RAT Rathjen Land System

Discontinuous belt of dissected low rocky hills extending from south of Keyneton to south of Palmer

Area: 51.4 km²

Annual rainfall: 425 - 650 mm average

Geology: The land is formed on granites and granitic gneisses which were intruded into the older

surrounding Kanmantoo Group rocks during the Ordovician geological period. Variable weathering of these rocks has resulted in a patchwork of rocky outcrops where weathering has been slight, and rock free ground where weathering has been significant and hard rock may be deeper than a metre. Locally derived alluvium, gritty sands to sandy clays, fills

drainage depressions, but these are minor.

Topography: The landscape is characteristically uneven and rocky. Depending on the nature of the rocks,

slopes can be smooth, relatively rock free and gentle (5 - 10%). More common however, are moderately steep to steep very rocky slopes with spectacular outcrops of granitic tors, tombstones and massive reefs. Watercourses are well defined, but gully erosion, with some

exceptions, is relatively minor.

Elevation: 120 m to 480 m

Relief: Variable up to 100 m

Soils: The soils are typically sandy surfaced and gritty, with or without clayey subsoils, over hard

to weathered rock. Where present, subsoil clays are commonly dispersive. Deeper texture

contrast or gradational soils occur on lower slopes and flats.

Main soils
Hillslopes

L1a Shallow loamy coarse sand L1b Shallow stony loamy sand

K4/D7 Sandy loam over dispersive brown clay

K5 Loamy sand over reddish brown sandy clay loam

Minor soils

Flats and drainage depressions

F2 Sandy loam over dispersive brown clay

M1 Gradational sandy loam

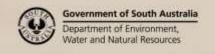
Main features: The Rathjen Land System is dominated by rocky slopes which are non arable, and

commonly non trafficable. Shallow stony and sandy soils have low productive potential. Limited areas of more subdued topography have deeper soils with clayey subsoils and are generally free of extensive outcrop. Waterlogging, erosion potential and low fertility are the

main limitations to land use. Creek flats are a minor component of the landscape.

Watercourses are susceptible to erosion due to the high run off from adjacent rocky slopes. However, most are relatively stable. There is sporadic saline seepage in some drainage

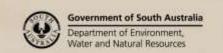
depressions.





Soil Landscape Unit summary: 12 Soil Landscape Units (SLUs) mapped in the Rathjen Land System

