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# Lagoon Creek Resources Pty Ltd

## 2015 Partial Relinquishment Report

for

**EPM 14967**

**Period Ending 23 July 2015**

<b>LICENCEE:</b>	Lagoon Creek Resources Pty Ltd.
<b>OPERATOR:</b>	Lagoon Creek Resources Pty Ltd.
<b>STANDARD 1:250,000 SHEET:</b>	SE 54-05      Westmoreland
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<b>DATE:</b>	September 2015.

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## SUMMARY

Lagoon Creek Resources Pty Ltd (LCR) is conducting exploration in the Westmoreland area for sandstone hosted uranium–gold–PGE mineralisation. Historic exploration has focused on the Redtree – Huarabagoo – Junnagunna uranium mineralisation associated with the NE trending Redtree dyke. EPM 14967 is part of a contiguous tenement holding which forms the Westmoreland Project area. The tenement was granted on 26 July 2005. Previous work undertaken by LCR has included sacred site and Native Title clearance work, geological reconnaissance, stream sediment sampling, and reprocessing of existing radiometric and magnetic data.

After undertaking a geological and prospectivity review of EPM 14967, LCR has concluded that part of tenement is not a high priority exploration target compared to other areas within the EPM. As such, LCR have decided to surrender part of the tenement.

## **1. INTRODUCTION.**

The EPM is located on pastoral land in the Gulf District adjacent to the Northern Territory border in far west north Queensland. Access is via the Savannah Way Highway from Burketown to Borroloola turning off on station tracks at Westmoreland Station.

### **EPM\_14967\_201509\_02\_map.pdf**

The Westmoreland region lies within the Palaeoproterozoic Murphy Tectonic Ridge, which separates the Palaeoproterozoic Mt Isa Inlier from the Mesoproterozoic McArthur Basin and the flanking Neoproterozoic South Nicholson Basin.

The tenement was granted on 26 July 2005 following negotiations with the Carpentaria Land Council Aboriginal Corporation (CLCAC) representing the Garawa – Gangallida Claimants in the area.

This report provides details of work undertaken to date since grant of the tenement on the area being relinquished.

## **2. LOCATION & ACCESS**

The EPM is located on pastoral land in the Gulf District adjacent to the Northern Territory border in far west north Queensland. Access is via the Savannah Way Highway from Burketown to Borroloola turning off on station tracks at Westmoreland Station.

The EPM is approximately 380 km from Mt Isa by air and approximately 550 km by road.

## **3. TENEMENT DETAILS**

EPM 14967 was granted to LCR on 31 July 2007 following negotiation of an s31 Agreement with the Carpentaria Land Council Aboriginal Corporation.

### **3.1 Partial Relinquishment Details**

In 2010 LCR reduced EPM 14967 by 51 sub-blocks, retaining 49 sub-blocks. In 2015, LCR has decided to relinquish an additional 31 sub-blocks, retaining 18 sub-blocks.

EPM 14967: Proposed Sub-Blocks to Relinquish																											
BIM	Block	Sub-blocks																									
NORM	1083																					Y	Z				
NORM	1084													N	O	P		R				V					
NORM	1154											K				O	P		R	S	T	U					
NORM	1155	A	B	C				F	G	H			L	M	N												
NORM	1225																										
NORM	1226																										
NORM	1300																			S	T	U	V	W	X	Y	Z
<b>Total: 31 Sub-Blocks to Relinquish</b>																											

