DEPARTMENT OF MINES AND ENERGY
SOUTH AUSTRALIA

Rept.Bk.No. 80/89

YUNTA TOWN WATER SUPPLY
1979 GROUNDWATER INVESTIGATION

GEOLOGICAL SURVEY

by

R.E. READ

GEOLOGIST

AUGUST, 1980

D.M. No. 671/73

CONTENTS

TABLES

APPENDIX

FIGURES

DEPARTMENT OF MINES AND ENERGY
SOUTH AUSTRALIA

Rept.Bk.No. 80/89
D.M. No. 671/73

YUNTA TOWN WATER SUPPLY
1979 GROUNDWATER INVESTIGATION

ABSTRACT

Six wells were drilled along a water course about 5 km west of Yunta. Three of these obtained supplies of over 30 kl/day from a fractured rock aquifer but Salinity ranged from 3500 mg/l to 4800 mg/l. Discharge testing of the best well showed a strip-aquifer type response with drawdown rapidly increasing with time. The evidence suggests that there is little or no change in salinity with depth, and that significantly high permeability is restricted to within 30 metres of the surface.

Further drilling is unlikely to reveal any better quality groundwater close to the township, but reserves should be adequate to provide feedwater for a desalination plant.

INTRODUCTION

The township of Yunta is supplied with water from the old railway dam. This source of supply is not reliable and at times it is necessary to cart water by rail. The E. & W.S. Department, which is now responsible for Yunta's water supply requested that the possibility of using groundwater be investigated. Although previous drilling near Yunta had been discouraging, another investigation consisting of 13 resistivity probes, drilling six wells and discharge testing the most promising well was carried out.

TOPOGRAPHY

Yunta lies on a gently sloping pediment. To the north lies a range of hills including Tattawuppa Hill. Yunta Creek flows south through a gap in the range past Yunta. A number of small water courses drain from the hills across the pediment into Yunta Creek.

CLIMATE

The climate is warm and dry with short cool winters. Mean rainfall is 227 mm, and median rainfall 216 mm. Rainfall has no marked seasonal peak, the wettest month being June, (mean 22 mm, median 16 mm) and the driest February (mean 15 mm, median 5 mm). July evaporation is 90 mm and annual evaporation 2500 mm. Data from surrounding stations indicates that evaporation exceeds 90 percentile rainfall in all months.

GEOLOGY

The area is chiefly underlain by folded siltstones of the Umberatana Group. More resistant Pepuarta Tillite forms a range of hills to the north of Yunta. Dolomite of the Nucaleena Formation occurs to the north of this range. Around Yunta the older rocks are generally concealed by about 2 metres of Quaternary soil and clay. Thin sands and gravels occur in present day stream channels.

PREVIOUS INVESTIGATIONS

In 1975 three wells were drilled near Yunta on the same creek as the 1979 drilling. Results are reported in Bowering, 1975. Thin layers of relatively good water were found over water with a salinity of 9000 mg/l. Because of the low density difference pumping of the fresh water caused rapid intrusion of the more saline water. Bowering concluded that the better quality water occurred in alluvial sediments. This does not appear to be borne out by the geological logs which record only clay (weathered siltstone) and siltstone below the watertable. Depths of weathering in this area appear to be greater than those found in the 1979 investigation. However, it must be remembered that the cable-tool drilling methods used in 1975 would disturb the samples more than the air-rotary method used in 1979.

The aquifers were in jointed Waukaringa Siltstone. All known wells are shown on Fig. 2 and a summary of well details is

given in Tables 1 to 3.

HYDROGEOLOGY

With the exception of sands and gravels in the bed of Yunta Creek, which carry saline water the only known aquifers in the area are jointed siltstones. The Nuccaleena Dolomite may contain aquifers, but is of no importance since its outcrop is not crossed by creeks which might provide good qulaity recharge.

Recorded salinities range from 290 mg/1 to 10 000 mg/1. The former value is exceptional and the wells (6832WW11) from which it came is discussed below. In general better quality water is found near creeks on higher ground. Low-lying areas are unfavourable.

Since evaporation exceeds 90 percentile rainfall in all months recharge by direct infiltration through outcrop will occur very rarely. Direct infiltration through the 2 metres or so of clay on the plains must be even more rare, and it follows that water recharged by direct infiltration is of poor quality, about 8000 mg/1. Better quality water is recharged from creeks where conditions are favourable.

Yunta creek is an area of groundwater discharge and saline water occurs in gravels and water holes along its course. Water tables in the area are shallow, generally about 8 metres. There are three reasons for this:

1. Low overall permeability of the jointed siltstones.
2. The relatively shallow depth (about 30 metres) to which permeability extends.
3. The fairly flat nature of the topography and hence small available hydraulic gradients.

Woolshed Bores

Wells 6832WW22 and 6832WW11, known as Woolshed Bores, yield the best quality water known within a considerable distance of Yunta. They are of some interest, firstly as an example of a favourable target and secondly as it has been suggested that a further well be drilled in this area to supply Yunta.

Examination of aerial photographs shows that the wells are located near the junction of an east-flowing creek and a straight south flowing tributary which apparently follows a fault. It appears that the wells are located in a fault-zone where fracture permeability allows recharge and the adjoining zone of low permeability prevents rapid decay of the recharge mound. It should be noted that the salinity of the wells has exhibited an upward trend over the years, suggesting that more saline water is being drawn in by pumping (Table 3). The geophysical soundings confirmed the limited extent of fresh water.

