

# FOR Forreston Land System

Undulating to gently rolling low hills with loamy soils in the Forreston - Mount Torrens area

**Area:** 54.0 km<sup>2</sup>

**Annual rainfall:** 705 – 860 mm average

**Geology:** The land is formed on predominantly fine grained weakly metamorphosed rocks of the Saddleworth, Balhannah and Stonyfell Formations. Main lithological types are phyllites, fine grained schists and slates. These rocks are often deeply weathered, giving rise to deep soil profiles. On lower slopes and flats are extensive deposits of mainly fine grained locally derived outwash sediments.

**Topography:** The Forreston Land System comprises two tracts of undulating to rolling rises and low hills, separated by a quartzite range of the Mount Torrens Land System. The Torrens River flows from east to west through the landscape, and is fed by several drainage systems. These are characterized by broad valleys which grade almost imperceptibly to the basement rock rising ground. Slopes are mostly less than 20%.

**Elevation:** 320 m where the Torrens flows out to 510 m in the south

**Relief:** Up to 80 m but usually less than 50 m

**Soils:** Most soils are moderately deep to deep, with loamy to clay loamy surfaces overlying well structured clayey subsoils. On rising ground the soils are formed over weathering rock, although commonly this is deeper than 100 cm. Depth to rock tends to increase downslope. In valley flats, basement rock is usually buried below unconsolidated local outwash sediments. Medium to fine textured gradational soils are common in valleys, reflecting the generally fine grained nature of the parent rocks of the System.

## Main soils

### *Soils formed in weathering basement rock*

**K2** Acidic loam over brown (**K2a**) or red (**K2b**) clay

**K3** Acidic sandy loam over red clay

**K1** Acidic gradational loam

### *Soils formed in alluvial outwash sediments*

**F1c** Sandy loam to loam over brown clay

## Minor soils

### *Soils formed in weathering basement rock*

**K4** Acidic sandy loam over brown clay

### *Soils formed in deeply weathered basement rock*

**F1** Loam (**F1a**) to sandy loam (**F1b**) over brown clay

### *Soils formed in alluvial outwash sediments*

**E1/M2** Deep black clay to clay loam

**M2** Grey clay loam or clay

**Main features:** The Forreston Land System is characterized by a rounded, undulating to gently rolling landscape dominated by loamy surfaced soils with clayey subsoils. These soils are generally moderately deep to deep, moderately well drained and inherently fertile. Less than 8% of the land is too steep for arable land uses, so the potential for horticulture and other more intensive uses is high where water is available. The main limitation is the potential for erosion, particularly on moderate slopes. Minor salinity is of local concern.



