MGA Mount Gawler Land System

Steep hills between Para Wirra and Kangaroo Creek

Area: 49.5 km^2

Annual rainfall: 540 – 900 mm average

Geology: The land is underlain by schists and gneisses of the Barossa Complex. These are deeply weathered on gentler slopes, but generally fresh weathering rock is within 100 cm, and often 50 cm of the surface. Alluvium derived from localized erosion and deposition is a minor component.

Topography: The landscape is dominated by strongly dissected steep hillslopes. The steepest slopes are in the south, where dissection by the Torrens River and Millbrook Creek has been severe. Further north in the South Para catchment, the landscape is more subdued, but is nevertheless steep. Slopes exceed 30% over about three quarters of the System.

Elevation: 250 m at Kangaroo Creek Reservoir in the south, and 260 m at South Para Reservoir in the north, to 550 m at Mt. Gawler near the middle of the System.

Relief: Up to 150 m

Soils: The soils are mixed texture contrast and shallow skeletal types. They have medium to thick hard setting sandy loam surfaces overlying brown to red clayey subsoils which are commonly absent on steep and / or rocky slopes. These soils are typically very stony. Basement rock is generally shallower than 100 cm. On limited lower slopes and flats, soils are deep with subsoil clays which are mottled and often poorly structured.

Main soils

Soils formed in weathering basement rock on hillslopes

L1 Shallow stony sandy

K4a Acidic sandy loam over brown clay, over freshly weathered rock

K4b Acidic sandy loam over brown clay, over kaolinized rock

Soils formed in alluvium or deeply weathered rock on lower slopes and flats

F1 Sandy loam over brown mottled clay on alluvium or deeply weathered rock

Minor soils

Soils formed in alluvium or deeply weathered rock on lower slopes and flats

F2/K4 Sandy loam over poorly structured brown mottled clay on deeply weathered rock

F2/G3 Sandy loam over poorly structured brown mottled clay on alluvium

Main features: The Mount Gawler Land System is characterized by steep rocky hillslopes with shallow to moderately deep sandy loam surface soils. It is virtually all non arable, and three quarters is too steep for normal farm machinery, so productive potential is severely limited. Where accessible, soils are infertile and acidic. Most of the more moderate slopes are used for grazing, with most of the steep land under scrub in reserves.

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

SLU	% of area	Main features #
AeC AeD AeF	22.8 71.0 3.3	Rolling to very steep low hills and hills formed on schists and gneisses of the Barossa Complex. Drainage depressions are narrow and infilled with locally derived sediments. Rock outcrop and stone vary from minor on gentler slopes to extensive on steep slopes. **AeC** Rolling low hills with minor rock and stone and well defined but unmappable drainage depressions; relief is up to 80 m and slopes are 18-30%. **AeD** Steep to very steep rocky hillslopes with narrow crests and drainage depressions; relief is up to 100 m and slopes are 30-80%. **AeF** Very steep to precipitous, rocky hillslopes with narrow crests and gullies: relief to 150 m and slopes 80-200%. The soils are mixed texture contrast and shallow stony types. Main soils: Shallow stony sandy loam - **L1** (E) on steeper rocky slopes Acidic sandy loam over brown clay on rock - **K4a** (C) Acidic sandy loam over brown clay on kaolinized rock - **K4b** (L) Sandy loam over brown mottled clay - **F1** (L) Sandy loam over poorly structured brown clay - **F2/K4** and **F2/G3** (M) on flats and lower slopes These soils are shallow to moderately deep, generally infertile and acidic, and well to moderately well drained. Only the slopes of AeC are readily accessible to machinery, so productive potential is severely limited. Much of the steeper land remains under scrub. Productivity potential of the moderate slopes of AeC is low to moderate.
CjC	0.2	Gentle slopes formed on schists and gneisses. Soils are as for AeC (above), but without the shallow stony sandy loams. Soils are generally deep enough that waterholding capacity is not a major limitation, but they are infertile, acidic and imperfectly drained in places, particularly lower slopes. Erodibility is high. Although overall productivity potential is low, the land has some horticultural value where water is available.
LBE	2.7	Drainage depressions and creek flats formed on medium to fine grained alluvium. The soils are deep and mostly texture contrast over alluvium. Main soils: Sandy loam over brown mottled clay - **F1** (E) Sandy loam over poorly structured brown clay - **F2/K4** and **F2/G3** (E) These soils are deep but imperfectly to poorly drained. They commonly have hard setting surfaces, bleached A2 layers and tight, poorly structured mottled clayey subsoils. With appropriate species and fertilizer programs, pasture productivity can be high, but horticultural productivity depends on improvements in drainage as well. There is sporadic saline seepage and watercourses are highly susceptible to erosion.

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:

Soils formed in weathering basement rock on hillslopes

K4a Acidic sandy loam over brown clay (Bleached, Mesotrophic, Brown Chromosol)
Medium thickness gravelly brown loamy sand to light sandy clay loam, overlying a yellowish red to strong brown finely structured clay subsoil grading to weathering rock within 100 cm.

K4b Acidic sandy loam over brown clay on kaolinized rock (Bleached-Mottled, Mesotrophic, Brown Chromosol)
Medium thickness gravelly brown loamy sand to light sandy clay loam, overlying a yellowish red to strong brown finely structured clay subsoil grading to soft kaolinitic schist or gneiss continuing below 200 cm.

L1 Shallow stony sandy loam (Acidic, Paralithic, Bleached-Leptic Tenosol)
Thick, greyish, very gravelly loamy sand to sandy loam with a bleached A2 horizon, grading to hard schist, gneiss or metasandstone by 50 cm.

Soils formed in alluvium or deeply weathered rock on lower slopes or flats

F1 Sandy loam over brown mottled clay (Bleached-Mottled, Eutrophic, Brown Chromosol)
Thick sandy loam to sandy clay loam, with a bleached and gravelly A2 horizon, overlying a yellowish brown, brown and red mottled firm coarsely structured sandy to medium clay.

F2/G3 Sandy loam over poorly structured brown clay (Hypocalcic, Mottled-Subnatric, Brown Sodosol)
Thick greyish brown massive loamy sand to sandy loam with a bleached A2 horizon, overlying a yellowish brown, brown and grey mottled clay with coarse prismatic structure.

F2/K4 Sandy loam over poorly structured brown clay (Eutrophic, Mottled-Subnatric, Brown Sodosol)
Thick grey brown loamy sand to sandy loam surface with a bleached A2 horizon, sharply overlying a brown, red and grey mottled columnar structured clay subsoil, grading to soft kaolinitic rock below 100 cm.

Further information: DEWNR Soil and Land Program