333001
96-3848

Mancala Pty Ltd

Mine Management & Contracting

PO Box 103
St. Helens Tas. 7215

Phone/Fax:
(003) 761 295

EL 1/92 AND O'BRIENS MINE

PROPOSED EXPLORATION PROGRAMME

1994

G. D. Iliff
Senior Geologist

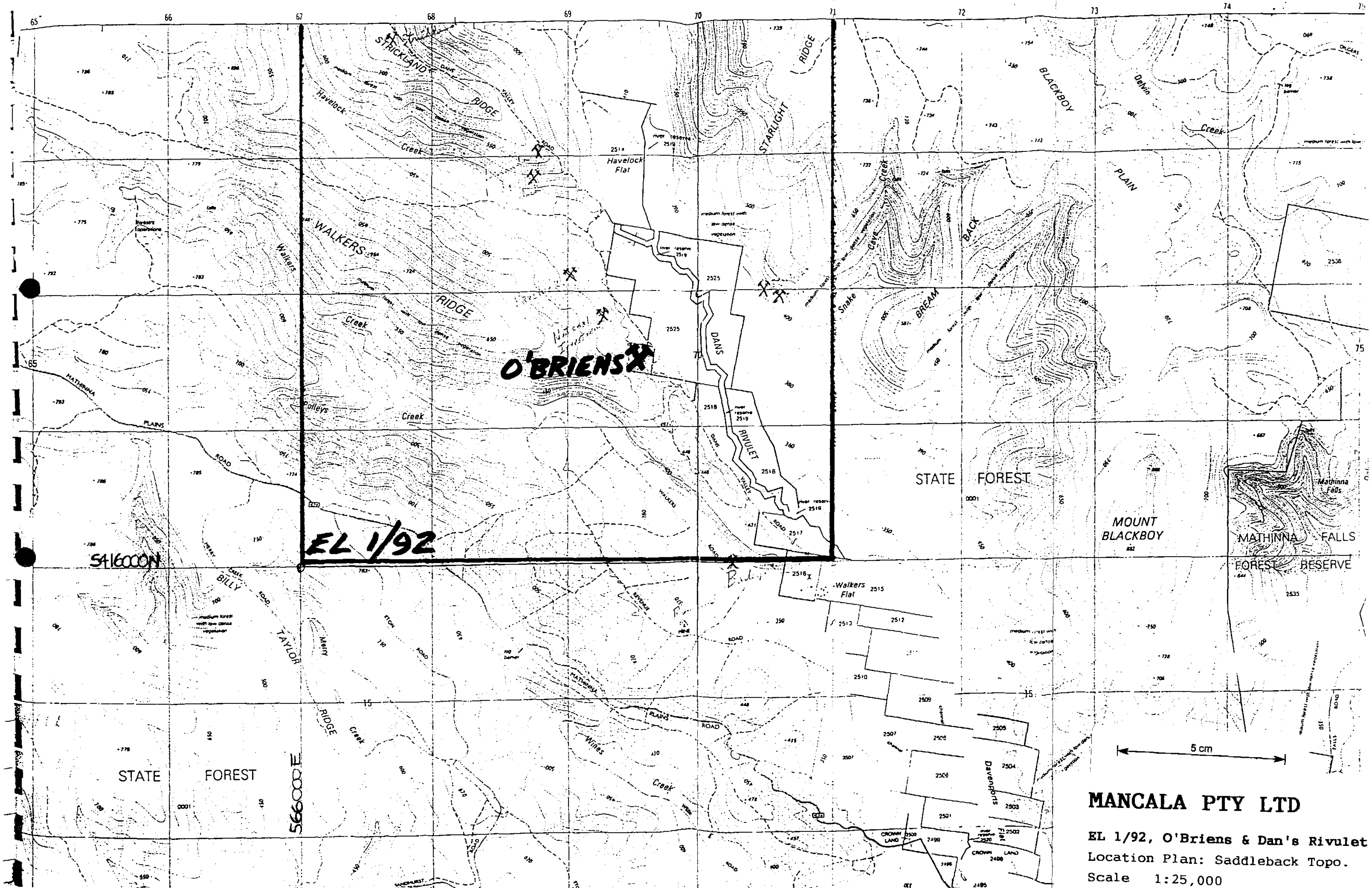
14th September 1994

TABLE OF CONTENTS

FIGURES

333003

SADDLEBACK 1:25,000



MANCALA PTY LTD

EL 1/92, O'Briens & Dan's Rivulet
Location Plan: Saddleback Topo.
Scale 1:25,000

SUMMARY

O'Briens Mine is unusual in this gold-rich belt in that its reef has recently been drilled, and this drilling is well documented, though the results were disappointing. However, this is no less useful information to subsequent workers than had the results been encouraging.

The programme here proposed is based on the premise that the ore shoot of the O'Briens Reef pitches east, rather than west, as the previous programmes were based. Reasons for this notion lie in the suggestion that the reefs were fed from the main shear to the east of the reefs.

There are two plays recognised here as potential targets:-

1. O'Briens Reef itself.
2. The confluence of O'Briens Reef with the main shear, which is postulated to occur beneath Dan's Rivulet Valley.

500m of drilling of two targets is proposed: the O'Briens Reef and the main shear, which, as evidently established by Mines Department drilling, runs up the middle of the valley. A programme of stream sediment sampling and panning for gold is proposed to run concurrently with drilling the first target, to aid in siting the second target.

Success in the first pass of either area will be followed up with a further 250m drilling.

The complete first pass and follow up programme is anticipated to cost about $100,000.

1. INTRODUCTION: REVIEW OF TARGETS.

O'Briens Reef was discovered in the 1870s. In 1884 to 1943 it produced 39.6kg of gold, averaging 29.5g/t Au (Taheri & Findlay 1992).

Four reefs were mined up to about 8m depth, accessed by separate adits. The No.1 Reef was also intersected by a cross cut at about 48m depth from shaft top, driven from the bottom of the 'main shaft' (Newnham 1994) (Figures 6 and 7).

Exploration in more recent times has consisted of three phases of diamond drilling; the first, of five holes, by the Mines Department, the second and third by Goldstream Mining N.L./Montroyal Mining N.L./Cuttack Mining & Exploration N.L., with a total of seven holes, one of which was beneath the No. 2 tunnel (Newnham 1994). All of these holes were drilled beneath the western half of the workings of the east-west trending reef, or west of the workings (Figures 6 and 7). These drilling programmes were based on the presumption the ore shoot pitches west on the No. 1 Reef. This notion was at the insistence of one who apparently worked in the mine. The continuity of the reef was represented in the holes by "a zone of somewhat intense quartz veining" (Newnham 1994), but the ore shoot was not present in the perceived intersections of the reef.

Of these programmes, one hole, MD3, drilled in the Mines Department 1954-55 programme, showed significant gold values, which averaged 9.9g/t Au over 4.5 metres (Newnham 1992). This hole is the only one which intersected the reef within the confines of the workings (Figure 7). This could be an important point in the interpretation of the structure of the reef and ore shoot, for reasons explained in Section 2, which might seem a diversion, but has bearing on the writer's exploration philosophy for O'Briens Reef and its association.

2. THE GOLDEN GATE MODEL: AN EXPLORATION TARGET.

The Golden Gate mineralisation is in the form of six major subparallel quartz veins striking north to north west (Figure 5, from Taheri & Findlay 1992). They are associated with a shear zone up to 12m wide, locally known as the 'main slide', which trends 327° and dips 70° to the south west, though the auriferous veins occur mainly outside the shear zone, and the shear apparently terminates the mineralisation to the south. This structure is parallel to the regional cleavage. The shear has not been positively identified past the confines of the mine (Threader 1987), though it has been postulated by Keele (1994) to continue well outside the Mathinna Goldfield, as shown in Figures 10 and 11 (from Keele et al 1994).

The Golden Gate mine lies in a belt of intensely folded and cleaved Mathinna Beds up to 500m wide. In diamond drilling of two holes across the Dan's Rivulet (Figure 8), it was found that the shearing was confined to a 'lutite' formation (Threader 1987). Threader suggested the alignment of Dan's Rivulet valley could be due to a combination of the lutite formation and the shear structure, with the presence of the lutite determining the presence of the shear (Threader 1987). The continuity of the line of the Dan's Rivulet in the Dorset River Valley indicates a much more significant structure than one which is solely controlled in its position by lithology. The length of this structure is indicated by Threader (1987) as 80km (see Figure 12, from Keele et al 1994). It is terminated at the southern end by a granite and the northern end vanishes under the Quaternary sediments of Anderson's Bay. This is surely not simply a lithologically controlled structure. It is more likely to be the other way round, with the structure being older than the sediments and exercising control on their deposition.

