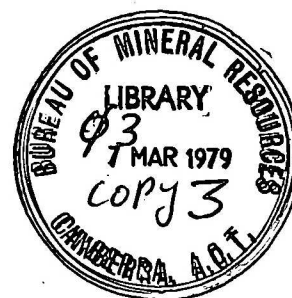


DEPARTMENT OF
NATIONAL RESOURCES



BUREAU OF MINERAL RESOURCES,
GEOLOGY AND GEOPHYSICS

Record 1978/88



DRILLING IN THE SPENCER GULF AREA OF SOUTH AUSTRALIA,
FEBRUARY AND MARCH 1978

by

J.B. COLWELL, and R.V. BURNE

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CONTENTS

	<u>Page</u>
ABSTRACT	
INTRODUCTION	1
REGIONAL SETTING AND LOCATION OF THE BOREHOLES	1
DRILLING AND SAMPLING TECHNIQUES	2
STRATIGRAPHY AND DESCRIPTION OF THE SEDIMENTS	3
REFERENCES	5
APPENDIX 1 WATER SAMPLES OBTAINED FROM THE BOREHOLES (compiled by D.B. Fitzsimmons)	13
APPENDIX II GEOLOGICAL LOGS OF THE BOREHOLES	15

FIGURES

1. Locality map
2. Location of the boreholes drilled in the Redcliff area
3. Location of the boreholes drilled in the Mambray Creek area
4. Location of the boreholes drilled in the Wood Point area
5. Location of the boreholes drilled in the Fisherman Bay area
6. Geological section, Redcliff area
7. Geological section, Mambray Creek area
8. Geological section, Wood Point area
9. Geological sections, Fisherman Bay area

TABLES

1. Elevations, coordinates, location data, and total depths of boreholes	7
2. Location of permanent survey marks adjacent to boreholes	8
3. Physiographic setting and purpose of boreholes	9
4. Summary of the stratigraphic units of the Port Augusta - Port Pirie region	10

ABSTRACT

Thirteen holes, ranging in depth from 4.8 to 32.1 m, were drilled, and 150 m of core and 38 water samples recovered from four areas of prograding shoreline on the eastern coast of the upper part of Spencer Gulf, South Australia. In all areas, Holocene shallow marine, beach ridge and/or aeolian sediments overlie a thick sequence of Pleistocene clays, sandy clays and clayey sands. The Holocene shallow marine and beach ridge sediments (St Kilda Fm) consist mainly of calcareous sands composed of fragmented and whole shell material. The aeolian sediments (Fulham Sand) consist of red to brown silty quartzose sand. The Pleistocene sequence (Hindmarsh Clay) contains secondary carbonate and minor gypsum in places, and is underlain in one of the holes by ?Tertiary limestone, calcilutite and calcrete. In other parts of the region, basement to the sequence consists of Upper Proterozoic quartzite.

INTRODUCTION

The Baas-Becking Geobiological Laboratory and the Bureau of Mineral Resources (BMR) are studying aspects of the sedimentation, diagenesis, hydrology, microbial ecology, and geochemistry of the Spencer Gulf region that may have a bearing on low-temperature metallogenesis. Detailed investigations are being undertaken in four areas of prograding shoreline on the eastern coast of the upper part of Spencer Gulf (Fig. 1).

During February and March 1978, shallow drilling was undertaken in each of these areas to try to elucidate their Holocene depositional history, to test for any buried concentrations of organic material, to establish the diagenetic processes and products in the area, and to establish the chemistry and distribution of groundwater. Thirteen holes ranging in depth from 4.8 to 32.1 m were completed, and approximately 150 m of core and 38 water samples recovered. This Record summarizes initial results of the drilling, which was carried out under contract by the South Australian Department of Mines.

REGIONAL SETTING AND BOREHOLE LOCATION

Spencer Gulf lies within the structural province known as the Torrens Sunklands (Fenner, 1930), which extend from the mouth of the Gulf northwards to include Lake Torrens, and which contain, in places, over 200 m of generally flat-lying unconsolidated Tertiary and Quaternary sediments of marine, lacustrine, and fluvial origin (Firman, 1965; Robertson, 1974). The area is bounded on the east by the Flinders Ranges, composed of deformed Proterozoic sedimentary rocks, and on the west by the relatively undeformed Proterozoic sedimentary rocks of the Stuart Shelf and Gawler Block.

The climatic and tidal regimes of the Gulf strongly influence the form of the depositional associations evolving in it. The Gulf is a semi-arid region, with average rainfall in Port Pirie of 342 mm and Port Augusta of 244 mm. The adiabatic effect of the Flinders Ranges produces a higher rainfall in their vicinity: at Wilmington, in the Ranges northeast of Port Pirie, average annual rainfall is 438 mm (Clarke 1975).

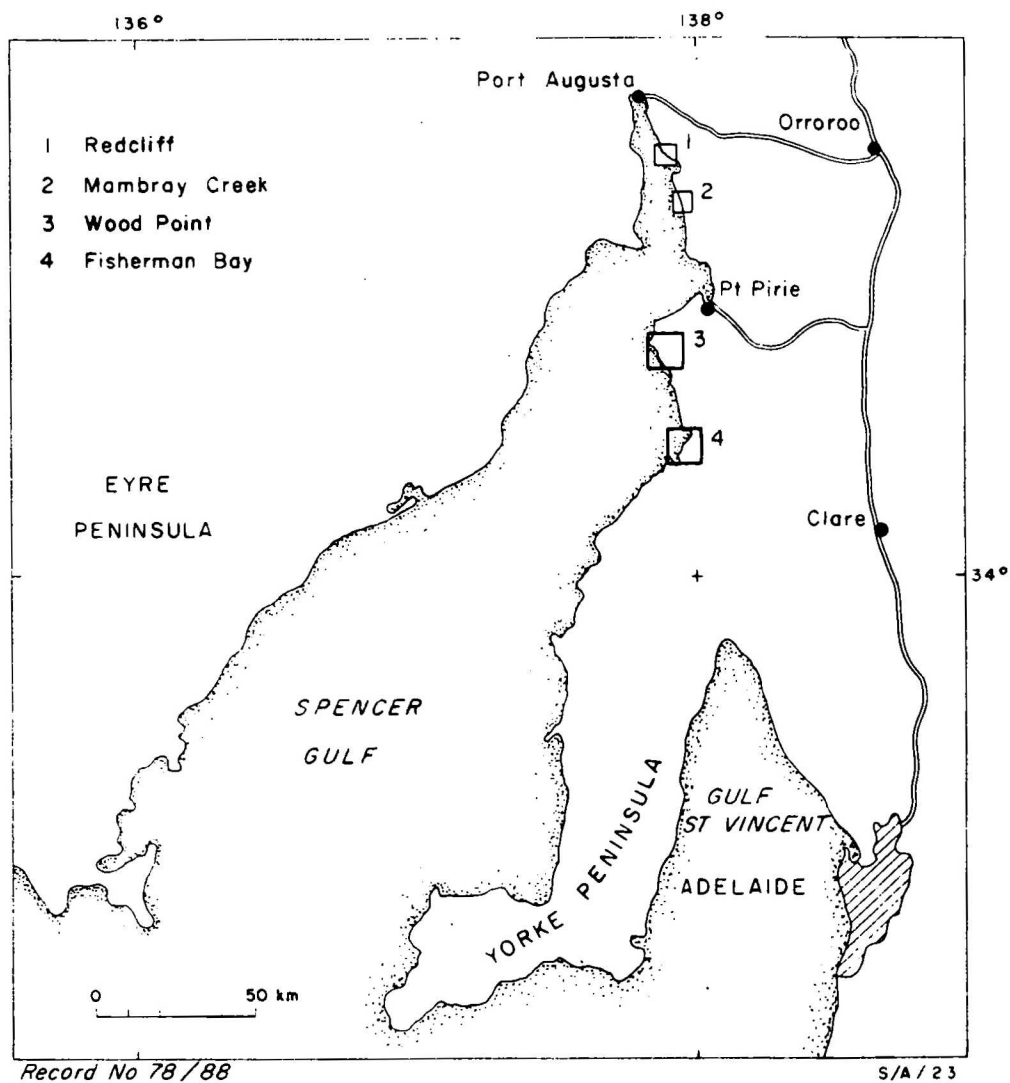


Fig. 1 Locality map

Tides in the Upper Gulf are significantly influenced by the funnelling effect of the gulf, distant wind and barometric pressures, and local weather (Radok, 1973), which may almost double the predicted height of high tide. Mean tidal range is in the order of 1.5 m, while spring tides (range 3.6 m) can raise the sea and level more than 0.5 m above mean high tide level (Depers, 1974; Australia Pilot Vol. 1).

Spencer Gulf is an area of active carbonate sediment production. The shallow sub-tidal platforms and banks are colonised by sea grasses, which provide a sheltered benthic environment, and the blades of the grasses support a rich epibiota of carbonate-producing organisms. These sea-grass fields dominate the eastern margin of the gulf, where they are interspersed between tidal channels. Wind and tidal processes transport the sediment produced within the sea-grass fields shoreward, resulting in the progradation of a number of areas on the eastern shore of the gulf across the inter-tidal flats and sub-tidal sea-grass banks (Gostin, 1976; Depers, 1974; Robb, 1975).

These areas tend to develop into asymmetrical triangular complexes with carbonate sand beaches facing southwest, parallel to the dominant wave attack, and a lee margin, facing northeast, characterised by mangroves, samphire, algal-colonised flats, and tidal channels. Behind this zone is an infrequently inundated deflation plain with evaporitic gypsum forming locally within the sediments. The landward edge of this plain is often the locus of groundwater springs or resurgences.

Accurate locations and elevations of the drill sites (Table 1, Figs 2-5) were determined by a survey party from the Australian Survey Office, led by Mr Peter Rumbold. A permanent bench-mark was placed adjacent to most borehole locations (Table 2). Table 3 summarises the physiographic setting and purpose of each hole.

DRILLING AND SAMPLING TECHNIQUES

A light-weight trailer-mounted cable tool rig was used for drilling which was carried out by the South Australian Department of Mines. Standard techniques of continuous tube sampling were employed, using thin-walled steel sample tubes 30 cm long and 4" internal diameter. Relatively undisturbed samples were recovered in all but the most unconsolidated material, and an overall core recovery in excess of 85 percent was achieved. Holes were progressively reamed-out and cased with 6" steel casing.

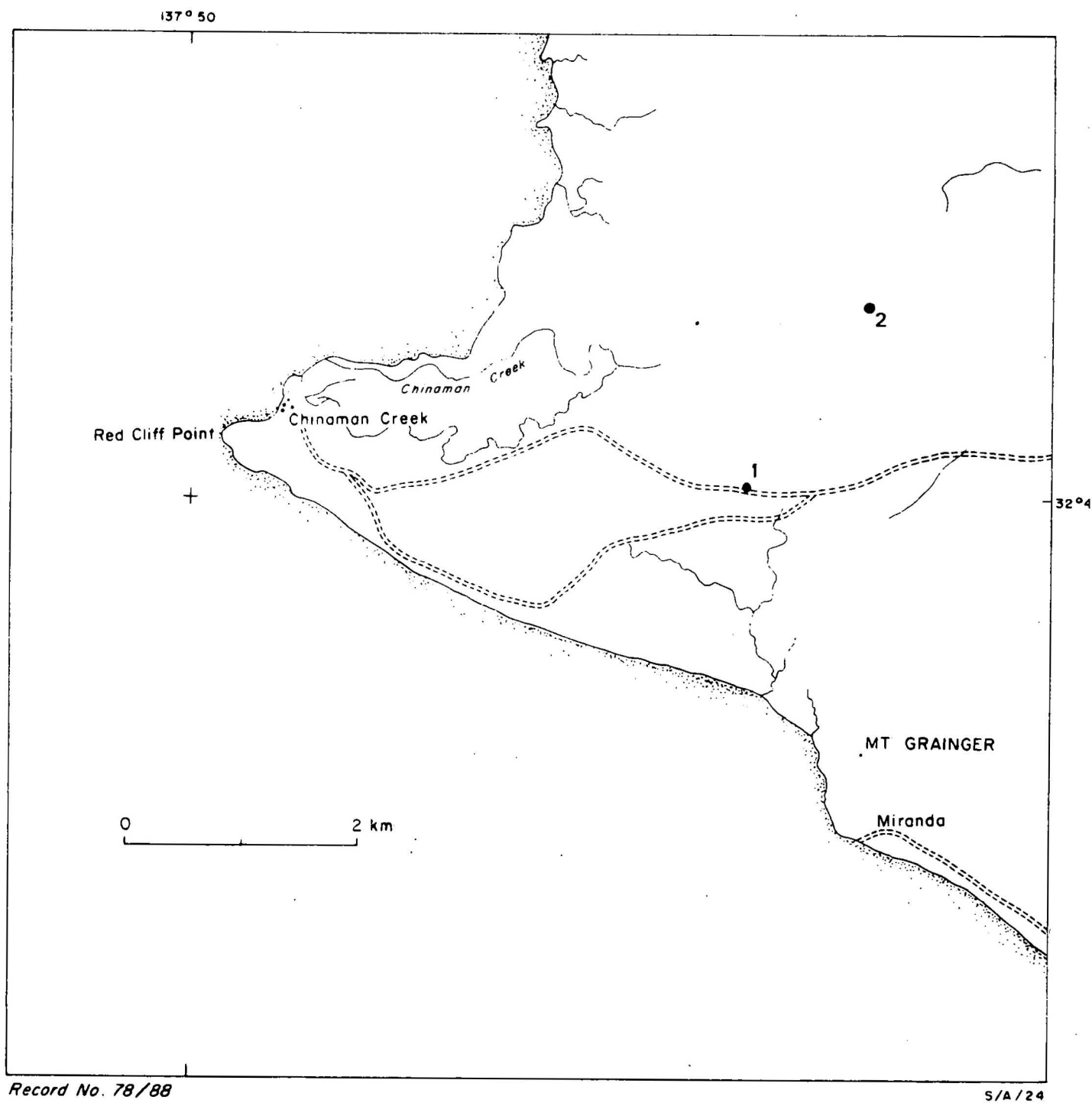
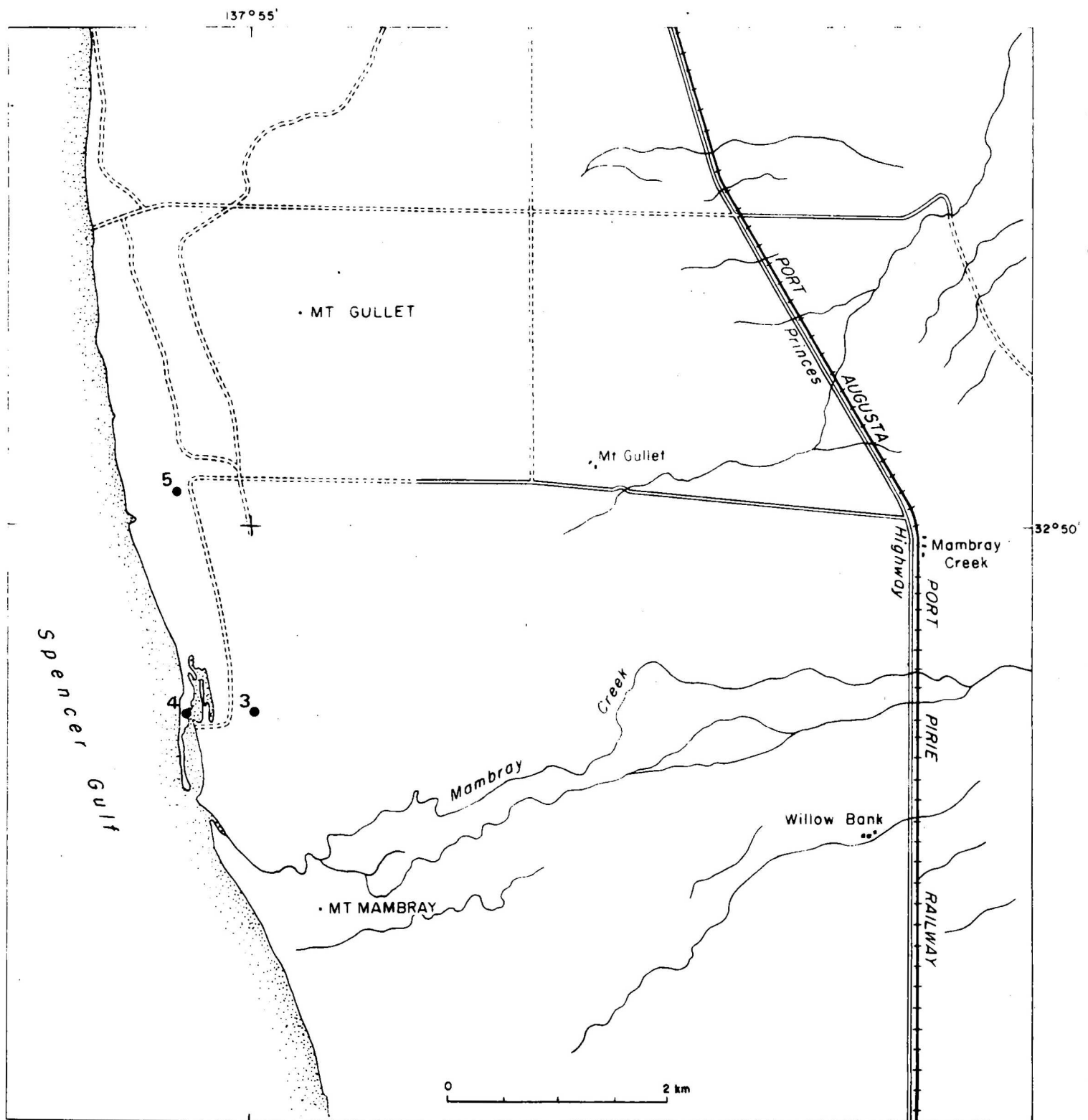


