Tasmania Department Of Mines — Report 1992/29

The Mangana Goldfield and adjacent gold mining areas

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INTRODUCTION

This report is predominantly a literature review of lode gold deposits in the Mangana area of northeastern Tasmania. The geology, mineralisation and mining history are summarised, with emphasis on the more recent surveys and exploration programmes. Summaries of the major deposits are provided in Appendix 1 and Appendix 2, and their locations are shown in Figure 3. Prospectivity is discussed briefly.

Lode gold deposits are widespread in western and northern Tasmania, and principally occur in the pre-Carboniferous rocks of the Dundas Trough and Lachlan Fold Belt (fig. 1). The northeastern area is most important, with numerous gold-quartz veins in the turbidite-bearing Mathinna Beds, of Ordovician to Devonian age, in the Lachlan Fold Belt. The greatest concentration of deposits occurs in a belt running through the Mathinna Beds from around Waterhouse, near the north coast, south for about 80 km almost to Fingal. This "gold belt" is characterised by abundant quartz veining and close folding. It was probably a continuous structure, but is intruded in places by Devonian granitoid intrusions, and buried in others by later sedimentary deposits, from the Permian to Recent in age, and is intruded or partly obscured by Jurassic dolerite. The "gold belt" has been historically subdivided into seven main goldfields; namely the Waterhouse, Forester, Warrentinna, Alberton–Mt Victoria, Dans Rivulet, Mathinna and the Mangana fields (Noldart and Threader, 1965).

The Mangana goldfield represents the southernmost part of this belt, and for the purposes of this report includes some nearby deposits. The division between this goldfield and the Mathinna goldfield is rather arbitrary, as for most mineral fields, but is taken as the Tower Hill ridge in this report (5 400 000 mN). A locality map is shown in Figures 1 and 2.

HISTORY AND PRODUCTION

The Mangana goldfield was the site of the first discovery of payable gold in Tasmania. The goldfield was discovered by James Grant of Tullochgorum in February 1852, on Richardsons Creek near Mangana ("about 150 yards below the present bridge": Twelvetrees, 1907). Most production occurred between 1852 and 1910, but has been sporadic ever since. The first lode gold mining in the area commenced at the Sovereign mine in April 1859 (Twelvetrees, 1907; Blake, 1939). Some alluvial mining continued at Majors Gully into recent years.

The total recorded production from lode deposits in the area is 208 kg (Table 1) but, as early records are poor, the actual production could have been much greater. Between 5,000 and 15,000 ounces (about 160–470 kg) of gold was also produced from alluvial deposits (Twelvetrees, 1907). Some of this alluvial gold was apparently traced to conglomerates in the Parmeener Supergroup, but no production from these was recorded (Twelvetrees, 1907). A large proportion of the gold was probably taken directly to the mint in Victoria by the miners. The largest mine in the area was the Golden Entrance, which had a recorded production of 90 kg of gold (2939 oz) at an average grade of 125.3 g/t. In comparison, the Golden Gate mine in the contiguous *Mathinna* goldfield, approximately 10 km to the north of Mangana, had a recorded production of 7.896 t (253,865 oz) at an average grade of 26 g/t (Noldart and Threader, 1965).

REGIONAL GEOLOGY

The geology of the Mangana area is shown on the Ben Lomond 1:50 000 scale geological map (Calver *et al.*, 1988). The oldest rocks exposed in the area are the Mathinna Beds, quartzwacke to pelitic turbidite sequences of (?)Ordovician–Early Devonian age, generally classified with the Lachlan Fold Belt. These rocks are intruded and locally contact metamorphosed by granitic to dioritic rocks of the Scottsdale and Blue Tier Batholiths, of probable upper Devonian to lower Carboniferous age (not exposed in this area). These rocks were all overlain by sediments of the Parmeener Supergroup, now largely removed by erosion except in some of the more elevated areas, particularly around Tower Hill and Mt Victoria. Jurassic dolerite has intruded these sequences as sills and dykes, but is relatively uncommon in this area except, again, on Tower Hill and Mt Victoria. The river valleys are partly filled with Cainozoic alluvium, perhaps Tertiary in part.

Although the *Mathinna* Beds cover much of northeastern Tasmania their geology is relatively poorly known, mainly because of poor outcrop and the lack of marker beds. The bedding strikes approximately 340° and the sediments consist of sandstone, quartzite, siltstone and pelite (phyllite, shale or slate), with local hornfelsing close to granitoid bodies (McClenaghan *et al.*, 1982). No hornfels has been noted in the Mangana area, and M. Roach (unpublished data) considers the sediments to be about 10 km thick below the "gold belt". The folding and syntectonic metamorphism (lower greenschist facies) in the *Mathinna* Beds is considered to pre-date the intrusion of granitoids (McClenaghan *et al.*, 1982). The major mineralogy is simple, usually quartz and muscovite, with lesser chlorite, albite, graphite, heavy minerals, etc. The metamorphic aureoles are commonly sharply defined, varying from 800 m to about 5 km in width, depending upon the dip of the contact (McClenaghan *et al.*, 1982). Within these aureoles the sediments are commonly spotty and/or hornfelsed, and may contain biotite, epidote-clinozoisite, andalusite and cordierite, as well as quartz, muscovite and chlorite. Gold mineralisation appears to be associated with such aureoles in the Lisle–Golconda area (R. S. Bottrill, unpublished data).

The "gold belt" is a poorly-defined zone about 2 km wide with a concentration of gold deposits running through the Mathinna Beds from around Waterhouse, near the north coast, south for about 80 km almost to Fingal. The strike is about NNW in general, but about NW near Mangana. This "gold belt" is characterised by close folding, axial plane shears, strongly-cleaved slates and abundant quartz veining (of several generations). The belt, along with the bedding and major structures, are disrupted by post-granitoid mega-kinking (Goscombe and Findlay, 1989). The structural controls on the veining and gold mineralisation are poorly understood in this area. Other, less well developed belts, may occur in the northeast of Tasmania.

