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Review of orogenic gold and antimony mineralisation in the Mossman Orogen, north Queensland

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EXECUTIVE SUMMARY

Orogenic gold±antimony deposits occur in metasedimentary rocks in the Hodgkinson and Broken River Provinces in north Queensland and have been significant historical gold producers. Recent exploration has indicated the presence of significant unmined resources in the region and the potential for further discoveries.

This report provides a brief overview of the orogenic gold deposits and the gold mining history in this region. The report focuses on the grade and tonnage properties of primary gold deposits and summarises the available information on other characteristics and genesis of the orogenic gold mineralisation.

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Cover photograph: Old boiler at the Anglo Saxon mine in the Hodgkinson Goldfield

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Contents

FIGURE

TABLE

SUMMARY

Orogenic ('slate-belt') gold±antimony deposits occur in metasedimentary rocks in the Hodgkinson and Broken River Provinces in north Queensland and have been significant historical gold producers. Recent exploration has indicated the presence of significant unmined resources in the region and the potential for further discoveries.

Although distal magmatic fluids cannot be ruled out, it is probable that most gold-quartz and stibnite-gold-quartz veins and refractory gold mineralisation were deposited from homogeneous, deeply-sourced fluids generated by devolatilisation of the sediment pile during regional tectonism and channelled to dilation sites in shear zones. Three or more Devonian to Permian deformation events have generated various stages of vein formation and mineralisation.

Keywords: Mineral deposits; mining history, mineral production; mineral resources; gold; antimony; Hodgkinson Province; Broken River Province; Queensland.

INTRODUCTION

Orogenic gold±antimony deposits in the Hodgkinson Province in north Queensland have been a significant historical source of gold production, particularly from alluvial deposits in the Palmer Goldfield and lode deposits in the Hodgkinson Goldfield. The Broken River Province is a more recent gold producer. Both provinces have potential for future discoveries.

This record was prepared to document the mining history and known mineralisation and resources of historic goldfields in the Hodgkinson and Broken River Provinces. It supports a regional assessment of potential orogenic gold±antimony mineralisation in north Queensland that is being conducted as part of the Geological Survey of Queensland's (GSQ) Greenfields 2020 program. The information in this report has been sourced mainly from reports prepared by the GSQ during its recently completed mineral occurrence mapping program, as well as regional compilations for the Hodgkinson Province (Garrad & Bultitude, 1999) and north Queensland (Bain & Draper, 1997).

TECTONIC FRAMEWORK

The North Queensland region is geologically complex and consists of Palaeoproterozoic to Mesoproterozoic continental basement bounded by the accretionary North Queensland Orogen to the east, the Thomson Orogen to the south, and the New England Orogen and Bowen Basin to the south-east (Figure 1).

The North Queensland Orogen (Hodgkinson, Charters Towers, Broken River and Barnard Provinces) represents the northern part of the largely Palaeozoic Tasman Orogen, which dominates eastern Australia, and is generally thought to have been produced by a long-lived accretionary convergent margin (Kositcin & others, 2009).

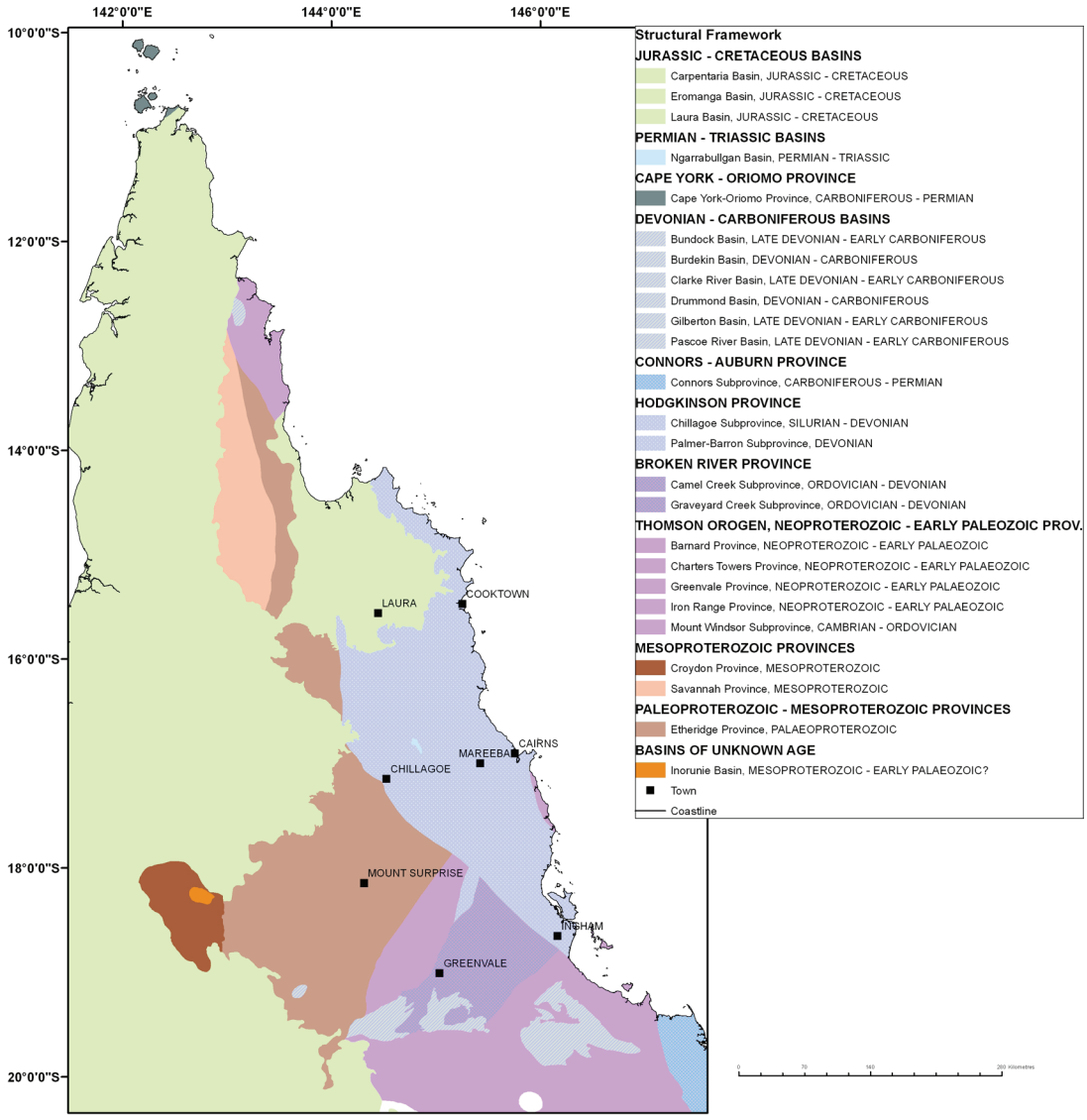

Figure 1: Distribution of geological provinces in North Queensland; the magmatic Macrossan and Pama Igneous Associations are not shown.

REGIONAL GEOLOGY

HODGKINSON PROVINCE

The Palmerville Fault juxtaposes Palaeozoic Hodgkinson Province rocks and Proterozoic rocks of the Etheridge Province along the Palmerville Fault. The Proterozoic rocks are thought to have been the source of metamorphic and plutonic detritus deposited in the Hodgkinson Province during the Ordovician (Bultitude & others, 1993), suggesting emergence of the Proterozoic rocks during the early Palaeozoic and some form of geographical proximity between the provinces (Blewett & others, 1997). An extensional regime, either a rifted continental margin or a back-arc basin, is favoured as the tectonic environment for the province (Withnall & others, 1997c).

The early-middle Palaeozoic Hodgkinson Province succession forms the northern part of the Tasman Fold Belt. The main formations, from west to east, are the Quadroy Conglomerate, Mulgrave Formation, Mountain Creek Conglomerate, Van Dyke Litharenite, Chillagoe Formation and Hodgkinson Formation (Figure 2). The early Ordovician Mulgrave Formation is generally included in the Hodgkinson Province although it may form part of an older province extensively exposed in south-eastern Australia (Bultitude & others, 1997).

The formations within the province form distinct, mainly fault-bounded belts, most of which are extensively disrupted internally by numerous thrust faults that trend parallel or subparallel to the strike of the beds. Most of these fault slices young internally to the west, particularly those in the western part of the province (Bultitude & others, 1997).

The dominant rock types in the province are arenite and mudstone, which represent deep-water, density current deposits. These are interlayered with subordinate conglomerate, chert and metabasalt, and minor (on a regional scale) shallow-water limestone. Subdivision of the rocks into stratigraphic units is not practicable because of the complex deformational history, scarcity of stratigraphic markers, lack of observable stratigraphic contacts between units, and general lack of age control (Bultitude & others, 1997).

BROKEN RIVER PROVINCE

The Broken River Province is dominated by an open to tightly folded sequence of late Ordovician to early Carboniferous sedimentary and volcanic rocks that are structurally juxtaposed in the north-west against the Proterozoic Etheridge Province. The province can be subdivided into two contrasting, spatially discrete assemblages — the Graveyard Creek and Camel Creek Subprovinces — separated by the Gray Creek Fault Zone (Withnall & Henderson, 2012). Although interfingering stratigraphic relationships occur locally within the subprovinces, most contacts between lithological units are tectonic in nature (Vos & others, 2005).

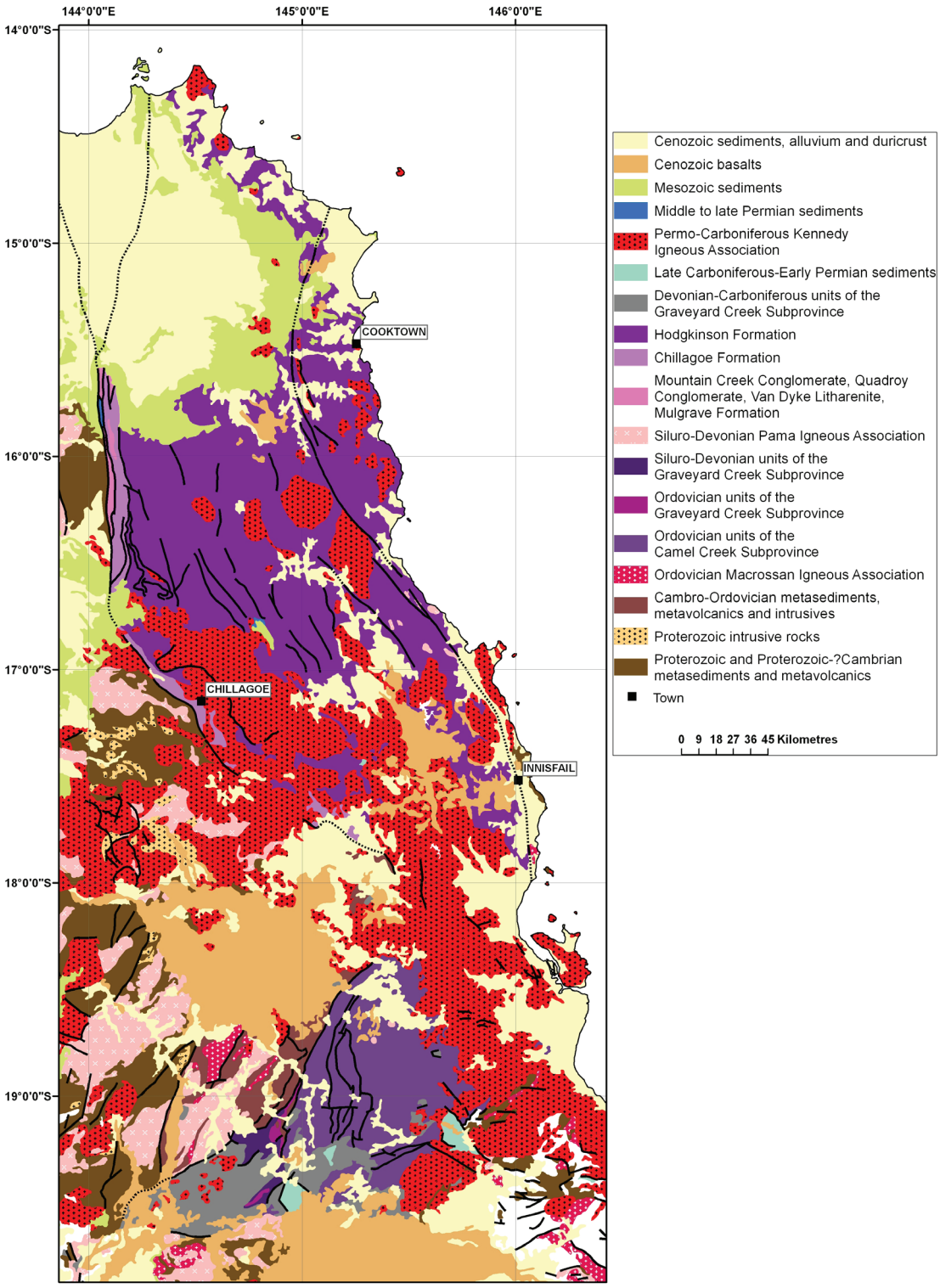

Figure 2: Regional geology, north-east Queensland

Camel Creek Subprovince

The Camel Creek Subprovince forms the eastern part of the Broken River Province. It consists of Ordovician to Early Devonian quartz-rich and quartz-intermediate deep marine turbidites, tholeiitic basalt and calc-alkaline volcanic and volcaniclastic rocks that were multiply deformed in the Devonian and contain extensive melange (Withnall & others, 1997a).

The main constituent units of the Camel Creek Subprovince are the Ordovician Wairuna Formation, Pelican Range Formation, Tribute Hills Arenite, Everetts Creek Volcanics, Carriers Well Formation and Greenvale Formation, and the Silurian – Early Devonian Perry Creek Formation and Kangaroo Hills Formation (Figure 2; Withnall & others, 1997a).

Graveyard Creek Subprovince

The Graveyard Creek Subprovince comprises Silurian turbidites and shelf deposits and early to Middle Devonian shelf deposits, including extensive carbonates. In the Late Devonian, a pull-apart basin referred to as the Bundock Basin developed in the south-west of the subprovince, and received a thick sequence of fluviatile and some shallow marine sediments. The main folding episode was in the Carboniferous, although some hiatuses and slight angular unconformities are recognised in the sequence (Withnall & others, 1997a).

The main constituent units of the Graveyard Creek Subprovince are the early Silurian – Early Devonian Graveyard Creek Group and Shield Creek Formation, and the Devonian – early Carboniferous Broken River Group and Bundock Creek Group (Figure 2; Withnall & others, 1997a).

OROGENIC GOLD AND GOLD-ANTIMONY DEPOSITS

Orogenic (low-sulphide) quartz-gold deposits form as a consequence of events that occur in the crust at the end of arc-to-continent and continent-to-continent collisions. The critical factor in these events is that hydrated rocks are subducted and/or otherwise brought into zones where they are subjected to high geothermal gradients and dehydration reactions (Drew, 2003). The style of plate tectonics need not be critical to the formation of orogenic gold deposits. Any thermal event within hydrous and sulphur-bearing juvenile crust, whether it be initiated by Precambrian plume-like events, or younger, more-typical subduction/collision type processes, can form the same type of gold deposit (Goldfarb & others, 2001).

Host rocks are diverse, but more commonly include mafics, ultramafics, turbidite sediments (shale, carbonaceous shale, argillite, greywacke), iron formation, granitic intrusives and, locally, felsic volcanics and limestones. Host rocks are usually of greenschist metamorphic grade, ranging from virtually undeformed to totally schistose, but may reach amphibolite grade. Deposits show structural control and may

occur in both brittle and ductile regimes. The most common structural controls are second- and third-order faults of moderate to steep dip that occur near regional (often transcrustal) compressional faults. More local structural and lithological controls include faults, shears, jogs, fold hinges, cleavage, joints and reactive rocks. Generally there is no direct spatial relationship to granites. Where deposits are spatially associated with plutonic bodies, it may be because of their structural properties rather than a direct genetic relationship. Goldfields and individual deposits tend to be aligned along regional structural trends.

Gold is deposited at crustal levels within and near the brittle-ductile transition zone at depths of 2–20km, pressures of <1–5kilobars, and temperatures from 180° to 700°C (Groves & others, 1998). There may be a broad correlation between mineralisation temperature and regional metamorphic facies.

Orogenic gold and gold-antimony deposits occur in the Hodgkinson and Broken River provinces, and possibly in the Greenvale Province in north Queensland. The most significant of these are in the Hodgkinson, Palmer and Amanda Bel Goldfields and in the Broken River area (Figure 3), where they are hosted by metasedimentary rocks of the Hodgkinson Formation, Kangaroo Hills Formation and Broken River Group and localised close to major structures. Gold mineralisation is hosted by sulphide-poor (arsenopyrite-pyrite ± sphalerite-galena-tetrahedrite-stibnite) quartz veins, with early gold-quartz veins and later gold-antimony (stibnite)-quartz veins (Peters & others, 1990; Vos & Bierlein, 2006). Fluid inclusion data for the Hodgkinson Goldfield (Peters & others, 1990; Vos & Bierlein, 2006) indicate low salinity fluids with minor CO_2 and temperatures of 150–400°C, consistent with lode/orogenic gold mineralisation styles, though Peters & others (1990) did not rule out a distal magmatic contribution.

The timing of mineralisation is uncertain. Morrison & Beams (1995) suggested a Carboniferous age of ~ 328Ma, whereas Davis & others (2002) suggested much of the lode gold in the Hodgkinson was Permian in age, and Vos & Bierlein (2006) proposed two episodes of mineralisation related to successive deformation events in the Late Devonian – Early Carboniferous and the Middle Carboniferous. $^{40}Ar/^{39}Ar$ dating of two samples of sericite associated with gold-bearing quartz veins (Vos & others, 2007) produced mean ages of 342.6Ma and 340.8Ma (Early Carboniferous), interpreted to indicate the timing of regional metamorphism and the earliest possible age of gold mineralisation at the Airport and Minnie Moxham deposits respectively, in the Amanda Bel and Hodgkinson Goldfields. Total gas ages are 335.9±3.4Ma and 356.3±4.2Ma for Airport and Minnie Moxham respectively. In proposing a single Permian gold event, Davis & others (2002) suggested that, whilst quartz veins are of multiple ages, the gold mineralisation is one age related to the last major orogenic deformation event in the provinces. What is not in dispute is the structural control and relationship of the gold mineralisation to major deformation events, so multiple gold events within a region or within the one deposit are not surprising.

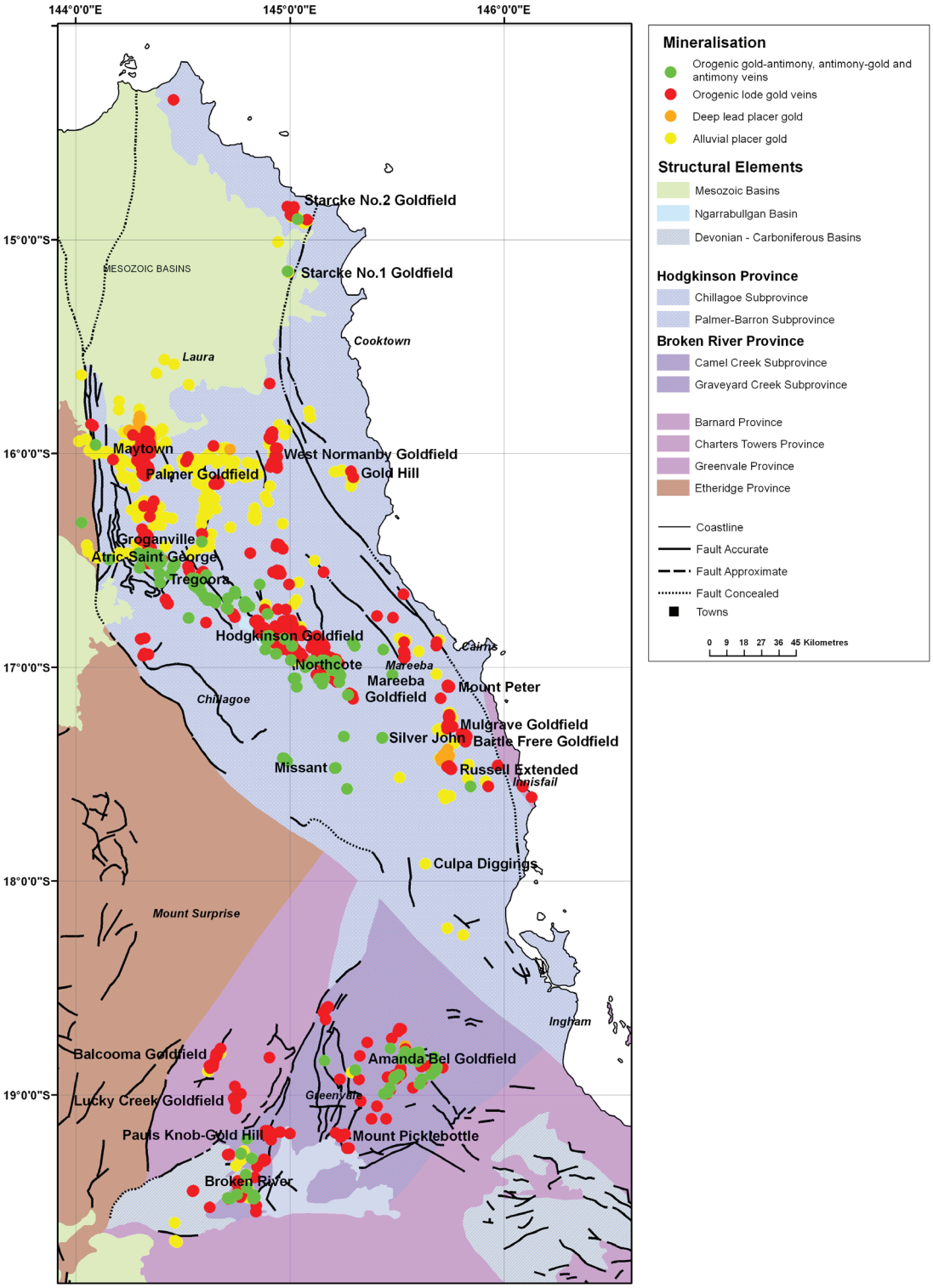

Figure 3: Distribution of lode and alluvial gold mineralisation within the Hodgkinson and Broken River Provinces

STARKE NO.1 GOLDFIELD (COCOA CREEK)

MINING HISTORY

Gold-bearing quartz reefs were discovered at Cocoa Creek in 1890 but all except the Cocoa Creek P.C. were abandoned by 1893. Webb and party erected a five-head battery in 1893 and the Cocoa Creek P.C. was worked until the beginning of 1896. This area was gazetted as the Starcke No.1 Goldfield (Figures 3 and 4) in 1895. Stibnite-bearing lodes were found in 1893 but no antimony production was recorded (Culpeper & others, 1994; Bultitude & others, 1997; Garrad & Bultitude, 1999). Total production from the Cocoa Creek reef from 1892 to 1896 was 1157.32t ore for a yield of 34.5kg gold bullion. The gold bullion was worth £3 18s per ounce (Ball, 1909).

The First Call lease was secured over the Cocoa Creek reef in 1900 but no work appears to have been carried out until 1906, when an English firm took out an option over the property with a view to proving the reported existence of large deposits of antimony ore. Disappointing results led to the closure of the mine and, towards the end of 1908, the main winding gear was removed to the Starcke Consols mine at Munburra (Culpeper & others, 1994).

Ball (1909) reported that alluvial workings occur on the northern slope of a low ridge between Cocoa and Yamba Creeks, and in the south-eastern corner of the Starcke No.1 Goldfield. Ball described the gold as being shed from gold-bearing leaders in indurated quartz-veined slate. Much “specimen gold” (gold attached to quartz) was found in soil at this locality and ~12t of rubble yielded ~124g/t Au. The short gullies running southwards into Cocoa Creek were raked for gold. No record was kept of the production from these workings (Culpeper & others, 1994).

From 1987 to 1988, Freshwater Resources and Noble Resources attempted to treat eluvial and alluvial gravels north and north-east of the old mine workings but ceased work because of poor recovery and equipment failure (Culpeper & others, 1994).

MINERALISATION

The Starcke No.1 Goldfield contains north-north-west-trending gold-antimony-quartz veins hosted by the Hodgkinson Formation. Traces of visible gold are associated with both the quartz and stibnite. The mineralisation is relatively high level (certainly higher than that at Maytown and the West Normanby) but does not exhibit any significant epithermal characteristics (Derrick & Ogierman, 1988). Alluvial gold deposits in this area are derived from these reefs. However, the deposits are small and only limited production has occurred (Bultitude & others, 1997; Garrad & Bultitude, 1999). The tailings dump at Cocoa Creek contains an estimated 1395t at an average grade of 5.2% Sb (Denaro & Ewers, 1995).

Figure 4: Location of Starcke Nos 1 and 2 Goldfields and Palmer Goldfield

STARCKE NO.2 GOLDFIELD (MUNBURRA)

MINING HISTORY

Cairns and Bowden discovered alluvial gold at the head of Diggings (or Diggins) Creek in 1890. This area was also known as Old Starcke Camp. By the end of 1890, more than 230 men were mining the alluvium of Diggings Creek and its tributary gullies. The main gullies worked were Nuggety, Prospectors, McKenzies, Specimen, Bearaway, Fearaway and Death Adder. Nuggety, McKenzies and Prospectors Gullies were the most productive. Nuggets up to 1.15kg were found. The main Diggings Creek also produced alluvial gold, with the best yields coming from just below Top Camp. Although a total of 71.5kg of gold bullion was recovered from here between 1890 and 1895, the field was never officially reported as being payable. The alluvial workings were abandoned in 1895 (Denaro & others, 1992).

As the alluvial miners gradually left the field, Mr Dick and party tested a number of gold-bearing quartz leaders found ~1.6km south-east of Mount Hetty. Pits and shallow costeans were excavated on three leaders and 3.9kg gold was dollied from surface stone. Several adits (the Co-operative Tunnels), reported to be 21–30m long, were driven from creek level. Very little gold was recovered from the adits (Denaro & others, 1992).

In August 1896, the Webb brothers discovered payable alluvial gold in Kitty Gully, 7.5km west-north-west of the Old Starcke Camp. Another gold rush commenced and more than 70 men were on the field by September. The ground was shallow and easily worked, but the payable alluvium was of limited extent. Kitty and Starlight Gullies and their tributaries were all raked. The new discovery was known as Munburra and the Starcke No.2 Goldfield was proclaimed in 1898 (Figures 3 and 4). Total recorded alluvial gold production was 46.0kg gold bullion between 1896 and 1898. This figure may include dollied gold won from the rich caps of the reefs in the area. A total of ~117.5kg of gold was won from shallow alluvial and eluvial deposits at Munburra and in the headwaters of Diggings Creek between 1890 and 1898 (Denaro & others, 1992).

The first auriferous quartz reef (Butchers) was found in 1898. Stuckey's two-stamper battery was erected in the same year. A second small battery was erected in 1899 but was later removed to the Hamilton Goldfield. Most of the mining activity was in the area north of Munburra township (Denaro & others, 1992).

The ore mined was high-grade secondary enriched ore above the water table. The main reefs worked were the Boomerang, Last Hit, Queen Alexandra, Ruby United, Rio Tinto, Duke of York and Gladstone. The reefs were mostly narrow and erratic in grades; many yielded low returns in the last few years of production. Most mines were worked above the water table to depths of 15–30m; the deepest workings were only 47.5m (Denaro & others, 1992).

A small local company carried out operations at the Boomerang claim during 1901. In 1902, the Queen Alexandra Company took over these operations and installed a pump at the Boomerang mine. By 1906, only three of the reefs (Boomerang, Last Hit and Gladstone) were still being worked. The other mines had been abandoned pending the introduction of pumping equipment. Some cyaniding of tailings was carried out in 1906 and 1907 (Denaro & others, 1992).

The Starcke United Gold Mining Company was floated in July 1907 and mainly worked the Last Hit reef. The company was reconstructed as the Starcke Gold Mining Company NL in 1910. Work at the Last Hit and Boomerang continued until 1913. Other companies working on the field at this time were the Starcke Consols Syndicate and the Gladstone Gold Mining Company (Denaro & others, 1992).

Mining ceased in 1913. The main factors leading to the closure of the mines were poor management, the size of the payable orebodies, difficulties in mining below the water table, high cartage costs, and poor recovery from the battery. Only high-grade ore (>30g/t or even 60g/t) could be treated economically (Denaro & others, 1992).

The total recorded gold production for the Munburra reefs from 1898 to 1913 was 314kg gold bullion from 5964t ore plus 2.2kg gold bullion from the cyaniding of 457t of tailings in 1913. The Uncle Sandy mine also produced a trial shipment of 9t of 9% Sb ore in 1906. Starcke gold was reportedly worth £4 per ounce (Denaro & others,

Table 1: Lode gold production, Starcke No.2 Goldfield (Denaro & others, 1992)

Mine	Years	Ore (t)	Au bullion (kg)
Boomerang	1898–1903	193	34.2
Boomerang East	1898–1906	302	40.7
Boomerang West	1899	4	0.2
Butchers	1908	11	Not reported
Co-operative Tunnels	1895	Not reported	3.9
Duffs	1901	2	0.05
Duke of York	1898, 1901	>3	0.9
Dyer's Opencut	1900s	10	Not reported
Francis	1900	3	0.08
Gladstone	1898–1906, 1910–1912	502	18.8
Gold Mount	1906	2	0.07
Graveyard	?1908	2	0.06
Hamesley and Quinn	1898	3	0.16
Hit or Miss	1899–1906	59	1.8
Jephson's Surprise	1899–1900, 1904	37	3.9
Last Hit	1898–1909, 1911, 1913	2157	144.0
Lily of the Valley	1898–1899	>4	2.2
Lizzie Trembles	1899	2	0.2
Monte Carlo	1898–1899, 1902-1903	272	10.7
Mountain Maid	1898–1899	>5	2.5
Poor Old Torres	1902	8	0.6
Queen Alexandra	1902–1904	118	11.0
Rapport	1900s	2	0.02
Rio Tinto	1898–1904, 1908, 1910	320	20.2
Ruby United	1898–1900	75.5	6.0
Slattery's	1902	8	0.6
Slattery's Adit	1899	8.4	0.2
Saint Patrick	1899–1901	111	6.7
Tuckers	1899	3	0.1
Uncle Sandy	1899–1900, 1906	18	0.3
Weir's	1899	5.7	0.5

1992) but returns from 1898 to 1906 ranged from £3 3s 8d to £4 4s per ounce (Ball, 1909). The production from individual mines is listed in Table 1.

The goldfield was virtually abandoned from 1914 to 1932. Attempts to reopen the Starcke Consols in 1932 to 1939 met with little success. In 1980, MP Hoy took out mining leases over the Last Hit, Boomerang and Queen Alexandra workings and set up a one-head stamper battery and treatment plant at the Last Hit mine. Hoy carried out some shaft sinking and recovered ore from the Boomerang, Last Hit and Rio Tinto reefs. There is no record of any production (Denaro & others, 1992).

In 1983, Amlex Pty Ltd installed an alluvial mining and extraction plant on Kitty Gully. The alluvium proved to have good grades but reserves were small and the company went into liquidation in 1984 (Denaro & others, 1992). Other recent attempts to rework the alluvials have met with little success. Several smaller alluvial deposits containing nuggetty gold were also worked to the south-east of Munburra.

MINERALISATION

Alluvial gold deposits at Munburra and Diggings Creek are in steep, V-shaped gullies draining outcropping quartz reefs.

Gold-quartz veins occur within steeply dipping, north-trending metasedimentary rocks of the Hodgkinson Formation. The host rocks are mainly coarse- to medium-grained arenite or greywacke and carbonaceous slaty mudstone, with interspersed lenses of chert and melange zones (Denaro & others, 1992; Bultitude & others, 1997; Garrad & Bultitude, 1999).

Mineralisation occurs in quartz veins and stockworks spatially associated with porphyritic microgranite ('felsite') dykes and with some east to north-east-trending structural control. Almost all historical production came from discrete, steeply dipping, lenticular quartz veins that contain gold, pyrite, arsenopyrite and minor chalcopyrite; minor stibnite is also present in some veins. Total sulphide content is <5%. The veins range from several centimetres to 3m in width (generally 200–250mm) and strike north-east and south-east across bedding trends. The veins comprise euhedral buck quartz with ribbons and angular inclusions of pyritic host rock, which impart a brecciated texture to the veins. Reefs commonly branch. Comb and fibre textures have been noted in the thinner veins. The distribution of mineralised zones was patchy; ore shoots were generally pipe-like and pitched steeply west. Historical grades were very rich at the surface (up to 300g/t) but decreased notably with depth, indicating some degree of supergene enrichment. The gold was commonly fairly coarse and yellow. Grades were generally inversely proportional to reef width and reached up to 300g/t (even 3kg/t) Au in places. Silver content ranged up to 8g/t (Denaro & others, 1992; Bultitude & others, 1997; Garrad & Bultitude, 1999).

Quartz veinlet stockworking is generally confined to the more competent rock types such as arenite, silicified slate, chert and microgranite and contains low-grade disseminated gold. The stockworking is best developed in the microgranite dykes, but may extend for several metres from fissure veins and dykes. Individual veinlets are 1–20mm thick and comprise medium- to coarse-grained quartz with minor sulphides (dominantly pyrite). Minor sericitic alteration is associated with the stockworks (Denaro & others, 1992; Bultitude & others, 1997; Garrad & Bultitude, 1999).

Gold also occurs in a >1000m long by 50m wide mylonitic shear zone that contains quartz and chert lenticles in an anastomosing, dark grey, carbonaceous, slaty matrix. Pyrite is common along slickensided surfaces, as discrete grains in quartz lenticles and veins, and as coatings on microfractures (Denaro & others, 1992). Extensive exploration in the Munburra area has failed to delineate any economic gold deposits (Bultitude & others, 1997; Garrad & Bultitude, 1999).

The only antimony mineralisation in the Starcke No.2 Goldfield occurs in an antimony-gold-quartz vein at the old Uncle Sandy mine. The lode is a 100–300mm wide quartz fissure vein in silicified siltstone and mudstone. The vein comprises cherty quartz with pyritic host rock inclusions to 20mm across. Stibnite appears to

be associated more with sheared or brecciated host rock than with quartz and may be concentrated on the vein margins. The only recorded production was 9t of 9% Sb ore and 0.3kg of gold (Denaro & others, 1992; Bultitude & others, 1997; Garrad & Bultitude, 1999).

Noble Resources NL (Derrick & Ogierman, 1988) proposed the following mineralisation controls for Au and Au-Sb mineralisation in the Starcke No.2 and No.1 Goldfields:

- Mineralisation is probably Carboniferous to Permian in age.
- Stockworking and Au-As mineralisation occurred late in a cycle of ?Carboniferous deformational events and could be synchronous with late stages of dyke intrusion or be slightly younger.
- A late $?D_3$ structural event probably produced areas of north–south shearing, zones of high strain, tensional opening of earlier structures, gentle warping of dykes, and possibly east–west kinking. Brittle deformation of favourable rock types focused quartz vein development and stockworking of these rocks.
- Mineralisation is relatively high-level but has no significant epithermal signature. The Au-As association at Munburra may be separate from or overlap the Au-Sb association at Uncle Sandy.
- High gold grades at and near the surface indicate local supergene enrichment.
- The felsite dykes are not necessarily the primary source of the gold. Deep-seated igneous activity related to the dykes probably contributed an influx of gold-bearing magmatic hydrothermal and metamorphic fluids.

At Munburra, fluids may have been channelled along critical vein systems in shear zones that had already been intruded by felsite dykes. These veins were less mineralised than the transverse veins that formed in east–west fractures extending out from and, in some cases, across the dykes. Breccia textures were caused by spalling of wall rocks due to local pressure drops or by the explosive release of high fluid pressures in wall rocks as fluid pressures in the veins decreased (Denaro & others, 1992).

PALMER GOLDFIELD

ALLUVIAL GOLD

Mining history

Gold was discovered on the Palmer River in 1872 by Frederick Warner, a surveyor with an exploration party led by William Hann. The Palmer Goldfield (Figures 3 and 4), covering 8934km^2, was proclaimed in November 1873, following other discoveries of alluvial gold at Palmerville and along the Palmer River and its tributaries by James Venture Mulligan. This goldfield subsequently became the most prolific alluvial gold producer in Queensland (Lam & others, 1991).

Alluvial gold mining commenced soon after the announcement of Mulligan's find in late 1873. As the ensuing rush proceeded, small townships sprang up at Palmerville, Maytown, Lukinville, Echo Town, Revolver Point, German Bar, Stonyville, Byerstown, Groganville, Uhrstown and Four Mile (Quartzborough). Cooktown was established at the mouth of the Endeavour River to service the goldfield and, within months, became one of the busiest ports in Queensland. By 1874, it was estimated that 10 000 miners were on the field. Alluvial deposits were mined in the North Palmer, Palmer, South Palmer, West Normanby, Saint George, Mosman and Mitchell Rivers and their tributaries such as Sandy, Oaky, Greasy Bill, White Horse, Kennedy, Dog Leg, Butchers, Granite and Fine Gold Creeks and Thompson and Nelson Gullies. Gold was readily recovered from shallow alluvium at a depth of <1m and the average daily yield was 70g per miner. Adverse conditions, including water shortages, remoteness and the high cost of cartage and supplies, prevented the rich ground from being worked out within the first year of discovery. By the end of 1875, many outlying creeks and gullies were also being worked and the population was approaching 20 000. In 1877, more than 90% of the population was Chinese. By 1879, the rush to the Palmer Goldfield was virtually over and a new phase of lode mining took over (Lam & others, 1991). By the end of 1883, most of the alluvial gold had been worked out and the Chinese population dropped to ~1000 (Denaro & others, 1994).

Production figures for the Palmer Goldfield up to 1980 have been variously reported as 36 709kg of gold (Burrows, 1991) or 41 500kg of gold (Lam & others, 1991), but the total yield was undoubtedly much higher. More than 90% of this production came from alluvial sources along the Palmer River and its tributaries. The most productive period was between 1874 and 1882. Peak production was in 1875, when 7750kg of gold was produced from alluvial deposits. Alluvial gold output declined steadily from 1029kg in 1882 to 119kg in 1890. Between 1891 and 1908, the average yield was ~50kg per annum. Apart from a small revival averaging ~24kg per annum during the Depression years from 1931 to 1934, the average yearly production to 1979 was ~1kg gold; 37kg was produced in 1980 (Burrows, 1991)

In the late 1970s, several companies started mining alluvial gold in the Mammoth Bend and Four Mile Bend areas of the Palmer River. In the early 1980s, a sharp increase in the gold price drew Australian Diversified Resources and Rimeki Pty Ltd to the area. These companies, in a joint venture with AUR NL, mined Fine Gold, McGann, Stony and Sandy Creeks and the gullies draining Mount Madden. Production from 1986 to 1992 totalled 1273kg Au (Garrad & Bultitude, 1999).

Falling tin prices in the mid-1980s compelled many tin miners to rework the Palmer, Saint George and Mitchell Rivers and their tributaries for alluvial gold. Results were mixed, mainly due to competition for ground and the inefficiency of converting tin concentrators to trap the very fine-grained gold in the river wash. In 1989, alluvial gold mining was still being carried out along the beaches of the Saint George River, ~5km upstream from the confluence with the Mitchell River, the lower section of Dogleg Creek, and Thompson Gully. The combined output is not available but, in general, would be very small compared to the company production (Lam & others, 1991).

In 1986, an area from the Palmer River (including the old Maytown township) to north of the RL Jack Memorial was proclaimed as the Palmer Goldfields Reserve, which is administered by the Queensland Government to protect mineral resources, mining heritage and natural values (Lam & others, 1991).

Alluvial gold mining is still carried out in the North Palmer River. Total production from the Jessop Creek lease is 51.95kg Au between 1996 and 2010. The Blakes Gully No.2 lease produced 32.92kg Au between 1998 and 2010. The Middle Revolver lease produced 45.13kg Au between 1996 and 2011. Alluvial gold is still mined at Limestone Creek, a tributary of the Mitchell River; production from 1996 to 2010 totalled 177.35kg.

Mineralisation

The alluvial gold recovered from the Palmer Goldfield was reportedly of a high fineness and occurred in several forms. These include nuggetty gold, angular to rounded gold, bullet-like gold, wire gold, flat striated grains, wire and filigree gold attached to quartz, and very fine-grained flakes (Garrad & Bultitude, 1999).