Post depositional movement of the structure could have caused the shearing and deformation of the sediments, as seen in the broad nor-nor-westerly trending shear zone (about 200m wide) exposed on the Mt Victoria Road, which traverses the saddle between the Dorset River valley and the Dan's Rivulet valley. A structure of this size would be quite deep seated, in terms of kilometres. It has been suggested (Taheri and Findlay 1992) that the concentrations of gold mineralisation at the Alberton, Dan's Rivulet and Mathinna goldfields are there because of jogs in this shear zone (Figure 9).

Fluids moving within such a structure would have been hydrothermal, which can be generated by various agents:-

A. By heat sources, such as intruding granite (see Figure 12), which cause mobility of metals, including gold, and silica.

B. Fluids heated solely by metamorphic pressure being the transporting agent is the process favoured by Taheri (1992), as a result of fluid inclusion work.

C. A similar, but more localised process, occurs in fault movements. In studies of movement of modern active faults, such as the San Andreas Fault, it has been recognised the pressure in movement of the fault causes release of water from the fault wall rocks, and this water is typically hydrothermal: very hot, and it dissolves silica and metals in the adjacent rocks, extending to depths of several kilometres. The faults are also conduits for these fluids. The fluids tend to deposit the silica (and other rock-forming minerals, such as carbonates) and metals in concentrations where physical conditions, such as temperature, traps and voids, combine with changes in chemical conditions, such as pH and reduction (White and Wright 1994).

Threader (1967) was of the opinion that gold mineralisation is related to shear zones rather than the folding and emplacement of granitoid bodies, in agreement with

Taheri and Findlay (1992).

A large shear structure provides all the ingredients for deposition of vein-type concentrations of metals: the hot water initially; the conduits for the water movement; and the space for emplacement, often large enough to accommodate big reefs, in both lateral and vertical extent.

The contention here is that the Dorset River and Dan's Rivulet valleys manifest such a structure.

3. TARGET SPECIFICATIONS.

We should be looking for a combination of the following:-

a) Known gold mineralisation: old gold mines.

b) A major shear zone: eg the Dorset River/Dan's Rivulet shear zone.

c) Reefs within and generally parallel to the major shear.

d) Reefs which are offshoots of the shear, and their confluence with the shear.

All these ingredients occur in O'Briens and its vicinity.

4. DAN'S RIVULET TARGETS.

In EL 1/92 (now owned by Cuttack Mining & Exploration N.L.) is a cluster of nine old mines straddling the Dan's Rivulet valley, with O'Briens, Havelock and several others on the west side and Starlight, Carnegie and others on the east side (Figure 4, from Taheri and Findlay 1992). This juxtaposition across the valley raises the possibility of a feeder conduit in the shear in the middle of the valley, which would be the prime target in this locality for extensive vertical and horizontal mineralisation. The writer is not unique in this line of thought, as will be seen in the next paragraph. No alluvial mining has been reported in this locality (Threader 1987).

In 1985-86 the Mines Department drilled two holes across the Dan's Rivulet Valley across the AMG northing of 5,413,000N, 4.5km south of O'Briens (Threader 1987). These holes intersected a shear zone (see Figures 1 to 3 from Threader 1987 and Figure 8). Threader(1987) commented, "Drilling beneath the alluvium between O'Briens mine and the Carnegie mine would be a suitable site for a follow-up drilling programme because these mines were two of the best lode prospects of the district and the ground between them is therefore more prospective".

4.1 O'Briens Mine.

O'Briens Reef has been drilled recently by Newnham Exploration and Mining Services on behalf of Goldstream Mining NL/Montroyal Mining/Cuttack Mining (Newnham 1994), based on the premise that the ore shoot pitches westwards (Figures 6 and 7).

This drilling failed to enhance the perceived value of the property, but it nevertheless provided valuable information. Significantly, all the drilling to date has been west of the main shaft.

One reef intersection of 4.5m true width in the 1954-55 Mines Department hole MD3 at 9.9g/t Au (Newnham 1992) was within the ground encompassed by the workings (Figure 7). This intersection, it is suggested, is near the lower western margin of the ore shoot, for the following reason.

If the hypothesis of the main shear being the conduit for the mineralisation is correct, it is probable the ore shoot pitches eastwards towards the main shear, for it was thence the mineralisation came, since O'Briens is on the west side of the valley. The recent drilling was done at the west end of the reef, where it passed beneath the west side of the shoot.

It is therefore suggested further drilling of O'Briens should be east of the workings (Figures 6 and 7).

O'Briens is a target that has the advantages of:-

- An evidently rich reef that has been only partly worked.

- It has been recently drilled, with well documented but negative results, showing where not to drill.

- Easy access.

- The owner, Cuttack Mining & Exploration NL, wishes to have Mancala drill it, in joint venture.

4.2 The Main Shear.

If the main shear is indeed in the middle, or close to the middle of the Dan's Rivulet Valley, and within it the conduit for the ore shoots and reefs of the mines on each side of the valley, as postulated above, there should be ways of locating this conduit.

The simplest means could be valid, in that the reefs of this cluster might be radiating from a central conduit or shoots parallel to the shear. Some of them are aligned enough in diagrammatic representation by Taheri and Findlay to support this notion (Figure 4, from Taheri and Findlay 1992).

Systematic sampling of the Dan's Rivulet might also provide clues of underlying mineralisation, providing the mineralisation came up that high in the conduit, and it is still above the source as an eluvial rather than an alluvial deposit.

If drilling O'Briens vindicates the suggestion that it pitches east, and provides a fix on the angle of the pitch, this could give a clue to the depth at which mineralisation could be expected in the shear, if the mineralisation is blind to other means of locating it.

5. PROPOSED PROGRAMME.

5.1 First Pass.

5.1.1 Drilling: O'Briens

A fence of five 50m holes at 15 metre intervals, totalling 250m, is proposed as the first test of O'Briens (Figures 6 and 7), intended to intersect the reef about 30m below the surface, to test the suspected easterly extension and pitch of the ore shoot.

Costs:-

250 drilling, at $80/m:	$20,000
Geology, supervision and follow up:	$ 8,000
Equipment hire:	$ 2,000
Assays: 50 samples @ $15 each:	$ 750
Ancillaries, travel, accommodation, etc:	$ 2,000
Total:	$32,750

5.1.2 Stream sediment sampling, Dan's Rivulet

A 1.5km stretch of Dan's Rivulet (Figure 4), from 100m south of a line between O'Briens and Carnegie, should be sampled at 50m intervals along the river itself, rather than in a straight line. Places most likely to have accumulated gold should be sampled between the 50m intervals.

Each sample location should be tested with a gold pan at the same time as the samples are taken.

Costs:-

50 assays @ $15 each:	$ 750
Labour and supervision:	$2,000
Ancillaries, travel, accommodation, etc:	$ 500
Total:	$3,250

5.1.3 Drilling in the valley

At this stage, with no knowledge of the depth of the target, it is suggested 250m would be a reasonable allotment of drilling for a first pass drilling programme.

Costs:-

Drilling cost: 250m @ $80	$20,000
Geology, supervision and follow up:	$ 8,000
Equipment hire:	$ 2,000
Assay: 50 samples @ $15	$ 750
Ancillaries, travel, accommodation, etc:	$ 2,000
Total:	$32,750

5.1.4 Total cost of first pass programme

Total cost of the preliminary programme: $64,750

5.2 Follow up Programme

Should either phase of the drilling programme above prove successful, it would be appropriate to follow it up immediately with a further 250m drilling.

Costs:-

Drilling cost: 250m @ $80	$20,000
Geology, supervision and follow up:	$ 8,000
Equipment hire:	$ 2,000
Assay: 50 samples @ $15	$ 750
Ancillaries, travel, accommodation, etc:	$ 2,000
Total:	$32,750

5.3 Total Anticipated Cost of First Pass and Follow up

First pass programme:	$64,750
Follow up programme:	$32,750
Cost of progress meeting, travel, etc:	$ 5,000
Total	$102,500

REFERENCES

Keele, R.A., Taheri, J. and Bottrill, R.S. 1994. Structure and veining in the Devonian-aged Mathinna-Alberton Gold Lineament, northeast Tasmania. NETGOLD Report 1994/06. Mineral Resources Tasmania.

