

UHE Upper Hermitage Land System

Moderately steep to steep low hills between Anstey Hill and Victoria Hill (west of the Barossa Reservoir)

Area: 47.6 km²

Annual rainfall: 600 – 750 mm average

Geology: The land is underlain by a variety of rocks of the Stonyfell Quartzite, Woolshed Flat Shale and Castambul/Montacute Dolomite Formations. Rock types include fine, medium and coarse grained sandstones and siltstones, with interbedded quartzites and dolomites/calcareous siltstones. The landscape was evidently once lateritized, but most of this deep weathering material has been eroded, with only minor summit surface remnants. Unconsolidated alluvial sediments (locally derived) occupy minor creek flats. These sediments are mostly medium to coarse grained.

Topography: The landscape is dominated by moderately steep to steep hillslopes. The underlying geological strata impose a distinctive grain to the country, with prominent quartzitic ridges trending NNE - SSW. This directs drainage to some extent, but a system of east - west water courses creates a reticulate pattern. Most of the land drains into the South Para or Little Para catchments, except for the south western slopes which form part of the western escarpment of the ranges.

Elevation: 120 m where the South Para River cuts through in the north, to 410 m in the south

Relief: Up to 120 m, but mostly in the range 50 - 80 m

Soils: Most soils are moderately deep to shallow over basement rock. Surface soils vary from loamy sands to clay loams, depending on the grain size of the parent rock. Most profiles have clayey subsoils, but there is a significant number of shallow stony soils forming directly in rock. Texture contrast soils formed on deeply weathered, kaolinized or lateritized rock occur sporadically, usually on gentler slopes. Deep texture contrast or sandy loam gradational soils formed on alluvium are limited to minor creek flats.

Main soils: *Soils formed in acid-neutral weathering basement rock*
K2a Acidic loam over red clay
K4 Acidic sandy loam over brown clay
L1 Shallow stony soil - sandy loam (**L1a**) or loam (**L1b**)

Minor soils: *Soils formed in acid-neutral weathering basement rock*
K1 Acidic gradational brown loam (**K1a**), sandy loam (**K1b**) or red loam (**K1c**)
K2b Acidic loam over brown and red clay
K3 Acidic sandy loam over red clay
K5 Acidic gradational coarse sandy loam
Soils formed in calcified weathering basement rock
C2 Shallow gradational red loam
D1 Shallow loam over red clay
Soils formed in deeply weathered basement rock
K4/J2 Acidic sandy loam over brown clay on kaolinized rock
F1a Sandy loam over brown clay on saprolite



Soils formed on lateritized basement rock

K1/J2 Deep loamy ironstone soil

Soils formed in alluvial outwash sediments

F1b Sandy loam to loam over brown clay

F2 Sandy loam over poorly structured brown clay

M1 Deep sandy loam

Main features: The Upper Hermitage Land System is characterized by moderately steep to steep hillslopes. Only minor summit surfaces and creek flats (less than 10% of overall area) are potentially arable. Almost 50% of the land is too steep for agricultural machinery. The soils are moderately deep to shallow over a variety of basement rocks, which influence surface texture, depth and natural fertility. Most of the slopes are well to moderately well drained. The more moderate slopes with limited rocky outcrop and mostly reasonably deep soils have potential for perennial horticultural crops where water is available.

Soil Landscape Unit summary: 11 Soil Landscape Units (SLUs) mapped in the Upper Hermitage Land System