Table 1: EPM 14967 sub-blocks being relinquished

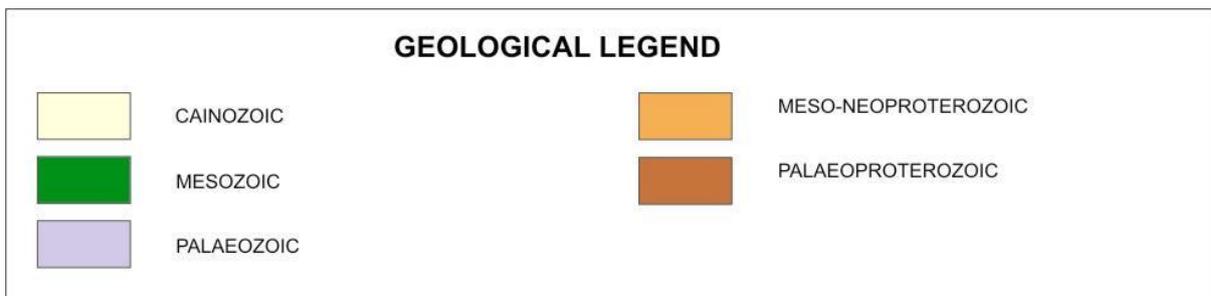
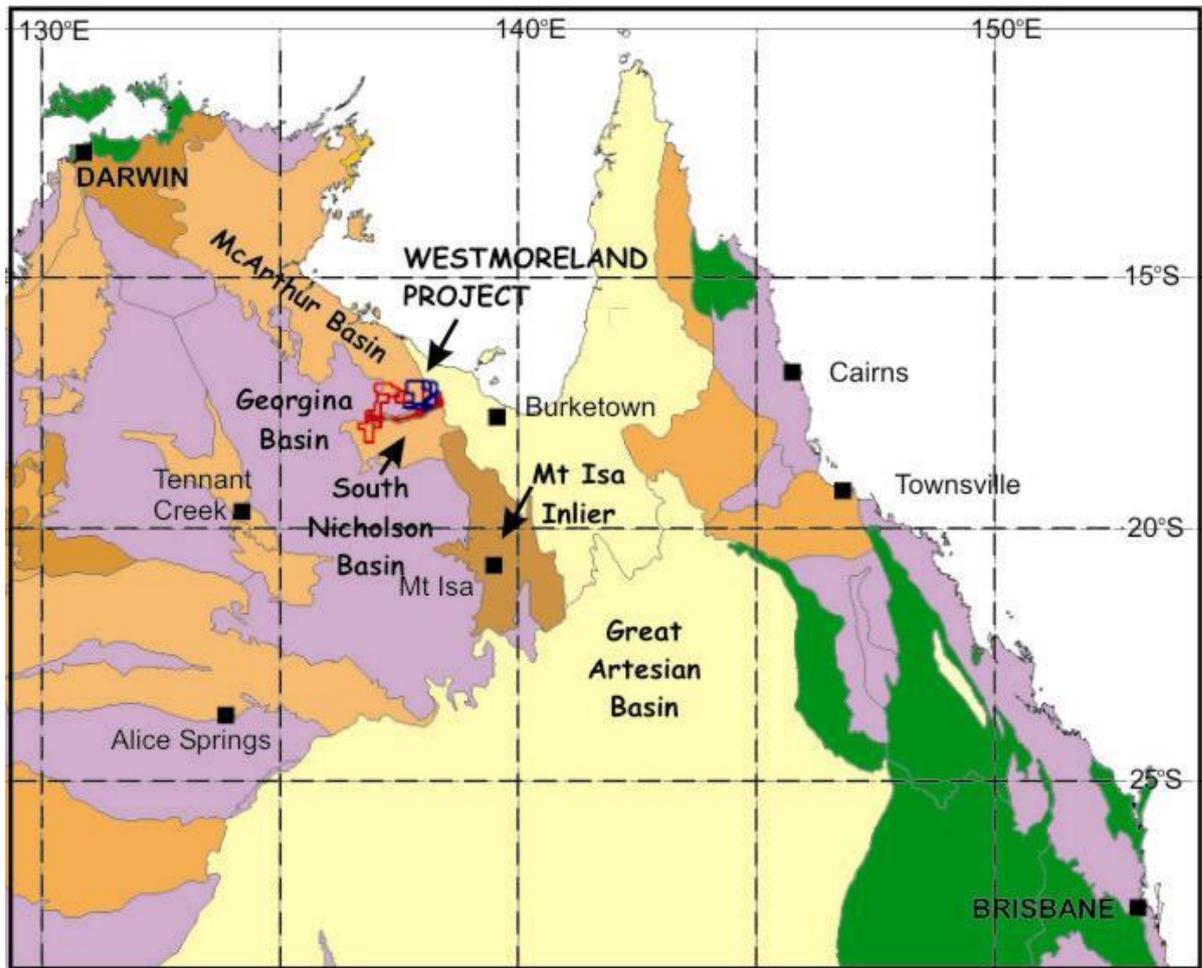
See: EPM\_14967\_201509\_03\_map.pdf