**Soil Landscape Unit summary:** 14 Soil Landscape Units (SLUs) mapped in the Forreston Land System:

SLU	% of area	Main features #
AqC	1.6	<p>Moderately inclined to steep strike ridges, generally with well defined north-south lineation. Parent rocks are metamorphosed sandstones and quartzites of the Stonyfell, Gilbert Range and Mitcham Quartzite Formations. In general, slopes are 15% to 30%, but up to 50% in places and relief is up to 80 metres. Creek lines are well defined and narrow, usually unmappable.</p> <p><b>AqC</b> Moderately inclined and sporadically rocky hillslopes, upper slopes and crests and rolling low hills with relief to 80 m and slopes of 15-30%.</p> <p><b>AqD</b> Steep, rocky hillslopes and prominent ridges with relief to 100 m and slopes of 30-50%.</p> <p>There is a range of soils, usually with gravelly sandy loam to sandy clay loam surfaces and variably coloured and structured clay subsoils, formed on fresh weathering or deeply weathered and kaolinitic micaceous sandstones. Shallow stony soils are common on steeper or rocky slopes. Deeper texture contrast soils occur on lower slopes.</p> <p>Main soils: <u>Acidic sandy loam over poorly structured brown clay</u> - <b>K4a</b> (E)  <u>Shallow sandy loam on rock</u> - <b>L1</b> (E) on steeper rocky slopes  <u>Acidic sandy loam over red clay</u> - <b>K3</b> (L)  <u>Sandy loam over brown clay on deeply weathered rock</u> - <b>F1b</b> (L)</p> <p>The land is non arable, although the majority is suitable for perennial crops provided erosion is controlled. Despite the rocky reefs, most soils are moderately deep, moderately well drained and have adequate water holding capacities. Natural fertility is low, and all soils are prone to acidification. Most soils have poor surface structure, and are highly erodible.</p>
AxC	6.2	<p>Rolling slightly rocky low hills with relief to 80 m and slopes of 18-30%. Underlying rocks are phyllites, fine grained schists and slates. Soils are typically moderately deep loams with clayey subsoils over weathering rock.</p> <p>Main soils: <u>Acidic loam over brown or red clay</u> - <b>K2a/K2b</b> (E)  <u>Acidic gradational loam</u> - <b>K1</b> (C)  <u>Acidic sandy loam over red clay</u> - <b>K3</b> (L) on coarser grained rocks</p> <p>Although non arable due to moderate slopes, this land has potential for productive perennial crops and pastures. The soils are moderately deep, well drained, and inherently fertile, although acidic. Erosion control during establishment phases is essential.</p>
BdC BdD	16.9 44.6	<p>Undulating rises, gentle slopes and gently rolling low hills formed on phyllites, fine grained schists and slates. Slopes range from 4% to 18%, and relief varies from 20 to 50 m. Water courses are well defined and too narrow in their upper reaches to be mappable. Minor granitic outcrops occur in places.</p> <p><b>BdC</b> Undulating rises and gentle slopes with relief to 30 m and slopes of 4-10%.</p> <p><b>BdD</b> Gently rolling low hills with relief to 50 m and slopes of 10-18%.</p> <p>Soils are mostly moderately deep, overlying fine grained metamorphic rocks. They have loamy surfaces and variably coloured and structured subsoil clays.</p> <p>Main soils: <u>Acidic loam over brown to red clay on rock</u> - <b>K2b / K2a</b> (E) on fine grained rocks  <u>Acidic sandy loam over red or brown clay on rock</u> - <b>K3 / K4</b> (C) on quartzitic and coarser grained rocks  <u>Loam to sandy loam over brown clay</u> - <b>F1a / F1b</b> (L) on lower slopes  <u>Acidic gradational loam</u> - <b>K1</b> (L) on upper slopes  <u>Sandy loam over brown clay</u> - <b>F1c</b> (M) on unmappable creek flats</p> <p>This land is arable with mostly deep, naturally fertile and moderately well drained soils. Slight limitations are caused by poorly structured hard setting surface soils, and susceptibility to acidification and associated manganese toxicity. This is potentially some of the most productive land in the Mount Lofly Ranges, but more intensive development must be accompanied by appropriate erosion control.</p>



CbC CbD	2.5 0.8	<p>Undulating rises to gently rolling low hills formed on micaceous sandstones, commonly kaolinized, of the less quartzitic strata of the Stonyfell and Mitcham Quartzite Formations. Slopes range from 3% to 18% and relief is as low as 20 metres on undulating rises to a maximum of 60 metres on low hills. Water courses are well defined in broad drainage depressions.</p> <p><b>CbC</b> Undulating rises with relief to 40 m and slopes of 3-8%.  <b>CbD</b> Gently rolling low hills with relief to 60 m and slopes of 8-18%.</p> <p>The majority of soils have sandy to loamy surfaces overlying brown or red clay subsoils forming in fresh, or more commonly deeply weathered, basement rock. Deeper texture contrast soils on alluvium are common on lower slopes.</p> <p>Main soils: <u>Acidic sandy loam over poorly structured brown clay</u> - <b>K4a</b> (E) } on slopes  <u>Acidic sandy loam over red clay</u> - <b>K3</b> (C) }  <u>Sandy loam over brown clay on deeply weathered rock</u> - <b>F1b</b> (C) }  <u>Sandy loam over brown clay</u> - <b>F1c</b> and <b>F1d</b> (L) on lower slopes and drainage creek flats</p> <p>Most soils are deep, but drainage is commonly imperfect due to perching of water on clayey subsoils, and natural fertility is low. All soils are prone to acidification. The soils are highly erodible, so <b>CbD</b> in particular is at high risk of erosion if protective vegetative cover is removed.</p>
LEJ	0.6	<p>Alluvial flats of the River Torrens formed on sand, clayey sand and sandy clay alluvium derived from the erosion of coarse grained metamorphic rocks. The soils are predominantly sandy, with most profiles having clayey subsoils, some of which are sodic. There are also deep sandy soils.</p> <p>Main soils: <u>Sandy loam over poorly structured brown clay</u> - <b>F2a</b> (E)  <u>Thick sand over brown clay</u> - <b>G3</b> (E)  <u>Bleached siliceous sand</u> - <b>H3</b> (L)</p> <p>These flats are inherently infertile, a function of the predominantly sandy soils. Most soils are imperfectly drained due to poorly structured and sometimes sodic subsoils. The river dominates the land. Land use is restricted by problems of accessibility, flooding, stream bank erosion and water pollution potential.</p>
LdE LdJ	0.2 5.0	<p>Creek flats formed on clayey alluvium.</p> <p>Main soils: <u>Deep black clay to clay loam</u> - <b>E1/M2</b> (E)  <u>Sandy loam over brown clay</u> - <b>F1c</b> (E)</p> <p>These soils are deep and fertile, but imperfectly drained and sporadically saline. Productive potential is high but waterlogging is a hazard under irrigation.</p>
LeB LeC LeE LeJ	1.1 12.0 6.4 1.0	<p>Broad, shallow drainage depressions, and gently undulating to undulating lower slopes of up to 10% formed on very deeply weathered basement siltstones, shales, phyllites and schists, or on alluvium derived from them.</p> <p><b>LeB</b> Lower slopes, 1-4%.  <b>LeC</b> Lower slopes, 4-8%.  <b>LeE</b> Shallow drainage depressions with slopes of 0-10%.  <b>LeJ</b> Shallow drainage depressions with slopes of 0-10% and eroded water courses.</p> <p>The soils have sandy to loamy surfaces over mottled brown, yellow and grey clay subsoils. Variations are due to drainage conditions, grain size of the parent sediments and ironstone gravel content.</p> <p>Main soils: <u>Sandy loam over brown clay</u> - <b>F1c</b> (E) on alluvium  <u>Loam to sandy loam over brown clay</u> - <b>F1a/F1b</b> (E) on deeply weathered rock</p> <p>These soils are deep, fertile and moderately well to imperfectly drained. Productive potential is high provided that temporary waterlogging is managed.</p>
LgF	1.1	<p>Broad alluvial flats formed on clayey alluvial sediments. The dominant soils are dark clay loams to clays. The subdominant soils are texture contrast types with loamy surfaces and brown and yellow mottled clay subsoils.</p> <p>Main soils: <u>Deep black or grey clay to clay loam</u> - <b>E1/M2</b> or <b>M2</b> (E)  <u>Loam over brown clay</u> - <b>F1c</b> (E)</p> <p>These soils are deep and naturally fertile, with high productive potential. Slight limitations are due to waterlogging and minor salinity.</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:***Soils formed in weathering basement rock*

