

WIT Williamstown Land System

Undulating to rolling low hills between Williamstown and Cockatoo Valley

Area: 30.4 km²

Annual rainfall: 575 – 700 mm average

Geology: The land system is underlain by folded basement rocks of variable age and lithology. The beds strike in a NNW-SSE direction, and because they are steeply dipping, there is a series of parallel strips of rock formations, none more than two km wide. These include schists and gneisses of the Barossa Complex, Aldgate Sandstones, Saddleworth Formation siltstones, and sandstones and quartzites of the Stonyfell Formation. The rocks are extensively covered by clayey sands and sandy clays of Tertiary age. This veneer of sediments appears to have been lateritized at some time, as remnants of the lateritic surface (evidenced by ferricrete) occur sporadically. The Tertiary sediments and their lateritic capping probably covered the entire area in the past, but they have been substantially eroded, so that now they cover about 50% of the area, and a further 40% is directly underlain by re-exposed basement rocks. The rest of the land is covered by more recent silty and sandy alluvium derived from both basement rocks and Tertiary sediments on adjacent rising ground.

To further complicate the situation, windblown carbonate-rich dust has been deposited across the land surface and leached into the underlying soil, sediments and rocks. The distribution of carbonates is erratic, and probably reflects local leaching and erosional conditions.

Topography: The Williamstown Land System comprises undulating to moderately steep rises and low hills. Most of the land lies in the South Para River catchment, with a small area in the north east draining into the North Para. In the west and south west, the land is deeply dissected, exposing basement rocks on moderately steep to steep hillslopes. The Barossa Reservoir is contained within one of the valleys in this area. Remnant laterites occur on flat topped crests associated with these slopes. Elsewhere the topography is more subdued and retains its cover of Tertiary sediments. These undulating to gently rolling slopes include isolated basement rock highs, broad rises of Tertiary sediments, and valleys and drainage depressions filled by locally derived alluvium.

Elevation: 140 m in the west to 330 m in the south east.

Relief: Up to 70 m in the dissected basement rock areas, and up to 50 m on the Tertiary slopes.

Soils: There is a wide range of soils reflecting the variety of geological materials in the System. Sandy to sandy loam soils with clayey subsoils, and stony sands are typical on Tertiary sediments, with deep ironstone soils on crests. Moderately deep sandy loam to loam over clay soils are common on basement rocks. These may be acidic throughout or calcareous at depth. Shallow stony soils occur on steeper slopes. Deep texture contrast or deep sandy soils predominate on the alluvium of valley floors.

Main soils:

G2/G5	Bleached sand over sandy clay loam on Tertiary sediments
D1	Shallow loam over red clay on calcified basement rock
F2a	Sandy loam over poorly structured brown clay on Tertiary sediments
K4c	Acidic sandy loam over brown clay on basement sandstone
J2a	Deep acidic ironstone soil on lateritized Tertiary sediments
D6	Ironstone gravelly sandy loam over red clay on Tertiary sediments
G3	Thick sand over clay on alluvium



Minor soils:

Acidic soils formed in weathering basement rock

- K1** Acidic gradational sandy loam
- K2** Acidic loam over red clay
- K3** Acidic sandy loam over red clay
- K4** Acidic sandy loam over brown clay
- K4a** formed on schist
- K4b** formed on kaolinized schist
- L1** Shallow stony soil
- L1a** sandy loam
- L1b** loam

Soils formed on calcified basement rock

- B6** Shallow loam over red clay on calcreted rock
- C2** Shallow gradational red loam
- L1c** Shallow stony loam

Soils formed on Tertiary sediments

- M3** Shallow stony loamy sand

Ironstone soils

- J2b** Deep acidic ironstone soil on basement rock

Soils formed in alluvium

- D2** Loam over red clay
- D3** Sandy loam to loam over poorly structured red clay
- D3a** Sandy loam over red and brown mottled clay
- D3b** Loam over red clay
- F1** Sandy loam over brown mottled clay
- F1a** formed over clayey alluvium
- F1b** formed over ironstone gravelly alluvium
- F2** Sandy loam over poorly structured brown or black clay
- F2b** brown clay
- F2c** black clay
- G4** Sand over poorly structured brown clay
- M1** Deep coarse textured soil
- M1a** Gravelly loamy sand associated with Tertiary sediments
- M1b** Sandy loam associated with basement rocks

