocks – 17 are retained.
Figure 2 – EL25664, Mt Alone, Application Map
Figure 3 - EL25664, Mt Alone, Relinquished Area 2009
Figure 4 - EL25664, Mt Alone, Relinquished Area 2010
Figure 5 - EL25664, Mt Alone, Relinquished Area 2011
LAND TENURE
The exploration license covers parts of the following pastoral leases:

- Derry Downs Station, NT Portion 1289, PPL 1107. Owned by DA and CM Weir, Ammaroo PMB 154 Alice Springs NT.
- Elkedra Station, NT Portion 3431, PPL 1000, via Alice Springs, NT 0870. Owned by Roy Driver, via Tennant Creek 0861.
- Ammaroo Station NT Portions 749 & 1290, PPL 1105. Owned by DA and CM Weir, Ammaroo PMB 154 Alice Springs NT.

The area relinquished is entirely within Elkedra Station.

NATIVE TITLE
An Exploration Agreement between NuPower Resources Ltd and Central Land Council (representing the Native Title Holders of the land) was signed between both parties on 11th July 2008.

This agreement covers both Exploration licenses in NuPower’s Arganara Project area i.e. EL25664 and EL24726.

A Native Title Claim (NTD 6069/01), Tribunal No. DC01/69 was lodged that covers the entire area on 19/12/2001.

An ILUA (EP127 and 128) by NT Oil Ltd that covers the southern part of the area was lodged on 24/07/2007.
ABORIGINAL SACRED SITES
An inspection of the AAPA Register of Sacred Sites indicates that over the original granted tenement there are 10 recorded sites, 4 registered sites and two exclusion zones one of which covers an extensive area around the Tosca Mine. None of the Sacred Sites are within areas of interest to NuPower.

The Exploration Agreement with the CLC further requires NuPower to commission the CLC to undertake sacred site surveys on the license area prior to any drilling operations or detailed hard rock reconnaissance surveys.

GEOLOGICAL SETTING

REGIONAL GEOLOGY

Mt Alone lies within the southeastern part of the North Australian Platform Cover successions (Figure 7) of the Davenport Province, a major Proterozoic tectonic unit with deposits of tungsten, gold and minor occurrences of copper, bismuth, silver-lead and molybdenum. The geology comprises mostly Hatches Creek Group consisting of shallow marine-fluvial sediments with interlayered felsic and mafic volcanics, intruded by felsic and mafic sills and granite plutons, one of which, the Elkedra Granite that outcrops in the southern part of Mt Alone, is dated at 1640Ma.

The Hatches Creek Group is represented by six formations of the Ooradidgee Subgroup, seven formations of the overlying Wauchope Subgroup and three formations of the succeeding Hanlon Subgroup with a total thickness of at least 10,000 metres. The group is typified by ridge-forming arenites separated by recessive sediments and volcanics. Widespread cross bedding, ripple marks, bedding planes with mudstone or siltstone pellets, rare stromatolites, and occasional pebbly-conglomeratic beds indicate that most sediments were deposited in shallow water.

The Hatches Creek Group and sills within it were initially folded about northwest trending axes into several major upright, open to tight synclines, anticlines and then subsequently refolded about northeast trending axes and faulted into a complex terrain of arcuate domes and basins during an orogeny dated between 1800-1650Ma. This deformation was accompanied by regional metamorphism to greenschist facies and occurred prior to emplacement of the Elkedra Granite.

Proterozoic rocks are unconformably overlain by largely flat-lying Cambrian sediments of the Georgina Basin succession comprising conglomerate and sandstone of the Early-Mid Cambrian Andagera Formation and sandstone, chert and siltstone of the Mid Cambrian - Ordovician Sandover Beds. They are of very limited extent in the relinquished area.

