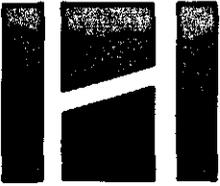


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A. C. A. HOWE AUSTRALIA PTY LTD

MINING AND GEOLOGICAL CONSULTANTS

351001

P.O. Box R356
SYDNEY 2000
2nd Floor
37 Pitt Street
SYDNEY NSW 2000
Telephone: (02) 27 9523
Telex: AA71611

Your Ref:
Our Ref: ZT/bam

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PRELIMINARY ASSESSMENT OF
E.L. 1/83, RINGAROOMA
TASMANIA

BY

A.C.A. HOWE AUSTRALIA PTY. LTD.

ON BEHALF OF

FEPESO PTY. LIMITED

August, 1984
Report No. 136

Z. Telakowska
Geologist

AMG REFERENCE POINTS ADDED

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SUMMARY

A literature review and photogeological interpretation of the E.L. 1/83 area has been completed. The past drilling results revealed that sediments of the Boobyalla River paleo-channel were reworked by a progressive sea in Tertiary times impoverishing their tin content significantly. Tributary leads, located within the present river valley, were situated above the "then" sea level, thus may have been preserved and may contain tin deposits as has been shown south of E.L. 1/83, at Shallamar Flat. Of the two river valleys containing extensive flats, Boobyalla River - Little Boobyalla River and Ringarooma River - Hardwickes Creek, the former is considered as being more prospective. A tentative exploration programme consisting of 300 m of churn drilling and pan concentrate sampling is proposed to test these possibilities.

1.0 INTRODUCTION

Alluvial tin has been worked from a number of areas along the course of the present day Ringarooma River. Tin mining has been undertaken almost continuously on a small scale since the 1870's. During the past 30 years, several companies have attempted to examine the potential for large scale exploitation of the plain between the Tomahawk and Ringarooma Rivers. These efforts did not produce the tonnage and grade required to support a large scale dredging operation.

This report discusses the results of a field trip, literature review and photogeological interpretation of the E.L. 1/83 area.

2.0 LAND TENURE

E.L. 1/83 was granted in May 1984, for a one year period (20th May, 1985) to Mineral Holdings Australia Pty. Ltd. of second floor, 100 Collins Street, Melbourne. The licence area is located in the District of Dorset, vicinity of Ringarooma Bay, Tasmania. E.L. 1/83 covers 58 square kilometres, being about 19.5 km long (E-W direction) and 3 km wide (N-S direction).

By an agreement with Mineral Holdings, A.C.A. Howe Australia Pty. Ltd. obtained 50% interest in the licence. A.C.A. Howe Australia Pty. Ltd. is to be the manager of all exploration work conducted and will recoup exploration expenditure from profits derived from any mineral production in the licence area.

3.0 LOCATION AND LOGISTICS

The prospect area is situated in Northeast Tasmania, about 140 km east from Launceston. The closest major airport to the prospect area is at Launceston which is serviced by regular TAA and Ansett flights

