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HISTORICAL REVIEW OF MINE WORKINGS, PRODUCTION AND ORE TREATMENT, MANNAHILL GOLDFIELD

GEOLOGICAL SURVEY

by

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DEPARTMENT OF MINES AND ENERGY
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ABSTRACT

Prospectors and miners have prospected and mined the Mannahill area since 1881, with ore being treated at numerous locations, by several processes. Locations include Government Batteries at Mount Torrens and Peterborough, several private plants on the field, at Teetulpa, Waukaringa, Wadnaminga and Kapunda in South Australia, at Interstate plants and in England.

Gold mineralisation occurs in quartz veining sporadically over approximately 70 square kilometres. Maximum depth of any working is less than 80 m on the incline, which is less than 30 m vertically. Copper, silver, lead and bismuth minerals are associated with the gold ore in small amounts.

Total recorded production to 31 December 1987 is 106 582.76 grams of gold bullion from 5 852.45 tonnes of ore, a yield of 18.21 g/t.

INTRODUCTION

This report provides an historical outline and a brief description of the various workings and contains all known records of ore treated and gold bullion recovered by amalgamation and cyanidation from the mines on the goldfield.

Records of ore treated and gold bullion recovered at private plants on the field, as well as that treated interstate are scarce. Much of the available information is stored at Peterborough Battery. All data have been metricated.

Historical details were obtained from newspapers of the day, and reports in Mining Reviews. Workings have been described from the latest information, supported where accessible by personal observations. However, some shafts have been either backfilled or deepened and workings extended.

LOCATION AND TENURE

Mannahill goldfield is located approximately 15 km northwest of Mannahill, a small town on the Barrier Highway, 350 km by road northeast of Adelaide (Fig. 1).

Workings are scattered over an area of 70 square km on Florina Station. The goldfield is outside of counties and district councils, within the Far North Planning Area.

Five Mineral Leases, 5144, 5316 and 5461-5463 inclusive cover a total area of 303.75 hectares and are held by Mark Selga. Mineral Leases 5144 and 5461 cover the Westward Ho workings where Selga is currently treating the gold tailings. Mineral Leases 5462 and 5463 cover the workings along the eastern extension of Westward Ho and include Elsie May and Eudunda Hope workings. Mineral Lease 5316 covers the main workings at the Homeward Bound mine.

HISTORICAL REVIEW

Early history of Mannahill Goldfield is scarce. Most writers credit McEvoy with the field's discovery in early 1886. Influx of men to the area in late 1886 and early 1887 with the discovery of nearby Teetulpa Goldfield kept interest high.

Earliest reference to gold at Mannahill noted during this current study is a survey plan of Gold Claims 525, 526, 527 and 528 on Jackson's Reef, dated 20 December, 1881. Shafts are shown on Gold Claim 525. Measurements and directions from Jackson's Pile (latter plans show this as Jackson Pile) plot Gold Claim 525 (latter Gold Lease 83) close to the position of Trojan. Gold claims 526 and 527 (latter Gold leases 85 and 82) plot on the position of Jacksons, and Gold Claim 528 (latter Gold lease

84) on the position of Eudunda Hope. These Gold Claims later became Gold Sections, retaining their same number. Other Gold Sections were surveyed in 1887, 1889, 1890, and 1902 (see Appendix 2).

During December 1885, several reports mention Oulnina Goldfield, located about 8 km northwest of the Mannahill public house. The public house referred to is not the Railway Hotel in Mannahill, but was on the site of the old Government Research Station, located approximately where Florina Station Homestead now exists.

Mr. W. McEvoy was one of a number of prospectors who while returning to Adelaide from Silverton, decided to try prospecting the area now known as Birthday Reef. Although early assays showed up to 193.06 g/t Au, progress was slow. Closest domestic and drinking water was 6.5 km away, with timber suitable for mining purposes being even further away.

Gosling's Store opened for business on Birthday Reef in April 1886, with a Post Office and Boarding House following. A Public House constructed of galvanised iron was erected 0.8 km from Haycocks Claim. However, Warden Hack refused it a licence in October. Mannahill Goldfield, of 310.8 square km (120 square miles) was proclaimed in August.

The Advertiser newspaper of 6 September 1886 published an article summarising work done on Mannahill Goldfield until the end of August 1886. Part of the article stated:

> *"Since the early part of November, 1885, the following amount of work, etc., has been done on Mannahill goldfields approximately:-Feet sunk 1,889, at a cost of £2,175; ore at grass 276 tons; quantity of ore treated 24 tons 15 cwt.; average result, 2 oz. 5 dwt.; deepest shaft, 67 feet; average depth of shafts, 35 feet; number of men engaged in mining, 75; estimated quantity of ore that could be raised in six months, 2,000 tons. Tradespeople on the field - general storekeeper, butcher and baker, an assayer, blacksmith, and three boardinghouse-keepers".*

Lack of crushing facilities on the field hindered development. Some small parcels of ore were sent to Victoria for testing and small crushings were done at the Alma Battery at Waukaringa. Transport of the ore to Waukaringa cost 30

shillings per ton, crushing 20 shillings per ton, and bags to put the ore in, 8 shillings, a total of 58 shillings. Gold at that time was worth approximately 80 shillings per ounce, thus cartage and crushing costs made the exercise uneconomic. In addition there was a lack of cartage contractors due to shortage of feed for the animals used. Two bullocks carting ore in July 1886 died during the trip illustrating the harshness of the country. Crushing at the Alma could only be done on an intermittent basis, as the battery was usually fully operational crushing Waukaringa ore.

W. McEvoy and E.W. Priest in a bid to overcome the crushing problem, bought a three head battery from Forwood, Down and Company, and erected it on Salt Creek, in October 1886. Crushing commenced in the same month, the battery reportedly working day and night. In order to expand crushing facilities, the Mannahill Mining Company Limited was formed in March 1887. They increased capacity to 8 head of stamps.

AURORA AUSTRALIS LINE OF REEF

This line strikes northeast - southwest. In the southwest end it consists of 7.5-20.0 cm thick quartz-iron veins, dipping southeast at 17-20°. Near the northeast end the reefs include massive quartz, 1.5-1.8 m thick, containing iron and pyrite and dipping almost vertically.

PUTTS

Prospected in 1886.

HOLMES AND RADFORD

Several parallel lodes, 15-20 cm thick, consisting of quartz and iron. One underlie shaft 15.2 m deep.

GOLDEN HILL

ALTERNATIVE NAME: ROBERTS AND PADMORE

Three shafts to 3.7 m on a 31-38 cm lode, striking northeast and dipping 70° northwest. Shaft 11.6 m on parallel 15 cm wide lode.

LESTERS

Prospected by two small cuttings in 1886.

ELLIOTT AND CLARKE

ALTERNATIVE NAME: SILVERTON SYNDICATE

Shaft 3.7 m on a 31-46 cm lode. Second shaft 6.1 m on vertical lode of iron and pyrite, 31-62 cm wide. Later deepened to 9.1 m by Silverton Syndicate.

ROBERTS AND COMPANY

Two parallel reefs, 0.61 - 1.22 m wide. Shaft 12.2 m sunk on 1.22 m wide load of quartz, iron, gossan and pyrite. Other shafts to 12.2 m.

DALTON

Costeen on quartz outcrop.

RIVETT AND COMPANY

ALTERNATIVE NAME: RIVETT AND BRYAR

Two parallel reefs, 45.7 m apart. Shaft on North Reef 3.1 m, lode 2.44 m wide. Shaft on South Reef 2.4 m deep. A parcel of 1.02 tonnes of ore crushed at Salt Creek early in 1887 returned 22-55 grams of gold bullion.

During early 1887, H.Y.L. Brown, Government Geologist, sent a parcel of 2.13 tonnes of ore to Melbourne from this line of reef, to be treated by the Newberry-Vactin Gold Extraction Company. A total of 7.26 grams of gold bullion was recovered, a yield of 3.41 g/t Au, the tailings assaying 1.65 g/t Au.

BIRTHDAY LINE OF REEF

This is a line of workings extending in an east northeast direction for a length of 1.6 km. Centre of the line of workings is located 3.0 km north northeast of Jackson Pile. Veinstone is composed of hard, glassy, white quartz, with cavities containing gossan, ferruginous clay, iron oxides and pyrite. Traces of copper are often found. Gold is fine and occurs mainly in the iron rich portion of the reefs.

Numerous claims were pegged and worked along this line during 1886. McEvoys claim, first one pegged, was centre of the line. H.Y.L. Brown inspected this area in June 1886 and W. Pleitner inspected it in October 1886. Claims are described from west to east, from Brown and Pleitner's reports.

CHIEFTAIN BLOCKS

Consisted of 4 claims, including those formerly held by Padmore and Company and Moore's claim.

Shaft 7.7 m on a 31 cm lode. Shaft 4.6 m on South Reef, lode 38 cm gossan and iron. Padmore and Company - shaft 9.1 m, lode contains pyrite. Moore's - 4 shallow shafts on two parallel lodes, dipping south southeast. Specks of gold seen in south vein.

CHRISTMAS DAY

ALTERNATIVE NAME: ROBERTS AND COMPANY

Underlie shaft 23.2 m deep, sunk at 55°-60°. At 18.3 m a 3.7 m drive put in to the south, which cut 2 veins in the hanging wall. Lode is 15-31 cm thick and consists of iron, quartz, pyrite with small specks of gold being reported.

MCEVOY

ALTERNATIVE NAMES: PROSPECTING CLAIM, PIONEER.

Shaft near western boundary, 4.3 m deep, sunk on a 1.22 m wide quartz vein, containing iron and pyrite. Lode strikes east northeast. Open cut in middle of claim 2.5 m deep, on a 61 cm

vein. On the eastern side of the claim an open cut 9.1 m long exposed a vein 5-46 cm wide. Gold was seen in the ore and from here a parcel was sent to Waukaringa for treatment. A total of 6.60 tonnes of ore treated, but became mixed with 1.52 tonnes of ore from Gibbons claim. Total gold recovered from all 8.12 tonnes was 466.62 grams. A parcel of 4.06 tonnes of ore treated at Salt Creek in 1887 yielded 131.04 grams of gold bullion.

GORDON AND STIRLING

ALTERNATIVE NAME: SQUATTERS REVENGE

Shafts have been opened on 2 parallel reefs. An 11.6 m deep shaft opened up South Reef, which is from 61-91 cm wide. A 6.1 m deep shaft opened North Reef, which is 1.8 to 2.1 m wide, and dips south southeast at 45°. Another shaft has been sunk 3.7 m on a quartz iron lode.

HAYCOCK'S

ALTERNATIVE NAMES: HAYCOCK AND COMPANY, EAGLES NEST

Underlie shaft sunk 10.7 m on two veins of quartz and gossan, approximately 1.0 m apart.

In 1886 0.25 tonnes of ore treated at Waukaringa yielded 21.78 grams of gold bullion, 2.08 tonnes treated in Melbourne by Newberry Vautin Gold Extraction Co. yielding 8.30 grams of gold bullion, with tailings assaying 1.19 g/t Au.

C. SMITH

ALTERNATIVE NAME: C. SMITH AND COMPANY

Underlie shaft 9.2 m sunk on two veins which dip south southeast at 60°.

IVEY

Two small veins have been opened up by trenching and shallow shafts. Deepest working is an underlie 5.5 m deep.

GIBBONS AND COMPANY

Underlie 10.4 m on a 30 cm vein of quartz and iron. Second underlie to south sunk 8.3 m on a 30-61 cm lode, dipping 70° south southeast. Coarse gold reported.

1.52 tonnes treated. See McEvoy for comments.

GOSHEN

Five shafts, 2.4 m to 3.1 m deep on a lode of quartz, iron and gossan.

H. KONIG

Underlie shaft 7.7 m deep.

H. WERNER

Shallow underlie sunk on a small vein dipping 60° south southeast.

UNNAMED CLAIMS

Several claims were held but no work done on them.

JENKINS

Three openings 1.0m to 3.7 m deep, on a lode of quartz, iron and gossan, 61-91 cm wide.

STAR OF THE EAST

This claim is unlocated, but could be Gibbons and Company. Shaft on North Reef 17.1 m on a 61-91 cm lode. Shaft on South Reef 9.8 m on a 30-61 m lode.

AUSTRAL

ALTERNATIVE NAME: AUSTRAL GOLD MINING COMPANY (1888-1889)

Austral Gold Mining Company was registered on 13 March 1888 and held 18 claims on Birthday Reef. This probably included all of the above claims. T. Pedler (Manager) and four men commenced operations on 26 March. W.C. Bayly took over as manager in

early 1889. After treating a small tonnage of ore the company went into liquidation in July 1889.

Claims 1 and 2 - no information. Claim 3 - shaft 20.4 m on a 25-30 cm lode. Claims 4, 5 and 6 - no information. Claims 7, 8 and 9 - shallow shafts and costeens. Claim 10 - Underlie shaft 6.1 m, vertical shaft 15.2 m. Claim 11 (Squatters Revenge) - shaft 2.7 m. Claim 12 - shallow shafts and costeens. Claim 13 - Underlie shaft 5.0 m on 20 cm lode dipping south. Underlie shaft 6.1 m on east dipping lode. Underlie shaft 8.5 m on 46 cm lode. Claim 14 - no information. Claim 15 (Haycock's) - shaft 20.4 m, shaft 2.4 m. No. 2 (New Shaft) sunk by Austral G.M.C. 12.7 m on 25-30 cm lode. Shaft 15.2 m with 1.0 m drive. Claim 16 - no information. Claim 17 - shaft 6.1 m, shaft 5.2m. Claim 18 - costeening.

A parcel of 56.90 tonnes of ore was crushed at Dr. Dixon's Battery on the Westward Ho. Results are unknown, however 12 bags of concentrates were saved. A parcel of 6.6 tonnes, consisting of 100 bags of bags of ore and 12 bags of concentrates was sent to the South Australian Gold Extraction Company, to be treated by the Hutton and Yeates Process (of which nothing is known). Two samples of the ore gave the following results: No. 1 - ferruginous quartz 8.63 g/t Au, 8.63 g/t Ag; No. 2 -ironstone and quartz 129.58 g/t Au. Results were reportedly disappointing, so another parcel was sent to Fulton and Company, who also reported disappointing results.

During 1887 a parcel of 5.08 tonnes of ore was crushed at Salt Creek Battery from this line of reef for a return of 124.43 grams of gold bullion, however the name of the claim it was from is not given in the records.

OTHER WORKINGS

ALDENHAVEN, H.

During 1898 H. Aldenhaven treated 1.27 tonnes of ore at Peterborough State Battery, recovering 6.68 grams of gold bullion.

BAND OF HOPE

ALTERNATIVE NAME: BAND OF HOPE GOLD MINING COMPANY

Underlie shaft 27.4 m deep on a 30-61 cm lode which widened at bottom to 1.37 m. Approximately 8.23 tonnes of ore yielded 340.64 grams of gold bullion. A parcel of 3.05 tonnes treated at Teetulpa yielded 200.65 grams of gold bullion, 108.9 kg treated at Dry Creek yielded 23-33 grams of gold bullion, while a parcel of 5.08 to 6.10 tonnes treated at Dr. Dixon's battery yielded 116.66 grams of gold bullion.

BOUCAUT, HILLARY

During 1899 Hillary Boucaut treated 2.74 tonnes of ore at Peterborough State Battery which yielded 38.89 grams of gold bullion.

C.C.K.

During 1897, 5.08 tonnes of ore yielded 74.59 grams of gold bullion at Peterborough State Battery.

CLAYTON EVAN

Adjoins Homeward Bound on the east. A 3.0 m shaft sunk in 1915 on a 10-15 cm lode of ferricalcite and quartz, possibly a continuation of the lode worked in Homeward Bound. sample of ore from bottom of shaft assayed 6.32 g/t Au, trace Ag, trace Bi.

COCKRAM, WILLIAM

During 1899 8.13 tonnes of ore treated at Peterborough State Battery for a yield of 63.78 grams of gold bullion.

DAVIS, S.D.

Workings located 11.3 km west of Mannahill. Worked in 1901 and 1906, when a total of 7.87 tonnes of ore treated at Peterborough State Battery for 97.93 grams of gold bullion. During September 1942, 6.55 grams of gold bullion from Mannahill was smelted and sold to the Mt. Torrens Battery by S.D. Davis.

EASTWARD HO

ALTERNATIVE NAMES: EASTWARD HO GOLD MINING VENTURE
EASTWARD HO GOLD MINING COMPANY

Located 4.0 km northwest of Jackson Pile, on Gold Section 222. Worked in 1888, with two shafts being sunk. Western shaft 11.9 m vertical, cutting water at 5.8 m, lode 36 cm reported at unknown depth. Eastern shaft sunk to unknown depth.

ELLA JONES

Located 2.5 km south southwest of Jackson Pile. During 1934 4.06 tonnes of ore treated at Peterborough yielded 21.65 grams of gold bullion.

