

JES Jessie Land System

- Area:** 42.1 km²
- Annual rainfall:** 560 – 635 mm average
- Geology:** The land system is formed on ancient coastal dune sand, which has become indurated at the surface to form calcarenite (Naracoorte Limestone). The system is a discontinuous single dune to the east and parallel to the Naracoorte Range. There are extensive sand spreads and shallow stony soils.
- Topography:** The Jessie Land System is a discontinuous single range that runs NNW – SSE and parallel to the east of the Naracoorte Range. The Kybybolite and Wrattenbully Land Systems surround this land system. There are minor closed depressions within this land system. The range is up to 2 km wide and up to 20 m high.
- Elevation:** 70 - 110 m
- Relief:** Maximum relief 20 m
- Soils:**
- Sandy Soils (dunes, rises and flats)*
- H3** Bleached siliceous sand
 - G2** Bleached sand grading to sandy clay loam
 - G3** Thick sand over clay
 - I1** Highly leached sand
- Stony soils (rises)*
- B2** Shallow calcareous loam on calcrete
 - B3** Shallow sandy loam on calcrete
 - B4** Shallow red loam on calcrete
 - B6** Shallow loam over red-brown clay on calcrete
 - RR** Limestone outcrop
- Other soils*
- D2** Loam over red clay
 - F1** Loam over brown or dark clay
 - M2** Deep friable gradational clay loam
- Main features:** The Jessie Land System is a linear calcarenite range that is bisected by undulating plains of the Kybybolite and Wrattenbully Land Systems. The rises are characterised by deep sandy soils and soil and/or stony soils. The deep sands have low fertility and moderate waterholding capacity and are prone to water repellence, soil acidity and wind erosion. The shallow soils have limited water holding capacity and moderately low to moderate fertility.



Soil Landscape Unit summary: 8 Soil Landscape Units (SLUs) mapped in the Jessie Land System:

SLU	% of area	Main features #
M-B	19.94	<p>Undulating rises formed on calcreted calcarenites of ancient coastal dunes. Greater than 50% calcrete outcropping on these rises with associated shallow soils over limestone and minor deep sands.</p> <p>Main soils: <u>limestone outcrop - RR (E)</u>, <u>shallow calcareous loam on calcrete - B2 (E)</u>, <u>shallow loam over red clay on calcrete - B6 (C)</u>, <u>shallow sandy loam on calcrete - B3 (M)</u> and <u>shallow red loam on limestone - B4 (M)</u>.</p> <p>The soils are very shallow to shallow, have moderately low to moderate fertility and very low to moderately low water holding capacity. The rocky areas are semi-arable with up to 50% exposed outcropping in concentrated areas. Surface stone is a slight limitation.</p> <p>The minor soils include <u>loam over red clay - D2 (M)</u>, <u>bleached siliceous sand - H3 (L)</u>, <u>thick sand over clay - G3 (M)</u> and <u>sand grading to sandy clay loam - G2 (C)</u>.</p> <p>The deep sandy soils have low fertility and moderate waterholding capacity. Other limitations include soil acidity, water repellence and susceptibility to wind erosion.</p> <p>The moderately deep loamy soils have moderate fertility and moderate to high water holding capacity. They have high productive potential.</p>
MAB	5.40	<p>Undulating rises formed on calcreted calcarenite and overlain by siliceous sand. There is greater than 90% shallow soil or calcrete outcrop with greater than 50% bare calcrete.</p> <p>Main soils: <u>limestone outcrop - RR (E)</u>, <u>shallow calcareous loam on calcrete - B2 (E)</u>, <u>shallow sandy loam on calcrete - B3 (L)</u>, <u>shallow loam over red-brown clay on calcrete - B6 (L)</u>.</p> <p>This land is non-arable as these soils are very stony and shallow and have very low water holding capacity and low fertility.</p> <p>Loamy soils: <u>shallow red loam on limestone - B4 (M)</u> and <u>loam over red clay - D2 (M)</u>.</p> <p>The loamy soils are very shallow to shallow with low waterholding capacity and moderate fertility.</p>
MHB MHC	5.77 24.95	<p>Undulating rises formed on calcreted calcarenite and overlain by siliceous sand. There is up to 30 m relief and slopes vary from 3-6%. There is variable surface calcrete, depending on the presence of sand. 10-20% stone cover is common, with outcropping reefs and heavy stone in places.</p> <p>MHB Undulating rises MHC Undulating rises to low hills</p> <p>Main soils: <u>bleached siliceous sand - H3 (C)</u>, <u>sand grading to sandy clay loam - G2 (C)</u> and <u>thick sand over clay - G3 (M)</u>.</p> <p>These soils are deep with low fertility, moderate water holding capacity and rapid drainage. Severe water repellence and soil acidity are limitations for pasture and crop growth and is susceptible to wind erosion. The minor shallow and loamy soils are similar to MAB landscape unit.</p> <p>This land is semi-arable as these soils are very shallow and/or stony and have low water holding capacity and moderately low fertility. These soils are calcareous throughout. The loamy soils are moderate to shallow, have moderate to high waterholding capacity and moderate fertility.</p>
MRB MRC	6.53 2.41	<p>The ridges are formed on calcreted calcarenite. They are partially overlain by sand spreads which tend to be more extensive on the eastern slopes. There is variable surface stone on the non sandy slopes.</p> <p>MRB Undulating rises MRC Undulating rises to low hills</p> <p>Main soils: <u>bleached siliceous sand - H3 (L)</u>, <u>sand grading to sandy clay loam - G2 (L)</u>, <u>thick sand over clay - G3 (L)</u> and <u>highly leached sand - I1 (M)</u>.</p> <p>These soils are deep with low fertility, moderate water holding capacity and rapid drainage. Severe water repellence and soil acidity are limitations for pasture and crop growth and is susceptible to wind erosion.</p> <p>Loamy soils: <u>loam over brown or dark clay - F1 (M)</u>, <u>loam over red clay - D2 (M)</u>, <u>shallow loam over red clay on calcrete - B6 (L)</u>, and <u>shallow red loam on limestone - B4 (M)</u>.</p> <p>These soils are shallow to moderately deep, have moderate fertility, moderate to high water holding capacity and rapid drainage. These soils have high productive potential. The stony soils are <u>shallow calcareous loam on calcrete - B2 (M)</u>, <u>limestone outcrop - RR (M)</u>, <u>shallow sandy loam on calcrete - B3 (M)</u> and B6.</p> <p>These soils are very shallow, have moderate fertility, low waterholding capacity and are</p>