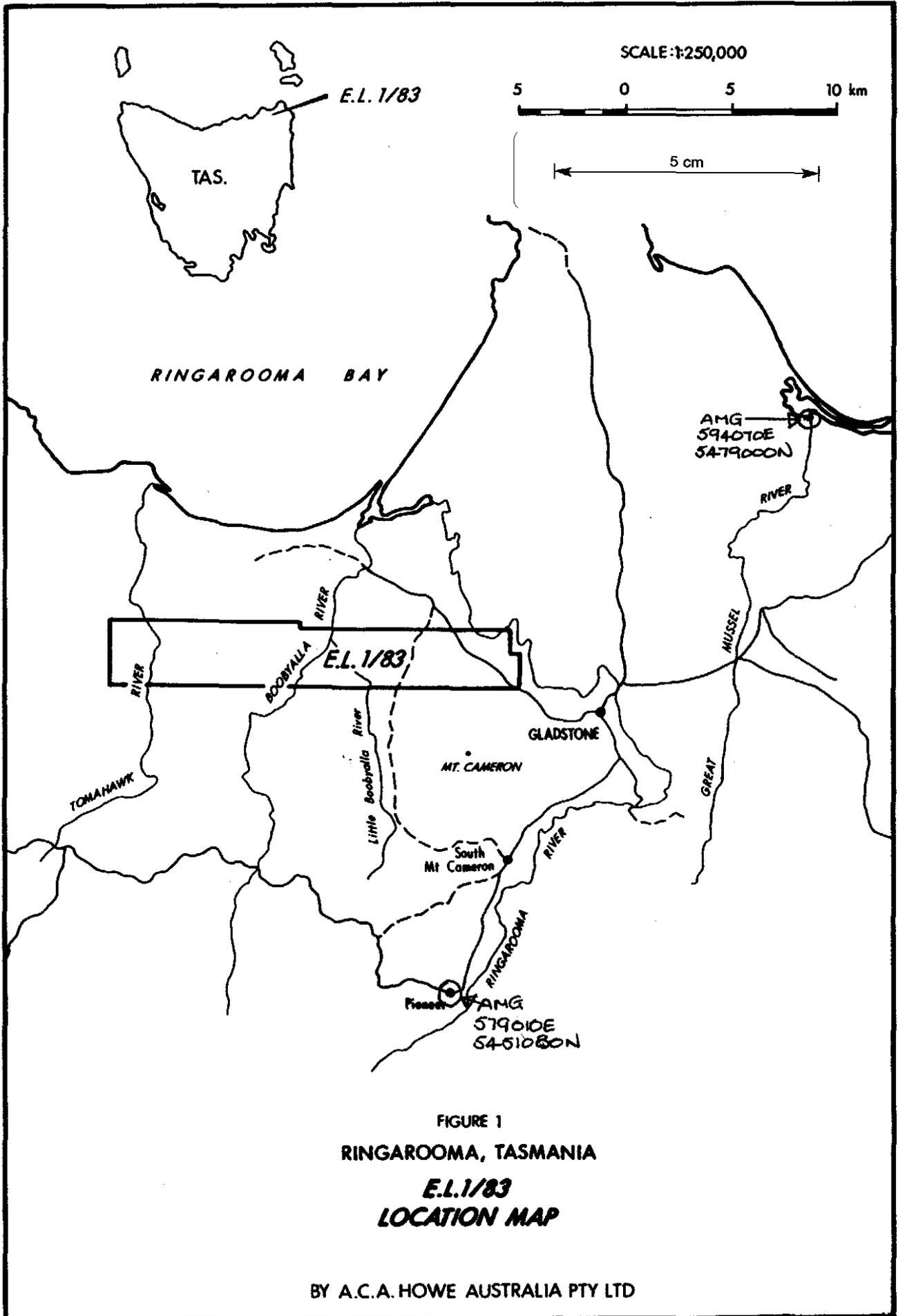


FIGURE 1
 RINGAROOMA, TASMANIA
E.L.1/83
LOCATION MAP

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AMG REFERENCE POINTS ADDED

from Sydney, Melbourne and Hobart. The 2.5 hour drive from Launceston to the prospect area is along the Tasman Highway up to Herrick, then by secondary road to Gladstone. The road is sealed as far as Gladstone, but is narrow and winding. From Gladstone, an unsealed road extends to the prospect area.

The Gladstone Hotel (Tel: 003 572143) in Gladstone is the closest accommodation available. Casual labour can be drawn from local population. One person, Ted Watt, was employed during the field trip and he is willing to be employed in the future. Backhoe and bulldozer services are available in the area:

D. Smith - backhoe owner (003) 542231

R.E. Vinery - bulldozer owner (003) 561476, Waterhouse Road,
Bridport, Tasmania

Ted Watt (003) 572180 can assist with any further enquiries in respect of local services.

4.0 GEOLOGICAL BACKGROUND

Secondary tin deposits in the district occur in Tertiary and Quaternary sediments of alluvial, lacustrine, estuarine and marine origin. The primary source of tin in these sediments is a large area of tin-bearing granite and associated veinlets where it intrudes quartzites and slates along the contacts.

The Pre-Tertiary bedrock comprises Cambrian (?) to Lower Devonian slates and quartzites, Upper Devonian to Lower Carboniferous granites, Upper Carboniferous to Triassic sediments and Jurassic dolerite. During Lower Tertiary times, the land surface in Northeast Tasmania subsided relative to the then sea level. The lower reaches of the river systems became progressively drowned by the formation of wide lakes and estuaries.

