

WOL Wolseley Land System

Very gently undulating elevated clay plains in the Wolseley - Bordertown area

Area: 372.1 km²

Annual rainfall: 475 - 500 mm average

Geology: The Wolseley Land System is formed on an extensive deposit of late Tertiary / early Pleistocene clay, probably laid down in a lacustrine (lake floor) environment. The clay has morphological and chemical properties similar to the Blanchetown Clay which occurs over large areas of the Murray Basin to the north. In places there are sandier deposits, often associated with ironstone gravel. These appear to be older than the clays and occur where the clay has been stripped off, exposing underlying material. There are significant areas of Recent alluvial sediments, derived from the localized erosion and re-deposition of the Tertiary sediments. Most of the sediments are mantled by soft carbonates which have blown over the landscape and been leached into the soil. There is minor sand drift in the north (from the Lowan Vale Land System).

Topography: The Wolseley Land System is a relict land surface - the westward extension of the Victorian Wimmera. The dominant feature of the land is the extensive area of very gently undulating elevated clay plains. These are up to 22 kilometres from north to south, and extend a similar distance into South Australia from the border. The main topographic features are the valleys and drainage depressions flowing in a westerly and north westerly direction, into the Tatiara and Nalang Creeks and eventually into Poocher and Mundulla Swamps respectively. Remnants of the System occur further north in the in the Lowan Vale Land System.

Elevation: 70 m in the west to 125 m in the north

Relief: Generally less than 10 m but up to 25 m where Tatiara Creek has cut into the land surface

Soils: Cracking clays are characteristic of the Wolseley Land System. Associated soils include loamy brown and red texture contrast soils and limited sandy soils.

Main soils:

- E3a** Grey cracking clay
- E3b** Brown cracking clay
- D3** Sandy loam over dispersive red clay
- E1** Friable black cracking clay
- F2** Hard loam over dispersive brown clay

Minor soils:

- D2** Loam over friable red clay
- D5** Loamy sand over dispersive red clay
- D6** Ironstone gravelly sandy loam over red clay
- F1** Loam over brown clay
- G3** Sand over yellow clay
- G4** Sand over dispersive brown clay
- H3** Deep bleached sand
- M2a** Gradational dark clay loam
- M2b** Deep black friable clay loam to clay



Vegetation: Mallee broom, heath and stringybark
Mallee heath, stringybark and blue gum
Bullock

Main features: The Wolseley Land System is characterized by very gently undulating plains with cracking clays and loamy texture contrast soils. Soil fertility is high to very high, but surface soils are often hard setting. This condition may cause excessive runoff or surface ponding, impaired workability, patchy emergence and uneven root growth. Subsoils in some texture contrast soils are dispersive and cause subsurface waterlogging. Waterlogging is a common problem throughout, in both sandy loam over clay soils and cracking clays. Boron toxicity is likely to be a problem in places. There is some potential for water erosion on long slopes, and low lying areas are prone to flooding.

