BLEACHED SAND OVER CALCRETE

General Description: *Thick bleached sand with an organically darkened surface over a thin (sometimes absent) brown clayey sand to light sandy clay loam, on calcreted sand to sandy clay or limestone.*

Landform: Very gently undulating plains and low rises.

Substrate: Interbedded limestone, calcareous sand and marl of the Padthaway Formation, and calcarenite of the Bridgewater Formation.

Vegetation: Ridge-fruited mallee (E. incrassata) and narrow leaved red mallee (E. leptophylla) scrub.

Type Site: Site No.: SE072

1:50,000 sheet:	6925-4 (Laffer)	Hundred:	Laffer
Annual rainfall:	470 mm	Sampling date:	13/09/04
Landform:	Low rise on a very gently undulating plain		
Surface:	Soft with occasional calcrete fragments		

Soil Description:

Depth (cm)	*Description*
0-15	Dark greyish brown soft single grain light loamy sand. Gradual to:
15-35	Very pale brown (bleached) soft single grain sand. Sharp to:
35-42	Yellowish brown, pale brown and dark brown firm massive heavy sandy loam. Sharp to:
42-48	Weakly cemented massive calcrete pan. Clear to:
48-70	Light yellowish brown and pale brown firm, massive very highly calcareous sandy clay loam. Clear to:
70-90	Brownish yellow and pale yellow firm massive non calcareous sandy light clay with minor soft carbonate segregations. Clear to:
90-110	Strongly cemented massive calcreted limestone. Clear to:
110-150	White friable massive very highly calcareous light clayey sand with more than 50% calcrete fragments to 60 mm.

Classification: Bleached-Mottled, Petrocalcic, Brown Kandosol; medium, non-gravelly, sandy/loamy, shallow

Summary of Properties

Drainage: Well drained. The profile rarely remains wet for more than a few days at a time.

Fertility: Inherent fertility is low, as indicated by the exchangeable cation data, and low clay content. Phosphorus levels are low (as expected because site is not in a pasture / cropping paddock), but deficiencies of potassium, copper, zinc and manganese, as well as nitrogen and phosphorus, are typical on these soils.

pH: Neutral to the surface, alkaline with depth.

Rooting depth: Most root growth occurs above the first calcrete layer (0-42 cm), but some roots persist to 150 cm.

Barriers to root growth:

Physical: The calcrete layers are the dominant physical barrier, but fractures in the calcrete allow roots of perennial plants to explore deeper layers.

Chemical: There are no apparent chemical barriers.

Water holding capacity: Approx. 40 mm above the first calcrete layer, and approx. 100 mm to 150 cm depth.

Seedling emergence: Water repellence reduces emergence. Satisfactory where non-repellent.

Workability: Sandy surface is easily worked.

Erosion Potential

Water: Low.

Wind: Moderate.

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	Zn	Mn		Ca	Mg	Na	K	
0-15	6.7	6.3	0	0.05	0.58	1.51	15	62	33	10	0.6	1.44	70	4.48	8.85	6.5	5.49	0.75	0.15	0.13	2.3
15-35	7.0	6.6	0	0.04	0.34	0.17	11	41	11	4.1	0.2	0.36	43	0.46	0.93	1.4	1.06	0.18	0.07	0.09	na
35-42	7.9	7.1	0	0.16	0.93	0.37	25	448	56	11	0.6	0.29	111	0.3	2.39	12.7	7.84	3.18	0.47	1.17	3.7
42-48	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
48-70	8.6	7.8	24	0.34	1.87	0.44	7	159	293	24	0.7	0.21	6	0.43	2.47	22.3	15.0	6.12	0.75	0.4	3.4
70-90	8.9	8.0	1	0.14	0.89	0.11	5	231	71	6.5	0.8	0.19	21	0.43	2.76	14.5	9.24	3.95	0.74	0.58	5.1
90-110	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
110-150	9.1	8.1	31	0.31	2.66	0.18	3	136	278	12	0.3	0.19	10	0.66	2.34	15.9	10.5	3.99	1.19	0.3	7.5

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 estimated by dividing the exchangeable sodium value by the sum of cations.