SLU	% of area	Main features #
AaC AaD	20.3 8.6	<p>Rolling to steep low hills and hills formed on siltstones, fine sandstones and minor quartzites and dolomites of the Woolshed Flat and Castambul Formations. Slopes range from 18% to 50%. On some upper slopes and broader crests, slopes are less than 10%. Relief varies from about 40 metres on rolling country to 120 metres in strongly dissected country. Drainage depressions are narrow with well defined water courses. There is usually an abrupt break between creek flats and adjacent hillslopes.</p> <p>AaC Rolling low hills and slopes with relief to 70 m, slopes of 18-30% and minor surface stone. AaD Steep to very steep hillslopes with relief to 120 m, slopes of 30-50%, occasional rock outcrop and moderate surface stone.</p> <p>The soils are mostly loamy with red to brown clay subsoils forming in weathering rock. On steeper slopes, loamy surface soils are formed directly in rock. Red loamy soils overlying soft to semi-hard carbonate occur on calcareous rocks.</p> <p>Main soils: <u>Acidic loam over red clay on rock - K2a</u> (E) <u>Shallow stony loam - L1b</u> (C) <u>Shallow gradational red loam - C2</u> (L) on calcareous rocks <u>Acidic gradational brown loam - K1a</u> (L) <u>Acidic loam over brown and red clay - K2b</u> (M)</p> <p>These soils are moderately deep to shallow, the latter usually more common on steeper slopes. All soils are moderately well to well drained and relatively fertile, although prone to acidification. However, land use is primarily restricted by the topography. The gentler slopes of AaC are non arable, but suitable for perennial crops where water is available. The steep slopes of AaD are mainly used for rough grazing.</p>
AsC AsD	12.2 12.2	<p>Moderately steep to steep hillslopes formed on medium to coarse grained sandstones with limited interbedded fine sandstones, siltstones and quartzites of the Stonyfell Formation. Rocky outcrops are variable, but extensive on steeper slopes.</p> <p>AsC Rolling moderately rocky low hills with relief to 60 m and slopes of 18-30%. AsD Steep, rocky hillslopes with relief to 70 m and slopes of 30-50%.</p> <p>Most soils are moderately deep to shallow over bedrock. Sandy to sandy loam soils with clayey subsoils occur on the coarser grained rocks. Loamier soils are typical on finer grained rocks.</p> <p>Main soils: <u>Acidic sandy loam over brown clay on rock - K4</u> (E) } on sandstones <u>Shallow stony sandy loam - L1a</u> (E) } <u>Acidic gradational brown loam - K1a</u> (L) } on finer grained rocks <u>Acidic loam over brown and red clay - K2b</u> (L) } <u>Acidic gradational sandy loam - K1b</u> (M) on upper slopes <u>Acidic gradational coarse sandy loam on rock - K5</u> (M) on coarse sandstone strata <u>Shallow loam over red clay - D1</u> (M) on calcified rocks</p>



