

1979/21. Gravel workings at Royal George, Municipality of Fingal

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### Abstract

Investigations of an area for a gravel pit at Royal George indicates a weathering mantle of 0.5 - 1 m of gravel and clay overlying granite, yielding about 12 000 m<sup>3</sup> of clean quartz gravel. Future mining should be closely controlled to prevent a repetition of previous unsatisfactory practices.

### INTRODUCTION

A gravel pit located east of Royal George on the Royal George Road [EP743695] has been investigated at the request of the Fingal Municipal Council. It is claimed that the pit is worked out and the Council has applied to the Department of Lands for land south of the old workings.

### HISTORY

The workings occupy an area of about 5 ha, but are spread out over a much greater area. The Fingal Council, Department of Main Roads and Tasmanian Pulp and Forest Holdings have all worked in this area, with the result that the resource has been badly mined. It is estimated that 15 000 m<sup>3</sup> of gravel has been won from these workings and that at least as much again has been left between the scattered pits and in the heaped up material along the pit boundaries. The old workings are badly eroded, with gullies exposing bedrock granite. This has caused flooding in a house in Royal George and causes clay to be washed over the main road which runs along the northern boundary of the area.

### GEOLOGY

The area is composed of granite which is covered by a mantle of weathered material 0.5 - 1 m thick. This consists of 50 - 200 mm of soil, 200 - 600 mm of quartz gravel and 200 mm of clayey quartz gravel. The quartz gravel has had the original clay removed, partly by surface run-off and partly by percolating groundwater which deposited clay in the lower layer.

The mining practice has been to strip the soil and quartz gravel together for road sealing purposes and to incorporate this with some of the clay rich lower layer for gravel roads.

### MATERIAL TESTING

23 test pits were dug by the Fingal Council using a backhoe. The locations of the pits and gravel thicknesses are indicated on Figure 1 and in Table 1. The samples referred to were subjected to sizing analysis and the results are indicated on the sizing curve envelope (fig. 2), which comprises all of the clean quartz gravel samples. The mean particle size is 1 mm, corresponding to coarse sand. The largest particle size was 7 mm and fines content was 10%.

### RESERVES

It is estimated that 12 000 m<sup>3</sup> of clean quartz gravel lies in the 7.5 ha area drilled to the south of the old workings. This is a yield of 1600 m<sup>3</sup>/ha and is lower than that estimated for the worked out area. While it is difficult to estimate the yield accurately on the basis of a few test

pits, it could be expected that mass movement downslope could account for the difference. If a slightly more clayey product is required, the yield could be doubled, or even trebled by incorporating varying amounts of the underlying clayey gravel bed.

The thinness of this deposit will necessitate careful mining to prevent a repetition of the untidiness evident in the old workings. The stripping operation can be better controlled using bulldozers rather than backhoe/loader machines as has been done in the past.

#### RECOMMENDATIONS

It is recommended that;

(1) Future workings to be confined to small areas at a time (50 m squares), soil to be stripped and stockpiled, gravel removed and soil replaced before commencing new pits. Rehabilitation thus keeps pace with mining, the visual impact of mining is minimised and erosion gullies are prevented.

(2) Future mining should be properly charted so that workings are confined to specific areas and do not meander along tracks into private property as has happened in this case.

(3) Future mining to be allowed only in areas for which a Department of Mines stone lease is held. In this way, proper supervision of the environmental aspects of the operation can be maintained. It is felt that a more efficient operation would lead to a better resource management.

(4) Some erosion prevention is urgently needed in the old workings. The area will continue to give trouble unless the drainage is channeled off the slopes and away from the erosion gullies. It is further recommended that the old pits be filled in, planted and closed off to allow their rehabilitation and to prevent their continued use as waste disposal areas.