## 4. REGIONAL GEOLOGY

The Westmoreland region lies within the Palaeoproterozoic Murphy Tectonic Ridge, which separates the Palaeoproterozoic Mt Isa Inlier from the Mesoproterozoic McArthur Basin and the flanking Neoproterozoic South Nicholson Basin.

The oldest rocks exposed in the area are early Proterozoic sediments, volcanics and intrusives which were deformed and regionally metamorphosed prior to 1875 Ma. These Murphy Metamorphics (Yates et al, 1962) are represented mainly by phyllitic to schistose metasediments and quartzite. They are overlain by two Proterozoic cover sequences laid down after the early deformation and metamorphism of the basement, and before a period of major tectonism which began at about 1620 Ma. The oldest cover sequence is the Clifffdale Volcanics unit, which unconformably overlies the Murphy Metamorphics. The Clifffdale Volcanics contain over 4000 m thickness of volcanics of probably subaerial origin, more than half of which consist of crystal-rich ignimbrites with phenocrysts of quartz and feldspar. The remainder are rhyolite lavas, some of which are flow banded. The ignimbrites are more common in the lower part of the sequence, with the Billicumidjii Rhyolite Member occurring towards the top.

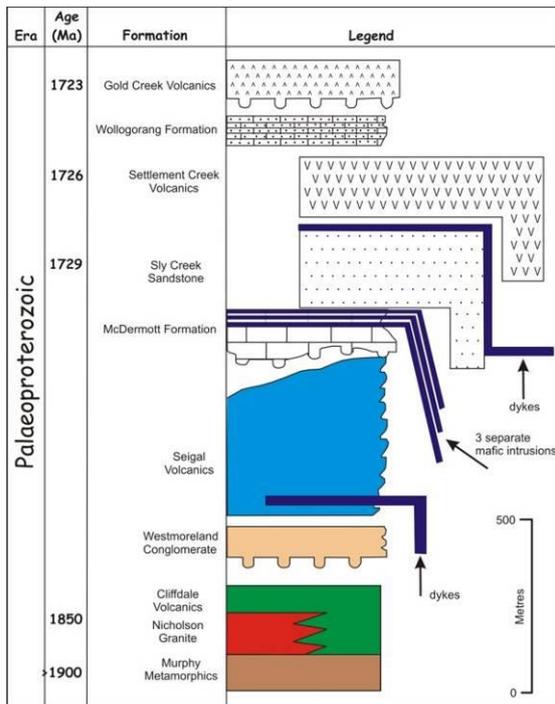
The Clifffdale Volcanics are comagmatic with the Nicholson Granite and together they comprise the Nicholson Suite. SHRIMP dating of both the Nicholson Granite and the Clifffdale Volcanics gave an age of 1850 Ma (Scott et al, 1997). The Nicholson Granite is predominantly I-type granodiorite in composition.



**Fig.1 Geological Regions.**

*Compiled by D G Jones from published data*

The Nicholson Suite shows little evidence of fractional crystallisation and on this basis the potential for forming large tonnage deposits is considered to be minor, although small tonnages of high grade are possible. In the vicinity of the granites there are no significant potential host rocks documented. Potential exists for small Sn and W deposits within the granite and for smaller Cu and Au deposits outside the granite (Budd et al, 2001).