Fig. 2 Location of the boreholes drilled in the Redcliff area. Holes Port Augusta 1 and 2



Record No. 78/88

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Fig. 3 Location of the boreholes drilled in the Mambray Creek area. Holes Port Augusta 3 - 5

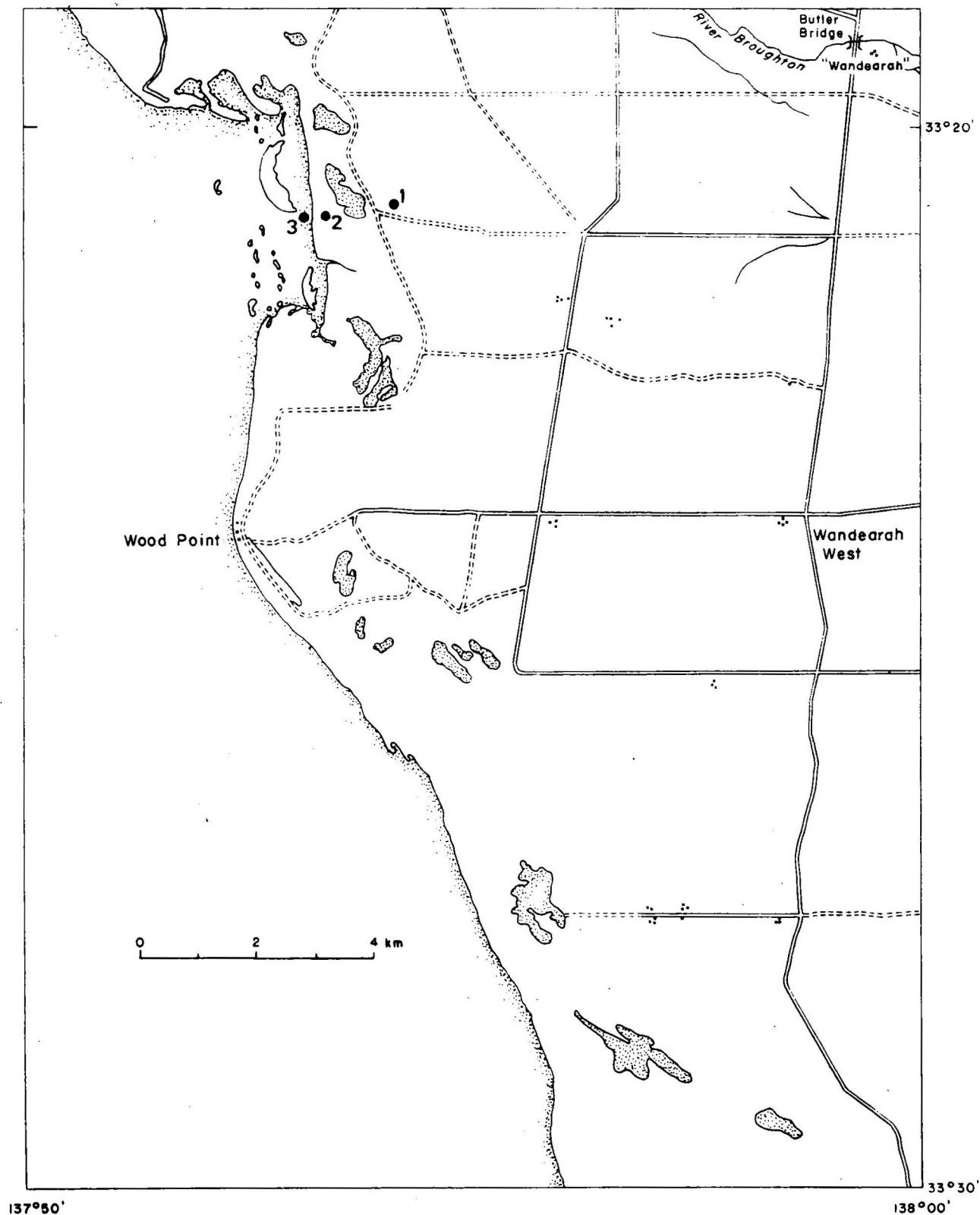
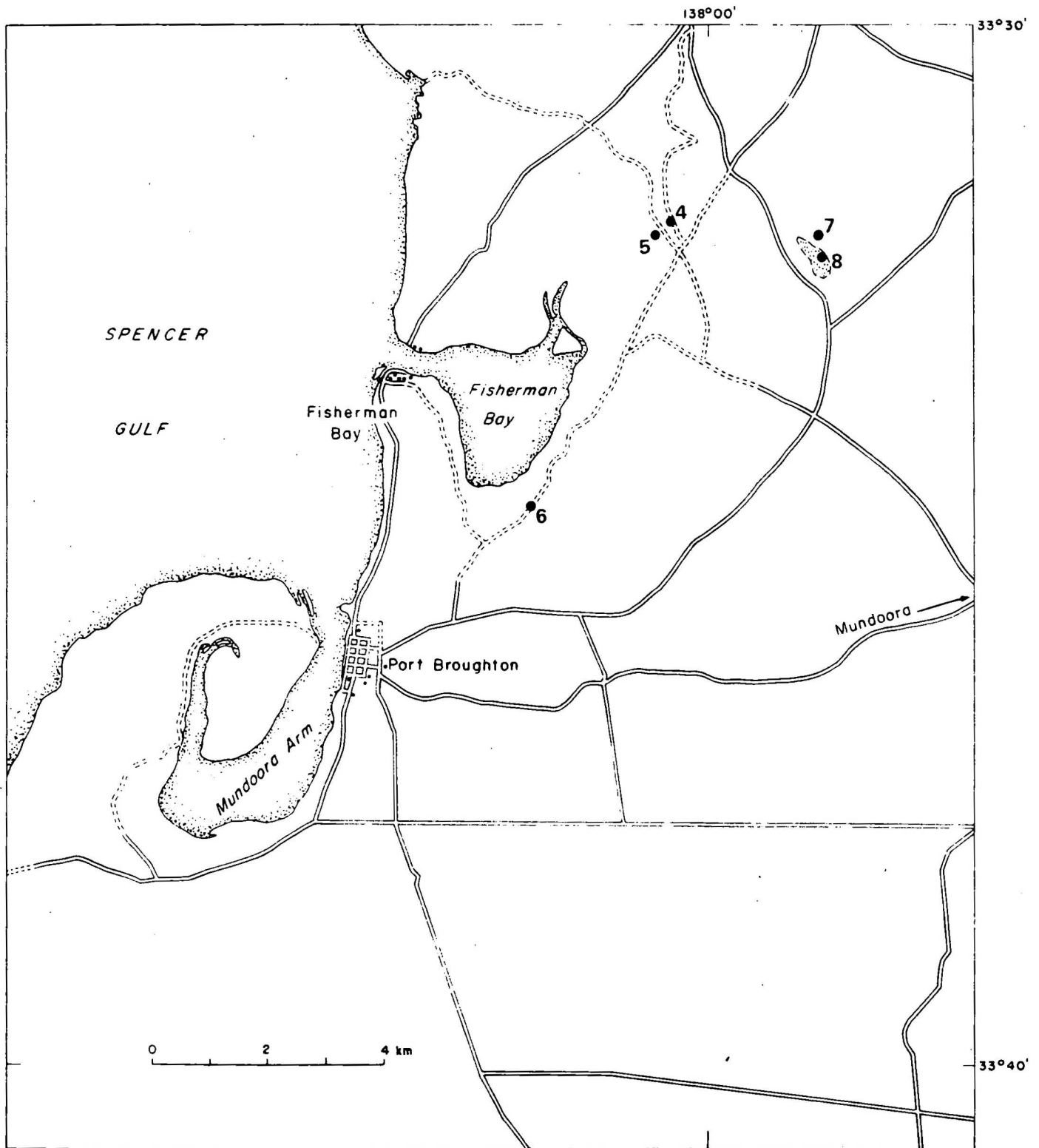


Fig.4 Location of the boreholes drilled in the Wood Point area. Holes Whyalla 1-3
Record No.78/88



Record No. 78/88

S/A / 27

Fig.5 Location of the boreholes drilled in the Fisherman Bay area.Holes Whyalla 4 - 8

Thirty eight water samples (Appendix 1) were collected during the drilling operations, using a steel tube bailer. Each "aquifer" was cased-off after being sampled, and the hole bailed dry to prevent waters intermixing.

EH, H, temperature, and dissolved oxygen measurements were taken in the field, using a TPS Portable Pollution Monitor. However, while the instrument worked well with clear water samples, the slurries often encountered in the field caused the electrodes to give unsteady readings. In the laboratory the samples were filtered through a 0.45 micron millipore filter. Some samples could not be filtered owing to their very high salinity and/or high organic content. After filtration, the samples were tested for conductivity, alkalinity, density, and iron content. These results are given in Appendix 1. A more complete analysis of each sample is currently being undertaken.

STRATIGRAPHY AND LITHOLOGY OF THE SEDIMENTS

A summary of the major stratigraphic units of the Port Augusta - Port Pirie region (after Hiern & others, 1973) is given in Table 4. The sequences penetrated in the boreholes are briefly described in the following sections: detailed logs of the holes are given in Appendix 2.

Redcliff Area

The two boreholes put down in the Redcliff area, Port Augusta 1 and 2 (Fig. 2), intersected a succession of sediments similar to those encountered by the South Australian Mines Department (Robertson, 1974; Hiern & others, 1973) and Alcoa Australia Ltd during drilling operations associated with site investigations for the proposed Redcliff petrochemical plant. The sequence, which is shown in Figure 6, consists of grey marine calcareous quartz sands (St Kilda Formation of Firman, 1966) overlying a thick sequence of mottled clays and sandy clays (Hindmarsh Clay of Firman). Basement consists of calcrete-capped Proterozoic quartzite (ABC Range Quartzite) similar to that occurring at Mt Grainger, slightly to the southeast.

Full details of the lithologies are given in Appendix 2.

