

# MLV McLaren Vale Land System

Undulating to gently rolling rises extending from Happy Valley to Aldinga and from Baker Gully to McLaren Vale

**Area:** 131.4 km<sup>2</sup>

**Annual rainfall:** 520 – 745 mm average

**Geology:** The System lies within a Tertiary depositional basin. Although basement rocks underlie the land, they rarely outcrop. The Tertiary sequence includes sands, sandy clays, clays and limestones. In places the sandy sediments have indurated to weak massive sandstones. The sediments were apparently deeply weathered and lateritized at some stage, for deep weathering profiles and ironstones occur on high elevation crests in the north. Sandy sediments have been reworked by wind into deep sand banks, and by water into lower slope and creek flat accumulations. At least parts of the basin were covered by a veneer of Hindmarsh Clay which has been largely eroded away, with remnants occurring on low benches. Alluvial clays, silts and clayey sands derived from the escarpments to the east were more recently deposited on outwash fans overlying the Tertiary sediments, and in valleys cutting through the Tertiary cover. Aeolian carbonates are a feature of the landscape, usually occurring as a band of soft to rubbly segregations in lower subsoils (between 50 and 150 cm depth).

**Topography:** The Land System includes much of the land in the Noarlunga and Willunga Embayments (Tertiary sedimentary basins). The Noarlunga Embayment is bounded by the Clarendon Escarpment to the east and the O'Halloran Hill block to the west. The Willunga Embayment is bounded by the Willunga Escarpment to the east and Piggot Range to the west. The Tertiary sediments have been moderately dissected by west to south west flowing water courses to produce an undulating to gently rolling terrain of rises and low hills. Flat topped summit surfaces are a feature in the north of the Willunga Embayment section, and low flat topped rises in valley floors are a feature in the south and west. There are limited areas of gently inclined outwash fans abutting the adjacent escarpments. Slopes rarely exceed 20%.

**Elevation:** 10 m in the southwest to 260 m in the northeast

**Relief:** Up to 40 m

**Soils:** There is a wide variety of soils reflecting the diversity of geological materials underlying the System. Sandy to clay loamy texture contrast soils are most common, but deep sands, cracking clays and shallow soils over calcareous materials are widespread.

## Main soils

*Soils formed on Tertiary / Pleistocene sediments*

- G2** Bleached sand over sandy clay loam
- D3a** Sandy loam over dispersive red clay
- G4** Loamy sand over dispersive clay
- F2a** Sandy loam (sandy clay loam) over dispersive brown clay



Minor soils

*Soils formed on Tertiary sandstones, sandy clays and sands*

**D2** Sandy loam over red sandy clay

**D5/G3** Thick loamy sand over red and brown clay

**H3** Deep bleached sand

*Soils formed on calcreted Tertiary sediments*

**A4** Calcareous sandy loam

**B4** Gradational loam over calcrete

*Soils formed on deeply weathered Tertiary sediments with ironstone gravel*

**J2** Thick ironstone gravelly sand over clay

*Soils formed on localized Tertiary outwash*

**G3** Thick sand over clay

*Soils formed on Tertiary / Pleistocene heavy clays*

**E1/E3** Black to grey cracking clay

**F2c** Clay loam over dark clay

*Soils formed on Quaternary alluvium*

**C1** Gradational red sandy loam

**D3b** Sandy loam over dispersive red clay

**F2b** Sandy loam over dispersive brown clay

**M1** Deep sandy loam

**M2** Dark gradational clay loam

**N3** Wet black clay loam

*Soils formed on basement rock*

**D1** Sandy loam over red clay

**Main features:**

The McLaren Vale Land System is characterized by undulating to gently rolling rises. A variety of Tertiary sediments are responsible for the wide range of soils, a feature of the land. The majority of soils are texture contrast types, with loose sandy to hard setting sandy clay loam surfaces overlying clayey subsoils varying from friable sandy clay loams to heavy dispersive clays. Most of these soils are not ideal agricultural soils due to one or more of low inherent fertility, impeded drainage, poor workability, erosion potential (wind and water), water repellence and acidification. However, horticultural land uses are generally well suited, provided that irrigation and soil management practices are adequate. Other locally important soils are cracking clays and heavy clay loams (highly productive cropping soils, but less favourable for horticulture), deep sands, shallow sandy loams on limestone (highly prized for viticulture) and deep alluvial soils. The combination of generally satisfactory soils, reasonable quality groundwater and mild climate make this an excellent horticultural and viticultural area. Threats to continued production are irrigation induced salinity and sodicity, and urban encroachment.

