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ASSESSMENT OF EXPLORATION POTENTIAL
 EL 6/78 : EL 2/77 : EL 28/76
 AP. 1/80 + 4/80.

RINGAROOMA TIN

ASSESSMENT OF EXPLORATION POTENTIAL

of AMDEX'S MINERAL TENEMENTS

OPEN FILE

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AMAX Iron Ore Corporation
(Minerals Exploration Division)

September 1980

81-1537

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LIST OF PLATES

- ✓ 1. EXPLORATION TITLE (print + transparency) ✓
Gladstone Area
- X 2. GREAT NORTHERN PLAINS (neither) Unavailable.
Drill Holes and Tin Grades (see Plate 7),
3. SCOTIA LEAD
Tin Grades and Bedrock Contours (print + transparency)
4. DETAILED DRILLING
MacGregor-Beltz-Taylor's (print + transparency)
5. DETAILED DRILLING ss
Vulcan-Native Lay~~l~~-Doone (print + transparency)
6. DETAILED DRILLING
Government Bores - Gladstone (neither). Unavailable
7. GREAT NORTHERN PLAINS
Ore Reserves (print + transparency) ✓

None of these plans are colour-coded
so in black and white are virtually
useless. Amdex claimed no coloured originals
were available.

See file AP 4/80 9-6-81. & sequel.

Amdex hold title over three Exploration Licences and a number of Mines Department reserves in the Ringarooma tinfield, northeast Tasmania. A 50% interest in these areas, with the exception of the Amdex Mine at Pioneer and future reserves at Endurance and Monarch, was offered to AMAX in consideration of further exploration expenditure.

This report is a compilation of available data which was undertaken, during the six month period 1 March - 1 September 1980, to enable an assessment of the exploration potential of the area to be made.

2. SUMMARY AND CONCLUSION

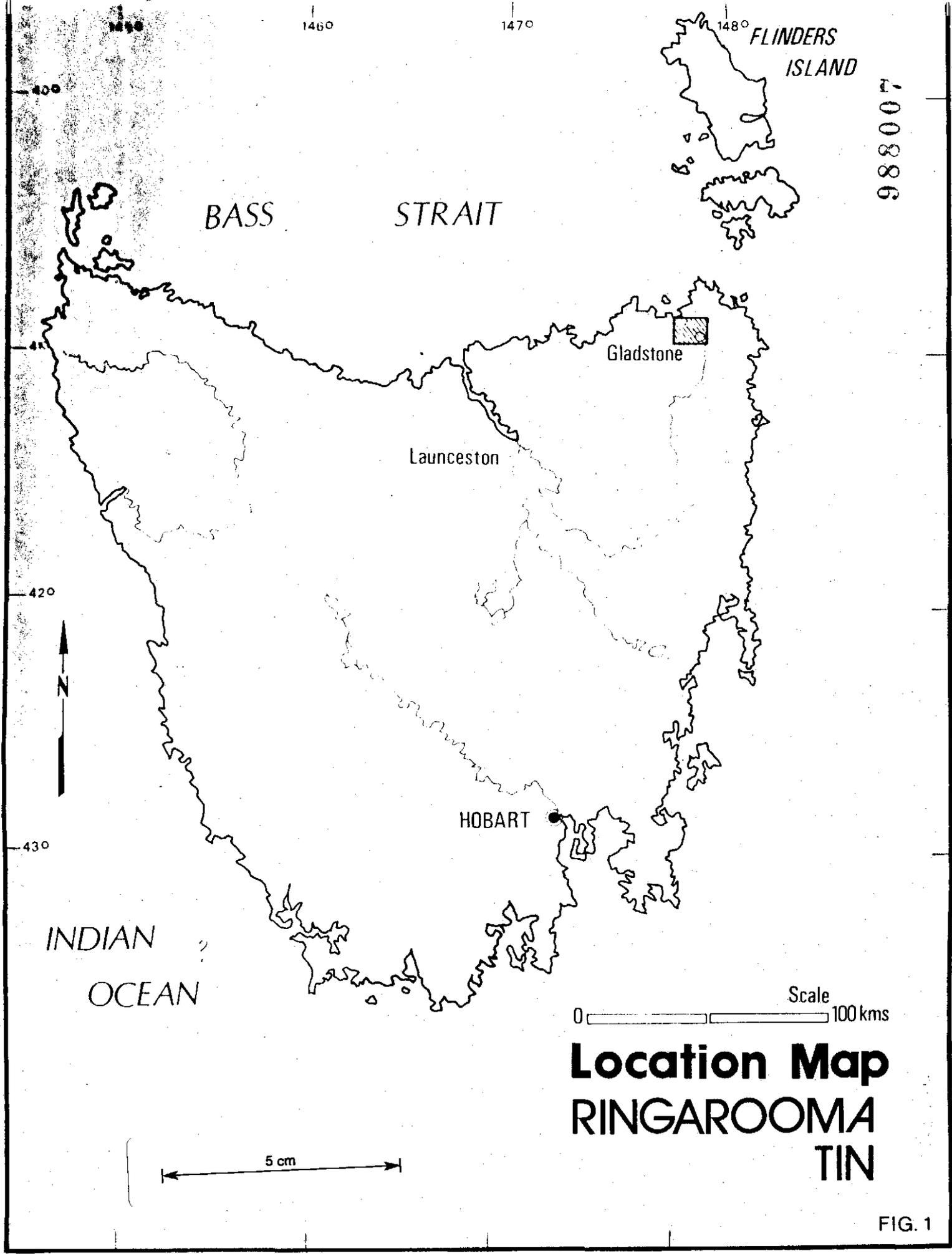
There has been considerable past production of tin from the Ringarooma tinfield over a period in excess of one hundred years, and no doubt further reserves of a similar size and style to the known occurrences may yet be discovered.

It is concluded, however, that the potential for large tonnage, low grade mineralization, on a scale that would interest AMAX, is not promising. AMAX has consequently notified Amdex of its intention not to proceed with the proposed joint venture.

3. LOCATION AND TENURE

The Ringarooma tinfield is located in northeast Tasmania near the towns of Derby, Pioneer and Gladstone (see figure 1).

