

# SAC Sandergrove Creek Land System

Shallow linear valley extending south from Strathalbyn to Finniss, then eastwards to Milang. Sandergrove Creek is the small watercourse now occupying the valley.

**Area:** 24.2 km<sup>2</sup>

**Annual rainfall:** 375 – 500 mm average

**Geology:** The land system is underlain by alluvial sediments (mainly silty sands to silty clay loams) laid down in a former channel and flood plain of the Angas River. The sediments tend to become finer with increasing distance downstream. Also included are remnant deposits of older Tertiary or early Quaternary sediments typical of the adjacent Milang Land System. These sediments occur as "islands" cut off from the main Milang System by the river. Similar sediments are exposed in moderately steep banks incised into the older land surface in the upper reaches of Sandergrove Creek.

**Topography:** The System is essentially a creek flat carved through an older land surface by a forerunner of the modern Angas River. At the upstream end, the watercourse cut a channel 15 m deep into the pre-existing land surface, but with decreasing elevation towards the lake, the depth of incision reduces to less than a metre. In the upper half, the channel of Sandergrove Creek is well defined within the broader valley, but from the point at which the valley bends eastwards, the channel loses definition and becomes a string of shallow depressions. At the mouth of the valley south of Milang, the landscape comprises a flat with numerous meandering flood channels. There is a narrow outlet to the lake through which water apparently flows in extremely wet seasons. Remnant "islands" of the Milang Land System occur as low rises protruding from the bed of the valley.

**Elevation:** 0 m at the mouth to 50 m in the north

**Relief:** Maximum relief is 15 m (depth of dissection in the upper part of the valley)

**Soils:** The land is dominated by sandy loam to loam texture contrast soils with red clayey subsoils. Sub dominant are dark coloured loamy texture contrast soils. Virtually all soils are deep over alluvium.

#### Main soils

*Hard setting texture contrast soils of alluvial flats*

- D3a** Loam over poorly structured red clay
- D2** Loam over red clay
- D3b** Sandy loam over poorly structured red clay
- F2a** Loam over poorly structured brown clay

#### Minor soils

*Hard setting texture contrast soils of alluvial flats*

- D5** Hard loamy sand over red clay
- F2b** Sandy loam over poorly structured brown clay

*Variable soils formed on early Quaternary sediments*

- C1** Gradational sandy loam
- D3c** Loam over poorly structured red clay
- F2c** Loam over poorly structured brown clay
- G1** Sand over red sandy clay loam



- G4** Sand over poorly structured clay  
*Soils formed on calcrete or calcareous rubble*
- A4** Rubbly calcareous loam
- B2** Shallow calcareous loam on calcrete
- B7** Shallow sand over clay on calcrete  
*Deep sandy soils of sandhills*
- G3** Thick sand over clay

**Main features:** The Sandergrove Land System is a valley marking a former course of the River Angas. It is dominated by flats representing the flood plain of the old river. These are characterized by deep moderately fertile texture contrast soils, productivity of which is limited by waterlogging, poorly structured subsoils and marginal salinity (with occasional highly saline patches). These limitations become more pronounced with increasing downstream distance. Associated soils are similar to the adjacent Milang Land System. They occur either on "islands" within the valley, or on banks cut into the older land surface.

