Recommendations for future drilling at the Etna Stone quarry, Pontville.

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Abstract

A pattern for diamond drilling north-east, north-west and south-west of the existing quarry to prove reserves of usable sandstone has been drawn up. It is recommended that boreholes be drilled at an angle of 65° from the horizontal toward 232° (true) in order to obtain maximum information on lithology and jointing. A revised trend of the dolerite intrusion south of the quarry was mapped.

INTRODUCTION

Etna Stone Pty Ltd requested geological advice on test drilling ahead of the working face of their quarry at Pontville [EN215739]. The drilling is undertaken to prove additional reserves of building stone.

Several reports have already been written for this company and a summary is appended with this report. The previous report was the result of a comprehensive investigation by M.R. Banks, which was undertaken when the present management took over operations from G. Giordano.

GEOLOGY

A sequence of coarsely and finely bedded Triassic sandstone layers striking 160° and dipping 5-12° west occurs in the quarry. The rock is fractured by two sets of joint planes, one striking 007° and dipping 65°E and the other striking 087° and dipping 75°N. Minor faulting, with strikes of 165° and 018°, occurs between blocks B and C in the old part of the quarry.

A dolerite intrusion lies to the south of the quarry and limits the development of the workings in this direction.

Quality of stone

Banks differentiated between good and bad quality stone principally on joint spacing. Good stone had a minimum of 200 mm between partings and on this basis, blocks A, B and C were delineated as containing workable amounts of good stone from the data obtained from a 16 hole diamond drilling programme. Banks recommended that this prospecting be extended north-west and south-west of block A to prove further reserves. The siting of holes to implement this is the subject of the present report.

Dolerite intrusion

It was considered necessary to accurately determine the sandstone/dolerite contact, as its position on Banks' map indicates that it could limit any westerly extension of the quarry. It is assumed that the criteria used in the original plot was the dolerite intersection in BH5 and the distribution of dolerite float on the surface. The boundary was re-mapped by D.E. Leaman using a proton magnetometer and a revised boundary, trending roughly east-west, has been plotted. Dolerite is therefore not anticipated to present any obstacle to a north-westerly or south-westerly extension of block A.

DRILLING PROGRAMME

Banks was quite specific in recommending drilling in certain directions to follow trends indicated by previous drilling results. The writer can see no reason for not following these recommendations.

It is suggested that a 20 m grid be used as the basis for further drilling with additional closer drilling as required to confirm any change in rock type. The lines of holes are spaced to detect any such change ahead of the present quarry face. Future drilling can be sited on parallel lines as the face advances.

There would be better recovery of stone if the workings conformed to the joint pattern, this opinion being shared by Banks (1975, P 20). Such a gain must be balanced against any disruption to the present operation and the percentage loss of stone due to breakage along joints which the company is prepared to tolerate. Similarly, there could be gains by angling the drill holes to get a clearer picture of the joint pattern, as the joints are steeply dipping. The best borehole attitude for joint plane intersection is one with a direction of 232° and plunging 32° (fig. 1). However, this would more than double drilling depths (41 m compared to 9.2 m for a vertical hole) and costs.

A compromise angle of plunge of 65° makes equal angles with bedding and jointing for only a 10% increase in drilling distance (fig. 2).