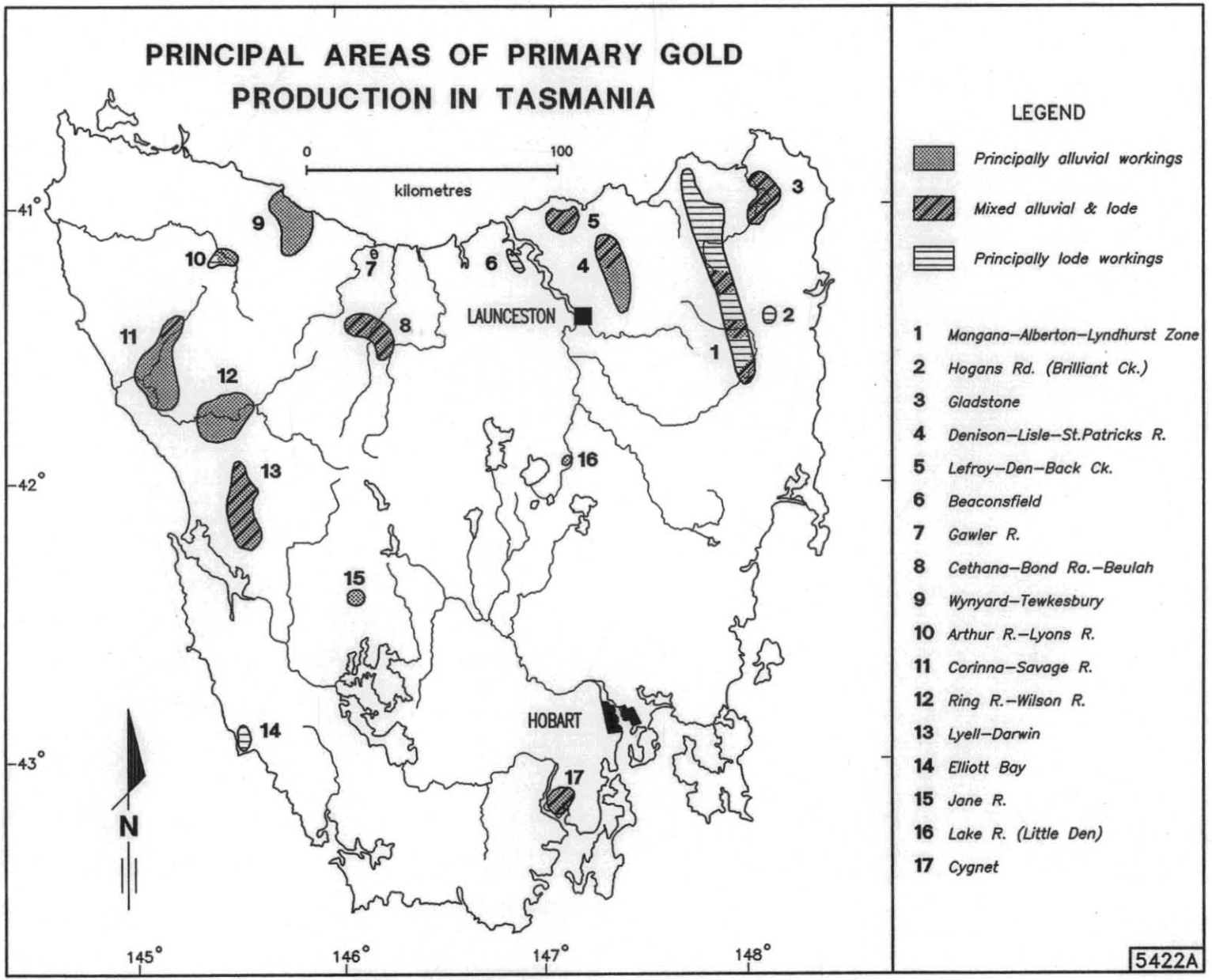

Figure 1. The distribution of major goldfields in Tasmania

5 cm

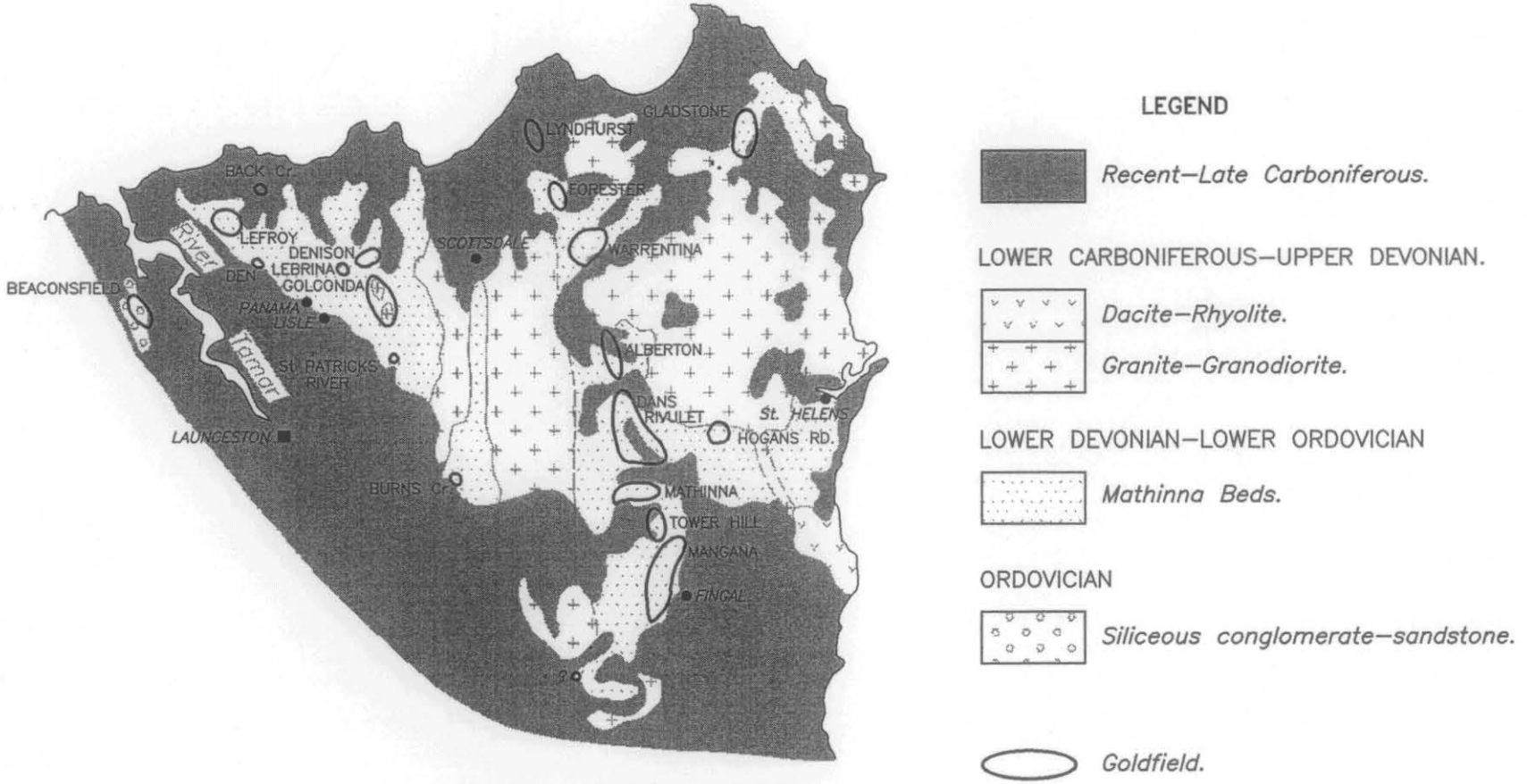

Figure 2. The geology and major goldfields of northeastern Tasmania

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MINERALISATION STYLES

The area is locally highly mineralised, with at least 70 significant known gold deposits within or in close proximity to the area (Appendix 1, fig. 3, and the departmental MIRLOCH database of mineral deposits).

Gold occurs in quartz-rich veins and breccia within the Mathinna Beds. These veins are usually small and, although often very gold-rich (up to 39.5 oz/ton or 1354 g/t: Twelvetrees, 1907), are typically erratic in size and grade. The quartz is usually white and glassy, but where auriferous is dense and milky to blue-grey in colour, with minor sulphides, or iron oxides where weathered. The sulphides include pyrite and arsenopyrite, with lesser chalcopyrite, galena and sphalerite. Minor mica, chlorite and carbonates (ankerite and siderite) may also be present. The veins vary in thickness from a few centimetres to about eight metres, and in length from about seven to 500 metres. The Golden Entrance reef may extend to about 2 km, but this has not been proven (Mconie, 1983). The veins are commonly bedding-parallel, striking about 315–345°, and usually dipping steeply. Some veins, however, are cross-veins, and some are sub-horizontal. The veins are commonly extensional in fold limbs and hinges. Some lodes are breccia zones (e.g. Golden Entrance), and these breccias are cemented by cherty to medium-grained quartz. Such refaulted veins have been highly prospective (Twelvetrees, 1907).

