

BAW Bagot Well Land System

Undulating rises and low hills north east of Kapunda

Area: 31.9 km²

Annual rainfall: 450 – 515 mm average

Geology: The Land System is formed mainly on fine grained weakly metamorphosed sedimentary rocks of the Tapley Hill Formation in the north, and Tarcowie and Ulupa Siltstone and Pepuerta Tillite Formations in the south. There are limited areas of locally derived alluvium on outwash fans and in valleys. These sediments are fine grained. All rocks and sediments are mantled by fine secondary carbonates which occur as soft segregations in the lower soil profile.

Topography: The Land System is mainly undulating rises and low hills with slopes in the range of 4-12%. On the western side, there are numerous prominent but isolated crests with steeper slopes. The topography is more subdued in the east, with very gently undulating rises on basement rock alternating with low angle outwash fans and drainage depressions.

Elevation: 396 m in the north to 240 m in the south

Relief: Maximum relief is 50 m

Soils: The soils are predominantly red loams with clayey subsoils, calcareous at depth. Differences are due to depth to rock, structure and horizon distinctness.

Main soils

- C2** Gradational loam on rock
- D1** Hard loam over red clay on rock
- D3** Hard loam over red clay on alluvium
- E2** Red cracking clay

Minor soils

- C3** Gradational clay loam
- D3/D7** Hard sandy loam over red clay on deeply weathered rock
- D7a** Hard loam over poorly structured red clay on rock
- D7b** Hard sandy loam over poorly structured red clay on rock
- E1** Black cracking clay
- L1** Shallow stony loam

Main features: The Bagot Well Land System is characterized by medium to fine textured soils in an undulating landscape. Although cracking clays are limited, many other soils (eg the gradational clay loams) have clay loamy to clayey surfaces, are well structured, deep and fertile. Sandier, poorer structured soils are more prominent in the south. Erosion potential is moderate over most of the area, but apart from the requirement for structure amelioration on the dispersive soils, this is the only significant limitation to productivity.



Soil Landscape Unit summary: 8 Soil Landscape Units (SLUs) mapped in the Bagot Well Land System:

SLU	% of area	Main features #
DHC	6.6	Undulating rises to 40 m high formed on Pepuarta Tillite, with slopes of 5-12% and some short slopes to 20%. Main soils: <u>hard sandy loam over poorly structured red clay on rock</u> - D7b (E) and <u>hard sandy loam over red clay on deeply weathered rock</u> - D3/D7 (E). The soils are poorly structured and only moderately fertile. Excessive runoff, waterlogging on lower slopes, workability difficulties and patchy early crop growth are consequences of poor soil structure. The soils are highly erodible, so even moderate slopes are at risk of erosion.
DSD	5.4	Prominent moderately steep upper slopes and crests formed on fine grained rock, with interbedded resistant quartzitic strata. Slopes are 10-20%. There is up to 10% rock outcrop and up to 20% surface quartzite. Main soils: <u>hard loam over red clay on rock</u> - D1 (E) and <u>hard loam over poorly structured red clay on rock</u> - D7a (E), with <u>shallow stony loam</u> - L1 (L). This land is only semi arable due to moderate slopes, rocky outcrop and exposed position.
EKB EKC EKH	12.3 43.5 10.3	Rises formed on fine grained rocks and clayey materials derived from their weathering. EKB Gently undulating rises of 2-3% slope. EKC Undulating rises to 40 m high with slopes of 3-10% EKH Rises to 30 m high with slopes of 5-12% and eroded water courses. Main soils: <u>gradational loam on rock</u> - C2 (E), <u>hard loam over red clay on rock</u> - D1 (C) and <u>hard loam over poorly structured red clay on rock</u> - D7a (L), with <u>red / black cracking clay</u> - E2/E1 (L) and <u>hard sandy loam over poorly structured red clay on rock</u> - D7b (M). These soils are deep, fertile, and mostly well structured, although the D7a/b soils are hard setting and have dispersive subsoils causing waterlogging and uneven root growth. Provided that erosion is controlled and surface management is targeted at improving soil structure, this land has high productive potential.
JEB JEE JEH	13.3 4.0 4.6	Outwash fans and drainage depressions formed on fine grained alluvium. JEB Fans with slopes of 2-4%. JEE Drainage depressions with slopes of 1-2%. JEH Fans with slopes of 3-7% and eroded water courses. Main soils: <u>hard loam over dispersive red clay</u> - D3 (V) and <u>gradational clay loam</u> - C3 (C). The soils are deep and inherently fertile, but most are poorly structured. Hard setting surfaces are common. These restrict water infiltration, are difficult to work and cause patchy emergence and early growth. Subsoil waterlogging is also likely in lower lying areas. Acidification may be a problem on those soils with a history of high productivity. Although there is no evidence of salinity, subsoil salt levels should be monitored.

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:

- C2** Gradational loam on rock (Hypercalcic, Red Dermosol)
15 - 40 cm loam to clay loam grading to a well structured red medium to heavy clay, calcareous from 50 cm, over weathered phyllite at 70 cm.
- C3** Gradational clay loam (Hypercalcic, Red Dermosol)
15 - 40 cm clay loam to light clay grading to a well structured red medium to heavy clay, calcareous from 50 cm, over alluvium deeper than 100 cm.
- D1** Hard loam over red clay on rock (Calcic, Red Chromosol)
20 - 40 cm hard loam to clay loam abruptly overlying a red clay, calcareous from 65 cm grading to weathering phyllite within 100 cm.
- D3** Hard loam over red clay (Calcic, Red Sodosol)
20 - 40 cm hard loam to clay loam abruptly overlying a hard dispersive red clay, calcareous from 65 cm grading to alluvium, deeper than 100 cm.
- D3/D7** Hard sandy loam over red clay on deeply weathered rock (Hypercalcic, Red Sodosol)
10 - 30 cm hard sandy loam abruptly overlying a coarsely structured red clay, calcareous from 75 cm, grading to very highly weathered basement rock, deeper than 200 cm.
- D7a** Hard loam over poorly structured red clay on rock (Calcic, Red Sodosol)
20 - 40 cm hard loam to clay loam abruptly overlying a poorly structured dispersive red clay, calcareous from 65 cm grading to weathering phyllite within 100 cm.
- D7b** Hard sandy loam over poorly structured red clay (Calcic, Red Sodosol)
40 - 50 cm hard sandy loam abruptly overlying a red coarsely structured dispersive clay, calcareous from 70 cm, grading to quartzitic sandstone deeper than 100 cm.
- E1** Black cracking clay (Self-mulching, Black Vertosol)
15 - 25 cm well structured seasonally cracking black calcareous medium clay, grading to a coarsely structured very dark grey heavy clay, with soft carbonate at 80 cm.
- E2** Red cracking clay (Epipedal, Red Vertosol)
15 - 25 cm well structured seasonally cracking dark coloured calcareous medium clay, grading to a coarsely structured red heavy clay, with soft carbonate at 80 cm.
- L1** Shallow stony loam (Lithic, Leptic Tenosol)
Up to 50 cm stony loam directly overlying hard rock.

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