ELSIE MAY

ALTERNATIVE NAMES: GOSLINS CLAIM (1886)
THE MANNAHILL MINING COMPANY LIMITED (1887-1888)
SALT CREEK BATTERY GOLD MINING CLAIMS
ELSIE MAY SILVER MINING COMPANY (1888)

Located 3.5 km north of Jackson Pile. Opened in 2 places in 1886. A trial crushing of 6.10 tonnes was taken out from east end of the lease, on top of a ridge, from a 30-46 cm wide vein of iron oxide and gossan ore dipping south. A second 6.10 tonne parcel was taken from an iron ore and gossan vein, 30 cm thick, 213 m to the west northwest. Both parcels were crushed at the Alma Battery, Waukaringa (see Table 1).

During 1888 a shaft, equipped with a horse whip for haulage, was sunk to 34.8 m. Water was cut at 9.8 m, and flowed

in at 1820 litres per day. A drive was put in northwards for 19.8 m at the 18.3 m level. A 20 cm vein of galena was associated with the hanging wall of the lode. Pyrite appeared at depth. Lode width varied from 61 cm to 1.37 cm.

In 1934 an opencut, 2.4 m long and 1.8 m deep was opened on a vein which assayed less than 1.32 g/t.

Production returns are shown below in Table 1.

TABLE 1: ELSIE MAY PRODUCTION FIGURES

YEAR	TONNAGE	YIELD (GRAMS)	COMMENTS
1886	12.19	746.60	Tailings contained 63.21 g/t Au
1887	71.12	127.54	
TOTALS	83.31	874.14	

EUDUNDA HOPE

ALTERNATIVE NAME: THE EUDUNDA HOPE MANNAHILL GOLD MINING COMPANY LIMITED

Located 2.5 km northwest of Jackson Pile. Discovered by McEvoy in 1886. The Eudunda Hope Mannahill Gold Mining Company Limited was formed to work 16 claims. M. Butler was appointed manager in February 1888, and the company was officially registered on 2 May 1888. Four more claims were added and in July, J.W. William replaced Butler as manager. After sinking 6 shafts, the company was wound up in June 1889.

No. 1 shaft has been sunk 3.0 m and a crosscut cut a lode which was driven on for 6.1 m. No. 2 shaft is located west of No. 1. It was sunk 3.7 m and has a 10.7 m drive. Main shaft, or No. 2 shaft sunk 10.1 m vertical with a drive at bottom for 11.9 m on a 1.07m wide lode. No. 4 shaft sunk 5.5 m, with a 4.9 m drive. South shaft, or No. 5 shaft sunk 12.8 m. Drive east 1.0 m, lode pinched. Drive west 3.7 m, lode 15 cm wide, containing no values.

An unnamed vertical shaft was sunk 28.0 m, at which depth both water and a 46 cm wide lode were cut. A drive was put in to the east for 14.9 m, however the lode pinched at 7.6 m. A winze was sunk on the underlie of the lode (20°) for 11.0 m. Water inflow was 16,360 litres/day.

Small tonnages of ore have been treated in several locations between 1887 and 1898. (See Table 2).

TABLE 2: ORE TREATED FROM EUDUNDA HOPE

1887	43.67	tonnes yielded	1462.9	grams at Salt Creek Battery
1888	.30	tonnes yielded	15.55	grams at ?Sandhurst, Victoria
1888	6.10	tonnes yielded	9.33	grams at ?Dry Creek
1897	24.89	tonnes yielded	168.50	grams at Peterborough State Battery
1898	8.38	tonnes yielded	78.09	grams at Peterborough State Battery
TOTALS	83.34	tonnes yielded	1733.56	grams

EURO

ALTERNATIVE NAME: EURO GOLD MINING SYNDICATE

Workings are located on top of a hill, 1.3 km south of Jackson Pile. A vein striking southwest and dipping 45° northwest has been opened by opencuts and a 15.2 m shaft. Lode material is ironstone near surface, becoming quartz rich in depth. Near surface ironstone assayed in 1889 returned 14.22 g/t Au. A total of 12.19 tonnes of ore yielded 69.41 grams of gold bullion at Peterborough.

FULLGRABE, R.W.

During February 1941 R.W. Fullgrabe sold 5.46 grams of alluvial gold at Mt Torrens Battery.

GOSLINS CLAIM

Located 3.5 km northwest of Jackson Pile, possibly on Elsie May line. Lode material is quartz, ironstone and gossan, striking east and dipping south at a low angle. Five shallow

shafts between 2.4 and 3.1 m deep open the lode over 183 m. A parcel of 12.2 tonnes of ore, 6.1 tonnes from either end of the reef was crushed at Waukaringa, reportedly returning 771.16 grams of gold bullion.

HODGE, D.M.

In 1897 5.08 tonnes of ore yielded 42.58 grams of gold bullion at Peterborough.

HOMEWARD BOUND

ALTERNATIVE NAMES: MORGAN AND PARTY
JONES' WORKINGS
JENKINS'S WORKINGS
WANDA
DUNN'S HOMEWARD BOUND
HOWARD AND COMPANY
RED RUTH
VENTURE
CALEDONIA
BUNBURY

Located 1.8 km east of Jackson Pile. Six claims of 8.09 ha comprised the original Homeward Bound. Four of these covered approximately 1130 m strike length of outcrop, the remaining two being south of the two western claims. These claims were surveyed as sections in July 1902, and numbered 41-46. Most workings are on sections 41 and 44. Workings west of section 41 have often been included as Homeward Bound, but are also known as Klondyke. Lode formation is quartz, containing varying amounts of iron, calcite and bismuth. Small amounts of bismuth have been recovered as a by product. Silver and minor amounts of lead and copper also occur in the ore.

No. 1 underlay sunk 33.5 m. At 14.6 m drive east 6.4 m, drive west 30.5 m. At 22.9 m drive east 14.0 m, drive west 54.9 m, which connects to No. 2 underlay. Stopes between drives east

and above west drive. Lode dips south 45° and varies between 23-46 cm in width.

No. 2 underlay sunk 76.2 m, deepest point opened, and is located 50 m west of No. 1. At 22.9 m drive east connects to No. 1 underlay. Stopes above and below drive. Drive west 5.0 m, stope below drive. At 53.3 m stopes east and west. A fault cutting northeast-southwest cuts the vein off between 53.3 m to 57.9 m. Below this point (57.9 m) to 61.1 m the shaft contains no ore vein. A barren cross vein at this point downthrows the lode south.

A parcel of 4.52 tonnes of ore from 50 m in the shaft yielded 24.13 grams per tonne of gold bullion. Another parcel of 9.11 tonnes from above 61.6 m in the shaft, yielded 45.18 grams per tonne gold bullion.

No. 3 underlay, west of No. 2 sunk for 22.9 m.

No. 1 Open Cut is approximately 20 m in length and was sunk an average of 2.4 m. No. 2 Open Cut was reportedly 61 m west of No. 1, however size and depth are unrecorded.

No. 4 underlay 67.0 m west of No. 3, sunk 21.3 m on a 15-30 cm lode. A parcel of 1.63 tonnes of ore from this shaft yielded 410.88 g/t gold bullion.

During 1911 a new vertical shaft, (exact location unrecorded) sunk near the boundary with Klondyke cut the lode at 4.3 m. The lode was 15-23 cm wide, and a stope, 6.1 m wide, extending 7.6 m northwards, was opened. An underlie of 9.1 m was also sunk from this working. A parcel of 12.95 tonnes of ore yielded 55.55 grams per tonne gold bullion.

Also reported but unlocated are Gibbons underlay of 9.1 m and a 9.1 m prospecting shaft, both to the western end of the mine. A 4.6 m shaft with a drive 1.2 m west are also reported a short distance west of No. 2 underlay.

On the eastern end Morgan and party reportedly sank a shaft, 3 m, drove 16.8 m south, and stoped east and west. A parcel of 8.13 tonnes of ore from here yielded 17.38 g/t gold bullion.

Several other shafts were sunk, but are described under Klondyke. Lode material is basically quartz. Varying amounts of calcite, iron and chlorite occur throughout the lode. Gold occurs in rich patches or shoots, as well as larger amounts of lower grade ore. Bismuth occurs throughout the lode, richer patches have been mined and Bismuth concentrates obtained from plants on site at various periods. Returns for Bismuth are nonexistent. However concentrates were sent to Queensland in 1902, 0.51 tonnes returning no Bismuth, but 412.18 grams of gold.

Generally silver contents are low in the main lode, however assays on a parallel lode to the south, taken in 1913 indicate high silver but very low gold.

Copper occurs in the ore and in places can be seen as oxide staining in lode material in upper workings. Sulphides, mainly pyrite, occur at depth, however no workings have yet been sunk to cut the water table, where sulphide content can be expected to increase.

TABLE 3

HOMEWARD BOUND - ASSAY DATA

SAMPLE NO.	YEAR TAKEN	LOCATION	Au G/T	Ag G/T	Bi %	COMMENTS
1	1902	No. 1 shaft, 31.7 m west side	1.58			Mines Dept. sample
2	"	" " " " east "	1.58			" " "
3	"	" " " 25.6 m, east drive	1.58			" " "
4	"	" " " " " "	1294.26		2.80	" " " (sorted ore)
5	"	" " " " west " at 30.5 m	86.92		trace	" " "
6	"	No. 2 shaft, 15.3 m	158.03		trace	" " "
7	"	No. 1 open cut, west end	105.88		trace	" " "
8	"	" 2 " "	63.21		trace	" " "
9	"	100 m from west boundary	7.90			
10	1911	Near Klondyke boundary	396.65			" " " Bismuth ore
11	"	No. 2 shaft 53.3 m level	104.30			" " "
12	1913	400 m SSE of vertical shaft	trace	63.21	trace	" " " Outcrop on Parallel lode
13	"	" " " " "	trace	183.31	trace	" " " " " " "
14	"	" " " " "	3.16		trace	" " " " " " "
15	1914	Dump on vertical shaft	344.50	53.73	4.00	" " " Ore dump
16	1915	13.7 m Morgans workings	72.69			" " "
17	"	4.6 m level ?Jones underlay	363.47	31.61	0.30	" " "
18	"	Dump material " "	4.74			" " "
19	"	" " No. 1 shaft	3.16			" " " Ferruginous quartz
20	"	No. 3 shaft	79.01		0.20	" " " quartz and gossan
21	"	57.9 m level No. 2 shaft	33.19		0.10	" " " lode 38 cm
22	1916	Drive west Morgans vertical shaft	1.58			" " "
23	"	" " " " "	4.74			" " "
24	"	" " " " "	3.16	660.56		" " " Galena in sample
25	"	Stope 10.7 m level Jones underlie	41.09			" " "
26	"	Ore dump " "	77.43	18.96		" " "
27	1930	No. 2 shaft west side 73.2-76.2 m	153.29	trace	0.26	" " " Lode 3-10 cm Ave. 8 cm
28	"	" " " east " 73.2-76.2 m	161.19	trace	0.20	" " " " 0-6 cm " 4 cm
29	"	" " " west " 70.7-73.2 m	63.21	trace	0.11	" " " " Ave. 10 cm
30	"	" " " east " 70.7-73.2 m	34.77	trace	0.08	" " " " " 8 cm
31	"	" " " walls & roof 67.1-68.6m	7.90	-	0.03	" " " " " 10 cm
32	"	" " " west side 64.6-67.1 m	12.64	-	0.02	" " " " " 6 cm
33	"	" " " east " 64.6-67.1 m	15.80	trace	0.08	" " " " " 8 cm

Early assays were poor. H.Y.L. Brown (1898) reports two assays of ore returned only a trace of gold and silver. Assays of specimen material returned 562.59 g/t Au and 34.77 g/t Ag.

In 1898 5.08 tonnes of ore crushed at Kapunda yielded 4.45 g/t gold bullion. A second parcel of 11.94 tonnes, treated at Peterborough in 1899, yielded 10.55 g/t gold bullion. While today these are good returns, in the 1890s they were considered to be uneconomic.

Table 3 shows other assay data for the mine.

Records of treatment plants and returns of ore treated on site are almost non-existent. Several plants appear to have operated on site, as is evidenced by foundations and tailings piles. A report in the Advertiser in April 1902 states "Erection of machinery completed, and jigs now being put into position". No other references to this plant appear.

Notes on parcel 258, in the battery books from Peterborough, show that during mid 1903 a parcel of 0.31 tonnes of headings and tailings from Bismuth ore treated by Nield with a Huntingdon Mill using canvas tables for recovery, was cyanided. Extraction was 208.15 g/t gold as compared to Nield's extraction of 3.16 g/t gold.

Parcel 265, consisting of 1.02 tonnes of concentrates from tailings put through a Huntingdon Mill with canvas tables by Nield was cyanided. Recovery was 35.14 g/t gold, which was noted in the Peterborough Battery book on that parcel.

This indicates that the plant probably consisted of a Huntingdon Mill, which would have been used for crushing, canvas tables to recover coarse gold, and jigs to recover a Bismuth concentrate from the tailings.

In June, 1904, Joseph Gottlieb took over the mine. After sending 43.85 tonnes of high grade ore to Peterborough he erected a 10 head stamp battery in 1907, building a dam for water supply. Water was pumped for crushing purposes from the Westward Ho. Crushing results are unknown, but most of the tailings on site probably resulted from this treatment plant. Method of gold

recovery is unknown, but probably consisted of amalgam tables. During 1908, two parcels of concentrates, parcels 334 and 340 were cyanided at Peterborough. A total of 5.54 tonnes yielded 172.72 grams of gold bullion (31.18 g/t). This indicates that some sort of concentration plant existed on site, possibly to obtain a gold/bismuth concentrate.

During 1933 a three head stamp battery was reported as being in the process of erection. During 1951 the three head battery, 2 boilers, 1 oil engine and 1 steam engine still existed on site, but were later removed.

Table 4
Ore treated from Homeward Bound

TONNAGE (TONNES)	BULLION (GRAMS)	WHERE TREATED	YEARS TREATED
5.08	22.62	Kapunda	?1898
0.51	412.18	Queensland	1902
4.98	1 363.32	Unknown	1904
14.99	3 642.26	Unknown	1905-1906
39.62	4 448.48	On site	1907
355.60	2 488.66	On site	1908
212.34	2 504.21	On site	1908
984.61	45 379.06	Peterborough	1899-1983
1 617.73	60 260.79		

JACKSON'S REEF

This is a line of lode striking east-west and dipping south, located 1.8 km north of Jackson Pile. Jubilee workings on this line produced 3.05 tonnes of ore treated at Salt Creek Battery in 1887 for a yield of 124.43 grams of gold bullion.

JOHN BULL

These workings, located north of Birthday Reef are recorded on H.Y.L. Brown's 1898 Geological map of the Mannahill Goldfield. However no other information has been located.

KLONDYKE

East of Jackson Pile, workings adjoin Homeward Bound to west.

Jones underlay No. 1 was sunk near the western boundary, to a depth of 13.7 m. At 10.7 m a drive extended east 15.2 m on an iron calcite lode, 30-36 cm wide. A parcel of 5.08 tonnes from a stope on this drive yielded 63.74 g/t Au. Drive west 15.2 m. At bottom of shaft, drive southeast for 6.1 m. A sample from this level assayed 72.69 g/t Au. During shaft sinking, a parcel of 5.27 tonnes of ore from near the surface returned 14.22 g/t Au.

Jones No. 2, 6.1 m southwest of No. 1, sunk vertically 4.3 m, then on underlie 9.1 m. Stoping carried out on east side on a siliceous calcite and iron lode, 23-30 cm wide. This shaft collapsed by 1930.

Morgans No. 1 shaft located southwest of Jones No. 2 shaft, sunk vertically for 5.5 m. From size of dump on surface an amount of driving can be inferred, however the only work recorded is a drive south for 2.1 m on a 15-46 cm vein of ferruginous calcite.

Unnamed underlie east of Jones No. 1 sunk to a shallow depth, with some driving. A second unnamed underlie east of this sunk 12.2 m and a drive west connects it to Jones No. 1. A drive east stops near to Jenkins No. 1 shaft.

Jenkins No. 1 shaft sunk on underlie to a reported depth of 24.4 m. A parcel of 30.48 tonnes of ore from these workings returned 94.82 g/t Au.

Morgan No. 2 shaft, south of Jenkins No. 1, sunk vertically for 7.0 m. No workings are recorded, but it could have connected to Jenkins No. 1 underlie.

Jenkins No. 2 underlie, 12.2 m east of Jenkins No. 1, sunk 15.2 m on a 15-23 cm vein.

Unnamed underlie east of Jenkins No. 2 underlie sunk to unknown depth. Workings collapsed and inaccessible.

Underlie shaft on eastern boundary, unnamed. Sunk 9.1 m on an iron calcite lode, averaging 46 cm. Bismuth reported in lode.

A parcel of 30.48 tonnes of ore from these workings averaged 55.31 g/t Au.

Morgan No. 3 shaft, south of above unnamed underlie, sunk 9.1 m. Drive east 13.7 m. Shaft continued on underlie for another 2.13 m. Workings collapsed in 1915. Lode material reportedly 61-91 cm in width. A parcel of 7.62 tonnes of ore from these workings returned 44.25 g/t Au. Another parcel of 5.08 tonnes returned 39.51 g/t Au.

LITMANS CLAIM

Worked in 1897, when 5.23 tonnes yielded 27.22 grams of gold by battery treatment only at Peterborough.