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

SLU	% of area	Main features #
GbC	0.2	<p>Low rise formed on sandy Tertiary sediments overlain by an east west sand dune. Main soils: <u>sand over dispersive brown clay</u> - G4 (E) on slopes and flats, <u>sand over yellow clay</u> - G3 (L) on slopes, <u>deep bleached sand</u> - H3 (C) on sandhills and <u>loamy sand over dispersive red clay</u> - D5 (L) on margins.</p> <p>Key properties:</p> <p>Drainage: Imperfect (G4 soils) due to dispersive clay subsoils causing perched water tables. Moderate (G3 soils) and rapid (H3 soils).</p> <p>Fertility: Moderately low to low due to sandy surfaces. Very low (H3 soils).</p> <p>Physical condition: Good in surface, although sands are prone to water repellence. Poor in G4 subsoils (dispersive clays).</p> <p>AWHC: Moderate to low (G4 and G3). Low (H3 soils).</p> <p>Salinity: Moderate to low. Low (H3 soils).</p> <p>Erosion potential: Water: Moderate. Wind: Moderately low to high (H3 soils)</p> <p>Water repellence: High.</p> <p>Rockiness: Nil.</p> <p><u>Summary:</u> Low to very low fertility, subsurface waterlogging on lower slopes and wind erosion potential on higher ground.</p>
GhC	1.2	<p>Short moderately steep slopes forming sections of the north bank of the Tatiara Creek. Slopes are up to 10%, and relief is up to 25 metres. The soils are formed on Tertiary clayey sands and sandy clays, weakly indurated to sandstones in places. Main soils: <u>sand over yellow clay</u> - G3 (V), with <u>sand over dispersive brown clay</u> - G4 (L), <u>deep bleached sand</u> - H3 (L) and <u>loamy sand over dispersive red clay</u> - D5 (L).</p> <p>Key properties:</p> <p>Drainage: Moderate to high (G3 and H3 soils). Imperfect (G4 soils) due to dispersive clay subsoils.</p> <p>Fertility: Moderately low (G4 and G3 soils) to very low (H3 soils).</p> <p>Physical condition: Good in surface, although sands are prone to water repellence. Fair (G3) to poor (G4) in subsoil due to dispersive clays.</p> <p>AWHC: Moderate to low (G3 and G4). Low (H3).</p> <p>Salinity: Low.</p> <p>Erosion potential: Water: Moderate to moderately high. Wind: Moderately low to moderately high.</p> <p>Water repellence: High.</p> <p>Rockiness: Nil.</p> <p><u>Summary:</u> Low to very low fertility, subsurface waterlogging on lower slopes and erosion potential (water and wind).</p>



HdB	1.0	<p>Very gently inclined lower slopes, usually adjacent to creek flats or swamps. Underlying materials are Tertiary / Pleistocene clays.</p> <p>Main soils: <u>loam over friable red clay</u> - D2 (E) and <u>sandy loam over dispersive red clay</u> - D3 (E).</p> <p>Key properties:</p> <p>Drainage: Moderately well (D2) to imperfect (D3). Clayey subsoils cause some subsurface waterlogging.</p> <p>Fertility: Moderate to high.</p> <p>Physical condition: Fair. Most soils have hard setting surfaces. D3 soils have dispersive subsoils.</p> <p>AWHC: Moderately high.</p> <p>Salinity: Moderately low.</p> <p>Erosion potential: Water: Moderately low. Wind: Low.</p> <p>Water repellence: Nil.</p> <p>Rockiness: Nil.</p> <p><u>Summary:</u> Moderate to high fertility, but poor soil structure and some waterlogging.</p>
HhA	1.2	<p>Very gently inclined lower slopes adjacent to the southern side of the Nalang Creek. Slopes are less than 2%. Underlying materials are clays.</p> <p>Main soils: <u>loam over brown clay</u> - F1 (E) and <u>sandy loam over dispersive red clay</u> - D3 (E) with <u>friable black cracking clay</u> - E1 (L).</p> <p>Key properties:</p> <p>Drainage: Moderately well (F1) to imperfect (D3 and E1).</p> <p>Fertility: Moderate to high.</p> <p>Physical condition: Fair to good. F1 and D3 surface soils set hard. D3 subsoils are dispersive.</p> <p>AWHC: Moderately high to high.</p> <p>Salinity: Moderately low to moderate (subsoil).</p> <p>Erosion potential: Water: Low. Wind: Low.</p> <p>Water repellence: Nil.</p> <p>Rockiness: Nil.</p> <p><u>Summary:</u> Moderate to high fertility. Some poor soil structure and waterlogging.</p>
O-D	0.1	<p>Isolated sand hills, remote from the main areas of deep sand deposits. Main soil is <u>deep bleached sand</u> - H3 (D). They are deep, infertile, water repellent and prone to wind erosion.</p>
TUB TUC	16.0 18.9	<p>Slopes adjacent to the elevated plains of TVA formed on Tertiary/Pleistocene clays.</p> <p>TUB Slopes are up to 3%.</p> <p>TUC Slopes are up to 5%.</p> <p>Main soils: <u>grey and brown cracking clay</u> - E3a / E3b (E) and <u>sandy loam over dispersive red clay</u> - D3 (E), with <u>hard loam over dispersive brown clay</u> - F2 (L), <u>gradational dark clay loam</u> - M2a (L) and <u>ironstone gravelly sandy loam over red clay</u> - D6 (M).</p> <p>Key properties:</p> <p>Drainage: Moderately well to imperfect. Heavy and/or dispersive clay subsoils cause sub surface waterlogging.</p> <p>Fertility: Moderately high to high.</p> <p>Physical condition: Fair to poor. Most soils have hard setting surfaces and the D3 and F2 soils have dispersive subsoils.</p> <p>AWHC: Moderately high to high.</p> <p>Salinity: Moderately low to moderate (subsoils).</p> <p>Erosion potential: Water: Moderately low (TUB) to moderate (TUC) Wind: Low.</p> <p>Rockiness: Minor ironstone gravel.</p> <p>Other: Subsoil boron toxicity is likely where substrate clay is within 75 cm of the surface.</p> <p><u>Summary:</u> Poor soil structure and waterlogging, but moderately high soil fertility.</p>