The host Mathinna Beds vary from slaty to silty, arenaceous or quartzitic in nature. Locally abundant poikiloblastic siderite in the sediments may represent hydrothermal alteration related to mineralisation. Cleavage is usually enhanced around mineralised areas.

Blake (1939) considered that gold had been upgraded by surface enrichment processes, during leaching of auriferous sulphides and reprecipitation of gold into ferruginous zones. This was the reason given for few workings reaching a depth of more than 30 metres. However this has not been proven, and the veins are so erratic in grade it would be difficult to prove. It may have been a convenient explanation for miners who, having found some rich ore on the surface, failed to trace the veins underground. Difficulties in handling sulphide ores may also have resulted in abandonment of prospects on reaching such ores. The situation is different in Western Australia, where gold is enriched in gossan and laterite (Mann, 1984), following much longer periods of weathering than prevail in Tasmania. Zeegers and Leduc (1991) note that gold mobilisation usually requires extreme conditions, and much of the dissolved gold is reprecipitated close to the source. In the New Golden Gate mine to the north, the original workings were abandoned at shallow depth, as with most of the early mines in the area, but were later re-opened and reached a final depth of about 600 m, with average grades of 26 g/t (Noldart, and Threader, 1965). This suggests a high potential for gold reserves at depth below other mines and "barren" veins.

Gold has been recovered from placer deposits in Cainozoic alluvial sediments, which have not generally been well tested. Most of the gullies running into the Tower Rivulet were sufficiently auriferous to employ miners for some time (Twelvetrees, 1907). Some production continues from these today. Twelvetrees (1907) reported that gold nuggets, up to 7 or 11 ounces in weight, occurred in the area.

Twelvetrees (1907) and Finucane (1932*b*) also reported on some ocurrences of alluvial gold in the Permian conglomerate at the head of some of the northern gullies, and suggested that these palaeoplacers made an important contribution to the recent alluvial gold deposits.

RECENT GEOLOGICAL WORK: THE STATE OF KNOWLEDGE

Geology

The area was recently mapped at a 1:50 000 scale by the Tasmania Department of Mines (Ben Lomond sheet: Calver *et al.*, 1988). Reconnaissance studies by the Department are in progress, and include geochemistry, metamorphic and ore petrology, and structural investigations. Fluid inclusion and oxygen isotope studies (J. Taheri, unpublished data) indicate deposition of gold from metamorphic fluids, in contrast to the studies of G. Davidson (1988) who identified apparently magmatic fluid-related gold veins in other parts of northeastern Tasmania.

Geophysical Coverage

Gravity station coverage is in the reconnaissance category, with about one station per 50 km^2 (Richardson and Leaman, 1987).

Aeromagnetic data for the area was derived from flights at a spacing of about 1.5 km and 400 m, and is assessed as regional (Gregory, 1961; Bureau of Mineral Resources Aeromagnetic Survey, 1985).

An airborne radiometric survey flown by Geophoto Resources Consultants in about 1969 covered only a very small northern part of this area (Rattigan, 1970), and the data appear to be poorly constrained and recorded (Mortimore, 1974).

Geochemical Coverage

Geochemical surveys over the area have been very erratic. No systematic regional surveys have covered the area, although Geophoto conducted some poorly-recorded studies around Tower Hill (Turner, 1972, 1974; Mortimore, 1974). Billiton conducted some reconnaissance stream sediment and rock-chip sampling in the area (Randell, 1991). Australian Anglo American conducted some stream sediment sampling in the Miami area (Mellor, 1982).

Detailed rock-chip surveys (mostly for gold and base metals) have been conducted in and about several mines and prospects by exploration companies. Pegasus surveyed the Tower Hill Freehold, Buckland, Cardinal and Argyle mines (Morrison, 1989, 1990), and Tasminex surveyed the Argyle, Golden Entrance, Mangana Gold Reefs, Underlay and Union Jack mines (Daly and Charlton, 1981). The Department of Mines has recently initiated some reconnaissance rock-chip sampling (unpublished data).

Drilling Coverage

No full diamond-drill holes have been located within the area, although 22 reverse circulation holes, drilled in alluvial areas by Australian Anglo American Ltd, cored some basement (Mellor, 1982). The deepest of these holes reached 50 metres. These holes tested some possible alluvial gold occurrences in the South Esk River valley, and delineated some low-grade deposits.

Eight percussion holes have been drilled in the Argyle mine area by Alcaston, the deepest reaching 31 m (Morrison, 1988). Extensive backhoe testing, up to about six metres depth, of alluvial material around Mangana has been conducted by Tasminex (Charlton, 1982).

RECENT MINERAL EXPLORATION (1950 –)

The goldfield has been the site of numerous small mining operations, but little extensive or systematic exploration using modern techniques. The principal exploration licences held over the area are summarised below:

EL 2/59, Electrolytic Zinc Co. of Aust. Ltd

This company flew airborne aeromagnetic surveys over much of the area, identifying one EM anomaly near Mangana, but there is no record of any follow up (Hancock, 1959).

EL 6/68, Geophoto Resources Consultants, Texins Development Pty Ltd

This relatively large lease covered only the Tower Hill part of the area. Regional surveys conducted included airborne radiometric surveys, geological mapping, fracture analysis, stream sediment, soil and rock geochemistry, costeaning of some lodes and test pitting of some alluvial sediments (Turner, 1972 and 1974; Mortimore, 1974). Little or no detailed work was conducted over the Tower Hill or other areas discussed here. The hard-rock (quartz vein) prospects tested were deemed too small for cost-effective exploration or mining, while the alluvial prospects tested were too low and erratic in grade to be of great interest. It was considered that, while some potential existed, the other prospects in the area would probably be similarly sub-economic (Turner, 1972 and 1974; Mortimore, 1974).

EL 17/78, Tasminex

Exploration on this EL investigated the alluvial, hard-rock and tailings prospects. Some of the old gold mines in the area were investigated (Argyle, Golden Entrance, Golden Gully, Mangana Reefs, Underlay and Union Jack), and some alluvial sediments around Mangana were trenched and bulk sampled. The prospects investigated were considered to be too small and/or sub-economic in grade to be of interest (Charlton, 1982).

EL 22/80, Australian Anglo American Ltd

This licence, covering the easternmost part of the area, concentrated on the search for alluvial gold and tin in the South Esk River valley. Large areas of low-grade, sub-economic gold were delineated (Mellor, 1982). Geochemical surveys (stream sediment) in the Miami area delineated areas of anomalous gold and arsenic, but were not followed up.

EL 55/83, Tasmanian Alluvials, Alcaston Mining NL, Pegasus Gold Australia Ltd

The explorers on this EL examined several hard-rock and alluvial prospects near Mangana. Various lode prospects, particularly Argyle and Tower Hill Freehold, were prospected using geological mapping, rotary drilling, soil and rock-chip geochemistry, ground magnetics and aeromagnetics (Morrison, 1988, 1989, 1990). The lode prospects were considered to be low and erratic in grade, and probably sub-economic overall. Alluvial deposits were tested by bulk sampling and were more promising (Morrison, 1987). One alluvial prospect (Majors Gully) was converted into a mining lease and is currently operating.

