

DEPARTMENT OF MINES AND ENERGY

GEOLOGICAL SURVEY

SOUTH AUSTRALIA

REPORT BOOK 93/45

**UPPER SOUTH EAST DRYLAND SALINITY
DRILLING PROGRAM - JANUARY 1993**

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NOVEMBER 1993

DME

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Upper South East Dryland Salinity Drilling Program – January 1993

G A MacKenzie

INTRODUCTION

To address the problems of dryland salinity and surface water flooding in the Upper South East of South Australia, the construction of various groundwater drains through the area has been recommended to control elevated and rising groundwater levels (the primary causes of the salinisation). The locations of the proposed drains are shown on the locality plans (Fig. 1 and Fig. 2).

In order to assess the longer term performance of such groundwater drainage schemes, a reasonable background data base of groundwater levels is required prior to the construction of drains.

The installation of 71 additional groundwater level monitoring wells was undertaken to supplement the existing SADME regional observation well network throughout the area, thereby providing localised water table information in close proximity to the proposed drains.

SITE SELECTION

Sites were selected along proposed drainage routes and observation wells were drilled at varying distances away from the drain to enable the preparation of detailed cross-sections showing the relationship between ground level and the water table away from the drains. This

would allow an assessment to be made of the impact of the drains on the water table.

WELL CONSTRUCTION

A total of 71 wells were completed with a total of 457 metres being drilled. The locations of the wells are shown on Figures 1 and 2.

Drilling commenced on 18/1/93 and was completed in 8 days. All wells were drilled with a Mayhew 1500 rotary drilling rig using air and a foaming agent (a mixture of Liquid Polymer and Geofoam).

The average completion depth of an observation well was 6 metres and all wells were cased with 40 mm Class 12 PVC with the bottom 4 metres being slotted and fitted with a base cap.

A 50 mm by 1 metre galvanised standpipe (with cap) was placed over the PVC casing and cemented into position. Each standpipe is fitted with an aluminium identification plate showing the observation well number.

Well construction details are presented in Appendices 1, 2 and 3.

MONITORING

The monitoring frequency of all wells will commence at 3-monthly intervals for the first 12 months. Following an assessment of the data, monitoring will continue for at least 5 years at a nominal frequency.

All wells will be sampled for total dissolved salts using a small diameter pump over the next 3 months, and some periodic monitoring of groundwater salinity will be undertaken in the future to determine any longer term salinity trends.

APPENDIX 1

**WELL CONSTRUCTION DETAILS
100 000 MAP SHEET: 6825**

MAP SHEET: 6825**WELL CONSTRUCTION DETAILS**

UNIT NO	OBS NO	HUNDRED	SECTION	DATE	DRILL DEPTH	WATER CUT	FINAL DEPTH	SWL	CASING DEPTH	SLOTTED CASING
6825-4-646	SAN 4	SANTO	ADJ 13	18/1/93	12	6	12	5.8	0 - 12	8 - 12
6825-4-647	SAN 5	SANTO	ADJ 78	18/1/93	6	4	6	2.75	0 - 6	2 - 6
6825-4-649	MSN 23	MESSENT	1	19/1/93	12		12	5	0 - 12	8 - 12
6825-4-650	MSN 24	MESSENT	1	19/1/93	8	4.5	8	3.25	0 - 8	4 - 8
6825-1-651	MSN 25	MESSENT	ADJ 1	19/1/93	6		6	1.5	0 - 6	2 - 6
6825-1-652	MSN 26	MESSENT	ADJ 9	19/1/93	10		10	3.7	0 - 10	6 - 10
6825-1-653	MCN 32	MINECROW	ADJ 19	19/1/93	6	3	6	2.7	0 - 6	2 - 6
6825-1-654	MCN 33	MINECROW	ADJ 19	19/1/93	6	2.5	6	1.7	0 - 6	2 - 6
6825-1-655	RIC 3	RICHARDS	ADJ 132	19/1/93	6	2.5	6	1.9	0 - 6	2 - 6
6825-1-656	MCN 34	MINECROW	ADJ 29	19/1/93	6	2	6	1.25	0 - 6	2 - 6
6825-1-657	MCN 37	MINECROW	ADJ 4	20/1/93	6	4	6	0.5	0 - 6	2 - 6
6825-1-658	MSN 27	MESSENT	24	20/1/93	6	4	6	0.45	0 - 6	2 - 6
6825-1-660	MSN 28	MESSENT	3	20/1/93	6	1.5	6	0.6	0 - 6	2 - 6