McClennaghan, M.P., Everard, J.L., Goscombe, B.D., Findlay, R.H. and Calver, C.R. 1993. Alberton Geological Atlas 1:50,000 Series - Sheet 8415S (40). Department of Mines, Hobart.

Newnham, L.A. 1992. O'Briens Gold Mine, Mathinna, North-east Tasmania. Report on drilling program completed April-May 1992. Newnham Exploration and Mining Services. Unpub. rep. for Montroyal Mining N.L. 1992.

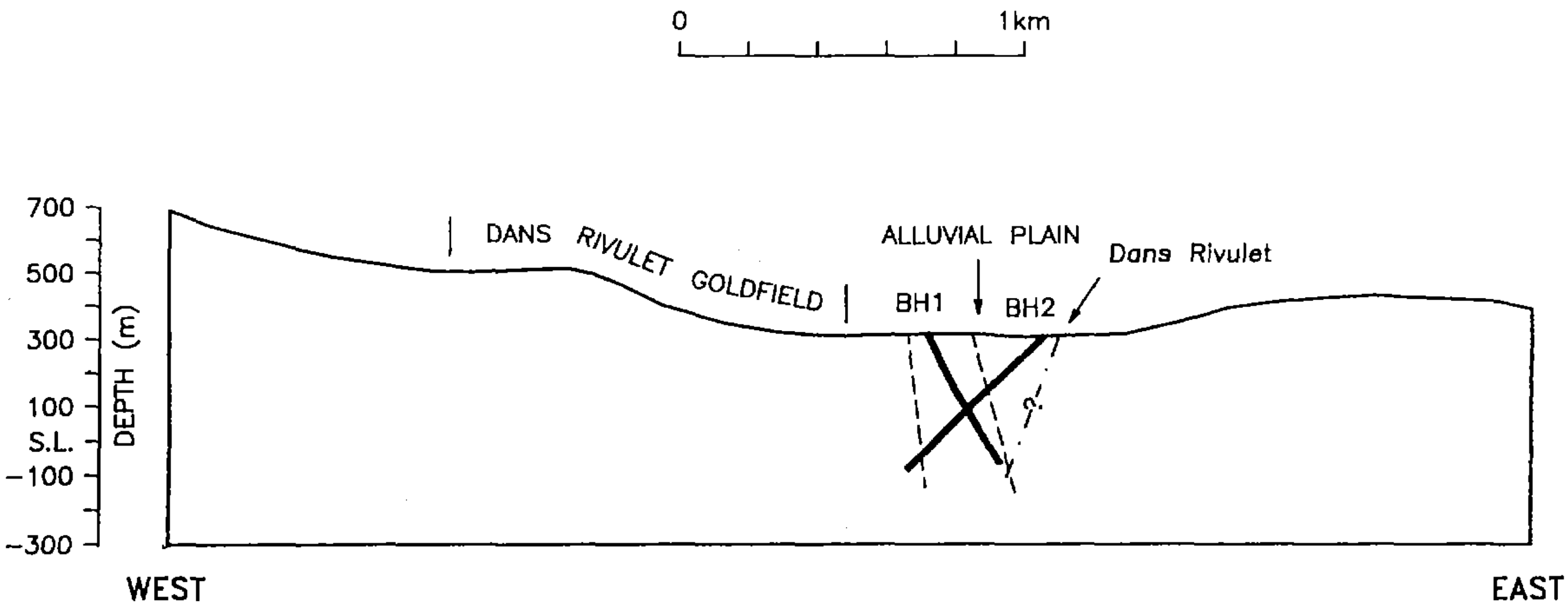
Newnham, L.A. 1994. EL 1/92, Mathinna, Tasmania. Results of a core drilling program, O'Briens Mine. Annual Report E.L. 1/92: Mathinna Area, 1994 (unpublished).

Taheri, J. and Findlay, R.H. 1992. Northeast Goldfields: A summary of the Tower Hill, Mathinna and Dans Rivulet Goldfields. NETGOLD Report 1992/10. Mineral Resources Tasmania, 1994.

Threader, V.M. 1987. Diamond and churn drilling in the Dans Rivulet valley. Unpublished Report 1987/54, Tasmania Department of Mines.

White, S.H. and Wright, J.V. 1994. A Guide to Exploration in Basins. A shortcourse presented to Pasminco Exploration, Melbourne, 1994.

SECTION THROUGH DANS RIVULET BOREHOLES 1 AND 2



5 cm

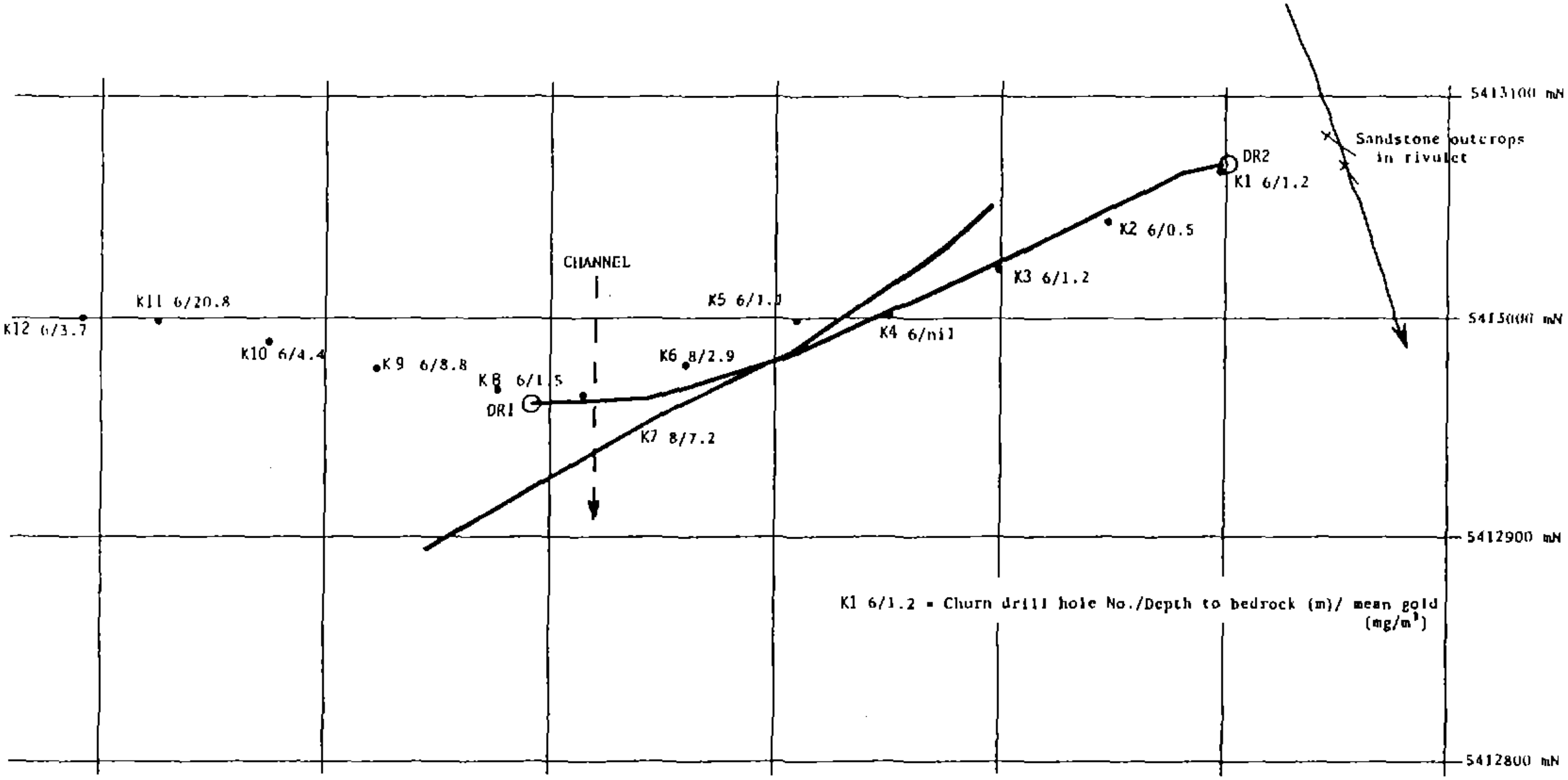
------ *Zone of Mathinna Beds lutite*

-.-.- *Shear Zone (If present, was anticipated to dip towards the west at approx. 70° and to lie somewhere beneath the alluvial plain which is here, about 600m wide)*

Figure 1.