SUMMARY OF PROSPECTIVITY

The principal style of gold mineralisation in the area is turbidite-hosted, mesothermal, quartz-sulphide-gold veins, very similar to those Phanerozoic deposits of central Victoria, Nova Scotia, Alaska, Wales and many other areas (Nesbitt, 1991). Early gold mining focused on the rich but relatively small veins, while more modern exploration and mining has focused on open-cuttable resources such as disseminated, stockwork and multiple vein-style deposits.

The area, therefore, is highly prospective for gold in rich, small to medium-sized quartz reefs (style 36a of Cox and Singer, 1986), in sheeted veins and stockworks. Gold-bearing stockworks have been described in arenaceous units at the Tower Hill mine, just north of this area (Morrison, 1990). Sheeted veins are reported at the Alpine mine and other prospects within the Mangana goldfield area. There is a low prospectivity for economic disseminated gold in the Mathinna Beds; disseminated gold in turbiditic greywacke has been described in very similar settings, with quartz-gold veins, in the Meguma area, Nova Scotia, but is very low in grade (Crocket *et al.*, 1986).

Two medium to large gold mines of this mesothermal vein type have operated as underground workings in Tasmania; the Tasmania mine at Beaconsfield, and the New Golden Gate mine at Mathinna. The Tasmania mine produced 26.6 t of gold from 1.1 Mt of ore, with reserves of 0.67 Mt of ore grading 24 g/t (Hicks and Sheppy, 1990). The Golden Gate mine produced 7.9 t of gold from 0.3 Mt of ore grading 26 g/t, and reserves are unknown (Noldart and Threader, 1965). There seems to be great potential for locating similar deposits within this area but, unfortunately, most recent exploration has been rather superficial. Only one lode deposit has been drilled in the Mangana goldfield in the last 50 years, and few systematic geological, geochemical or geophysical surveys have been conducted over the mines in this time, on either a regional or detailed scale.

The area also has good potential for more placer gold deposits, although these have, in general, been better tested than the lode deposits (Mortimore, 1974; Charlton, 1982; Morrison, 1987). There is also significant potential for

palaeoplacers in the Permian conglomerates, the probable source for most of the gold in Majors Gully (Twelvetrees, 1907; Finucane, 1932*b*).

The area requires:

1. a detailed structural geological investigation of veining and other structures;

2. systematic geochemical sampling (soil, stream sediment and rock-chip; regional and locally detailed);

3. application of various geophysical techniques (e.g. airborne and ground magnetics);

4. petrology and ore genesis studies of mineralisation and host rocks;

5. lineament and fracture analysis to identify controlling structures in this and other goldfields.

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Table 1

Gold production, Mangana goldfield (adapted from Mconie, 1983)

Mine	Gold production (kg)	Tonnes ore	Average grade (g/t)
Abbotsford Creek	0.22	1525	0.14
Alpine	19.19	27.5	?
Buckland	35.88	1421	25.25
Cardinal	4.91	240	20.48
Fingal	9.88	9.10	
Golden Entrance	91.41	718	127.31
Golden Gully	-	0.8	?
Great Fingal	1.00	5	199.06
Mangana	24.60	3106	7.92
Miami	19.91	795	25.04
Pinchers	0.31	10	31.10
Richardsons Creek	-	40.6	-
Tower Hill Freehold	-	61.2	?
Union Jack	0.31	20	15.55
West Miami	0.23	27	8.41
Miscellaneous alluvials	~150		
Total	207.85	8057.6	25.80

Appendix 1
Principal mineral deposits

Prospect: ABBOTSFORD CREEK
Goldfield: Mangana
Location: about 570 000 mE, 5 390 000 mN.

References:

Twelvetrees, 1903; Mconie, 1983.

Style:

This prospect is based on at least three quartz reefs (Burns, Beauty and Morgans), striking 030° and dipping steeply SE or NW in slate and sandstone of the Mathinna Beds. The reefs vary up to 4.8 m wide (average 1.5 m), and are generally unmineralised, with glassy white quartz. Apparently other quartz veins in the area are slighty auriferous.

History and Production:

Mined between 1902 and 1903, for only 7.7 oz Au from 1525 t ore (0.16 g/t), although grades of up to 15 g/t were recorded. A substantial amount of development was undertaken, including three adit levels (to 210 m long) and some shafts.

Prospect: ALPINE
Goldfield: Mangana
Location: 571 650 mE, 5 395 870 mN

References:

Twelvetrees, 1907; Blake, 1939; Mconie, 1983; Townrow, 1986.

Description:

This prospect contains one quartz reef which splits into two veins, less than two metres apart, towards the south. The veins are less than a metre in width and are over 194 m in length, and strike at 335° and dip at 60°N. They are partly obscured by Permian sediments to the north.

History and Production:

Discovered in 1877; mined by the Alpine Gold Mining Co. mainly from 1880 to 1885. Production is estimated as 617 oz (19.2 kg), and 81 t averaged 27.5 g/t. Underground workings (two adits, shafts and stopes) reach a depth of 30 m, and underground drilling intersected a barren quartz reef (the Buckland reef?).

Prospect: ARGYLE

Goldfield: Mangana

Location: 574 940 mE, 5 392 750 mN

References:

Finucane, 1932*c*; Blake, 1939; Mconie, 1983; Townrow, 1986

Style:

This prospect worked a sulphidic quartz vein, an extension of the Golden Entrance reef, up to 1.7 m wide. The vein strikes about 327° and dips about 55–70°NE in slates and quartzites. A reef 50 m to the SW was also worked. This strikes 300° and is about 0.7 m wide.

History and Production:

Discovered and worked briefly in the period 1927–1928, by three adits (to 126 m), shafts (to 8 m) and open stopes. Production of about 7.5–8 oz Au from 10 t ore was recorded (averaging 124 g/t). More recent exploration was conducted by Tasminex (Charlton, 1982) and Pegasus (Morrison, 1988; 1989; 1990).

Prospect: BIG HOSPITAL CREEK

Goldfield: Mangana

Location: 578 500 mE, 5 395 400 mN

References:

Baird, 1960.

Style:

This placer deposit occurs in alluvial deposits, probably shallow and of uncertain depth.

History and Production:

This prospect was worked for alluvial gold, probably in the early 1900s. No estimates of production are available, but the workings were reported to be quite rich.

Prospect: BUCKLAND

Goldfield: Mangana

Location: 571 700 mE, 5 395 650 mN

References:

Twelvetrees, 1907; Blake, 1939; Mconie, 1983; Townrow, 1986

Style:

This prospect worked a quartz fissure reef oriented 343°/65° SW, subparallel to the enclosing slate and quartzite. It averages 0.9 m in width and is 64 m in length at the surface.

History and Production:

Discovered in 1877 with a recorded production of 1001.65 oz from 1340 t (at 27.5 g/t) in 1884, and 152 oz from 81 t at a later date. Shafts extend to 15 m and 34 m in depth, open stopes extend over 20 m, and an adit is present. More recent exploration was conducted by Pegasus (Morrison, 1989; 1990).

Prospect: CARDINAL

Goldfield: Mangana

Location: 571 700 mE, 5 395 400 mN

References:

Twelvetrees, 1907; Blake, 1939; Mconie, 1983; Townrow, 1986

Style:

A quartz fissure reef striking 343°/SW, about one metre in width, carrying quartz veins up to 0.3 metres. Other small parallel veins and reefs are present.

History and Production:

The mine was worked in about 1889–1890, and recorded production is 158 oz of gold from 240 t ore (20 g/t). Workings extend to 30 m depth, and the vein can be traced for about 300 m, with a series of shafts, trenches and open stopes. More recent exploration was conducted by Pegasus (Morrison, 1989; 1990).