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Marine waters encroached over the gradually submerging land surface in coastal areas. The net result of sedimentation during the Lower Tertiary period was the formation of alluvial gravels in the stream courses, which were later progressively buried by lacustrine, estuarine or marine strata. These alluvial leads carried tin concentration shed from the higher country of the catchments. The lacustrine and estuarine strata also contain stanniferous wash bands formed by dispersion and reconcentration of cassiterite from earlier alluvials, or during periods of more rapid sedimentation.

The close of this period of subsidence was marked by extrusions of basalt which spread over the old depressions, but did not completely fill the major valleys. Some minor sedimentation continued between flows. During, or shortly after the extrusive period, the land surface began rising. New drainage systems originated on the surface of the Tertiary rocks. The present cycle of erosion, which began in Upper Tertiary or Quaternary times, resulted in partial stripping of the basalt and Tertiary sediments. Sediments accumulated during the present cycle are of some economic importance, as tin-bearing alluvial terraces were formed at several levels by the new river systems cutting their present courses as well as the tin-bearing marine shingle terraces which were left by the retreat of the sea. Some fairly thick mixed alluvial and marine deposits (6-22 m) were also accumulated in flats along the present river courses (e.g. Fosters Marshes).

5.0 PREVIOUS EXPLORATION

The expectations of large deposits of alluvial tin in Northeast Tasmania encouraged many companies as well as the Department of Mines and Bureau of Mineral Resources to explore the tin potential of the area. In 1957, the Bureau of Mineral Resources conducted a brief geophysical survey over traverses chosen by Rio Tinto Australia Exploration Pty. Ltd. In 1958, Rio Tinto carried out a drilling programme over the area, but no encouraging results were obtained. One of the seismic - drilling lines was located within E.L. 1/83 across the present Boobyalla River valley (Figure 2).

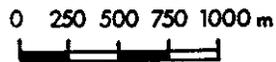
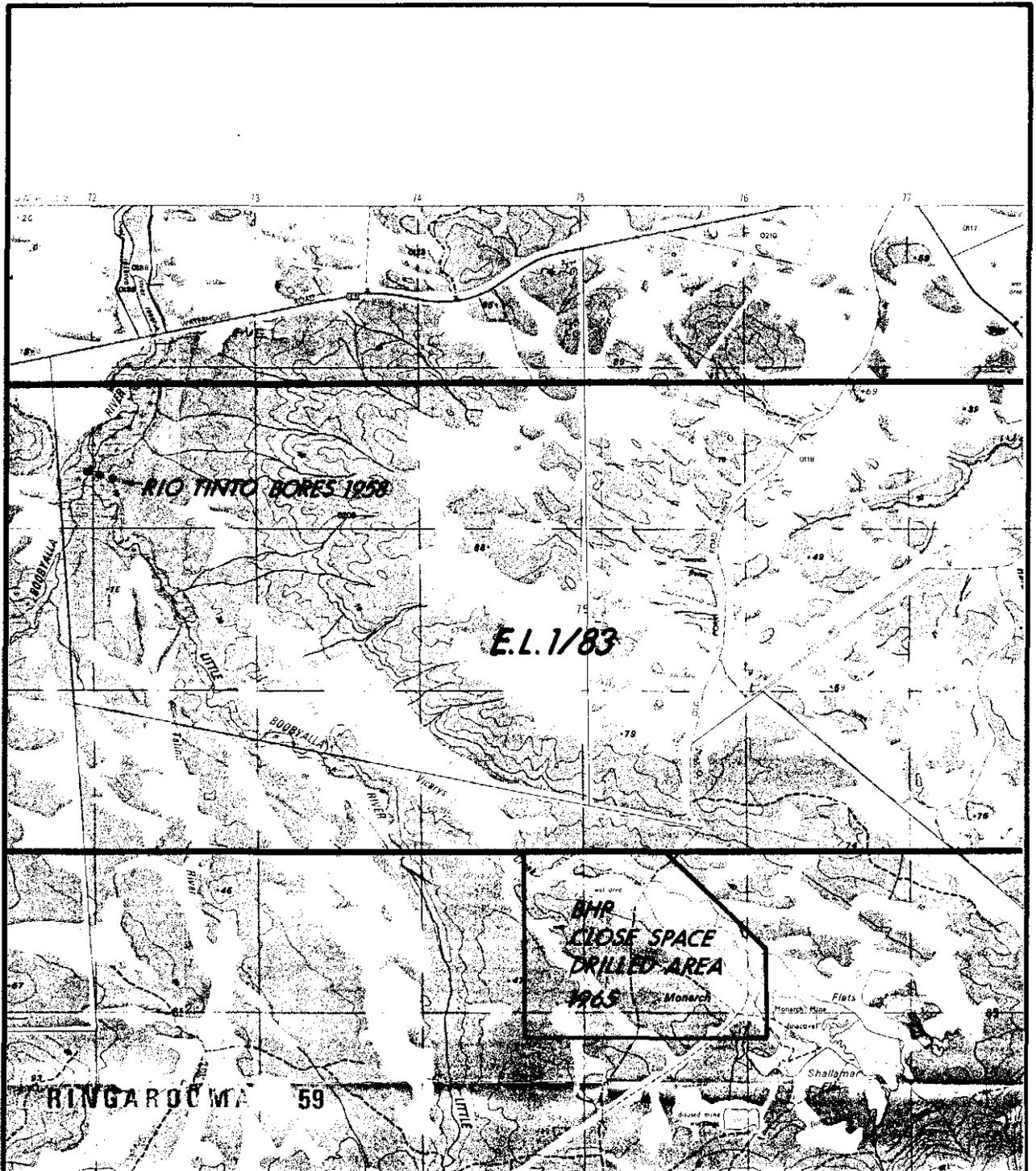


