DEPARTMENT OF MINES
SOUTH AUSTRALIA

GEOLOGICAL SURVEY
ENVIRONMENT & RESOURCE DIVISION

DRILLHOLE INTERSECTIONS OF EOCENE SEDIMENTS

NORTHERN MARGIN, WILLUNGA SUB-BASIN

(PROPOSED QUARTERLY NOTE)

by

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Rept.Bk.No.75/50
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INTRODUCTION

During 1973, 1974 and 1975, 21 holes were drilled in the search for construction sand in sections 142, 143, 151 and 152, Hd. Willunga, 1.5 km east of the operating sand pits at Maslin Beach and within the Extractive Industry Zone. Most of these holes reached Precambrian bedrock in contrast to the 66 auger holes of 1961-63 when all but 4 were stopped in Tertiary sediments (Olliver & Weir, 1967).

DRILLHOLES SELECTED

The 7 holes detailed in Table 1 have been selected from the 87 holes drilled in sections, 132, 133, 142, 143, 151 and 152, Hd. Willunga since 1961. Locations are shown on Fig. 1.

TABLE 1

Drillhole Data

Drillhole	Year	Rig	Section	R.L. of Collar(m)	Depth (m)	Reference
B3/73	1973	Percussion	152	65.0	43.4	Lindsay & Harris, 1974. Olliver,1974.
RB1	1973	Rotary	143	46.0	52.5	Reed, 1974.
PM8	1974	Rotary	142	44.5	25.5	Olliver & Reed, 1975.
PM10	1974	Rotary	142	51.0	43.5	Olliver & Reed,1975.
PM11	1974	Rotary	142	50.5	47.0	Olliver & Reed,1975.
PM12	1974	Rotary	142	47.0	48.0	Olliver & Reed,1975
RC1	1975	Rotary	143	55.0	48.0	Olliver, 1975

RESULTS OF DRILLING

The formations encountered are compared with the coastal section of Reynolds (1953) in Table 2; are represented diagrammatically in Fig. 1; and summarised below. Boundaries are approximate due to downhole contamination and sample intervals, varying from 1.5 m to 3 m, in places being greater than the thickness of stratigraphic units.

(1) Soil Profile - brown clay loam

(2) Carisbrooke Sand - only in B3/73, 4.6 m thick. Unfossiliferous, varicoloured quartz sand, very fine to medium grained, slightly clayey. Gravelly at base. Probably fluviatile. Lithology is similar to the upper finer portion of North Maslin Sand.

(3) Blanche Point Soft Marl - only in B3/73 as an erosional remnant 6.2 m thick. Glauconitic mottled soft spicular clay and claystone with chertstone nodules containing mullusc moulds. Foraminifera in basal part (Lindsay & Harris, 1974).

(4) Blanche Point Banded Marl - complete section of 12.1 m in B3/73 and a remnant basal 3.0 m in RC1. Bands of hard grey to white and pale brown chertstone, marlstone and limestone interbedded with soft clay and marl. Green glauconitic blebs and yellow ferruginous mottling at base. Abundant sponge spicules, foraminifera and fragmentary moulds of Turritella (Lindsay & Harris, 1974). Base of unit is placed at lowest band of hard limestone.

(5) Blanche Point Transition Marl. From 1.5 m in RB1 to 3.1 m in B3/73. Soft mottled marly sand and marl with diverse planktonic assemblage. Transitional into both overlying and underlying units.

(6) Tortachilla Limestone. Generally 3.0 m thick. Pale brown limestone, green (glauconitic) limestone, brown (ferruginous) limestone, yellow brown to olive clay or marl. The basal polyzoal sands rich in limonite grains of Reynolds (1953) could not be distinguished from the underlying South Maslin Sand.

(7) South Maslin Sand. Maximum thickness of only 9.0 m in RB1 compared with 50 m at Maslin Bay (Reynolds, op.cit). Mainly yellow and brown ferruginous quartz sand, poorly fossiliferous, clayey in parts, with polished limonite grains.