TVA	46.2	<p>Very gently undulating high level plains formed on Tertiary/Pleistocene heavy clays, calcified by fine carbonates. Elevations range from 100 to 125 metres with two small outliers near Mundulla as low as 80 metres. The plains are dissected by the Tatiara and Nalang Creeks. The surface of the plains is between 10 and 20 metres above the floors of the drainage depressions. A prominent feature of the plains is the widespread occurrence of crabholes (gilgai).</p> <p>Main soils: <u>grey and brown cracking clay</u> - E3a / E3b (E) and <u>friable black cracking clay</u> - E1 (C) with <u>sandy loam over dispersive red clay</u> - D3 (L) and <u>gradational dark clay loam</u> - M2a (L).</p> <p>Key properties:</p> <p>Drainage: Moderately well to imperfectly drained.</p> <p>Fertility: Moderately high to very high.</p> <p>Physical condition: Good to fair. D3 and E3 soils have hard setting surfaces. Black clays (E1) have well structured surfaces. Dispersive subsoils in D3 soils cause subsurface waterlogging.</p> <p>AWHC: High.</p> <p>Salinity: Moderately low to moderate (subsoils).</p> <p>Erosion potential: Water: Low. Wind: Low.</p> <p>Water repellence: Nil.</p> <p>Rockiness: Nil.</p> <p>Other: Crabholes may become flooded in wet years. Subsoil boron toxicity is likely where substrate clay is within 75 cm of the surface.</p> <p><u>Summary:</u> High soil fertility is offset by waterlogging and poor structure in some soils.</p>
TWA	1.4	<p>Broad alluvial flat of Nalang Creek, east of Mundulla formed on alluvial clays.</p> <p>Main soil: <u>deep black friable clay loam to clay</u> - M2b (D).</p> <p>Key properties:</p> <p>Drainage: Moderately well to imperfect.</p> <p>Fertility: Very high.</p> <p>Physical condition: Good.</p> <p>AWHC: High.</p> <p>Salinity: Moderate (subsoil).</p> <p>Erosion potential: Water: Low. Wind: Low.</p> <p>Water repellence: Nil.</p> <p>Rockiness: Nil.</p> <p>Other: Prone to flooding.</p> <p><u>Summary:</u> Highly fertile, well structured soils prone to waterlogging and flooding.</p>
TWE	13.7	<p>Alluvial flats of the Tatiara and Nalang Creeks and their tributaries. The Tatiara flat extends from Victoria to Poocher Swamp. The Nalang flat is discontinuous, extending from Custon to the Mundulla Swamp. The landscape includes the water courses and many small swamps. Underlying sediments are alluvial clays and sandy clays.</p> <p>Main soils: <u>deep black friable clay loam to clay</u> - M2b (E), <u>hard loam over dispersive brown clay</u> - F2 (E) and <u>grey and brown cracking clay</u> - E3a / E3b (L).</p> <p>Key properties:</p> <p>Drainage: Imperfect to poor.</p> <p>Fertility: High to moderate.</p> <p>Physical condition: Good to fair (some hard setting surfaces and dispersive subsoils).</p> <p>AWHC: High.</p> <p>Salinity: Moderate to moderately high (subsoil).</p> <p>Erosion potential: Water: Low. Wind: Low.</p> <p>Water repellence: Nil.</p> <p>Rockiness: Nil.</p> <p>Other: Prone to flooding.</p> <p><u>Summary:</u> High fertility soils but susceptible to waterlogging and flooding.</p>
Xq-	0.1	Fresh to marginally saline swamps, at least seasonally inundated.

