

## INTRODUCTION

This brief report was prepared in response to requests from several industry sources for information on the dolomite resources of Tasmania, particularly as a source of magnesium. The report is not intended to be exhaustive, and relies heavily on information collected by the Department of Mines some decades ago.

## GENERAL DISTRIBUTION OF DOLOMITE

The major known dolomite deposits are all considered to be Late Precambrian in age, and occur in six main outcrop areas (fig. 1): (1) Smithton Dolomite, between the coast at Smithton and the Arthur River; (2) Savage Dolomite, on the lower Pieman River; (3) Jane Dolomite, south of Frenchmans Cap and at Mount Arrowsmith on the Lyell Highway; (4) Weld River dolomite, at Tim Shea and in the upper Weld Valley; (5) Blakes Opening dolomite, on the upper Huon River; (6) Hastings Dolomite, near Southport.

Dolomite or dolomitic units also occur within the Ordovician Gordon Limestone, which is widespread, and two small deposits of magnesite ( $MgCO_3$ ) are known from near Savage River.

Dolomite is a mineral composed of the carbonates of Ca and Mg in equal molecular proportions, the formula being  $CaCO_3 \cdot MgCO_3$ . The pure form contains 54.35%  $CaCO_3$  and 45.65%  $MgCO_3$ , or 30.4% CaO, 21.7% MgO, 47.9%  $CO_2$ .

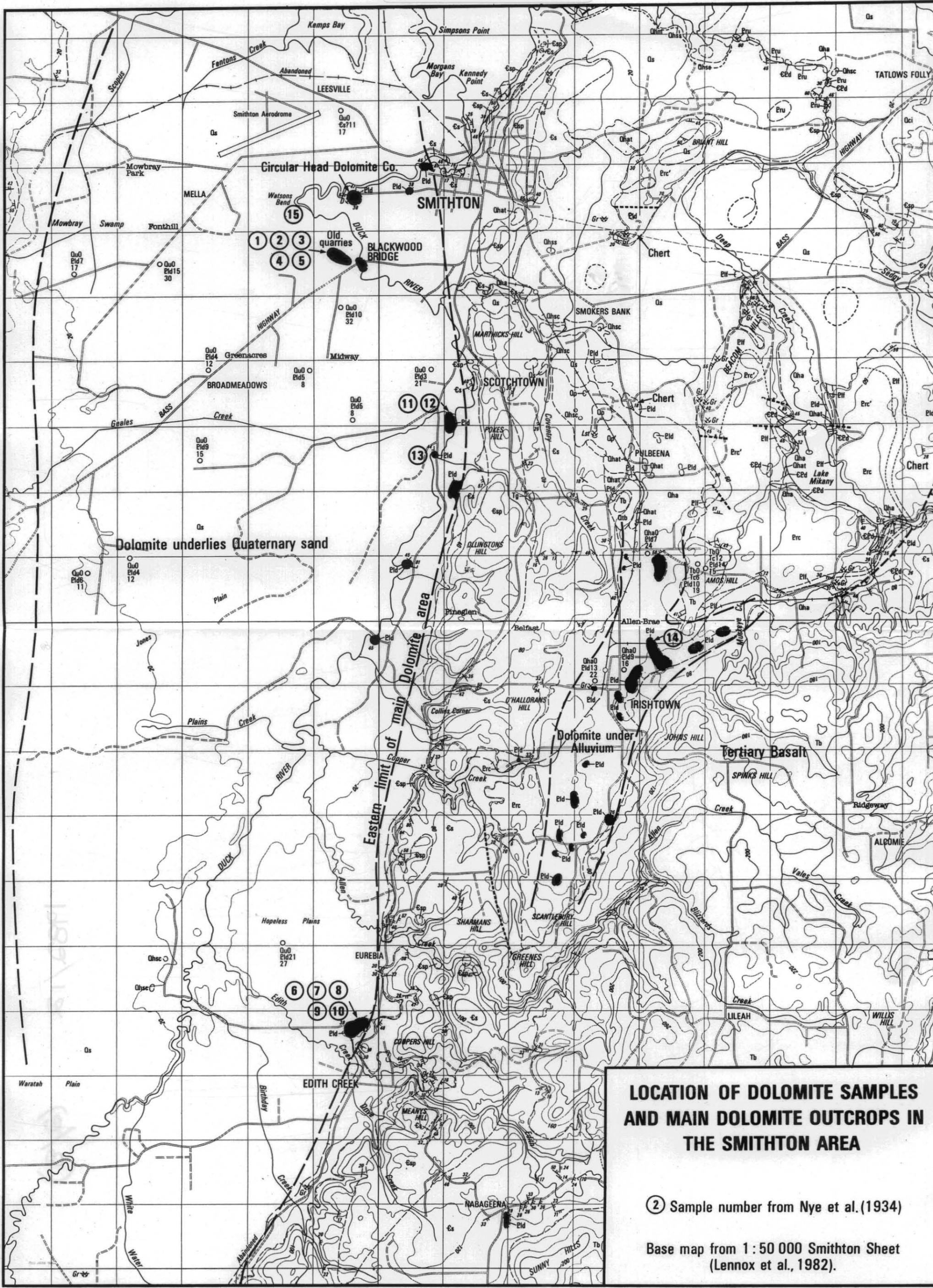
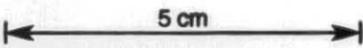
## THE MAJOR DOLOMITE UNITS