**Soil Landscape Unit summary:** 23 Soil Landscape Units (SLUs) mapped in the McLaren Vale Land System:

SLU	% of area	Main features #
-Q-	0.7	Quarries.
DBD	0.9	Hillslopes with gradients of 10-18% underlain by fine sandstone basement rocks, partly covered by Tertiary clays. The soils have fine sandy loam surfaces with clayey subsoils.  Main soils: <u>Sandy loam over red clay</u> - <b>D1</b> (V) on basement rock <u>Sandy loam over dispersive red clay</u> - <b>D3a</b> (C) on Tertiary clays These soils are deep and inherently fertile, but have impeded drainage (particularly those with dispersive subsoils). Productive potential is high, but erosion is a serious threat.



FiZ	4.3	<p>Summit surfaces with broad flat to very gently undulating crests, grading away to slopes up to 15% at the margins. Land is underlain by Tertiary sandstones and clays, deeply weathered and lateritized in places. Soils are mainly sandy, but there are more loamy types. Most soils have clayey subsoils.</p> <p>Main soils: <u>Bleached sand over sandy clay loam</u> - <b>G2</b> (E)  <u>Sandy loam over dispersive brown clay</u> - <b>F2a</b> (L)  <u>Thick ironstone gravelly sand over clay</u> - <b>J2</b> (L)  <u>Loamy sand over dispersive clay</u> - <b>G4</b> (L)</p> <p>The soils are deep, but with variable drainage and fertility. The most common soils (G2 and J2) are well drained, but infertile and prone to acidification, water repellence and wind erosion. The others (F2a and G4) are more fertile, but dispersive clay subsoils tend to perch water. The land is not suitable for cropping, but has potential for viticulture and other perennial horticulture provided soil and irrigation management are adequate.</p>
GAC GAD	15.4 13.3	<p>Undulating to gently rolling rises formed on massive clayey sands to sandy clays, commonly indurated to weak sandstones, with characteristic bright red, yellow and grey colourings. Slopes are usually less than 16%, but occasionally reach 20%. Maximum relief is 40 metres. Watercourses are only weakly defined. There are minor patches of surface ironstone and no rock outcrop.</p> <p><b>GAC</b> Undulating rises with relief to 30 m and slopes of 3-8%.  <b>GAD</b> Gently rolling rises with relief to 40 m and slopes of 8-16%.</p> <p>The soils generally have sandy surfaces, but there is a range of subsoils including friable sandy clay, sodic heavy clay, ironstone rich clay and loose sand.</p> <p>Main soils: <u>Bleached sand over sandy clay loam</u> - <b>G2</b> (E) } on rises  <u>Deep bleached sand</u> - <b>H3</b> (C) }  <u>Thick loamy sand over red and brown clay</u> - <b>D5/G3</b> (M) }  <u>Thick ironstone gravelly sand over clay</u> - <b>J2</b> (M) }  <u>Loamy sand over dispersive clay</u> - <b>G4</b> (M) }  <u>Sandy loam over red sandy clay</u> - <b>D2</b> (M) } on lower slopes  <u>Thick sand over clay</u> - <b>G3</b> (L) }  <u>Sandy loam over dispersive brown clay</u> - <b>F2b</b> (M) }</p> <p>These soils are generally infertile and erodible with variable drainage conditions, although the most common types are well drained. They are generally not well suited to cropping, but have high horticultural potential if appropriately managed. Acidification, erosion and water repellence must be controlled, fertility maintained, and irrigation carefully scheduled for sustained productivity.</p>
GFB GFE	2.8 3.5	<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. Watercourses are moderately well defined, and are sometimes associated with saline seepage. There is no rock or stone.</p> <p><b>GFB</b> Very gently inclined lower slopes of 1-3%.  <b>GFE</b> 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.</p> <p>Main soils: <u>Thick sand over clay</u> - <b>G3</b> (V)  <u>Sandy loam over dispersive brown clay</u> - <b>F2a</b> (L)  <u>Dark gradational clay loam</u> - <b>M2</b> (M)</p> <p>These soils are infertile and imperfectly drained, although surface sands are usually thick enough that perched water tables are not a serious problem. Nevertheless, careful irrigation management is required on these soils to prevent waterlogging and salt accumulation. The soils are susceptible to both wind and water erosion. Minor saline seepages can generally be controlled by increasing water use efficiency higher up in the catchment.</p>
GND	0.7	<p>Short, moderately inclined south facing slopes, up to 40 metres high, and between 20% and 40%, with no surface drainage. The underlying sediments are loose, windblown sands and associated sandstones. Soils are mostly deep sands. Less common soils have clayey subsoils at varying depths.</p> <p>Main soils: <u>Deep bleached sand</u> - <b>H3</b> (V)  <u>Bleached sand over sandy clay loam</u> - <b>G2</b> (L)  <u>Thick loamy sand over red and brown clay</u> - <b>D5/G3</b> (L)</p> <p>Soils are deep but highly infertile, and prone to water repellence, wind erosion and acidification. Slopes also moderately steep and south facing. Land use potential is therefore extremely limited.</p>