Pumping 100 kl/day or more from this basin to supply Yunta would be most unwise since it is unlikely that rapid dewatering and intrusion of saline water would occur. (See Table 3).

GEOPHYSICS

In 1979 thirteen Schlumberger Vertical Electrical Soundings were carried out at various locations in the Yunta area. The results were reported in detail by Limb, 1979. In brief these indicated that the fresh water at Woolshed Bore is of very limited extent. The sounding at Woolshed Bore indicates an abrupt transition from a layer of moderate resistance (jointed siltstone with fresh water) to high resistance (unjointed siltstone). This suggests that there is no saline water underlying the fresh. Soundings to either side indicate the presence of at least only a thin layer of fresh water overlying saline water. Soundings

were also carried out close to the holes drilled in 1975. These illustrate the difficulty of locating thin layers of fresh water, particularly in complex fractured rock situations.

Further exploratory soundings were made adjacent to water courses which seemed to be likely targets. Only one area appeared to show any promise for locating potable water. This was site 13, located west of Yunta and further upstream along the creek where drilling took place in 1975.

DRILLING

Drilling was by air-rotary methods using a Mayhew 1000 rig. All wells were located along an east flowing creek. Well 6732WW18 was drilled at geophysical site 13, near an outcrop of strongly cleaved siltstone. First water was cut at 22 metres and the yield increased to 30 m^3/day at 30 metres. Salinity was 4 430 mg/l and the well was backfilled. Well 6732WW19 was drilled 280 m west on the same creek. 50 m^3/day was cut from 14 to 16 m, in fracture siltstone. Drilling continued to 41 m with no further increase in supply. Salinity was over 3000 mg/l. The well was completed with 150 mm casing to 6 m. Well 6782WW20 was drilled 330 m west of 6732WW19. A soakage of 4500 mg/l water was cut at 26 m and the well was abandoned at 38 m in tight meta-siltstone. Well 6732WW21 was drilled 200 m west of 6732WW20. A soakage of 4850 mg/l water was cut at 13 m and the well was abandoned at 17 m.

Well 6732WW22 was drilled 550 m east of 6732WW18. A supply of 130 kl/day was cut between 18 m and 19 m. This decreased during drilling, and only 50 kl/day was being airlifted when drilling ceased at 32 metres. Salinity was 3750 mg/l. 6832WW108 was drilled 500 m of east 6732WW22. It was abandoned at 15 m in massive meta-siltstone.

DISCHARGE TEST

A 24 hour discharge test was planned for well 6732WW22. However after 3 hours pumping reliable drawdowns could not be measured because of water cascading into the well. The test was abandoned at 7½ hours. Pumping rate averaged 72kl/day. No recovery measurements were taken. Because of the short time span for which reliable drawdowns are available the behaviour of the well under long term pumping cannot be predicted with any reliability. For the first 25 minutes of the test the semi-log plot of drawdown falls on a straight line after which it deviates onto a steepening curve in the manner characteristic of double boundary (or 'strip aquifer') conditions. Drilling data indicate that available drawdown to the aquifer is about 10 m, as no increase in supply was recorded below 19 m. If this is the case the well should have forked soon after drawdowns reached 10 m. From the graph this should have occurred at about 300 minutes.

Several factors could account for the well not forking before 450 mins.

1. The well could have reached a steady state drawdown condition. (If so due to leaky aquifer conditions, the readings for 180 minutes to 450 minutes might not be spurious).
2. Additional aquifers may have been cut below 19 m without causing a noticeable increase in supply during drilling. This would apply particularly if any fractures cut were part of the same aquifer system as that cut from 18m to 19 m.
3. Dewatering of the aquifer with accompanying change from a confined to un-confined storage coefficient may have slowed the rate of drawdown sufficiently to prevent the well from forking before 450 minutes.

Explanation 1 is inconsistent with the decline in airlifted yield from 120 kl/day to 50 kl/day during drilling. Either 2 or 3 (or a combination) could apply. In any case the yield of the well is not large, perhaps 40 kl/day for 24 hours. Recovery would be slow, about 40% residual drawdown after 24 hours recovery.

Samples taken during the test show a very slight decrease in salinity from 3520 mg/l to 3450 mg/l. It is likely therefore that salinity would remain reasonably constant with long term pumping.

CONCLUSIONS

1. Although the low lying areas near Yunta are underlain by water with a salinity of about 9000 mg/l better quality water does occur further upstream near moderate size creeks.
2. The area tested in this investigation could yield water of salinity 3500 mg/l to 4000 mg/l. The yields of wells drilled to date are low, but it might be possible to drill a large yielding well in the area. It is probable that at least two wells would be required to supply Yunta.
3. Vertical Electrical Soundings do not give reliable quantitative results in this area, because of the nature of the fractured rock aquifer. However they do give a qualitative indication of likely targets.
4. It is considered unlikely that any better quality water will be found within a reasonable distance of Yunta

RECOMMENDATIONS

1. Further drilling is unlikely to reveal supplies of any better quality water and consideration should be given to using groundwater as feedwater for a desalination plant.
2. If this is considered economic, two or three production wells should be drilled in Paratoo Creek.
3. Modification of the stream bed, upstream of the production wells, should also be considered to increase recharge during and immediately after periods of runoff.