*Smithton Dolomite*

Dolomite occurs extensively in the Smithton area (fig. 2), with the known outcrops extending for some 50 km south to the Arthur River. Analyses and information on the dolomite near Smithton are given by Nye, Finucane and Blake (1934) and Hughes (1957). The locations of the fifteen available analyses are shown on Figure 2 and the analyses are given in Table 1. Two main types of dolomite are recorded by Nye *et al.* (1934); a coarse-grained crystalline type of white colour and generally good grade, and a fine-grained type of light grey colour and more variable grade. Impurities in the dolomite are mostly silica (0.08-6.64%  $SiO_2$ ) and alumina (0.36-8.24%  $Al_2O_3$ ). An analysis of the insoluble component of a composite sample (from samples 6 to 13 of Table 1) is given in Table 2.

In the Mowbray Swamp area, immediately west and south of Smithton, dolomite occurs extensively beneath a cover of superficial sand. Sparse outcrops occur along the Duck River, at the eastern margin of the plain, and in drainage ditches. Good quality crystalline dolomite occurs in a series of small quarries near Blackwood Bridge (21.48-22.22% MgO, samples 1-5), and at Watsons Bend on the Duck River (sample 15). The Circular Head Dolomite Company currently operates a quarry in this area, producing crushed dolomite for agricultural purposes (production for 1980-81 financial year was 9872 t). Surface relief in this area is generally less than four metres. Poorer grades are evident at Scotchtown (samples 11-13), and intermediate grades (samples 6-10) in the southern area at Edith Creek.

Dolomite also crops out in more hilly country near Irishtown, adjacent



**LOCATION OF DOLOMITE SAMPLES AND MAIN DOLOMITE OUTCROPS IN THE SMITHTON AREA**

② Sample number from Nye et al. (1934)

Base map from 1 : 50 000 Smithton Sheet (Lennox et al., 1982).

Table 1. ANALYSES OF SMITHTON DOLOMITE SAMPLES (FROM NYE, FINUCANE AND BLAKE, 1934). ANALYSES EXPRESSED IN PERCENTAGES.

Sample	CaO	MgO	CO <sub>2</sub> by ign.loss	SiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	P <sub>2</sub> O <sub>5</sub>	C	FeO and Fe <sub>2</sub> O <sub>3</sub>
1	31.12	21.48	46.73	0.08	0.36	Trace	0.02	0.24
2	31.22	21.64	46.14	0.20	0.48	Trace	0.156	0.24
3	31.32	21.50	46.68	0.12	0.36	Trace	0.032	0.12
4	31.22	21.56	46.64	0.08	0.48	Trace	0.028	0.12
5	31.60	22.22	46.84	0.08	0.40	Trace	0.03	N.D. 0.08
6	28.70	19.72	43.60	4.60	3.18	0.029	0.20	0.84 0.37
7	28.30	19.76	43.31	4.88	3.06	0.03	0.25	0.78 0.44
8	28.64	19.32	43.35	4.80	3.56	0.03	0.25	0.87 0.47
9	28.40	20.36	43.73	3.80	3.38	0.028	0.35	0.74 0.29
10	28.00	19.20	43.63	5.08	3.86	0.035	0.25	0.71 0.35
11	28.20	14.62	40.75	6.64	8.24	0.054	0.65	1.26 0.76
12	29.80	19.40	44.73	2.12	3.54	0.04	0.35	1.03 0.71
13	28.00	19.98	42.48	5.52	3.68	0.03	0.40	0.94 0.40
14	30.40	21.56	44.83	3.28	0.42	0.06	0.05	0.38 0.15
15	31.20	21.36	46.46	0.52	0.56	0.10	0.14	0.71 0.65

Samples 1-5 from near Blackwood Bridge, 6-10 from near Edith Creek, 11-13 from near Scotchtown, 14 from near Irishtown, 15 from Watsons Bend (see fig. 2 for localities). Details of samples in Nye et al. (1934) and Hughes (1957).

