PARTIAL RELINQUISHMENT REPORT ON EXPLORATION LICENCE

8451 (ARNOLD)

FOR THE PERIOD 20/10/94 TO 19/10/96

TANUMBIRINI 1:250,000 SHEET SD 53-02

VOLUME 1 OF 1

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Commodities: Zinc, Lead, Copper, Silver

Date: January 1997

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Report No.21094

OPEN FILE
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Title: PARTIAL RELINQUISHMENT REPORT ON EXPLORATION LICENCE 8451 (ARNOLD) FOR THE PERIOD 20/10/94 TO 19/10/96

Authors: A.T. PRICE

Date: JANUARY 1997

ABSTRACT

Exploration Licence 8451 (Arnold) was granted to Normandy Exploration on the 20 October, 1994.

The licence was applied for to target base metal mineralisation in the Middle Proterozoic Roper Group.

Exploration carried out on the relinquished area has included an airborne magnetic and radiometric survey and compilation of open file data.

Petroleum well data released onto open file late in 1995 revealed that the depth of Cambrian cover is in excess of 150m over much of the licence area. As a result the licence was reduced from 500 blocks to 63 blocks in October 1996.
1. **INTRODUCTION**

Exploration Licence 8451 "Arnold" was granted to Normandy Exploration for a period of six years on 20 October 1994. The licence is being explored for base metal mineralisation in the Middle Proterozoic Roper Group.

2. **LOCATION AND ACCESS**

The licence is located on the Tanumberini (SD 53-02) 1:250,000 mapsheet and is centred approximately 125km southeast of Larrimah (figure 1). The relinquished portion covers an area of 1435km². Access is via the Stuart and Carpentaria Highways with station tracks and old seismic lines providing further access within the tenement.

3. **PHYSIOGRAPHY**

The relinquished portion of EL 8451 is covered by the tableland physiographic sub-division which forms part of the extensive Barkly-Beetaloo Tableland. The surface of the tableland is gently undulating.

The northwesterly flowing Arnold River drains the licence area and flows into the Roper River system.

4. **TENURE**

EL 8451 was applied for on 22/10/93 and granted on 20/10/94 for a period of six years. The licence originally covered 500 blocks but was reduced to 63 blocks in October 1996.

5. **REGIONAL GEOLOGY**

The licences are located in the north-western McArthur Basin.

The McArthur Basin comprises the principal element of the North Australian Platform Cover, a group of mid-Proterozoic basins which unconformably overlie the Palaeoproterozoic North Australian Orogenic Province.

The basin outcrops over an area of about 200,000 km² and contains up to 12,000m of relatively undeformed and unmetamorphosed sedimentary rocks which are subdivided into four groups or Mega sequences, separated by regional unconformities.

Lowermost is the Tawallah Group, which mainly consists of sandstones with subordinate volcanics, fine-grained clastics and rare carbonates, up to 4,500m thick and about 1700-1800 Ma old.

Overlying this are the McArthur and Nathan Groups which both largely comprise evaporitic and stromatolitic cherty dolostones interbedded with dolomitic sandstone and shale, totalling up to 5,500m. The McArthur Group hosts the giant
McArthur River (HYC) shale-hosted Zn-Pb-Ag deposit. The McArthur Group is estimated to be between 1600-1700 Ma old.

Uppermost is the significantly younger Roper Group which consists of up to 5,000m of alternating quartz-rich sandstones, siltstones and mudstones, estimated to be at least 1430 Ma old.

The McArthur Basin overlies and is bounded to the north-west, north-east and south-east by basement, but it is concealed by younger basins to the east, north and south-west.

5.1 Tenement Geology

There is no outcrop of Proterozoic lithologies in the relinquished portion of the licence due to extensive Cambrian, Cretaceous and Cainozoic cover. The cover sequences include residual soil and sand underlain by lateritised Cretaceous sediments including sandstone, siltstone, claystone and conglomerate. These overlie a Cambro-Ordovician sequence including the Tindal Limestone, Antrim Plateau Volcanics and Bukalara Sandstone.

6. CURRENT EXPLORATION

6.1 Airborne Magnetic and Radiometric Survey

An airborne magnetic and radiometric survey was flown over EL 8451 by Aerodata in July 1995.

The survey specifications and equipment used are detail below:

- Flight Line Spacing - 500m
- Flight Line Direction - East-West
- Tie Line Spacing - 5,000m
- Tie Line Direction - North-South
- Sensor Height - 80m
- Magnetometer Sample Interval - 7m
- Magnetometer Cycle Rate - 0.1 seconds
- Magnetometer Resolution - 0.001nT
- Spectrometer Sample Interval - 70m
- Spectrometer Cycle Rate - 1 second
- GPS Cycle Rate - 1 second

Equipment Used

- Scintrex VIW2321/CS2 split beam cesium vapour sensor and pre-amp with a Picodas Magnetometer.
- Picodas PDAS 1000 acquisition system.
- Picodas PGAM 256 channel self calibrating spectrometer.
- One 16.75 litre Nal crystal sensor.
- Sperry radar altimeter.
- Barometric altimeter.
- WGC video tracking system.
- Differential GPS satellite navigation system.
- Picodas PNAV 2001 navigation system.
Flight Lines and contoured data are shown in Plans 1 and 2.

6.2 **Open File Data Compilation**

Pacific Oil and Gas (POG) had undertaken regionally extensive petroleum exploration in the area during the period 1986 to 1993. This included seismic surveying and drilling. Relevant data has been acquired and digitally captured. New POG drilling data released late in 1995 showed that much of the licence area was covered by significant thicknesses of Cambrian cover ranging up to 450m in the southwest.

7. **CONCLUSIONS AND RECOMMENDATIONS**

Much of the licence area is covered by significant thicknesses of Cambrian cover ranging up to 450m. This depth of cover was considered to be prohibitive for sediment hosted base metal exploration and much of the licence was relinquished.