FIGURE 2
 RINGAROOMA, TASMANIA
 LOCATION OF RIO TINTO AND BHP HOLES

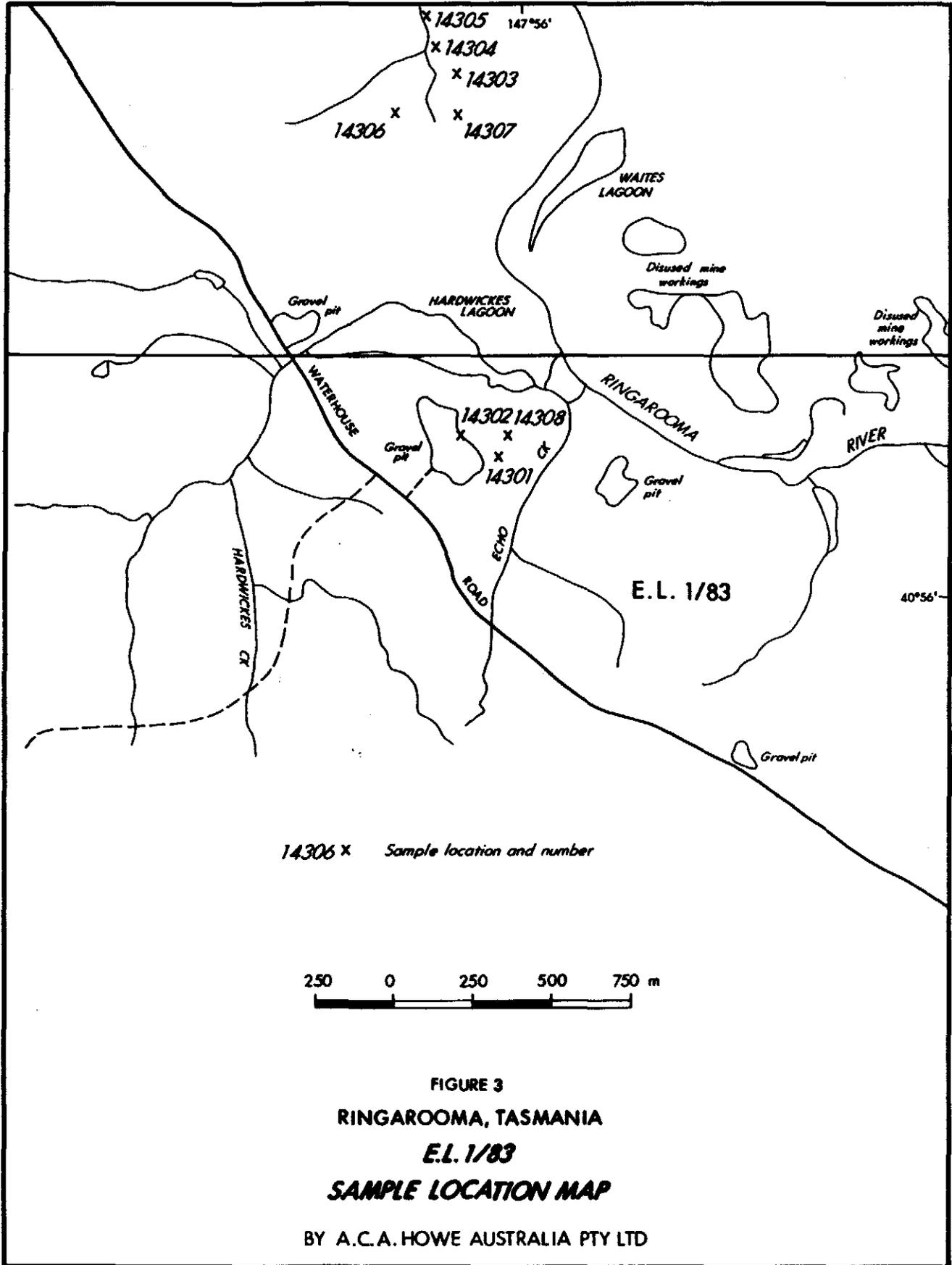
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Three holes (27-32 m deep) were put down to test the deepest ground as well as a higher level depression with well-defined flanks as shown on the seismic profile. The holes went through an upper sequence of light grey sand and pebbles of estaurine origin. They bottomed in granite. No sign of a basal stanniferous wash layer was found and the overlying pebble beds carried out traces of tin.

