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mining

EXPLORATION LICENCE  
EL35/2008  
MANGANA, NORTH EAST TASMANIA

FINAL REPORT  
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## **1 EXECUTIVE SUMMARY**

This report is being submitted as a Final Report for EL35/2008 prior to the completion of the second year of tenure.

The company was granted EL35/2008, which covers the Mangana Goldfield, as the result of a successful tender application for ERA 699. The principal targets for exploration in EL35/2008 are gold-bearing quartz reefs, veins and stockworks within the Palaeozoic Mathinna Group metasediments (also known as the Mathinna Beds).

Work conducted in the first year of tenure mainly comprised literature research and compilation of the results of previous explorers. Several field trips were made to the tenement in order to gain an understanding of terrain and access limitations, and to investigate the nature, size and distribution of the old workings. The only exploration activity undertaken in the licence area during the past year was a reconnaissance visit by technical staff in February 2010.

Over the past 12 months, the focus of MHML's exploration in NE Tasmania has narrowed to examining the potential for near-surface economic resources within its tenements in this region. It has been concluded that the gold anomalism within the tenement area is unlikely to support the type of deposit sought by MHML, and that the tenement therefore be surrendered.

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## 2 INTRODUCTION

This is the final report on EL35/2008 which is held in the name of Goldstock Mining Pty Ltd, a wholly owned subsidiary of Macquarie Harbour Mining ("MHM"). The tenement covers an area of 178 sq km and lies immediately northwest of the town of Fingal in NE Tasmania (Figure 1). The old gold mining centre of Mangana, which is at the southern end of the Mangana – Waterhouse "gold corridor", falls in the southern part of the licence. RL14/1988 (17 sq km), held by The Cornwall Coal Mining Company Pty Ltd, covers Tower Hill, a prominent landmark north of Mangana. This retention license, and a small mining lease at Bucklands Hill (1769P/M) are excluded from EL35/2008.

Most of the tenement lies in strongly dissected hill country designated as State Forest. Access in the eastern half is facilitated by a network of logging roads which are less widespread in the west. Private ownership is mainly confined to the lower lying areas in the south and east.

Surface geology (Figure 2) is dominated by the Mathinna Group turbidite sequence of sandstone and siltstone which hosts the widespread gold mineralisation in NE Tasmania. The topography is dominated by two landforms in excess of 1000 metres, Tower Hill and Byatt's Razorback, both of which are capped by Jurassic dolerite with associated talus. Underlying are sub-horizontal Triassic sandstones and Permian sandstones, siltstones and mudstones. Quaternary alluvium fills the valley floors.

Three styles of gold mineralisation exist in the Mangana region: sheeted vein systems, stockworks and alluvial deposits. The sheeted veins tend to be sub-vertical and usually occur parallel to bedding within slaty sequences of the Mathinna Beds. They are narrow (0.05 – 1.5m) and have no surrounding alteration haloes. Almost all the hard rock production has been of this style. Quartz stockworks are hosted in the Mathinna Beds that have undergone brittle deformation. They generally appear to be associated with larger sheeted vein systems and can be seen at Bucklands Hill and the Tower Hill Goldfield. Alluvial gold at Mangana is hosted in a clayey cobble wash in Major's Gully, Sharkeys Gully, Richardson's Creek and the creek flats surrounding Tower Hill Rivulet.

### **3 REVIEW OF PREVIOUS MINING AND EXPLORATION**

The Mangana goldfield was the first discovery of payable gold in Tasmania. Most production occurred between 1852 and 1910 with the first lode mining commencing at the Sovereign Mine in 1859 while some alluvial mining was still taking place at Majors Gully in the 1990's. The total recorded production from lode deposits in the area is 208kg but actual production was probably much greater. Between 5,000 and 15,000oz (160 – 470kg) of gold was also produced from alluvial deposits. The area is highly mineralised with more than 30 known deposits close to the township itself. It forms a NNW trending corridor approximately 6km long and 2km wide where the gold occurs in structurally (fault) controlled veins and breccia zones within sandstone and siltstone and slate. The veins are typically small and erratic in grade although it is considered that the Golden Entrance reef may extend for 2km. This reef was the largest single producer with 91kg (2940oz) at an average grade of 127g/t Au. This is small in comparison to Golden Gate (253,856oz) which lies immediately north of EL35/2008. The principal historic workings close to Mangana are shown in Figure 3.

At Tower Hill, 8km to the north of Mangana and considered a separate goldfield, the only recorded production was from the Sunbeam Mine (12t of ore for 0.12kg Au).

#### **Recent Exploration**

Like other small goldfields in NE Tasmania Mangana and Tower Hill experienced a number of decades of inactivity following the initial production period. The last 25 years have seen modern exploration by a number of companies over wide areas; the work carried out on EL55/1983 (Tasmanian Alluvials, Alcaston Mining NL and Pegasus Gold Australia Ltd), EL18/1991 (Resolute Samantha Ltd, Defiance Mining NL) and EL22/1992 (Newcrest Mining Ltd) is the most relevant.