		Soil depth is highly variable, depending on the type of underlying rock. The soils are moderately well to well drained, but most have low natural fertility and are prone to acidification. Moderately steep to steep slopes are the main limitation to land use. The gentler slopes of AsC are suitable for perennial crops (where water is available) and improved pastures, but the steep slopes of AsD are suitable only for rough grazing. Most soils are highly erodible - maintenance of protective surface cover is essential.
AuD	2.4	<p>Rocky steep low hills with relief to 100 m and slopes of 30-75%, formed on medium to coarse grained sandstones and quartzites of the Stonyfell Formation. Drainage valleys are narrow and deeply incised. Most soils are shallow over bedrock, with sandy, gritty and stony surfaces. Subsoils are often absent.</p> <p>Main soils: <u>Acidic gradational coarse sandy loam on rock</u> - K5 (E) <u>Shallow stony sandy loam</u> - L1a (C) <u>Acidic sandy loam over brown clay on rock</u> - K4 (L) <u>Acidic sandy loam over red clay</u> - K3 (L) <u>Acidic gradational sandy loam</u> - K1b (M)</p> <p>This land is too steep, and the soils too shallow, stony and infertile for any significant agricultural production.</p>
AwC AwD	10.1 26.5	<p>Rolling low hills to steep hills formed on siltstones, sandstones, quartzites and dolomites of the Castambul/Montacute Dolomite Formation. The steep hills have strong north-south orientation of strike ridges and secondary east-west oriented spurs. Slopes are 30% to 80% and relief is up to 150 metres. Crests and drainage depressions are narrow. Quartzite outcrops are extensive on steeper slopes.</p> <p>AwC Gently rolling to rolling low hills with relief to 60 m and slopes of 10-30%. AwD Steep, rocky hillslopes with relief to 150 m and slopes of 30-80%.</p> <p>Loamy surface soils with red or brown subsoils are most common. Sandier surfaces and yellower subsoils occur on coarser grained rocks. Shallow soils are common on steeper, rocky slopes. Subsoil carbonate layers occur in soil on calcareous rocks.</p> <p>Main soils: <u>Acidic loam over red clay</u> - K2a (E) } on fine grained rocks <u>Shallow stony loam</u> - L1b (L) } <u>Acidic sandy loam over brown clay</u> - K4 (L) } on coarser grained rocks <u>Shallow stony sandy loam</u> - L1a (L) } <u>Sandy loam over brown clay on saprolite</u> - F1a (L) <u>Shallow gradational red loam</u> - C2 (M) } on calcified rocks <u>Shallow loam over red clay</u> - D1 (M) }</p> <p>These soils are moderately deep to shallow, generally well drained and with moderate to low fertility. All are prone to acidification. Moderate to steep slopes limit land use to grazing, with some opportunities for perennial crops on AwC where water is available.</p>
FgZ	2.8	<p>Undulating upper slopes and crests (summit surfaces) of rolling to steep low hills, with slopes ranging from 2% on crests to 20% on the margins grading to the steeper slopes below. The underlying rocks are deeply weathered kaolinized siltstones and sandstones. The soils are deep over kaolinized and / or lateritized rock. Surfaces are sandy to loamy with variable ironstone gravel. Subsoils are clayey and red or yellow brown. Variations in soils are due to the depth of weathering and the nature of the underlying materials. Main soils: <u>Deep loamy ironstone soil</u> - K1/J2 (E) <u>Acidic gradational red loam</u> - K1c (E) <u>Acidic sandy loam over brown clay on kaolinized rock</u> - K4/J2 (L)</p> <p>These soils are deep and moderately well drained but low in natural fertility. There is potential for a range of land uses, given the generally gentle slopes, but low fertility and exposure limit productivity.</p>
FiZ	0.6	<p>Summit surfaces with gently sloping crests, moderately inclined (up to 15% slope) as they grade away to the hillsides below. The landscape is formed on deeply weathered kaolinized Tertiary age sands and sandy clays, usually occurring as thin remnants on basement rock. Surface ironstone is common, often occurring as large boulders. The soils are sandy surfaced and usually gravelly. Most have yellow to brown clayey subsoils forming in highly weathered sandstones or gravel beds.</p> <p>Main soils: <u>Ironstone soil</u> - J2a (E) <u>Stony gradational loamy sand</u> - M3 (C) <u>Bleached sand over sandy clay loam</u> - G2/G5 (L) <u>Sandy loam over brown mottled clay</u> - F1/K1 (L)</p> <p>These soils are extremely infertile and acidic. They have very little development potential.</p>



LtE	2.1	Narrow creek flats and drainage depressions infilled by variable sediments from adjacent hillslopes.
LtJ	2.2	All have well defined water courses, some of which are eroded. LtE Creek flats with generally stable water courses. LtJ Creek flats with water courses which are commonly eroded. Soils are deep, but highly variable, as is usual on creek flats emanating from hills of mixed rock types. Typical soils: <u>Sandy loam to loam over brown clay</u> - F1b (E) <u>Deep sandy loam</u> - M1 (E) <u>Sandy loam over poorly structured brown clay</u> - F2 (L) Although deep, these soils are often imperfectly drained, and the sandier types are low in natural fertility. Productive potential is variable, relying on adequate drainage. There is scope for some intensive production in better drained areas. Water courses are an important feature, and measures are required to prevent or control erosion and minimize water pollution.

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

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| (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 in acid-neutral weathering basement rock