		well drained. These soils are calcareous throughout and alkaline at depth and there is a slight limitation to tillage by rockiness.
MWB	8.96	<p>Gently sloping undulating rise with less than 3% slope and maximum relief of 10m, which is formed on calcreted calcarenites of ancient coastal dunes. There is variable deep sand and non sandy slopes and surface stone.</p> <p>Main soils: <u>loam over brown or dark clay - F1 (L)</u>, <u>shallow loam over red clay on calcrete - B6 (L)</u>, <u>shallow sandy loam on calcrete - B3 (M)</u>, <u>bleached siliceous sand - H3 (L)</u>, <u>sand grading to sandy clay loam - G2 (L)</u>, <u>thick sand over clay - G3 (M)</u> and <u>highly leached sand - I1 (L)</u>.</p> <p>The loamy soils are shallow to moderately deep, have moderate fertility and high water holding capacity.</p> <p>The sandy soils are deep with low fertility, moderate waterholding capacity and rapid drainage. Severe water repellence and soil acidity are limitations for pasture and crop growth and is susceptible to wind erosion.</p>
MYB	26.04	<p>Gently sloping undulating rise with less than 3% slope and maximum relief of 10m, which is formed on calcreted calcarenites of ancient coastal dunes.</p> <p>Main soils: <u>loam over brown or dark clay - F1 (C)</u>, <u>shallow loam over red clay on calcrete - B6 (C)</u>, <u>deep friable gradational clay loam - M2 (M)</u>, <u>thick sand over clay - G3 (L)</u>, <u>bleached siliceous sand - H3 (M)</u> and <u>sand grading to sandy clay loam - G2 (M)</u>.</p> <p>The loamy soils are shallow to moderate with moderate fertility and moderate water holding capacity.</p> <p>The sandy soils are deep with low fertility, moderate waterholding capacity and rapid drainage. Severe water repellence and soil acidity are limitations for pasture and crop growth and is susceptible to wind erosion.</p> <p>The minor stony shallow soils are described in MAB landscape unit. This land is semi-arable as the soils are very shallow, have moderately low fertility and very low water holding capacity. The soils are calcareous and alkaline throughout.</p>

PROPORTION codes assigned to soils within Soil Landscape Units (SLU):

- (D) Dominant in extent (>90% of SLU)
- (V) Very extensive in extent (60–90% of SLU)
- (E) Extensive in extent (30–60% of SLU)
- (C) Common in extent (20–30% of SLU)
- (L) Limited in extent (10–20% of SLU)
- (M) Minor in extent (<10% of SLU)