RR:RS

R. READ for
GEOLOGIST

REFERENCES

Bowering, O.J.W., 1975. Yunta Town Water Supply. Report on Groundwater Investigations. SADME Rept.Bk. 75/109

Laute P. et al, 1977. Environments of South Australia, Province 5 Eastern Pastoral. Division of Land Use Research. CSIRO

Limb, N.J., 1979 Yunta Town Water Supply, Report on Resistivity Soundings. SADME Rept.Bk. 79/110

Waterhouse J.D. and Griffin G.K., 1973. Yunta Water Supply, Preliminary Investigations and Recommendations. SADME Rept.Bk. 73/251.

TABLE 1

Drilling Results 1979 Investigation

UNIT NO.	DEPTH	S.W.L.	WATER CUT	YIELD kl/day	SALINITY mg/l TDS
6732WW18	36	9.4	22	5	
			22-30	50	4430
6732WW19	41	8.5	14-16	50	over 3000
6732WW20	38		26	soakage	4500
6732WW21	17		13	soakage	4850
6732WW22	32	8.5	14	soakage	
			18-19	120 reducing to 50	3450
6832WW108	15			dry	

TABLE 2

Previous Drilling

UNIT NO.	DEPTH METRES	S.W.L. METRES	WATER CUT M	YIELD kl/day	SALINITY mg/l	
6732WW9	?	5m	?	?	Good	
6832WW1	7.5	3.9			6500	Teetalpa House Well Adjacent to Yunta Creek
6832WW2	48.8			14	7068	Yunta T/S
" 11	21	3 to 5		100	250 to	Ulupa Siltstone (Woolshed Bore)
" 17	12.2	5.5			10545	
" 19	35	9			7000	In Township
					10145	
" 22	18	3		80	250	Ulupa siltstone (Woolshed Bore)
" 24	17	0.5	6	400	9100)	1975
" 25	34	5	25		9800)	Investigation Waukaringa
" 26	9	5	6		7350)	Siltstone
" 97	17.7	4.0			7500	Yunta T/S
" 98	15.2	3.5			10000	

TABLE 3

Woolshed Bores, Salinities

Date	Well 6832WW11 Salinity mg/l	Well 6832WW22 Salinity in mg/l
31/5/65	345	
31/5/68	385	
4/1/72	290	
3/10/73	340	283
12/8/77	735	570
1/5/79	700	820 (field tests)

APPENDIX A
Water Well Logs

PROJECT: YUNTA G/W INVESTIGATIONS 1978
ROTARY PROGRAMME

LOCATION OR COORDS:

SEC. HD.

EL Surface m

EL Ref. Point m Datum

MINES DEPARTMENT — SOUTH AUSTRALIA
ENGINEERING DIVISION

WATER WELL LOG

HOLE NO: 1

UNIT / STATE NO: 6732 WW 18

DM 671/73

AQUIFER	DEPTH TO WATER CUT (m)	DEPTH TO STANDING WATER (m)	INTERVAL TESTED From:	INTERVAL TESTED To:	SUPPLY kilolitres/day*	SUPPLY Test Length (hrs)	SUPPLY Method	TOTAL DISSOLVED SOLIDS milligrammes/litre	TOTAL DISSOLVED SOLIDS Analysis No:
SUMMARY:	22	9.4			5		airlift	4430	Field analysis
	29		22	30	30-50	¼	airlift		Field analysis
		9.4	22	36	30-50	¼	airlift		Field analysis

DEPTH (m) From	DEPTH (m) To	GRAPHIC LOG	ROCK / SEDIMENT NAME	GEOLOGICAL DESCRIPTION	FORMATION / AGE	DEPTH CORE SAMPLE	CASING Dia(mm)	CASING From(m)	CASING To(m)
0	3.5		Alluvium	dark brown alluvial clay and siltstone fragments					
3.5	7.5		Weathered silt-stone	dark fawn-light brown partly indurated siltstone, strongly cleaved. (Fast penetration rate)					
7.5	36		Metasiltstone	grey green fractured siltstone, indurated 32-36: minor staining, slow penetration rate.					

REMARKS: P. No. 6100. Abandoned and backfilled.
Conductivity metre inaccurate. Salinity in fact 4430 mg/l (GLENSIDE ANALYSIS)

* NOTE: 110 kl / day = 1000gals / hr.

