DEPARTMENT OF MINES AND ENERGY
SOUTH AUSTRALIA

REPT.BK.NO. 82/77
MURRAY BASIN HYDROGEOLOGICAL INVESTIGATIONS, DRILLING PROGRAMME - UPPER MURRAY AND NORTHERN REGION, PROGRESS REPORT NO. 3

GEOLOGICAL SURVEY

by

D.R. EDWARDS

OCTOBER 1982

DME.186/80

CONTENTS

PLANS

FIGURES		PLAN NO.
Composite Well Log, Well	M55	82-356
" " " "	M56	82-357
" " " "	M57	82-358
" " " "	M58	82-359
" " " "	M59	82-360
" " " "	M60	62-361
" " " "	M61	62-362
" " " "	M62	82-363
" " " "	M63	82-364
" " " "	M64	82-365
" " " "	M65	82-366
" " " "	M66	82-367
" " " "	M67A	82-368
" " " "	M68	82-369
" " " "	M68A	82-370
" " " "	M70	82-371
" " " "	M71	82-372
" " " "	M72	82-373
" " " "	M73	82-374
" " " "	M74	82-375
" " " "	M75	82-376
" " " "	M76	82-377
" " " "	M77	82-378
" " " "	M90	82-379
" " " "	M91	82-380

DEPARTMENT OF MINES AND ENERGY
SOUTH AUSTRALIA

Rept.Bk.No. 82/77
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MURRAY BASIN HYDROGEOLOGICAL INVESTIGATION, DRILLING PROGRAMME - UPPER MURRAY AND NORTHERN REGION, PROGRESS REPORT NO. 3.

ABSTRACT

A further twenty six rotary investigation wells have been drilled in the Upper Murray area of South Australia as part of a continuing investigation into the effect of groundwater on River Murray salinity. The northern and northwestern limits of Tertiary limestone deposition have been defined and salinity/potentiometric head/lithological data have been accurately delineated for three Tertiary aquifers. Composite geophysical and geological logs are presented.

INTRODUCTION

As part of an investigation by the Engineering and Water Supply Department into salinity of the River Murray and its control, an original programme of 73 observation wells was planned to better define groundwater salinities and hydraulic gradients of the two main aquifers contributing salt to the river (Reed, 1980). The programme has now been extended (Barnett, 1981). Details of the first 49 holes were presented in two reports (Edwards, 1981a,b) and this progress report covers the next 26 holes drilled between February and July 1981.

DRILLING METHODS

Rotary drilling rig RDI was employed throughout this phase of the programme. All holes were drilled 140 mm to total depth and using mud as the water table was everywhere intercepted in unstable (sandy) material. Development by airlifting was attempted using the rig's air compressor. The holes were geologically and geophysically logged by the author (except for

M63) in an uncased mud-filled state. The completion intervals were selected, and either a 2 m stainless steel sandscreen or 12 metres of slotted 80 mm PVC was installed at the end of a string of 80 mm blank class 12 PVC casing. Aquifer separation was achieved by cementing between the casing and hole walls above a linatex seal set opposite the least permeable zones. Accurate elevations (to A.H.D.) have been obtained by the Surveying Section. All wells were completed for long term observations with a 1 metre yellow standpipe cemented over each well.

RESULTS

A summary of well data (depth, water level, salinity, etc.) is presented in Table 1. Two water samples were obtained from each well, one for total dissolved solids and the other for full analysis, results of which are presented in Table 2. In the field use of a portable conductivity meter enabled the salinity pattern to be monitored during development.

In the area investigated the unconfined Pliocene Sands aquifer did not contain enough water for development by air lifting, and only three wells (M60, 66 and 68A) could be sampled at the time of drilling. These wells are all situated in the south-east area near the "Renmark Trough" and "Canegrass Lobe" structural lows, and have a saturated sand thickness in excess of 18 m. The unsampled wells are M62, 64, 67A, 71, 73, 75, 76, 77 and M91 and of these M67A and M76 were completed in the confined Murray Group aquifer. A later sampling programme failed to obtain representative samples from all holes except M67A due to poor aquifer characteristics and/or aquifer clogging by residual drilling mud.

TABLE 1

SUMMARY OF WELL DATA
(metres)

TEMPORARY NO.	PERMIT NO.	UNIT NO.	TOTAL DEPTH m	WATER CUT (G.L.) m	WATER LEVEL (G.L.) m	SCREENED (2m) or SLOTTED (12m) INTERVAL m	SALINITY (mg/L)	AQUIFER TYPE*	AQUIFER NAME**	REMARKS
M55	90791	7029-630	90	68	14	78-90	29,859	C	MG	*
M56	90792	7029-631	200	70	30.80	108-120	24,217	C	MG	
M57	90799	7029-632	48	5	4.90	14.50-16.50	53,653	UC	PS	
M58	8305	7030-382	200	116	23.10	114-126	16,371	C	MG	
M59	8306	7030-383	138	116	10.40	120-138	14,566	C	MG	
M60	8307	7030-384	60	22	21.60	49-51	39,576	UC	PS	
M61	8308	7031-11	150	116	39.80	138-150	8,277	C	MG	
M62	8309	7031-12	66	57	44.70	64-66	?	UC	PS	
M63	8310	7031-13	144	110	43.30	132-144	11,610	C	MG	
M64	8311	7031-14	66	51	50.2	61.5-63.5	?	UC	PS	
M65	8312	6930-8	130	104	33.40	108-120	12,637	C	MG	
M66	8313	6930-9	54	39	38.30	43-45	39,118	UC	PS	
M67	A B A N D O N E D	A T	9 0 M	(INFORMATION SAME AS M67A)						
M67A	8314	6930-11	130	73	40.10	96-114	14,203	C	MG	*
M68	8315	6930-12	130	64	41.65	108-120	37,176	C	MG	
M68A	91314	6930-15	60	41	40.25	52-54	41,299	UC	PS	
M70	8317	6930-13	108	90	38.65	96-108	13,322	C	MG	
M71	8318	6930-14	45	40	39.40	43-45	?	UC	PS	
M72	8319	6931-24	132	120	48.70	120-132	10,890	C	MG	
M73	8320	6931-25	50	?	?	45-47	?	UC	PS	Aquifer must lie below upper confining layer.
M74	8652	7031-15	157.5	150	61.80	154-156	11,314	C	RB	
M75	8653	7031-16	62	58.1	58.05	60-62			PS	
M76	8654	6931-26	138.5	?	?	OPEN HOLE 72 -138.5	?	C	MG	Mud blocking aquifer?
M77	8655	6931-27	58	?	?	54-56	?	UC	PS	
M90	91466	6931-28	12	?	?	6-12	?	PERCHED AQUIFER		Mud blocking aquifer?*
M91	91470	6931-29	190	159	74.40	174-176		C	RB	

*C - Confined UC - Unconfined *MG - Murray Group PS - Pliocene Sands RB - Renmark Beds

TABLE 2

WATER ANALYSES (mg/L)

TEMPORARY NUMBER	AQUIFER *	Ca	Mg	Na	K	HCO_3	SO_4	Cl	NO_3	TDS	pH	W/No.	Remarks
M55	MG	440	710	10,000	185	269	1,360	17,031	<1	29,859	8.0	3270/81	
56	MG	570	680	7,520	120	345	3,200	11,956	<1	24,217	7.5	3272/81	
57	PS	905	1,800	16,000	195	57	7,640	27,084	<1	53,653	7.2	3269/81	
58	MG	280	405	5,200	95	337	1,440	8,784	<1	16,371	7.5	3273/81	
59	MG	175	310	4,800	82	356	1,330	7,693	<1	14,566	8.1	4699/81	
60	PS	580	1,410	11,800	180	156	7,300	18,228	<1	39,576	7.8	4698/81	
61	MG	104	178	2,800	61	437	670	4,248	<1	8,277	8.3	4700/81	
62	PS	NOT ENOUGH WATER FOR DEVELOPMENT											*
63	MG	210	3,560	3,650	67	354	1,370	5,782	7	11,610	8.1	4158/81	
64	PS	NOT ENOUGH WATER FOR DEVELOPMENT											*
65	MG	275	420	3,900	66	492	1,700	6,015	19	12,637	8.1	4150/81	
66	PS	700	1,580	11,400	120	111	7,500	17,763	<1	39,118	7.3	4152/81	
67A	MG	385	400	4,150	64	297	3,200	5,856	<1	14,203	8.0	4126/82	
68	MG	810	955	11,700	130	269	7,100	16,348	<1	37,176	7.6	3271/81	
68A	PS	660	1,460	12,400	148	0	8,500	18,130	<1	41,299	4.5	4148/81	
70	MG	370	420	3,960	64	301	1,720	6,640	<1	13,322	7.8	4154/81	
71	PS	NOT ENOUGH WATER FOR DEVELOPMENT											*
72	MG	325	410	3,100	56	290	1,980	4,876	<1	10,890	8.1	4156/81	*
73	PS	NO AQUIFER CONTACT											
74	RB	235	360	3,550	67.5	422	1,420	5,473	<1	11,314	8.0	4697/81	
75	PS	NOT ENOUGH WATER FOR DEVELOPMENT											
76	MG	)											
77	PS	) NO AQUIFER CONTACT											
90	PERCHED* AQUIFER	)											
91	RB	COULD NOT DEVELOP BY BAILING											*ABOVE BLANCHET CLAY

*MG - MURRAY GROUP
PS - PLIOCENE SANDS
RB - RENMARK BEDS

At site M73, the hole, as at all other sites, was completed in the sandy basal Pliocene Sands but was found to be dry. The water table aquifer therefore must be within the Bookpurnong Beds which forms the confining layer between the unconfined Pliocene Sands and the confined Murray Group aquifers. At M76 and M77 the Pliocene Sands and Murray Group have extremely low permeability and the drilling mud filter cake could still be preventing entry of aquifer water in both cases.

M67 was abandoned at 90 m in favour of M67A after the hole filled up with fines and would not return aquifer water at development. At site M68, the upper confining layer (Bookpurnong Beds) was unexpectedly present and an additional hole (M68A) was drilled and completed in the unconfined Pliocene Sands aquifer.

Access was only a problem in one area. A grader was hired to clear a route between sand dunes to M56 and through overgrown scrub to M68.

A new "Tek-Serve" geophysical logging unit was operated by the author. Tools available were gamma, neutron, 16" and 64" normal resistivity, self potential and point resistivity. The resistivity logs had only very limited use as no groundwater of salinity less than 8 500 mg/L was intercepted.

RECOMMENDATIONS

1. Palaeontological examination of the deepest bore at each site should be performed to correlate formation tops across the basin and into their respective equivalents outside of the known area of limestone deposition on the basin margin (Fig. 1).

2. A cable tool hole be drilled to the top of Bookpurnong Beds, to an approximate depth of 70 m (sited adjacent to M77) at "Quondong Vale" to check for the presence of:-

(i) A perched aquifer above Blanchetown Clay.

(ii) An unconfined Pliocene Sands aquifer.

If these two aquifers are found to be present, then a mud filter cake is considered to have definitely frustrated earlier attempts at aquifer contact, and future rotary-mud drilled holes in this area should have provision to "revert" the drilling muds after hole stabilisation is no longer necessary.

The cable tool hole would be completed for long term observations in the unconfined aquifer.

DRE:ZV

D.R. EDWARDS

TECHNICAL OFFICER III

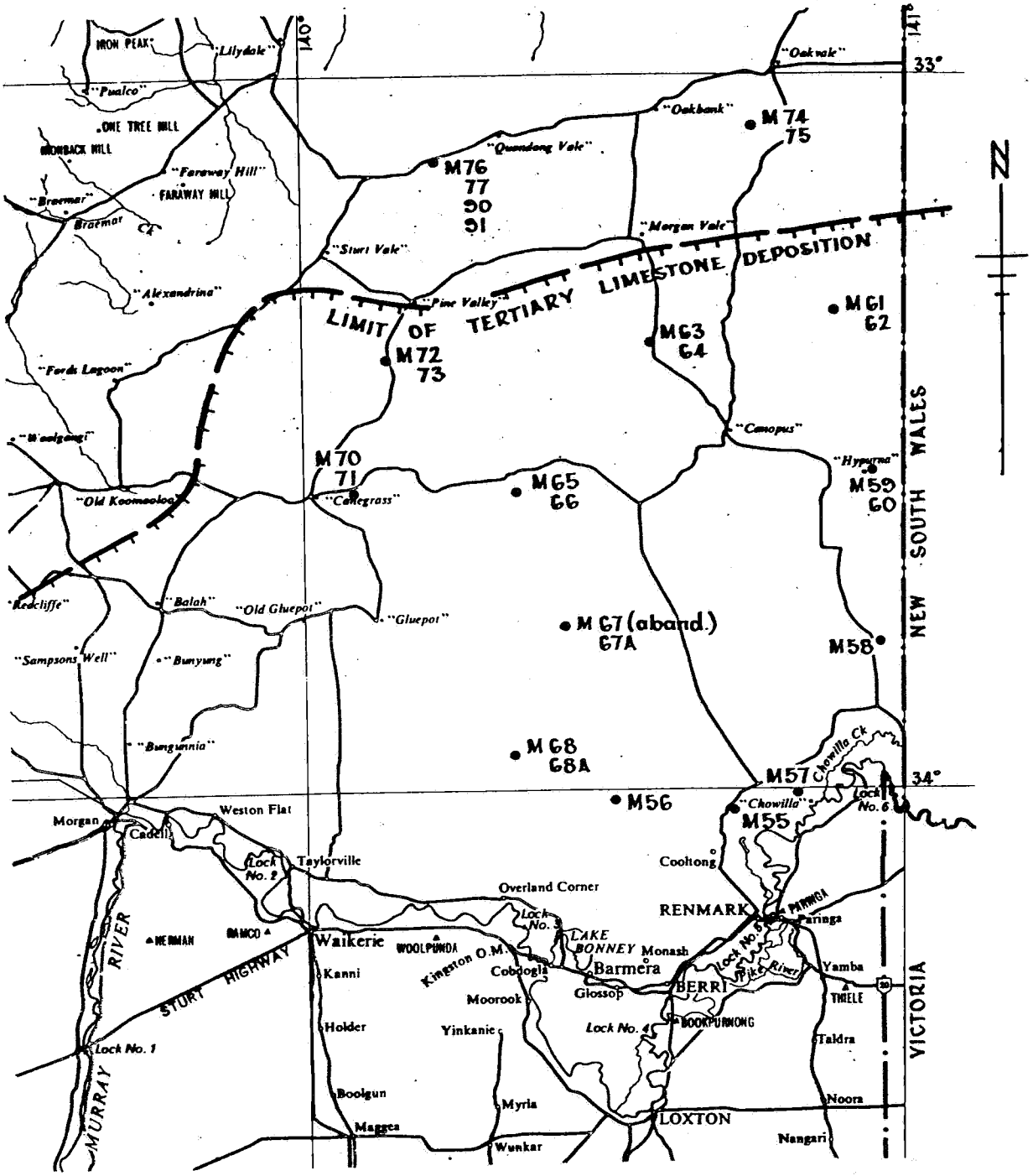
REFERENCES

Barnett, S.R., 1981. Murray Basin Hydrogeological Investigation, Data Assessment - North Western Margin. S. Aust. Dept. of Mines and Energy report 81/85 (unpublished).

Edwards, D.R., 1981a. Murray Basin Hydrogeological Investigation, Drilling Programme-Upper Murray and Northern Region, Progress Report No. 1. S. Aust. Dept. Mines and Energy report 81/31 (unpublished).