54-3

332010



NOTE: Higher galena grade on western side of alluvial plain (bottom of K11 grade was 55.6 mg/m³)

Figure 2. *Plot of DDH 1 and DDH2, and Keystone Holes K1 to K12*

5 cm

54-5

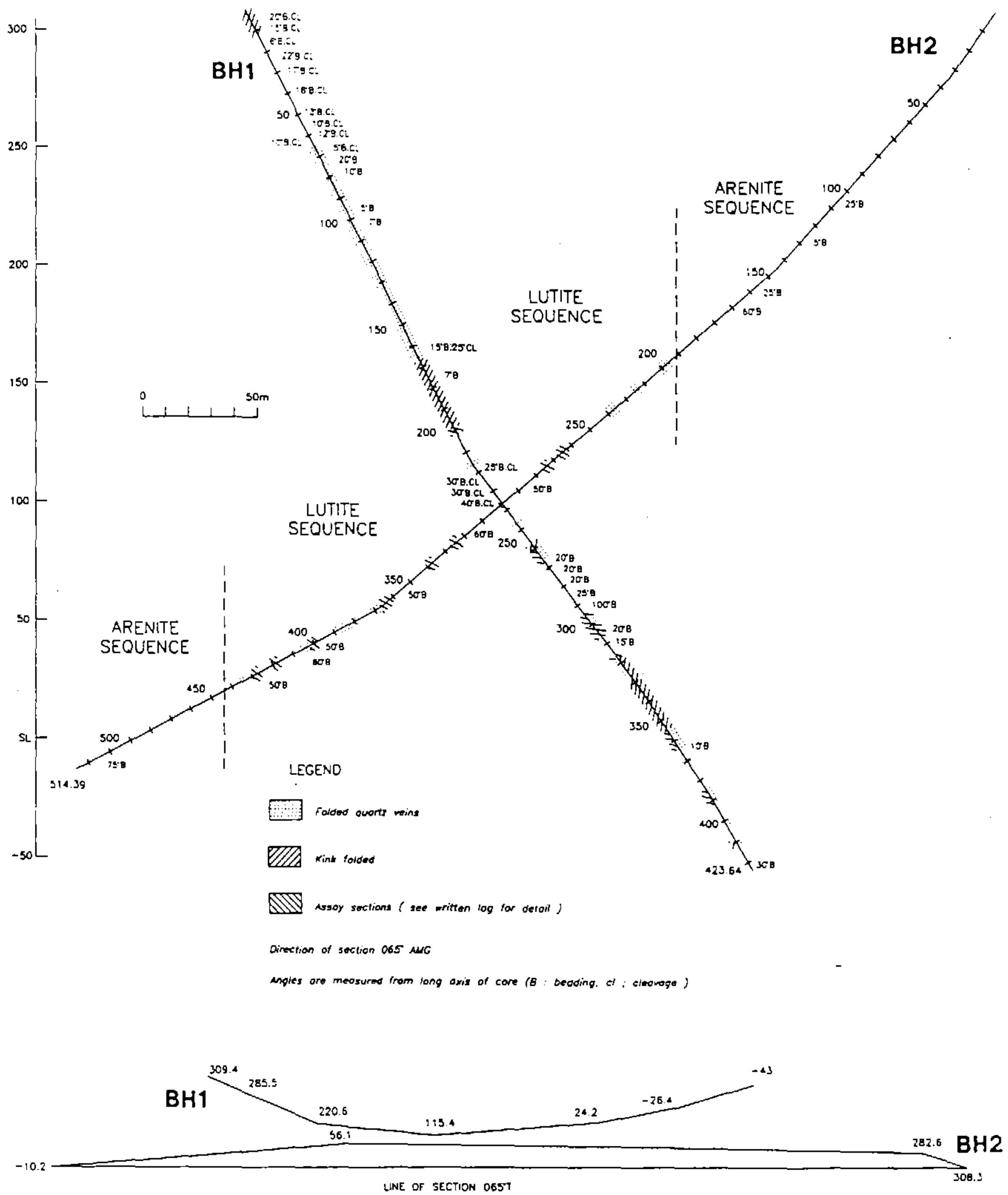
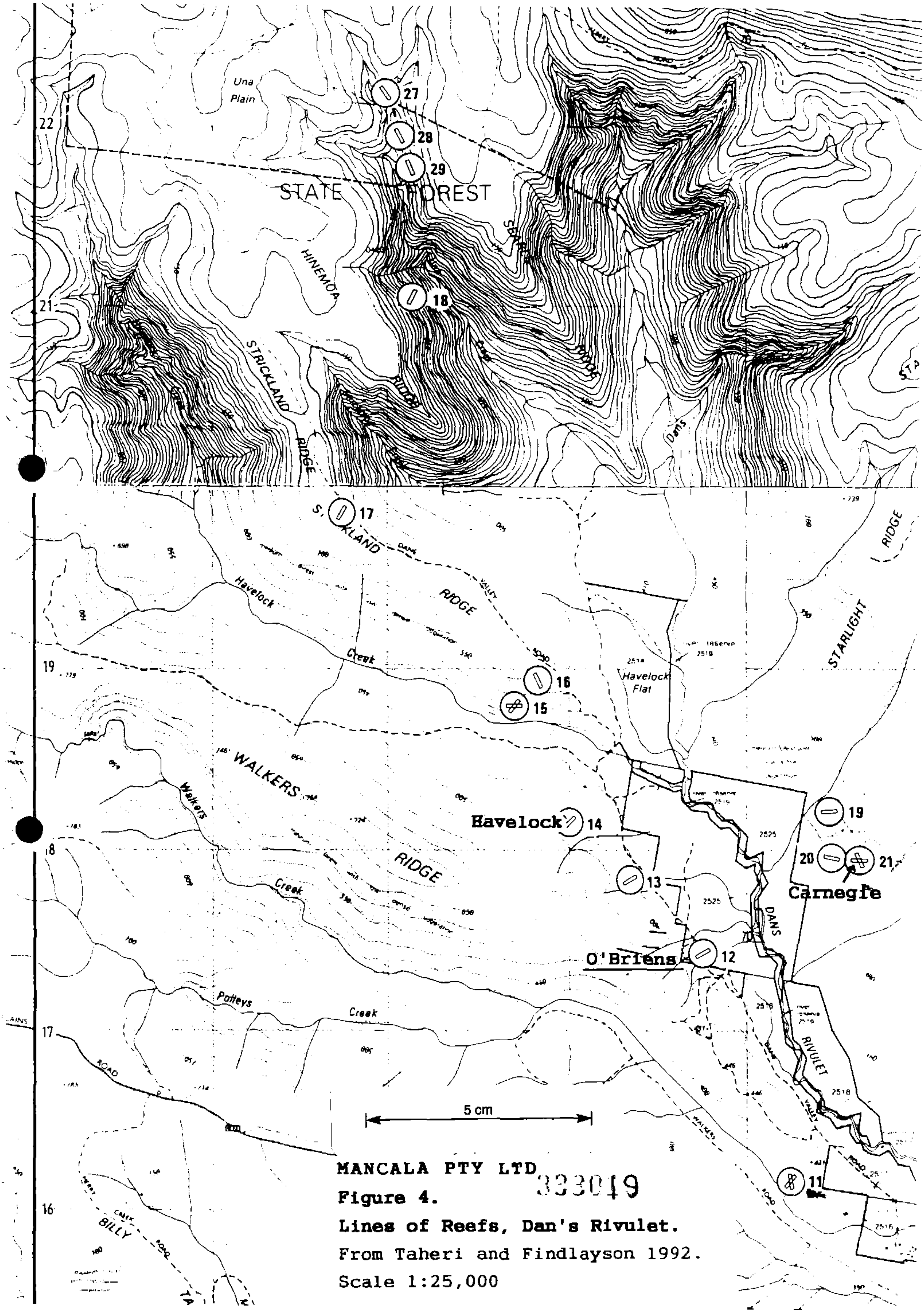


Figure 3. *Section through DDH 1 and 2, Dans Rivulet.*

5 cm



MANCALA PTY LTD 333019

Figure 4.