**Soil Landscape Unit summary:** 10 Soil Landscape Units (SLUs) mapped in Sandergrove Creek Land System

SLU	% of area	Main features #
GRA	7.4	Very gently undulating plains formed on clayey sands and sandy clays, overlain by Woorinen Formation Class III carbonates. Slopes are up to 2%. Main soils: <u>Sand over poorly structured clay</u> - <b>G4</b> (V) <u>Shallow sand over clay on calcrete</u> - <b>B7</b> (L) These soils have low natural fertility and restricted water holding capacities due to the shallow depth to dispersive clayey subsoils and hostile carbonate layers. They are prone to wind erosion and water repellence. Most have marginally saline subsoils.
GSB	1.1	Gently undulating rises formed on Tertiary or Pleistocene sandy clays to clays, variably calcified by soft to hard Class III carbonates of the Woorinen Formation. Slopes are up to 4% and there is minor surface calcrete. There is no defined surface drainage pattern. Soils are either sandy or rubbly. Main soils: <u>Sand over sandy clay loam</u> - <b>G1</b> (V) <u>Deep rubbly calcareous loam</u> - <b>A4</b> (L) The sandy soils are deep to moderately deep but of low fertility and prone to wind erosion and water repellence. The calcareous soils are shallower, but are more fertile. All soils are well drained.
HEA	3.9	Very gently undulating plains, gently inclined slopes and low rises with slopes ranging from 1% to 5% underlain by Tertiary clays and alluvium, partly overlain by calcareous aeolian deposits of the Woorinen Formation. <b>HEA</b> Very gently undulating plains and valley floors with slopes of 1-2%. Main soil: <u>Loam over red clay</u> - <b>D2a</b> (E) <u>Gradational red sandy loam</u> - <b>C1</b> (C) <u>Hard loamy sand over red clay</u> - <b>D5</b> (L) <u>Deep rubbly calcareous loam</u> - <b>A4</b> (L) <u>Sandy loam over poorly structured brown clay</u> - <b>F2</b> (L) <u>Gradational calcareous clay loam</u> - <b>A6</b> (M) These soils are mostly deep and inherently fertile, although boron levels are elevated in subsoils. Poorly structured surfaces are a minor limitation in D2a and D5 soils, while shallow carbonate layers restrict root zone depth in places. Productivity potential is high.
HED	2.0	Moderately steep banks on the eastern side of Sandergrove Creek cut into early Quaternary sediments. Slopes are variable to 20%, relief to 15 m. Main soils: <u>Loam over poorly structured red clay</u> - <b>D3c</b> (E) <u>Sand over red sandy clay loam</u> - <b>G1</b> (C)