Edwards, D.R., 1981b. Murray Basin Hydrogeological Investigation, Drilling Programme-Upper Murray and Northern Region, Progress Report No. 2. S. Aust. Dept. Mines and Energy report 81/110 (unpublished).

Reed, J.A., 1980. Murray Basin Hydrogeological Investigation, Data Assessment - Upper Murray and Northern Region. S. Aust. Dept. Mines and Energy report 80/42 (unpublished).



M56 • Observation well (drilled in this program)

SCALE

0 10 20 30 40 50 60

KILOMETRES

FIG. 1

DEPARTMENT OF MINES AND ENERGY SOUTH AUSTRALIA	COMPILED D.R.E.	2·11·82 CDO DATE
MURRAY BASIN HYDROGEOLOGICAL INVESTIGATION PROGRESS REPORT No 3	DRAWN R.H.	SCALE 1:1,000,000
LOCALITY PLAN	DATE July 1982	PLAN NUMBER S16336
	CHECKED	

2825

APPENDIX A

COMPOSITE WELL LOGS

(in order of project number)

2829

DEPARTMENT OF MINES AND ENERGY - SOUTH AUSTRALIA
ENGINEERING DIVISION

COMPOSITE WELL LOG - GROUNDWATER

WELL UNIT No. 7029004ØW00630
PERMIT No. 90791
PLAN No. 82-356

PROJECT: UPPER MURRAY GROUNDWATER INVESTIGATION
LOCATION: Approx. 17 km north of Renmark on Wentworth Road.
SECTION: ..... HUNDRED: .....
REFERENCE ELEV. 33·40 m A.H.D. LOGGED BY: D. EDWARDS

LOG SYMBOLS
- CASING SEAL
- WIREWOUND SCREEN
- SLOTTED CASING
- GRAVEL PACKED INTERVAL
- K HYDRAULIC CONDUCTIVITY (m/day, Estimated)

CONSTRUCTION DETAILS

DRILLING TECHNIQUE: ROTARY MUD RESISTIVITY: < 1700 mhos
CIRCULATION: MUD
START: 3·2·81 FINISH: 5·2·81 TOTAL DEPTH: 90 m.

	mm.	FROM (m)	TO (m)
HOLE DIAMETER	140	0	90
CASING DIAMETER	80 P.V.C.	0	90
	Cemented	46	62
	Linatex	Seal at 62m	
SCREEN DETAILS	80 P.V.C. (slotted)	78	90

TYPE OF LOG	16 in. NORMAL	64 in. NORMAL	6 ft. LATERAL	SELF POTENT.	POINT RESIST.	NEUTRON	GAMMA	DENSITY
DATE OF RUN	4·2·81	4·2·81		4·2·81		10·2·81	10·2·81	
FIRST READING	90	89		90		87·4	87·4	
LAST READING	12	11		37·5		0	0	
RECORDED BY			D.	EDWARDS				

DEPTH TO WATER	TOTAL DISSOLVED SOLIDS mg/L	Analysis No.	DATE
15·0 (from R.P.)	29859	4654/81	6·2·81

REMARKS:
For Grain Size Analysis
Interval m to m
See plan No. .....

TEMPORARY No. ..... M 55

2829

DEPARTMENT OF MINES AND ENERGY - SOUTH AUSTRALIA
ENGINEERING DIVISION

COMPOSITE WELL LOG - GROUNDWATER

WELL UNIT No. 7029004-0W0063
PERMIT No. 90792
PLAN No. 82-357

PROJECT: UPPER MURRAY GROUNDWATER INVESTIGATIONS
LOCATION: CALPERNUM STATION (ON SEISMIC LINE)
SECTION: HUNDRED:
REFERENCE ELEV. 51·276 m A.H.D. LOGGED BY: D.R. EDWARDS

LOG SYMBOLS
CASING SEAL
WIREWOUND SCREEN
SLOTTED CASING
GRAVEL PACKED INTERVAL
K HYDRAULIC CONDUCTIVITY (m/day, Estimated)

CONSTRUCTION DETAILS

DRILLING TECHNIQUE: ROTARY MUD
CIRCULATION: MUD RESISTIVITY: 1700 mhos
START 2/3/81 FINISH 9/3/81 TOTAL DEPTH: 200m

	mm.	FROM (m)	TO (m)
HOLE DIAMETER	140	0	200
CASING DIAMETER	80 pvc cemented from	0	120
	69		47
SCREEN DETAILS	80 pvc (slotted)	108	120

TYPE OF LOG	16in. NORMAL	64in. NORMAL	6ft. LATERAL	SELF POTENT.	POINT RESIST.	NEUTRON	GAMMA	DENSITY
DATE OF RUN	6/3/81	6/3/81		6/3/81		6/3/81	6/3/81	
FIRST READING	191·3	190·3		191		190·3	191	
LAST READING	12	11		12		0	0	
RECORDED BY	D.R. EDWARDS			D.R. EDWARDS		D.R. EDWARDS		

DEPTH TO WATER	TOTAL DISSOLVED SOLIDS mg/L	Analysis No.	DATE
31·3	24,217	4654/81	10/3/81
(R.P.)			

REMARKS:
For Grain Size Analysis Interval m to m
See plan No.
LINATEX SEAL at 69m. An S.P. log is also available.
Temporary No. M56.

CONSTRUCTION LOG	WATER STRUCK (m)	STRATIGRAPHIC UNIT	LITHOLOGY	LITHO LOG	DEPTH (m)
		PLEISTOCENE / WORIREN FORMATION	SAND, ferruginous, medium - coarse, calcareous, well-sorted, sub-rounded. Red Brown.		
		PLEISTOCENE / WORIREN FORMATION	SANDSTONE & CALCRETE silty, well cemented, medium, ferruginous. Pale Brown.		
		PLEISTOCENE / WORIREN FORMATION	CLAY, sandy, silty, high plasticity. Olive grey/Brown.		
	Dry	PLEISTOCENE / UPPER PLIOCENE / PARILLA SANDS	SAND, very silty, non ferruginous, medium. Olive grey/Brown. 12-16m SANDSTONE/CALCRETE.		
		PLEISTOCENE / UPPER PLIOCENE / PARILLA SANDS	16-36m medium - coarse, some Olive grey fines. Pale Brown.		20
	Aq	LOWER PLIOCENE / LOXTON SANDS	SAND, micaceous, ferruginous, medium-coarse, poorly sorted sub-angular. Pale Brown.		40
		LOWER PLIOCENE / LOXTON SANDS	From 40m pyritic (minor), carbonaceous, silty from 52-60m. Grey/Brown from 52m.		60
		LOWER PLIOCENE / LOXTON SANDS	Gravel, fine, rounded, pyritic, carbonaceous, well sorted, Grey		
	Cb	LOWER PLIOCENE / BOOLEROO BEDDING	CLAY, glauconitic, silty, sandy, carbonaceous, high plasticity, Grey		
		MIOCENE / MURRAY GROUP	MARL, very shelly, limonitic, glauconitic, low plasticity, Grey (Greenish)		80
	Aq	MIOCENE / MURRAY GROUP	LIMESTONE & MARL, interbedded LIMESTONE, fine, well cemented, fossiliferous, glauconitic Grey MARL, moderate - high plasticity, fossiliferous, bryozoal, Grey		100
		MIOCENE / MURRAY GROUP	LIMESTONE, strongly cemented, fossiliferous, glauconitic, fine, Grey		120
		MIOCENE / MURRAY GROUP	146 - 162m, very limonitic		140
	Aq	MIOCENE / MURRAY GROUP	160 - 200m, bryozoa sticks common, some thin grey marl bands, minor fine sand		160
					180
			END OF HOLE AT 200m		200

GAMMA cps 0 10 20 30
NEUTRON cps 300 350 400 450
NORMAL 64 inch
NORMAL 16 inch

2829

DEPARTMENT OF MINES AND ENERGY - SOUTH AUSTRALIA
ENGINEERING DIVISION

COMPOSITE WELL LOG - GROUNDWATER

WELL UNIT No. 7029001ØW00632
PERMIT No. 90799
PLAN No. 82-358

PROJECT: UPPER MURRAY GROUNDWATER INVESTIGATION
LOCATION: On River flats, west of Chowilla Homestead.
SECTION: ..... HUNDRED: .....
REFERENCE ELEV. 22·246 m A.H.D. LOGGED BY: D. EDWARDS

LOG SYMBOLS
CASING SEAL
WIREWOUND SCREEN
SLOTTED CASING
GRAVEL PACKED INTERVAL
K HYDRAULIC CONDUCTIVITY (m/day, Estimated)

CONSTRUCTION DETAILS

DRILLING TECHNIQUE: ROTARY MUD RESISTIVITY: <1700 mhos
CIRCULATION: MUD
START: 6·2·81 FINISH: 8·2·81 TOTAL DEPTH: 48 m

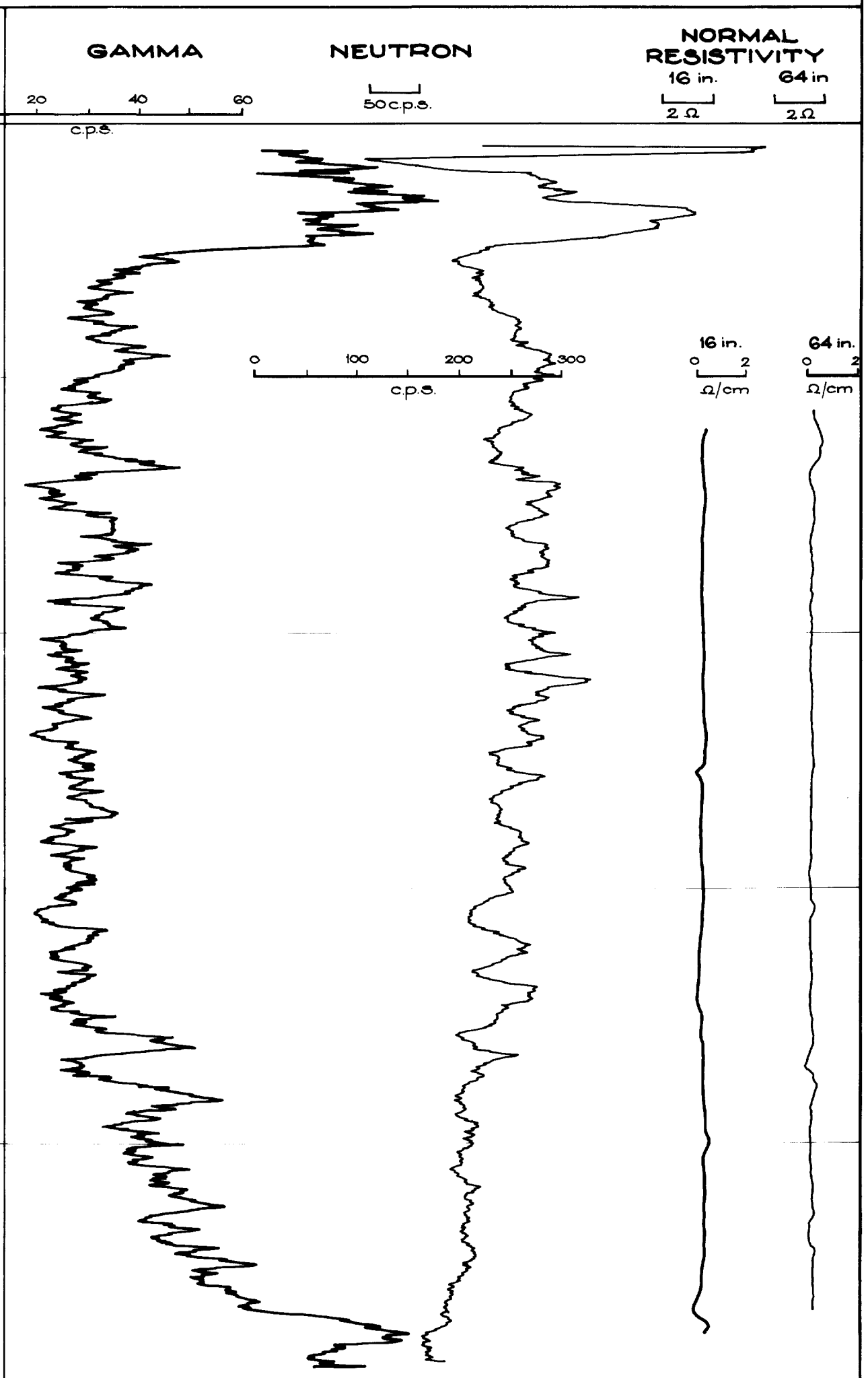
	mm.	FROM (m)	TO (m)
HOLE DIAMETER	140	0	48
CASING DIAMETER	80 PVC	0	14·5
SCREEN DETAILS	80 (Surescreen 0·42 aperture)	14·5	16·5

TYPE OF LOG	16 in. NORMAL	64 in. NORMAL	6 ft. LATERAL	SELF POTENT.	POINT RESIST.	NEUTRON	GAMMA	DENSITY
DATE OF RUN	6·2·81	6·2·81		6·2·81		6·2·81	6·2·81	
FIRST READING	47·4	46·4		47·4		48·4	48·4	
LAST READING	12	11		12		1	1	
RECORDED BY			D. EDWARDS					

DEPTH TO WATER	TOTAL DISSOLVED SOLIDS mg/L	TOTAL DISSOLVED SOLIDS Analysis No.	DATE
5·90 (from R.P.)	53653	4654/81	12·2·81

REMARKS:
For Grain Size Analysis
Interval m to m
See plan No.
Linatex seal set at 13·5 m.
Gravel packed 16·5 to 48 m
TEMPORARY No. M 57

CONSTRUCTION LOG	WATER DEPTH (m)	HYDRO DATA	AGE	UNIT	LITHOLOGY	LITHO LOG	DEPTH (m)
		Dry	RECENT		**CLAY/SAND**: Sand is fine, calcareous, ferruginous, well sorted (ave 0·1 to 0·2 mm). Poorly sorted from 4 m. Light brown.		
			RECENT	Yamba Fmn.	**SAND**: Gypsiferous, medium moderately sorted, ferruginous, some weakly cemented sandstone, subangular. Pale brown.		
			UPPER PLIOCENE	Parilla Sands ?	**SAND**: Medium, ferruginous, poorly sorted. Light brown.		
		Aquifer	LOWER PLIOCENE	Loxton Sands	**SAND**: Pyritic, micaceous, carbonaceous, fine to medium, poorly sorted. Grey.		20
			LOWER PLIOCENE	Bookpurnong Beds	**CLAY**: Carbonaceous, pyritic, sandy (fine), low plasticity. Grey. (Shelly 36-38 m).		40
			LOWER PLIOCENE	Bookpurnong Beds	**SILT**: Sandy (10-20%), carbonaceous, pyritic. Grey.		
			LOWER PLIOCENE	Bookpurnong Beds	**CLAY**: High plasticity, carbonaceous, pyritic, sandy. Grey.		
					END OF HOLE 48 m		



NOTE: A Self Potential Log is also available.

