POO Poocher Land System

Flats and gently undulating plains between Bordertown and Kongal.

Area: 239.6 km^2

Annual rainfall: 475 - 525 mm average

Geology: The land system is formed on sediments representing two major geological events. In the north and south the land is formed on Padthaway Formation sediments, which were laid down, probably as lake or lagoon floor sediments, following the retreat of the sea. These are clayey sands to sandy clays and limestones. A strip of land running east - west through the centre of the System is formed on more recent clayey alluvial sediments. All sediments are capped by hard, semi-hard, or less commonly, soft carbonate, derived from dissolution and recrystallization of carbonates from the limestone sediments, or from the reworking of calcarenites from old coastal dunes. Remnants of the old coastal dune system protrude through the sedimentary cover in places. There are minor deposits of clayey alluvium adjacent to modern watercourses, windblown clays from old lake floors and drift sand.

Topography: The Land System comprises mainly very gently undulating flats grading to an elongate east west plain extending from east of Poocher Swamp to the northern end of the Naracoorte Range. This plain appears to be a relatively young alluvial feature, formed during a period when the Tatiara and Nalang Creeks flowed further west than at present (ie through the Naracoorte Range). Swamps, notably Poocher, and frequent runaway holes are a feature of the eastern end of the plain. Poocher Swamp accepts most of the floodwaters from Tatiara Creek. There are isolated low stony linear ridges with a roughly north - south orientation (remnants of old coastal dunes) scattered throughout.

Elevation: 35 m in the west to 75 m in the east

Relief: Up to 30 m on isolated rises, but usually less than 5 m

Soils There is a considerable range in soil variability, reflecting the nature of the underlying materials. The predominant soils are sandy to loamy texture contrast profiles, and shallow sandy loam to clay loam soils over limestone.

Main soils

B2/A4 Shallow calcareous sandy loam - on lagoonal limestone
F1a Silty sand over grey silty clay - on alluvium
B5 Black clay loam over calcrete - on calcreted alluvium
F1b Sandy loam over brown clay - on lagoonal limestone

Minor soils

Soils formed on calcreted calcarenite or lagoonal limestone

B6 Sandy loam over red sandy clay on calcrete
B3 Shallow stony loamy sand on calcrete
B7 Sand over brown clay on calcrete
B4 Red loam on calcrete
D2 Loam over friable red clay

Soils formed on lagoonal clays or alluvium
G4 Sand over dispersive brown clay
F2 Hard loam over dispersive brown clay
M2 Deep black friable clay
Soils formed on sand dunes
H3 Deep bleached sand

Vegetation: Mallee and pink gum on non calcareous sandier soils on Padthaway Formation, dryland tea tree on shallow calcareous soils on calcrete, blue gum on loamy soils and red and blue gums on old alluvial flats.

Main features: The Poocher Land System is flat to gently undulating and is characterized by sandy loam to clay loam soils either over calcrete at shallow depth, or firm clayey subsoils grading to rubbly calcrete. Many soils are calcareous throughout. Drainage is generally satisfactory, although waterlogging is locally a problem where subsoil clays are tight. Fertility is moderately low to moderately high depending on the sandiness and alkalinity of the surface soil. Soil depth over calcrete is commonly a limitation, restricting waterholding capacity. Salinity is not an apparent problem, although subsoil levels are commonly elevated. Isolated seasonal inundation occurs in depressions and swamps.

Soil Landscape Unit summary: 17 Soil Landscape Units (SLUs) mapped in the Poocher Land System:

SLU	% of area	Main features #
HbB	0.5	Undulating rises formed on clayey sediments. Main soils: hard loamy sand over brown clay - **F1** (E) and sandy loam over dispersive red clay - **D3** (C) on rising ground, hard loam over dispersive brown clay - **F2** (L) on flats, with loam over friable red clay - **D2** (L) adjacent swamps. Key properties: Drainage: Imperfect (D3 and F2) to moderately well drained (F1 and D2). Fertility: Moderately low (sandier soils) to moderately high (loamy soils). Physical condition: Hard setting surfaces are common. Most soils have coarsely structured, hard and/or dispersive subsoils which impede root growth. AWHC: Moderately high. Salinity: Moderate to moderately low (subsoil). Erosion potential Water: Moderately low to low. Wind: Moderately low. Water repellence: Nil. Rockiness: Nil. Summary: Poor soil structure, imperfect drainage and marginal soil fertility are the main features.
HdB	0.3	Very gently inclined lower slopes adjacent to swamps. Underlying materials are Tertiary / Pleistocene clays. Main soil: loam over friable red clay - **D2** (D). Key properties: Drainage: Moderately well drained. Clayey subsoils cause some sub surface waterlogging. Fertility: High to moderate. Physical condition: Fair. Most soils have hard setting surfaces. Subsoils are well structured. AWHC: Moderately high. Salinity: Moderately low. Erosion potential Water: Moderately low. Wind: Low. Water repellence: Nil. Rockiness: Nil. Summary: Deep red loam over clay soils of moderately high fertility, but poorly structured surfaces.