The Palmer River and its tributaries contained extensive deposits of auriferous alluvium. Three main types of Cenozoic alluvium/eluvium have been recognised as being associated with present-day drainage systems:

- recent wash occurring within flow channels and under active sand banks
- older wash lying outside the active flow channels but adjacent to recent sand banks. This wash forms restricted deposits in the larger drainage systems such as the Palmer River.
- High-level wash associated with old stream channels, situated some distance from the river and forming terraces (in places 30–50m above present river level). These deposits are generally shallow, but carry a higher gold content than recent river wash (Bultitude & others, 1997; Garrad & Bultitude, 1999).

Gold also occurs in deep lead deposits beneath Cenozoic basalt in the Jimmy Ah Chee's Tableland area.

Lam & others (1991) listed the sources of the gold as:

- auriferous quartz veins and lodes (for example, lodes at Maytown and Groganville)
- stockworks of auriferous quartz veinlets (for example, White Horse, Kennedy, McGann, Sandy and Fine Gold Creeks)
- auriferous sulphide lodes (for example, stibnite-quartz lodes near the Saint George River)
- auriferous sedimentary units (for example, quartzite and chert beds at Mount Madden and Mount Bennett)
- *in situ* precipitation of gold nuggets

- concentration of gold from reworking of earlier placer deposits (for example, reworking of Mesozoic deposits in the basal Dalrymple Sandstone and Gilbert River Formation).

LODE GOLD

Mining history

The gold-bearing quartz lodes in the Maytown district were probably mined soon after the depletion of the alluvial ground in 1875. Lode production, totalling 4340.5kg, came mainly from the Maytown, Groganville and North Palmer areas and peaked in 1888–1889 (Burrows, 1991). Richness rather than size appears to have been a characteristic of the majority of the lodes worked. Most lodes were mined out above the water table within 20 years of their discovery. By the end of the 1880s, many mines were forced to close due to the high cost of deeper development. Very little mining was done after 1893. Cyanide treatment of tailings met with some success in 1898, but most miners had left the field by the end of the 1890s (Lam & others, 1991; Denaro & others, 1994).

From the early 1900s to the 1980s, many companies and syndicates unsuccessfully attempted to dewater and reopen mines such as the Anglo Saxon, Albion/Just in Time, Blackbird, Ida, King of the North, Louisa, Mount Buchanan, Mount Madden, Queen of the North and Saint George. Minor success was realised at the Louisa, Blackbird, King of the North, Queen of the North and Saint George mines, which produced 11.4kg Au in 1931 to 1941. The fate of lode gold mining was finally sealed by the outbreak of World War 2. Between 1945 and 1989, <2kg of lode gold was produced from the field (Lam & others, 1991). The total recorded lode gold production for the Palmer Goldfield from 1874 to 1957 is 4437.6kg (Burrows, 1991).

Maytown area

It is not known which lode was discovered first at Maytown, although in 1876 the Ida was credited as the first mine in the district to have its ore crushed. The Louisa, Queen of the North, King of the Ranges, Albion-Caledonian, Alexandra and Rob Roy were among the earliest discoveries, followed by the Hart's Content, Recompense, Lord Nelson and others (Lam & others, 1991).

Production in the Maytown area came mainly from narrow quartz lodes grading 30 to 60g/t Au (Table 2). Jack (1899) reported that bullion from the Ida mine was unusually high in fineness and worth £4 3s per ounce. Bullion produced from the Alexandra mine between 1878 and 1880 averaged £4 1s 8d per ounce (Jack, 1896). The charges for carting and crushing for most of the period up to 1882 amounted to £4 per ton for ore from the Alexandra and Ida mines.

Table 2: Lode gold production, Maytown area, Palmer Goldfield (Lam & others, 1991)

Mine	Years	Ore (t)	Au bullion (kg)
Albion		618	25
Alexandra (Alexander)	1878–1882, 1897–1899	717.8	56.3
Alliance	1881–1902	295	10.74
Baal Gammon	1896–1898	18.3	0.82
Best Friend	1895–1897	78	3.6
Black Bird	1880, 1942	63	1.53
Boolay's	1897	5	0.6
British Lion	1879–1909	132	6.0
Captain Cook (International)	1880, 1892	34	2.4
Catalpa	1887–1901	140	6.8
Comet	1880–1889	6300	356
Comstock	1896	5	0.4
Difficulty	1877–1879	82.8	7.9
Doctor	1903	13.2	0.5
Donnybrook	1877–1886	90	4.6
Downpatrick	1877, 1882–188	89	3.6
Durham	1876–1878, 1901	33.5	1.6
Exchange	1897–1903	114	6.4
General Sarsfield	1879, 1882, 1883, 1893	65	2.2
Gypsy	1895–1896	15	0.54
Hart's Content (Hearts Content)	1880–1898	238.6	12.53
Helen Macgregor	1877–1896	26.7	2.0
Hit or Miss	1878–1909	2785.4	125.8
Hop Bitters	1881–1883	250.6	12.2
Ida	1876–1883	7000	430
Independent P.C.	1877, 1897–1909	101	9.1
Just in Time	1876–1901	377	25
Keep It Dark	<1896, 1896–1897	117.8	5.1
King of the North	1881	394.2	20.7
Lady Florence	1883, 1884	98	2.8
Lady Mary	1876–1881	65.7	5.3
Last Chance	1880–1883	247	20.2
Little Union	1897	34.8	1.55
Lone Star	1877–1879, 1900–1926	503	13.0
Lord Nelson	1911	7.6	0.23
Louisa	1884, 1896–1899, 1939–1941	1869	68.1
Marching Through Georgia	1877	40	1.3
Morning Star	1992	0.02	0.03
Mountain Maid	1880–1906	4255.5	191.7
Mount Atlas	1898–1899, 1957	31	2.5
New Zealand	1899, 1910	28	3.3
Oliver Cromwell	1877	42.2	2.3
Otto	1877	19	0.5
Perseverance (Persevarence)	1883–1885	117.3	4.53
Prince Patrick		17.1	0.5
Princess Midas	1896	11	0.9

Table 2 (continued)

Mine	Years	Ore (t)	Au bullion (kg)
Queen of Beauty (Try Again)	1880, 1882–1883	91	13
Queen of the North (Queen)	1877–1909	8042.6	512
Queenie (Queenie May)	1926–1927, 1932	12.5	4.7
Queenslander	1876–1877	77.5	6.6
Recompense	1896–1901	178.5	14
Rob Roy	1876–1877	206.8	21.1
Saint George	1897–1900	72.1	8.62
Saint Patrick	1880–1882, 1896, 1903	1011.4	33.3
Scandinavian	1897–1900	110	4.5
Smithfield	1876–1881	434	43.5
Star of the East	1898, 1899, 1923, 1924	65	1.5
Star of the South	1880–1881, 1899	56.5	7.19
Sunburst	1882–1899	132	9.9
Union (Zoe)	1876–1879, 1898–1899	162	9.75
Viking	1876–1896	410	19.4
Walhalla Group	1877, 1878, 1898–1903	515	13.5
Who Would Have Thought It (Who'd a' Thought It)	1897	4.3	0.28
Wild Irish Girl	1894–1952	565	24.6

Groganville area

The Anglo Saxon lode east of Groganville was discovered by Messrs Waters, Harbord and Kummer in 1886, although others lodes in the area may have been worked in the mid-1870s (Table 3). The Anglo Saxon was the most productive lode mine in the Palmer Goldfield and produced 960kg Au between 1886 and 1897 (Lam & others, 1991). Jack (1888) reported that gold bullion from the Anglo Saxon mine was worth £4 4s 6d per ounce.

Table 3: Lode gold production, Groganville area, Palmer Goldfield (Lam & others, 1991)

Mine	Years	Ore (t)	Au bullion (kg)
Anglo Saxon	1887–1897	19 057	960
German Miner (German Miller)	1889	4	0.257
Good Hope (General Kitchener)	1891	352.5	10.8
Healeys	1889	32	0.043
Homeward Bound	1881	5.6	5.7
Jubilee (Jubillee)	1909	11.2	1.5
Mortar	1887	1.3	1.0
Rosannah	1889	32	0.03
South Cross	1891–1892	87	3.0

West Normanby Goldfield

Several quartz claims had been taken up and a ten-head stamp battery erected on the West Normanby field, located ~80km south of Cooktown, by the end of 1878. Reporting of mine names and production figures for the area has been confused with mine names and production from the Normanby Goldfield near Bowen, which opened in 1871. No official production figures are available for the early mining period as the field lay outside the then boundaries of the Palmer Goldfield (Culpeper & others, 1994).

In 1884, the Palmer Goldfield boundary was expanded to include the lodes in the West Normanby River area. Some of the leading gold mines in the West Normanby field at that time were the Monte Christo, Star of Normanby, Isabella, Edna, Emily, Poverty and Zig-zag. Most of the lodes were mined to just above the water table as the miners had no means of coping effectively with excessive groundwater. By 1898, most of the miners had left the field and did not return until The Brothers deposit was discovered around 1900. Between 1903 and 1906, ~18kg gold was recorded from the field, probably mainly from the Brothers mine. In 1906, a two-head stamper battery was installed at the mine to service the field. Twelve other mines were operating near the Brothers, including the Maddens and Good Luck. The Brothers battery treated ~600t of ore and produced 20kg gold between 1906 and 1916 (Lam & Genn, 1993; Culpeper & others, 1994; Bultitude & others, 1997; Garrad & Bultitude, 1999).

From 1916, there was virtually no mining in the area until increasing gold prices in the 1970s revived exploration interest in the field and some alluvial mining by companies along the West Normanby River. A short revival in lode mining was signalled by the opening of the Maddens mine in the late 1990s (Culpeper & others, 1994; Bultitude & others, 1997; Garrad & Bultitude, 1999). Production from this mine was 44.88kg gold bullion from 1994 to 1999. The Poverty, Mint, Isabella and Edna reefs were also worked.

Table 4: Lode gold production, West Normanby Goldfield (Lam & Genn, 1993; Culpeper & others, 1994)

Mine	Years	Ore (t)	Au bullion (kg)
Gilbert	1884–1885	168	5.5
Isabella	1884–1885	45	1.5
Maddens	1994–1999	Not reported	44.88
Monte Christo	1885–1886	352	36.1
Norton	1895–1896	60	3.6
Poverty	1877, 1885	114	6.8
Star of Normanby	1887	40	4.6
The Brothers	1903–1906, 1908–1910	Not reported	27.0
Zig-zag	1885	51	1.0

Mineralisation

Maytown area

The Maytown area (Figure 3) extends from the Palmer River (south of the abandoned township of Maytown) north to the Conglomerate Range. It contains the greatest concentration of gold-bearing quartz veins in the Palmer Goldfield — approximately 160 lodes occur within an 11km by 2km north-north-west-trending belt (Bultitude & others, 1997; Garrad & Bultitude, 1999).

The main features of the veins are:

- they occur in groups within a 2km wide, north-north-west-trending zone
- within each group of workings, the veins are subparallel
- the reefs commonly strike 100° and 140–150° and dip 70–90° south and south-west
- pinching and swelling occur along strike and tabular boudinage features occur down dip
- reefs are brecciated on the margins and slickensided down dip
- branching or bifurcation occurs in some of the major veins and closely spaced subparallel veinlets, spur veins and bends are common
- they are commonly truncated by doleritic dykes
- free gold is disseminated as small irregular masses and discrete grains in quartz and intermixed with pyrite and arsenopyrite throughout the veins, but is concentrated along contacts with host rock laminae, in small ore shoots, and in pinches along the lodes
- gold fineness is upward of 920–940
- Reefs worked historically averaged ~2oz per ton for ore from the shallower levels but grades declined at depth to <1oz per ton; the bullion recovered was worth ~£4 per ounce (Jackson, 1913).
- associated sulphide minerals (generally <5%) include pyrite, arsenopyrite, marcasite, galena, sphalerite, pyrrhotite and stibnite
- wall rocks, particularly adjacent to gold-bearing shoots, may have narrow sericitic alteration selvedges; brecciated margins are common (Lam & others, 1991; Denaro & others, 1994; Garrad & Bultitude, 1999).

The host rocks in the Maytown area are metasedimentary rocks of the Hodgkinson Formation. They comprise a sequence of meta-arenite, phyllite, phyllitic mudstone and meta-siltstone intruded by basic dykes. The meta-arenite contains weathered pyrite cubes up to 10mm across (Lam & others, 1991; Bultitude & others, 1997; Garrad & Bultitude, 1999).

Medium-grained doleritic dykes, up to 1m wide and often traceable for more than 1km along strike, are common in the area. They are subparallel to the regional north-

north-west trend and commonly truncate the mineralised quartz veins. Up to 5% pyrite and arsenopyrite occur in the dykes, which invariably contain xenoliths of vein quartz (Lam & others, 1991; Garrad & Bultitude, 1999).

At least two distinct types of quartz veins occur — large, gold-bearing veins and narrow, barren veinlets. The barren veins parallel S_1 and S_3 fold axial planes striking 125° and 060° respectively, and are commonly crosscut by mineralised veins. The veinlets are of limited strike length, commonly tapering off into the host rocks. Rock chip samples from some of the barren quartz veinlets indicate grades of 1–9ppb Au; phyllitic sediments assay tens of ppb Au; sediments with stockwork veins assay hundreds of ppb Au; and larger veins contain gold in ppm levels (Lam & others, 1991).

Mineralised quartz veins are commonly tens of metres in strike length and in depth. They form groups in which individual veins are arranged in an *en echelon* fashion, with a strike of between 100°–150° and a steep dip to the south. The veins range from <10mm–0.3m in width and are fault/shear controlled. They comprise white drusy quartz with localised comb, vugh and ribbon textures, and contain gold, minor sulphide minerals and inclusions of host rock. Many of the veins were extremely rich, averaging 30–60g/t Au; the mineralisation persisted below the water table (Lam & others, 1991; Garrad & Bultitude, 1999).

The gold is unevenly distributed and is generally concentrated in pinches and in shoots associated with dilation zones in the veins that are caused by changes in strike, splays, lithologic contacts and fissure intersections. It occurs as discrete grains and as grains associated with pyrite and arsenopyrite. The gold is deep in colour and of a high fineness (Lam & others, 1991; Denaro & others, 1994; Garrad & Bultitude, 1999).

The sulphide assemblage in reef material examined from mullock dumps varies from mine to mine but generally contains pyrite, marcasite and arsenopyrite. Less commonly pyrrhotite, sphalerite, galena, stibnite and ?chalcopyrite can be observed (Lam & others, 1991; Garrad & Bultitude, 1999).

Host rock laminae, ranging from <1mm to centimetres in width, commonly define a crude banding in the veins. They are concentrated along vein margins. Laminae margins are commonly limonite-stained by oxidised sulphides (Lam & others, 1991; Garrad & Bultitude, 1999).

Some of the veins' physical attributes, such as tabular boudinage down-dip features, imply they have undergone intense ductile deformation as a result of faulting or folding and metamorphism. Most of the veins occur in blocks in line with the regional north-north-west trend. Narrow belts with few or no veins occur between the blocks and may represent zones of movement between mineralised blocks. Kinks and bends in veins may represent initial fracture refraction across competent sandstone and incompetent siltstone beds (Lam & others, 1991; Garrad & Bultitude, 1999).

The mineralisation is considered to be of the slate-belt style, with mineralising fluids generated by devolatilisation of the sediment pile during regional metamorphism. These fluids scavenged precious metals from the host rocks. They were then focused into regional structures where precipitation of gold and the associated minerals was induced by pressure release at dilation sites or reaction with reductant lithologies (Bultitude & others, 1997).

Groganville area

Approximately 49 reefs have been mined within an 11km long by 1.5km wide north–south corridor that lies along Limestone Creek extending from Hidden Valley in the north, through the Groganville township, to the Four Mile area in the south. The major mines in the area are the Anglo Saxon and Good Hope located at Groganville (Figure 3). Intense faulting has occurred within the mine areas (Lam & others, 1991; Garrad & Bultitude, 1999).

Mineralisation in the area comprises gold-bearing quartz lodes along east-north-east, east-south-east and north-trending shear/fault zones in a rhythmically interbedded arenite–siltstone–shale sequence with minor lenses of basalt and conglomerate that have undergone low-grade metamorphism.

At Hidden Valley, mineralisation is associated with a zone of south-south-east-trending quartz lodes in feldspathic arenite and phyllite. The lodes comprise several distinct veins up to 1m wide and stockworks of veinlets. The stockworks are 0.2–0.4m wide and contain white vughy quartz with calcite, limonite and minor sulphides. The distribution of these veins and stockworks coincides with alluvial gold concentrations in the drainage systems (Lam & others, 1991; Garrad & Bultitude, 1999).

At the Anglo Saxon and Good Hope mines, fault zones ranging from 1–5m wide can be traced along strike as siliceous outcrops for >500m. Quartz lodes and brecciated arenite and siltstone occur along the fault zones. Gold mineralisation is patchy but is commonly concentrated in quartz lodes at fault intersections and in areas where faulting has been most intense. The Anglo Saxon and Good Hope mines were sunk on intersections of east-north-east- and east-south-east-trending faults (Lam & others, 1991; Garrad & Bultitude, 1999).

The quartz veins mined in the Anglo Saxon ranged from 1–3m in width and were deposited within a prominent north-east-trending fault zone. Fractures are commonly limonite- and scorodite-stained from oxidised pyrite and arsenopyrite in the veins. The veins comprise cherty or granular quartz, crosscutting quartz veinlets, carbonaceous laminae, pyrite and arsenopyrite. Gold was patchily distributed throughout the veins, but was generally concentrated in ‘pockets’ and was associated with veinlets of black quartz and carbonaceous(?) shale laminae. The mineralisation persisted below the water table, the Anglo Saxon being worked to a depth of ~150m (Lam & others, 1991; Garrad & Bultitude, 1999).

The Good Hope mine was on a 4.5m wide shear zone containing two subparallel, east-trending quartz veins that dip 75° south. The lode was up to 1m wide and comprised massive quartz with minor shale fragments and arsenopyrite grains. Gold mineralisation occurred in shoots pitching at a low angle to the west and in patches throughout the veins. The higher gold grades occurred in the hanging wall vein (Lam & others, 1991).

Mineralisation at Four Mile occurs in fracture-controlled, south-south-east-trending, *en echelon* veins. Workings are scattered along narrow, quartz-filled shears. The lode zones of brecciated quartz/country rock and quartz veining generally strike 160–170° and some are conformable with the cleavage of the country rocks. The lodes average 0.3m in width, dip steeply east, and are up to 500m long (average 50m). Chloritic schistose material is commonly disseminated in the veins. Higher gold contents usually occur in limonite-stained quartz. Pyrite and arsenopyrite occur in the quartz below the oxidised zone (Lam & others, 1991).

West Normanby Goldfield

The lodes in the West Normanby Goldfield (Figure 3) lie within a north-north-west-trending shear zone that follows the West Normanby River. They comprise discrete, thin, gold-bearing quartz veins. They are fissure infillings that tend to be irregular in thickness, both along strike and down dip. The veins follow joints and shears, forming a zigzag pattern. Minor spur veins follow the host rock schistosity and joints for short distances (Lam & Genn, 1993; Bultitude & others, 1997; Garrad & Bultitude, 1999).

Some of the main mines in the West Normanby Goldfield were the Monte Christo, Star of Normanby, Isabelle, The Maddens, Wasp Gully, Good Luck (Taylor Reef), The Brothers, and Zig-zag. The average lode grade is estimated to be in the range 30–60g/t Au. The mineralised veins averaged 0.3m in width and ranged from <0.1m–>1m. They consist of white drusy quartz with localised comb, vugh, and ribbon textures. The gold was irregularly distributed and commonly concentrated in pinches and shoots associated with dilational zones. The gold is typically more than 940 fine, and occurs as discrete grains and as grains intermixed with pyrite and arsenopyrite (Lam & Genn, 1993; Garrad & Bultitude, 1999).

Gold-bearing veins at the Maddens are hosted by the Taylors Fault, a major regional structure. Veins have been emplaced throughout the history of this fault and commonly fill dilational jogs. Graphitic laminations have developed within these veins. Davis & others (1996) believe they are the product of dissolution of tabular country rock slabs that were tectonically sliced and incorporated into the veins. They also noted that the gold was concentrated in zones of relatively coarse-grained quartz adjacent to shear planes; the shearing produced numerous microfractures that allowed fluid access and consequent gold precipitation. The gold may have been introduced with the quartz and subsequently redistributed within the reef during deformation (Lam & Genn, 1993; Bultitude & others, 1997; Garrad & Bultitude, 1999).

Based on overprinting relationships of deformational fabrics with isotopically dated igneous intrusions, Davis & others (1996; 2002) proposed that gold-bearing quartz veins in the West Normanby Goldfield and the Hodgkinson Province as a whole were emplaced during the waning stages of the main contractional deformation of the Hunter-Bowen Orogeny. They also considered that the close spatial association between syn-deformation Whypalla Supersuite granites and gold mineralisation implies the granites were an integral part of the major gold mineralising event in the Hodgkinson Province during the Early Permian or later, particularly in the West Normanby Goldfield (Bultitude & others, 1997; Garrad & Bultitude, 1999).

ATRIC – SAINT GEORGE RIVER AREA

MINING HISTORY

Antimony and copper mineralisation were discovered along the Saint George River in the late 1890s. The Saint George, Lincoln and Poppy antimony deposits, near the confluence of the Mitchell and Saint George Rivers (Figure 3), were probably opened up prior to 1892. No official record of their early history is available except for comments that the lodes were narrow and auriferous. From the extent of the workings, production would have been small. In 1971, Nickelfields of Australia NL attempted to mine the Saint George and Lincoln by open cut. An estimated 60t of ore grading ~60% Sb was treated at a nearby plant but the venture ceased shortly afterwards because of a shortage of ore (Lam & others, 1991).

MINERALISATION

Antimony-bearing quartz lodes associated with north-east- to south-east-trending conjugate fractures occur as discontinuous, north-trending, *en echelon* mineralised lenses in the Hodgkinson Formation near the confluence of the Saint George and Mitchell Rivers. There are 16 occurrences within a 5km by 2km area. Within the lenses, 100–500mm wide mineralised veins strike north-east and south-east and 100–300mm wide barren veins strike east. Some mineralised veins are lightly iron-stained and brecciated on the margins, with strongly slickensided surfaces. In places, the veins swell to form large outcrops of white ‘buck’ quartz. Elsewhere, they thin out to form quartz veinlets, or pinch out completely in the country rock (Lam & others, 1991; Bultitude & others, 1997; Garrad & Bultitude, 1999).

The lodes commonly consist of a dominant quartz vein containing multiple stibnite-rich lenses, ranging from 10 to 50mm wide, and stockworks. In some lodes, stibnite occurs preferentially along the vein margins, and narrow zones of anastomosing stibnite veinlets occur within the adjacent wall rock. Where oxidised, these veinlets are difficult to distinguish from the host rock. Stibnite typically forms 10-30% of the lodes. Selected stibnite samples assayed up to 40% antimony. Channel samples indicated that antimony and traces of gold are present in both the lodes and in the adjacent wall rock (Lam & others, 1991; Bultitude & others, 1997; Garrad & Bultitude, 1999).

Table 5: Gold and antimony resources, Atric – Saint George area

Name	Geological estimate	Indicated resource	Inferred resource	Reference	Comments
Atric		989 000t at 1.9g/t Au for 1879kg Au, at 1.9g/t Au cut-off	51 000t at 1.7g/t Au for 86kg Au, at 1.7g/t Au cut-off	Republic Gold Limited (2006a)	
Lincoln No.1	22 000t at 3% Sb for 660t Sb			Taylor (1971)	Maximum potential to 30m depth; not JORC compliant
Saint George	5750t at 3.1% Sb for 177t Sb, at 0.5% Sb cut-off			Taylor (1971)	Not JORC compliant

Exploration work by several companies has defined a 6km long zone containing twelve gold prospects within a regional shear zone termed the Bellevue East Shear. This north-west-trending shear zone is thought to represent a major thrust fault (south-west over north-east). The main prospect within the shear zone is the Atric prospect, where anomalous gold mineralisation has been delineated over a strike length of 300m (Bultitude & others, 1997; Garrad & Bultitude, 1999).

The gold mineralisation is intimately associated with very fine-grained arsenopyrite and pyrite hosted by metasedimentary rocks of the Hodgkinson Formation (Birch, 1998). Gold anomalous zones appear to correspond to anomalous antimony values (commonly <30ppm) and gold is concentrated in shoots with lower grade envelopes. The mineralisation plunges shallowly to the south-east within a dilational jog in the Bellevue East Shear. Birch (1998) considered the deposit to be formed from remobilisation of gold and sulphides present in the metasedimentary rocks, possibly associated with mafic volcanism or hot spring activity, to structurally favourable sites or lithologies. Pan Australian Resources NL conducted a metallurgical evaluation of the deposit and concluded that the mineralisation is refractory in nature through an arsenopyrite association which precludes conventional leaching processes to extract the gold (Bultitude & others, 1997; Garrad & Bultitude, 1999). Known gold and antimony resources in the Atric – Saint George area are listed in Table 5.

KOBI CREEK AND HILDA CREEK (GOLD HILL)

MINING HISTORY

Kobi and Hilda Creeks lie in the headwaters of the Daintree River. I.L. Idriess and party discovered alluvial gold in Morrison (?Hilda) Creek in 1919. Numerous prospecting shafts were excavated in the alluvial terraces and gold nuggets up to 10g in weight were recovered from the wash. Prospecting by other parties in the same general area produced >400g of alluvial gold in 1922 and 100g in 1925 (Lam, 1993).

The Enterprise mine, to the south of Gold Hill (Figure 3), was discovered by B. Dowell in 1926. The area was worked on a small scale from 1926 to 1932, when ~3.5kg gold was produced, half of which came from the Enterprise lode. In 1933, Enterprise Gold Mines Ltd acquired the mine and several nearby prospects and installed a battery. Gold production increased significantly to 4.6kg from treatment of 113t of ore in 1933; 3.8kg gold was produced in 1934. The mine closed in 1935 when the company failed. An extended gold reef claim was taken out 200m north of the Enterprise mine in 1951. The claim was worked briefly in 1952 but no production was recorded (Lam, 1993).

Hand trenching was carried out by prospectors to test alluvium in the upper reaches of Kobi Creek in the vicinity of the Enterprise mine. Gold was recovered from dredging of auriferous wash downstream of the Enterprise lode. Total production from Kobi Creek and its tributaries was ~1.6kg gold (Lam, 1993).

MINERALISATION

Alluvium in Hilda Creek averaged 2m in depth and comprised loose red loam over blue slate clay. Gold was found mainly in the clay, which ranged from 0.3m to 0.6m in thickness (Lam, 1993).

The Enterprise lode comprises narrow gold-bearing quartz veins hosted by the Hodgkinson Formation. The veins crosscut the prominent cleavage in the metasediments. The lode was reputed to be very rich in gold and the average grade of ore mined was 78g/t Au. The deposit is a slate-belt type, with the quartz veins derived from regional metamorphism (Lam, 1993; Bultitude & others, 1997; Garrad & Bultitude, 1999).

The alluvial wash in Kobi Creek was up to 2m deep and covered by 1m of silty alluvium. The gold was coarse-grained and rough textured, often with attached quartz (Lam, 1993).

TREGOORA (MITCHELL RIVER AREA)

MINING HISTORY

Although the Mitchell River orebody (Retina mine) was being worked from 1890, official production records for this deposit only commence in 1905. Production continued at low levels until 1907 when the Mitchell River Gold and Antimony Company Limited constructed a mill with a capacity to treat 40t of auriferous antimony ore per day. The mill was designed to recover both antimony and gold. The extraction process performed well in the laboratory but the venture proved unsuccessful on a larger scale (Garrad, 1993; Garrad & Bultitude, 1999).

Table 6: Lode gold and antimony production, Tregoora (Mitchell River) area (Garrad, 1993)

Mine	Years	Ore (t)	Au bullion (kg)	Stibnite (t)
Hurricane Range		208	14.609	
Retina	1890–1906, 1917, 1941, 1947, 1951–1952, 1970s	4374		122.4

The Mitchell River area has produced about 389t antimony ore/concentrate (including the 1905–07 production from the Saint George area). Maximum production occurred during the price escalation of antimony in the early 1970s (Table 6; Garrad, 1993; Bultitude & others, 1990).

The Tregoora, Retina and Black Knight deposits were being worked by Solomon Mines in the late 1990s for the gold present in the oxide portion of the deposits; antimony concentrates were recovered as a by-product of treatment and stockpiled (Garrad & Bultitude, 1999).

MINERALISATION

Mines in the Tregoora (Mitchell River) area (Figure 3) are located on the Retina Fault, a major shear zone, and related structures. Antimony is also present south-east of these mines, where numerous small deposits of limited economic value occur along the same structure. Small deposits of antimony are also present to the south-west of the Mitchell River mines. These include the Pillidge, Antimony Hill, Jestah and Current Creek Group lodes, as well as the Fence Antimony prospect. These deposits are all structurally controlled and may be related to dilational structures or shear zones that cut the Hodgkinson Formation (Culpeper & others, 1990). A positive correlation exists between pyrite and arsenopyrite content and gold grade (Reisgys, 1986). Mineralogical examination indicates these sulphides are replaced by stibnite (Woodcock, 1958).

The most significant deposit in the Mitchell River area is the Retina lode, where stibnite, with associated gold, is concentrated in several lenses over a strike length of ~350m. The fault gouge associated with the main shear zone (Retina Fault) is the host of the antimony and gold mineralisation (Garrad, 1993). The Retina mine attracted significant attention in the 1970s as a moderate-tonnage low-grade prospect (Bultitude & others, 1997; Garrad & Bultitude, 1999).

The eastern (footwall) margin of the shear zone at the Retina mine is defined by a prominent 150mm thick lens of pale grey, kaolinitic fault gouge. The shear zone is bounded to the east by a zone of intense wall rock alteration. This zone is white, very friable, and consists of euhedral quartz and feldspar grains in a kaolinitic matrix. The country rock was probably a felsic dyke. The mineralised zone extends to the north-north-west (Retina North prospect) and south-south-east (Retina South prospect). It has an overall strike length of ~2km (Garrad, 1993; Bultitude & others, 1997; Garrad & Bultitude, 1999).

East of the Retina Fault and north of the Mitchell River there is a large anomalous gold concentration within a 1.5km wide deformed zone, bounded to the west by the Retina Fault. The main prospect in this zone is the Tregoora deposit (also known as the Black Knight-Rim Fire deposit), which is located within a larger gold-anomalous zone called the Sleeping Giant. Antimony is associated with this large, low-grade gold deposit. The antimony is hosted by quartz and occurs within shears and associated structures. The age of mineralisation is probably early Carboniferous (Garrad, 1993; Bultitude & others, 1997; Garrad & Bultitude, 1999). Known gold and antimony resources in the Tregoora area are listed in Table 7.

Table 7: Gold and antimony resources, Tregoora (Mitchell River) area

Name	Geological estimate	Indicated resource	Inferred resource	Reference
Honey			218 000t at 1.5g/t Au for 327kg Au, at a 1.5g/t Au cut-off	Resource figure from Republic Gold Ltd website, November 2006
Hurricane			230 000t at 0.9g/t Au for 207kg Au, at a cut-off of 0.5g/t Au	Taylor (1997)
Lost Mine	500 000t at 3.0g/t Au for 1500kg Au			Chapple & Gibbes (1989)
Midway			224 000t at 1.4g/t Au for 313kg Au	Resource figure from Republic Gold Ltd website, November 2006
Pillage			133 000t at 2.1g/t Au for 279kg Au	Resource figure from Republic Gold Ltd website, November 2006
Rainbird		40 000t at 1.9g/t Au for 76kg Au	69 000t at 1.4g/t Au for 96kg Au	Resource figure from Republic Gold Ltd website, November 2006
Reedy			886 000t at 1.3g/t Au for 1151kg Au	Republic Gold Limited (2006a)
Retina - antimony	45 000t at 5% Sb for 2250t Sb			Linde (1972)
Retina North - gold	115 000t at 1.46g/t Au for 168kg Au			Chapple & Gibbes (1989)
Sleeping Giant		1 683 000t at 1.6g/t Au for 2692kg Au	504 000t at 1.4g/t Au for 705kg Au	Republic Gold Limited (2009)

HODGKINSON GOLDFIELD

MINING HISTORY

Alluvial and reef gold were discovered in the Hodgkinson Goldfield in 1876 by two separate parties of prospectors. A rush of miners followed and about 2000 men were soon working the meagre alluvial deposits. Many of the men left the field soon after, disillusioned and regarding the field as a 'fizzer' (Garrad, 1993; Garrad & Bultitude, 1999).

Although geologically similar to the Palmer Goldfield, the Hodgkinson field was primarily a lode mining area. The only recorded alluvial production figures are for 1876–1879, when 1088kg gold was won. An additional 120.3kg gold was obtained between 1881 and 1882 (Bultitude & others, 1997). The most recent alluvial mining occurred in 1992, when ~0.33kg gold was mined from a gully draining the Monarch lode (Garrad & Bultitude, 1999).

The Hodgkinson Goldfield (Figures 3 and 5) included the mining centres of Northcote, Minnie Moxham, Beaconsfield, Union, Thornborough, Kingsborough and Woodville and was proclaimed in June 1876. The goldfield was subsequently extended in 1886, and then cancelled in 1909 when the Chillagoe Gold and Mineral Field was proclaimed over the area. Total gold production was of the order of 9.82t, of which no more than 1.3t was alluvial (Dash & Cranfield, 1993).

Crushing machines were quickly brought to the field. The Glen Mowbray machinery site was the first established, with crushing commencing in December 1876. Eight machines were operating on the field within a year of its discovery and another four arrived the following year. By 1877, the township of Kingsborough had a population of 1100 and Thornborough 1000. A network of rough tracks provided access from Cairns, Port Douglas and Smithfield. Alluvial and near-surface lodes were mined at first, and only the larger reefs were being worked past the turn of the century; the principal mines were the Tyrconnel, General Grant and Flying Pig. Peak annual production was 1.257t gold in 1878 at an average grade of 59g/t Au. Despite head grades above 30g/t Au, production declined from 1880 as a result of high costs due to the isolation of the mines. In an effort to conserve money, miners used primitive mining methods (mostly hand shovelling and winding) and scant timbering (Dash & Cranfield, 1993).

By 1882, there were only four mines worked by steam machinery and nine with horse-drawn whips or whims. Expensive milling machinery was brought in but the mill owners charged high milling costs to recoup the investment and running costs. Total gold production up to 1886 was ~5.4t. The advent of company mining in the early 1890s was a dismal failure. The first and longest lasting of these companies was the Tyrconnel Gold Mining Company; it was formed to work the Tyrconnel and Lizzie Redmond reefs. Intensive mining activity continued until around 1897 (Dash & Cranfield, 1993).

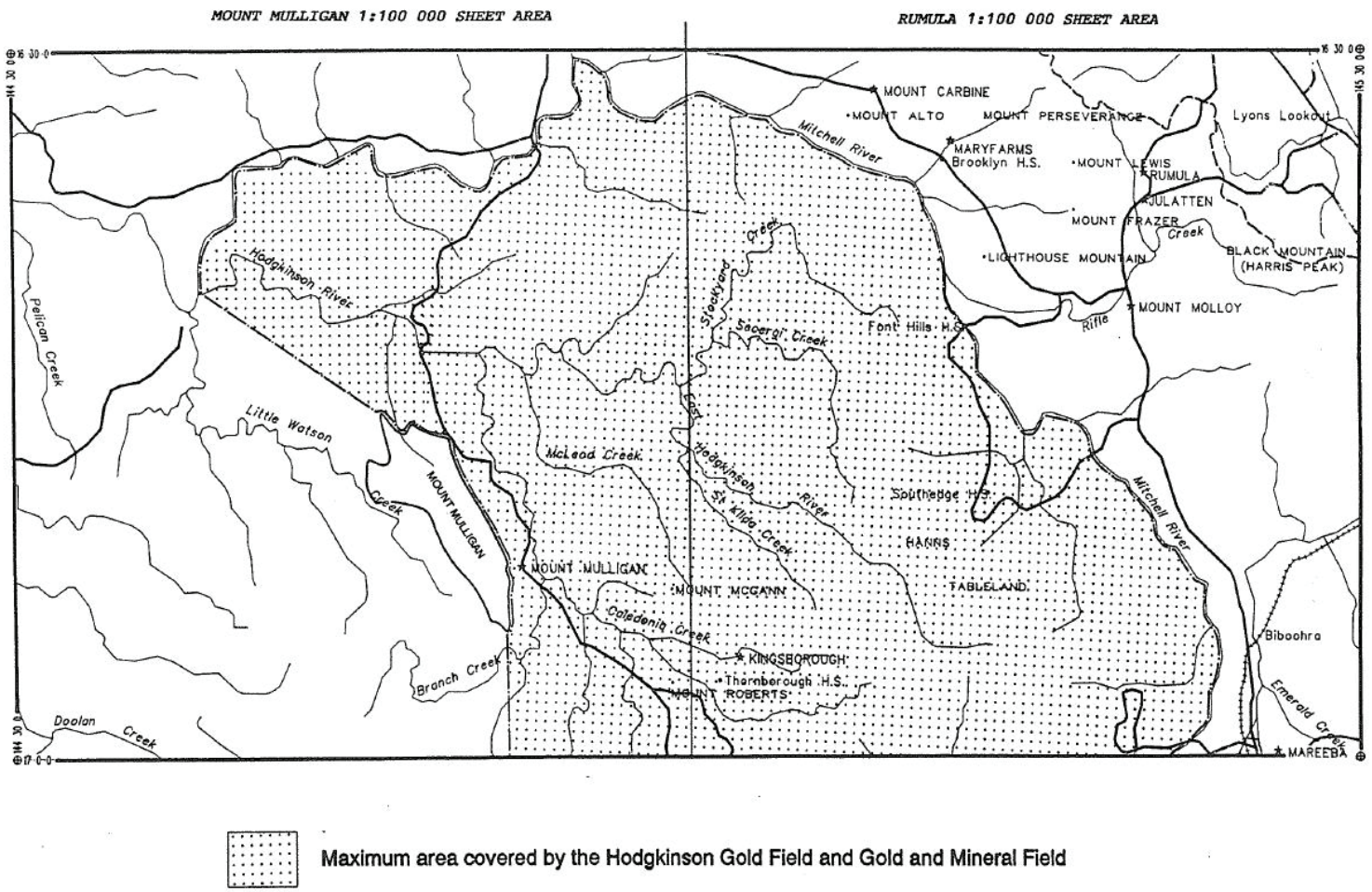

Figure 5: Boundary of the Hodgkinson Goldfield in the Mount Mulligan and Rumula 1:100 000 Sheet areas (Dash & Cranfield, 1993)

Intermittent alluvial and small-scale lode mining operations have occurred since these early boom times (Table 8; Garrad, 1993; Garrad & Bultitude, 1999). Mines in the Thornborough–Kingsborough area produced ~3.82t of gold at grades averaging 37g/t Au (Dash & Cranfield, 1993).

