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Exploration Licence E 6347 - Manton Dam
Rum Jungle Area - Northern Territory
Exploration Report - 1989-1990

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March 21st, 1990
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EL 6347 - Manton Dam - Geology and Sample Location Map
1.0 - Summary

This 43.2 square kilometre, grass-roots Exploration Licence in the Rum Jungle area of the Northern Territory was appraised by both literature research and field examination for a variety of minerals known in the area, particularly uranium, base metals and gold.

The significant uranium and base metal deposits such as those at Rum Jungle and Woodcutters are structurally controlled, epigenetic, and exclusively hosted by the Whites Formation member of the Mt. Partridge Group of Proterozoic sedimentary rocks.

The Whites Formation, consisting of black, pyritic, carbonaceous shales, is almost entirely absent from EL 6347 except for a small area near the Manton Dam Reservoir, so it is concluded that there is little potential for uranium or base metal mineralization.

A large proportion of the central area of the tenement is occupied by the Manton Dam Reservoir, which with associated recreational and catchment areas renders much of EL 6347 effectively closed to exploration and mining.

The appraisal was therefore limited to the gold potential of three target areas at the extremities of the tenement which included rocks representing the South Alligator Group, the Rum Jungle Complex, and the Mt. Partridge Group. Of these the first two groups were judged to have no potential after consideration of conceptual and analytical data.

In the third area over basal Mt. Partridge Formation rocks at the southeast corner of the tenement, a cluster of three samples returned low-level, anomalous gold values from a variety of rock types. These are not however considered indications of significant gold mineralization as field examinations of the area have not produced any evidence for structures such as major axial-zone shears, or for any rock types that could potentially host such mineralization.

A brief field re-examination of the anomalous zone to confirm this opinion is desirable, but otherwise no further work is recommended for the prospect.
2.0 - Tenement

The Manton Dam prospect comprises one Exploration Licence E 6347, defined by approximately 13 minute-blocks with a total area of 43.2 square kilometres.

It was granted to Auridiam N.L. on May 22, 1989 for a period of six years.

3.0 - Location, Access, Services, and Exploration Restrictions

The tenement is situated in the Rum Jungle area, 65 km south of Darwin in the Northern Territory of Australia.

It is shown on the NOONAMAH 1:100,000 Tenement Sheet (8/5), and is located in the vicinity of the Manton Dam Reservoir about 2 km west of the Stuart Highway, the major sealed road linking Darwin with Alice Springs. The Acacia Roadhouse, located on the highway near the northeast corner of the lease, provides a convenient reference point and a service stop.

The southern sector of the tenement is accessible by two tracks; one along the new Darwin-to-Katherine power transmission line which crosses the highway at a transformer complex 10 km south of Acacia Roadhouse, the other through a gate in the fence along the highway 12 km south of the roadhouse (see Plate 1).

The northern sector is accessible along an old quarry track from the highway about 2 km north of the roadhouse, on the west side of a pass through the Acacia Ridge. The track connects with an east-west power transmission line, and then continues down the center of the tenement for 3.5 km to a firebreak along the margin of the Manton Dam catchment area.

The central area of the lease encloses parts of the Manton Dam Reservoir and recreational areas which are reached by an access road from the highway. Virtually the entire tenement except for its northern and western extremities lies within the catchment area of the reservoir, with the implication that should any mineral deposits be found their development would be subject to extreme and possibly insurmountable environmental controls. Due to this competing land use the area between the new power line and the east-west leg of the Acacia Ridge is therefore effectively closed to exploration.

4.0 - Geology

4.1 - Regional Geology - The Pine Creek Geosyncline

The regional geological setting of the Manton Dam area is depicted on two recent maps: the PINE CREEK GEOSYNCLINE 1:500,000 and RUM JUNGLE URANTUM FIELD 1:100,000 geological sheets, both published by the Bureau of Mineral Resources in 1984.
The Manton Dam area lies near the western margin of the Pine Creek Geosyncline, a composite structure of several overlapping sedimentary wedges which represent a period of sedimentation and dolerite intrusion in a shallow intra-cratic basin during the early Proterozoic. Rocks of the geosyncline cover an area of some 100,000 square kilometres in the northern half of the Northern Territory, including several small Archaean basement inliers.

In the central sector of the geosyncline the rocks were folded along axes trending north to northwest, accompanied by parallel, high-angle faulting. Near the margins, fold, faults and other structures were modified by basement tectonics, and included the development of east to northeast faults. Post-orogenic granites of Early Carpentarian age intrude both the geosynclinal sediments and marginal basement rocks, and are in places associated with felsic volcanism.

The geosynclinal sediments have been ranked into several major and minor groups, each representing a distinct episode of sedimentation and transport direction which collectively can be interpreted to trace the development of the Pine Creek Geosyncline.