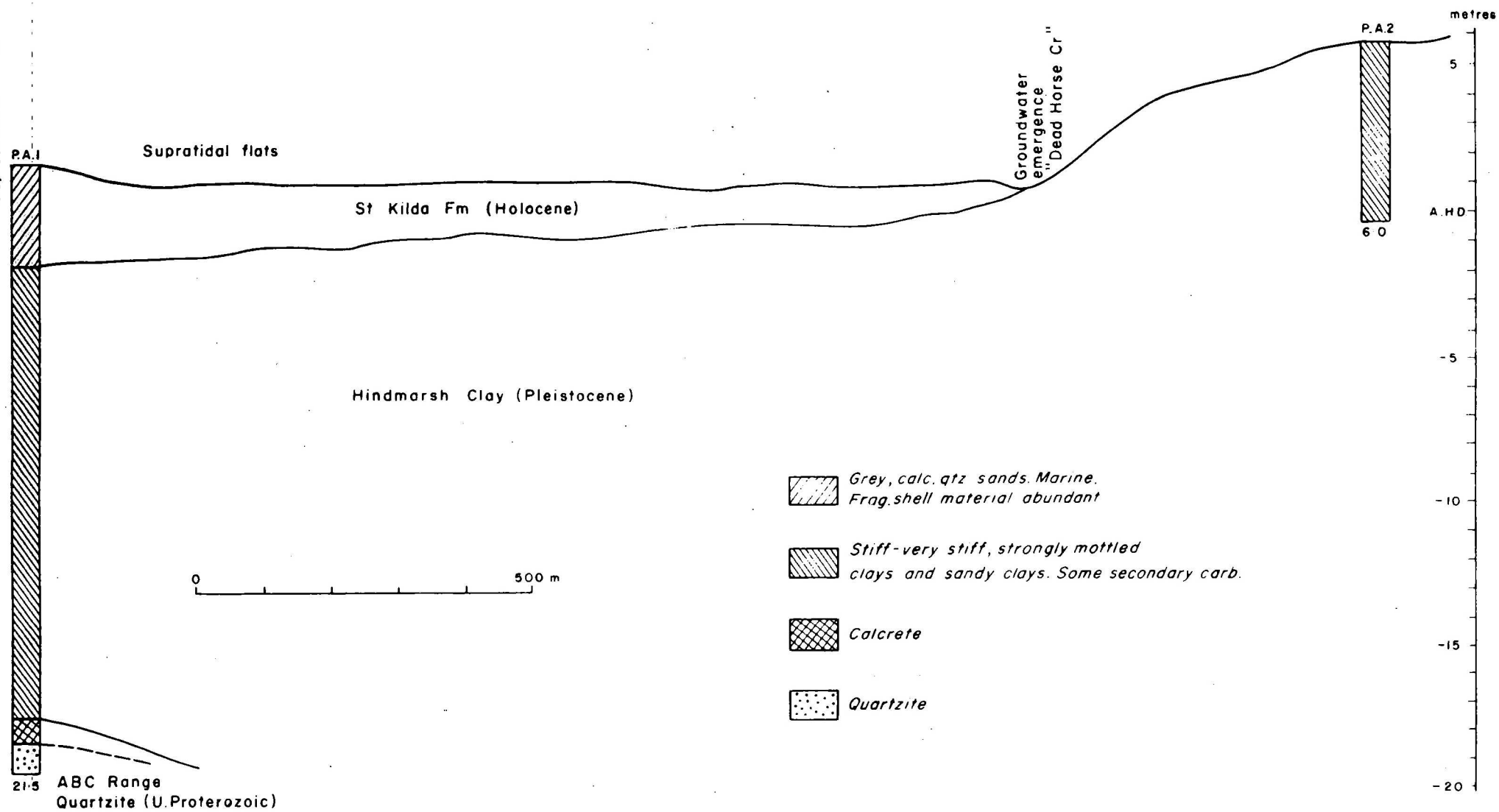


Fig. 6 Geological section, Redcliff area

Manbray Creek Area

Holes at Mambray Creek, Port Augusta 3-5 (Fig. 3), encountered a sequence similar to that intersected at Redcliff. Holocene dune sands (Fulham Sands of Firman, 1966) or marine-beach ridge sediments (St Kilda Formation) overlie a thick sequence of the Pleistocene Hindmarsh Clay (see Fig. 7).

The Fulham Sand is typically light brown to red, loose, silty and quartzose, and contains trace amounts of finely fragmented shell material. The St Kilda Formation consists of calcareous quartz sands containing abundant fragmented and whole shell material (including Anadara); and the Hindmarsh Clay, of firm to stiff, strongly mottled sandy clays and clayey sands containing some secondary carbonate, as well as pebble and granule layers. Full details of the sediments are given in the logs in Appendix 2.

Wood Point Area

Holes at Wood Point, Whyalla 1-3 (Fig. 4), intersected sequences similar to those at Redcliff and Mambray Creek. In the supratidal and immediately adjacent areas, beach-ridge and shallow marine sands, silts, and clays of the St Kilda Formation overlie the Hindmarsh Clay. Inland from the supratidal zone, Hindmarsh Clay is exposed at the surface or is overlain by Holocene quartzose self dune deposits and sand spreads of the Fulham Sand (Fig. 8).

The Hindmarsh Clay commonly contains secondary carbonate. Thin veins of gypsum occur in places and large gypsum rosettes occur at 0.5 m in Whyalla 1. Full details are given in Appendix 2.

Fisherman Bay Area

Five holes, Whyalla 4-8 (Fig. 5), were drilled at Fisherman Bay.

The Holocene sediments overlie stiff, strongly mottled, sandy clays and clays of the Pleistocene Hindmarsh Clay. A thick sequence of quartz sands (including minor gravel components) forms the basal part of the Hindmarsh Clay in Whyalla 6 (see Fig. 9). Secondary carbonate is common; minor amounts of celestite occur in Whyalla 7. Marls, limestones, and calcrete of possible Tertiary age underlie the formation in Whyalla 4.

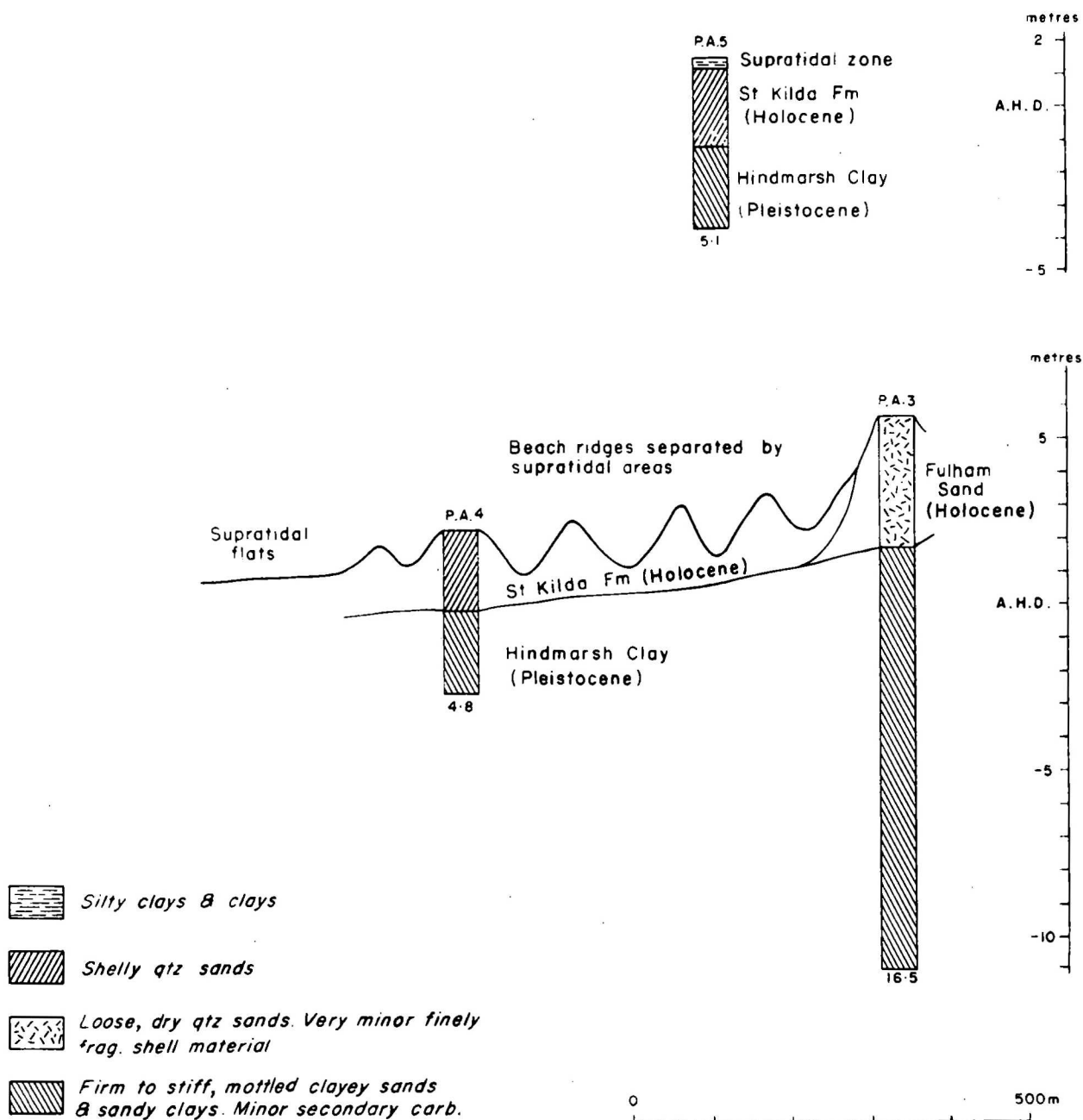


Fig. 7 Geological section, Mambray Creek area

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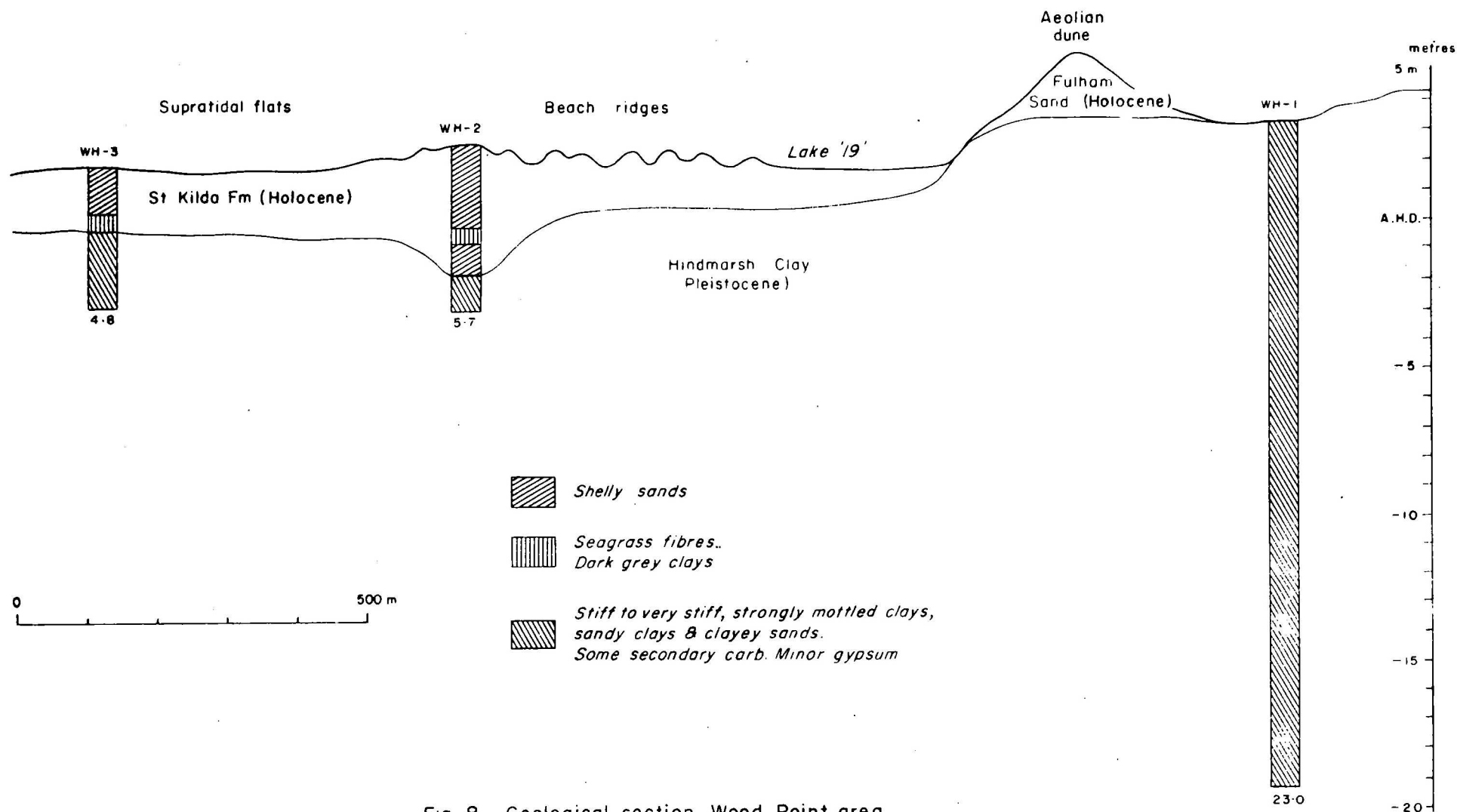


Fig. 8 Geological section, Wood Point area

S/A /30

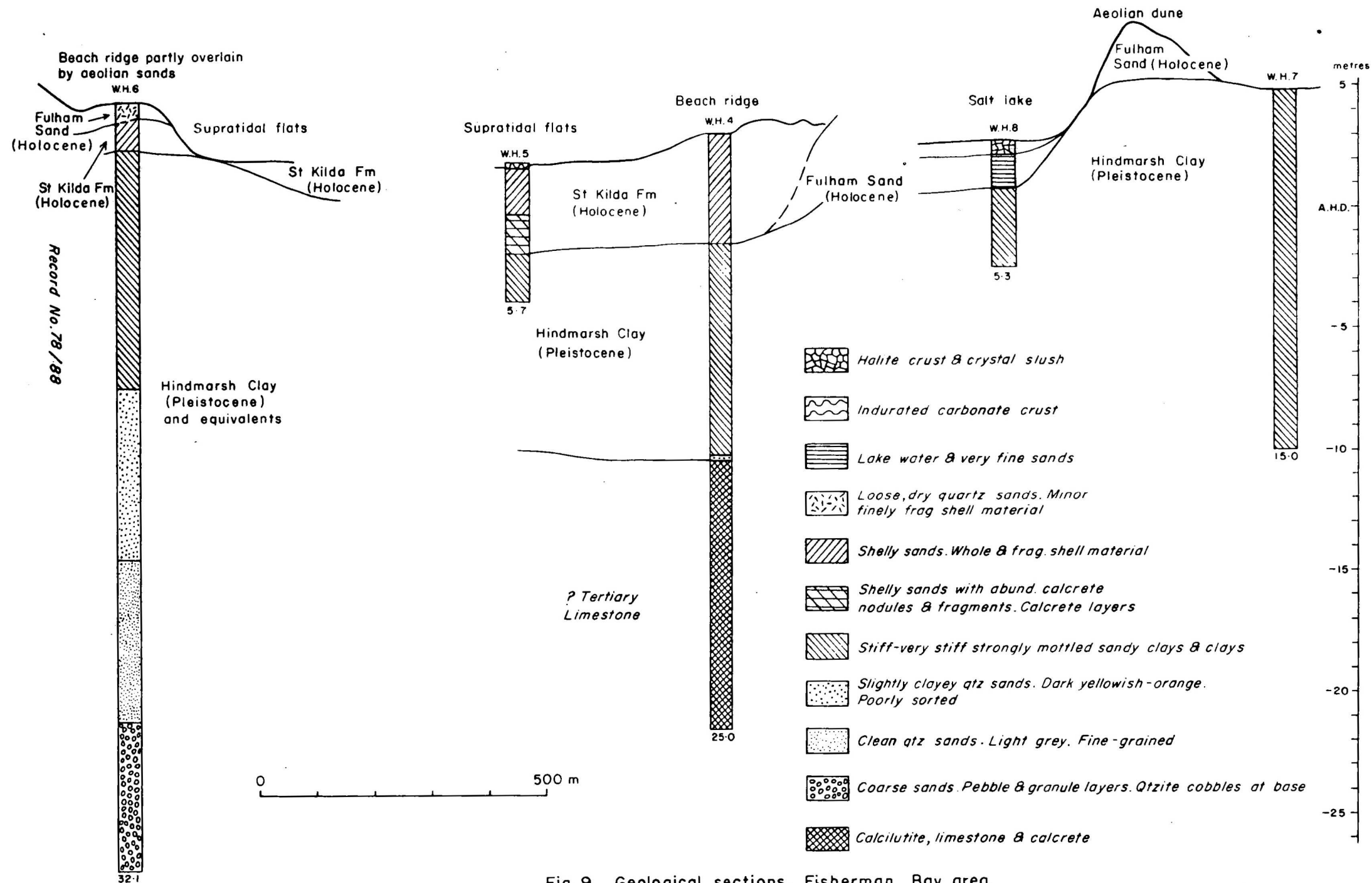


Fig. 9 Geological sections, Fisherman Bay area.