HLB HLC	5.9 25.6	<p>Gently undulating to undulating rises formed on Tertiary sandy clays, clayey sands and sandstones. Relief is between 10 metres and 40 metres, and slopes range from 2% to 10%. Drainage depressions are shallow and broad and have poorly defined watercourses. There is very occasional surface calcrete or ironstone, but no rock outcrop.</p> <p><b>HLB</b> Gently undulating rises with relief up to 20 m and slopes of 2-3%.  <b>HLC</b> Undulating rises with relief to 40 m and slopes of 3-10%.</p> <p>There is a range of sand to sandy loam over clay soils in which subsoils are either friable and well structured, or hard and sodic. There are also minor calcareous soils and shallow soils over carbonate.</p> <p>Main soils: <u>Sandy loam over dispersive red clay</u> - <b>D3a</b> (E)  <u>Loamy sand over dispersive clay</u> - <b>G4</b> (E)  <u>Sandy loam over red sandy clay</u> - <b>D2</b> (L)  <u>Sandy loam over dispersive brown clay</u> - <b>F2a</b> (M)  <u>Gradational loam over calcrete</u> - <b>B4</b> (M)  <u>Calcareous sandy loam</u> - <b>A4</b> (M)  <u>Clay loam over dark clay</u> - <b>F2c</b> (M)</p> <p>These soils are deep and have moderate to low natural fertility. Most have restricted drainage due to dispersive clayey subsoils. They are also highly erodible. They are not well suited to cropping, but are productive viticultural soils provided that soil and irrigation management are adequate.</p>
HYB	0.2	<p>Gentle slopes: less than 2%, formed on Hindmarsh clay. There is a well developed gilgai microrelief over much of the land. Soils are medium to fine textured with heavy clay subsoils at shallow depth.</p> <p>Main soils: <u>Sandy clay loam over dispersive brown clay</u> - <b>F2a</b> (V)  <u>Grey cracking clay</u> - <b>E3</b> (C)</p> <p>This land is poorly drained and intractable, with little agricultural potential.</p>
IUC IUD	0.9 2.2	<p>Short moderately inclined to steep slopes adjacent to watercourses. Tertiary sediments are exposed on the slopes, and include clayey sands, sandy clays, sandstones and limestones, frequently calccreted. Slopes range from 5% to 40% and relief is up to 40 metres.</p> <p><b>IUC</b> Undulating rises and gently inclined slopes with relief to 50 m and slopes of 4-10%.  <b>IUD</b> Moderately inclined slopes with relief to 30 m and slopes of 8-16%.</p> <p>The soils are highly variable, reflecting the range of exposed parent materials.</p> <p>Main soils: <u>Calcareous sandy loam</u> - <b>A4</b> (E)  <u>Sandy loam over dispersive red clay</u> - <b>D3a</b> (L)  <u>Loamy sand over dispersive clay</u> - <b>G4</b> (L)  <u>Bleached sand over sandy clay loam</u> - <b>G2</b> (L)</p> <p>Soil and landscape variability restrict land use on these slopes. The most common soils are calcareous, but well drained and moderately deep. They are suitable for vines, but productive potential for other crops is limited. Other soils are infertile and/or erodible.</p>
JBB	2.0	<p>Very gently inclined outwash fans with slopes of 1.5-3% formed on sandy clays and clays derived from the erosion and deposition of soil and rock materials from the escarpments to the east. Most soils have texture contrast profiles with a range of surface textures from loamy sand to clay loam, overlying thick clayey subsoils, calcareous with depth.</p> <p>Main soils: <u>Sandy loam over dispersive red clay</u> - <b>D3b</b> (V)  <u>Sandy loam over dispersive brown clay</u> - <b>F2b</b> (C)</p> <p>These soils are deep and inherently fertile; their main limitations are physical. Poorly structured, hard setting surfaces and dispersive clayey subsoils contribute to poor infiltration, perched water tables, difficult workability and patchy emergence. Conservative soil management and gypsum application can overcome these limitations.</p>
JRA JRB JRC JRE	1.0 0.7 1.3 3.7	<p>Very gently to gently inclined outwash fans, valley flats and drainage depressions. The underlying sediments are calcified sandy clays to clays, derived from the erosion and deposition of soil and rock materials from the escarpments to the east. Slopes are 2% to 10%. Well defined water courses occur in each of the drainage depressions and flow across the fans.</p> <p><b>JRA</b> Flats with slopes of 0-1.5%.  <b>JRB</b> Very gently inclined fans with slopes of 1.5-3%.  <b>JRC</b> Gently inclined fans with slopes of 3-10%.  <b>JRE</b> Drainage depressions with slopes of 1-4%.</p> <p>The main soils have sandy loam to sandy clay loam surfaces over clayey subsoils, usually with abundant soft carbonate at depth. Differences between soils are due to the colour of the subsoil clay (better drained soils are red, less well drained soils are brown mottled), and the soil texture.</p>



