

ANG Angaston Land System

Low hills between Stockwell and Angaston

Area: 67.6 km²

Annual rainfall: 490 – 640 mm average

Geology: There are two distinctive geological formations underlying the Land System. The Angaston Marble is predominant in the west, and a range of non calcareous metamorphosed sedimentary rocks dominates the east. These include metasandstones, phyllites, metasilstones and schists of the Tapley Hill, Tarcowie, Ulupa and Wilyerpa Formations and the Normanville Group. Secondary carbonate is generally absent in soils formed on the non calcareous rocks. There are significant deposits of localized outwash sediments, mainly in the south and east. These are mainly medium to coarse grained.

Topography: The Land System includes dissected low hills forming the eastern boundary of the Barossa Valley between Stockwell and Angaston, and undulating to rolling rises and low hills south and east of Angaston. The landscape in the north has relief of up to 60 m and slopes of up to 30% due to dissection by the North Para River and Duckponds Creek. The land in the south and east comprises broad undulating rises with alluvial flats, interspersed with steeper rocky crests.

Elevation: 440 m in the east to 300 m at the exit point of the North Para River

Relief: Maximum relief is 60 m

Soils: The soils are moderately deep with loam or sandy loam surfaces, and usually with red or brown clayey subsoils. Weathering rock is generally evident within a metre. The calcareous rocks usually give rise to more clayey soils with better structure than the non calcareous types. Deep sandy to loamy soils with variable subsoils occur on creek flats.

Main soils

K3 Fine sandy loam over red clay on non calcareous basement rock

B4/B5 Gradational red or black loam on calcareous rock

K1 Gradational brown fine sandy loam on non calcareous basement rock

Minor soils

Soils formed on non calcareous rocks

L1 Shallow stony sandy loam

K2 Acidic loam over red clay

K4 Acidic sandy loam over brown mottled clay

K5 Gradational sandy loam on rock

Soils formed on alluvium

M1 Deep gradational sandy loam

F1 Loamy sand over brown/red clay

F2 Sandy loam over brown dispersive clay

M4 Deep gradational loam

E3 Grey brown cracking clay

Soils formed on calcareous rocks

D1 Loam over red clay on calcareous rock

A2 Calcareous loam

B3 Shallow loam on calcrete

M2/E2 Dark clay



Main features:

The Angaston Land System includes extensive areas of non arable hill country with shallow loamy soils over calcareous rocks or stony sandy loams over coarse grained rocks. Semi arable and arable slopes have a range of shallow stony soils to moderately deep texture contrast soils, most of which have moderately low fertility and are highly erodible. Creek flats and outwash fans have mostly deep sandy surfaced soils. The main limitations on the slopes are erosion potential, shallow stony soils and poor surface structure. On the creek flats, sporadic waterlogging and low fertility are the main issues. Most of the land, except the shallow stony soils on steeper slopes and wetter flats has horticultural potential.

Soil Landscape Unit summary: 15 Soil Landscape Units (SLUs) mapped in the Angaston Land System:

SLU	% of area	Main features #
ACC	8.2	Moderately steep low hills up to 70 m high with slopes of 10-30% formed on interbedded metasilstones and "honeycomb rock" (silica cemented calcareous rock from which the carbonate has been dissolved). There is up to 20% surface quartz, siltstone and limestone. Main soils: <u>acidic loam over red clay</u> - K2 (E) and <u>gradational brown fine sandy loam</u> - K1 (E) with <u>loam over red clay on calcareous rock</u> - D1 (L) and <u>gradational red or black loam</u> - B4/B5 (L). Minor soils include <u>dark clay</u> - M2/E2 on slopes, and <u>deep gradational loam</u> - M4 on creek flats and lower slopes. This land is generally too steep for cultivated agriculture, but most is suitable for perennial crops. The soils, although stony, are relatively deep, fertile and well structured.
ADC	22.0	Moderately steep slopes formed on interbedded Angaston Marble, metasandstones, phyllites and schists. Slopes are 15-30% and relief is up to 70 m. There is up to 20% surface stone, and sporadic rock outcrop. Main soils: <u>gradational red or black loam</u> - B4/B5 (E), with <u>calcareous loam</u> - A2 (L), <u>loam over red clay</u> - D1 (L) and <u>shallow loam on calcrete</u> - B3 (M) on calcareous rocks, and <u>fine sandy loam over red clay</u> - K3 (C) and <u>shallow stony sandy loam</u> - L1 (C) on non calcareous rocks. This land is generally too steep for cultivated agriculture, and soils are often marginally shallow for horticulture, although physically and chemically they are ideal. There are extensive marble quarries in the unit.
ANC ANI	7.5 4.1	Low hills formed on metasandstones and phyllites. ANC Low hills up to 50 m high with slopes of 15-30%. ANI Moderate slopes of 15-30% and up to 60 m high created by the downcutting of Duckponds Creek. Water courses are generally eroded. Main soils: <u>acidic sandy loam over brown mottled clay</u> - K4 (E) and <u>shallow stony sandy loam</u> - L1 (E) with <u>fine sandy loam over red clay</u> - K3 (L) and <u>acidic loam over red clay</u> - K2 (L). This land is mostly too steep for cultivated agriculture, but there is horticultural potential on the gentler less stony slopes. Shallow stony soils and erosion potential are the major limitations.
CgC CgD CgH	8.9 14.2 5.7	Rises formed on metamorphosed fine sandstones and phyllites of the Tarcowie and Tapley Hill Formations. There is up to 10% surface stone, and isolated rock outcrop on steeper slopes. CgC Gentle slopes and undulating rises to 30 m high with slopes of 3-10%. CgD Gently rolling low hills to 50 m high and isolated moderately steep rises and crests within CgC . Slopes are 8-20%. There is some water course erosion and sporadic rock outcrop. CgH Slopes of 3-10% with eroded water courses. Main soils: <u>sandy loam over red clay</u> - K3 (E), <u>gradational brown fine sandy loam</u> - K1 (C) and <u>shallow stony sandy loam</u> - L1 (C), with <u>acidic sandy loam over brown mottled clay</u> - K4 (L), <u>acidic loam over red clay</u> - K2 (M) and <u>gradational sandy loam on rock</u> - K5 (M). <u>Deep gradational loam</u> - M4 and <u>deep gradational sandy loam</u> - M1 are minor on lower slopes and narrow flats. This land is transitional between the hard red soils typical of the mid north and the grey sandy loam country of the eastern Mt. Lofty Ranges. The variation within this land is principally due to variations in soil depth. Shallow rocky soils are interspersed with deeper texture contrast soils. All have moderate to low natural fertility, and are highly erodible due to the high fine sand content of the surfaces. This also causes the soils to set hard, so patchy establishment can be expected. Soil acidity is likely,



		particularly where there is a long history of legume based pastures. Use of lime (where pH levels are low), gypsum and modified surface management practices will help alleviate problems of acidity and poor soil structure.
DDD	6.6	Moderate slopes and low hills with slopes of 10-20% formed on interbedded metasiltstones and "honeycomb rock" (silica cemented calcareous rock from which the carbonate has been dissolved). There is up to 20% surface quartz, siltstone and limestone. Main soils: <u>loam over red clay on calcareous rock</u> - D1 (E) and <u>acidic loam over red clay</u> - K2 (E) with <u>gradational brown fine sandy loam</u> - K1 (C) and <u>gradational red or black loam</u> - B4/B5 (L). Minor soils include <u>dark clay</u> - M2/E2 on slopes, and <u>deep gradational sandy loam</u> - M1 and <u>deep gradational loam</u> - M4 on lower slopes and creek flats. These soils are generally moderately deep, fertile and well structured. Erosion potential is their main limitation. Cropping potential is limited but horticultural potential is good.
ELC ELD	5.9 1.7	Rises and low hills formed on Angaston Marbles interbedded with miscellaneous metasediments and phyllites. There is up to 10% surface sandstone, quartzite and marble and minor rock outcrop. ELC Rises with slopes of 5-10% and relief to 30 m. ELD Rises and low hills with slopes of 10-20% and relief to 40 m. Main soils: <u>gradational red or black loam</u> - B4/B5 (E), with <u>calcareous loam</u> - A2 (L) and <u>loam over red clay</u> - D1 (L) on calcareous rocks, and <u>sandy loam over red clay</u> - K3 (C), <u>shallow stony sandy loam</u> - L1 (L) and <u>acidic sandy loam over brown mottled clay</u> - K4 (M) on non calcareous rocks. These soils are generally moderately fertile and well structured, although often shallow. The soils formed on non calcareous rocks are less fertile and less well structured, with associated higher erosion potential. Except for stonier areas (usually on the steeper ground), the land has good horticultural potential.
LRC LRE LRe LRH	2.7 6.7 2.3 1.7	Outwash fans, creek flats and drainage depressions formed on medium to coarse grained alluvium. LRC Fans with slopes of 2-5%. LRE Drainage depressions and valley flats with slopes of 2-10%. LRe Creek flats with eroded water courses and sporadic saline seepage. LRH Fans with slopes of 3-6% and eroded water courses. Main soils: <u>deep gradational sandy loam</u> - M1 (E) and deep <u>sandy loam over brown / red clay</u> - F1 (E), with deep <u>sandy loam over brown dispersive clay</u> - F2 (L), <u>deep gradational loam</u> - M4 (L) and <u>grey brown cracking clay</u> - E3 (M). These soils are deep and generally well drained (exceptions are those with dispersive subsoils). Fertility is moderately low due to the mainly sandy surfaces. Although much of LRE is within the town of Angaston, there is significant horticulture on the land. In the east the land is used mainly for grazing. It tends to be less well drained and there is evidence of salinity.
LUO	1.8	Valley flats with well defined watercourses formed on medium to fine grained alluvial sediments. There are sporadic saline seepages where salty water tables are near the surface. The dominant soils have massive sandy surfaces overlying dark grey or yellow brown mottled sandy clay loam to clay subsoils. Main soils are deep <u>sandy loam over brown dispersive clay</u> - F2 (E) and <u>deep gradational sandy loam</u> - M1 (E). These soils are deep but imperfectly to poorly drained due to perching of water on clayey subsoils, or shallow seasonal water tables on low lying ground. Fertility is moderate to low, depending on clay content. Most soils are acidic, and all are susceptible to acidification. Surface soils are susceptible to compaction which can occur if the soils are worked or over-grazed when wet. There is minor stream bank erosion.

