SANDY CLAY LOAM OVER DARK BROWN HEAVY CLAY

General Description: *Hard sandy clay loam with a bleached subsurface layer over a black to brown dispersive heavy clay, calcareous with depth*

Landform: Old alluvial plains of the lower reaches of the Bremer River.

Substrate: Heavy clay – Blanchetown Clay equivalent at this site.

Vegetation:

Type Site: Site No.: CH134

1:50,000 sheet:	6727-3 (Alexandrina)	Hundred:	Freeling
Annual rainfall:	390 mm	Sampling date:	06/12/04
Landform:	Low lying area of flat plain		
Surface:	Hard and seasonally cracking with no stones		

Soil Description:

Depth (cm)	*Description*
0-17	Very dark greyish brown hard light fine sandy clay loam with weak granular structure and 2-10% gypsum crystals. Clear to:
17-24	Light grey (bleached) hard massive fine sandy clay loam with 2-10% gypsum crystals. Abrupt to:
24-55	Very dark greyish brown and dark yellowish brown mottled hard medium heavy clay with strong coarse prismatic structure, breaking to medium angular blocky. Clear to:
55-85	Dark yellowish brown and brown mottled hard moderately calcareous medium heavy clay with strong coarse angular blocky structure and 2-10% fine carbonate segregations. Gradual to:
85-130	Dark yellowish brown, yellowish brown and yellowish red mottled very hard slightly calcareous heavy clay with coarse lenticular structure breaking to coarse angular blocky, and 2-10% carbonate nodules. Gradual to:
130-160	Yellowish red, brown and dark greyish brown mottled hard medium clay with strong coarse blocky structure and 2-10% carbonate nodules.

Classification: Bleached-Vertic, Calcic, Brown Chromosol; medium, non-gravelly, loamy / clayey, deep

Summary of Properties

Drainage: Imperfectly drained. The subsoil perches water for periods of up to several weeks following heavy or prolonged rainfall during winter. Deep drainage is also impeded by the heavy clay substrate.

Fertility: Inherent fertility is high, as indicated by the exchangeable cation data. Moderate to high clay content throughout ensures ample nutrient retention capacity. Apart from a possible zinc deficiency, the profile at the sampling site is well supplied with nutrient elements.

pH: Slightly alkaline at the surface (possibly some road dust effect), alkaline with depth.

Rooting depth: 130 cm in pit, but few roots below 85 cm.

Barriers to root growth:

Physical: The heavy clay subsoil restricts even root distribution. Effective root zone depth is 85 cm.

Chemical: Marginally high salinity and sodicity from 55 cm may have some impact on root growth. Sodicity and slight boron toxicity from 85 cm are likely to have a greater effect.

Water holding capacity: (Estimates for potential root zone of grape vines)

Total available: 115 mm
Readily available: 50 mm

Seedling emergence: Fair due to hard setting surface.

Workability: Fair. Soil tends to shatter if worked too dry and puddle if worked too wet.

Erosion Potential

Water: Low.

Wind: Low.

Laboratory Data

Depth cm	pH H_2O	pH $CaC1_2$	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-S mg/kg	Boron mg/kg	Trace Elements mg/kg (EDTA)				Sum cations cmol (+)/kg	Exchangeable Cations cmol(+)/kg				Est. ESP
												Cu	Fe	Mn	Zn		Ca	Mg	Na	K	
0-17	8.1	7.6	0	0.308	2.35	1.81	84	531	103	69.6	1.5	6.55	206	87.9	2.82	15.4	11.7	1.96	0.44	1.32	2.9
17-24	7.9	7.6	0	0.198	2.34	0.81	6	278	31	106	1.0	3.45	117	41.7	0.53	11.8	8.51	2.27	0.41	0.65	3.5
24-55	7.6	7.0	0	0.293	2.06	0.36	4	431	36	137	1.5	4.13	73	66.7	0.19	20.6	12.1	6.37	1.00	1.09	4.9
55-85	8.6	8.0	4.8	0.427	2.63	0.15	2	476	85	177	1.7	2.24	22	38.2	0.16	20.2	10.0	7.26	1.82	1.13	9.0
85-130	8.8	8.1	1.8	0.457	2.67	0.07	2	537	167	183	3.1	2.12	35	110	0.10	22.7	8.17	9.60	3.59	1.38	15.8
130-160	8.9	8.1	0.5	0.448	2.96	0.06	5	483	250	93.0	3.4	1.45	40	104	0.43	17.9	5.37	7.98	3.36	1.21	18.8

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.