Lines of Reefs, Dan's Rivulet.

From Taheri and Findlayson 1992.

Scale 1:25,000

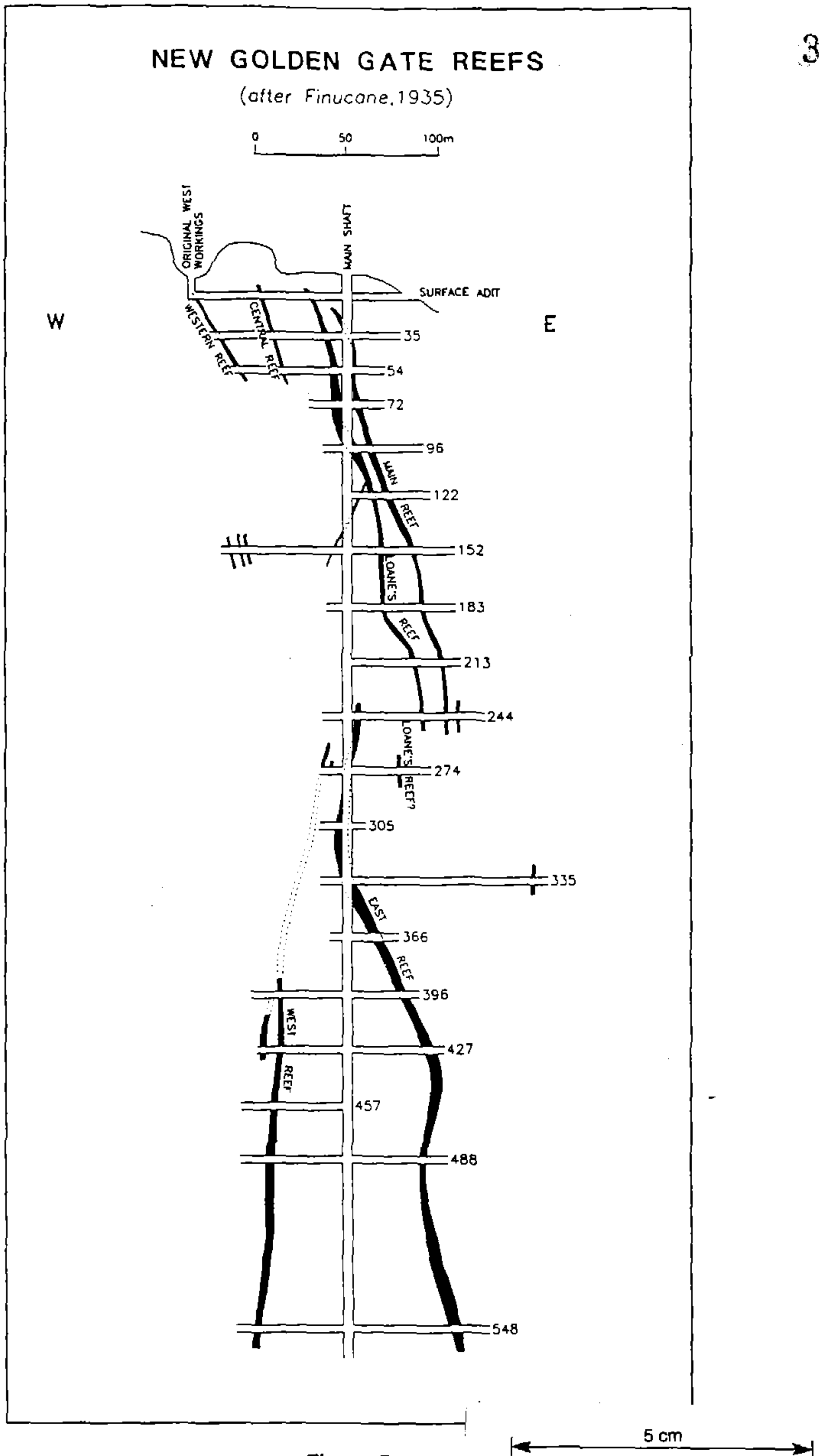
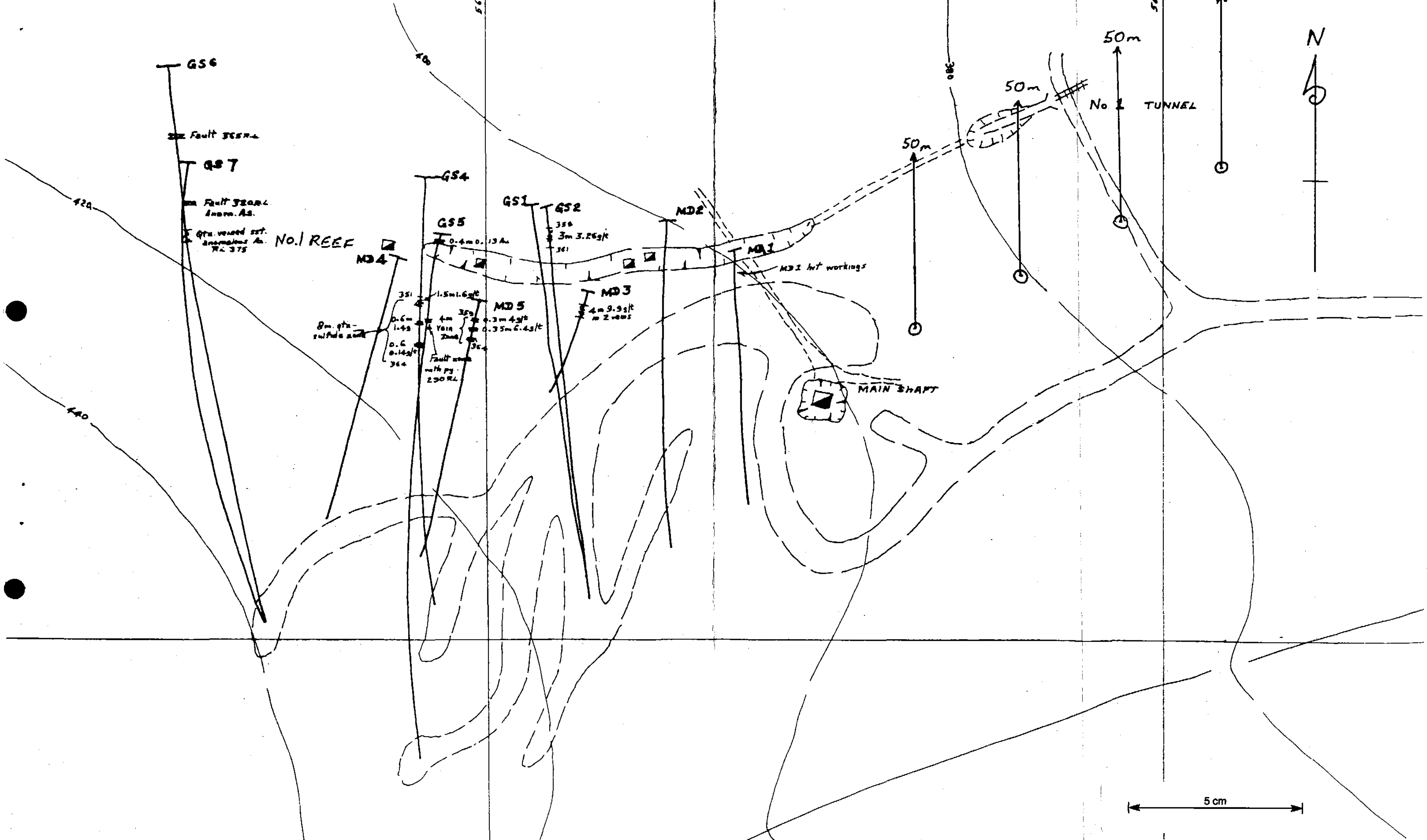