Main features:

The Williamstown Land System is a complex landscape comprising several distinctive components. Moderately steep to steep rocky slopes in the Barossa Reservoir area are characterized by shallow sandy loam soils of low fertility. Most of the land is undeveloped and has little potential. Undulating to gently rolling rises and low hills, mainly in the east, are dominated by sandy soils usually with clayey subsoils. These are infertile, often imperfectly drained, and highly erodible, but are suitable for horticulture and viticulture. In the south west is an extensive ridge of ironstone soils with very low fertility and poor development prospects. Creek flats with variable alluvial soils occur throughout. Provided drainage is managed, these flats are potentially productive, although areas are small.



Soil Landscape Unit summary: 17 Soil Landscape Units (SLUs) mapped in the Williamstown Land System

SLU	% of area	Main features #
AAC	2.0	<p>Moderately steep slopes to 40 m high formed on siltstones mantled by soft to semi-hard carbonates. Slopes are 18-30%. There is up to 10% surface stone and minor rocky outcrop. Soils are mainly loamy, with or without subsoil clays.</p> <p>Main soils: <u>Shallow stony loam</u> - L1c (E) <u>Shallow loam over red clay</u> - D1 (C) <u>Shallow loam over red clay on calcreted rock</u> - B6 (L) <u>Shallow gradational red loam</u> - C2 (L) <u>Loam over red clay</u> - D2 (M) lower slopes and creek flats</p> <p>These soils are moderately deep to shallow, but are mostly fertile and well drained. Most of the land is in the Barossa Reservoir Reserve, so its potential use is restricted.</p>
AJC	0.2	<p>Moderately steep to steep strongly dissected low hills and hills, formed on weakly calcified siltstones, slates and fine sandstones, and minor quartzites and dolomites. Gully slopes are up to 50% (100% in extreme cases), grading to more gently inclined upper slopes and crests (10% to 30% slopes, down to 4% on narrow crests). Maximum relief is 100 metres. Watercourses are well defined in narrow drainage depressions. Rock outcrop is sporadic, but extensive in places. There is variable surface stone.</p> <p>AJC Moderate slopes and rolling low hills with relief to 80 m and slopes of 20-30%. Most soils are shallow to moderately deep over siltstone which may be non-calcified or contain soft carbonate in rock fissures. Common profiles include loams over red brown clays, shallow non-calcareous stony loams, and shallow loams over calcified rock.</p> <p>Main soils: <u>Acidic loam over red or brown clay</u> - K2a / K2b (E) <u>Shallow stony loam</u> - L1a / L1b (C) <u>Shallow loam over red clay</u> - D1 (L) <u>Shallow gradational red loam</u> - C2 (L)</p> <p>Variation in soil depth is considerable, but otherwise the soils are inherently fertile and well drained. The slopes preclude any cultivated agriculture, but gentler slopes where water is available are suitable for perennial horticulture or viticulture.</p>
AXC	8.4	<p>Moderately steep slopes to 40 m high formed on fine to coarse grained sandstones of the Aldgate Sandstone Formation. Slopes are mostly in the range 16-25%. Some crests have ferricrete (laterite or ironstone) residuals, and may exhibit "breakaway" features. Rock outcrops are sporadic, occupying a maximum of 10% of the surface. Ironstone gravel and boulders are common on lateritic crests. Watercourses are narrow, well defined and usually unmappable. Most soils have sandy loam surfaces over more clayey subsoils, the nature of which is determined by the underlying material.</p> <p>Main soils: <u>Acidic sandy loam over brown or red clay</u> - K4c / K3 (V) on most slopes <u>Acidic gradational sandy loam</u> - K1 (L) on upper slopes <u>Acidic deep ironstone soil</u> - J2b (L) on residual lateritic crests <u>Sandy loam with ironstone gravel over brown clay</u> - F1b (M) on lower slopes</p> <p>The soils are moderately deep but are often imperfectly drained, low in natural fertility, prone to acidification and highly erodible. The land is too steep for cultivation, and virtually all is uncleared and much is in reservoir reserve. Its productive value is therefore low.</p>
AeC AeD	7.5 0.9	<p>Moderately steep to steep hillslopes formed on schists and gneisses of the Barossa Complex.</p> <p>Drainage depressions are narrow and infilled with locally derived sediments. Rock outcrop and stone vary from minor on gentler slopes to extensive on steep slopes.</p> <p>AeC Moderate slopes of 18-30%, up to 70 m high. AeD Short steep rocky hillslopes up to 50 m high with slopes of 30-50%.</p> <p>The soils are mixed texture contrast and shallow stony types.</p> <p>Main soils: <u>Shallow stony sandy loam</u> - L1a (E) on steeper rocky slopes <u>Acidic sandy loam over brown clay on rock</u> - K4a (C) <u>Acidic sandy loam over brown clay on kaolinized rock</u> - K4b (L) <u>Sandy loam over brown mottled clay</u> - F1a (L) on flats and lower slopes</p> <p>These soils are shallow to moderately deep, generally infertile and acidic, and well to moderately well drained. Most of the land is uncleared, so productive potential is limited.</p>



