

Alanvale trunk sewer.

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A sewer main is being laid in a five foot trench through gravels on the property of Mr R.C. Archer, Newnham. Mr Archer is claiming unspecified damages due to loss of revenue from the gravels remaining in his gravel pit and made inaccessible by these works. The location of the gravel pit and the proposed sewerage line are shown in Figure 1.

Gutteridge, Haskins and Davey Pty Ltd set out a pattern of bore hole sites (fig. 2) which were drilled by Mono Pumps (Aust.) Pty Ltd using a rotary machine and tricone bit. A series of samples were collected by the driller and drillers logs have been provided.

The area of interest is situated on a river terrace bounding the Tamar flood plain (fig. 1). A 12 ft working face has been established on the edge of the terrace, approximately 150 yd in length. A typical cross-section would be:

Rock type	Thickness (ft)
Soil	1
Clayey gravel	1
Clay	5
Gravel	5
	<hr/>
	12
	<hr/>

The owner states that only the lower gravels are of interest. This lower gravel bed contains rounded quartz pebbles of an average size of 1-2 inches in a matrix of sand and clay. It is stated by the owner to be of marginal quality and unsuitable for use as concrete aggregate or road pavement construction under seal.

The samples provided were analysed by the Department of Mines laboratory for silt-clay content by sedimentation and expressed as $-20 \mu\text{m}$ fraction. The results of the analyses are given in Table 1. As a rough guide, a gravel should contain less than 10% of this fraction. It is estimated that in the area indicated in Figure 2 there are $10,000 \text{ yd}^3$ of material with less than 25% of this fraction and that the overburden cover is approximately the same amount giving an overburden ratio of 1:1. The analytical results are compared with the drillers logs on the accompanying cross-sections (fig. 3) where it can be seen that half of the hachured area (less than 25% silt and clay) is described as fine wash and should therefore be subtracted from the total, thus proportionately increasing the overburden ratio.

The drilling and sampling methods used were unsuitable for this type of work. Gravel beds should be drilled by auger or percussion drill and bailer or opened up by trench digging equipment. The tricone bit produced samples of grindings in which the original shape and size of the constituent particles were destroyed. The availability of drillers logs made it possible to interpret the sampling results to give a rough estimate of the reserves in the area, indicated at $5,000 \text{ yd}^3$ of marginal quality gravel with an overburden ratio of 2:1.

[3 February 1972]

Table 1. SILT-CLAY ANALYSIS FROM ARCHER'S GRAVEL PIT.

Reg. No.	Bore Hole No.	Depth (ft)	Percentage -20 μm
720042	1	5.5-6.5	71.6
720043	1	8.0-9.0	36.4
720044	1	9.0-10.0	21.3
720045	1	10.0-12.0	25.0
720046	1	13.8-15.0	19.8
720047	1	15.0-20.0	21.0
720048	1	20.0-25.0	22.7
700107	2	5.0-7.0	3.9*
720108	2	9.3-10.0	32.8
720109	2	10.0-15.0	29.0
720110	2	15.0-25.0	35.2
720142	3	2.0-5.0	16.2
720143	3	6.0-7.5	13.3
720144	3	8.0-10.0	36.2
720145	3	12.0-15.0	64.4
720146	3	15.5-17.5	64.0
720147	3	19.0-20.0	64.5
720116	4	3.0-4.0	27.0
720117	4	6.0-7.0	30.9
720118	4	7.5-8.5	40.7
720119	4	9.0-10.0	41.7
720120	4	10.5-11.5	51.0
720121	4	12.0-13.0	59.5
720122	4	14.5-15.5	54.7
720123	5	3.0-4.0	10.0
720124	5	6.0-7.0	15.0
720125	5	8.0-10.0	22.1
720126	5	10.0-12.0	21.8
720127	5	12.0-15.0	35.6
720128	6	8.5-10.0	10.4
720129	6	15.0-16.5	22.3
720130	6	16.5-17.5	21.2
720131	6	19.0-20.0	50.0
720148	7	4.0-5.5	56.2
720149	7	8.0-10.0	10.1
720150	7	10.0-12.0	27.6

* Drill core of rock

SITE OF ARCHER'S GRAVEL PIT AND THE PROPOSED SEWERAGE LINE.