Table 2. ANALYSIS OF INSOLUBLES FROM COMPOSITE SAMPLES (6-13 OF TABLE 1) OF SMITHTON DOLOMITE (FROM NYE, FINUCANE AND BLAKE, 1934).

Constituents	%
SiO <sub>2</sub>	82.60
Al <sub>2</sub> O <sub>3</sub>	11.92
K <sub>2</sub> O	4.59
Na <sub>2</sub> O	0.26
Fe <sub>2</sub> O <sub>3</sub>	0.21
TiO <sub>2</sub>	0.81
MgO	0.25
	<hr/> 100.64 <hr/>

to the railway line. Thomas (quoted in Hughes, 1957, p. 285) indicates that selection would be necessary to avoid some quartz and chert in this area, but that quarrying would be quite feasible. The available analysis (14) indicates good quality in this area (21.56% MgO) but some variability in quality is likely. Basalt-derived soil would be an increasing overburden problem to the south. The main outcrop area at the sample locality is about 75 000 m<sup>2</sup> in surface area, and has a relief of at least 20 m, suggesting there could be 1.5 million cubic metres present. However, there is insufficient information for any realistic estimate of reserves and grades.

Access to the Smithton Dolomite deposits is extremely good in the northern areas, with both road and rail access within a few kilometres or less. The other areas of dolomite to the south have been mapped at a reconnaissance level only. Recent forestry roads provide access into much of this area, but there is no information available on the grades of dolomite present.

#### *Savage Dolomite*

Spry (1964) described a belt of dolomite crossing the Pieman River at the Savage River junction. The belt is about 700 m wide, and consists of massive fawn to grey dolomite with minor interbedded slate and patches of chert. The area is remote and densely forested, lying several kilometres west of the road terminus at Corinna.

#### *Jane Dolomite*

Large areas of dolomite occur in very inaccessible country in the Jane River area south of Frenchmans Cap (Hughes, 1957). A similar belt of dolomite extends through the Surprise Valley and crops out on the Lyell Highway at the western foot of Mount Arrowsmith. This area presently lies entirely within the Wild Rivers National Park. Two samples taken by Blake (1947) from the highway give the following partial analyses (from Hughes, 1957):

(1) CaO 29.34%, MgO 19.96%, SiO<sub>2</sub> 4.64%

(2) CaO 29.74%, MgO 20.87%, SiO<sub>2</sub> 3.60%

#### *Weld River - Tim Shea*

Dolomite crops out extensively in the upper Weld River Valley and on the north-east slopes of Mount Anne, mostly within areas of very difficult access within the South-West Conservation Area.

At Tim Shea, 15 km north-west of Maydena, dolomite occurs extensively in the valley of the Tyenna River and on the adjacent slopes of Tim Shea and The Needles. Several road metal quarries have been opened up in this unit on the Gordon River Road, and the Australian Newsprint Mills road to the Florentine Valley passes close to its northern boundary. The dolomite varies from well-bedded to massive, and from dark grey to pale fawn in colour.

#### *Blakes Opening*

Dolomite crops out in the Huon River at Blakes Opening and also on the slopes of Mount Picton to the south near Red Rag Scarp. A forestry road which crosses the Picton River extends to within about 5 km of this

area, which is entirely within the South-West Conservation Area. Partial analyses of 23 samples collected by G.R. Green of the Department of Mines in 1972 (see fig. 3 for localities) from the Huon River and Red Rag Scarp areas are given in Table 3. The analyses show a marked decline in quality towards the eastern side of the belt, where there is interbedding of other sediments with the dolomite.

Table 3. ANALYSES OF DOLOMITE SAMPLES FROM BLAKES OPENING - RED RAG SCARP AREA.