Prospect: CHINESE PITS

Goldfield: Mangana

Location: about 573 500 mE, 5 393 500 mN

References:

Twelvetrees, 1907; Townrow, 1986

Style:

This alluvial deposit covers an old river bed about 750 m long by 20 m wide, and is of uncertain, probably shallow, depth.

History and Production:

This prospect was worked for alluvial gold in the 1860s or 1870s. No estimates of production are available, but at least 223 pits are present, up to 1.5 m deep.

Prospect: DAYLIGHT

Goldfield: Mangana

Location: 578 600 mE, 5 393 900 mN

References:

Baird, 1960; Mconie, 1983

Style:

This prospect exhibits quartz veins of variable strike, dip and width. Development is concentrated on some veins of strike 238° and dip 80° SE, and width up to 0.22 metres. The enclosing slates strike 343°/70°W.

History and Production:

The mine was working in 1917 and 1933. A shaft, with connected adit, reaches 28 m, and is partly stoped. Production is unknown but a battery was present and grades up to 2.5 oz/t (78 g/t) were reported.

Prospect: FINGAL
Goldfield: Mangana
Location: 574 420 mE, 5 394 420 mN

References:

Twelvetrees, 1907; Blake, 1939; Mconie, 1983; Townrow, 1986

Style:

Two parallel reefs are present: the western one is considered to be an extension of the Golden Entrance reef, while the eastern is probably equivalent to that worked by the Union Jack and Underlay mines. They are 30 m apart and strike 002°/40°E and 350°/45°E respectively. The reefs consist of quartz veins (to 1 m wide), slate and breccia. Other small reefs have been worked nearby.

History and Production:

One of the first reef workings opened in the area: discovered in 1864 and operated mainly between 1867 and c.1870. A gold production of 317.6 oz was recorded in 1867, and average grades of about 9 g/t were given. There are six shafts (to c.60 m), two adits and some open stopes, over a length of 120 metres.

Prospect: GOLDEN ENTRANCE
Goldfield: Mangana
Location: 574 820 mE, 5 393 010 mN

References:

Twelvetrees, 1907; Blake, 1939; Mconie, 1983

Style:

This prospect consists of a quartz reef striking about 333° and dipping 80°W at the north and 80°E at the southern end. The reef is up to 2.1 m thick and may be up to 2 km in length. It contains variably sized bunchy quartz veins in soft slate.

History and Production:

Discovered in 1896 and mined by the Golden Entrance Gold Mining Co. from 1900–1907, and tributers to 1924. The Argyle mine worked the same vein. There are a number of adits (to 55 m depth), shafts and open stopes. Grades up to 7 oz/t (220 g/t) were recorded. Production is recorded as 2939 oz to 1905, from 718 t of ore, with an average grade of 125 g/t. It was the largest and richest producer in the field. More recent exploration was conducted by Tasminex (Charlton, 1982).

Prospect: GOLDEN GULLY
Goldfield: Mangana
Location: 573 080 mE, 5 396 450 mN

References:

Twelvetrees, 1907; Blake, 1939; Mconie, 1983

Style:

This prospect is a quartz reef striking 330°/75°SW, up to 3.2 m thick and 131 m long. Dowlings Buck reef, a 2.4 m wide vein 50 m to the NW, may be a continuation.

History and Production:

Discovered in 1889 and mined by the Golden Gully Gold Mining Co. and tributers until 1898. There is an 800 m adit, a shaft (to 15 m) and open cuts. Production is unknown. Dowlings Buck reef was apparently almost barren. More recent exploration was conducted by Tasminex (Charlton, 1982).

Prospect: GREAT FINGAL (GREAT UNKNOWN)

Goldfield: Mangana

Location: 578 300 mE, 5 394 000 mN

References:

Blake, 1940*a*; Baird, 1960; Mconie, 1983

Style:

This prospect was based upon a quartz lode 3 m wide, striking 009°, with low grades (<0.6 g/t Au). A smaller lode, striking about 283°–328°, up to 0.15 m wide and more than 27 m long is present, with much higher grades and production. Other veins are present.

History and Production:

Worked in 1901–1902 and 1934–1940, with 32 oz Au from 5 t quartz recorded production. Two shafts to 9 m, and 27 m of open stopes are present.

Prospect: HIT OR MISS

Goldfield: Mangana

Location: 579 000 mE, 5 397 900 mN

References:

Blake, 1940*b*; Baird, 1960; Mconie, 1983

Style:

This prospect is based on a quartz reefs striking about 328°/80°E, and 043°/80°N, in country rock striking 327°/80°E. The reefs are up to 2 m wide with quartz veins to 0.75 m. Other near-vertical veins were opened, and measured strikes include 024°, 350° and 285°.

History and Production:

Prospected in 1901–1902 by the Hit or Miss Prospecting Association, and in about 1920 by Brock. Four small shafts (to about 10 m) and a 40 m adit are present. No production is recorded and Blake records only traces of gold and silver in assay samples.

Prospect: MAJORS GULLY

Goldfield: Mangana

Location: about 573 100 mE, 5 395 400 mN

References:

Twelvetrees, 1907; Blake, 1939; Mconie, 1983; Townrow, 1986

Style:

This alluvial deposit covers an area of about 2 km by 0.25–1.5 km, and is less than 13 m deep.

History and Production:

This prospect has been sporadically worked for alluvial gold since 1852. Estimates of production vary from 5000–8000 oz (150–250 kg), and up to 400 miners worked the gully at one time. More recent exploration was conducted by Geophoto (Mortimore, 1974), Tasminex (Charlton, 1982), and Pegasus (Morrison, 1987). Mining operations have recently re-opened.

Prospect: MANGANA GOLD REEFS (SOVEREIGN; UNION; REUNION)

Goldfield: Mangana

Location: 574 650 mE, 5 392 770 mN

References:

Twelvetrees, 1907; Blake, 1939; Mconie, 1983

Style:

This mine is based on a sulphidic quartz fissure reef striking 329°/68°SE, up to 350 m long and 7.6 m wide. The lode contains quartz veins up to 1.8 m wide, intercalated with slate. There are a number of other parallel lodes.

History and Production:

This was the first gold reef discovered in Tasmania, in 1859, and operators included the Midland Gold Mining Co., Union Gold Mining Co., Reunion Gold Mining Co., Sovereign, New Sovereign and Mangana (Tas.) Gold Reefs Ltd., between 1859 and 1907. There are four adits at different levels, up to 220 m long, and a shaft, with 5 levels, to 249 m deep. Production is recorded as 791 oz Au from 3106 t ore (average 9.7 g/t). More recent exploration was conducted by Tasminex (Charlton, 1982).

Prospect: MIAMI (SALMON GOLD ESTATES)

Goldfield: Mangana

Location: 579 400 mE, 5 396 770 mN

References:

Blake, 1940*b*; Baird, 1960; Mconie, 1983

Style:

This prospect is based on sulphidic quartz reefs striking 290°/75°S and up to 0.75 m wide and 68 m long. The main reef splits into a number of veins. Some alluvial gold also occurred in the area.

History and Production:

Operated by the Salmon Gold Syndicate from 1898 to 1902. Production of 652 oz Au from 795 t ore was recorded, with grades of up to 24.3 g/t. There are open stopes and shafts to 122 m, connected to two adits (55 and 170 m).