Table 8: Lode gold and antimony production, Thornborough–Woodville area (Garrad, 1993; Dash & Cranfield, 1993)

Mine	Years	Ore (t)	Au bullion (kg)	Stibnite (t)
Albion	1877–1882, 1884, 1886, 1897, 1906	1913	59.038	
Alliance	1877–1881	311	11.717	
Amy Moore	1880	31	0.747	
Aristocrat	1878, 1879, 1895, 1898	185	4.818	
Attila	1876	27	1.151	
Ben Joy	1877-1878, 1898	70.1	2.9	
Bismark	1877–1883, 1885, 1902	220	15.451	
Black Ball	1877–1895, 1932	7301	196.05	
Black Diamond	1880	240	5.109	
Black Prince	1877–1880, 1902, 1911	980	52.26	
Britannia	1877–1882, 1884, 1911	964.5	28.564	
Caledonia	1877–1882, 1884, 1896–1899	2929	104.93	
Cardigan	1877–1880, 1885, 1886	1858	58.366	
Chance	1877, 1878, 1894, 1916, 1932	175	6.817	
City of Brisbane	1877, 1878	37	1.372	
City of Dublin	1877–1879	110	4.271	
Columbia	1877–1885, 1899, 1902, 1909	667	28.418	
Commodore	1877–1883, 1898	1149	45.825	
Comstock	1877–1878, 1934, 1961	51.8	1.376	
Contest	1877–1879, 1899, 1906	197	8.006	
Devon and Cornwall	1877–1881	368	34.145	
Eldorado	1879, 1893, 1895–1897	209	20.356	
Emperor	1877–1880	160	10.647	
Empress of India	1877–1882, 1914	780	63.248	
Eureka	1877, 1879–1882, 1895–1897, 1902, 1910	1000	38.749	
Explorer	1876–1888, 1892, 1896, 1897, 1911, 1932	776	67.093	

Table 8 (continued)

Mine	Years	Ore (t)	Au bullion (kg)	Stibnite (t)
Flying Pig	1876–1886, 1894, 1898, 1909–1912, 1917, 1918, 1931–1939, 1986	4847	254.47	
Forget Me Not	1879, 1880, 1883–1885, 1898, 1899, 1902, 1909	451	31.495	
Fourth of July	1877–1880, 1883–1885, 1895, 1902, 1909, 1910	721	26.03	
Gate Prospect	1877-1878	765.8	71.01	
General Grant	1877–1910, 1932, 1936, 1937, 1941, 1946, 1959, 1982–1987	40674	811	
Glendower	1878–1879	115	3.635	
Good Hope	1883	51	0.6	
Going Home	1880, 1882–1885	576	14.822	
Great Britain	1877–1880, 1886, 1893, 1910, 1935, 1938, 1947–1951, 1961	2593	96.126	
Great Dyke	1877–1879	205	14.5	
Great Northern	1877–1879, 1898	352	14.802	
Gregory	1878–1879	55	1.22	
Gustavus Adolphus	1877–1883, 1885, 1914, 1915	997	38.428	
Henry Grattan	1877, 1878, 1880, 1896, 1898	272	48.968	
Hero	1877–1886, 1890, 1891, 1893, 1895–1899, 1909–1911	1424	61.353	
Heroic	1932	4.75	0.266	
Hilltop		Not recorded		0.5
Homeward Bound	1877–1886, 1892–1905, 1941, 1842, 1946, 1947	6776	244.52	
Honest Lawyer	1877–1883, 1902, 1905, 1911	625	23.834	
Hope	1877–1890	158	8.8	
Idaho	1878–1881, 1883, 1886, 1906, 1910, 1911	257	9.775	
Jackson	1896, 1905–1907, 1915–1916, 1940–1952	1227	0.407	
Lady Ann	1877–1880, 1885	256	8.991	
Lady Catherine	1877–1885	739	33.405	
Laird of the Hills	1877–1879, 1896	84	2.146	
Leviathan	1895, 1946–1947	29.5	0.211	

Table 8 (continued)

Mine		Years	Ore (t)	Au bullion (kg)	Stibnite (t)
Lizzie Redmond		1876–1885, 1895–1902, 1987	2218	92.87	
Macrossan Tower		1877–1879	74	2.932	
Mark Twain		1877–1881, 1885, 1886	2515	111.36	
Mary		1877, 1878	83	4.582	
McLeodsville Group	Admiral Napier	1878–1879, 1886, 1895–1896	294.14	8.474	
	B.B.	1877–1886, 1889–1890	832.6	26.3	
	General Sarsfield	1878	47	1.865	
	Glendower	1878–1879	115	3.767	
	Gregory	1878–1879	55	1.263	
	Inflexible	1878–1881, 1886	145.6	8.8	
	Iron Clad	1877–1881, 1884–1885, 1936	111.5	7	
	Lady Burdett Coutts	1878–1880	94	0.983	
	New Zealand	1878, 1898	128	2.154	
	Pride of the North	1878	19	0.729	
	Rise and Shine	1878	17	0.526	
	Star	1878	11	0.16	
	Sunrise	1878	7	0.11	
	Surprise	1877–1878	55	2.683	
	Swift	1878	5	0.156	
	Three Bells	1878	28	0.684	
	Victoria	1877-1880, 1895, 1898	240	7.203	
	Victory	1877-1883, 1886, 1888, 1896	1809	64	
	Welcome Stranger	1877–1879	586	21.9	
	McLeodsville Group (total)	1877–1936	4359.84	151.55	
Mowbray		1877–1881, 1989–1900	546	33.785	
North Star		1877–1883, 1885, 1896–1905, 1932	1788	46.105	
Outward Bound		1878–1880	303	7.066	
Pioneer		1877–1886, 1898, 1906, 1908, 1909–1911	2607	130.83	
Providence		187–1882, 1885	310	13.595	
Queenslander		1877–1901	1796	76.5	
Queenstown		1877	51	4.658	
Reconstruction		1877–1890, 1896	Not Recorded	100	
Richmond		1932, 1935	12	0.158	
Rob Roy		1877–1884, 1886, 1899, 1900, 1905	2815	97.519	
Royal Sovereign		1878, 1892–1894	224.5	5.76	
Saxby		1878	22	0.33	

Table 8 (continued)

Mine		Years	Ore (t)	Au bullion (kg)	Stibnite (t)
Southern Cross		1877, 1878, 1896, 1902, 1904, 1905, 1907, 1908, 1934, 1948, 1961	455	29.408	
Star of the South		1877–1880, 1906	188	22.671	
Stuartown Group	Band of Freedom	1877–1878	353,5	9.073	
	Chance	1877–1880	257	6.5	
	Crown	1877–1878, 1899–1903, 1905, 1910–1911	260	10.4	
	Lighthouse	1877–1879, 1886–1888, 1894–1895, 1897–1899	1050	32.3	
	Mount Blake	1877–1879, 1895	94.5	5.014	
	Result	1877–1878, 1893	282	7.092	
	Working Miner	1884–1885, 1894–1899, 1901, 1904, 1910–1911	1066	27.6	
	Stuartown Group (total)		3363	97.98	
Sunbeam		1877–1879	65	4.527	
Tasmanian		1877–1883	1910	80.4	
Tichbourne		1877–1882, 1885, 1886	1001	56.86	
Tyrconnel		1876–1914, 1924, 1930–1942, 1946, 1955, 1958, 1978, 1982–1988	50888	1819.3	
Union Group	Catherine	1878	22.8	0.277	
	Challenge	1878	22.8	0.277	
	Exchange	1877–1878	47.8	0.689	
	Geraldine	1877–1882	1091	24.116	
	Great Western	1878	10.7	0.365	
	Hit or Miss	1877–1878, 1884–1886, 1911	209	11.16	
	Homeward Bound	1877–1878, 1884–1905, 1958	1370	36.193	
	Infant	1877, 1895	45	1.383	
	Lady Emily	1877	2.5	0.28	
	Lady Emmeline	1877	20	0.395	
	Lady Francis Hills	1878, 1897, 1899, 1905–1906, 1932, 1938–1939	401.5	12	
	Maid of the Forest	1878–1880, 1894	184	2.322	
	Main Stay	1877–1878, 1900, 1902–1904	199.5	6.417	
	Mount Lilly	1878	21	0.53	
	Mountain	1877	31.5	0.516	
	Never Too Late To Mend	1878	64	1.005	

Table 8 (continued)

Mine		Years	Ore (t)	Au bullion (kg)	Stibnite (t)
Union Group (continued)	North Star	1877–1879, 188401885, 1896, 1898, 1905, 1936–1937	680	11.34	
	Old Jack	1877	3.6	0.101	
	Perseverance	1877–1881, 1901	534	0.011	
	Robin Hood	1878–1881, 1888, 1895–1898	631	13.5	
	Saint Patrick	1878–1879, 1894–1895, 1897–1898, 1902	303	5.83	
	Saint Paul's	1878–1879	27	0.58	
	Sir John Robertson	1878	28	0.277	
	Star of Hope	1877–1878	38	2.337	
	Stranger	1877	8	0.28	
	Tokatea	1878	19	0.286	
	Try Again	1877–1880, 1897	135	3.669	
	Union	1877–1889, 1892–1911, 1921–1922, 1946	22175	650.6	
	Union Jack	1878, 1897	61.5	1.146	
	Wellesley	1877–1878	34	2.018	
	Union Group (total)		28481.2	782.7	
Von Moltke		1877–1880	336	10.989	
Vulcan		1877–1887, 1891, 1893, 1896, 1898, 1900, 1904–1906, 1908, 1910	2393	81.417	
Warrior		1878	30	0.649	
Waterford		1877–1883, 1887, 1889–1893, 1898	215	14.822	
Woodville Group	Captain Cook	1877–1882, 1884–1885, 1894–1895, 1897–1898	1132	43.98	
	Dagworth	1877–1882, 1884–1916	3613.7	144.5	
	Home Rule	1877–1882, 1909-1912, 1914–1916	5376	152.1	
	Rose and Shamrock	1877	19	0.588	
	Saint George	1877–1881, 1896, 1900–1903, 1966	534	62.6	
	Under the Binnacle	1877–1880, 1890	770	21.7	
	William Tell	1877–1888, 1908, 1914	619	20.2	
	Woodville Group (total)		12002.7	422.87	

Jack (1884) reported the value of gold bullion produced in the Kingsborough-Thornborough, Woodville-Victory, Saint George –Home Rule and Great Australian areas (Tables 9, 10, 11 and 12). Reid (1932) reported that gold bullion produced from the Flying Pig mine in the Thornborough area in 1931 and 1932 was valued at £4.76 per ounce; bullion from the Chance mine was valued at £5.15 per ounce.

Peters (1987) noted that the fineness of gold within gold-antimony-quartz veins in the Hodgkinson Goldfield was 900 (based on Jack's bullion figures), as opposed to fineness values of 720–740 for the gold quartz veins.

The Tyrconnel mine was reopened in 1982 by R. Kidd and G. Hicks, who refurbished the Tyrconnel stamper battery and treated dump material for a yield of >24.3kg gold. The Flying Pig mine was reopened at about the same time and produced ~4.62kg gold. Intermittent small scale mining continued until 1985, when exploration intensified during a gold boom. Gold Copper Exploration Ltd developed an open cut mine along the Lizzie Redmond reef from 1987 to 1989. This company also excavated a decline at the Tyrconnel, cleaned out workings at the Great Britain, and commenced widening the Pugo tunnel at the General Grant. Dump material from various mines

Table 9: Value of gold bullion, Kingsborough–Thornborough area (Jack, 1884)

Mine	Years	Value of gold bullion per ounce
Caledonia	1877	~£3 10s
Marl Twain	1876–1877	£3 10s
Lady Mary	1876	£3 3s
Cardigan	1877	£2 11s
Bismarck	1877	£3 9s
Emperor	1877	£3 8s
Lady Ann	1877	£3 10s 6d
Tyrconnel	1877	£2 18s to £3 7s 4d
Commodore	1877	£3 9s 9d
Hero	1877	£3 9s 6d
El Dorado	1877	£3 9s 11d
Honest Lawyer	1877	£3 5s
Fourth of July	1877	£3 8s 8d
Alliance	1877	£3 1s
Empress of India	1877	£2 19s 10d
Cornwall and Devon	1877	£2 12s 11d and £3 1s 10d
Explorer	1877	£3 3s 5d
True Blue	1877	£2 16s 2d
Hope	1877	£3 2s 3d
Chance	1877	£2 13s 11d
Maori Chief	1877	£3 2s 6d
Kingsborough	1877	£3 1s 10d and £3 0s 0d
Ace of Hearts	1877	£3 3s 8d
Birmingham	1877	£2 17s 3d and £2 10s
Finland	1877	£3 7s 2d
Great Britain	1877	£3 2s 10d and £3 5s 10d
General Grant	1877	£3 11s 4d
Mary	1877	£2 13s 6d
Maitland	1877	£3 7s 4d
Mount Pleasant	1877	£3 11s 7d

Table 10: Value of gold bullion, Woodville–Victory area (Jack, 1884)

Mine	Years	Value of gold bullion per ounce
Victoria	1877	£3 17s
Crown	1877	£3 13s 8d
Mount Blake	1877	£3 14s 10d
Chance	1877	£2 13s, £3 9s 7d and £3 13s
Richmond	1877	£3 19s 1d
Geraldine	1877	£3 17s 4d and £3 16s 9d
Union	1877	£3 18s 6d, £3 19s and £3 17s
Infant	1877	£3 18s and £3 16s 4d
Wellesley	1877	£3 16s 6d
Catherine	1877	£3 16s 8d
Flying Jib	1877	£3 13s
Hit or Miss	1877	£3 17s 1d
Mountain	1877	£3 15s 10d
North Star	1877	£3 17s
Old Jack	1877	£3 4s 6d
Perseverance	1877	£3 11s 11d and £3 11s 7d
Spring Gully	1877	£3 16s
Try Again	1877	£3 11s 6d

Table 11: Value of gold bullion, Saint George – Home Rule area (Jack, 1884)

Mine	Years	Value of gold bullion per ounce
Saint George	1877	£3 16s 9d
Home Rule	1877	£3 16s 1d
William Tell	1877	£3 16s 8d
Red Jacket	1877	£3 14s 9d
Ben Joy	1877	£3 17s 6d

Table 12: Value of gold bullion, Great Australian area (Jack, 1884)

Mine	Years	Value of gold bullion per ounce
Just in Time	1877	Averaged £3 10s

was screened and treated along with mined ore to produce 297.7kg of gold bullion. The average grade of the treated ore was 3g/t Au. Mining ceased in 1989 when the company went into liquidation (Dash & Cranfield, 1993).

Mining in the Woodville area commenced as early as 1877, with the first reports of antimony production in 1884. Woodville is estimated to have produced about 1266t of ore (probably containing 2% stibnite), with maximum production during 1906. In 1907, the Jackson mine at Woodville was reported to be working a 0.6m thick lode grading 50% antimony at 20m depth. The annual production for 1906–1907 exceeded that of the Northcote area. During 1915 and 1916 production recommenced in the Woodville area and the owner of the nearby Home Rule battery installed a plant to treat low-grade antimony ores. Production continued at low levels from 1916 to the mid 1960s (Garrad, 1993; Garrad & Bultitude, 1999).

Beaconsfield, also known as ‘Beaconville’, is located in the eastern part of the Hodgkinson Goldfield. The largest mine (the Monarch) was discovered in 1876 by

W.M. Thompson. The first machinery reached the Monarch mine late in October 1877. The area was worked from 1877 to 1900 (Table 13) and subsequently only intermittently (Dash & Cranfield, 1993; Garrad & Bultitude, 1999). Total production from Beaconsfield is 300kg Au (Peters, 1987).

The Moxham brothers discovered gold in several quartz reefs in the Minnie Moxham area soon after the rush to the Hodgkinson Goldfield. The first recorded crushing was in July 1878. Most of the gold was produced between 1878 and 1886 and between 1893 and 1895 (Table 13). Production continued at a slower rate from 1897–1902, from 1911–1940, and from 1949–1950. The total gold production up to 1987 was ~700kg. Jack (1884) reported that bullion produced between 1878 and 1883 was valued at £3 19s 3.75d to £4 0s 1.75d per ounce. There is no discernable variation in the value of the bullion produced over time.

Small amounts of barite have been produced from the Minnie Moxham, together with 0.1t Cu. Although stibnite is a common accessory mineral in the quartz reefs, no antimony production was recorded from this mine. In 1988, Mount Arthur Molybdenum NL constructed a decline to access the old workings at the 69m level and open-cutting commenced to the east and west of the main shaft. A 100 000t per annum carbon-in-leach (CIL) plant incorporating a gravity recovery section was built on site and treated ore until mid-1990. About 110kg of Au bullion was produced in the two year period. The operation was not economic and the company went into liquidation. The mine and plant were placed under care and maintenance and later sold to Nittoc International Co Ltd. The plant was reopened in 1991 to extract gold from ore mined in the nearby Northcote area. Mining ceased in June 1992 and ore processing ceased at the end of July 1992 (Dash & Cranfield, 1993; Garrad & Bultitude, 1999).

Mining of quartz-stibnite-gold reefs in the Northcote area commenced as early as 1877 (Table 13). The first recorded production was from the Emily lode in 1881. In response for a demand for a reduction works, the Northcote Antimony Smelting Company commenced smelting in late 1883 (Wallis, 1993). In 1883, approximately 406t of ore were smelted and, in 1884, 559t. Financial mismanagement and low yields forced the smelter to close by the end of 1884 (Kirkman, 1982).

The town of Northcote existed for no more than ten years — 1877–1887. Smelting recommenced at New Northcote, farther upstream on Leadingham Creek, near the Emily mine, in the 1890s. By 1892, the Emily lode was being worked for gold, while the Ethel lode was the main antimony producer. Production continued in some of the mines up to 1927, most of the production occurring in the period from 1878–1900. Production recommenced briefly between 1940 and 1942. Intermittent production continued at low levels until the late 1960s. Interest in antimony was reawakened in the late 1960s and early 1970s by abnormally high prices. Between 1970 and 1973, Queensland Antimony NL carried out development work at the Tunnel lode and Black Bess mine, and reopened the main Ethel shaft. A crushing and processing plant to extract antimony was planned at New Northcote but never eventuated (Dash & Cranfield, 1993; Garrad & Bultitude, 1999).

Nittoc International Company Ltd carried out open cut mining of gold-stibnite-quartz lodes in the Northcote area from October 1991 to June 1992. The main deposits worked were the Emily, South Emily, East Leadingham, Ethel and Black Bess. The total production from these mines during this period was 383kg of gold bullion from 75 145t of ore, at an average grade of 5.1g/t Au. The ore from these mines was treated in the carbon-in-leach plant at the Minnie Moxham mine, 3km to the north-east. Antimony was not recovered from the ore (Dash & Cranfield, 1993; Bultitude & others, 1997; Garrad & Bultitude, 1999).

Table 13: Lode gold and antimony production, Northcote area (Dash & others, 1991; Garrad, 1993; Dash & Cranfield, 1993)

Mine		Years	Ore (t)	Au bullion (kg)	Stibnite (t)
Australasian		1877–1879, 1898, 1900	261	4.602	
Centennial		1877–1880, 1899	799	46.867	
Downpatrick		1877–1884	92	4.241	
Enterprise		1877–1881, 1894, 1903, 1947	1638	26.203	
Great Australian		1879–1880, 1938–1942, 1946–1948	1389	26.533	
Just-in-Time		1877–1879, 1894, 1916, 1919–1924, 1933, 1935, 1936	3043	131.58	
Maria		1877–1881, 1898, 1899	704	19.046	
Minnie Moxham		1877–1886, 1893–1895, 1913–1940, 1946	Estimated 15250.5	700	
		1989–1990	Estimated 11458	~110	
Monarch		1877–1895, 1893–1901, 1909, 1938, 1992	11400	303.7	
Mountaineer		1877–1881, 1897	1338	94.503	
Northcote Group	Black Bess	1926, 1940, 1941, 1944, 1992	32453	127.368	>8.4
	East Leadingham	1880s, 1991–1992	15968	156.8	
	Emily	1878, 1879, 1891–1895, 1940–1942, 1991–1992	>10857	>57.67	>3.05
	Emily South	1991–1992	11884	44.32	
	Ethel	1892, 1926, 1940–1944, 1947, 1949, 1950, 1991–1992	6433	25.022	>67.6
	Ethel Extended	1948	Not recorded		>1.5
	Jacobsen	1948	1		0.5
	Northcote Group (total)	1877–1927, 1940–1942, 1991	Not recorded	480	2362
You Never can Tell		1877, 1878, 1880	193	7.648	

Total production of antimony metal and concentrates from the Northcote area was approximately 2362t. The area was the largest antimony producer in Queensland, accounting for approximately one third of the State's production (Wallis, 1993).

MINERALISATION

Peters (1987) and Golding & others (1990) recognised two distinct quartz vein associations in the Hodgkinson Formation, namely, gold-quartz veins and gold-antimony-quartz veins. The gold-antimony-quartz veins tend to be located in separate domains from the gold-quartz veins, or on domain boundaries truncating the gold-quartz veins, and are grouped into two main areas — Kingsborough–Woodville and Northcote.

Gold-quartz veins

The gold-quartz veins range from a few centimetres to a maximum of 3m in width and contain only minor amounts of sulphide minerals. A marked coincidence of mine occurrences with the dominant north-west trend of the major and minor faults in the region indicates a structural control on their distribution either parallel or trending at a low angle to these regional shear zones. The presence of mafic volcanics in the Union mine area may have some influence on the presence of mineralisation in this area. Most gold lodes are steeply dipping and cut across the bedding and regional foliation. Kinks in the quartz veins were sites of gold enrichment (Bultitude & others, 1997; Garrad & Bultitude, 1999).

The veins are a complex mixture of gouge and inclusion-rich quartz. The quartz is massive, milky-white and deformed, with abundant laminations, stylolites and clear quartz veinlets. The veins also show evidence of incremental quartz deposition. 'Ribbons' or laminations of dark grey country rock and associated sulphides within the quartz are commonly associated with higher gold grades. These laminations may be concentrated on one side of the quartz reef. Other gold-bearing vein types include massive (buck) quartz, complexly brecciated quartz, and fractured quartz. A footwall quartz-stringer zone is also present in many of the workings (Garrad, 1993; Dash & Cranfield, 1993; Bultitude & others, 1997; Garrad & Bultitude, 1999).

The laminations are thought to have formed from a crack-seal process as defined by Ramsay (1980). Native gold is commonly concentrated in the laminated quartz as specks/blebs along the laminations. Mining therefore tended to focus on the laminated quartz. Minor sulphides associated with the gold include galena, arsenopyrite, pyrite, sphalerite, chalcopyrite and stibnite; minor scheelite occurs in some deposits. Poorly developed sericitic and argillic alteration zones form selvedges, a few centimetres wide, adjacent to the veins (Garrad, 1993; Bultitude & others, 1997; Garrad & Bultitude, 1999).

Gold-antimony-quartz veins

Buck and ribbon quartz, together with local comb quartz, are the main textural types represented in the gold-antimony-quartz veins (Golding & others, 1990). The quartz veins, especially those associated with the higher grade pods of stibnite, tend to be discontinuous, with well-developed pinch and swell structures. Preferential but erratic enrichment is localised in receptive sites, such as dilation zones, tension gashes, cross fractures and shear zones that cut more competent rock types such as massive arenite. The veins are generally steeply dipping and range in length from a few tens of metres to ~4km (Garrad, 1993). Gold fineness in the antimony occurrences of the Hodgkinson Goldfield is higher than in the gold-quartz mineralisation (Peters, 1987).

The antimony is generally discrete from the main gold mineralisation and not associated with melange zones. In general, the massive antimony ore contains little gold, whereas arsenical ore has a significantly higher gold content. In the Mitchell River area, for example, there is generally a positive correlation between pyrite and arsenopyrite contents and gold grades (Reisgys, 1986). Mineralogical studies indicate these sulphides have been commonly replaced by stibnite (Woodcock, 1958). The truncation of gold-bearing quartz veins in places by stibnite-bearing veins also indicates the antimony mineralisation was a later event.

The main mines in the Northcote area were the Flottershow, Lone Hand, Jacobsen, Tunnel, Craigs, Emily, Emily South, East Leadingham, Ethel, Black Bess, Edith and Belfast Hill deposits. These lodes occur in a major north-west-trending structural 'corridor'. The main feature of this corridor is a large, north-west-trending, west-dipping, brittle reverse fault with a slightly oblique sinistral component of movement (McConnel, 1992). Subsidiary structures have a range of orientations from east–west (Craig's Lode) to north–south (Black Bess). The stibnite forms massive pods and lenses in the quartz veins. The quartz veins consist mainly of ribbon and buck varieties, with fragments of country rock on the margins. Minor comb quartz is present locally. Veins characterised by milled breccia textures have been reported by Nittoc International Company (Kinnane, 1985). The veins display mesothermal affinities but grade into veins of more epithermal character. Beneath the oxide zone, gold mineralisation is associated with stibnite, arsenopyrite, and pyrite, and minor chalcopyrite, pyrrhotite, and galena occur in places. Stibnite mineralisation often occurs in later overprinting veins (Garrad & Bultitude, 1999). At the Emily deposit, a rhyodacite dyke cuts the gold mineralisation. This dyke has been brecciated and contains antimony mineralisation, further indicating the stibnite is a late phase (Garrad & Bultitude, 1999).

Paragenesis

The gold-quartz and gold-stibnite-quartz veins are confined to discrete structural zones where they are localised in shears and secondary brittle reactivation zones along axial planes of folds. These discontinuities are associated with larger, commonly regionally significant shear and melange zones that show evidence of multiple

deformation, for example, the Retina, Monarch and Kingsborough Faults (Garrad, 1993; Dash & Cranfield, 1993; Bultitude & others, 1997).

The source of the gold mineralisation is uncertain. It may have been:

- exhaled from submarine volcanic vents and concentrated within nearby mafic volcanics or chert of the Hodgkinson Formation, and remobilised to the present sites
- transported in hydrothermal solutions derived from plutons of the Whypalla Supersuite
- related to emplacement of the Featherbed Volcanic Group and related high-level intrusives
- derived from the devolatilisation of the sediment pile during regional metamorphism and channelled to dilational sites in shear zones (Phillips & Powell, 1992; Garrad, 1993; Dash & Cranfield, 1993; Bultitude & others, 1997; Garrad & Bultitude, 1999).

Studies of the structural, paragenetic, stable isotopic and fluid inclusion characteristics of the gold and gold-stibnite veins support a model involving a post-tectonic mineralising event for the formation of these ores. Some conclusions from these studies are as follows:

- A late Carboniferous (~300Ma) mineralisation age has been obtained from K-Ar isotopic dating of alteration muscovite from gold-quartz veins in the Hodgkinson Goldfield (Morrison, 1988), suggesting mineralisation was contemporaneous with development of the nearby Featherbed Cauldron Complex and emplacement of tin granites in the Herberton – Mount Garnet and Chillagoe minerals fields. Morrison & Beams (1995) reported this age date as 328Ma.
- Fluid inclusion studies by Peters (1987) indicate no evidence of boiling and suggest formation temperatures of 285–335°C, assuming formation depths of 3km. The inclusions have 7–10 wt% NaCl and <1 % CO_2. Data from vein quartz and alteration muscovite both suggest a fluid oxygen composition of 10±2‰.
- Oxygen isotope studies by Golding & others (1990) indicate that the antimony-gold-bearing quartz veins of the Hodgkinson Province are characterised by distinctive, mainly heavier $\delta 0^{18}$ values compared to those obtained from the gold-bearing quartz and barren quartz veins.
    - Oxygen isotopic data do not distinguish barren quartz veins from gold-quartz veins. Samples from Maytown, Stony Creek-Cannibal Creek and the upper Normanby River have similar δO^{18} ranges (14.8–18.3) and median δO^{18} values between 15.9 and 18.0‰. Barren quartz veins that predate the major S_2 deformation generally exhibit the greatest range of δO^{18} values but are not otherwise distinctive. Two gold-quartz samples from the Anglo Saxon and Good Hope mines in the

Groganville area are distinctively lighter, with δO^{18} values of 8.6 and 13.7‰, respectively.

- Stibnite-gold-quartz veins typically have oxygen isotopic compositions several per mil heavier than gold-quartz and barren quartz veins. Samples from the Mitchell River area had a δO^{18} range of 18.1–20.4‰, with a median of 19.0‰. Samples from the Starcke No.2 Goldfield (Cocoa Creek area) had a δO^{18} range of 20.8–22.2‰, with a median of 21.6‰.

- The δD values for water extracted from fluid inclusions in quartz from the Maytown, Stony-Creek-Cannibal Creek and Mitchell River areas range from -89 to -43‰ (200–300°C) and -55 to -25‰ (300–600°C) and do not distinguish between barren and mineralised quartz types. The measured fluid δD values fall mainly within the area of overlap between metamorphic and primary magmatic waters and are not compatible with a significant component of meteoric water in the sampled vein systems (Golding & others, 1990).
- Peters & others (1990) reported that the calculated isotopic composition for the mineralising fluid (δO^{18} = 10±2‰, δD = -100±20‰) overlaps the fields of metamorphic and primary magmatic waters, but its hydrogen isotope composition is much lower than typical metamorphic waters. Similar δO^{18} fluid values have been reported for other syn- to post-deformational gold-quartz vein systems in low-grade metamorphic terranes such as Otago, New Zealand, the Mother Lode, California, and the Victorian and Charters Towers goldfields, Australia.
- The distinctive, typically heavier δO^{18} values of antimony-gold-quartz relative to gold-quartz and barren quartz may reflect a more enriched fluid and/or deposition at a lower temperature from a fluid of similar oxygen isotopic composition (Golding & others, 1990). In either case, the differences support separate flow paths or a distinct and separate source for the antimony-bearing ore fluids. Although distal magmatic fluids cannot be ruled out, it is probable that most gold-quartz and antimony-gold-quartz veins were deposited 'from homogeneous, deeply-sourced fluids generated during regional tectonism and channelled to dilation sites in shear zones'. The stable isotopic characteristics of these mesothermal auriferous fluids mainly reflect extensive fluid-rock interaction either at source or within fluid conduits.
- Peters & others (1990) found that fluid inclusions in quartz are liquid and vapour types and give salinity ranges of 7 to 10 equivalent weight percent NaCl for assimilation-textured quartz and 2 to 8 equivalent weight percent NaCl for buck, ribbon and some secondary quartz veinlets, indicating a slight salinity decrease through time. Some fluids in secondary inclusions and secondary veinlets approach the composition of pure water. CO_2 and other gases are not abundant. Sequential heating and Raman Laser microprobe analyses suggest that CO_2 and other gases may be present in some of the fluid inclusions but in low volumes.
- Peters & others (1990) recorded homogenisation temperatures for 166 fluid inclusions in several quartz types of the Hodgkinson Goldfield. The T_h results

for primary inclusions ranged between 100°C and 369°C. Median T_h for ribbon and buck quartz and some of the secondary quartz veinlets was 205°C. Fluid inclusions from assimilation-textured quartz usually homogenised at higher temperatures from 255–340°C. Below 250°C, T_h ranges in different quartz textures or fluid inclusion types overlapped. The majority of homogenisation temperatures for ribbon and buck quartz are between 170°C and 250°C. Most of the quartz samples were deposited at temperatures between 270°C and 350°C, based on estimated formation pressures of ~1kbar.

- Peters & others (1990) interpreted maximum formation temperatures of 360°C from illite crystallinity indices of 0.26° 2θ for the <2mm fraction of metasediments of the Hodgkinson Goldfield. Temperatures determined from the <2mm fraction of the matrix in clast-in-matrix rocks were about 300°C, also based on the illite crystallinity index (0.33° 2θ). A subgreenschist metamorphic grade for the rocks is likely, which equates to a depth of burial of 5–10km if a geothermal gradient of 35 to 65°C/km is assumed. This depth range would correspond to a pressure range between 1 and 3kbars, assuming a 25bar/km lithostatic gradient.
- Peters & others (1990) concluded that the fluids responsible for the gold-quartz veins were of low salinity and CO_2 poor, with moderate homogenisation temperatures (100–350°C). The range in homogenisation temperature and salinity is in general irrespective of quartz type and timing. The general homogeneity of the fluid inclusion types and data is indicative of a fluid that decreased only slightly in salinity and temperature during vein formation. The stable isotope data are compatible with deposition of the gold-quartz veins from deeply sourced homogeneous fluids generated during the regional tectonism that accompanied Permian–Carboniferous plutonism. Differences in the oxygen isotope composition of the fluids depositing gold-quartz and stibnite-gold-quartz may reflect distinctive flow paths and/or a distinct and separate proximal magmatic source for the antimony-bearing ore fluids.
- Based on overprinting relationships of deformational fabrics with isotopically dated igneous intrusions, Davis & others (2002) postulated that gold mineralisation throughout the Hodgkinson Province was more likely to have occurred contemporaneously with 280–240Ma contraction (Hunter-Bowen Orogeny).
- Based on studies of sulphide paragenesis in the Northcote region, Vos & Bierlein (2006) proposed two episodes of mineralisation related to successive deformation events in the Late Devonian – early Carboniferous and the middle Carboniferous. The first episode is characterised by relatively simple vein-hosted sulphide assemblages consisting of pyrite and arsenopyrite with minor galena, sphalerite and tetrahedrite; intergrown pyrite and arsenopyrite occur disseminated in the host rocks peripheral to zones of quartz veining. This episode is associated with north- to north-west-trending isoclinal folding and thrusting characteristic of regional $hD_{2/3}$ deformation. The second episode is dominated by stibnite pods and lenses with minor arsenopyrite and gold and can be found intermingled with brecciated quartz. This episode occurred contemporaneously with local sinistral shearing and fault reactivation, most probably related to regional hD_4 deformation.

- Vos & Bierlein (2006) distinguished two types of primary fluid inclusions in mineralised quartz from the Northcote deposits. Rare, isolated inclusions range in size from 5–8μm with 3–8vol% vapour; abundant elongated and irregular inclusions range in size from 3–5μm with up to 8vol% vapour. Indicated salinities ranged up to 9wt% NaCl equivalent, with rare inclusions with 9–13wt% NaCl equivalent. Homogenisation temperatures ranged from 108–312°C (average 197±55°C). Pressure correction using a 35°C/km thermobaric gradient suggested minimum fluid trapping temperatures of ~150–400°C, implying fluids were trapped at mesozonal to epizonal crustal levels at pressures between 50 and 150Mpa. The ranges in homogenisation temperatures and salinity were similar for gold-quartz and gold-antimony quartz deposits.
- Vos & Bierlein (2006) concluded that the first episode of gold mineralisation in the Northcote district was associated with metamorphic devolatilisation during orogenesis. The subsequent antimony-rich mineralisation may be genetically related to the initiation of widespread magmatism in the Hodgkinson Province that could have instigated additional metamorphism and provided Sb-rich fluids.
- The $^{40}Ar/^{39}Ar$ dating of sericite associated with gold-bearing quartz veins from the Minnie Moxham deposit produced a mean age of 340.8Ma (early Carboniferous) for the timing of metamorphism associated with mica growth and the earliest phase of gold mineralisation (Vos & others, 2007).
- Based on overprinting relationships of deformational fabrics with isotopically dated igneous intrusions, Davis & others (1996, 2002) proposed that gold-bearing quartz veins in the West Normanby Goldfield and the Hodgkinson Province as a whole were emplaced during the waning stages the main contractional deformation of the Hunter-Bowen Orogeny. They also considered that the close spatial association between syn-deformation Whypalla Supersuite granites and gold mineralisation implies the granites were an integral part of the major gold mineralising event in the Hodgkinson Province during the Early Permian or later, particularly in the West Normanby Goldfield (Bultitude & others, 1997; Garrad & Bultitude, 1999).
- Many of the stibnite-gold-quartz veins are located on domain boundaries that truncate the gold mineralisation. The distribution, therefore, of the antimony-gold-quartz veins implies they postdate the main gold-quartz mineralising event, as postulated by de Keyser & Lucas (1968). Work by Western Mining Corporation and Nittoc International also established that the stibnite mineralisation post-dates the main gold mineralisation (Garrad, 1993; Dash & Cranfield, 1993).

Phillips & Powell (1992) proposed a metamorphic model for the formation of gold-only deposits similar to the Hodgkinson Goldfield. It accounts for all the observations listed above. Their model has the gold scavenged from the country rocks by low salinity, high temperature (>200°C) reducing fluids derived from devolatilisation during regional metamorphism. These fluids are enriched in sulphur (due to the presence of pyrite in the host rocks) and form ideal gold transporters in an Au-S complex. The deposition of the gold is considered to occur at temperatures between 250°C and 400°C and can be due to interaction with Fe-rich country rocks, a drop

in temperature, or lower oxygen activity. The distribution of the fluids is controlled by major shear zones (Garrad, 1993; Bultitude & others, 1997; Garrad & Bultitude, 1999).

This metamorphic model also accounts for the presence of gold enrichment around selvedges of host rock. The fluid interacts with the chlorite (Fe-silicate) present in the wall rock, causing the gold to precipitate. This wall rock is subsequently incorporated in the vein by repeated fluid injection (the crack-seal process). The less common presence of disseminated gold within the vein quartz is due to decreases in fluid temperature (Garrad, 1993; Bultitude & others, 1997; Garrad & Bultitude, 1999).

Resources

Exploration by Western Mining Corporation Ltd in 1985–1991 indicated that the bounding fault (termed the "Eastern Bounding Fault") on the eastern side of the central melange zone (Kingsborough Fault), contains a large, subeconomic gold resource with a grade in the order of 0.5g/t Au. This structure extends ~22km; detailed investigation by WMC delineated the Gate, Homeward Bound, Forget Me Not and South E.B.F. prospects. Lode morphology consists of sericitised and silicified arenite fragments in a matrix of massive to crystalline quartz (Dugdale, 1989). Mineralisation within these prospects occurs as fault-controlled vein systems, silicified arenite fragments in a matrix of massive to crystalline quartz, or disseminated within brecciated host rock and older quartz vein material (Garrad & Bultitude, 1999). Known gold resources in the Thornborough–Woodville area are listed in Table 14. Exploration by Republic Gold Limited since 2004 has led to the delineation of significant gold resources in the Northcote area (Table 15).

Table 14: Gold resources, Thornborough–Woodville area

Name	Geological estimate	Inferred resource	Reference
General Grant	7260t at 12.4g/t Au for 90kg Au		Peters (1987)
Hilltop	20 050t at 1.78g/t Au for 36kg Au		Hegarty (1989b)
Maid of the Forest	17490t at 1.97g/t Au for 34kg Au		Hegarty (1989c)
Pinnacle Creek		420 000t at 1.87g/t Au for 785kg Au.	Blackwattle Gold Limited (1994)
Quartz Top Ridge	12 000t at 1.75g/t Au for 21kg Au.		Hegarty (1989a)
Victory	10 000t at 6.67g/t Au for 67kg Au.		Morrison (1990)

Table 15: Gold and antimony resources, Northcote area

Name	Geological estimate	Measured resource	Indicated resource	Inferred resource	Reference
Belfast Hill		153 000t at 1.4g/t Au and 0.5% Sb for 214kg Au and 765t Sb.	64 000t at 1.1g/t Au and 0.23% Sb for 70kg Au and 147t Sb.	52 000t at 1.1g/t Au and 0.23% Sb for 57kg Au and 119t Sb.	Republic Gold Limited (2005)
Black Bess		274 000t at 2.5g/t Au and 0.32% Sb for 685kg Au and 876t Sb.	312 000t at 2.4g/t Au and 0.4% Sb for 748kg Au and 1248t Sb.	201 000t at 2.2g/t Au and 0.73% Sb for 442kg Au and 1467t Sb.	Republic Gold Limited (2005)
East Leadingham		296 000t at 2.9g/t Au and 0.22% Sb for 858kg Au and 651t Sb.	169 000t at 1.6g/t Au and 0.09% Sb for 270kg Au and 152t Sb.	92 000t at 1.6g/t Au and 0.09% Sb for 147kg Au and 82t Sb.	Republic Gold Limited (2005)
Emily		256 000t at 2.8g/t Au and 0.21% Sb for 716kg Au and 537t Sb.	402 000t at 1.7g/t Au and 0.01% Sb for 683kg Au and 40t Sb.	106 000t at 1.5g/t Au and 0.02% Sb for 159kg Au and 21t Sb.	Republic Gold Limited (2005)
Emily South		92 000t at 2.4g/t Au and 0.06% Sb for 220kg Au and 55t Sb.	80 000t at 2.2g/t Au and 0.02% Sb for 176kg Au and 16t Sb.	50 000t at 2.1g/t Au and 0.03% Sb for 105kg Au and 15t Sb.	Republic Gold Limited (2005)
Ethel		400 000t at 2g/t Au and 0.21% Sb for 800kg Au and 840t Sb.	225 000t at 1.7g/t Au and 0.26% Sb for 382kg Au and 585t Sb.	218 000t at 1.9g/t Au and 0.28% Sb for 414kg Au and 610t Sb.	Republic Gold Limited (2005)
Minnie Moxham	73 000t at 2.94g/t Au for 215kg Au.				From Intierra website (resource dated 1989)
Navan Hill		37 000t at 1.5g/t Au and 0.03% Sb for 55kg Au and 11t Sb.	23 000t at 1.6g/t Au and 0.14% Sb for 36kg Au and 32t Sb.	26 000t at 1.3g/t Au and 0.06% Sb for 33kg Au and 15t Sb.	Republic Gold Limited (2005)
Tunnel Hill		219 000t at 2g/t Au and 0.34% Sb for 438kg Au and 744t Sb.	131 000t at 1.6g/t Au and 0.2% Sb for 209kg Au and 262t Sb.	100 000t at 1.5g/t Au and 0.23% Sb for 150kg Au and 230t Sb.	Republic Gold Limited (2005)

CLOHESY RIVER

MINING HISTORY

The Clohesy River deposits (Figure 3) were first reported in 1891. Most recorded production came during the period 1894–1898, when a 5 stamp battery and 3 berdan (grinding) pans were in operation. Intermittent mining occurred between 1905 and 1951. The most recent attempts to reopen this area were between 1983 and 1990. The total production of the area was at least 40.242kg of Au from 2453t of ore. The main mines were the Waitemata, Black Snake, Black Bear and Hill Top (Table 16). The Golden Mile and Thirty Three Mile Creek were the main alluvial workings. The Waitemata was the largest mine in the Clohesy River area and accounted for about 70% of the total production (Dash & Morwood, 1994; Bultitude & others, 1997; Garrad & Bultitude, 1999).