Detailed soil profile descriptions:

(In alphabetic order)

- B2** Shallow calcareous loam on calcrete (Petrocalcic, Lithocalcic Calcarosol)
Thin stony calcareous sandy loam to clay loam, becoming more clayey and rubbly with depth, overlying calcreted calcarenite shallower than 50 cm.
- B4** Red sandy loam over calcrete (Petrocalcic, Red Dermosol)
Medium thickness red sandy loam grading to friable red clay loam over calcreted calcarenite within 50 cm.
- B6** Sandy loam over red sandy clay on calcrete (Petrocalcic, Red Kandosol)
Medium thickness loamy sand with slight ironstone gravel overlying a weakly structured reddish brown sandy clay on calcarenite within 50 cm.
- D2** Loam over red clay (Mottled, Hypercalcic Red Chromosol)
Medium to thick sandy loam to clay loam overlying a well structured red clay grading to red mottled clay with limestone segregations at depth.
- F1** Loam over brown or dark clay (Melanic, Hypercalcic, Black/Brown Chromosol)
Medium thickness dark brown sandy loam over a thin to medium sand layer over a structured brown to black clay grading to a brown mottled clay with limestone segregations at depth.
- G2** Sand grading to sandy clay loam (Mesotrophic, Yellow Kandosol)
Thick bleached sand, organically darkened at surface, grading to a yellow and red friable massive sandy clay loam.



- G3** Thick sand over clay (Eutrophic / Calcic, Brown Chromosol)
Thick to very thick bleached sand to loamy sand with an organically darkened surface abruptly overlying a friable yellowish brown and red sandy clay.
- 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.
- RR** Limestone outcrop (Petrocalcic, Leptic Rudosol)
Organically stained sandy to loamy sand surface over a sandy sub-soil with very little development on limestone or calcrete.

(Grouped on landscape position)

Sandy Soils (dunes, rises and flats)

- H3** Bleached siliceous sand (Arenic, Bleached-Orthic Tenosol)
Thick to very thick bleached sand, organically darkened at the surface over yellow sand continuing below 100 cm.
- G2** Bleached sand grading to sandy clay loam (Sandy Petrocalcic, Brown Chromosol-Kandosol)
Medium to thick sand with a bleached A2 layer abruptly overlying a brownish friable light sandy clay loam to sandy clay over calcreted calcarenite
- G3** Thick sand over clay (Eutrophic, Mottled, Brown Chromosol/Sodosol)
Thick to very thick sand with a pale sand layer directly overlying a brownish clay
- I1** Highly leached sand (Humeosesquic Aeric Podosol)
Organically darkened sand to loamy sand grading to greyish sand overlying dark sands with organic-aluminium compounds.

Stony soils (rises)

- B2** Shallow calcareous loam on calcrete (Petrocalcic, Hypocalcic Calcarosol)
Thin calcareous loam to clay loam directly overlying calcarenite within 30 cm
- B3** Shallow sandy loam on calcrete (Petrocalcic, Orthic Tenosol)
Loamy sand to loam with variable rubble and slight clay increase with depth overlying calcreted calcarenite shallower than 50 cm. Extensive on stony rises.
- B4** Red loam over calcrete (Petrocalcic, Red Dermosol)
Medium thickness red loam grading to friable red clay loam over calcreted calcarenite within 50 cm - rises.
- B6** Shallow loam over red-brown clay on calcrete (Hypocalcic, Petrocalcic, Red Dermosol)
Medium thickness loam to clay loam over a red to red-brown clay directly overlying calcarenite within 50 cm
- RR** Limestone outcrop (Petrocalcic, Leptic Rudosol)
Organically stained sandy to loamy sand surface over a sandy sub-soil with very little development on limestone or calcrete.

Other soils

- D2** Loam over red clay (Mottled, Hypercalcic Red Chromosol)
Medium to thick sandy loam to clay loam overlying a well structured red clay grading to red mottled clay with limestone segregations at depth.
- F1** Loam over brown or dark clay (Mottled, Eutrophic Brown Chromosol/Sodosol)
Thick organically darkened sandy loam to clay loam over a light brown sand directly overlying structured brown mottled clay
- M2** Deep friable gradational clay loam (Haplic, Petrocalcic Red Dermosol)
Medium thickness clay loam over a well structured red clay overlying calcarenite within 100 cm

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