- K1** Acidic gradational loam (Mesotrophic, Red Dermosol)  
Thick fine sandy loam with minor ironstone grading to a brownish or reddish coarsely blocky clay loam to clay, siltier with depth, grading to kaolinized phyllite or siltstone, continuing to depths of 200 cm or more.
- K2a** Acidic loam over brown clay on rock (Eutrophic, Brown Kurosol)  
Thick loam with a paler coloured gravelly A2 horizon, overlying a dark brown, yellowish brown and red mottled coarsely structured clay, grading to weathering metasiltstone or phyllite from about 100 cm.
- K2b** Acidic loam over red clay on rock (Eutrophic, Red Kurosol)  
Medium thickness reddish loam to clay loam with a gravelly and paler coloured A2 horizon, overlying a red very well structured clay grading to weathering phyllite from about 100 cm.
- K3** Acidic sandy loam over red clay on rock (Bleached-Mottled, Eutrophic, Red Chromosol)  
Medium thickness sandy loam with a paler or bleached A2 horizon, overlying a dark red and brown mottled prismatic structured clay, grading to weathering schist or phyllite by 100 cm.
- K4** Acidic sandy loam over brown clay on rock (Bleached-Mottled, Eutrophic, Brown Kurosol)  
Thick, gravelly sandy loam with a bleached and gravelly A2 horizon, overlying a yellowish brown, red and greyish brown coarsely prismatic clay, grading to weathering metasandstone below 100 cm.

*Soils formed in deeply weathered basement rock*

- F1a** Loam over brown clay (Eutrophic, Brown Kurosol)  
Thick dark brown sandy loam to clay loam with a bleached A2 horizon, overlying a brown, yellowish brown and red coarsely blocky clay subsoil grading to grey and brown coarsely prismatic clay forming in weathering schist or phyllite, deeper than 200 cm.
- F1b** Sandy loam over brown clay (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 in alluvial outwash sediments*

- F1c** Sandy loam to loam over brown clay (Bleached-Mottled, Hypocalcic, Brown Chromosol)  
Thick loamy sand to clay loam surface soil with a strongly bleached A2 horizon, sharply overlying a yellowish brown, grey and red mottled clay grading to fine grained alluvium.
- E1/M2** Deep black clay to clay loam (Epipedal, Black Vertosol / Melanic, Eutrophic, Black Dermosol)  
Thick black light clay, clay loam or silty loam with strong granular structure (clayey surfaces crack), overlying a black to dark brown clay with strong blocky structure, becoming yellow and grey mottled with depth.
- M2** Deep grey clay loam (Melanic, Calcic, Grey Dermosol)  
Thick black clay loam with granular structure, overlying a dark grey to black heavy clay with strong blocky structure. The clay is yellow and weakly calcareous with depth.

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