Prospect: OTWAYS CREEK (OTOWAYS CREEK)

Goldfield: Mangana

Location: 571 900 mE, 5 393 000 mN

References:

Blake, 1939; Mconie, 1983

Style:

This prospect exhibited two quartz lodes trending 306°/63°SW, up to 3.7 m wide and 91 m long, in a narrow slate belt.

History and Production:

The prospect was worked in 1887 and 1897, with adits up to 50 m long and shafts less than 10 m in depth. Production was small and only "a small button of gold" was reported.

Prospect: PINCHER'S (RODMAN)

Goldfield: Mangana

Location: 573 860 mE, 5 393 830 mN

References:

Twelvetrees, 1907; Blake, 1939; Mconie, 1983

Style:

This prospect exhibited a sulphidic quartz reef (Pincher's) striking 325° and dipping 75°E in the south and 85°W in the north. It is up to 143 m long and up to 0.7 m wide. Another vein (Rodman's) intersects this, and strikes 285°, 70°SE.

History and Production:

Discovered in the 1890s, with minor working up to at least 1938. Production was estimated as about 10 oz Au from 10 t ore. There is a shaft to 15 m, and other shallow workings.

Prospect: RICHARDSONS CREEK (CHESHIRE PR., BROCK BROS.)

Goldfield: Mangana

Location: 571 300 mE, 5 395 800 mN

References:

Nye, 1930; Finucane, 1932*a*; Blake, 1939; Mconie, 1983

Style:

This prospect worked a sulphidic quartz reef striking 012°/65°W and up to 0.6 m wide and c.100 m long. A northern extension strikes 022°/70°W. Nye described four parallel sulphidic quartz veins over c.14 metres.

History and Production:

Discovered in 1930, and probably last worked in 1936. Records indicate the production of 40 t of ore from surface workings. Grades from about 2 to 60 g/t were recorded.

Prospect: SPECIMEN HILL

Goldfield: Mangana

Location: 573 130 mE, 5 393 300 mN

References:

Twelvetrees, 1907; Blake, 1939; Mconie, 1983

Style:

This prospect contains several quartz veins over an area about 800 m long (N-S) by 20 m wide, striking about 360°. Individual veins are up to 45 m long and 0.75 m wide, in slate.

History and Production:

Worked in the 1890s and 1930s from several shafts (Trilby, Corbett's and Goodall's, to about 45 m depth), an adit (Brennan's, about 70 m), trenches, pits and open cuts. Production of a few tons grading about 8 g/t was recorded. A considerable amount of alluvial gold was also recovered around these workings.

Prospect: TOWER HILL FREEHOLD

Goldfield: Mangana

Location: 572 000 mE, 5 397 800 mN

References:

Twelvetrees, 1907; Blake, 1939; Mconie, 1983; Morrison, 1988

Style:

The lodes strike 327° and dip 50°E in sandstone and slate of the Mathinna Beds, which dip SW. One lode (No. 1 reef) is traceable for 323 m and varies from 0.05–1.5 m in width. This is the only lode with underground workings (3 adits), which show the lode to split and feather out with depth. The other three subparallel lodes are up to 227 m long and 4.3 m wide, but show only surface workings.

History and Production:

This deposit was discovered in 1869 and apparently only worked briefly (Townrow, 1986). The mineral potential has recently been re-evaluated by costeaning and rock-chip sampling (Morrison, 1988). The area of workings (~250 × 60 m) comprises three adits, trenches and open stopes on four separate, subparallel lodes. The remains of an associated battery and dam also exist 5 km south of the site. Early crushings indicated grades of about 2 oz/t, but the grades apparently did not persist at depth. No records of production are known.

Prospect: TULLOCHGORUM

Goldfield: Mangana

Location: about 575 000 mE, 5 387 000 mN

References:

Thureau, 1885; Mconie, 1983

Style:

This prospect covered Quaternary sediments along the South Esk River, containing alluvial gold derived from the Mangana goldfield.

History and Production:

The alluvial materials were tested in about 1885 by shafts and drillholes, to 31 m, in an attempt to locate a deep lead. Only minor gold was reported.

Prospect: UNDERLAY

Goldfield: Mangana

Location: 574 460 mE, 5 393 200 mN

References:

Twelvetrees, 1907; Blake, 1939; Mconie, 1983

Style:

This prospect worked a quartz reef striking 012°/30°E, considered to be equivalent to the Union Jack reef and the eastern Fingal reef (a total strike length of 1.2 km). The reef is rather flat and consists of laminated quartz with pyrite, up to 0.5 m wide.

History and Production:

Discovered in 1872, but only worked superficially (to 4.5 m). Grades of between 9 and 15 g/t were reported from trial crushings. More recent exploration was conducted by Tasminex (Charlton, 1982).

Prospect: UNION JACK

Goldfield: Mangana

Location: 574 400 mE, 5 393 760 mN

References:

Twelvetrees, 1907; Blake, 1939; Mconie, 1983

Style:

This prospect worked the same reef as the Underlay and Fingal mines. It strikes about 015°/31°E, and is up to 5.1 m wide. The reef contains broken slate and numerous small quartz veins less than a metre wide.

History and Production:

First mined in 1887 and intermittently to 1939. Records indicate a production of 10 oz Au from 20 t of ore in 1902. Grades of 30 g/t were reported from trial crushings. The workings are more than 200 m long, with a shaft more than 12 m deep. More recent exploration was conducted by Tasminex (Charlton, 1982).

Prospect: WEST MIAMI

Goldfield: Mangana

Location: 578 600 mE, 5 396 950 mN

References:

Blake, 1940*b*; Baird, 1960; Mconie, 1983

Style:

This prospect worked two parallel quartz reefs striking about 328°, dipping steeply SW, subparallel to the cleavage at 334°/78°W, with a number of cross-cutting veins (striking about 280° and 183°). The reef channels contained numerous veinlets in slate and quartzite, and are up to 2.5 m in width, up to 0.6 m wide, and about 100 m long. Bedding strikes 345°/40°E.

History and Production:

Mined in 1900–1902 and in 1941–1942. Records indicate a production of 7.3 oz Au from 27 t of ore in 1942. Grades of up to 84 g/t were reported across 0.75 m of lode. The southernmost reef (Gearings) has been worked most extensively, with shafts to 45 m and an 80 m adit.

Appendix 2

MIRLOCH listing of mines and mineral occurrences, Mangana area

STATUS

OPM	Operating mine
NOR	Non-operating mine — reserves known
NOX	Non-operating mine — reserves unknown
AMR	Abandoned mine — reserves known
AMX	Abandoned mine — reserves unknown
AMO	Abandoned — mined out
PEX	Prospect — explored
PUN	Prospect — unexplored
MAR	Mineralised area
MOC	Mineral occurrence

SIZE OF DEPOSIT

ND	Not determined
VS	Very small: < 100 tonnes (or cubic metres)
SM	Small: 100 t – 10 000 t
ME	Medium: 10 000 t – 1 000 000 t
LA	Large: 1 000 000 t – 10 000 000 t
VL	Very large: > 10 000 000 t

HOST ROCK

PCS	Precambrian sequences
CSS	Cambrian sedimentary sequences
CIG	Cambrian igneous sequences
MRV	Mount Read Volcanics and correlates
OMS	Owen Conglomerate/Moina Sandstone and correlates
GLE	Gordon Limestone/Eldon Group and correlates
MAT	Mathinna Beds
DGN	Devonian granitoid
PSG	Parmeener Supergroup
JCS	Jurassic–Cenozoic sequences