In 1964-65, the Broken Hill Proprietary Company Limited completed a seismic - drilling programme over the flats along Vicary Creek, immediately south of the E.L. 1/83 boundary in an attempt to find the northwest extension of the "Monarch" lead. The drilling revealed that there was no readily definable major lead, but instead a system of small leads of irregular development. The deep western section of the area has apparently been subjected to marine influence during deposition and did not have economic potential. Marine influence is evidenced by the partly opalized remains of the oyster/mussel shells found in the wash. Additional features indicating probable marine influence such as uniform blue-green colour, the abundance of pyrite/marcasite as disseminated grains, the character of the cementing matrix and a thick nodular horizon were observed. In any event, the volume of wash was too small to interest the company. In the shallower eastern part of the flat, reserves of 3 million m³, defined in several small channels averaging 220.4 g/m³ of the 70% tin, were outlined. This volume of possible economic material was too small to be of interest to the company.

In 1972-73, Wanex carried out closely-spaced drilling in the vicinity of the Macgregor workings (NW of Gladstone). The drilling showed mineralization to be very patchy and low grade. In 1978, Preussag Australia Proprietary Limited completed a drilling programme northwest of Gladstone, searching for 100 million cubic yards with a recovered grade of 180 g/m³ of 70% tin, suitable for a dredging operation. Twenty four holes were drilled. Generally two layers of sediments were distinguished upper, sand, silt and clay between 8.5 - 19 m thick; and lower, typical shingle wash 0.5 - 8.5 m. Almost all the cassiterite was associated with the shingle wash. Although the wash occasionally contained excellent tin values, all the drill holes were uneconomic with field values varying between 0 and 71 g/m³ resulting in the area being relinquished.



5 cm

In 1981, an exploration licence west and northwest from Gladstone was granted to C.R.A. Exploration Pty. Limited, however, no field work was conducted and the lease was relinquished.

In 1981, east of the C.R.A. licence, Santos Ltd. in joint venture with Mineral Holdings Australia Pty. Ltd., commenced an extensive churn and bulk drilling programme as well as environmental, hydrogeological and feasibility studies. The final results of the programme are not available.

A small bentonite deposit was also discovered by Mineral Holdings Pty. Ltd. near Gladstone. However, from 15 samples sent to Savage River Mines in 1970, for testing their suitability as pelletizing additives, only three approached the desired standards. A further mineralogical and chemical test of the bentonite clay done by the C.S.I.R.O. in 1979, showed the SiO_2 content (57-62%) to be well above that expected for a pure montmorillonite and it was concluded that the clay was of beidellitic rather than montmorillonitic character.