- OM2/20 Survey peg
- Future sewerage line
- / — Boundary fence
- ~ Contour
- - - - -> Creek

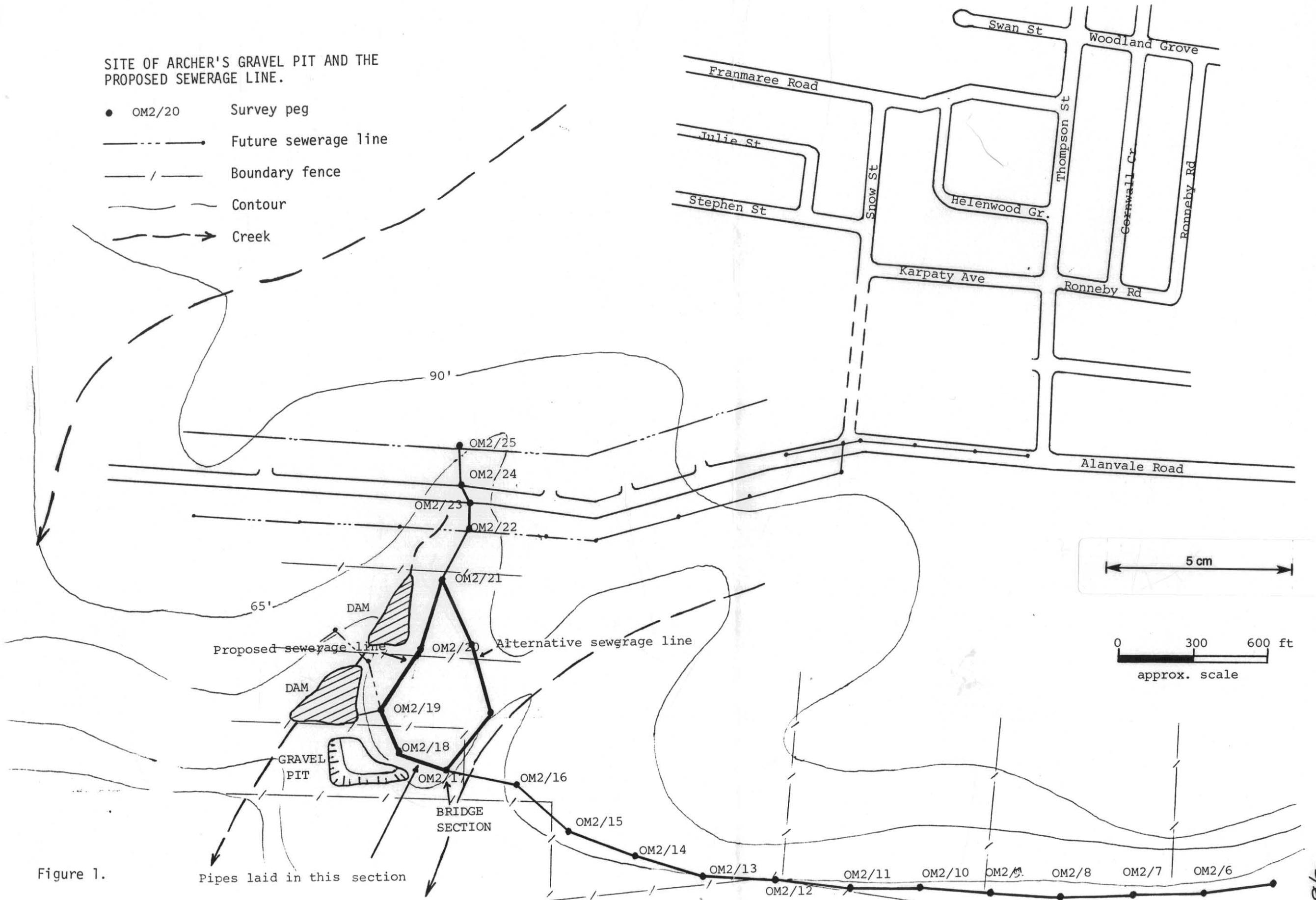
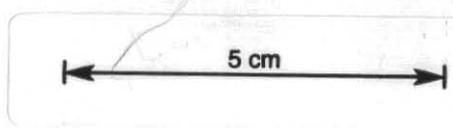


Figure 1.