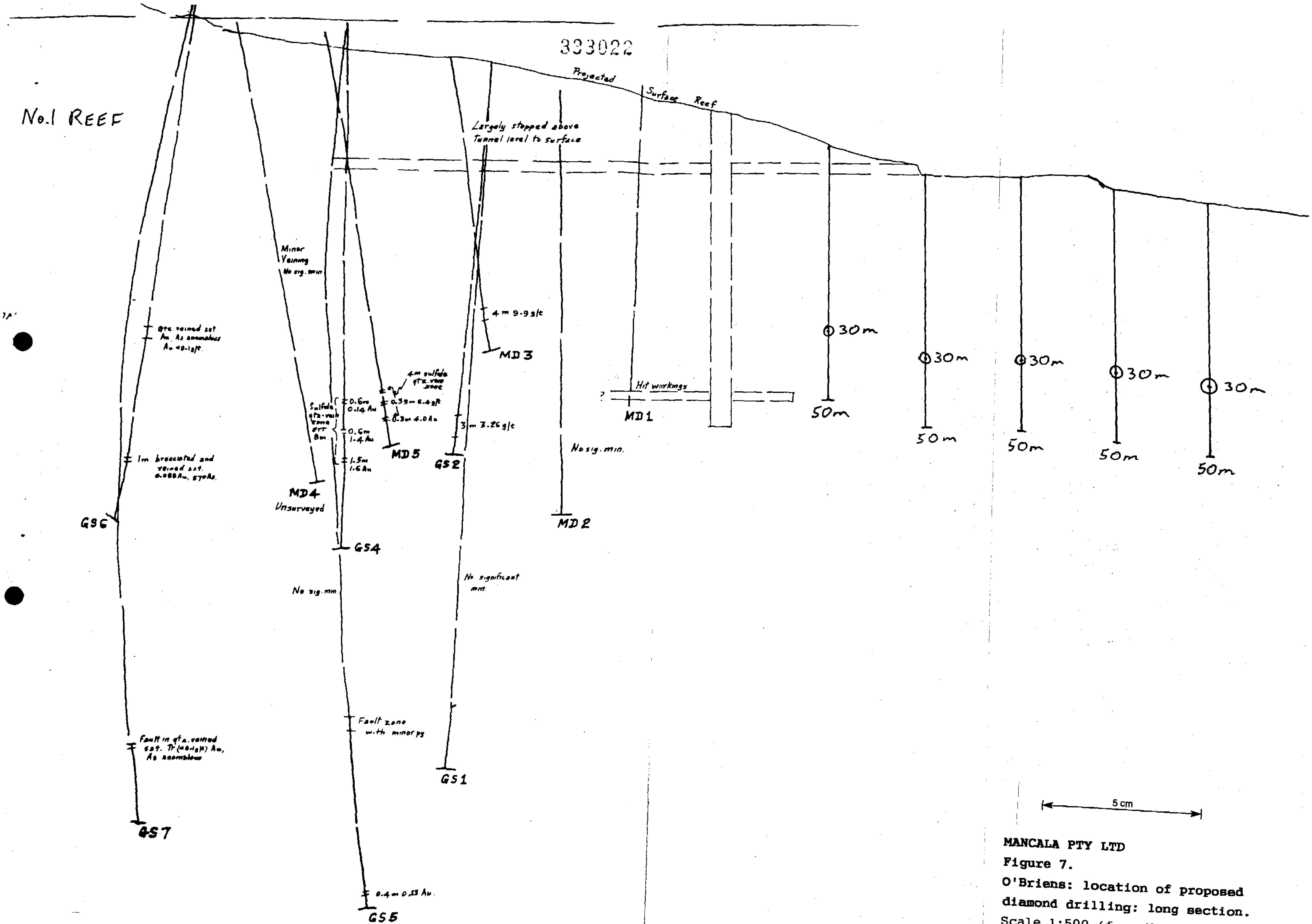
Figure 5

E–W cross section, showing the main reefs at the New Golden Gate Mine, Mathinna Goldfield

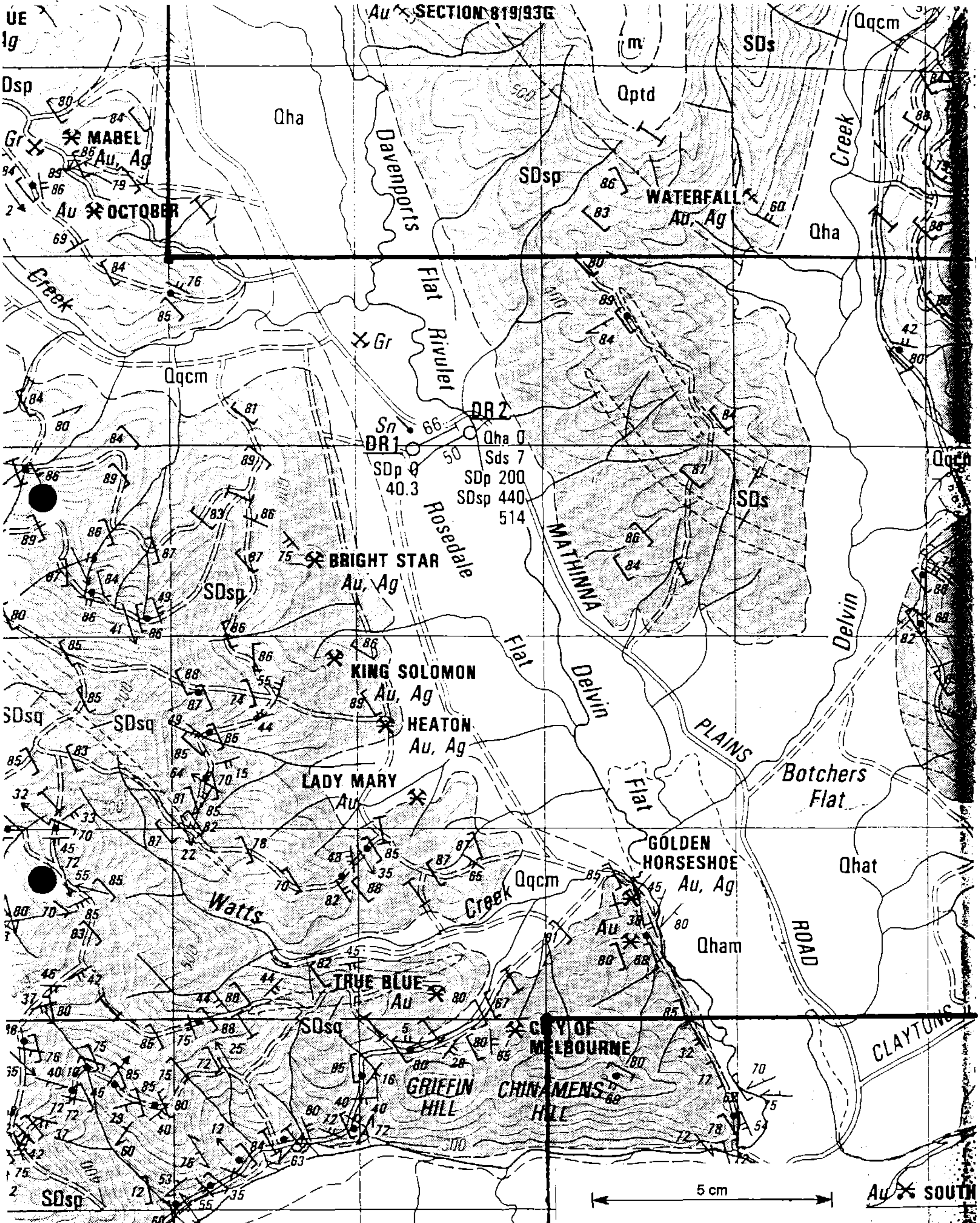
333021



MANCALA PTY LTD
Figure 6.
Location of proposed diamond drilling: plan.
Scale 1:500 (From Newnham 1994)



MANCALA PTY LTD
Figure 7.
O'Briens: location of proposed diamond drilling: long section.
Scale 1:500 (from Newnham 1994)



MANCALA PTY LTD

Figure 8. Location of Mines Dept. 1985 Dan's Rivulet drilling.