#### **EL 55/1983:**

1984-85 (CR 85-2510): Seventeen backhoe holes were dug in Majors Gully, with visible gold in 10 of the 17 pan concentrates, and the slate bottom found to be less than 3m deep. Three 20 litre drums of tailings from the Mangana reef averaged 1.69 g/t Au (note that in 1994 Mancala Pty Ltd estimated the Mangana tailings to contain 20,000t at 0.83 g/t Au).

1985-86 (CR 86-2607): Bulk testing of alluvials in Majors Gully delineated a resource of 300,632 cu metres at 0.307 g/cu.m Au.

1987-88 (CR 88-2883) Work concentrated on the Argyle Reef, a southeastern extension of the Golden Entrance Reef about 1.5 km SE of Mangana. Access to the reef was through three drives, two from the NW end and one from the SE, and Alcaston stated in this report that limited mining took place in only one of the drives (Argyle No1 South) with the ore mined being less than 500 tonnes. Earlier sampling (Tasminex NL, 1981) in Argyle No1 South produced grades from 17 rock chip samples ranging from 4-133 g/t (mean 31.2 g/t) with the vein width over the interval sampled ranging from 10-90 cm (average 44 cm).

In 1988 Alcaston tested the Argyle Reef, adjacent wall rocks and two minor parallel quartz reefs, with eight shallow (31m) angled open hole percussion holes and 38 composite rock chip samples taken from inside the old drives. Although significant (0.1

– 0.4ppm) vein quartz was encountered in all holes except one there were no ore grade intersections. Background arsenic values in the drill holes varied from 10 to 200ppm but higher arsenic did not necessarily correlate with high gold values.

Four anomalies were found in the rock chip sampling: two from Argyle No.1 South adit (53 metres in) recorded 10.02 and 9.03 g/t, and two from the Argyle No. 2 South adit (21 metres in) were 4.93 and 3.15 g/t. The remaining 34 samples ranged from 0.026 – 0.759 g/t, again with no direct arsenic correlation.

1988-89 (CR 89-3052): Alcaston undertook resampling and assay of the bulk samples from the previous year's drilling at the Argyle line of reef and came up with similar results. It is of interest that AA7 is the only hole drilled below the water table which returned anomalous values (10x background). These occurred over a true thickness of approximately 5 metres within pyritic black shale. On the other hand the samples from the oxide profile have narrower, often high grade sections.

At Tower Hill, quartz vein stockwork was assessed in two outcropping sub-parallel sandstone units. This consisted of cutting two grids over the prospective sandstones, mapping the geology and old workings at 1:1000, composite rock chip sampling in prospective locations and soil sampling using a hand auger. A ground magnetic survey was also conducted.

Results from the rock chip sampling show that only 17 of the 68 rock chip samples produced grades of >0.1 g/t Au and 16 (8 of which were > 1g/t Au) of these came from dumps around the mine shafts and old exploration trenches. The soil sampling indicates a group of anomalous gold values (>20ppb) trending approximately magnetic E-W to the south of the Tower Hill – Sunbeam workings.

RC drilling was recommended to follow up at Tower Hill.

1989-90 (CR 90-3197): A helicopter aeromagnetic survey was flown with 150m spacing and an 80m terrain clearance. This indicated "systematic but subtle variations" in the magnetic field across the Mathinna Beds. It was also found to correlate with the previous year's ground survey at Tower Hill.

A programme of RC drilling was completed in the Tower Hill – Sunbeam area (13 holes totalling 357m). These holes were aimed at a combination of geochemical, structural and magnetic targets and encountered minor gold mineralisation. Best intersections were 1m @ 3.11g/t Au from 43-44m and 3m @ 2.87g/t Au, both from Sunbeam.

#### **EL 18/1991:**

1993-94 Alec White (CR 94-3564): Thirty rock chip samples from the Golden Entrance/Mangana area analysed for gold with best result being 1.37 ppm. Alluvial testing at Sharkey's Gully, recoverable grade of 0.096 g/cu.yd reported.

1995-96 Resolute Samantha Ltd. (CR 96-3842): Work consisted of gridded soil sampling in the Golden Entrance/Mangana Gold Reefs/Fingal area east of the town, at Buckland Hill and at Blackboy Ridge. The area of old workings at Mangana were also geologically mapped and 64 rock samples collected. Useful historical production information is provided in a set of plans and sections. Results of the rock sampling indicate strong variability in grades and the mapping confirmed a general narrow reef

width (< 0.5 metres the norm). At Buckland Hill a zone of stockworked quartz gave poor results in rock sampling with a single 1.52 g/t Au sample not supported by further sampling. A significant soil anomaly (peak value 195 ppb Au, 570 ppm As) was delineated on Blackboy Ridge. Enhancement of aeromagnetics highlighted a major NNW trending structure passing through the Fingal Mine and continuing through the zone of Au and As anomalism on Blackboy Ridge.