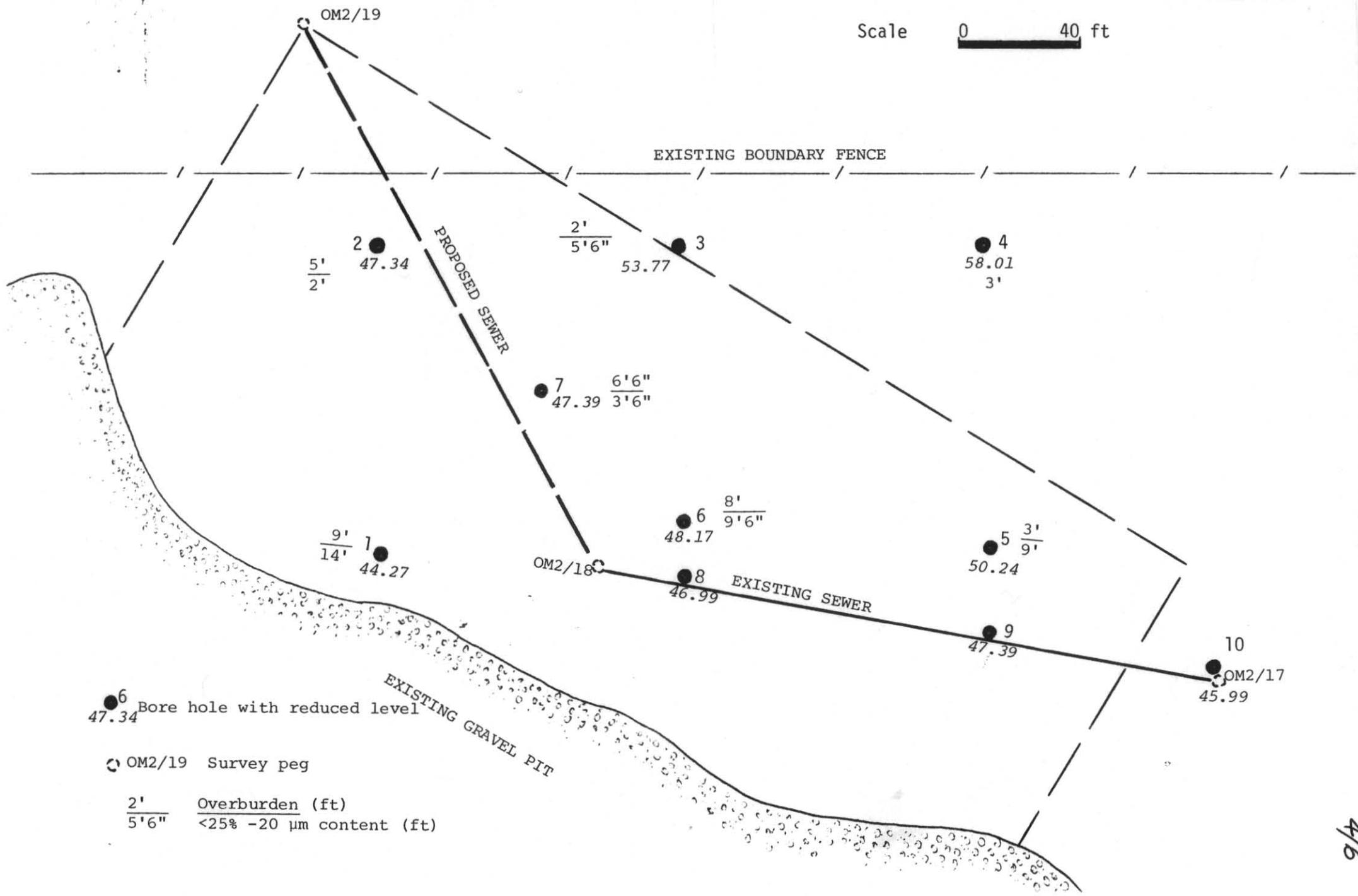
Pipes laid in this section

Figure 2.