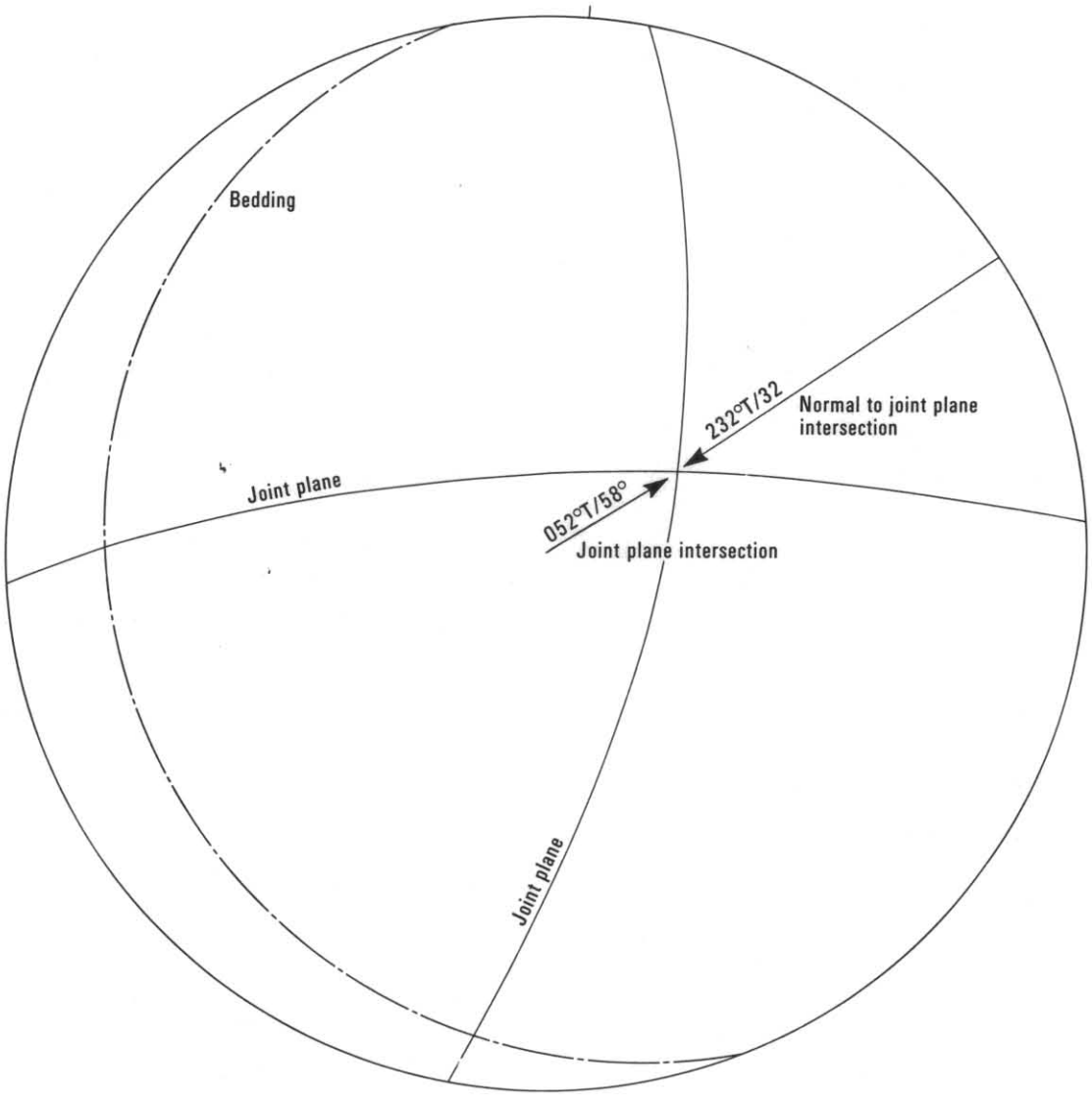
The relative positions of previous drilling are shown on Figures 3 and 4. It is noted that Banks (1975) recommended that no further quarrying be attempted in a north-easterly direction because of the underlying (undesirable) thinnly bedded sandstone, which would be exposed by such an operation and that in a south-easterly direction is an area of light coloured stone (also undesirable). The stone is broken up by close jointing of a bedding further south-east.

The dolerite contact lies further to the south-east and further work in this direction is not justified. Some further drilling to the north-east on a more widely spaced grid could prove useful in determining the quality of stone underlying the poor stone and the recommended drilling programme (fig. 3) takes account of this.

RECOMMENDATION

The surface should be cleared to bedrock and cleaned to facilitate mapping and drilling on a 20 m grid. Drilling should be undertaken on a trend of 232° and dipping 65°.

