

UR1981-36

1981/36. A sand resource on the Coles Bay Road.

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Abstract

A recoverable reserve of 200 000 m<sup>3</sup> of coarse sand has been proved using a 100 m grid test pitting programme.

A refraction seismic survey was carried out in the area prior to the operation for comparative purposes.

The seismic method detected the main layer interfaces but did not distinguish between the upper layer of usable sand and the lower unusable sandy clay. The seismic method would be useful for regional sand prospecting but it would not be practicable to reduce geophone spacing to provide additional detail.

The area [around FP025512] is bounded by a creek, a lagoon and a tourist road and would be subject to frequent flooding if worked out, a more suitable site should be sought for long term use.

INTRODUCTION

The Lands Department wishes to confine the mining of sand on Coles Bay Road to a 30-40 ha area bounded by Rogers Creek, Moulting Lagoon and Coles Bay Road.

This area has been mined for some years already. The workings are unsightly and it was hoped that a management plan could be evolved which would lead eventually to a lessening of the environmental effects of mining in the area which is adjacent to a main tourist route.

METHOD

A 100 m grid was marked out over about 30 ha (figs. 1-3) by the Lands Department and levels were obtained from an earlier Department of Main Roads map, the datum for which was mean sea level.

Sand workings indicated on the maps are taken from aerial photographs of March 1980 and are slightly out of date. Sand mining in the intervening 15 months has been mainly confined to the pits along the southern access track.

Test pits were dug by backhoe on the grid intersections and were terminated either at the bottom of the sand layer or when water was struck. Additional information was obtained using a Stihl power auger at some locations (see Table 1).

A seismic survey was requested prior to the backhoe operation for comparative purposes. If a satisfactory correlation of results could be obtained then the seismic method would be employed to explore other areas.

GEOLOGY

The area is a piedmont plain with a gentle slope towards Moulting Lagoon in the south. The source area was a range of hills 2-3 km to the east consisting of Jurassic dolerite, Permian sediments and Devonian granite.

Bedrock was not intersected in any of the pits but is presumably dolerite which is widespread in the vicinity and crops out on the east side of Coles Bay Road. Dolerite also occurs on the surface near the southern end of the sand deposit but may be talus.

The material in the test pits was medium to coarse sand of probable granitic origin consisting of an upper leached layer and a lower clay-enriched layer usually with a gradational contact. Water was struck at about this level but several of the holes in the north and east of the deposit were dry (fig. 3, 4).

The most desirable sand for building purposes has a fines content of less than 5% which limits the usable material to the upper layer in these pits. The thickness of this layer is given on the isopach map (fig. 1). As shown on the sections, the bottom of the sand roughly parallels the land surface indicating that it is a weathering effect (leached zone) except in the vicinity of pits 15, 20, and 26 which may indicate a possible old drainage channel. Some samples from this area contained traces of heavy mineral.

#### SEISMIC SURVEY

In a seismic survey by Leaman (1980) 55 m reciprocal seismic spreads were centred on ten of the test pit sites. The sites are shown on Figure 1 and the results in Table 1.

Velocity ranges indicating six layers were recognised.

<i>Layer</i>	<i>Seismic velocity (m/s)</i>	<i>Description</i>
1	300- 600	sand
2	750-1100	cemented sand
3	1200-1250	wet sand
4	1800-2000	clay
5	2300-3000	decomposed bed- rock
6	>3000	bedrock

There was a clear distinction between pure sand and pure clay but not between pure sand and impure (clayey) sand. Seismic velocities in the range 600 to 1800 m/s reflect the degree of cementation, degree of impurity and water content.

The method is however useful for exploration and would set upper limits to a deposit which could then be examined in detail by other methods.

#### SAND MINING

Two main areas have been worked. The northern workings occupy 60 000 m<sup>2</sup> and average 0.5 m in depth, the southern workings (along an access track just north of the lagoon) occupy 15 000 m<sup>2</sup> and average 1.5 m in depth; a total of 52 500 m<sup>3</sup> for the two areas. There has been little attempt at systematic mining which is due mainly to the fact that several contractors are independently working in the same area, some illegally. The southern workings are in current use and, when visited in May 1981, the access track appeared to be in imminent danger of collapse as a result of extended sand workings. This could have serious consequences as contractors would seek a new access further to the south by felling some of

the timbered barrier protecting the lake shore. Access on the north side of these southern workings would not be preferred as this area is swampy and inaccessible for part of the year.

Sand mining in this area is not apparent on the 1949-50 aerial photographs so it can be assumed that the 52 500 m<sup>3</sup> has been mined in the last 30 years (i.e. 1750 m<sup>3</sup> per annum). Earlier production was probably quite small, with perhaps amounts of 5000 m<sup>3</sup> per annum in more recent years. This is conjectural but in the absence of reliable production statistics it is difficult to predict future demand.

SAND RESERVES

The resource area is delineated by the one metre sand isopach and by reserves to protect the road, creek and lagoon (fig. 1). Within this area, the various subsections representing workings and thickness zones have been measured by planimeter and the results are given in Table 2.

A reserve of 290 748 m<sup>3</sup> of recoverable sand has been proved for this area.

A separate calculation has been made for the southern area delineated by the zero base of sand contour (figs. 1, 2). 87 055 m<sup>3</sup> or approximately 30% of the reserve lies in this area. If this were removed, the shore of Moulting Lagoon would move inland to this line and about 6.5 hectares would be inundated (area III of table 2 and the foreshore reserve).