(8) North Maslin Sand. Maximum thickness of 28.5 m in RC1 (Olliver, 1975). Non-marine, fluviatile, quartz sand, white and grey to yellow, brown and red, with clayey lenses. Mica flakes widespread. Generally fine grained at top becoming coarser with depth culminating in basal gravels. Top of unit is placed at first appearance of pale clay (Lindsay & Harris, op.cit.). Seams of grey clay with black lignitic bands rich in spores and pollen from 46.0-48.5 m in B2/73 (Olliver, 1974), and 42.5-43.5 at bottom of B3/73, comparable to but younger than the lens of black clay at ABM Noarlunga Sand Pit (McGowran et al., 1970; Lange, 1970 and Lindsay & Harris, op. cit.).

(9) Precambrian. Light coloured clay grading downwards into partly weathered siltstone and shale. Shallowest intersection was 1.2 m in A20 in the north western corner of section 142, (Olliver & Reed, op. cit.). From here, bedrock slopes gently away to the south.

CONCLUSIONS

Drilling near the northern margin of the Willunga Sub-basin has intersected Recent soil units and ?Plio Pleistocene Carisbrooke Sand unconformably overlying an Eocene marine sequence of Blanche Point Soft Marl, Blanche Point Banded Marl, Blanche Point Transition Marl, Tortachilla Limestone and South Maslin Sand over non-marine North Maslin Sand. The Port Willunga Beds of Eocene-Miocene age were not recognized. The Tertiary

sequence rests unconformably on an undulating surface of weathered Precambrian bedrock which slopes gently southwards.

Up to 27.5 m of marine sediments were encountered compared with 84 m in the coastal cliffs because the basal marine unit, South Maslin Sand, is considerably thinner inland. Marine transgression was probably progressively later north eastwards along the northern margin of the Willunga Sub-basin.

1/4/75

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TABLE 2

SUMMARY OF DRILLHOLE INTERSECTIONS

AGE	UNIT	REYNOLDS 1953 maximum	B3/73		RB1		PM8		PM10		PM11		PM12		RC1	
Quaternary	Soil Profile		0-3.0	3.0	-		-		-		-		-		-	
?Plio-Pleistocene	Carisbrooke Sand		3.0-7.6	4.6	-		-		-		-		-		-	
Late Eocene	Blanche Point Soft Marl	17.4	7.6-13.8	6.2	-		-		-		-		-		-	
	Blanche Point Banded Marl	11.3	13.8-25.9	12.1	-		-		0-1.0?	1.0	-		0-1.0?	1.0	0-3.0	3.0
	Blanche Point Transitional Marl	2.3	25.9-29.0	3.1	0-1.5?	1.5	-		?1.0-3.0	2.0	0-3.0	3.0	?1.0-3.0	2.0	3.0-5.0?	2.0
	Tortachilla Limestone	3.0	29.0-31.0	2.0	?1.5-3.0	1.5	-		3.0-6.0	3.0	3.0-6.0	3.0	3.0-6.0	3.0	?5.0-7.0	2.0
?Late Eocene	South Maslin Sand	50.0	31.0-35.1	4.0	3.0-12.0	9.0	0-1.5?	1.5	6.0-12.0	6.0	6.0-13.5	7.5	6.0-13.5	7.5	7.0-11.0	4.0
Mid Eocene	North Maslin Sand	20.0	35.1-43.4	8.3	12.0-43.5	31.5	?1.5-16.5	15.0	12.0-36.0	24.0	13.5-38.9	25.4	13.5-41.5	28.0	11.0-39.5	28.5
Precambrian	Weathered Bedrock	-	-		43.5-52.5	9.0	16.5-25.5	9.0	36.0-43.5	7.5	38.9-47.0	8.1	41.5-48.0	6.5	39.5-48.0	8.5