DEPARTMENT OF MINES AND ENERGY - SOUTH AUSTRALIA
ENGINEERING DIVISION

COMPOSITE WELL LOG - GROUNDWATER

WELL UNIT No. 7030002W00382
PERMIT No. 8305
PLAN No. 82-359

PROJECT: UPPER MURRAY GROUNDWATER INVESTIGATIONS
LOCATION: "PARADISE" HOMESTEAD (CHOWILLA STATION)
SECTION: HUNDRED:
REFERENCE ELEV. 52.961 m A.H.D. LOGGED BY: D. EDWARDS

LOG SYMBOLS
CASING SEAL
WIREWOUND SCREEN
SLOTTED CASING
GRAVEL PACKED INTERVAL
K HYDRAULIC CONDUCTIVITY (m/day, Estimated)

CONSTRUCTION DETAILS

DRILLING TECHNIQUE: ROTARY MUD RESISTIVITY: < 1700 ohms
CIRCULATION: MUD
START: 11-2-81 FINISH: 17-2-81 TOTAL DEPTH: 200m

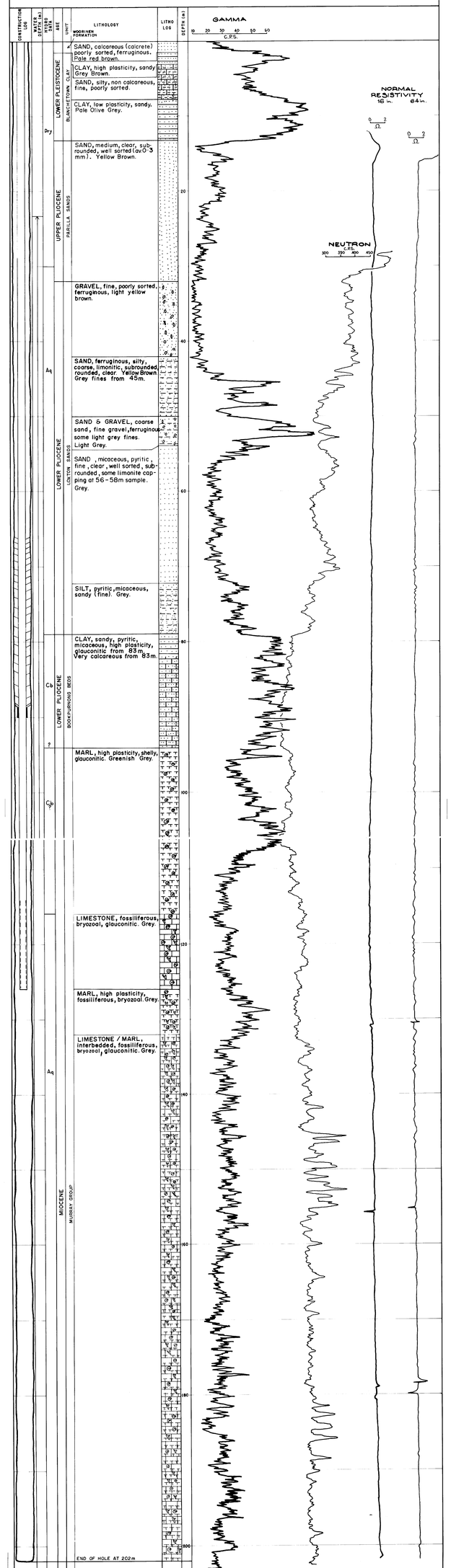
	mm.	FROM (m)	TO (m)
HOLE DIAMETER	140	0	200
CASING DIAMETER	80 pvc	0	114
	(LINATEX SEAL AT (CEMENTED 88		88m. 64)
SCREEN DETAILS	80 pvc	114 (slotted)	126

TYPE OF LOG	16 in. NORMAL	64 in. NORMAL	6 ft. LATERAL	SELF POTENT.	POINT RESIST.	NEUTRON	GAMMA	DENSITY
DATE OF RUN	13-2-81			13-2-81		13-2-81		
FIRST READING	202.2	202.2		202.2		202.4	202.4	
LAST READING	12.8	15.8		13		0	0	
RECORDED BY	D.EDWARDS					D. EDWARDS		

DEPTH TO WATER	TOTAL DISSOLVED SOLIDS mg/L	Analysis No.	DATE
24.10 (EP)	16,371	4654/81	17-2-81

REMARKS:
For Grain Size Analysis Interval m to m
See plan No.

Temporary No. M58



2629

DEPARTMENT OF MINES AND ENERGY - SOUTH AUSTRALIA
ENGINEERING DIVISION

COMPOSITE WELL LOG - GROUNDWATER

WELL UNIT No. 703000010W00383
PERMIT No. 8306
PLAN No. 82-360

PROJECT: UPPER MURRAY GROUNDWATER INVESTIGATION
LOCATION: Hypurna Station Homestead
SECTION: HUNDRED:
REFERENCE ELEV. 45.687 m A.H.D. LOGGED BY: D. EDWARDS

LOG SYMBOLS
CASING SEAL
WIREWOUND SCREEN
SLOTTED CASING
GRAVEL PACKED INTERVAL
K HYDRAULIC CONDUCTIVITY (m/day, Estimated)

CONSTRUCTION DETAILS

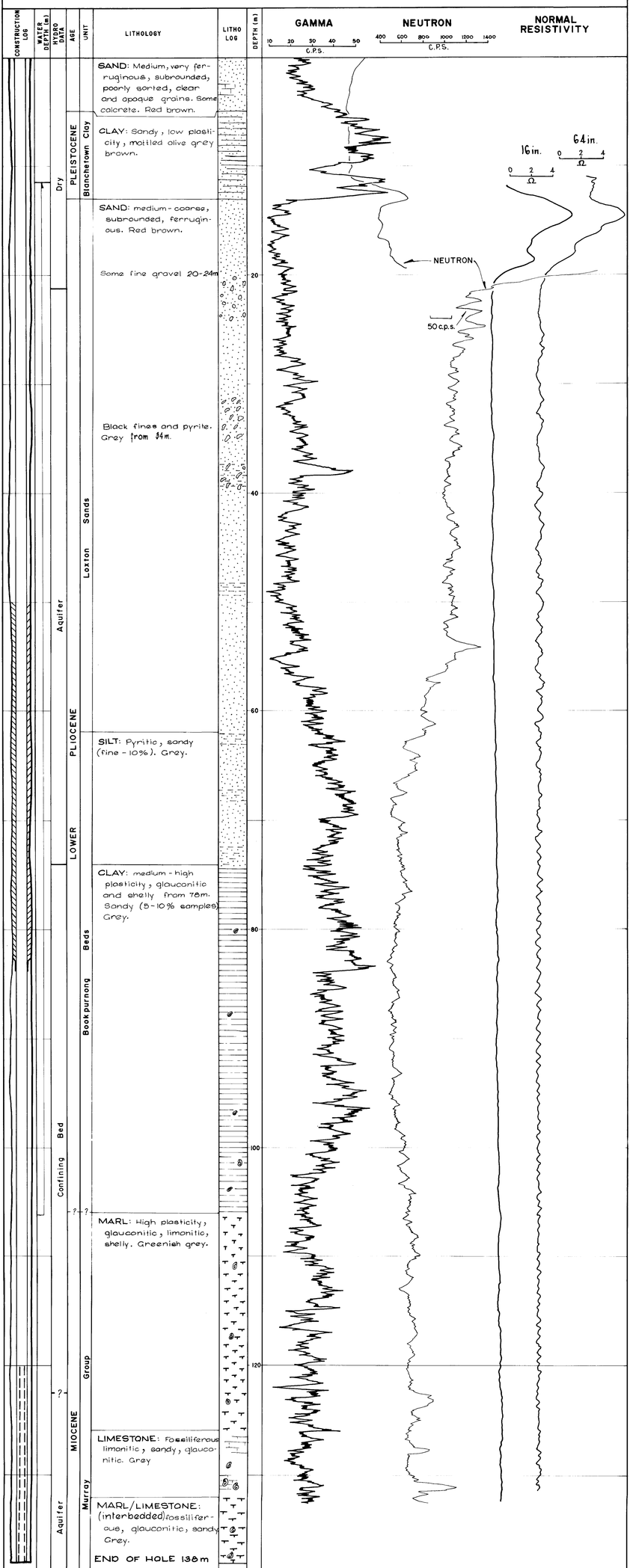
DRILLING TECHNIQUE: ROTARY MUD RESISTIVITY: ∠1700 mhos
CIRCULATION: MUD
START: 4-5-81 FINISH: 7-5-81 TOTAL DEPTH: 138 m

	mm.	FROM (m)	TO (m)
HOLE DIAMETER	140	0	138
CASING DIAMETER	80	0	138
SCREEN DETAILS	80 (Slotted pvc)	120	138

TYPE OF LOG	16 in. NORMAL	64 in. NORMAL	6 ft. LATERAL	SELF POTENT.	POINT RESIST.	NEUTRON	GAMMA	DENSITY
DATE OF RUN	5-5-81	5-5-81				5-5-81	5-5-81	
FIRST READING	132	131				132	132	
LAST READING	12	11				0	0	
RECORDED BY	D. EDWARDS					D. EDWARDS		

DEPTH TO WATER	TOTAL DISSOLVED SOLIDS mg/L	Analysis No.	DATE
11.60 m (R.P.)	14566	4699/81	8-5-81

REMARKS:
For Grain Size Analysis
Interval m to m
See plan No.
Linatex seal set at 83m
TEMPORARY No. M 59



2829

DEPARTMENT OF MINES AND ENERGY - SOUTH AUSTRALIA
ENGINEERING DIVISION

COMPOSITE WELL LOG - GROUNDWATER

WELL UNIT No. 7030001 GW 00384
PERMIT No. 8307
PLAN No. 82-361

PROJECT: UPPER MURRAY GROUNDWATER INVESTIGATIONS.
LOCATION: HYPURNA STATION HOMESTEAD
SECTION: HUNDRED:
REFERENCE ELEV. 45·659 m A.H.D. LOGGED BY: D.R.EDWARDS.

LOG SYMBOLS
- CASING SEAL
- WIREWOUND SCREEN
- SLOTTED CASING
- GRAVEL PACKED INTERVAL
- K HYDRAULIC CONDUCTIVITY (m/day, Estimated)

CONSTRUCTION DETAILS

DRILLING TECHNIQUE: ROTARY MUD RESISTIVITY:
CIRCULATION: MUD
START: 7/5/81 FINISH: 11/5/81. TOTAL DEPTH: 60m

	mm.	FROM (m)	TO (m)
HOLE DIAMETER	140	0	60
CASING DIAMETER	80	0	49
	(LINATEX SEAL AT 48 m.)		
SCREEN DETAILS	80	49	51
	SCREEN (STEEL 0·42mm APERTURE)		

TYPE OF LOG	16 in. NORMAL	64in. NORMAL	6ft. LATERAL	SELF POTENT.	POINT RESIST.	NEUTRON	GAMMA	DENSITY
DATE OF RUN							8/5/81	
FIRST READING							59	
LAST READING							0	
RECORDED BY							D.R. EDWARDS	

DEPTH TO WATER	TOTAL DISSOLVED SOLIDS mg/L	TOTAL DISSOLVED SOLIDS Analysis No.	DATE
22·3 (R.P)	39,576	4698/81	13/5/81.

REMARKS:
For Grain Size Analysis
Interval m to m
See plan No.
Temporary No. M60

CONSTRUCTION LOG	WATER DEPTH (m)	HYDRO DATA	AGE	UNIT	LITHOLOGY	LITHO LOG	DEPTH (m)
					SAND – medium, very ferruginous, sub-rounded, poorly sorted, clear and opapue grains, some calcrete Red-Brown.		
		Dry	PLEISTOCENE	BLANCHETOWN CLAY	CLAY – sandy, low plasticity, mottled. Olive grey-Brown.		
					SAND – medium-coarse, sub-rounded, ferruginous. Red-Brown.		
					20 – 24 m Some fine gravel.		20
		Aquifer	LOWER PLIOCENE	LOXTON SANDS	32 – 36 m Some fine gravel		
					34 – 60 m Black Fines, Pyritic Grey from 34 m.		40
							60

GAMMA cps
0 10 20 30 40 50 60

END OF HOLE 60 m.

2625

DEPARTMENT OF MINES AND ENERGY - SOUTH AUSTRALIA
ENGINEERING DIVISION

COMPOSITE WELL LOG - GROUNDWATER

WELL UNIT No. 7031002@W00011
PERMIT No. 8308
PLAN No. 82-362

PROJECT: UPPER MURRAY GROUNDWATER INVESTIGATION
LOCATION: Birthday Dam - Hypurna Station
SECTION: HUNDRED:
REFERENCE ELEV. 71·405 m A.H.D. LOGGED BY: D. Edwards

LOG SYMBOLS
CASING SEAL
WIREWOUND SCREEN
SLOTTED CASING
GRAVEL PACKED INTERVAL
K HYDRAULIC CONDUCTIVITY (m/day, Estimated)

CONSTRUCTION DETAILS

DRILLING TECHNIQUE: ROTARY MUD RESISTIVITY: < 1700 mhos
CIRCULATION: MUD
START: 13·5·81 FINISH: 16·5·81 TOTAL DEPTH: 150 m

	mm.	FROM (m)	TO (m)
HOLE DIAMETER	140	0	150
CASING DIAMETER	80 P.V.C. Cemented	0	138
	Linajex Seal at 74 m	34	74
SCREEN DETAILS	80 P.V.C. (Slotted)	138	150

TYPE OF LOG	16 in. NORMAL	64 in. NORMAL	6 ft. LATERAL	SELF POTENT.	POINT RESIST.	NEUTRON	GAMMA	DENSITY
DATE OF RUN	15·5·81	15·5·81				15·5·81	15·5·81	
FIRST READING	150	149				150	150	
LAST READING	12	11				0	0	
RECORDED BY				D. Edwards				

DEPTH TO WATER	TOTAL DISSOLVED SOLIDS mg/L	Analysis No.	DATE
38·80 (from R.P.)	8277	4700/81	18·5·81

REMARKS:
For Grain Size Analysis
Interval m to m
See plan No.

TEMPORARY No. M 61

CONSTRUCTION LOG | WATER DEPTH (m) | HYDRO DATA | AGE | UNIT | LITHOLOGY | LITHO LOG | DEPTH (m)

GAMMA 20 40 60 c.p.s. | NEUTRON 200 c.p.s. | 0 400 800 c.p.s. | 50 c.p.s.

UPPER PLIOCENE ? — Parilla Sand ?

SAND: Medium (ave. 0·3mm), unconsolidated, ferruginous, some calcrete, poorly sorted. Yellow brown.

CLAY/SAND: Yellow brown

SAND: Medium to coarse, well sorted, unconsolidated (ave. 1·0mm), subrounded, ferruginous. Yellow brown.

Ferruginous capping 26-28m (sandstone)

Dry

PLIOCENE — Loxton Sands — Aquifer

From 47m, some carbonaceous material and pyrite. Yellow brown.

From 56m, fine sand, very silty, subangular, clayey, pyritic, unconsolidated. Yellow brown.

CLAY/SAND: Glauconitic, moderate plasticity. Fine unconsolidated sand. Greenish grey.

LOWER PLIOCENE — Bookpurnong Beds — Confining Bed

CLAY: Moderate to high plasticity, sandy (5-10%), glauconitic. Greenish grey

Shelly, gray 98 - 116 m.

SAND: Medium, shelly, pyritic, carbonaceous, subangular. Grey.

MIOCENE — Murray Group — Aquifer

MARL: Low to moderate plasticity, very shelly plus glauconite. Grey.
(some thin interbedded limestone).

Rare bryozoa 136 - 138 m.

LIMESTONE and MARL: Interbedded. Limestone - consolidated, bryozoal, sandy. Marl - glauconitic, low plasticity. Grey.