DRILL TYPE: ROTARY HAMMER

CIRCULATION: AIR

SHEET 1 OF 1

COMPLETED: 23/10/79

LOGGED BY: XPS

DATE: 23/10/79

A-1

PROJECT: YUNTA G/W INVESTIGATIONS
1978 ROTARY PROGRAMME

MINES DEPARTMENT — SOUTH AUSTRALIA
ENGINEERING DIVISION

WATER WELL LOG

HOLE NO: 2

LOCATION OR COORDS:

UNIT / STATE NO: 6732 WW 19

EL Surface m

SEC. HD. EL Ref. Point m Datum

DM 671/73

AQUIFER SUMMARY:	DEPTH TO WATER CUT (m)	DEPTH TO STANDING WATER (m)	INTERVAL TESTED From:	INTERVAL TESTED To:	SUPPLY kilolitres/day*	SUPPLY Test Length (hrs)	SUPPLY Method	TOTAL DISSOLVED SOLIDS milligrammes/litre	TOTAL DISSOLVED SOLIDS Analysis No:
	14				Soakage		airlifting	3000 mg/1	W Field analysis
	16	8.5	14	16	50		airlifting		Field analysis
			14	41	50		airlifting		Field analysis

DEPTH (m) From	DEPTH (m) To	GRAPHIC LOG	ROCK / SEDIMENT NAME	GEOLOGICAL DESCRIPTION	FORMATION / AGE	DEPTH CORE SAMPLE	CASING Dia(mm)	CASING From(m)	CASING To(m)
0	2		Allumium	alluvial clay and siltstone gravels			145	0	5.8
2	15		Siltstone	grey green layered siltstone (fast penetration rates					
15	41		metasiltstone	grey siltstone, minor staining (slow penetration rate)					

REMARKS: * NOTE: 110 kl / day = 1000gals / hr.

P. No. 6100. Completed as production well for Teetulpa Pastoral Co. Drilled 280m west of hole 1. Field analysis incorrect.

DRILL TYPE: ROTARY-HAMMER

COMPLETED: 24/10/79

CIRCULATION: AIR

LOGGED BY: XPS

SHEET 1 OF 1

DATE 24/10/79

A-2

PROJECT: YUNTA G/W INVESTIGATIONS
1978 ROTARY PROGRAMME

LOCATION OR COORDS:

SEC. HD.

MINES DEPARTMENT — SOUTH AUSTRALIA
ENGINEERING DIVISION

WATER WELL LOG

EL Surface m
EL Ref. Point m Datum

HOLE NO: 3
UNIT / STATE NO 6732 WW 20
DM 671/73

AQUIFER	DEPTH TO WATER CUT (m)	DEPTH TO STANDING WATER (m)	INTERVAL TESTED From:	INTERVAL TESTED To:	SUPPLY kilolitres/day*	SUPPLY Test Length (hrs)	SUPPLY Method	TOTAL DISSOLVED SOLIDS milligrammes/litre	TOTAL DISSOLVED SOLIDS Analysis No:
SUMMARY:	26 m	-			Soakage			4500	W — Field analysis

DEPTH (m) From	DEPTH (m) To	GRAPHIC LOG	ROCK / SEDIMENT NAME	GEOLOGICAL DESCRIPTION	FORMATION / AGE	DEPTH CORE SAMPLE	CASING Dia(mm)	CASING From(m)	CASING To(m)
0	2.5		Clay	brown sandy pastic stiff clay					
2.5	38		Metasiltstone	grey-green to dark grey massive strongly indurated siltstone					

REMARKS:

P. No. 6100. Hole abandoned and backfilled. Drilled 330m west of Hole 2. Incorrect field analysis

* NOTE: 110 kl / day = 1000gals / hr.

DRILL TYPE: ROTARY/HAMMER
CIRCULATION: AIR
SHEET 1 OF 1

COMPLETED: 24/10/79
LOGGED BY: XPS
DATE 24/10/79

A-3

PROJECT: YUNTA G/W INVESTIGATIONS 1978
ROTARY PROGRAMME

LOCATION OR COORDS:

SEC. HD.

MINES DEPARTMENT — SOUTH AUSTRALIA
ENGINEERING DIVISION

WATER WELL LOG

EL Surface m
EL Ref. Point m Datum

HOLE NO: 4

UNIT / STATE NO
6732 WW 21

DM 671/73

AQUIFER SUMMARY:	DEPTH TO WATER CUT (m)	DEPTH TO STANDING WATER (m)	INTERVAL TESTED From:	INTERVAL TESTED To:	SUPPLY kilolitres/day*	SUPPLY Test Length (hrs)	SUPPLY Method	TOTAL DISSOLVED SOLIDS milligrammes/litre	TOTAL DISSOLVED SOLIDS Analysis No:
	13m	-	13	15	Soakage			4850	W Field analysis W 4373/79

DEPTH (m) From	DEPTH (m) To	GRAPHIC LOG	ROCK / SEDIMENT NAME	GEOLOGICAL DESCRIPTION	FORMATION / AGE	DEPTH CORE SAMPLE	CASING Dia(mm)	CASING From(m)	CASING To(m)
0	2		Clay	dark brown sandy clay					
2	17		Siltstone	grey green siltstone becoming very indurated and massive with dpeth.					

REMARKS:

Permit 6100. Hole abandoned and backfilled, drilled 200m west of hole 3.

* NOTE: 110 kl / day = 1000gals / hr.

DRILL TYPE ROTARY/HAMMER
CIRCULATION AIR
SHEET 1 OF 1

COMPLETED: 24/10/79
LOGGED BY: XPS
DATE

PROJECT: YUNTA G/W INVESTIGATIONS 1978 ROTARY PROGRAMME

LOCATION OR COORDS:

SEC. HD.