6.0 EXPLORATION WORK CONDUCTED BY A.C.A. HOWE AUSTRALIA PTY. LTD.
TO AUGUST, 1984

A brief visit to Tasmania was undertaken from the 3rd through to the 7th June, 1984. During this period, one day was spent in Hobart undertaking a literature survey at the Mines Department of Tasmania. Following this, two days were spent in the field. During one day, bentonite deposits were sampled. Two areas were sampled (Figure 2):-

- i) North of Hardwickes Lagoon, as suggested by Neil Thomas (Minerals Holdings Pty. Ltd). Note: This area is outside the E.L. 1/83 boundary.
- ii) South of Hardwickes Lagoon within the E.L. 1/83 boundary.

Five samples were taken north of Hardwickes Lagoon (1-3 m depth) and three samples from the flat, south of Hardwickes Lagoon (1-2 m) depth). All samples were estimated to weigh between 3-5 kg.

In addition to the above, several small tin workings on the western side of the Ringarooma River were also visited. All of these are blanket type deposits (1 m thick gravel overburden lying on weathered bedrock).

Following the literature study mentioned above, photogeological interpretation of colour airphotographs covering the E.L. area was completed in July and August, 1984.

7.0 PHOTOGEOLOGICAL INTERPRETATION

The photogeological interpretation of colour airphotographs at a 1:20,000 scale was carried out in July, 1984. The following morpho-lithological units were differentiated:-

Qa - Undifferentiated Alluvium, Swamp and Marsh Deposits.

The unit was differentiated on the basis of its geomorphological position. It displays a range of colours from light green through yellow, orange to dark brown. The unit lacks trees.

Qr - River Terraces.

As with Qa, this unit was differentiated on the basis of its geomorphological position. It displays either light yellow or more often a dark green colour where densely vegetated with trees.

Ts - Gravel, Sand, Clay and Mud.

Flat lying, blanket type deposits filling topographically low areas. The unit displays orange-brownish colour when unvegetated and brownish-greenish colour where covered with trees. Vegetation cover is not dense.

Dbau - Dominantly Adamellite Granite.

This unit occupies topographically high areas forming extensive, flat topped hills. It displays dark green to greyish colour and is most often heavily vegetated with trees. Two systems of fractures are predominant, NE-SW and NW-SE. Both are probably joint systems. The drainage pattern is tectonically controlled.

SD - Micaceous Quartzwacke, Turbidite dominant.

The unit mostly occupies topographically high areas. It displays brown colour when unvegetated and brown-green where covered with trees. If vegetated, it has photo-characteristics similar to Ts, thus in topographically low areas, it is difficult to differentiate these two units.

Apart from the morpho-lithological units, possible paleo-channels of Hardwicks Creek and Boobyalla River have been outlined. However, apart from the southern section of Hardwicks Creek, which is mostly outside of the E.L. boundary, the position of these channels is very doubtful.

During photo-interpretation, an attempt was made to find a flat of similar photo-characteristics to the one with the known occurrence of bentonite. The area southeast of Echo Creek displays similar photo-characteristics, but because it is situated 18 m higher it is more probable that this similarity has other causes.

8.0

POTENTIAL

The previous drilling results show that in Tertiary time the E.L. 1/83 area was located on the sea shore. Estuarine deposits found in the Boobyalla River valley at its junction with the Little Boobyalla River and the notable lack of stanniferous wash indicate that the

paleo-channel deposits have been reworked by a progressive sea. This is supported by drilling results further south between Vicary and Shallamar Creeks. At this point, the deepest zone is filled with wash of marine origin and lacks a significant tin content. Better tin values are found in shallower parts of the valley within several tributary gutters.

On consideration of these facts, one cannot expect the Boobyalla River paleo-channel to have economical potential. Extensive flats south of the Boobyalla - Little Boobyalla Rivers junction are of interest as they may contain tributary gutter deposits which did not undergo marine reworking during the Tertiary due to being above the then sea level. A similar geological situation exists in a flat area between the Ringarooma River and Hardwickes Creek. The possible "Hardwickes paleo-channel" follows the present creek course in its southern part until the latter runs northwest. At that point, the paleo-channel vanishes. There is a possibility that it goes straight north to Echo Dam, but evidence to support this is insufficient. No drilling has been done to test either the paleo-channels or the flats. Although the flats are extensive, the Tertiary deposits may be very shallow because, unlike the Boobyalla River situation, the valley is not well defined.

