STF Stonyfell Land System

Steep very rocky hillslopes scattered between Anstey Hill and Crafers and including Mount Lofty Summit.

Area: 35.6 km^2

Annual rainfall: 650 – 1100 mm average

Geology: The land is underlain almost entirely by coarse grained quartzitic sandstones of the Stonyfell Quartzite Formation. These are typically pale in colour with well developed fracture planes giving rise to more or less cubic blocks which are commonly exposed in cliff faces and cuttings. There are minor inclusions of Woolshed Flat Shales.

Topography: The landscape comprises steep to very steep rocky hillslopes, including some frontal escarpment slopes in the Black Hill - Anstey Hill area. The underlying rocks are highly resistant to weathering, so the System stands above much of the surrounding country, and includes the highest point in the Southern Mount Lofty Ranges. In the Waterfall Gully, Morialta and Torrens Gorge areas, precipitous cliffs have been carved into the rocks by major water courses. Outwash fans and valley flats are virtually non existent.

Elevation: 100 m where the Torrens River flows out on to the Adelaide Plains to 727 m at Mount Lofty summit.

Relief: Up to 250 m

Soils: The vast majority of soils are shallow to moderately deep over coarse grained rocks, with gritty sandy to sandy loam surfaces and variable clayey sand to sandy clay subsoils. Loamy surfaced soils formed on fine grained rocks, and deep alluvial soils are minor.

Main soils

Soils formed on coarse grained basement rock

K5 Acidic gradational sandy loam
L1a Shallow stony sandy loam
K4 Acidic sandy loam over brown clay
K3 Acidic sandy loam over red clay on rock

Minor soils

Soils formed on fine grained basement rock

A2 Shallow calcareous loam
C2 Shallow gradational red loam over calcareous rock
D1 Loam over red alkaline clay
K1 Acidic gradational brown loam
L1b Shallow stony loam

Soils formed on alluvium

F1 Sandy loam over brown sandy clay
M1 Deep gradational sandy loam

Main features: The Stonyfell Land System is characterized by steep to very steep rocky hillslopes formed on quartzitic sandstones. The soils are typically shallow, very gritty and stony, with grey loamy sand to sandy loam surfaces and, where deep enough, yellow brown sandy clay subsoils. They are highly infertile and acidic, although well drained. The combination of difficult terrain, surface rock and poor soils precludes most agricultural uses. The land has excellent recreational and conservation value and most is in reserves.

Soil Landscape Unit summary: 5 Soil Landscape Units (SLUs) mapped in the Stonyfell Land System

SLU	% of area	Main features #
ACD	4.3	Strongly dissected escarpment slopes formed on calcified siltstones, shales, calcareous siltstones and quartzites. The slopes comprise east-west trending spurs, separated by gullies with side slopes of 25% to 100%. Footslopes grade down to 12% slope. Maximum relief is 200 metres. Water courses are very well defined in narrow valley floors. There is sporadic rock outcrop. The majority of soils are shallow to moderately deep, loamy, and underlain by a thick, massive layer of soft to semi-hard carbonate. Typical profiles include loams over red brown clay subsoils, and shallow calcareous and non-calcareous loams. Less commonly these soils are formed directly on siltstone with variable soft carbonate in the lower part of the profile. Main soils: Shallow gradational red loam over calcareous rock - **C2** (E) Shallow calcareous loam - **A2** (L) Loam over red alkaline clay - **D1** (L) Shallow stony loam - **L1b** (C) This land is steep to very steep, and although the soils are fertile and well drained (although often shallow), the topography severely restricts land use options. Much of the land is zoned Hills Face.
AaD	0.2	Steep to very steep hills formed on siltstones, fine sandstones and minor quartzites and dolomites of the Saddleworth, Balhannah and Castambul Formations. Slopes range from 20% to 50% generally, but are up to 150% in places. On some upper slopes and broader crests, slopes are less than 10%. Relief is typically between 100 and 200 m. Drainage depressions are narrow with well defined water courses. There is usually an abrupt break between creek flats and adjacent hillslopes. **AaD** Steep to very steep hillslopes with relief to 200 m, slopes of 30-75%, occasional rock outcrop and moderate surface stone. The soils are predominantly loamy with red to yellow clay subsoils forming in weathering rock. On steeper slopes, loamy surface soils are formed directly in rock. Red loamy soils overlying abundant soft to semi-hard carbonate occur on calcareous rocks. Main soils: Shallow stony loam - **L1b** (E), most abundant on steeper slopes Shallow gradational red loam - **C2** (L) Acidic loam over red clay - **K2** (E-L) most abundant on gentler slopes Acidic gradational brown loam - **K1** (L) Although most soils are shallow, there is a significant proportion that are moderately deep, well drained and inherently fertile. However, the steep terrain limits land use options. The land is used mostly for light grazing where it has been cleared. On the limited rounded crests and moderate slopes (**AaC**), there is potential for more intensive use, where water is available.
AuD AuF	86.5 8.6	Steep to very steep low hills and hills developed on medium to coarse grained sandstones and quartzites. Slopes generally range from 12% to 75% and relief is up to 250 metres. In the Waterfall Gully, Morialta and Torrens Gorge areas, precipitous slopes and cliffs occur. The slopes are rough and very rocky. **AuD** Rocky, steep low hills with relief to 100 m and slopes of 30-75%. Drainage depressions are narrow and deeply incised. **AuF** Precipitous, very rocky slopes of 75-150% and relief to 250 m. Some cliffs are included. Drainage depressions are very deeply incised. Main soil features are shallow profiles over bedrock and grey, sandy surfaces which are gritty and stony. Subsoils are often not present. Main soils: Acidic gradational sandy loam on rock - **K5** (E)