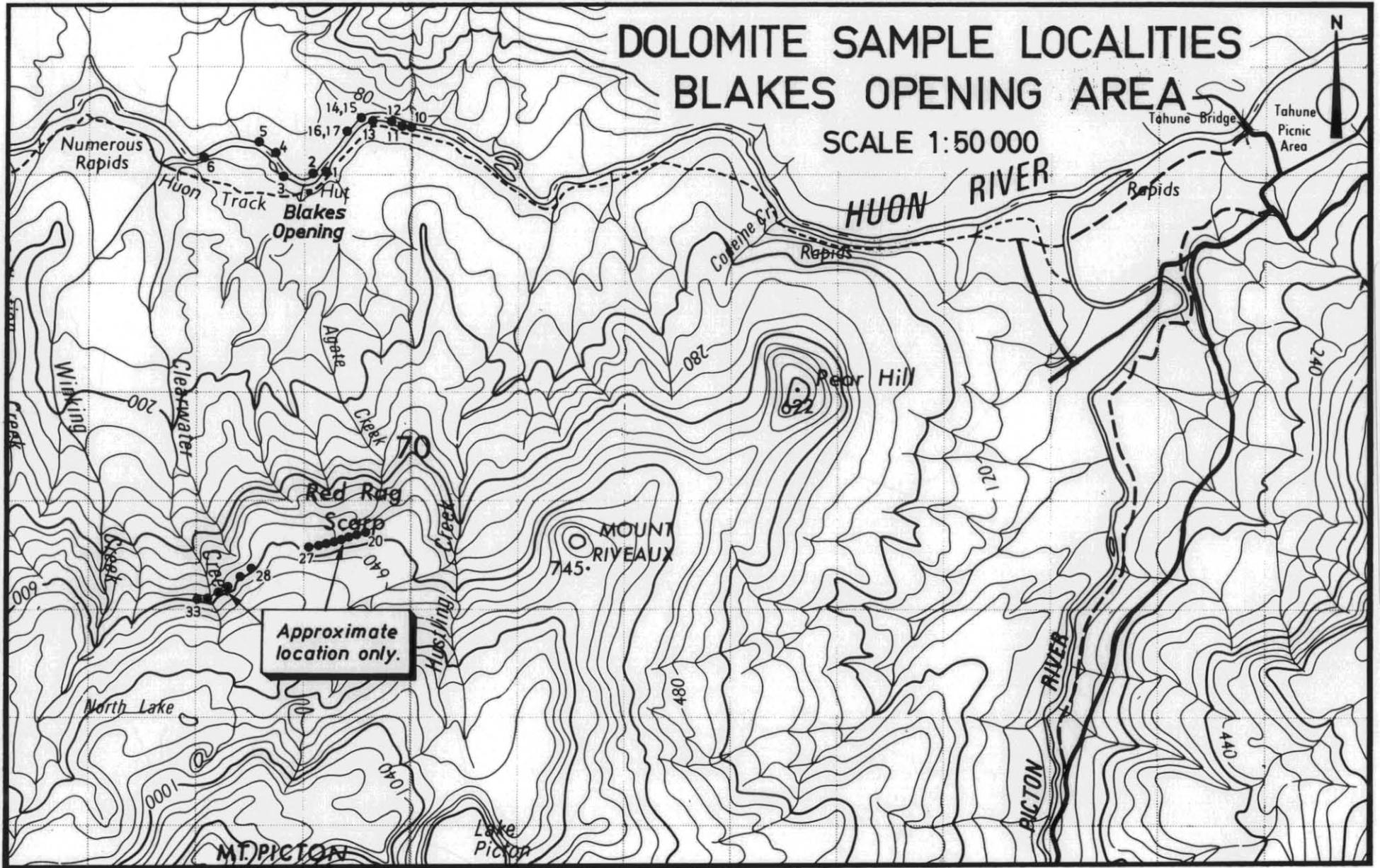
Sample No.	%CaO	%MgO	% Acid insoluble	% Loss on ignition
1	31.6	20.2	1.8	
2	29.7	21.1	5.4	
3	30.2	21.2	2.0	
4	30.2	21.6	1.8	
5	31.4	20.9	1.4	
6	26.9	18.6	14.0	
10a	7.7	6.0	65.7	10.4
10b	4.9	5.6	69.7	7.9
11	4.7	6.6	67.9	9.1
12	5.0	4.5	72.4	7.8
13	2.3	3.7	74.5	6.8
14	23.2	15.3	26.7	33.5
15	30.2	20.5	2.6	42.8
16	31.7	20.9	0.5	46.6
17	31.1	20.9	1.1	46.3
20	29.5	20.9	3.6	45.1
21	28.5	20.5	6.2	43.9
22	29.9	21.3	2.0	45.8
23	26.0	19.0	14.3	39.8
24	29.1	21.8	1.7	45.5
26	29.1	19.5	7.4	42.1
27a	5.0	3.6	83.1	7.5
27b	30.6	21.1	1.0	47.1
28	27.9	19.2	10.0	42.4
29	30.6	20.9	1.2	46.3
30	20.5	13.7	34.4	30.1
31	26.4	18.5	14.1	40.5
32	24.5	16.6	22.0	35.9
33	22.6	15.0	30.0	31.5

Analyses 1-6 by W. Baker, others by Department of Mines Laboratories, Launceston.