Scale 1:25,00

333023

(adapted, McClennaghan et al 1993)

333024

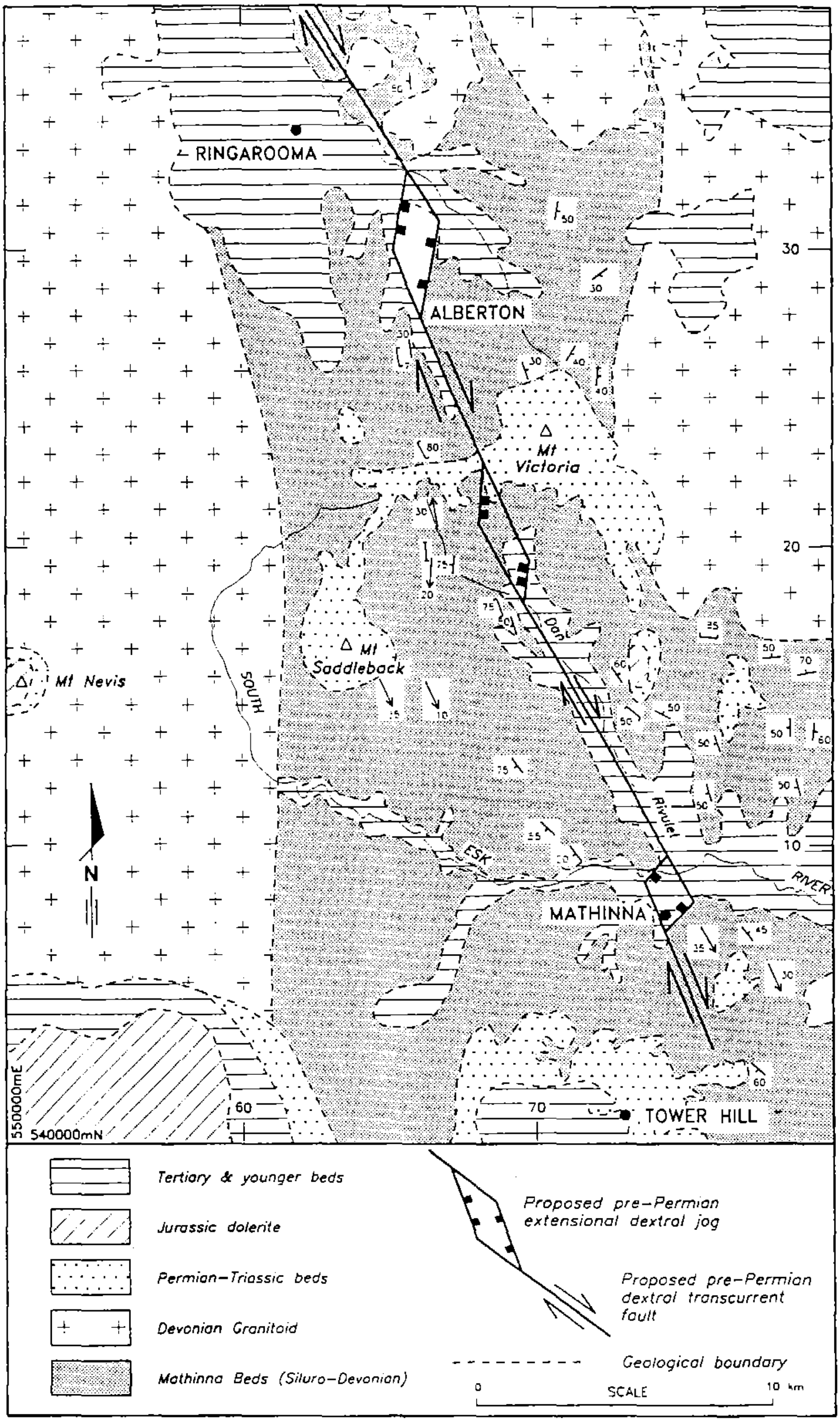


Figure 9

Simplified geology of Tower Hill — Ringarooma area, showing proposed pre-Permian extensional jog and dextral transcurrent fault.

5 cm

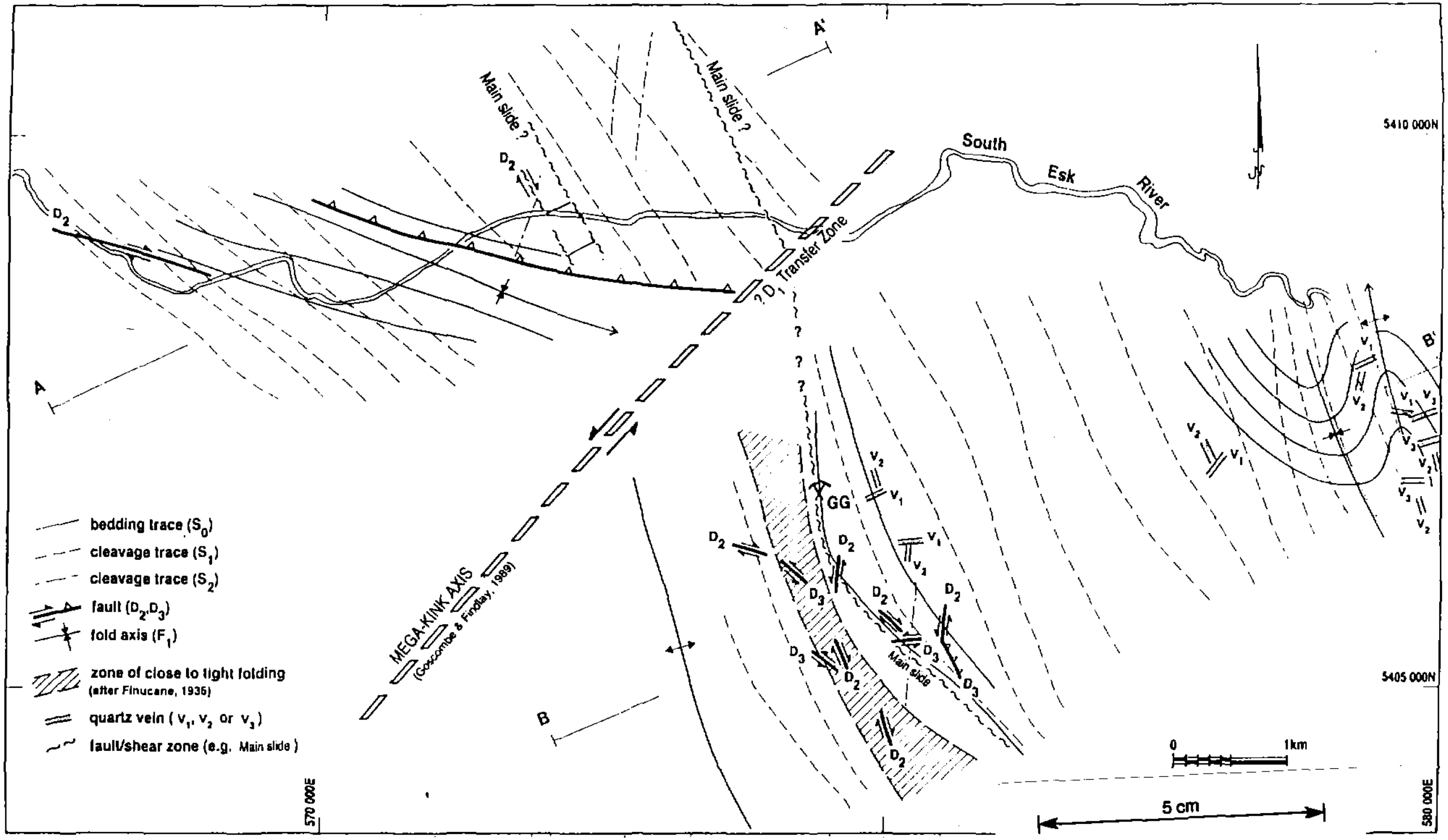


Figure 10. Structural map of the Mathinna mining district. The Mathinna traverse has been divided into a western and eastern section. A lack of correlation between the two sections suggests that a major D1 transfer zone separates a northwestern structural domain from a southeastern domain; the mega-kink zone (Goscombe and Findlay, 1989), which passes through the township, is the most likely site of such a transfer zone. Localities mentioned in the text are marked, as also are the positions of individual structural stations which appear in Appendix 1 at the back of this report. For further explanation, see text.