Excluding this area from the reserve leaves a balance of 203 693 m<sup>3</sup> (recoverable). Some of area III could be mined, indeed some of the southern workings have already reached sea level but it would be prudent to base a management plan on the exclusion of further mining in this portion of the area.

This reserve of 200 000 m<sup>3</sup> (or more) could be mined for 20 years at a production rate of 5000 m<sup>3</sup> per annum and so appears to be adequate for the local industry.

This area has disadvantages as a long term sand resource and steps should be taken to locate a more suitable site. In the meanwhile mining could continue at this site provided certain constraints were exercised. The area is part swampland and can only be worked during prolonged dry periods. Even if the mining and rehabilitation are carefully controlled, the land surface will be lower and the swampiness increased. The area could most likely become a series of semi-permanent lakes if worked out.

MANAGEMENT PLAN

The management plan should include the following provisions:

- (1) Mining to cease in the southern portion
- (2) The mining reserve to be enclosed
- (3) Rehabilitation of worked areas outside reserve
- (4) Partition of reserve into 100 m blocks to be mined one at a time and rehabilitated before a new block is commenced
- (5) Mining and rehabilitation to be continuous with stripped overburden spread on the worked out area.

- (6) Workings to extend to full depth to be mined so that the area is not left with a scattering of shallow depressions separated by hillocks of waste.
- (7) One person to be responsible for the operation, either one of the contractors or preferably a contractor employed by the Lands Department who would also load contractors trucks and keep production records.
- (8) Royalty charged to be adjusted to cover the additional costs of enclosure and operation.

The above is recognised as a departure from past mining practice on Crown land but the procedure is considered to be the only way that the State's resources can be fully utilised, the land rehabilitated, illegal mining prevented and a reasonable payment made for the commodity.

REFERENCE

LEAMAN, D.E. 1980. Feasibility refraction survey, Moulting Lagoon sand reserve. *Unpubl.Rep.Dep.Mines Tasm.* 1980/32.

[26 June 1981]

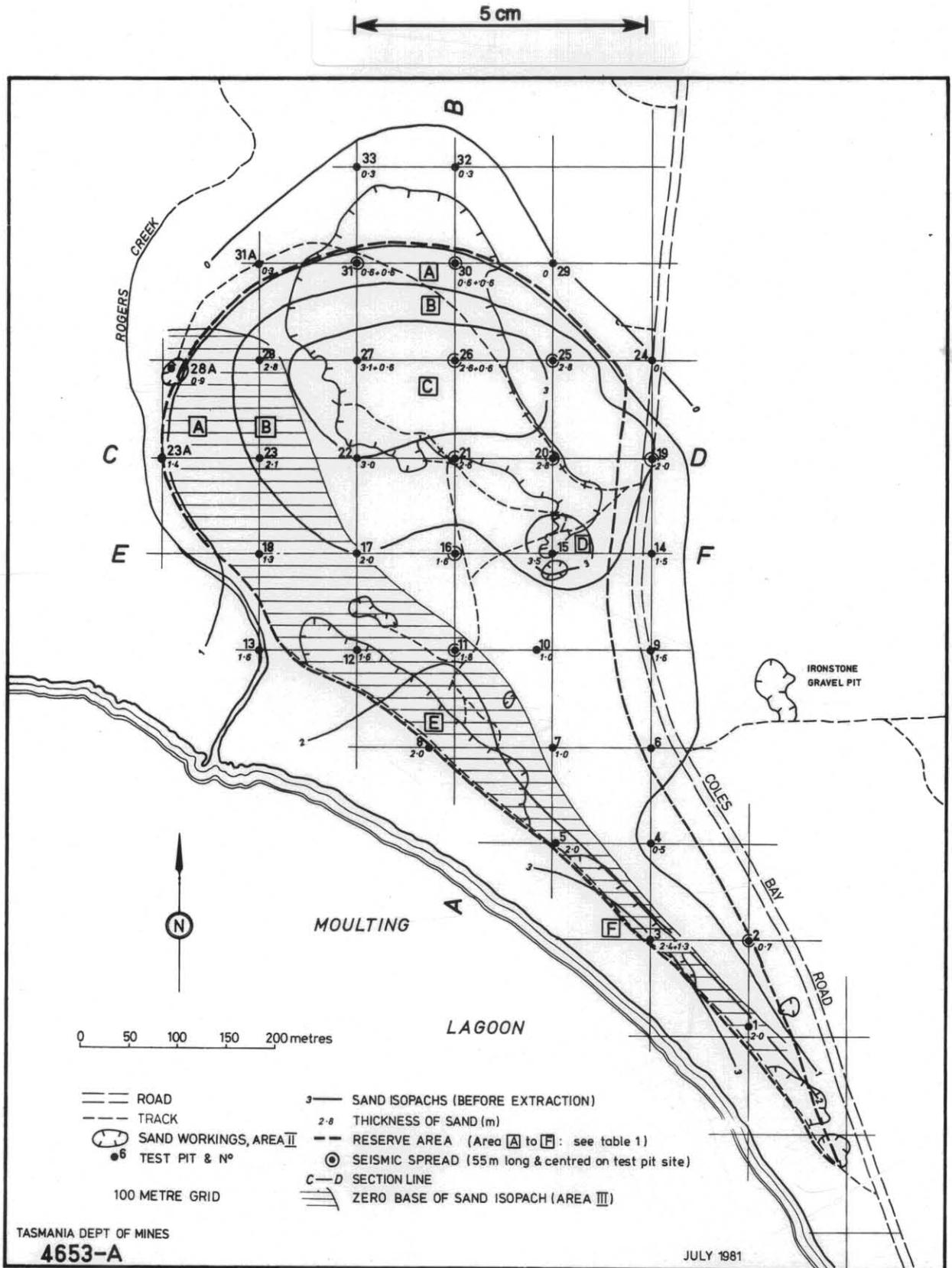


Figure 1. Sand isopachs and seismic spreads.