The Holocene sediments consist of: (a) shallow marine and beach-ridge shelly sands (St Kilda Formation), which contain, in Whyalla 5, layers of calcrete and abundant calcrete nodules; and (b) seif dune deposits of the Fulham Sand. Modern sediments of a salt lake were intersected in Whyalla 8.

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TABLE 1. Co-ordinates, Elevations, and Depths of Bore Holes

HOLE NAME	AREA	A.M.G. Co-ordinates, ZONE 53		GEOGRAPHICAL CO-ORDINATES		ELEVATION A.H.D.	T.D. (Metres)
		EAST	NORTH	LATITUDE SOUTH	LONGITUDE EAST		
Port Augusta 1	Redcliff	770458.01	6378 194.79	32°42'02".6670	137°53'05".9345	1.872	21.5
Port Augusta 2	Redcliff	771234.24	6380 233.32	32°40'55".8743	137°53'33".5758	5.764	6.0
Port Augusta 3	Mambray Creek	773085.95	6361 594.56	32°50'58".7277	137°55'04".3079	5.564	16.5
Port Augusta 4	Mambray Creek	772463.98	6361 583.11	32°50'59".6563	137°54'40".4227	2.101	4.8
Port Augusta 5	Mambray Creek	772319.63	6363 915.99	32°49'44".1253	137°54'32".4063	1.528	5.1
Whyalla 1	Wood Point	769459.90	6306 953.63	33°20'34".0388	137°53'42".9654	3.283	23.0
Whyalla 2	Wood Point	768576.15	6306 356.60	33°20'54".1959	137°53'09".4581	2.868	5.7
Whyalla 3	Wood Point	768173.95	6306 499.11	33°20'49".9355	137°52'53".7647	2.156	4.8
Whyalla 4	Fisherman Bay	778121.72	6285 168.09	33°32'12".5352	137°59'41".8882	3.041	25.0
Whyalla 5	Fisherman Bay	777937.89	6285 030.05	33°32'17".1499	137°59'36".3185	1.732	5.7
Whyalla 6	Fisherman Bay	774647.78	6280 383.77	33°34'50".9117	137°57'32".6659	4.117	32.1
Whyalla 7	Fisherman Bay	780411.72	6285 342.76	33°32'04".7164	138°01'10".3598	4.763	15.0
Whyalla 8	Fisherman Bay	780395.84	6285 158.21	33°32'10".7155	138°01'09".9532	2.754	5.3

TABLE 2. LOCATION OF PERMANENT SURVEY MARKS ADJACENT TO BOREHOLES

BENCH MARK	AMG CO-ORDINATES, ZONE 53		GEOGRAPHICAL CO-ORDINATES		ELEVATION
	EAST	NORTH	LATITUDE SOUTH	LONGITUDE EAST	AHD (metres)
Port Augusta 1A	770459.21	6378 199.53	32°42'02".5220	137°53'05".9756	2.014
Port Augusta 2A	771235.30	6380 233.30	32°40'55".8546	137°53'33".6156	5.759
Port Augusta 3A	773086.94	6361 594.68	32°50'58".7230	137°55'04".3460	5.583
Port Augusta 4a	772465.02	6361 562.07	32°51'00".3376	137°54'40".4898	-
Port Augusta 5A	772319.89	6363 915.02	32°49'44".1564	137°54'32".4179	1.588
Whyalla 1A	769479.75	6306 963.81	33°20'33".6907	137°53'43".7216	3.305
Whyalla 6A*	774648.61	6280 386.83	33°34'50".8117	137°57'32".6946	-
Whyalla 7A	780263.14	6285 402.04	33°32'02".9346	138°01'04".5401	8.819

* Pair of steel droppers

TABLE 3 Physiographic setting and purpose of boreholes

HOLE NAME	PHYSIOGRAPHIC LOCATION	PURPOSE	HOLE NAME	PHYSIOGRAPHIC LOCATION	PURPOSE
Port Augusta 1	Boundary between beach ridge system and supratidal deflation plain	1, 2	Whyalla 2	Beach ridges in front of gypsum lake	1, 2, 4
Port Augusta 2	Depression in Hindmarsh Clay terrace shorewards of ground water resurgence	2, 3	Whyalla 3	Supratidal plain seaward of Whyalla 2	1, 2
Port Augusta 3	Landward ridge of beach ridge system	1, 2, 4	Whyalla 4	Early Holocene strand	1, 2, 3
Port Augusta 4	Beach ridge immediately behind present day beach	2, 4	Whyalla 5	Lithified crust of supratidal plain	2, 5
Port Augusta 5	Centre of supratidal deflation plain	1, 2, 4	Whyalla 6	Pleistocene dune landwards of supratidal iron pan	1, 2, 3
Whyalla 1	Dry pan on Hindmarsh clay terrace	1, 2, 3	Whyalla 7	Interdune depression, Pleistocene dunes	2, 3
			Whyalla 8	Salt Lake	2, 5

Key to purposes:-

1 = Sedimentological Facies Sequence and Stratigraphy
 2 = Sample Groundwater
 3 = Diagenesis

4 = Prospecting for Buried Organic Rich Reduced Layers.
 5 = Sample Sediments of Salt Lake.

TABLE 4

SUMMARY OF STRATIGRAPHIC UNITS OF PORT AUGUSTA-PORT PIRIE REGION (from HIERN & others, 1973)

		AGE	UNIT NAME	DESCRIPTION	LOCATION
CAINOZOIC	Holocene		Fulham Sand	Sand sheets and sief dunes of red brown silty fine sand.	Much of Baroota Plain, Lake Torrens Plain and Stuart Shelf between Simmens and Arcoona Plateau.
			Recent alluvium	Fluviatile sands and gravels of modern drainage systems.	Minor channel deposits in Torrens sunk-land, more extensive flood plain deposits on Stuart Shelf.
			St. Kilda Formation	Sands, shelly silts and sands and soft grey clay.	Tidal flats and mangrove swamps mainly east of Spencer Gulf. Minor areas west of Gulf at Blanch Harbour and north of Whyalla.
			Yamba Formation	Grey plastic gypsiferous muds with salt crust.	Playas and salinas including Lake Torrens, north of Gulf.
	Pleistocene to Holocene		Pooraka Formation	Interlensing gravels, sands and clayey sands with gravel lenses.	Alluvial fans and piedmont deposits adjacent to the Tent Hills to the west and the Flinders Ranges to the east.

TABLE 4 (Continued)

AGE	UNIT NAME	DESCRIPTION	LOCATION	
CAINOZOIC	Pleistocene	Hindmarsh Clay (Avondale Clay is equivalent)	Red brown stiff clays, sandy clays and sands, with lensing beds of laminated gypsum sand.	Underlies Pooraka Formation. Outcrops as low cliffs south of Redcliff Point.
	Eocene		Lignitic clays and yellow carbonaceous sands.	Known only from deep bores in Torrens Sunkland.
PROTEROZOIC	Adelaide System	Various units in Flinders Ranges inc. ABC Range Qtzte.	Folded and faulted indurated sedimentary rocks, mainly white and orange quartzites, purple and grey-green shales and dolomites.	Thick quartzites form prominent bluffs of Flinders Ranges and the monadnocks (such as Mt. Grainger) of the Torrens Sunkland.
		Tent Hill Formation	Flat lying dense white and pinkish quartzites overlying purple Tregalana Shale Member.	Forms Simmens Plateau, Arcoona Plateau, Tent Hills.
		Pandurra Formation	Medium grained, gritty red sandstones.	Whyalla Hills, north of Whyalla on Stuart Shelf.

TABLE 4 (Continued)

AGE	UNIT NAME	DESCRIPTION	LOCATION
Carpentarian	Cultana Granite	Mainly pink porphyritic granite.	Douglas Hills on the west of Spencer Gulf.
	Moonabie Formation	Indurated dark grey quartzite and granular greywacke. Gently folded.	Outcrops at Backy Point south of the Douglas Hills.

APPENDIX 1 WATER SAMPLES OBTAINED FROM THE BOREHOLES
(compiled by D.B. Fitzsimmons)

Hole	Depth (m)	Cond (mho.cm ⁻²)	Alkalinity (meq/l)	Density (g/ml)	(Fe) (mg/l)*
Port Augusta 1	5.0	136 000	1.9	1.098	0.22
	7.7	136 000	2.45	1.096	0.72
Port Augusta 2	5.1	24 500	8.0	1.008	0.03
	5.5	25 000	9.1	1.008	0.03
Port Augusta 3	6.6	62 000	2.05	1.024	0.025
	8.9	62 000	2.05	1.027	0.025
	10.7	69 000	2.5	1.030	0.035
	12.0	96 000	3.05	1.040	0.025
	13.9	123 000	3.8	1.059	0.035
Port Augusta 4	3.6	114 000	3.6	1.076	0.07
Port Augusta 5	1.4	150 000	1.45	1.117	0.02
Whyalla 1	1.2	129 000	2.1	1.097	0.06
	3.2	125 000	1.9	1.094	0.19
	5.3	120 000	1.45	1.086	0.20
	12.2	122 000	2.7	1.080	0.09
	17.6	117 000	2.4	1.084	0.25
Whyalla 2	-				
Whyalla 3	1.2	155 000	2.25	n.a.	0.18
Whyalla 4	4.3	123 000	5.7	n.a.	0.08
	6.7	111 000	6.0	n.d.	1.59
	8.2	108 000	6.3	n.d.	7.45
	13.0	54 000	8.6	n.d.	20.0
	13.6	50 000	n.d.	n.d.	6.00
	14.8	50 500	11.5	n.d.	0.64
	17.8	46 000	11.3	n.d.	0.06
Whyalla 5	0.4	52 000	10.8	n.d.	0.07
	1.8	45 000	11.3	n.d.	2.03
	3.9	47 000	n.d.	n.d.	0.22

* Soluble + particulate 0.45 microns

Whyalla 6	5.8	52 000	4.0	n.d.	0.05
	7.8	51 000	4.5	n.d.	0.05
	12.6	50 000	5.1	n.d.	5.76
	18.0	52 500	4.0	n.d.	18.9
	20.7	51 000	0.8	n.d.	67.3
	31.8	53 000	4.0	n.d.	24.6
Whyalla 7	12.0	n.d.	n.d.	n.d.	n.d.
	14.1	35 000	6.7	n.d.	3.79
	15.0	38 000			
Whyalla 8	0.2	Lake water	50	n.d.	5.81
	2.0	"	23	n.d.	6.50

APPENDIX 2

GEOLOGICAL LOGS OF THE

BOREHOLES

GEOLOGICAL LOG OF DRILL HOLE

1978 SPENCER GULF FIELD SURVEY
 HOLE NO. PORT AUGUSTA #1
 LOCATION RED CLIFF

REMARKS

R. HOUND

MS.

ANGLE FROM HORIZONTAL 090

DIRECTION

DESCRIPTION OF CORE	UNIT	DEPTH	LOG	SAMPLES	COLOR	REMARKS	ASSAYS
CASING	SIZE OF CORE						
Silty qtz sand. Well sorted v.f.-gr. Passing into clayey sand at base. Shelly sand. Fragmented shell material - 20%. Fine-gr. qtz sand - 80%. Large fragments <i>Anadara trapezia</i>. Occasional whole bivalve & gastropod.		0.5	2	546/4		AROLIAN. At base halite + minor gypsum laminae supratidal.	
		1.0	3	N7		Gray marine sands. Loose.	
		1.5	4	N7		Loose through out.	
Gray calcareous qtz sand. Biogenic carbonate - 30%. Fine - v.f.-gr. Occasional forams, minute gastropod. Predom. fragmented shell. Qtz - 70%. Well sorted, angular f.-v.f.-gr.		2.0	5	548/1		Totally loose.	
		2.5	6				
As above. Couple of large bivalve shells including <i>Anadara</i>. Shell material - 20-30% of sediment.		3.0	7	547/1		Water at 2.7 m Insufficient to sample.	
		3.5	8	547/1			
Increase in biogenic carb. to 40%. Large <i>Anadara</i> shells common towards base.		4.0	9	546/4		Irregular erosion at contact	
		4.5	10			Stiff	
Stiff, slightly sandy clays. Clay - 80%. Sand - 20%. Sand - fine-gr. med. Mod. sorted.		5.0	11	546/4		Moderate brown minor mottling - light olive gray.	
		5.5	12				
Minor secondary carbonate in matrix towards base.		6.0	13	546/4		Stiff.	
				546/4			

GEOLOGICAL LOG OF DRILL HOLE

PROJECT 1978 SPENCER GULF FIELD SURVEY

HOLE No PORT AUGUSTA #1

LOCATION (CONT.)