AsC	2.0	<p>Moderate slopes formed on fine to coarse grained sandstones and quartzites. Rocky outcrops are variable, but extensive on minor steeper slopes. Slopes are 15-25% with relief to 30 m. Most soils are moderately deep to shallow over bedrock. Profiles vary according to the nature of the parent rock. Sandy to loamy soils over brown, yellow or red clay subsoils are predominant.</p> <p>Main soils: <u>Acidic sandy loam over brown clay</u> - K4c (E) <u>Acidic gradational sandy loam</u> - K1 (E) <u>Shallow stony sandy loam</u> - L1a (L) on steeper slopes</p> <p>These soils are mostly moderately deep but infertile, acidic and highly erodible. The land is in the Reservoir reserve, and is uncleared. Overall productive potential is low.</p>
BED	0.7	<p>Gently rolling low hills and moderate slopes with relief to 60 m and slopes of 10-18%, formed on siltstones, fine sandstones and minor quartzites. Drainage depressions are narrow with well defined watercourses. The soils are predominantly loamy with red to orange clay subsoils forming in weathering rock. On rockier slopes, loamy surface soils are formed directly in rock.</p> <p>Main soils: <u>Acidic loam over red clay</u> - K2 (E) <u>Shallow stony loam</u> - L1b (L) on rocky slopes <u>Acidic gradational brown loam</u> - K1b (C) <u>Sandy loam over brown mottled clay</u> - F1a (L) on lower slopes</p> <p>These soils are generally moderately deep to deep, well drained and inherently fertile with high production potential. The slopes are semi arable due to the potential for erosion but are suitable for perennial crops where water is available. Pasture production potential is high.</p>
CtD	2.3	<p>Gently rolling slopes of 8-16% with relief to 40 m formed on fine to coarse grained sandstones of the Aldgate Sandstone Formation. Most soils have sandy loam surfaces over more clayey subsoils which vary depending on parent material.</p> <p>Main soils: <u>Acidic sandy loam over brown or red clay</u> - K4c / K3 (V) on most slopes <u>Acidic gradational sandy loam</u> - K1 (L) on upper slopes <u>Acidic deep ironstone soil</u> - J2b (L) on residual lateritic crests <u>Sandy loam with ironstone gravel over brown clay</u> - F1b (M) on lower slopes</p> <p>The soils are moderately deep but are often imperfectly drained, low in natural fertility, prone to acidification and highly erodible. Productive potential is low due to the adverse soil conditions, so the land is mostly used for grazing.</p>
DBC	14.2	<p>Undulating rises and gentle slopes with relief to 30 m and slopes of 2-10%. Underlying rocks are siltstones, slates and fine sandstones, mantled by soft carbonates. Surface stone is minor. There is no rock outcrop. Soils are typically loamy with red clay subsoils.</p> <p>Main soils: <u>Shallow loam over red clay</u> - D1 (V) on slopes <u>Loam over red clay</u> - D2 (C) on lower slopes and creek flats</p> <p>These soils are moderately deep to deep, well drained and inherently fertile. Although there is moderate erosion potential, the land is suited to a range of annual and perennial crops.</p>
DGD	2.2	<p>Gently rolling hillslopes of 10-20% with relief to 40 m, formed on weakly calcified siltstones, slates and fine sandstones. Soils are loamy, usually with a clayey subsoil and variable carbonate content.</p> <p>Main soils: <u>Acidic loam over red clay</u> - K1 (E) } on non calcareous rocks <u>Shallow stony loam</u> - L1b (M) } <u>Shallow gradational red loam</u> - C2 (L) <u>Shallow loam over red clay on rock</u> - D1 (L) <u>Shallow stony loam</u> - L1c (M)</p> <p>This land is partly cleared and used for grazing, although there is potential for horticulture where water is available.</p>
FiZ	7.5	<p>Summit surfaces with gently sloping crests, steepening to 5% 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>Deep acidic ironstone soil</u> - J2a (V) <u>Shallow stony loamy sand</u> - M3 (L) <u>Bleached sand over sandy clay loam</u> - G2/G5 (L)</p> <p>These soils are extremely infertile and acidic. They have little development potential.</p>
GBD	31.9	<p>Gently rolling rises and low hills to 50 m high, formed on Tertiary clayey sands, sandy clays and gravels, usually weakly indurated to sandstones and conglomerates. Slopes are 8-16%. Drainage</p>



