

MWA Mount Watts Land System

Well defined narrow north - south range bordering the eastern side of the Georgetown - Gulnare plains

Area: 42.3 km²

Annual rainfall 460 – 585 mm average

Geology: Tillites of the Appila Formation, mantled by fine grained carbonate of aeolian origin which usually occurs as soft segregations in weathering rock cleavages, but may occur as a rubble layer between the soil and the parent rock. There is very little reworked alluvial material in the system due to the moderate to steep slopes and well defined margins. Virtually all of the sediments eroded from the range have been washed west on to the Georgetown - Gulnare plain or east into the Bundaleer Creek valley.

Topography: Moderately steep to steep range of low hills extending in a gentle arc from about eight km north of Yacka to Teetuppenie Creek. Except for a low gently inclined saddle east of Gulnare, where slopes are as low as 4%, most of the land is moderately steep (15 - 30% slope) with some steeper areas to 60%. North - south trending rocky reefs are characteristic (5 - 10% coverage). There are some prominent quartzite outcrops in the north. There is 10 - 20% surface coverage of quartzite, tillite or siltstone fragments. Watercourses occur every 300 - 400 m. They sometimes flow along strike lines, but general flow is perpendicular to the strike of the range. They are generally stable.

Elevation: The highest points along the range are 626 m in the north down to 441 m (Mt. Watts in the south). Along the western side, elevations adjacent to the Georgetown Land System vary from 300 m in the south to 440 m in the north. On the eastern side, elevations adjacent to the Flairville Land System range from 550 m to 320 m.

Relief: Maximum relief is 200 m (from crest to lower slope margin), but local relief is usually less than 100 m. Relief is only 40 m in the saddle near Gulnare.

Soils: Most soils are shallow to moderately deep over basement rock. Many have well developed red clayey subsoils, but others have calcareous subsurface layers, or surface soils grade directly to weathering rock.

Main soils

A2 Shallow calcareous loam - common (throughout, particularly on upper slopes)

D1 Loam over red clay on rock - common (throughout)

C2 Gradational loam on rock - limited (throughout)

L1b Shallow stony loam with carbonate - limited (rocky slopes)

L1a/B3 Shallow stony loam - limited (rocky slopes)

Minor soils

D7 Loam over dispersive red clay on rock - quartzitic rock strata

Main features: The Mount Watts Land System is largely non-arable moderately steep to steep hill country. Soils are shallow, stony and exposed. Grazing is the predominant land use, but care is needed to maintain surface cover for erosion prevention. Arable slopes are characterized by mixed loam over clay, calcareous loam and shallow stony soils, with associated limitations of poor soil structure, marginal fertility and restricted waterholding capacity. Erosion control is crucial in all parts of the System.



Soil Landscape Unit summary: 7 Soil Landscape Units (SLUs) mapped in the Mount Watts Land System:

SLU	% of area	Main features #
AAC AAD AAE	50.0 7.5 3.9	<p>Rocky land formed on mainly fine grained rocks.</p> <p>AAC Low hills with slopes of 15-30%. AAD Steep ridges or slopes of 30-50%. AAE Steep hills of 30-50% slope.</p> <p>Main soils: <u>shallow calcareous loam</u> - A2 (E) and <u>shallow stony loam (with carbonate)</u> - L1a/L1b (E), with <u>loam over red clay on rock</u> - D1 (L) and <u>gradational loam on rock</u> - C2 (L). The hills are non arable due to the roughness of the terrain, moderate slopes and shallow stony soils. Rocky outcrops limit accessibility in places. Runoff is rapid and exposure is high, so a significant proportion of rainfall does not infiltrate the soil. However, areas of deeper soils are potentially productive for grazing.</p>
ABD	2.1	<p>Rocky low hills formed on mainly fine grained rocks with prominent quartzite reefs.</p> <p>Main soils: <u>shallow stony loam</u> - L1a (E) with <u>shallow calcareous loam</u> - A2 (C), <u>loam over red clay on rock</u> - D1 (L) and <u>loam over dispersive red clay on rock</u> - D7 (L). These ridges are non-arable and largely inaccessible due to moderate slopes and rocky reefs. The soils are mainly shallow and stony with marginal waterholding capacities and fertility.</p>
DGC DGD	17.9 13.1	<p>Low hills formed on fine grained and quartzitic basement rocks.</p> <p>DGC Slopes of 4-12%. DGD Slopes and ridges of 12-20% slope.</p> <p>Main soils: <u>loam over red clay on rock</u> - D1 (E) and <u>loam over dispersive red clay on rock</u> - D7 (E), with <u>shallow stony loam with carbonate</u> - L1b (C), <u>shallow calcareous loam</u> - A2 (L) and <u>gradational loam on rock</u> - C2 (L). These slopes are mostly arable (except for minor rocky outcrops and dissected areas). The slopes are moderate with a consequent potential for water erosion. This is exacerbated by the predominant hard setting, poorly structured soil type which tends to seal over and shed water. Other limitations caused by poor structure are difficulty in working and patchy emergence.</p>
ESD	5.5	<p>Moderately steep slopes of 10-20% and up to 50 m high, with rocky reefs occupying about 20% of the land surface.</p> <p>Main soils: <u>gradational loam on rock</u> - C2 (E) and <u>shallow calcareous loam</u> - A2 (E), with <u>shallow stony loam (with carbonate)</u> - L1a/L1b (C) on rocky areas. Rocky reefs, shallow stony soils and sometimes moderate slopes limit cropping of these areas. The arable land is generally confined to strips between the reefs of rock. Water erosion is a potential problem because of the high runoff from the shallow soils and rocky areas.</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:

- A2** Shallow calcareous loam (Paralithic, Calcic / Lithocalcic Calcarosol)
Calcareous stony loam grading to soft or rubbly carbonate, over weathering rock at less than 50 cm.
- C2** Gradational loam on rock (Hypercalcic / Calcic, Red / Black Dermosol)
Medium thickness loam to clay loam grading to a well structured red or dark coloured clay with soft to semi-hard carbonate before 50 cm, over weathering rock within one metre.
- D1** Loam over red clay on rock (Hypercalcic / Hypocalcic, Red Chromosol)
Medium thickness hard gravelly loam to clay loam abruptly overlying a well structured red clay, with variable soft carbonate at depth grading to weathering rock within a metre.
- D7** Loam over dispersive red clay on rock (Calcic, Red Sodosol)
Medium thickness hard stony loam to clay loam sharply overlying a dispersive red clay with soft carbonate from about 70 cm grading to weathering quartzitic rock.
- L1a/B3** Shallow stony loam (Lithic / Petrocalcic, Leptic Rudosol)
Shallow stony loam over hard rock or sheet calcrete within 50 cm.
- L1b** Shallow stony loam with carbonate (Calcareous, Paralithic, Leptic Tenosol)
Medium thickness stony loam, slightly more clayey with depth over soft carbonate grading to weathering rock within 50 cm.

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