ANGLES FROM HORIZONTAL

DIRECTION

DESCRIPTION OF CORE

UNIT
CASING
DEPTH
SIZE OF
CORE

SAMPLES

COLOR

REMARKS

ASSAYS

Calcrete

Clayey sand. Qtzose.
v.f. gr. well sorted.
clay - 25%.Clayey sand as above
Sand - 70%. Qtz. f-v.f. gr.
mod. sorted.Increase in clay.
Sandy clay - clayey sand
Sand - 60% fine-gr.
clay - 40%.Decrease in clay
Clayey sand
clay - 30%. Sand - f. gr., 70%
well sorted.Increase in clay.
clay - 65% Sand 35% -
f. gr. mod. - w. sort.

Sandy clay - clayey sands

Some more sandy
lenses. Sand - f -
v.f. grained, well sorted }

HINDMARSH CLAY

49

10
SYR4/4Slightly mottled
minor secondary
carbonate.
Moderately soft

SYR4/4

Soft - Firm

Minor calcareous
patches.

SYR4/4

SYR4/1

Mottled. Some
secondary carb.
in grey mottled

SYR4/4

SYR4/1

SYR4/1

Strongly mottled
Some secondary
carbonate

Stiff.

SYR4/4

2 NB

Mottled.

Firm

SYR4/4

NB-5

2 NB

Stiff
Mottled
Some secondary
carbonate in
light grey mottledMottling more
pronounced.

Firm

SYR4/4

NB-5

Very minor
secondary
calcification
light grey mottled

GEOLOGICAL LOG OF DRILL HOLE

PROJECT 1978 SPENCER GULF
HOLE NO. PORT AUGUSTA #1 COORDINATES
LOCATION (CONT.)

REMARKS

F.L. GROUND

ANGLE FROM HORIZONTAL

DIRECTION

DESCRIPTION OF CORE	UNIT	DEPTH	LOG	CORE	SAMPLES	COLOR	REMARKS	ASSAYS
Sandy clay Qtz - f. gr. well sorted Minor secondary carbonate Sand = 40% Clay = 60%	CLAY	10.5		31	SYR4/4 & NB.5		Mottled. Firm.	
				32	"		stiff	
				33	"			
		11.0		34	"		Very stiff	
				35	"			
"	CLAY	11.5		36	SYR5/6 NB.5 & SYR8/2		INCREASE in secondary carbonate. Well cemented in place	
		12.0		37	"			
				38	"		"	
		12.5		39	NB.5 & SYR5/6		Very stiff. Strongly mottled	
				40	"			
Sandy clay. - as above. Sand - f. & v. f. gr. gts. Well sorted.	HINDMARSH	13.0		41	SYR5/6 NB.5 & SYR8/1			
				42	"		stiff	
		13.5		43	NB.5 & SYR5/6		↑ MINOR GYP-SUM.	
		14.0		44	"		Occurs as thin veins.	
				45	"		↓	
"	HINDMARSH	14.5		46	"			
				47	"			

GEOLOGICAL LOG OF DRILL HOLE

PROJECT 1978 SPENCER GULF

HOLE No PORT AUGUSTA #1

COORDINATES

LOCATION (CONT)

R. J. BROWN

ANGLE FROM HORIZONTAL

DIRECTION

DESCRIPTION OF CORE

UNIT
CASING
SIZE OF
COREDEPTH
GORE

LOG

SAMPLES

COLOR

REMARKS

ASSAYS

Sandy clay - clayey sand

Calcrete

Sandy clay.
Sand - 94.3, f-gr. mod.
- 30% sorting

"

Calcrete layer

Sandy clays
Sand - 40%. Qtz. f-gr. mod.
mod. sorted.Becoming increasingly
sandy & less sorted
towards base
Quartzite pebbles

Calcrete

HINDMARSH CLAY

DRILED AHEAD

CUTTINGS

5485/6 Stiff, strongly
& mottled.
N6-5
5486/1 Some secondary
carbonate.
Well cemented
in places.
N7 Very hard

N6-5 Some secondary
carbonate
5487/1 Well cemented
in places
Dry, friable
"

5488/1 Very hard.

5489/1 Mottled, firm
- N7 & Some secondary
5485/6 carbonate

5490/1 Soft.
- N7

Some material

5491/2 Very hard
- 5492
8/1 Pale pink
- grey.

GEOLOGICAL LOG OF DRILL HOLE

HOLE NO. **PORT AUGUSTA #1** COORDINATES
LOCATION **(CONT.)**

Q: MA-111

2. ROUND

LOCATION

AVOID FROM HOPZ 1414

DIRECTION

DESCRIPTION OF CORE

UNIT

DEPT-4

金江里 金江

၁၁၆

SAMPLE

5/10/04

REMARKS

ASSAYS

Calculate

Quartzite
Basement

ADOC RANGE QVZNYE
100000 PHOTOLOGICAL

5-05

21.0

21.5

63

54

65

56

27

10

69

10

Very hard.
Red iron oxide
stains etc.

GEOLOGICAL LOG OF DRILL HOLE

PROJECT 1978 SPENCER GULF AREA
 HOLE No PORT AUGUSTA #2
 LOCATION REDCLIFF

REMARKS

ROUND

M

ANGLE FROM HORIZONTAL 090

DIRECTION

DESCRIPTION OF CORE

UNIT DEPTH
 CASING SIZE OF
 GORE

LOG

SAMPLES

COLOR

REMARKS

ASSAYS

Silty-sandy soil.

Sandy clay - clayey sand
 Sand 40-50%. Fine-gr. med.
 Mod. sorting. Qtz.

Becoming more clayey
 clay - 65%. Sandy clay
 Sand - f. gr. qtz. well sorted

Sandy clay

Clayey sands
 Some qtz granular layers.
 Sands - f-med. gr. med.
 Mod. sorting.

Sandy clay - clayey sand
 Sand - 50%. f-med.
 grained med. Mod. sorting
 Clayey sand. Mod. gr. qtz.

HINDMARSH CLAY

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

51A4/4

Well developed
 pads.
 Dry.

51A4/4

Firm - stiff.

10A4/6

Minor secondary
carbonate.

"

"

"

10A4/6

51A4/4

"

51A4/4

Stiff

51A4/4

51A4/4

Slightly mottled.

51A4/4

51B/1

A N7

Stiff.

51A4/4

51A4/4

10A4/6

Minor concretions
- arg. carbonate.

51A4/4

10A4/6

51B/1

A N7

Stiff - v. stiff.

Mottled.

Minor secondary
carbonate.

51A4/4

10A4/6

A N7

"

51A4/4

10A4/6

A N7

"

51A4/4

10A4/6

A N7

Mottled.

Firm - soft.

51A4/4

51A4/4

Stiff.

Poorly sorted
Includes calcareous
concretions.

GEOLOGICAL LOG OF DRILL HOLE

PROJECT 1978 SPENCER GULF AREA.
 HOLE No. PORT AUGUSTA #2 (CONT.) CO-ORDINATES
 LOCATION

REMARKS

REL GROUND

ANGLE FROM HORIZONTAL

DIRECTION

DESCRIPTION OF CORE	UNIT CASING	DEPTH M SIZE OF CORE	LOG	SAMPLES COLOR	REMARKS	ASSAYS
Sandy clay.						
Coarse very poorly sorted quartz sand Quartzite pebbles & granular granules.						
Sandy clay - clayey sand Coarse quartz sands						
	HINDMARSH CLAY	5.5		18 SYA4/4 2 SYA4/1	WATER CUT AT 5.1 m MOHLED. FIRM	
				19 "W"		
		6.0		20 SYA4/4 & HB-25 SYA4/1	MOHLED. MINDI SECONDARY CARBONATE	

GEOLOGICAL LOG OF DRILL HOLE

PROJECT 1978 SPENCER GULF AREA

HOLE NO. PORT AUGUSTA #3

CO-ORDINATES

REMARKS

R. GROUND

LOCATION MAMBRAY CREEK

ANGLE FROM HORIZONTAL 090

DIRECTION

DESCRIPTION OF CORE	UNIT	DEPTH	LOG	CORE	SAMPLES	COLOUR	REMARKS	ASSAYS
	CASING	SIZE OF CORE						
Quartz sand. Fine - medium grained med. Moderate sorting Trace of clay-silt.		0.5		1		5YR 5/6		
"				2		"	Very occasional finely broken sh. shell fragment.	
Medium grained med.				3		"	Loose, dry	
		1.0		4		5YR 5/6		
Medium grained med. Moderately - well sorted quartz sand		1.5		5		"		
"				6		"		
		2.0		7		"		
"				8		"		
		2.5		9		"		
				10				
		3.0		11		"		
Fine - medium grained				12		5YR 5/6 5YR 4/4	"	
"		3.5		13		5YR 4/4		
		4.0		14			Loose.	
Clayey sands. Sand - 60-70% Fine - medium gr. Moderately sorted. Some more sandy lenses		4.5		15		5YR 5/6 MIND N6/5	MIND SECONDARY CARBONATE Firm.	
				16		"		
		5.0		17		"		

GEOLOGICAL LOG OF DRILL HOLE

PROJECT: 1978 SPENCER GULF

HOLE No. PORT AUGUSTA #3 (CONT.) CO-ORDINATES

REMARKS

GROUND

LOCATION

ANGLE FROM HORIZONTAL

DIRECTION

DESCRIPTION OF CORE	UNIT	DEPTH	LOG	CORE	SAMPLES	COLOR	REMARKS	ASSAYS
	CASING	SIZE OF BORE						
Clayey sand.								
				18		5YR5/6 & N6.5	Slightly mottled.	
Increase in clay 5.5-5.8m		5.5		19		5YR5/6 N6.5 & 10YR2/2	Minor secondary carbonate cementation.	
				20			Occasional well cemented - calcareous.	
Clayey sand. Medium gr. Clay - 30%. Sand - 70%.		6.0		21		"	Mottled Firm	
Sandy clays. Sand - 40% grs. fine-grained.				22		5YR5/6 & N6.5	Mottled	
		6.5		23		"	WATER CUT AT 6.6m. Soft.	
Clayey sand. Clay - 30%. Sand - 70%. Quartz. F-gr. mod. sorting.				24		"	Minor carbonate cementation. micro morphic	
		7.0		25		5YR5/6 - 10YR4/6 & 5Y7/2		
Becoming more clayey Sandy clays		7.5		26		"	Stiff mottled. Some secondary carbonate incl. Calcite patches	
				27				
		8.0		28		5YR5/6 N6.5 & 5Y8/4	Some secondary carbonate.	
Clayey sand. Clay - 35%. Sand - 65% Qtz. f-gr. mod. sorted.		8.5		29		"		
				30		"	Water saturated soft.	
		9.0		31		5YR5/6 & 10YR4/2 - N6.5	Mottled.	
				32		5YR5/6 10YR4/2 & N6.5	Mottled, water soft. Trace secondary carb.	
Sandy clay. Sand - 20%. More sandy towards 10m.		9.5		33			Stiff.	
		10.0						

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT 1978 SPENCER GULF

HOLE No PORT AUGUSTA #3 (CONT.) CO-ORDINATES

REMARKS

R. GROUND

LOCATION

ANGLE FROM HORIZONTAL

DIRECTION

DESCRIPTION OF CORE

UNIT
CASINGDEPTH
SIZE OF
CORE

LOG

CORE

SAMPLES

COLOR

REMARKS

ASSAYS

Sandy clay - clayey sand.
Sand - 50%. f. - med. gr.
qtz. Mod. sorting.

clayey sand. Sand - 70%.
Qtz. f. gr., med. sorting.

"

clay sand - sandy clay
Sand 50-60%. f. - v. f.
grained. Well sorted. Qtz.

Quartz sands.
Medium-grained.
Moderately sorted

clayey sand.
Calcrete.

Quartz sands. Minor clay
Poorly sorted, medium
-grained med.

"

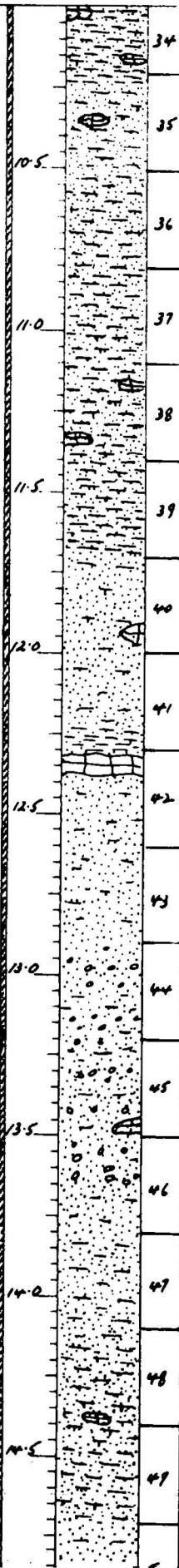
Qtz sands
f. - medium grained.
Quartzite pebble layers.
Poorly sorted

Finer grained. Slight
increase in clay

clayey qtz sands
fine-grained med.
Mod. sorted.

Quartz sand. Medium-gr.
med. Poorly sorted

HINDMARSH CLAY



34 Firm.
Secondary carb-
onate inc.
well cemented
patches
MON/ld.

35 5YR5/6
10YR6/2
& N6-5

36 " Firm
WATER CUT 10.7 m

37 " Firm - stiff.
MON/ld.
Some secondary
carbonate

38 5YR5/6
N7 &
5YR/1

39 " Stiff.

40 " Little clay.
WATER CUT 11.8 m
Soft

41 " " " "

42 " Firm. Minor
calcrete - Hard

43 5Y7/2
&
10YR6/6

44 " Soft. MON/ld.

45 " " " "

46 5YR5/6
5Y7/2
N9

47 " Includes well
rounded quartzite
pebbles.

48 5YR5/6
5Y7/2
N9

49 " More pronounced
MON/ld.

50 " Soft - loose.

51 " " " "

52 " Water sample
13.9 m.

53 5YR5/6
5Y7/2
N9

54 " Minor secondary
carbonate.

