

SOM Somme Land System

Somme River Valley in the Keyneton district

Area: 52.9 km²

Annual rainfall: 500 – 600 mm average

Geology: The underlying rocks are metamorphosed sandstones and siltstones of the Carrickalinga Head Formation. These are deeply weathered in places where they are characterized by kaolinitic clay development and ironstone gravels. There are minor reefs of Milendella Limestone. Localized erosion and re-deposition of the rocks and associated soils has produced clayey sand to sandy clay valley infill. Salts stored in the rocks are being mobilized by rising ground water tables, resulting in sporadic saline seepage, mainly adjoining creek lines.

Topography: The land system includes the relatively smooth and gentle slopes of the catchment of the Somme River. The rougher rocky land on the eastern side of the river in the Keyneton area is not included, nor is the strongly dissected land downstream of the junction with the Marne. The land is dominated by undulating to moderately steep rises with slopes of 3-20% formed on basement rocks. The Somme and its tributaries occupy well defined valley flats and drainage depressions. Water courses are often eroded, and saline seepage is most common in these areas. In places there are gentle slopes underlain by basement rock highs and local depositional areas.

Elevation: 290 m in the south where the Somme flows out, to 496 m on the watershed in the west.

Relief: Up to 50 m

Soils: Soil depth varies from shallow over basement rock to deep over alluvium. Nearly all soils have sandy loam surfaces, and most have clayey subsoils which are commonly dispersive. These tend to have waterlogging problems.

Main soils

Soils formed on basement rock on rising ground

L1 Shallow stony sandy loam

K3 Sandy loam over red clay

K1 Gradational loam

Soils formed on alluvium on lower slopes and flats

F2b Sandy loam over dispersive brown clay

M1 Gradational sandy loam

Minor soils

Soils formed on rising ground

K1/J2 Ironstone gravelly red sandy loam on lateritized weathered rock

K4 Sandy loam over brown clay on rock

F2a Sandy loam over dispersive brown clay on highly weathered rock

D1 Sandy loam over red clay on calcified rock



Main features: The Somme Land System comprises the mostly arable slopes and flats of the Somme River catchment. The slopes are characterized by sandy loams, either with red clay subsoils, or directly overlying basement rock. Poor soil structure, acidity and fertility are the main issues. The lower slopes and flats have deeper but less well drained soils, subject to waterlogging, salinization and erosion. Increased water use efficiency throughout the catchment should be the main management goal.

Soil Landscape Unit summary: 10 Soil Landscape Units (SLUs) mapped in the Somme Land System:

SLU	% of area	Main features #
AXC	0.1	Barren Hill - an abrupt conical peak 30 m high with slopes of 20-40%. No inspections made but similar to other hills formed on ferruginized siltstone with red ironstone gravelly loamy soils. Cork Hill, one km south east of Keyneton is a similar shaped hill, but smaller and unmapped.
AnC	0.2	Moderately steep rocky slopes. Main soil is <u>shallow stony sandy loam</u> - L1 (D). These slopes are too steep and rocky for any uses other than rough grazing.
CSC CSD	33.5 20.7	Undulating to moderately steep slopes formed on basement rocks, lateritized in places. Linear rocky reefs are common. There is up to 20% surface quartzite, metasandstone (and ironstone in places). There is occasional gully development in water courses, and sporadic saline seepage on lower slopes and sometimes on mid slopes. CSC Undulating rises up to 30 m high and gentle slopes with limited rocky outcrop. Slopes are 3-10%. CSD Moderately steep slopes and rises up to 50 m high with common to extensive rock outcrop. Slopes are 10-20%. Main soils: <u>sandy loam over red clay</u> - K3 (E) and <u>shallow stony sandy loam</u> - L1 (E), with <u>gradational loam</u> - K1 (L) and <u>ironstone gravelly red sandy loam</u> - K1/J2 (L). Soils as for CZC occur to a minor extent in hollows and depressions. The shallower stony soils are more common on steeper rocky slopes. Variations in soil depth and presence of subsoil clays affect the waterholding capacities of these soils, and this is evident in late spring as differential drying off of crops and pastures occurs. The soils have moderate natural fertility, but acidity must be controlled. Poor soil structure leading to excessive runoff and erosion is a potential problem for productivity and also contributes to salinization due to reduced water use. Lime applications may be needed to correct acidity and improve the calcium status (and structure) of the soils.
CZC	20.3	Undulating to gently undulating slopes formed on a mixture of basement rock and locally derived outwash sediments. Rocky outcrop is minor, and there is sporadic surface quartzite and metasandstone. Slopes are 2-4%. There is minor watercourse erosion and saline seepage. Main soils: <u>sandy loam over brown clay</u> - K4 (E), <u>shallow stony sandy loam</u> - L1 (L), and <u>gradational loam</u> - K1 (M) on weathering rock, with <u>sandy loam over dispersive brown clay</u> - F2a (C) and <u>gradational sandy loam</u> - M1 (L) on local outwash sediments. This land is similar to CSC, but soils are deeper and less well drained. Salinization hazard is also higher. Maximizing water use efficiency is essential through maintaining or improving soil fertility, pH and surface condition.
ETC ETD	2.2 3.8	Rises formed on basement rocks veneered by carbonate deposits. ETC Gentle slopes of 2-5% with minor rock outcrop. ETD Low rises to 20 m high with slopes of 5-20% and 10-20% rocky outcrop. Main soils: <u>shallow stony sandy loam</u> - L1 (V) and <u>sandy loam over red clay on calcified rock</u> - D1 (C). These soils have variable depth, affecting moisture holding capacity, but are inherently fertile and well drained. Productivity on the shallower rocky soils is restricted, but the deeper, fully arable soils of ETC are potentially productive.