MCB	3.2	Rises with relief to 30 metres and slopes to 10% formed on calcreted calcarenites of ancient coastal dunes. There is variable surface calcrete up to 10% and minor outcrops of sheet calcrete. Main soils: sandy loam over red sandy clay on calcrete - **B6** (V), with red loam on calcrete - **B4** (L) and shallow stony loamy sand on calcrete - **B3** (L). Key properties: Drainage: Rapidly to moderately well drained due to permeable soils and elevated position. Fertility: Moderately low to moderate, due to the predominantly sandy surfaces. Physical condition: Good. Most soils have firm to soft surface soils with friable subsoils. AWHC: Low (B3 soils) to moderately high (B6 soils). Salinity: Low. Erosion potential Water: Moderately low to moderate. Wind: Low to moderately low. Water repellence: Nil. Rockiness: Minor. Up to 10% surface calcrete and sheet rock. Other: Rises are exposed. Summary: Well drained shallow stony soils with marginal fertility.
MFB	2.4	Gently inclined rises with relief to 20 metres and slopes to 8% formed on calcreted calcarenite. These are the most easterly of the old linear coastal dune remnants. Main soils: red loam on calcrete - **B4** (E) and loam over friable red clay - **D2** (E). Key properties: Drainage: Rapidly to moderately well drained. Fertility: Moderate to high. Physical condition: Surface soils may set hard. Subsoils are well structured. AWHC: Moderately low to moderately high. Salinity: Low. Erosion potential: Water: Moderately low. Wind: Low. Water repellence: Nil. Rockiness: Less than 2% surface calcrete. Summary: Well drained moderately fertile shallow soils over calcrete.
NAA	9.3	Flat to very gently undulating plains formed on calcreted sediments of the Padthaway Formation. Main soils: sand over brown clay on calcrete - **B7** (E) and shallow calcareous sandy loam on calcrete - **B2** (E). Key properties: Drainage: Well to moderately well drained. Fertility: Moderately low to moderate. Physical condition: Good. AWHC: Moderately low. Salinity: Moderately low to moderate in subsoil. Erosion potential: Water: Low. Wind: Low to moderately low. Water repellence: Nil. Rockiness: Up to 5% calcrete surface stone. Summary: Well drained marginally fertile soils with limited water holding capacity.

NBA	3.8	Flat to very gently undulating plains with very low stony rises formed on calcreted sediments of the Padthaway Formation. Main soil: shallow calcareous sandy loam **- B2/A4** (D). Key properties: Drainage: Well drained. Fertility: Moderate. Physical condition: Surface soils generally friable, but can set hard. Subsoil is well structured but thin and mixed with calcrete rubble. AWHC: Low to moderately low, due to shallow depth to sheet or rubbly calcrete. Salinity: Moderately low to moderate in highly calcareous subsoil materials. Erosion potential: Water: Low. Wind: Low. Water repellence: Nil. Rockiness: Up to 10% surface calcrete stone, occasional sheet rock to surface. Summary: Well drained shallow calcareous soils over rubbly calcrete.
NBB	3.3	Flat plain with extensive surface calcrete formed on strongly calcreted sediments of the Padthaway Formation. Main soil: shallow calcareous sandy loam on calcrete **- B2** (D). Key properties: Drainage: Well drained. Fertility: Moderate. Calcareous soils tend to tie up some nutrients. Physical condition: Surface soils are calcareous and well structured and grade directly to calcrete. AWHC: Very low to moderately low, depending on depth to calcrete. Salinity Moderately low to moderate. Erosion potential: Water: Low. Wind: Low. Water repellence: Nil. Rockiness: Up to 50% surface calcrete stone. The land is notable for its stone heaps. Summary: Shallow and very stony well drained loamy soils with moderate fertility.
NBC	15.9	Very gently undulating plains formed on calcreted sediments of the Padthaway Formation. Main soils: shallow calcareous sandy loam on calcrete **- B2** (V), with shallow stony loamy sand on calcrete - **B3** (L) and sandy loam over red sandy clay on calcrete - **B6** (L). Key properties: Drainage: Well drained. Fertility: Moderate. Physical condition: Surface soils are usually friable but can set hard. Subsoils are well structured but thin over rubbly or sheet calcrete. AWHC: Low to moderate depending on depth to calcrete. Salinity: Low to moderately low. Erosion potential: Water: Low. Wind: Low. Water repellence: Nil Rockiness: Up to 5% surface calcrete stone. Summary: Well drained shallow mixed calcareous and non calcareous loamy soils over calcrete.