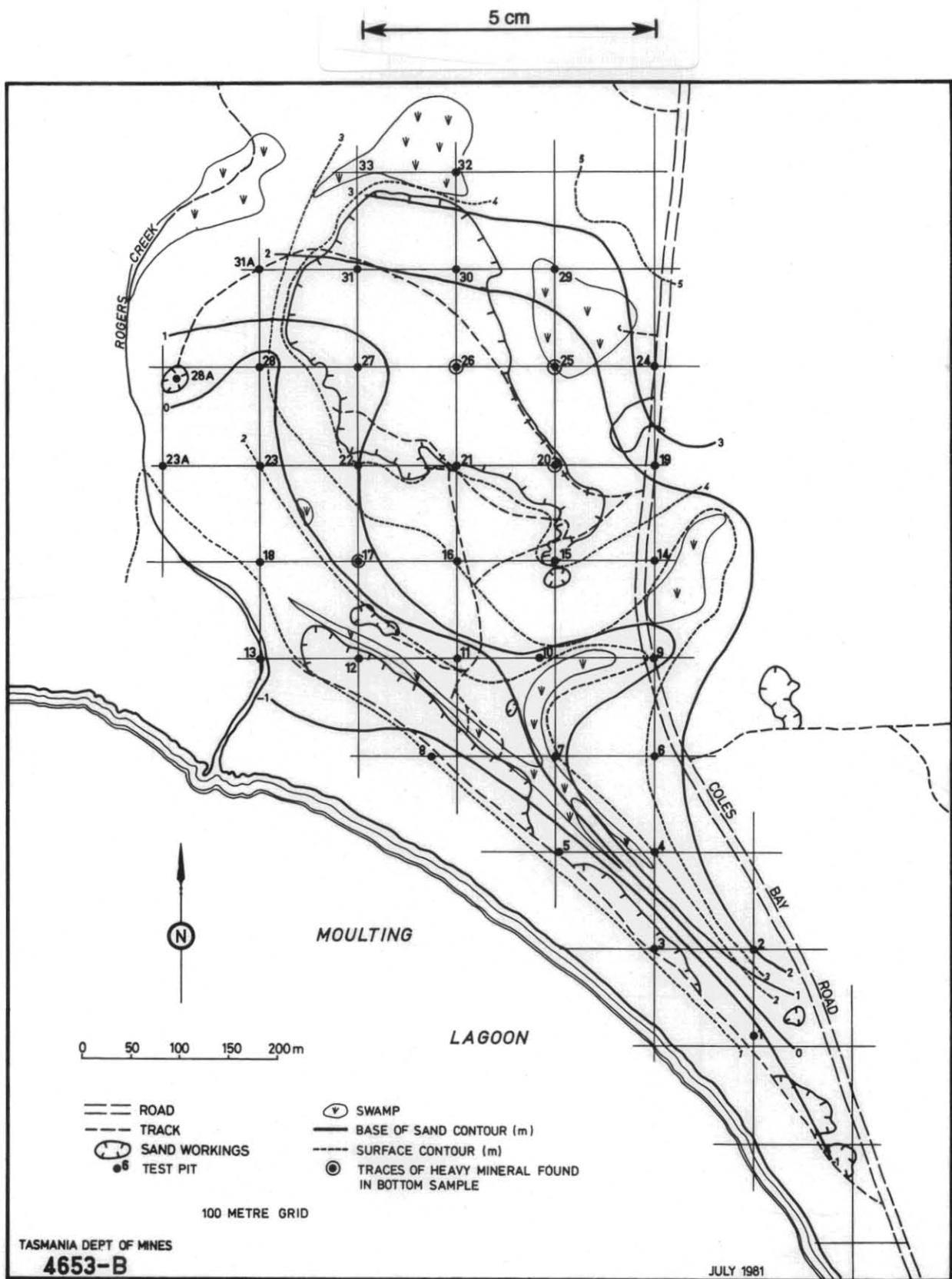


Figure 2. Base of sand contours.