55 " Firm - loose

56 " " " "

57 " Loose, wet

GEOLOGICAL LOG OF DRILL HOLE

LOCATION

EFMA44-

W. YOUNG

ANG. FROM HORIZONTAL

DISCUSSION

Sheet 4 of 4
S/A/51

GEOLOGICAL LOG OF DRILL HOLE

PROJECT 1978 SPENCER GULF

HOLE NO PORT AUGUSTA #4

CO-ORDINATES

LOCATION MAMBRAY CREEK

REMARKS

W. POINT

M

ANGLE FROM HORIZONTAL 090

DIRECTION

DESCRIPTION OF CORE

UNIT
CASINGDEPTH
SIZE OF
CORE

LOG

COR

SAMPLES

COLOUR

REMARKS

ASSAYS

Shelly sand.
Shell - 40%. Whole + fragmented
bivalves, gastropods.
Sand - Qtz fine-gr.

80% Qtz sand. Med. gr.
20% biogenic carb.

Increase shell material.
50% Qtz sand
50% fragmented + whole shell
material. Minor silt.

Poorly sorted.

Silty shelly sand.
Qtz sand - 40%. Silt - 20%.
40% - Whole + fragmented
shell material.

Clayey sand. Qtz sand - 60%.
Silt + clay - 40%. Fine-gr.
mode. Poorly sorted.

Qtz sand. Poorly
sorted. Med.-grained
mode.

Clayey quartz sand.
Clay - 40%. Sand - 60% -
f.-med. gr. mode. Poorly
sorted.

"

Clayey sand. Qtz sand
60% clay + silt - 40%.
fine-gr. mode. Med.-sort.

"

"

Beach-ridge deposits

MINDMARSH CLAY

0.1W

Loose, dry

Very pale brown

"

"

5YR 5/6

10YR 6/6

? Sphagnum
fibres.

10YR 4/6

5Y 7/6

Firm. Slightly
mottled

"

5Y 6/4

-5Y 7/2

Some secondary
carbonate -
caliche

Loose.

5Y 6/4

5Y 7/2

6N 7

-5Y 5/1

Firm.
Strongly mottled
Some secondary
carbonate

Stiff.

5YR 5/6

N6.5

6N 9

NO RECOVERY

WATER CUT 3.6 m

"

Firm.

5YR 5/6

N6.5

6N 9

Strongly mottled
Minor secondary
carbonate.

NO RECOVERY

"

Firm - soft.

GEOLOGICAL LOG OF DRILL HOLE

PROJECT 1978 SPENCER GULF

HOLE No. PORT AUGUSTA #5

REMARKS

FL GROUND

M

LOCATION MAMBRAY CREEK

ANGLE FROM HORIZONTAL 090

DIRECTION

DESCRIPTION OF CORE	UNIT CASING	DEPTH m SIZE OF CORE	LOG	CORE	SAMPLES	COLOR	REMARKS	ASSAYS
Silty clay. Small gypsum crystals. Med-gr. qtz sand. Minor shell. Clays. Mottled. Med-gr. poorly sorted clayey qtz sand. Clay-30%. Sand contains trace fragmented biogenic carb.	CLAY MARINE SANDS HINDMARSH CLAY	0.5		1	5Y6/1 N7/6 10YR6/6 5YR4/4 N7		Mottled. Some gypsum. Minor gypsum	
				2	5YR4/4 5Y6/1		Slight mottling Soft.	
				3				
f-gr. clayey qtz sand. Clay-50%.		1.0		4	5YR 4/4 2 4 N7		Soft. Slightly mottled.	
Sands - coarse grained. Qtz. Minor fragmented carbonate - shell. f-med. grained mode.				5	"		"	
Shell grit layer. Includes large <i>Anadara trapezia</i> shells		1.5		6	5YR 5/6 10YR6/6		WATER CUT 1.4 m	
Wet, soft shelly clayey qtz sands. 25% - fragmented shell, small gastropods etc. Clay-30%. Sand Qtz-45%. f + v.f gr. well sorted		2.0		7	10YR6/6 5YR5/6		Soft.	
"				8	"		"	
		2.5		9	10YR6/6 5Y6/4 5Y7/2		Stiff. Some secondary carbonate. Forming hard calcrete patches in places	
Strongly mottled clayey sand. Clay 30%. Sand-70%. qtz - f-gr. mode. Med-well sorted.				10				
		3.0		11	5Y6/4 10YR6/2			
clayey sand. clay 25%. Sand 75%. Qtz - f-gr. poor - med. sorting.		3.5		12	5Y6/4		Soft, wet	
Mottled sandy clay.				13	5Y7/2 5Y6/4 5YR5/6 5Y7/2 2 N9		Mottled Abundant sec- ondary carbonate Stiff. Some small concreted calcrete patches	
Sandy clay - clayey sand. Qtz sand - poor-med sort. f-med. grained mode		4.0		14				
"		4.5		15	5YR5/6 10YR6/6 N6-5 - N9		Stiff, strongly mottled Secondary carbonate - calcite common.	
				16				
"				17	"		Stiff - v. stiff.	

GEOLOGICAL LOG OF DRILL HOLE

PROJECT 1978 SPENCER GULF

HOLE NO. WHYALLA #1

LOCATION WOOD POINT.

REMARKS

R. GROUND

M

ANGLE FROM HORIZONTAL 090

DIRECTION

DESCRIPTION OF CORE	UNIT	DEPTH	LOG	CORE	SAMPLES	COLOR	REMARKS	ASSAYS
	CASING	SIZE OF BORE						
clayey qtz sand - sandy clay Sand - qtz med. f. gr.							5YAS/6 A minor gyp Some secondary carbonate slightly mottled	
"		0.5		2			5YAS/6 At 0.4 m Gypsum crystals up to 2 cm forming radiating aggregates - nodules.	
				3			"	
clayey qtz sand & sandy clay. Sand - 50% qtz, medium - gr. med., moderately sorted.		1.0		4			5YAS/6 Some secondary carbonate. Includes well cemented calcrete patches. Moist, fairly friable.	
"		1.5		5			" WATER cut at 1.2 m	
		2.0					NO RECOVERY	
"		2.5		6			5YAS/6 Some secondary carbonate.	
Calcrete							Hard	
Sandy clay. Clay - 60% Sand - 40% qtz, f. gr. med., med. sorting.		3.0		7			5YAS/6 Stiff, dry Complete large Gypsum crystals	
"		3.5		8			5YAS/6 Slightly mottled Some secondary carbonate. Water cut 3.2 m	
"		4.0		9			" Several large gypsum crystal - als.	
		4.5		10			"	
							NO RECOVERY	
Sandy clay - clayey sand. Sand - qtz f. gr. med. Mod. - well sorted.		4.5		11			5YAS/6 & 10YR 6/2 Firm - stiff slightly mottled Some secondary carbonate.	
				12			" A few large gypsum crystals at 4.5 m	
							NO RECOVERY	

GEOLOGICAL LOG OF DRILL HOLE

PROJECT 1978 SPENCER GULF

HOLE No. WNYALLA #1 (CONT.)

REMARKS

P.L. SURROUND

LOCATION

ANGLE FROM HORIZONTAL

DIRECTION

DESCRIPTION OF CORE	UNIT CASING	DEPTH m SIZE OF CORE	LOG	SAMPLES	Color	REMARKS	ASSAYS
Clayey sands. Clay - 40%. Sand Grs - f-gr. med., moderately sorted		5.0		13	5YAS/6 & 10YR6/2	Some secondary carbonate Firm - stiff.	
		5.5		14	5YAS/6 & 5Y7/2	Water Cut 5.3m minor gypsum	
Medium-grained clayey quartz sands. Poorly sorted.		6.0		15	5YAS/6		
Fine-med.-gr. clayey quartz sands Clay - 40%.		6.5		16	" (5Y7/2)	Moist, firm Firm	
Coarse-gr. quartz sands Poorly sorted. clay - 5%.		7.0		17			
		7.5		18	10YR5/4	Loose. Wet Typical fluvial sand.	
		8.0		19	10YR5/4		
		8.5		20	10R4/6 & N7	- Sharp planar contact.	
Sandy clays. Sand - f-gr. mod - poorly sorted. Sand - 40%. Clay 60%.		9.0		21	"	Stiff, strongly mottled. Minor secondary carbonate	
		9.5		22	"		
		10.0		23	10R4/6 & N7	"	
		10.5		24	"		
		11.0		25	"	Stiff - v. stiff mottled	
		11.5		26	10R4/6 & N7		
Sandy clays. Clay - 65% Sand - 35%. f-gr. med moderately sorted		12.0		27	"	Stiff, strongly mottled Some secondary carbonate	
		12.5		28	"		
Stiff, mottled clay		13.0		29	10R4/6 & N7		

GEOLOGICAL LOG OF DRILL HOLE

PROJECT 1978 SPENCER GULF

HOLE No WHYALLA #1 (CONT)

LOCATION

REMARKS

R.C. AROUND

ANGLE FROM HORIZONTAL

DIRECTION

DESCRIPTION OF CORE	UNIT CASING	DEPTH M SIZE OF CORE	LOG	CORE	SAMPLES	COLOR	REMARKS	ASSAYS
Sandy clays. Clay - 75%. Sand - 25%. Qtz - f. gr. mode poorly sorted.		10.0		29			Stiff - very stiff mottled	
				30	10R4/6 & N6		Minor secondary carbonate. Small veinlets of gypsum	
		10.5		31				
Sandy clays. Clay 60%. Sand - 40%. Qtz - f. gr. mode, mod- poorly sorted				32	10R4/6 & N6		Firm - stiff. Strongly mottled	
		11.0		33	10R4/6 & N6.5		Firm - stiff. Strongly mottled	
				34	"		Firm.	
" "		11.5		35	"			
				36			Some secondary carbonate Water cut at 12.2 m	
		12.0					Not recovered	
clayey sands - sandy clays.				37	10R4/6 & N6.5		Stiff.	
		12.5		38	10R4/6 & N6		Some secondary carbonate Minor gypsum veinlets & layers	
				39	"		stiff - very stiff.	
Increase in clay. Sandy clays. Sand - 40%. Clay - 60%. Sand - Qtz f. gr. mode mod. sorted		13.0		40	"		Minor gypsum veining	
							Not recovered	
		13.5		41	10R4/6 N7 & N9		Stiff - very stiff. Very minor gypsum veining Minor secondary carbonate	
Sandy clays. Sand - 30% clay - 70%. Sand - Qtz - f. grained mode, moderately sorted.				42				
		14.0		43				
		14.5						
" "								
		15.0						

GEOLOGICAL LOG OF DRILL HOLE

PROJECT 1978 SPENCER GULF

HOLE No. WHYALLA #1 (CONT.)

COORDINATES

REMARKS

P.L. GROUND

LOCATION WOOD POINT.

ANGLE FROM HORIZONTAL

DIRECTION

DESCRIPTION OF CORE	UNIT	DEPTH m	UNIT NO.	SAMPLES	COLOR	REMARKS	ASSAYS
	ASING	SIZE OF CORE					
Slightly sandy clay. Sand - 20% - f. gr. mod. mod. sorting		13.0	44	10R4/6 & N7		Stiff - v. stiff mottled. Minor gypsum veining	
			45				
Sandy clay - clayey sand. Sand - Qtz 50-60% f. gr. mod. mod. sorting		15.5	46	10R4/6 & N6		Firm - friable Interact in sand	
			47	10R4/6 & N6		Stiff. mottled.	
Slightly sandy clay. Sand - Qtz - 25%		16.0	48			Stiff - very stiff.	
			49				
		16.5	50				
			51	10R4/6 & N6		Stiff, mottled	
Sandy clay. Clay - 60% Sand - 40% Qtz. f. mod. gr. mod. sorted		17.0	52				
			53				
		17.5	54			Water cut 17.6 m	
			55	10R4/6 & N6.5		Some secondary carbonate - forming hard patches in places. Minor gypsum veining Stiff.	
		18.0	56				
			57				
		18.5	58	10R4/6 & N6.5		Stiff, mottled Some secondary carbonate	
			59				
		19.0	60				
		19.5					
		20.0					

GEOLOGICAL LOG OF DRILL HOLE

PROJECT 1978 SPENCER GULF

HOLE No. WYALLA #1 (CONT)

LOCATION

REMARKS

ELEVATION

ANGLE FROM HORIZONTAL

DIRECTION

DESCRIPTION OF CORE	UNIT CASING	DEPTH m SIZE OF CORE	LOG	SAMPLES	COLORS	REMARKS	ASSAYS
Sandy clay Sand - 30% Qtz. f-v. gr. med - well sorted.		20.0					
				61	10R4/6 N6.5 d N9	Stiff, mottled. Some secondary carbonate inc. hard, well cement. ed patches.	
		20.5		62			
				63			
		21.0		64			
				65	10R4/6 d N6.5	Stiff, mottled very minor gypsum veining	
		21.5				No recovery	
				66		Few hard calcrete patches	
		22.0		67			
				68		Stiff, mottled minor gypsum	
		22.5					
				69	10R4/6 d N6.5		
		23.0					
Sandy clays Sand - 20% Qtz. f. gr.							

GEOLOGICAL LOG OF DRILL HOLE

PROJECT 1978 SPENCER GULF

HOLE No WHYALLA #2

LOCATION WOOD POINT.

P. NOTES

REMARKS

GROUND

ANGLE FROM HORIZONTAL 090

DIRECTION

DESCRIPTION OF CORE	UNIT CASING	DEPTH SIZE OF CORE	LOG	SAMPLES	COLOUR	REMARKS	ASSAYS
Shelly silty sand.	BEACH RIDGE SANDS					10YR 4/4 Whole + fragmented bivalve + gaster.	
Shelly sands. Whole + fragmented biogenic carbonate. Small bivalve + gastropods. Very little quartz.						10YR 8/2 Loose.	
		0.5				"	
						10YR 4/4	
		1.0				"	
	MARINE SANDS					FINER GRAINED. SP. almost entirely fragment -ed biogenic carbonate.	
		1.5				" Loose, wet.	
						5GY 4/1 Dark greenish grey. Organic reduction.	
		2.0				No recovery.	
Shelly sand including abundant sea grass fibres towards top.						5Y 4/1 Some sea grass fibre material.	
		2.5				10YR 8/2	
Very fine grained sandy clay. clay + silt - 70%. Sand - carb. - 30%. Minor sea grass - fibre material.						5B 5/1 Firm	
		3.0				10YR 4/2 Marked colour change.	
						Loose, wet.	
		3.5				5Y 6/1	
Shelly sands. Finely broken up shell material, small gastropods. Minor forams. 20% fine-grained quartz.						Minor sea grass fibre material.	
		4.0				5Y 6/1	
						"	
		4.5				" AN occasional large bivalve.	
		5.0					
Brown sandy silt - clay. Sand - 40%. Silty. Clay - silt - 60% calcareous pebbles.						10YR 4/4 Firm	
						Very occasional whole gastropods, bivalve.	
						5YR 4/4 Slightly mottled.	
						5YR 4/4 Firm - stiff. Secondary carbonate.	
						5Y 7/1	

GEOLOGICAL LOG OF DRILL HOLE

PROJECT **1978 SPENCER GULF**
 HOLE NO **WHYALLA #2 (CONT.)**
 LOCATION

REMARKS

R. ROUND

ANGLE FROM HORIZONTAL

DIRECTION

DESCRIPTION OF CORE

UNIT DEPTH
 CASING SIZE OF
 CORE

SAMPLES

COLOUR

REMARKS

ASSAYS

Sandy clays.
 Clay - 60%. Sand 40%. Qtz
 fine-gr. mode. well sorted

PROBABLE
 HINDMARSH CLAY.

