

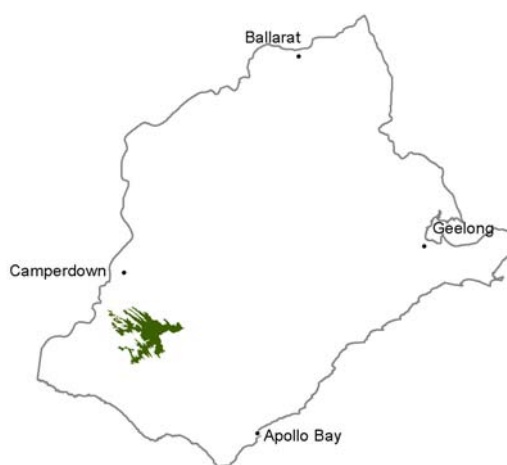
## 16. Sands and sands with pans on Neogene sediments

These soils are found on the gently undulating plains, rises or low level plateaux in western areas of the CMA underlain by Neogene sediments (generally sands) and are in local association with texture contrast soils with very sharp boundaries between these two types, unobservable by topographical differences.

Dark organic-stained surface soils contrast with the pale conspicuously bleached sandy unconsolidated subsurface horizons which can be over 100 cm deep sitting on either an organic and/or sesquioxide pan (iron and aluminium) which has a much harder consistence. This is underlain by either a coloured subsoil (still sandy) or clay in some cases.

This translocation of humic (organic) material and sesquioxides down the profile is a characteristic feature of these soils, but the boundary, though sharp, may be wavy or even tongue-like, making depth generalisations difficult. Depending on the source and amount of organic matter there may be variants where the surface (and subsurface) soils are not pale but grey or even black. These soils are strongly acidic with little retentive capacity for nutrients and highly permeable except for dense pans.

Notable characteristics are the (often deep) sandy soil with low waterholding and nutrient holding capacity and the variable depth to an organic and/or mineral pan ("coffee rock") and heavier material below restricting water and root movement.



### Soil sites

Site code	Soil-landform unit	Component	ASC	FK	1:100 000 mapsheet
MM328	159	Crest	?, Homosesquic, ? Podisol	Dy3.61	T7521 - CORANGAMITE
MM5117	79	Flat	Melanic-Basic, ?, Bleached-Orthic Tenosol	Uc2.20	T7721 - GEELONG
SW56	165	Upper slope - crest	Melacic, Humic/Sesquic, Semiaquic Podisol	Dy2.41	T7520 - PRINCETOWN
SW59	159	Upper slope - crest	Vertic, Mesotrophic, Brown Kurosol	Gn2.31	T7520 - PRINCETOWN
SW61	159	Flat	Melacic, Humic/Humosesquic, Semiaquic Podisol	Uc2.33	T7520 - PRINCETOWN
SW70	92	Upper slope	Humose, Sesquic, Semiaquic Podisol	Uc2.32	T7621 - COLAC

Site code<sup>1</sup> OTR608



Dissected sand hills near Chapple Vale

**Location** Chapple Vale  
**Landform** Hills  
**Geology** Palaeogene Pebble Point Formation/Quaternary aeolian deposits  
**Element** Hillslope –mid slope  
**Slope** 12%  
**Aspect** North westerly



Melacic, Humic/alsilic, Semiaquic, Podosol

Horizon	Depth (cm)	Description
A1	0–25	Very dark brown (10YR2/2); loamy fine sand; weak subangular blocky structure; gradual smooth boundary to:
A2	25–60	Very dark greyish brown (10YR3/2); fine sand; weak subangular blocky structure; occasional quartz gravel; clear wavy boundary to:
B1	60–69	Black (10YR2/1); loamy fine sand; apedal single grain structure; clear wavy boundary to:
B2	69–75	Dark brown (10YR 3/2); sandy clay loam; apedal single grain structure; abrupt wavy boundary to:
2Cm	75+	Dark yellowish brown (10YR4/4); cemented sand; apedal massive structure; extremely hard.

<sup>1</sup> Source: Pitt AJ (1981) A study of the land in the catchments of the Otway Range and adjacent plains. TC-14. Soil Conservation Authority. Kew, Victoria

## Analytical data<sup>2</sup>

Site OTR608 Horizon	Sample depth cm	pH		EC dS/m	NaCl %	Ex Ca cmol <sub>c</sub> /kg	Ex Mg cmol <sub>c</sub> /kg	Ex K cmol <sub>c</sub> /kg	Ex Na cmol <sub>c</sub> /kg	Ex Al mg/kg	Ex Acidity cmol <sub>c</sub> /kg	FC -10kPa %	PWP -1500kPa %	KS %	FS %	Z %	C %
		H <sub>2</sub> O	CaCl <sub>2</sub>														
A1	0-10	4.6	N/R	0.058	0.006	0.5	0.7	0.2	0.3	N/R	N/R	N/R	N/R	70	10	4	6
A1	10-20	4.5	N/R	0.041	0.004	0.3	0.5	0.07	0.13	N/R	N/R	N/R	N/R	78	10	4	9
A2	30-60	4.6	N/R	0.018	0.001	0.08	0.14	<D.01	0.04	N/R	N/R	N/R	N/R	78	15	4	2
B1	60-69	4.3	N/R	0.047	0.004	0.05	0.17	0.03	0.22	N/R	N/R	N/R	N/R	70	13	3	9
B2	69-75	4.2	N/R	0.048	0.004	0.01	0.02	0.01	0.04	N/R	N/R	N/R	N/R	62	9	6	17
11Cm	90-120	4.8	N/R	0.015	0.001	0.01	0.05	0.02	0.10	N/R	N/R	N/R	N/R	72	20	2	3

## Management considerations

Deep sandy soils generally have poor plant water/nutrient holding capacity. The sandy nature of the soils make them prone to wind and sheet and rill erosion. Soils may be hydrophobic (in conjunction with organic coatings) when dried out, taking time to reabsorb moisture. These soils do however drain rapidly. The soil profile is consistently acidic (often associated with sandy surfaces due to the lack of base minerals) and may or may not have organic matter (humose or peaty surfaces). This restricts the uptake of certain nutrients as well as intolerance for some plant species (due in part to the increasing mobilisation of aluminium and manganese). Deficiencies of calcium, potassium and molybdenum are likely. Coffee rock is a pan of variable strength that is found beneath 75cm in these soils (Podosols) where sesquioxides (iron and aluminium) and organic matter have cemented soil material. Where this is only weakly developed then it is called a fragipan. This is often a restriction for root development by limiting water and gas movement. This may also have an influence on subsurface water movement such as lateral flow.

<sup>2</sup> Source: Government of Victoria State Chemistry Laboratory.