**Fig. 2 Simplified Stratigraphy in the Westmoreland Region.**

*Compiled by D G Jones from published data*

Unconformably overlying the Nicholson Suite is the Tawallah Group (Yates et al, 1962). This is the oldest segment of the southern McArthur Basin. The base is a sequence of conglomerates and sandstones comprising the Westmoreland Conglomerate (Carter et al, 1958). The conglomerates thin out to the southeast and are in turn conformably overlain by the Seigal Volcanics (Grimes & Sweet, 1979), an andesitic to basic sequence containing interbedded agglomerates, tuffs and sandstones. Together these units comprise about two-thirds of the total thickness of the Tawallah Group. The volcanics are overlain in turn by the McDermott Formation, the Sly Creek Sandstone, the Aquarium Formation and the Settlement Creek Volcanics.

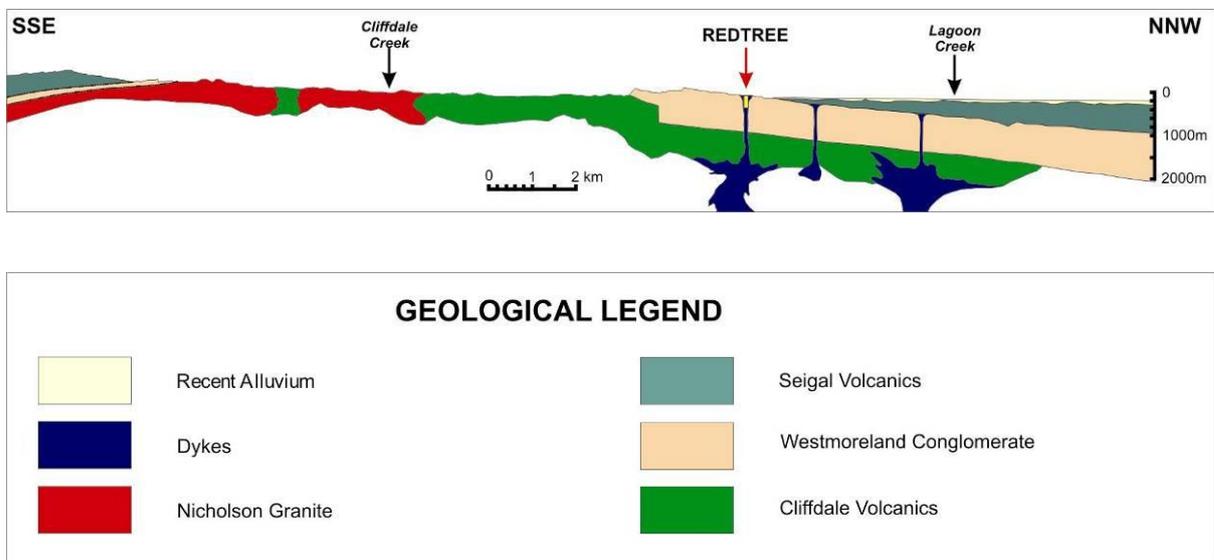
Uranium mineralisation has been recognised in the Westmoreland region in numerous structural and stratigraphic positions. These include:

1. associated with faults and fractures in Murphy Metamorphics;
2. in shear zones in the Cliffdale Volcanics near the Westmoreland Conglomerate unconformity;
3. at the reverse-faulted contact between Cliffdale Volcanics and Westmoreland Conglomerate;
4. within Westmoreland Conglomerate about 50m above its base;
5. in Westmoreland Conglomerate in close proximity to the overlying Seigal Volcanics;

6. in association with mafic dykes and sills; and
7. in shear zones within the Seigal Volcanics.

The most important uranium deposits occur on the northern dip slope of the Westmoreland Conglomerate in situation 5 above. The deposits represent thicker and higher grade concentrations of trace uranium mineralisation than is regionally common beneath the Seigal Volcanics-Westmoreland Conglomerate contact and along the flanks of the Redtree dyke zone. Mineralisation in other settings is only present in trace amounts (Rheinberger et al, 1998).

The deposits are associated with an altered basic dyke system intruded along faults. Mineralisation is present in both the sandstones and dyke rocks. To the north the Westmoreland Conglomerate is overlain by the Seigal Volcanics under Recent alluvium cover.