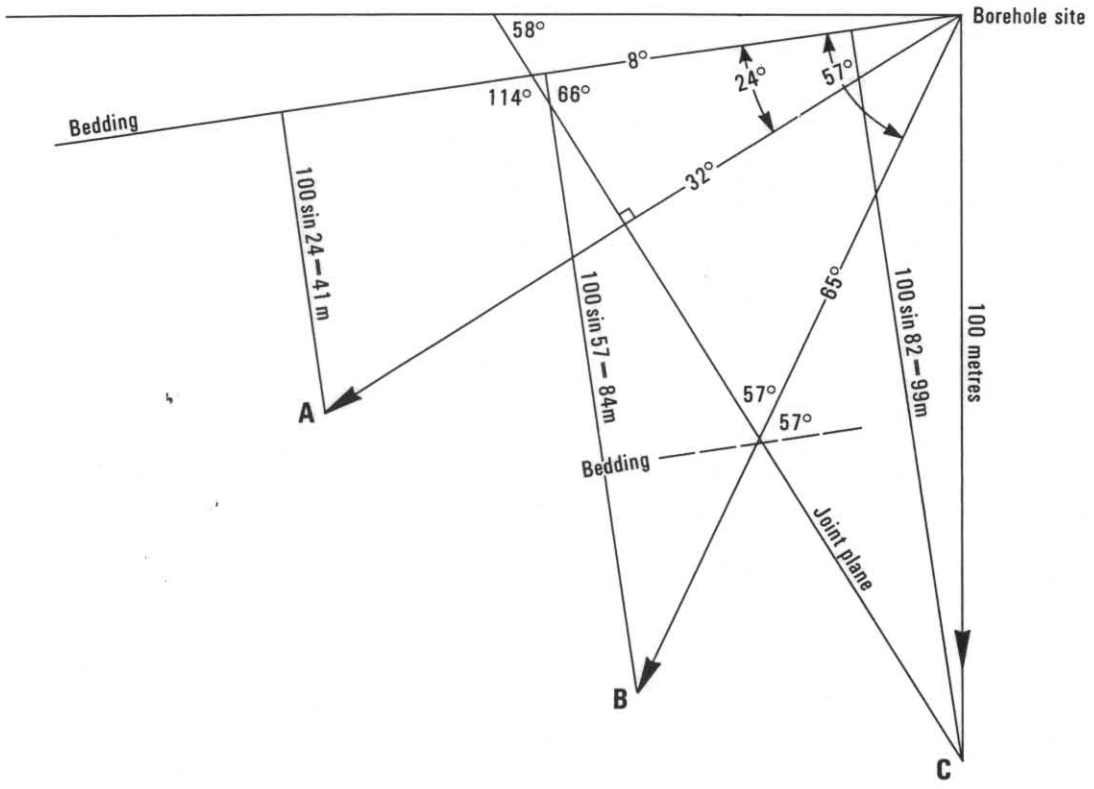
[13 February 1978]



STEREOGRAPHIC PROJECTION (lower hemisphere)
ETNA STONE QUARRY - PONTVILLE

Figure 1.

5 cm



Borehole	Dip	Thickness of beds penetrated per 100 metres drilled.
A (perpendicular to jointing)	32°	41m
B (making equal angles with bedding and jointing)	65°	84m
C (vertical)	90°	99m

ETNA STONE QUARRY - PONTVILLE SECTION IN PLANE OF LINE OF INTERSECTION OF PRINCIPAL JOINTS

Figure 2.

