MODERATELY DEEP SAND OVER SANDY CLAY LOAM

General Description: *Medium to thick (variable) red brown sand over a red sandy clay loam, calcareous with depth*

Landform: Gently undulating rises.

Substrate: Coarse grained Tertiary sediments capped by windblown carbonates.

Vegetation: Mallee.

Type Site:

Site No.:	MP013	1:50,000 mapsheet:	6727-3 (Alexandrina)
Hundred:	Freeling	Easting:	331360
Section:	24	Northing:	6089800
Sampling date:	06/12/2004	Annual rainfall:	380 mm average

Midslope of gently undulating rise, 1% slope. Loose surface with no stones.

Soil Description:

Depth (cm)	*Description*
0-10	Reddish brown loose sand (drift). Clear to:
10-35	Light reddish brown loose sand (drift). Abrupt to:
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Original soil surface	
35-88	Dark reddish brown soft light loamy sand. Sharp to:
88-95	Yellowish red firm massive sandy clay loam with 2-10% calcrete fragments (6-20 mm). Abrupt to:
95-140	Reddish yellow firm massive very highly calcareous light sandy clay loam with more than 50% fine carbonate segregations and 2-10% carbonate nodules (6-20 mm). Diffuse to:
140-180	Yellowish red, light olive brown and brownish yellow mottled firm massive clayey sand with 10-20% fine carbonate segregations.

Classification: Basic, Arenic, Red-Orthic Tenosol; medium, non-gravelly, sandy / sandy, shallow - overlying: Hypercalcic, Subnatric, Red Sodosol; thick, non-gravelly, sandy / clay loamy, deep

Summary of Properties

Drainage: Well drained. The soil rarely remains wet for more than a day or so following heavy or prolonged rainfall. Deep drainage is satisfactory.

Fertility: Inherent fertility is low, as indicated by the exchangeable cation data and low clay content. The more clayey subsoil at 88 cm is of little use in supplying nutrients, as it is below the main rootzone. Regular fertilizer applications are essential. At the sampling site, concentrations of copper and zinc are low.

pH: Slightly acidic at the surface, strongly alkaline with depth.

Rooting depth: 160 cm in pit, but few roots below 140 cm.

Barriers to root growth:

Physical: The massive clayey sand substrate imposes a moderate restriction on root penetration.

Chemical: High pH and marginally high sodicity and boron concentrations restrict root growth from 95 cm.

Waterholding capacity: (Estimates for potential rootzone of irrigated crops)
Total available: 110 mm
Readily available: 65 mm

Seedling emergence: Satisfactory unless surface develops water repellence. Slight repellence at this site.

Workability: Surface is easily worked over a range of moisture conditions. Dry working predisposes the soil to wind erosion.

Erosion Potential:

Water: Low

Wind: Moderate.

Laboratory Data

Depth cm	pH H_2O	pH $CaCl_2$	CO_3 %	EC 1:5 dS/m	ECe dS/m	Org.C %	Avail. P mg/kg	Avail. K mg/kg	Cl mg/kg	SO_4 mg/kg	Boron mg/kg	Trace Elements mg/kg (EDTA)				Sum cations cmol (+)/kg	Exchangeable Cations cmol(+)/kg				Est. ESP
												Cu	Fe	Zn	Mn		Ca	Mg	Na	K	
0-10	6.2	5.8	0	0.327	4.09	0.69	49	214	90	133	0.7	0.21	44	0.45	20.1	6.1	4.06	1.19	0.33	0.50	5.4
10-35	7.3	6.7	0	0.125	1.75	0.38	22	163	33	45.2	0.5	0.15	50	0.12	14.6	4.7	3.43	0.65	0.16	0.43	3.4
35-88	7.9	7.3	0	0.142	2.01	0.33	5	314	41	47.9	0.8	0.40	32	0.21	34.0	6.9	4.67	1.15	0.28	0.80	4.1
88-95	9.1	8.3	1.2	0.172	1.52	0.29	4	377	41	15.1	4.3	0.44	15	0.24	18.9	12.4	6.64	3.67	1.08	1.00	8.7
95-140	9.4	8.5	24.6	0.420	2.27	0.23	4	296	87	28.8	10.5	0.21	7.1	0.14	2.73	16.7	8.62	4.69	2.60	0.80	15.6
140-180	9.5	8.5	3.6	0.523	3.95	0.07	2	287	175	67.3	10.4	0.18	4.8	0.20	0.70	14.8	5.81	4.25	3.96	0.75	26.8

Note: Sum of cations, in a neutral to alkaline soil, approximates the CEC (cation exchange capacity), a measure of the soil's capacity to store and release major nutrient elements.
ESP (exchangeable sodium percentage) is derived by dividing the exchangeable sodium value by the CEC, in this case estimated by the sum of cations.

Further information: DEWNR Soil and Land Program