AGE OF MINERALISATION

ND	Not determined
PC	Precambrian
EC	Eocambrian–Early Cambrian
MC	Middle–Late Cambrian
OD	Ordovician–Early Devonian
LD	Late Devonian (granite associated)
PT	Permo-Triassic
JC	Jurassic–Cretaceous
TT	Tertiary
QT	Quaternary

FORM OF DEPOSIT

VMS	Volcanic massive sulphide
STFM	Stratiform
VEIN	Vein (single, sheet, saddle)
STWK	Stockwork
DISS	Disseminated
REPL	Replacement
PIPE	Pipe
PLAC	Placer
RESD	Residual
OTHR	Other (noted in references)

EXPLORATION OF DEPOSIT

NO	Nil or no known exploration
PS	Prospecting
GM	Geological mapping
GC	Geochemical surveys
GP	Geophysical surveys
DR	Drilling

Ref. No.	MINE/DEPOSIT NAME	MAJOR - COMM - MINOR	mE	mN	ERROR	SHEET	STAT	SIZE	HOSTROX	AGE	FORM	STK	EXPLOR
48033	GREAT FINGAL; GREAT UNKNOWN REFS: TR5 p.20, PLAN 786B, BLAKE (1940) UR p.15.	AU	578300	5394000	<100	84141	AMX	ND	MAT	LD	VEIN	328	PS
48034	HIT OR MISS REFS: PLAN 786; UR 1940 p.19; TR5 p.20	AU	579000	5397900	<100	84141	AMX	ND	MAT	LD	VEIN	43	PS
48037	MAJORS GULLY (NORTH) REFS: TCR 86-2607; GSB1; TOWNROW (1986)	AU	573100	5395600	<100	84141	PEX	D	JCS	TT	PLAC	-99	PS,GC,DR
48038	MIAMI; SALMON GOLD ESTATES REFS: UR1940 p.19; TR5 p.20; PLAN 783, 785, 786	AU	579400	5396770	<100	84141	PEX	ND	MAT	LD	VEIN	290	PS
48047	TOWER HILL FREEHOLD REFS: PLAN 772J, 772A, BLAKE (1939) URP75; GSB1	AU	572200	5397600	<100	84141	AMX	ND	MAT	LD	VEIN	327	PS
48048	WEST MIAMI REFS: BAIRD (1960) TR5, PLAN 786B, UR1940 p.19	AU	578600	5396950	<100	84141	PEX	ND	MAT	LD	VEIN	328	PS
48053	ALPINE REFS: GSB1, BLAKE (1939) URP75; PLAN 772K	AU	571650	5395870	<100	84141	AMX	ND	MAT	LD	VEIN	335	PS
48054	RICHARDSONS CK REFS: GSB1, BLAKE (1939) URP75; PLAN 772K	AU	571300	5395800	<100	84141	AMX	ND	MAT	LD	VEIN	12	PS
48055	UNNAMED REFS: PLAN 772K	AU	571650	5395680	<100	84141	PEX		MAT	LD	VEIN	28	PS
48056	BUCKLAND REFS: GSB1, BLAKE (1939) URP75; PLAN 772K	AU	571700	5395650	<100	84141	AMX	SM	MAT	LD	VEIN	343	PS
48057	CARDINAL REFS: GSB1, BLAKE (1939) URP75; PLAN 772K	AU	571700	5395400	<100	84141	AMX	ND	MAT	LD	VEIN	343	PS
48058	GOLDEN GULLY REFS: PLAN 772A, BLAKE (1939) UR	AU	573080	5396450	<100	84141	AMX	ND	MAT	LD	VEIN	330	PS
48059	FINGAL REFS: PLAN 772G, GSB1, BLAKE (1939) UR	AU	574420	5394420	<100	84141	AMX	ND	MAT	LD	VEIN	2	PS
48060	PINCHER (RODMAN) REFS: PLAN 772G, GSB1, BLAKE (1939) UR	AU	573860	5393830	<100	84141	AMX	ND	MAT	LD	VEIN	325	PS
48061	UNION JACK REFS: PLAN 772G, GSB1, BLAKE (1939) UR	AU	574400	5393760	<100	84141	AMX	ND	MAT	LD	VEIN	15	PS

Ref. No.	MINE/DEPOSIT NAME	MAJOR - COMM - MINOR	mE	mN	ERROR	SHEET	STAT	SIZE	HOSTROX	AGE	FORM	STK	EXPLOR
48062	UNDERLAY REFS: PLAN 772B, GSB1, BLAKE (1939) UR	AU	574460	5393200	<100	84141	AMX	ND	MAT	LD	VEIN	12	PS
48063	GOLDEN ENTRANCE at #2 ADIT REFS: PLAN 772B, GSB1, BLAKE (1939) UR	AU	574820	5393010	<100	84141	AMX	ND	MAT	LD	VEIN	333	PS
48064	MANGANA GOLD REEFS (LOWER ADIT) REFS: PLAN 772B, GSB1, BLAKE (1939) UR	AU	574650	5392770	<100	84141	AMX	ND	MAT	LD	VEIN	329	PS
48065	ARGYLE REFS: TCR 88-2883, PLAN 772B, BLAKE (1939) UR	AU	574940	5392750	<100	84141	AMX	ND	MAT	LD	VEIN	327	PS
48066	SPECIMEN HILL (CORBETT SHAFT) REFS: PLAN 772M, GSB1, BLAKE (1939) UR	AU	573130	5393300	<100	84141	AMX	ND	MAT	LD	VEIN	357	PS
48067	OTOWAYS CK/OTWAYS CK REFS: PLAN 772A & 772N, GSB1, BLAKE (1939) UR	AU	571900	5393000	<100	84141	AMX	ND	MAT	LD	VEIN	306	PS
48068	ABBOTSFORD CK REFS: MIN MAP 12; OS 212; MCONIE (1985)	AU	570000	5390000	<1000	84141	AMX	ND	MAT	LD	VEIN	30	PS
48069	SOUTH GOLDEN ENTRANCE REFS: PLAN 772B	AU	575000	5392500	<100	84141	AMX	ND	MAT	LD	VEIN	321	PS
48112	DAYLIGHT REFS: BAIRD (1960) TR5	AU	578600	5393900	<100	84141	AMX		MAT	LD	VEIN	238	PS
48113	BIG HOSPITAL CK REFS: BAIRD (1960) TR5	AU	578500	5395400	<100	84141	PEX		JCS	QT	PLAC	-99	PS
48114	SPECIMEN HILL (S WKGS) REFS: PLAN 772M; GSB 1; UR1939 p.75-	AU	573130	5393230	<100	84141	PEX		MAT	LD	VEIN	186	PS
48115	BRENNAN'S ADIT REFS: PLAN 772M, GSB1	AU	572860	5393150	<100	84141	PEX		MAT	LD	VEIN	-99	PS
48116	TULLOCHGORUM REFS: THUREAU (1884) OS58; KRAUSE (1883) OS	AU	575000	5387000	<1000	84141	PEX		JCS	TT	PLAC	-99	PS, DR
48117	UNNAMED REFS: PLAN 772G	AU	574480	5393900	<100	84141	PEX		MAT	LD	VEIN	328	PS
48118	ML 1207/93 G REFS: PLAN 772G, BLAKE (1939) UR p.75-	AU	574200	5393770	<100	84141	PEX		MAT	LD	VEIN	360	PS