MANNAHILL PROSPECTING ASSOCIATION

Workings consist of several costeens, 3.4 km north west of Jackson Pile. During September and October 1886, J.F. Hocking prospected several quartz veins, 8-30 cm in width. Gold was reported, but not in payable quantities.

Capital was raised from 100 shares, each costing 12 pounds sterling.

M.C. 4758

Mineral claim held by James O'Bryan during 1902-1903, 0.7 km north northwest of Jackson Pile. A total of 25.04 tonnes of ore yielded 219.05 grams of gold bullion at Peterborough.

MOODY AND COMPANY

Located on Old Trick line of reef, 2.1 km west southwest of Jackson Pile. Lode was quartz and gossan, 10.30 cm thick, striking east west and dipping south. Deepest shaft 2.4m.

NECTAR

ALTERNATIVE NAMES: NECTAR REEF GOLD PROSPECTING SYNDICATE (1886)
CARR AND PARTY (1888)

Workings are on Gold Section 223, located 5.0 km east northeast of Jackson Pile. Discovered by Roberts in 1885, worked by Nectar Reef Gold Prospecting Syndicate in 1886, and Carr and Party in 1888.

There are approximately one dozen shafts on this property. H.Y.L. Brown in his report of June 1886 describes 6 workings from east to west - shaft 5.5 m which cut a flat ironstone vein at 1.8 m, shaft 4.3 m on gossany ironstone, 3 shafts 2.7m, 4.6 m and 4.6 m sunk in a network of small ironstone veins. Deepest shaft described was one of 6.1 m which cut a 1.83 m thick quartz reef at the bottom, which underlied northwest. A drive northwest opened this lode.

A latter report described a shaft 7.6 m deep, with a 6.1 m drive west on a lode of gossany ironstone with a flat dip northwest. C. Winnecke during his survey in September 1889 reported a 34.4 m deep shaft.

During 1908-9 a new shaft was sunk 4.5 m and ore stoped from both ends of the shaft. Lode formation followed consisted of brown iron ore and quartz, with best values in the ironstone. Selected ore was sent to Peterborough.

Inspector of Mines, H. Jones inspected and sampled this new shaft during 1908 and again in 1909. He recorded the following assays (Table 5). He also reported two parallel lodes, striking northeast and dipping northwest.

TABLE 5

SAMPLES TAKEN AT NECTAR BY H. JONES, 1908, 1909

LOCATION	GOLD (G/T)	SILVER (G/T)
3.05 m down shaft	158.03	37.93
Ore dump - seconds	30.03	7.40
Lode - over width of 1.52 m	22.12	
Ore dump - seconds	4.74	

Ore has been treated at several localities. (See Table 6).

TABLE 6

ORE TREATED FROM NECTAR

DATE	TONNAGE	YIELD (GRAMS)	WHERE TREATED
April 1886	2.34	183.54	Waukaringa
? 1886	2.44	213.25	Intercolonial Smelting Works, Spotswood, Victoria
? 1886	2.08	43.46	Newberry Vautin Gold Extraction Co., Melbourne
Feb 1888	?	?	Teetulpa - recovered 63.21 g/t
1908-1909	19.00	888.07	Peterborough State Battery
TOTALS	25.86	1 328.32	

NO GAMMON

Located 5.7 km east of Jackson Pile. Discovered by H. Mills in 1885 while prospecting for alluvial gold. He pegged 5 claims which were sold in November 1886 to Dr H. Dixon, who sunk the Main shaft. Work ceased in July 1887.

H.Y.L. Brown in his report of June 1886, described the workings from east to west as follows - Pit 1.1 m on iron and quartz, hole 2.0 m on quartz, gossan and iron, shaft 6.1 m on quartz vein, open cut 0.61-0.91 m wide and 2.4 m deep, shaft (?vertical) 4.6 m on a flat dipping reef 60-90 cm wide, with an underlie of shallow depth on the lode, 4.6 m excavation. A large costeen 64.0 m long and 0.61-1.22 m deep was also reported.

Latter reports describe a 30.5 m Main Shaft. An underlie shaft was also sunk 18.3 m in kaolinised slate and sandstone. It opened up a lode of quartz 46 to 61 cm wide, consisting of quartz and iron and dipping north at 27°.

No ore has been treated from this mine.

ODD TRICK

ALTERNATIVE NAME: MOODY AND COMPANY

Located 2.1 km west southwest of Jackson Pile. A 10-30 cm wide lode of quartz and gossan strikes eastwest and dips south. Deepest working 2.4 m.

A total of 4.67 tonnes of ore yielded 25.47 grams of gold bullion by battery treatment only.

OHIO

ALTERNATIVE NAME: TERREL AND COMPANY

Vertical shaft to unknown depth on Westward Ho line of reef.

POTTER'S CLAIMS

Located 300 m south of Goslin's Reef, and possibly 300 m south of Elsie May. Quartz and iron lode dips south at a low angle. No workings reported.

RADFORD AND COMPANY

A 30-46 cm lode opened up in two places on Elsie May Reef, near battery site.

RODEY AND COMPANY

Several holes to 3.0 m deep on Jackson's Reef opened a quartz, iron and gossan lode 46 cm wide. Specks of gold were reported in the ore.

ROSEBERY GOLD MINING COMPANY LIMITED

This company formed 13 October 1887 to work 16 claims 1.6 km south of Trojan, with capital of 22 000 pounds sterling in one pound shares. Lode reportedly split into 3 in No. 1 shaft. A parcel of 60.96 tonnes of ore treated at Dr Dixon's Battery in 1888 yielded approximately 1870 grams of gold bullion.

SMITH, D.W.

During 1900 6.86 tonnes of ore yielded 56.0 grams of gold bullion by battery treatment only.

SPANISH AMERICAN

Workings adjoin Klonyke to the east. A continuation of Homeward Bound lode, it strikes eastwest and dips south, consists of ferruginous calcite and quartz, varying in thickness from 8-30 cm. Bismuth noted in the ore.

Four shafts have been sunk on the underlie from 10.0 to 33.0 m in depth. Western shaft is 33.0 m with a drive west 25.0 m long. On the eastern end two shafts 10 m apart are joined at a depth of 15 m by a drive. Drive west 12.8 m at a depth of 15.0 m.

A total of 23.01 tonnes of ore yielded 370.12 grams of gold bullion, with 21.49 tonnes treated at Peterborough yielding 330.46 grams of gold bullion. The remaining 1.52 tonnes of ore were treated at an unknown location and yielded 39.66 grams of gold bullion.

STAR OF THE EAST

These workings lie on the Birthday Reef, and are 1.8 km north of Jackson Pile. Two parcels of ore have been treated in 1897 and 1939, 13.41 tonnes yielding 50.03 grams of gold bullion.

STAR OF THE SOUTH

During early 1887 Newberry Vautin Gold Extraction Company of Melbourne treated 1.78 tonnes of ore for a yield of 19.64 grams of gold bullion. Tailings assayed 2.96 g/t Au.

TAYLOR, H.R.

During 1897 H.R. Taylor treated 20.32 tonnes of ore at Peterborough State Battery for 465.39 grams of gold bullion.

THE MANNAHILL MINING COMPANY, LIMITED

This company was registered on 31 March 1887 with a capital of 40 000 pounds sterling in one pound shares, of which 27 000 were issued as paid to 10 shillings and 13 000 were unissued. They held Salt Creek Battery Gold Mining claims, which included a three head battery erected by McEvoy, Priest and Troy in 1886. Another 5 head battery was added. Winininnie Creek is known as Salt Creek in its lower reaches.

TOP NOTCH

During 1902 ore from Top Notch, which is recorded as being in the Mannahill area, was treated at Peterborough, 11.68 tonnes yielding 68.50 grams of gold bullion.

TROJAN

ALTERNATIVE NAME: THE TROJAN GOLD MINING COMPANY LIMITED (1886-?1888)

The Trojan Gold Mining Company was registered on 19 August 1886 with capital of 3 720 pounds sterling in one pound shares. Two claims were held, one on the Aurora Australis line, 3.5 km north of Jackson Pile, on which no work was done, and one 2.4 km northeast of Jackson Pile. Workings consisted of a shaft 6.1 m, with a 13.7 m drive on a lode striking east northeast and dipping south at 45°. A second lode of quartz, iron and gossan, 46 cm wide, was opened by a 3.1 m deep shaft. A third reef, 61-91 cm wide was tested by a 4.6 m underlie shaft. Copper was noted in the ore, both as carbonate and as sulphide. Prior to 1887 a parcel of 4.57 tonnes of ore reportedly returned 139.94 grams of gold bullion.

VRANCE, MATT

During 1954 Matt Vrance treated 5.08 tonnes of ore at Peterborough State Battery for 28.0 grams of gold bullion.

WATERHOUSE'S CLAIM

In 1902 two openings were made on the eastern continuation of Homeward Bound, deepest hole being 3.1 m. In 1915 it was repegged as Clayton Evan.

WESTWARD HO

ALTERNATIVE NAMES: RADFORD AND HOLMES
RADFORD'S WESTWARD HO
DIXON'S WESTWARD HO
MANNAHILL WESTWARD HO GOLD MINING COMPANY
MT. HECLA COMPANY

Workings are located on Gold Sections 302, 545, 546, 574 and 548, located 4.9 km west northwest of Jackson Pile.

Early history of the mine is obscure. Radford and Homes worked by surface stripping the lode and by sinking a 3.1 m underlie shaft. In March 1887 a parcel of 25.40 tonnes of ore crushed at Salt Creek yielded 933.25 grams Au bullion. These results led Dr Hartley Dixon into running tests on the ore, and eventually to purchasing the leases in July 1887.

Workings consist of five vertical shafts and two underlie shafts. Western most shaft is a vertical shaft 4.6 m deep, sunk in the centre of an opencut, 3.1 m deep and 30.5 m long. A winze is sunk southwards for 9.1 m from the bottom of this shaft. A second shallow vertical shaft connects to the main underlie as an air shaft.

Main underlie or western underlie shaft has been sunk 68.6 m. Water was cut at 48.8 m. A 33.5 m drive eastwards at water level connects to the No. 2 or eastern underlie. A drive at the bottom of the main underlie extends 15.2 m eastwards, with an overhand stope 7.6 m wide and 10.4 m high. An underhand stope extends below the drive for full length to a depth of 1.5 to 1.8 m.

No. 2 or eastern underlie has been sunk 41.5 m. A shallow winze, approximately 3.7 m deep has been sunk in the middle of the drive at waterlevel. Stoping has been carried out between

both underlies, with most of the ore being removed. Stoping to the west of the main underlie has been carried out for 18.3 m. A small stope on the eastern side of No. 2 underlie extends 5.5 m eastwards.

A shallow vertical shaft exists 52m east of the air shaft on main underlie. Another shaft exists 50 m east of this shaft, depth unknown. A vertical water shaft was sunk 98 m south of the main underlie to a depth of 29.9 m. Water was cut at 18.9 m.

Workings are developed on a lode striking east-west and dipping south at 20°. Dip of the hanging wall is fairly constant, however the footwall is erratic, sometimes dropping away to form steps. Thickness varies, from 30 cm at surface to 3.0-4.5 m in depth, with 6.1 m being reported in the vertical water shaft.

H.Y.L. Brown in his 1898 report on Mannahill Goldfield gave the results of nine assays, shown in Table 7.

Table 7
ASSAYS BY H.Y.L. BROWN (1898) from Westward Ho

No.		GOLD (G/T)	SILVER (G/T)
1		9.48	3.42
2		.T	.T
3		.T	.T
4		.T	3.82
5		15.61	5.00
6	Pyrite	26.47	9.61
7	"	29.10	1.84
8	"	15.61	5.00
9	"	.T	37.93

NOTE: T denotes trace (less than 1.58 g/t)

Brown took further samples in December 1898. Results are shown in Table 8.

TABLE 8
SAMPLES TAKEN BY H.Y.L. BROWN, DECEMBER 1898, Westward Ho

No.	Material	Gold (G/T)	Silver (G/T)	Copper
1	Pyrite and quartz	T	-	-
2	" " "	T	-	-
3	Pyrite	3.16	-	T
4	Quartz and pyrite	3.16	-	T
5	Ironstone and Pyrite	11.06	7.90	-
6	Ironstone and arsenopyrite	33.19	9.48	T
7	Quartz and aresenopyrite	45.83	7.90	T
8	" " "	15.80	22.12	T
9	" " "	23.70	4.74	T
10	Ferruginous quartz	18.96	23.70	-

Note: T denotes less than 1.58 g/t for gold
T denotes Trace for copper

During April 1900, five samples were taken by W.H. Mathews, Inspector of Mines. Results are shown in Table 9.

TABLE 9
SAMPLES TAKEN BY W.H. MATHEWS, Westward Ho

LOCATION	GOLD (G/T)
Drive east off bottom of Main underlie	6.32
" " " " " " "	22.12
Bottom of Main underlie	3.16
" " " "	9.48
Stopes (?bottom drive)	7.90

Inspector of Mines J.L. Pearson inspected the mine in 1932. Results of samples taken by him are shown in Table 10.

TABLE 10
RESULTS OF SAMPLES TAKEN BY J.L. PEARSON (1932), Westward Ho

No.	Location	Gold (G/T)
1	Slimes and tailings south of vertical shaft	7.90
2	Tailings east of vertical shaft	5.53
3	Slimes south of old battery site	6.32
4	Tailings and slimes heap near old tank	12.64
5	Tailings and slimes near old tank	8.69
6	Main dump - west end (Tailings)	6.32
7	" " centre "	4.74
8	" " east end "	4.74
9	Untreated lode at old mill site	7.90
10	Ore heap at top of main incline (leached quartz)-top of heap	0.79
11	" " " " " " " (quartz, iron, arsenopyrite) - bottom of heap	10.27

Chief Inspector of Mines A.T. Armstrong visited on 25 February 1947. He sampled the stope above water level plus workings off the bottom of the main incline. Results are shown in Table 11.

TABLE 11
RESULTS OF SAMPLES TAKEN BY A.T. ARMSTRONG (25.2.1947) Westward Ho

No.	Location	Description	Gold(G/T)	Arsenic(%)
1	Eastern side of rise from stope, 6.7m above 160′ level. From hanging wall to 76cm.	Siliceous ironstone, limestone and scorodite.	3.79	1.6
2	Eastern side of rise from stope, 5.5m above 160′ level. From hanging wall to 84cm.	As above.	4.58	2.6
3	Western end of stope, 4.6m above 160′ level. From hanging wall to 1.2m.	As above.	2.84	1.1
4	Western end of stope, 3.1m above 160′ level. From hanging wall to 1.2m.	As above.	1.11	2.2
5	Western end of stope, back of 160′ level. From hanging wall to 1.8m.	As above.	23.07	2.0
6	From hanging wall to 1.5m.	Quartz, shale, pyrite, arsenopyrite.	2.69	1.0
7	From hanging wall to 1.7m.	Pyrite, quartz, shale.	0.16	-
8	From hanging wall to 1.1m.	As above.	1.11	-
9	From hanging wall to 1.1m.	Quartz, pyrite, arsenopyrite.	1.58	1.1
10	From hanging wall to 1.8m.	As above.	2.21	0.7
11	From hanging wall to 1.5m.	As above.	15.33	0.7
12	From hanging wall to 1.5m.	As above.	4.27	6.0
13	From hanging wall to 1.6m.	Quartz, shale, pyrite, arsenopyrite.	14.54	6.2

NOTE: Samples 1 to 5 oxidised ore.
Samples 6 to 13 taken from bottom of 225′ level - 1.5 m intervals commencing 2.9 m from shaft.
Samples 1-13 assayed for silver but it was not detected.

Dr. Dixon began an intensive development programme, shaft sinking and driving to open the lode and erecting machinery to raise and treat ore. Twenty five men were employed under Captain Barla, later rising to fourty.

Ore was raised from the underlie by Martin and Company's patent whip. This whip's drum was 2.13 m in diameter and 25 cm wide. It was worked by a pole and clutch gear, along with a brake, and was powered by a horse. Unlike a normal horse whip which required the horse to walk in a circle in one direction to raise and in the reverse direction to lower, it could be operated by the horse walking in only one direction. The whip was capable of winding a wire rope from a depth of 61.0 m.

A brace, 3.7 m high, 3.1 m wide and 4.6 m long connected the shaft to a tramway or truck line. This tramway was 122 m long and 5.3 m above ground at its highest point. Both were constructed of timber which came from Wirrabarra. The tramway connected the whip to the battery shed.

A secondhand battery consisting of 20 head of stamps which dropped at the rate of 80 drops per minute was obtained from the Aroona Mine (?Victoria) during 1887. Power was supplied by a 36 H.P. engine, which ran at 50 RPM. Both battery and engine were built by Thompson and Son's Foundry of Castlemaine, Victoria. A boiler, 10.97 m long and 3.66 m wide, built by Martin and Company of Gawler for the 1886 Jubilee Exhibition, supplied steam to the engine.