		Shallow sandy loam on rock - **L1a** (C) Acidic sandy loam over brown clay on rock - **K4** (L) Acidic sandy loam over red clay on rock - **K3** (L) Acidic gradational brown loam - **K1** (M) on fine grained rocks This land has very limited productive potential due to the combination of steep terrain, rocky land surface and shallow infertile soils. Most of it is used for conservation.
LDE	0.4	Creek flats formed on coarse grained alluvial deposits derived from the erosion of sandstones. The majority of soils comprise sandy and often gritty and stony surfaces overlying brown, yellow, grey and red sandy clay loam to clay subsoils. There are also deep coarse textured alluvial soils. Main soils: Sandy loam over brown sandy clay - **F1** (E) Deep gradational sandy loam - **M1** (E) These soils are deep and imperfectly to moderately well drained. Natural fertility is low and most soils are acidic. Most of this land is urbanized.

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:

Soils formed on coarse grained basement rock

K3 Acidic sandy loam over red clay on rock (Mesotrophic, Red Chromosol / Kurosol)
Medium thickness loamy sand to sandy loam, with a paler coloured and very gravelly A2 horizon, overlying a red sandy clay subsoil with abundant rock fragments, grading to weathering coarse grained sandstone before 100 cm.

K4 Acidic sandy loam over brown clay on rock (Bleached, Mesotrophic, Brown Kurosol)
Medium to thick, gravelly loamy sand to sandy loam surface soil, with a bleached and very gravelly A2 horizon, overlying a yellowish brown, red and brown sandy clay to clay subsoil grading to weathering medium to fine sandstone by 100 cm.

K5 Acidic gradational sandy loam on rock (Bleached-Acidic, Mesonatric, Yellow Kandosol)
Thick, gravelly loamy coarse sand to coarse sandy loam surface soil with a bleached and very gritty and gravelly A2 horizon, overlying a brown or yellow sandy clay loam to sandy clay subsoil with abundant rock fragments, grading to coarse grained sandstone.

L1a Shallow stony sandy loam (Acidic, Lithic, Bleached-Leptic Tenosol)
Thick grey loamy coarse sand to coarse sandy loam surface soil with abundant sandstone and quartzite fragments, grading to a bleached and very stony A2 horizon overlying rock, sometimes containing pockets of brown clayey sand.

Soils formed on fine grained basement rock

A2 Shallow calcareous loam (Paralithic, Calcic Calcarosol)
Medium thickness, calcareous, reddish brown, stony loamy surface soil, overlying a brown, highly calcareous, stony clay loam subsoil, increasingly calcareous and paler coloured with depth. Highly calcareous weathering siltstone or slate occurs at about 50 cm.

C2 Shallow gradational red loam over calcareous rock (Calcic, Red Dermosol)
Medium thickness dark reddish brown loam, overlying a reddish well structured loam to clay loam, grading to soft, highly calcareous siltstone, or soft carbonate with siltstone fragments throughout at about 50 cm.

D1 Loam over red alkaline clay (Hypocalcic, Red Chromosol)
Medium thickness, reddish sandy loam with a pink, gravelly A2 horizon, overlying a red, well structured clay subsoil with occasional soft calcareous segregations at depth, grading to weathering fine sandstone.

K1 Acidic gradational brown loam (Eutrophic, Brown Dermosol)
Medium thickness loam, becoming clay loamy and gravelly with depth, overlying an orange friable clay subsoil, grading to soft shale or siltstone.

L1b Shallow stony loam (Basic / Calcareous, Paralithic, Leptic Tenosol)
Thick reddish brown stony sandy loam to loam, grading to weathering fine sandstone, with occasional soft carbonate segregations in cracks.

Soils formed on alluvium

F1 Sandy loam over brown sandy clay (Bleached-Mottled, Eutrophic, Brown Chromosol)
Thick dark brown loamy sand to light sandy clay loam with a bleached A2 horizon, overlying a yellow brown and grey brown sandy clay to medium clay with coarse prismatic structure, grading to variable grey, brown and yellow mottled clayey sand to sandy clay alluvium.

M1 Deep gradational sandy loam (Bleached-Acidic, Mesotrophic, Grey Kandosol)
Very thick sandy loam surface soil, with a bleached A2 horizon, grading to a dark grey massive light sandy clay loam to sandy clay loam, overlying clayey sand alluvium.

Further information: DEWNR Soil and Land Program