		<p>There are minor deep dark heavy soils.</p> <p>Main soils: <u>Sandy loam over dispersive brown clay</u> - <b>F2b</b> (E)  <u>Sandy loam over dispersive red clay</u> - <b>D3b</b> (C)  <u>Gradational red sandy loam</u> - <b>C1</b> (L)  <u>Dark gradational clay loam</u> - <b>M2</b> (M)</p> <p>These soils are deep and inherently fertile; their main limitations are physical. Poorly structured, hard setting surfaces and dispersive clayey subsoils contribute to poor infiltration, perched water tables, difficult workability and patchy emergence. Erosion is a potential problem on most land. Conservative soil management and gypsum application can overcome these limitations.</p>
KUA KUE	1.5 1.3	<p>Valley flats and drainage depressions with well defined water courses, formed on alluvial loams to clays, mantled by soft fine grained carbonates. Slopes in channels are less than 2%, but on margins adjacent to rising ground, slopes are up to 10%. There are occasional waterlogged areas.</p> <p><b>KUA</b> Valley flats with slopes of 0-2%.  <b>KUE</b> Drainage depressions with slopes of 1-5%.</p> <p>Dominant soils are deep sandy loams to clays, usually with increasing clay contents with depth.</p> <p>Main soils: <u>Dark gradational clay loam</u> - <b>M2</b> (E)  <u>Deep sandy loam</u> - <b>M1</b> (E)  <u>Gradational red sandy loam</u> - <b>C1</b> (C)</p> <p>Soils are deep and moderately to highly fertile. Drainage variable, from well to imperfectly drained. Provided that waterlogged areas are avoided, this land has high potential for horticultural crops.</p>
LjA	0.4	<p>Level plain, drained by well defined water courses, formed on alluvial clays and sandy clays. Slopes are 0-1.5%. The dominant soils have sandy loam surfaces with clayey subsoils which are reddish mottled in the most common soil type and less commonly brown mottled. There are also grey clay loam profiles.</p> <p>Main soils: <u>Sandy loam over red and brown clay</u> - <b>F1c</b> (E)  <u>Sandy loam over brown clay</u> - <b>F1a</b> (E)  <u>Deep grey clay loam</u> - <b>M2</b> (C)</p> <p>These soils are deep and reasonably fertile. The main limitations are impeded drainage due to restrictive clay subsoils, and poor surface structure. The redder soils (F1c) are better drained than the others. Pasture production potential is high, but control of stocking is needed during winter to avoid soil compaction. Irrigated horticulture requires control of waterlogging; either by drain installation or mounding.</p>
TEC	1.6	<p>Level plains and gently undulating to undulating rises with slopes up to 12% and maximum relief of 40 metres, formed on Hindmarsh Clay, altered by variable amounts of aeolian carbonate, deposited and washed into the clay. Surface drainage patterns are very poorly defined on the plains, but on the undulating ground, there are well defined watercourses in shallow drainage depressions.</p> <p><b>TEC</b> Undulating rises with relief to 40 m and slopes of 4-12%.</p> <p>The principal soils are calcareous loam, dark cracking clay, loam over red clay and sandy loam over a brown mottled sodic clay. These soils have significant accumulations of soft to nodular carbonate in the lower profile, grading to Hindmarsh Clay, which is typically red and grey mottled, coarsely blocky in structure with well developed slickensides, and containing pockets of soft carbonates, decreasing with depth.</p> <p>Main soils: <u>Rubbly calcareous loam</u> - <b>A5</b> (E)  <u>Black to grey cracking clay</u> - <b>E1/E3</b> (C)  <u>Loam over red clay</u> - <b>D2a</b> (L)  <u>Sandy loam (sandy clay loam) over dispersive brown clay</u> - <b>F2</b> (L)  <u>Gradational calcareous clay loam</u> - <b>A6</b> (L)  <u>Dark gradational clay loam</u> - <b>M2</b> (M)  <u>Calcareous sandy loam</u> - <b>A4a</b> (M) on sloping margins</p> <p>These soils are excellent cropping soils, deep and moderately to highly fertile, although commonly imperfectly drained and difficult to work when wet. However, with impermeable Hindmarsh Clay usually within a metre of the surface, they are poor irrigation soils. Significant areas are urbanized.</p>
TMA	9.6	<p>Level plains to gently undulating rises, invariably in elevated positions in the landscape, formed on Hindmarsh Clay, calcified by low to moderate amounts of aeolian carbonate. Slopes to 5%, but are usually &lt; 3%. There are no defined surface drainage patterns. There is gilgai microrelief in non cultivated areas. The dominant soils have medium to fine textured surfaces and heavy clay subsoils.</p> <p>Main soils: <u>Black to grey cracking clay</u> - <b>E1/E3</b> (E)</p>