Crushed ore ran from each 5 head battery across a 6.1 m long triangular shaped amalgamation table, the apex of the triangle being the top. Tailings discharged from the table were fed into a Denny and Watson pan, revolving at 60 RPM, reground and amalgamated. Discharge from the pans ran through V shaped chutes, into four settling tanks, 6.4 m by 3.7 m and 1.7 m deep. Water overflow from these tanks ran into another settling tank, 9.7 m by 7.6 by 2.6 m deep. A Tangye engine and pump supplied water to this tank from the vertical water shaft. Water was recirculated through the battery from here, as well as to the boiler.

A building consisting of galvanised iron over a timber frame, 15.2 m long, 18.3 m wide and 8.5 m high housed the entire

plant, a carpenters shop and a blacksmith shop. Mr. Grundey, of Martin and Company, supervised construction of plant and shed.

Steam was raised on 4 January 1888 and the engine started. Crushing commenced on the 5th, using 10 head, however after only three hours a Denny and Watson pan broke, stopping operations. Crushing was not recommenced until 2 February. Lack of water delayed use of all 20 head until late March.

Late April saw the plant stopped and the Denny and Watson pans supplemented with an Alvey gold and pyrites concentrator and float gold amalgamator. Mr. Gershon, the patentee, claimed that his machine would revolutionise gold mining, however it does not appear to have been very successful in treating Westward Ho ore.

Trouble was experienced in recovering fine gold from oxidised ore due to large amounts of iron present. Sulphide ore was found below the water table and the machinery was inadequate to cope with it. The first 7.11 tonnes of sulphide ore yielded 0.25 tonnes of concentrate, reportedly assaying 2 163.23 g/t gold and 103.25 g/t silver. No mention is made as to where or how this concentrate was treated, however tailings contained 101.14 g/t gold after treatment.

During October 1890 Dr. Dixon sold out to the Golden Chance Company, an English mining concern. They ran several tests on parcels of ore to see which method was most suitable for treatment. Chlorination tests were tried in England, along with a process touted by Shedlock and Denny. This involved roasting the ore and then by means of an Archimedean screw forcing it through a bath of molten lead, which recovered the gold. This process is the same as was used at Waukaringa by the Adelaide Reliable Gold Saving Company in 1896, who called it the Christmas Extraction Process.

Tests were also carried out in Australia. Proposals were made to treat a parcel of ore at the Alma and Victoria mine, at Waukaringa, using their Molseworth Calciner. It is not known if this test was ever carried out. Cyanidation tests were carried out in January 1894 at the Virginia mine, Wadnaminga, where a

parcel of 14.22 tonnes of tailings was treated. These tailings assayed between 10.27 and 11.85 g/t gold, and gave a recovery rate of 70%.

Mr. Deeble erected a cyanide plant on the mine in November 1897 and commenced cyaniding the tailings on site, using an agitation process. During 1898 he recovered 20 998.06 grams of gold bullion from 3 048 tonnes of tailings. He also proposed plans for treating ore.

Mannahill Westward Ho Gold Mining Company erected a new treatment plant during the first half of 1899. Ore was fed through a rockbreaker, then elevated into a bin fitted with an automatic feeder, which fed a Huntingdon Mill. No mention has been found of amalgamation plates, although these were probably used. A Wilfley table was used to produce a concentrate, which was then roasted in a 35.56 tonne capacity Shering Furnace. No records exist as to how this roasted concentrate was treated. Although a cyanide plant was proposed, it was never constructed. Crushing commenced in July 1899. Resulted are unknown, and the company was liquidated in July 1900.

Mount Hecla Company during 1911-1912 dewatered the workings and continued sinking the vertical water shaft from 21.6 to 29.9 m. Work ceased due to the boiler for the pump breaking down, and this company also went into liquidation.

During 1933 an Adelaide Syndicate again dewatered the workings, using a Richard's pump and a 6 H.P. Hormsby engine. Work ceased in 1934.

During 1937 Mr. S. Prime submitted a sample of tailings for testing to determine what size the material had to be ground to for cyanidation. Sieving tests showed that 61% of the tailings to be already finer than 200 mesh, and a cyanidaltion test of this material was carried out. Extraction wase only 3.7%. Grinding of the tailings was then carried out until 94.1% were finer than 200 mesh. Extraction rose to 37.0%. Tests varying the amount of lime and length of time for agitation of the

cyanide solution were also carried out, however increased recovery was not achieved.

During 1938 Mr. S. Prime submitted a sample of oxidized ore for testing by amalgamation and cyanidaltion. Ore was crushed to minus 18 mesh and split into two fractions - plus 200 mesh and minus 200 mesh. Amalgamation tests gave an extraction of 9% for the plus 200 mesh ore and 19% for the minus 200 mesh ore, demonstrating that it was not a suitable method for gold recovery.

Crushed ore was passed over a strake, the concentrates being amalgamated in a mortar. Extraction was 10%. Tailings from this strake test were then tested by cyanidation. Straight cyanidation recovered 82% of the gold while testing with lime (to give a protective alkalinity to the solution) gave only a 52% recovery. While the results showed an increased gold extraction by straight cyanidation, the higher cyanide consumption and difficulty in precipitating gold from the solution was thought to offsset the benefits obtainable. A series of tests varying length of time the ore was cyanided showed little increase in recovery.

Cyanide tests were carried out on ore of different fineness. Results showed that the finer the ore, greater the recovery. Length of time required for cyanidation decreased with increasing fineness. Crushed ore was also roasted and cyanided. Recovery was 94.5% on minus 18 mesh ore, showing that roasting increases the efficiency of cyanidation.

PRODUCTION: Figures are incomplete. No records have been found to indicate the amount of gold recovered by Dr. Dixon. Tonnage treated by him has been estimated in the region of 4,000 tonnes.

TABLE 12
WESTWARD HO PRODUCTION

FEB. 1887	1.78 tonnes yielded 125.21 grams, 2.03 tonnes yielded 69.86 grams in Melbourne. Treated by Newberry Vautin Gold Extraction Company.
MAR. 1887	25.40 tonnes yielded 933.25 grams at Salt Creek Battery. Blanketings assayed 39.51 g/t gold. Tailings assayed 30.03 g/t gold.
JUNE 1887	Tests done on ore - 9.07 kg yielded 3.89 grams 18.14 kg yielded 8.68 grams 13.61 kg yielded 4.80 grams 36.29 kg yielded 0.58 grams
JULY 1887	0.25 tonnes of concentrates yielded 515.52 grams. Tailings assayed 101.14 g/t gold.
MARCH 1888	152.40 tonnes of ore treated by Dr. Dixon yielded 13,998.70 grams of amalgam.
JAN. 1894	14.22 tonnes of tailings yielded approx. 1650 grams of gold.
1898	3048 tonnes of tailings yielded 20,998.06 grams of gold bullion by cyanide treatment.
AUG. 1911	11.43 tonnes yielded 112.18 grams of gold bullion at Peterborough State battery.
1938-1948	522.99 tonnes of ore yielded 8,335.78 grams of gold bullion at Peterborough State Battery.

Total recorded gold production is 32,827.35 grams, however actual production is possibly closer to 100,000.00 grams.

WESTWARD HO EXTENDED

During 1939 7.62 tonnes of ore were treated from here at Peterborough State Battery for a yield of 24.17 grams of gold bullion.

WINNININNIE

ALTERNATIVE NAMES: RAILWAY AND SHEPHERDS CLAIMS
WINNININNIE PROSPECTING ASSOCIATION (?1887-1888)
THE WINNININNIE GOLD AND SILVER PROPRIETARY COMPANY, NO LIABILITY (1888-1889)

Workings are located between Elsie May and Eudunda Hope. No. 1 shaft, was sunk on the underlie to 25.3 m, on a lode of iron, arsenopyrite and pyrite, dipping ?south 25°. A parcel of

ore was treated at Dry Creek. No. 2 shaft was sunk 4.3 m on the underlie. No. 3 or Western shaft was sunk 42.1 m on the underlie on a 41-91 cm wide lode. After the death of the mine manager T.D. Jackson on 15 July 1888, this shaft was renamed Jackson's.

The Winnininnie Gold and Silver Proprietary Company, No Liability, with T.D. Jackson as manager, was registered on 8 June 1888, and held 24 claims. The South Australian Government granted a subsidy of 250 pounds sterling to the company in August 1888, the money being used to erect a Chilean Mill close to the claims. The company was wound up in January 1889, after treating 10.16 tonnes of ore at Dry Creek for a yield of 451.97 grams of gold bullion.

MISCELLANEOUS UNLOCATED CLAIMS

Deane (1886), Hoar's (1886), Mill's (1886) (possibly No Gammon), Twelve Mile (1886) and Black Bull (1887) are recorded in early reports as being in existence. Queensland Smelting Company (1901) had several leases with shafts to 30.5 m deep and was probably the Homeward Bound under another name.

APPENDIX 1

TOTAL GOLD PRODUCED FROM MANNAHILL GOLDFIELD

TOTAL GOLD PRODUCED FROM MANNAHILL GOLDFIELD

MINE NAME	TONNAGE (TONNES)	BULLION (GRAMS)	YIELD (G/T)
Aldenhaven, H.	1.27	6.68	5.26
Aurora Australia	2.13	7.26	3.41
Austral	63.50	?	?
Band of Hope	8.23	340.64	41.39
Birthday Reef	5.08	124.43	24.49
Boucaut, Hillary	2.74	38.89	14.19
C.C.K.	5.08	74.59	14.68
Cockram, William	8.13	63.78	7.85
Davis, S.D.	7.87	104.48	12.44*
Ella Jones	4.06	21.65	5.33
Elsie May	83.31	874.14	10.49
Eudunda Hope	82.34	1 733.56	21.05
Euro	12.19	69.41	5.69
Fullgrabe, R.W.	-	5.44**	-
Goslin's Claim	12.20	771.16	63.21
Haycocks	2.33	30.08	12.91
Hodge, D.M.	5.08	42.58	8.38
Homeward Bound	1 617.73	60 260.79	37.25
Jubilee	3.05	124.43	40.80
Klondyke	60.40	3 297.99	54.60
Litmans Claim	5.33	27.22	5.11
McEvoy (includes Gibbons)	12.18	597.66	49.07
M.C. 4758	25.04	219.05	8.75
Nectar	25.86	1 328.32	51.37
Odd Trick	4.67	25.47	5.45
Rivett and Company	1.02	22.85	22.40
Rosebery	60.96	1 870.00	30.68
Smith, D.W.	6.86	56.00	8.16
Spanish American	23.01	370.12	16.09
Star of the East	13.41	50.03	3.73
Star of the South	1.78	19.64	11.03
Taylor, H.R.	20.32	465.39	22.90
Top Notch	11.68	68.50	5.86
Trojan	4.57	139.94	30.62
Vrance, Matt	5.08	28.00	5.51
Westward Ho	3 626.18	32 827.35	9.05
Westward Ho Extended	7.62	24.17	3.17
Winnininnie	10.16	451.07	44.40
Totals	**5 852.45**	**106 582.76**	
Average			**18.21**

NOTE: * Yield does not include 6.55 grams of alluvial gold.
** Alluvial gold.

APPENDIX 2

LIST OF GOLD SECTIONS ON MANNAHILL GOLDFIELD

LIST OF GOLD SECTIONS ON MANNAHILL GOLDFIELD

GOLD SECTION	DATE SURVEYED	SIZE (Ha)	HELD BY	COMMENTS	MINE NAME
525	20-12-1881	15.8		Gold Lease 83	Trojan
526	"	9.7		" " 85	Jackson's
527	"	10.9		" " 82	"
528	"	8.9		" " 84	Eudunda Hope
545	10-10-1887	6.5	Emily A. Dixon	" Claim 144	Westward Ho
547	"	8.1	Elizabeth M. Niesche	" " 146	" "
546	12-10-1887	8.1	Hartley Dixon	" " 145	" "
548	"	8.1	Henry Dixon	" " 147	" "
222	2-09-1889	8.1		" Lease 235	
223	"	4.1		" " 223	Nectar
301	27-02-1890	6.1		" " 248	Elsie May
302	"	2.0		" " 247	Westward Ho
41	31-07-1902	4.1	G.V.S. Dunn	" " 1820	Homeward Bound
42	"	8.1	J. Bruce	" " 1348	" "
43	"	8.1	J. Bruce	" " 1347	" "
44	"	8.1	G.V.S. Dunn	" " 1321	" "
45	"	8.1	J. Bruce	" " 1350	" "
46	"	8.1	J. Bruce	" " 1346	" "

APPENDIX 3

ORE FROM MANNAHILL GOLDFIELD TREATED AT PETERBOROUGH STATE BATTERY

ORE FROM MANNAHILL GOLDFIELD TREATED AT
PETERBOROUGH STATE BATTERY

Parcel No.	Ore in Tonnes	Bullion Recovered (Grams) Amalgamation	Cyanidation	Total	Yield (Grams/Tonne)
3	20.32	311.15	154.25	465.40	22.90
4	5.08	42.58	-	42.58	8.38
10	5.08	51.91	22.68	74.59	14.68
12	12.19	69.41	-	69.41	5.69
17	5.33	27.22	-	27.22	5.11
18	5.33	35.90	-	35.90	6.74
19	9.45	26.44	-	26.44	2.80
20	4.93	51.78	25.41	77.19	15.66
23	24.89	76.41	92.09	168.50	6.77
24	10.41	42.77	-	42.77	4.11
31	1.27	6.68	-	6.68	5.96
43	8.38	46.01	32.08	78.09	9.32
72	8.13	38.89	24.89	63.78	7.85
82	11.94	125.99	-	125.99	10.55
96	2.74	38.89	-	38.89	14.19
133	6.86	56.00	-	56.00	8.16
174	4.93	223.66	32.47	256.13	51.95
181	4.47	52.88	-	52.88	11.83
183	10.26	227.48	64.74	292.22	28.48
195	23.62	246.01	76.80	322.81	13.67
199	20.98	160.34	56.19	216.53	10.32
204	34.54	284.64	112.38	397.02	11.49
208	4.93	18.92	11.92	30.84	6.26
209	4.88	20.48	12.77	33.25	6.81
213	106.68	594.23	279.06	873.23	8.19
218	65.53	323.01	175.57	498.58	7.61
226	5.33	51.91	35.00	86.91	16.31
227	4.67	25.47	-	25.47	5.45
236	5.44	34.28	-	34.28	6.30
237	4.88	35.13	-	35.13	7.20
239	6.25	34.22	-	34.22	5.48
242	13.21	216.44	61.50	277.94	21.04
244	5.08	31.24	15.23	46.47	9.15
246	9.96	72.46	-	72.46	7.28
249	4.47	275.31	165.07	440.38	98.52
257	10.21	84.77	26.70	111.47	10.92
258	0.38	-	63.51	63.51	167.14
263	14.99	327.09	120.41	347.50	23.18
264	11.07	237.98	210.50	448.48	40.51
265	1.02	-	31.17	31.17	30.56
266	4.83	79.52	51.98	131.50	27.22
267	10.16	762.22	437.46	1 199.68	118.08
268	4.32	243.23	105.77	349.00	80.79
270	5.74	91.45	198.77	290.22	50.56
271	1.57	129.55	48.48	177.96	113.35
274	2.74	205.57	120.41	325.98	118.97
277	6.60	728.26	313.80	1 042.06	157.89
282	9.14	1 493.20	562.86	2 056.06	224.95
292	4.98	989.24	374.08	1 363.32	273.76
296	5.33	1 231.89	436.88	1 668.77	313.09
304	7.52	597.41	308.81	906.22	120.51
305	4.52	549.06	215.10	764.16	149.06
307	4.48	895.92	313.67	1 209.59	270.00
308	1.33	34.74	-	34.74	26.12
312	4.32	786.00	279.84	1 065.84	246.72
313	2.84	64.68	-	64.68	22.77
315	4.47	962.80	335.32	1 298.12	290.41
329	6.60	1 034.35	465.07	1 499.42	227.18
330	5.08	958.13	439.40	1 397.53	275.11
332	5.74	630.07	250.42	880.49	153.40
333	6.35	600.39	155.54	755.93	119.04
334	2.49	-	113.61	113.61	45.63
335	1.07	139.99	34.28	174.27	162.87