- K1a** Acidic gradational brown loam (Eutrophic, Brown Dermosol)
Medium thickness loam, becoming clay loamy and gravelly with depth, overlying an orange friable clay, grading to soft shale or siltstone.
- K1b** Acidic gradational sandy loam (Mesotrophic, Brown Kandosol)
Medium thickness loamy sand to sandy loam with a pale and gravelly A2 horizon, grading to a yellow and brown sandy clay loam merging with a clay loam or light clay forming in soft weathering sandstone.
- K1c** Acidic gradational red loam (Eutrophic, Red Dermosol)
Medium thickness dark brown loam with a paler coloured clay loamy A2 horizon containing abundant ferruginous rock fragments, overlying a red clay with polyhedral structure and increasing rock fragments with depth, grading to soft weathering siltstone at about 100 cm.
- K2a** Acidic loam over red clay on rock (Eutrophic, Red Kurosol)
Medium thickness loam with a paler coloured and gravelly A2 horizon, overlying a reddish brown to red, well structured clay with rock fragments, grading to weathering siltstone or slate by 100 cm.
- K2b** Acidic loam over red and brown clay on rock (Mottled, Eutrophic, Red / Brown Kurosol)
Thick sandy loam to loam with a paler coloured and gravelly A2 horizon, overlying a yellowish brown, brown and red well structured clay grading to weathering siltstone or fine sandstone by 100 cm.
- K3** Acidic sandy loam over red clay (Mesotrophic, Red Chromosol)
Medium thickness loamy sand to sandy loam surface soil, 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, with a bleached and very gravelly A2 horizon, overlying a yellowish brown, red and brown sandy clay to clay grading to weathering medium to fine sandstone by 100 cm.
- K5** Acidic gradational coarse sandy loam on rock (Bleached-Acidic, Mesotrophic, Brown Kandosol)
Thick, gravelly loamy coarse sand to coarse sandy loam with a bleached and very gritty and gravelly A2 horizon, overlying a brown or yellow sandy clay loam to sandy clay with abundant rock fragments, grading to coarse grained sandstone.



L1a Shallow stony sandy loam (Acidic, Lithic, Bleached-Leptic Tenosol)

Thick, greyish, very gravelly loamy sand to sandy loam with a bleached A2 horizon, grading to hard sandstone or quartzite by 50 cm.

L1b Shallow stony loam (Basic, Paralithic, Leptic Tenosol)

Thick, stony sandy loam to loam, forming in weathering siltstone at 50 cm or less.

*Soils formed in calcified weathering basement rock***C2** Shallow gradational red loam (Calcic, Red Dermosol)

Medium thickness dark reddish brown loam grading to a reddish well structured loam to clay loam, over soft, highly calcareous siltstone, or soft carbonate with siltstone fragments throughout at about 50 cm.

D1 Shallow loam over red clay (Calcic, 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.

*Soils formed in deeply weathered basement rock***K4/J2** Acidic sandy loam over brown clay on kaolinized rock (Bleached, Mesotrophic, Brown Kurosol)

Medium to thick gravelly loamy sand to sandy loam, with a bleached and very gravelly A2 horizon, overlying a yellowish brown, red and brown sandy clay to clay grading to soft kaolinized sandstone by 100 cm, continuing below 200 cm.

F1a Sandy loam over brown clay on saprolite (Bleached-Mottled, Mesotrophic, Brown Kurosol)

Thick grey loamy sand to loam with a gravelly and bleached A2 horizon, overlying a brown, yellowish brown and red coarsely prismatic sandy clay to clay, becoming siltier and greyer with depth. Soft weathering metasandstone occurs from about 150 cm.

*Soils formed on lateritized basement rock***K1/J2** Deep loamy ironstone soil (Ferric, Red Dermosol)

Medium thickness reddish brown sandy loam to sandy clay loam with a paler coloured and ironstone gravelly A2 horizon, overlying a yellowish red to brown clay loam grading to medium clay with polyhedral structure. The clay grades to a pale grey kaolinitic silty clay loam with laterite fragments, forming in deeply weathered siltstone or sandstone deeper than 200 cm.

*Soils formed in alluvial outwash sediments***F1b** Sandy loam to loam over brown clay (Bleached-Mottled, Hypocalcic / Eutrophic, Brown Chromosol)

Thick loamy sand to sandy clay loam with a strongly bleached A2 horizon, sharply overlying a yellowish brown, grey and red mottled clay grading to fine grained alluvium.

F2 Sandy loam over poorly structured brown clay (Eutrophic, Brown Sodosol)

Thick grey brown hard loamy sand to sandy loam with a bleached A2 horizon, overlying a yellow brown, brown and red massive sandy clay loam to sandy clay with coarse columnar structure.

M1 Deep sandy loam (Regolithic, Brown-Orthic Tenosol / Eutrophic, Brown Kandosol)

Thick brown sandy loam, overlying a grey to brown silty sand to silty clay loam with weak prismatic structure, grading to variable sandy, gritty and clayey alluvial sediments.

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

