

MLC Millicent Land System

- Area:** 259.0 km²
- Landscape:** Broad dune corridor plains formed mostly on lagoonal clays, extending northwest from near Tantanoola, past Millicent, to east of Hatherleigh with mainly dark coloured, clay loam to clay soils. Swamps are common in places.
- Annual rainfall:** 715 – 775 mm average
- Geology:** Pleistocene Padthaway Formation calcareous clays.
- Main soils:**
- A7** (22%) Calcareous clay loam on marl (Marly Calcarosol)
 - B5** (18%) Shallow dark clay loam on limestone (Petrocalcic Black-Grey Dermosol)
 - N1** (12%) Peaty soil (Organosol)
 - N3** (11%) Wet soil (non to moderately saline) (Sodosolic-Calcarosolic-Dermosolic Hydrosol)
 - C5** (10%) Gradational dark clay loam (Calcic-Hypercalcic Brown-Grey-Black Dermosol-Calcarosol)
- Minor soils:**
- A6** (9%) Gradational calcareous clay loam (Pedal Hypercalcic-Lithocalcic Calcarosol with clayey subsoil)
 - B2** (7%) Shallow calcareous loam on calcrete (Petrocalcic Calcarosol-Rudosol)
- Summary:** The soils of the Millicent Land System are generally poorly drained. They are fertile and highly productive when drained. The presence of carbonate in some soils is a limitation for some crops such as lupins. The undrained clayey plains support high grazing-capacity pastures. Watertables are generally close to the surface.

Soil Landscape Unit summary: Millicent Land System (MLC)

| SLU | % of area | Component | Main soils | Prop# | Notes |
|-----|-----------|------------|------------|-------|--|
| MWA | 0.0 | Plain | F2 | D | Plains with loam over poorly structured brown clay, Miocene limestone below 50cm. Main soils: <u>Sandy loam over poorly structured brown or dark clay - F2.</u> |
| MAB | 0.1 | Rise | B3RR | D | Gently undulating calcreted former beach ridges with stony, very shallow red and brown loamy over red clay soils. >50% bare calcrete. Main soils: <u>Shallow sandy loam on calcrete - B3</u> and <u>Rock or exposed calcrete - RR.</u> |
| M-B | 0.01 | Stony rise | B3RR | V | As above but <50% bare calcrete. M-B Gently undulating rises. M-C Steeper undulating rises. |
| | | Swale | B7B6 | L | |
| M-C | 0.1 | Rise | RRB3 | D | Main soils: Rises: <u>Shallow sandy loam on calcrete - B3</u> and <u>Rock or exposed calcrete - RR.</u> Swales: <u>Sand over friable brown clay on calcrete - B7</u> and <u>Shallow sandy loam over red-brown clay on calcrete - B6.</u> |



