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 mapsheet:	6925-4 (Laffer)
Hundred:	Laffer	Easting:	430800
Section:	69	Northing:	6007900
Sampling date:	13/09/2004	Annual rainfall:	490 mm average

Low rise on a very gently undulating plain. Soft surface 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.

Waterholding 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 $CaCl_2$	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	
0-15	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.

Further information: DEWNR Soil and Land Program