Dolomite also occurs along the western side of the Craycroft River near The Razorback, and Blake (1935, quoted in Hughes, 1957) gives the following analysis: CaO 29.4%, MgO 20.92%.

*Hastings Dolomite*

The Hastings Caves, 10 km north-west of Southport, lie within an area of dolomite about 3 km<sup>2</sup> in extent. Most of the area is within the Caves Reserve.



MAGNESITE DEPOSITS

Urquhart (1966) described two deposits of magnesite in tributaries of the Savage River, about 6 km south-west of Savage River township and 1-2 km west of the Corinna Road (see also Jennings, Noldart and Williams, 1967). The Main Rivulet deposit is at least 240 m x 180 m in extent and 3 m deep, indicating a reserve of the order of 300 000 tonnes. Four analyses quoted by Urquhart (p. 92) show MgO contents of 40.3, 43.4, 44.8, and 44.6%. The smaller Bowry Creek deposit has a possible width of 90 m, and MgO content of 42.9%.

DOLOMITE IN THE GORDON LIMESTONE

Dolomitic units occur within the Gordon Limestone in most localities where the sequence has been investigated in detail, but sampling for dolomite content has generally not been done. The extent and accessibility of the Gordon Limestone in Tasmania has been covered by Hughes (1957). The survey by Collins (1977) of the inaccessible Gordon River-Olga River section showed that the middle part of the limestone sequence included some 200 m of highly dolomitic material in which the average of the 18 best samples was 42.2% MgCO<sub>3</sub>.

The survey by Summons (1981) in the Lune River quarries area showed extensive dolomitisation in the lower and middle parts of the sequence. Only part of the sequence was systematically analysed for dolomite, but one section, in drill hole DLR2, showed 31 m of >36% MgCO<sub>3</sub>, including 12 m of >41% MgCO<sub>3</sub>.

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[13 May 1982]

# MAJOR DOLOMITE OCCURRENCES



# TASMANIA

1:500000

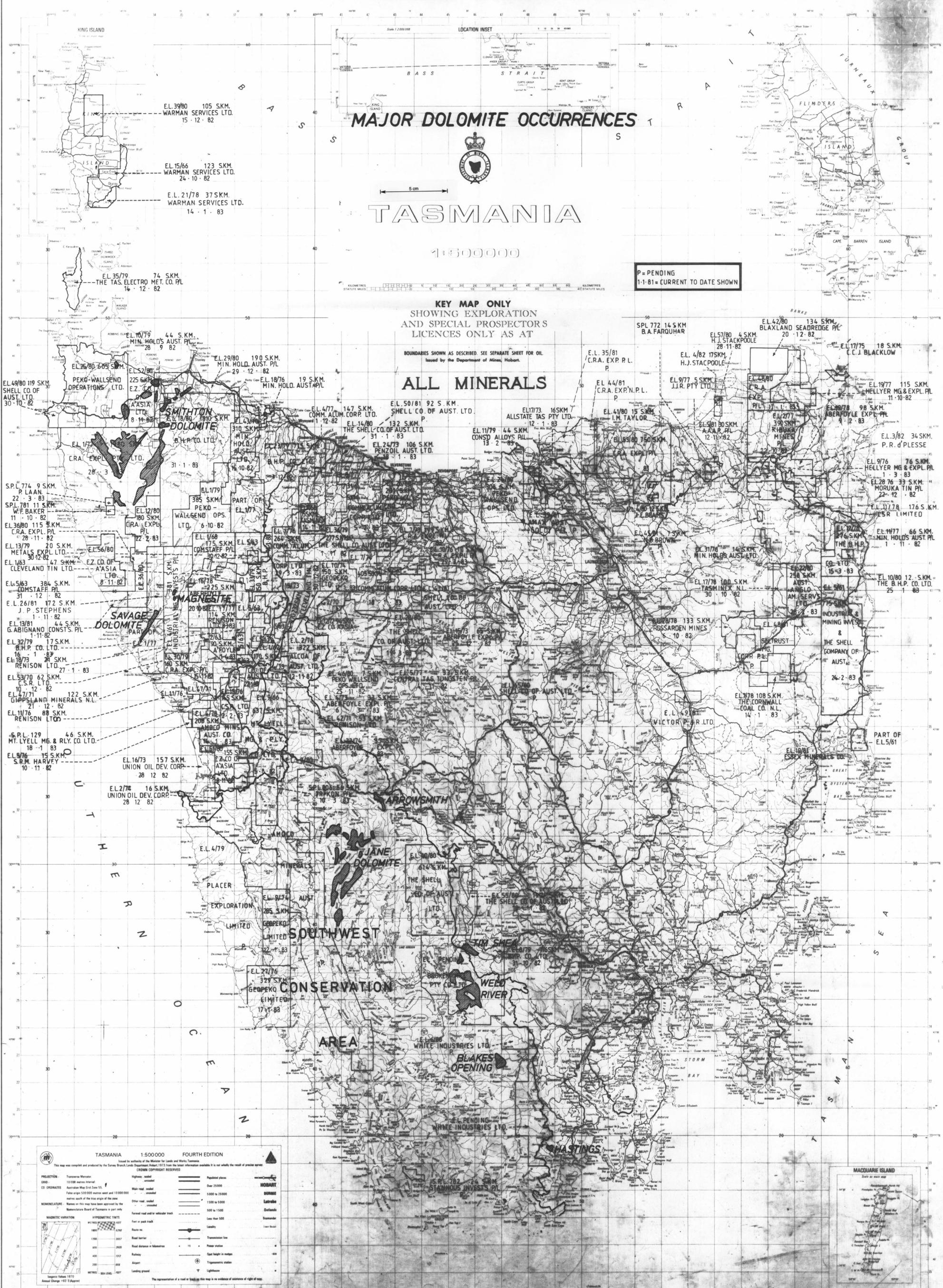
P = PENDING  
1-1-81 = CURRENT TO DATE SHOWN