4.2 - Regional Geology - The Rum Jungle Area

The main feature of the Rum Jungle area is an Archaean inlier formed by a basement doming which has exposed a core of Archaean granitoids mantled by basal Proterozoic sediments over an area measuring some 45 km by 25 km. The granitoids form two domed complexes, the Rum Jungle and Waterhouse Complexes, both consisting of coarse-grained granite with inclusions of gneisses, garnetiferous granites, migmatites, schists, banded iron formations and metasediments. The Rum Jungle Complex is anomalously high in uranium and thorium containing on the average 10.3 ppm U and 45.7 ppm Th.

The base of the Proterozoic is represented by the Namoona Group, which unconformably overlies the Archaean basement, and consists of basal conglomerates and sandstones overlain by stromatolitic carbonates and cherts. These were deposited locally as clastic and biogenic sediments around palaeo-topographic highs formed by the Archaean granitoid complexes.

The Namoona Group is unconformably overlain by the more regionally extensive Mount Partridge Group, which consists of a wedge of continental, fluvial and alluvial conglomerates, sandstones and siltstones. In the Rum Jungle area the Group is represented by near-shore equivalents of the regional stratigraphy, consisting of basal Crater Formation arenites and conglomerates, overlain by stromatolitic dolomites and cherts of the Coomalie Dolomite. These are overlain by Whites Formation carbonaceous, pyritic shales, and capped in turn by the Acacia Gap Quartzite Member of the Wildman Siltstone (Fig. 3).
The Mount Partridge Group is unconformably overlain by rocks of the South Alligator Group, which are widely distributed throughout the Pine Creek Geosyncline, and are significant host rocks for gold deposits, particularly in shear zones along anticlinal fold axes in the vicinity of granite intrusions.

The Lower Proterozoic sediments have been moderately to tightly folded along north-south axes into broad domes and low-amplitude synclines and anticlines. All lithologies have been offset along a major north-east striking fault, the Giants Reef Fault, with a dextral displacement of up to 8 km.

4.3 - Mineral Deposits - Rum Jungle Area

Several significant mineral deposits have been found to date in the Rum Jungle area, in addition to numerous small but uneconomic prospects. Four deposits comprised the uranium, copper, lead and cobalt mines of the Rum Jungle Uranium Field, recently augmented by the Woodcutters Pb-Zn-Ag and Browns Pb-Cu-Zn-Co deposits.

All the major uranium/base metal deposits are epigenetic, and localized by zones of faulting and/or folding in the black, pyritic and sericitic, carbonaceous shales of the Whites Formation, usually near the contact with the underlying Coomalie Dolomite. The Woodcutters mineralization for example appears to be localized in a basinal zone of a doubly-plunging, north-south striking anticlinal fold, and in part associated to two unusual carbonatized lamprophyric dykes.

At the Rum Jungle uranium mines the mineral assemblages consisted of complex uraniferous phosphates with sulphides of copper, lead, iron, nickel and cobalt.

Syngenetic thorium minerals have been identified in the matrix of conglomerates of the Crater Formation, and of the basal Namoona Group rocks (e.g. the Manton No. 1 and Manton No. 2 prospects within or adjacent to EL 6347), almost certainly formed as placer deposits from erosion of the adjacent Archaean basement with its high background uranium and thorium content. It is likely that the Rum Jungle uranium deposits were formed by metamorphic remobilization of such primary placer mineralization into structurally suitable sites within the sulphide-rich carbonaceous shales of the Whites Formation.

Some gold has been reported from the area, and a minor gold deposit was worked at a small quartz vein in the Crater Formation east of Batchelor.

4.4 - Geology - EL 6347

A field examination of EL 6347 showed it to enclose rocks representing each of the major groups discussed above (Plate 1).

Most of the southern sector of the lease encloses granitoids and metasediments of the Rum Jungle Complex, except for the southeast
corner where basal Mt Partridge Group rocks outcrop to the southeast of the Giants Reef fault contact. These consist of coarse arenites and poorly sorted, matrix-supported conglomerates of the Crater Formation, overlain to the south by grey crystalline carbonate rocks probably representing the Coomalie Dolomite. The Proterozoic rocks are folded into a south-plunging anticline which is probably a surface expression of the fold which hosts the Woodcutters deposit, located 6 km to the south. That part of the stratigraphy containing the Whites Formation has however been totally eroded from this sector of the prospect.

Some outcrops of Whites Formation rocks have been mapped in the prospect by the BMR to the north of the granite and west of Manton Dam, stratigraphically below the Acacia Gap Quartzite, but their small area and proximity to the reservoir rules them out as practical exploration targets.

The Acacia Gap quartzite outcrops in the northern sector of the prospect area, forming two limbs of a prominent V-shaped ridge known locally as the Acacia Ridge, which probably defines the nose and limbs of a broad, northwesterly-plunging synclinal fold.

The trough of the syncline contains rocks of the overlying South Alligator Group. These comprise ferruginous siltstones and goethitic ironstones of the Basal Koolpin Formation, overlain by grey tuffaceous siltstones of the Gerowie Tuff.

5.0 - Auridiam N.L. Work Programme

As EL 6347 was acquired as a grass-roots exploration prospect, a literature review was carried out to assist in the formulation of exploration concepts.