Parcel No.	Ore in Tonnes	Bullion Recovered (Grams) Amalgamation	Cyanidation	Total	Yield (Grams/Tonne)
337	1.63	514.52	183.34	697.86	428.14
339	2.79	156.90	32.60	189.50	67.92
340	3.05	-	74.66	74.66	24.48
341	4.67	150.23	98.96	249.19	53.36
342	5.54	35.77	18.34	54.11	9.77
345	6.65	483.08	183.34	666.42	100.21
346	2.64	207.13	55.09	262.22	99.33
348	2.03	56.12	36.42	92.54	45.59
349	5.44	259.75	112.31	372.06	68.39
355	4.78	245.11	131.56	376.67	78.80
356	3.56	150.87	42.19	193.06	54.23
360	4.52	256.77	166.10	422.87	93.56
369	4.42	149.71	37.72	187.43	42.40
370	2.90	137.78	63.71	201.49	69.48
374	5.08	80.23	57.36	137.59	27.08
380	5.59	40.57	14.13	54.70	9.79
385	7.37	42.06	20.67	62.73	8.51
394	4.52	76.22	32.86	109.08	24.13
403	4.11	135.32	50.36	185.68	45.18
406	12.95	435.64	257.81	693.45	53.55
412	5.74	214.65	147.89	362.54	63.16
416	4.06	258.59	111.99	370.58	91.28
421	5.08	190.67	62.54	253.21	49.84
432	3.61	148.09	77.97	226.06	62.62
435	4.57	77.38	37.33	114.71	25.10
438	5.18	146.08	115.68	261.76	50.53
443	4.98	149.32	106.68	253.00	50.80
447	7.37	158.91	135.32	294.23	39.92
450	5.08	49.58	25.28	74.86	14.74
452	3.30	116.66	72.65	189.31	57.37
455	4.67	88.66	48.28	136.94	29.32
456	3.86	79.84	35.45	115.29	29.87
457	13.97	295.85	128.32	424.17	30.36
459	4.42	170.84	102.33	273.17	61.80
460	8.13	96.76	45.11	141.87	17.45
461	5.08	107.71	42.77	150.48	29.62
464	5.08	37.14	20.74	57.88	11.39
469	3.05	63.97	37.33	101.30	33.21
470	10.41	167.98	118.21	286.19	27.49
471	4.67	98.31	73.88	172.19	36.87
472	7.11	527.28	228.65	755.93	106.32
473	4.47	109.66	46.14	155.80	34.86
475	10.16	277.97	179.52	457.49	45.03
476	10.41	509.72	302.92	812.64	78.06
480	7.87	174.21	104.47	278.68	35.41
481	9.91	242.19	159.82	402.01	40.57
482	3.86	50.03	48.74	98.77	25.59
483	11.18	172.00	126.90	298.90	26.73
485	7.11	451.07	239.53	690.60	97.13
486	3.81	102.66	69.99	172.65	45.32
489	4.83	342.19	206.87	549.06	113.68
490	4.06	52.43	35.77	88.20	21.73
492	5.49	346.86	226.77	573.63	104.49
493	4.06	35.00	42.00	77.00	18.96
494	4.32	145.88	66.10	211.98	49.07
495	5.23	114.97	68.05	183.02	34.99
496	5.08	288.79	174.98	463.77	91.29
500	6.35	283.80	174.98	458.78	72.25
501	4.11	314.58	192.09	506.67	123.28
502	6.55	177.19	90.28	267.47	40.83
503	2.79	62.61	42.77	105.38	37.77
504	5.38	221.00	74.14	295.14	54.86
505	5.44	371.48	162.22	533.70	98.11
507	7.87	208.17	94.43	302.60	38.45
508	5.59	153.60	106.93	260.53	46.61
510	4.67	95.92	68.57	164.49	35.22

Parcel No.	Ore in Tonnes	Bullion Recovered (Grams) Amalgamation	Cyanidation	Total	Yield (Grams/Tonne)
511	9.14	136.88	49.00	185.88	20.34
512	16.26	101.10	90.21	191.31	11.77
531	3.56	225.92	100.71	326.63	91.75
537	13.21	106.87	80.88	187.75	14.21
538	5.94	48.22	28.78	77.00	12.96
540	2.79	40.96	29.94	70.90	25.41
547	2.90	88.66	38.37	127.03	43.80
549	5.38	133.38	98.90	232.28	43.17
560	1.32	22.94	20.22	43.16	32.70
597	4.83	185.22	110.82	296.04	61.29
617	9.14	188.85	161.57	350.42	38.34
656	4.93	83.41	45.24	128.65	26.09
659	9.40	427.74	258.98	686.72	73.05
674	5.84	102.14	77.51	179.65	30.76
682	17.78	330.52	260.86	591.38	33.26
685	5.84	82.44	60.34	142.78	24.45
701	4.37	136.10	77.19	213.29	48.81
719	5.08	206.93	121.19	328.12	64.59
724	5.44	177.06	100.91	277.97	51.10
756	4.06	21.65	-	21.65	5.33
760	5.33	204.21	107.84	312.05	58.55
769	6.10	255.22	125.21	380.43	62.37
784	6.35	237.33	174.98	412.31	64.93
790	6.10	17.89	12.44	30.33	4.97
793	6.20	20.29	20.93	41.22	6.65
797	6.40	40.96	35.52	76.48	11.95
799	6.60	56.71	31.56	88.27	13.37
802	8.74	85.03	37.91	122.94	14.07
804	6.40	137.39	58.78	196.17	30.65
808	7.52	230.01	132.86	362.87	48.25
814	5.23	99.81	37.33	137.14	26.22
818	5.59	44.33	18.86	63.19	11.30
824	6.30	80.56	39.47	120.03	19.05
831	5.33	52.82	28.58	81.40	15.27
836	3.91	39.86	18.66	58.52	14.97
906	11.79	74.66	39.86	114.52	9.71
1026	9.35	175.37	150.23	325.60	34.82
1028	32.77	395.79	372.00	767.79	23.43
1041	24.89	176.67	215.94	392.61	15.77
1044	33.38	268.83	306.55	575.38	17.24
1045	26.42	159.56	188.72	348.28	13.18
1048	39.32	145.04	280.88	425.92	10.83
1051	20.32	129.29	181.46	310.75	15.29
1052	12.19	153.14	110.43	263.57	21.62
1055	11.43	212.31	129.75	342.06	29.93
1060	27.43	478.74	269.48	748.22	27.31
1062	19.30	148.80	231.50	380.30	19.70
1063	51.26	124.76	261.57	386.33	7.54
1072	24.38	54.89	93.32	148.21	6.08
1077	19.30	121.78	199.48	321.26	16.65
1080	8.28	46.79	-	46.79	5.65
1082	23.37	111.21	122.23	233.44	9.99
1087	30.23	114.19	161.96	276.15	9.13
1089	7.62	7.13	17.04	24.17	3.17
1090	3.96	23.59	-	23.59	5.96
1091	11.18	39.47	45.63	85.10	7.61
1095	6.60	151.26	183.54	334.80	50.73
1099	11.43	117.82	46.66	164.48	14.39
1101	5.49	31.51	22.42	53.93	9.82
1102	24.64	178.29	490.34	668.63	27.14
1107	4.98	123.07	53.34	176.41	35.42
1118	3.25	63.58	20.80	84.38	25.96
1120	25.65	98.31	104.73	203.04	7.92
1124	3.56	119.31	30.85	150.16	42.18
1140	2.59	20.41	30.07	50.48	19.49
1142	7.32	90.54	8.88	99.42	13.58

Parcel No.	Ore in Tonnes	Bullion Recovered (Grams) Amalgamation	Cyanidation	Total	Yield (Grams/Tonne)
1144	5.64	65.52	11.86	77.38	13.72
1177	0.71	53.53	11.54	65.07	91.64
1178	4.27	86.45	44.07	130.52	30.57
1189	0.91	31.89	13.29	45.18	49.64
1221	18.29	78.16	37.33	115.49	6.31
1264	6.91	102.92	250.75	353.67	51.18
1270	4.32	48.74	39.66	88.40	20.46
1302	5.08	28.00	-	28.00	5.51
1340	3.05	45.69	-	45.69	14.98
1465	8.13	59.56	-	59.56	7.33
1494	2.03	21.39	-	21.39	10.54
1510	8.13	119.77	-	119.77	14.91
1562	7.11	43.55	-	43.55	6.13
1609	7.0	24.88	-	24.88	3.55
1611	10.0	50.20	-	50.20	5.02
	1 906.74	39 709.47	21 304.27	61 013.74	32.00

APPENDIX 4

ORE FROM MANNAHILL GOLDFIELD TREATED AT MOUNT TORRENS STATE BATTERY

ORE FROM MANNAHILL GODLFIELD TREATED AT MOUNT TORRENS STATE BATTERY

Parcel 1433 was treated on 20 February 1941, when R.W. Fullgrabe bought in 6.42 grams of alluvial gold from Mannahill Goldfield. After smelting it weighed 5.44 grams, and was purchased by the S.A. Government.

Parcel 1466 was treated on 18 September 1942, when S.D. Davis sold 6.55 grams of gold to the S.A. Government from Mannahill Goldfield.

APPENDIX 5

PRODUCTION FIGURES FROM INDIVIDUAL MINES ON THE MANNAHILL GOLDFIELD

ALDENHAVEN, H.

HALF YEAR ENDED	PARCEL NO.	ORE TREATED tons	cwt	gr	GOLD BULLION RECOVERED BY AMALGAMATION ONLY BULLION oz	dwt	gr	TAILING ASSAY oz	dwt	gr	% RECOVERY	GOLD BULLION RECOVERY BY CYANIDATION OF BATTERY TAILINGS BULLION oz	dwt	gr	TAILING ASSAY oz	dwt	gr	% RECOVERY	TOTAL BULLION RECOVERED oz	dwt	gr	YIELD PER TON oz	dwt	gr
30-6-1898	31	1 (1.27 tonnes)	5	-	- (6.68 grams)	4	7	-	1	3	75.18	-	-	-	-	-	-	-	- (6.68 grams)	4	7	- (5.26 G/T)	3	10

BOUCAUT, HILLARY

HALF YEAR ENDED	PARCEL NO.	ORE TREATED tons	cwt	gr	GOLD BULLION RECOVERED BY AMALGAMATION ONLY BULLION oz	dwt	gr	TAILING ASSAY oz	dwt	gr	% RECOVERY	GOLD BULLION RECOVERY BY CYANIDATION OF BATTERY TAILINGS BULLION oz	dwt	gr	TAILING ASSAY oz	dwt	gr	% RECOVERY	TOTAL BULLION RECOVERED oz	dwt	gr	YIELD PER TON oz	dwt	gr
31-12-1899	96	2 (2.74 tonnes)	14	-	1 (38.89 grams)	5	-	-	3	3	74.72	-	-	-	-	-	-	-	1 (38.89 grams)	5	-	- (14.19 G/T)	9	6

C.C.K.

HALF YEAR ENDED	PARCEL NO.	ORE TREATED tons	cwt	gr	GOLD BULLION RECOVERED BY AMALGAMATION ONLY BULLION oz	dwt	gr	TAILING ASSAY oz	dwt	gr	% RECOVERY	GOLD BULLION RECOVERY BY CYANIDATION OF BATTERY TAILINGS BULLION oz	dwt	gr	TAILING ASSAY oz	dwt	gr	% RECOVERY	TOTAL BULLION RECOVERED oz	dwt	gr	YIELD PER TON oz	dwt	gr
31-12-1897	10	5 (5.08 tonnes)	-	-	1 (51.91 grams)	13	9	-	4	1	62.29	- (22.68 grams)	14	14	-	1	3	72.16	2 (74.59 grams)	7	23	- (14.68 G/T)	9	14

COCKRAM, WILLIAM

HALF YEAR ENDED	PARCEL NO.	ORE TREATED TONNAGE tons	cwt	gr	GOLD BULLION RECOVERED BY AMALGAMATION ONLY BULLION oz	dwt	gr	TAILING ASSAY oz	dwt	gr	% RECOVERY	GOLD BULLION RECOVERY BY CYANIDATION OF BATTERY TAILINGS BULLION oz	dwt	gr	TAILING ASSAY oz	dwt	gr	% RECOVERY	TOTAL BULLION RECOVERED oz	dwt	gr	YIELD PER TON oz	dwt	gr
30-6-1899	72	8 (8.13 tonnes)	-	-	1 (38.89 grams)	5	-	-	2	22	51.72	- (24.89 grams)	16	-	-	-	22	68.57	2 (63.78 grams)	1	-	- (7.85 G/T)	5	3

DAVIS, S.D.

HALF YEAR ENDED	PARCEL NO.	ORE TREATED TONNAGE tons	cwt	gr	GOLD BULLION RECOVERED BY AMALGAMATION ONLY BULLION oz	dwt	gr	TAILING ASSAY oz	dwt	gr	% RECOVERY	GOLD BULLION RECOVERY BY CYANIDATION OF BATTERY TAILINGS BULLION oz	dwt	gr	TAILING ASSAY oz	dwt	gr	% RECOVERY	TOTAL BULLION RECOVERED oz	dwt	gr	YIELD PER TON oz	dwt	gr
31-12-1901	209	4	18	2	-	13	4	-	2	15	50.56	-	8	5	-	-	23	63.75	1	1	9	-	4	8
31-12-1906	313	2	16	-	2	1	14	?	?	?	?	-	-	-	-	-	-	-	2	1	14	-	14	20
		7	14	2	2	14	18					-	8	5					3	2	23	-	8	-
		(7.87 tonnes)			(85.16 grams)							(12.77 grams)							(97.93 grams)			(12.44 G/T)		

ELLA JONES

HALF YEAR ENDED	PARCEL NO.	ORE TREATED TONNAGE tons	cwt	gr	GOLD BULLION RECOVERED BY AMALGAMATION ONLY BULLION oz	dwt	gr	TAILING ASSAY oz	dwt	gr	% RECOVERY	GOLD BULLION RECOVERY BY CYANIDATION OF BATTERY TAILINGS BULLION oz	dwt	gr	TAILING ASSAY oz	dwt	gr	% RECOVERY	TOTAL BULLION RECOVERED oz	dwt	gr	YIELD PER TON oz	dwt	gr
31-12-1934	756	4	-	-	-	13	22	-	2	7	60.29	-	-	-	-	-	-	-	-	13	22	-	3	12
		(4.06 tonnes)			(21.65 grams)														(21.65 grams)			(5.33 G/T)		

EUDUNDA HOPE

HALF YEAR ENDED	PARCEL NO.	ORE TREATED TONNAGE tons	cwt	gr	GOLD BULLION RECOVERED BY AMALGAMATION ONLY BULLION oz	dwt	gr	TAILING ASSAY oz	dwt	gr	% RECOVERY	GOLD BULLION RECOVERY BY CYANIDATION OF BATTERY TAILINGS BULLION oz	dwt	gr	TAILING ASSAY oz	dwt	gr	% RECOVERY	TOTAL BULLION RECOVERED oz	dwt	gr	YIELD PER TON oz	dwt	gr
31-12-1897	23	24	10	-	2	9	3	-	4	1	33.16	2	19	5	-	1	15	59.78	5	8	8	-	4	10
30-6-1898	43	8	5	-	1	9	14	-	3	15	49.72	1	-	15	-	1	3	68.94	2	10	5	-	6	2
		32	15	-	3	18	17				41.44	3	19	20				64.36	7	18	13	-	4	18
		(33.27 tonnes)			(122.42 grams)							(124.17 grams)							(246.59 grams)			(7.41 G/T)		

EURO

HALF YEAR ENDED	PARCEL NO.	ORE TREATED TONNAGE tons cwt gr	GOLD BULLION RECOVERED BY AMALGAMATION ONLY BULLION oz dwt gr	TAILING ASSAY oz dwt gr	% RECOVERY	GOLD BULLION RECOVERY BY CYANIDATION OF BATTERY TAILINGS BULLION oz dwt gr	TAILING ASSAY oz dwt gr	% RECOVERY	TOTAL BULLION RECOVERED oz dwt gr	YIELD PER TON oz dwt gr
21-12-1897	12	12 - - (12.19 tonnes)	2 4 15 (69.41 grams)	- 2 22	56.04	- - -	- - -	-	2 4 15 (69.41 grams)	- 3 17 (5.69 G/T)

HODGE, D.M.