LCE	3.5	Creek flats and drainage depressions formed on variable locally derived alluvium. This is typically sandy or gritty through to sandy clay. LCE Creek flats with little apparent salinity and generally stable water courses. LCJ Gently sloping (2%) alluvial flats with eroded watercourses. LCe Drainage depressions with eroded water courses and sporadic saline seepage. Main soils: <u>sandy loam over dispersive brown clay</u> - F2b (E) and <u>gradational sandy loam</u> - M1 (E). These soils are deep and of moderately low fertility, but susceptible to waterlogging, compaction and erosion. The latter is exacerbated by salinity resulting from insufficient water use higher in the catchments. Controlled grazing, erosion control, nutrition maintenance and revegetation with salt and waterlogging tolerant plants are the main management issues.
LCJ	3.0	
LCe	12.7	

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:

- D1** Sandy loam over red clay on calcified rock (Hypercalcic / Lithocalcic, Red Chromosol)
Medium thickness hard sandy loam abruptly overlying a red well structured clay, with abundant soft to rubbly carbonate from about 60 cm, grading to weathering rock from about 90 cm.
- F2a** Sandy loam over dispersive brown clay (Eutrophic, Brown Sodosol)
Thick quartz gravelly sandy loam with a paler coloured or bleached A2 layer, abruptly overlying a brown mottled strongly structured dispersive clay, becoming sandier with depth and continuing below 100 cm.
- F2b** Sandy loam over dispersive brown clay (Eutrophic, Grey / Brown Sodosol)
Thick hard massive sandy loam with a bleached A2 layer over a brown and grey mottled medium clay with coarse prismatic structure, grading to variable alluvium, continuing below 100 cm.
- K1/J2** Ironstone gravelly red sandy loam (Ferric, Red Chromosol / Kandosol)
Medium thickness hard fine sandy loam with an ironstone gravelly A2 layer, over a friable red clay grading to highly weathered basement rock deeper than 100 cm.
- K1** Gradational loam (Eutrophic, Red Kandosol)
Medium to thick hard fine sandy loam to clay loam grading to a reddish or brown clay loam to light clay merging with weathering rock from about 45 cm.
- K3** Sandy loam over red clay (Eutrophic, Red Chromosol)
Medium to thick hard sandy loam to loam with a paler coloured and gravelly A2 layer, abruptly overlying a reddish strongly structured light to medium clay, occasionally calcareous with depth, over weathering metamorphosed sandstone or siltstone at about 70 cm.
- K4** Sandy loam over brown clay (Eutrophic, Brown Chromosol)
Medium thickness hard quartz gravelly sandy loam with a paler coloured A2 layer, abruptly overlying a brown or red strongly structured medium clay grading to weathering metamorphosed sandstone at about 70 cm.
- L1** Shallow stony sandy loam (Lithic, Leptic Rudosol / Tenosol)
Medium to thick hard massive stony sandy loam, sometimes paler coloured with depth, over hard metamorphosed sandstone within 50 cm.
- M1** Gradational sandy loam (Eutrophic, Brown Kandosol)
Thick grey sandy loam grading to a brown and grey mottled massive sandy clay loam, continuing below 100 cm.

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