5 cm

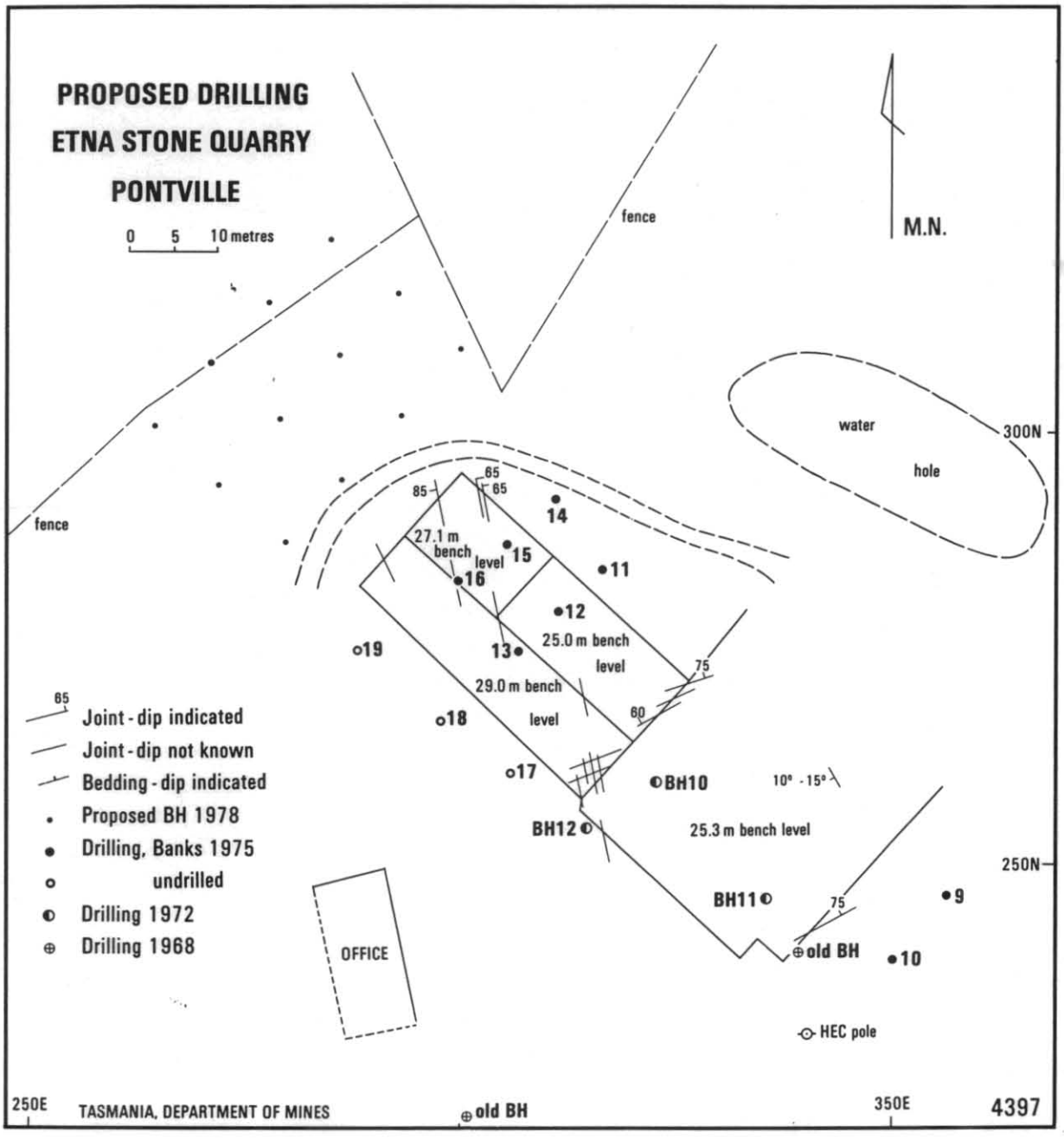

5 cm
PROPOSED DRILLING
ETNA STONE QUARRY
PONTVILLE
0 5 10 metres
fence
M.N.
water
hole
300N
fence
65
85
65
14
27.1 m
bench
level
15
16
11
12
25.0 m bench
level
19
13
29.0 m bench
level
75
18
60
17
BH10
10° - 15°
BH12
25.3 m bench level
250N
BH11
75
9
old BH
10
OFFICE
HEC pole
65
Joint - dip indicated
Joint - dip not known
Bedding - dip indicated
Proposed BH 1978
Drilling, Banks 1975
undrilled
Drilling 1972
Drilling 1968
250E
TASMANIA, DEPARTMENT OF MINES
old BH
350E
4397