END OF HOLE 150m

NOTE: Normal Resistivity Logs (16 & 64 in.) are also available.

2829

DEPARTMENT OF MINES AND ENERGY - SOUTH AUSTRALIA
ENGINEERING DIVISION

COMPOSITE WELL LOG - GROUNDWATER

WELL UNIT No.	7031 002 ØW 00012
PERMIT No.	8309
PLAN No.	82-363

PROJECT: UPPER MURRAY GROUNDWATER INVESTIGATIONS

LOCATION: BIRTHDAY DAM - HYPURNA STATION

SECTION: HUNDRED:

REFERENCE ELEV. 71·485 m A.H.D. LOGGED BY: D.R.EDWARDS

LOG SYMBOLS

- CASING SEAL
- WIREWOUND SCREEN
- SLOTTED CASING
- GRAVEL PACKED INTERVAL
- K HYDRAULIC CONDUCTIVITY (m/day, Estimated)

CONSTRUCTION DETAILS

DRILLING TECHNIQUE: ROTARY MUD RESISTIVITY:

CIRCULATION: MUD

START: 16/5/81 FINISH: 18/5/81 TOTAL DEPTH: 66m

	mm.	FROM (m)	TO (m)
HOLE DIAMETER	140	0	66
CASING DIAMETER	80 PVC	0	64
	LINATEX	SEAL AT 63m	
SCREEN DETAILS	80	64	66
	Steel screen	(0·42 mm Aperture.)	

TYPE OF LOG	16 in. NORMAL	64in. NORMAL	6ft. LATERAL	SELF POTENT.	POINT RESIST.	NEUTRON	GAMMA	DENSITY
DATE OF RUN							18/5/81	
FIRST READING							66	
LAST READING							0	
RECORDED BY							D.R.EDWARDS	

DEPTH TO WATER	TOTAL DISSOLVED SOLIDS mg/L	Analysis No.	DATE
56·7	Unable to obtain a representative sample in June 1982		18/5/81

REMARKS:
For Grain Size Analysis
Interval m to m
See plan No.
Temporary No. M62

CONSTRUCTION LOG	WATER DEPTH (m)	HYDRO DATA	AGE	UNIT	LITHOLOGY	LITHO LOG	DEPTH (m)
					SAND , medium , ave = 0·3mm unconsolidated , ferruginous , some calcrete , poorly sorted. Yellow Brown.		
					CLAY/SAND , Yellow Brown.		
			PLEISTOCENE	BLANCHETOWN CLAY	SAND , medium - coarse, well sorted , unconsolidated , ave = 1·00 mm , sub-rounded, ferruginous. Yellow Brown.		
			UPPER PLIOCENE	PARILLA SANDS ?			20
					? ? Ferruginous Capping ? ?		
		Dry					40
			LOWER PLIOCENE	LOXTON SANDS	From 49m some carbonaceous material and pyrite. Yellow Brown.		
		Aq			From 58m fine sand , very silty, sub-angular , clayey , pyritic , unconsolidated. Yellow Brown.		60
					END OF HOLE AT 66m		

GAMMA cps
10 20 30 40

2829

DEPARTMENT OF MINES AND ENERGY - SOUTH AUSTRALIA
ENGINEERING DIVISION

COMPOSITE WELL LOG - GROUNDWATER

WELL UNIT No. 7031 003 ØW 00013
PERMIT No. 8310
PLAN No. 82-364

PROJECT: UPPER MURRAY GROUNDWATER INVESTIGATIONS
LOCATION: LITTLE OAK DAM – CANOPUS STATION
SECTION: HUNDRED:
REFERENCE ELEV. 78·881 m A.H.D. LOGGED BY: X.SIBENALER.

LOG SYMBOLS
- CASING SEAL
- WIREWOUND SCREEN
- SLOTTED CASING
- GRAVEL PACKED INTERVAL
- K HYDRAULIC CONDUCTIVITY (m/day, Estimated)

CONSTRUCTION DETAILS

DRILLING TECHNIQUE: ROTARY — MUD RESISTIVITY 1800mhos at 25° C
CIRCULATION: MUD
START: 27/4/81 FINISH: 28/4/81 TOTAL DEPTH: 144m

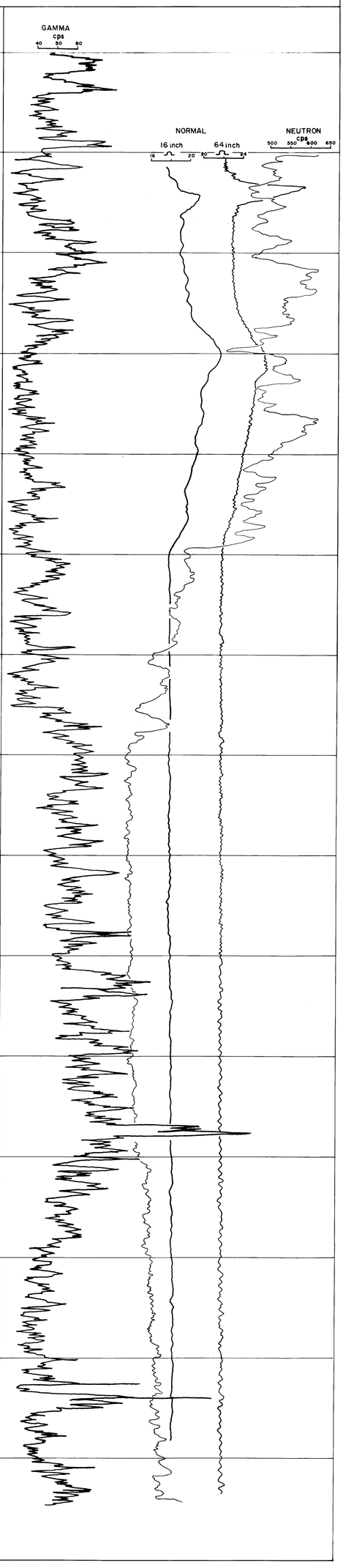
	mm	FROM (m)	TO (m)
HOLE DIAMETER	140	0	144
CASING DIAMETER	80 PVC	0	132
	CEMENT	FROM 50	80
SCREEN DETAILS	80 PVC slotted (LINATEX SEAL AT 80m.)	132	144

TYPE OF LOG	16 in NORMAL	64 in NORMAL	6ft LATERAL	SELF POTENT.	POINT RESIST.	NEUTRON	GAMMA	DENSITY
DATE OF RUN	28/4/81	28/4/81		28/4/81		28/4/81	28/4/81	
FIRST READING	144	143		144		144	144	
LAST READING	12	11		11·5		0	0	
RECORDED BY	X.SIBENALER					X.SIBENALER		

DEPTH TO WATER	TOTAL DISSOLVED SOLIDS mg/L	Analysis No.	DATE
44·45 (R.P.)	11,610	4158/81	5/5/81

REMARKS:
For Grain Size Analysis
Interval m to m
See plan No.
An S.P. Log is also available.
Temporary No. M63

CONSTRUCTION LOG	WATER DEPTH (m)	HYDRO UNIT	AGE	UNIT	LITHOLOGY	LITHO LOG	DEPTH (m)
			PLEISTOCENE	BLANCHETOWN CLAY	CLAY, sandy, fine - medium, Red Brown. 2-4m, some grey mottling more gritty. 4-6m, 30-40 % sand, medium-coarse. Brown.		
					SANDS, medium - coarse, milky, commonly stained, some strongly weathered sandstone.		
		Dry	LOWER PLIOCENE	LOXTON SANDS	26-48m, generally coarse, minor fine gravel.		20
					48 - 56m, Grey Brown.		40
		Aq			56-66m, Grey, minor pyrite.		60
					66-68m, Rare shell fragments, some carbonaceous material. Grey.		
		Cb			CLAY, plastic, minor fossils, pyritic, sandy, minor glauconite. Dark Grey – Black.		80
	P		LOWER PLIOCENE	BOOKPURNONG BEDS	MARL/CLAY, sandy in parts, thin Limestone beds, strongly fossiliferous in places, pyritic, up to 3% opaques. Grey.		100
	P	Aq					120
	P ?		MIOCENE	MURRAY GROUP	MARL, strongly fossiliferous, glauconitic, some thin indurated limestone, minor pyrite, poor sample returns. Grey.		140
					MARL/LIMESTONE, sandy, fossiliferous, pyritic. Grey.		
					END OF HOLE AT 144m.		



2829

DEPARTMENT OF MINES AND ENERGY - SOUTH AUSTRALIA
ENGINEERING DIVISION

COMPOSITE WELL LOG - GROUNDWATER

WELL UNIT No. 7031 003 ØW 00014
PERMIT No. 8311
PLAN No. 82-365

PROJECT: UPPER MURRAY GROUNDWATER INVESTIGATIONS.
LOCATION: LITTLE OAK DAM — CANOPUS STATION.
SECTION: ..... HUNDRED: .....
REFERENCE ELEV. 79·289 m A.H.D. LOGGED BY: X.SIBENALER

LOG SYMBOLS
- CASING SEAL
- WIREWOUND SCREEN
- SLOTTED CASING
- GRAVEL PACKED INTERVAL
- K HYDRAULIC CONDUCTIVITY (m/day, Estimated)

CONSTRUCTION DETAILS

DRILLING TECHNIQUE: ROTARY MUD RESISTIVITY: .....
CIRCULATION: MUD
START: 30/4/81 FINISH: 1/5/81 TOTAL DEPTH: 66m

	mm.	FROM (m)	TO (m)
HOLE DIAMETER	140	0	66
CASING DIAMETER	80	0	61·5
	PVC		
	LINATEX SEAL AT 60·5 m		
SCREEN DETAILS	80	61·5	63·5
	Screen (APERTURE 0·42mm)		

TYPE OF LOG	16in. NORMAL	64in. NORMAL	6ft. LATERAL	SELF POTENT.	POINT RESIST.	NEUTRON	GAMMA	DENSITY
DATE OF RUN							1/5/81	
FIRST READING							65	
LAST READING							0	
RECORDED BY							X.SIBENALER	

DEPTH TO WATER	TOTAL DISSOLVED SOLIDS mg/L	Analysis No.	DATE
51·35	Not able to be sampled in		5/5/81
(R.P)	June 1982		

REMARKS:
For Grain Size Analysis
Interval m to m
See plan No. .....
.....
Temporary No. M 64

CONSTRUCTION LOG	WATER DEPTH (m)	HYDRO DATA	AGE	UNIT	LITHOLOGY	LITHO LOG	DEPTH (m)
			PLEISTOCENE	BLANCHETOWN CLAY	CLAY, sandy, fine-medium, 10-20%, Red Brown. 2-4m some grey mottling, more gritty, 4-6 m Brown Sand, 30-40% sample - coarse.		
					SANDS, medium - coarse, milky commonly stained, some strongly weathered sandstone fragments. Yellow Brown.		20
		Dry	LOWER PLIOCENE	LOXTON SANDS	26 - 48 m, coarse, minor fine gravel.		40
					48 - 56 m Grey Brown.		
		Aq			56 - 66 m Grey minor pyrite.		60
					END OF HOLE AT 66m		

GAMMA
20 30 cps 40 50

DEPARTMENT OF MINES AND ENERGY - SOUTH AUSTRALIA
ENGINEERING DIVISION

COMPOSITE WELL LOG - GROUNDWATER

WELL UNIT No. 6930001OW00008
PERMIT No. 8312
PLAN No. 82-366

PROJECT: UPPER MURRAY GROUNDWATER INVESTIGATIONS
LOCATION: TWO MILE TANK TURNOFF - CALPERUM STATION
SECTION: HUNDRED:
REFERENCE ELEV. 67·339 m A.H.D. LOGGED BY: D.R.EDWARDS

LOG SYMBOLS
- CASING SEAL
- WIREWOUND SCREEN
- SLOTTED CASING
- GRAVEL PACKED INTERVAL
- K HYDRAULIC CONDUCTIVITY (m/day, Estimated)

CONSTRUCTION DETAILS

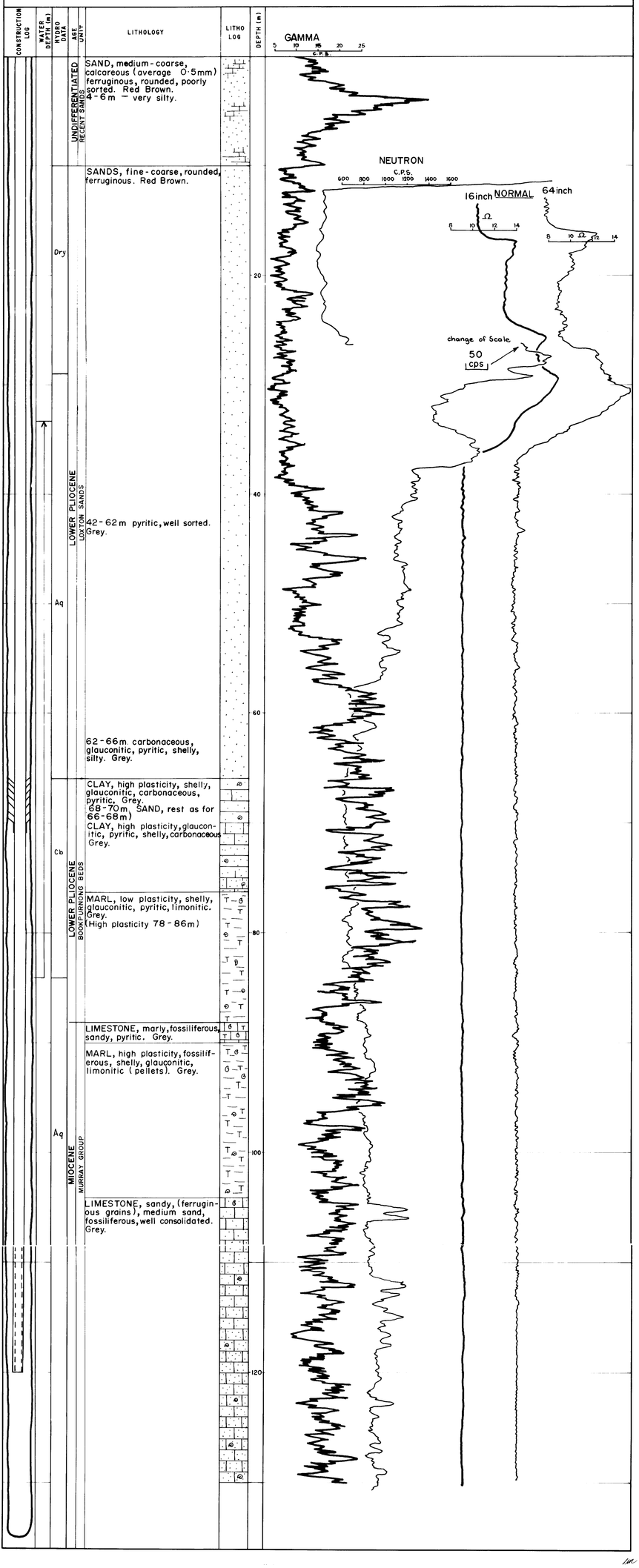
DRILLING TECHNIQUE: ROTARY
CIRCULATION: MUD
MUD RESISTIVITY: 1700 mhos
START 30/3/81 FINISH: 2/4/81 TOTAL DEPTH: 130 m

	mm.	FROM (m)	TO (m)
HOLE DIAMETER	140	0	130
CASING DIAMETER	80 pvc (cemented from 66	0	108 70)
SCREEN DETAILS	80 pvc(slotted) (LINATEX SEAL AT	108 70m)	120

TYPE OF LOG	16in. NORMAL	64in. NORMAL	6ft. LATERAL	SELF POTENT.	POINT RESIST.	NEUTRON	GAMMA	DENSITY
DATE OF RUN	30·3·81			30·3·81		30·3·81		
FIRST READING	130·0	129·0		130		130	130	
LAST READING	12·4	11·4		13		12	0	
RECORDED BY	D. R. EDWARDS			D.R.EDWARDS		D. R. EDWARDS		

DEPTH TO WATER	TOTAL DISSOLVED SOLIDS mg/L	Analysis No.	DATE
34·40 (R.P.)	12637	4150/81	6·4·81

REMARKS:
For Grain Size Analysis
Interval m to m
See plan No.
Temporary No. M65
An S.P. Log is also available.