EL Surface m

EL Ref. Point m Datum

MINES DEPARTMENT — SOUTH AUSTRALIA
ENGINEERING DIVISION

WATER WELL LOG

HOLE NO: 5

UNIT / STATE NO 6732 WW 22

DM 671/73

AQUIFER SUMMARY:	DEPTH TO WATER CUT (m)	DEPTH TO STANDING WATER (m)	INTERVAL TESTED From:	INTERVAL TESTED To:	SUPPLY kilolitres/day*	SUPPLY Test Length (hrs)	SUPPLY Method	TOTAL DISSOLVED SOLIDS milligrammes/litre	TOTAL DISSOLVED SOLIDS Analysis No:
	14	8.5 m	14	15	Soakage				Field analysis
	18	8.5	18	19	120	¼	airlifting	5450	Field analysis
			18	32	50	1	airlifting		Field analysis
								3450	W4686/79

DEPTH (m) From	DEPTH (m) To	GRAPHIC LOG	ROCK / SEDIMENT NAME	GEOLOGICAL DESCRIPTION	FORMATION / AGE	DEPTH CORE SAMPLE	CASING Dia(mm)	CASING From(m)	CASING To(m)
0	3		Clay	Brown sandy clay			150		6m
3	32		Siltstone	3-15 Strongly fractured green grey siltstone (fast penetration rate) 15-18 grey green siltstone,minor fracturing, dry 18-28 fractured siltstone, strongly stained 28-32 minor staining, massive siltstone (very slow penetration rate)					

REMARKS: Permit 6100

* NOTE: 110 kl / day = 1000gals / hr.

Productive well drilled about 500m. East of hole 1.
Initial yield of 120 kl/day decreased with depth and salinity improved possibly indicating that the more saline higher yielding zone was being dewatered by airlifting. Field analysis incorrect.

DRILL TYPE: ROTARY-HAMMER

COMPLETED: 25/10/79

CIRCULATION: AIR

LOGGED BY: XPS

SHEET 1 OF 1

DATE 26/10/79

A-5

PROJECT: YUNTA G/W INVESTIGATIONS 1978
ROTARY PROGRAMME

LOCATION OR COORDS:

SEC. HD.

EL Surface m
EL Ref. Point m Datum

MINES DEPARTMENT — SOUTH AUSTRALIA
ENGINEERING DIVISION

WATER WELL LOG

HOLE NO: 6
UNIT / STATE NO: 6832 WW 108
DM 671/73

AQUIFER SUMMARY:	DEPTH TO WATER CUT (m)	DEPTH TO STANDING WATER (m)	INTERVAL TESTED From:	INTERVAL TESTED To:	SUPPLY kilolitres/day*	SUPPLY Test Length (hrs)	SUPPLY Method	TOTAL DISSOLVED SOLIDS milligrammes/litre	TOTAL DISSOLVED SOLIDS Analysis No:
									W —

DEPTH (m) From	DEPTH (m) To	GRAPHIC LOG	ROCK / SEDIMENT NAME	GEOLOGICAL DESCRIPTION	FORMATION / AGE	DEPTH CORE SAMPLE	CASING Dia (mm)	CASING From (m)	CASING To (m)
0	3.5		Alluvial Clay sands & gravels						
3.5	15		Siltstone	grey green massive siltstone (v. slow penetration rates)					

REMARKS:

P.N. 6100
Abandoned dry hole, 500m East of hole 5.

* NOTE: 110 kl / day = 1000gals / hr.

DRILL TYPE ROTARY-HAMMER
CIRCULATION AIR
SHEET 1 OF 1

COMPLETED 27/10/79
LOGGED BY: XPS
DATE 27/10/79

A-6

APPENDIX B
Water Analysis (well 6732WW22)

WATER ANALYSIS REPORT WELL 6732WW22 AMDEL COMPUTER SERVICES

SAMPLE ID. W4357-79 JOB NO. 2324-80

CHEMICAL COMPOSITION

		MILLIGRAMS PER LITRE MG/L	MILLIEQUIVS. PER LITRE ME/L
CATIONS			
CALCIUM	(CA)	151	7.5
MAGNESIUM	(MG)	127	10.4
SODIUM	(NA)	1025	44.6
POTASSIUM	(K)	8	.2
IRON	(FE)		
ANIONS			
HYDROXIDE	(OH)		
CARBONATE	(CO3)		
BICARBONATE	(HCO3)	274	4.5
SULPHATE	(SO4)	535	11.1
CHLORIDE	(CL)	1574	44.4
BROMIDE	(BR)		
FLUORIDE	(F)		
NITRATE	(NO3)	16	.3
PHOSPHATE	(PO4)		

TOTALS AND BALANCE

CATIONS (ME/L) 62.8 DIFF = 2.5
ANIONS (ME/L) 60.3 SUM = 123.0

DIFF*100. / SUM = 2.0 %

DERIVED AND OTHER DATA

	MILLIGRAMS PER LITRE MG/L
CONDUCTIVITY (E.C.) MICRO-S/CM AT 25 DEG. C 5824.	
TOTAL DISSOLVED SOLIDS	
A. BASED ON E.C.	
B. CALCULATED (HCO3=CO3)	3570.
C. RESIDUE ON EVAP. AT 180 DEG. C	
TOTAL HARDNESS AS CACO3	900.
CARBONATE HARDNESS AS CACO3	224.
NON-CARBONATE HARDNESS AS CACO3	675.
TOTAL ALKALINITY AS CACO3	224.
FREE CARBON DIOXIDE (CO2)	
SUSPENDED SOLIDS	
SILICA (SIO2)	
BORON (B)	

	UNITS
REACTION - PH	7.4
TURBIDITY (JACKSON)	
COLOUR (HAZEN)	
SODIUM TO TOTAL CATION RATIO (ME/L)	71.0 %

REMARKS

PROJECT YUNTA TWS
PROJECT NO 12-02-0090

NAME- SIEBEN ALEF
ADDRESS-

DATE COLLECTED 25/10/79
DATE RECEIVED

HUNDRED-TEETULPA STATION
SECTION-
HOLE NO-PERMIT 6100
SUPPLY-
SAMPLE COLLECTED BY-X.P.S.