Figure 3

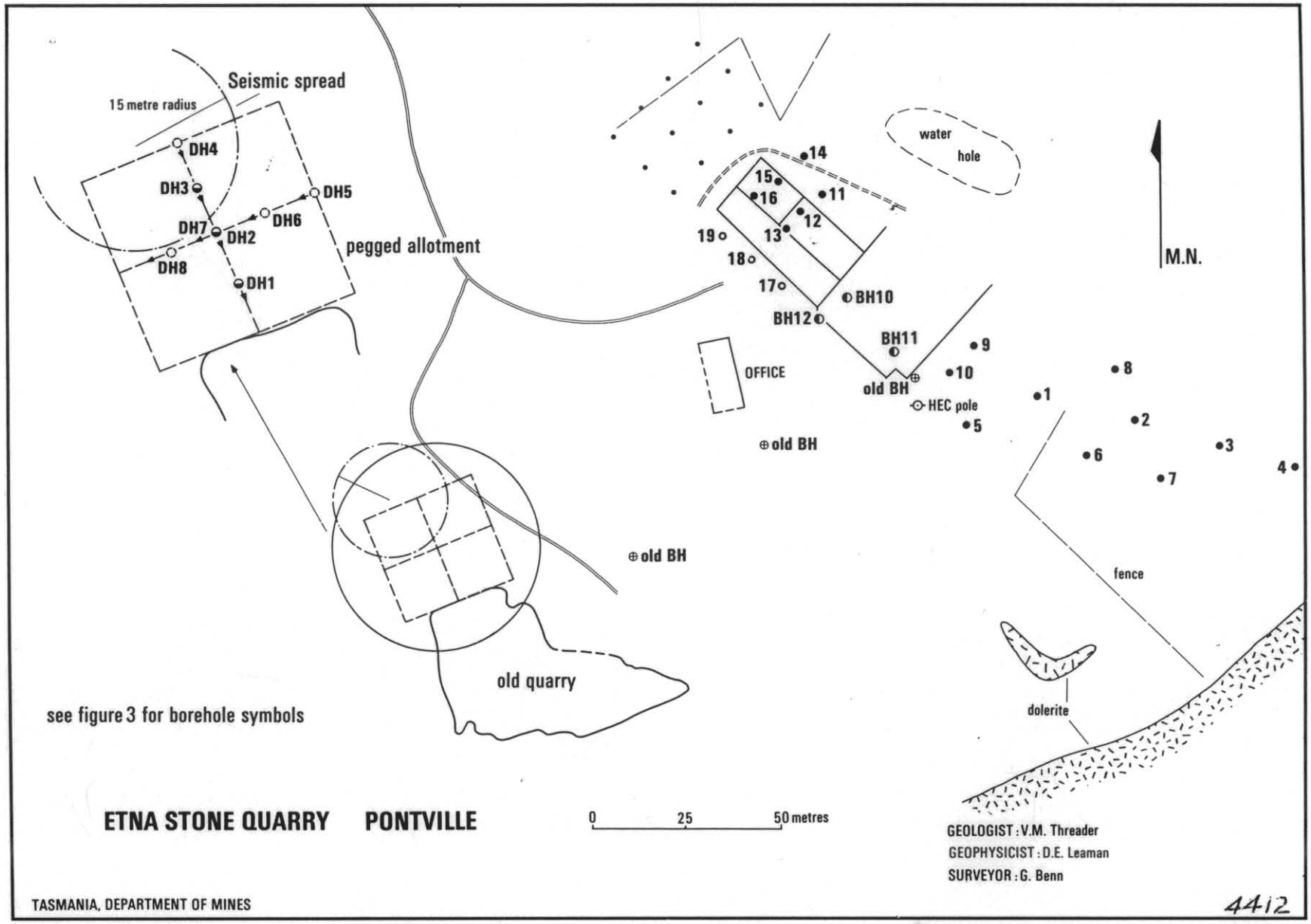


Figure 4

5 cm

5-6

6/7

APPENDIX 1

Summary of reports on the Etna Stone quarry, Pontville.

Date	*Author*	*Subject*	*Remarks*
11. 3.68	M.R. Banks	Petrological descriptions of sandstone.	
4. 4.68	V.M. Threader	Core logging.	4 holes were drilled at sites chosen by G. Giordano, who retained the core for testing.

THREADER, V.M. 1969. Proposed quarry at Pontville. *Tech.Rep.Dep.Mines Tasm.* 13:20-21.

19.12.69	G. Everard	Petrological descriptions.	An attempt to ascertain the cause of differences in resistance to weathering.

EVERARD, G.B. 1971. Notes on specimens collected at various localities; 36, Pontville. *Tech.Rep.Dep.Mines Tasm.* 14:141-142.

26.10.70	R. Bender	Physical testing.	A comparison of Etna Stone with stones from other (local) sources. (Unpublished report, Public Works Department).
October 1971	P.W. Baillie	Petrological descriptions.	Private report for G. Giordano.
18. 2.72	V.M. Threader	Search for white sandstone.	Geophysics and diamond drilling at site chosen by G. Giordano. 12 holes drilled, No. 8 not plotted (sited near entrance).

LEAMAN, D.E.; THREADER, V.M. 1974. Seismic survey and diamond drilling at Pontville Stone quarry. *Tech.Rep.Dep.Mines Tasm.* 17:34-37.

April 1972	M.R. Banks	Search for white stone.	Report on the drilling of a further 3 holes.
21. 3.73)))) 30. 4.75)) 12.12.75)	M.R. Banks	Comprehensive geological report.	Under new management and entire operation under review.
13. 2.78	V.M. Threader (This report)	Further drilling for reserves.	Implementation of recommendation by Banks (1975).