**Fig.3 Diagrammatic section looking west towards the Northern Territory border.**

*Compiled by D G Jones from Queensland Mines Ltd (1969).*

The Westmoreland Conglomerate is a flat-lying sequence dipping between 5° and 10° to the NNW. The dominant fault directions are WNW and NE. A prominent open joint system trending NE appears to have some control on the mineralisation.

Locally, the Westmoreland Conglomerate consists of a sequence of coarse to gritty feldspathic sandstone with local pebble and cobble lenses, overlaying a basal conglomerate bed containing abundant volcanic material.

Vesicular tholeiitic dykes have intruded along the fault zones in an en echelon pattern. The dykes weather more easily than the conglomerate and thus tend to be obscured at surface. Fresh dykes in core are brecciated and sheared, and extensively altered along the contact zones. The unaltered dyke is typically a dark green dolerite.



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## 5. PREVIOUS MINING AND EXPLORATION

### Discovery and Ownership

The Westmoreland region was probably first prospected in the 1890s, after the discovery in 1887 of silver-lead deposits at Lawn Hill, 100 km south. Copper was discovered in 1911 at Settlement Creek and at the nearby Redbank lode in the Northern Territory in 1916. In 1912 the Packsaddle and Bauhinia copper lodes were discovered near Wollogorang homestead. Pitchblende has been mined in the Peters Creek Volcanics, which overlie the Westmoreland Conglomerate, 20-30 km west of Redtree (Syvret, 1957).

Uranium exploration in Australia was initiated in 1948 by requests from the United States and British governments for uranium oxide. The federal government encouraged explorers by offering tax-free rewards up to \$50 000 for uranium discoveries, and by offering a guaranteed price for any uranium produced. A local prospector found secondary uranium minerals on his leases at Rum Jungle in 1949, which initiated the first uranium exploration boom in the Northern Territory.

The BMR acquired regional airborne radiometric data and offered free geological advice to prospectors to further encourage exploration. Individual prospectors or newly formed companies undertook most exploration activities, which mainly involved ground-truthing BMR airborne radiometric anomalies using Geiger counters. Most of the smaller vein-type deposits were found at this time, including those in the Pandanus Creek area of the Northern Territory in 1955 by prospector R T Norris (Lord, 1955). The main deposit was discovered in 1958 by Eva Clarke, niece of Norris, who was found playing with yellow pebbles of autunite and torbernite (Morgan, 1965), and named the Eva prospect.

Mount Isa Mines Limited ("MIM") were granted Authority to Prospect ("AP") 46M on 1<sup>st</sup> August 1956. The AP covered 1,800 sq miles (4,662 sq km) from Westmoreland station to Lawn Hill station, adjacent to the Queensland-Northern Territory border. The principal targets were copper and uranium. In early November 1956 the Bureau of Mineral Resources ("BMR") commenced an airborne scintillometer survey of the Westmoreland area. Anomalies located by the BMR were notified to the MIM field party as soon as they came to hand,

together with a comment as to their relative value. While following up one of these anomalies during the second week of November 1956, a “promising occurrence of torbernite was found in the Westmoreland Conglomerate, in the vicinity of Lagoon Creek”, by prospector A Blackwell from the MIM field party (Battey, 1956). The deposit was given the name Redtree.

During 1958 MIM drilled 277m in 11 holes at Redtree using a wagon drill with a 6 cm bit. Target depth of the holes was 30m, which was rarely attained. All the holes returned visible torbernite. The best assay was 12m @ 0.25% U<sub>3</sub>O<sub>8</sub>. Two core holes were drilled the following year, one to 37m and one to 12m depth. The core assays confirmed the wagon drill results.

Up to 12 mineralised horizons were reported by MIM in the secondary mineralisation, which averaged 7.3m in thickness over an area 430m long by 90m wide. Grade ranged from 0.05% to 0.5%, averaging 0.15% U<sub>3</sub>O<sub>8</sub> (Brooks, 1960).