2829

DEPARTMENT OF MINES AND ENERGY - SOUTH AUSTRALIA
ENGINEERING DIVISION

COMPOSITE WELL LOG - GROUNDWATER

WELL UNIT No.	6930 001 OW 00009
PERMIT No.	8313
PLAN No.	82-367

PROJECT: UPPER MURRAY GROUNDWATER INVESTIGATIONS.
LOCATION: TWO MILE TANK TURNOFF - CALPERUM STATION.
SECTION: HUNDRED:
REFERENCE ELEV. 67·746 m A.H.D. LOGGED BY: D.R.EDWARDS

LOG SYMBOLS
- CASING SEAL
- WIREWOUND SCREEN
- SLOTTED CASING
- GRAVEL PACKED INTERVAL
- K HYDRAULIC CONDUCTIVITY (m/day, Estimated)

CONSTRUCTION DETAILS

DRILLING TECHNIQUE: ROTARY MUD RESISTIVITY:
CIRCULATION: MUD
START: 2/4/81 FINISH: 3/4/81 TOTAL DEPTH: 54m

	mm.	FROM (m)	TO (m)
HOLE DIAMETER	140	0	54
CASING DIAMETER	80	0	43
	PVC		
SCREEN DETAILS	80	43	45
	Steel Sand Screen (0·42mm APERTURE)		

TYPE OF LOG	16in. NORMAL	64in. NORMAL	6ft. LATERAL	SELF POTENT.	POINT RESIST.	NEUTRON	GAMMA	DENSITY
DATE OF RUN							3/4/81	
FIRST READING							52·5	
LAST READING							0	
RECORDED BY							D.R.EDWARDS	

DEPTH TO WATER	TOTAL DISSOLVED SOLIDS mg/L	TOTAL DISSOLVED SOLIDS Analysis No.	DATE
39·3	39,118	4152/81	7/4/81
(R.P)			

REMARKS:
For Grain Size Analysis
Interval m to m
See plan No.

Temporary No. M66

CONSTRUCTION LOG	WATER DEPTH (m)	HYDRO DATA	AGE	UNIT	LITHOLOGY	LITHO LOG	DEPTH (m)
			UNDIFFERENTIATED	RECENT SANDS	SAND, medium - coarse, ave = 0·5mm, calcareous, rounded, ferruginous, poorly sorted. Red Brown. 4-6m very silty.		
		Dry			SAND, fine - coarse, rounded, ferruginous. Red Brown.		20
			LOWER PLIOCENE	LOXTON SANDS	42-54m pyritic, well sorted. Grey.		40
		Aq			END OF HOLE AT 54m		

GAMMA
5 10 15 20

DEPARTMENT OF MINES AND ENERGY - SOUTH AUSTRALIA
ENGINEERING DIVISION

COMPOSITE WELL LOG - GROUNDWATER

WELL UNIT No. 6930002 0W00011
PERMIT No. 8314
PLAN No. 82-368

PROJECT: UPPER MURRAY GROUNDWATER INVESTIGATIONS
LOCATION: HIDEAWAY CATCH PIPELINE - CALPERUM STATION
SECTION: HUNDRED:
REFERENCE ELEV. 69·914 m A.H.D. LOGGED BY: D.R. EDWARDS

LOG SYMBOLS
CASING SEAL
WIREWOUND SCREEN
SLOTTED CASING
GRAVEL PACKED INTERVAL
K HYDRAULIC CONDUCTIVITY (m/day, Estimated)

CONSTRUCTION DETAILS

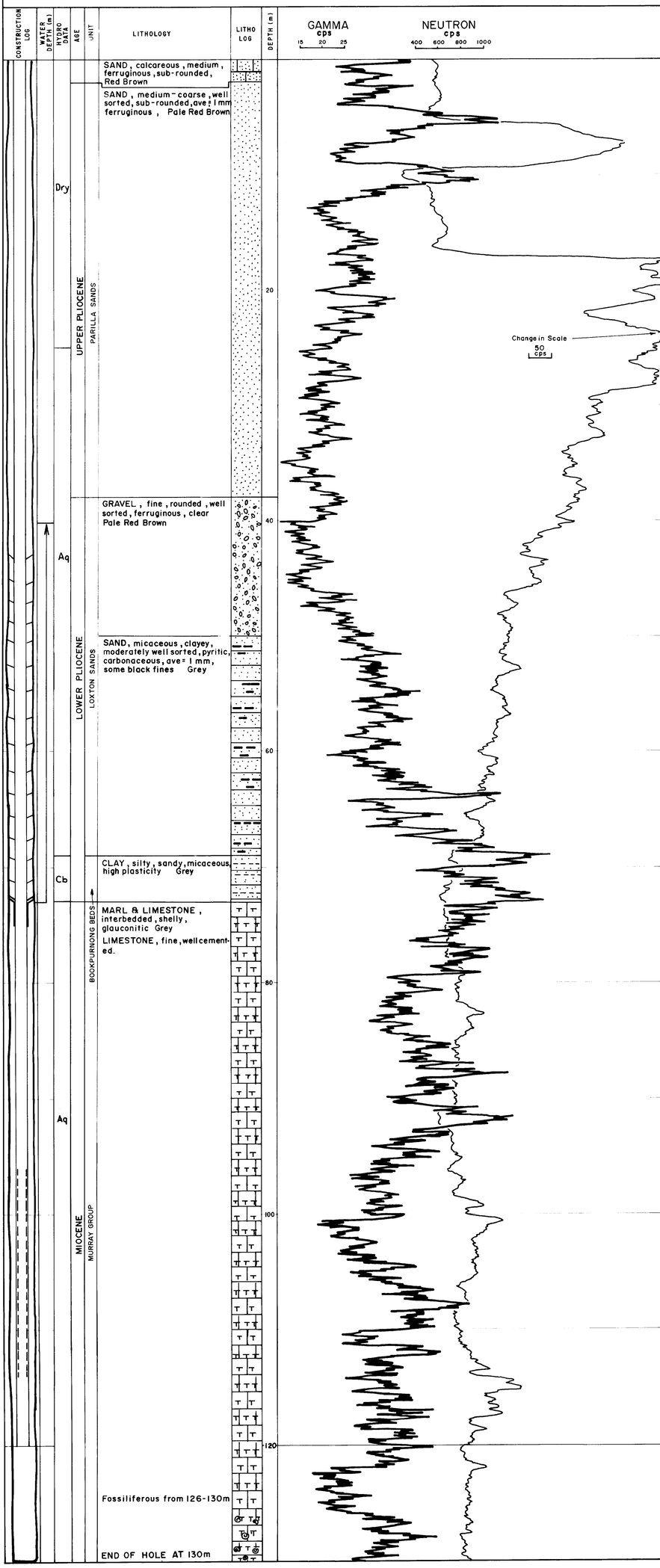
DRILLING TECHNIQUE: ROTARY MUD RESISTIVITY: 1700 mhos
CIRCULATION: MUD
START 24/2/81 FINISH 26/2/81 TOTAL DEPTH: 130m

	mm.	FROM (m)	TO (m)
HOLE DIAMETER	140	0	130
CASING DIAMETER	80 PVC	0	96
		114	120
	(Cemented from 73		43)
SCREEN DETAILS	80 (slotted PVC)	96	114

TYPE OF LOG	16in. NORMAL	64in. NORMAL	6ft. LATERAL	SELF POTENT.	POINT RESIST.	NEUTRON	GAMMA	DENSITY
DATE OF RUN	24/2/81	24/2/81		24/2/81		24/2/81	24/2/81	
FIRST READING	129·8	128·2		129		130	130	
LAST READING	12	11		16		0	0	
RECORDED BY	D.R.EDWARDS			D.R.E.		D.R.EDWARDS		

DEPTH TO WATER	TOTAL DISSOLVED SOLIDS mg/L	Analysis No.	DATE
41·1	14,203	4126/82	24/6/82
(R.P)			

REMARKS:
For Grain Size Analysis
Interval m to m
See plan No.
Linatex Seal at 73m. Drilled as replacement well for adjacent M67.
An S.P. Log is also available.
Temporary No. M67A.



DEPARTMENT OF MINES AND ENERGY - SOUTH AUSTRALIA
ENGINEERING DIVISION

COMPOSITE WELL LOG - GROUNDWATER

WELL UNIT No. 6930 002 OW 00012
PERMIT No. 8315
PLAN No. 82-369

PROJECT: UPPER MURRAY GROUNDWATER INVESTIGATIONS
LOCATION: FRENCH DAM — TAYLOR BROS. STATION
SECTION: HUNDRED:
REFERENCE ELEV. 68·540 m A.H.D. LOGGED BY: D. EDWARDS

LOG SYMBOLS
CASING SEAL
WIREWOUND SCREEN
SLOTTED CASING
GRAVEL PACKED INTERVAL
HYDRAULIC CONDUCTIVITY (m/day, Estimated)

CONSTRUCTION DETAILS

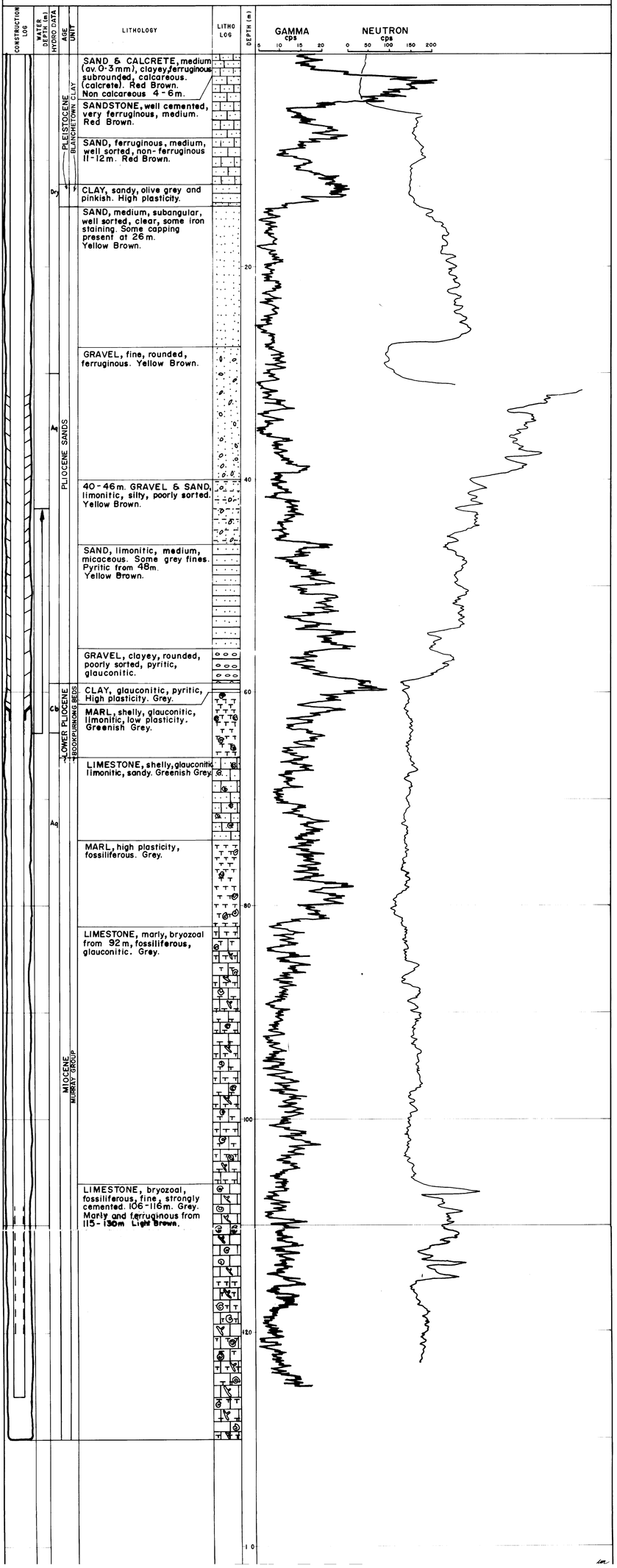
DRILLING TECHNIQUE: ROTARY MUD RESISTIVITY: 1700mhos
CIRCULATION: MUD
START: 10-3-81 FINISH: 12-3-81 TOTAL DEPTH: 130m

	mm.	FROM (m)	TO (m)
HOLE DIAMETER	140	0	130
CASING DIAMETER	80 pvc	0	108
	80 pvc cemented (LINATEX SEAL IS SET AT 62m)	62	32
SCREEN DETAILS	80 slotted pvc	108	120

TYPE OF LOG	16 in. NORMAL	64 in. NORMAL	6 ft. LATERAL	SELF POTENT.	POINT RESIST.	NEUTRON	GAMMA	DENSITY
DATE OF RUN	11-3-81			11-3-81		11-3-81	25-3-81	
FIRST READING	129·1	128		128·8		122·8	125	
LAST READING	19	18		18		0	0	
RECORDED BY	D. EDWARDS			D. EDWARDS		D. EDWARDS		

DEPTH TO WATER	TOTAL DISSOLVED SOLIDS mg/L	Analysis No.	DATE
42·65 (R.P)	37,176	4654/81	25/3/81
25/3/82			

REMARKS:
For Grain Size Analysis Interval m to m
See plan No.
An S.P. Log is also available.
Temporary No. M68.