55

57

16

17

stiff dry.
 MOHILL.
 5124/4
 & N9
 Secondary
 carbonate in the
 clay fraction.

GEOLOGICAL LOG OF DRILL HOLE

PROJECT 1978 SPENCER GULF.

HOLE NO. WHYALLA #3.

LOCATION WOOD POINT.

REMARKS

GROUND

ANGLE FROM HORIZONTAL 090

DIRECTION

DESCRIPTION OF CORE

UNIT	DEPTH
CASING	SIZE OF CORE

LOG

SAMPLES

COLUMN

REMARKS

ASSAYS

This dried algal mat.

Shelly sand. Composed of
finely broken up shell
material. - mainly bivalve
& gastropods

MARINE SANDS

Layer of seagrass fibres

Marine clay. - 25% finely
broken up biogenic carb.

Sandy clay. Clay - 70%.
- includes secondary carb.
Sand - 30%. Mainly qtz. Minor
fragmented carbonate.

Slightly sandy silt-clay.
Clay - 70%. - includes
secondary calcite.
Sand - 30% qtz. f.g. mode
moderately sorted.

Sandy clay - clayey sand
Clay - 50%. Sand - qtz 50%.
f. med. gr. mode. Poor - med
sorting.

Sandy clay. Sand - 40%
qtz. f. med. gr. mode. Moderately
poorly sorted.

PROBABLE MUDFLAT CLAY.

Trace of Halite &
Gypsum.
Loose Occasional
whole bivalve.
Small gastropods
common

NO RECOVERY

Some whole
bivalves.

50V4/1 Organic reduction
zone

50S/1 Some seagrass
fibres, small
gastropods.
marked colour
change.

5YR3/4 Firm.

Some carbonate
clay fraction

5YR3/4 Soft - firm
more sandy.

5YR5/6 Firm
Several thin layers
of gypsum
crystals.

5YR5/6
& 10YR7/4 Mottled.
Some gypsum
crystals.

5YR5/6
& 5Y/2 Firm - stiff.
Mottled.
Minor gypsum
veining.

5YR5/6 Stiff, mottled
& 10YR5/4 Secondary carbon
ate in mottled.
Minor gypsum
veining.

GEOLOGICAL LOG OF DRILL HOLE

PROJECT 1978 SPENCER GULF

HOLE No WHYALLA # 4

COORDINATES

REMARKS

W. C. ROUND

LOCATION FISHERMANS BAY.

ANGLE FROM HORIZONTAL 090.

DIRECTION

DESCRIPTION OF CORE

UNIT	DEPTH
CASING	SIZE OF CORE

LOG

CORE

SAMPLES

COLOUR

REMARKS

ASSAYS

Slightly silty, shelly sands.
Composed of fragmented
shells, small whole gastropods
& bivalves. Qtz < 10%.
Poorly sorted. Typical
beach ridge deposit.

MARINE & BEACH RIDGE SANDS

0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0

NO RECOVERY - SANDS TOO LOOSE

CUTTINGS

5Y8/1

Loose. Dry.

10Y4.8/2

5Y8/1

20% Qtz.

Probably shelly
sandstone as
above in cores
1-6.

Mottled sandy clays
Sand - 30%. Qtz.
f-med. gr. moderately
sorted.

10R4/6
G
N6

Water in shelly
sands overlying
clay sequence

Firm - stiff.
Mottled.
Dry.

GEOLOGICAL LOG OF DRILL HOLE

PROJECT 1978 SPENCER GULF

HOLE NO. WHYALLA #4 (CONT.)

REMARKS

LOCATION

COORDINATES

SURROUND

ANGLE FROM HORIZONTAL

DIRECTION

DESCRIPTION OF CORE	UNIT CASING	DEPTH m SIZE OF CORE	OG	SAMPLES	COLOUR	REMARKS	ASSAYS
Sandy clays. clay=70% sand=30% Qtz. f.-gr. mode moderately sorted		5.5	8	10R4/6 & N6	Firm-stiff mottled dry		
			9	"	minor sandy lamellae		
			10	"			
		6.0	11	N6 & 10R4/6	Fairly friable		
"			12	"	"		
			13	"	"		
		6.5	14	N6.5 & 10R4/6	Water cut at 6.7m		
			15	N6 & 10R4/6	mottled dry, friable		
"		7.0	16	"	"		
			17	"	"		
		7.5	18	"	"		
			19	N6 & 10R4/6	Water cut at 8.2m stiff slightly mottled 10R4/6 minor		
Slightly sandy clay. clay=75%. Sand=25% Qtz. f.-gr. mode. Well sorted		8.0	20	"			
			21	"			
		8.5	22	"	stiff-very stiff.		
			23	"			
"		9.0	24	10R4/6 & N6	stiff. pronounced -ad mottling.		
		9.5					
		10.0					

GEOLOGICAL LOG OF DRILL HOLE

PROJECT 1978 SPENCER GULF.

HOLE No WYNALLA #4 (CONT.)

REMARKS

LOCATION

ROUND

ANGLE FROM HORIZONTAL

DIRECTION

DESCRIPTION OF CORE

UNIT

DEPTH

LOG

SAMPLES

COLOUR

REMARKS

ASSAYS

Slightly sandy clay. Clay - 80%
Sand - 20% - Qtz. v.f. gr.
med. well sorted.

MUDMARCH CLAY.

Sandy clays.

Quartz sand. Fine-gr.
well sorted. Dark yellowish
orange.

Sandy calcarenites.

Quartzose calcarenite
limestone. Composed of
microfossil detritus + qtz.
v.f. grained.

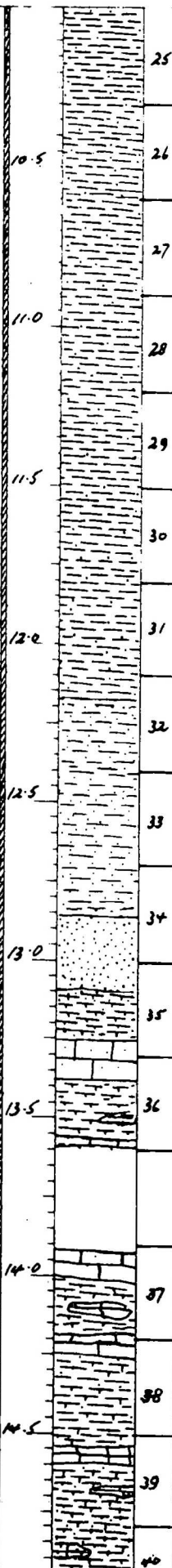
Calcarentite. Small
calcrete patches.

Calcarentite alternating
with lava (well cemented)
v.f. gr. quartzose calcarenite
limestone. Some calcrete
patches.

Mixture calcareous & non-
calcareous clays

Slightly sandy calcarenite
(marl).

(2 TERTIARY)

10R4/6
B
N6

Stiff, mottled

"

N6
10R4/6

Very stiff.

"

Stiff
strongly mottled
Fragile.

"

Stiff

"

"

10R4/6
10R4/6
B
N6-5

Firm - stiff.

"

"

10R4/6

Loose.
Water cut 12.8 mN9 -
10R4/6

517/2

Hard well
cemented.
Forams, bryozoa
etc.10R4/6
-N9

Water cut 13.6 m

No recovery

N9

N9,
516/1
B
10R4/6

Mottled.

10R4/6

GEOLOGICAL LOG OF DRILL HOLE

PROJECT 1978 SPENCER GULF.

HOLE No WNYALLA #4 (CONT.)

ORDINATES

REMARKS

F. ROUND

LOCATION

ANGLE FROM HORIZONTAL

DIRECTION

DESCRIPTION OF CORE	UNIT	DEPTH m	LOG	SAMPLES	COLOR	REMARKS	ASSAYS
CASING	SIZE OF CORE						
Broken up quartzose calcarenite limestone and calcareate. Quartzose calcareous sands. Quartz - 50%. Biogenic carbonate + fragments of calcareate + limestone - 50%. Med - coarse grained at top becoming finer towards base of core 45. Quartzose - calcareous sands. Fine grained. Well sorted. Qtz - 35%. Finely fragmented biogenic carbonate - 65%. Minor calcarenite. Marl towards base. Sandy marl. Largely non-calcareous sandy clays. Slightly sandy marls some calcareate patches and layers - rare. Calcareous limestone.		40				NO RECOVERY	
		15.5		41	SYB/1		
				42	"		
		16.0		43	"		
				44	SYB/1	LOOSE	
		16.5		45			
		17.0					
				46	SYB/1		
		17.5		47	10YR 8/2 minor SG 6/1	LOOSE WET	
						Water sample taken 17.8 m.	
		18.0			N9		
				48	SYB 5/6 & N6.5	moistened.	
		18.5		49	N9		
				50			
		19.0		51	N9		
				52			
		19.5		53	N9		
		20.0					

GEOLOGICAL LOG OF DRILL HOLE

PROJECT 1978 SPENCER GULF.

HOLE No WHYALLA #4 (CONT.)

LOCATION

ALTERNATES

REMARKS

WIND DIRECTION

ANGLE FROM HORIZONTAL

DIRECTION

DESCRIPTION OF CORE

UNIT
CASINGDEPTH
M
SIZE OF
CORE

LOG

IN

SAMPLES

COLOR

REMARKS

ASSAYS

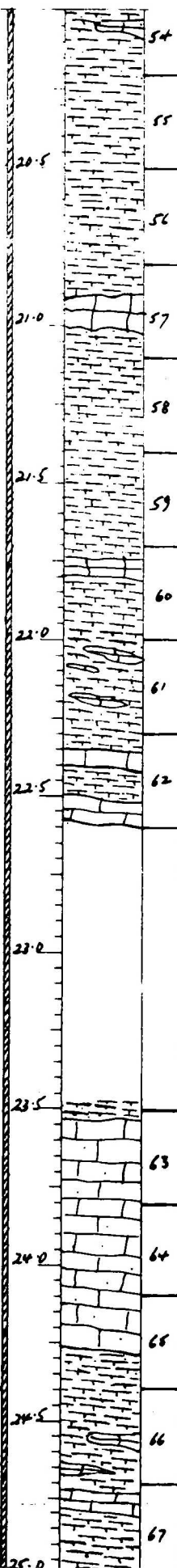
MOHIA slightly sandy
clays. Sand ~25-30% v.f. gr.
Calcutite occurring in
white moths.

Calcrete layer.

Marl (calcutite)
with well cemented
calcrete layers. Includes
some finely fragmented
microfossil material

Calcareous limestone.
? forams, bryozoa etc.
Well cemented with
secondary carbonate -
calcrete in places.

Calcutite - marls.
Calcrete - limestone
patches.



SGY6/1
-N6.5
d N9.

N6.5
d N9

SGY6/1
-N9

SGY8/1
-N9

Soft.

N9-
SY8/1
-SGY8/1

Hard.

N9

In places fairly
friable.

N9

GEOLOGICAL LOG OF DRILL HOLE

LOCATION *ASHEMANS BAY.*

REMARKS:

2. WE INT

1

ANGLE FROM HORIZ. IN ° 090

Discussion

Sheet 1 of 2
S/A/58

GEOLOGICAL LOG OF DRILL HOLE

PROJECT 1978 SPENCER GULF
HOLE NO. WHYALLA #5 (CONT.)

REMARKS

COORDINATES

REL. AROUND

LOCATION

ANGLE FROM HORIZONTAL

DIRECTION

DESCRIPTION OF CORE

UNIT DEPTH
CASING SIZE OF
CORE

LOG

SAMPLES

COLOUR

REMARKS

ASSAYS

Sandy clay. Sand 25%
gt 3 - 1.5 mm mod sorted

H

5.5

17

18

5.7

10A46
&
N6.5

Stiff. Mottled

10A46
&
N6

LOCATION *FISHERMANS BAY*

- 2 MAY -

2. PCINE



2N-1: FROM (06) IN-A. 090

2008, 2009, 2010

UNIT		DEPTH	LOG	SAMPLES	COLOUR	REMARKS	ASSAYS
CASING	SIZE OF CORE	(m)					
Thin rounded pebbles							
Silty sands. Dune sands Predom quartz - 90, moderately sorted. V. minor shell material towards base. Lower part shows minor soil development			0.5	1	5YR 3/6	Loose dry Organically rich & colour	
Quartz sands cemented with secondary carbonate. Fine or med. grained. Minor fragmented shell material			1.0	2	10YR 8/6		
				3			
Calcareous quartz sand Quartz - 60% Carbonate - 40% - broken up shell material. Poorly sorted. Includes occasional large shell fragments including <u>Anadara trapezia</u>			1.5	4	10YR 6/6	Loose, dry.	
				5	10YR 7/4		
				6			
Clayey quartz sand. Clay - 40% - includes secondary carbonate. Sand - 60% mod. sorting.			2.0	7	5YR 5/6 10YR 8/6 & 10YR 8/2	Firm. Well cemented with secondary carbonate in places.	
				8			
Sandy clays - clayey sands Some secondary carbonate			2.5	9	10R 4/6 & 10YR 8/2	Firm - stiff.	
				10	10R 4/6 10YR 5/6 & 10YR 8/2 - 19	Hard calcareated patches.	
				11		Stiff	
			3.5				
				12			
			4.0				
				13			
			4.5				
Sandy clays. Considerable secondary carbonate.				14	10R 4/6 & 5Y 6/4	Firm - stiff Strongly mottled Some hard well cemented patches - secondary carbon- ate.	
				15			

MINERAL RESOURCES ACT 1989 AND GEOPHYSICS GEOLOGICAL LOG OF DRILL HOLE

1978 SPENCER GULF
WYALLA #6 (CONT)

LOCATION

ROUND

FROM WYALLA

DIRECTION

DESCRIPTION OF CORE

UNIT DEPTH
CASING SIZE OF
CORE

SAMPLES

COLOUR

REMARKS

ASSAYS

Slightly sandy clay
considerable secondary
carbonate Sand Qtz
~20%

5.5

16

1024/6
546/4
& N9

Firm Moist
Mottled

17

"

• W

Water cut 5.8m

6.0

6.5

18

N9 Strongly mottled
& wet
10426/6

7.0

19

7.5

20

10426/6
& N9 Many hard
calcreted patches
considerable
secondary carbon-
ate

21

• W

22

"

Firm

8.0

23

8.5

24

10426/6
& N9

Slightly sandy clays with
abundant secondary carbonate
including hard (well cemented)
calcrete patches

25

"

9.0

26

9.5

27

10426/6
& N9 -
10428/2

Firm - stiff

28

Some calcrete layers

GEOLOGICAL LOG OF DRILL HOLE

PROJECT 1978 SPENCER GULF.