HALF YEAR ENDED	PARCEL NO.	ORE TREATED TONNAGE tons cwt gr	GOLD BULLION RECOVERED BY AMALGAMATION ONLY BULLION oz dwt gr	TAILING ASSAY oz dwt gr	% RECOVERY	GOLD BULLION RECOVERY BY CYANIDATION OF BATTERY TAILINGS BULLION oz dwt gr	TAILING ASSAY oz dwt gr	% RECOVERY	TOTAL BULLION RECOVERED oz dwt gr	YIELD PER TON oz dwt gr
31-12-1897	4	5 - - (5.08 tonnes)	1 7 9 (42.58 grams)	? ? ?	?	- - -	- - -	-	1 7 9 (42.58 grams)	- 5 11 (8.38 G/T)

MINE: HOMEWARD BOUND

HALF YEAR ENDED	PARCEL NO.	ORE TREATED TONNAGE tons	cwt	gr	GOLD BULLION RECOVERED BY AMALGAMATION ONLY BULLION oz	dwt	gr	TAILING ASSAY oz	dwt	gr	% RECOVERY	GOLD BULLION RECOVERY BY CYANIDATION OF BATTERY TAILINGS BULLION oz	dwt	gr	TAILING ASSAY oz	dwt	gr	% RECOVERY	TOTAL BULLION RECOVERED oz	dwt	gr	YIELD PER TON oz	dwt	gr
31-12-1899	82	11	15	-	4	1	-	-	2	12	73.39	-	-	-	-	-	-	-	4	1	-	-	6	21
30-06-1901	174	4	17	-	7	3	19	-	6	12	82.01	1	6	21	-	-	23	85.20	8	10	16	1	15	4
"	181	4	8	-	1	14	-	-	2	8	76.84	-	-	-	-	-	-	-	1	14	-	-	7	17
"	183	10	2	-	7	6	6	-	5	12	72.48	2	1	15	-	1	9	74.94	9	7	21	-	18	14
31-12-1901	195	23	5	-	7	18	4	-	3	4	68.24	2	9	9	-	1	1	67.06	10	7	13	-	8	22
"	199	20	13	-	5	3	2	-	2	15	88.50	1	16	3	-	-	21	66.64	6	19	5	-	6	18
"	204	34	-	-	9	3	-	-	3	5	62.65	3	12	6	-	1	2	66.23	12	15	6	-	7	12
"	213	105	-	-	19	2	1	-	2	12	59.27	8	19	9	-	-	19	68.33	28	1	10	-	5	8
30-06-1902	218	64	10	-	10	7	16	-	2	8	57.98	5	12	21	-	-	14	75.00	16	-	13	-	4	23
31-12-1902	249	4	8	-	8	17	-	1	7	3	59.73	5	6	3	-	3	-	88.93	14	3	3	3	4	8
30-06-1903	258	-	6	3	-	-	-	6	4	-	-	2	-	20	-	15	3	87.81	2	-	20	5	8	21
31-12-1903	263	14	15	-	7	6	-	-	7	6	57.72	3	17	10	-	2	-	72.38	11	3	10	-	15	4
"	264	10	18	-	7	13	-	-	15	10	47.66	6	15	8	-	3	-	80.54	14	8	8	1	6	11
"	265	1	-	-	-	-	-	1	3	1	-	1	-	1	-	3	-	46.52	1	-	1	1	-	1
"	267	10	-	-	24	10	1	1	11	3	61.16	14	1	6	-	3	-	90.36	38	11	7	3	17	3
30-06-1904	270	5	13	-	2	18	19	1	5	15	28.88	6	7	19	-	3	-	88.26	9	6	14	1	13	1
31-12-1904	277	6	10	-	23	8	5	1	14	1	67.91	10	1	18	-	3	-	91.17	33	9	23	5	3	2
"	282	9	-	-	48	-	-	2	3	5	71.17	18	1	21	-	3	-	91.17	66	1	21	7	6	21
30-06-1905	292	4	18	-	31	16	-	2	12	2	71.36	12	-	12	-	3	-	94.24	43	16	12	8	18	21
31-12-1905	296	5	5	-	39	12	-	2	16	12	72.75	14	-	21	-	3	-	94.69	53	12	21	10	4	9
"	305	4	9	-	17	13	-	1	14	2	69.95	6	18	7	-	3	-	91.18	24	11	7	5	10	10
30-06-1906	307	4	8	2	28	16	-	2	8	14	72.91	10	1	16	-	2	19	94.24	38	17	16	8	5	16
31-12-1906	312	4	5	-	25	5	8	2	5	8	72.40	8	19	22	-	3	-	93.38	34	5	6	8	1	6
"	315	4	8	-	30	19	-	2	12	-	73.01	10	15	14	-	3	-	94.23	41	14	14	9	9	16
31-12-1907	329	6	10	-	33	5	-	2	9	-	67.62	14	19	-	-	3	-	93.88	48	4	-	7	8	7
"	330	5	-	-	30	16	-	2	19	12	67.43	14	2	12	-	3	-	94.96	44	18	12	8	19	17
"	332	5	13	-	20	5	2	1	11	12	69.48	8	1	-	-	3	-	90.47	28	6	2	4	10	5
30-06-1908	333	6	5	-	19	6	-	-	19	-	76.47	5	-	-	-	3	-	84.21	24	6	-	3	17	18
"	334	2	9	2	-	-	-	1	12	2	-	3	13	1	-	2	8	92.60	3	13	1	1	9	18
31-12-1908	337	1	12	-	16	10	19	3	6	6	75.73	5	1	4	-	3	-	95.44	21	11	23	13	10	-
"	340	3	-	-	-	-	-	-	19	-	-	2	8	-	-	3	-	84.21	2	8	-	-	16	-
"	342	5	9	-	1	3	-	-	2	23	58.79	-	8	20	-	-	19	73.13	1	11	20	-	6	7
"	345	6	11	-	15	10	14	1	1	-	69.31	5	17	21	-	3	-	85.70	21	8	11	3	5	10
"	349	5	7	-	8	7	-	-	16	12	65.42	3	12	5	-	3	-	81.78	11	19	5	2	4	11
30-06-1909	355	4	14	-	7	17	14	1	1	-	61.49	4	4	14	-	3	-	85.69	12	2	4	2	11	13
"	360	4	9	-	8	5	2	1	7	-	57.87	5	6	19	-	3	-	88.87	13	11	21	3	1	2
31-12-1909	370	2	17	-	4	8	14	-	17	9	64.15	2	-	23	-	3	-	82.74	6	9	13	2	5	11
"	374	5	-	-	2	11	14	-	9	9	52.39	1	16	21	-	2	-	78.67	4	8	13	-	17	17
30-06-1910	385	7	5	-	1	7	1	-	3	4	53.73	-	13	7	-	1	8	57.07	2	-	8	-	5	14
31-12-1910	394	4	9	-	2	9	-	-	6	18	61.99	1	1	3	-	2	-	70.32	3	10	3	-	15	18
30-06-1911	403	4	1	-	4	7	-	-	10	-	68.24	1	12	9	-	2	-	79.94	5	19	9	1	9	12
31-12-1911	406	12	15	-	14	-	2	-	16	-	57.86	8	5	18	-	3	-	81.25	22	5	20	1	14	23
"	412	5	13	-	6	18	-	-	19	20	55.19	4	15	2	-	3	-	84.86	11	13	2	2	1	6

HALF YEAR ENDED	PARCEL NO.	ORE TREATED TONNAGE tons	cwt	gr	GOLD BULLION RECOVERED BY AMALGAMATION ONLY BULLION oz	dwt	gr	TAILING ASSAY oz	dwt	gr	% RECOVERY	GOLD BULLION RECOVERY BY CYANIDATION OF BATTERY TAILINGS BULLION oz	dwt	gr	TAILING ASSAY oz	dwt	gr	% RECOVERY	TOTAL BULLION RECOVERED oz	dwt	gr	YIELD PER TON oz	dwt	gr
30-06-1912	416	4	-	-	8	6	6	1	1	-	66.43	3	12	-	-	3	-	85.71	11	18	6	2	19	13
31-12-1912	421	5	-	-	6	2	14	-	10	13	69.93	2	-	5	-	2	12	76.28	8	2	19	1	12	13
30-06-1913	432	3	11	-	4	15	5	-	17	3	61.03	2	10	3	-	3	-	82.45	7	5	8	2	-	23
31-12-1913	435	4	10	-	2	9	18	-	7	8	60.12	1	4	-	-	2	-	72.73	3	13	18	-	16	10
30-06-1914	438	5	2	-	4	13	22	-	17	14	51.16	3	14	9	-	3	2	82.95	8	8	7	1	12	22
"	443	4	18	-	4	16	-	-	17	-	53.54	3	8	14	-	3	-	82.34	8	4	14	1	13	14
31-12-1914	447	7	5	-	5	2	4	-	14	12	49.29	4	7	-	-	2	12	82.76	9	9	4	1	6	2
"	450	5	-	-	1	11	21	-	5	6	54.84	-	16	6	-	2	-	61.90	2	8	3	-	9	15
30-06-1915	452	3	5	-	3	15	-	-	17	9	57.05	2	6	17	-	3	-	82.73	6	1	17	1	17	11
"	455	4	12	-	2	17	-	-	8	18	58.61	1	11	1	-	2	-	77.12	4	8	1	-	19	3
"	456	3	16	-	2	11	8	-	8	-	62.79	1	2	19	-	2	-	74.93	3	14	7	-	19	12
31-12-1915	457	13	15	-	9	10	5	-	8	-	63.36	4	2	12	-	2	-	75.00	13	12	17	-	19	20
"	459	4	7	-	5	9	20	-	18	3	58.22	3	5	19	-	3	-	83.54	8	15	15	2	-	9
"	460	8	-	-	3	2	5	-	5	15	58.03	1	9	-	-	2	-	64.44	4	11	5	-	11	10
"	461	5	-	-	3	9	6	-	7	12	64.87	1	7	12	-	2	-	73.73	4	16	18	-	19	8
31-12-1915	464	5	-	-	1	3	21	-	4	-	54.42	-	13	8	-	1	8	66.67	1	17	5	-	7	11
30-06-1916	469	3	-	-	2	1	3	-	10	12	56.63	1	4	-	-	2	12	76.19	3	5	3	1	1	17
"	470	10	5	-	5	8	-	-	9	10	52.80	3	16	-	-	2	-	78.72	9	4	-	-	17	23
31-12-1916	471	4	12	-	3	3	5	-	12	10	51.70	2	7	12	-	2	12	80.45	5	10	17	1	4	2
"	472	7	-	-	16	19	-	1	4	-	66.86	7	7	-	-	3	-	87.50	24	6	-	3	9	10
"	473	4	8	-	3	10	12	-	8	18	64.78	1	9	16	-	2	-	77.06	5	-	4	1	2	18
30-06-1917	475	10	-	-	8	18	17	-	14	1	56.00	5	15	10	-	2	12	82.20	14	14	3	1	9	10
"	476	10	5	-	16	7	17	1	2	-	59.24	9	14	18	-	3	-	86.36	26	2	11	2	6	23
31-12-1917	480	7	15	-	3	12	-	-	11	4	56.41	3	7	4	-	2	8	77.61	8	19	4	1	3	3
"	481	9	15	-	7	15	17	-	13	1	55.04	5	2	18	-	2	12	80.80	12	18	11	1	6	12
"	482	3	16	-	1	12	4	-	10	18	44.06	1	11	8	-	2	12	76.73	3	3	12	-	16	17
"	483	11	-	-	5	10	14	-	9	10	51.63	4	1	4	-	2	-	78.76	9	12	4	-	17	11
30-6-1918	485	7	-	-	14	10	-	1	5	-	62.37	7	14	-	-	3	-	88.00	22	4	-	3	3	10
"	486	3	15	-	3	6	-	-	14	12	54.83	2	5	-	-	2	12	82.76	5	11	-	1	9	14
"	489	4	15	-	11	-	-	1	11	-	59.90	6	13	-	-	3	-	90.32	17	13	-	3	14	8
"	490	4	-	-	1	13	17	-	7	18	52.09	1	3	-	-	2	-	74.19	2	16	17	-	14	4
31-12-1918	492	5	8	-	11	3	-	1	10	-	57.92	7	5	19	-	3	-	89.99	18	8	19	3	8	7
"	493	4	-	-	1	2	12	-	8	18	39.13	1	7	-	-	2	-	77.14	2	9	12	-	12	10
"	494	4	5	-	4	13	19	-	12	12	63.84	2	2	12	-	2	12	80.00	5	16	7	1	12	2
"	495	5	3	-	3	13	22	-	11	-	56.60	2	3	18	-	2	12	77.21	5	17	6	1	2	20
30-06-1919	496	5	-	-	9	5	16	1	5	12	59.29	5	12	12	-	3	-	88.24	14	18	4	2	19	15
31-12-1919	500	6	5	-	9	2	11	1	1	-	58.16	5	12	12	-	3	-	85.71	14	14	23	2	7	5
"	501	4	1	-	10	2	6	1	13	12	59.85	6	3	12	-	3	-	91.03	16	5	18	4	-	11
30-6-1920	503	2	15	-	2	-	6	-	12	12	53.94	1	7	12	-	2	12	80.00	3	7	18	1	4	15
"	504	5	6	-	7	2	2	-	11	12	69.98	2	7	16	-	2	12	78.20	9	9	18	1	15	19
"	505	5	7	-	11	18	20	1	2	12	66.49	5	4	7	-	3	-	86.64	17	3	3	3	4	3
31-12-1920	507	7	15	-	6	13	20	-	10	8	62.56	3	-	17	-	2	12	75.81	9	14	13	1	5	2
"	508	5	10	-	4	18	18	-	15	12	53.67	3	8	18	-	3	-	80.65	8	7	12	1	10	11
31-12-1921	512	16	-	-	3	5	-	-	4	23	45.03	2	18	-	-	1	8	73.11	6	3	-	-	7	16
30-06-1929	531	3	10	-	7	5	6	1	1	12	65.87	3	4	18	-	3	-	86.05	10	10	-	3	-	-

HALF YEAR ENDED	PARCEL NO.	ORE TREATED TONNAGE tons	cwt	gr	GOLD BULLION RECOVERED BY AMALGAMATION ONLY BULLION oz	dwt	gr	TAILING ASSAY oz	dwt	gr	% RECOVERY	GOLD BULLION RECOVERY BY CYANIDATION OF BATTERY TAILINGS BULLION oz	dwt	gr	TAILING ASSAY oz	dwt	gr	% RECOVERY	TOTAL BULLION RECOVERED oz	dwt	gr	YIELD PER TON oz	dwt	gr
31-12-1929	537	13	-	-	3	8	17	-	6	-	46.83	2	12	-	-	2	-	66.67	6	-	17	-	9	7
"	538	5	17	-	1	11	-	-	4	12	54.07	-	18	12	-	1	8	70.25	2	9	12	-	8	13
"	540	2	15	-	1	6	8	-	9	-	51.55	-	19	6	-	2	-	77.78	2	5	14	-	16	14
31-12-1930	549	5	6	-	4	5	18	-	14	12	52.74	3	3	14	-	2	12	82.75	7	9	8	1	8	4
31-12-1931	597	4	15	-	5	19	2	-	18	-	58.21	3	11	6	-	3	-	83.33	9	10	8	2	-	2
"	617	9	-	-	6	1	10	-	14	1	49.00	5	3	21	-	2	12	82.20	11	5	7	1	5	1
31-12-1932	656	4	17	-	2	13	15	-	8	-	58.03	1	9	2	-	2	-	74.97	4	2	17	-	17	1
"	659	9	5	-	13	15	-	1	1	-	58.60	8	6	12	-	3	-	85.71	22	1	12	2	7	18
"	674	5	15	-	3	5	16	-	11	4	50.56	2	9	20	-	2	12	77.61	5	15	12	1	-	2
"	682	17	10	-	10	12	12	-	12	2	50.12	8	7	17	-	2	12	79.31	19	-	5	1	1	17
"	685	5	15	-	2	13	-	-	8	18	51.29	1	18	19	-	2	-	77.07	4	11	19	-	15	23
30-06-1933	701	4	6	-	4	7	12	-	14	1	59.17	2	9	15	-	2	12	82.19	6	17	3	1	11	21
31-12-1933	719	5	-	-	6	13	1	-	18	14	58.88	3	17	22	-	3	-	83.86	10	10	23	2	2	5
"	724	5	7	-	5	13	20	-	15	3	58.45	3	4	21	-	3	-	80.18	8	18	17	1	13	10
31-12-1934	760	5	5	-	6	11	7	-	16	5	60.68	3	9	8	-	3	-	81.49	10	-	15	1	18	5
"	769	6	-	-	8	4	2	-	16	10	62.49	4	-	12	-	3	-	81.73	12	4	14	2	-	18
30-06-1935	784	6	5	-	7	12	14	1	1	-	53.76	5	12	12	-	3	-	85.71	13	5	2	2	2	10
31-12-1935	790	6	-	-	-	11	12	-	2	16	41.82	-	8	-	-	1	8	50.00	-	19	12	-	3	6
"	793	6	2	-	-	13	1	-	3	13	37.62	-	13	11	-	1	8	62.24	1	6	12	-	4	8
"	797	6	6	-	1	6	8	-	4	23	45.73	1	2	20	-	1	8	73.07	2	9	4	-	7	19
"	799	6	10	-	1	16	11	-	4	11	55.70	1	-	7	-	1	8	69.97	2	16	18	-	8	18
"	802	8	12	-	2	14	16	-	4	18	57.24	1	9	9	-	1	22	59.69	4	4	1	-	9	5
"	804	6	6	-	4	8	8	-	8	-	63.66	1	17	19	-	2	-	74.96	6	6	3	1	-	-
"	808	7	8	-	7	7	21	-	14	1	58.73	4	5	10	-	2	13	82.20	11	13	7	1	11	12
"	814	5	3	-	3	4	4	-	6	16	65.14	1	4	-	-	2	-	69.90	4	8	4	-	17	3
30-06-1936	818	5	10	-	1	8	12	-	3	13	59.38	-	12	3	-	1	8	62.18	2	-	15	-	7	9
"	824	6	4	-	2	11	19	-	6	2	57.87	1	5	7	-	2	-	67.29	3	17	2	-	12	10
"	831	5	5	-	1	13	23	-	5	12	54.05	-	18	9	-	2	-	63.64	1	12	8	-	9	23
"	836	3	17	-	1	5	15	-	4	11	59.88	-	12	-	-	1	8	63.64	1	17	15	-	9	19
31-12-1936	906	11	12	-	2	8	-	-	3	13	53.88	1	5	15	-	1	8	62.37	3	13	15	-	6	8
30-06-1939	1080	8	3	-	1	10	2	-	1	-	78.65	-	-	-	-	-	-	-	1	10	2	-	3	17
31-12-1939	1101	5	8	-	1	-	6	-	4	-	48.41	-	14	10	-	1	8	66.80	1	14	16	-	6	10
"	1107	4	18	-	3	19	3	-	9	-	64.22	1	14	7	-	2	-	77.79	5	13	10	1	3	4
"	1118	3	4	-	2	-	21	?	?	?	?	-	13	9	?	?	?	?	2	14	6	-	16	23
"	1124	3	10	-	3	16	17	-	7	16	74.08	-	19	20	-	2	-	73.91	4	16	13	1	7	14
31-12-1983	1562	7	-	-	1	8	-	-	5	-	44.44	-	-	-	-	-	-	-	1	8	-	-	4	-
	TOTALS	969	1	3	973	12	23					485	2	-					1458	14	23			
		(984.61 tonnes)			(30 288.46 grams)							(15 090.60 grams)							(45 379.06 grams)					
	AVERAGE										59.72							79.10				1	9	15
																						(46.09 G/T)		