		<p><u>Loam over poorly structured brown clay</u> - <b>F2c</b> (L)  <u>Sand over poorly structured clay</u> - <b>G4</b> (L)  <u>Gradational sandy loam</u> - <b>C1</b> (L)</p> <p>These soils are mostly deep, but generally poorly structured. Fertility is moderate (loamy soils) to low (sandy soils). Although short, the slopes are prone to water erosion.</p>
JhA	63.3	<p>Valley flats, plains, terraces and water courses of the Sandergrove Creek. This landscape feature represents the former course of the Angas River. It comprises a valley up to 15 metres deep in its north - south section with a well defined water course which meanders in the floor of the valley. After it bends eastwards near Finnis, the valley broadens into a flat plain in which the water course degenerates into a series of depressions.</p> <p>The soils have texture contrast profiles, with sandy to loamy surfaces overlying reddish and usually sodic clay subsoils, calcareous with depth.</p> <p>Main soils: <u>Loam over poorly structured red clay</u> - <b>D3a</b> (E)  <u>Loam over red clay</u> - <b>D2</b> (C)  <u>Sandy loam over poorly structured red clay</u> - <b>D3b</b> (L)  <u>Hard loamy sand over red clay</u> - <b>D5</b> (M)</p> <p>These soils are deep and moderately fertile, but are limited by impeded drainage and marginal salinity, with some surface soils seriously affected.</p>
JiA	8.6	<p>Shallow depressions at the downstream end of Sandergrove Creek. These usually represent abandoned water course depressions and are subject to seasonal waterlogging. Most soils have texture contrast profiles with sandy to loamy surfaces and red to brown sodic clay subsoils, calcareous with depth.</p> <p>Main soils: <u>Sandy loam over poorly structured brown clay</u> - <b>F2b</b> (V)  <u>Hard loamy sand over red clay</u> - <b>D5</b> (C)  <u>Loam over poorly structured red clay</u> - <b>D3a</b> (L)</p> <p>These soils are deep and moderately fertile but imperfectly drained and marginally saline.</p>
KuA	9.2	<p>Plains at the mouth of the Sandergrove Creek, south west of Milang. The plains are marked by a fine network of shallow channels which carry excess seasonal water. This occasionally discharges to the lake through a narrow channel. The dominant soils have medium to fine textured, mildly saline and seasonally wet profiles.</p> <p>Main soil: <u>Loam over poorly structured brown clay</u> - <b>F2a</b> (D)</p> <p>These soils are deep and highly fertile, but productivity is limited by imperfect drainage and moderate salinity.</p>
SdA	3.6	<p>Gently undulating plains with relief of less than 10 metres and slopes of less than 3%, formed on rubbly to sheet calcrete, overlying sands, sandy clays or heavy clays. Surface calcrete stone is common and there is minor outcrop. There is no surface drainage pattern. Most soils are calcareous throughout with rubble at shallow depth. There are some red texture contrast types.</p> <p>Main soils: <u>Rubbly calcareous loam</u> - <b>A4</b> (E)  <u>Shallow calcareous loam on calcrete</u> - <b>B2</b> (E)  <u>Gradational sandy loam</u> - <b>C1</b> (L)  <u>Loam over red clay</u> - <b>D2</b> (L)</p> <p>These soils are well drained and moderately fertile, but water holding capacity is commonly restricted by shallow rubble or sheet rock. Workability is a limitation in places due to surface stone.</p>
THA	0.3	<p>Flat plains and swales underlain at shallow depth by Blanchetown Clay. Gilgai microrelief is characteristic of these landscapes. Soils vary considerably over short distances as a result of seasonal clay movement.</p> <p>Main soils: <u>Grey-brown cracking clay</u> - <b>E3</b> (E)  <u>Sandy loam over poorly structured brown clay</u> - <b>F2</b> (C)  <u>Sand over poorly structured clay</u> - <b>G4b</b> (L)  <u>Gradational calcareous clay loam</u> - <b>A6</b> (L)</p> <p>Impeded drainage, poor root growth conditions, uneven land surface, workability problems, boron toxicity and marginal salinity combine to affect the productive potential of this land.</p>
U-C	0.6	<p>Low sandhills on the shores of Lake Alexandrina, separating the lake from the flats of KuA.</p> <p>Main soil: <u>Thick sand over clay</u> - <b>G3</b> (D)</p> <p>These soils are highly infertile and susceptible to wind erosion.</p>



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

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

### Detailed soil profile descriptions:

#### *Hard setting texture contrast soils of alluvial flats*

##### **D2** Loam over red clay (Sodic, Calcic, Red Chromosol)

Medium thickness reddish brown loamy sand to clay loam with a pink A2 layer, overlying a dark reddish brown well structured clay with soft calcareous segregations (Class I or III A carbonate) from 55 cm. The profile grades to brown clayey sand to silty clay loam alluvium from 70 cm.

##### **D3a** Loam over poorly structured red clay (Calcic, Mesonatric, Red Sodosol)

Medium thickness reddish brown massive loamy sand to loam with a pink A2 layer, overlying a red and brown mottled sandy clay with coarse columnar structure becoming more clayey and prismatic with depth. Soft calcareous segregations (Class I carbonate) from 55 cm.

##### **D3b** Sandy loam over poorly structured red clay (Calcic, Subnatric, Red Sodosol)

Medium thickness reddish brown loamy sand to sandy clay loam with a bleached A2 layer, overlying a dark reddish brown sandy clay loam to clay with columnar structure, grading to a coarsely blocky clay, calcareous with depth (Class I or III A carbonate). Clayey sand to silty clay loam alluvium underlies the soil at 65 cm.

##### **D5** Hard loamy sand over red clay (Hypocalcic, Subnatric, Red Sodosol)

Thick reddish brown sand to loamy sand with a pink, hard and gritty A2 layer, overlying a red and brown sandy clay to clay with coarse prismatic structure, grading to clayey sand to sandy clay with minor soft calcareous segregations (Class III A carbonate) from 70 cm.