On considering the merits of the above two locations, the Boobyalla River valley has better potential as the Tertiary deposits, possibly including stanniferous tributary leads, are probably thicker and more well developed there than in the Ringarooma River - Hardwickes Creek area.

9.0 EXPLORATION PROGRAMME

The following tentative exploration programme is proposed:-

Churn drilling between the Boobyalla and Little Boobyalla Rivers. Twenty four holes are to be drilled along four lines (Figure 3). The three NS trending lines (A, B, C) are designed to cross the probable direction

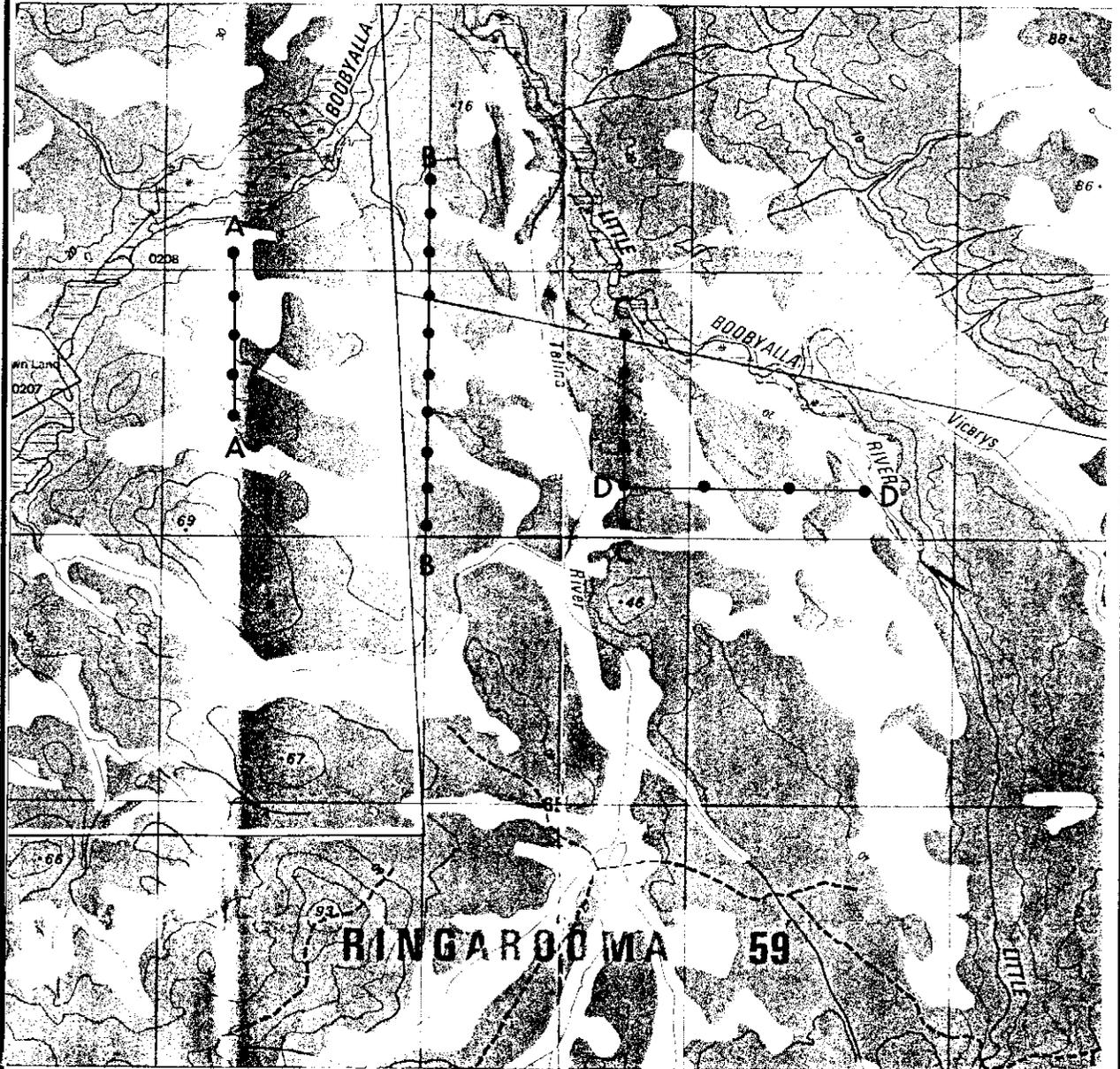


FIGURE 5

RINGAROOMA, TASMANIA

PROPOSED DRILL HOLE LOCATION MAP

BY A.C.A. HOWE AUSTRALIA PTY LTD

5 cm

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of potential tributary leads. The holes are spaced 150 m apart based on the fact that the width of tributary channels on Vicarays - Shallamar Flat was up to 150 m. The lines are 750 m apart. Line D in an E-W direction is designed to cross the proposed main channel of the deep lead, as interpreted from airphotos. The four holes of this line will be spaced 300 m apart.

Sampling of each metre of drilled material using a sand pump, and panning of the samples on the spot is recommended.

Exploratory hand auger drilling (5 holes) is further recommended over the flat southeast of Echo Creek in order to check for the possibility of a bentonite occurrence there.