Plains and valley floors are covered by surficial Cainozoic-Quaternary sediments.
Figure 7 - Geological Regions of the Northern Territory (image from Ahmad and Scrimgeour, 2004) showing the approximate location of EL 25664.
LOCAL GEOLOGY  
(from Blake & Horsfall, 1987)  

PROTEROZOIC  

Ooradidgee SubGroup  
The oldest rocks in the Mt Alone area are represented by three formations of the Ooradidgee SubGroup exposed in the Tosca Anticline/Dome in the southernmost part of the license and intruded by the Elkedra Granite. This subgroup is represented by a partly interfingering sequence of mostly fluvial sedimentary and volcanic rocks probably exceeding 6000m thick. The lowermost Rooneys Formation forms a series of low strike ridges comprising thinly bedded micaceous arenite and siltstone of probable deltaic origin and felsic porphyry (possibly intrusive). Spotted mica schist and quartzitic hornfels are developed within 100m of the Elkedra Granite. Rooneys Formation is overlain by ridge-forming Kurinelli Sandstone consisting of well-bedded feldspathic arenite that includes minor siltstone and felsic volcanics. This is in turn overlain by the Treasure Volcanics comprising variably recessive, subaerial porphyritic flow banded rhyolite lava flows, tuffs and agglomerates and rhyolitic ignimbrites with interlayered quartzose-volcaniclastic arenites and pebbly to conglomeratic arenites.

Wauchope Subgroup  
Unimbra Sandstone, the lowermost formation of the overlying Wauchope Subgroup and up to 1500m thick, is also exposed in the Tosca Anticline where lies conformably and unconformably on the Treasure Volcanics or Kurinelli Sandstone where the volcanics are missing. It outcrops in the northern part of the relinquished areas, (Figure 8) and is the only Proterozoic formation exposed here. The Unimbra Sandstone is the oldest of the three major sandstone ridge-forming units in the Hatches Creek Group represented by variably feldspathic/lithic medium-thinly bedded arenite and minor quartz arenite, arkose and quartz greywacke. It is intruded by rhyolitic granophyre.

Newlands Volcanics, up to 2000m thick, overlies conformably the Unimbra Sandstone. They are exposed more extensively in the Tosca Anticline, the Rockhole Anticline in the central eastern part of the area and in the Whisky Camp Anticline, the northern part of the area comprising generally recessive porphyritic dacitic-rhyolitic lavas and ignimbrite, bedded tuffs and minor feldspathic/volcaniclastic/tuffaceous arenite, siltstone, shale, mudstone and agglomerate. The volcanics are intruded by silt-like bodies of probably comagmatic dacitic granophyre.

Coulters Sandstone, 350-1000m thick, the second major sandstone ridge-forming units in the Hatches Creek Group, is extensive throughout the northern part of the area, conformably to disconformably overlying Newlands Volcanics. Thick-thinly bedded, well jointed, commonly cross-bedded quartz arenites predominate with subordinate recessive volcaniclastic feldspathic/lithic/kaolinitic arenite and rare pebbly arenite. Felsic volcanics appear in the upper part and a highly altered ?basaltic lava is present.

Frew River Formation, up to 600m thick, lies conformably over Coulters Sandstone but is limited to minor exposures against the Supplejack Fault in the Whisky Camp Anticline and in the nose of the Erlpunda Anticline in the western part of the area. It comprises recessive thinly bedded-laminated fine grained arenite and micaceous siltstone, cherty siltstone, mudstone, calcareous siltstone, calcarenite, limestone and dolomite. Stromatolites are present indicative of very shallow sedimentary conditions-possibly a coastal lagoonal environment. The carbonates weather to manganiferous and hematitic “gossans” as exposed at the Cobalt Bloom occurrence, northeast of Supplejack Bore in the adjacent Arganara block. This formation also includes an andesite flow or sill.

Kudinga Basalt, the uppermost unit of the Wauchope Subgroup and 150-500m thick, lies conformably on the Frew River Formation. Generally recessive and poorly exposed on the northern limb of the Whisky Camp Anticline and in the nose of the Erlpunda Anticline it consists of amygdaloidal basaltic lavas and minor volcaniclastic (basaltic) and micaceous arenites. The basalt
is strongly lateritised and patches of calcrete are common. Fresh material is confined to corestones on low mounds.

