

BRN Brownlow Land System

Weakly dissected outwash fans extending from near Stonefield to east of Coronation Hill

Area: 242.0 km²

Annual rainfall: 260 – 335 mm average

Geology: The System is formed on calcreted outwash sediments of the Pooraka and Telford Gravel Formations. Partial erosion of the fan has re-exposed the outwash sediments, particularly in incised drainage depressions. On higher ground the calcrete cap is retained, usually as rubble, but often as sheet rock.

Topography: The Brownlow Land System is a weakly dissected gently inclined east facing outwash fan abutting the margin of the Northern Mt. Lofty Ranges. The slopes are undulating, with stony rises (where the calcrete capping has not been eroded away) alternating with shallow drainage depressions and valleys. In the Brownlow area, the dissection has been more pronounced, water courses are more deeply incised and slopes are steeper (up to 8%). All water courses flow in a general easterly direction and dissipate in the Mt. Mary Land System. There are some extensive remnant calcrete benches on lower slopes which are relatively unaffected by water course activity and retain a hard capping with abundant surface stone. These become isolated in the north.

Elevation: 300 m in the north-west to 100 m on the eastern side

Relief: Maximum relief is 15 m

Soils: The soils are all calcareous, the differences being due to amount of rubble, and presence or absence of calcrete at shallow depth.

Main soils

- A4b** Deep calcareous loam
- A4a** Rubbly calcareous loam
- B2** Rubbly calcareous loam on calcrete
- A5** Calcareous loam on clay

Minor soils

- A6** Deep non rubbly calcareous loam on clay
- A3** Deep moderately calcareous loam

Main features: The Brownlow Land System comprises gentle slopes and flats dominated by calcareous soils which generally have a high rubble content. Marginal rainfall coupled with the shallowness of many soils restricts cropping and the land is only semi arable. The transition from regular cropping to pastoral use occurs across the Land System. On arable land, limitations include restricted waterholding capacity due to dense rubble and / or moderate to high pH, salinity and possibly high boron levels in the subsoil. Erosion and scalding are common on creek flats, and these areas need careful management to maintain protective cover.



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

SLU	% of area	Main features #
KVB KVE KVG KVJ KVI KV _o	14.7 2.0 8.4 6.2 2.5 3.0	<p>Drainage depressions, flats and outwash fans formed on fine to medium grained alluvial sediments.</p> <p>KVB Fans with slopes of 2-4% and comprising gentle rises and shallow drainage valleys. There is variable surface stone (calcrete and quartzite) up to 20%. There is minor erosion in water courses.</p> <p>KVE Drainage depressions with slopes of less than 2%.</p> <p>KVG Fans with slopes of 1-3% and eroded water courses.</p> <p>KVJ Drainage depressions with eroded water courses.</p> <p>KVI Fans with slopes of 1-2% with eroded water courses and scalding.</p> <p>KV_o Drainage depressions with eroded water courses and scalded patches.</p> <p>Main soils: <u>deep calcareous loam</u> - A4b (V) and <u>calcareous loam on clay</u> - A5 (L), with <u>deep non rubbly calcareous loam on clay</u> - A6 (L), <u>deep moderately calcareous loam</u> - A3 (L) and <u>rubbly calcareous loam</u> - A4a (M). Although these soils are deep and moderately fertile, only about a third to a half of the area is cropped, with higher proportions in the north. The land is only semi arable due to a combination of marginal rainfall and moderate to high subsoil salinity, pH and possibly boron levels. The rubbly soils have low water holding capacity. In addition, the drainage depression units are characterized by fragile water courses which restrict the workability of the land. In wider flats the channels are often braided, further reducing the size of workable areas. Water course erosion and scalding have occurred in the past, probably as a result of inappropriate cropping practices.</p>
QMB	10.9	<p>Low stony benches less than 10 m high with slopes of 1-4% formed on calcreted Pooraka Formation or Telford Gravel outwash. There is 20-50% surface calcrete.</p> <p>Main soils: <u>rubbly calcareous loam on calcrete</u> - B2 (V) and <u>rubbly calcareous loam</u> - A4a (E). These soils are shallow and stony - combined with the low rainfall, they are very marginal for cropping.</p>
ShA ShB ShF ShG ShH	8.0 22.7 3.7 8.4 9.5	<p>Undulating slopes formed on medium to fine textured or gravelly sediments capped by rubbly carbonates. There are 10-20% (up to 30%) surface calcrete fragments. Water courses are generally well defined and eroded in places.</p> <p>ShA Very gently undulating slopes of less than 1%.</p> <p>ShB Gentle slopes of 1-3% with minor water course erosion.</p> <p>ShF Very gently undulating lower slopes of less than 1% with minor water course erosion.</p> <p>ShG Dissected slopes of 1-3% with minor water course erosion.</p> <p>ShH Dissected slopes of 3-8% with minor to moderate water course erosion.</p> <p>Main soils: <u>rubbly calcareous loam</u> - A4a (E), with <u>deep calcareous loam</u> - A4b (C) and <u>calcareous loam on clay</u> - A5 (L) in drainage depressions, and <u>rubbly calcareous loam on calcrete</u> - B2 (L) on very stony areas. There is variable rubble content in these soils, resulting in a range of effective soil depths. Although moisture holding capacity is generally restricted, this may only be a limitation on soils with heavy rubble layers or calcrete, given the marginal rainfall. Remnant scrub patches indicate areas where rock or shallow depth do not allow cultivation. Fertility is generally low to moderate due to low clay content and high pH, but structure, drainage and aeration are good. Very high subsoil pH levels, moderate salinity and possibly toxic boron concentrations may restrict root growth and water use efficiency. Maintenance of sufficient surface cover to minimize the risk of erosion is essential, whether under agricultural or pastoral uses.</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:

- A3** Deep moderately calcareous loam (Regolithic, Calcic Calcarosol)
Calcareous loam to clay loam continuing below 100 cm with only minor increases in clay and carbonate content.
- A4a** Rubbly calcareous loam (Regolithic, Supracalcic / Lithocalcic Calcarosol)
10 - 20 cm calcareous sandy loam to loam over a Class III B or III C carbonate rubble layer, becoming less rubbly with depth and grading to a light clay from 70 cm (30% of profiles). Slightly rubbly Class III A sandy loam to sandy clay loam continues below 100 cm in the other 70%.
- A4b** Deep calcareous loam (Regolithic, Hypercalcic Calcarosol)
10 - 25 cm calcareous loam to clay loam grading to a brown very highly calcareous clay loam to light clay, with abundant fine to slightly rubbly carbonate accumulations at 30 cm, grading to a reddish alluvial light clay at 75 cm.
- A5** Calcareous loam on clay (Regolithic, Supracalcic / Hypercalcic Calcarosol)
Calcareous sandy loam to loam grading to a very highly calcareous sandy clay loam with variable rubble, over alluvial clay at about 100 cm.
- A6** Deep non rubbly calcareous loam on clay (Regolithic / Pedal, Calcic Calcarosol)
10 - 20 cm calcareous loam to clay loam grading to a very highly calcareous brown clay loam to clay merging with clayey alluvium from about 100 cm.
- B2** Rubbly calcareous loam on calcrete (Petrocalcic, Lithocalcic Calcarosol)
10 - 20 cm calcareous loam to sandy loam grading to Class III C rubble abruptly overlying sheet calcrete at 30 cm.

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

