

GUM Gumbowie Land System

Range of low hills and associated outwash fans between Terowie and Yongala

Area: 214.3 km²

Annual rainfall: 310 – 455 mm average

Geology: The main range on the western side of the Land System is formed on Ulupa Siltstones. The more gentle and lower relief eastern slopes are formed on mixed siltstones, tillites and calc-siltstones of the Tapley Hill, Saddleworth and Appila Formations. Most of the rocks are mantled by a veneer of fine carbonates, sometimes cemented into rubbly or occasionally sheet forms. The outwash fans and pediments on the eastern side are formed on a relatively thin veneer of locally derived fine to medium grained alluvium. This is also mantled by soft or rubbly carbonates.

Topography: The Land System comprises a range of moderately steep to steep low hills and ridges on the western side (mainly formed on Ulupa Siltstones), and undulating rises interspersed with broad outwash fans, pediments and drainage depressions on the eastern side. Most of the land has been sheet eroded in the past, and scalded patches are still evident, particularly near drainage channels, many of which also show evidence of severe historic erosion. Slopes on the steeper land range from 10 - 40%, from 5 - 10% on the undulating rises and less than 5% on the fans and pediments.

Elevation: The highest point is 678 m on the range west of Gumbowie siding. The eastern edge of the fan is 500 m at Terowie.

Relief: Maximum local relief is 60 m, with 10 - 30 m being more usual on the eastern side

Main Soils: Shallow calcareous or non calcareous loams dominate the rises, with deep red loamy texture contrast soils, gradational loams or calcareous loams on flats and gentle slopes. The following soils are characteristic:

Shallow soils on rises and hills formed over basement rock

- L1** Shallow stony sandy loam to loam - extensive
- A2** Shallow calcareous loam - limited
- C2** Shallow gradational red loam - limited

Deeper soils of outwash fans, pediments and drainage depressions formed on alluvium

- D4** Loam over friable red clay - limited
- C3** Deep gradational loam - limited
- A4** Deep calcareous loam - minor

Main features: The Gumbowie Land System includes some steep to moderately steep and stony non-arable low hills (mainly in the west), semi arable rises with rocky reefs, and arable rises, fans and pediments. Soils on the rising ground are predominantly shallow and often stony, although usually well structured. On the gentler slopes soils are deeper and moderately fertile. Although the more arable land is opportunistically cropped, low rainfall is a permanent limitation to agriculture. A feature of the Land System is the widespread evidence of past sheet and gully erosion. Scalded patches and eroded water courses are still apparent. The degraded state of the soils makes them even more susceptible to erosion by both wind and water.



Soil Landscape Unit summary: 25 Soil Landscape Units (SLUs) mapped in the Gumbowie Land System:

SLU	% of area	Main features #
AAM AAN AAO AAP AAg AAh AAi AAj	1.0 5.7 8.7 1.6 1.9 4.2 10.0 2.8	<p>Rocky rises and low hills formed on basement siltstones and generally affected by erosion in the past, with some scalding still evident.</p> <p>AAO Undulating rises with slopes of 5-10% and relief to 20 m.</p> <p>AAN Rises with slopes of 10-20% and relief of 20 m.</p> <p>AAO Low hills with slopes of 10-30% and relief of between 20 and 60 m.</p> <p>AAP Steep slopes of 25-40% with extensive rocky outcrop and scalded patches.</p> <p>AAg Rises with slopes of 4-12%, relief of 20 m and eroded water courses.</p> <p>AAh Low ridges to 20 m high with slopes of 8-15% and eroded water courses.</p> <p>AAi Low hills with slopes of 10-25%, relief to 50 m and eroded water courses.</p> <p>AAj Steep slopes of 20-40% up to 60 m high with eroded water courses.</p> <p>Main soils: <u>shallow stony loam</u> - L1 (V) with <u>shallow gradational red loam</u> - C2 (L) and <u>shallow calcareous loam</u> - A2 (L). Shallow stony soils, low rainfall, rocky outcrops and often moderate to steep slopes limit the use of these areas to light grazing. The soils, damaged by historic erosion, are fragile, thereby increasing the potential for erosion by water as well as wind.</p>
ABB ABC	0.7 3.2	<p>Rocky rises and moderately steep to steep quartzite ridges. There is extensive rock outcrop, particularly along the quartzite reefs.</p> <p>ABB Rises up to 30 m high with slopes of less than 20%.</p> <p>ABC Ridges with slopes of 20-40% and relief of between 30 and 60 m.</p> <p>Main soils: <u>shallow stony sandy loam</u> - L1 (V) with <u>shallow calcareous loam</u> - A2 (C). Shallow stony soils, low rainfall, rocky outcrops and moderate to steep slopes limit the use of these areas to light grazing. The soils are highly susceptible to erosion by water and wind.</p>
EFV EFW	0.7 5.6	<p>Gently undulating to undulating rises formed on fine grained rocks of the Tapley Hill Formation and Appila Tillite. Much of the land has been eroded in the past with some scalded areas and eroded water courses still evident.</p> <p>EFV Slopes of 1-3% with relief to 20 m.</p> <p>EFW Slopes of 2-8% with relief to 30 m.</p> <p>Main soils: <u>shallow calcareous loam</u> - A2 (V) with <u>shallow stony loam</u> - L1 (L) and <u>shallow gradational red loam</u> - C2 (L). Low rainfall limits cropping of these areas, but the soils are mostly arable. Shallow depth and therefore low waterholding capacity is the main limitation. Although infiltration rates are moderately high, there is always the potential for runoff and consequent erosion of unprotected soil during heavy rain.</p>
ESV ESW ESX ESm	0.3 8.9 2.8 1.4	<p>Rocky rises. Most of the land has been sheet eroded in the past, with some scalding still evident. Reefs of rock outcrop are a feature of these areas.</p> <p>ESV Rises with slopes of less than 3% and relief of less than 10 m.</p> <p>ESW Undulating rocky rises with slopes of 2-10% and relief to 30 m.</p> <p>ESX Moderately steep rocky rises and ridges with slopes of 10-20% and relief to 30 m.</p> <p>ESm As for ESW but with significant water course erosion.</p> <p>Main soils: <u>shallow stony loam</u> - L1 (E) and <u>shallow calcareous loam</u> - A2 (E) with <u>shallow gradational red loam</u> - C2 (L). This land is very marginal for cropping due to the combination of low rainfall, shallow stony soils and rocky reefs, restricting the area of land which can be worked. The rocky areas generate moderate runoff which increases erosion potential. Wind erosion is also a hazard when cover is low.</p>
EZm	0.9	<p>Complex of gently inclined pediments and basement rock rises with slopes of 2-6% and eroded water courses. Much of the land has been sheet eroded in the past.</p> <p>Main soils: <u>shallow calcareous loam</u> - A2 (E) and <u>shallow gradational red loam</u> - C2 (L) on rises, and <u>deep calcareous loam</u> - A4 (L), with <u>loam over friable red clay</u> - D4 (L) and <u>deep gradational loam</u> - C3 (L) on lower ground. These areas have features common to EFW and KQV.</p>
JLG JLJ JLV JLI JLm JLo	0.4 1.3 4.6 20.8 2.4 7.2	<p>Gently sloping pediments, outwash fans and drainage depressions formed on alluvial sediments. Most of the land has been sheet eroded in the past - some scalding is still evident and some water courses are gullied. There are sporadic rises of basement rock.</p> <p>JLG Pediments / fans with slopes of 2-3% and negligible water course erosion and scalding.</p> <p>JLJ Drainage depressions with eroded water courses.</p> <p>JLV Pediments / fans with slopes of 2-3%.</p> <p>JLI Pediments / fans with slopes of 2-3% and eroded watercourses.</p>



		<p>JLm Pediments / fans with slopes of 3-7% and eroded water courses.</p> <p>JLo Drainage depressions with eroded water courses, scalding and variable slopes to 10%.</p> <p>Main soils: <u>loam over friable red clay - D4</u> (E) and <u>deep gradational loam - C3</u> (E) with <u>deep calcareous loam - A4</u> (C). Soils similar to those in EFV occur on low basement rock rises. The soils are mostly deep and moderately fertile, productivity only being limited by low rainfall. Erosion in the past has damaged surface structure, so very careful management is needed to prevent further damage and erosion. Potential for water erosion is moderate due to the long grades characteristic of the land, and adjacent steeper slopes generating run off water.</p>
KQU KQV	0.8 2.1	<p>Pediments and outwash fans formed on medium to fine grained alluvium. Minor scalding is still evident from more extensive historic erosion.</p> <p>KQU Slopes of 1-2%.</p> <p>KQV Slopes of 2-3%.</p> <p>Main soils: <u>deep calcareous loam - A4</u> (E) and <u>deep gradational loam - C3</u> (E). The soils are moderately deep, well structured and have satisfactory fertility levels, but productivity is limited by low rainfall. Erosion control (both water and wind) is imperative.</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:

A2 Shallow calcareous loam (Paralithic, Hypercalcic / Supracalcic Calcarosol)

Calcareous stony loam over a highly calcareous silty loam or rubble layer, grading to weathering rock within 100 cm and commonly less than 50 cm.

A4 Deep calcareous loam (Regolithic, Hypercalcic / Supracalcic Calcarosol)

Calcareous loam becoming more clayey and calcareous with depth and having a prominent layer of rubbly or soft carbonate within 50 cm. This grades to alluvium deeper than 100 cm.

C2 Shallow gradational red loam (Calcic / Supracalcic, Red Dermosol)

Medium thickness loam grading to a well structured red clay loam to clay subsoil with soft or rubbly carbonate within 50 cm, overlying weathering rock within 100 cm.

C3 Deep gradational loam (Supracalcic / Hypercalcic, Red Dermosol)

Medium thickness loam grading to a well structured red clay loam to clay subsoil with soft or rubbly carbonate within 50 cm, overlying alluvium deeper than 100 cm.

D4 Loam over friable red clay (Pedaric, Red Sodosol)

Thin loam to clay loam sharply overlying a well structured red clay with minor soft carbonate at depth.

L1 Shallow stony sandy loam to loam (Basic / Calcareous, Lithic, Leptic Tenosol / Rudosol)

Stony sandy loam to loam overlying bedrock (sometimes capped by soft or rubbly carbonate) at depths shallower than 50 cm.

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