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|-----|------|-------------|--------|---|--|
| MDB | 0.02 | Rise | B6 | D | Gently sloping rises with shallow sandy loam, mostly over red sandy clay loam to clay on calcreted calcarenite. 10-30% exposed calcrete. Main soils: Rises: <u>Shallow sandy loam over red-brown clay on calcrete</u> - B6 . |
| MRC | 0.03 | Rise | B6B3 | D | Undulating calcreted former beach ridges with shallow sand/brown clay and loam over red clay soils. Main soils: <u>Shallow sandy loam over red-brown clay on calcrete</u> - B6 and <u>Shallow sandy loam on calcrete</u> - B3 . |
| MXH | 0.3 | Rise | RRB3 | D | MXH Gently undulating calcarenite rises with bare calcrete or very shallow sandy loam soils. <10% swamps with non-peaty clay loam and peat soils. MXO Plain as above. Main soils: Rises and plains: <u>Rock or exposed calcrete</u> - RR and <u>Shallow sandy loam on calcrete</u> - B3 . Swamps: <u>Wet clay loam</u> - N3 and <u>Peaty soil</u> - N1 . |
| | | Swamp | N3N1 | M | |
| MXO | 0.4 | Plain | RRB3 | D | MXO Plain as above. Main soils: Rises and plains: <u>Rock or exposed calcrete</u> - RR and <u>Shallow sandy loam on calcrete</u> - B3 . Swamps: <u>Wet clay loam</u> - N3 and <u>Peaty soil</u> - N1 . |
| | | Swamp | N3N1 | M | |
| NBB | 0.9 | Stony plain | B5B2 | D | NBB Stony plain with thin black cracking clay or clay loam over calcreted marl or calcareous lagoonal clayey sediments, often with freshwater shells. NBI Stony plain as above, 20-30% swamps with shallow, often wet, dark clay loam and alkaline peat soils. NBM Stony plain as for NBB, with 20-30% rises with very shallow calcareous loam over calcrete, soils. NBN Poorly drained plain with shallow dark grey calcareous clay loam over calcrete. 10-30% wet depressions contain variously shallow non-peaty wet dark grey clay loam or peat. Main soils: Stony plains: <u>Shallow dark clay loam on limestone</u> - B5 and <u>Shallow calcareous loam on calcrete</u> - B2 . Swamps: <u>Shallow calcareous loam on calcrete</u> - B2 , <u>Wet clay loam</u> - N3 and <u>Peaty soil</u> - N1 . Rises: <u>Shallow sandy loam on calcrete</u> - B3 . Plains: <u>Shallow dark clay loam on limestone</u> - B5 . |
| NBI | 1.8 | Stony plain | B5B2 | V | |
| | | Swamp | B2N3N1 | C | |
| NBM | 1.2 | Stony plain | B5B2 | V | |
| | | Rise | B3 | C | |
| NBN | 2.1 | Plain | B5 | D | |
| | | Rise | B3 | M | |
| NFM | 0.6 | Plain | B6B5B2 | V | Plain with shallow sandy clay loam over red clay; shallow dark clay; or shallow sandy clay loam, on calcrete. 20-30% rises with shallow sandy loam, often over red clay, on calcrete. Main soils: Plains: <u>Shallow sandy loam over red-brown clay on calcrete</u> - B6 , <u>Shallow dark clay loam on limestone</u> - B5 and <u>Shallow calcareous loam on calcrete</u> - B2 . Rises: <u>Shallow sandy loam over red-brown clay on calcrete</u> - B6 and <u>Shallow sandy loam on calcrete</u> - B3 . |
| | | Rise | B6B3 | C | |
| NJA | 29.7 | Plain | B5A7A6 | D | NJA Plains with shallow black or grey cracking clay on calcrete; deep clayey calcareous soils on marl and wet soils. <10% swamps with wet soils and peats. NJF Plains with deep loam over calcareous clay soils. 10-20% swamps with non-peaty wet soils and peats co-dominant. Main soils: Plains: <u>Shallow dark clay loam on limestone</u> - B5 , <u>Calcareous clay loam on marl</u> - A7 , <u>Gradational calcareous clay</u> - A6 and <u>Gradational dark clay loam</u> - C5 . Swamps: <u>Wet clay loam</u> - N3 and <u>Peaty soil</u> - N1 . |
| | | Swamp | N3N1 | M | |
| NJF | 1.6 | Plain | C5 | V | |
| | | Swamp | N3N1 | L | |