HOLE NO WHYALLA # 6 (CONT.)

REMARKS

GROUND

LOCATION

ANGLE FROM HORIZONTAL

DIRECTION

DESCRIPTION OF CORE	UNIT	DEPTH	SAMPLES	COLOUR	REMARKS	ASSAYS
Sandy clay. Sand ~20% gty. Some secondary carbonates including well cemented (caliche) patches. Sand is poorly sorted, med. gr. mode.		29		10YR 6/6 & 5Y 7/2	Still Mohled.	
		30		10YR 6/6 & 5Y 7/2	Still	
		31		"		
		32				
Minor v. coarse quartz sand & granite layers.		33		"		
		34		10YR 6/6	Still	
		35		5Y 4/6	Marked colour change.	
		36		"		
Clay with coarse sand layers & minor quartz, & pebbles & granule components.		37		10YR 6/6 & 5Y 4/6	Water cut 12.6 m	
		38		10YR 6/6 & 5Y 4/6		
		39		10YR 6/6 & 5Y 4/6		
		40		10YR 6/6 & 5Y 4/6		
Sandy clay - clayey sand 40% gty sand - calc. or poorly sorted - includes gty & quartz pebbles & granules. Becoming more sandy towards base.		41		"		
		42		"		
		43		"		
		44		"		
Quartz sand. Slightly clayey. Poorly sorted - ranges fine - very coarse. med. - gr. mode.		45		"		
		46		"		
		47		"		
		48		"		

GEOLOGICAL LOG OF DRILL HOLE

PROJECT 1978 SPENCER GULF.

HOLE No WHYALLA #6 (CONT.)

REMARKS

CO-ORDINATES

REL GROUND

LOCATION

ANGLE FROM HORIZONTAL

DIRECTION

DESCRIPTION OF CORE

UNIT

DEPTH

LOG

CORE

SAMPLES

COLOUR

REMARKS

ASSAYS

Slightly clayey quartz sands
Sand - 80% poorly sorted -
ranges v. f - v. coarse.
Minor quartz granule layers

15.5

43

10YR6/6

Soft, wet.
Some graded
bedding.

44

"

45

"

16.0

46

"

16.5

47

10YR6/6
(N7)

48

17.0

49

10YR6/6
5Y6/4

50

"

17.5

51

"

52

"

18.0

53

OW
Sludge water
sample.

54

10YR6/6
5Y6/4
(N7)

18.5

55

"

56

"

19.0

57

Marked colour
change.

58

N7

Wet, soft.

59

"

19.5

58

"

59

"

Light grey fine &
very fine-grained
clean quartz sands.
Very well sorted.
Only quartz & trace of
feldspar.

GEOLOGICAL LOG OF DRILL HOLE

PROJECT 1978 SPENCER GULF

HOLE No WYVALLA #6 (CONT.)

COORDINATES

REMARKS

R. GROUND

LOCATION

ANGLE FROM HORIZONTAL

DIRECTION

DESCRIPTION OF CORE	UNIT	DEPTH	LOG	CORE	SAMPLES	COLOUR	REMARKS	ASSAYS
	CASING	SIZE OF CORE						
Clean, very fine grained quartz sands very well sorted.		60				N7	Wat, soft.	
		20.5						
		61				"		
		21.0						
Medium grained, poorly sorted quartz sands.		62				"		
		21.5						
Fine-grained quartz sands.		63				"		
		22.0						
Fine-medium grained moderately sorted quartz sands. Clean		64				SG6/1		
		22.5						
		65				N7		
		23.0				SG6/1		
		66				SG46/1		
		23.5				N7		
		67				"		
		24.0						
Medium-grained quartz sands. Trace amounts of lalaupe. Moderately sorted.		68				N7		
		24.5						
Fine-medium grained. well sorted.		69				N6.5		
		25.0						
		70				SG7/2		
		25.5						
		71				"		
		26.0						
		72				"		
		26.5						
		73				"		
		27.0						
		74				"		
		27.5						
		75				"		
		28.0						
Coarse-grained, poorly sorted quartz sands						107A4/4	Marked colour change. Iron oxides	
						SG6/4		

GEOLOGICAL LOG OF DRILL HOLE

PROJECT 1978 SPENCER GULF
HOLE No WYVALLA #6 (CONT)

REMARKS

CO-ORDINATES

R L GROUND

LOCATION

ANGLE FROM HORIZONTAL:

DIRECTION

DESCRIPTION OF CORE	UNIT	DEPTH	LOG	CORE	SAMPLES	COLOUR	REMARKS	ASSAYS
	CASING	SIZE OF CORE						
Medium - coarse grained moderately or poorly sorted quartz sands. Slightly clayey.		25.5		76		10YR 6/6	Wet, loose.	
				77		"		
				78		"		
				79		"		
Coarse - very coarse quartz sand containing some granule & pebble material with a white - light grey non calcareous clay matrix. Sand etc - 60-70%. Matrix - 30-40%. Pebbles are well rounded - water worn. Occasional dark grey clay clasts.		26.5		80		N7-N9	Firm	
				81		"	"	
		27.0		82		N9	"	
				83		N7-N9	"	
				84		"	"	
		28.0		85		"	"	
				86		N7	"	
		28.5		87		10YR 6/6	Colour change. incoming iron oxides.	
				88		"		
				89		"		
Very coarse, poorly sorted quartz sand. Contains quartzite & quartz pebbles & granules - mod. - well rounded - 20% clay		29.0		90		10YR 6/6 (10R 4/6)		

GEOLOGICAL LOG OF DRILL HOLE

PROJECT 1978 SPENCER GULF

HOLE No WYVALLA #6 (CONT)

CO-ORDINATES

REMARKS

R.L. GROUND

LOCATION

ANGLE FROM HORIZONTAL

DIRECTION

DESCRIPTION OF CORE	UNIT	DEPTH	LOG	CORE	SAMPLES	COLOUR	REMARKS	ASSAYS
	CASING	SIZE OF CORE						
Clayey (~25%) very poorly sorted very coarse grained quartz sands containing well-rounded quartzite pebbles minor clay lithoclasts.		30.5						
				91		10YR 6/6	WAT	
						-5Y 8/1		
		31.0		92		5Y 8/1		
						10YR 8/2		
"				93		"		
		31.5						
				94		"		
Quartzite pebble + cobble layer. Well rounded.				95				
		32.1						
					•W		Water sample 32.1 m	

GEOLOGICAL LOG OF DRILL HOLE

PROJECT 1978 SPENCER GULF

HOLE No WYVALLA #7 (CONT.)

CO-ORDINATES

REMARKS

R L GROUND

LOCATION

ANGLE FROM HORIZONTAL

DIRECTION

DESCRIPTION OF CORE	UNIT	DEPTH	LOG	CORE	SAMPLES	COLOUR	REMARKS	ASSAYS
	CASING	SIZE OF CORE						
Clays. Sand content 45%.								
		10.5		34	N7 & 10YR6/6 (N3)		Very stiff Strongly mottled.	
				35				
				36	"			
		11.0		37	N7 & 10YR6/6			
				38	"			
		11.5		39	"			
Sandy clays. Clay 50-60% Sand - gtz f - med gr. med. sorted				40	10YR6/6		Firm - stiff	
"		12.0		41			Water cut 12.0 m.	
				42	10YR6/6 N7 & N9		Minor secondary carbonate mottled. Some small iron oxide? pisolites.	
		12.5		43	"		"	
"				44	"		"	
		13.0		45	"		"	
		13.5					NO RECOVERY	
		14.0		46	10YR6/6 & N7			
							NO RECOVERY.	
		14.5		47	10YR6/6 & N7 - N9		Firm - stiff mottled Minor secondary carbonate	
Sandy clay. Sand ~40%		15.0						

GEOLOGICAL LOG OF DRILL HOLE

PROJECT 1978 SPENCER GULF

HOLE No WNYALLA #7 (CONT.)

COORDINATES

REMARKS

GROUND

LOCATION

ANGLE FROM HORIZONTAL

DIRECTION

DESCRIPTION OF CORE	UNIT	DEPTH m	LOG	CORE	SAMPLES	COLOUR	REMARKS	ASSAYS
	CASING	SIZE OF BORE						
Slightly sandy clay. Sand - 15-20% v.f. + f. gr. qtz well sorted. Quartz.								
		5.5		18	N7 & 10R4/6		Stiff, mottled slightly moist.	
				19	"		"	
				20	"		"	
		6.0		21	"		Some veining of Celestite xrd 1.2.	
				22	"		"	
		6.5		23	10R4/6 & N7		Strongly mottled. stiff	
		7.0		24	N7, 10R4/6 & 10YR4/6		Mottled. Stiff. slightly moist.	
				25	"		"	
		7.5		26	"		"	
				27	"		"	
		8.0		28	"		"	
				29	N7 10YR4/6 & 10R4/6		Strongly mottled very stiff.	
		8.5		30	N7 & 10YR4/6		"	
				31	"		"	
		9.0		32	"		"	
				33	"		"	
		9.5		34	"		"	
				35	"		"	
				36	"		"	
				37	"		"	
				38	"		"	
				39	"		"	
				40	"		"	
				41	"		"	
				42	"		"	
				43	"		"	
				44	"		"	
				45	"		"	
				46	"		"	
				47	"		"	
				48	"		"	
				49	"		"	
				50	"		"	
				51	"		"	
				52	"		"	
				53	"		"	
				54	"		"	
				55	"		"	
				56	"		"	
				57	"		"	
				58	"		"	
				59	"		"	
				60	"		"	
				61	"		"	
				62	"		"	
				63	"		"	
				64	"		"	
				65	"		"	
				66	"		"	
				67	"		"	
				68	"		"	
				69	"		"	
				70	"		"	
				71	"		"	
				72	"		"	
				73	"		"	
				74	"		"	
				75	"		"	
				76	"		"	
				77	"		"	
				78	"		"	
				79	"		"	
				80	"		"	
				81	"		"	
				82	"		"	
				83	"		"	
				84	"		"	
				85	"		"	
				86	"		"	
				87	"		"	
				88	"		"	
				89	"		"	
				90	"		"	
				91	"		"	
				92	"		"	
				93	"		"	
				94	"		"	
				95	"		"	
				96	"		"	
				97	"		"	
				98	"		"	
				99	"		"	
				100	"		"	

very slightly sandy clay.
Clay 95%. Sand - 5%.

GEOLOGICAL LOG OF DRILL HOLE

PROJECT 1978 SPENCER GULF.

HOLE No WNYALLA #7

LOCATION FISHERMANS BAY.

COORDINATES

JUST EAST OF SALT LAKE

REMARKS

R.L. GROUND

ANGLE FROM HORIZONTAL 090

DIRECTION

DESCRIPTION OF CORE

UNIT
CASINGDEPTH
SIZE OF
CORE

LOG

CORE

SAMPLES

COLOUR

REMARKS

ASSAYS

Sandy soil. Aeolian dune material.

Clayey sands. Sand - 70%
gt3. Moderately sorted.
fine-gr. med.Clayey sands - sandy clays
Clay - 50%. Sand - 50% gt3
- f. gr. med., moderately
sorted.Sandy clays. Sand - 30%
gt3. f + v. b. gr. well sorted.

Decrease in sand to ~20%

Sandy clays. Sand - 20%
gt3. f + v. b. gr. well sorted.

"

"

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

SYR
6/4

SYR 5/6

SYR 5/6

4
SYR 6/4

SYR 5/6

4
SYR 7/2

"

"

10R 4/6

4
SYR 7/2

"

"

"

"

10R 4/6

4
SYR 7/2

-N7

"

"

"

SYR 7/6

Loose, dry.

Firm. Some
secondary carb.Slightly moist.
Mottled. Firm.
Some secondary
carbonate in
clay fraction.Mottled, firm
slightly moist.

"

"

"

"

"

"

"

Strongly mottled.
Firm. moist.

Minor gypsum

Trace gypsum

Firm - stiff.

"

GEOLOGICAL LOG OF DRILL HOLE

PROJECT 1978 SPENCER GULF

HOLE No WHYALLA #8

CO ORDINATES

REMARKS

H. GROUND

M.

LOCATION FISHERMANS BAY.

SALT LAKE.

ANGLE FROM HORIZONTAL 090.

DIRECTION

DESCRIPTION OF CORE	UNIT	DEPTH	LOG	ORE	SAMPLES	COLOUR	REMARKS	ASSAYS
	CASING	SIZE OF CORE						
Halite crust. Crystals up to 1cm in diameter. Passing into crystal slush.								
Reduction. Iron sulfides etc → black colour.								
Black reduced zone.								
Very fine grained laminated sands. Quartz?								
		0.5						
		1.0						
No recovery. Fall from 0.6 - 2.0 m - though lake water and highly water saturated sediments.								
		1.5						
Laminated very fine-grained sands.								
		2.0						
Slightly sandy clays. Same - 20% v.l. - f. grained. Well sorted.								
"		2.5						
"		3.0						
"		3.5						
		4.0						
		4.5						
Slightly sandy clays. Sand - 15% f. gr. quartz.								
		5.0						
		5.5						