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:

- D2** Loam over friable red clay (Hypercalcic, Red Chromosol)
Medium thickness red brown loam abruptly overlying a red brown well structured clay grading to soft carbonate or calcarenite at 50-100 cm.
- D3** Sandy loam over dispersive red clay (Calcic, Red Sodosol)
Thin to medium thickness hard sandy loam (often with minor ironstone gravel) abruptly overlying a coarsely structured dispersive red and yellow brown clay, with soft carbonate at depth.
- D5** Loamy sand over dispersive red clay (Hypercalcic, Red Sodosol)
Thin hard loamy sand sharply overlying a red and brown mottled coarsely columnar sandy clay, calcareous with depth, grading to red and yellow massive sandy clay.
- D6** Ironstone gravelly sandy loam over red clay (Ferric, Red Sodosol)
Medium to thick hard sandy loam to sandy clay loam with a paler ironstone gravelly A2 layer abruptly overlying a coarsely structured red clay, calcareous with depth grading to Tertiary sandy clay.
- E1** Friable black cracking clay (Self-mulching, Black Vertosol)
Black self-mulching seasonally cracking clay, becoming coarser structured, greyer and calcareous with depth.
- E3a** Grey cracking clay (Epipedal, Grey Vertosol)
Hard coarse blocky seasonally cracking grey clay, calcareous and prismatically structured at depth.
- E3b** Brown cracking clay (Epipedal, Brown Vertosol)
Grey brown seasonally cracking clay, becoming browner, more clayey and coarsely structured with depth, calcareous from about 50 cm.
- F1** Loam over brown clay (Calcic, Brown Chromosol)
Thick loam with a paler coloured A2 layer overlying a brown well structured clay, calcareous with depth.
- F2** Hard loam over dispersive brown clay (Hypercalcic, Brown Sodosol)
Medium thickness hard setting loamy sand to loam abruptly overlying a coarsely structured grey brown, yellow and red clay grading to soft carbonate.
- G3** Sand over yellow clay (Calcic / Mesotrophic, Yellow Chromosol)
Medium to thick ironstone gravelly loamy sand abruptly overlying a yellow and red friable sandy clay over sandstone within 100 cm.
- G4** Sand over dispersive brown clay (Hypercalcic, Brown Sodosol)
Thin to medium thickness sand sharply overlying a brown and yellow or grey mottled dispersive clay with strong columnar structure, calcareous with depth.
- H3** Deep bleached sand (Basic, Arenic, Bleached-Orthic Tenosol)
Thick to very thick bleached sand, organically darkened at the surface over yellow sand continuing below 100 cm.
- M2a** Gradational dark clay loam (Vertic / Sodic, Calcic, Brown Dermosol)
Dark clay loam over moderately structured dark brown medium heavy clay, becoming calcareous and more coarsely structured with depth
- M2b** Deep black friable clay loam to clay (Calcic, Black Dermosol / Vertosol)
Medium thickness friable black clay loam to clay (may crack) grading to a coarsely structured dark grey clay, calcareous with depth.

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