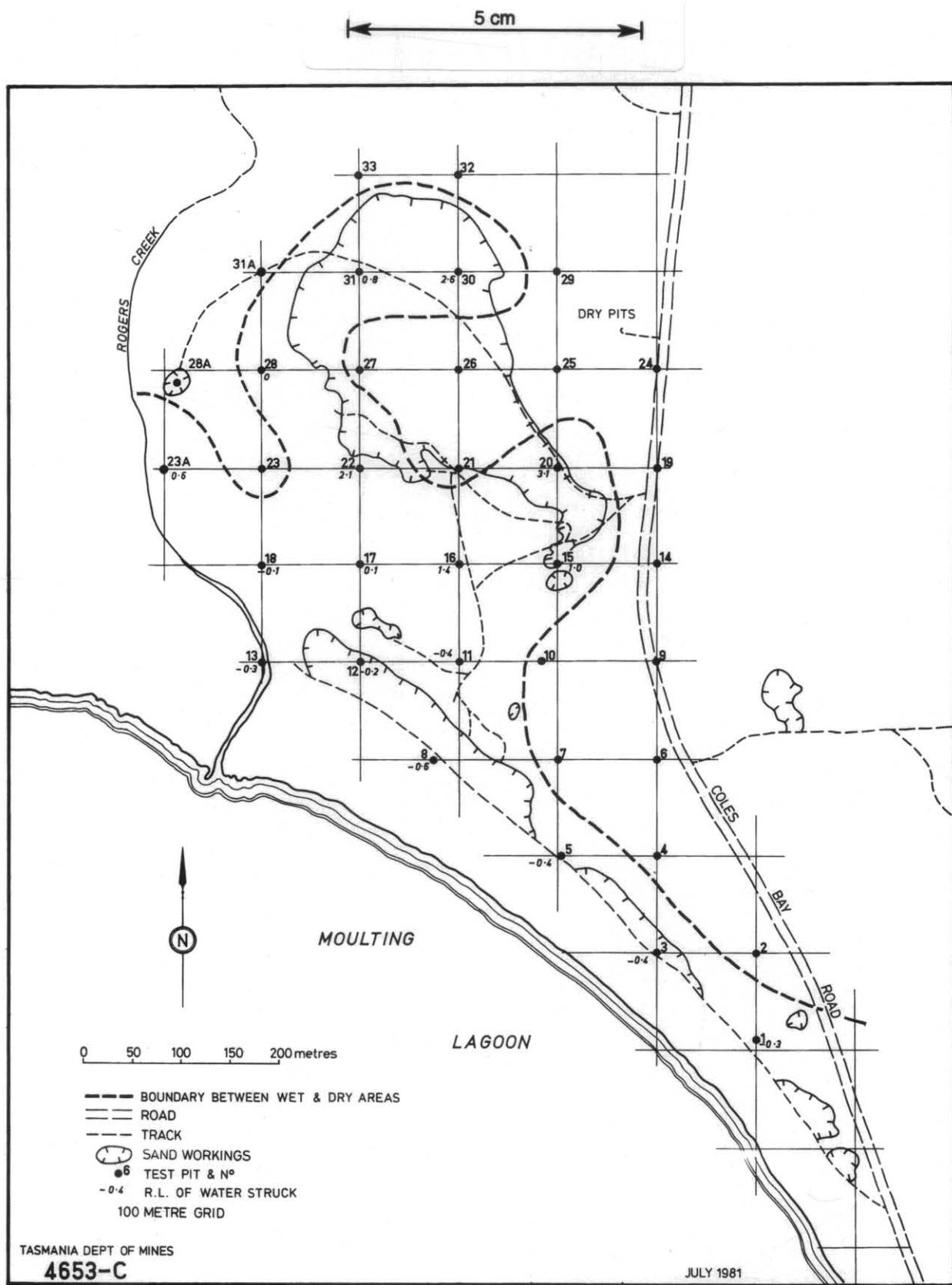


Figure 3. R.L. of water struck and boundary between wet and dry areas.

