BILLITON AUSTRALIA
THE METALS DIVISION OF THE
SHELL COMPANY OF AUSTRALIA LIMITED

EXPLORATION LICENCE 6485 — UNION REEF WEST
FIRST AND FINAL REPORT

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Exploration Licence 6485, Union Reef West, comprising 2 sub-blocks was granted to Coronation Hill Gold Mines NL and The Shell Company of Australia Limited on 9 June, 1989 for a period of three (3) years.

The licence area lies approximately 12 km north of Pine Creek, consisting of a thick sequence of shales, siltstones and greywackes of the lower Proterozoic Burrell Creek Formation.

Work carried out on the E.L. has consisted of Bulk Cyanide Leach (BCL) and -80# stream sediment sampling, geological ground checking, rock chip sampling, BCL soil sampling, and acquisition and image processing of detailed airborne magnetic and radiometric data.

Results from the work on E.L. 6485 have been disappointing, consequently the licence area is being relinquished.
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1.0 INTRODUCTION AND TENEMENT STATUS

Exploration Licence 6485, Union Reef West, comprising 2 sub-blocks was granted to Coronation Hill Gold Mines NL and The Shell Company of Australia Limited on 9th June, 1989, for a period of three (3) years (Figure 1).


This report describes exploration carried out and results achieved to-date.

2.0 GEOLOGY

The Union Reef West tenement lies approximately 12 km north of Pine Creek within an embayment of Lower Proterozoic sediments forming a roof pendant on the Cullen Batholith which is exposed near the western edge of the licence area and east of Union Reefs.

The geology of the licence area is dominated by the Finnis River Group, namely the Burrell Creek Formation. This unit is comprised of a thick sequence of shales, siltstones and lesser greywacke or sandstone units which have undergone at least two phases of deformation. The dominant deformation consists of upright north-northwest folds with lesser gentle north-northeast warping.
Detailed aeromagnetics show the sediments of the Burrell Creek Formation, along the western licence boundary to be more magnetically active. This region corresponds to the contact metamorphic aureole of the nearby McMinns Bluff Granite, possibly resulting from the formation of disseminated and vein hosted magnetite, pyrrhotite and during metamorphism. Regional metamorphism to greenschist facies occurs outside the contact aureole.

3.0 WORK COMPLETED

During the second half of 1989 programmes of Bulk Cyanide Leach (BCL) and -80# stream sediment sampling, geological ground checking, rock chip sampling, BCL soil sampling, acquisition and image processing of detailed airborne magnetic and radiometric data were completed.

Detailed stream sampling was conducted over the entire licence area with a nominal drainage area of 0.40 square kilometres per sample. Given the good drainage pattern this is considered more than adequate to locate any exposed gold or base metal mineralisation.

Two samples were collected from each site:
A 5 kg sample of active stream sediment sieved to -10# was despatched to Australian Laboratory Services in Brisbane for gold determination by the bottle roll Bulk Cyanide Leach (BCL) method. A second sample of -80# sediment was analysed by Classic Comlabs in Darwin for copper, lead, zinc and silver using Atomic Absorption Spectrometry (AAS) and tin and arsenic via the X-Ray Fluorescence method.
A compass and chain, flagged grid was established over a 600m x 600m area covering a 79.1 ppb Au gold in streams anomaly. Soil sampling was completed on 100 metre spaced lines with samples of approximately 500g of -10#. 'B' horizon soil samples were collected every 10m. Five (5) samples were then composited to produce a 2.5 kg sample covering a nominal width of 50 metres. These samples were dispatched to Australian Assay Laboratories for gold determination using the 2 kg bottle roll BCL method. Smaller -80# samples were analysed for tin and arsenic via the XRF method and copper, lead and zinc using AAS.

Image processing was completed by GeoImage of Brisbane on detailed airborne magnetic and radiometric data acquired from Aerodata as part of a major multi-client survey over the central Pine Creek Geosyncline (Figure 2). This survey was conducted using a 200 m flight line spacing, 5000 m tie line spacing and 70 m mean sensor height. Images produced include:

- grey scale magnetics
- colour magnetics with vertical illumination
  - " " " 0° shade
  - " " " 45° shade
  - " " " 90° shade

4.0 RESULTS

A total of 21 active stream sediments were collected within the licence area (Figure 3). Two significant anomalies were obtained. One anomaly (539 ppb) was a result of an alluvial gold plant upstream, the second (79.1 ppb) was followed up on the ground with reconnaissance geological mapping, rock chip sampling and BCL soil sampling.
A northwest striking, 15 m wide sheeted quartz vein system within strongly pyritic sandstone was recognised as the possible source for the 79.1 ppb anomaly.

Rock chip samples taken across the vein system contained below detection limits of gold (Figure 3). A soil sampling grid was established over the anomalous drainage area including this vein system. The grid covers an area 600m x 600m on 100m spaced grid lines. Results were poor with one value of 6.8 ppb, the remainder below 1 ppb. Base metal values were at background levels (Figure 4).

The detailed aeromagnetics have defined a series of low-amplitude N-S ridges in the western half of the licence area. This anomalous has probably been produced by the formation of magnetite and pyrrhotite during contact metamorphism concurrent to the intrusion of the nearby McMinns Bluff Granite.

A well defined northeast fault can be delineated from the aeromagnetics, passing through the centre of the licence area. No discrete magnetic anomalies containing gold-pyrrhotite-quartz mineralisation were detected.
5.0 EXPENDITURE

Listed below are costs incurred during exploration on E.L. 6485

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<table>
<thead>
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<tr>
<td>Staffing Regional Office</td>
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CORONATION HILL GOLD MINES NL. - COSTS

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TOTAL $16,600

6.0 RECOMMENDATIONS

The objective of locating near surface bulk tonnage gold mineralisation within the Union Reef West licence area has been satisfactorily tested. Results from this work has been negative. No further work is recommended for E.L. 6485.

Due to the negative results and expenditure being below the first year covenant set by the NTDME, E.L. 6485 is being relinquished.