		<p>depressions are broad and shallow with weakly defined watercourses. Sand to sandy loam over clay soils are dominant, with deep sandy loams and gravels.</p> <p>Main soils: <u>Bleached sand over sandy clay loam</u> - G2/G5 (E) <u>Ironstone gravelly sandy loam over red clay</u> - D6 (C) <u>Sandy loam over poorly structured brown clay</u> - F2a (L) <u>Shallow stony loamy sand</u> - M3 (L) <u>Deep loamy sand</u> - M1a (M)</p> <p>Although the soils are variable, low natural fertility is an over-riding feature. Most soils are moderately deep to deep, and most are acidic. Impeded drainage is a limitation on F2a soils, but drainage is adequate in the others. Most of the soils are highly erodible to both wind and water, so care is needed during crop establishment. The land is generally suited to perennial horticulture and viticulture, where water is available.</p>
GFB GFC GFE	4.0 4.5 2.9	<p>Lower slopes and drainage depressions formed on alluvial sands, clayey sands and sandy clays derived from the erosion and redeposition of upslope Tertiary materials. Slopes are gently inclined, between 2% and 10%, below steeper rising ground. Drainage depressions are up to 300 metres wide, with floor slopes of less than 2%, rising to 5% on margins. Watercourses are moderately well defined and are sometimes gullied. There is no rock or stone.</p> <p>GFB Very gently inclined lower slopes of 1-3%. GFC Gently inclined lower slopes of 3-10%. GFE Drainage depressions with slopes of 2% (floors) to 5% (margins).</p> <p>Texture contrast soils are predominant. Most have sandy surfaces with sodic clay subsoils, but some have well structured friable subsoils. There are also deep sandy soils.</p> <p>Main soils: <u>Thick sand over clay</u> - G3 (E) <u>Sandy loam over poorly structured brown clay</u> - F2b (C) <u>Sand over poorly structured brown clay</u> - G4 (L) <u>Sandy loam over poorly structured red clay</u> - D3a (L) <u>Deep loamy sand</u> - M1a (M)</p> <p>These soils are deep but generally imperfectly drained and infertile. Most are neutral to acidic at the surface, but alkaline with depth. There are sporadic saline seepages. The soils are erodible (to both water and wind). The land has potential for horticulture and viticulture, but drainage and salinity problems are a potential threat.</p>
LDE	1.1	<p>Narrow drainage depressions with sediments derived from erosion of adjacent basement rock hillslopes. The soils are deep with thick sandy loam surfaces. Main soils: <u>Sandy loam over brown mottled clay</u> - F1a (E) <u>Deep sandy loam</u> - M1b (E)</p> <p>These flats comprise narrow strips of land either side of a central watercourse. The small areas available for agricultural use, and the risk of erosion and flooding, severely restrict development potential.</p>
LGE	7.7	<p>Alluvial flats, drainage depressions and adjacent lower slopes of undulating rises and low hills formed on alluvial sands, clayey sands and sandy clays derived from Tertiary sediments and underlying basement rocks. The land is mostly flat, but slopes of up to 10% occur on lower slope margins. Watercourses are well defined and commonly eroded. Most soils have texture contrast profiles with sandy to loamy surfaces and clayey subsoils which are generally sodic although variable in colour and structure. There are also deep alluvial sandy loams.</p> <p>Main soils: <u>Sand over poorly structured brown clay</u> - G4 (E) <u>Thick sand over clay</u> - G3 (C) <u>Loam over poorly structured red clay</u> - D3b (L) <u>Sandy loam over poorly structured black clay</u> - F2c (L) <u>Deep sandy loam</u> - M1b (L)</p> <p>These soils are deep but commonly imperfectly drained. Natural fertility is low to moderate, and most are neutral at the surface to alkaline with depth. Watercourse erosion is a problem in places and there is sporadic saline seepage. Land is generally unsuited to cropping, but there is potential for horticultural/viticultural development provided adequate drainage can be maintained.</p>