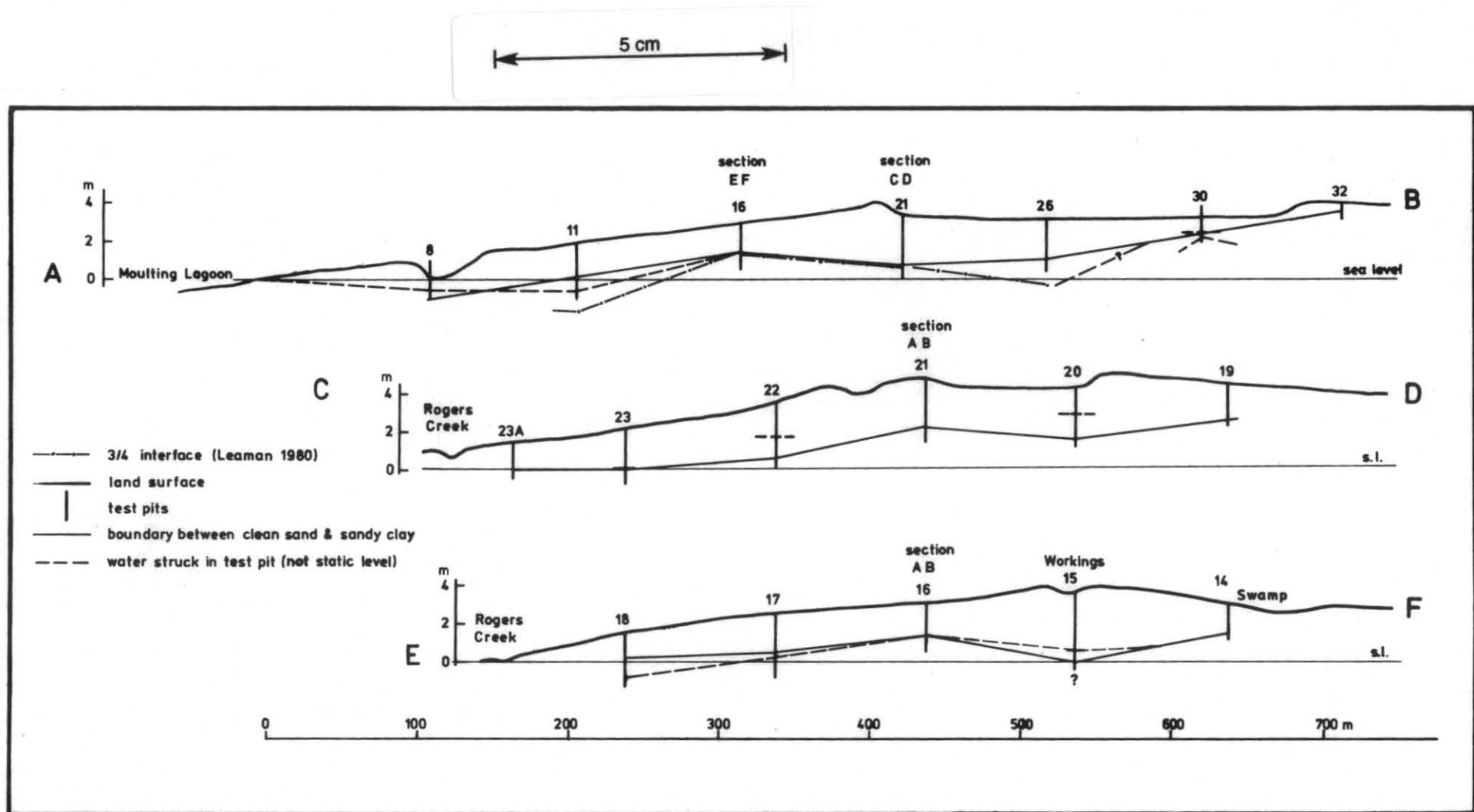


Figure 4. Sections A-B, C-D and E-F.

Table 1. DATA FROM PITS AND AUGER HOLES, SEISMIC INTERPRETATION AND CORRELATION

Site No.	Depth from (m)	Depth to (m)	Thickness (m)	R.L. surface (m)	R.L. bottom of sand (m)	Water level (struck) (m) <sup>1</sup>	R.L. water (struck) (m)	Seismic interpretation <sup>2</sup>	Sample No.	-75 µm content (%)	Description	Correlation pit/seismic <sup>3</sup>
1	0	0.25	0.25	1.4	-0.7	1.7	-0.3		1A	1.9	Fine sand	
	0.25	1.70	1.45								Coarse sand	
	1.70	2.10	0.40								Coarse sand grading into sandy clay	
	2.10	2.15	0.05						1B	88.3	Clay	
2	0	0.60	0.60	3.0	2.3	-	-	2.2 (2/3)	2	11.5	Fine black sandy soil	Poor
	0.60	0.70	0.10								Coarse white sand	
	0.70	0.80	0.10								Sandy clay	
3	0	1.60	1.60	1.2	-1.2	1.6	-0.4		3	0.5	Coarse sand	
	1.60	2.40	0.80								Coarse sand	
	2.40	2.50	0.10								Green-blue sandy clay	
4	0	0.30	0.30	2.0	1.5	-	-		4	0.4	Peaty soil	
	0.30	0.50	0.20								Coarse white sand	
	0.50	1.20	0.70								Sandy clay	
5	0	1.60	1.60	1.2	-1.8	1.6	-0.4		5A	0.5	Coarse sand	
	1.60	2.10	0.50								Coarse sand becoming clayey	
	2.10	2.20	0.10						5B	47.1	Green-blue sandy clay	

1-3 See notes at end of table.

36-9

08/16

Table 1. (continued)

Site No.	Depth from (m)	Depth to (m)	Thickness (m)	R.L. surface (m)	R.L. bottom of sand (m)	Water level (struck) (m) <sup>1</sup>	R.L. water (struck) (m)	Seismic interpretation <sup>2</sup>	Sample No.	-75 μm content (%)	Description	Correlation pit/seismic <sup>3</sup>
6	0	0.40	0.40	3.0	1.9	-	-	2.2 (2/3)	6A	5.0	Coarse white sand	Poor
	0.40	1.50	1.10						6B	7.8	Coarse red-yellow sand	
	1.50	1.60	0.10								Green-brown sandy clay	
7*	0	1.0	1.0	2.0	1.0	-	-				Sand	
	1.0	1.3	0.3								Clay	
8	0	2.00	2.00	1.0	-1.0	1.6	-0.4		8	0.4	Coarse sand	
9*	0	1.6	1.6	2.0	0.4	-	-				Sand	
	1.6	1.9	0.3								Sandy clay	
10*	0	1.0	1.0	2.0	1.0	-	-				Reddish sand	
	1.0	1.2	0.2								Red sandy clay	
11	0	0.40	0.40	2.2	-0.4	2.6	-0.4	3.7 (3/4)	11A	2.8	Medium white sand	Poor
	0.40	1.80	1.40						11B	3.6	Coarse-medium white sand	
	1.80	2.70	0.90						11C	23.8	Coarse white sand clayey at base	

\* Augered hole, no samples taken. 1-3 See notes at end of table.