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|-----|------|---------------------|--------|---|--|
| NKA | 10.0 | Plain | C5A7 | D | <p>NKA Plains with deep grey cracking clay and calcareous clay over grey calcareous clay soils.</p> <p>NKD Plains with shallow black cracking clay and dark grey clay loam soils. 10-30% each of calcareous grey clays on marl and wet clay loams in swampy areas. 10-20% sandy rises with deep siliceous bleached sands.</p> <p>NKF Plains as for NKA with 20-30% swamps with non-peaty clay loam, often calcareous, over clay or marl.</p> <p>Main soils:</p> <p>Plains: <u>Gradational dark clay loam</u> - C5 and <u>Calcareous clay loam on marl</u> - A7 or <u>Shallow dark clay loam on limestone</u> - B5 and <u>Shallow calcareous loam on calccrete</u> - B2.</p> <p>Sandy rises: <u>Bleached siliceous sand</u> - H3 and <u>Wet highly leached sand</u> - I2.</p> <p>Swamps: <u>Wet clay loam</u> - N3; <u>Gradational dark clay loam</u> - C5.</p> |
| NKD | 0.8 | Plain | B5B2 | V | |
| | | Rise | H3I2 | L | |
| NKF | 5.1 | Plain | C5A7 | V | |
| | | Swamp | N3C5 | C | |
| NIC | 1.3 | Plain | B2 | D | <p>Plains with shallow calcareous clay loam over calccrete. <10% stony rises with shallow dark grey, often calcareous, clay loam on calccrete.</p> <p>Main soils:</p> <p>Plains: <u>Shallow calcareous loam on calccrete</u> - B2.</p> <p>Stony rises: <u>Shallow dark clay loam on limestone</u> - B5 and <u>Shallow calcareous loam on calccrete</u> - B2.</p> |
| | | Stony rise | B5B2 | M | |
| NnD | 0.7 | Plain | G3 | D | <p>NnD Plain with deep acid sand over brown clay soils. <10% sandy rises with mostly, deep well-drained, water repellent acid sands; less frequently, poorly drained sands over brown clay and/or coffee rock; with 10-30% shallow sand, often over poorly drained brown clay, on calccrete.</p> |
| | | Sandy rise | I1H3G3 | M | |
| NnO | 1.7 | Plain | A7E1M2 | E | <p>NnO Plain with deep calcareous clay loam over marl; deep black cracking clay; or deep clay loam over grey clay, soils. 20-30% sandy rises with deep acid sand over brown clay soils. 10-20% stony rises with deep calcareous clay loam over rubbly clay, co-dominant with shallow clay loam on calccrete. <10% swamps with; wet organic loam over clay; and peat soils.</p> <p>Main soils:</p> <p>Plains and swamps: <u>Thick sand over clay</u> - G3, <u>Calcareous clay loam on marl</u> - A7, <u>Black cracking clay</u> - E1 and <u>Deep friable gradational clay loam</u> - M2.</p> <p>Sandy rises: <u>Highly leached sand</u> - I1, <u>Bleached siliceous sand</u> - H3 and <u>Thick sand over clay</u> - G3.</p> <p>Stony rises: <u>Shallow calcareous loam on calccrete</u> - B2 and <u>Rubbly calcareous loam on clay</u> - A5.</p> |
| | | Sandy rise | G3 | C | |
| | | Stony rise | A5B2 | L | |
| | | Swamp | N3N1 | M | |
| NQA | 17.9 | Lake plain | N1A7N3 | D | <p>Lake bed plain with peat; deep calcareous clay loam over clay and marl; and other clayey swamp soils.</p> <p>Drainage depressions with soils as above.</p> <p>Main soils:</p> <p>Lake plains: <u>Peaty soil</u> - N1, <u>Calcareous clay loam on marl</u> - A7 and <u>Wet clay loam</u> - N3.</p> <p>Drainage depressions: <u>Peaty soil</u> - N1, <u>Wet clay loam</u> - N3 and <u>Calcareous clay loam on marl</u> - A7.</p> |
| NQG | 0.2 | Drainage depression | N1N3A7 | D | |
| NSF | 0.3 | Plain | G3 | V | <p>Swampy plains with deep sand over brown clay; 10-20% swamps with clay loam over dark clay, occasionally calcareous throughout on marl.</p> <p>Main soils:</p> <p>Plains: <u>Thick sand over clay</u> - G3.</p> <p>Swamps: <u>Wet clay loam</u> - N3.</p> |
| | | Swamp | N3 | L | |



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| NuC | 1.5 | Plain | M4M2 | D | Plains with dark, non cracking clays, often poorly structured; 10-30% calcareous clay loam grading to clay on marl. <10% stony rises with shallow loam often over thin red clay on calcreted calcarenite. Main soils: Plains: <u>Deep hard gradational sandy loam - M4</u> and <u>Deep friable gradational clay loam - M2</u> . Stony rises: <u>Shallow sandy loam on calcrete - B3</u> . |
| | | Stony rise | B3 | M | |
| NVA | 1.3 | Plain | A6A7 | D | Plains with mostly dark, pedal calcareous clay loam grading to grey calcareous clay on rubble, or marl. Main soils: <u>Gradational calcareous clay - A6</u> and <u>Calcareous clay loam on marl - A7</u> . |
| Nx C | 2.3 | Plain | B5B2 | D | Nx C Plains with shallow dark grey clay loam, mostly on grey clay over calcrete. <10% stony rises with shallow loam, sometimes with red clay subsoils over calcreted calcarenite. |
| | | Stony rise | B3 | M | |
| Nx F | 0.5 | Plain | B5B2 | V | Nx F Plains as above, 20-30% swamps with wet clay loam grading to friable grey clay or peat soils. |
| | | Swamp | N3N1 M2 | C | |
| Nx J | 6.7 | Plain | B5B2 | V | Nx J plains and swamps as for Nx F above, but also with <10% stony rises with shallow loam, sometimes with red clay subsoil over calcreted calcarenite. Main soils: Plains: <u>Shallow dark clay loam on limestone - B5</u> and <u>Shallow calcareous loam on calcrete - B2</u> . Swamps: <u>Wet clay loam - N3</u> , <u>Peaty soil - N1</u> and <u>Deep friable gradational clay loam - M2</u> . Stony rises: <u>Shallow sandy loam on calcrete - B3</u> . |
| | | Swamp | N3N1M2 | C | |
| | | Stony rise | B3 | M | |
| NYF | 0.2 | Plain | C5 | V | NYF Plains with mostly deep clay loam grading to calcareous clay. Minor soils include: calcareous clay loam on clay or marl and wet, often peaty soils. 20-30% swamps with peat and deep clay loam over clay, with calcareous or marly subsoils. |
| | | Swamp | N1C5 | C | |
| NYI | 0.7 | Stony plain | B5 | V | NYI Stony plain with shallow black or grey cracking clay over calcrete. 20-30% swamps with mostly wet, clay or clay loam over dark clay soils. Main soils: Plains: <u>Gradational dark clay loam - C5</u> . Stony plains: <u>Shallow dark clay loam on limestone - B5</u> . Swamps: <u>Wet clay loam - N3</u> , <u>Peaty soil - N1</u> , <u>Gradational dark clay loam - C5</u> and <u>Deep friable gradational clay loam - M2</u> . |
| | | Swamp | N3M2 | C | |
| Nz C | 3.7 | Plain | F2C5 | V | Plains with clay loam over poorly structured dark brown clay, with calcareous subsoils. 10-20% stony rises with shallow dark loam, mostly grading to clay loam, on calcrete. Main soils: Plains: <u>Sandy loam over poorly structured brown or dark clay - F2</u> and <u>Gradational dark clay loam - C5</u> . Stony rises: <u>Shallow dark clay loam on limestone - B5</u> and <u>Shallow calcareous loam on calcrete - B2</u> . |
| | | Stony rise | B5B2 | L | |
| OFD | 0.1 | Low dune | I1 | D | Low siliceous dunes, with deep, well drained, water repellent, acidic sandy soils. Up to 30% is less well-drained sand over coffee rock or brown clay, especially lower slopes and flats or swales. Main soils: <u>Highly leached sand - I1</u> |
| Xc- | 0.1 | Lunette | B2B3 | D | Lunette with shallow, mostly calcareous loam, over calcrete. Main soils: <u>Shallow calcareous loam on calcrete - B2</u> and <u>Shallow sandy loam on calcrete - B3</u> . |