Figure 8 - EL25664, Mt Alone, Geology, Relinquished Area

Hanlon Subgroup
Hanlon Subgroup conformably overlies the Wauchope Subgroup and appears to be entirely marine. Errolola Sandstone, 200-800m thick, forms the basal sequence and is the third major ridge forming unit although it is poorly exposed here in the Whisky Camp Anticline. It includes thin-medium and cross bedded feldspathic/lithic arenite, quartz arenite and minor recessive arenite that probably accumulated in an intertidal-subtidal environment.

Alinjabon Sandstone, about 500m thick, conformably overlies Errolola Sandstone in the Erlpunda Anticline comprising interbanded, ridge-forming, quartzose to feldspathic arenite and recessive arenite, thinly bedded siltstone, mudstone, shale, altered basaltic lavas and possible calcareous beds, indicative of a shallow marine-deltaic environment. The uppermost unit of the Hanlon Subgroup and Ha\n\tcches Creek Group, Lennee Creek Formation, is apparently not exposed at Mt Alone. Recessive, it consists of deeper water, medium bedded to laminated, arenite, siltstone and shale conformably overlying Alinjabon Sandstone and may include some calcareous beds weathering to magnesite and calcrete concretions.

Proterozoic Intrusions
High-level felsic and mafic sill-like bodies intrude the Ooradidgee and Wauchope Subgroups and the Rooneys Formation is intruded by the Elkeda Granite and an unnamed granite in the southern part of the Mt Alone.

Of the felsic bodies, dacitic to rhyolitic granophyre and microgranite form sills and concordant bodies up to 8km along strike and 300m thick, predating the folding of the Hatches Creek Group. They are petrographically and chemically similar to the felsic volcanics of this group and are considered to be comagmatic equivalents of the extrusives with rhyolitic granophyre corresponding to the Treasure Volcanics and dacitic granophyre to the Newlands Volcanics. Such a body intrudes
Newlands Volcanics exposed in the Tosca Anticline near Supplejack Bore and in the Rockhole Anticline to the east.

Mafic sills of medium-fine grained dolerite and quartz dolerite intrude Kurinelli Sandstone, Rooneys Formation and Unimbra Sandstone in the Tosca Anticline.

Elkedra Granite intrudes Rooneys Formation and dacite granophyre in the core of the Tosca Anticline, outcropping over an area of 12 square kilometres in the south of Mt Alone and extending into the abutting Arganara tenement. It consists of an even-grained slightly megacrystic, medium-coarse grained monzogranite. It is cut by quartz-feldspar-tourmaline pegmatite and quartz-tourmaline-wolframite veins with greisen altered margins at the Juggler Mine. Contact metamorphism includes spotted schists and hornfels within 100m of the granite contact. The granite post dates folding of the Hatches Creek Group and has not been significantly deformed or metamorphosed.

Unnamed granodiorite intrudes Rooneys Formation at the Tosca Turquoise Mine on the southern border of Mt Alone and leucocratic microgranite is present 2km north of here.

CAMBRIAN

The Proterozoic Hatches Creek Group and intrusives are unconformably overlain by generally flat-lying Cambrian and possible Mesozoic sediments at Mt Alone. Two Cambrian units are present but of limited extent, and are absent from the relinquished areas.

MESOZOIC

A unit of possible Mesozoic sediments is preserved as relicts on the outer flanks of the Whisky Creek Anticline and in the nose of the Erlpunda Anticline, comprising a 1-15m thick sequence of basal granule conglomerate overlain by fine grained and cross bedded sandstone and siltstone. The conglomerate is polymict containing rounded pebbles and cobbles of orthoquartzite, vein quartz, pegmatite and rare weathered granite. It is not found in the relinquished areas.

CAINOZOIC

Tertiary

Most pre-Cainozoic outcrops show evidence of ferruginisation or silification. Ferruginisation has particularly affected the Cambrian arenaceous units and some of the recessive volcanic units of the Hatches Creek Group. Silification is prevalent on the siltier and more carbonate-rich rocks of the Arthur Creek Formation and sandstone outcrops of the Hatches Creek Group have a silified coating imparting a quartzitic appearance. Ferricretes forming low rises of duricrust or chert-ferricrete rubble and silcretes however are of very limited extent here.