MAP SHEET: 6825**WELL CONSTRUCTION DETAILS**

UNIT NO	OBS NO	HUNDRED	SECTION	DATE	DRILL DEPTH	WATER CUT	FINAL DEPTH	SWL	CASING DEPTH	SLOTTED CASING
6825-1-661	MSN 29	MESSENT	3	20/1/93	6	1.5	6	0.7	0 - 6	2 - 6
6825-2-662	DUF 9	DUFFIELD	ADJ 32	21/1/93	6	1	6	0.75	0 - 6	2 - 6
6825-2-663	NVL 23	NEVILLE	ADJ 25	21/1/93	6	2	6	1.3	0 - 6	2 - 6
6825-2-664	DUF 10	DUFFIELD	ADJ 28	21/1/93	6	2	6	1.1	0 - 6	2 - 6
6825-2-665	DUF 11	DUFFIELD	ADJ 26	21/1/93	5.5	1.5	5.5	0.75	0 - 5.5	1.5 - 5.5
6825-2-666	DUF 12	DUFFIELD	ADJ 26	21/1/93	6	2	6	1.1	0 - 6	2 - 6
6825-2-667	DUF 13	DUFFIELD	ADJ 26	21/1/93	6	1.5	6	0.85	0 - 6	2 - 6
6825-2-668	WEL 20	WELLS	ADJ 5	21/1/93	6	2	6	1.6	0 - 6	2 - 6
6825-2-669	WEL 22	WELLS	ADJ 20	21/1/93	6	2	5.5	1.1	0 - 5.5	1.5 - 5.5

APPENDIX 2
WELL CONSTRUCTION DETAILS
100 000 MAP SHEET: 6924

MAP SHEET: 6924**WELL CONSTRUCTION DETAILS**

UNIT NO	OBS NO	HUNDRED	SECTION	DATE	DRILL DEPTH	WATER CUT	FINAL DEPTH	SWL	CASING DEPTH	SLOTTED CASING
6924-4-3177	PEC 61	PEACOCK	ADJ 54	21/1/93	6	1.5	6	0.9	0 - 5.5	1.5 - 5.5
6924-4-3178	PEC 63	PEACOCK	ADJ 45	21/1/93	6	1.5	6	0.9	0 - 6	2 - 6
6924-1-3179	MAR 81	MARCOLLAT	ADJ 43	22/1/93	6	1.5	6	1.5	0 - 6	2 - 6
6924-1-3180	MAR 82	MARCOLLAT	13	22/1/93	5.5	3.5	5.5	1.2	0 - 5.5	1.5 - 5.5
6924-1-3181	MAR 78	MARCOLLAT	ADJ 23	22/1/93	6	2	6	1.55	0 - 6	2 - 6
6924-1-3182	WLM 52	WOOLUMBOOL	ADJ 32	22/1/93	6	2.5	6	1.95	0 - 6	2 - 6
6924-1-3183	WLM 53	WOOLUMBOOL	ADJ 71	22/1/93	6	2	6	1.35	0 - 6	2 - 6
6924-1-3184	WLM 54	WOOLUMBOOL	ADJ 71	22/1/93	6	4	6	1.05	0 - 6	2 - 6
6924-2-3185	WLM 57	WOOLUMBOOL	93	22/1/93	6	1.5	6	1.0	0 - 6	2 - 6
6924-2-3186	LOC 28	LOCHABER	ADJ 333	23/1/93	6	2	6	1.2	0 - 6	2 - 6
6924-2-3187	LOC 29	LOCHABER	ADJ 331	23/1/93	6	2	6	0.8	0 - 6	2 - 6
6924-1-3188	WLM 55	WOOLUMBOOL	ADJ 10	23/1/93	6	2	6	1.35	0 - 6	2 - 6
6924-1-3189	WLM 56	WOOLUMBOOL	ADJ 41	23/1/93	6	2	6	0.95	0 - 6	2 - 6
6924-1-3190	MAR 75	MARCOLLAT	ADJ 62	23/1/93	6	2	5.7	1.35	0 - 5.7	1.7 - 5.7
6924-1-3191	MAR 76	MARCOLLAT	ADJ 63	23/1/93	6	2	6	1.55	0 - 6	2 - 6
6924-1-3192	MAR 77	MARCOLLAT	ADJ 23	23/1/93	6	3	6	1.0	0 - 6	2 - 6