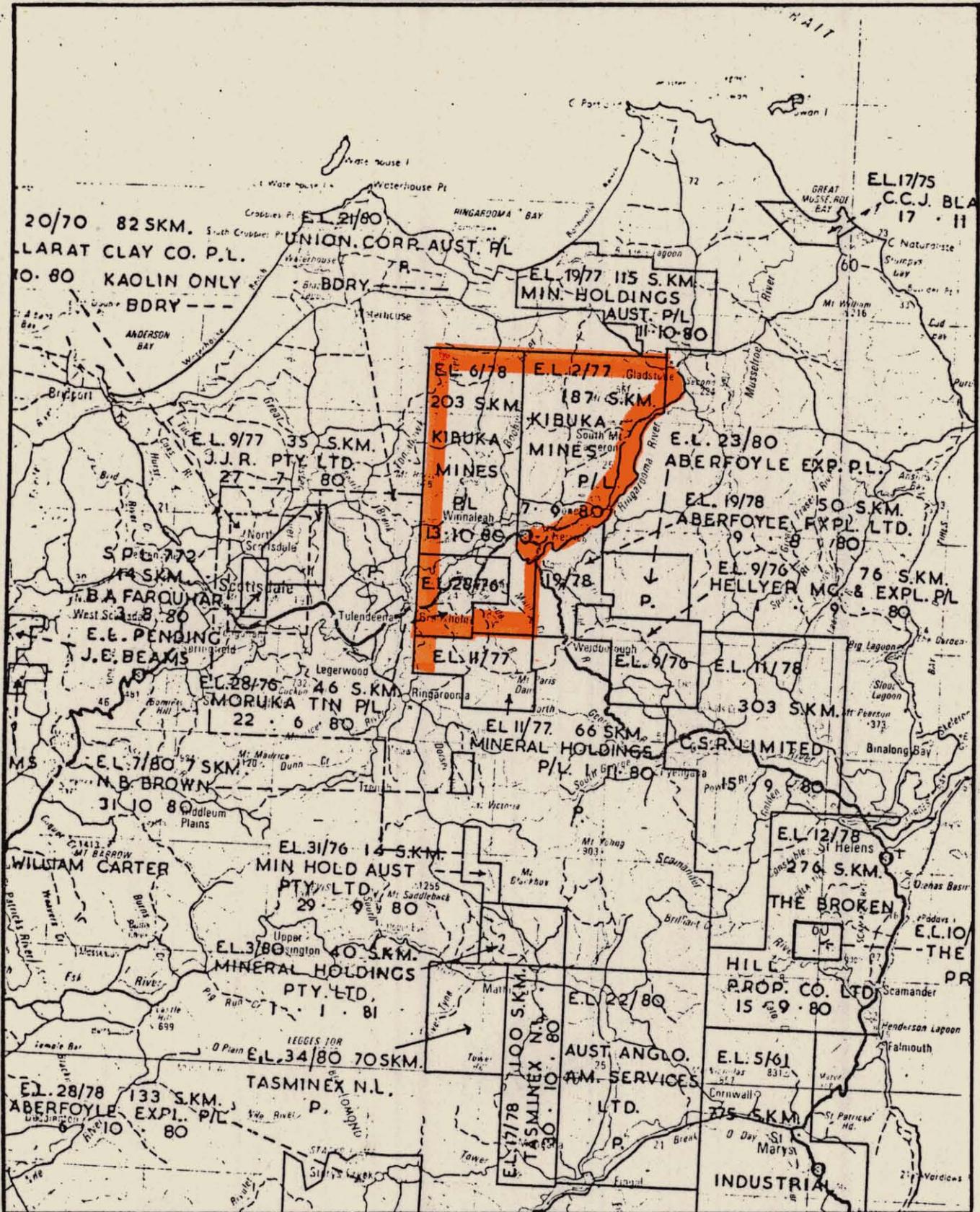
Amdex holds title to three Exploration Licences (figure 2) which are located to the south of Mt Cameron, and a number of Mines Department reserves and leases to the north of Mt Cameron. Details of the Amdex titles in the Gladstone area, to the north of Mt Cameron, are shown on Plate 1.



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Location Map RINGAROOMA TIN

FIG. 1



KEY MAP ONLY

Showing Exploration and Special Prospectors Licences as at 29 July 1980

4. GEOLOGY

Figure 3 is a copy of portion of the Boobyalla 1:50,000 sheet of the Tasmanian geological series. The following general description of the geology is taken from Jennings (Jennings, D.J., 1975, Alluvial Tin Deposits of Tasmania).

*erroneous
selective
quoting!*

"Granitic rocks of Devonian age outcrop throughout north-eastern Tasmania where they intrude ~~a range of Proterozoic and lower Palaeozoic~~ host rocks. The major outcrop lies in the Blue Tier region south of the main alluvial tinfield.