36-10

10/20

Table 1. (continued)

Site No.	Depth from (m)	to (m)	Thickness (m)	R.L. surface (m)	R.L. bottom of sand (m)	Water level (struck) (m) <sup>1</sup>	R.L. water (struck) (m)	Seismic interpretation <sup>2</sup>	Sample No.	-75 μm content (%)	Description	Correlation pit/seismic <sup>3</sup>
12	0	1.60	1.60	1.4	-0.2	1.6	-0.2		12	0.7	Coarse sand	
13	0	1.20	1.20	0.9	-0.7	1.20	-0.3		13A	0.2	Coarse sand	
	1.20	1.60	0.40						13B	23.4	Peaty sandy clay	
	1.60	1.70	0.10									
14	0	0.50	0.50	3.0	1.5	-	-		14A	7.9	Coarse white sand	
	0.50	1.50	1.00						14B	2.5	Coarse red sand	
	1.50	1.60	0.10								Sandy clay	
15	0	0.50	0.50	4.0	1.3	3.0	1.0		15A	2.6	Coarse white sand	
	0.50	2.70	2.20						15B	2.1	Coarse red sand	
	2.70	3.50+	0.80+						15C	2.6	White sand	
16	0	0.20	0.20	3.0	1.4	1.6	1.4	1.7 (3/4)			Fine black sandy soil	Good
	0.20	0.50	0.30						16A	3.3	Coarse white sand	
	0.50	1.60	1.10						16B	5.0	Coarse orange-brown sand	
	1.60	2.50	0.90								Blue-brown sandy clay	

1-3 See notes at end of table.

36-11

11/30

Table 1. (continued)

Site No.	Depth from (m)	Depth to (m)	Thickness (m)	R.L. surface (m)	R.L. bottom of sand (m)	Water level (struck) (m) <sup>1</sup>	R.L. water (struck) (m)	Seismic interpretation <sup>2</sup>	Sample No.	-75 µm content (%)	Description	Correlation pit/seismic <sup>3</sup>
17	0	0.30	0.30	2.3	0.3	2.2	0.1		17A	4.6	Coarse white sand	
	0.30	0.90	0.60						17B	7.5	Coarse orange-brown sand	
	0.90	2.00	1.10						17C	3.5	Medium-coarse orange sand	
	2.00	3.50	1.50						17D	26.5	Green-blue sandy clay	
18	0	0.05	0.05	1.2	-0.1	2.2	-1				Fine off-white sand	
	0.05	1.30	1.25						18A	0.3	Coarse white sand	
	1.30	2.80	1.50						18B	19.8	Orange sandy clay	
19	0	0.50	0.50	4.7	2.7	-	-	2.4 (2/3)	19A	4.5	Coarse white sand	Fair
	0.50	2.00	1.50						19B	9.7	Coarse red sand	
	2.00	2.10	0.10								Green-white sandy clay	
20	0	1.40	1.40	4.5	1.7	1.4	3.1	3.4 (3/4)	20A	2.5	Coarse cream sand	Fair
	1.40	2.80	1.40								Coarse cream sand	
	2.80	3.00	0.20						20B	74.0	Green-blue sandy clay	

1-3 See notes at end of table.

36-12

08/21

Table 1. (continued)

Site No.	Depth from (m)	Depth to (m)	Thickness (m)	R.L. surface (m)	R.L. bottom of sand (m)	Water level (struck) (m) <sup>1</sup>	R.L. water (struck) (m)	Seismic interpretation <sup>2</sup>	Sample No.	-75 µm content (%)	Description	Correlation pit/seismic <sup>3</sup>
21	0	0.05	0.05	4.0	1.4	-	-	2.6 (3/4)			Fine black sandy soil	Good
	0.05	0.70	0.65						21A	2.3	Coarse white sand	
	0.70	2.10	1.40						21B	1.7	Coarse orange sand	
	2.10	2.60	0.50						21C	4.2	Fine sand	
	2.60	3.20	0.60					21D	18.2	Clayey sand		
22	0	0.8	0.8	4.0	1.0	1.9	2.1		22A	8.5	Coarse red sand	
	0.8	1.9	1.1					22B	6.7	Coarse white sand		
	1.9	3.0	1.1							Medium-fine white sand		
	3.0	3.5	0.5							Sandy clay		
23	0	0.5	0.5	2.0	-0.1	-	-				Fine brown soil	
	0.5	1.5	1.0							Soil and sand		
	1.5	2.10	0.60							Coarse mottled sand		
	2.10	2.80	0.70							Grey sandy clay		
23A*	0	1.4	1.4	1.2	-0.5	0.6	0.6				Sand	
	1.4	1.7	0.3							Clay		

\* Augered hole, no samples taken. 1-3 See notes at end of table.