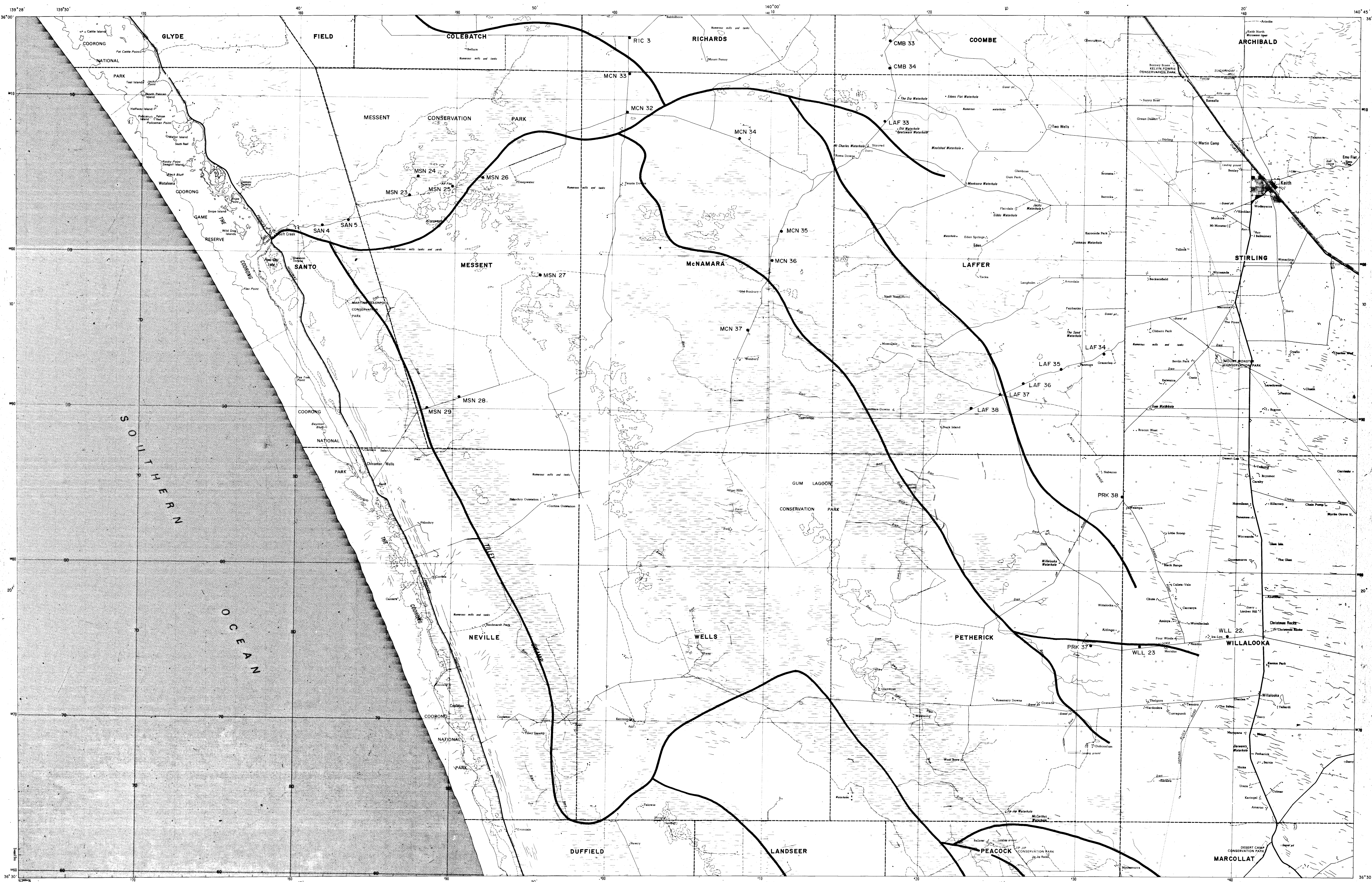
MAP SHEET: 6924**WELL CONSTRUCTION DETAILS**