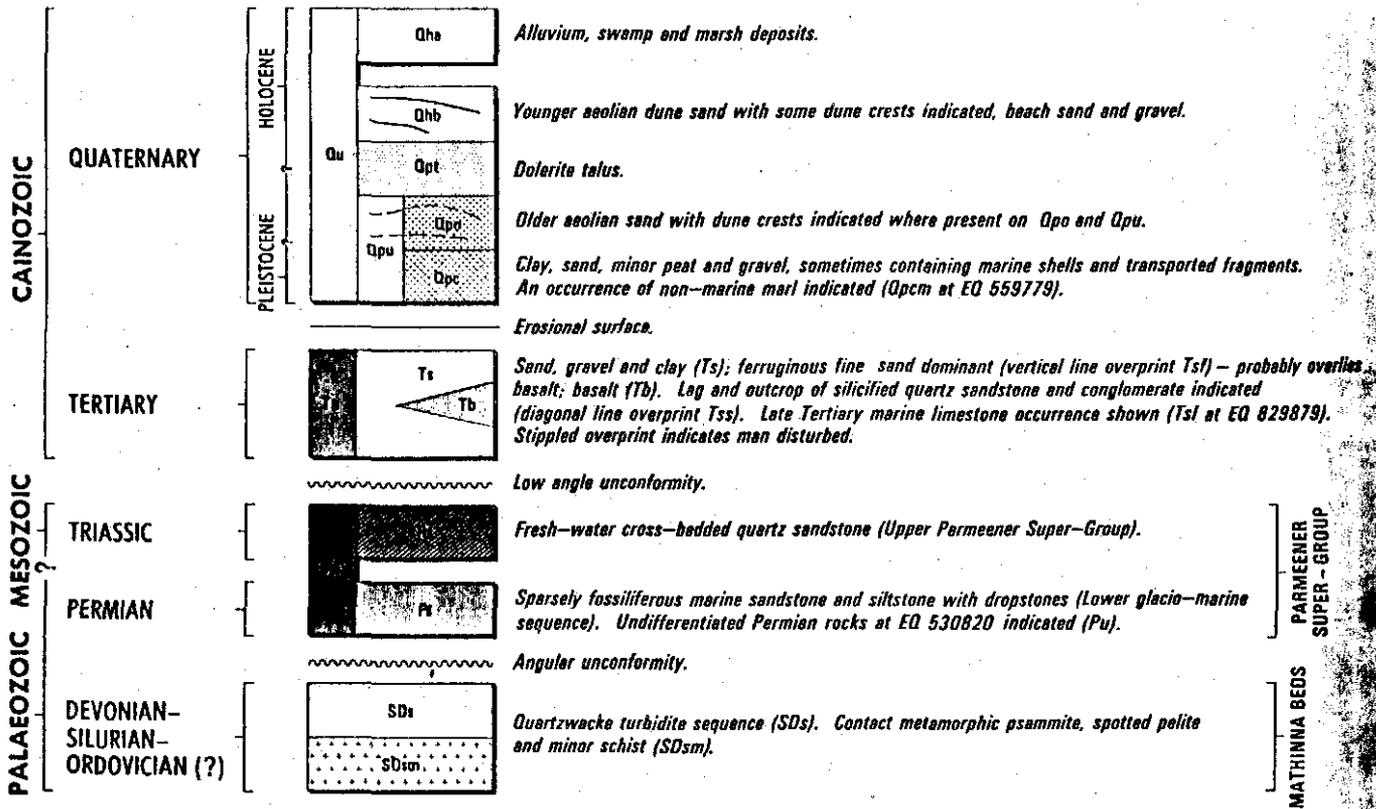
The granitic suite shows a compositional range from early granodiorite to late stage biotite muscovite members; tin mineralization is associated mainly with the latter as greisen sheets, dykes and mineralized quartz veins invading the local country rock.

Cassiterite was concentrated in alluvial deposits, mainly in Tertiary times, when erosion dissected the terrain, exposing mineralized roof zones and greisenised granite bodies. Creeks transported weathered debris, dropping cassiterite as stream gradients decreased and less dense components progressively further from source. Contemporaneous or subsequent reworking resulted in concentration of heavy minerals immediately on bedrock, or less commonly on compact horizons within the sediments.

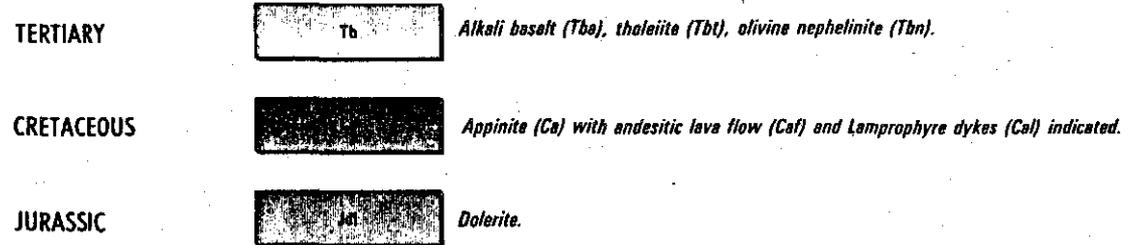
The 'deep lead' tin deposits, many subsequently protected by late Tertiary basalt flows, are visualised as segments of shallow alluvial cones formed at the break of stream gradients, their geometry and present cassiterite distribution affected by variable degrees of reworking".

The genesis of near surface mineralization which often contains interesting quantities of gold is still poorly understood.

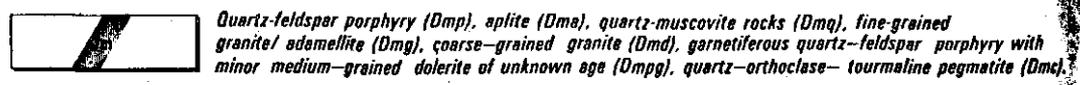
REFERENCE



IGNEOUS ROCKS



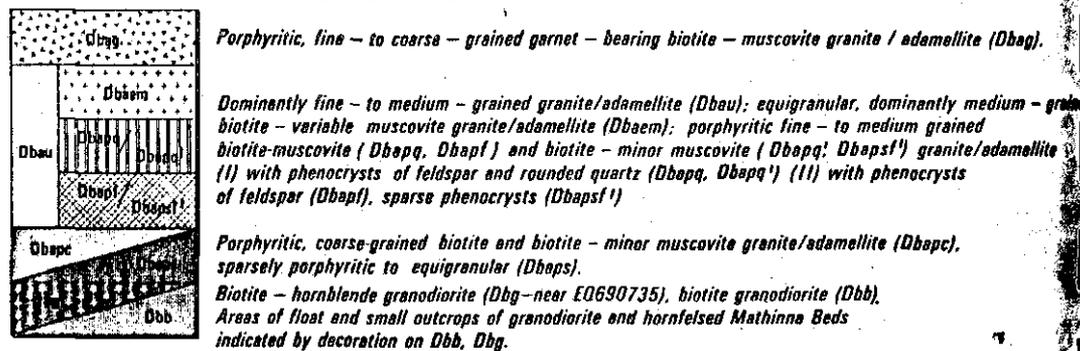
MINOR GRANITE INTRUSIONS



MAJOR GRANITE INTRUSIONS
SCOTTSDALE BATHOLITH



BLUE TIER BATHOLITH



DEVONIAN-CARBONIFEROUS

5480000mN

50'