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| XQC | 0.5 | Swamp | N3M2E1 | D | Swamps with mostly wet, dark clay loam over clay soils or peat. Main soils: <u>Wet clay loam</u> - N3 , <u>Deep friable gradational clay loam</u> - M2 and <u>Black cracking clay</u> - E1 . |
| XRC | 2.0 | Swamp | N3 | D | XRC Swamps with wet dark cracking clay soils with minor peats. XRf Swamps as above, with 10-20% stony rises with shallow dark clay loam grading to clay on calcrete. Main soils: Swamps: <u>Wet clay loam</u> - N3 . Stony rises: <u>Shallow dark clay loam on limestone</u> - B5 and <u>Shallow calcareous loam on calcrete</u> - B2 . |
| XRf | 0.1 | Swamp | N3 | V | |
| | | Stony rise | B5B2 | L | |
| Xtc | 0.1 | Swamp | B5N3 | D | Xtc Swamps and stony rises with, often wet, shallow dark clay loam grading to clay on calcrete. Minor peat soils. XtC Peat swamps. Xtf Swamps with shallow, often wet, clay loam grading to clay on calcrete. Minor peat soils. 20-30% rises with shallow calcareous loam or siliceous sand over calcrete. Main soils: Swamps: <u>Shallow dark clay loam on limestone</u> - B5 , <u>Peaty soil</u> - N1 and <u>Wet clay loam</u> - N3 . Rises: <u>Shallow calcareous loam on calcrete</u> - B2 and <u>Shallow sandy loam on calcrete</u> - B3 . |
| XtC | 2.7 | Swamp | N1 | D | |
| Xtf | 0.6 | Swamp | B5N3 | V | |
| | | Rise | B2B3 | C | |
| Xud | 0.1 | Swamp | N3 | V | Non-peaty swamps with 10-20% sandy rises with deep sand, often over brown clay or coffee rock. Main soils: Swamps: <u>Wet clay loam</u> - N3 . Sandy rises: <u>Highly leached sand</u> - I1 ; <u>Deep brown sand</u> - H2 . |
| | | Sandy rise | I1H2 | L | |
| Xxf | 0.0 | Swamp | N1N3 WW | V | Swamps with deep acid peats, organic loam over clay, or water filled. 10-20% stony rises with shallow calcareous clay loams, or siliceous sand, over calcrete or shallow dark clay loam on dark clay on calcrete. Main soils: Swamps: <u>Peaty soil</u> - N1 and <u>Wet clay loam</u> - N3 . Stony rises: <u>Shallow calcareous loam on calcrete</u> - B2 , <u>Shallow sandy loam on calcrete</u> - B3 and <u>Shallow dark clay loam on limestone</u> - B5 . |
| | | Stony rise | B2B3B5 | L | |