		<p><u>Dark gradational clay loam - M2 (C)</u>  <u>Clay loam over dark clay - F2c (L)</u>  <u>Sandy loam over dispersive brown clay - F2a (L)</u>  <u>Sandy loam over dispersive red clay - D3a (L)</u></p> <p>The soils are deep and inherently fertile, but are difficult to work and become intractable when wet. They are excellent cropping soils, but are less well suited to horticulture.</p>
XWL	0.5	<p>Swampy creek flats.  Main soil: <u>Wet black clay loam - N3</u>  Although inherently fertile and deep, these soils are too wet for most uses. Much of the land is covered by reed beds, although cleared areas support useful summer grazing.</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 on basement rock*

##### **D1** Sandy loam over red clay (Hypercalcic, Red Chromosol)

Medium thickness hard setting fine sandy loam with quartz and siltstone gravel, over a well structured red medium clay, highly calcareous from about 55 cm, grading to weathering siltstone from about 100 cm.

#### *Soils formed on Tertiary sandstones, sandy clays and sands*

##### **D2** Sandy loam over red sandy clay (Hypercalcic, Red Chromosol)

Medium thickness firm reddish brown loamy sand to sandy loam, overlying a reddish brown well structured clay loam to clay with abundant soft calcareous segregations (Class III A carbonate) from 50 cm, grading to weakly structured sandy clay to clay or soft sandstone with carbonate inclusions from 75 cm.

##### **D3a** Sandy loam over dispersive red clay (Hypercalcic, Red Sodosol)

Medium thickness hard reddish brown sandy loam to loam with a paler coloured A2 horizon, overlying a red prismatic clay with abundant calcareous segregations (Class I carbonate) from 55 cm.

##### **G2** Bleached sand over sandy clay loam (Mesotrophic / Calcic, Brown Chromosol)

Thick grey sand with a bleached grading to yellow A2 horizon containing ironstone and sandstone gravel, overlying a brown, yellow and red sandy clay loam to clay, grading to weakly cemented Tertiary sandstone within 100 cm. Minor carbonate segregations in lower subsoil in drier areas.

##### **D5/G3** Thick loamy sand over red and brown clay (Calcic, Red Chromosol)

Thick soft loamy sand with a pale coloured ironstone and quartz gravelly A2 layer, sharply overlying a red and brown heavy clay with soft calcareous segregations within 100 cm, grading to sandy to light sandy clay sediments.