NCB	8.6	Flat to very gently undulating plains formed on calcreted sediments of the Padthaway Formation. Main soils: shallow calcareous sandy loam on calcrete **- B2** (E) and sandy loam over brown clay - **F1b** (E) with shallow stony loamy sand on calcrete - **B3** (L) and sandy loam over red sandy clay on calcrete - **B6** (M). Key properties: Drainage: Moderately well to well drained. Fertility: Moderate. Physical condition: Surface soils usually well structured, but may set hard. Subsoils are usually well structured but thin over calcrete. Clayey subsoils of F1b are commonly hard and may restrict root growth. AWHC: Moderately low to moderately high, depending on depth to calcrete. Salinity: Moderately low to moderate in subsoil. Erosion potential: Water: Low. Wind: Low to moderately low. Water repellence: Nil to slight. Rockiness: Up to 5% surface calcrete stone. Summary: Moderately shallow to shallow, generally well drained loamy to sandy loam soils, often with firm clay subsoils over rubbly calcrete.
NCD	8.1	Plains and gently undulating rises formed on calcreted sediments of the Padthaway Formation. Main soil is sandy loam over brown clay - **F1b** (D). Key properties: Drainage: Moderately well drained. The clayey subsoil will perch water for short periods. Fertility: Moderate. Physical condition: Surface soils are soft to firm. Subsoils are often hard and slightly restrictive to root growth. AWHC: Moderate to moderately high. Salinity Moderate in subsoil. Erosion potential: Water: Low to moderately low. Wind: Low to moderately low. Water repellence: Nil. Rockiness: Less than 2% surface calcrete stone. Summary: Moderately deep and moderately fertile sandy loam soils with subsoil clays causing slight to moderate restrictions on root growth and drainage.
NEC	6.2	Flats and gently undulating rises formed on calcreted sediments of the Padthaway and Bridgewater Formations. Main soils: red loam on calcrete - **B4** (E), loam over friable red clay - **D2** (E) and sandy loam over red sandy clay on calcrete - **B6** (E). Key properties: Drainage: Well drained. Fertility: Moderate to moderately high. Physical condition: Surface soils commonly set hard. Subsoils are well structured, but often thin. AWHC: Moderately low to moderate. Salinity: Moderately low. Erosion potential: Water: Low. Wind: Low. Water repellence: Nil Rockiness: Up to 5% surface calcrete stone. Summary: Moderately deep well drained, reasonably fertile loamy soils, usually with red clay loam to clay subsoils over calcrete.