Table 16: Lode gold production, Clohesy River area (Dash & Morwood, 1994)

Mine	Years	Ore (t)	Au bullion (kg)
Black Snake	1895, 1896, 1935	36	1.022
Waitemata	1894–1898, 1906, 1909–1911, 1934–1936, 1951, 1983–1984	1555.6	26.028

MINERALISATION

Several north-trending, gold-bearing quartz veins cut sedimentary rocks of the Hodgkinson Formation in the Clohesy River area. The main deposit is the Waitemata (Jannie Jan), which comprises one main quartz vein and numerous smaller veins that have not been fully explored. Accessory minerals in the veins are pyrite, chalcopyrite, malachite, arsenopyrite, covellite (in the Black Bear lease area) and bournonite (in the Waitemata mine) (Dash & Morwood, 1994; Bultitude & others, 1997; Garrad & Bultitude, 1999).

The main vein at the Waitemata mine is a shear infilling in phyllitic meta-arenite, meta-greywacke and carbonaceous shale that have not been visibly altered. The vein pinches and swells and, at a depth of 13m in the most recent shaft, it bifurcates. The gold occurs as coarse specks and very coarse slugs, irregularly distributed throughout the vein (average production grade was 18.13g/t Au). Petrology of ore samples from the Waitemata mine by V. Nettle revealed that the bournonite ($CuPbSbS_3$) occurs as fine streaks and clumps, and has a close spatial association with free gold (Dash & Morwood, 1994; Bultitude & others, 1997; Garrad & Bultitude, 1999).

Willmott & others (1988) noted that the Waitemata deposit may be granite-related, as it is in the contact aureole of the Tinaroo Granite, 5km to the east. The deposits in this area also contain more copper than those in the Hodgkinson Goldfield to the north-west (Dash & Morwood, 1994; Bultitude & others, 1997; Garrad & Bultitude, 1999). However, Golding & others (1990) concluded that these veins are derived from metamorphic fluids.

KAMERUNGA AREA

MINING HISTORY

Gold was discovered in the Kamerunga area (Figure 3), 11km west-north-west of Cairns, in May 1931. A payable reef could not be traced at the discovery site but the main vein was discovered soon after. Kamerunga Mines NL produced 307t of ore grading 11.1g/t Au between 1931 to 1935, when a five head stamper battery was on site. The company went into liquidation in 1935 (Dash & Morwood, 1994).

Kamerunga Gold Mines Pty Ltd excavated a decline and installed plant and equipment between 1981 and 1985. In 1984/85, 3500t of vein material and old stope backfill was treated for a return of 6.035kg gold. Total production from the Kamerunga mines was 9.442kg gold from >3800t of ore (Dash & Morwood, 1994).

MINERALISATION

The main vein in the Kamerunga area is a fissure vein up to 2.7m wide and at least 107m long, comprising dense white quartz with a few chlorite inclusions and a little iron staining. The host rocks are mudstone and siltstone interlaminated with very fine- to fine-grained arenite of the Hodgkinson Formation. Pyrite is the only accessory sulphide recorded. The vein pinches and swells and both the hanging and foot walls are sheared (Dash & Morwood, 1994).

MAREEBA GOLDFIELD

MINING HISTORY

The Mareeba Goldfield (Figure 3), 7.2km east-south-east of Mareeba, was opened up in about 1893. Gold production from this area is comparatively small at 332kg. Almost all of this came from the Queen Constance (Dina) deposit, which produced 330.63 kg gold from 23 500t ore in 1893–1905, 1914–1916, 1939 and the 1980s (Dash & others, 1991).

MINERALISATION

Most veins in the Mareeba Goldfield form saddle reefs and are hosted by schistose sediments of the Hodgkinson Formation. At the Queen Constance, auriferous quartz veins cut schistose metasedimentary rocks (Dash & others, 1991; Bultitude & others, 1997; Garrad & Bultitude, 1999).

SILVER JOHN AREA

The Silver John mine (Figure 3), 7.7km north-east of Herberton, produced 2.03t of antimony concentrates from 20t of ore in 1970–1971. The lode is a quartz vein stockwork striking 015° and contains stibnite and pyrite. It is hosted by arenite of the Hodgkinson Formation (Dash & others, 1991).

MISSANT AREA

At the Missant mine (Figure 3), 4.8km south-south-east of Irvinebank, Atherton Antimony NL produced 0.44t of antimony concentrates from 25t of ore in 1970. The quartz lode strikes 075° in quartzite and arenite of the Hodgkinson Formation, close to a contact with granite, and contains stibnite, pyrite and arsenopyrite (Dash & others, 1991).

FRESHWATER CREEK

Alluvial gold has been reported in the headwaters of Freshwater Creek, (Figure 3) several kilometres west of Edmonton. The area was the site of a small alluvial gold rush before 1919 (Bultitude & others, 1997). The Freshwater Creek Diggings were mentioned in 1891 as being almost abandoned, suggesting that alluvial mining occurred some time prior to 1891. Little information is recorded for this area. The gold is probably derived from the erosion of small quartz veins in the Hodgkinson Formation (Garrad & Rees, 1995).

MOUNT PETER PROVISIONAL GOLDFIELD

MINING HISTORY

The Mount Peter Provisional Goldfield is located in Sawmill Pocket, in the ranges behind Edmonton (Figures 3 and 6). Traces of alluvial gold were known to occur in gullies around Mount Peter but prospectors failed to find the source. Peter Petersen, after finding traces of gold in his cultivated paddock, prospected the adjoining hills for the source and discovered the Mount Peter reef in 1913. Other reefs were discovered soon after and the Mount Peter Provisional Goldfield was proclaimed two years later in July 1915. The largest deposit (accounting for one third of the field's total production) and deepest workings occur along the Talisman reef; other reefs include the Mount Peter, Golden Crown and Specimen Hill. Initially, ores won from the various reefs were crushed at a five head battery erected near the Mount Peter mine. With increasing depth, sulphide-rich ores were produced and these were taken to the Chillagoe State Smelters or the Venus battery (Charters Towers) for treatment. The high cost of transportation to distant treatment facilities resulted in only the

Figure 6: Historical goldfields, north-east Queensland

high-grade deposits being economic. High ore processing costs hampered mining operations throughout the history of the field.

Mining occurred in three main periods, namely: 1915–1925, 1931–1943 (the main period of activity), and 1946–1970s. The last phase of mining was dominated by small operations on the historic workings around the Talisman and a new deposit called the Lady Lyn. The total gold production from the field has been reported as 313.734kg from 5890.49t ore from 1915 to 1973 (Garrad & Rees, 1995) but returns

from individual mines indicate a total of 365.706kg of gold bullion from 6659.5t of ore between 1915 and 1987 (Table 17). The average grade of the ore was 54.9g/t Au, reflecting the selective mining of the richer veins and hand sorting of the ore (Garrad & Rees, 1995; Bultitude & others, 1997; Garrad & others, 1999). The gold was of unusually high quality, many mint returns showing better than standard value. Gold bullion produced between 1916 and 1943 averaged £4 14s per ounce in value (Denmead, 1947).

Table 17: Lode gold production, Mount Peter Provisional Goldfield (Garrad & Rees, 1995)

Mine	Years	Ore (t)	Au bullion (kg)
Alpine	1931–1932	75.19	3.275
Easter Monday	1919–1923	52.324	4.833
Golden Bar	1931–1941, 1948–1949	133.9	7.12
Golden Crown	1916–1919, 1930, 1937–1948	577.8	19.792
Lady Lyn	1949–1964, 1987	528.3	31.56
Lucky Wednesday	1931–1942	194	21.354
Mount Peter	1915–1925, 1931–1935, 1942–1950	2115.3	49.499
Mountview	1929–1947	159	11.382
Queen	1941	4.064	0.062
Root, Hog or Die	1924	3.556	0.073
Seaview	1931–1941, 1947	69.8	2.463
Specimen Hill	1915–1924, 1930–1940, 1946, 1957, 1962–1971	1076.9	80.177
Talisman	1915–1924, 1930–1942, 1946–1952, 1959–1971	1662.25	133.8
The Gift	1923	7.112	0.316

MINERALISATION

Three main gold-bearing quartz reef systems have been worked in this goldfield since 1915 — the Talisman, Specimen Hill and Mount Peter. The host rocks consist of quartzite and pelitic schist of the Hodgkinson Formation; a small limestone lens is also located in the goldfield. The reefs have irregular strikes and commonly anastomose. The gold occurs in widely spaced narrow shoots (splay veins) in which it is mainly present as discrete visible specks of high fineness or associated with arsenopyrite. Apart from the Talisman, which maintained its size, the lodes were found to pinch out at depth. The veins are generally narrow and ribbon-textured, with abundant host rock fragments forming the ribbons. The larger veins contain ribbon quartz, stylolites and clear quartz veinlets. These veins also show evidence of incremental quartz deposition. The ribbon texture may form on both margins of the vein or be confined to one side of a larger buck quartz vein. Other types of gold-bearing reef are buck quartz, complexly brecciated quartz, and fractured quartz (Garrad & Rees, 1995; Bultitude & others, 1997; Garrad & Bultitude, 1999).

Arsenopyrite commonly occurs along the ribbons where it partly replaces the host rock fragments. Denmead (1947) also noted the presence of pyrite and chalcopyrite

in restricted narrow bands within quartz veins; galena is also present. The presence of sulphides often indicated higher gold grades. The ribbon quartz is considered to have formed from a crack-seal process as defined by Ramsay (1980). Native gold is commonly associated with the ribbon quartz in which it occurs as specks/blebs along the ribbon surfaces; coarse grained gold also commonly occurs within the massive white quartz. The white, massive quartz generally had a low gold content and mining focused on the ribbon quartz (Garrad & Rees, 1995; Garrad & Bultitude, 1999). The characteristics of the veins and the textures present are consistent with the slate-belt model of vein genesis as defined by Phillips & Powell (1992).

MULGRAVE GOLDFIELD

MINING HISTORY

Alluvial gold was found in the Mulgrave River in October 1879 and the Mulgrave Goldfield (Figures 3 and 6) was proclaimed in July 1880. There were three main centres — Goldsborough (Lower Camp or Fanning Town), Top Camp (Upper Mulgrave) and Kraft Creek (also informally called the Bartle Frere Goldfield). The total recorded gold production for the Goldsborough and Top Camp areas from 1879 to 1942 was 130.012kg of alluvial gold and 76.115kg of gold from auriferous quartz reefs, 60.007kg of which came from 1240.627t of ore (Table 18). The main production of alluvial gold has been from the Swipers Flat area. This area was the site of a small gold rush in 1890. In 1934, the area was worked by sluicing but no production was recorded (Garrad & Rees, 1995; Bultitude & others, 1997; Garrad & Bultitude, 1999).

The Goldsborough (Lower Camp) area is located on the western bank on the Mulgrave River at its junction with Toohey Creek. The Chance group of workings

Table 18: Lode gold production, Mulgrave Goldfield (Garrad & Rees, 1995)

Mine		Years	Ore (t)	Au bullion (kg)
Alice Loeven		1885	59.944	0.246
Blue Peter		1939	2.377	0.063
Goldsborough	Beatrice	1931	10.16	0.247
	Chance	1880–1891, 1923–1931	272.8	27.822
	Crown	1880–1891, 1923–1931	203	12.6
	Golden Crown	1885	78.232	1.337
	Lindo's Claim	1882	40.64	1.169
Top Camp	Lucknow	1882	32.512	1.244
	Mabel	1882	50.8	2.333
	Maid of Mountains	1931	10.922	0.317
	Orient & Mowbray	1883–1897, 1906, 1930–1931	127	3.498
	Scandinavian	1882	53.848	1.648
	Walter Hodgson & Occident	1887–1903	198	4.9
Welcome		1885	13.208	0.311

is located on the largest and richest reef. In 1880, a Cairns syndicate installed the first mining plant on the field, a steam-driven five-head battery called the General Roberts Mill. The Golden Crown Company erected a water-driven five-head battery at Goldsborough in 1885. The Chance mine was worked until 1891, when it was abandoned; the mine reopened in 1922 as the Goldsborough. A five-head battery was erected in 1924 (Garrad & Rees, 1995; Garrad & Bultitude, 1999).

The area referred to as Walter Hodgson or 'Upper Camp' is located ~7km south of Goldsborough, in rugged country between Butcher and Machinery Creeks. This area was first mentioned in the 1881 Annual Report of the Department of Mines and by 1888 the area was being actively mined. The Upper Camp area contains mainly hard rock mines, the Walter Hodgson and Orient-Mowbray being the largest workings. The first battery in the area, a five-head stamper called the Mowbray Mill and later referred to as the Mount Orient battery, was established in 1882. This battery was situated on Toohey Creek below the Orient-Mowbray mine, the ores being transported down the steep rugged slope by a rail bucket system. These operations were abandoned in 1897 because of poor grades. The Walter Hodgson mine, discovered in 1887, was the longest operating mine in the Mulgrave field. The reef was worked via several adits to a depth of 90m (Garrad & Rees, 1995; Bultitude & others, 1997; Garrad & Bultitude, 1999).

Locally, the Kraft Creek area was also called the Bartle Frere Goldfield, although it was not a gazetted goldfield but part of the Mulgrave Goldfield. It was discovered in about 1931 by W. Kraft and S. Wilkie, who traced alluvial gold found in the Mulgrave River upstream to its source. The gold was found to be shedding from quartz reefs located on the northern slopes of Mount Bartle Frere in 1936. The discovery attracted considerable attention, with more than 100 leases being pegged by the middle of 1937 over the ten major reefs and alluvial/eluvial deposits. The inaccessible nature of the area and steep topography hampered mining operations. The total gold production from the area was 16.206kg; recorded production from named mines was 14.042kg Au from 427.807t ore (Table 19). The gold was produced between 1937 and 1942 and represented the only production from the Mulgrave Goldfield for that period.

Table 19: Lode gold production, Bartle Frere Goldfield (Garrad & Rees, 1995)

Mine	Years	Ore (t)	Au bullion (kg)
Dividend	1939–1940	11.5	0.736
Dud	1941–1942	22.089	1.196
Golden Horseshoe	1937–1940	96.5	0.727
Haile Selassie	1938–1940	1	0.0093
Highcroft	1937–1940	39.1	0.814
Key of the Hills	1935–1940	22.35	1.1
Krawil	1935–1940	197.3	6.231
Lascar	1941	20.32	0.622
No Blue and Speculation	1940	53.848	0.933
Reward	1937–1939	27.6	1.248
Ross	1939	2.388	0.26
Stockers	1937–1940	8	0.148
The Raider	1941	16.256	0.963

The main method of mining was by hand-picking quartz floaters from the creeks and hillsides in the area of the original discovery. Initially the ore was packed by horse to Babinda and then forwarded to the Chillagoe State Smelters, a costly exercise, which attests to the rich nature of the ore. In 1939, a five-head battery, two three-stamp batteries, and one single-stamp battery were erected in the area. These had all been abandoned by 1942. The Mount Morgan Development Company investigated two of the most promising reefs (Key of the Hills and Krawil) during 1937 and 1938 by driving adits. The results of this work were disappointing and the area was abandoned by the company (Garrad & Rees, 1995; Bultitude & others, 1997; Garrad & Bultitude, 1999).

MINERALISATION

The gold-bearing quartz reefs mined in the Mulgrave Goldfield are hosted by graphitic schists and meta-arenite of the Hodgkinson Formation. These reefs are both concordant with and cut the dominant foliation. The mineralised quartz veins are consistently associated with graphitic schist. In the Chance and Sheila mines (Goldsborough), the gold-bearing quartz vein occurs along the contact between the graphitic schist and meta-arenite (Garrad & Rees, 1995; Bultitude & others, 1997; Garrad & Bultitude, 1999). Wilkinson (1974) estimated that the Walter Hodgson & Occident lode has a geological resource of 10 000t at 11.5g/t Au for 115kg Au.

The reefs in the goldfield consist of ribbon quartz, commonly with associated massive white crystalline quartz. Host rock selvedges within the ribbon quartz are composed of graphitic schistose material that is commonly replaced by fine pyrite and arsenopyrite. Galena has also been reported. The gold occurs as patches of mostly visible coarse grains associated with these selvedges within the ribbon quartz (Garrad & Rees, 1995; Bultitude & others, 1997; Garrad & Bultitude, 1999).

In summary, the quartz reefs:

- are commonly localised along the boundary between graphitic schist and meta-arenite
- display ribbon textured quartz
- are characterised by graphitic selvedges
- are characterised by rare infill textures in the quartz.

These features indicate that the crack-seal model of ribbon/laminated vein formation (Ramsay, 1980) appears to have operated. The lithological control on some of the reefs suggests the graphitic schist may have influenced auriferous reef formation. The presence of broad bands of massive crystalline quartz displaying infill textures is possibly due to increased hydrostatic pressures generating favourable sites for crystal growth. The veins appear to have formed from metamorphic devolatilisation of the country rock in a similar fashion to the auriferous deposits of the Hodgkinson and Palmer Goldfields (Garrad & Rees, 1995; Bultitude & others, 1997; Garrad & Bultitude, 1999).

The Kraft Creek area also contains gold-bearing quartz reefs hosted by the Hodgkinson Formation. These reefs range from several centimetres to >3m in width. The strike of the reefs parallels pervasive cleavage in the host rocks. The rocks marginal to the veins commonly contain thin quartz stringers but no extensive stockworks have developed (Garrad & Rees, 1995; Garrad & Bultitude, 1999).

The gold occurs in association with sulphides and as discrete visible grains (often coarse-grained). The sulphides, which include pyrite, arsenopyrite, marcasite, galena and sphalerite, form aggregates and disseminated grains within the coarsely crystalline quartz. Most lode mining operations concentrated on the sulphide ore. This was reported to contain the highest grades of 31–186g/t Au. The majority of ore came from quartz floaters up to 1.5m across in Kraft Creek and its steep banks. Most of these boulders could not be traced to a source; consequently their geological setting is not known. Field examination of the sulphide-rich quartz float yielded several samples containing disseminated visible gold associated with sulphide clots in massive crystalline quartz (Garrad & Rees, 1995; Garrad & Bultitude, 1999).

Inspection of the reef exposed in the Krawil workings and descriptions of the other deposits indicate the reefs consist of ribbon quartz with abundant graphitic material. These reefs are similar to those in the Mount Peter, Towalla and Mulgrave areas (Garrad & Rees, 1995). Most of the auriferous quartz boulders examined in Kraft Creek contained few graphitic ribbons and were commonly gossanous, contrasting with the quartz reef exposed in the Krawil workings. The quartz float may be from a discrete source, possibly related in some way to the nearby Bartle Frere Granite (Garrad & Bultitude, 1999).

RUSSELL RIVER GOLDFIELD

MINING HISTORY

The Russell River Goldfield is located at the head of the Russell River, in dense rainforest (Figures 3 and 6). The region was discovered in 1886 by Christie Palmerston and a colleague, Svenson, who decided to investigate the area to the north of the North Johnstone River. On a second visit to the area, Palmerston met Clarke and Joss (an old colleague) who prospected the discovery area but moved into Coopooroo Creek where most of the auriferous deep leads occur (the Boonjie Terraces). News of the discovery prompted a rush of miners in 1887. The goldfield was proclaimed in September 1887. In 1890 two smaller rushes occurred in the field; these were in the Five-Mile and Nine-Mile areas. They were short lived, the deep-lead deposits being of limited extent (Garrad & Rees, 1995; Garrad & Bultitude, 1999).

The field was worked intermittently between 1887 and 1959, producing 680.409kg of alluvial gold and possibly as much as 100t of cassiterite concentrates. Between 1891 and 1901, 586.323kg of gold was extracted. This figure is too low as a result of the practice not to tabulate alluvial production figures in the earliest Annual Reports of the Department of Mines and the lack of regulatory bodies to monitor production.

Dempsey (1980) quoted a figure of 3000kg of gold produced from the Astronomer mine alone (the largest workings on the field), whereas de Keyser (1964) recorded 833kg as the estimated gold production for the entire field (Garrad & Rees, 1995; Bultitude & others, 1997; Garrad & Bultitude, 1999).

The principal method of mining the deep leads was by tunnelling below the basalt capping and following the auriferous wash. This method was eventually replaced by larger-scale sluicing. The water for these operations was channelled to the faces being worked along a total of 64km of races. Faces up to 20m high were worked using this method (Garrad & Rees, 1995; Garrad & Bultitude, 1999).

MINERALISATION

Most deposits in this area are deep leads. The auriferous alluvium occurs in Tertiary valleys and is overlain by up to 60m (average 15m) of basalt. The alluvium appears to occur at different elevations, suggesting a complex system of channels and terraces below the basalt. A possible northern extension of these deposits occurs in the Gadgarra area (~15km to the north), where there are several smaller deep leads (Garrad & Rees, 1995; Bultitude & others, 1997; Garrad & Bultitude, 1999).

The grade of the alluvium varies significantly, with an average of 4.67g Au and 1.78kg Sn per cubic metre (Hughes, 1971); Minute flakes of platinum have also been found in the gold-bearing alluvium in places. The gold is probably derived from weathering of thin, auriferous quartz veins in the underlying Hodgkinson Formation. The presence of gold-bearing reefs in the Towalla area supports this theory (Garrad & Rees, 1995; Bultitude & others, 1997; Garrad & Bultitude, 1999).

The Tertiary drainage was from west to east implying that the most likely source of the cassiterite in the alluvium was erosion of granites in the Malanda-Peeramon area (Garrad & Rees, 1995; Bultitude & others, 1997; Garrad & Bultitude, 1999).

RUSSELL EXTENDED GOLDFIELD (TOWALLA)

MINING HISTORY

The earliest recorded production from this area was in 1889, when 9.5kg of alluvial gold was recovered. The reef gold deposits of the Towalla area were first mentioned in 1892 by the local Mining Warden. The area has also been referred to as the Russell Extended Goldfield (Figures 3 and 6). It was not until 1893, when a gold rush occurred to the area, that the main period of mining commenced. The first claims worked in 1893 were the Coral Queen and the Victory, which used a small, water-driven two-head battery (the Phoenix Mill). By 1894, a three-head battery was on the Towalla King claim and a five-head, water-driven stamper (the New Years Gift Mill) was located in a steep ravine. The later was the only mill operating by 1897. Cartage and crushing costs were ~£3–4 per ton so only the richest stone was worth treating. The rugged, often inaccessible, rainforest-covered region forced most prospectors to

leave by 1898. The creeks and gullies of the area were also worked for alluvial gold. Mining activity had ceased by 1900 (Garrad & Rees, 1995; Bultitude & others, 1997; Garrad & Bultitude, 1999).

After 1907, the area was incorporated into the Russell Goldfield but it lay abandoned until 1941 when the Python mine commenced processing ore from extensive underground operations at Towalla. Operations ceased in 1943 due to a shortage of manpower as a result of World War II. The area was never reopened. The total production is 155.328kg of gold, obtained between 1889 and 1907. Lode mining contributed 137.685kg and alluvial mining produced the remaining 17.663kg (Garrad & Rees, 1995; Bultitude & others, 1997; Garrad & Bultitude, 1999). Known production from named mines totalled 46.664kg from 828.345t ore (Table 20); the remaining 91.022kg of reef Au was from unknown sources.

Table 20: Lode gold production, Russell Extended Goldfield (Garrad & Rees, 1995)

Mine	Years	Ore (t)	Au bullion (kg)
Coral Queen	To 1884	149.8	0.897
Elee	1893	3.048	0.086
King of the Ranges	To 1884	21.3	0.976
Lady Esbensen	1898	4.064	0.249
Lone Hand	1896	71.12	1.113
New Years Gift	1896	14.224	0.428
Phoenix	1892	10.6	0.995
Python	1896, 1941–1943	312.9	9.842
Rose & Shamrock	To 1896	12.2	0.134
Towalla King	To 1894, 1901–1903, 1933, 1938	187	14.944
Water Lily	1896	10.16	0.157

MINERALISATION

The mineralisation in the Towalla area is identical to that in the Mulgrave Goldfield, with the gold localised in heavily stylolitised and ribbon-textured quartz. Pyrite and arsenopyrite are associated with both the graphitic selvedges and the ribbons (Garrad & Rees, 1995; Bultitude & others, 1997; Garrad & Bultitude, 1999).

The largest reefs in the area were the Rose & Shamrock and the Towalla King, which averaged 0.15–0.6m wide. Other reefs averaged <100mm in width and were of limited extent. The quartz reefs were discontinuous in both strike and depth extent (Garrad & Rees, 1995).

EUBENANGEE

The Eubenangee area (Figure 3), 40km east-south-east of Malanda, was first mentioned in 1924 when alluvial gold was found. This discovery was short-lived and the area was abandoned by 1926. A total of 3.389kg gold was produced during this

period. The area was again worked from 1931 to 1937, with operations mainly on several small reefs. These efforts had limited success (Garrad & Rees, 1995; Bultitude & others, 1997).

The gold in the Eubenangee area was from both reef and alluvial deposits. The quartz veins are 0.05–0.15m wide and trend north-east. They are hosted by hornfelsed metasediments of the Hodgkinson Formation and by granite and may be granite-related rather than slate-belt style (Garrad & Rees, 1995).

CULPA DIGGINGS

The Culpa diggings (Figures 3 and 6) are on the Tully River, upstream from Koombooloomba Dam. Mining operations concentrated on gold-bearing alluvial terraces along Culpa Creek. The area was first mentioned in 1894. Total production from 1894 to 1905 was ~30kg of alluvial gold (Garrad & Rees, 1995; Bultitude & others, 1997).

BALCOOMA GOLDFIELD

MINING HISTORY

The Balcooma Goldfield (Figure 3), about 10km east-north-east of The Oasis, was discovered in about 1895, but little is recorded about it apart from Mining Warden's reports from 1895 to 1898. The area had already been worked for alluvial gold. Production between 1895 and 1898 totalled 27.7kg of gold bullion from 591t of ore (Withnall & Grimes, 1995; Withnall & others, 1997a). Total production from the Balcooma Goldfield (1895–1899, 1903, 1906–1912, 1932–1938) was >34.99kg gold bullion, 1.01kg fine gold and 0.42kg silver from >681t of ore. Production figures are not available for individual mines (Barker & others, 1997).

MINERALISATION

Several narrow reefs (~120mm wide) were worked in metadolerite and metasediments of the Balcooma Metavolcanics and alluvial gold was reported from most of the creeks and gullies draining the metadolerite in a 10km long belt (Withnall & Grimes, 1995).

LUCKY CREEK GOLDFIELD

MINING HISTORY

Gold was discovered in the headwaters of Lucky and Dinner Creeks around 1903, but the field was never officially gazetted. From 1903 to 1912, the Lucky Creek Goldfield

(Figure 3) produced a total of 53kg gold from 796t of ore. Peak production in 1907 was 15kg gold from 250t of ore. Two five-head stamper batteries were erected on the field in 1906 and 1908; a cyanide plant was also erected to treat tailings. The field suffered from groundwater problems and a lack of suitable pumping equipment meant that most mines did not extend below the water table. Mining ceased in 1912, when most of the miners rushed to the Oaks Goldfield, and an attempt to revive it in 1932 resulted in very minor production (~1kg gold from 160t of ore). Total production from the field was 54kg of gold bullion between 1903 and 1930 (Table 21; Lam, 1995b; Withnall & others, 1996; Barker & others, 1997; Withnall & others, 1997b).

The Try Again United and the Lucky Surprise were the largest mines. Grades of 150–300g/t Au were mined initially, but with increasing depth the grades diminished to 15g/t Au or less. The average grade was 39g/t Au (Lam, 1995b; Withnall & others, 1996).

Table 21: Lode gold production, Lucky Creek Goldfield (Lam, 1995b)

Mine	Years	Ore (t)	Au bullion (kg)
Aulwary	1906		0.093
Bates & Chamberlain		3.3	0.16
Big Ben	1932	152	0.9
Dreadnought		10.5	0.095
Golden King	1906–1908	18.7	1.01
Grey Jack	1911–1932	114.5	2.65
Grover	1906	13	0.146
Hansen	1906	16	0.205
Havelock	1906-1911	3.5	0.25
Lucky Hit	1906	23	0.53
Lucky Surprise (Steam Engine)	1905–1911	167	11.7
Mint	1907	30.5	3.95
O'Keefe		3.8	0.195
Orient	1908	47	2.0
Perseverance	1906–1911	7.8	0.2
Star	1906	1.1	0.125
Sunburst	1906	9.25	0.28
Sunburst South	1906	3.56	0.03
Try Again United	1905–1908	380	19.5

MINERALISATION

Gold mineralisation in the Lucky Creek Goldfield occurs in quartz veins in a sequence of north striking and steeply dipping rocks of the Lugano Metamorphics and the Eland Metavolcanics of the Cambrian to Ordovician Lucky Creek Metamorphic Group. These rocks are intruded by the Silurian to Devonian Dido Tonalite to the west. The host rocks comprise interbedded biotite gneiss, amphibolite, calcareous chlorite-mica schist and thin marble and pyritic hematite-magnetite metachert with minor disseminated arsenopyrite. Most of the lodes are conformable with the host rocks, although some old pits were sunk on crosscutting quartz-filled shears. The lodes average 1m in width and are lenticular. Quartz veins are white and strongly banded, and some contain pyrite; host rock fragments form laminae along some vein margins (Lam, 1995b; Withnall & others, 1996; Withnall & others, 1997b).

Plutonic Operations arbitrarily divided the old workings into three main zones that were interpreted to occupy different stratigraphic horizons (Rea, 1990):

- In the 200m long by 3-9m wide Steam Engine Zone (including the Lucky Surprise mine), the host rocks are fine-grained amphibolite intruded by diorite within quartz-feldspar-hornblende gneiss. Native gold is intermixed with pyrite and arsenopyrite; chalcopyrite, pyrrhotite, magnetite and tourmaline are common in the host rock. The Steam Engine Zone has an indicated mineral resource of 280 000t at 2.5g/t Au to a depth of 50m Au (Rea, 1990).
- The Southern Zone (Try Again United mine) has mainly quartz-feldspar-biotite-hornblende gneiss host rocks and a shorter strike length than the Steam Engine Zone. Drilling indicated that gold mineralisation is confined to a 1m wide zone with grades of 0.30–2.70g/t Au.
- Mineralisation in the Eastern Zone is associated with carbonate-rich sericite schist within a unit of chlorite-carbonate schist and feldspar-chlorite gneiss. A sample of banded chert with boxworks after pyrite assayed 3.23g/t Au (Withnall & others, 1996; Withnall & others, 1997b).

Auriferous alluvium in the Lucky Creek area is restricted to active stream channels because the topography does not favour development of extensive or deep alluvium in the creek or valley floors (Withnall & others, 1996).

AMANDA BEL (CAMEL CREEK) GOLDFIELD

MINING HISTORY

The Mount Dora antimony deposit, just west of the Kangaroo Hills Mineral Field in the eastern part of the region, was discovered around 1893. Minor production, totalling 15.6t of antimony ore occurred in 1907 and 1955 (Withnall & others, 1997a).

In 1987, a prospector discovered gold-bearing, shear-hosted veins (the Camel Creek Prospect) in the Camel Creek area. Golden Ant Mining Ltd was formed to explore this deposit and 30 others, which lay in a new gold province, the Amanda Bel Goldfield (Figure 3; Morwood & Dash, 1996; Teale & others, 1989).

Eleven of these gold occurrences were subsequently mined. Golden Ant Mining Ltd commenced production from the Golden Ant line of mineralisation in 1989 at what is now known as the Camel Creek mine, at an annual rate of 500 000t with a recovered grade of 1.92g/t Au. Other deposits in the group that were mined were AP Gold, Beatrice, Black Bull, Dora Creek, Dead Horse, Helens, Jacko (Mount Dora), Golden Cup, Red Gold and Spartan (Table 22). Mining of the oxide ore ended in 1994 and total production was about 2962.693kg of gold (Morwood & Dash, 1996; Withnall & others, 1997a). SMC Resources Ltd produced 90kg of gold bullion from 15 000t of ore from the Blue Gold open cut in 1999 (Barker & others, 1997).

Table 22: Lode gold production, Amanda Bel Goldfield (Morwood & Dash, 1996; Barker & others, 1997)

Mine	Years	Ore (t)	Au bullion (kg)
AP Gold	1989–1993		200
Beatrice	1991–1994	27 335	36.629
Black Bull	1991–1994	73 471	130.778
Blue Gold	1999	15 000	90
Camel Creek (Golden Ant)	1989–1994	1 059 696	1780.289
Dead Horse	1991–1994	13 402	27.34
Dora Creek	1991–1994	13 958	16.749
Golden Cup	1990–1996	209 066	529.519
Mount Dora (Jacko)	1907–1955, 1991–1994	34 566	84.687
Red Gold	1991–1994	88 070	264.21
Spartan	1991-1994	16 275	26.528

MINERALISATION

About forty gold deposits (mostly subeconomic) have been discovered as veins in shear zones (possibly melanges) in strongly folded sediments of the late Silurian to Early Devonian Kangaroo Hills Formation in the Amanda Bel Goldfield. Teale & others (1989) described a variety of styles of gold deposits associated with three episodes of mineralisation — syn-ccD_1, syn-ccD_2 and post-ccD_2/ccD_3. Most of the deposits are similar to the Hodgkinson Province slate belt deposits and were considered by Tate & others (1990) to be of probable 'shallow metamorphic' origin, because of the apparent lack of intrusives during ccD_1 and ccD_2. The exception is the post-ccD_2/ccD_3 mineralisation which, on the basis of the concentric zoning of elements and similarities with porphyry-hosted mineralisation elsewhere in the Broken River Province, was considered by Tate & others (1990) to have formed during intrusive emplacement (Morwood & Dash, 1996; Withnall & others, 1997a).

The deposits in the Amanda Bel field have a very subtle surface expression due to the marked lack of quartz, particularly compared to other, better known slate belt type deposits. This is probably the reason why these deposits remained undiscovered until 1987 (Morwood & Dash, 1996).

The most significant deposit is the Golden Ant, which was worked as the Camel Creek mine. The syn-D_1 mineralisation consists of lenses of quartz veins up to one metre thick carrying stibnite and minor pyrite, sphalerite, boulangerite and gold. The D_1 mineralisation commonly occurs in the hinges of D_1 folds in carbonaceous shales with a high Au-Sb-Ag background. Wall rock alteration consists of quartz, sericite, ankerite and chlorite along vein margins. Syn-D_2 mineralisation usually consists of groups of narrow quartz veins and stockworks and is best developed where the shear zones overprint D_1 quartz lenses. The D_2 veins contain arsenopyrite with minor pyrite, chalcopyrite and sphalerite. Post-D_2/D_3 mineralisation consists of open-space fill textured quartz veins in brittle sandstone. Discrete quartz veins and stibnite veins generally carry less than 0.5ppm Au. However, where the quartz veins overprint the stibnite veins, grades of up to 22ppm Au have been obtained (Morwood & Dash, 1996; Withnall & others, 1997a).

Antimony mineralisation is widely distributed with low-grade gold mineralisation in the Amanda Bel Goldfield (Teale & others, 1989). Antimony mineralisation is also sporadically distributed throughout the Graveyard Creek Subprovince. The deposits consist of narrow, isolated lodes apparently related to regional north-east-striking faults. They occur as *en echelon* or discontinuous, subparallel, dilation fissure veins crosscutting sedimentary rocks of the Graveyard Creek Group, Broken River Group and Clarke River Group. Most of the lodes strike north-north-west to north and are steeply dipping. They crop out for a few metres to several tens of metres, and are generally <0.3m wide. Apart from narrow zones of clay alteration in host rocks along vein margins, no other alteration has been recognised. The ore consists of buck, ribbon and comb quartz, with multiple, anastomosing stibnite veinlets and pods surrounded by secondary cervantite, valentinite and stibiconite. Traces of gold are present. Tate & others (1990) suggested a metamorphic fluid source as for the Amanda Bel deposits, although a distant igneous source such as the Montgomery Range Igneous Complex could also be the source of the fluids, or at least the heat source for the deposits in the Graveyard Creek Subprovince (Withnall & others, 1997a).

Tate & others (1990) noted that worldwide, Au-Sb-As deposits consistently occur in slate belt settings. The Broken River Province has many features in common with such slate belts. However, a feature of most of the gold occurrences in the Broken River Province noted by Tate and others is the dominance of fine comb and saccharoidal quartz in fissure veins, rather than the buck, stylolite and spider veinlet textures typical of slate-belt occurrences elsewhere. Tate and others interpreted this as indicating that the veins formed at a shallower crustal level than typical slate-belt deposits (Withnall & others, 1997a).

Tate & others (1990) favour a metamorphic origin for the fluids that produced gold-antimony mineralisation at Camel Creek. Their overall model is that the fluids were derived from moderate to deep-level crustal processes, particularly during metamorphic dewatering during the main north-east-trending folding. This fluid leaked to shallow crustal levels in the Carboniferous and was focussed along deep-seated structures. These structures also were a locus for the emplacement of rhyolite intrusions that also established their own hydrothermal systems by heating circulating groundwaters. Input from the deeper seated fluids or scavenging from country rocks that may already have contained Au-Sb-As mineralisation gave rise to deposits in the porphyry and epithermal environments (Withnall & others, 1997a).

Vos & others (2005) described two main stages of gold mineralisation in the Amanda Bel field, distinguished by the coarse-grained versus invisible nature of gold particles and their association with particular sulphide phases. A third stage of gold deposition was attributed to introduction of antimony±gold-rich ore fluids. Fluid inclusions recorded minimum trapping temperatures of 140–380°C and salinities of up to 6.5wt% NaCl equivalent for the two main gold-forming stages. Fluids were slightly more saline in the first of the two main stages and the veins formed at higher temperatures.

- Syn-D_1 mineralisation (Early Devonian) occurred primarily as fold repetitions of quartz-stibnite-carbonate-arsenopyrite lenses and boudin necks in

auriferous, commonly quartz-veined, arsenopyrite-rich carbonaceous shales. Stibnite-rich domains in the lenses and boudins can contain some gold, pyrite, sphalerite, boulangerite, allemontite, aurostibite and native antimony. Gold was introduced late in the mineralising episode and comprises minute free gold grains that are mostly associated with stibnite; minor gold occurs in solid solution within arsenopyrite and arsenical pyrite.

- D_2 gold-arsenopyrite-pyrite mineralisation (Late Devonian) comprises boudinaged quartz veins and stockworks that parallel north-east-trending F_2 axial planes in sheared, carbonaceous shales. Gold can be found mostly in solid solution within arsenopyrite. No free gold or stibnite was observed in samples associated with this mineralisation phase.

- Minor D_3 mineralisation (mid- to late Carboniferous) is associated with numerous generations of breccia veins and injection of silica-Au-As-rich fluids along north-west-trending fault zones. Antimony is the dominant phase of this mineralising episode and very little arsenopyrite or pyrite has been found. Discrete stibnite pods and lenses in quartz veins formed late in the paragenetic history and may contain some gold. Textures indicate shallow formation levels.

Vos & others (2005) distinguished two types of fluid inclusions in vein quartz from the Amanda Bel field:

Rare isolated inclusions ranging from 5 to 10µm contain 3–8vol% vapour. Fluid salinities range from 0.4 to 6.0wt% NaCl equivalent. Homogenisation temperatures range from 164 to 376°C.

Abundant elongated and irregular inclusions ranging from 3 to 5µm contain 2–5vol% vapour. Fluid salinities range from 0.0 to 6.5wt% NaCl equivalent. Homogenisation temperatures range from 116 to 297°C.

After pressure correction using a 35°C/km thermobaric gradient, calculated minimum fluid-trapping temperatures are 180–380°C, implying that fluids were trapped at rather shallow crustal levels at pressures between 50 and 100MPa. Furthermore, salinities and homogenisation temperatures for fluids associated with D_1 mineralisation are slightly higher than those associated with D_2 mineralisation. CO_2 concentrations are very small (<<5vol%)(Vos & others, 2005).

$^{40}Ar/^{39}Ar$ dating of sericite associated with gold-bearing quartz veins from the Airport deposit by Vos & others (2007) produced a mean age of 342.6Ma (early Carboniferous) for hydrothermal alteration associated with the late antimony-rich mineralising episode of Vos & others (2005).

Table 23 lists known remaining mineral resources in the goldfield.

Table 23: Gold and antimony resources, Amanda Bel Goldfield

Name	Geological estimate	Inferred resource	Reference	Comments
DP	1500t at 2g/t Au for 3kg Au		Forrest & Plumridge (1990)	
Far Ant	3000t at 1.27g/t Au for 4kg Au		Forrest & Plumridge (1990)	
Golden Cup		44 475t at 9.42g/t Au for 419kg Au	Robertson & Fielding (1998)	Resources extending beneath existing Pits 1 and 3

PAULS KNOB – GOLD HILL AREA

MINING HISTORY

Alluvial mining in the Gold Hill area (Figure 3) in 1960 to 1995 produced 0.375kg gold (Withnall & others, 1996).