[9 July 1979]

Table 1. SUMMARY OF TEST PIT DATA

Pit	Thickness (mm) *				Remarks
	Soil	Gravel	Clayey gravel	decomposed granite	
1	50	250/22	680/1	50	
2	100	150/21	1000	500	
3	100	200/20	700	mostly clay	
4	100	300/18	500	100/4	
5	200	200/19	200	200/5	
6	50	150		1050/6	
7	50	350/7		200	
8	50	350/8		200	slight gully, gravel clayey
9	50	150/9	200		pure clay at bottom of hole
10	50		200		
11	50	450/10	250		
12	50	200/11	500		
13	50	350/12	100/13		
14	50	250/14	200		
15	50	400/15	150/16		
16	50	250/17	250		
17	50	400/23	550		
18	50	150/24	100		100 mm fragments on surface
19	50	350/25	150		mostly clay at bottom
20	50	300/26	350/27		
21	50	350/28	250		
22	500	clay, no gravel			
23	350	with scattered grit/29		150/30	microgranite at bottom

\* 350/12 = thickness of deposit (mm)/sample number

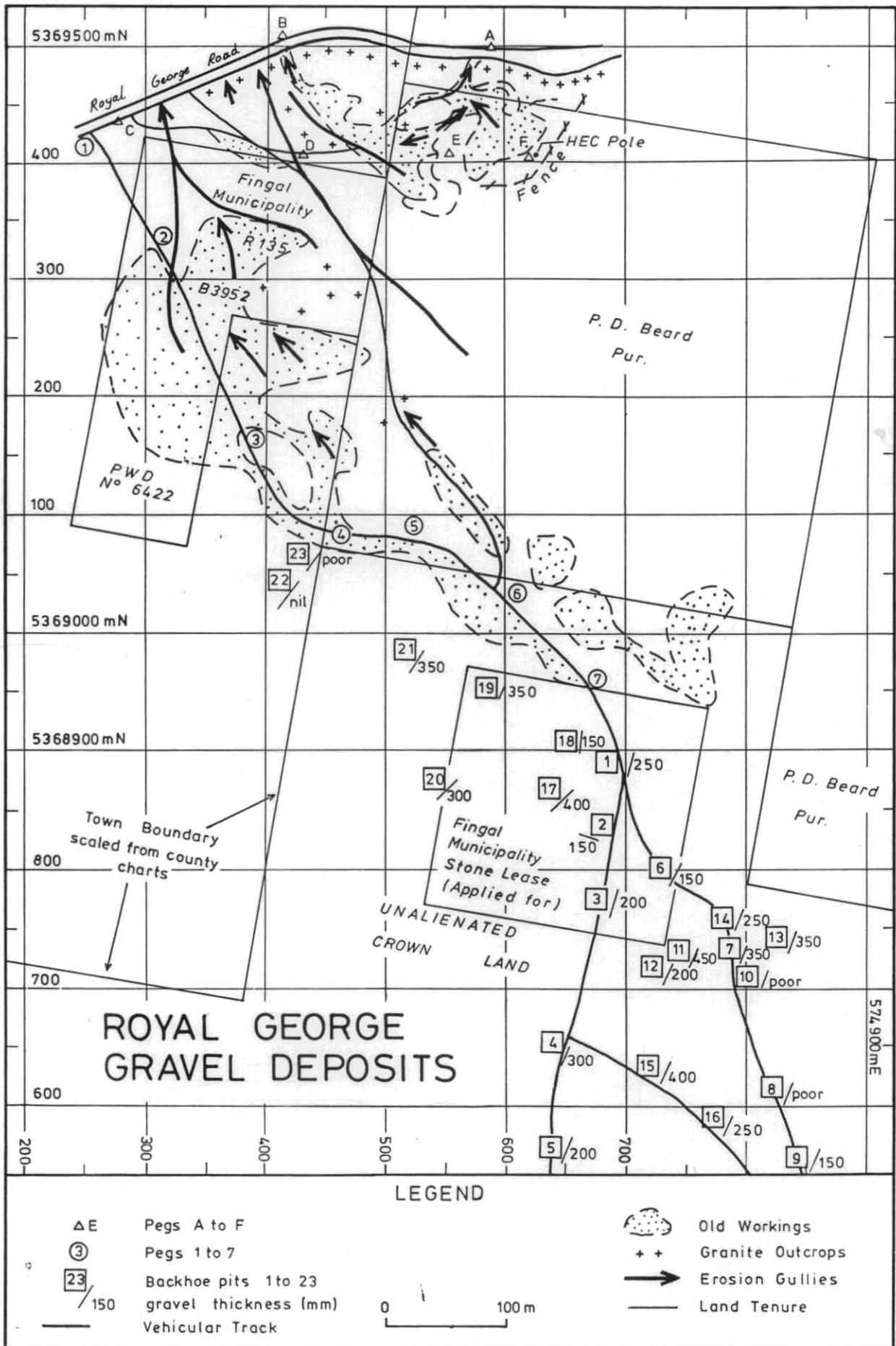


Figure 1.