988011



GEOLOGY

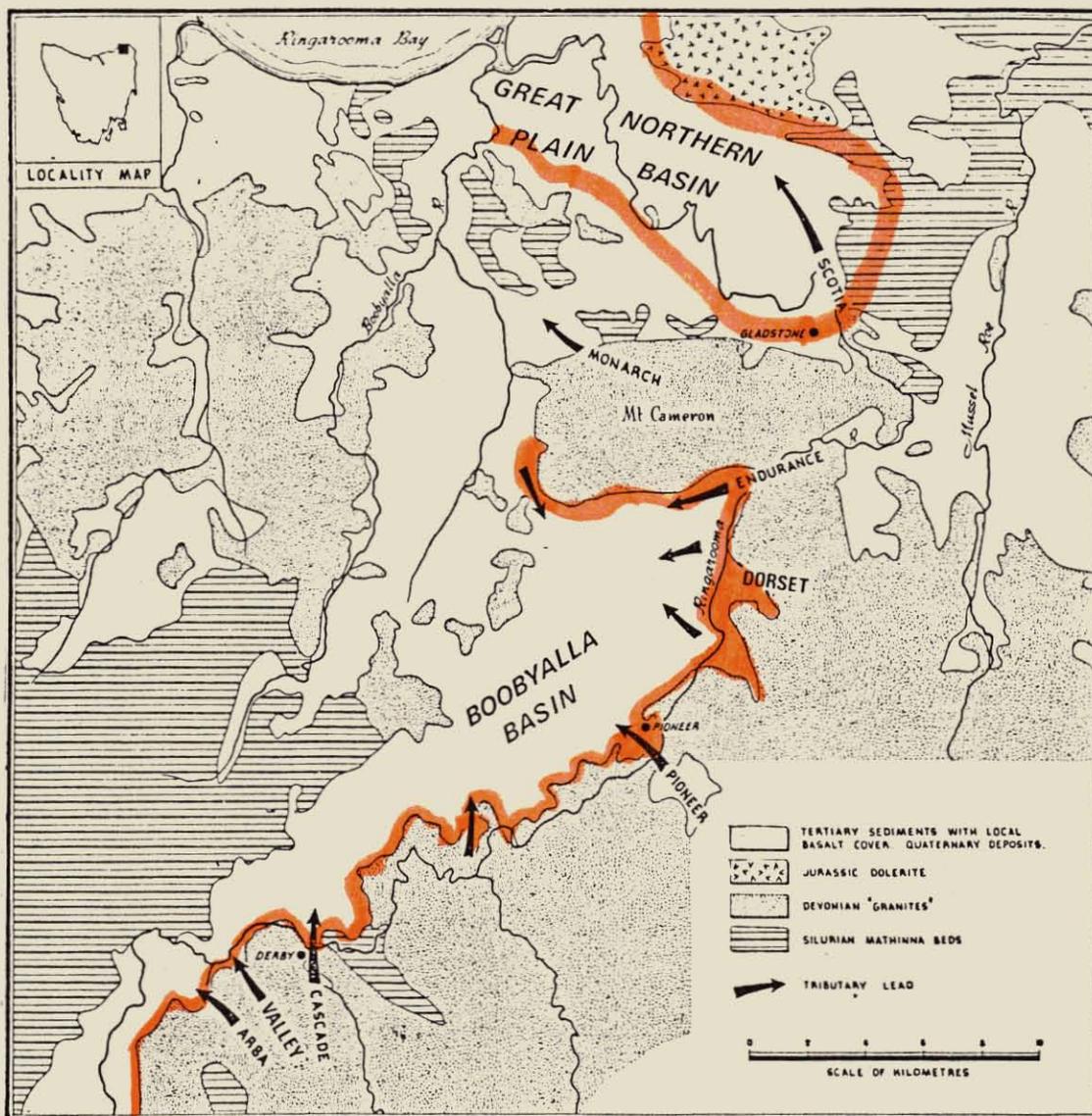
BOOBYALLA 1:50,000

FIG. 3

5 cm

For the purpose of further discussion, the area can be divided into two parts:

- i. the Boobyalla Basin south of Mt Cameron, and
- ii. the Great Northern Plain Basin between Mt Cameron and Ringarooma Bay in the northwest (figure 4).



THE MAIN TERTIARY TIN LEADS OF NORTH EASTERN TASMANIA
after Jennings 1975

5 km

FIG. 4

5. PAST PRODUCTION5.1 Boobyalla Basin

Records are probably incomplete but there is a total recorded production of at least 36,000 tonnes of cassiterite (Table 1).

TABLE IBOOBYALLA BASIN, TOTAL RECORDED CASSITERITE PRODUCTION

Mine	Production period	Grade (g/m ³ SnO ₂)	Cassiterite Production (tonnes concentrate)	Gold Production (oz)
Arba	to 1925	590	1757	^Σ 1230
Valley	to 1945	710	714	500
Cascade River	-	1180-1780	18559	12990
Echo	-		237	166
Pioneer	to 1930	1070	10804	7563
Endurance	1949-68	300	1518	1063
Monarch	1965-71	410	350	245
Dorset Flats	1944-59		1786	5500
Dorset Extended	1959-63		379	1400
New Dorset	1964-67		223	35
			36327	

At current prices, the value of tin production is well in excess of \$300 million. Some gold was also produced from the Dorset Flats.

5.2 Great Northern Plain

Records are very poor but Rattigan, in a report for Rio Tinto in 1958, estimated a total of 5000 tonnes of cassiterite as a likely production figure based on 1000 tonnes of concentrate from Scotia, and 4000 tonnes from other workings.

6. EXPLORATION POTENTIAL

6.1 Boobyalla Basin

In the area west of the Eastern (Dorset) Leads, the ground rapidly deepens as an asymmetrical valley with inferred ridges and gullies, some of which may be tin-bearing. Texens Geophoto Resources, using a Mines Department rig, drilled about 16 percussion holes which indicated good thicknesses of wash but no values (although one report indicates a small block of 0.38 million cubic metres carrying $163\text{g}/\text{m}^3$ in the Eastern Leads area). Auger drilling (101 holes) northwest and along the extension of the earlier delineated gutter of the Eastern Leads outlined a small area which, with later drilling, failed to define any worthwhile orebody. Overburden was 20-35 metres thick.