MINERALISATION

A small alluvial gold occurrence near Gold Hill, south-east of Lucky Springs Homestead and adjacent to Gray Creek, can be traced back to auriferous quartz stringers in serpentinite and silicified serpentinite of the Gray Creek Complex (Lam, 1995b; Withnall & others, 1996; Withnall & others, 1997a).

The Gold Hill gold deposit is associated with a belt of north-trending serpentinite intruded along the Gray Creek Fault System. The belt extends south, from east of Gray Creek to the headwaters of Spring Creek at the Discovery gold deposit. Gold mineralisation is apparently associated with quartz in carbonate alteration zones in the serpentinite. The Discovery prospect consists of a large structurally controlled talc alteration zone in serpentinite. Gold mineralisation occurs in stockwork quartz veins trending south-east, obliquely cutting across a north-east-trending fault (Lam, 1995b; Withnall & others, 1997a).

MOUNT PICKLEBOTTLE AREA

Several small gold prospects are associated with north-north-east striking faults in the Perry Creek and Greenvale Formations in the Mount Picklebottle area (Figure 3). They have been discovered since the late 1980s by companies using BCL stream sediment sampling. They include the Ridge, Mount Picklebottle and Gossan Ridge prospects. At Mount Picklebottle, the veins are related spatially and temporally to rhyolitic intrusives (Tate & others, 1990). Minor gold mineralisation occurs in stockwork quartz veins in breccia. The average grade is <1g/t Au. These veins are up to 3m wide and consist of epithermal quartz carrying minor pyrite, arsenopyrite

and milled sedimentary rock clasts. Antimony is distinctly absent, in contrast to the Amanda Bel Goldfield to the north-east. Wall rock alteration consists predominantly of silicification and quartz veining (Withnall & others, 1996; Withnall & others, 1997a).

Several anomalous zones in the Venetia Formation have also been investigated at Storm Hill and Spencer's Ridge near Gill Creek in the Clarke River Basin. Assays of up to 3.4g/t Au were obtained at Storm Hill in a zone of silicification and stockwork quartz veining. Percussion drilling encountered no major mineralised zone. At Spencer's Ridge, a series of narrow antimony-bearing quartz breccia veins assayed up to 3.24g/t Au. They carry sulphide minerals (stibnite, arsenopyrite, pyrite and sphalerite) in both clasts and matrix (Withnall & others, 1996; Withnall & others, 1997a).

BROKEN RIVER AREA

MINING HISTORY

Alluvial gold was mined around the 1870s near the Broken River at Nuggety Gully and Diggers and Gorge Creeks, although there is no record of the production. Nuggety Gully and Diggers Creek produced 0.61kg gold in the 1930s (Lam, 1995b; Withnall & others, 1996).

Small antimony deposits in fissure veins were discovered about 1890 near the Broken River and Pandanus Creek. In 1911, the Phar Lap lode was discovered south of the Broken River. Veins in this area were mined spasmodically between 1936 and 1970, producing about 82t of ore averaging 58% Sb, mainly from the Phar Lap, Dosey Creek and Shield Creek deposits (Table 24; Lam, 1995b; Withnall & others, 1996; Withnall & others, 1997b).

The Big Rush gold deposit was discovered by Shell Company of Australia in the Gorge Creek area in the late 1980s (Lam, 1995b). Werrie Gold Ltd commenced mining the deposit in 1995, and reported a reserve of 915 000t of oxidised ore at 2.1g/t Au and a resource of 2Mt at 1.5g/t Au. Mining was completed in 1997 (Withnall & others, 1997a).

Table 24: Lode gold and antimony production, Broken River area (Lam, 1995b)

Mine	Years	Ore (t)	Au bullion (kg)	Stibnite (t)
Big Rush	1995–1997	987 000	1008.8	
Dosey Creek	1935–1944			24
Fred's Hope	1940–1970			30
Janelle's Hope	1952			4.3
Lofty	1940–1970			30
Phar Lap	1939	20	0.12	

MINERALISATION

Alluvial gold in the Broken River area (Figure 3) is concentrated in placer deposits in Recent and Tertiary alluvium. Some of the gold deposits in Recent alluvium may have been derived from reworked Tertiary wash. Remnants of Tertiary wash extend over a large area in the Diggers Creek catchment, but the wash is generally shallow (<0.3m deep), with an average grade of 0.75g/t Au. Extensive 'bulk testing' for alluvial gold in 1987–88 confirmed that grades of 0.20g/t Au occur in Recent alluvium in the Broken River. Most of the gold grains have a fineness of >970. Exploration indicated that the Tertiary wash occurs over a large area on the northern side of the Broken River. The wash is generally shallow but rich patches with higher grades are confined to isolated pockets. The better deposits were probably removed by the 'bulk testing', but the actual production was not recorded. South of the Broken River, auriferous Tertiary wash may exist under the cover of extensive basalt flows (Withnall & others, 1996; Withnall & others, 1997a).

Lode gold deposits comprise structurally controlled narrow quartz veins associated with semi-ductile to semi-brittle zones near major fault systems. The veins mainly consist of quartz, with minor laminae of wall rock inclusions along vein margins and low sulphide content. Wall rock alteration in the sedimentary host rocks is subtle and generally extends less than a few centimetres from the veins (Withnall & others, 1997a).

The Jessey Springs – Lockup Well Fault system trends north-east and is spatially associated with several economic to subeconomic deposits. The Big Rush deposit lies adjacent to the fault system on the eastern limb of the Rockfields Syncline. Gold, minor amounts of pyrite and arsenopyrite, and traces of chalcopyrite, sphalerite, galena and tetrahedrite are associated with shear-related quartz-carbonate veins in the Myrton Formation of the Broken River Group. Large quartz blows and auriferous veins up to several metres wide (some interpreted as saddle reefs) have developed in hinge areas of small synclinal and anticlinal folds. However, the bulk of the gold mineralisation at Big Rush occurs in zones of stockwork veining in meta-arenites. The host rocks are carbonaceous and dolomitic sulphide-bearing shale, siltstone and sandstone with mild silicification and sericitisation. Oxidation is >50m deep in the host rocks. Gold mineralisation at Big Rush is associated with strongly anomalous As (often >1000ppm) and elevated Sb (12–150ppm, based on several analyses).

The reserve at Big Rush before mining commenced was 880 000t at 2.09g/t Au, at a cut-off grade of 0.5g/t Au (Cock, 1995). The Yellow Jack deposit contains a remaining indicated resource of 490 000t at 1.86g/t Au for 911kg Au and an inferred resource of 314 000t at 0.67g/t Au for 210kg Au (Hewitt, 1998).

The subeconomic Sedhost deposit lies within the Lockup Well Fault zone, a northern extension of the Jessey Springs Fault. Gold mineralisation occurs in stockwork comb quartz veins associated with shear zones trending 030° in sandstone, and in sericite altered, quartz-veined siltstone. The veins are deformed and are poddy, discontinuous and brecciated (Lam, 1995b; Withnall & others, 1996; Withnall & others, 1997a).

The small Phar Lap deposit lies to the east of the Jessey Springs Fault, in an area of intensely folded and faulted sedimentary rocks of the Broken River Group. It occurs at the intersection of several lineaments (dominated by one striking 120°). Gold-antimony mineralisation is associated with quartz breccia veins in the Papillio Mudstone near the boundary of the Dosey Limestone. The Phar Lap and other nearby Au-Sb deposits comprise *en echelon* or discontinuous, subparallel, dilatent fissure veins crosscutting sedimentary rocks of the Graveyard Creek and Broken River Groups. Most of the lodes strike north-north-west to north and are steeply dipping. The ore consists of buck, ribbon and comb quartz, with multiple, anastomosing stibnite veinlets and pods surrounded by secondary mineralisation. Traces of gold are present. They may be of metamorphic origin (Lam, 1995b; Withnall & others, 1996; Withnall & others, 1997a).

Other anomalous areas in the Broken River area that have been investigated by companies in recent years include the Nuggety Gully, Wally, Drizzle, Beccy and Janelle's Hope prospects. Most consist of minor quartz veins and stockworks in siliciclastic sedimentary rocks. Antimony-quartz lodes with anomalous gold occur at the Janelle's Hope prospect (Lam, 1995b; Withnall & others, 1996; Withnall & others, 1997a).

Tate & others (1990) noted that, worldwide, Au-Sb-As deposits consistently occur in slate belt settings. The Broken River Province has many features in common with such slate belts. However, a feature of most of the gold occurrences in the Broken River Province noted by Tate and others is the dominance of fine comb and saccharoidal quartz in fissure veins, rather than the buck, stylolite and spider veinlet textures typical of slate-belt occurrences elsewhere. Tate and others interpreted this as indicating that the veins formed at a shallower crustal level than typical slate-belt deposits (Withnall & others, 1997a).

Tate & others (1990) favoured a metamorphic origin for the fluids that produced gold-antimony mineralisation at the Phar Lap and other deposits in the Graveyard Creek Subprovince. Their overall model is that the fluids were derived from moderate to deep-level crustal processes, particularly during metamorphic dewatering during the main north-east-trending folding. This fluid leaked to shallow crustal levels in the Carboniferous and was focussed along deep-seated structures. These structures also were a locus for the emplacement of rhyolite intrusions that also established their own hydrothermal systems by heating circulating groundwaters. Input from the deeper seated fluids or scavenging from country rocks that may already have contained Au-Sb-As mineralisation gave rise to deposits in the porphyry and epithermal environment (Withnall & others, 1997a).

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APPENDIX 1

LOCATIONS OF RECORDED OROGENIC GOLD±ANTIMONY MINES [FROM MINOCC]

Appendix 1: Locations of recorded orogenic gold±antimony mines [from MinOcc]

SITE_NO	NAME	STYLE	MGA_ZONE	EAST94	NORTH94	MINE STATUS	DEPOSIT SIZE (Au, t)	COMMODITIES
41121	ALBION	Orogenic lode gold veins	55	212396	8224399	ABANDONED MINE	<0.5	AU
43639	ALBION	Orogenic lode gold veins	55	288514	8129450	ABANDONED MINE	<0.5	AU AG
41122	ALEXANDRA	Orogenic lode gold veins	55	213156	8218269	ABANDONED MINE	<0.5	AU
41123	ALLIANCE	Orogenic lode gold veins	55	211416	8226469	ABANDONED MINE	<0.5	AU
43640	ALLIANCE	Orogenic lode gold veins	55	290054	8125930	ABANDONED MINE	<0.5	AU AG
45151	ALPINE	Orogenic lode gold veins	55	366390	8109722	ABANDONED MINE	<0.5	AU AG
482262	AMANDA BEL GROUP	Gold-antimony, antimony-gold and antimony veins	55	348005	7917865	ABANDONED MINE	0.5-5	AU SB AG
43641	AMY MOORE	Orogenic lode gold veins	55	288984	8129140	ABANDONED MINE	<0.5	AU AG
41124	ANGLO AUSTRALIAN	Orogenic lode gold veins	55	214315	8183669	ABANDONED MINE	<0.5	AU
41125	ANGLO SAXON	Orogenic lode gold veins	55	214915	8185369	ABANDONED MINE	0.5-5	AU
482263	ANNABELLE	Gold-antimony, antimony-gold and antimony veins	55	340715	7906870	MINERAL OCCURRENCE	<0.5	AU SB
482264	ANNABELLE NORTH	Gold-antimony, antimony-gold and antimony veins	55	341095	7907770	MINERAL OCCURRENCE	<0.5	AU SB
41127	ANTI-CLIQUE	Orogenic lode gold veins	55	211296	8226509	ABANDONED MINE	<0.5	AU
37762	ANTIMONY HILL	Gold-antimony, antimony-gold and antimony veins	55	222015	8162469	ABANDONED MINE	<0.5	SB
40352	AP GOLD	Orogenic lode gold veins	55	361595	7912870	ABANDONED MINE	<0.5	AU
43642	ARISTOCRAT	Orogenic lode gold veins	55	288834	8129330	ABANDONED MINE	<0.5	AU AG
43643	ARORA	Orogenic lode gold veins	55	303164	8131570	ABANDONED MINE	<0.5	AU AG
43644	ARORA NORTH	Orogenic lode gold veins	55	301614	8131970	ABANDONED MINE	<0.5	AU AG
43645	ARSENIC PIT	Orogenic lode gold veins	55	302114	8132520	ABANDONED MINE	<0.5	AU AS
493628	ATRIC	Gold-antimony, antimony-gold and antimony veins	55	218488	8172078	MINERAL OCCURRENCE	0.5-5	AU SB
43646	ATTILA	Orogenic lode gold veins	55	287564	8128830	ABANDONED MINE	<0.5	AU AG
43647	AUSTRALASIAN	Orogenic lode gold veins	55	305474	8120130	ABANDONED MINE	<0.5	AU AG
41666	B.B.	Orogenic lode gold veins	55	283964	8139420	ABANDONED MINE	<0.5	AU
44872	BAAL GAMMON	Orogenic lode gold veins	55	215976	8234449	ABANDONED MINE	<0.5	AU
38294	BACK CREEK ANTIMONY	Gold-antimony, antimony-gold and antimony veins	55	284014	8072169	MINERAL OCCURRENCE	<0.5	SB
43648	BACK REEF	Orogenic lode gold veins	55	298464	8132690	ABANDONED MINE	<0.5	AU AG
481044	BAGMAN	Orogenic lode gold veins	55	344015	7909070	ABANDONED MINE	<0.5	AU AG
41735	BAND OF FREEDOM	Orogenic lode gold veins	55	275614	8137570	ABANDONED MINE	<0.5	AU
478752	BASALT CREEK	Orogenic lode gold veins	55	289715	7877771	ABANDONED MINE	<0.5	AU
481045	BEATRICE	Orogenic lode gold veins	55	343015	7908770	ABANDONED MINE	<0.5	AU AG
478753	BECCYS HOPE	Orogenic lode gold veins	55	265815	7844571	ABANDONED MINE	<0.5	AU
41131	BELFAST	Orogenic lode gold veins	55	212366	8227589	ABANDONED MINE	<0.5	AU
36049	BELFAST HILL	Gold-antimony, antimony-gold and antimony veins	55	311414	8116520	ABANDONED MINE	0.5-5	AU SB AG
41626	BEN JOY	Gold-antimony, antimony-gold and antimony veins	55	275614	8134370	ABANDONED MINE	<0.5	SB AU
44874	BEST FRIEND	Orogenic lode gold veins	55	215516	8235369	ABANDONED MINE	<0.5	AU
478942	BETTONG	Orogenic lode gold veins	55	255115	7921520	ABANDONED MINE	<0.5	AU
41132	BEVERLEY HILLS	Gold-antimony, antimony-gold and antimony veins	55	211215	8177669	ABANDONED MINE	<0.5	SB
43649	BIBOOHRA	Gold-antimony, antimony-gold and antimony veins	55	333414	8128870	MINERAL OCCURRENCE	<0.5	SB
482307	BIF	Orogenic lode gold veins	55	273515	7837171	MINERAL OCCURRENCE	<0.5	AU
41134	BIG REEF	Orogenic lode gold veins	55	212916	8228909	ABANDONED MINE	<0.5	AU
478754	BIG RUSH	Orogenic lode gold veins	55	264490	7851820	ABANDONED MINE	0.5-5	AU
478755	BIG RUSH 1	Orogenic lode gold veins	55	264515	7852971	ABANDONED MINE	<0.5	AU
478756	BIG RUSH 2	Orogenic lode gold veins	55	264515	7851971	ABANDONED MINE	<0.5	AU
478757	BIG RUSH 3	Orogenic lode gold veins	55	264115	7851371	ABANDONED MINE	<0.5	AU
478758	BIG RUSH 4	Orogenic lode gold veins	55	265115	7852671	ABANDONED MINE	<0.5	AU
41627	BIG SADDLE	Orogenic lode gold veins	55	259464	8145069	ABANDONED MINE	<0.5	AU SN
41352	BILLY	Orogenic lode gold veins	55	212515	8184069	ABANDONED MINE	<0.5	AU AG
41736	BINNACLE	Orogenic lode gold veins	55	276664	8135920	ABANDONED MINE	<0.5	AU
43652	BISMARK	Orogenic lode gold veins	55	287284	8128930	ABANDONED MINE	<0.5	AU AG

SITE_NO	NAME	STYLE	MGA_ZONE	EAST94	NORTH94	MINE STATUS	DEPOSIT SIZE (Au, t)	COMMODITIES
43653	BLACK BALL	Orogenic lode gold veins	55	288414	8129720	ABANDONED MINE	<0.5	AU AG
38037	BLACK BEAR	Orogenic lode gold veins	55	343814	8132820	MINERAL OCCURRENCE	<0.5	CU AU
36573	BLACK BESS	Gold-antimony, antimony-gold and antimony veins	55	308014	8118120	ABANDONED MINE	0.5-5	AU SB
41135	BLACK BIRD	Orogenic lode gold veins	55	211516	8226169	ABANDONED MINE	<0.5	AU
481046	BLACK BULL	Orogenic lode gold veins	55	350152	7919838	ABANDONED MINE	<0.5	AU AG
43655	BLACK DIAMOND	Orogenic lode gold veins	55	288874	8129230	ABANDONED MINE	<0.5	AU AG
482291	BLACK DINGO	Orogenic lode gold veins	55	307815	7943620	MINERAL OCCURRENCE	<0.5	AU
41628	BLACK HILL	Gold-antimony, antimony-gold and antimony veins	55	263914	8151819	ABANDONED MINE	<0.5	AU SB
41629	BLACK HILL NORTH	Gold-antimony, antimony-gold and antimony veins	55	264364	8152619	ABANDONED MINE	<0.5	SB
41630	BLACK HILL SOUTH	Gold-antimony, antimony-gold and antimony veins	55	264464	8150269	ABANDONED MINE	<0.5	AU SB
43656	BLACK PRINCE	Orogenic lode gold veins	55	288484	8126970	ABANDONED MINE	<0.5	AU AG
38038	BLACK SNAKE	Orogenic lode gold veins	55	343714	8128070	ABANDONED MINE	<0.5	AU
45152	BLACK SNAKE	Orogenic lode gold veins	55	366334	8110069	ABANDONED MINE	<0.5	AU
478760	BLACK WATTLE CREEK	Gold-antimony, antimony-gold and antimony veins	55	268615	7874771	ABANDONED MINE	<0.5	SB
45468	BLUE ANGEL	Orogenic lode gold veins	55	332415	7892470	MINERAL OCCURRENCE	<0.5	AU
482265	BLUE ANT	Gold-antimony, antimony-gold and antimony veins	55	337535	7899610	ABANDONED MINE	<0.5	AU SB AG
482266	BLUE GOLD	Gold-antimony, antimony-gold and antimony veins	55	338615	7902120	ABANDONED MINE	<0.5	AU SB
44406	BLUE PETER	Orogenic lode gold veins	55	276115	8237639	ABANDONED MINE	<0.5	AU
41633	BLUE WREN	Gold-antimony, antimony-gold and antimony veins	55	247015	8154669	ABANDONED MINE	<0.5	SB
36078	BONTABA	Gold-antimony, antimony-gold and antimony veins	55	316098	8105342	ABANDONED MINE	<0.5	SB AU
546490	BONTABA EAST	Orogenic lode gold veins	55	318254	8105110	MINERAL OCCURRENCE	<0.5	AU
546492	BONTABA NORTH	Orogenic lode gold veins	55	316950	8106144	MINERAL OCCURRENCE	<0.5	AU
44878	BOOLAY'S	Orogenic lode gold veins	55	207416	8238719	ABANDONED MINE	<0.5	AU
38080	BOOMERANG	Orogenic lode gold veins	55	285325	8353689	ABANDONED MINE	<0.5	AU
41137	BOOMERANG	Orogenic lode gold veins	55	215116	8222369	ABANDONED MINE	<0.5	AU
38081	BOOMERANG EAST	Orogenic lode gold veins	55	285375	8353709	ABANDONED MINE	<0.5	AU
38082	BOOMERANG WEST	Orogenic lode gold veins	55	285215	8353639	ABANDONED MINE	<0.5	AU
545418	BOTTLE BIRD	Orogenic lode gold veins	55	214114	8124319	MINERAL OCCURRENCE	<0.5	AU
501243	BOTTLETREE	Orogenic lode gold veins	55	262988	7890511	MINERAL OCCURRENCE	<0.5	CU AU
41634	BOUNCER	Gold-antimony, antimony-gold and antimony veins	55	249015	8153069	ABANDONED MINE	<0.5	SB AU
41635	BOUNCER SOUTH	Gold-antimony, antimony-gold and antimony veins	55	249665	8152369	ABANDONED MINE	<0.5	SB
37772	BOWLER CREEK GRID	Orogenic lode gold veins	55	212715	8133069	ABANDONED MINE	<0.5	AU CU
41138	BRICKY BILLS	Orogenic lode gold veins	55	211666	8227289	ABANDONED MINE	<0.5	AU
41141	BRITANNIA	Orogenic lode gold veins	55	212516	8224769	ABANDONED MINE	<0.5	AU
43657	BRITANNIA	Orogenic lode gold veins	55	290064	8128270	ABANDONED MINE	<0.5	AU AG
43658	BRITISH COLOURS	Gold-antimony, antimony-gold and antimony veins	55	298114	8122720	ABANDONED MINE	<0.5	SB
44879	BRITISH LION	Orogenic lode gold veins	55	212856	8232729	ABANDONED MINE	<0.5	AU
478763	BROKEN RIVER	Gold-antimony, antimony-gold and antimony veins	55	264015	7845871	MINERAL OCCURRENCE	<0.5	SB
478766	BROKEN RIVER 4	Gold-antimony, antimony-gold and antimony veins	55	263815	7845771	MINERAL OCCURRENCE	<0.5	SB
41636	BRUMBY HILL	Gold-antimony, antimony-gold and antimony veins	55	274814	8128420	ABANDONED MINE	<0.5	AU SB
41637	BRUMBY RIDGE	Orogenic lode gold veins	55	286714	8134170	ABANDONED MINE	<0.5	AU
478943	BRUSHTAIL	Orogenic lode gold veins	55	250015	7911270	ABANDONED MINE	<0.5	AU
38084	BUTCHERS	Orogenic lode gold veins	55	286055	8353599	ABANDONED MINE	<0.5	AU
545763	CAIRNS BATTERY	Orogenic lode gold veins	55	284814	8149270	ABANDONED MINE	<0.5	AU
43659	CALEDONIA	Orogenic lode gold veins	55	290434	8127870	ABANDONED MINE	<0.5	AU AG
41143	CALEDONIAN	Orogenic lode gold veins	55	212896	8224289	ABANDONED MINE	<0.5	AU
481047	CAMEL	Orogenic lode gold veins	55	343915	7912070	ABANDONED MINE	<0.5	AU
481048	CAMEL CREEK MINE	Gold-antimony, antimony-gold and antimony veins	55	348515	7918470	ABANDONED MINE	0.5-5	AU SB
41147	CAPTAIN COOK	Orogenic lode gold veins	55	213036	8222769	ABANDONED MINE	<0.5	AU
41830	CAPTAIN COOK	Gold-antimony, antimony-gold and antimony veins	55	276414	8135470	ABANDONED MINE	<0.5	AU SB

SITE_NO	NAME	STYLE	MGA_ZONE	EAST94	NORTH94	MINE STATUS	DEPOSIT SIZE (Au, t)	COMMODITIES
43660	CARDIGAN	Orogenic lode gold veins	55	287814	8129090	ABANDONED MINE	<0.5	AU AG
45096	CATALANO HILL	Orogenic lode gold veins	55	386114	8058469	ABANDONED MINE	<0.5	AU
45075	CATALOGUE	Orogenic lode gold veins	55	374614	8081369	ABANDONED MINE	<0.5	AU
44880	CATALPA	Orogenic lode gold veins	55	211116	8236869	ABANDONED MINE	<0.5	AU
45097	CECCHI'S HILL	Gold-antimony, antimony-gold and antimony veins	55	377287	8058447	ABANDONED MINE	<0.5	AU SB
43661	CENTENNIAL	Orogenic lode gold veins	55	304054	8129436	ABANDONED MINE	<0.5	AU AG
44150	CHAMPANE	Orogenic lode gold veins	55	266815	8178339	ABANDONED MINE	<0.5	AU
41737	CHANCE	Orogenic lode gold veins	55	275214	8137570	ABANDONED MINE	<0.5	AU
43662	CHANCE	Orogenic lode gold veins	55	288134	8126340	ABANDONED MINE	<0.5	AU AG
45169	CHANCE	Orogenic lode gold veins	55	366827	8094215	ABANDONED MINE	<0.5	AU
44883	CHRISTIE'S ANTIMONY SHAFT	Gold-antimony, antimony-gold and antimony veins	55	188716	8233369	ABANDONED MINE	<0.5	SB
41150	CHRISTMAS	Orogenic lode gold veins	55	211636	8228329	ABANDONED MINE	<0.5	AU
43664	CITY OF BRISBANE	Orogenic lode gold veins	55	291014	8126030	ABANDONED MINE	<0.5	AU AG
43665	CITY OF DUBLIN	Orogenic lode gold veins	55	288384	8127230	ABANDONED MINE	<0.5	AU AG
481075	CLARKE REEF	Orogenic lode gold veins	55	353915	7913170	ABANDONED MINE	<0.5	AU SN
482277	CLAYHOLES DAM	Orogenic lode gold veins	55	323715	7918470	ABANDONED MINE	<0.5	AU CU PB
482279	COCKATOO	Gold-antimony, antimony-gold and antimony veins	55	338715	7922470	MINERAL OCCURRENCE	<0.5	AU SB
44402	COCOA CREEK	Gold-antimony, antimony-gold and antimony veins	55	284015	8324369	ABANDONED MINE	<0.5	AU SB
43666	COLUMBIA	Orogenic lode gold veins	55	291634	8125510	ABANDONED MINE	<0.5	AU AG
41151	COMET	Orogenic lode gold veins	55	211816	8225169	ABANDONED MINE	<0.5	AU
43667	COMMODORE	Orogenic lode gold veins	55	291494	8125770	ABANDONED MINE	<0.5	AU W
43668	COMMONWEALTH	Orogenic lode gold veins	55	292654	8125330	ABANDONED MINE	<0.5	AU AG
41638	COMSTOCK	Orogenic lode gold veins	55	280814	8134570	ABANDONED MINE	<0.5	AU
44884	COMSTOCK	Orogenic lode gold veins	55	213716	8234369	ABANDONED MINE	<0.5	AU
43669	CONTEST	Orogenic lode gold veins	55	291844	8125640	ABANDONED MINE	<0.5	AU AG
38087	CO-OPERATIVE TUNNELS	Orogenic lode gold veins	55	293515	8351069	ABANDONED MINE	<0.5	AU
45524	COPPERFIELD WORKINGS	Orogenic lode gold veins	55	329715	7885870	ABANDONED MINE	<0.5	CU AU
45227	CORAL QUEEN	Orogenic lode gold veins	55	367728	8067349	ABANDONED MINE	<0.5	AU
45076	CORONATION	Orogenic lode gold veins	55	373264	8083219	ABANDONED MINE	<0.5	AU
482312	CRAIGIE 1	Orogenic lode gold veins	55	273615	7840371	MINERAL OCCURRENCE	<0.5	AU NI CU SB
43788	CRAIG'S LODE	Gold-antimony, antimony-gold and antimony veins	55	306214	8121820	ABANDONED MINE	<0.5	AU AG SB
44159	CRAIG'S VEIN	Orogenic lode gold veins	55	281115	8182769	ABANDONED MINE	<0.5	AU
481049	CROSS CUTTING ZONE	Orogenic lode gold veins	55	347355	7918030	MINERAL OCCURRENCE	<0.5	AU
41738	CROWN	Orogenic lode gold veins	55	275814	8136870	ABANDONED MINE	<0.5	AU
45171	CROWN	Orogenic lode gold veins	55	366536	8095430	ABANDONED MINE	<0.5	AU
478945	CU-AU PROSPECT	Orogenic lode gold veins	55	253515	7919170	ABANDONED MINE	<0.5	CU AU
41154	CURLEY	Gold-antimony, antimony-gold and antimony veins	55	216915	8175869	ABANDONED MINE	<0.5	SB AU
41831	DAGWORTH	Orogenic lode gold veins	55	276364	8135220	ABANDONED MINE	<0.5	AU
41155	DARWIN	Orogenic lode gold veins	55	211816	8227569	ABANDONED MINE	<0.5	AU
478768	DAVEN'S HOPE	Gold-antimony, antimony-gold and antimony veins	55	272015	7845871	MINERAL OCCURRENCE	<0.5	SB
38048	DAVIES AND KELLY	Orogenic lode gold veins	55	343314	8157629	MINERAL OCCURRENCE	<0.5	AU
481051	DEAD HORSE	Orogenic lode gold veins	55	360715	7910770	ABANDONED MINE	<0.5	AU AG
43671	DEVON AND CORNWALL	Orogenic lode gold veins	55	289514	8125810	ABANDONED MINE	<0.5	AU AG
41159	DIFFICULTY	Orogenic lode gold veins	55	209476	8229169	ABANDONED MINE	<0.5	AU
36493	DINA	Gold-antimony, antimony-gold and antimony veins	55	338144	8115920	ABANDONED MINE	<0.5	AU SB PB ZN
478771	DISCOVERY	Orogenic lode gold veins	55	276815	7863471	ABANDONED MINE	<0.5	AU
45077	DIVIDEND	Orogenic lode gold veins	55	374314	8081889	ABANDONED MINE	<0.5	AU
41161	DOCTOR	Orogenic lode gold veins	55	213416	8221659	ABANDONED MINE	<0.5	AU
478946	DOLERITE CREEK	Orogenic lode gold veins	55	251385	7912090	ABANDONED MINE	<0.5	AU
478772	DOLLY POT	Orogenic lode gold veins	55	260015	7843871	ABANDONED MINE	<0.5	AU

SITE_NO	NAME	STYLE	MGA_ZONE	EAST94	NORTH94	MINE STATUS	DEPOSIT SIZE (Au, t)	COMMODITIES
41163	DONNYBROOK	Orogenic lode gold veins	55	212306	8224849	ABANDONED MINE	<0.5	AU
481052	DORA CREEK	Orogenic lode gold veins	55	353115	7904170	ABANDONED MINE	<0.5	AU
478773	DOSEY CREEK	Gold-antimony, antimony-gold and antimony veins	55	260915	7843871	ABANDONED MINE	<0.5	SB
43672	DOWNPATRICK	Orogenic lode gold veins	55	303114	8129170	ABANDONED MINE	<0.5	AU AG
44888	DOWNPATRICK	Orogenic lode gold veins	55	209496	8229469	ABANDONED MINE	<0.5	AU
43673	DOWNPATRICK EXTENDED	Orogenic lode gold veins	55	302364	8129220	ABANDONED MINE	<0.5	AU AG
43674	DOWNPATRICK NORTH	Orogenic lode gold veins	55	302764	8129220	ABANDONED MINE	<0.5	AU AG
481050	DP	Orogenic lode gold veins	55	353915	7905670	ABANDONED MINE	<0.5	AU
478774	DRIZZLE	Orogenic lode gold veins	55	265915	7844771	ABANDONED MINE	<0.5	AU
478959	DRY RIVER GOLD SHOW	Orogenic lode gold veins	55	279215	7917070	MINERAL OCCURRENCE	<0.5	AU
44978	DUFFER	Orogenic lode gold veins	55	214916	8229569	ABANDONED MINE	<0.5	AU
44979	DUFFER	Orogenic lode gold veins	55	214916	8229669	ABANDONED MINE	<0.5	AU
38089	DUFF'S	Orogenic lode gold veins	55	285455	8353819	ABANDONED MINE	<0.5	AU
38090	DUKE OF YORK	Orogenic lode gold veins	55	286055	8354009	ABANDONED MINE	<0.5	AU
44173	DUNG VEIN	Orogenic lode gold veins	55	280115	8182669	ABANDONED MINE	<0.5	AU
41164	DURHAM	Orogenic lode gold veins	55	215136	8222269	ABANDONED MINE	<0.5	AU
38092	DYERS	Orogenic lode gold veins	55	285785	8354209	ABANDONED MINE	<0.5	AU
38091	DYER'S OPENCUT	Orogenic lode gold veins	55	285845	8354729	ABANDONED MINE	<0.5	AU
43789	EAST LEADINGHAM	Gold-antimony, antimony-gold and antimony veins	55	307984	8120030	ABANDONED MINE	0.5-5	AU AG SB
478811	EASTERN RIDGE WORKINGS	Orogenic lode gold veins	55	262770	7895484	ABANDONED MINE	<0.5	AU
43676	EASTERN STAR	Orogenic lode gold veins	55	310114	8123720	ABANDONED MINE	<0.5	AU AG
36574	EDITH	Gold-antimony, antimony-gold and antimony veins	55	309614	8118570	ABANDONED MINE	<0.5	SB AU
478949	EDMONDS NORTH	Orogenic lode gold veins	55	252965	7918730	ABANDONED MINE	<0.5	AU
44410	EDNA	Orogenic lode gold veins	55	276035	8238399	ABANDONED MINE	<0.5	AU
43677	ELDORADO	Orogenic lode gold veins	55	292554	8125010	ABANDONED MINE	<0.5	AU AG
545173	ELUSIVE	Orogenic lode gold veins	55	279784	8133770	MINERAL OCCURRENCE	<0.5	AU
43790	EMILY	Gold-antimony, antimony-gold and antimony veins	55	307544	8120670	ABANDONED MINE	0.5-5	AU SB AG
44411	EMILY	Orogenic lode gold veins	55	276585	8240269	ABANDONED MINE	<0.5	AU
43791	EMILY SOUTH	Gold-antimony, antimony-gold and antimony veins	55	307364	8120250	ABANDONED MINE	0.5-5	AU SB AG
43678	EMPEROR	Orogenic lode gold veins	55	287454	8128830	ABANDONED MINE	<0.5	AU AG
43679	EMPRESS OF INDIA	Orogenic lode gold veins	55	289744	8125940	ABANDONED MINE	<0.5	AU AG
44412	ENDEAVOUR	Orogenic lode gold veins	55	276225	8237499	ABANDONED MINE	<0.5	AU
41555	ENTERPRISE	Orogenic lode gold veins	55	316615	8221070	ABANDONED MINE	<0.5	AU
43680	ENTERPRISE	Orogenic lode gold veins	55	303254	8121270	ABANDONED MINE	<0.5	AU AG
36576	ETHEL	Gold-antimony, antimony-gold and antimony veins	55	308194	8118570	ABANDONED MINE	0.5-5	SB AU
36575	ETHEL EXTENDED	Gold-antimony, antimony-gold and antimony veins	55	308454	8118470	ABANDONED MINE	<0.5	AU SB
45108	ETTY BAY	Orogenic lode gold veins	55	403214	8058470	MINERAL OCCURRENCE	<0.5	AU
45109	EUBENANGEE	Orogenic lode gold veins	55	390743	8069294	ABANDONED MINE	<0.5	AU
43681	EUREKA	Orogenic lode gold veins	55	291674	8125370	ABANDONED MINE	<0.5	AU AG
44891	EXCHANGE	Orogenic lode gold veins	55	216366	8232469	ABANDONED MINE	<0.5	AU
41165	EXPLORER	Orogenic lode gold veins	55	214325	8183519	ABANDONED MINE	<0.5	AU
43682	EXPLORER	Orogenic lode gold veins	55	288714	8126200	ABANDONED MINE	<0.5	AU AG
481054	FAR ANT	Orogenic lode gold veins	55	348015	7917070	ABANDONED MINE	<0.5	AU
478950	FEATHERTAIL	Orogenic lode gold veins	55	251715	7913770	ABANDONED MINE	<0.5	AU
37780	FENCE ANTIMONY PROSPECT-1	Gold-antimony, antimony-gold and antimony veins	55	221415	8167369	ABANDONED MINE	<0.5	SB
37781	FENCE ANTIMONY PROSPECT-2	Gold-antimony, antimony-gold and antimony veins	55	221415	8166969	ABANDONED MINE	<0.5	SB
481053	FG	Orogenic lode gold veins	55	354415	7905970	ABANDONED MINE	<0.5	AU
41640	FIRST CALL	Gold-antimony, antimony-gold and antimony veins	55	275214	8133420	ABANDONED MINE	<0.5	SB AU
43684	FIRST TRY	Orogenic lode gold veins	55	297614	8129570	ABANDONED MINE	<0.5	AU AG
43792	FLOTTERSHOW	Orogenic lode gold veins	55	305254	8122640	ABANDONED MINE	<0.5	SB AU

SITE_NO	NAME	STYLE	MGA_ZONE	EAST94	NORTH94	MINE STATUS	DEPOSIT SIZE (Au, t)	COMMODITIES
43685	FLYING PIG	Orogenic lode gold veins	55	288064	8126250	ABANDONED MINE	<0.5	AU AG
41168	FOLORN HOPE	Orogenic lode gold veins	55	214625	8185869	ABANDONED MINE	<0.5	AU
43686	FORGET ME NOT	Orogenic lode gold veins	55	292074	8126250	ABANDONED MINE	<0.5	AU AG
41642	FOUND MINE	Gold-antimony, antimony-gold and antimony veins	55	245765	8153619	ABANDONED MINE	<0.5	AU SB
41643	FOUR-LEAF SHAMROCK	Orogenic lode gold veins	55	281114	8133370	ABANDONED MINE	<0.5	AU
43688	FOURTH OF JULY	Orogenic lode gold veins	55	290694	8125950	ABANDONED MINE	<0.5	AU AG
38095	FRANCIS	Orogenic lode gold veins	55	285295	8353779	ABANDONED MINE	<0.5	AU
478777	FREDS HOPE	Gold-antimony, antimony-gold and antimony veins	55	265815	7867071	ABANDONED MINE	<0.5	SB
43690	FREEHOLD NORTH	Orogenic lode gold veins	55	307314	8124770	ABANDONED MINE	<0.5	AU
41667	GADD'S HILL	Orogenic lode gold veins	55	283214	8142270	ABANDONED MINE	<0.5	AU
478780	GAP CREEK	Orogenic lode gold veins	55	259315	7866571	ABANDONED MINE	<0.5	AU
478969	GATE GRID	Orogenic lode gold veins	55	265415	7898170	MINERAL OCCURRENCE	<0.5	AU CU
43691	GATE PROSPECT	Orogenic lode gold veins	55	288174	8131510	ABANDONED MINE	<0.5	AU
43692	GENERAL GRANT	Orogenic lode gold veins	55	289163	8127964	ABANDONED MINE	0.5-5	AU AG
44902	GENERAL SARSFIELD	Orogenic lode gold veins	55	209516	8229869	ABANDONED MINE	<0.5	AU
41765	GERALDINE	Orogenic lode gold veins	55	272414	8137670	ABANDONED MINE	<0.5	AU
41170	GERMAN MINER	Orogenic lode gold veins	55	214925	8187249	ABANDONED MINE	<0.5	AU
44415	GILBERT	Orogenic lode gold veins	55	276455	8239809	ABANDONED MINE	<0.5	AU
38096	GLADSTONE	Orogenic lode gold veins	55	286715	8357469	ABANDONED MINE	<0.5	AU
41171	GLADSTONE	Orogenic lode gold veins	55	214635	8183369	ABANDONED MINE	<0.5	AU
43693	GLENDOWER	Orogenic lode gold veins	55	289114	8137520	ABANDONED MINE	<0.5	AU AG
43694	GOING HOME	Orogenic lode gold veins	55	289544	8128640	ABANDONED MINE	<0.5	AU AG
41645	GOLD CREST	Orogenic lode gold veins	55	281315	8169269	ABANDONED MINE	<0.5	AU
478782	GOLD HILL	Orogenic lode gold veins	55	281515	7877771	ABANDONED MINE	<0.5	AU
38097	GOLD MOUNT	Orogenic lode gold veins	55	286315	8353669	ABANDONED MINE	<0.5	AU
45153	GOLDEN BAR	Orogenic lode gold veins	55	366242	8109995	ABANDONED MINE	<0.5	AU AG
45154	GOLDEN CROWN	Orogenic lode gold veins	55	366194	8109886	ABANDONED MINE	<0.5	AU
481055	GOLDEN CUP	Orogenic lode gold veins	55	359015	7909210	ABANDONED MINE	0.5-5	AU AG
41646	GOLDEN DROP	Orogenic lode gold veins	55	280515	8167619	ABANDONED MINE	<0.5	AU
45078	GOLDEN HORSESHOE	Orogenic lode gold veins	55	374394	8085269	ABANDONED MINE	<0.5	AU
44193	GOLDEN MILE	Orogenic lode gold veins	55	280115	8182269	ABANDONED MINE	<0.5	AU
45079	GOLDEN NUGGET	Orogenic lode gold veins	55	374614	8085119	ABANDONED MINE	<0.5	AU
45174	GOLDPOT CLAIM	Orogenic lode gold veins	55	368264	8089269	ABANDONED MINE	<0.5	AU
41173	GOOD HOPE	Orogenic lode gold veins	55	214555	8185989	ABANDONED MINE	<0.5	AU
43696	GOOD HOPE	Orogenic lode gold veins	55	289614	8128590	ABANDONED MINE	<0.5	AU AG
45540	GOSSAN RIDGE	Orogenic lode gold veins	55	312185	7878330	ABANDONED MINE	<0.5	AU
36231	GRANOLA	Gold-antimony, antimony-gold and antimony veins	55	304014	8113570	ABANDONED MINE	<0.5	AU SB
38098	GRAVEYARD	Orogenic lode gold veins	55	286075	8353249	ABANDONED MINE	<0.5	AU
43697	GREAT AUSTRALIAN	Orogenic lode gold veins	55	304514	8120140	ABANDONED MINE	<0.5	AU AG
43698	GREAT BRITAIN	Orogenic lode gold veins	55	290614	8127270	ABANDONED MINE	<0.5	AU AG
43699	GREAT DYKE	Orogenic lode gold veins	55	288244	8127650	ABANDONED MINE	<0.5	AU AG
37783	GREAT FIASCO NO. 1, 2 & 3	Gold-antimony, antimony-gold and antimony veins	55	219615	8172769	ABANDONED MINE	<0.5	SB AG
37782	GREAT L EXTENDED	Gold-antimony, antimony-gold and antimony veins	55	211615	8169869	ABANDONED MINE	<0.5	SB AG
41177	GREAT L MINOR NO.1 & 2	Gold-antimony, antimony-gold and antimony veins	55	212415	8175169	ABANDONED MINE	<0.5	SB
37784	MAJOR NOS 1 & 2	Gold-antimony, antimony-gold and antimony veins	55	222365	8173769	ABANDONED MINE	<0.5	SB AG
43700	GREAT NORTHERN	Orogenic lode gold veins	55	289174	8125740	ABANDONED MINE	<0.5	AU AG
41766	GREAT WESTERN	Orogenic lode gold veins	55	269564	8142970	ABANDONED MINE	<0.5	AU
41647	GREEN ANT RIDGE	Orogenic lode gold veins	55	275464	8147320	ABANDONED MINE	<0.5	AU
43701	GREGORY	Orogenic lode gold veins	55	289214	8138170	ABANDONED MINE	<0.5	AU AG