##### **F2a** Loam over poorly structured brown clay (Calcic, Mottled-Mesonatric, Brown Sodosol)

Medium thickness brown loam to clay loam, overlying a brown and greyish mottled sandy clay to heavy clay with coarse prismatic structure, moderately calcareous (Class I carbonate) from 35 cm.

##### **F2b** Sandy loam over poorly structured brown clay (Calcic, Mesonatric, Brown Sodosol)

Medium thickness dark brown massive loamy sand to loam with a pale grey A2 layer, overlying a dark brown and yellowish brown mottled sandy clay to heavy clay with strong coarse prismatic structure and soft calcareous segregations (Class I carbonate) from 45 cm.

#### *Variable soils formed on early Quaternary sediments*

##### **C1** Gradational sandy loam (Supracalcic, Red Kandosol)

Medium thickness reddish loamy sand to light sandy clay loam, grading to a red brown weakly structured sandy clay loam to light clay, over a rubbly Class III B carbonate layer from 30 cm. Brown, yellow, red and grey clayey sand to sandy clay underlies the carbonate at 70 cm.

##### **D3c** Loam over poorly structured red clay (Calcic, Subnatric, Red Sodosol)

Medium thickness reddish brown massive sandy loam to sandy clay loam with a paler A2 layer, overlying a reddish brown and greyish brown mottled clay with strong blocky structure and soft Class I carbonate segregations from 55 cm. The soil overlies a dark brown mottled clay with decreasing amounts of carbonate.

##### **F2c** Loam over poorly structured brown clay (Calcic, Mottled-Subnatric, Brown Sodosol)

Medium thickness grey brown massive loamy sand to sandy clay loam with a paler and sandier A2 layer, overlying a brown, grey and yellow heavy clay with strong blocky structure, highly calcareous from 50 cm (Class I carbonate layer). The carbonate grades to Blanchetown Clay at 70 cm.

##### **G1** Sand over red sandy clay loam (Eutrophic, Red Chromosol)

Thick reddish brown sand to light sandy loam with a gravelly pink A2 layer overlying a red sandy clay loam to sandy clay, becoming sandier and more gravelly with depth.



- G4** Sand over poorly structured clay (Calcic, Mottled-Mesonatric, Brown / Red Sodosol)  
Medium thickness brown sand to light sandy clay loam with a bleached A2 layer, sharply overlying a yellowish brown, greyish brown and red mottled clay with strong columnar structure, grading to a Class I carbonate layer of soft calcareous segregations at 45 cm. This grades to a non calcareous sandy clay to heavy clay with depth.

*Soils formed on calcrete or calcareous rubble*

- A4** Rubby calcareous loam (Regolithic, Supracalcic Calcarosol)  
Medium thickness brown calcareous loamy sand to light sandy clay loam with minor calcrete nodules, overlying a brown highly calcareous massive sandy clay loam, grading to a pale brown, very highly calcareous clayey sand to light clay with up to 50% calcrete nodules (Class III B carbonate). The carbonate layer grades to a brown, yellow, grey and red sandy clay from 65 cm.
- B2** Shallow calcareous loam on calcrete (Petrocalcic, Supracalcic Calcarosol)  
Medium thickness brown moderately calcareous loamy sand to light sandy clay loam with variable calcrete fragments, overlying sheet calcrete or heavy rubble grading to soft very highly calcareous pale brown sandy loam to clay loam with decreasing rubble content. The profile overlies Blanchetown Clay at depths from 100 cm to 10 m.
- B7** Shallow sand over clay on calcrete (Petrocalcic, Brown Chromosol)  
Thin brown sand to sandy loam with a pink A2 horizon, overlying an orange sandy clay loam to light clay with calcrete fragments. At 30 cm is a layer of massive or rubby calcrete, grading to a pale brown very highly calcareous clayey sand to sandy clay.

*Deep sandy soils of sandhills*

- G3** Thick sand over clay (Calcic, Brown Sodosol)  
Very thick pale brown coarse sand abruptly overlying a brown and grey mottled massive sandy clay, calcareous within 100 cm.

**Further information:** [DEWNR Soil and Land Program](#)