Tertiary to Quaternary

A thin calcrete crust is common over limestones and dolostones and occurs near exposures of Kudinga Basalt. Fans of poorly consolidated alluvial and colluvial gravel, dissected by active watercourses, have accumulated on the flanks of prominent sandstone ridges and mesas and are common at Mt Alone, including the relinquished area.

Quaternary

Colluvial sand, soil and gravel form gently sloping fans alongside ridges and hills throughout the relinquished area and are weakly incised by watercourses. Red earth soils form a mantle up to 10m thick over the mature deeply weathered plain in the centre of the relinquished area in the headwaters of George Creek. The soils contain variable amounts of small ferricrete granules
derived from lateritised sandstone and siltstone of the Arthur Creek Formation underlying the soil. Dense mulga covers most of these soils with a distinctive swaled growth habit.

Alluvium and alluvial soils have accumulated along George Creek and spread out over floodplains throughout the area. These floodplains are dissected by wide meandering channels filled with sand and gravel of George Creek throughout most of the area.

**Mineralisation**

There are no mapped mineral occurrences within the relinquished area.

**PREVIOUS EXPLORATION – ARGANARA PROJECT AREA**

Six exploration licenses have covered the area being relinquished.

**Metals Investment Holdings N L (1971) AP3228. CR71-083**

Covered the SW corner of the relinquished area. While it seems that the target was base metal mineralisation in, or proximal to, porphyry intrusives and/or volcanics, it seems that little field work was done.

**Amoco Minerals Australia Co (1983-84) EL4043. CR84-095**

This covered all of the relinquished area. Amoco considered that the Frew River Formation was a potential host for stratabound W and base metal mineralisation and its 1983 work was primarily designed to evaluate this formation, particularly its calcareous horizons. This is a generally recessive unit. Nonetheless, outcrops were located and a limited stream sediment and rock chip sampling programme found the "Cobalt Bloom" Prospect – outside the relinquished area.

BHP also joint ventured into EL4043 so as to search for diamonds. It carried out a wide-spaced, helicopter-supported, heavy mineral and silt stream sediment sampling programme over the EL. A total of 32 samples in each category was collected. BHP found no indications of kimberlites and withdrew from the venture.


This covered the southern 75% of the area relinquished. Initial exploration concentrated on the Au potential in the Hatches Creek sequence. A Pine Creek Inlier metallogenic province model was proposed as the Davenports are early Proterozoic low grade metamorphics intruded by granites. An initial helicopter supported stream sediment sampling programme was carried out over the whole of the EL: 289 samples were collected at a sample density about three per square kilometre. Samples were assayed for BLEG Au, and a minus 80 mesh split was also assayed for a variety of other elements. No Au assay exceeded 0.6 ppb. Other elements assayed were uniformly low, even where collected close to known surface mineralisation. It considered that the base metal results may have been very subdued because of the sandy nature of the streams.

A 1992 lag sampling programme in an area close to the Elkedra Granite failed to source anomalous float rock chip samples collected in 1990.

**CR19770036 EL555, International Turquoise Pty Ltd from 1972 to 1977**

EL555 covered the southern 2/3 of the relinquished area. Exploration was for turquoise and uranium and included rock chip sampling and bore water sampling from 8 water bores in the area.

**CR19920510, CR19930642 EL 7468 Harrow Holdings Pty Ltd 1991 to 1994**

EL7468 covered the northern part of the relinquished area. Their exploration was for gold and base metals and they carried out literature research, photogeological interpretation, geological
reconnaissance, plus outcrop and drainage geochemical sampling that included the Cobalt Bloom Prospect. 1:100 000 geological maps are available but there were no encouraging results.


EL 9709 was granted to explore for Kurinelli-type Au, Hatches Creek-type tungsten, Barrow Creek-type Ni/Cu and diamonds. A soil sampling program was conducted and this was the only exploration done. No elevated gold values were obtained.