REFERENCE No.	LAB. SERIAL No.	LOCALITY				SEDIMENT ANALYSIS PARAMETERS								
1979/21		ROYAL GEORGE GRAVEL PIT				M =	V =	Sk =	K =					
COARSE AGGREGATE			FINE AGGREGATE			A77-1957 (concrete)								
COARSE AGGREGATE		FINE AGGREGATE		BINDER		N.A.A.S.R.A. (road materials)								
COBBLE	PEBBLE		GRANULE	SAND					SILT					
				V. COARSE	COARSE	MEDIUM	FINE	V. FINE						
-6	-5	-4	-3	-2	-1	0	1	2	3	4	5	6 $\phi$		
75	53	37.5	26.5	19	9.5	4.75	2.36	1.18	0.6	0.3	0.15	0.075	0.038	Aust. Stand. Sieve

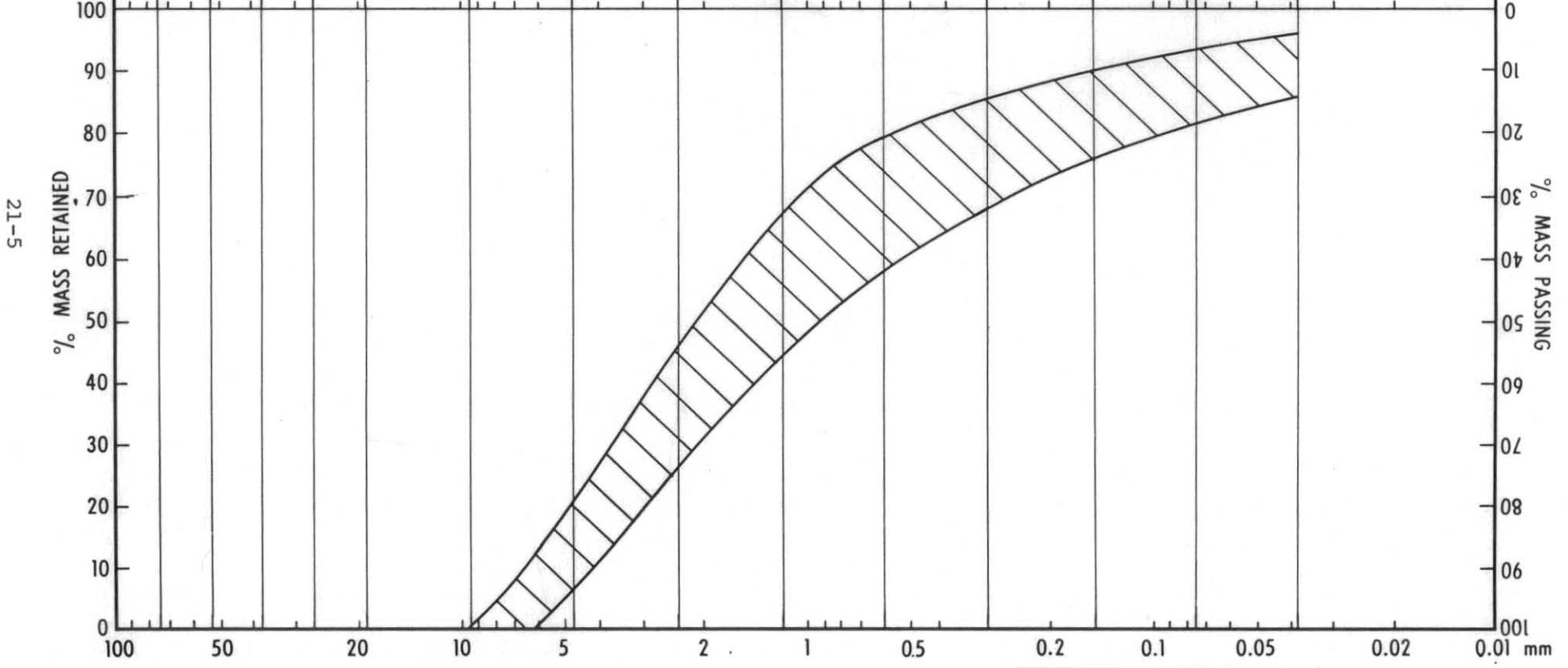


Figure 2. Sizing curve envelope, Royal George gravel deposit