SITE_NO	NAME	STYLE	MGA_ZONE	EAST94	NORTH94	MINE STATUS	DEPOSIT SIZE (Au, t)	COMMODITIES
545540	GREY HAWK	Orogenic lode gold veins	55	214614	8125569	MINERAL OCCURRENCE	<0.5	AU CU PB ZN
478817	GREY JACK	Orogenic lode gold veins	55	263115	7892170	ABANDONED MINE	<0.5	AU
43702	GUSTAVUS ADOLPHUS	Orogenic lode gold veins	55	290294	8127430	ABANDONED MINE	<0.5	AU AG
41179	GYPSY	Orogenic lode gold veins	55	212716	8227969	ABANDONED MINE	<0.5	AU
45080	HAILE SELASSIE	Orogenic lode gold veins	55	374034	8082319	ABANDONED MINE	<0.5	AU
38099	HAMESLY AND QUINN	Orogenic lode gold veins	55	285455	8353959	ABANDONED MINE	<0.5	AU
545541	HAPPY JACK	Orogenic lode gold veins	55	216614	8125069	MINERAL OCCURRENCE	<0.5	AU CU PB ZN
41181	HART'S CONTENT	Orogenic lode gold veins	55	212016	8224899	ABANDONED MINE	<0.5	AU
41184	HEALEYS	Orogenic lode gold veins	55	214155	8185689	ABANDONED MINE	<0.5	AU
41185	HEALLYS	Orogenic lode gold veins	55	214535	8185879	ABANDONED MINE	<0.5	AU
41186	HELEN MACGREGOR	Orogenic lode gold veins	55	213316	8218269	ABANDONED MINE	<0.5	AU
43703	HENRY GRATTAN	Orogenic lode gold veins	55	291054	8126150	ABANDONED MINE	<0.5	AU AG
43704	HERO	Orogenic lode gold veins	55	291734	8125660	ABANDONED MINE	<0.5	AU AG
41648	HEROIC	Orogenic lode gold veins	55	286264	8162269	ABANDONED MINE	<0.5	AU
44914	HIDDEN TREASURE	Orogenic lode gold veins	55	213316	8232669	ABANDONED MINE	<0.5	AU
41188	HIDDEN VALLEY WORKINGS	Orogenic lode gold veins	55	214425	8187179	ABANDONED MINE	<0.5	AU
45081	HIGHCROFT	Orogenic lode gold veins	55	372814	8085649	ABANDONED MINE	<0.5	AU
38039	HILL TOP	Orogenic lode gold veins	55	344114	8127070	ABANDONED MINE	<0.5	AU
41649	HILLTOP	Gold-antimony, antimony-gold and antimony veins	55	275614	8146870	ABANDONED MINE	<0.5	AU SB
38100	HIT OR MISS	Orogenic lode gold veins	55	285555	8353209	ABANDONED MINE	<0.5	AU
41189	HIT OR MISS	Orogenic lode gold veins	55	213296	8222839	ABANDONED MINE	<0.5	AU
41832	HOME RULE	Gold-antimony, antimony-gold and antimony veins	55	275864	8135320	ABANDONED MINE	<0.5	AU SB
41190	HOMEWARD BOUND	Orogenic lode gold veins	55	214635	8187299	ABANDONED MINE	<0.5	AU
41191	HOMEWARD BOUND	Orogenic lode gold veins	55	214816	8229069	ABANDONED MINE	<0.5	AU
41443	HOMEWARD BOUND	Orogenic lode gold veins	55	215715	8186169	ABANDONED MINE	<0.5	AU
43708	HOMEWARD BOUND	Orogenic lode gold veins	55	289594	8128700	ABANDONED MINE	<0.5	AU AG
43709	HOMEWARD BOUND PROSPECT	Orogenic lode gold veins	55	289914	8128870	ABANDONED MINE	<0.5	AU
43710	HONEST LAWYER	Orogenic lode gold veins	55	290154	8126280	ABANDONED MINE	<0.5	AU AG
560000	HONEY	Gold-antimony, antimony-gold and antimony veins	55	241665	8162069	ABANDONED MINE	<0.5	AU SB
41192	HOP BITTERS	Orogenic lode gold veins	55	210566	8224969	ABANDONED MINE	<0.5	AU
43711	HOPE	Orogenic lode gold veins	55	288184	8126350	ABANDONED MINE	<0.5	AU AG
41652	HURRICANE	Orogenic lode gold veins	55	256164	8149269	ABANDONED MINE	<0.5	AU
41653	HURRICANE NORTH	Orogenic lode gold veins	55	255214	8149769	ABANDONED MINE	<0.5	AU
41651	GROUP	Gold-antimony, antimony-gold and antimony veins	55	256014	8149269	ABANDONED MINE	<0.5	AU SB
41193	IDA	Orogenic lode gold veins	55	211716	8224369	ABANDONED MINE	<0.5	AU
43712	IDAHO	Orogenic lode gold veins	55	288394	8126110	ABANDONED MINE	<0.5	AU AG
44976	INDEPENDENT	Orogenic lode gold veins	55	215016	8229569	ABANDONED MINE	<0.5	AU
44980	INDEPENDENT	Orogenic lode gold veins	55	215016	8229669	ABANDONED MINE	<0.5	AU
44916	INDEPENDENT P.C.	Orogenic lode gold veins	55	213316	8235199	ABANDONED MINE	<0.5	AU
41769	INFANT	Orogenic lode gold veins	55	271914	8140270	ABANDONED MINE	<0.5	AU
41671	INFLEXIBLE	Orogenic lode gold veins	55	284214	8140070	ABANDONED MINE	<0.5	AU
41672	IRON CLAD	Orogenic lode gold veins	55	284114	8140070	ABANDONED MINE	<0.5	AU
478793	IRONSTONE	Orogenic lode gold veins	55	284915	7878471	MINERAL OCCURRENCE	<0.5	AU
482281	IRONSTONE DAM	Orogenic lode gold veins	55	323415	7906170	MINERAL OCCURRENCE	<0.5	AU
44418	ISABELLA	Orogenic lode gold veins	55	277205	8241069	ABANDONED MINE	<0.5	AU
482282	JACKS CREEK	Gold-antimony, antimony-gold and antimony veins	55	306315	7915770	ABANDONED MINE	<0.5	AU SB
41655	JACKSON	Gold-antimony, antimony-gold and antimony veins	55	276564	8133620	ABANDONED MINE	<0.5	SB AU
43793	JACOBSEN	Gold-antimony, antimony-gold and antimony veins	55	304934	8122190	ABANDONED MINE	<0.5	SB
478794	JANELLE'S HOPE	Orogenic lode gold veins	55	272115	7844871	ABANDONED MINE	0.5-5	AU SB

SITE_NO	NAME	STYLE	MGA_ZONE	EAST94	NORTH94	MINE STATUS	DEPOSIT SIZE (Au, t)	COMMODITIES
43713	JENSEN	Orogenic lode gold veins	55	303714	8131170	ABANDONED MINE	<0.5	AU AG
38106	JEPHSON'S SURPRISE	Orogenic lode gold veins	55	285775	8354309	ABANDONED MINE	<0.5	AU
478797	JESSIEVALE	Gold-antimony, antimony-gold and antimony veins	55	268915	7849471	ABANDONED MINE	<0.5	SB
44919	JESSOPS HARD ROCK PROSPECT	Orogenic lode gold veins	55	208616	8230469	ABANDONED MINE	<0.5	AU
37787	JESTAH	Gold-antimony, antimony-gold and antimony veins	55	226975	8166789	ABANDONED MINE	<0.5	SB AU
41195	JONROY NO.1 & 2.	Gold-antimony, antimony-gold and antimony veins	55	220815	8176569	ABANDONED MINE	<0.5	SB AU
41196	JONROY NO.3	Gold-antimony, antimony-gold and antimony veins	55	220915	8176569	ABANDONED MINE	<0.5	SB AU
41197	JUBILEE	Orogenic lode gold veins	55	214655	8186189	ABANDONED MINE	<0.5	AU
41198	JULIA	Gold-antimony, antimony-gold and antimony veins	55	219315	8175869	ABANDONED MINE	<0.5	SB AU
44209	JUMBO VEIN	Orogenic lode gold veins	55	279815	8181769	MINERAL OCCURRENCE	<0.5	AU
478798	JUNCTION RIDGE	Gold-antimony, antimony-gold and antimony veins	55	272915	7844771	MINERAL OCCURRENCE	<0.5	SB
41199	JUST IN TIME	Orogenic lode gold veins	55	211946	8224559	ABANDONED MINE	<0.5	AU
43714	JUST-IN-TIME	Orogenic lode gold veins	55	303614	8121130	ABANDONED MINE	<0.5	AU AG
482267	K.O.	Gold-antimony, antimony-gold and antimony veins	55	335615	7898970	MINERAL OCCURRENCE	<0.5	AU SB
38052	KAMERUNGA	Orogenic lode gold veins	55	359914	8132970	ABANDONED MINE	<0.5	AU
45228	KENDLE & DEVRY'S REEF	Orogenic lode gold veins	55	366914	8067819	ABANDONED MINE	<0.5	AU
36438	KENTUCKY	Orogenic lode gold veins	55	300314	8115670	ABANDONED MINE	<0.5	AU
45082	KEY OF THE HILLS	Orogenic lode gold veins	55	374814	8084049	ABANDONED MINE	<0.5	AU
41206	KING BILLY	Orogenic lode gold veins	55	213466	8223229	ABANDONED MINE	<0.5	AU
37775	KING COLE	Gold-antimony, antimony-gold and antimony veins	55	228315	8170769	ABANDONED MINE	<0.5	SB
41207	KING OF THE NORTH	Orogenic lode gold veins	55	213696	8223009	ABANDONED MINE	<0.5	AU
41208	KING OF THE RANGES	Orogenic lode gold veins	55	214415	8184269	ABANDONED MINE	<0.5	AU
41209	KING OF THE RANGES	Orogenic lode gold veins	55	211976	8225269	ABANDONED MINE	<0.5	AU
45229	KING OF THE RANGES	Orogenic lode gold veins	55	366914	8068469	ABANDONED MINE	<0.5	AU
41210	KINGSBOROUGH	Orogenic lode gold veins	55	215155	8183009	ABANDONED MINE	<0.5	AU
41896	KRAKATOA	Orogenic lode gold veins	55	281514	8137670	ABANDONED MINE	<0.5	AU
45083	KRAWIL	Orogenic lode gold veins	55	374494	8083989	ABANDONED MINE	<0.5	AU
43715	LADY ANN	Orogenic lode gold veins	55	287814	8128030	ABANDONED MINE	<0.5	AU AG
41673	LADY BURDETT COUTTS	Orogenic lode gold veins	55	283114	8135670	ABANDONED MINE	<0.5	AU
43716	LADY CATHERINE	Orogenic lode gold veins	55	287764	8128910	ABANDONED MINE	<0.5	AU AG
42520	LADY EDITH	Gold-antimony, antimony-gold and antimony veins	55	316014	8056669	ABANDONED MINE	<0.5	SB
44921	LADY FLORENCE	Orogenic lode gold veins	55	209616	8229869	ABANDONED MINE	<0.5	AU
41772	LADY FRANCIS HILLS	Orogenic lode gold veins	55	271714	8138670	ABANDONED MINE	<0.5	AU
41213	LADY HAMILTON	Orogenic lode gold veins	55	214416	8229069	ABANDONED MINE	<0.5	AU
44213	LADY HAMILTON	Orogenic lode gold veins	55	249815	8213869	ABANDONED MINE	<0.5	AU
37789	LADY LUCK	Gold-antimony, antimony-gold and antimony veins	55	221965	8172919	ABANDONED MINE	<0.5	SB AG
45155	LADY LYN	Orogenic lode gold veins	55	365586	8110602	ABANDONED MINE	<0.5	AU
41214	LADY MARY	Orogenic lode gold veins	55	210516	8224769	ABANDONED MINE	<0.5	AU
41215	LADY MARY	Orogenic lode gold veins	55	215176	8222069	ABANDONED MINE	<0.5	AU
43717	LADY MARY	Orogenic lode gold veins	55	288074	8128880	ABANDONED MINE	<0.5	AU AG
44922	LADY MOLLIE	Orogenic lode gold veins	55	214766	8231469	ABANDONED MINE	<0.5	AU
38435	LAHEY'S CREEK ANTIMONY	Gold-antimony, antimony-gold and antimony veins	55	286214	8070669	ABANDONED MINE	<0.5	SB
41773	LAIA MONTEZ	Orogenic lode gold veins	55	270714	8141720	ABANDONED MINE	<0.5	AU
43718	LAIRD OF THE HILLS	Orogenic lode gold veins	55	290214	8127820	ABANDONED MINE	<0.5	AU AG
36455	LARKIN PROSPECT	Gold-antimony, antimony-gold and antimony veins	55	303214	8110970	MINERAL OCCURRENCE	<0.5	AU SB
44923	LAST CHANCE	Orogenic lode gold veins	55	209306	8230489	ABANDONED MINE	<0.5	AU
38108	LAST HIT	Orogenic lode gold veins	55	285165	8353879	ABANDONED MINE	<0.5	AU
41656	LEVIATHAN	Orogenic lode gold veins	55	282814	8133070	ABANDONED MINE	<0.5	AU
41739	LIGHTHOUSE	Orogenic lode gold veins	55	276514	8136370	ABANDONED MINE	<0.5	AU
38109	LILY OF THE VALLEY	Orogenic lode gold veins	55	286075	8354199	ABANDONED MINE	<0.5	AU

SITE_NO	NAME	STYLE	MGA_ZONE	EAST94	NORTH94	MINE STATUS	DEPOSIT SIZE (Au, t)	COMMODITIES
41217	LINCOLN NO.1	Gold-antimony, antimony-gold and antimony veins	55	221415	8174569	ABANDONED MINE	0.5-5	SB AU
41218	LINCOLN NO.2 & 3	Gold-antimony, antimony-gold and antimony veins	55	221515	8174869	ABANDONED MINE	<0.5	SB AU
41219	LINCOLN NO.4	Gold-antimony, antimony-gold and antimony veins	55	221815	8175269	ABANDONED MINE	<0.5	SB
481056	LITTLE ANT	Orogenic lode gold veins	55	350515	7918270	MINERAL OCCURRENCE	<0.5	AU
41221	LITTLE UNION	Orogenic lode gold veins	55	211506	8226279	ABANDONED MINE	<0.5	AU
41774	LITTLE WILLIAM	Gold-antimony, antimony-gold and antimony veins	55	266614	8150669	ABANDONED MINE	<0.5	SB
41222	LITTLE WONDER	Orogenic lode gold veins	55	214635	8186029	ABANDONED MINE	<0.5	AU
43722	LIZZIE REDMOND	Orogenic lode gold veins	55	291374	8125730	ABANDONED MINE	<0.5	AU AG W
38110	LIZZIE TREMBLES	Orogenic lode gold veins	55	286165	8353819	ABANDONED MINE	<0.5	AU
478802	LOFTY	Gold-antimony, antimony-gold and antimony veins	55	265815	7867371	ABANDONED MINE	<0.5	SB
43794	LONE HAND	Gold-antimony, antimony-gold and antimony veins	55	305014	8122570	ABANDONED MINE	<0.5	SB AU
44925	LONE STAR	Orogenic lode gold veins	55	214706	8236029	ABANDONED MINE	<0.5	AU
41223	LORD NELSON	Orogenic lode gold veins	55	213861	8229099	ABANDONED MINE	<0.5	AU
44214	LORD NELSON	Orogenic lode gold veins	55	250515	8214469	ABANDONED MINE	<0.5	AU
41658	LOST MINE	Gold-antimony, antimony-gold and antimony veins	55	245715	8154269	ABANDONED MINE	0.5-5	AU SB
41224	LOUISA	Orogenic lode gold veins	55	211276	8225879	ABANDONED MINE	<0.5	AU
38111	LOVE'S DUFFER	Orogenic lode gold veins	55	285815	8354339	ABANDONED MINE	<0.5	AU
478970	LUCKY DIP	Orogenic lode gold veins	55	263793	7898160	ABANDONED MINE	<0.5	AU
45084	LUCKY HIT	Orogenic lode gold veins	55	374954	8083669	ABANDONED MINE	<0.5	AU
41225	LUCKY ROD	Gold-antimony, antimony-gold and antimony veins	55	218415	8176869	ABANDONED MINE	<0.5	SB
41659	LUCKY STRIKE	Gold-antimony, antimony-gold and antimony veins	55	255915	8154669	ABANDONED MINE	<0.5	SB
41660	MACROSSAN TOWER	Orogenic lode gold veins	55	280914	8136370	ABANDONED MINE	<0.5	AU
44221	MADDENS	Orogenic lode gold veins	55	277340	8225315	ABANDONED MINE	<0.5	AU
478844	MAG A	Orogenic lode gold veins	55	242415	7847471	ABANDONED MINE	<0.5	AU CU
478845	MAG B	Orogenic lode gold veins	55	242815	7847771	ABANDONED MINE	<0.5	AU CU
44222	MAHOUT VEIN	Orogenic lode gold veins	55	279915	8182969	MINERAL OCCURRENCE	<0.5	AU
41775	MAID OF THE FOREST	Orogenic lode gold veins	55	270714	8142570	ABANDONED MINE	<0.5	AU
41229	MAID OF THE VALLEY	Orogenic lode gold veins	55	214515	8184669	ABANDONED MINE	<0.5	AU
41230	MAID OF THE VALLEY NO.1	Orogenic lode gold veins	55	214415	8184569	ABANDONED MINE	<0.5	AU
44930	MARCHING THROUGH GEORGIA	Orogenic lode gold veins	55	214216	8233369	ABANDONED MINE	<0.5	AU
43741	MARIA	Orogenic lode gold veins	55	302914	8128370	ABANDONED MINE	<0.5	AU AG
43742	MARIA EXTENDED	Orogenic lode gold veins	55	302894	8127970	ABANDONED MINE	<0.5	AU SB
43743	MARIA WEST	Orogenic lode gold veins	55	302714	8127470	ABANDONED MINE	<0.5	AU SB
43744	MARK TWAIN	Orogenic lode gold veins	55	288494	8128650	ABANDONED MINE	<0.5	AU AG
43745	MARY	Orogenic lode gold veins	55	288654	8126210	ABANDONED MINE	<0.5	AU AG
41674	MATTHEWS	Orogenic lode gold veins	55	282414	8138570	ABANDONED MINE	<0.5	AU
41232	MCPHERSON'S	Orogenic lode gold veins	55	212816	8228119	ABANDONED MINE	<0.5	AU
43795	MI 1	Gold-antimony, antimony-gold and antimony veins	55	303114	8123070	ABANDONED MINE	<0.5	AU SB
43736	MI 8	Orogenic lode gold veins	55	296714	8121970	ABANDONED MINE	<0.5	AU
36483	MI4 PROSPECT	Gold-antimony, antimony-gold and antimony veins	55	294814	8119370	ABANDONED MINE	<0.5	AU SB
41233	MICHAEL DAVITT	Orogenic lode gold veins	55	213935	8185799	ABANDONED MINE	<0.5	AU
41714	MIDAS	Orogenic lode gold veins	55	280514	8134670	ABANDONED MINE	<0.5	AU
37768	MIDDLE RIDGE	Orogenic lode gold veins	55	224815	8153669	ABANDONED MINE	<0.5	AU HG
41715	MIDWAY	Gold-antimony, antimony-gold and antimony veins	55	241015	8162169	ABANDONED MINE	<0.5	AU SB
43746	MINNIE MOXHAM	Gold-antimony, antimony-gold and antimony veins	55	309854	8122754	ABANDONED MINE	0.5-5	AU SB BAR
43747	MINNIE MOXHAM SOUTH	Orogenic lode gold veins	55	311464	8121520	ABANDONED MINE	<0.5	AU AG
44425	MINT	Orogenic lode gold veins	55	277125	8238479	ABANDONED MINE	<0.5	AU
36505	MISSANT	Gold-antimony, antimony-gold and antimony veins	55	310414	8067519	ABANDONED MINE	<0.5	SB GA
43748	MITCHELL PROSPECT	Orogenic lode gold veins	55	330164	8146270	ABANDONED MINE	<0.5	AU
43749	MONARCH	Orogenic lode gold veins	55	300661	8125727	ABANDONED MINE	0.5-5	AU AG

SITE_NO	NAME	STYLE	MGA_ZONE	EAST94	NORTH94	MINE STATUS	DEPOSIT SIZE (Au, t)	COMMODITIES
38112	MONTE CARLO	Orogenic lode gold veins	55	286815	8357769	ABANDONED MINE	<0.5	AU
44426	MONTE CHRISTO	Orogenic lode gold veins	55	276495	8237889	ABANDONED MINE	<0.5	AU
44935	MORNING STAR	Orogenic lode gold veins	55	209616	8230069	ABANDONED MINE	<0.5	AU
41236	MORTAR	Orogenic lode gold veins	55	214275	8186319	ABANDONED MINE	<0.5	AU
44937	MOUNT ATLAS	Orogenic lode gold veins	55	214006	8229959	ABANDONED MINE	<0.5	AU
41740	MOUNT BLAKE	Orogenic lode gold veins	55	275814	8138070	ABANDONED MINE	<0.5	AU
481057	MOUNT DORA	Gold-antimony, antimony-gold and antimony veins	55	354415	7906770	ABANDONED MINE	<0.5	AU SB
478952	MOUNT ESK	Orogenic lode gold veins	55	249665	7912470	MINERAL OCCURRENCE	<0.5	AU
45157	MOUNT PETER	Orogenic lode gold veins	55	365924	8110475	ABANDONED MINE	<0.5	AU
45557	MOUNT PICKLEBOTTLE	Orogenic lode gold veins	55	316815	7877770	ABANDONED MINE	<0.5	AU
44429	MOUNT WILLIAMS	Orogenic lode gold veins	55	279735	8232769	ABANDONED MINE	<0.5	AU
38113	MOUNTAIN MAID	Orogenic lode gold veins	55	286275	8354369	ABANDONED MINE	<0.5	AU
41244	MOUNTAIN MAID	Orogenic lode gold veins	55	213126	8223029	ABANDONED MINE	<0.5	AU
43781	MOUNTAIN MAID	Orogenic lode gold veins	55	303714	8125170	ABANDONED MINE	<0.5	AU AG
43782	MOUNTAINEER	Orogenic lode gold veins	55	303864	8126870	ABANDONED MINE	<0.5	AU AG
45158	MOUNTVIEW	Orogenic lode gold veins	55	365663	8109717	ABANDONED MINE	<0.5	AU
43783	MOWBRAY	Orogenic lode gold veins	55	290044	8126170	ABANDONED MINE	<0.5	AU AG
43784	MOXHAM STAR	Orogenic lode gold veins	55	309314	8123520	ABANDONED MINE	<0.5	AU AG
45085	MULDOON	Orogenic lode gold veins	55	374174	8084069	ABANDONED MINE	<0.5	AU
36591	NAVAN HILL	Gold-antimony, antimony-gold and antimony veins	55	310714	8117470	ABANDONED MINE	<0.5	SB AU
41675	NELSON	Orogenic lode gold veins	55	284014	8139970	ABANDONED MINE	<0.5	AU
41247	NEW CHUM	Orogenic lode gold veins	55	212716	8224769	ABANDONED MINE	<0.5	AU
45159	NEW CHUM	Orogenic lode gold veins	55	365870	8110530	ABANDONED MINE	<0.5	AU
41472	NEW GREAT WALL QUARTZ REEF	Gold-antimony, antimony-gold and antimony veins	55	218615	8174069	ABANDONED MINE	<0.5	SB AU
44939	NEW ZEALAND	Orogenic lode gold veins	55	213216	8232669	ABANDONED MINE	<0.5	AU
45230	NEW ZEALAND GULLY	Orogenic lode gold veins	55	366692	8068837	ABANDONED MINE	<0.5	AU
41249	NONPAREIL	Orogenic lode gold veins	55	214616	8228669	ABANDONED MINE	<0.5	AU
41250	NORTH CROSS	Orogenic lode gold veins	55	214335	8185709	ABANDONED MINE	<0.5	AU
41780	NORTH STAR	Orogenic lode gold veins	55	272014	8139420	ABANDONED MINE	<0.5	AU
43785	NORTH STAR	Orogenic lode gold veins	55	289684	8128610	ABANDONED MINE	<0.5	AU AG
43786	NORTH TUNNEL	Orogenic lode gold veins	55	304714	8124470	ABANDONED MINE	<0.5	AU
36577	NORTHCOTE 1	Orogenic lode gold veins	55	303814	8118870	ABANDONED MINE	<0.5	AU SB
44431	NORTON	Orogenic lode gold veins	55	276475	8238019	ABANDONED MINE	<0.5	AU
45179	OCCIDENT	Orogenic lode gold veins	55	367114	8089069	ABANDONED MINE	<0.5	AU
37776	OLD ROLLEY	Gold-antimony, antimony-gold and antimony veins	55	229015	8172069	ABANDONED MINE	<0.5	SB
37777	OLD ROLLEY EXTENDED NO.1	Gold-antimony, antimony-gold and antimony veins	55	228915	8171569	ABANDONED MINE	<0.5	SB
41253	OLIVER CROMWELL	Orogenic lode gold veins	55	215126	8222169	ABANDONED MINE	<0.5	AU
478975	ONE MILE	Orogenic lode gold veins	55	262375	7901960	MINERAL OCCURRENCE	<0.5	AU CU
45180	ORIENT & MOWBRAY	Orogenic lode gold veins	55	365353	8089373	ABANDONED MINE	<0.5	AU
44940	OTTO	Orogenic lode gold veins	55	212016	8230669	ABANDONED MINE	<0.5	AU
43803	OUTWARD BOUND	Orogenic lode gold veins	55	289554	8128590	ABANDONED MINE	<0.5	AU AG
478810	PADDY'S PROSPECT	Orogenic lode gold veins	55	263137	7896029	ABANDONED MINE	<0.5	AU
478858	PANDANUS ZONE	Orogenic lode gold veins	55	260115	7866671	ABANDONED MINE	<0.5	AU
45086	PARDON	Orogenic lode gold veins	55	375254	8083769	ABANDONED MINE	<0.5	AU
478859	PAULS KNOB 1	Orogenic lode gold veins	55	277615	7879171	MINERAL OCCURRENCE	<0.5	AU CU PB ZN
478860	PAULS KNOB 2	Orogenic lode gold veins	55	278615	7879171	MINERAL OCCURRENCE	<0.5	AU CU PB ZN
478861	PAULS KNOB 3	Orogenic lode gold veins	55	277615	7877171	MINERAL OCCURRENCE	<0.5	AU CU PB ZN
478862	PAULS KNOB 4	Orogenic lode gold veins	55	278615	7877171	MINERAL OCCURRENCE	<0.5	AU CU PB ZN
41719	PELICAN	Gold-antimony, antimony-gold and antimony veins	55	236365	8144219	ABANDONED MINE	<0.5	SB
41259	PERSEVERENCE	Orogenic lode gold veins	55	212196	8224959	ABANDONED MINE	<0.5	AU

SITE_NO	NAME	STYLE	MGA_ZONE	EAST94	NORTH94	MINE STATUS	DEPOSIT SIZE (Au, t)	COMMODITIES
44951	PERSEVERENCE PROSPECT	Orogenic lode gold veins	55	187416	8243269	MINERAL OCCURRENCE	<0.5	AU
41721	PETERSEN'S	Gold-antimony, antimony-gold and antimony veins	55	249415	8153419	ABANDONED MINE	<0.5	AU SB
478863	PHAR LAP	Orogenic lode gold veins	55	259815	7843771	ABANDONED MINE	<0.5	AU
45231	PHOENIX	Orogenic lode gold veins	55	367514	8067169	ABANDONED MINE	<0.5	AU
41722	PILLAGE	Gold-antimony, antimony-gold and antimony veins	55	239365	8164619	ABANDONED MINE	<0.5	AU SB
43913	PINNACLE CREEK	Orogenic lode gold veins	55	296966	8121341	ABANDONED MINE	0.5-5	AU
36662	PINNACLE HILL	Gold-antimony, antimony-gold and antimony veins	55	301514	8113420	MINERAL OCCURRENCE	<0.5	AU AG SB
43807	PIONEER	Orogenic lode gold veins	55	288114	8126470	ABANDONED MINE	<0.5	AU AG
545721	PLUTON	Orogenic lode gold veins	55	317504	8104840	MINERAL OCCURRENCE	<0.5	AU
38126	POOR OLD TORRES	Orogenic lode gold veins	55	285625	8353819	ABANDONED MINE	<0.5	AU
41263	POPPY NO.1	Gold-antimony, antimony-gold and antimony veins	55	216015	8176769	MINERAL OCCURRENCE	<0.5	SB AU
41264	POPPY NO.2	Gold-antimony, antimony-gold and antimony veins	55	216315	8176669	MINERAL OCCURRENCE	<0.5	SB AU
481058	PORPHYRY DYKE	Orogenic lode gold veins	55	357615	7913470	ABANDONED MINE	<0.5	AU SN
44432	POVERTY	Orogenic lode gold veins	55	276515	8239969	ABANDONED MINE	<0.5	AU
41265	PRINCE PATRICK	Orogenic lode gold veins	55	209486	8229319	ABANDONED MINE	<0.5	AU
44954	PRINCESS MIDAS	Orogenic lode gold veins	55	212716	8230969	ABANDONED MINE	<0.5	AU
43810	PROVIDENCE	Orogenic lode gold veins	55	288394	8127820	ABANDONED MINE	<0.5	AU AG
45232	PYTHON	Orogenic lode gold veins	55	366464	8067919	ABANDONED MINE	<0.5	AU AG
41723	QUARTZ TOP RIDGE	Orogenic lode gold veins	55	279614	8140670	ABANDONED MINE	<0.5	AU
38127	QUEEN ALEXANDRA	Orogenic lode gold veins	55	285335	8353619	ABANDONED MINE	<0.5	AU
41266	QUEEN OF BEAUTY	Orogenic lode gold veins	55	215006	8221079	ABANDONED MINE	<0.5	AU
41267	QUEEN OF THE NORTH	Orogenic lode gold veins	55	213416	8222579	ABANDONED MINE	0.5-5	AU
41268	QUEENIE	Orogenic lode gold veins	55	212996	8223269	ABANDONED MINE	<0.5	AU
41269	QUEENSLANDER	Orogenic lode gold veins	55	214916	8222229	ABANDONED MINE	<0.5	AU
41724	QUEENSLANDER	Orogenic lode gold veins	55	278164	8134570	ABANDONED MINE	<0.5	AU
41272	R.B. NO.5	Orogenic lode gold veins	55	213415	8201969	ABANDONED MINE	<0.5	AU
41846	RAINBIRD	Gold-antimony, antimony-gold and antimony veins	55	239223	8162305	ABANDONED MINE	<0.5	AU SB
38129	RAPPORT	Orogenic lode gold veins	55	285325	8353809	ABANDONED MINE	<0.5	AU
545421	RAVEN	Orogenic lode gold veins	55	243444	8165946	MINERAL OCCURRENCE	<0.5	AU
41919	REBO	Orogenic lode gold veins	55	284414	8134070	ABANDONED MINE	<0.5	AU
41273	RECOMPENSE	Orogenic lode gold veins	55	209616	8225669	ABANDONED MINE	<0.5	AU
43812	RECONSTRUCTION	Orogenic lode gold veins	55	290040	8127922	ABANDONED MINE	<0.5	AU AG
481059	RED ANT	Gold-antimony, antimony-gold and antimony veins	55	351915	7915970	ABANDONED MINE	<0.5	AU SB
577773	RED DAM	Orogenic lode gold veins	55	235770	8170940	MINERAL OCCURRENCE	<0.5	AU
481060	RED GOLD	Orogenic lode gold veins	55	353615	7917210	ABANDONED MINE	<0.5	AU AG
493671	REEDY	Orogenic lode gold veins	55	242715	8187669	MINERAL OCCURRENCE	0.5-5	AU
545755	REEDY 8	Orogenic lode gold veins	55	242495	8188030	MINERAL OCCURRENCE	<0.5	AU
38130	REINE D'OR	Orogenic lode gold veins	55	285875	8353269	ABANDONED MINE	<0.5	AU
41741	RESULT	Orogenic lode gold veins	55	275814	8137170	ABANDONED MINE	<0.5	AU
41727	RETINA (ANTIMONY ZONE)	Gold-antimony, antimony-gold and antimony veins	55	237815	8164768	MAINTENANCE	0.5-5	SB AU AG
41727	RETINA (GOLD ZONE)	Gold-antimony, antimony-gold and antimony veins	55	237815	8164768	MAINTENANCE	0.5-5	SB AU AG
577772	RETINA NORTH	Orogenic lode gold veins	55	237321	8165005	ABANDONED MINE	<0.5	AU
45087	REWARD	Orogenic lode gold veins	55	374774	8084969	ABANDONED MINE	<0.5	AU AG
41728	RICHMOND	Orogenic lode gold veins	55	273164	8137020	ABANDONED MINE	<0.5	AU
45565	RIDGE PROSPECT	Orogenic lode gold veins	55	324415	7895070	ABANDONED MINE	<0.5	AU
38131	RIO TINTO	Orogenic lode gold veins	55	285715	8354059	ABANDONED MINE	<0.5	AU
41275	RISING SUN	Orogenic lode gold veins	55	213346	8223189	ABANDONED MINE	<0.5	AU
482268	ROADSIDE	Orogenic lode gold veins	55	341765	7906770	MINERAL OCCURRENCE	<0.5	AU
41277	ROB ROY	Orogenic lode gold veins	55	213216	8218229	ABANDONED MINE	<0.5	AU
43816	ROB ROY	Orogenic lode gold veins	55	289834	8127410	ABANDONED MINE	<0.5	AU AG

SITE_NO	NAME	STYLE	MGA_ZONE	EAST94	NORTH94	MINE STATUS	DEPOSIT SIZE (Au, t)	COMMODITIES
43817	ROBIN HOOD	Orogenic lode gold veins	55	338144	8145470	ABANDONED MINE	<0.5	AU
37778	ROLLEY NOS.2 & 3	Gold-antimony, antimony-gold and antimony veins	55	229015	8171669	ABANDONED MINE	<0.5	SB
43818	ROMAN	Orogenic lode gold veins	55	298614	8132670	ABANDONED MINE	<0.5	AU AG
41278	ROSANNAH	Orogenic lode gold veins	55	214245	8185629	ABANDONED MINE	<0.5	AU
45233	ROSE AND SHAMROCK	Orogenic lode gold veins	55	365664	8068569	ABANDONED MINE	<0.5	AU
38133	RUBY UNITED	Orogenic lode gold veins	55	285255	8353739	ABANDONED MINE	<0.5	AU
481061	RYE GOLD	Orogenic lode gold veins	55	352815	7920570	ABANDONED MINE	<0.5	AU
41279	SAINT GEORGE	Orogenic lode gold veins	55	211616	8225669	ABANDONED MINE	<0.5	AU
41280	SAINT GEORGE	Gold-antimony, antimony-gold and antimony veins	55	218515	8177169	ABANDONED MINE	0.5-5	SB AU
41834	SAINT GEORGE	Gold-antimony, antimony-gold and antimony veins	55	276114	8135370	ABANDONED MINE	<0.5	AU SB
38137	SAINT PATRICK	Orogenic lode gold veins	55	285705	8354129	ABANDONED MINE	<0.5	AU
41283	SAINT PATRICK	Orogenic lode gold veins	55	209796	8229249	ABANDONED MINE	<0.5	AU
41784	SAINT PATRICK	Orogenic lode gold veins	55	271564	8140370	ABANDONED MINE	<0.5	AU
43819	SAM THE ROMAN	Orogenic lode gold veins	55	300714	8133470	ABANDONED MINE	<0.5	AU AG
482269	SANDY CAMEL	Orogenic lode gold veins	55	337415	7907570	MINERAL OCCURRENCE	<0.5	AU
482270	SANDY GOLD	Orogenic lode gold veins	55	341015	7908720	MINERAL OCCURRENCE	<0.5	AU
41287	SCANDINAVIAN	Orogenic lode gold veins	55	211766	8226059	ABANDONED MINE	<0.5	AU
45160	SEAVIEW	Orogenic lode gold veins	55	365997	8110108	ABANDONED MINE	<0.5	AU
41731	SECOND CALL	Gold-antimony, antimony-gold and antimony veins	55	275414	8133670	ABANDONED MINE	<0.5	SB
478865	SEDHOST	Gold-antimony, antimony-gold and antimony veins	55	268315	7856271	ABANDONED MINE	<0.5	AU SB
481062	SHEBAS VALLEY	Orogenic lode gold veins	55	358915	7913070	MINERAL OCCURRENCE	<0.5	AU
45181	SHEILA	Orogenic lode gold veins	55	366214	8094269	ABANDONED MINE	<0.5	AU
36742	SILVER JOHN	Gold-antimony, antimony-gold and antimony veins	55	333334	8083259	ABANDONED MINE	<0.5	SB
36743	SILVER JOHN EXTENDED	Gold-antimony, antimony-gold and antimony veins	55	333204	8083139	ABANDONED MINE	<0.5	SB
482292	SIX MILE CREEK	Orogenic lode gold veins	55	306515	7942070	ABANDONED MINE	<0.5	AU
38136	SLATTERY'S	Orogenic lode gold veins	55	285635	8353869	ABANDONED MINE	<0.5	AU
38135	SLATTERY'S ADIT	Orogenic lode gold veins	55	285835	8354819	ABANDONED MINE	<0.5	AU
41760	SLEEPING GIANT	Gold-antimony, antimony-gold and antimony veins	55	238149	8163668	ABANDONED MINE	0.5-5	AU SB LST
482271	SLIGOSS	Orogenic lode gold veins	55	338715	7900970	MINERAL OCCURRENCE	<0.5	AU
41290	SMITHFIELD	Orogenic lode gold veins	55	213656	8223559	ABANDONED MINE	<0.5	AU
481064	SNAKE GULLY	Orogenic lode gold veins	55	349915	7902170	MINERAL OCCURRENCE	<0.5	AU
481065	SNIPPET	Orogenic lode gold veins	55	364415	7912770	MINERAL OCCURRENCE	<0.5	AU
41291	SOUTH CROSS	Orogenic lode gold veins	55	214465	8185429	ABANDONED MINE	<0.5	AU
43821	SOUTH E.B.F. PROSPECT	Orogenic lode gold veins	55	293564	8124520	ABANDONED MINE	<0.5	AU
43822	SOUTHERN CROSS	Orogenic lode gold veins	55	289917	8126830	ABANDONED MINE	<0.5	AU W
481066	SPARTAN	Orogenic lode gold veins	55	361315	7911870	ABANDONED MINE	<0.5	AU AG
45162	SPECIMEN HILL	Orogenic lode gold veins	55	365855	8110142	ABANDONED MINE	<0.5	AU AG
45567	SPENCER'S RIDGE	Orogenic lode gold veins	55	317915	7870570	ABANDONED MINE	<0.5	AU SB
43823	SPRING DOLLY	Orogenic lode gold veins	55	292294	8125270	ABANDONED MINE	<0.5	AU AG
547098	ST KILDA RIDGE	Orogenic lode gold veins	55	288522	8141229	ABANDONED MINE	<0.5	AU
45088	STANLEY	Orogenic lode gold veins	55	375214	8084469	ABANDONED MINE	<0.5	AU
44435	STAR OF NORMANBY	Orogenic lode gold veins	55	278955	8232639	ABANDONED MINE	<0.5	AU
44968	STAR OF THE EAST	Orogenic lode gold veins	55	215556	8239449	ABANDONED MINE	<0.5	AU
41295	STAR OF THE SOUTH	Orogenic lode gold veins	55	210616	8227369	ABANDONED MINE	<0.5	AU
43825	STAR OF THE SOUTH	Orogenic lode gold veins	55	292614	8124750	ABANDONED MINE	<0.5	AU AG
478825	STEAM ENGINE	Orogenic lode gold veins	55	262206	7895908	ABANDONED MINE	0.5-5	AU
41733	STIBNITE HILL	Gold-antimony, antimony-gold and antimony veins	55	259615	8157069	ABANDONED MINE	<0.5	SB AU
481081	STIBNITE HILL	Gold-antimony, antimony-gold and antimony veins	55	360515	7918070	MINERAL OCCURRENCE	<0.5	SB
45089	STOKER'S	Orogenic lode gold veins	55	373434	8084089	ABANDONED MINE	<0.5	AU
45569	STORM HILL	Orogenic lode gold veins	55	318815	7870670	ABANDONED MINE	<0.5	AU SB