Some tin has been worked in the Upper Boobyalla Creek/Walpole Creek area in the past but little systematic drilling has been carried out. Auger drilling by BMI indicated a deep lead parallel to Boobyalla Creek in the area west of Endurance. Twenty-two holes were drilled to granite bottom (1-6 metres deep) on two lines 15 chains apart, with holes 9-18 metres apart. The best value was $42\text{g}/\text{m}^3$ and most others were considerably less.

It appears from this drilling, and the nature of the Pioneer deposit, that the best tin-bearing wash in the Boobyalla Basin is restricted to gutters in bedrock and alluvial fans at the base of slope of the Tertiary land surface. It is concluded that it is unlikely that extensive development of wash with economic grades occurs under cover to the west.

6.2 Great Northern Plain

In excess of 1000 drill holes have been put down in the past 50 years by a number of companies, as well as the Mines Department, in an attempt to extend reserves adjacent to small workings, or locate new zones of mineralization (plate 2). The majority of these holes have been drilled in very dense patterns in the Scotia, Locharber, MacGregor, Beltz and Taylors areas as a follow-up to known mineralization. A few hundred holes, notably those drilled by Rio Tinto, Utah, Preussag, Austral Malay Tin and the Mines Department, were more widely spaced and give a reasonable coverage of much of the remaining prospective area (plate 2).

6.2.1 Established Prospects

Scotia (Plate 3) is a narrow lead (deepening to the north under the Great Northern Plain where it is 33 metres or more deep) which has been closely drilled over much of its length. Indicated reserves are 12.2 million cubic metres carrying $148\text{g SnO}_2/\text{m}^3$.

At Braithwaites, in the centre of the Great Northern Plain (Plate 2) drilling by the Tasmanian Department of Mines has disclosed an estimated 6.5 million cubic metres carrying $172\text{g SnO}_2/\text{m}^3$.

Fosters Lagoon (or Marsh) (Plate 2): 50 widely spaced holes drilled by Burma Malay Tin showed an average value per hole of $77\text{g}/\text{m}^3$. In the same general area, Storeys Creek Tin NL drilled 42 holes. Results are not available but Rattigan, in a report for Utah Exploration, quotes from the drill summary an estimated 45.8 million

10.

cubic metres carrying $79\text{g SnO}_2/\text{m}^3$. This figure should be regarded with caution as little confirmatory evidence was sighted during this study, and Utah's drilling results do not seem to contain any worthwhile tin values.

MacGregor, Beltz and Taylors (Plate 4). Portland Holdings estimate 2.29 million cubic metres carrying $178\text{g SnO}_2/\text{m}^3$. An assessment of essentially the same area by Baster and Associates, Melbourne, for Wanex Mining Pty Ltd gives a lower figure of 1.77 million cubic metres which was broken down as follows:

MacGregor	793,000 m ³	carrying 136g/m ³
Beltz	371,000 m ³	carrying 142g/m ³
Taylors	400,000 m ³	carrying 201g/m ³
Canary/Roy	210,000 m ³	carrying 166g/m ³

Delta area - 33 holes were drilled by Delta Tin Mines NL over an area 600m by 900m in which 24 holes intersected tin values from 136-812g/m³ at reasonably shallow depths.

Table II, below, summarises quoted reserves on these known prospects in the Great Northern Plain Basin.

TABLE II

QUOTED RESERVES, GREAT NORTHERN PLAIN

Prospect	Volume (millions m ³)	Grade (gm/m ³)	Contained cassiterite (tonnes)
Scotia	12.2	148	1805
Braithwaites	6.5	172	1118
Fosters Lagoon	45.8	79	3618
MacGregor	0.8	136	107
Beltz	0.37	142	52
Taylors	0.4	201	80

8 180
6 140
16 30
2 150

6.2.2 Large Scale Mining Potential

The objective of the present review of data on the Ringarooma tinfield was to assess whether it is reasonable to explore for a large, low grade deposit that could be exploited using a medium to large dredge of say 5-7 million cubic metres per year capacity. It is assumed on the basis of comparative costs elsewhere, that a volume of approximately 100 million m³ at a grade of about 200g/m³ of cassiterite is required to give acceptable economics. Plate 2 is a compilation, at a scale of 1:100,000, of all drill holes that could be located from available records. Those holes for which drill logs, or company plans showing grades, were available have been colour coded to indicate the tenor of mineralization. It is not possible, due to the great variety of equipment used and the various methods of assessing the value of the concentrate, to make direct comparisons between values obtained by different companies at different times.

Plate 7 shows the approximate location of the previously mined areas on the Great Northern Plain, and drill indicated reserves.

It is quite apparent from the data on plate 2 that of the documented holes to the west of the Ringarooma River, tin values encountered are rarely better than a trace.

In the Fosters March and Chimneys area, highest values (plate 2) are generally less than 200g/m³, and probably average less than 100g/m³. Many holes are barren or contain only a trace of tin,

and it would be difficult, based on the results to date, to envisage an area large enough to support operations with a large modern dredge.

Although grades would appear to be generally higher in the Braithwaites area and south towards the old workings at MacGregor, Beltz and Taylors, mineralization is very spotty and volumes of reasonable grade (in the order of 200g/m^3) are very small (table II and plate 7).

Reserves in the Scotia Lead and its extensions (Table II), although possibly amenable to sluicing, are far too small and restricted to be of interest in a large scale dredging operation (plate 3 and plate 7).

In addition to the areas mentioned, the Storeys Creek Tin Mining Company is reputed to have had 12 years dredging reserves along the Ringarooma River which was mined for only seven years prior to the dredge closure. The failure was apparently due to a lack of adequate closely-spaced drilling to properly define the dredgable ground prior to starting up the dredge. Some tonnages may therefore still be available in the river area south of MacGregor.