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:

- A2** Calcareous loam (Paralithic / Petrocalcic, Calcic Calcarosol)
10 - 25 cm calcareous loam to clay loam on marble or calcreted rock. Limited (slopes).
- B3** Shallow loam on calcrete (Petrocalcic Calcarosol)
Up to 30 cm loam over calcreted basement rock. Minor on slopes.
- B4/B5** Gradational red or black loam (Petrocalcic / Eutrophic, Red / Black Dermosol)
15 - 25 cm crumbly loam to clay loam grading to a well structured red or black clay loam to clay over calcreted rock or marble at 45 cm. Extensive on slopes.
- D1** Loam over red clay on calcareous rock (Eutrophic, Red Chromosol)
Up to 40 cm loam to clay loam overlying a well structured red clay grading to limestone or marble at 70 cm. Extensive on rises.
- E3** Grey brown cracking clay (Brown / Grey Vertosol / Dermosol)
Dark brown to dark grey seasonally cracking clay, becoming brown and grey mottled and weakly calcareous with depth. Minor on creek flats.
- F1** Sandy loam over brown / red clay (Eutrophic, Brown / Red Chromosol)
30 - 70 cm loamy sand to sandy loam abruptly overlying a red to brown sandy clay loam to sandy clay grading to alluvium. Extensive on creek flats.
- F2** Sandy loam over brown dispersive clay (Calcic, Brown Sodosol)
30 - 50 cm sandy loam over a coarsely structured brown mottled dispersive clay, calcareous from 60 cm. Limited on creek flats.
- K1** Gradational brown fine sandy loam (Eutrophic, Brown Kandosol)
20 - 35 cm fine sandy loam grading to a brown to red fine sandy clay loam, often with ironstone gravel over phyllite at 70 cm. Common on slopes.
- K2** Acidic loam over red clay (Eutrophic, Red Chromosol)
15 - 40 cm loam to clay loam abruptly overlying a well structured red clay grading to metasiltstone or phyllite at 70 cm. Extensive on rises.
- K3** Sandy loam over red clay (Eutrophic, Red Chromosol)
20 - 60 cm hard gravelly fine sandy loam to silty loam abruptly overlying a red structured clay grading to weathering metamorphosed fine sandstone, phyllite or schist at 80 cm. Extensive on rises in the south-east.
- K4** Acidic sandy loam over brown mottled clay (Eutrophic Brown, Chromosol / Sodosol)
25 - 65 cm stony loamy sand to sandy loam abruptly overlying a coarsely structured brown and red mottled sandy clay to clay, grading to metasandstone or phyllite at 80 cm. Limited on slopes.
- K5** Gradational sandy loam on rock (Mesotrophic, Brown Kandosol / Paralithic, Brown-Orthic Tenosol)
Thick to very thick loamy sand to sandy loam becoming slightly more clayey at depth with variable gravel, over weathering rock at about 100 cm.
- L1** Shallow stony sandy loam (Lithic, Leptic Tenosol)
Up to 50 cm stony sandy loam to loam directly overlying metasandstone, phyllite or marble. Common on slopes.
- M1** Deep gradational sandy loam (Eutrophic, Brown Kandosol / Regolithic, Brown-Orthic Tenosol)
30 cm to more than 100 cm fine sandy loam grading to a brown fine sandy clay loam over alluvium. Extensive on creek flats.
- M2/E2** Dark clay (Red / Black Dermosol / Vertosol)
Dark friable seasonally cracking clay loam to clay, becoming coarsely structured and redder with depth, over fine carbonate, grading to weathering rock below 100 cm. Minor on hillslopes.
- M4** Deep gradational loam (Eutrophic, Brown Kandosol)
Medium to thick loam grading to a weakly structured compact brown clay loam over alluvium.

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