SITE_NO	NAME	STYLE	MGA_ZONE	EAST94	NORTH94	MINE STATUS	DEPOSIT SIZE (Au, t)	COMMODITIES
546493	STREZZERIS	Orogenic lode gold veins	55	318695	8103296	MINERAL OCCURRENCE	<0.5	AU
545762	STUART FIND	Orogenic lode gold veins	55	280914	8149370	ABANDONED MINE	<0.5	AU
38138	STUCKEY'S	Orogenic lode gold veins	55	285455	8353769	ABANDONED MINE	<0.5	AU
43828	SUNBEAM	Orogenic lode gold veins	55	289914	8126881	ABANDONED MINE	<0.5	AU AG
44969	SUNBURST	Orogenic lode gold veins	55	209396	8230489	ABANDONED MINE	<0.5	AU
482295	SUPRENDRE	Gold-antimony, antimony-gold and antimony veins	55	321545	7911020	ABANDONED MINE	<0.5	AU SB CU PB ZN
482295	SUPRENDRE	Gold-antimony, antimony-gold and antimony veins	55	321545	7911020	ABANDONED MINE	<0.5	AU SB CU PB ZN
478867	SUSAN	Gold-antimony, antimony-gold and antimony veins	55	272415	7843971	ABANDONED MINE	<0.5	SB
44436	SUSSEX	Orogenic lode gold veins	55	247715	8233619	ABANDONED MINE	<0.5	AU
45163	TALISMAN	Orogenic lode gold veins	55	366228	8110145	ABANDONED MINE	<0.5	AU AG
41759	TANK HILL	Orogenic lode gold veins	55	258364	8146719	ABANDONED MINE	<0.5	AU
44264	TANK VEIN	Orogenic lode gold veins	55	283015	8180669	MINERAL OCCURRENCE	<0.5	AU
481067	TARA	Gold-antimony, antimony-gold and antimony veins	55	345915	7920670	ABANDONED MINE	<0.5	AU SB
43831	TASMANIAN	Orogenic lode gold veins	55	287864	8130320	ABANDONED MINE	<0.5	AU AG
44265	TATLOW REEF	Orogenic lode gold veins	55	278715	8228669	ABANDONED MINE	<0.5	AU
45573	TAURUS LINE	Orogenic lode gold veins	55	314715	7876270	ABANDONED MINE	<0.5	AU
44266	TAYLOR GOLD	Orogenic lode gold veins	55	276383	8222907	ABANDONED MINE	<0.5	AU
44971	TELEGRAPH LINE PROSPECT	Orogenic lode gold veins	55	186416	8243969	MINERAL OCCURRENCE	<0.5	AU
43832	TENNYSON WOODS	Orogenic lode gold veins	55	289904	8128034	ABANDONED MINE	<0.5	AU AG
577771	TERRACE CREEK	Orogenic lode gold veins	55	236435	8168713	MINERAL OCCURRENCE	0.5-5	AU
44268	THE BROTHERS	Orogenic lode gold veins	55	279715	8222469	ABANDONED MINE	<0.5	AU
41299	THE CALEDONIA	Orogenic lode gold veins	55	215315	8184369	ABANDONED MINE	<0.5	AU
41301	THE JULIA	Orogenic lode gold veins	55	197616	8225769	ABANDONED MINE	<0.5	AU
482320	THE SISTERS	Orogenic lode gold veins	55	250815	7839171	MINERAL OCCURRENCE	<0.5	AU
41302	THREE JACKS	Orogenic lode gold veins	55	211316	8225169	ABANDONED MINE	<0.5	AU
545727	THREE PEAKS	Gold-antimony, antimony-gold and antimony veins	55	271605	8162079	MINERAL OCCURRENCE	<0.5	AU SB
43833	TICHBOURNE	Orogenic lode gold veins	55	288244	8126440	ABANDONED MINE	<0.5	AU AG
37824	TOM 22	Gold-antimony, antimony-gold and antimony veins	55	221215	8173369	MINERAL OCCURRENCE	<0.5	SB
37825	TOM'S AREA NO. 9	Orogenic lode gold veins	55	215815	8172169	ABANDONED MINE	<0.5	AU
37826	TOM'S AREA NO.10	Orogenic lode gold veins	55	213015	8172469	ABANDONED MINE	<0.5	AU
45234	TOWALLA KING	Orogenic lode gold veins	55	366364	8068669	ABANDONED MINE	<0.5	AU
41684	TRAFALGAR	Orogenic lode gold veins	55	284214	8140270	ABANDONED MINE	<0.5	AU
41306	TRAINERS	Orogenic lode gold veins	55	214435	8185339	ABANDONED MINE	<0.5	AU
44972	TRIESTE	Orogenic lode gold veins	55	209476	8230929	ABANDONED MINE	<0.5	AU
43835	TRUE BLUE	Orogenic lode gold veins	55	288274	8126460	ABANDONED MINE	<0.5	AU AG
44272	TRUMPET VEIN	Orogenic lode gold veins	55	281415	8182369	MINERAL OCCURRENCE	<0.5	AU
478838	TRY AGAIN UNITED	Orogenic lode gold veins	55	262215	7894870	ABANDONED MINE	<0.5	AU
38139	TUCKERS	Orogenic lode gold veins	55	284315	8357569	ABANDONED MINE	<0.5	AU
43796	TUNNEL HILL	Gold-antimony, antimony-gold and antimony veins	55	305814	8121870	ABANDONED MINE	0.5-5	AU SB
478873	TURTLE CREEK NORTH	Gold-antimony, antimony-gold and antimony veins	55	271315	7864771	MINERAL OCCURRENCE	<0.5	SB
478874	TURTLE CREEK SOUTH	Gold-antimony, antimony-gold and antimony veins	55	271115	7864571	MINERAL OCCURRENCE	<0.5	SB
41654	TYPHOON	Gold-antimony, antimony-gold and antimony veins	55	255365	8149969	ABANDONED MINE	<0.5	SB AU
43836	TYRCONNEL	Orogenic lode gold veins	55	290754	8126660	ABANDONED MINE	0.5-5	AU W
482272	TYSON ZONE	Gold-antimony, antimony-gold and antimony veins	55	336575	7899220	MINERAL OCCURRENCE	<0.5	AU SB
38140	UNCLE SANDY	Gold-antimony, antimony-gold and antimony veins	55	288815	8351369	ABANDONED MINE	<0.5	AU SB
478879	UNCLE TOM	Gold-antimony, antimony-gold and antimony veins	55	271915	7844171	ABANDONED MINE	<0.5	SB
41791	UNION	Orogenic lode gold veins	55	272414	8139870	ABANDONED MINE	0.5-5	AU
41792	UNION JACK	Orogenic lode gold veins	55	272314	8139870	ABANDONED MINE	<0.5	AU
43846	UNNAMED 000307	Orogenic lode gold veins	55	300114	8130920	ABANDONED MINE	<0.5	AU
43847	UNNAMED 002313	Orogenic lode gold veins	55	300314	8131520	ABANDONED MINE	<0.5	AU

SITE_NO	NAME	STYLE	MGA_ZONE	EAST94	NORTH94	MINE STATUS	DEPOSIT SIZE (Au, t)	COMMODITIES
43848	UNNAMED 002347	Orogenic lode gold veins	55	300364	8134920	ABANDONED MINE	<0.5	AU
43849	UNNAMED 002355	Orogenic lode gold veins	55	300314	8135670	ABANDONED MINE	<0.5	AU
43850	UNNAMED 003335	Orogenic lode gold veins	55	300414	8133670	ABANDONED MINE	<0.5	AU
43851	UNNAMED 005253	Orogenic lode gold veins	55	300614	8125520	ABANDONED MINE	<0.5	AU
43853	UNNAMED 007317	Orogenic lode gold veins	55	300884	8131870	ABANDONED MINE	<0.5	AU
43852	UNNAMED 007338	Orogenic lode gold veins	55	300864	8134020	ABANDONED MINE	<0.5	AU
43855	UNNAMED 012326	Orogenic lode gold veins	55	301364	8132820	ABANDONED MINE	<0.5	AU
43856	UNNAMED 012339	Orogenic lode gold veins	55	301314	8134120	ABANDONED MINE	<0.5	AU
43857	UNNAMED 014327	Orogenic lode gold veins	55	301564	8132870	ABANDONED MINE	<0.5	AU
43858	UNNAMED 015338	Orogenic lode gold veins	55	301614	8133970	ABANDONED MINE	<0.5	AU
43859	UNNAMED 016314	Orogenic lode gold veins	55	301714	8131620	ABANDONED MINE	<0.5	AU
43861	UNNAMED 016334	Orogenic lode gold veins	55	301764	8133620	ABANDONED MINE	<0.5	AU
43860	UNNAMED 017331	Orogenic lode gold veins	55	301864	8133270	MINERAL OCCURRENCE	<0.5	AU
43862	UNNAMED 018320	Orogenic lode gold veins	55	301914	8132240	ABANDONED MINE	<0.5	AU
43863	UNNAMED 019322	Orogenic lode gold veins	55	302014	8132420	ABANDONED MINE	<0.5	AU
37059	UNNAMED 023131	Gold-antimony, antimony-gold and antimony veins	55	302464	8113320	MINERAL OCCURRENCE	<0.5	SB
37062	UNNAMED 027123	Gold-antimony, antimony-gold and antimony veins	55	302814	8112470	MINERAL OCCURRENCE	<0.5	SB AU
37066	UNNAMED 028120	Gold-antimony, antimony-gold and antimony veins	55	302964	8112170	MINERAL OCCURRENCE	<0.5	SB AU
43866	UNNAMED 033207	Orogenic lode gold veins	55	303434	8120930	ABANDONED MINE	<0.5	AU
43867	UNNAMED 033686	Orogenic lode gold veins	55	303414	8168769	ABANDONED MINE	<0.5	AU
43868	UNNAMED 037207	Orogenic lode gold veins	55	303894	8120930	ABANDONED MINE	<0.5	AU
43797	UNNAMED 037228	Gold-antimony, antimony-gold and antimony veins	55	303884	8123000	ABANDONED MINE	<0.5	SB AU
36579	UNNAMED 039182	Orogenic lode gold veins	55	304014	8118370	ABANDONED MINE	<0.5	AU CU PB
43869	UNNAMED 039205	Orogenic lode gold veins	55	304034	8120670	ABANDONED MINE	<0.5	AU
43870	UNNAMED 042299	Orogenic lode gold veins	55	304314	8130070	MINERAL OCCURRENCE	<0.5	AU
43798	UNNAMED 043226	Gold-antimony, antimony-gold and antimony veins	55	304414	8122770	ABANDONED MINE	<0.5	AU SB
43871	UNNAMED 043262	Orogenic lode gold veins	55	304494	8126460	MINERAL OCCURRENCE	<0.5	AU
43799	UNNAMED 044222	Gold-antimony, antimony-gold and antimony veins	55	304564	8122390	MINERAL OCCURRENCE	<0.5	SB
36580	UNNAMED 046183	Orogenic lode gold veins	55	304714	8118470	MINERAL OCCURRENCE	<0.5	AU
37085	UNNAMED 053168	Orogenic lode gold veins	55	305414	8116970	MINERAL OCCURRENCE	<0.5	AU
43800	UNNAMED 055208	Gold-antimony, antimony-gold and antimony veins	55	305614	8120970	ABANDONED MINE	<0.5	SB
482300	UNNAMED 065370	Orogenic lode gold veins	55	306615	7937170	MINERAL OCCURRENCE	<0.5	AU
482294	UNNAMED 069428	Orogenic lode gold veins	55	307015	7942970	MINERAL OCCURRENCE	<0.5	AU
43801	UNNAMED 070208	Gold-antimony, antimony-gold and antimony veins	55	307114	8120970	ABANDONED MINE	<0.5	SB AU
37099	UNNAMED 073170	Orogenic lode gold veins	55	307464	8117170	ABANDONED MINE	<0.5	AU PB ZN
43873	UNNAMED 073240	Orogenic lode gold veins	55	307414	8124170	ABANDONED MINE	<0.5	AU
36581	UNNAMED 074181	Orogenic lode gold veins	55	307574	8118340	ABANDONED MINE	<0.5	AU
45239	UNNAMED 075527	Orogenic lode gold veins	55	407614	8052920	ABANDONED MINE	<0.5	AU
37106	UNNAMED 079141	Orogenic lode gold veins	55	308014	8114270	MINERAL OCCURRENCE	<0.5	AU
36582	UNNAMED 080190	Gold-antimony, antimony-gold and antimony veins	55	308164	8119170	MINERAL OCCURRENCE	<0.5	SB
36583	UNNAMED 081190	Gold-antimony, antimony-gold and antimony veins	55	308274	8119170	ABANDONED MINE	<0.5	SB
36584	UNNAMED 084190	Gold-antimony, antimony-gold and antimony veins	55	308514	8119170	MINERAL OCCURRENCE	<0.5	SB
36585	UNNAMED 085182	Gold-antimony, antimony-gold and antimony veins	55	308614	8118370	ABANDONED MINE	<0.5	SB AU
37137	UNNAMED 086133	Orogenic lode gold veins	55	308714	8113470	MINERAL OCCURRENCE	<0.5	AU
36586	UNNAMED 090189	Gold-antimony, antimony-gold and antimony veins	55	309114	8119070	ABANDONED MINE	<0.5	SB AU
44986	UNNAMED 090305	Orogenic lode gold veins	55	209206	8230729	ABANDONED MINE	<0.5	AU
44985	UNNAMED 091300	Orogenic lode gold veins	55	209216	8230169	ABANDONED MINE	<0.5	AU
36587	UNNAMED 092178	Gold-antimony, antimony-gold and antimony veins	55	309314	8118030	ABANDONED MINE	<0.5	SB
44987	UNNAMED 092304	Orogenic lode gold veins	55	209346	8230569	ABANDONED MINE	<0.5	AU
44988	UNNAMED 092309	Orogenic lode gold veins	55	209406	8231079	ABANDONED MINE	<0.5	AU

SITE_NO	NAME	STYLE	MGA_ZONE	EAST94	NORTH94	MINE STATUS	DEPOSIT SIZE (Au, t)	COMMODITIES
36588	UNNAMED 094181	Gold-antimony, antimony-gold and antimony veins	55	309514	8118270	MINERAL OCCURRENCE	<0.5	SB
44989	UNNAMED 095302	Orogenic lode gold veins	55	209656	8230409	ABANDONED MINE	<0.5	AU
44990	UNNAMED 096297	Orogenic lode gold veins	55	209716	8229869	ABANDONED MINE	<0.5	AU
44991	UNNAMED 097298	Orogenic lode gold veins	55	209816	8229969	ABANDONED MINE	<0.5	AU
44994	UNNAMED 097301	Orogenic lode gold veins	55	209896	8230359	ABANDONED MINE	<0.5	AU
41319	UNNAMED 098252	Orogenic lode gold veins	55	209996	8225369	ABANDONED MINE	<0.5	AU
44992	UNNAMED 098296	Orogenic lode gold veins	55	209916	8229769	ABANDONED MINE	<0.5	AU
44993	UNNAMED 098299	Orogenic lode gold veins	55	209916	8230069	ABANDONED MINE	<0.5	AU
37181	UNNAMED 098672	Gold-antimony, antimony-gold and antimony veins	55	309914	8067369	MINERAL OCCURRENCE	<0.5	SB
37184	UNNAMED 099142	Orogenic lode gold veins	55	310014	8114370	MINERAL OCCURRENCE	<0.5	AU
36589	UNNAMED 100184	Gold-antimony, antimony-gold and antimony veins	55	310114	8118570	ABANDONED MINE	<0.5	SB AU
36589	UNNAMED 100184	Gold-antimony, antimony-gold and antimony veins	55	310114	8118570	ABANDONED MINE	<0.5	SB AU
41320	UNNAMED 100251	Orogenic lode gold veins	55	210116	8225269	ABANDONED MINE	<0.5	AU
41321	UNNAMED 101250	Orogenic lode gold veins	55	210216	8225209	ABANDONED MINE	<0.5	AU
37201	UNNAMED 102118	Orogenic lode gold veins	55	310314	8111970	MINERAL OCCURRENCE	<0.5	AU
36590	UNNAMED 103181	Gold-antimony, antimony-gold and antimony veins	55	310454	8118310	MINERAL OCCURRENCE	<0.5	SB
41322	UNNAMED 103250	Orogenic lode gold veins	55	210416	8225229	ABANDONED MINE	<0.5	AU
41323	UNNAMED 103268	Orogenic lode gold veins	55	210466	8227019	ABANDONED MINE	<0.5	AU
41325	UNNAMED 104264	Orogenic lode gold veins	55	210566	8226659	ABANDONED MINE	<0.5	AU
41324	UNNAMED 104272	Orogenic lode gold veins	55	210516	8227369	ABANDONED MINE	<0.5	AU
44996	UNNAMED 106305	Orogenic lode gold veins	55	210716	8230669	ABANDONED MINE	<0.5	AU
41326	UNNAMED 107248	Orogenic lode gold veins	55	210816	8224969	ABANDONED MINE	<0.5	AU
41327	UNNAMED 109248	Orogenic lode gold veins	55	211016	8224969	ABANDONED MINE	<0.5	AU
41328	UNNAMED 110252	Orogenic lode gold veins	55	211116	8225369	ABANDONED MINE	<0.5	AU
41330	UNNAMED 111251	Orogenic lode gold veins	55	211276	8225269	ABANDONED MINE	<0.5	AU
41329	UNNAMED 111270	Orogenic lode gold veins	55	211216	8227169	ABANDONED MINE	<0.5	AU
41331	UNNAMED 111272	Orogenic lode gold veins	55	211296	8227369	ABANDONED MINE	<0.5	AU
37238	UNNAMED 112125	Orogenic lode gold veins	55	311314	8112670	ABANDONED MINE	<0.5	AU AG
41332	UNNAMED 113261	Orogenic lode gold veins	55	211416	8226269	ABANDONED MINE	<0.5	AU
44999	UNNAMED 114341	Orogenic lode gold veins	55	211516	8234269	ABANDONED MINE	<0.5	AU
45000	UNNAMED 114342	Orogenic lode gold veins	55	211516	8234369	ABANDONED MINE	<0.5	AU
37246	UNNAMED 115160	Gold-antimony, antimony-gold and antimony veins	55	311664	8116220	ABANDONED MINE	<0.5	SB AU
41333	UNNAMED 115247	Orogenic lode gold veins	55	211616	8224869	ABANDONED MINE	<0.5	AU
41334	UNNAMED 115258	Orogenic lode gold veins	55	211646	8226009	ABANDONED MINE	<0.5	AU
45002	UNNAMED 115305	Orogenic lode gold veins	55	211616	8230669	ABANDONED MINE	<0.5	AU
37248	UNNAMED 116117	Gold-antimony, antimony-gold and antimony veins	55	311714	8111870	ABANDONED MINE	<0.5	AU SB
45003	UNNAMED 116322	Orogenic lode gold veins	55	211716	8232369	ABANDONED MINE	<0.5	AU
45004	UNNAMED 116333	Orogenic lode gold veins	55	211716	8233469	ABANDONED MINE	<0.5	AU
41337	UNNAMED 117241	Orogenic lode gold veins	55	211896	8224299	ABANDONED MINE	<0.5	AU
41336	UNNAMED 117279	Orogenic lode gold veins	55	211816	8228069	ABANDONED MINE	<0.5	AU
37254	UNNAMED 118156	Gold-antimony, antimony-gold and antimony veins	55	311964	8115770	ABANDONED MINE	<0.5	SB AU
41340	UNNAMED 118257	Orogenic lode gold veins	55	211986	8225909	ABANDONED MINE	<0.5	AU
41338	UNNAMED 118258	Orogenic lode gold veins	55	211986	8225979	ABANDONED MINE	<0.5	AU
41339	UNNAMED 119213	Orogenic lode gold veins	55	212056	8221489	ABANDONED MINE	<0.5	AU
41342	UNNAMED 120211	Orogenic lode gold veins	55	212166	8221349	ABANDONED MINE	<0.5	AU
41341	UNNAMED 120257	Orogenic lode gold veins	55	212116	8225869	ABANDONED MINE	<0.5	AU
45008	UNNAMED 120330	Orogenic lode gold veins	55	212176	8233239	ABANDONED MINE	<0.5	AU
41345	UNNAMED 121272	Orogenic lode gold veins	55	212296	8227459	ABANDONED MINE	<0.5	AU
41343	UNNAMED 121274	Orogenic lode gold veins	55	212226	8227619	ABANDONED MINE	<0.5	AU
37259	UNNAMED 122151	Gold-antimony, antimony-gold and antimony veins	55	312314	8115270	ABANDONED MINE	<0.5	AU SB

SITE_NO	NAME	STYLE	MGA_ZONE	EAST94	NORTH94	MINE STATUS	DEPOSIT SIZE (Au, t)	COMMODITIES
41344	UNNAMED 122184	Orogenic lode gold veins	55	212356	8218609	ABANDONED MINE	<0.5	AU
45014	UNNAMED 122311	Orogenic lode gold veins	55	212386	8231279	ABANDONED MINE	<0.5	AU
45012	UNNAMED 122339	Orogenic lode gold veins	55	212316	8234069	ABANDONED MINE	<0.5	AU
45013	UNNAMED 122340	Orogenic lode gold veins	55	212316	8234169	ABANDONED MINE	<0.5	AU
41346	UNNAMED 123245	Orogenic lode gold veins	55	212416	8224669	ABANDONED MINE	<0.5	AU
41347	UNNAMED 123256	Orogenic lode gold veins	55	212426	8225799	ABANDONED MINE	<0.5	AU
41348	UNNAMED 123275	Orogenic lode gold veins	55	212436	8227759	ABANDONED MINE	<0.5	AU
41349	UNNAMED 123276	Orogenic lode gold veins	55	212426	8227819	ABANDONED MINE	<0.5	AU
45015	UNNAMED 123336	Orogenic lode gold veins	55	212456	8233799	ABANDONED MINE	<0.5	AU
45016	UNNAMED 123339	Orogenic lode gold veins	55	212416	8234069	ABANDONED MINE	<0.5	AU
45017	UNNAMED 123340	Orogenic lode gold veins	55	212416	8234169	ABANDONED MINE	<0.5	AU
45018	UNNAMED 123342	Orogenic lode gold veins	55	212416	8234369	ABANDONED MINE	<0.5	AU
41350	UNNAMED 124213	Orogenic lode gold veins	55	212546	8221559	ABANDONED MINE	<0.5	AU
41353	UNNAMED 124245	Orogenic lode gold veins	55	212566	8224699	ABANDONED MINE	<0.5	AU
41351	UNNAMED 124248	Orogenic lode gold veins	55	212516	8224969	ABANDONED MINE	<0.5	AU
45020	UNNAMED 124338	Orogenic lode gold veins	55	212516	8233969	ABANDONED MINE	<0.5	AU
41354	UNNAMED 125267	Orogenic lode gold veins	55	212686	8226919	ABANDONED MINE	<0.5	AU
45022	UNNAMED 125336	Orogenic lode gold veins	55	212636	8233809	ABANDONED MINE	<0.5	AU
45023	UNNAMED 125339	Orogenic lode gold veins	55	212616	8234069	ABANDONED MINE	<0.5	AU
45024	UNNAMED 125340	Orogenic lode gold veins	55	212616	8234169	ABANDONED MINE	<0.5	AU
41355	UNNAMED 126268	Orogenic lode gold veins	55	212716	8227019	ABANDONED MINE	<0.5	AU
41356	UNNAMED 127244	Orogenic lode gold veins	55	212896	8224639	ABANDONED MINE	<0.5	AU
41357	UNNAMED 127247	Orogenic lode gold veins	55	212906	8224939	ABANDONED MINE	<0.5	AU
45026	UNNAMED 127316	Orogenic lode gold veins	55	212816	8231769	ABANDONED MINE	<0.5	AU
41360	UNNAMED 128244	Orogenic lode gold veins	55	213006	8224569	ABANDONED MINE	<0.5	AU
45027	UNNAMED 128334	Orogenic lode gold veins	55	212916	8233569	ABANDONED MINE	<0.5	AU
45028	UNNAMED 128336	Orogenic lode gold veins	55	212936	8233809	ABANDONED MINE	<0.5	AU
41358	UNNAMED 129181	Orogenic lode gold veins	55	213056	8218359	ABANDONED MINE	<0.5	AU
41359	UNNAMED 129222	Orogenic lode gold veins	55	213046	8222409	ABANDONED MINE	<0.5	AU
41363	UNNAMED 129226	Orogenic lode gold veins	55	213096	8222859	ABANDONED MINE	<0.5	AU
45029	UNNAMED 129337	Orogenic lode gold veins	55	213036	8233889	ABANDONED MINE	<0.5	AU
41361	UNNAMED 130182	Orogenic lode gold veins	55	213126	8218419	ABANDONED MINE	<0.5	AU
41362	UNNAMED 130205	Orogenic lode gold veins	55	213126	8220699	ABANDONED MINE	<0.5	AU
45032	UNNAMED 130316	Orogenic lode gold veins	55	213166	8231799	ABANDONED MINE	<0.5	AU
45033	UNNAMED 130317	Orogenic lode gold veins	55	213166	8231949	ABANDONED MINE	<0.5	AU
45034	UNNAMED 130326	Orogenic lode gold veins	55	213166	8232819	ABANDONED MINE	<0.5	AU
45030	UNNAMED 130335	Orogenic lode gold veins	55	213116	8233669	ABANDONED MINE	<0.5	AU
41367	UNNAMED 131216	Orogenic lode gold veins	55	213306	8221799	ABANDONED MINE	<0.5	AU
41364	UNNAMED 131226	Orogenic lode gold veins	55	213236	8222809	ABANDONED MINE	<0.5	AU
41365	UNNAMED 131229	Orogenic lode gold veins	55	213266	8223079	ABANDONED MINE	<0.5	AU
45037	UNNAMED 131295	Orogenic lode gold veins	55	213286	8229729	ABANDONED MINE	<0.5	AU
45031	UNNAMED 131306	Orogenic lode gold veins	55	213216	8230769	ABANDONED MINE	<0.5	AU
41366	UNNAMED 132205	Orogenic lode gold veins	55	213356	8220729	ABANDONED MINE	<0.5	AU
41373	UNNAMED 132214	Orogenic lode gold veins	55	213386	8221639	ABANDONED MINE	<0.5	AU
41374	UNNAMED 132222	Orogenic lode gold veins	55	213386	8222389	ABANDONED MINE	<0.5	AU
41368	UNNAMED 132224	Orogenic lode gold veins	55	213356	8222629	ABANDONED MINE	<0.5	AU
41369	UNNAMED 132229	Orogenic lode gold veins	55	213326	8223069	ABANDONED MINE	<0.5	AU
41375	UNNAMED 132229	Orogenic lode gold veins	55	213366	8223109	ABANDONED MINE	<0.5	AU
41376	UNNAMED 132233	Orogenic lode gold veins	55	213366	8223509	ABANDONED MINE	<0.5	AU
41377	UNNAMED 132237	Orogenic lode gold veins	55	213366	8223889	ABANDONED MINE	<0.5	AU

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41370	UNNAMED 132244	Orogenic lode gold veins	55	213316	8224569	ABANDONED MINE	<0.5	AU
41371	UNNAMED 132245	Orogenic lode gold veins	55	213316	8224669	ABANDONED MINE	<0.5	AU
41372	UNNAMED 132287	Orogenic lode gold veins	55	213316	8228869	ABANDONED MINE	<0.5	AU
45038	UNNAMED 132307	Orogenic lode gold veins	55	213316	8230869	ABANDONED MINE	<0.5	AU
45039	UNNAMED 132319	Orogenic lode gold veins	55	213396	8232069	ABANDONED MINE	<0.5	AU
41379	UNNAMED 133178	Orogenic lode gold veins	55	213506	8218059	ABANDONED MINE	<0.5	AU
41380	UNNAMED 133220	Orogenic lode gold veins	55	213486	8222189	ABANDONED MINE	<0.5	AU
41381	UNNAMED 133221	Orogenic lode gold veins	55	213496	8222309	ABANDONED MINE	<0.5	AU
41382	UNNAMED 133234	Orogenic lode gold veins	55	213476	8223599	ABANDONED MINE	<0.5	AU
41378	UNNAMED 133287	Orogenic lode gold veins	55	213416	8228869	ABANDONED MINE	<0.5	AU
45041	UNNAMED 133296	Orogenic lode gold veins	55	213506	8229809	ABANDONED MINE	<0.5	AU
45042	UNNAMED 133296	Orogenic lode gold veins	55	213486	8229829	ABANDONED MINE	<0.5	AU
41386	UNNAMED 134231	Orogenic lode gold veins	55	213596	8223299	ABANDONED MINE	<0.5	AU
41383	UNNAMED 134235	Orogenic lode gold veins	55	213546	8223699	ABANDONED MINE	<0.5	AU
45043	UNNAMED 134297	Orogenic lode gold veins	55	213566	8229869	ABANDONED MINE	<0.5	AU
45072	UNNAMED 134300	Orogenic lode gold veins	55	213516	8230169	ABANDONED MINE	<0.5	AU
41388	UNNAMED 134866	Orogenic lode gold veins	55	213575	8186789	ABANDONED MINE	<0.5	AU
41384	UNNAMED 135178	Orogenic lode gold veins	55	213636	8218039	ABANDONED MINE	<0.5	AU
41385	UNNAMED 135219	Orogenic lode gold veins	55	213636	8222069	ABANDONED MINE	<0.5	AU
41387	UNNAMED 135237	Orogenic lode gold veins	55	213616	8223929	ABANDONED MINE	<0.5	AU
41389	UNNAMED 136179	Orogenic lode gold veins	55	213746	8218079	ABANDONED MINE	<0.5	AU
41390	UNNAMED 136221	Orogenic lode gold veins	55	213726	8222309	ABANDONED MINE	<0.5	AU
41391	UNNAMED 136224	Orogenic lode gold veins	55	213726	8222629	ABANDONED MINE	<0.5	AU
41393	UNNAMED 137177	Orogenic lode gold veins	55	213896	8217909	ABANDONED MINE	<0.5	AU
41392	UNNAMED 137219	Orogenic lode gold veins	55	213846	8222079	ABANDONED MINE	<0.5	AU
41397	UNNAMED 137290	Orogenic lode gold veins	55	213896	8229189	ABANDONED MINE	<0.5	AU
45045	UNNAMED 137294	Orogenic lode gold veins	55	213906	8229649	ABANDONED MINE	<0.5	AU
482301	UNNAMED 138061	Orogenic lode gold veins	55	313965	7906320	MINERAL OCCURRENCE	<0.5	AU
41398	UNNAMED 138174	Orogenic lode gold veins	55	213996	8217599	ABANDONED MINE	<0.5	AU
41394	UNNAMED 138213	Orogenic lode gold veins	55	213936	8221499	ABANDONED MINE	<0.5	AU
41395	UNNAMED 138219	Orogenic lode gold veins	55	213946	8222089	ABANDONED MINE	<0.5	AU
41396	UNNAMED 138234	Orogenic lode gold veins	55	213916	8223619	ABANDONED MINE	<0.5	AU
45046	UNNAMED 138295	Orogenic lode gold veins	55	213926	8229719	ABANDONED MINE	<0.5	AU
45047	UNNAMED 138306	Orogenic lode gold veins	55	213916	8230769	ABANDONED MINE	<0.5	AU
41399	UNNAMED 139213	Orogenic lode gold veins	55	214036	8221529	ABANDONED MINE	<0.5	AU
45048	UNNAMED 139325	Orogenic lode gold veins	55	214016	8232669	ABANDONED MINE	<0.5	AU
41400	UNNAMED 139406	Orogenic lode gold veins	55	214076	8240849	ABANDONED MINE	<0.5	AU
41401	UNNAMED 140216	Orogenic lode gold veins	55	214156	8221849	ABANDONED MINE	<0.5	AU
41404	UNNAMED 140217	Orogenic lode gold veins	55	214166	8221929	ABANDONED MINE	<0.5	AU
41402	UNNAMED 140218	Orogenic lode gold veins	55	214146	8222029	ABANDONED MINE	<0.5	AU
41403	UNNAMED 141217	Orogenic lode gold veins	55	214216	8221889	ABANDONED MINE	<0.5	AU
41405	UNNAMED 141227	Orogenic lode gold veins	55	214236	8222929	ABANDONED MINE	<0.5	AU
45049	UNNAMED 141296	Orogenic lode gold veins	55	214216	8229769	ABANDONED MINE	<0.5	AU
41409	UNNAMED 141837	Orogenic lode gold veins	55	214265	8183909	ABANDONED MINE	<0.5	AU
41406	UNNAMED 141852	Orogenic lode gold veins	55	214225	8185379	ABANDONED MINE	<0.5	AU
41410	UNNAMED 141858	Orogenic lode gold veins	55	214285	8186009	ABANDONED MINE	<0.5	AU
41407	UNNAMED 142227	Orogenic lode gold veins	55	214316	8222909	ABANDONED MINE	<0.5	AU
41408	UNNAMED 142287	Orogenic lode gold veins	55	214316	8228869	ABANDONED MINE	<0.5	AU
37325	UNNAMED 142835	Gold-antimony, antimony-gold and antimony veins	55	314314	8083709	MINERAL OCCURRENCE	<0.5	SB
41414	UNNAMED 142853	Orogenic lode gold veins	55	214405	8185479	ABANDONED MINE	<0.5	AU

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41411	UNNAMED 143210	Orogenic lode gold veins	55	214426	8221189	ABANDONED MINE	<0.5	AU
41412	UNNAMED 143222	Orogenic lode gold veins	55	214416	8222369	ABANDONED MINE	<0.5	AU
41416	UNNAMED 143835	Orogenic lode gold veins	55	214485	8183729	ABANDONED MINE	<0.5	AU
41413	UNNAMED 143838	Orogenic lode gold veins	55	214435	8184049	ABANDONED MINE	<0.5	AU
41415	UNNAMED 143856	Orogenic lode gold veins	55	214425	8185809	ABANDONED MINE	<0.5	AU
45051	UNNAMED 144296	Orogenic lode gold veins	55	214516	8229769	ABANDONED MINE	<0.5	AU
41417	UNNAMED 144840	Orogenic lode gold veins	55	214515	8184169	ABANDONED MINE	<0.5	AU
41418	UNNAMED 144859	Orogenic lode gold veins	55	214555	8186129	ABANDONED MINE	<0.5	AU
41420	UNNAMED 144865	Orogenic lode gold veins	55	214565	8186759	ABANDONED MINE	<0.5	AU
41419	UNNAMED 144866	Orogenic lode gold veins	55	214545	8186859	ABANDONED MINE	<0.5	AU
45052	UNNAMED 145299	Orogenic lode gold veins	55	214616	8230069	ABANDONED MINE	<0.5	AU
37829	UNNAMED 145333	Orogenic lode gold veins	55	214615	8133469	ABANDONED MINE	<0.5	AU
41422	UNNAMED 145861	Orogenic lode gold veins	55	214685	8186309	ABANDONED MINE	<0.5	AU
41424	UNNAMED 146224	Orogenic lode gold veins	55	214776	8222569	ABANDONED MINE	<0.5	AU
45053	UNNAMED 146305	Orogenic lode gold veins	55	214716	8230669	ABANDONED MINE	<0.5	AU
45054	UNNAMED 146312	Orogenic lode gold veins	55	214716	8231369	ABANDONED MINE	<0.5	AU
41423	UNNAMED 146865	Orogenic lode gold veins	55	214725	8186719	ABANDONED MINE	<0.5	AU
45055	UNNAMED 147299	Orogenic lode gold veins	55	214816	8230069	ABANDONED MINE	<0.5	AU
41426	UNNAMED 147855	Orogenic lode gold veins	55	214905	8185669	ABANDONED MINE	<0.5	AU
45056	UNNAMED 148299	Orogenic lode gold veins	55	214916	8230069	ABANDONED MINE	<0.5	AU
45057	UNNAMED 148314	Orogenic lode gold veins	55	214916	8231569	ABANDONED MINE	<0.5	AU
41427	UNNAMED 148827	Orogenic lode gold veins	55	214995	8182959	MINERAL OCCURRENCE	<0.5	AU
45058	UNNAMED 149299	Orogenic lode gold veins	55	215016	8230069	ABANDONED MINE	<0.5	AU
41428	UNNAMED 149832	Orogenic lode gold veins	55	215015	8183379	ABANDONED MINE	<0.5	AU
41429	UNNAMED 150215	Orogenic lode gold veins	55	215156	8221709	ABANDONED MINE	<0.5	AU
45059	UNNAMED 150311	Orogenic lode gold veins	55	215166	8231319	ABANDONED MINE	<0.5	AU
41432	UNNAMED 152203	Orogenic lode gold veins	55	215386	8220479	ABANDONED MINE	<0.5	AU
41430	UNNAMED 152211	Orogenic lode gold veins	55	215316	8221309	ABANDONED MINE	<0.5	AU
45061	UNNAMED 152384	Orogenic lode gold veins	55	215316	8238599	ABANDONED MINE	<0.5	AU
41431	UNNAMED 152847	Orogenic lode gold veins	55	215315	8184869	ABANDONED MINE	<0.5	AU
41433	UNNAMED 153208	Orogenic lode gold veins	55	215456	8221049	ABANDONED MINE	<0.5	AU
41434	UNNAMED 153209	Orogenic lode gold veins	55	215446	8221129	ABANDONED MINE	<0.5	AU
41435	UNNAMED 154208	Orogenic lode gold veins	55	215546	8220999	ABANDONED MINE	<0.5	AU
41436	UNNAMED 154209	Orogenic lode gold veins	55	215516	8221079	ABANDONED MINE	<0.5	AU
45062	UNNAMED 154310	Orogenic lode gold veins	55	215516	8231169	ABANDONED MINE	<0.5	AU
41437	UNNAMED 154861	Orogenic lode gold veins	55	215515	8186269	ABANDONED MINE	<0.5	AU
41440	UNNAMED 155203	Orogenic lode gold veins	55	215666	8220529	ABANDONED MINE	<0.5	AU
41438	UNNAMED 155786	Orogenic lode gold veins	55	215615	8178769	ABANDONED MINE	<0.5	AU
41439	UNNAMED 155847	Orogenic lode gold veins	55	215615	8184949	ABANDONED MINE	<0.5	AU
41441	UNNAMED 156795	Orogenic lode gold veins	55	215715	8179669	ABANDONED MINE	<0.5	AU
41449	UNNAMED 156836	Orogenic lode gold veins	55	215775	8183819	MINERAL OCCURRENCE	<0.5	AU
41445	UNNAMED 157769	Gold-antimony, antimony-gold and antimony veins	55	215815	8177069	ABANDONED MINE	<0.5	SB AU
41446	UNNAMED 157786	Orogenic lode gold veins	55	215815	8178769	ABANDONED MINE	<0.5	AU
41447	UNNAMED 157794	Orogenic lode gold veins	55	215815	8179569	ABANDONED MINE	<0.5	AU
41448	UNNAMED 157795	Orogenic lode gold veins	55	215815	8179669	ABANDONED MINE	<0.5	AU
45064	UNNAMED 158342	Orogenic lode gold veins	55	215956	8234409	ABANDONED MINE	<0.5	AU
41450	UNNAMED 160291	Orogenic lode gold veins	55	216116	8229269	ABANDONED MINE	<0.5	AU
41451	UNNAMED 160775	Gold-antimony, antimony-gold and antimony veins	55	216115	8177669	ABANDONED MINE	<0.5	SB AU
41452	UNNAMED 161786	Orogenic lode gold veins	55	216215	8178769	ABANDONED MINE	<0.5	AU
41453	UNNAMED 162805	Orogenic lode gold veins	55	216315	8180669	ABANDONED MINE	<0.5	AU