PROPORTION codes assigned to Soil Landscape Unit (SLU) components:

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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:

- A5** Rubbly calcareous loam on clay (Supracalcic-Lithocalcic Calcarosol on clay)
Calcareous sandy-clay loamy topsoil grading into loamy-clay loamy subsoil on a clayey substrate. Usually (always?) rubbly. Clayey substrate (Blanchetown Clay equivalent: Imc or heavier) occurs at >60 cm(?) and <120 cm.
- A6** Gradational calcareous clay loam (Pedal Hypercalcic-Lithocalcic Calcarosol on clayey subsoil)
Calcareous loams to clay loams grading into brown-red clay. Often rubbly.
- A7** Calcareous clay loam on marl (Marly Calcarosol)
Dark calcareous clay with a marly subsoil (often saline in Upper SE). Often with shells and a peaty surface.
- B2** Shallow calcareous sandy loam on calcrete (Petrocalcic Calcarosol)
Up to 40 cm calcareous loamy sand to sandy loam with variable calcrete rubble overlying calcreted calcarenite - rises.
- B3** Shallow sandy loam on calcrete (Petrocalcic Rudosol)
Medium thickness non calcareous sandy loam, often having a slight clay increase with depth, over calcreted calcarenite shallower than 50 cm - rises.
- B5** Shallow dark clay loam on limestone (Petrocalcic, Black Dermosol)
Black clay loam to light clay over calcreted limestone at shallow depth, grading to highly calcareous clay - flats.
- B6** Shallow sandy loam over red-brown clay on calcrete (Petrocalcic, Red Kandosol)
Medium thickness sandy loam with slight ironstone gravel overlying a weakly structured reddish brown sandy clay on calcarenite within 50 cm - rises.
- B7** Shallow sand over sandy clay on calcrete (Petrocalcic, Brown Chromosol)
Medium thickness sand overlying brown friable sandy clay to clay on limestone or calcreted sandy clay within 50 cm - flats.
- C5** Gradational dark clay loam (Calcic-Hypercalcic Brown-Grey-Black Dermosol-Calcarosol)
Dark clay loam over abundant 'soft lime'. >10% carbonate is the cut off between this and M2 soils.
- E1** Black cracking clay (Black Vertosol)
- F2** Sandy loam over poorly structured brown or dark clay (Brown-Dark Sodosol-Chromosol)
Topsoil <30 cm over a poorly structured subsoil. Loamy, often sandy loam, to clay loamy texture contrast soil with a sodic/dispersive/poorly structured brown clayey subsoil. Often sandy loam, usually with a bleached horizon, and thin topsoil over a poorly structured B.
- G3** Thick sand over clay (Hypercalcic, Brown Sodosol/ Chromosol)
Thick bleached sand with an organically darkened surface abruptly overlying a massive to coarsely structured brown to reddish yellow sandy clay to clay, calcareous with depth - rises.
- H2** Siliceous sand (Sandy Calcarosol-Tenosol)
Deep to moderate depth calcareous siliceous sand. Often with non-calcareous topsoil; can be non calcareous throughout. Sometimes the subsoil is a light sandy loam.
- H3** Deep bleached sand (Basic, Arenic, Bleached-Orthic Tenosol)
Grey sand over a very thick bleached sand grading to yellow sand continuing below 100 cm.
- I1** Highly leached sand (Fragic, Pipey, Aeric Podosol)
Grey sand with a very thick bleached A2 layer, over dark brown and yellow massive soft to semi-hard clayey sand (coffee rock), grading to softer yellow and brown sand to sandy clay loam from about 80 cm.



- I2** Wet highly leached sand (Fragic, Humic, Aquic Podsol)
Grey sand with a thick bleached A2 horizon, overlying a thin to thick layer of coffee rock, grading to pale brown sand sharply overlying a grey, brown and yellow mottled sandy clay loam to light clay.
- M2** Deep friable gradational clay loam (Red-Brown-Grey- Black Dermosol)
Deep well structured red clay loamy soil.
- M4** Deep hard gradational sandy loam (Hard Brown-Dark Kandosol- Dermosol)
Deep dark brown loamy to clay loamy soil grading to clay at depth. Hardsetting surface often with prismatic structures in the subsoil.
- N1** Peat (Organosol)
Peaty soil.
- N3** Seasonally waterlogged, non to marginally saline equivalents of soils listed above, viz.:
N3c Wet **G3**
N3d Wet **B5**
N3e Wet **B7**
- RR** Bare rock
- WW** Water

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