PLAN OF BOREHOLE LOCATIONS



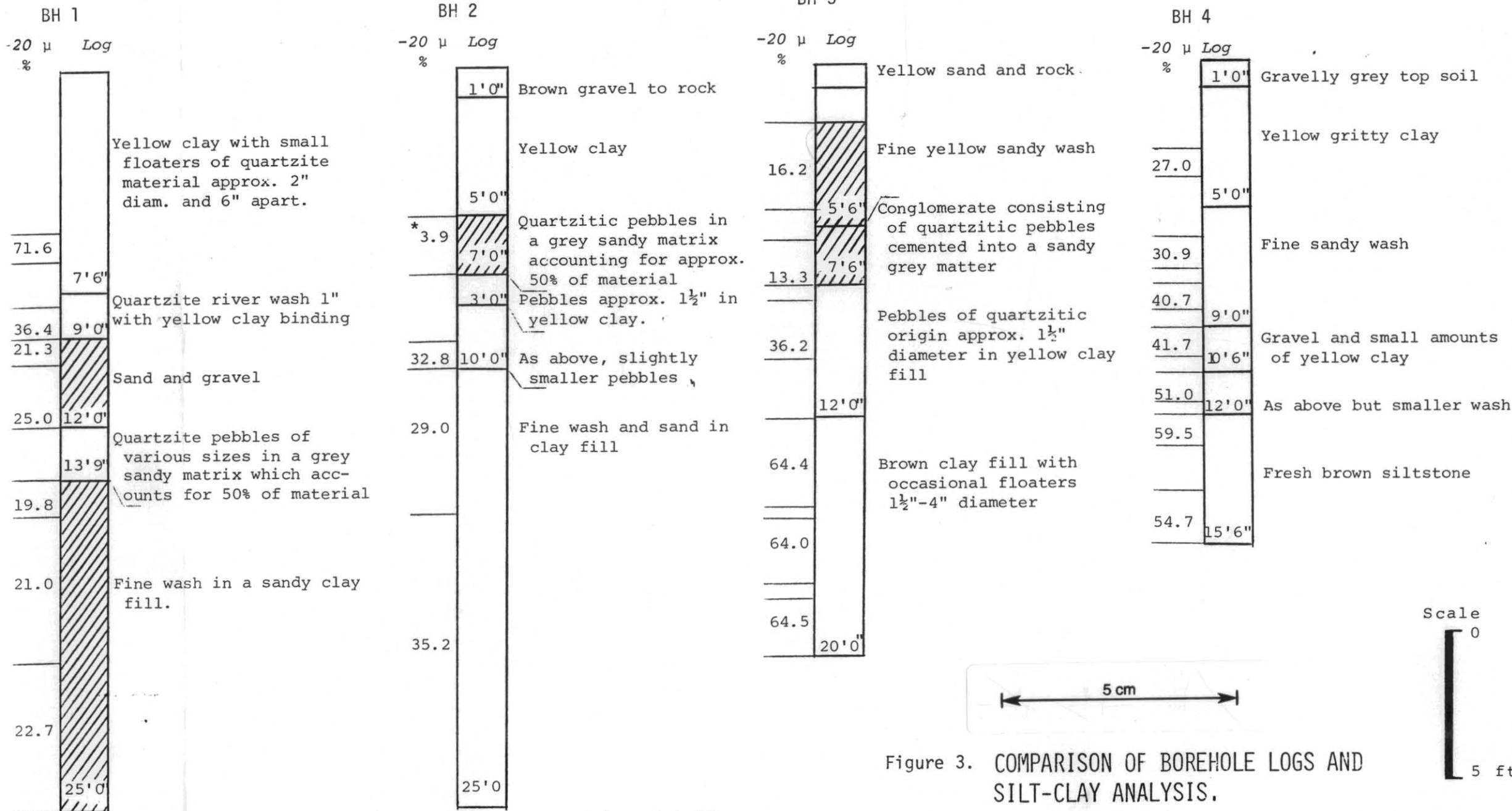
Scale 0 40 ft



● 6 Bore hole with reduced level
47.34

⊙ OM2/19 Survey peg

$\frac{2'}{5'6''}$ Overburden (ft)
<25% -20 μm content (ft)



*This sample was a section of drill core and so probably related to the

Figure 3. COMPARISON OF BOREHOLE LOGS AND SILT-CLAY ANALYSIS.