2829

DEPARTMENT OF MINES AND ENERGY - SOUTH AUSTRALIA
ENGINEERING DIVISION

COMPOSITE WELL LOG - GROUNDWATER

WELL UNIT No. 6930002ØW00015
PERMIT No. 91314
PLAN No. 82-370

PROJECT: UPPER MURRAY GROUNDWATER INVESTIGATION
LOCATION: French's Dam - Taylor Bros. Station
SECTION: ..... HUNDRED: .....
REFERENCE ELEV. 68·322 m A.H.D. LOGGED BY: D. Edwards

LOG SYMBOLS
- CASING SEAL
- WIREWOUND SCREEN
- SLOTTED CASING
- GRAVEL PACKED INTERVAL
- K HYDRAULIC CONDUCTIVITY (m/day, Estimated)

CONSTRUCTION DETAILS

DRILLING TECHNIQUE: ROTARY MUD RESISTIVITY: <1700 mhos
CIRCULATION: MUD
START: 25·3·81 FINISH: 26·3·81 TOTAL DEPTH: 60 m

	mm.	FROM (m)	TO (m)
HOLE DIAMETER	140	0	60
CASING DIAMETER	80 P.V.C.	0	52
		54	60
		Linatex Seal at 51 m	
SCREEN DETAILS	80 (Screen	52	54
		0·42 mm aperture)	

TYPE OF LOG	16 in. NORMAL	64 in. NORMAL	6 ft. LATERAL	SELF POTENT.	POINT RESIST.	NEUTRON	GAMMA	DENSITY
DATE OF RUN							25·3·81	
FIRST READING							55·8	
LAST READING							0	
RECORDED BY							D. Edwards	

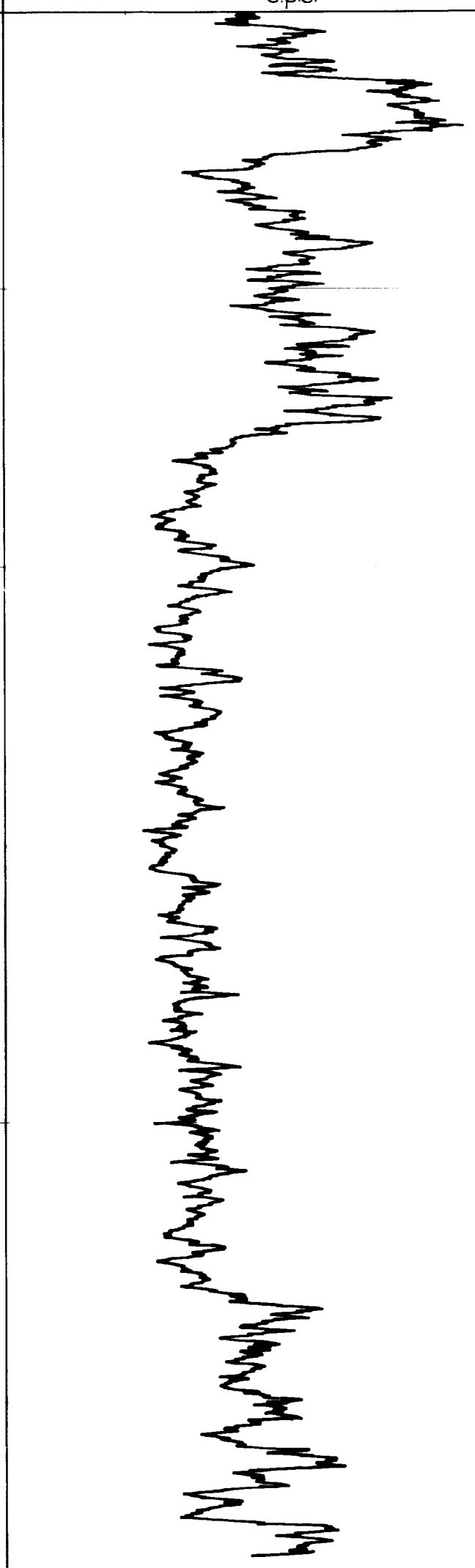
DEPTH TO WATER	TOTAL DISSOLVED SOLIDS mg/L	TOTAL DISSOLVED SOLIDS Analysis No.	DATE
41·25 (from R.P.)	41 299	4146/81	27·3·81

REMARKS:
For Grain Size Analysis
Interval m to m
See plan No. .....

TEMPORARY No. M 68A

CONSTRUCTION LOG	WATER DEPTH (m)	HYDRO DATA	AGE	UNIT	LITHOLOGY	LITHO LOG	DEPTH (m)
					SAND/CALCRETE: (medium, ave. 0·3 mm), ferruginous, subrounded. Red-brown.		
					SAND and SANDSTONE: Medium, silty, non-calcareous, ferruginous, (well sorted). Red-brown.		
			PLEISTOCENE	Blanchetown Clay	**CLAY**: High plasticity, sandy. Pinkish/olive grey.		
		Dry			**SAND**: Medium, subangular, well sorted, clear. Some Fe cemented cap rock at 26 m. Yellow brown.		20
			SANDS		**GRAVEL**: Fine (ave. 2 mm), rounded, ferruginous, well sorted. Yellow brown.		
			PLIOCENE		**GRAVEL/SAND**: Limonitic, silty, poorly sorted. Gravel - fine. Sand - medium. Yellow brown.		40
		Aquifer			**SAND**: Medium, micaceous, limonitic (pyritic from 48m) plus minor carbonaceous material. Yellow brown.		
					GRAVEL: Clayey, rounded, poorly sorted, pyritic, glauconitic. Grey.		
			LOWER PLIOCENE	Bookpurnong Beds	**CLAY**: Glauconitic, high plasticity, pyritic. Grey.		60
					END OF HOLE 60 m.		

GAMMA
0 10 20 30
c.p.s.



2628

DEPARTMENT OF MINES AND ENERGY - SOUTH AUSTRALIA
ENGINEERING DIVISION

COMPOSITE WELL LOG - GROUNDWATER

WELL UNIT No. 6930000ØW00013
PERMIT No. 8317
PLAN No. 82-371

PROJECT: UPPER MURRAY GROUNDWATER INVESTIGATION
LOCATION: Aitkens Tank turnoff - Canegrass Stn.
SECTION: ..... HUNDRED: .....
REFERENCE ELEV. 71·40 m A.H.D. LOGGED BY: D. EDWARDS

LOG SYMBOLS
- CASING SEAL
- WIREWOUND SCREEN
- SLOTTED CASING
- GRAVEL PACKED INTERVAL
- K HYDRAULIC CONDUCTIVITY (m/day, Estimated)

CONSTRUCTION DETAILS

DRILLING TECHNIQUE: ROTARY MUD RESISTIVITY: <1700 mhos
CIRCULATION: MUD
START: 8·4·81 FINISH: 9·4·81 TOTAL DEPTH: 108 m

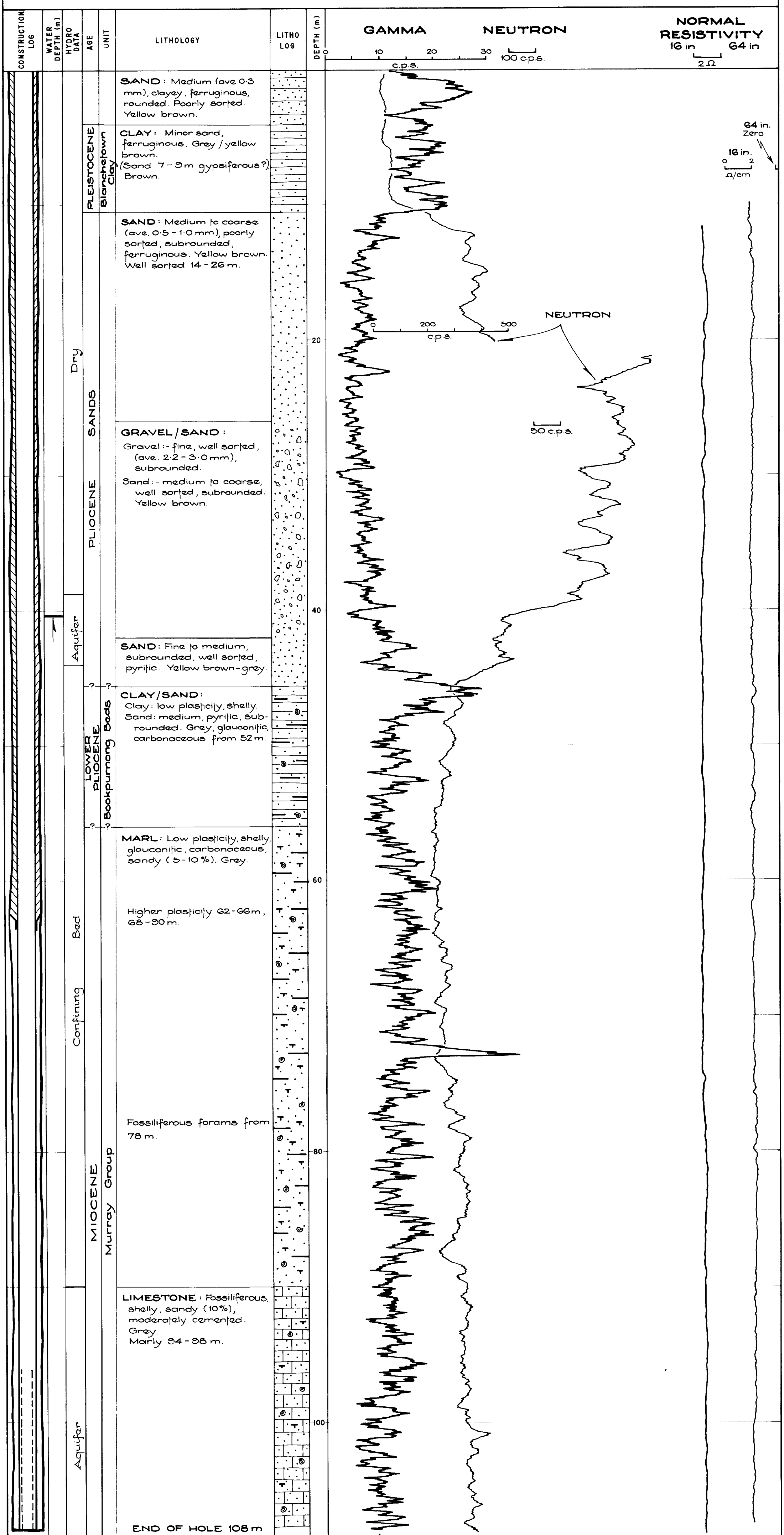
	mm.	FROM (m)	TO (m)
HOLE DIAMETER	140	0	108
CASING DIAMETER	80 P.V.C.	0	96
	Cemented from 0 to 63 m.		
	Linatex seal at 63 m.		
SCREEN DETAILS	80 P.V.C. (slotted)	96	108

TYPE OF LOG	16 in. NORMAL	64 in. NORMAL	6 ft. LATERAL	SELF POTENT.	POINT RESIST.	NEUTRON	GAMMA	DENSITY
DATE OF RUN	8·4·81	8·4·81		8·4·81		8·4·81	8·4·81	
FIRST READING	108·0	107·0		107·8		108·0	108·0	
LAST READING	12·2	11·2		12·7		0	0	
RECORDED BY				D. Edwards				

DEPTH TO WATER	TOTAL DISSOLVED SOLIDS mg/L	TOTAL DISSOLVED SOLIDS Analysis No.	DATE
40·55 (from R.P.)	13 322	4154/81	10·4·81

REMARKS:
For Grain Size Analysis
Interval m to m
See plan No. .....

TEMPORARY No. M 70



NOTE: A Self Potential Log is also available.

2829

DEPARTMENT OF MINES AND ENERGY - SOUTH AUSTRALIA
ENGINEERING DIVISION

COMPOSITE WELL LOG - GROUNDWATER

WELL UNIT No. 6930 0000W 00014
PERMIT No. 8318
PLAN No. 82-372

PROJECT: UPPER MURRAY GROUNDWATER INVESTIGATIONS.
LOCATION: AITKEN'S TANK TURNOFF – CANEGRASS STATION.
SECTION: HUNDRED:
REFERENCE ELEV. 71·53 m A.H.D. LOGGED BY: D.R.EDWARDS

LOG SYMBOLS
CASING SEAL
WIREWOUND SCREEN
SLOTTED CASING
GRAVEL PACKED INTERVAL
K HYDRAULIC CONDUCTIVITY (m/day, Estimated)

CONSTRUCTION DETAILS

DRILLING TECHNIQUE: ROTARY MUD RESISTIVITY: 1700mhos
CIRCULATION: MUD
START: 8/4/81 FINISH: 9/4/81 TOTAL DEPTH: 45m

	mm.	FROM (m)	TO (m)
HOLE DIAMETER	140	0	45
CASING DIAMETER	80	0	43
	LINATEX SEAL AT 41m		
SCREEN DETAILS	80	43	45
	Screen	(0·412mm APERTURE)	

TYPE OF LOG	16in. NORMAL	64in. NORMAL	6ft. LATERAL	SELF POTENT.	POINT RESIST.	NEUTRON	GAMMA	DENSITY
DATE OF RUN							9/4/81	
FIRST READING							45	
LAST READING							0	
RECORDED BY							D.R.EDWARDS	

DEPTH TO WATER	TOTAL DISSOLVED SOLIDS mg/L	Analysis No.	DATE
40·4 (R.P)	Unable to be representatively sampled at June' 1982		14/4/81

REMARKS:
For Grain Size Analysis
Interval m to m
See plan No.
Temporary No. M71.

CONSTRUCTION LOG	WATER DEPTH (m)	HYDRO DATA	AGE	UNIT	LITHOLOGY	DEPTH (m)
					SAND, clayey, rounded, poorly sorted, medium, ave = 0·3mm, ferruginous, Yellow Brown.	
			PLEISTOCENE	BLANCHETOWN CLAY	CLAY, high plasticity, sandy, ferruginous, Grey Yellow Brown. 7–9m Sandy, Gypsiferous, Brown.	
		Dry	PLIOCENE	LOXTON and PARILLA SANDS	SAND, medium – coarse, sub-rounded, poorly sorted, ferruginous, ave = 0·5–1mm Yellow Brown. Well sorted 14–26m	20
					Gravel and Sand, Gravel, fine, well sorted, ferruginous, ave = 2·2–3mm, sub-rounded, SAND, medium – coarse, well sorted, ferruginous, subrounded Yellow Brown.	40
		Aq			SAND, fine – medium, sub-rounded, ferruginous, well sorted pyritic from 44m.	
					END OF HOLE AT 45m.	

GAMMA 0 5 10 15 cps

2628

DEPARTMENT OF MINES AND ENERGY - SOUTH AUSTRALIA
ENGINEERING DIVISION

COMPOSITE WELL LOG - GROUNDWATER

WELL UNIT No. 6331000ØW00024
PERMIT No. 8319
PLAN No. 82-373

PROJECT: UPPER MURRAY GROUNDWATER INVESTIGATION
LOCATION: South Well Dam - Pine Valley Station
SECTION: HUNDRED:
REFERENCE ELEV. 85·136 m A.H.D. LOGGED BY: D. EDWARDS

LOG SYMBOLS
- CASING SEAL
- WIREWOUND SCREEN
- SLOTTED CASING
- GRAVEL PACKED INTERVAL
- K HYDRAULIC CONDUCTIVITY (m/day, Estimated)

CONSTRUCTION DETAILS

DRILLING TECHNIQUE: ROTARY MUD RESISTIVITY: < 1700 mhos
CIRCULATION: MUD
START: 13-4-81 FINISH: 15-4-81 TOTAL DEPTH: 132 m

	mm.	FROM (m)	TO (m)
HOLE DIAMETER	140	0	132
CASING DIAMETER	80 P.V.C.	0	120
	Cemented from approx. 33 - 73 m		
	Linatex seal at 73 m.		
SCREEN DETAILS	80 (slotted P.V.C.)	120	132

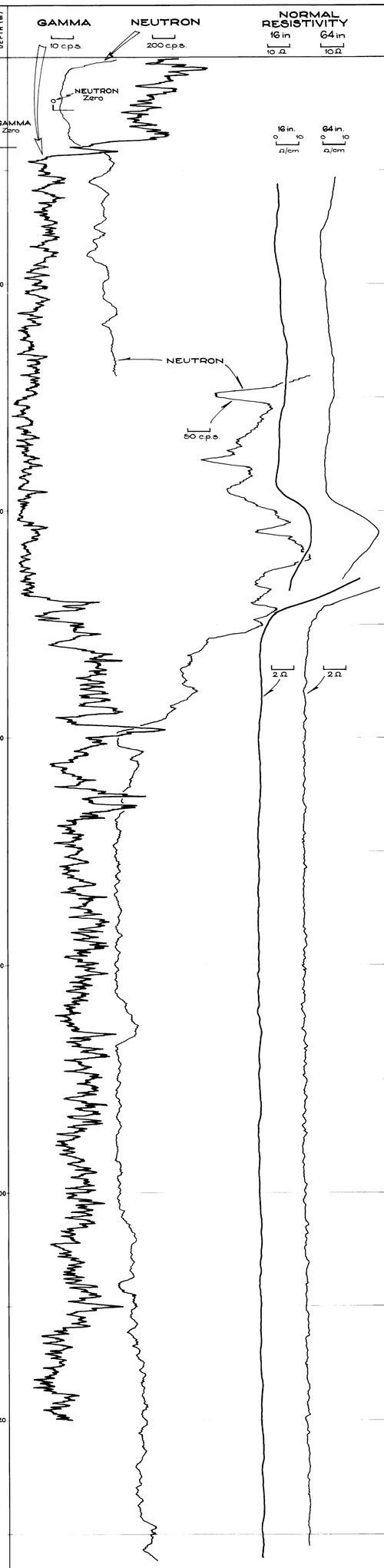
TYPE OF LOG	16 in. NORMAL	64 in. NORMAL	6 ft. LATERAL	SELF POTENT.	POINT RESIST.	NEUTRON	GAMMA	DENSITY
DATE OF RUN	14-4-81	14-4-81		14-4-81		14-4-81	14-4-81	
FIRST READING	132	131		132		132	120	
LAST READING	11·7	10·7		12		0	0	
RECORDED BY	D. Edwards							

DEPTH TO WATER	TOTAL DISSOLVED SOLIDS mg/L	Analysis No.	DATE
48·30 (from R.P.)	10,890	4158/81	24-4-81

REMARKS:
For Grain Size Analysis
Interval m to m
See plan No.