It was concluded that there was little potential for uranium or base metal mineralization in view of the poor representation of Whites Formation rocks, and the extensive exploration of radiometric anomalies already carried out in the area. The exclusion of large areas of the prospect from effective exploration by the Manton Dam Reservoir and its catchment also closed off a large area of the lease.

It was therefore decided to appraise only the gold and base metal potential of the tenement by testing three target areas at its extremities:

-1- The axial zone of the folded Mt. Partridge Group rocks at the southeast corner.

-2- Banded iron formation within the Rum Jungle granitoids.

-3- Koolpin Formation rocks at the northern end.

The areas were initially appraised by chain-and-compass traversing, geological mapping at 1:25,000, and the collection of 20 rock chip samples (528601 to 528620). A further 5 samples were subsequently taken by a consultant from Darwin (MD1 to MD5).
6.0 - Results

6.1 - Mt. Partridge Group

Traverses confirmed semi-continuous outcrop of coarse arenites and conglomerates of the Crater Formation, as well as overlying carbonate rocks of the Coomalie Dolomite. Very little quartz veining was observed except in probable association with shearing near the Giants Reef Fault (sample 528601), and minor quartz stringers along the axis of the south-plunging anticline (sample 528602). There was no major shearing observed along the anticlinal axis.

In the absence of any other interesting material, samples were taken of ferruginous shale float (528603), and ferruginized quartz arenite grit (528604). Positive gold values were returned as follows:

528601 - 0.276 gm/tonne Au - Quartz; cellular, some limonite.
528602 - 1.332 " - Quartz stringer in sheared dolomite.
528603 - 6.980 " - Ferruginous shale float.
528604 - 0.876 " - Ferruginous quartz arenite grit.

Two further samples of lateritic material to the south (528605 and 528606), and several subsequent samples of Crater Formation arenites (MD1 to MD4) carried no detectable gold.

6.2 - Rum Jungle Complex

Three samples of metasediments and oxide-facies banded iron formation within the granitoid complex (528607, 528608 & MD5) carried traces or undetectable gold. There is no scope for further testing of this area.

6.3 - South Alligator Group

Two traverses across rocks of this formation in the northern sector of the tenement showed only minor indications of shearing or quartz veining. Of 12 samples, no detectable gold was present in 10, and trace amounts were reported in two.

Although South Alligator Group rocks host gold mineralization elsewhere in the Pine Creek Geosyncline, the necessary structural and lithostratigraphic relationships (shearing along anticlinal fold axes and nearby granite intrusion) are absent in the Manton Dam area, which with the above analytical results indicates no potential for gold mineralization.

7.0 - Conclusions and Recommendations

On the basis of the above considerations no further work is proposed for those parts of the prospect enclosing South Alligator Group rocks, the Manton Dam Reservoir area, and the Rum Jungle Complex granitoids. This reduces the area of potential interest to a small triangle of Mt. Partridge Group rocks at the
south-east corner of the lease, defined by the tenement boundaries and the Giants Reef Fault.

There is no potential for Woodcutters-type base metal mineralization as the rock units underlying this area are too low in the stratigraphic sequence to contain the favourable Whites Formation pyritic shales, which has been confirmed to be totally absent.

The anomalous gold results in samples 528602 to 528604 are somewhat enigmatic, but are not considered indications of significant mineralization as field examinations of the area have not produced any evidence for structures such as major anticlinal axial shears, or for any rock types that could host such mineralization.

A brief field re-examination of the anomalous zone to confirm this opinion is desirable, but otherwise no further work is recommended for the prospect.

8.0 - Expenditure to 31 January 1990

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Walpole, B.P., Dunn, P.R., Randal, M.A., 1968  "Geology of the Katherine-Darwin Region, Northern Territory" - Bulletin 82, Department of National Development, Bureau of Mineral Resources, Geology and Geophysics.


Bureau of Mineral Resources, 1984 - Geological sheets:
- PINE CREEK GEOSYNCLINE 1:500,000
- RUM JUNGLE URANIUM FIELD 1:100,000

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Results in ppm unless otherwise specified.

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X = element concentration is below detection limit
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**ANALYTICAL REPORT NO:**

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C/O ZAPOPAN NL  
5TH FLOOR HARBORVIEW PLAZA, 8 MCMini  
DARWIN NT 0800

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**RESULTS REQUIRED** ASAP

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**REMARKS**

RESULTS

MR A ROMANOFF  
AURIDIAM NL  
C/O ZAPOPAN NL  
5TH FLOOR HARBORVIEW PLAZA, 8 MCMini ST  
DARWIN NT 0800

RESULTS

TO

RESULTS

TO

**AUTHORISED OFFICER**
Appendix - 1

Analytical Report No. 999.37.21.03811

Analabs - Darwin, N.T. 11/9/1989
AURIDIAM N.L.

EL 6347 - MANTON DAM
NORTHERN TERRITORY
Exploration Report - 1989/90
Geology and Sample Locations

Author: [Name]
Drawn: GEOGRAPHICS
Drawing No.: GNT-AC1
Date: March 1990
Revision: [Version]