

BRI Brinkworth Land System

Gentle slopes and rises in the Hart - Brinkworth area

Area: 114.9 km²

Annual rainfall 400 – 500 mm average

Geology: The Land System comprises two broad geological features. Rising ground is formed on basement siltstones and occasional sandstones and quartzites, partially overlain by clays derived from rock weathering or localized reworking. Intervening outwash fans and flats are underlain by clayey sediments of the Pooraka Formation (often with sandy and gravelly lenses), and Hindmarsh Clay (coarse blocky heavy clay). Alluvial flats are formed on more recent mixed sediments. All geological materials are mantled by carbonates of aeolian origin, most of which are fine, but rubbly forms also occur.

Topography: Undulating rises and low hills with slopes of 2 - 12%, flanked by gently to very gently sloping outwash fans and plains with slopes of 1 - 5%. Weakly defined ephemeral watercourses cross the fans flowing in a westerly direction, and there is an extensive alluvial flat in the south of the system.

Elevation: 160 m in the south west to 294 m at the highest point south east of Brinkworth

Relief: Maximum relief from hillcrest to watercourse is 100 m

Soils: Calcareous loams to clay loams are the characteristic soils, with gradational non calcareous loams. Sandy loam texture contrast profiles and cracking clays are minor.

Main soils

- A6** Calcareous clay loam - throughout
- C3** Gradational loam - gentle slopes
- A5/A6** Rubbly calcareous loam - throughout

Minor soils

- D2** Sandy loam over red clay - gentle slopes
- A2** Shallow calcareous loam - rises
- E2** Red cracking clay - gentle slopes and flats
- D3** Sandy loam over dispersive red clay - rises

Main features: The Brinkworth Land System is characterized by gently undulating to undulating rises with mainly deep loamy to clay loamy soils, the majority of which are calcareous throughout. These are inherently fertile and well structured with high production potential. Minor limitations are due to high levels of subsoil boron, and lime-induced nutrient deficiencies, both of which are manageable. There are minor areas of poorly structured texture contrast soils with associated problems of poor infiltration, workability restrictions and impaired emergence and root growth. On sloping ground, these soils are prone to erosion.



Soil Landscape Unit summary: 7 Soil Landscape Units (SLUs) mapped in the Brinkworth Land System:

SLU	% of area	Main features #
HJB	1.1	Low rises with slopes of 2-4%. Main soils: <u>sandy loam over dispersive red clay</u> - D3 (E), <u>calcareous clay loam</u> - A6 (E), <u>rubbly calcareous loam</u> - A5/A6 (L) and <u>shallow calcareous loam</u> - A2 (L). The rises are arable but are less chemically and physically fertile than other land in the System. This is due to poor soil structure and sandier textures, which also increase the potential for both wind and water erosion.
IZB IZC IZD	16.2 6.3 14.9	Rises and low hills formed on basement rock or clays. IZB Rises of 2-3% slope. IZC Rises of 3-5% slope. IZD Low hills of 4-12% slope. Main soils: <u>calcareous clay loam</u> - A6 (E), <u>rubbly calcareous loam</u> - A5/A6 (C), <u>gradational loam</u> - C3 (C), <u>shallow calcareous loam</u> - A2 (L), <u>red cracking clay</u> - E2 (M) and <u>sandy loam over dispersive red clay</u> - D3 (M). The land is fully arable, although some slopes require contour banking to control water erosion. The soils are generally medium textured and calcareous, affecting fertility (through induced nutrient deficiencies) to some extent. The main soil limitations are moderate to high levels of boron and salt, sometimes at moderately shallow depth. Poor soil structure resulting in waterlogging and difficult workability occurs on some lower slopes.
JFA	9.0	Flats with slopes of 1-2%, formed on clayey alluvial sediments. Main soils: <u>sandy loam over red clay</u> - D2 (E), with <u>gradational loam</u> - C3 (L), <u>calcareous clay loam</u> - A6 (L) and <u>sandy loam over dispersive red clay</u> - D3 (L). The land is productive cropping country with minor limitations due to poor soil structure, causing reduced infiltration, temporary waterlogging, restricted workability and patchy emergence. Occasional flooding causes problems of siltation and weed seed dispersal.
KBA KBB	30.5 22.0	Outwash fans formed on clayey sediments of either the Pooraka Formation or Hindmarsh Clay. KBA Slopes of 1-2%. KBB Slopes of 2-5%. Main soils: <u>calcareous clay loam</u> - A6 (E) and <u>gradational loam</u> - C3 (C) with <u>rubbly calcareous loam</u> - A5/A6 (L), <u>red cracking clay</u> - E2 (L) and <u>sandy loam over red clay</u> - D2 (L). The land is generally highly productive; most soils are naturally fertile, deep and well structured. High levels of boron and sodium within potential root zones, slight salinity and some localized waterlogging are the only limitations. 10-15% of soils are poorly structured with hard setting surfaces. These are difficult to work and are prone to patchy seedling establishment, waterlogging and runoff. Water erosion potential on the long gentle slopes of KBB is the only other significant land management issue.

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 / Lithocalcic Calcarosol)
Calcareous loam to clay loam, more clayey and calcareous with depth over a Class III A, B or C carbonate layer within 40 cm, grading to highly weathered rock or fresh weathering rock at between 50 and 100 cm.
- A5/A6** Rubbly calcareous loam (Regolithic, Lithocalcic / Supracalcic Calcarosol)
Calcareous loam to light clay, more clayey and calcareous with depth over a Class III C or III B carbonate layer within 40 cm, grading to clayey alluvium or Hindmarsh Clay at between 50 and 100 cm.
- A6** Calcareous clay loam (Regolithic, Hypercalcic Calcarosol)
Calcareous loam to light clay, more clayey and calcareous with depth over a Class I or III A carbonate layer within 50 cm, grading to clayey alluvium or Hindmarsh Clay at between 50 and 100 cm.
- C3** Gradational loam (Hypercalcic, Red Dermosol)
Loam to clay loam grading to a well structured red clay with abundant fine Class I carbonate from about 50 cm, overlying alluvial clay or Hindmarsh Clay.
- D2** Sandy loam over red clay (Calcic / Hypercalcic, Red Chromosol)
Hard sandy loam to sandy clay loam over a well structured red clay with fine Class I carbonate from about 60 cm overlying clayey alluvium.
- D3** Sandy loam over dispersive red clay (Hypercalcic / Calcic, Red Sodosol)
Hard setting sandy loam to sandy clay loam over a poorly structured dispersive red clay with a fine Class I carbonate layer from about 60 cm, grading to clayey alluvium or highly weathered rock.
- E2** Red cracking clay (Epicalcareous-Endohypersodic, Epipedal, Red Vertosol)
Well structured, generally non calcareous seasonally cracking light clay grading to a coarsely structured calcareous red heavy clay over Hindmarsh Clay at between 50 and 100 cm.

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