In conclusion, it would appear that although the occurrence of tin on the Great Northern Plain is widespread, there could have been extensive reworking and addition of barren sediment during the Pleistocene. Potentially economic mineralization is now restricted to deposits preserved in narrow bedrock channels (eg, Scotia) or isolated river gravel terraces (eg, Braithwaites).



EL 19/77 113 SKM
MINERAL HOLD AUST PTY LTD
11 10 80

EL 5/78 430 SKM
C.C. BROOKS
30 12 79

625 S.M.
EXEMPT FROM THE MINING ACT 1929

EL 19/77 115 SKM
MINERAL HOLD AUST PTY LTD
11 10 80

S.R. 32/70

1750 AC
EXEMPT FROM THE MINING ACT 1929

EL 5/78 430 SKM
C.C. BROOKS
30 12 79

265 HA
EXEMPT FROM THE MINING ACT 1929
S.R. 166/67

EL 5/78 430 SKM
C.C. BROOKS
30 12 79

EL 19/77 175 SKM
MINERAL HOLD AUST PTY LTD
11 10 80

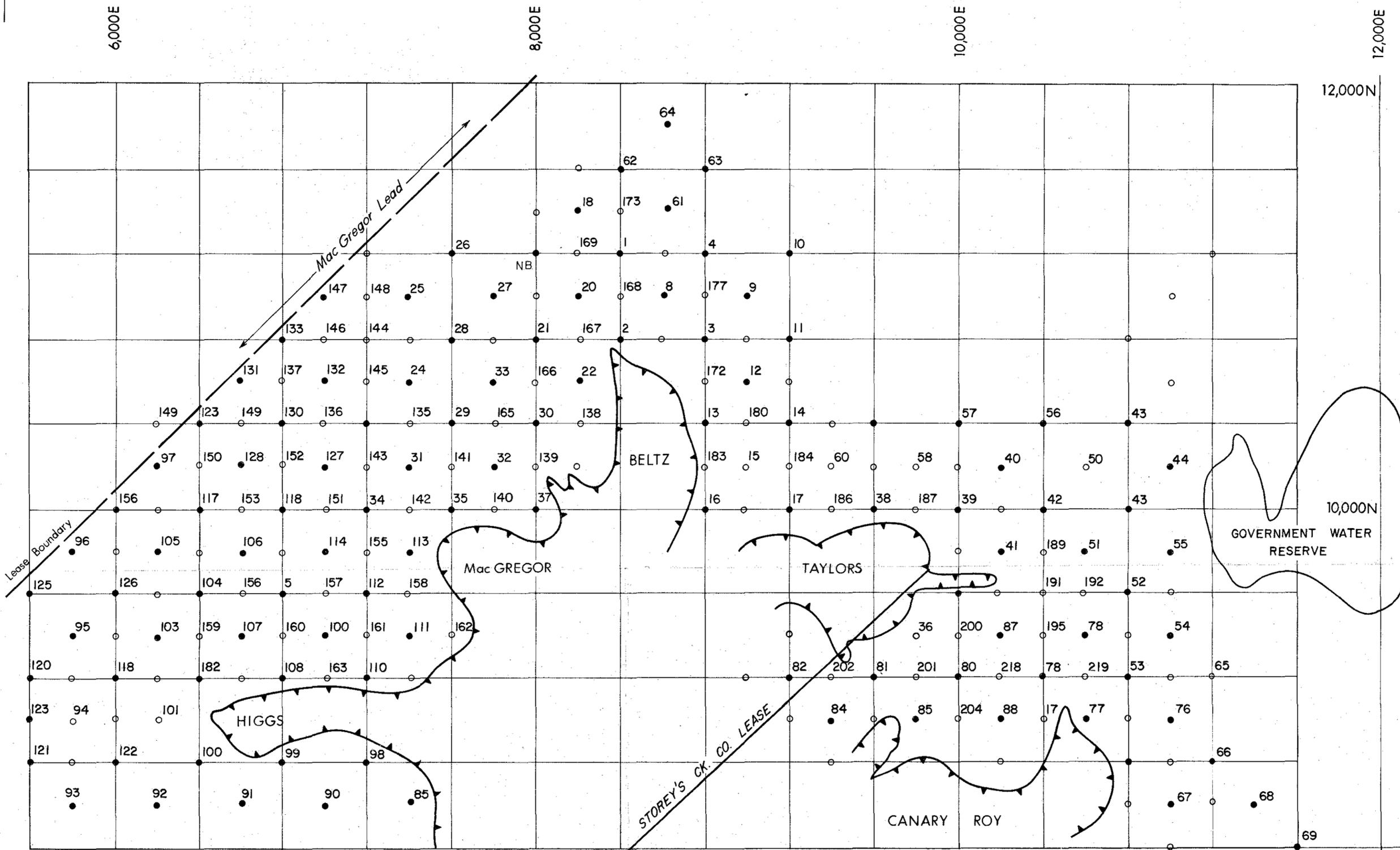
275 HA
EXEMPT FROM THE MINING ACT 1929
S.R. 1976/198

EL 2/77 187 SQ. KM.
KIBUKA MINES P/L
7 9 80

All Land on this sheet subject to the provisions of the Mining Act 1956 (No. 55 of 1956)

SCALE - 30 CHAINS TO 1 INCH
CONTINUOUS INTERVAL 100 FEET

EXPLORATION TITLE
Gladstone Area Plate 1 98802



- GRADE
- 0.19 lb. c.y. and over of 70% tin concentrates
 - 0.1 to 0.18
 - less than 0.10 lb. c.y.

N.B. Not bottomed

DORSET DREDGE PROJECT
 Gladstone - Tasmania

Proposed Stage 2 Drilling Programme

For Wanex Mining Pty. Ltd. - Perth W.A.