36-13

13/20

Table 1. (continued)

Site No.	Depth from (m)	to (m)	Thickness (m)	R.L. surface (m)	R.L. bottom of sand (m)	Water level (struck) (m) <sup>1</sup>	R.L. water (struck) (m)	Seismic interpretation <sup>2</sup>	Sample No.	-75 µm content (%)	Description	Correlation pit/seismic <sup>3</sup>	
24	0	0.15	0.15	5.0	-	-	-		24	12.1	Clayey soil Mottled sandy clay		
	0.15	0.60	0.45										
25	0	0.5	0.5	4.5	1.7	-	-		25A	5.0	Coarse white sand		
	0.5	1.5	1.0						25B	7.8	Coarse orange sand		
	1.5	2.8	1.3						25C	6.1	Coarse and fine cream sand		
	2.8	3.0	0.2						25D	16.7	Coarse clayey sand		
	3.0	3.1	0.1										Clay
26	0	1.20	1.20	3.5	1.6	-	-	3.4 (3/4)	26A	3.1	Coarse white sand	Poor	
	1.20	1.90	0.70						26B	2.5	Coarse mottled sand		
	1.90	2.40	0.50						26C	16.2	Fine mottled sandy clay		
	2.40	2.60	0.20										Fine mottled sandy clay
27	0	0.40	0.40	3.5	0.4	-	-		27A	0.5	Coarse white sand		
	0.40	1.40	1.00						27B	8.5	Coarse orange sand		
	1.40	3.10	1.70										Coarse white sand
	3.10	3.20	0.10										Red sandy clay

36-14

1-3 See notes at end of table.

Table 1. (continued)

Site No.	Depth from (m)	Depth to (m)	Thickness (m)	R.L. surface (m)	R.L. bottom of sand (m)	Water level (struck) (m) <sup>1</sup>	R.L. water (struck) (m)	Seismic interpretation <sup>2</sup>	Sample No.	-75 μm content (%)	Description	Correlation pit/seismic <sup>3</sup>
28	0	0.30	0.30	2.8	-0	2.8	0		28A	13.0	Coarse and fine white sand	
	0.30	1.40	1.10						28B	8.5	Coarse orange sand	
	1.40	2.80	1.40+						28C	5.4	Coarse white sand	
28A*	0	0.60	0.60	1.7	1.0	-	-				Slightly clayey sand	
	0.60	0.70	0.10								Sandy clay	
29	0	2.0	2.0			-	-				Grey, yellow brown sandy clay	
30	0	0.60	0.60	3.5	2.9	0.9	2.6	1.1 (4/5)	30A	1.4	Black, yellow and white sand	Poor
	0.60	0.90	0.30						30B	41.0	Mottled sandy clay	
31	0	0.60	0.60	3.5	2.9	2.7	0.8	1.4 (2/3)	31A	4.6	Coarse, medium and fine white sand	Good
	0.60	1.50	1.10								Mottled clayey sand	
	1.50	1.60	0.10								Blue sandy clay	
	1.60	3.10	1.50						31B	20.4	Clayey sand	

\* Augered hole, no samples taken. 1-3 See notes at end of table.

36-15

15/20

Table 1. (continued)

Site No.	Depth from (m)	Depth to (m)	Thickness (m)	R.L. surface (m)	R.L. bottom of sand (m)	Water level (struck) (m) <sup>1</sup>	R.L. water (struck) (m)	Seismic interpretation <sup>2</sup>	Sample No.	-75 µm content (%)	Description	Correlation pit/seismic <sup>3</sup>
31A*	0	0.30	0.30	2.5	2.2	-	-				Sand Sandy clay	
	0.30	0.50	0.20									
32	0	0.30	0.30	3.5	3.2	-	-				Coarse sand Mottled clay	
	0.30	1.20	0.90									
33*	0	0.30	0.30	3.5	3.2	-	-				Sand Sandy clay	
	0.30	0.50	0.20									

1. Water levels were recorded during the prospecting and holes were backfilled immediately. Static levels were therefore not observed.
  2. In the seismic interpretation column, the first figure is the depth and the second, in parentheses, is the interface - e.g. 2.2 (2/3) : 2.2 m to interface between layers 2 and 3.
  3. Correlation with the seismic results is a comparison of clean sand thickness recorded from test pits with the seismic interpretation.
- \* Augered holes, no samples taken.

36-16

08/91

17/20

Table 2. ESTIMATES OF SAND RESERVES

Area on					
Section	Subsection	1:2500 map (cm <sup>2</sup> )	ground (m <sup>2</sup> )	Thickness (m)	Volume (m <sup>3</sup> )
I (Total area, fig. 1)	A	373			
	B	140			
	C	44			
	D	3			
	E	28			
	F	1			
	A-B-E	205	128 125	1.5	192 187
	B-C-D	93	58 125	2.5	145 312
	E-F	27	16 875	2.5	42 187
	F	1	625	3.5	2 187
			203 750		381 873
II (Area of old workings)	a (northern)		60 000	0.5	30 000
	b (southern)		15 000	1.5	22 500
			75 000		52 500
III (Area south of zero base of sand con- tour)	A'	80			
	B'	20			
	E	28			
	F	1			
	A'-E-F	51	31 875	1.5	47 812
	B'	20	12 500	2.5	31 250
	E-F	27	16 875	2.5	42 187
	F	1	625	3.5	2 187
			61 875		123 437
IV (unworked portion of III)	Area III-				123 437
	I Ib				22 500
					100 937
V overburden	Area I-II		203 750	0.3	38 625
			75 000		
			128 750		
VI overburden of Area IV	Area III-		61 875	0.3	13 882
	I Ib		15 000		
			46 275		
Total sand reserve	Area I-II-				381 873
	V				52 500
					329 373
					38 625
					290 748

Table 2. (continued)

Area on					
Section	Subsection	1:2500 map (cm <sup>2</sup> )	ground (m <sup>2</sup> )	Thickness (m)	Volume (m <sup>3</sup> )
Sand reserve Area III	Area IV- VI				100 937
					<u>13 882</u>
					87 055
Sand reserve excluding Area III					290 748
					<u>87 055</u>
					203 693