##### **G4** Loamy sand over dispersive clay (Calcic, Brown Sodosol)

Thick brown loamy sand to sandy loam with a pale brown A2 horizon, overlying a dark brown, yellow and red mottled clay with strong coarse columnar structure, and up to 50% soft calcareous segregations (Class I carbonate) from 65 cm.

##### **H3** Deep bleached sand (Arenic, Bleached-Orthic Tenosol)

Very thick white sand, organically darkened at the surface, overlying yellow loose sand with variable ferruginous gravels, grading to red and yellow clayey sand below 100 cm.

#### *Soils formed on calcreted Tertiary sediments*

##### **A4** Calcareous sandy loam (Supracalcic Calcarosol)

Medium thickness dark brown calcareous sandy loam to sandy clay loam, overlying a dark brown highly calcareous clay loam with up to 50% carbonate nodules (Class III B carbonate), becoming more clayey with depth. Weak calcrete pans occur sporadically. Highly calcareous sandstone or limestone from 120 cm.



**B4** Gradational loam over calcrete (Lithocalcic / Petrocalcic, Red Dermosol)

Medium thickness dark brown to dark red loam to clay loam with strong granular structure, and semi-hard carbonate fragments at the base, overlying rubbly or platy calcrete (Class III C carbonate) at depths ranging from 30-50 cm. This grades to a very highly calcareous massive sandy clay loam, grading to soft sandstone.

*Soils formed on deeply weathered Tertiary sediments with ironstone gravel*

**J2** Thick ironstone gravelly sand over clay (Ferric, Mesotrophic, Red/Brown Chromosol)

Thick red brown to grey brown sand to loamy sand with an ironstone gravelly A2 horizon, overlying a red and yellowish brown sandy clay to clay with ironstone gravel, grading to a grey and red mottled (kaolinitic) sandy clay, often with ferricrete, forming in indurated sandstone deeper than 200 cm.

*Soils formed on localized Tertiary outwash*

**G3** Thick sand over clay (Eutrophic, Brown Sodosol)

Thick soft greyish brown sand to loamy sand with a bleached grading to yellow A2 horizon, overlying a yellowish brown, grey and red mottled heavy clay with coarse prismatic structure. Minor soft carbonate segregations may occur in lower subsoil.

*Soils formed on Tertiary / Pleistocene heavy clays*

**F2a** Sandy loam (sandy clay loam) over dispersive brown clay (Calcic, Brown Sodosol)

Thick brown sandy loam to sandy clay loam with a sporadically bleached A2 horizon, overlying a dark brown coarsely structured dispersive clay, calcareous with depth. Heavy clay continues below 100 cm.

**E1/E3** Black to grey cracking clay (Self-mulching, Black Vertosol / Epipedal, Grey Vertosol)

Medium thickness very dark grey to black moderately calcareous light clay with fine blocky structure, overlying a black to grey brown coarsely prismatic heavy clay becoming paler coloured and more calcareous with depth. Hindmarsh Clay is evident from about 70 cm.

**F2c** Clay loam over dark clay (Calcic, Black Chromosol / Sodosol)

Medium thickness black fine sandy clay loam with a bleached A2 layer, overlying a very dark coarsely structured clay with variable amounts of soft calcareous segregations at depth, grading to Hindmarsh Clay.

*Soils formed on Quaternary alluvium*

**C1** Gradational red sandy loam (Calcic, Red Kandosol)

Thick reddish brown loamy sand to sandy loam with a pink A2 horizon, overlying a yellowish red weakly structured clay loam to clay, calcareous with depth.

**D3b** Sandy loam over dispersive red clay (Calcic, Red Sodosol)

Thick reddish brown massive loamy sand to sandy clay 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.

**F2b** Sandy loam over dispersive 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.

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

Thick brown sandy loam to clay loam, overlying a grey to brown silt loam to clay loam with weak prismatic structure, weakly calcareous with depth. The soil is formed in variable sandy, gritty and clayey alluvial sediments.

**M2** Dark gradational clay loam (Calcic, Black Dermosol)

Medium thickness black clay loam to light clay with strong granular structure, overlying a very dark clay with blocky structure and variable amounts of soft calcareous segregations.

**N3** Wet black clay loam (Dermosolic, Oxyaquic Hydrosol)

Medium thickness strongly granular black clay loam to light clay, overlying a black clay with strong blocky structure, grading to a grey and yellow clay with depth. The profile overlies variable sandy to clayey sediments from 100 cm.

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