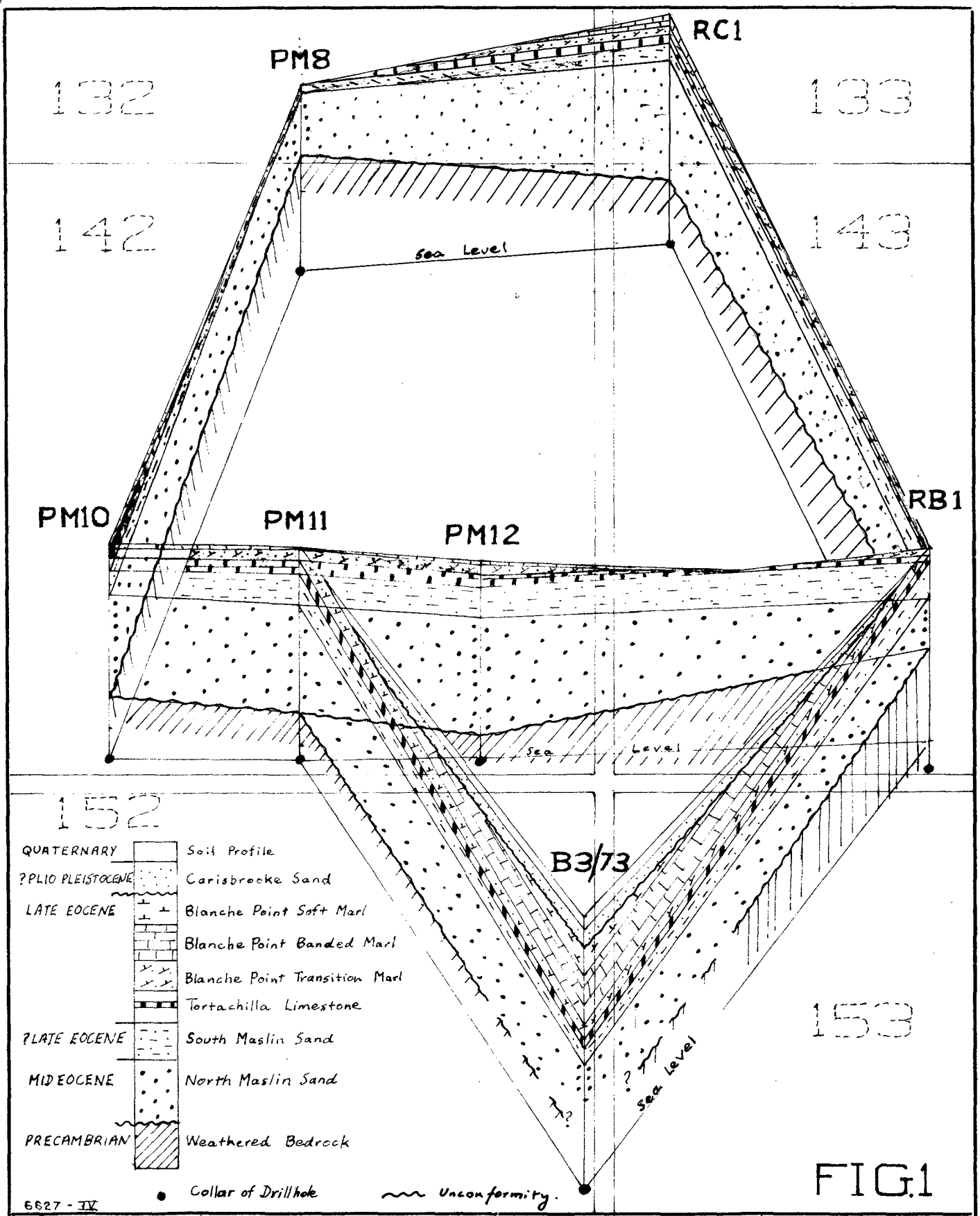

FIG.1

6627 - IV

	DEPARTMENT OF MINES — SOUTH AUSTRALIA	Scale: Hor 1:5000 Ver 1:1250
Compiled: J.A.R	FENCE DIAGRAM	Date: 25-3-75
Drn. J.G.O | Ckd.	NORTHERN MARGIN - WILLUNGA SUB-BASIN	Drg. No. S11422

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