Because of the low grade and the remote location of the deposit, MIM relinquished the AP but pegged three mining lease applications over Redtree and other known surface uranium mineralisation. The leases were granted in 1959 to a 50:50 MIM/Consolidated Zinc Pty Ltd joint venture. Consolidated Zinc later became CRA, which subsequently purchased a 100% interest in the leases.

Subsequent drilling (12,000m of core), pitting and shaft sinking by Queensland Mines Ltd (“QML”) at the Redtree prospect during 1967-69 indicated continuous primary uranium mineralisation between minimum depths of 15m and maximum depths of 135m extending for at least 4800m along a major joint system. The average width of mineralisation was stated to be 9.5m. Assays varied between 0.05% and 1%, averaging 0.2% U<sub>3</sub>O<sub>8</sub>. The Queensland Geological Survey reports that: “At this stage, the total resource was estimated to contain 16,000 tonnes of uranium oxide.” (Culpeper et al, 1999). The Huarabagoo deposit was discovered during this programme.

At the same time, BHP carried out an airborne radiometric survey of 1,224 line km cutting across the strike of the Westmoreland Conglomerate. Only minor anomalies were recorded.

Following the discovery of the Nabarlek deposit in 1971, QML ceased exploration at Westmoreland to concentrate their efforts in the Alligator Rivers area of the NT. In 1975 QML formed a joint venture with Urangesellschaft Australia Pty Ltd (“UAPL”), Anglo Australian Resources NL and CRA Ltd. UAPL discovered the Junganunna deposit in the period 1976 to 1983 when they were managing the joint venture. Omega Mines Ltd entered

the joint venture in 1982 and completed a programme of drilling and re-assay of core for gold at Huarabagoo. Results confirmed some erratic high grades up to 86 g/t Au. In 1990 CRA took over management, and purchased 100% of the joint venture in 1996. Prior to this time, CRA had purchased a 100% interest in the old MIM mining leases at Redtree.

During the late 1960s uranium prices had begun to rise in expectation of increased demand for nuclear powered electricity generation. In Australia, the federal government relaxed the export policy for uranium to encourage exploration. During this period, large private companies, rather than prospectors, undertook all the exploration. From 1960 to 1980, more than 20 EPMs were explored in the Queensland section of area covered by Laramide's Westmoreland tenements, generating over 90 open file reports,. Apart from the work discussed above, this exploration included:

- BHP (1967-73) - airborne radiometrics followed up by percussion drilling (6,900m) and diamond drilling (2,400m) in 146 holes. Best intersection was 2m @ 0.92% U<sub>3</sub>O<sub>8</sub> at the Amphitheatre prospect.
- US Steel International (1968-70) - stream sampling for base metals around the Gulf of Carpentaria, as part of a manganese-uranium search.
- Westmoreland Minerals Limited (1970) - field inspection of base metal anomalies in Hedley's Creek.
- Esso Mineral Enterprises Australia Ltd (1971-72) - 3 vertical holes (664m total) to max 275m in alluvial plain of Lagoon Creek without reaching the Seigal Volcanics/Westmoreland Conglomerate contact, considered to be the prospective horizon.
- Mt Arthur Molybdenum NL (1973-79) - reconnaissance radiometrics, including 170km of Track Etch lines, plus 3000m of auger drilling in 2,565 holes.
- Savage Exploration Pty Ltd (1975-81) - soil geochemistry, airborne radiometrics, track etch, and diamond drilling 50 holes (2,500m).
- Mines Administration Pty Ltd (1977-79) - stream sediment geochemistry and ground radiometrics for uranium, tin and tungsten.