Table 3. GRAIN SIZE ANALYSES OF TEST PIT SAMPLES

Sample No.	Regd. No.	Grain size (mm)									
		Cumulative mass% retained									
		38.10	19.05	9.83	4.75	2.36	1.18	0.60	0.30	0.15	0.075
1A	802310		0.6	1.5	2.7	13.1	35.8	58.0	83.1	96.4	98.1
1B	802311					0.3	0.8	1.4	2.5	7.3	11.7
2A	802312					1.7	7.1	21.8	58.7	80.3	88.5
3	802313				1.7	18.0	51.4	82.8	97.2	99.2	99.5
4	802314					0.4	11.6	59.3	91.4	99.3	99.6
5A	802315				1.6	12.7	31.7	52.0	79.0	95.9	99.5
5B	802316	7.1	14.0	15.6	17.0	18.9	24.1	32.3	40.8	48.7	52.9
6A	802317					5.9	24.6	51.0	72.4	92.4	95.0
6B	802318				1.4	12.4	31.6	50.5	65.9	87.4	92.2
8	802319				2.1	11.8	35.8	54.5	77.8	95.9	99.6
11A	802320					0.8	2.3	12.0	69.2	95.7	98.1
11B	802321				2.0	12.8	26.6	34.8	43.0	87.5	96.4
11C	802322					7.1	27.1	47.2	60.5	70.3	76.2
12	802323				1.9	19.4	50.7	72.6	85.7	96.7	99.3
13A	802324					12.8	43.1	69.3	91.3	99.3	99.8
13B	802325				1.6	13.4	33.6	49.4	65.0	73.0	76.6
14A	802326					1.6	11.5	39.3	75.0	89.1	92.1
14B	802327					3.4	13.5	44.7	89.9	96.6	97.5
15A	802328				1.7	17.4	39.4	61.9	84.8	95.6	97.4
15B	802329				2.9	23.0	49.1	58.7	69.7	91.0	97.9
15C	802330					5.4	14.5	27.0	67.1	95.0	97.4
16A	802331					10.0	25.6	43.1	69.8	94.5	96.7
16B	802332				3.6	17.3	34.3	40.2	51.8	86.1	95.0
17A	802333					8.8	25.4	48.9	79.2	92.0	95.4
17B	802334				1.9	14.0	33.5	51.8	59.2	65.9	85.6
17C	802335					0.4	4.4	15.7	40.9	90.6	96.5
17D	802336					1.2	4.6	14.3	30.1	58.0	73.5
18A	802337					9.3	41.6	81.2	96.0	99.6	99.7
18B	802338					2.7	17.9	42.4	58.2	77.3	80.2
19A	802339					2.8	18.4	53.8	84.4	93.0	95.5
19B	802340					1.4	13.4	43.6	72.1	84.6	90.3
20A	802341				2.2	13.9	28.8	51.4	75.8	91.4	97.5
20B	802342					0.8	4.5	9.5	15.2	20.2	26.0
21A	802343					11.7	34.7	59.7	86.2	96.5	97.7
21B	802344				2.3	21.6	47.0	60.2	73.8	93.0	98.3
21C	802345					1.7	5.1	8.1	16.7	72.0	94.8
21D	802346					21.5	50.4	64.0	71.9	78.7	81.3
22A	802347				3.9	23.2	43.9	54.7	67.6	85.7	91.5
22B	802348					1.1	3.0	12.9	38.6	72.4	93.3
23	802349				1.7	17.6	48.9	69.6	87.4	97.2	99.2
24	802350					2.6	16.6	39.1	66.3	81.2	87.9
25A	802351				2.1	15.7	35.9	57.9	82.1	92.2	95.0
25B	802352				2.1	22.6	44.5	59.8	72.5	87.1	92.2
25C	802353					5.6	19.0	30.0	41.1	79.5	93.9
25D	802354					11.6	40.9	62.3	70.9	80.4	83.3
26A	802355				1.2	9.6	34.0	62.5	85.1	94.5	96.9
26B	802356				2.4	15.1	31.0	48.4	68.8	91.0	97.5
26C	802357					0.8	2.7	6.4	12.4	39.0	83.8
27A	802358				2.8	18.9	46.8	71.0	91.4	98.7	99.5
27B	802359				2.3	24.5	55.5	76.0	88.2	90.5	91.5
28A	802360					8.2	24.6	39.9	58.7	81.2	87.0
28B	802361				3.0	21.1	43.6	59.4	75.9	88.0	91.5

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Table 3. (continued)

Sample No.	Regd. No.	Grain size (mm)									
		Cumulative mass% retained									
		38.10	19.05	9.83	4.75	2.36	1.18	0.60	0.30	0.15	0.075
28C	802362				2.5	17.9	38.8	56.9	77.5	91.0	94.6
30A	802363				2.0	21.0	50.2	74.9	92.4	97.8	98.6
30B	802364					8.6	20.6	30.3	42.0	53.9	59.0
31A	802365				2.0	9.9	23.7	40.3	67.4	91.8	95.4
31B	802366					5.9	26.2	53.3	70.0	76.1	79.6
32	802367					6.7	31.8	55.9	74.8	84.9	91.0