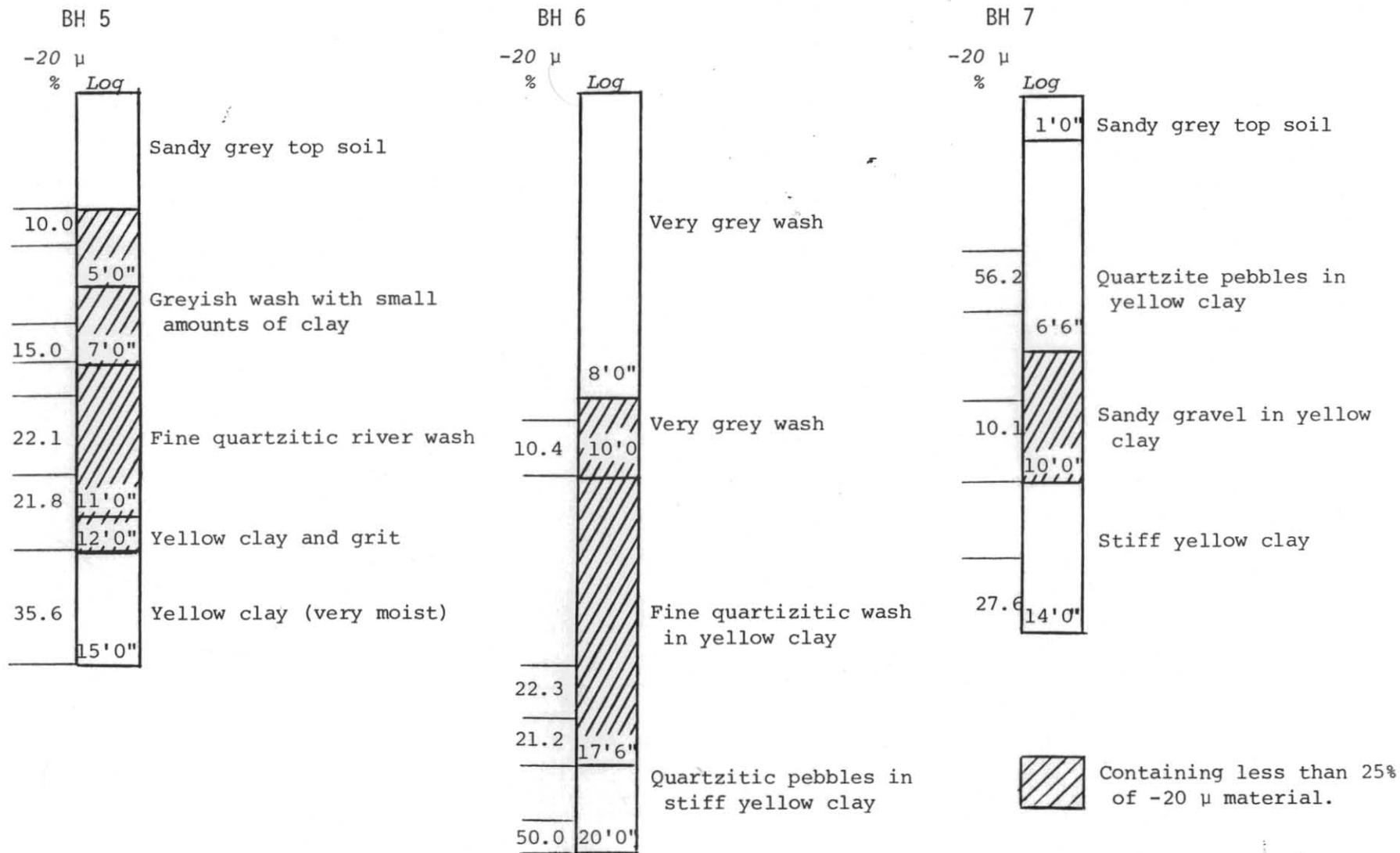


Figure 3. (continued)