It was concluded that further work should be aimed at drill testing the reef systems east of the town with one targeting the north end of No 4 adit at Mangana Gold Reefs and follow-up at Blackboy Ridge.

1997-98 (CR 98-4212): Incorporated into EL 3/97. No field work by new operators Connemara GM Pty Ltd. Proposals for drilling at Buckland (two 100m RC holes), Mangana (one 200m diamond hole) and Blackboy Ridge (four fences of 80m RC holes).

1998-1999 (CR 99-4321): Operator now Defiance Mining NL. Compilation of geochemical data into a GIS, processing of existing aeromagnetic data. Drilling proposed for Argyle/Golden Entrance and Blackboy Ridge areas.

1999-2000 (CR 00-4438): Work comprised two declined percussion drill holes (total 180m) into the Golden Entrance Reef and follow-up soil sampling at Blackboy Ridge. While a number of quartz veins were intersected in both holes at Golden Entrance the sulphide content was very low and assays were disappointing, with the best intersection being 1m from 43m at 0.5g/t Au. The work at Blackboy Ridge downgraded the anomaly.

2000-01 (CR 01-4573): No field work carried out during this year. It was proposed that 6-8 RC holes should be drilled to test the southern end of the Golden Entrance Reef/Argyle Reef between Sailor's Gully and Irvine's Gully.

There are no further reports on EL18/91 so presumably the licence was relinquished.

#### **EL 22/1992:**

1992-1993 (CR 93-3498): Newcrest's targets were large volumes of quartz stockwork gold with grades > 1.5 g/t Au. Their EL excluded the main part of the Mangana and Golden Entrance reefs.

Soil and outcrop sampling at Tower Hill failed to identify significant gold mineralisation. Work then concentrated on the Golden Gully – Blackboy Ridge area some 3 km to the north and along strike from the Mangana/Golden entrance mines and upstream from the Majors Creek alluvials. Initial drainage results (up to 143ppb Au from Golden Gully) led to ridge and spur sampling which showed quartz stockworked sandstone occurs extensively throughout the catchment. The only significant value (1.1ppm) was sourced from a narrow (<0.5m quartz matrix breccia vein) of limited extent.

Newcrest concluded that the majority of the quartz vein stockwork zones were not mineralised.

## **4 EXPLORATION COMPLETED DURING THE PERIOD OF TENURE**

### **Year 1 (November 2008 – October 2009)**

A literature review was conducted of the area covered by the Exploration Licence, with emphasis on “open file” reports compiled by exploration companies.

Two visits were made to EL35/2008 during the year with the aim of traversing as much of the tenement as possible to examine ease of access for drilling and gain a good understanding of surface geology and the nature of mineralisation in the old workings.

The most pertinent observations are summarised below:

- The area is steep and forested meaning access, particularly for drilling equipment, will be difficult.
- Numerous open shafts, difficult terrain, fire in summer, and falling trees in high wind all present significant safety risks.
- A number of land titles, particularly close to Mangana, exist in the area and some exploration activities may prove problematic.
- Lack of phone coverage makes setting up a remote office/caravan a more difficult prospect.
- All hardrock mines have worked isolated narrow vein or reef systems; with the exception of Bucklands Hill, no rock was observed with quartz stockwork.
- Alluvial deposits in the area are very unlikely to be economic.

Conclusions drawn from the data review and field reconnaissance indicate that alluvial deposits are very unlikely to be economic and very little potential exists for disseminated bulk mineable mineralisation. The area however is highly prospective for high grade concentrated vein systems of a similar nature to the Golden Gate mine 10km to the north of Mangana. Of particular interest is a narrow northwest trending zone that extends from Argyle in the south through the Golden Entrance, Underlay, Fingal and Golden Gully Mines to the Tower Hill Freehold in the north.

### **Year 2 (November 2009 - May 2010)**

The work was undertaken on this license during the past year consisted of a review of exploration by MHML and previous explorers as well as a 1-day reconnaissance field visit, undertaken by technical staff new to MHML during February 2010.

Over the past 12 months, the focus of MHML’s exploration in NE Tasmania has narrowed to examining the potential for near-surface economic gold resources within its tenements in this region. It has been concluded that the gold anomalism within the license area is unlikely to support the type of deposit sought by MHML, and that the tenement be surrendered.

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## 7 EXPENDITURE

Total annual expenditure for EL35/2008:

<b>Geoscientific Costs</b>	
Geology	12,743.58
Geochemistry	
Geophysics	
Remote sensing	
<b>Drilling &amp; Gridding Costs</b>	
Gridding	
Drilling	
Earthmoving	
Land Access Costs	
Rehabilitation Costs	
Feasibility Costs	
Other Costs	4,489.45
Rental fees	
Vehicular track Construction	
Surveying, contract drafting etc	
Capital equipment purchase	
Administration Costs	
(note: not to exceed 10% of annual expend)	
Legal	
Office & Admin	
<b>Total</b>	<b>17,233.03</b>