EXPLORATION ACTIVITIES BY NUPOWER OF THE RELINQUISHED AREA

Exploration license (EL) 25664 was applied for by Imperial Granite and Minerals Limited on the 19th October 2006 (Figure 2). The title was granted on 23rd August 2007 for a period of six years, comprising 176 blocks covering an area of 563 square kilometres. The license was then purchased by NuPower Resources from Imperial Granite and Minerals and NuPower became the effective owner on 12th December 2007.

As NuPower was not the owner of the title in Year 1, there was no exploration to report.

YEAR 2 – (23/08/08 – 22/08/09)

NuPower compiled the results of previous exploration work from open file data available from DRDPIFR together with uranium and thorium radiometric images from the NTGS airborne surveys database and selected a series of radiometric anomalies for reconnaissance follow up.

Limited reconnaissance exploration was carried out in Year 2 that included the area relinquished, but no samples were taken here.

YEAR 3 – (23/08/09 – 22/08/10)

There was no on-ground exploration of the relinquished area in Year 3.

YEAR 4 – (23/08/10 – 22/08/11)

Work Done

Two weeks of field exploration was completed November 2010. The aims of this work were to:

1. Carry out a regional stream sediment sampling program over as much as possible of the license area.
2. Visit and inspect all known mineralization occurrences (MODAT) in the license area.

It was hoped that this work would define targets for follow up in 2011.

Samples were submitted to ALS-Chemex laboratories in Alice Springs for preparation and assay.

Sampling Methodology

Stream sediment sites were pre-determined from the 1:250,000 Elkedra topographic sheet and Google Earth imagery to provide systematic coverage of the license area. Three samples were collected at each site (Figure 9);

1. a 5kg BLEG sample of sieved -1.46mm active sediment sourced preferentially from perched flood material within the stream channel and assayed for Au, Cu,
2. a 2kg sieved -80+200 mesh sample of active sediment from the base of the dry water course by selectively sampling around larger boulders and trap sites and assayed for a range of 20 elements,
3. a 2 kg sieved -200 mesh sample of similar material to (2) and assayed for the same range of elements.

Outcrop and float rock types were noted at each sample site.

A total of 36 samples were taken from 12 different sites within the relinquished area. Note that on Figure 9 only the first sample number at each site is shown.

Results

There has been no orientation stream sediment sampling at Mt Alone and so BLEGs and two size ranges were taken to cover the range of sediment types and size fractions present that included samples from the only known area of reported mineralisation at the Juggler Mine for the purposes of an orientation study.

BLEG Samples
BLEG samples were assayed by the ALS-Chemex Au-CN12 method for Au and Cu with Limits of Detection of 0.001ppm and 0.01ppm respectively. No significant results were returned for samples within the relinquished area.

Stream Sediment Samples

The set of samples for each of 2 size fractions is statistically small and the assays throughout are generally low. It is noted that;

- Comparisons of assay values between the -80+200 and -200 mesh fractions shows mostly little difference except for Be, Ce, Cu, La where the -200 mesh value is consistently higher and Sb where the -80+200 mesh values are higher,
- Neither fraction is consistently better at anomaly definition-for some elements the -80+200 mesh works better, for some the -200 mesh is better and for some there is no difference between size fractions.

Stream sediment samples were assayed for gold by the ALS-Chemex Au-ICP21 method that has a Limit of Detection of 0.001ppm Au. Maximum assay was 0.002ppm, not of significance.

Nineteen other elements were assayed. No significant results were returned for samples from within the relinquished area. Maximum Cu assay was 22.4ppm, maximum Mo – 3.08ppm, and maximum W – 2.1ppm.
Figure 9 - EL25664, Mt Alone, Stream Sediment Locations
CONCLUSIONS AND RECOMMENDATIONS – EL25664, MT ALONE

Conclusions

- Drainage sampling using BLEGs and two stream sediment size fractions showed that there is no preferred sample type or size fraction.
- No significant results were obtained from samples taken from within the relinquished area. There was no encouragement to justify further work.
EXPENDITURE STATEMENT

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4 September 2012
REFERENCES


APPENDICES
APPENDIX 1 – EXPENDITURE REPORT