SHALLOW LOAMY SAND OVER FERRICRETE

General Description: *Less than 50 cm ironstone gravelly loamy sand to sand over massive but discontinuous ferricrete, overlying partly indurated and ferruginized glacial sand*

Landform: Upper slopes and crests of undulating rises and low hills (often characterized by break-away features).

Substrate: Iron cemented hardpan (ferricrete) overlying Permian age glacial sands.

Vegetation:

Type Site: Site No.: CH137

1:50,000 sheet:	6627-3 (Willunga)	Hundred:	Myponga
Annual rainfall:	850 mm	Sampling date:	16/12/04
Landform:	Upper slope of undulating low hill, 8% slope		
Surface:	Soft with 2-10% ferricrete stones to 200 mm		

Soil Description:

Depth (cm)	*Description*
0-10	Brown soft single grain loamy sand with 20-50% ironstone gravel to 60 mm. Clear to:
10-35	Pink (bleached) soft single grain loamy sand with more than 50% ironstone gravel to 60 mm. Sharp to:
35-45	Massive strongly cemented ferricrete (ironstone pan). Clear to:
45-85	Reddish yellow, red and pink mottled massive extremely hard light clayey sand. Sharp to:
85-100	Strongly cemented laminar ferricrete (ironstone pan). Abrupt to:
100-145	Brownish yellow and pale yellow mottled massive extremely hard light clayey sand. Abrupt to:
145-180	Very pale brown and yellow firm massive fine sandy clay loam (kaolinized gneissic basement rock).

Classification: Bleached, Petroferric, Sesqui-Nodular Tenosol; medium, moderately gravelly, sandy / -, shallow

Summary of Properties

Drainage: Rapidly drained. The soil rarely remains wet for more than a few hours following heavy or prolonged rainfall.

Fertility: Inherent fertility is very low, as indicated by the exchangeable cation data. Low clay content and high level of high leaching result in low nutrient retention capacity, while abundant ironstone gravel causes fixation of phosphate. Low levels of most tested nutrients are indicative, but on low side of typical, as site is on road reserve.

pH: Acidic above ferricrete, neutral in indurated sand, alkaline in kaolinized rock.

Rooting depth: 35 cm.

Barriers to root growth:

Physical: The ferricrete fragments prevent all root growth, but fractures or gaps between the fragments allow root penetration. However, growth below the pan is poor due to the semi-indurated state of the sand. Here, roots of perennial plants exploit softer parts of the sand mass to extract water.

Chemical: There are no apparent chemical barriers, except low nutrient retention / status. Elevated salinity and sodicity in the indurated sand layers is atypical of this material.

Water holding capacity: Approximately 20 mm above ferricrete, plus up to 30 mm in the 40 cm of clayey sand between the two pans.

Seedling emergence: Satisfactory except where surface is water repellent.

Workability: Sandy surface soils are easily worked, but wind erosion risk is high if over-cultivated. Surface and near surface ironstone is highly abrasive.

Erosion Potential

Water: Moderately low to low. Discontinuity in the pan allows water to penetrate, preventing short term saturation of the surface, which would otherwise predispose the soil to sheet erosion.

Wind: Moderately low to moderate, due to the sandy surface.

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	
0-10	5.7	4.6	0	0.04	0.30	2.24	3	81	14	3.6	0.4	0.4	156	15.2	0.4	5.1	3.84	0.99	0.10	0.18	2.0
10-35	6.0	4.9	0	0.04	0.22	1.87	2	60	10	3.6	0.3	0.3	162	7.37	0.3	3.7	2.59	0.83	0.10	0.16	na
35-45	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
45-85	6.4	6.1	0	0.48	5.96	0.12	<1	104	577	40.4	0.3	0.3	12	1.76	0.3	3.4	1.12	0.70	1.37	0.17	na
85-100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100-145	6.7	6.3	0	0.36	5.84	0.09	<1	47	509	33.9	0.2	0.2	9	1.67	0.2	2.3	0.62	0.35	1.16	0.12	na
145-180	8.0	7.2	0	0.10	0.82	0.09	<1	65	84	5.5	0.3	0.3	17	2.23	0.3	2.8	1.68	0.71	0.31	0.13	na

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.