UNIT NO	OBS NO	HUNDRED	SECTION	DATE	DRILL DEPTH	WATER CUT	FINAL DEPTH	SWL	CASING DEPTH	SLOTTED CASING
6924-4-3193	PEC 64	PEACOCK	ADJ 57	25/1/93	6	2	6	1.1	0 - 6	2 - 6
6924-4-3194	PEC 65	PEACOCK	ADJ 38	25/1/93	6	2	6	1.3	0 - 6	2 - 6
6924-4-3195	PEC 66	PEACOCK	ADJ 43	25/1/93	6	2	6	1.0	0 - 6	2 - 6
6924-4-3196	PEC 67	PEACOCK	ADJ 56	25/1/93	6	2	6	0.4	0 - 6	2 - 6
6924-4-3197	MNC 39	MINECROW	ADJ 198	25/1/93	6	2.5	6	1.75	0 - 6	2 - 6
6924-4-3198	PEC 68	PEACOCK	ADJ 73	25/1/93	8	6	8	1.75	0 - 8	2 - 8
6924-4-3199	MNC 42	MINECROW	ADJ 119	25/1/93	6	2	6	1.45	0 - 6	2 - 6
6924-4-3200	PEC 69	PEACOCK	ADJ 72	25/1/93	6	3	6	2.25	0 - 6	2 - 6
6924-4-3201	MNC 41	MINECROW	ADJ 191	25/1/93	6	1	6	0.55	0 - 6	2 - 6
6924-4-3202	MNC 45	MINECROW	ADJ 94	25/1/93	6	1	6	0.55	0 - 6	2 - 6
6924-4-3203	MRB 16	MURRABINNA	ADJ 12	25/1/93	6	2.5	6	1.9	0 - 6	2 - 6
6924-4-3204	MRB 17	MURRABINNA	ADJ 61	25/1/93	6	2	5.5	1.2	+0.5 - 5.5	1.5 - 5.5
6924-3-3205	MRB 18	MURRABINNA	500	25/1/93	6	3	6	2.3	0 - 6	2 - 6
6924-3-3206	MRB 19	MURRABINNA	ADJ 33	25/1/93	6	2	6	1.6	0 - 6	2 - 6