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:*Acidic soils formed in weathering basement rock*

- K1** Acidic gradational sandy loam (Bleached, Mesotrophic, Brown Kandosol)
Medium thickness sandy loam, with a pale and gravelly A2 horizon, overlying a yellow and brown sandy clay loam grading to a clay loam or light clay subsoil formed in soft weathering sandstone.
- K2** Acidic loam over red clay (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 siltstone from about 100 cm.
- K3** Acidic sandy loam over red clay (Bleached, Eutrophic, Red Kurosol)
Thick brown loamy sand to sandy loam with a gravelly and bleached A2 horizon, overlying a red coarsely structured clay, stony and browner with depth, grading to weathering metasandstone by 100 cm.
- K4a** Acidic sandy loam over brown clay (Bleached, Mesotrophic, Brown Chromosol)
Medium thickness gravelly brown loamy sand to light sandy clay loam, overlying a yellowish red to strong brown finely structured clay subsoil grading to weathering schist within 100 cm.
- K4b** Acidic sandy loam over brown clay on kaolinized rock (Bleached-Mottled, Mesotrophic, Brown Chromosol)
Medium thickness gravelly brown loamy sand to light sandy clay loam, overlying a yellowish red to strong brown finely structured clay subsoil grading to soft kaolinitic schist or gneiss continuing below 200 cm.
- K4c** Acidic sandy loam over brown clay (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.
- 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 metasandstone by 50 cm.
- L1b** Shallow stony loam (Basic, Paralithic, Leptic Tenosol)
Thick stony loam forming in weathering siltstone at 50 cm or less.

Soils formed on calcified basement rock

- B6** Shallow loam over red clay on calcreted rock (Petrocalcic, Red Chromosol)
Medium thickness hard setting loam with a paler and stony A2 horizon, over a dark reddish brown well structured clay underlain by a massive calcrete pan at about 40 cm. The calcrete grades to a highly calcareous clay loam with weathering calcified rock at variable depths averaging 100 cm.
- C2** Shallow gradational red loam on rock (Hypercalcic, Red Dermosol)
Medium thickness red brown loam to clay loam, grading a red well structured clay loam, grading to massive semi hard carbonate over weathering siltstone below 50 cm.
- D1** Shallow loam over red clay on rock (Hypercalcic, Red Chromosol)
Medium thickness hard setting loam with a paler and stony A2 horizon, overlying a dark reddish brown well structured clay which is highly calcareous from about 50 cm. Weathering, calcified siltstone or slate occurs within 100 cm.
- L1c** Shallow stony loam (Calcareous, Paralithic, Leptic Tenosol)
Thick stony reddish brown loam grading to calcified weathering siltstone or fine sandstone within 50 cm.



Soils formed on Tertiary sediments

- D6** Ironstone gravelly sandy loam over red clay (Calcic, Red Chromosol)
Medium thickness reddish brown loamy sand to sandy loam with a paler coloured and ironstone gravelly A2 horizon, overlying a well structured red and brown clay with soft calcareous segregations (Class III A carbonate) from 70 cm, grading to soft ferruginized sandstone at 100 cm.
- F2a** Sandy loam over poorly structured brown clay (Eutrophic, Brown Sodosol)
Thick brown loamy sand to sandy loam with a bleached and quartz gravelly A2 horizon, over a brown, yellow and red mottled clay with strong blocky structure, grading to soft sandstone deeper than 100 cm.
- G2/G5** Bleached sand over sandy clay loam (Bleached, Mesotrophic, Brown Chromosol)
Thick grey sand with a bleached A2 horizon containing ironstone and sandstone gravel, over a brown, yellow and red sandy clay loam to clay, grading to weakly cemented Tertiary sandstone within 100 cm.
- M3** Shallow stony loamy sand (Basic, Regolithic, Bleached-Orthic Tenosol)
Thick grey gravelly loamy coarse sand to coarse sandy loam with a bleached A2 horizon containing more than 50% quartz gravel and cobbles, overlying a yellow gravelly sandy clay loam grading to gravel and stone beds in a clay matrix.