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41454	UNNAMED 163789	Orogenic lode gold veins	55	216415	8179069	ABANDONED MINE	<0.5	AU
41455	UNNAMED 163792	Orogenic lode gold veins	55	216415	8179369	ABANDONED MINE	<0.5	AU
41456	UNNAMED 163804	Orogenic lode gold veins	55	216415	8180569	ABANDONED MINE	<0.5	AU
41457	UNNAMED 163806	Orogenic lode gold veins	55	216415	8180769	ABANDONED MINE	<0.5	AU
41458	UNNAMED 164787	Orogenic lode gold veins	55	216515	8178869	ABANDONED MINE	<0.5	AU
41459	UNNAMED 164803	Orogenic lode gold veins	55	216515	8180469	ABANDONED MINE	<0.5	AU
41460	UNNAMED 164805	Orogenic lode gold veins	55	216515	8180669	ABANDONED MINE	<0.5	AU
37830	UNNAMED 165736	Gold-antimony, antimony-gold and antimony veins	55	216665	8173819	ABANDONED MINE	<0.5	SB AU
41461	UNNAMED 165788	Orogenic lode gold veins	55	216615	8178969	ABANDONED MINE	<0.5	AU
41462	UNNAMED 166787	Orogenic lode gold veins	55	216715	8178869	ABANDONED MINE	<0.5	AU
37831	UNNAMED 167725	Orogenic lode gold veins	55	216865	8172669	ABANDONED MINE	<0.5	AU
41463	UNNAMED 167797	Orogenic lode gold veins	55	216815	8179869	ABANDONED MINE	<0.5	AU
41464	UNNAMED 170010	Orogenic lode gold veins	55	217115	8201169	ABANDONED MINE	<0.5	AU
41465	UNNAMED 170801	Orogenic lode gold veins	55	217115	8180269	ABANDONED MINE	<0.5	AU
41466	UNNAMED 171800	Orogenic lode gold veins	55	217215	8180169	ABANDONED MINE	<0.5	AU
37832	UNNAMED 173737	Gold-antimony, antimony-gold and antimony veins	55	217415	8173869	ABANDONED MINE	<0.5	SB AU
41467	UNNAMED 173764	Gold-antimony, antimony-gold and antimony veins	55	217415	8176569	ABANDONED MINE	<0.5	SB
37833	UNNAMED 174734	Gold-antimony, antimony-gold and antimony veins	55	217565	8173569	ABANDONED MINE	<0.5	SB AU
41468	UNNAMED 174766	Gold-antimony, antimony-gold and antimony veins	55	217515	8176769	ABANDONED MINE	<0.5	SB
41586	UNNAMED 177179	Orogenic lode gold veins	55	317815	8218070	ABANDONED MINE	<0.5	AU
43882	UNNAMED 181324	Gold-antimony, antimony-gold and antimony veins	55	318214	8132570	ABANDONED MINE	<0.5	SB AU
41471	UNNAMED 182044	Orogenic lode gold veins	55	218315	8204569	ABANDONED MINE	<0.5	AU
41473	UNNAMED 189754	Gold-antimony, antimony-gold and antimony veins	55	219015	8175569	MINERAL OCCURRENCE	<0.5	SB
41474	UNNAMED 189763	Gold-antimony, antimony-gold and antimony veins	55	219015	8176469	MINERAL OCCURRENCE	<0.5	SB
43884	UNNAMED 192306	Gold-antimony, antimony-gold and antimony veins	55	319314	8130770	ABANDONED MINE	<0.5	SB
41476	UNNAMED 227744	Orogenic lode gold veins	55	222815	8174569	ABANDONED MINE	<0.5	AU
38143	UNNAMED 255124	Orogenic lode gold veins	55	225615	8412569	MINERAL OCCURRENCE	<0.5	AU
37769	UNNAMED 255518	Orogenic lode gold veins	55	225615	8151969	ABANDONED MINE	<0.5	AU
37770	UNNAMED 260514	Orogenic lode gold veins	55	226115	8151569	ABANDONED MINE	<0.5	AU
482303	UNNAMED 272253	Orogenic lode gold veins	55	327315	7925470	MINERAL OCCURRENCE	<0.5	AU
545422	UNNAMED 296281	Orogenic lode gold veins	55	279765	8228269	MINERAL OCCURRENCE	<0.5	AU
44285	UNNAMED 340252	Orogenic lode gold veins	55	234115	8225369	ABANDONED MINE	<0.5	AU
44286	UNNAMED 350275	Orogenic lode gold veins	55	235115	8227669	ABANDONED MINE	<0.5	AU
45589	UNNAMED 367858	Orogenic lode gold veins	55	336865	7885970	MINERAL OCCURRENCE	<0.5	AU
41845	UNNAMED 388609	Gold-antimony, antimony-gold and antimony veins	55	238915	8161069	MINERAL OCCURRENCE	<0.5	SB
41847	UNNAMED 403598	Gold-antimony, antimony-gold and antimony veins	55	240415	8159969	MINERAL OCCURRENCE	<0.5	SB
41848	UNNAMED 410632	Gold-antimony, antimony-gold and antimony veins	55	241165	8163419	ABANDONED MINE	<0.5	SB
41849	UNNAMED 415625	Gold-antimony, antimony-gold and antimony veins	55	241615	8162669	ABANDONED MINE	<0.5	SB
545544	UNNAMED 422675	Orogenic lode gold veins	55	242315	8165869	MINERAL OCCURRENCE	<0.5	AU
41850	UNNAMED 423579	Gold-antimony, antimony-gold and antimony veins	55	242465	8158119	MINERAL OCCURRENCE	<0.5	SB
545543	UNNAMED 423671	Orogenic lode gold veins	55	242415	8167269	MINERAL OCCURRENCE	<0.5	AU
545547	UNNAMED 423837	Gold-antimony, antimony-gold and antimony veins	55	242415	8183869	MINERAL OCCURRENCE	<0.5	SB
481086	UNNAMED 425311	Orogenic lode gold veins	55	342615	7931270	MINERAL OCCURRENCE	<0.5	AU
481071	UNNAMED 429325	Orogenic lode gold veins	55	343015	7932670	MINERAL OCCURRENCE	<0.5	AU
545545	UNNAMED 432677	Orogenic lode gold veins	55	243315	8167869	MINERAL OCCURRENCE	<0.5	AU
545546	UNNAMED 432677	Orogenic lode gold veins	55	243315	8168369	MINERAL OCCURRENCE	<0.5	AU
38043	UNNAMED 437246	Orogenic lode gold veins	55	343814	8124840	MINERAL OCCURRENCE	<0.5	AU
38044	UNNAMED 438245	Orogenic lode gold veins	55	343944	8124670	MINERAL OCCURRENCE	<0.5	AU
481072	UNNAMED 439323	Orogenic lode gold veins	55	344015	7932470	MINERAL OCCURRENCE	<0.5	AU
41851	UNNAMED 441552	Gold-antimony, antimony-gold and antimony veins	55	244215	8155369	MINERAL OCCURRENCE	<0.5	SB

SITE_NO	NAME	STYLE	MGA_ZONE	EAST94	NORTH94	MINE STATUS	DEPOSIT SIZE (Au, t)	COMMODITIES
41852	UNNAMED 445549	Gold-antimony, antimony-gold and antimony veins	55	244615	8155069	ABANDONED MINE	<0.5	SB
41853	UNNAMED 448663	Gold-antimony, antimony-gold and antimony veins	55	244915	8166469	ABANDONED MINE	<0.5	SB
41854	UNNAMED 450419	Orogenic lode gold veins	55	245114	8142069	ABANDONED MINE	<0.5	AU
41855	UNNAMED 472533	Gold-antimony, antimony-gold and antimony veins	55	247365	8153519	ABANDONED MINE	<0.5	SB
44287	UNNAMED 483136	Orogenic lode gold veins	55	248415	8213769	MINERAL OCCURRENCE	<0.5	AU
44288	UNNAMED 488139	Orogenic lode gold veins	55	248915	8214069	MINERAL OCCURRENCE	<0.5	AU
44289	UNNAMED 495156	Orogenic lode gold veins	55	249615	8215769	MINERAL OCCURRENCE	<0.5	AU
44290	UNNAMED 497139	Orogenic lode gold veins	55	249815	8214069	ABANDONED MINE	<0.5	AU
478955	UNNAMED 530174	Orogenic lode gold veins	55	253115	7917570	ABANDONED MINE	<0.5	AU
41856	UNNAMED 591581	Gold-antimony, antimony-gold and antimony veins	55	259265	8158319	ABANDONED MINE	<0.5	SB
478887	UNNAMED 595438	Gold-antimony, antimony-gold and antimony veins	55	259615	7843971	ABANDONED MINE	<0.5	SB
478889	UNNAMED 596440	Gold-antimony, antimony-gold and antimony veins	55	259715	7844171	ABANDONED MINE	<0.5	SB AU
478890	UNNAMED 597439	Orogenic lode gold veins	55	259815	7844071	ABANDONED MINE	<0.5	AU
478891	UNNAMED 598437	Orogenic lode gold veins	55	259915	7843871	ABANDONED MINE	<0.5	AU
478892	UNNAMED 599435	Orogenic lode gold veins	55	260015	7843671	ABANDONED MINE	<0.5	AU
478841	UNNAMED 618956	Orogenic lode gold veins	55	261915	7895770	ABANDONED MINE	<0.5	AU
45188	UNNAMED 620037	Orogenic lode gold veins	55	362114	8103869	ABANDONED MINE	<0.5	AU
478842	UNNAMED 624945	Orogenic lode gold veins	55	262515	7894670	ABANDONED MINE	<0.5	AU
41857	UNNAMED 643528	Gold-antimony, antimony-gold and antimony veins	55	264414	8152969	ABANDONED MINE	<0.5	SB
478971	UNNAMED 643978	Orogenic lode gold veins	55	264445	7898020	MINERAL OCCURRENCE	<0.5	AU
478896	UNNAMED 644470	Orogenic lode gold veins	55	264515	7847171	MINERAL OCCURRENCE	<0.5	AU
45189	UNNAMED 655899	Orogenic lode gold veins	55	365702	8090094	ABANDONED MINE	<0.5	AU
45190	UNNAMED 664931	Orogenic lode gold veins	55	366514	8093290	ABANDONED MINE	<0.5	AU
45191	UNNAMED 666888	Orogenic lode gold veins	55	366790	8089050	ABANDONED MINE	<0.5	AU
478901	UNNAMED 678480	Orogenic lode gold veins	55	267915	7848171	ABANDONED MINE	<0.5	AU
478903	UNNAMED 682474	Orogenic lode gold veins	55	268315	7847571	MINERAL OCCURRENCE	<0.5	AU HG SAPP ZIR GN
41794	UNNAMED 695426	Orogenic lode gold veins	55	269614	8142820	ABANDONED MINE	<0.5	AU
41795	UNNAMED 695429	Orogenic lode gold veins	55	269614	8143120	ABANDONED MINE	<0.5	AU
41796	UNNAMED 701428	Orogenic lode gold veins	55	270214	8142970	ABANDONED MINE	<0.5	AU
41797	UNNAMED 702428	Orogenic lode gold veins	55	270314	8142970	ABANDONED MINE	<0.5	AU
41799	UNNAMED 703433	Orogenic lode gold veins	55	270464	8143520	ABANDONED MINE	<0.5	AU
41798	UNNAMED 703434	Orogenic lode gold veins	55	270414	8143570	ABANDONED MINE	<0.5	AU
41800	UNNAMED 707422	Orogenic lode gold veins	55	270814	8142370	ABANDONED MINE	<0.5	AU
41801	UNNAMED 707423	Orogenic lode gold veins	55	270814	8142470	ABANDONED MINE	<0.5	AU
41802	UNNAMED 712425	Orogenic lode gold veins	55	271314	8142670	ABANDONED MINE	<0.5	AU
41803	UNNAMED 712430	Orogenic lode gold veins	55	271314	8143170	ABANDONED MINE	<0.5	AU
41804	UNNAMED 712430	Orogenic lode gold veins	55	271314	8143220	ABANDONED MINE	<0.5	AU
41805	UNNAMED 715385	Orogenic lode gold veins	55	271614	8138670	ABANDONED MINE	<0.5	AU
41806	UNNAMED 716404	Orogenic lode gold veins	55	271714	8140570	ABANDONED MINE	<0.5	AU
41807	UNNAMED 716405	Orogenic lode gold veins	55	271714	8140670	ABANDONED MINE	<0.5	AU
41808	UNNAMED 717404	Orogenic lode gold veins	55	271814	8140570	ABANDONED MINE	<0.5	AU
41809	UNNAMED 717406	Orogenic lode gold veins	55	271814	8140770	ABANDONED MINE	<0.5	AU
41810	UNNAMED 718386	Orogenic lode gold veins	55	271914	8138770	ABANDONED MINE	<0.5	AU
41811	UNNAMED 718402	Orogenic lode gold veins	55	271914	8140370	ABANDONED MINE	<0.5	AU
41812	UNNAMED 719392	Orogenic lode gold veins	55	272014	8139370	ABANDONED MINE	<0.5	AU
41813	UNNAMED 720391	Orogenic lode gold veins	55	272114	8139270	ABANDONED MINE	<0.5	AU
41814	UNNAMED 720392	Orogenic lode gold veins	55	272114	8139370	ABANDONED MINE	<0.5	AU
41815	UNNAMED 721397	Orogenic lode gold veins	55	272214	8139870	ABANDONED MINE	<0.5	AU
41858	UNNAMED 722369	Orogenic lode gold veins	55	272314	8137070	ABANDONED MINE	<0.5	AU
41816	UNNAMED 722374	Orogenic lode gold veins	55	272314	8137570	ABANDONED MINE	<0.5	AU

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41817	UNNAMED 722398	Orogenic lode gold veins	55	272314	8139970	ABANDONED MINE	<0.5	AU
41818	UNNAMED 723372	Orogenic lode gold veins	55	272414	8137370	ABANDONED MINE	<0.5	AU
41819	UNNAMED 723374	Orogenic lode gold veins	55	272414	8137570	ABANDONED MINE	<0.5	AU
41820	UNNAMED 723396	Orogenic lode gold veins	55	272414	8139770	ABANDONED MINE	<0.5	AU
41822	UNNAMED 724377	Orogenic lode gold veins	55	272564	8137870	ABANDONED MINE	<0.5	AU
41823	UNNAMED 725377	Orogenic lode gold veins	55	272614	8137870	ABANDONED MINE	<0.5	AU
41825	UNNAMED 726375	Orogenic lode gold veins	55	272714	8137670	ABANDONED MINE	<0.5	AU
41826	UNNAMED 726375	Orogenic lode gold veins	55	272764	8137720	ABANDONED MINE	<0.5	AU
41859	UNNAMED 732368	Orogenic lode gold veins	55	273314	8136970	ABANDONED MINE	<0.5	AU
41860	UNNAMED 738367	Orogenic lode gold veins	55	273964	8136920	MINERAL OCCURRENCE	<0.5	AU
41862	UNNAMED 738395	Orogenic lode gold veins	55	273964	8139670	ABANDONED MINE	<0.5	AU
41861	UNNAMED 739380	Orogenic lode gold veins	55	274014	8138170	ABANDONED MINE	<0.5	AU
41863	UNNAMED 742490	Orogenic lode gold veins	55	274364	8149170	ABANDONED MINE	<0.5	AU
41743	UNNAMED 744361	Orogenic lode gold veins	55	274514	8136270	ABANDONED MINE	<0.5	AU
41744	UNNAMED 744365	Orogenic lode gold veins	55	274514	8136670	ABANDONED MINE	<0.5	AU
41745	UNNAMED 750375	Orogenic lode gold veins	55	275114	8137670	ABANDONED MINE	<0.5	AU
41746	UNNAMED 750385	Orogenic lode gold veins	55	275114	8138670	ABANDONED MINE	<0.5	AU
41747	UNNAMED 753376	Orogenic lode gold veins	55	275414	8137770	ABANDONED MINE	<0.5	AU
41748	UNNAMED 754367	Orogenic lode gold veins	55	275564	8136870	ABANDONED MINE	<0.5	AU
41749	UNNAMED 754370	Orogenic lode gold veins	55	275564	8137220	MINERAL OCCURRENCE	<0.5	AU
44443	UNNAMED 754660	Orogenic lode gold veins	55	275515	8266169	ABANDONED MINE	<0.5	AU
44445	UNNAMED 755380	Orogenic lode gold veins	55	275705	8238179	ABANDONED MINE	<0.5	AU
41864	UNNAMED 755470	Orogenic lode gold veins	55	275614	8147170	ABANDONED MINE	<0.5	AU
41750	UNNAMED 756367	Orogenic lode gold veins	55	275714	8136870	ABANDONED MINE	<0.5	AU
41754	UNNAMED 756368	Orogenic lode gold veins	55	275764	8137020	ABANDONED MINE	<0.5	AU
44444	UNNAMED 756378	Orogenic lode gold veins	55	275735	8238009	ABANDONED MINE	<0.5	AU
41751	UNNAMED 756379	Orogenic lode gold veins	55	275714	8138070	ABANDONED MINE	<0.5	AU
41752	UNNAMED 756380	Orogenic lode gold veins	55	275714	8138170	ABANDONED MINE	<0.5	AU
44446	UNNAMED 756380	Orogenic lode gold veins	55	275745	8238239	ABANDONED MINE	<0.5	AU
41865	UNNAMED 756467	Orogenic lode gold veins	55	275714	8146870	ABANDONED MINE	<0.5	AU
41866	UNNAMED 757341	Gold-antimony, antimony-gold and antimony veins	55	275814	8134320	ABANDONED MINE	<0.5	SB
41837	UNNAMED 757350	Orogenic lode gold veins	55	275814	8135170	ABANDONED MINE	<0.5	AU
41753	UNNAMED 757368	Orogenic lode gold veins	55	275814	8136970	ABANDONED MINE	<0.5	AU
41755	UNNAMED 757375	Orogenic lode gold veins	55	275814	8137670	ABANDONED MINE	<0.5	AU
41867	UNNAMED 758331	Gold-antimony, antimony-gold and antimony veins	55	275914	8133270	ABANDONED MINE	<0.5	SB
41756	UNNAMED 758366	Orogenic lode gold veins	55	275914	8136770	ABANDONED MINE	<0.5	AU
41757	UNNAMED 758367	Orogenic lode gold veins	55	275914	8136870	ABANDONED MINE	<0.5	AU
41868	UNNAMED 759330	Gold-antimony, antimony-gold and antimony veins	55	276014	8133170	ABANDONED MINE	<0.5	SB
41869	UNNAMED 759331	Gold-antimony, antimony-gold and antimony veins	55	276014	8133270	ABANDONED MINE	<0.5	SB
41870	UNNAMED 759338	Gold-antimony, antimony-gold and antimony veins	55	276014	8133970	ABANDONED MINE	<0.5	SB
41871	UNNAMED 760342	Gold-antimony, antimony-gold and antimony veins	55	276114	8134370	ABANDONED MINE	<0.5	SB
41872	UNNAMED 761338	Gold-antimony, antimony-gold and antimony veins	55	276214	8133970	ABANDONED MINE	<0.5	SB
41873	UNNAMED 762338	Gold-antimony, antimony-gold and antimony veins	55	276314	8133970	ABANDONED MINE	<0.5	SB
41874	UNNAMED 762340	Gold-antimony, antimony-gold and antimony veins	55	276314	8134170	ABANDONED MINE	<0.5	SB
41875	UNNAMED 762341	Orogenic lode gold veins	55	276364	8134320	ABANDONED MINE	<0.5	AU
41758	UNNAMED 763367	Orogenic lode gold veins	55	276414	8136920	ABANDONED MINE	<0.5	AU
44447	UNNAMED 764402	Orogenic lode gold veins	55	276515	8240419	ABANDONED MINE	<0.5	AU
44448	UNNAMED 765389	Orogenic lode gold veins	55	276635	8239089	ABANDONED MINE	<0.5	AU
44449	UNNAMED 765399	Orogenic lode gold veins	55	276685	8240089	ABANDONED MINE	<0.5	AU
41876	UNNAMED 767346	Orogenic lode gold veins	55	276814	8134820	ABANDONED MINE	<0.5	AU

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44450	UNNAMED 767392	Orogenic lode gold veins	55	276865	8239399	ABANDONED MINE	<0.5	AU
478907	UNNAMED 767632	Orogenic lode gold veins	55	276815	7863371	ABANDONED MINE	<0.5	AU
478908	UNNAMED 771642	Orogenic lode gold veins	55	277215	7864371	ABANDONED MINE	<0.5	AU
478909	UNNAMED 777638	Orogenic lode gold veins	55	277815	7863971	MINERAL OCCURRENCE	<0.5	AU
41877	UNNAMED 780337	Orogenic lode gold veins	55	278114	8133870	ABANDONED MINE	<0.5	AU
41878	UNNAMED 780338	Orogenic lode gold veins	55	278164	8133970	ABANDONED MINE	<0.5	AU
41879	UNNAMED 781344	Orogenic lode gold veins	55	278214	8134570	ABANDONED MINE	<0.5	AU
41880	UNNAMED 781683	Orogenic lode gold veins	55	278215	8168469	ABANDONED MINE	<0.5	AU
478910	UNNAMED 782777	Orogenic lode gold veins	55	278315	7877871	ABANDONED MINE	<0.5	AU
41881	UNNAMED 783330	Orogenic lode gold veins	55	278414	8133170	ABANDONED MINE	<0.5	AU
41882	UNNAMED 784326	Orogenic lode gold veins	55	278564	8132770	ABANDONED MINE	<0.5	AU
44293	UNNAMED 785283	Orogenic lode gold veins	55	278615	8228469	ABANDONED MINE	<0.5	AU
44451	UNNAMED 787322	Orogenic lode gold veins	55	278905	8232419	ABANDONED MINE	<0.5	AU
41883	UNNAMED 788320	Orogenic lode gold veins	55	278914	8132170	ABANDONED MINE	<0.5	AU
41884	UNNAMED 789321	Orogenic lode gold veins	55	279014	8132270	ABANDONED MINE	<0.5	AU
41885	UNNAMED 792317	Orogenic lode gold veins	55	279314	8131870	ABANDONED MINE	<0.5	AU
44453	UNNAMED 793320	Orogenic lode gold veins	55	279485	8232249	ABANDONED MINE	<0.5	AU
41886	UNNAMED 794358	Orogenic lode gold veins	55	279514	8135970	ABANDONED MINE	<0.5	AU
41887	UNNAMED 798359	Orogenic lode gold veins	55	279914	8136070	ABANDONED MINE	<0.5	AU
41888	UNNAMED 799324	Orogenic lode gold veins	55	280014	8132570	ABANDONED MINE	<0.5	AU
41889	UNNAMED 799692	Orogenic lode gold veins	55	280015	8169419	ABANDONED MINE	<0.5	AU
41890	UNNAMED 801361	Orogenic lode gold veins	55	280214	8136270	ABANDONED MINE	<0.5	AU
41891	UNNAMED 804323	Orogenic lode gold veins	55	280514	8132470	ABANDONED MINE	<0.5	AU
478914	UNNAMED 804743	Orogenic lode gold veins	55	280515	7874471	MINERAL OCCURRENCE	<0.5	AU
41892	UNNAMED 811332	Orogenic lode gold veins	55	281214	8133370	ABANDONED MINE	<0.5	AU
41893	UNNAMED 812381	Orogenic lode gold veins	55	281314	8138270	ABANDONED MINE	<0.5	AU
41894	UNNAMED 812383	Orogenic lode gold veins	55	281314	8138470	ABANDONED MINE	<0.5	AU
41895	UNNAMED 813377	Orogenic lode gold veins	55	281414	8137870	ABANDONED MINE	<0.5	AU
41897	UNNAMED 817331	Orogenic lode gold veins	55	281814	8133270	ABANDONED MINE	<0.5	AU
41898	UNNAMED 818327	Orogenic lode gold veins	55	281914	8132870	ABANDONED MINE	<0.5	AU
41688	UNNAMED 818395	Orogenic lode gold veins	55	281914	8139670	ABANDONED MINE	<0.5	AU
41899	UNNAMED 820307	Orogenic lode gold veins	55	282114	8130870	ABANDONED MINE	<0.5	AU
41900	UNNAMED 820675	Orogenic lode gold veins	55	282115	8167669	ABANDONED MINE	<0.5	AU
41689	UNNAMED 821401	Orogenic lode gold veins	55	282214	8140270	ABANDONED MINE	<0.5	AU
41690	UNNAMED 821403	Orogenic lode gold veins	55	282214	8140470	ABANDONED MINE	<0.5	AU
41691	UNNAMED 822402	Orogenic lode gold veins	55	282314	8140370	ABANDONED MINE	<0.5	AU
41692	UNNAMED 823385	Orogenic lode gold veins	55	282414	8138670	ABANDONED MINE	<0.5	AU
41693	UNNAMED 823396	Orogenic lode gold veins	55	282414	8139770	ABANDONED MINE	<0.5	AU
41694	UNNAMED 824394	Orogenic lode gold veins	55	282514	8139570	ABANDONED MINE	<0.5	AU
41695	UNNAMED 824404	Orogenic lode gold veins	55	282514	8140570	ABANDONED MINE	<0.5	AU
41901	UNNAMED 825297	Orogenic lode gold veins	55	282614	8129870	MINERAL OCCURRENCE	<0.5	AU
41902	UNNAMED 825299	Orogenic lode gold veins	55	282614	8130070	ABANDONED MINE	<0.5	AU
41903	UNNAMED 825336	Orogenic lode gold veins	55	282614	8133770	ABANDONED MINE	<0.5	AU
41904	UNNAMED 827295	Orogenic lode gold veins	55	282814	8129670	ABANDONED MINE	<0.5	AU
41905	UNNAMED 828294	Orogenic lode gold veins	55	282914	8129570	ABANDONED MINE	<0.5	AU
41906	UNNAMED 828295	Orogenic lode gold veins	55	282914	8129670	ABANDONED MINE	<0.5	AU
41907	UNNAMED 828360	Orogenic lode gold veins	55	282914	8136170	ABANDONED MINE	<0.5	AU
41697	UNNAMED 828403	Orogenic lode gold veins	55	282914	8140470	ABANDONED MINE	<0.5	AU
41908	UNNAMED 829295	Orogenic lode gold veins	55	283014	8129670	ABANDONED MINE	<0.5	AU
41909	UNNAMED 829361	Orogenic lode gold veins	55	283014	8136270	ABANDONED MINE	<0.5	AU

SITE_NO	NAME	STYLE	MGA_ZONE	EAST94	NORTH94	MINE STATUS	DEPOSIT SIZE (Au, t)	COMMODITIES
41910	UNNAMED 831284	Orogenic lode gold veins	55	283214	8128570	ABANDONED MINE	<0.5	AU
41911	UNNAMED 833284	Orogenic lode gold veins	55	283414	8128570	ABANDONED MINE	<0.5	AU
41698	UNNAMED 833421	Orogenic lode gold veins	55	283414	8142270	ABANDONED MINE	<0.5	AU
41699	UNNAMED 834431	Orogenic lode gold veins	55	283514	8143270	ABANDONED MINE	<0.5	AU
38150	UNNAMED 835577	Orogenic lode gold veins	55	283615	8357869	ABANDONED MINE	<0.5	AU
41912	UNNAMED 838350	Orogenic lode gold veins	55	283914	8135170	ABANDONED MINE	<0.5	AU
41700	UNNAMED 838394	Orogenic lode gold veins	55	283914	8139570	ABANDONED MINE	<0.5	AU
41913	UNNAMED 840340	Gold-antimony, antimony-gold and antimony veins	55	284114	8134170	ABANDONED MINE	<0.5	SB
41701	UNNAMED 840391	Orogenic lode gold veins	55	284114	8139270	ABANDONED MINE	<0.5	AU
41702	UNNAMED 840392	Orogenic lode gold veins	55	284114	8139370	ABANDONED MINE	<0.5	AU
41703	UNNAMED 840394	Orogenic lode gold veins	55	284114	8139570	ABANDONED MINE	<0.5	AU
41704	UNNAMED 840397	Orogenic lode gold veins	55	284114	8139870	ABANDONED MINE	<0.5	AU
41705	UNNAMED 840400	Orogenic lode gold veins	55	284114	8140170	ABANDONED MINE	<0.5	AU
41705	UNNAMED 840400	Orogenic lode gold veins	55	284114	8140170	ABANDONED MINE	<0.5	AU
41914	UNNAMED 841365	Orogenic lode gold veins	55	284214	8136670	ABANDONED MINE	<0.5	AU
41915	UNNAMED 841374	Orogenic lode gold veins	55	284214	8137570	ABANDONED MINE	<0.5	AU
41706	UNNAMED 841390	Orogenic lode gold veins	55	284214	8139170	ABANDONED MINE	<0.5	AU
41707	UNNAMED 841396	Orogenic lode gold veins	55	284214	8139770	ABANDONED MINE	<0.5	AU
41916	UNNAMED 842329	Orogenic lode gold veins	55	284314	8133070	ABANDONED MINE	<0.5	AU
41917	UNNAMED 842369	Orogenic lode gold veins	55	284314	8137070	ABANDONED MINE	<0.5	AU
41918	UNNAMED 842373	Orogenic lode gold veins	55	284314	8137470	ABANDONED MINE	<0.5	AU
41708	UNNAMED 842391	Orogenic lode gold veins	55	284314	8139270	ABANDONED MINE	<0.5	AU
41709	UNNAMED 842392	Orogenic lode gold veins	55	284314	8139370	ABANDONED MINE	<0.5	AU
41710	UNNAMED 842398	Orogenic lode gold veins	55	284314	8139970	ABANDONED MINE	<0.5	AU
41711	UNNAMED 842400	Orogenic lode gold veins	55	284314	8140170	ABANDONED MINE	<0.5	AU
41921	UNNAMED 843337	Gold-antimony, antimony-gold and antimony veins	55	284464	8133920	ABANDONED MINE	<0.5	AU SB
41920	UNNAMED 843349	Orogenic lode gold veins	55	284414	8135070	ABANDONED MINE	<0.5	AU
41712	UNNAMED 843390	Orogenic lode gold veins	55	284414	8139170	ABANDONED MINE	<0.5	AU
41713	UNNAMED 843398	Orogenic lode gold veins	55	284414	8139970	ABANDONED MINE	<0.5	AU
41922	UNNAMED 844368	Orogenic lode gold veins	55	284514	8136970	ABANDONED MINE	<0.5	AU
41923	UNNAMED 846336	Orogenic lode gold veins	55	284714	8133770	ABANDONED MINE	<0.5	AU
38640	UNNAMED 849718	Gold-antimony, antimony-gold and antimony veins	55	285014	8071969	ABANDONED MINE	<0.5	SB SN
38152	UNNAMED 857529	Orogenic lode gold veins	55	285835	8353069	ABANDONED MINE	<0.5	AU
41924	UNNAMED 865277	Orogenic lode gold veins	55	286614	8127870	ABANDONED MINE	<0.5	AU
43894	UNNAMED 873229	Gold-antimony, antimony-gold and antimony veins	55	287464	8123070	ABANDONED MINE	<0.5	SB AU
43895	UNNAMED 879302	Gold-antimony, antimony-gold and antimony veins	55	288044	8130450	ABANDONED MINE	<0.5	SB AU
43896	UNNAMED 884365	Orogenic lode gold veins	55	288574	8136700	ABANDONED MINE	<0.5	AU
37623	UNNAMED 889135	Gold-antimony, antimony-gold and antimony veins	55	289064	8113670	MINERAL OCCURRENCE	<0.5	SB AU
37643	UNNAMED 899134	Gold-antimony, antimony-gold and antimony veins	55	290014	8113570	MINERAL OCCURRENCE	<0.5	SB AG AU
43898	UNNAMED 901357	Orogenic lode gold veins	55	290274	8135880	ABANDONED MINE	<0.5	AU
43897	UNNAMED 901359	Orogenic lode gold veins	55	290224	8136070	MINERAL OCCURRENCE	<0.5	AU
37660	UNNAMED 905090	Gold-antimony, antimony-gold and antimony veins	55	290614	8109170	ABANDONED MINE	<0.5	AU SB
43899	UNNAMED 905358	Orogenic lode gold veins	55	290694	8135980	MINERAL OCCURRENCE	<0.5	AU
43900	UNNAMED 916253	Orogenic lode gold veins	55	291794	8125470	ABANDONED MINE	<0.5	AU
43901	UNNAMED 921265	Orogenic lode gold veins	55	292254	8126670	ABANDONED MINE	<0.5	AU
43903	UNNAMED 923259	Orogenic lode gold veins	55	292464	8126070	ABANDONED MINE	<0.5	AU
43905	UNNAMED 926357	Orogenic lode gold veins	55	292784	8135910	ABANDONED MINE	<0.5	AU
43904	UNNAMED 926379	Orogenic lode gold veins	55	292754	8138070	MINERAL OCCURRENCE	<0.5	AU
43906	UNNAMED 927363	Orogenic lode gold veins	55	292894	8136480	ABANDONED MINE	<0.5	AU
43907	UNNAMED 927371	Orogenic lode gold veins	55	292884	8137300	ABANDONED MINE	<0.5	AU

SITE_NO	NAME	STYLE	MGA_ZONE	EAST94	NORTH94	MINE STATUS	DEPOSIT SIZE (Au, t)	COMMODITIES
43908	UNNAMED 927374	Orogenic lode gold veins	55	292884	8137570	ABANDONED MINE	<0.5	AU
41477	UNNAMED 964739	Gold-antimony, antimony-gold and antimony veins	55	196516	8174069	MINERAL OCCURRENCE	<0.5	SB
43917	UNNAMED 995350	Orogenic lode gold veins	55	299614	8135170	ABANDONED MINE	<0.5	AU
43918	UNNAMED 997224	Orogenic lode gold veins	55	299814	8122570	MINERAL OCCURRENCE	<0.5	AU
43920	UNNAMED 998351	Orogenic lode gold veins	55	299914	8135270	ABANDONED MINE	<0.5	AU
41309	UPPER FINE GOLD CREEK NO.1	Orogenic lode gold veins	55	216315	8196569	ABANDONED MINE	<0.5	AU
481068	VALENTINE	Gold-antimony, antimony-gold and antimony veins	55	351915	7919970	ABANDONED MINE	<0.5	AU SB
482293	VALLEY OF LAGOONS	Orogenic lode gold veins	55	305615	7940670	MINERAL OCCURRENCE	<0.5	AU PB ZN CU
45184	VANCE	Orogenic lode gold veins	55	366114	8089969	ABANDONED MINE	<0.5	AU
45090	VICTOR	Orogenic lode gold veins	55	375114	8084169	ABANDONED MINE	<0.5	AU
41310	VICTORIA	Orogenic lode gold veins	55	213826	8223569	ABANDONED MINE	<0.5	AU
41685	VICTORIA	Orogenic lode gold veins	55	280014	8131770	ABANDONED MINE	<0.5	AU
41686	VICTORY	Orogenic lode gold veins	55	284014	8140270	ABANDONED MINE	<0.5	AU
41311	VIKING	Orogenic lode gold veins	55	213516	8223409	ABANDONED MINE	<0.5	AU
43838	VON MOLTKE	Orogenic lode gold veins	55	287644	8128690	ABANDONED MINE	<0.5	AU AG
43839	VULCAN	Orogenic lode gold veins	55	290004	8128280	ABANDONED MINE	<0.5	AU AG
478881	WADE	Orogenic lode gold veins	55	272815	7854871	ABANDONED MINE	<0.5	AU
38042	WAITEMATA	Orogenic lode gold veins	55	344214	8125070	ABANDONED MINE	<0.5	AU
44977	WALHALLA	Orogenic lode gold veins	55	215016	8229469	ABANDONED MINE	<0.5	AU
478882	WALLY	Orogenic lode gold veins	55	267639	7847866	ABANDONED MINE	<0.5	AU
45185	WALTER HODGSON & OCCIDENT	Orogenic lode gold veins	55	367374	8089146	ABANDONED MINE	<0.5	AU
41312	WARDHILLTOP NO.1	Orogenic lode gold veins	55	212615	8189969	ABANDONED MINE	<0.5	AU
547099	WARREN TUNNEL	Orogenic lode gold veins	55	287722	8143733	MINERAL OCCURRENCE	<0.5	AU
41827	WARREN'S MAIN SHAFT	Gold-antimony, antimony-gold and antimony veins	55	276314	8133670	ABANDONED MINE	<0.5	SB
43840	WARRIOR	Orogenic lode gold veins	55	287674	8142370	ABANDONED MINE	<0.5	AU AG
44278	WASP GULLY	Orogenic lode gold veins	55	279515	8224369	ABANDONED MINE	<0.5	AU
43841	WATERFORD	Orogenic lode gold veins	55	287884	8127730	ABANDONED MINE	<0.5	AU AG
38141	WEIR'S	Orogenic lode gold veins	55	285675	8353939	ABANDONED MINE	<0.5	AU
41687	WELCOME STRANGER	Orogenic lode gold veins	55	286214	8143770	ABANDONED MINE	<0.5	AU
41793	WELLESLEY	Orogenic lode gold veins	55	271364	8142770	ABANDONED MINE	<0.5	AU
478954	WEST CENTRAL EDMONDS	Orogenic lode gold veins	55	252715	7917070	ABANDONED MINE	<0.5	AU
481069	WESTERN ANT	Gold-antimony, antimony-gold and antimony veins	55	343915	7916970	ABANDONED MINE	<0.5	AU SB
482273	WESTERN FRONT	Orogenic lode gold veins	55	337215	7898970	MINERAL OCCURRENCE	<0.5	AU
41828	WESTWARD HO	Gold-antimony, antimony-gold and antimony veins	55	280114	8126170	ABANDONED MINE	<0.5	SB
41313	WHO WOULD HAVE THOUGHT IT	Orogenic lode gold veins	55	213626	8221569	ABANDONED MINE	<0.5	AU
44981	WILD IRISH GIRL	Orogenic lode gold veins	55	215496	8235559	ABANDONED MINE	<0.5	AU
41314	WILLIAM NO. 1, 2 & 3	Gold-antimony, antimony-gold and antimony veins	55	182316	8192969	ABANDONED MINE	<0.5	SB
41836	WILLIAM TELL	Gold-antimony, antimony-gold and antimony veins	55	275264	8134770	ABANDONED MINE	<0.5	SB AU
481070	WINDMILL	Orogenic lode gold veins	55	346115	7922170	MINERAL OCCURRENCE	<0.5	AU
41742	WORKING MINER	Orogenic lode gold veins	55	276464	8136320	ABANDONED MINE	<0.5	AU
38059	YALBOGIE	Orogenic lode gold veins	55	359874	8131110	MINERAL OCCURRENCE	<0.5	AU
493662	YELLOW JACK	Orogenic lode gold veins	55	273807	7860583	MINERAL OCCURRENCE	0.5-5	AU
482299	YELLOWJACK	Orogenic lode gold veins	55	339315	7927660	MINERAL OCCURRENCE	<0.5	AU
45186	YETI RIDGE	Orogenic lode gold veins	55	365520	8088120	ABANDONED MINE	<0.5	AU
43845	YOU NEVER CAN TELL	Orogenic lode gold veins	55	303274	8120870	ABANDONED MINE	<0.5	AU AG
44295	YOU-CAN-TELL-US	Orogenic lode gold veins	55	279215	8227469	ABANDONED MINE	<0.5	AU
37779	YOUNG ROLLEY	Gold-antimony, antimony-gold and antimony veins	55	229215	8172369	ABANDONED MINE	<0.5	SB
44439	ZIG ZAG	Orogenic lode gold veins	55	276165	8237479	ABANDONED MINE	<0.5	AU