The surge in gold exploration from 1980-1990 was reflected in the increased tempo of exploration in the Westmoreland area. Close to 30 EPMs were granted in the area now covered by Laramide's tenements in Queensland; more than 70 open file reports record the work done through this decade while 18 ELs were explored by 6 companies on the Northern Territory side. Some of the more significant exploration, apart from that already described above, was as follows:

- Kratos Uranium NL (1975-1988) - geochem sampling, radiometrics and drilling in the Pandanus Creek (NT) area.
- Triako Mines NL (1979-80) - drilled 47 RC holes in the Redbank area.
- Minatome Australia Pty Ltd (1980-82) - ground geophysics, trenching and 9 percussion drill holes into dolerite dykes targeted to 200m depth.
- Total Mining Australia Pty Ltd (1983-84) - ground geophysics (including Track Etch) for uranium in the Lagoon Creek area.
- Central Electricity Generating Board Exploration (Australia) Pty Ltd (1983-89) - BLEG sampling for gold and soil gas sampling for radon; RAB and percussion drilling (2,610m).
- International Mining Corporation NL (1984-85) - stream sediment sampling for gold, diamonds, uranium and base metals.
- CSR Ltd (1987) - BLEG and rock chip sampling for epithermal gold in the Cliffdale Volcanics.
- Golden Plateau NL (1988-89) - BLEG and rock chip sampling for gold.
- Uranerz Australia Pty Ltd (1982-89) - explored for uranium on both sides of the border; BLEG sampling for gold; ground geophysics; RAB drilling (16 holes, 601m); one percussion hole (44m); one core hole (169m).

- By 1990 CRA Ltd held a dominant interest in tenements in the region. An internal reorganisation saw CRA absorbed into the Rio Tinto group. Rio Tinto relinquished its tenements in 2000 and subsequently LCR Resources Pty Ltd filed applications over the areas previously held by Rio Tinto.
- LCR applied for EPM 14967 in 2005 and the tenement was subsequently granted in 2007.

## **6. EXPLORATION ON RELINQUISHED AREA OF EPM 14967**

### **2007-2008**

During the first year of tenure clearance was granted by the Carpentaria Land Council Aboriginal Council (CLCAC) within the neighbouring tenement EPM 14558 and 14967 allowing access to the tenement package; further clearance proposals were submitted to CLCAC; further literature reviews and desk studies outlining exploration potential and targets were undertaken.

### **2008-2009**

During the second year of tenure further Native Title clearances on 14967 were granted allowing for greater access to the tenement package; a comprehensive stream sediment sampling programme was undertaken with 48 samples from 24 sites obtained and sent to the laboratories for multi-element MS-ICP analysis and a second sample which was submitted for BLEG (Bulk Leach Gold) analysis.

### **2009-2010**

Exploration during the third year of tenure comprised completion of a comprehensive regional stream sediment sampling programme, however, no samples were collected on the area being relinquished.

### **2010-2011**

Exploration during the fourth year of tenure comprised a review of exploration data collected to date, geophysical datasets, and geological information, was undertaken to develop new exploration targets. Reprocessing of existing radiometric and magnetic data was undertaken by GeoDiscovery Pty Ltd.

### **2011-2012**

During the fifth year of tenure work comprised a helicopter borne geological recce and continuation of the stream sediment sampling programme. No stream sediment samples were collected on the area being relinquished.

**2012-2013**

During the sixth year of tenure, geological reconnaissance and soil sampling was attempted over two target areas. Unfortunately, given the amount of surficial cover over the areas, geological and radiometric data was not ascertainable, and as a result soil samples were not submitted for assay.

**2013-2014**

During the seventh year of tenure the Company furthered research and development work on the project area; work was undertaken on a Scoping Study and Preliminary Economic Assessment (PEA) for the Westmoreland resource area.

**2014-2015**

During the eighth year of tenure the Company reviewed the prospectivity of EPM 14967 and considered to reduce it by 31 sub-blocks.

## 7. EXPLORATION SUMMARY

For the area of EPM 14967, exploration completed comprised:

- Reprocessing of radiometric and magnetic data;
- Collection of 48 samples from 24 sample sites as part of a regional stream sediment sampling programme;
- Geological reconnaissance and review.

After undertaking a geological and prospectivity review of EPM 14967, LCR has concluded that part of the tenement is not a high priority exploration target compared to other areas of the tenement. As such, LCR have decided to partially relinquish the tenement.