TEMPORARY No. M 72

CONSTRUCTION LOG	WATER DEPTH (m)	HYDRO DATA	AGE	UNIT	LITHOLOGY	LITHO LOG	DEPTH (m)
			PLEISTOCENE	Blanchetown Clay	SAND: Poorly sorted, ferruginous, medium (ave. 0·3mm), calcareous, sub-rounded. Red brown. CLAY: Ferruginous, high plasticity, sandy. Red brown.		0
		Dry	PLIOCENE	SANDS	SAND: Medium to coarse, poorly sorted (ave. 0·3 - 1·0 mm), ferruginous, mainly clear, subrounded. Red brown to light red brown.		20
					Very limonitic 34 - 36 m.		40
	?	Aquifer		Basal Sands	SAND: (clayey 58-66m), medium, pyritic, well sorted slightly micaceous (muscovite). Grey, shelly, glauconitic, limonitic (pellets) from 64 m.		60
	?		LOWER PLIOCENE		CLAY: Glauconitic, shelly, high plasticity, limonitic (pellets), pyritic. Grey.		
	?				SAND/CLAY: Interbedded well sorted sand - medium, pyritic, glauconitic, limonitic, shelly, fossiliferous. Clay :- low to high plasticity Grey.		80
		Confining Bed	? MIOCENE	? Murray Group			100
					MARL: Low plasticity, glauconitic, very shelly, pyritic, carbonaceous (pellets). Greenish grey.		120
		Aquifer			LIMESTONE: Glauconitic, shelly, fossiliferous, pyritic, minor sand (fine). Grey.		
					END OF HOLE 132 m		



NOTE: A Self Potential Log is also available.

2829

DEPARTMENT OF MINES AND ENERGY - SOUTH AUSTRALIA
ENGINEERING DIVISION

COMPOSITE WELL LOG - GROUNDWATER

WELL UNIT No. 6931 000 0W 00025
PERMIT No. 8320
PLAN No. 82-374

PROJECT: UPPER MURRAY GROUNDWATER INVESTIGATIONS
LOCATION: SOUTH WELL DAM - PINE VALLEY STATION
SECTION: HUNDRED:
REFERENCE ELEV. 85·186 m A.H.D. LOGGED BY: D.R.EDWARDS

LOG SYMBOLS
CASING SEAL
WIREWOUND SCREEN
SLOTTED CASING
GRAVEL PACKED INTERVAL
K HYDRAULIC CONDUCTIVITY (m/day, Estimated)

CONSTRUCTION DETAILS

DRILLING TECHNIQUE: ROTARY
CIRCULATION: MUD
MUD RESISTIVITY: 1700 mhos
START: 23/4/81 FINISH: 24/4/81 TOTAL DEPTH: 50m

	mm.	FROM (m)	TO (m)
HOLE DIAMETER	140	0	50
CASING DIAMETER	80	0	45
	PVC	47	50
	LINATEX	SEAL AT 44m	
SCREEN DETAILS	80 Screen	45 (0·42mm Aperture)	47

TYPE OF LOG	16in. NORMAL	64in. NORMAL	6ft. LATERAL	SELF POTENT.	POINT RESIST.	NEUTRON	GAMMA	DENSITY
DATE OF RUN							23/4/81	
FIRST READING							50	
LAST READING							0	
RECORDED BY							D.R.EDWARDS	

DEPTH TO WATER	TOTAL DISSOLVED SOLIDS mg/L	Analysis No.	DATE
	Aquifer is not in Basal Pliocene Sands		

REMARKS:
For Grain Size Analysis
Interval m to m
See plan No.
Aquifer lower than anticipated, must be below 50 m in Bookpurnong Beds (between 50m and 65m)
Temporary No. M73

CONSTRUCTION LOG	WATER DEPTH (m)	HYDRO DATA	AGE	UNIT	LITHOLOGY	LITHO LOG	DEPTH (m)
			PLEISTOCENE	BLANCHETOWN CLAY	SAND, poorly sorted, ave = 0·3mm, calcareous, sub-rounded. Red Brown.		
					CLAY, sandy, ferruginous, high plasticity, Red Brown.		
		DRY	PLIOCENE	LOXTON & PARILLA SANDS	SAND, medium-coarse, ave = 0·3 - 1·0 mm, poorly sorted, ferruginous, mainly clear, sub-rounded, Red Brown - Light Brown.		20
	?				END OF HOLE AT 50m		40
		?					60

GAMMA cps
10 20 30 40 50 60

2623

DEPARTMENT OF MINES AND ENERGY - SOUTH AUSTRALIA
ENGINEERING DIVISION

COMPOSITE WELL LOG - GROUNDWATER

WELL UNIT No.	7031000@W00015
PERMIT No.	8652
PLAN No.	82-375

PROJECT: UPPER MURRAY GROUNDWATER INVESTIGATION
LOCATION: Fairchild Dam - Danggali Conservation Park
SECTION: ..... HUNDRED: .....
REFERENCE ELEV. 98·68 m A.H.D. LOGGED BY: D. Edwards

LOG SYMBOLS
CASING SEAL
WIREWOUND SCREEN
SLOTTED CASING
GRAVEL PACKED INTERVAL
k HYDRAULIC CONDUCTIVITY (m/day, Estimated)

CONSTRUCTION DETAILS

DRILLING TECHNIQUE: ROTARY MUD RESISTIVITY: < 1700 mhos
CIRCULATION: MUD
START: 3·6·81 FINISH: 5·6·81 TOTAL DEPTH: 157·5 m

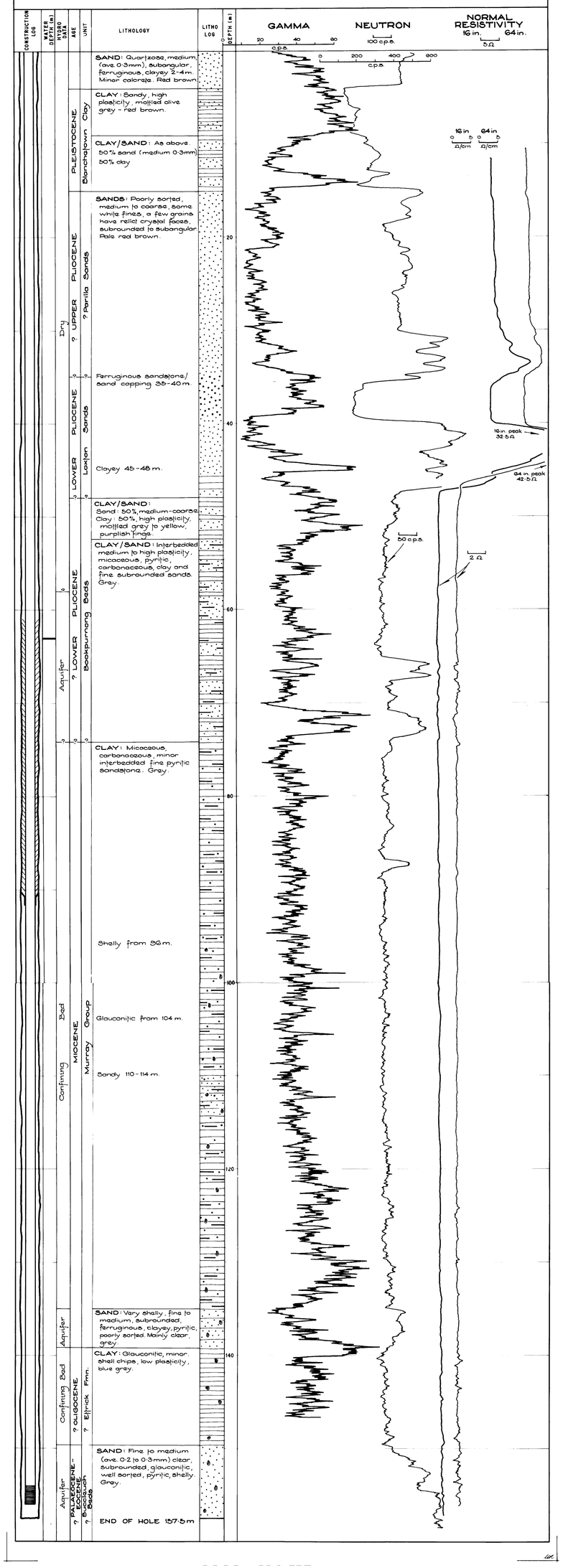
	mm.	FROM (m)	TO (m)
HOLE DIAMETER	140	0	157·5
CASING DIAMETER	80 P.V.C.	0	154
	Cemented from 61 to 81 m		
	Linatex seal at 81 m.		
SCREEN DETAILS	80 Steel (0·4 mm aperture)	154	156

TYPE OF LOG	16 in NORMAL	64 in NORMAL	6 ft LATERAL	SELF POTENT.	POINT RESIST.	NEUTRON	GAMMA	DENSITY
DATE OF RUN	4·6·81	4·6·81				4·6·81	4·6·81	
FIRST READING	157	156				157·5	146·5	
LAST READING	12	11				0	0	
RECORDED BY				D. Edwards				

DEPTH TO WATER	TOTAL DISSOLVED SOLIDS mg/L	Analysis No.	DATE
63·0 (from R.P.)	11,314	4697/81	5/9/81

REMARKS:
For Grain Size Analysis Interval m to m
See plan No. .....

TEMPORARY No. M 74



2829

DEPARTMENT OF MINES AND ENERGY - SOUTH AUSTRALIA
ENGINEERING DIVISION

COMPOSITE WELL LOG - GROUNDWATER

WELL UNIT No. 7031 000 0W 00016
PERMIT No. 8653
PLAN No. 82-376

PROJECT: UPPER MURRAY GROUNDWATER INVESTIGATIONS
LOCATION: FAIRCHILDS DAM - DANGGALI CONSERVATION PARK.
SECTION: HUNDRED:
REFERENCE ELEV. 98·4 m A.H.D. LOGGED BY: D.R.EDWARDS

LOG SYMBOLS
CASING SEAL
WIREWOUND SCREEN
SLOTTED CASING
GRAVEL PACKED INTERVAL
K HYDRAULIC CONDUCTIVITY (m/day, Estimated)

CONSTRUCTION DETAILS

DRILLING TECHNIQUE: ROTARY MUD RESISTIVITY:
CIRCULATION: MUD
START: 5/6/81 FINISH: 9/6/81 TOTAL DEPTH: 62m

	mm.	FROM (m)	TO (m)
HOLE DIAMETER	140	0	62
CASING DIAMETER	80 LINATEX	0 SEAL AT 44 m	60
SCREEN DETAILS	80 (0·42 mm APERTURE)	60	62

TYPE OF LOG	16 in. NORMAL	64in. NORMAL	6ft. LATERAL	SELF POTENT.	POINT RESIST.	NEUTRON	GAMMA	DENSITY
DATE OF RUN							6/6/81	
FIRST READING							62	
LAST READING							0	
RECORDED BY							D.R.EDWARDS	

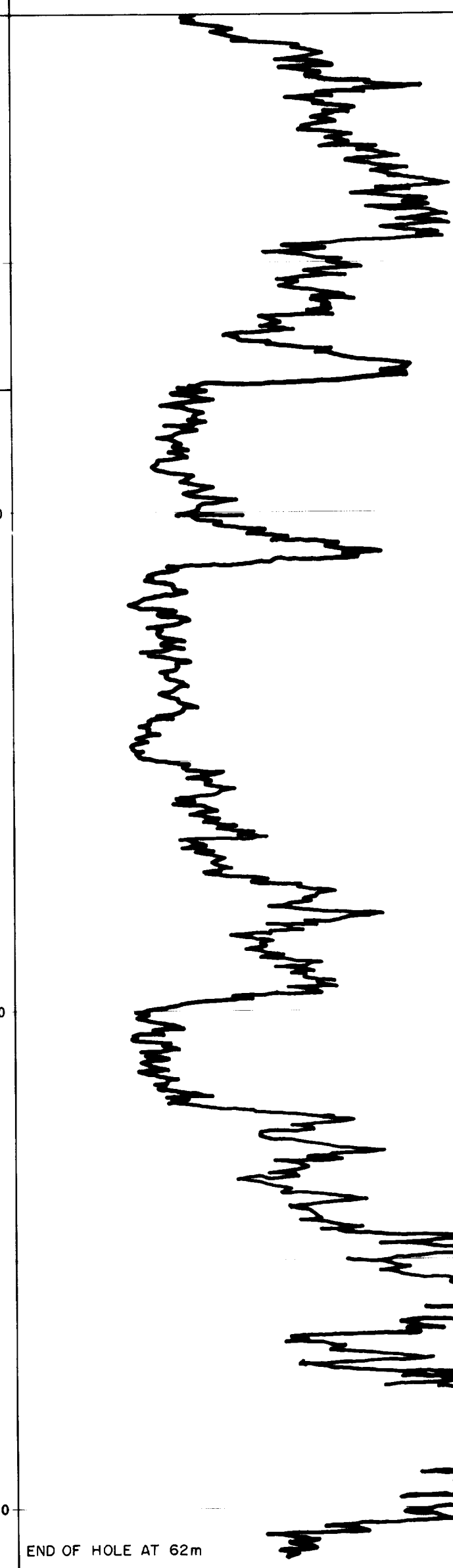
DEPTH TO WATER	TOTAL DISSOLVED SOLIDS mg/L	Analysis No.	DATE
59·15 (R.P)	Unable to obtain a representative sample in June	1982	10/6/81

REMARKS:
For Grain Size Analysis
Interval m to m
See plan No.

Temporary No. M75.