NHA	33.1	Level plain with shallow depressions and channels of abandoned water courses formed on strongly calcified and calcreted alluvial clays. Runaway holes are common. Main soils: silty sand over grey silty clay - **F1a** (E) and black clay loam over calcrete - **B5** (E). Key properties: Drainage: Well to imperfectly drained. Water is held up in places on clayey subsoils or low permeability substrate. Fertility: Moderate to high. Physical condition: Surfaces of F1a soils may set hard. Some F1a subsoils are hard and restrictive to root growth and water movement. Structure of B5 soils is favourable. AWHC: Moderate to high. Erosion potential: Water: Low. Wind: Low. Water repellence: Nil. Rockiness: Up to 10% calcrete stone in places. Usually less than 2%. Other: Occasional small swampy depressions are prone to flooding. Summary: Moderately deep to deep sandy loam to clay loam soils of moderate to high fertility, generally well drained, but with areas of impeded drainage and sub optimal root growth conditions. Occasional swampy depressions.
O-D	0.3	Isolated sand hills, remote from the main areas of deep sand deposits. Main soil: deep bleached sand - **H3** (D). These are deep but infertile, water repellent and prone to wind erosion.
TWE	1.0	Alluvial flats of the Tatiara Creek either side of Poocher Swamp. Underlying sediments are alluvial clays and sandy clays. Main soils: deep black friable clay - **M2** (E) and hard loam over dispersive brown clay - **F2** (E). Key properties: Drainage: Imperfect to poor. Fertility: High to moderate. Physical condition: Clayey soils are well structured but loam over clay soils have hard setting surfaces and dispersive subsoils. AWHC: High. Salinity: Moderate to moderately high (subsoil). Erosion potential: Water: Low. Wind: Low. Water repellence: Nil. Rockiness: Nil. Other: Prone to flooding. Summary: Deep fertile mostly clayey soils prone to waterlogging and flooding.
VXT	0.4	Narrow, crescent shaped rises (lunettes) on the leeward sides of the larger swamps. The soils include deep sands to silt loams, sand over clay and loam over clay.
VZ-	2.2	Playas, or old swamp beds, roughly circular in shape and no longer subject to regular inundation. Main soils: hard loam over dispersive brown clay - **F2** (V) and shallow calcareous loam **- B2/A4** (E). These soils are moderately fertile, but have variable drainage characteristics. Some may be marginally saline, but elevated salt levels were not detected. They flood in wet years.
Xq-	1.4	Fresh to marginally saline swamps, at least seasonally inundated.

PROPORTION codes assigned to soils within Soil Landscape Units (SLU):

(D) Dominant in extent (>90% of SLU)
(V) Very extensive in extent (60–90% of SLU)
(E) Extensive in extent (30–60% of SLU)
(C) Common in extent (20–30% of SLU)
(L) Limited in extent (10–20% of SLU)
(M) Minor in extent (<10% of SLU)

Detailed soil profile descriptions:

B2/A4 Shallow calcareous sandy loam (Petrocalcic / Regolithic, Supracalcic / Lithocalcic Calcarosol)
Medium thickness calcareous stony sandy loam to clay loam overlying Class III B/C carbonate grading to limestone or calcareous clay.

B3 Shallow stony loamy sand over calcrete (Petrocalcic, Leptic Tenosol)
Loamy sand to loam with variable rubble and slight clay increase with depth overlying calcreted calcarenite shallower than 50 cm.

B4 Red loam over calcrete (Petrocalcic, Red Dermosol)
Medium thickness red sandy loam grading to clay loam over calcreted calcarenite.

B5 Black clay loam over calcrete (Petrocalcic, Black Dermosol)
Shallow black well structured loam to clay overlying limestone or semi hard carbonate.

B6 Sandy loam over red sandy clay (Petrocalcic, Red Kandosol)
Medium thickness sandy loam with slight ironstone gravel grading to a weakly structured reddish brown sandy clay loam on calcarenite.

B7 Sand over brown clay over calcrete (Petrocalcic, Brown Chromosol)
Medium thickness sand overlying a yellowish brown friable to firm clay on limestone or calcreted sandy clay within 50 cm.

D2 Loam over friable red clay (Hypercalcic, Red Chromosol)
Medium thickness red brown loam abruptly overlying a red brown well structured clay grading to soft carbonate or calcarenite at 50 - 100 cm.

F1a Silty sand over grey silty clay (Calcic / Lithocalcic, Grey / Brown Chromosol)
Medium thickness grey silty sand to silty loam overlying a grey to brown silty clay grading to soft or hard carbonate, over old alluvium.

F1b Sandy loam over brown clay (Hypercalcic, Brown Chromosol)
Medium thickness loamy sand to sandy loam abruptly overlying a brown and yellow firm to friable clay grading to Class III A or B carbonate.

F2 Hard loam over dispersive brown clay (Hypercalcic, Brown Sodosol)
Medium thickness hard setting loamy sand to loam abruptly overlying a coarsely structured grey brown, yellow and red clay grading to soft carbonate.

G4 Sand over dispersive brown clay (Hypercalcic, Brown Sodosol)
Thin to medium thickness sand sharply overlying a brown and yellow or grey mottled dispersive clay with strong columnar structure, calcareous with depth.

H3 Deep bleached sand (Basic, Arenic, Bleached-Orthic Tenosol)
Thick to very thick bleached sand, organically darkened at the surface over yellow sand continuing below 100 cm.

M2 Deep black friable clay (Calcic, Black Dermosol / Vertosol)
Medium thickness friable black clay loam to clay (may crack) grading to a coarsely structured dark grey clay, calcareous with depth.

Further information: DEWNR Soil and Land Program