Ironstone soils

- J2a** Deep acidic ironstone soil on Tertiary materials (Ferric, Mesotrophic, Brown Kandosol)
Thick brown ironstone gravelly loamy sand with a pale A2 horizon, overlying a brownish yellow and orange sandy clay loam to sandy clay with ironstone gravel throughout.
- J2b** Deep acidic ironstone soil on basement rocks (Bleached-Ferric, Mesotrophic, Brown Kurosol)
Medium thickness grey brown loamy sand with a bleached A2 horizon containing over 50% ironstone gravel, overlying a yellow brown clay with soft red inclusions of weathered ironstone, grading to a greyish silty clay forming in weathering schist or micaceous sandstone deeper than 200 cm.

Soils formed in alluvium

- D2** Loam over red clay (Sodic, Calcic, Red Chromosol)
Thick loam with a paler coloured A2 horizon, overlying a dark reddish brown well structured clay which is highly calcareous (Class I carbonate) from about 60 cm. The soil grades to medium to fine grained alluvium below 100 cm.
- D3a** Sandy loam over poorly structured red clay (Calcic, Red Sodosol)
Medium thickness brown loamy sand to light sandy clay loam with a bleached A2 horizon, overlying a red and brown mottled clay with prismatic structure and calcareous segregations (Class I carbonate) from 50 cm.
- D3b** Loam over poorly structured red clay (Calcic, Red Sodosol)
Thick reddish brown massive fine sandy loam to loam with a pink, very hard A2 horizon, overlying a reddish brown clay with prismatic structure and many soft carbonate segregations (Class I carbonate) from 65 cm.
- F1a** Sandy loam over brown mottled clay (Bleached-Mottled, Eutrophic, Brown Chromosol)
Thick sandy loam to sandy clay loam, with a bleached and gravelly A2 horizon, overlying a yellowish brown, brown and red mottled firm coarsely structured sandy to medium clay.
- F1b** Sandy loam with ironstone gravel over brown clay (Bleached-Mottled, Mesotrophic, Brown Kurosol)
Thick greyish loamy sand to sandy clay loam with a bleached and ironstone gravelly A2 horizon, overlying a brownish yellow, brown and red well structured clay, grading to kaolinitic and ironstone gravelly clay continuing below 200 cm.



- F2b** Sandy loam over poorly structured brown clay (Calcic, Brown Sodosol)
Thick grey brown massive sandy loam to loam with a bleached A2 horizon, overlying a yellowish brown, dark brown and grey mottled clay with strong blocky structure and soft Class I carbonate segregations from 75 cm.
- F2c** Sandy loam over poorly structured black clay (Calcic, Black Sodosol)
Thick grey massive loamy sand to sandy loam with a bleached A2 horizon, overlying a dark grey and yellow brown prismatic structured clay with soft calcareous segregations with depth, grading to alluvium.
- G3** Thick sand over clay (Eutrophic, Brown / Red Sodosol)
Thick grey sand with a bleached A2 horizon, overlying a yellow brown, dark brown, red and grey mottled sandy clay to clay with coarse prismatic structure, grading to a sandier sediment below 100 cm.
- G4** Sand over poorly structured brown clay (Calcic, Brown Sodosol)
Thick brown soft loamy sand to sandy loam with a bleached A2 horizon, overlying a yellow brown, grey brown and red mottled clay with columnar structure, grading to a Class I carbonate layer of soft calcareous segregations at 70 cm.
- M1a** Deep loamy sand (Basic, Regolithic, Brown-Orthic Tenosol)
Very thick brown loamy sand with a yellowish and quartz gravelly A2 horizon, overlying a yellowish red clayey sand with variable gravel.
- M1b** Deep sandy loam (Basic, Regolithic, Brown-Orthic Tenosol)
Thick brown sandy loam to loamy sand, overlying a reddish brown clayey coarse sand to silty sand, grading to variable sandy and gritty alluvial sediments.

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