G01315

MINE: KLONDYKE (BLOCK 1319)

HALF YEAR ENDED	PARCEL NO.	ORE TREATED TONNAGE tons	cwt	gr	GOLD BULLION RECOVERED BY AMALGAMATION ONLY BULLION oz	dwt	gr	TAILING ASSAY oz	dwt	gr	% RECOVERY	GOLD BULLION RECOVERY BY CYANIDATION OF BATTERY TAILINGS BULLION oz	dwt	gr	TAILING ASSAY oz	dwt	gr	% RECOVERY	TOTAL BULLION RECOVERED oz	dwt	gr	YIELD PER TON oz	dwt	gr
30-06-1902	242	13	-	-	6	19	4	-	4	6	71.58	1	19	13	-	1	5	71.57	8	18	17	-	13	18
31-12-1903	268	4	5	-	7	16	9	-	19	-	65.95	3	8	-	-	3	-	84.21	11	4	9	2	12	19
30-06-1904	271	1	11	-	4	3	7	1	3	2	69.94	1	11	3	-	3	-	86.96	5	14	10	3	13	20
"	274	2	14	-	6	12	4	1	11	17	60.68	3	17	10	-	3	1	90.41	10	9	14	3	17	15
31-12-1905	304	7	8	-	19	4	2	1	9	20	63.50	9	18	13	-	3	-	89.94	29	2	15	3	18	18
30-06-1908	335	1	1	-	4	10	-	1	4	-	78.12	1	2	1	-	3	-	87.44	5	12	1	5	6	17
31-12-1908	341	4	12	-	4	16	14	-	16	20	55.51	3	3	15	-	3	-	82.19	8	-	5	1	14	20
"	348	2	-	-	1	16	2	-	14	5	55.94	1	3	10		2	12	82.40	2	19	12	1	9	18
30-06-1920	502	6	9	-	5	13	22	-	11	12	60.57	2	18	1	-	2	12	78.26	8	11	23	1	6	16
30-06-1921	510	4	12	-	3	1	16	-	12	2	52.59	2	4	2	-	2	12	79.31	5	5	18	1	3	-
31-12-1921	511	9	-	-	4	8	-	-	5	12	64.00	1	11	12	-	2	-	63.64	5	19	12	-	13	7
31-12-1930	547	2	17	-	2	17	-	-	11	4	64.17	1	4	16	-	2	8	77.49	4	1	16	1	8	16
TOTALS		59	9	-	71	18	8					34	2	-					106	-	8			
AVERAGE		(60.40 tonnes)			(2 237.20 grams)						63.55	(1060.79 grams)						81.15	(3 297.99 grams)			1	15	2
																						(54.60 G/T)		

MINE: LITMANS CLAIM

HALF YEAR ENDED	PARCEL NO.	ORE TREATED TONNAGE tons	cwt	gr	GOLD BULLION RECOVERED BY AMALGAMATION ONLY BULLION oz	dwt	gr	TAILING ASSAY oz	dwt	gr	% RECOVERY	GOLD BULLION RECOVERY BY CYANIDATION OF BATTERY TAILINGS BULLION oz	dwt	gr	TAILING ASSAY oz	dwt	gr	% RECOVERY	TOTAL BULLION RECOVERED oz	dwt	gr	YIELD PER TON oz	dwt	gr
31-12-1897	7	5	5	-	-	17	12	-	2	-	62.50	-	-	-	-	-	-	-	-	17	12	-	3	8
		(5.33 tonnes)			(27.22 grams)														(27.22 grams)			(5.11 G/T)		

MINE: M.C. 4758 (J O'BRYAN)

HALF YEAR ENDED	PARCEL NO.	ORE TREATED TONNAGE tons	cwt	gr	GOLD BULLION RECOVERED BY AMALGAMATION ONLY BULLION oz	dwt	gr	TAILING ASSAY oz	dwt	gr	% RECOVERY	GOLD BULLION RECOVERY BY CYANIDATION OF BATTERY TAILINGS BULLION oz	dwt	gr	TAILING ASSAY oz	dwt	gr	% RECOVERY	TOTAL BULLION RECOVERED oz	dwt	gr	YIELD PER TON oz	dwt	gr
30-06-1902	237	4	16	-	1	2	14	-	1	19	72.42	-	-	-	-	-	-	-	1	2	14	-	4	17
31-12-1902	246	9	16	-	2	6	14	-	1	20	72.18	-	-	-	-	-	-	-	2	6	14	-	4	18
30-06-1903	257	10	1	-	2	14	12	-	3	1	64.05	-	17	4	-	1	8	56.13	3	11	16	-	7	3
		24	13	-	6	3	16					-	17	4					7	-	20	-	5	15
		(25.04 tonnes)			(192.35 grams)						69.55	(26.70 grams)						56.13	(219.05 grams)			(8.75 G/T)		

MINE: NECTAR

HALF YEAR ENDED	PARCEL NO.	ORE TREATED TONNAGE tons	cwt	gr	GOLD BULLION RECOVERED BY AMALGAMATION ONLY BULLION oz	dwt	gr	TAILING ASSAY oz	dwt	gr	% RECOVERY	GOLD BULLION RECOVERY BY CYANIDATION OF BATTERY TAILINGS BULLION oz	dwt	gr	TAILING ASSAY oz	dwt	gr	% RECOVERY	TOTAL BULLION RECOVERED oz	dwt	gr	YIELD PER TON oz	dwt	gr
31-12-1908	339	2	15	-	5	-	21	-	9	15	79.22	1	-	23	-	2	-	79.21	6	1	20	2	4	7
"	346	2	12	-	6	13	4	-	16	15	75.50	1	15	10	-	3	-	81.97	7	8	14	3	4	20
30-06-1909	356	3	10	-	4	17	-	-	9	18	73.98	1	7	3	-	2	-	79.49	6	4	3	1	15	11
31-12-1909	369	4	7	-	4	16	6	-	7	14	74.47	1	4	6	-	2	-	73.48	6	-	12	1	7	17
"	380	5	10	-	1	6	2	-	3	3	60.25	-	9	20	-	1	11	52.78	1	15	22	-	6	10
		18	14	-	22	13	9					5	17	14	-				27	10	23	1	10	1
		(19.00 tonnes)			(705.18 grams)						72.68	(182.89 grams)						73.39	(888.07 grams)			(46.74 G/T)		

MINE: ODD TRICK REEF

HALF YEAR ENDED	PARCEL NO.	ORE TREATED TONNAGE	GOLD BULLION RECOVERED BY AMALGAMATION ONLY			GOLD BULLION RECOVERY BY CYANIDATION OF BATTERY TAILINGS			TOTAL BULLION RECOVERED	YIELD PER TON
			BULLION	TAILING ASSAY	% RECOVERY	BULLION	TAILING ASSAY	% RECOVERY		
30-06-1902	227	4 12 - (4.67 tonnes)	- 16 9 (25.47 grams)	- 1 4	75.29	- - -	- - -	-	- 16 9 (25.47 grams)	- 3 13 (5.45 G/T)

MINE: SMITH, D.W.

HALF YEAR ENDED	PARCEL NO.	ORE TREATED TONNAGE	GOLD BULLION RECOVERED BY AMALGAMATION ONLY			GOLD BULLION RECOVERY BY CYANIDATION OF BATTERY TAILINGS			TOTAL BULLION RECOVERED	YIELD PER TON
			BULLION	TAILING ASSAY	% RECOVERY	BULLION	TAILING ASSAY	% RECOVERY		
30-06-1900	133	6 15 - (6.86 tonnes)	1 16 - (56.00 grams)	- 1 22	73.53	- - -	- - -	-	1 16 - (56.00 grams)	- 5 8 (8.16 G/T)

MINE: SPANISH AMERICAN

HALF YEAR ENDED	PARCEL NO.	ORE TREATED TONNAGE	GOLD BULLION RECOVERED BY AMALGAMATION ONLY			GOLD BULLION RECOVERY BY CYANIDATION OF BATTERY TAILINGS			TOTAL BULLION RECOVERED	YIELD PER TON
			BULLION	TAILING ASSAY	% RECOVERY	BULLION	TAILING ASSAY	% RECOVERY		
31-12-1901	208	4 17 -	- 12 4	- 2 13	49.66	- 7 16	- - 23	62.16	- 19 20	- 4 2
30-06-1902	226	5 5 -	1 13 9	- 5 21	30.25	1 2 12	- 1 14	72.97	2 15 21	- 10 15
"	244	5 - -	1 - 2	- 2 17	59.73	- 9 19	- - 18	72.31	1 9 21	- 5 23
31-12-1903	266	4 15 -	2 11 3	- 9 1	54.34	1 13 10	- 2 -	77.79	4 4 13	- 19 19
30-06-1906	308	1 6 2	1 2 8	TRACE	?	- - -	- - -		1 2 8	- 17 3
		21 3 2 (21.49 tonnes)	6 19 2 (216.33 grams)		48.50	3 13 9 (114.13 grams)		71.31	10 12 11 (330.46 grams)	- 9 21 (15.38 G/T)

MINE: STAR OF THE EAST

HALF YEAR ENDED	PARCEL NO.	ORE TREATED TONNAGE tons	cwt	gr	GOLD BULLION RECOVERED BY AMALGAMATION ONLY BULLION oz	dwt	gr	TAILING ASSAY oz	dwt	gr	% RECOVERY	GOLD BULLION RECOVERY BY CYANIDATION OF BATTERY TAILINGS BULLION oz	dwt	gr	TAILING ASSAY oz	dwt	gr	% RECOVERY	TOTAL BULLION RECOVERED oz	dwt	gr	YIELD PER TON oz	dwt	gr
31-12-1897	19	9	6	-	-	17	-	?	?	?	?	-	-	-	-	-	-	?	-	17	-	-	1	20
30-06-1939	1090	3	18	-	-	15	4	-	1	9	73.83	-	-	-	-	-	-	-	-	15	4	-	3	21
		13	4	-	1	12	4				73.83	-	-	-					1	12	4	-	2	10
		(13.41 tonnes)			(50.03 grams)														(50.03 grams)			(3.73 G/T)		

MINE: TAYLOR, H.R.

HALF YEAR ENDED	PARCEL NO.	ORE TREATED TONNAGE tons	cwt	gr	GOLD BULLION RECOVERED BY AMALGAMATION ONLY BULLION oz	dwt	gr	TAILING ASSAY oz	dwt	gr	% RECOVERY	GOLD BULLION RECOVERY BY CYANIDATION OF BATTERY TAILINGS BULLION oz	dwt	gr	TAILING ASSAY oz	dwt	gr	% RECOVERY	TOTAL BULLION RECOVERED oz	dwt	gr	YIELD PER TON oz	dwt	gr
31-12-1897	3	20	-	-	10	-	1	-	6	2	62.18	4	19	4	-	1	3	81.51	14	19	5	-	14	23
		(20.32 tonnes)			(311.15 grams)							(154.24 grams)							(465.39 grams)			(22.90 G/T)		

MINE: TOP NOTCH

HALF YEAR ENDED	PARCEL NO.	ORE TREATED TONNAGE tons	cwt	gr	GOLD BULLION RECOVERED BY AMALGAMATION ONLY BULLION oz	dwt	gr	TAILING ASSAY oz	dwt	gr	% RECOVERY	GOLD BULLION RECOVERY BY CYANIDATION OF BATTERY TAILINGS BULLION oz	dwt	gr	TAILING ASSAY oz	dwt	gr	% RECOVERY	TOTAL BULLION RECOVERED oz	dwt	gr	YIELD PER TON oz	dwt	gr
30-06-1902	236	5	7	-	1	2	1	-	1	13	72.76	-	-	-	-	-	-	-	1	2	1	-	4	5
"	239	6	3	-	1	2	-	-	2	10	59.66	-	-	-	-	-	-	-	1	2	-	-	3	12
		11	10	-	2	4	1	AVERAGE			66.21								2	4	1	-	3	18
		(11.68 tonnes)			(68.50 grams)														(68.50 grams)			(5.86 G/T)		

MINE: VRANCE, MATT

HALF YEAR ENDED	PARCEL NO.	ORE TREATED TONNAGE tons	cwt	gr	GOLD BULLION RECOVERED BY AMALGAMATION ONLY BULLION oz	dwt	gr	TAILING ASSAY oz	dwt	gr	% RECOVERY	GOLD BULLION RECOVERY BY CYANIDATION OF BATTERY TAILINGS BULLION oz	dwt	gr	TAILING ASSAY oz	dwt	gr	% RECOVERY	TOTAL BULLION RECOVERED oz	dwt	gr	YIELD PER TON oz	dwt	gr
30-06-1954	1302	5	-	-	-	18	-	-	1	4	75.52	-	-	-	-	-	-	-	-	18	-	-	3	14
		(5.08 tonnes)			(28.00 grams)														(28.00 grams)			(5.51 G/T)		

MINE: WESTWARD HO

HALF YEAR ENDED	PARCEL NO.	ORE TREATED TONNAGE tons	cwt	gr	GOLD BULLION RECOVERED BY AMALGAMATION ONLY BULLION oz	dwt	gr	TAILING ASSAY oz	dwt	gr	% RECOVERY	GOLD BULLION RECOVERY BY CYANIDATION OF BATTERY TAILINGS BULLION oz	dwt	gr	TAILING ASSAY oz	dwt	gr	% RECOVERY	TOTAL BULLION RECOVERED oz	dwt	gr	YIELD PER TON oz	dwt	gr
31-12-1911	409	11	5	-	-	15	10	-	8	12	13.88	2	16	17	-	3	11	59.30	3	12	3	-	6	10
30-06-1938	1026	9	4	-	5	12	18	-	13	-	48.53	4	16	14	-	2	12	80.77	10	9	8	1	2	18
"	1928	32	5	-	12	14	11	-	9	10	45.59	11	19	4	-	2	-	78.75	24	13	15	-	14	23
31-12-1938	1041	24	10	-	5	13	14	-	7	16	37.68	6	18	20	-	2	-	73.91	12	12	10	-	10	7
"	1044	32	17	-	8	12	20	-	8	-	39.67	9	17	2	-	2	-	75.00	18	9	22	-	11	6
"	1045	26	-	-	5	2	14	-	6	16	37.18	6	1	8	-	2	-	70.00	11	3	22	-	8	15
"	1048	38	14	-	4	13	2	-	6	16	26.51	9	-	14	-	2	-	69.99	13	13	16	-	7	2
"	1051	20	-	-	4	3	3	-	7	20	34.67	5	16	16	-	2	-	74.47	9	19	19	-	10	-
"	1052	12	-	-	4	18	11	-	7	22	50.89	3	11	-	-	2	-	74.74	8	9	11	-	14	3
"	1055	11	5	-	6	16	12	-	9	10	56.30	4	3	10	-	2	-	78.73	10	19	22	-	19	13
"	1060	27	-	-	15	7	19	-	8	10	57.53	8	13	6	-	2	-	76.24	24	1	1	-	17	19
"	1062	19	-	-	4	15	16	-	10	8	32.82	7	8	20	-	2	12	75.81	12	4	12	-	12	21
"	1063	50	9	-	4	-	5	-	4	16	25.41	8	8	4	-	1	8	71.43	12	8	9	-	4	22
30-06-1939	1072	24	-	-	1	15	7	-	3	20	27.73	3	-	-	-	1	8	65.22	4	15	7	-	3	23
"	1077	19	-	-	3	18	7	-	8	18	32.02	6	8	6	-	2	-	77.14	10	6	13	-	10	21
"	1082	23	-	-	3	11	12	-	4	18	39.56	3	18	14	-	1	8	71.93	7	10	2	-	6	13
"	1087	29	15	-	3	13	10	-	4	20	33.80	5	4	3	-	1	8	72.41	8	17	13	-	5	23
"	1091	11	-	-	1	5	9	-	4	-	36.58	1	9	8	-	1	8	66.67	2	14	17	-	4	23
"	1095	6	10	-	4	17	6	1	-	18	41.90	5	18	-	-	2	14	87.49	10	15	6	1	13	3
"	1099	11	5	-	3	15	18	-	4	-	62.73	1	10	-	-	1	8	66.67	5	5	18	-	9	9
31-12-1939	1102	24	5	-	5	14	15	-	16	-	22.81	15	15	6	-	3	-	81.25	21	9	21	-	17	18
"	1120	25	5	-	3	3	5	-	4	-	43.45	3	7	8	-	1	8	66.67	6	10	13	-	5	4
31-12-1940	1142	7	4	-	2	18	5	-	2	13	75.11	-	5	17	-	1	18	31.21	3	3	22	-	8	21
"	1144	5	11	-	2	2	3	-	1	9	84.67	-	-	-	-	-	-	-	2	2	3	-	7	14
30-06-1944	1221	18	-	-	2	10	6	-	2	16	51.15	1	4	-	-	1	8	50.00	3	14	6	-	4	3
31-12-1948	1264	6	16	-	3	6	4	1	6	17	27.16	8	1	5	-	3	-	90.84	11	7	9	1	13	11
		526	-	-	125	17	22				41.74	145	13	10				71.47	271	11	8	-	10	8
		(534.42 tonnes)			(3916.40 grams)							(4531 .56 grams)							(8447.96 grams)			(16.33 G/T)		

WESTWARD HO EXTENDED

HALF YEAR ENDED	PARCEL NO.	ORE TREATED tons	cwt	gr	GOLD BULLION RECOVERED BY AMALGAMATION ONLY BULLION oz	dwt	gr	TAILING ASSAY oz	dwt	gr	% RECOVERY	GOLD BULLION RECOVERY BY CYANIDATION OF BATTERY TAILINGS BULLION oz	dwt	gr	TAILING ASSAY oz	dwt	gr	% RECOVERY	TOTAL BULLION RECOVERED oz	dwt	gr	YIELD PER TON oz	dwt	gr
30-06-1939	1089	7	10	-	-	4	14	-	2	19	17.94	-	10	23	-	1	8	42.90	-	15	13	-	2	2
		(7.62 tonnes)			(7.13 grams)							(17.04 grams)							(24.17 grams)			(3.17 G/T)		

APPENDIX 6

INVESTIGATIONS BY HALLMARK

GOLD N.L. 1987-1989

INVESTIGATIONS BY HALLMARK GOLD N.L. 1987-1989

Between 16 October 1987 and 15 October 1989 Hallmark Gold N.L. held E.L. 1436 which covered the Mannahill goldfield and surrounding area. Exploration was carried out to try to identify a Telfer style gold deposit, however results were not encouraging and the area relinquished. Work done is summarised below.