KEY MAP ONLY  
SHOWING EXPLORATION  
AND SPECIAL PROSPECTOR'S  
LICENCES ONLY AS AT

ALL MINERALS

BOUNDARIES SHOWN AS DESCRIBED. SEE SEPARATE SHEET FOR OIL  
Issued by the Department of Mines, Hobart.

ALL MINERALS



**TASMANIA 1:500000 FOURTH EDITION**

This map was compiled and produced by the Geomatics Branch, Department of Mines, Tasmania. It is not a substitute for the result of a professional survey.

**PROJECTION:** Transverse Mercator  
**GRID:** 100000 metres interval  
**CO-ORDINATES:** Australian Map Grid Zone 55  
 False origin 100 000 metres west and 10 000 000 metres north of the true origin of the zone.  
**SCALE:** Names on this map have been approved by the Geographical Names Board of Tasmania in part only.

**MAGNETIC VARIATION**

1970	10° 00' E
1980	10° 00' E
1990	10° 00' E
2000	10° 00' E
2010	10° 00' E
2020	10° 00' E
2030	10° 00' E
2040	10° 00' E
2050	10° 00' E
2060	10° 00' E
2070	10° 00' E
2080	10° 00' E
2090	10° 00' E
2100	10° 00' E

**SYMBOLS:**

- Highway (solid line)
- Main road (dashed line)
- Other road (dotted line)
- Footpath (dashed line with cross-ticks)
- Four or push track (dotted line with cross-ticks)
- Road barrier (solid line with cross-ticks)
- Road distance in kilometers (solid line with cross-ticks)
- Railway (line with cross-ticks)
- Spot height in metres (circle with cross-ticks)
- Trigonometric station (circle with cross-ticks)
- Lighthouse (circle with cross-ticks)
- Populated place (circle with cross-ticks)
- Over 25000 (circle with cross-ticks)
- 5000 to 25000 (circle with cross-ticks)
- 1500 to 5000 (circle with cross-ticks)
- 500 to 1500 (circle with cross-ticks)
- Less than 500 (circle with cross-ticks)
- Locality (circle with cross-ticks)
- Transmission line (line with cross-ticks)
- Power station (circle with cross-ticks)
- Spot height in metres (circle with cross-ticks)
- Trigonometric station (circle with cross-ticks)
- Lighthouse (circle with cross-ticks)

**HOBBART**  
**BURNIE**  
**LATROBE**  
**SOMERSET**  
**LAKE FLAVELL**

**MAQUARIE ISLAND**

This representation of a road on this map is not a substitute for the result of a professional survey.

Figure 1