CONSTRUCTION LOG	WATER DEPTH (m)	HYDRO DATA	AGE	UNIT	LITHOLOGY	LITHO LOG	DEPTH (m)
					SAND, unconsolidated, medium, ave = 0·3 mm, sub-angular, ferruginous, clayey, 1-4 m, minor calcrete. Red Brown		
			PLEISTOCENE	BLANCHETOWN CLAY	CLAY, high plasticity, sandy (10%), mottled. Olive Grey - Red Brown. 9-15 m 50 % clay (as above) 50 % medium, quartz sand.		
		Dry	UPPER PLIOCENE	PARILLA SANDS	SANDS, medium - coarse, some grains showing relict crystal faces, sub-rounded to sub-angular, ave = 0·3 - 0·7 mm. Pale Red Brown.		20
			?	? LOXTON SANDS	At 38-40 m some ferruginous sandstone capping (clayey).		40
		Aq	LOWER PLIOCENE	BOOKPURNONG BEDS	CLAY/SAND, 50% plastic clay, mottled, Yellow Grey with purplish tinge. 50% medium - coarse quartz sand, ave = 0·3 - 0·4 mm carbonaceous from 52 m. micaceous, pyritic from 56m.		60
			?	?	SAND, micaceous, pyritic, carbonaceous, fine-coarse, poorly sorted. Grey.		END OF HOLE AT 62m

GAMMA cps
10 20 30 40



2829

DEPARTMENT OF MINES AND ENERGY - SOUTH AUSTRALIA
ENGINEERING DIVISION

COMPOSITE WELL LOG - GROUNDWATER

WELL UNIT No. 6931000@W00026
PERMIT No. 8654
PLAN No. 82-377

PROJECT: UPPER MURRAY GROUNDWATER INVESTIGATION
LOCATION: Quondong - Sturt Vale Rd. / Powerline Rd. Intersection
SECTION: HUNDRED:
REFERENCE ELEV. 110·29 m A.H.D. LOGGED BY: D. EDWARDS

LOG SYMBOLS
CASING SEAL
WIREWOUND SCREEN
SLOTTED CASING
GRAVEL PACKED INTERVAL
K HYDRAULIC CONDUCTIVITY (m/day, Estimated)

CONSTRUCTION DETAILS

DRILLING TECHNIQUE: ROTARY MUD RESISTIVITY @ 13·5°C 2750mhos
CIRCULATION: MUD
START: 10·6·81 FINISH: 12·6·81 TOTAL DEPTH: 138·5

	mm.	FROM (m)	TO (m)
HOLE DIAMETER	140	0	138·5
CASING DIAMETER	80 P.V.C.	0	72
	Cemented	41	71
	Linatex seal at 71m		
SCREEN DETAILS	Open hole from 72		138·5

TYPE OF LOG	16in. NORMAL	64in. NORMAL	6ft. LATERAL	SELF POTENT.	POINT RESIST.	NEUTRON	GAMMA	DENSITY
DATE OF RUN	12·6·81	12·6·81				12·6·81	12·6·81	
FIRST READING	138·5	137·5				138·5	138·5	
LAST READING	11·8	10·8				0	0	
RECORDED BY			D. EDWARDS					

DEPTH TO WATER	TOTAL DISSOLVED SOLIDS mg/L	Analysis No.	DATE

REMARKS:
For Grain Size Analysis
Interval m to m
See plan No.

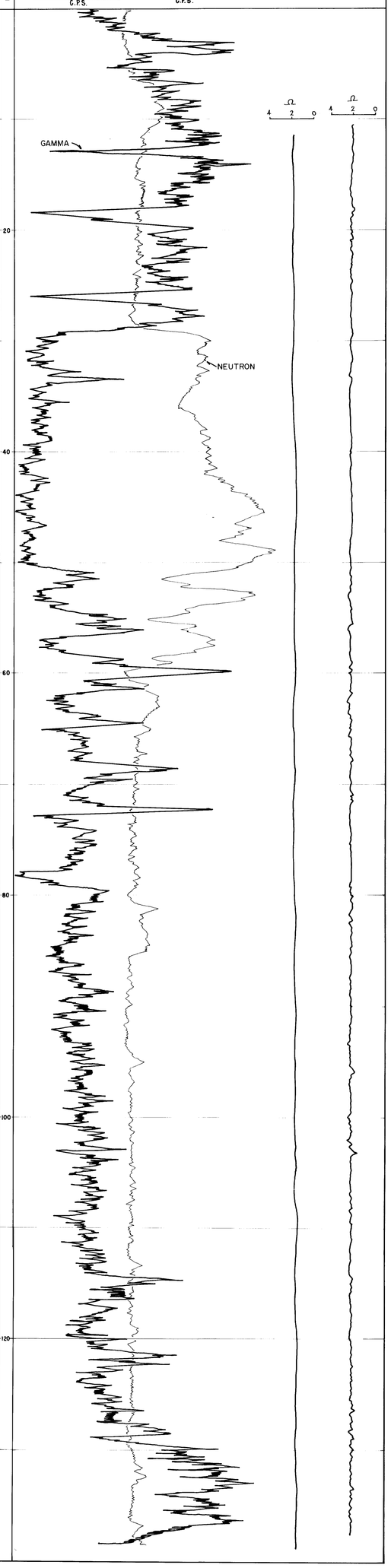
Note: No aquifer detected in well to original target depth of 140m (at 12/6/81).
From adjacent hole drilled later to pre-tertiary basement (M91), Gamma and Neutron Logs indicated an aquifer between 143 and 155m in shelly clayey sands. On 4/9/81 an unsuccessful attempt was made to deepen this well with 'A' rods to 144m.
TEMPORARY No. M 76

CONSTRUCTION LOG | WATER STRIKE(S) | BEYOND DATA | AGE | UNIT | LITHOLOGY | LITHO LOG | DEPTH (m)

AGE	UNIT	LITHOLOGY
PLEISTOCENE	Blanchetown Clay	SAND: Calcareous (nodular calcrete), medium - coarse (ave. 0·3mm), poorly sorted, subrounded - rounded, clayey, very ferruginous. Red - brown.
		CLAY: Moderate to high plasticity, minor fine sand. Olive grey / yellow brown.
PLIOCENE SANDS		SAND: 29 - 42m medium (ave. 0·4 - 0·5mm) subrounded to rounded, poorly sorted, clayey. Yellow brown.
		42 - 62m Coarse, clear, well sorted, average of 1mm.
		52m increasing in clay silt. Yellow / brown.
LOWER PLIOCENE	Bookpurnong Beds	SAND: fine / medium, silty, ferruginous, pyritic. Grey / brown. CLAY: Low to medium plasticity.
		CLAY: Sandy, medium to high plasticity, pyritic, micaceous, glauconitic.
		84 - 88m Some well consolidated claystone and sandstone.
		88m Calcareous (shell chips).
MIOCENE	Murray Group	108 - 112m Sandy and shelly.
		114 - 115m Sandy and shelly.
		END OF HOLE 138·5m

Note: There is no water cut between 71 and 138·5m.

GAMMA 20 40 60 80 100 C.P.S.
NEUTRON 150 200 250 300 350 C.P.S.
NORMAL RESISTIVITY Ω 4 2 0 4 2 0



2829

DEPARTMENT OF MINES AND ENERGY - SOUTH AUSTRALIA
ENGINEERING DIVISION

COMPOSITE WELL LOG - GROUNDWATER

WELL UNIT No. 6931000/W00027
PERMIT No. 8655
PLAN No. 82-378

PROJECT: UPPER MURRAY GROUNDWATER INVESTIGATIONS
LOCATION: QUONDONG - STURTVALE Rds. — POWERLINE Rd. INTERSECTION
SECTION: HUNDRED:
REFERENCE ELEV. 111·44 m A.H.D. LOGGED BY: D.R. EDWARDS.

LOG SYMBOLS
CASING SEAL
WIREWOUND SCREEN
SLOTTED CASING
GRAVEL PACKED INTERVAL
K HYDRAULIC CONDUCTIVITY (m/day, Estimated)

CONSTRUCTION DETAILS

DRILLING TECHNIQUE: ROTARY MUD RESISTIVITY:
CIRCULATION: MUD
START: 16/6/81 FINISH: 17/6/81 TOTAL DEPTH: 70m

	mm.	FROM (m)	TO (m)
HOLE DIAMETER	140	0	70
CASING DIAMETER	80 pvc (LINATEX	0 SEAL AT	54 53 m)
SCREEN DETAILS	80 (STEEL	54 0·4mm APERTURE.)	56

TYPE OF LOG	16 in. NORMAL	64in. NORMAL	6ft. LATERAL	SELF POTENT.	POINT RESIST.	NEUTRON	GAMMA	DENSITY
DATE OF RUN	FOR GEOPHYSICS SEE TOP SECTION OF ADJACENT HOLE							
FIRST READING			M76 + (6931-26)		(PLAN No. 82-377)			
LAST READING								
RECORDED BY								

DEPTH TO WATER	TOTAL DISSOLVED SOLIDS mg/l	Analysis No.	DATE
	NO AQUIFER OF SIGNIFICANCE IN WELL FROM 58-72 m (DEEPENED 5/9/81.)		

REMARKS: NOTE: ORIGINAL SCREEN TARGET 56-58 m (Hole fell in while running casing)
ON 5/9/81 DEEPENED HOLE TO 70 m (into BOOKPURNONG BEDS.)
NO AQUIFER DETECTED BETWEEN 58 and 72m AT DEVELOPMENT ON 5/9/81.
Temporary No. M77.

CONSTRUCTION LOG	WATER DEPTH (m)	HYDRO DATA	AGE	UNIT	LITHOLOGY	LITHO LOG	DEPTH (m)
			PLEISTOCENE	BLANCHETOWN CLAY	SAND - calcareous, nodular - calcrete, medium - coarse, poorly sorted, clayey, rounded - sub-rounded, ferruginous. Red - Brown.		
					CLAY - moderate-high plasticity, minor fine sand. Olive Grey - Yellow Brown		20
			PLEISTOCENE	SANDS	SANDS - 29 - 42 m medium, average, 0·4 - 0·5mm, sub-rounded — rounded, poorly sorted, clayey. Yellow Brown		40
			PLIOCENE		42 - 58 m coarse, clear, well sorted, (average 1 mm diameter.)		
					CLAY / SILT - content increasing from 52 m Yellow Brown		
			LOWER PLIOCENE	BOOKPURNONG BEDS	SAND and CLAY — fine / medium, silty, pyrite, ferruginous sand. clay - medium / high plasticity. Grey Brown		60
							END OF HOLE 70 m

NO GROUNDWATER DETECTED DURING DEVELOPMENT OF HOLE.

DEPARTMENT OF MINES AND ENERGY - SOUTH AUSTRALIA
ENGINEERING DIVISION

COMPOSITE WELL LOG - GROUNDWATER

WELL UNIT No. 6931 000 0W 00028
PERMIT No. 91466
PLAN No. 82-379

PROJECT: UPPER MURRAY GROUNDWATER INVESTIGATIONS
LOCATION: QUONDONG - STURT VALE Rd./ POWERLINE Rd. INTERSECTION
SECTION: ..... HUNDRED: .....
REFERENCE ELEV. 111·59 m A.H.D. LOGGED BY: D.R.EDWARDS

LOG SYMBOLS
CASING SEAL
WIREWOUND SCREEN
SLOTTED CASING
GRAVEL PACKED INTERVAL
K HYDRAULIC CONDUCTIVITY (m/day, Estimated)

CONSTRUCTION DETAILS

DRILLING TECHNIQUE: ROTARY
MUD RESISTIVITY: .....
CIRCULATION: WATER
START: 18/6/81 FINISH: 18/6/81 TOTAL DEPTH: 12 m

	mm.	FROM (m)	TO (m)
HOLE DIAMETER	140	0	12
CASING DIAMETER	80 PVC	0	6
SCREEN DETAILS	80 slotted PVC	6	12

TYPE OF LOG	16 in. NORMAL	64in. NORMAL	6ft. LATERAL	SELF POTENT.	POINT RESIST.	NEUTRON GAMMA	DENSITY
DATE OF RUN	FOR GEOPHYSICS SEE TOP SECTION OF ADJACENT HOLE						
FIRST READING	M91 (6931 - 29) PLAN No. 82-380						
LAST READING							
RECORDED BY							

DEPTH TO WATER	TOTAL DISSOLVED SOLIDS mg/L	Analysis No.	DATE
9·5 - 12	Approx. 1800 *	FIELD	18/6/81

* Only able to obtain very small sample. Sample would be diluted by drilling water (450 mg/L), no drilling mud in hole.

REMARKS:
For Grain Size Analysis
Interval m to m

Suspected seepage supply above high plasticity portion of Blanchetown Clay could not be water levelled. On 4/9/81 hole was dry at 9·2 m.

Temporary No. M90.

CONSTRUCTION LOG	WATER DEPTH (m)	HYDRO DATA	AGE	UNIT	LITHOLOGY	LITHO LOG	DEPTH (m)
	BELOW 9·2m	Dry ? Aq ?	PLEISTOCENE	BLANCHETOWN CLAY	SAND, calcareous (nodular calcrete), medium - coarse, ave = 0·3mm, sub-rounded to rounded, clayey, poorly sorted, very ferruginous. Red Brown. CLAY, silty, non-calcareous, moderate plasticity, (top section) minor fine sand Yellow Brown.		20

END OF HOLE AT 12m.

2829

DEPARTMENT OF MINES AND ENERGY - SOUTH AUSTRALIA
ENGINEERING DIVISION

WELL UNIT No. 6931-0006 & W00029
PERMIT No. 91470
PLAN No. 82-380

COMPOSITE WELL LOG - GROUNDWATER

PROJECT: **UPPER MURRAY GROUNDWATER INVESTIGATIONS.**
LOCATION: STURTVALE - QUONDONG Rds. / POWERLINE Rd. INTERSECTION.
SECTION: HUNDRED:
REFERENCE ELEV. 111·62 m A.H.D. LOGGED BY: D. EDWARDS

LOG SYMBOLS
- CASING SEAL
- WIREWOUND SCREEN
- SLOTTED CASING
- GRAVEL PACKED INTERVAL
- K HYDRAULIC CONDUCTIVITY (m/day, Estimated)

CONSTRUCTION DETAILS

DRILLING TECHNIQUE: ROTARY — MUD RESISTIVITY: 1700 mhos
CIRCULATION: MUD
START: 19/6/81 FINISH: 26/6/81 TOTAL DEPTH: 190m

	mm.	FROM (m)	TO (m)
HOLE DIAMETER	140	0	190
CASING DIAMETER	76 Steel CEMENTED FROM 107m - 167·5m (CEMENTED VALUE AT 167·5m)	0	174
SCREEN DETAILS	174 (0·25mm APERTURE SCREEN)		176

TYPE OF LOG	16in. NORMAL	64in. NORMAL	6ft. LATERAL	SELF POTENT.	POINT RESIST.	NEUTRON	GAMMA	DENSITY
DATE OF RUN	24/6/81	24/6/81				24-25/6/81		
FIRST READING	169	168				189	189·5	
LAST READING	18·5	18				0	0	
RECORDED BY	D. EDWARDS					D. EDWARDS		

DEPTH TO WATER	TOTAL DISSOLVED SOLIDS mg/L	Analysis No.	DATE
75·94 (R.P.)	Unable to obtain a representative sample in June 1982		7/9/81

REMARKS:
For Grain Size Analysis
Interval m to m
Interval 177m to 183m not screened - on basis of Neutron log - indicated low K zone and mudstone samples in cuttings.
Temporary No. M91.