Ref. No.	MINE/DEPOSIT NAME	MAJOR - COMM - MINOR	mE	mN	ERROR	SHEET	STAT	SIZE	HOSTROX	AGE	FORM	STK	EXPLOR
48119	UNNAMED REFS: PLAN 722G	AU	574200	5393600	<100	84141	PEX		MAT	LD	VEIN	112	PS
48120	SOVEREIGN; MANGANA GOLD REEFS-N; UNION REFS: PLAN 772B, GSB1, BLAKE (1939)	AU	574560	5393000	<100	84141	PEX		MAT	LD	VEIN	327	PS
48121	SHARKEYS GULLY ADIT (GE) REFS: PLAN 772B, GSB1, BLAKE (1939)	AU	574700	5393230	<100	84141	PEX		MAT	LD	VEIN	330	PS
48122	GOLDEN ENTRANCE #1 SHAFT REFS: PLAN 772B, GSB1, BLAKE (1939)	AU	574780	5393130	<100	84141	PEX		MAT	LD	VEIN	335	PS
48123	ARGYLE (#2 NORTH) REFS: PLAN 772B; UR1939 p.75-	AU	574880	5392880	<100	84141	PEX		MAT	LD	VEIN	310	PS
48124	UNNAMED REFS: PLAN 772B, GSB1	AU	574970	5392600	<100	84141	PEX		MAT	LD	VEIN	325	PS
48125	GOODALL NO 1 REEF REFS: PLAN 772K, GSB1	AU	571650	5395550	<100	84141	PEX		MAT	LD	VEIN	358	PS
48126	UNNAMED REFS: PLAN 772K, GSB1	AU	571700	5395750	<100	84141	PEX		MAT	LD	VEIN	352	PS
48127	SPECIMEN HILL ALLUV. REFS: GSB1	AU	573000	5393500	<500	84141	MAR		JCS	QT	PLAC	-99	PS
48128	RICHARDSON CK. ALLUV. REFS: GSB1	AU	573000	5395500	<1000	84141	MAR		JCS	QT	PLAC	-99	PS
48129	CALDERS GULLY REFS: GSB1	AU	572400	5395000	<1000	84141	MAR		JCS	QT	PLAC	-99	PS
48130	GRANTS CK. REFS: GSB1	AU	573600	5394000	<1000	84141	MAR		JCS	QT	PLAC	-99	PS
48131	SHARKEYS GULLY REFS: GSB1	AU	574200	5393200	<1000	84141	MAR		JCS	QT	PLAC	-99	PS
48132	SAILORS GULLY REFS: GSB1	AU	574400	5392500	<1000	84141	MAR		JCS	QT	PLAC	-99	PS
48133	IRVINES GULLY REFS: GSB1	AU	574800	5392200	<1000	84141	MAR		JCS	QT	PLAC	-99	PS

Ref. No.	MINE/DEPOSIT NAME	MAJOR - COMM - MINOR	mE	mN	ERROR	SHEET	STAT	SIZE	HOSTROX	AGE	FORM	STK	EXPLOR
48134	UNNAMED REFS: GSB1	AU	574400	5394100	<100	84141	PEX		MAT	LD	VEIN	-99	PS
48135	GOODALLS SHAFT REFS: GSB1	AU	573000	5393000	<100	84141	PEX		MAT	LD	VEIN	12	PS
48136	TRILBY REFS: GSB1; PLAN 772M	AU	573950	5392450	<100	84141	PEX		MAT	LD	VEIN	350	PS
48137	GRANT'S FIND REFS: GSB1	AU	573950	5392450	<50	84141	MOC		JCS	QT	PLAC	-99	PS
48116	TULLOCHGORUM REFS: THUREAU (1884) OS58; KRAUSE (1883) OS	AU	575000	5387000	<1000	84141	PEX		JCS	TT	PLAC	-99	PS, DR
48138	MAJORS GULLY (CENTRAL) REFS: TOWNROW (1986) UR, NPWS	AU	573200	5394800	<100	84141	OPM		JCS	TT	PLAC	-99	PS, GC, DR
48139	MAJORS GULLY (SOUTH) REFS: TOWNROW (1986) UR, NPWS	AU	573100	5394000	<100	84141	OPM		JCS	TT	PLAC	-99	PS, GC, DR
48140	CHINESE PITS-N REFS: TOWNROW (1986) UR, NPWS	AU	573200	5393700	<100	84141	MAR		JCS	TT	PLAC	-99	PS
48141	CHINESE PITS-S REFS: TOWNROW (1986) UR, NPWS	AU	573500	5393000	<100	84141	MAR		JCS	TT	PLAC	-99	PS
48142	CHINESE PITS-CENTRAL REFS: TOWNROW (1986) UR, NPWS	AU	573350	5393350	<100	84141	MAR		JCS	TT	PLAC	-99	PS
48143	BROOKS PR; FERN TREE GULLY-N REFS: FINUCANE (1932) UR p.65	AU	571900	5397400	<100	84141	MAR	PSG	JCS	PT	PLAC	-99	PS
48145	LITTLE HOSPITAL CK REFS: BAIRD (1960) TR5	AU	579200	5394000	<500	84141	MAR		JCS	TT	PLAC	-99	PS
48146	FERN TREE GULLY-S REFS: TWELVETREES (1900) GSB1	AU	572700	5395900	<500	84141	MAR		JCS	TT	PLAC	-99	PS

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INDEX OF DEPOSITS

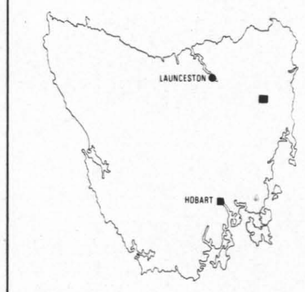
033 GREAT FINGAL ;GREAT UNKNOWN
034 HIT OR MISS
037 MAJORS GULLY (NORTH)
038 MIAMI ; SALMON GOLD ESTATES
047 TOWER HILL FREEHOLD
048 WEST MIAMI
053 ALPINE
054 RICHARDSONS CK
055 UNNAMED
056 BUCKLAND
057 CARDINAL
058 GOLDEN GULLY
059 FINGAL
060 PINCHER (RODMAN)
061 UNION JACK
062 UNDERLAY
063 GOLDEN ENTRANCE @ #2 ADIT
064 MANGANA GOLD REEFS (LOWER ADIT)
065 ARGYLE
066 SPECIMEN HILL (CORBETT SHAFT)
067 OTOWAYS CK /OTWAYS CK
068 ABBOTSFORD CK
069 SOUTH GOLDEN ENTRANCE
112 DAYLIGHT
113 BIG HOSPITAL CK
114 SPECIMEN HILL (S WKGS)
115 BRENNAN'S ADIT
117 UNNAMED
118 ML 1207/93 G
119 UNNAMED
120 SOVEREIGN;MANGANA GOLD REEFS-N;UNION
121 SHARKEYS GULLY ADIT(GE)
122 GOLDEN ENTRANCE #1 SHAFT
123 ARGYLE(#2 NORTH)
124 UNNAMED
125 GOODALL NO 1 REEF
126 UNNAMED
127 SPECIMEN HILL ALLUV.
128 RICHARDSON CK. ALLUV.
129 CALDERS GULLY
130 GRANTS CK.
131 SHARKEYS GULLY
132 SAILORS GULLY
133 IRVINES GULLY
134 UNNAMED
135 GOODALLS SHAFT
136 TRILBY
137 GRANT'S FIND

FORM OF DEPOSITS

VEIN Strike indicated.

ALLUVIAL/RESIDUAL

LOCALITY MAP



MANGANA GOLDFIELDS

SCALE 1:25 000
1 millimetre on this map represents 25 metres on the ground