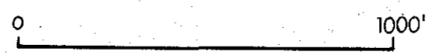
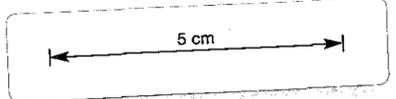
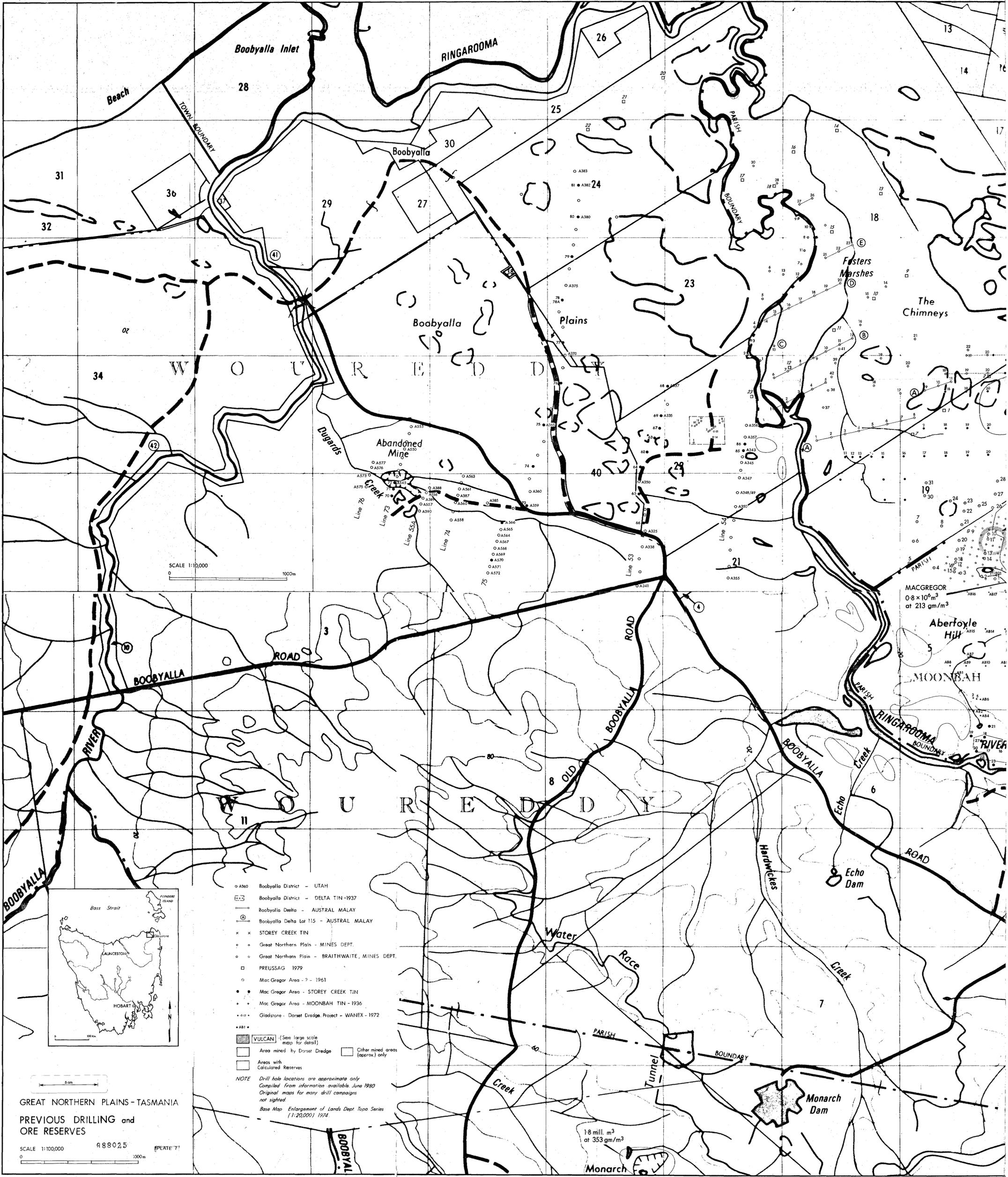


PLATE 4

by L.R. Baster and Associates
 Melbourne 14.11.1972

81-1537

988023



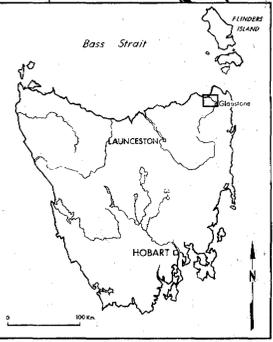
SCALE 1:100,000
0 1000m

MACGREGOR
0.8 x 10⁶ m³
at 213 gm/m³

1.8 mill. m³
at 353 gm/m³

- A360 Boobyalla District - UTAH
- Boobyalla District - DELTA TIN-1937
- Boobyalla Delta - AUSTRAL MALAY
- Boobyalla Delta Lot 115 - AUSTRAL MALAY
- × STOREY CREEK TIN
- Great Northern Plain - MINES DEPT.
- Great Northern Plain - BRAITHWAITE, MINES DEPT.
- PREUSSAG 1979
- Mac Gregor Area - ? - 1961
- Mac Gregor Area - STOREY CREEK TIN
- Mac Gregor Area - MOONBAH TIN - 1936
- Gladstone - Dorset Dredge Project - WANEX - 1972
- A81