WATER CUT- 32
WATER LEVEL-8.5
DEPTH HOLE- 32

6
1

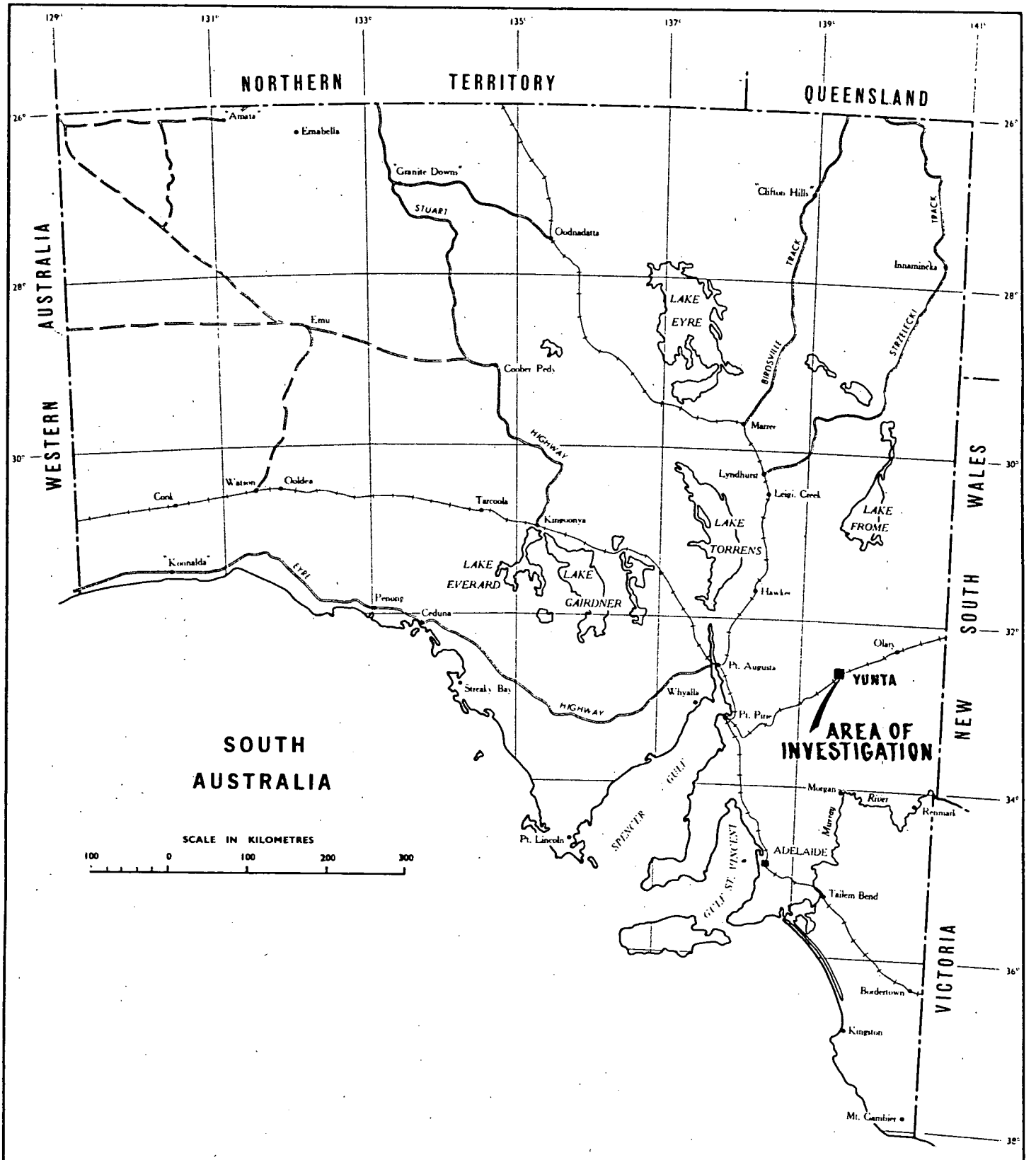


FIG. 1

DEPARTMENT OF MINES AND ENERGY
SOUTH AUSTRALIA

Compiled. R. Read	YUNTA GROUNDWATER INVESTIGATION - 1979	Date: July 1980
Drn. M.R. Ckd.	LOCALITY PLAN	Drg. No. S 14933
13-8-80		