SLU	% of area	Main features #
AgB	2.4	Rises and low hills formed on gneisses, granitic gneisses and granites. There is sporadic to
AgC	29.4	extensive rock outcrop and surface stone. Relief ranges from 20 m to 100 m, and slopes from 59
AgD	9.6	to 75%. There are occasional precipitous slopes. Watercourses are well defined in narrow and
Agt	8.6	commonly gullied depressions.
Agu	23.5	AgB Rounded rocky rises and low hills with relief to 60 m and slopes of 5-20%.
Agv	2.0	AgC Rocky low hills with relief to 100 m and slopes of 15-30%.
		AgD Steep to very steep and rocky hillslopes up to 60 m high with slopes of 30-75%. Agt Very rocky rises and low hills with relief to 60 m and slopes of 5-20%. There is 20-50% rock outcrop.
		Agu Very rocky low hills with relief to 100 m and slopes of 15-30%. There is about 50% outcropping rock.
		Agv Very rocky steep slopes of 30-50% with about 50% outcropping rock.
		Main soils: <u>shallow loamy coarse sand</u> - L1a (L-E) and <u>shallow stony loamy sand</u> - L1b (L-E) associated with steeper slopes and rocky outcrop, and <u>loamy sand over reddish brown sandy clay loam</u> - K5 (E-L) and <u>sandy loam over dispersive brown clay</u> - K4/D7 (C) on gentler slopes
		where soils are deeper. This land is too steep and / or rocky for any uses other than grazing
		(except for some small patches between rocky outcrops). Some of the moderate slopes are
		sufficiently rock free for pasture improvement, but most of the land is not readily accessible to conventional machinery.
CTD	19.5	Undulating to rolling rises and low hills formed on highly micaceous gneisses. Relief is 20 to 50 m and slopes are 6-15%. Rock outcrop is sporadic. Watercourses are well defined in broad
		depressions.
		Main soils: sandy loam over dispersive brown clay - K4/D7 (V), with shallow loamy coarse sand -
		L1a (L), <u>shallow stony loamy sand</u> - L1b (L) and <u>loamy sand over reddish brown sandy clay loam</u>
		- K5 (L). This land is relatively free of rocks, and is virtually fully arable.
		Main soils: moderately deep, but only marginally fertile. The clayey subsoils cause perching of water, so some waterlogging can be expected. The sub dominant soils are shallower but well
		drained. Erosion potential is high, so appropriate control measures are needed if the land is cropped.
ETI	0.7	Soils are shallow to moderately deep and subject to erosion, particularly by runoff from adjacen
		steeper slopes.
		Slopes formed on metasandstones of the Backstairs Passage Formation and mixed
		metasiltstones and metagreywackes of the Carrickalinga Head Formation. ETI Lower slopes with gradients of 10-20%. There is 10-20% rocky outcrop, but the
		remaining land is arable.
		Main soils: <u>shallow stony sandy loam</u> - L1a (E) and <u>hard sandy loam over red or brown clay</u> -
		K3/D1 (E). This land is semi arable, with about a third of the area too steep and / or rocky for
		cultivation. The arable strips have generally shallow stony soils with restricted water holding
		capacity and which are prone to erosion because of the moderate slopes and high runoff.
LCJ	0.7	Creek flats and drainage depressions in the northern sections of the System, formed on variable
LC3 LCe	2.2	locally derived alluvium. This is typically sandy or gritty through to sandy clay.
Lec	2.2	LCJ Gently sloping (2%) alluvial flats with eroded water courses.
		LCe Drainage depressions with eroded water courses and sporadic saline seepage.
		Main soils: <u>sandy loam over dispersive brown clay</u> - F2 (E) and <u>gradational sandy loam</u> - M1 (E).
		These soils are deep and of moderately low fertility, but susceptible to waterlogging, compactic
		and erosion. The latter is exacerbated by salinity resulting from insufficient water use higher in
		the catchments. Controlled grazing, erosion control, nutrition maintenance and revegetation wi
		salt and waterlogging tolerant plants are the main management issues.
LVO	0.8	Creek flats and drainage depressions in the southern section of the System, formed on variable
LVO LVe	0.8	locally derived sandy to sandy clay alluvium.
Lve	0.0	Main soils: <u>gradational sandy loam</u> - M1 (E) and <u>sandy loam over dispersive brown clay</u> - F2 (E).
		These small areas have deep soils of moderately low fertility. They are subject to waterlogging and erosion. There is minor saline seepage.





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:

F2 Sandy loam over dispersive brown clay (Eutrophic, Grey / Brown Sodosol)

Thick hard massive sandy loam with a bleached A2 layer over a brown and grey mottled medium clay with coarse prismatic structure, becoming sandier with depth, continuing below 100 cm.

K4/D7 Sandy loam over dispersive brown clay (Sodic, Eutrophic / Calcic, Brown Sodosol)

Medium thickness gritty loamy sand to sandy loam with a bleached A2 layer, sharply overlying a brown, red, yellow and grey mottled dispersive clay, grading to weathering highly micaceous gneiss at about 100 cm.

K5 Loamy sand over reddish brown sandy clay loam (Mesotrophic, Brown Kandosol)

Thick gritty and gravelly loamy sand grading to a brown or red gritty sandy clay loam to sandy clay, grading to weathering granite by 70 cm.

L1a Shallow loamy coarse sand (Acidic, Paralithic, Bleached-Leptic Tenosol)

Thick gritty and gravelly loamy coarse sand to coarse sandy loam, grading to weathering rock within 50 cm.

L1b Shallow stony loamy sand (Lithic, Leptic Rudosol)

Thick gritty loamy sandy to sandy loam with quartz and gneiss stones throughout, grading to weathering rock within 50 cm.

M1 Gradational sandy loam (Eutrophic, Grey / Brown Kandosol)

Thick grey sandy loam grading to a brown and grey mottled massive sandy clay loam, continuing below 100 cm.

Further information: <u>DEWNR Soil and Land Program</u>