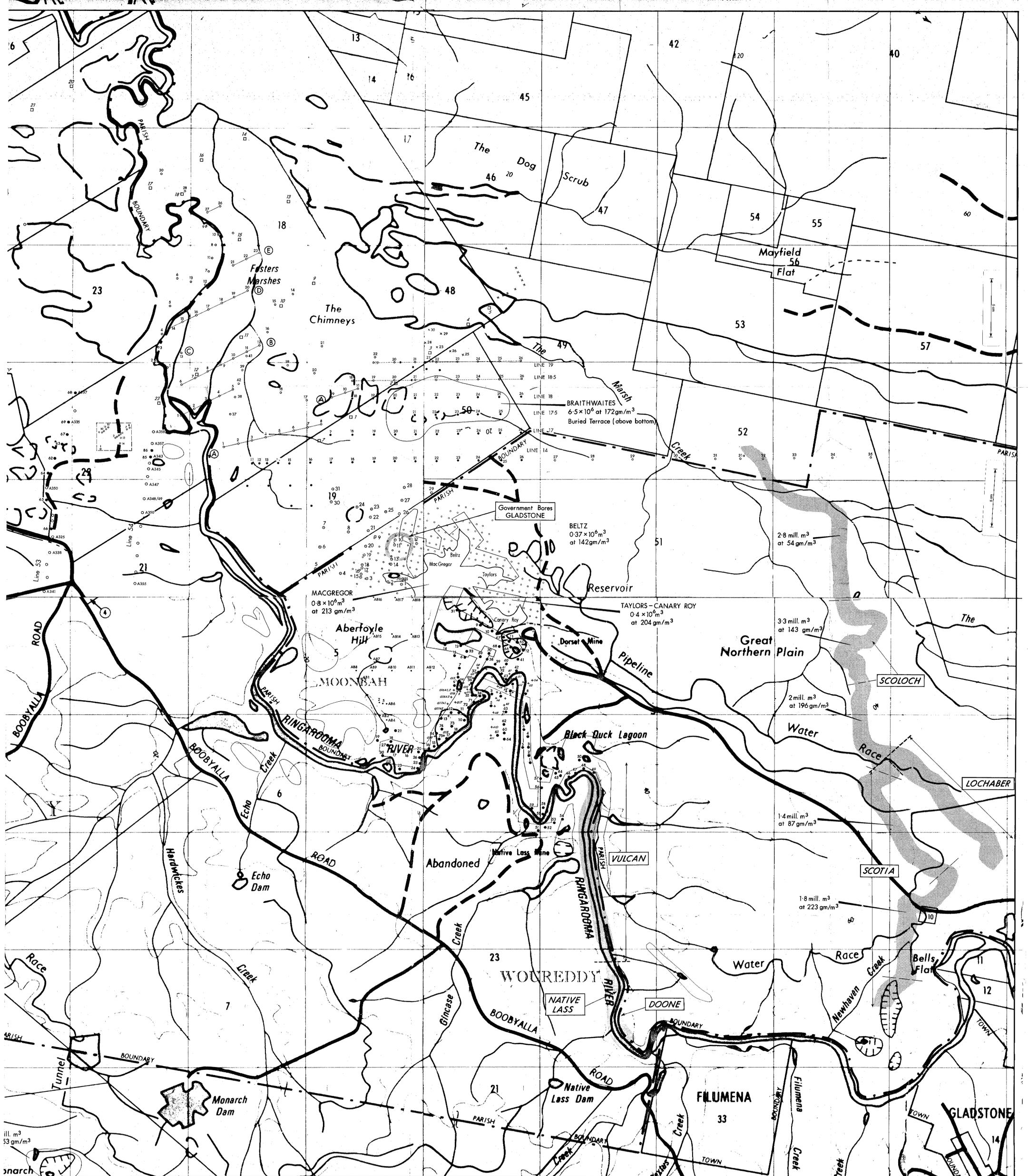
NOTE
Drill hole locations are approximate only
Compiled from information available June 1980
Original maps for many drill campaigns
not sighted.
Base Map Enlargement of Lands Dept Topo Series
(1:20,000) 1974.



GREAT NORTHERN PLAINS - TASMANIA

PREVIOUS DRILLING and ORE RESERVES

SCALE 1:100,000 988025 [PLATE 71]
0 1000m



1 mill. m³
53 gm/m³

Monarch

MACGREGOR
 $0.8 \times 10^6 \text{ m}^3$
at 213 gm/m^3

BELTZ
 $0.37 \times 10^6 \text{ m}^3$
at 142 gm/m^3

TAYLORS-CANARY ROY
 $0.4 \times 10^6 \text{ m}^3$
at 204 gm/m^3

2.8 mill. m³
at 54 gm/m^3

3.3 mill. m³
at 143 gm/m^3

2 mill. m³
at 196 gm/m^3

1.4 mill. m³
at 87 gm/m^3

1.8 mill. m³
at 223 gm/m^3

BRAITHWAITES
 6.5×10^6 at 172 gm/m^3
Buried Terrace (above bottom)

Government Bores
GLADSTONE

Reservoir

Pipeline

Black Duck Lagoon

VULCAN

DOONE

FILUMENA

GLADSTONE

MOONBAH

WOUREDDY

Great Northern Plain

SCOLOCH

LOCHABER

SCOTIA

Bells Flat

Fosters Marshes

The Chimneys

The Dog Scrub

Mayfield Flat

BOOBYALLA ROAD

Echo Dam

Monarch Dam

Abandoned

Native Lass Mine

Native Lass Dam

Tunnel

BOUNDARY

PARISH

TOWN

TOWN

BOUNDARY

Line 54

Line 53

Line 52

Line 51

Line 50

Line 49

Line 48

Line 47

Line 46

Line 45

Line 44

Line 43

Line 42

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Line 12

Line 11

Line 10

Line 9

Line 8

Line 7

Line 6

MACGREGOR
 $0.8 \times 10^6 \text{ m}^3$
at 213 gm/m^3

BELTZ
 $0.37 \times 10^6 \text{ m}^3$
at 142 gm/m^3

TAYLORS-CANARY ROY
 $0.4 \times 10^6 \text{ m}^3$
at 204 gm/m^3

2.8 mill. m³
at 54 gm/m^3

3.3 mill. m³
at 143 gm/m^3

2 mill. m³
at 196 gm/m^3

1.4 mill. m³
at 87 gm/m^3

1.8 mill. m³
at 223 gm/m^3

BRAITHWAITES
 6.5×10^6 at 172 gm/m^3
Buried Terrace (above bottom)

Government Bores
GLADSTONE

Reservoir

Pipeline

Black Duck Lagoon

VULCAN

DOONE

FILUMENA

GLADSTONE

MOONBAH

WOUREDDY

Great Northern Plain

SCOLOCH

LOCHABER

SCOTIA

Bells Flat

Fosters Marshes

The Chimneys

The Dog Scrub

Mayfield Flat

BOOBYALLA ROAD

Echo Dam

Monarch Dam

Abandoned

Native Lass Mine

Native Lass Dam

Tunnel

BOUNDARY

PARISH

TOWN

TOWN

BOUNDARY

Line 54

Line 53

Line 52

Line 51

Line 50

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