2041

P.F. No 55850 994 2

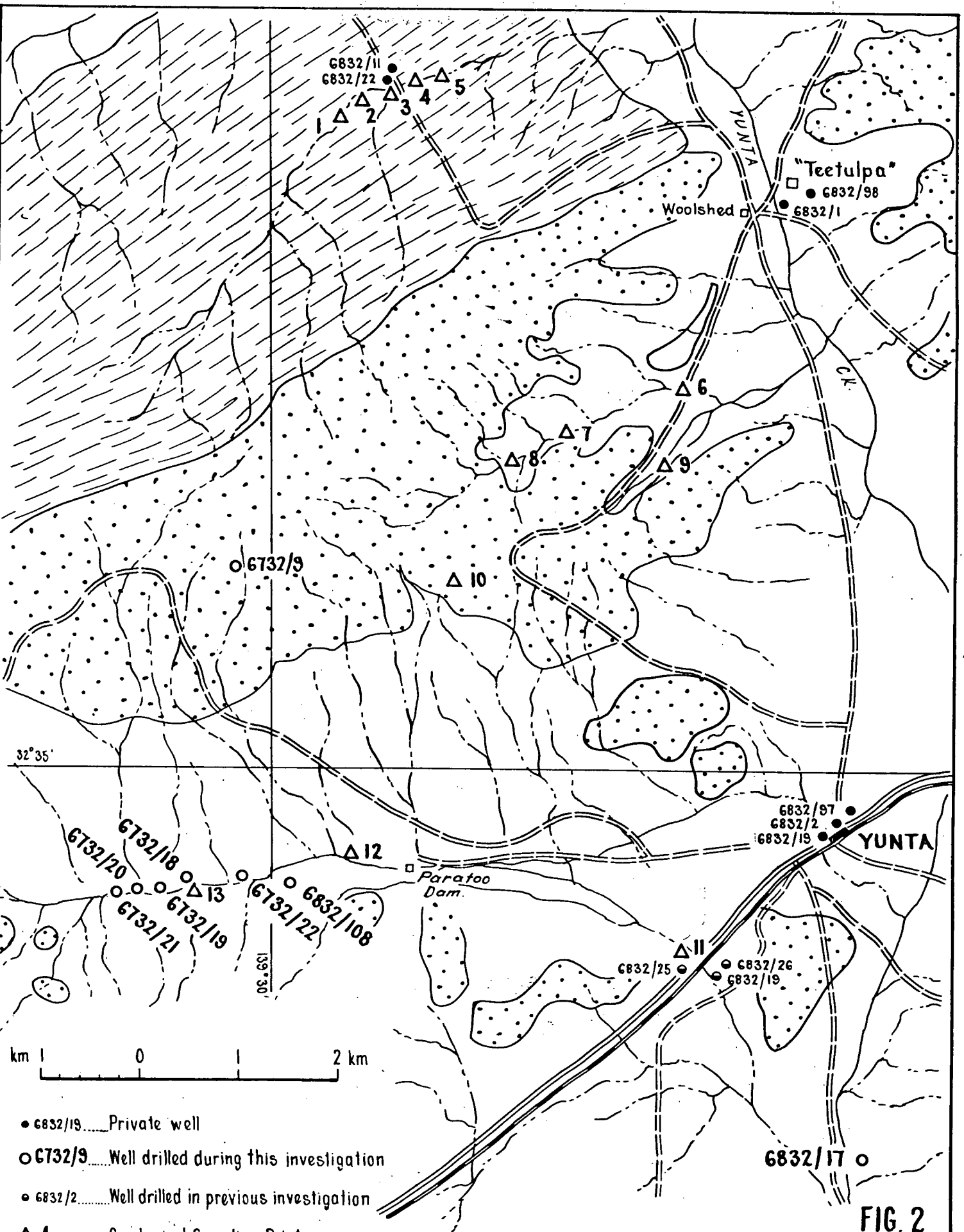


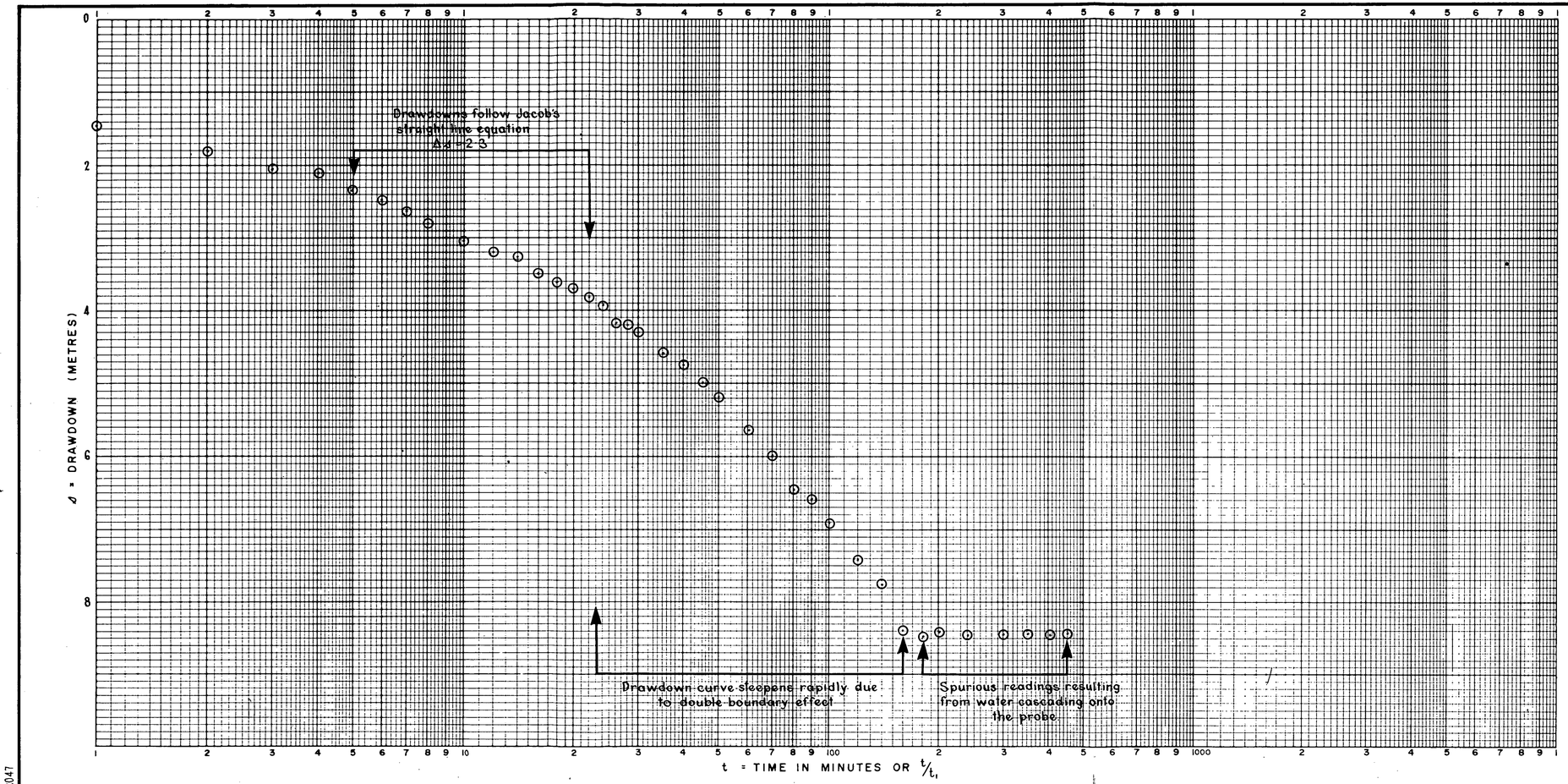
FIG. 2

DEPARTMENT OF MINES AND ENERGY
SOUTH AUSTRALIA

YUNTA GROUNDWATER INVESTIGATION-1979

WELL LOCATIONS AND REGIONAL GEOLOGY

COMPILED	R. Read
DRAWN	M.R.
DATE	July 1980
CHECKED	13-8-80 CDO DATE
SCALE	As shown
PLAN NUMBER	S 14934



STATE/UNIT No. OF WELL G7320000WW00022

REF. PT. 1·0 (m) above ground

AQUIFER FROM 18 TO 19 (m)

HOLE DEPTH 32 (m)

INTERVAL TESTED

FROM ..... TO ..... (m)

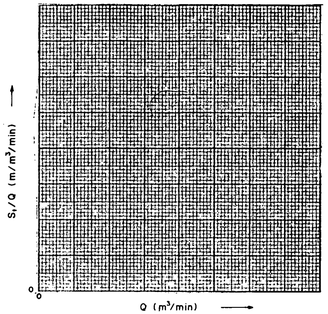
LENGTH OF TEST 8 hrs

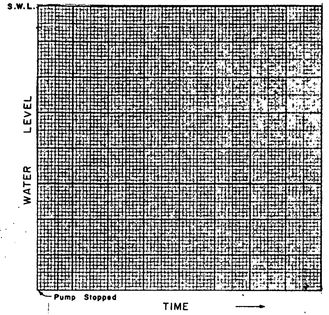
DEPTH PUMP INTAKE 9·5 (m)

DEPTH WATER LEVEL AT TEST START 30 (m)

AVAILABLE DRAWDOWN ..... (m)

WELL RECOVERY