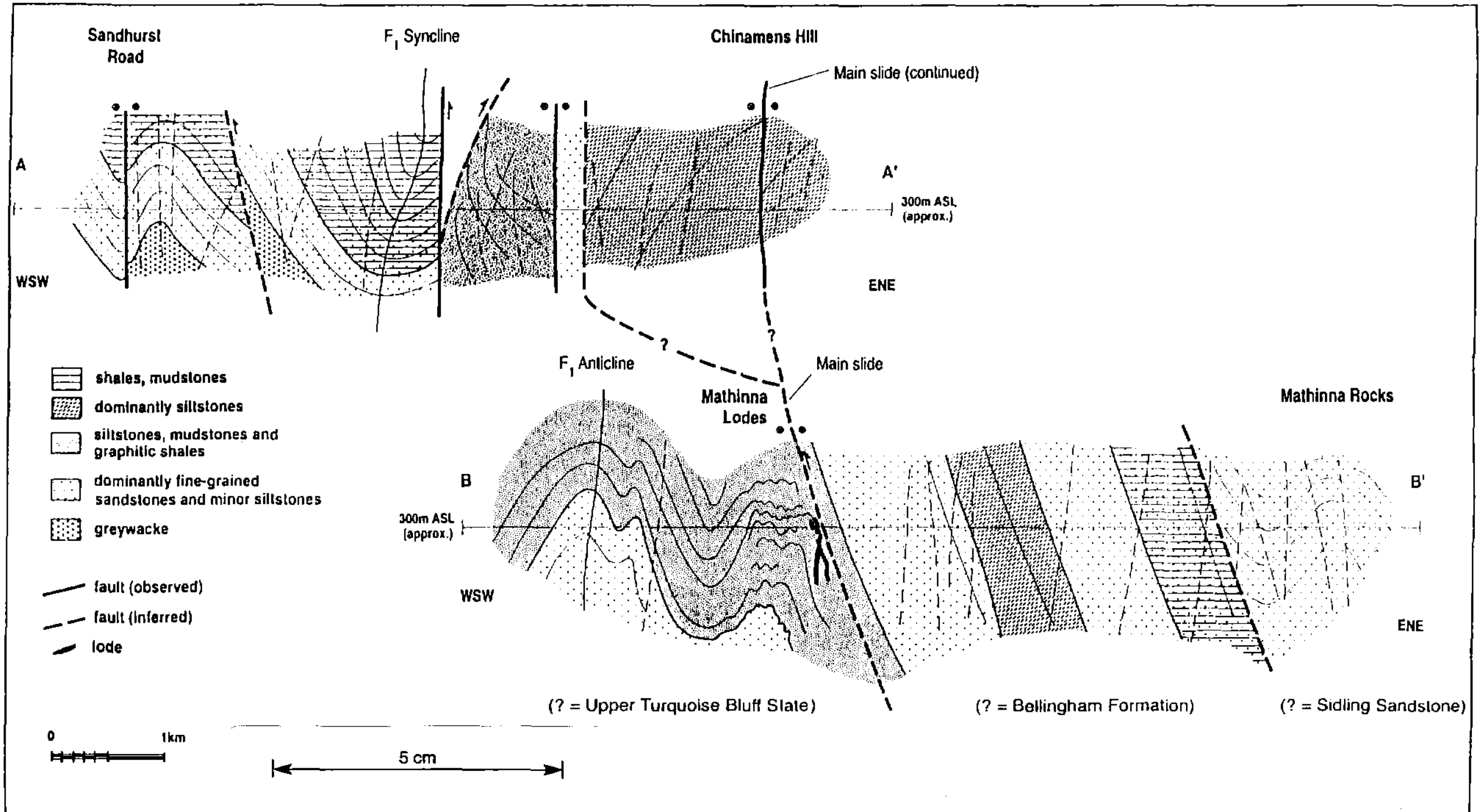


Figure 11. Structural traverse through the Mathinna goldfield. The section line A-A' follows the north bank of the South Esk River as far as the Main Slide, whilst the section line B-B' passes directly through the main mineralised area, including a projected cross-section through the Golden Gate mine. The western end of this section includes data from Finucane (1935).

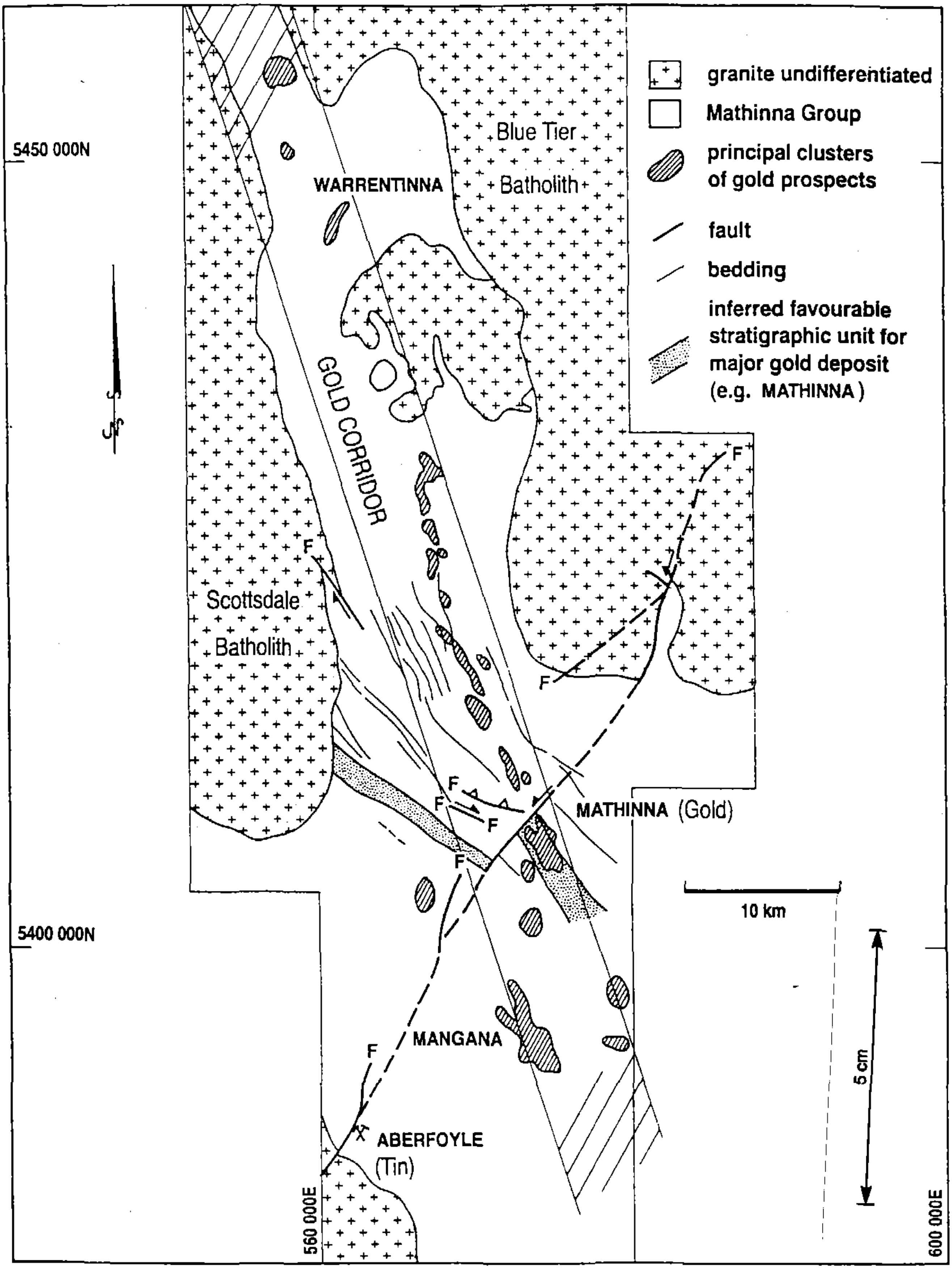


Figure 12. The Mathinna–Alberton Gold Lineament. The 70 by 6 km corridor contains the majority of the gold occurrences in the region. Bedding trends range from being parallel to the lineament to being markedly oblique to it. The main feature of this diagram is the NE-trending transfer fault zone which passes north of Mathinna. It has been extended to show how it appears also to control the position of the major Aberfoyle tin deposit, southwest of Mathinna. Sinistral offsets of about 500-600 m are apparent on this structure in the granites of the Blue Tier Batholith.