Estimated cost:-

	\$
Drilling 300 m	15,000
Mobilization	2,500
Car hire (1 month)	2,000
Petrol	2,000
Geologist (1 month)	6,300
Casual labour 2 x 30 days x \$80	1,400
Accommodation 1 x 35 days x \$40	1,400
Laboratory 250 x \$15	3,750
Airfares	600
Reporting	3,000
Miscellaneous	200
	<hr/>
TOTAL	\$39,650
+ 10% Contingency	3,965
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	\$43,615
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Respectfully Submitted:

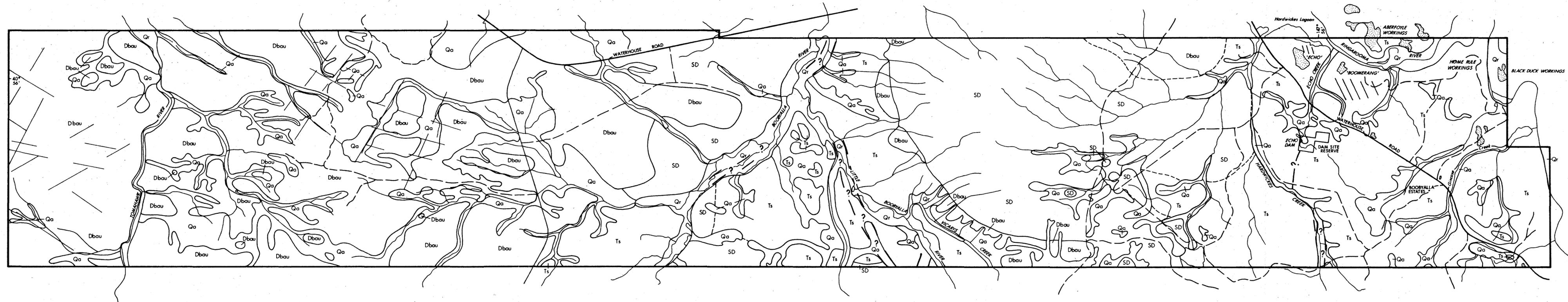
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Z. Telakowska

Z. TELAKOWSKA
Geologist

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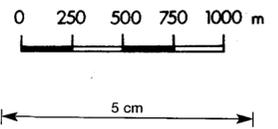


GEOLOGICAL LEGEND

QUATERNARY	[Qa	Alluvium, undifferentiated
		Qr	River terraces
TERTIARY		Ts	Gravel, sand, clay and mud
LOWER CARBONIFEROUS — UPPER DEVONIAN		Dbau	Dominantly adamellite granite
LOWER DEVONIAN — CAMBRIAN(?)	MATHINNA BEDS	SD	Quartzwacke, turbidite sequence

- Main road
- Secondary road
- ~~~~~ River or creek

- Geological boundary known
- - - - - inferred
- ? - Possible location of palaeochannel
- ||||| Possible bentonite occurrence
- ⊙ Abandoned workings
- + Joints



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RINGAROOMA, TASMANIA
PHOTOGEOLOGICAL MAP

FIGURE 4

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Prepared by Z.Telakowska

Drawn by: L. Armour Date: Aug, 84