	Q (m³/day)	$S_1 = 1$	$\frac{S_1 = 1}{Q}$	$S_1 = 10$	$\frac{S_1 = 10}{Q}$	$S_1 = 100$	$\frac{S_1 = 100}{Q}$	Δs	$\frac{\Delta s}{Q}$	T*
STEP 1	72							2·3		
STEP 2										
STEP 3										

WELL EQUATION $S_t = aQ + cQ^2 + bQ\log_{10}t$

or $S_t/Q = (a + b\log_{10}t) + cQ$

From S_t/Q versus Q a =

b =

c = = 5·7 (m³/day/m)

*TRANSMISSIVITY (JACOB EQUATION) = $\frac{0{\cdot}183Q}{\Delta s}$

THEREFORE WELL EQUATION $S_t = Q + Q^2 + \log_{10}tQ$

NOTE: For location of well see plan no. S 14934

FIG. 3

	DEPARTMENT OF MINES AND ENERGY SOUTH AUSTRALIA	SCALE
COMPILED R. Read	YUNTA GROUNDWATER INVESTIGATION - 1979	DATE July 1980
DRN M.R. CKD	WELL No. 6732000WW00022	PLAN NUMBER 80-452
13·8·80	CONSTANT DISCHARGE TEST	

2047

P.F. No. 69-953 MH