Rock Chip Sampling:

Grids were laid over Westward Ho, Birthday and Nectar mines. No results were reported.

Chip sampling of Euro, Trojan, Odd Trick, John Bull, Homeward Bound extension, Aurora Australis and No Gammon mines was undertaken. No results were reported.

Oriented Sampling

15 oriented samples were taken for petrology.

R.A.B. Drilling.

A programme of 16 holes was carried out by two drilling rigs, both of which were too underpowered to preform satisfactorily. Further planned drilling was abandoned. A total of 440 m of driling was completed and 89 samples assayed, generally over 6m intervals. Results are shown in table 13.

Table 13

Results of R.A.B. drilling by Hallmark Gold N.L.

Mine	Hole No.	Depth (m)	Range of Au Values (ppb)
Spanish American	MH01	16	2-3
Nectar	MH02	3	68
Nectar	MH03	2	285
Spanish American	MH04	35	1-10
Spanish American	MH05	15	1-18
Spanish American	MH06	51	X-8
Nectar	MH07	5	620
Nectar	MH08	8	37-475
Nectar	MH09	90	X-550
Nectar	MH10	22	1-36
Aurora Australis	MH11	17	3-8
Aurora Australis	MH12	45	1-7
Aurora Australis	MH13	30	1-6
Birthday	MH14	27	X-4
Birthday	MH15	44	X-6
Birthday	MH16	30	X-2

Note: X = undetected

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12/1, 19/1, 21/1, 2/2, 16/2, 9/3, 16/3, 6/4, 18/5, 8/6, 15/6, 29/6, 13/7, 20/7, 24/8, 19/10.

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27/12.

1891
17/1, 25/7.

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25/6, 23/7, 30/7.

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1901
18/12.

1902
19/3.

1903
13/5.

1904
13/1.

1905
1/4.

1907
30/1.

1909
17/1.

1911
13/5, 11/12.

1913
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14/5.

1915
1/5, 24/5.

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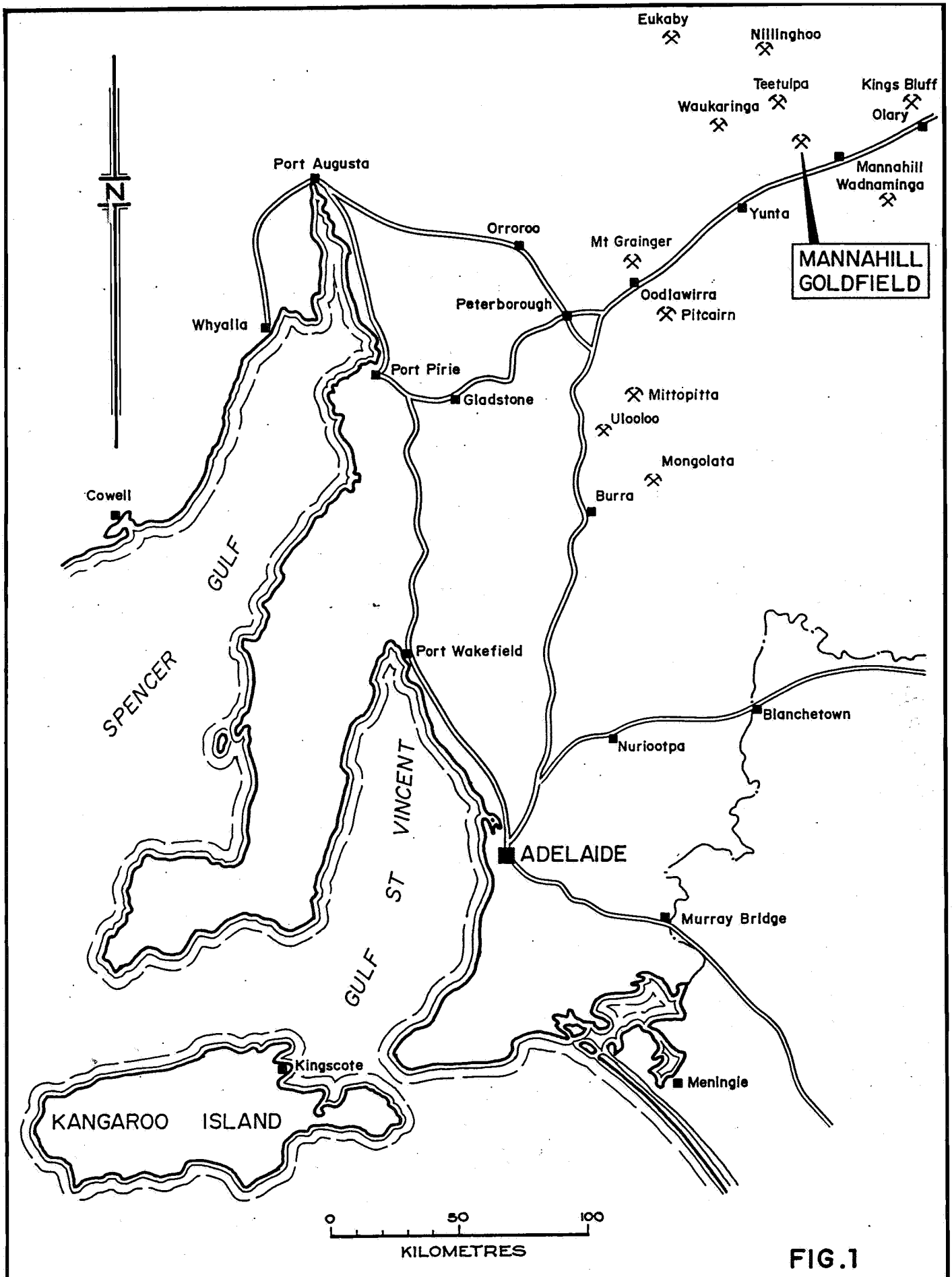

FIG.1

DEPARTMENT OF MINES AND ENERGY SOUTH AUSTRALIA	COMPILED C.M.Horn	DO 1-4-87 DATE
	DRAWN J.W./T.M.	SCALE 1:2000000
MANNAHILL GOLDFIELD LOCALITY PLAN	DATE 22-12-86	PLAN NUMBER S 19049
	CHECKED	

4280

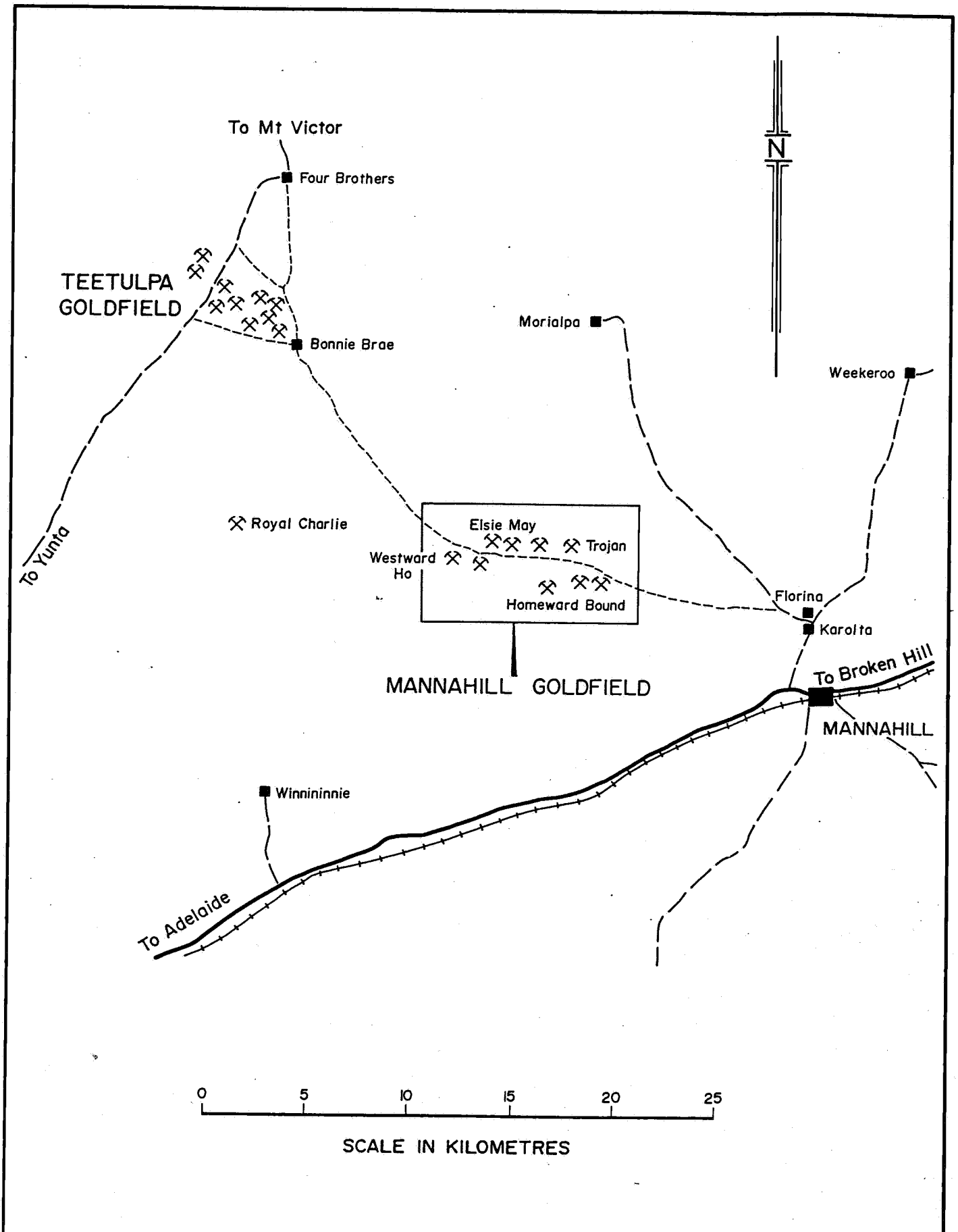

FIG. 2

DEPARTMENT OF MINES AND ENERGY SOUTH AUSTRALIA	COMPILED C.M.Horn	C.D.O 1·4·87 DATE
MANNAHILL GOLDFIELD	DRAWN T. McK	SCALE 1:250,000
LOCATION OF WESTWARD HO MINE AND ACCESS TRACKS	DATE 7·1·87	PLAN NUMBER S 19050
	CHECKED	

4280

MINE	LOCATION
Westward Ho	4·9km west north west of Jackson Pile
Elsie May	3·5km north west of Jackson Pile
Eudunda Hope	2·5km north west of Jackson Pile
Odd Trick	2·1km west south west of Jackson Pile
Euro	1·3km south of Jackson Pile
Homeward Bound	1·8km east of Jackson Pile
Nectar	5·0km east north east of Jackson Pile
No Gammon	5·7km east of Jackson Pile
Trojan	2·4km north east of Jackson Pile
Birthday Line of Reef	3·0km north north east of Jackson Pile
Aurora Australis Line of Reef	3·5km north of Jackson Pile

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Figure 3. Mannahill Goldfield_ Location of individual mines.

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S21623

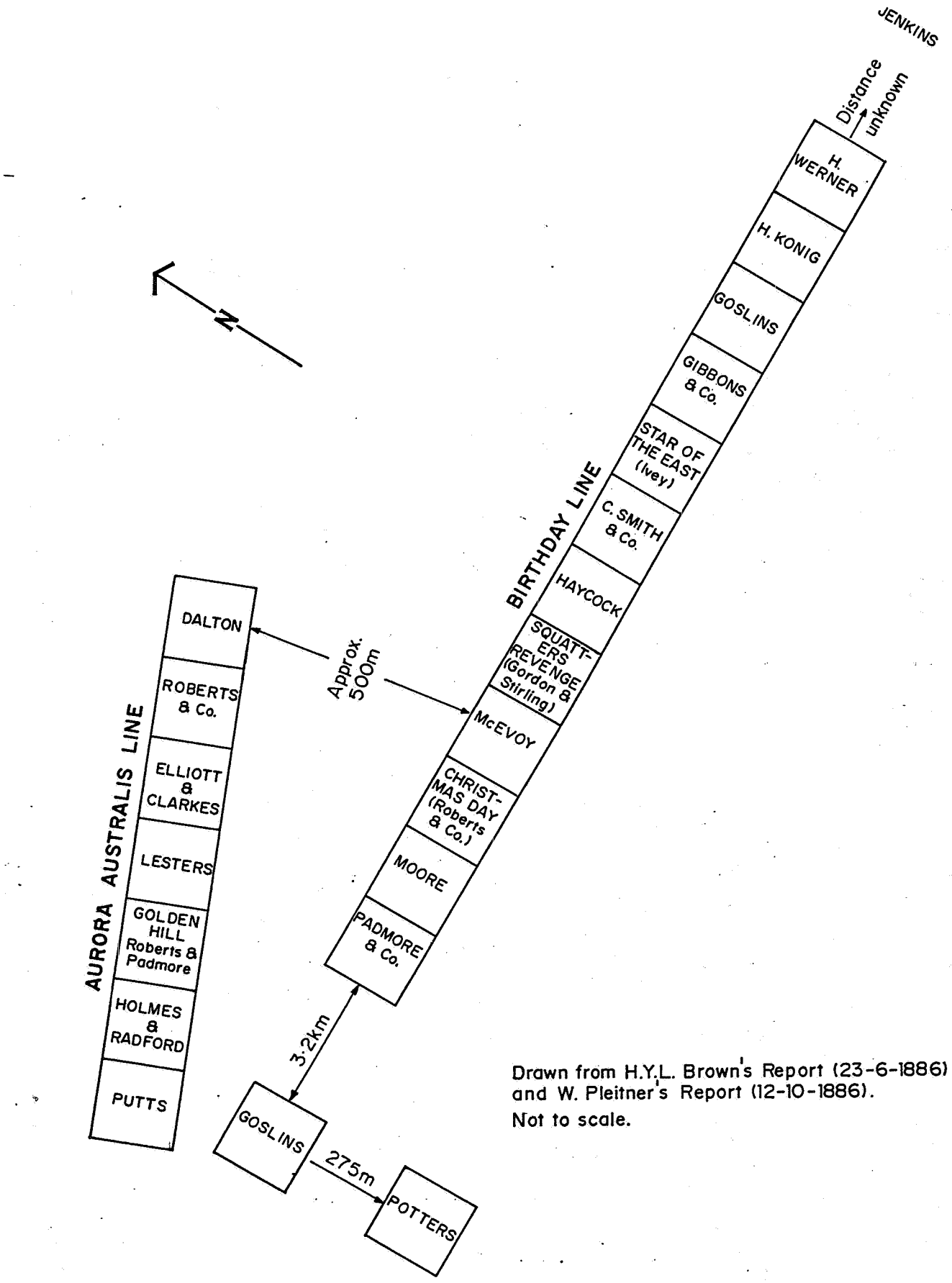

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Figure 4. Mannahill Goldfield_ Sketch plan of gold claims, 1886.

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