APPENDIX 3
WELL CONSTRUCTION DETAILS
100 000 MAP SHEET: 6925

MAP SHEET: 6925**WELL CONSTRUCTION DETAILS**

UNIT NO	OBS NO	HUNDRED	SECTION	DATE	DRILL DEPTH	WATER CUT	FINAL DEPTH	SWL	CASING DEPTH	SLOTTED CASING
6925-4-3147	LAF 33	LAFFER	ADJ 1	19/1/93	6	2	6	1.05	0 - 6	2 - 6
6925-4-3148	CMB 34	COOMBE	ADJ 87	19/1/93	6	2.5	6	1.35	0 - 6	2 - 6
6925-4-3149	CMB 33	COOMBE	ADJ 83	19/1/93	6	3.5	6	0.8	0 - 6	2 - 6
6925-4-3150	MCN 35	MCNAMARA	ADJ 54	20/1/93	6	1.5	6	1.0	0 - 6	2 - 6
6925-4-3151	MCN 36	MCNAMARA	ADJ 39	20/1/93	6	1	6	0.6	0 - 6	2 - 6
6925-3-3152	WEL 23	WELLS	20	21/1/93	12	4.5	9	3.6	0 - 9	5 - 9
6925-3-3153	WEL 24	WELLS	20	21/1/93	6	4.5	6	3.5	0 - 6	2 - 6
6925-3-3154	LAN 53	LANDSEER	19	21/1/93	6	2	6	1.2	0 - 6	2 - 6
6925-3-3155	PEC 59	PEACOCK	9	21/1/93	6	2	6	1.25	0 - 6	2 - 6
6925-3-3156	PEC 60	PEACOCK	9	21/1/93	6	1.5	6	0.7	0 - 6	2 - 6
6925-2-3157	WLL 22	WILLALOOKA	ADJ 67	26/1/93	6	1.5	6	0.55	0 - 6	2 - 6
6925-2-3158	WLL 23	WILLALOOKA	ADJ 66	26/1/93	6	1.5	6	0.6	0 - 6	2 - 6
6925-3-3159	PRK 37	PETHERICK	16	26/1/93	6	1	6	0.85	0 - 6	2 - 6
6925-2-3160	PRK 38	PETHERICK	ADJ 11	26/1/93	6	4	6	0.5	0 - 6	2 - 6
6925-4-3161	LAF 34	LAFFER	ADJ 82	26/1/93	6	2	6	0.5	0 - 6	2 - 6
6925-4-3162	LAF 35	LAFFER	ADJ 23	26/1/93	6	2	6	G/L?	0 - 6	2 - 6
6925-4-3163	LAF 36	LAFFER	ADJ 23	26/1/93	6	2	6	0.7	0 - 6	2 - 6
6925-4-3164	LAF 37	LAFFER	ADJ 25	26/1/93	6	1.5	6	0.8	0 - 6	2 - 6
6925-4-3165	LAF 38	LAFFER	ADJ 25	26/1/93	6	1	6	0.5	0 - 6	2 - 6



- Legend:
- Built-up area: National route marker
 - Principal road and highway: Gutter
 - Secondary road: Embankment
 - Minor road: Road bridge
 - Vehicular track
 - Gate: Cattle grid
 - Railway: multiple track: Station: Railway bridge
 - Railway: single track: Railway tunnel
 - Light railway or tramway
 - Power transmission line
 - Fence: Linear or bank
 - Mine: Windmill: Yard: Quarry
 - Buildings: Church: Run: Drive in theatre
 - Trig station: Bench mark with elevation: Spot elevation
 - Cliff: Contour with value: Depression contour
 - Sandridges
 - Forest: dense: medium: scattered
 - Shrub: dense: medium: scattered
 - Tropical rainforest: Pine plantation
 - Orchard: plantation or vineyard: Mangrove
 - Windbreak
 - Lake: perennial: Stream: perennial
 - Lake: intermittent: Stream: intermittent
 - Lake: mostly dry: Stream: mostly dry
 - Swamp: perennial: intermittent
 - Land subject to inundation: Rice field
 - Rice or wheat: Spring: Tank or small dam
 - Breakwater: Pier: Wharf
 - Wreck exposed: Lighthouse
 - Rock: bare or swash: Foreshore flat: Sand
 - Reef: Rock ledge: Saline coastal flat

MCN 36 ● Observation well and number

— Proposed drainage route

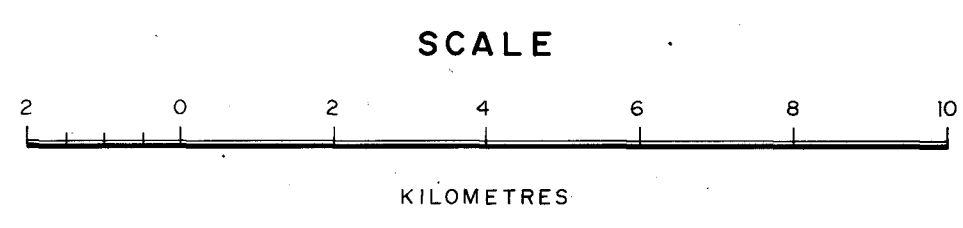


Figure 1

DEPARTMENT OF MINES AND ENERGY		COMPILED	G. MacKenzie	24/11/93
SOUTH AUSTRALIA		DRAWN	R. Bird	SCALE 1:100 000
UPPER SOUTH EAST DRYLAND SALINITY AND FLOOD MANAGEMENT PLAN		DATE	March 1993	PLAN NUMBER
NORTHERN REGION		CHECKED		93 - 202
LOCATION OF NEW OBSERVATION WELLS AND PROPOSED DRAINAGE ROUTES				

