

# GTN Georgetown Land System

Broad valley of the Yackamoorundie Creek extending from east of Gladstone to Gulnare

**Area:** 153.8 km<sup>2</sup>

**Annual rainfall** 435 – 520 mm average

**Geology:** Fine grained alluvium derived from the range to the east. The alluvium is covered by a veneer of fine carbonates deposited by the wind and leached into the overlying soil. The carbonate occurs mostly as finely divided segregations but some is rubbly. On the eastern side of the valley there are minor basement rock highs projecting through the alluvium. In the north are some Tertiary sand deposits which are also standing above the valley floor. These are relicts of a more extensive sheet of sediments largely eroded away by Yackamoorundie Creek.

**Topography:** The lowest part of the land system is a flat alluvial plain which runs north - south up the western side of the valley. Yackamoorundie Creek flows in a defined channel until about six km south of Georgetown where it spreads out on to a level plain which is marginally saline and subject to waterlogging and occasional flooding. Very gently to gently inclined outwash fans abut the plain and rise towards the range to the east. These have maximum slopes of 12%. On the upper fans are low rises underlain by basement rocks. In the north are three discrete north - south oriented rises of Tertiary sands. In the north-west the land rises to a gently undulating high plain before dropping sharply away into the catchment of Pisant Creek.

**Elevation:** The highest point on the eastern side is 440 m, and on the western side is 350 m. There is a gradual fall to the south with the flow of the creek to its exit point (220 m).

**Relief:** Tertiary residuals are up to 60 m above the plains and basement rock highs on the eastern side are up to 20 m high. Overall relief across the fan is up to 140 m.

**Soils:** The characteristic soils are deep clay loams to cracking clays. Some are calcareous. Loamy texture contrast soils are common.

#### Main soils

**C3** Gradational clay loam  
**A6** Calcareous loam  
**E3** Brown cracking clay

#### Minor soils

**D2/D1** Hard loam over red clay  
**E2** Red cracking clay  
**D5** Hard loamy sand over red clay  
**A2** Shallow calcareous loam  
**C2/B4** Shallow gradational loam

**Main features:** The Georgetown Land System is flat to undulating and is characterized by deep, fertile clayey soils. These have high production potential, with only minor limitations due to waterlogging, boron toxicity and salinity. Loamier soils on rises are also potentially productive, but are prone to structural problems and erosion. Minor sandy soils have lower fertility and are susceptible to both wind and water erosion.



**Soil Landscape Unit summary:** 14 Soil Landscape Units (SLUs) mapped in the Georgetown Land System:

SLU	% of area	Main features #
EGC	0.3	Rises with slopes of 3-7% on fine grained rock. Main soils: <u>shallow calcareous loam</u> - <b>A2</b> (V), with <u>shallow gradational loam</u> - <b>C2/B4</b> (L) and <u>hard loam over red clay</u> - <b>D1</b> (L). The rises are fully arable, although moisture shortages limit crops in dry finishes. Improvement of hard setting surface soils to reduce water loss and erosion through runoff is the main management issue. "Lime - induced" nutrient deficiencies are probable on calcareous soils.
HJB HJC	2.0 1.3	Rises formed on Tertiary sandstones and related unconsolidated sediments. There is minor surface calcrete. <b>HJB</b> Slopes of 2-3%. <b>HJC</b> Slopes of 3-8%. Main soils: <u>hard loamy sand over red clay</u> - <b>D5</b> (E) and <u>gradational clay loam</u> - <b>C3</b> (E). The rises are arable but have a number of slight limitations mostly related to the poorly structured surface of the main soil. Excessive runoff, lower water holding capacity, difficulty in working, water and wind erosion, and patchy emergence are all potential problems.
IZC IZD	1.6 0.2	Rises formed on clays derived from the deep weathering of basement rocks. Approximately 30% of profiles have rock within a metre of the surface. <b>IZC</b> Slopes of 4-10%. <b>IZD</b> Slopes of 10-20%. Main soils: <u>calcareous loam</u> - <b>A6</b> (V), with <u>gradational clay loam</u> - <b>C3</b> (C). These rises are small and isolated, surrounded by outwash fan slopes ( <b>KAH</b> ). Potential for water erosion is the main limitation, with slight restrictions due to shallow soils and surface stone.
JEE	2.4	Creek flats formed on fine grained alluvium. Main soils: <u>hard loam over red clay</u> - <b>D2</b> (V) with <u>gradational clay loam</u> - <b>C3</b> (C). The flats have deep well drained fertile soils with only slight limitations to agriculture. Hard setting surface soils are the main limitation, causing reduced water infiltration, restricted opportunities for working and patchy emergence.
KAB KAH	17.3 11.9	Outwash fans formed on fine grained alluvium, capped by secondary carbonates. <b>KAB</b> Slopes of 2-5%. <b>KAH</b> Slopes of 4-12% and eroded water courses. Main soils: <u>gradational clay loam</u> - <b>C3</b> (E) and <u>calcareous loam</u> - <b>A6</b> (E). This land has generally good agricultural potential, with the minor limitations of moderately low water holding capacity on shallower soils, boron toxicity in some places and abrasive surface stones. There has been extensive erosion in the past due to high levels of run-on water from the adjacent ranges and erosion control measures are required over much of the area.
KRP	5.5	Marginally saline alluvial flats. Main soils: <u>brown cracking clay</u> - <b>E3</b> (E) and <u>calcareous loam</u> - <b>A6</b> (E), with <u>gradational clay loam</u> - <b>C3</b> (L). These flats have heavy fertile soils, but marginal salinity and seasonal waterlogging restrict cropping.
KTA KTB	24.1 17.1	Flats and outwash fans formed on fine grained alluvium. <b>KTA</b> Flats with slopes of less than 2%. <b>KTB</b> Fans with slopes of 2-4%. Main soils: <u>brown cracking clay</u> - <b>E3</b> (E) and <u>gradational clay loam</u> - <b>C3</b> (E), with <u>calcareous loam</u> - <b>A6</b> (L) and <u>hard loam over red clay</u> - <b>D2</b> (L). This land is characterized by deep highly fertile soils with high production potential. Only limitations are slight; viz. some waterlogging, probable boron toxicity (unconfirmed) and potential for water erosion on slopes.
TAB TAC TAZ	11.7 2.2 2.4	Rises formed on clayey sediments or highly weathered fine grained rocks. <b>TAB</b> Rises with slopes of 2-4%. <b>TAC</b> Rises with slopes of 3-7%. <b>TAZ</b> Broad gently undulating crests with slopes of less than 4%. Main soils: <u>gradational clay loam</u> - <b>C3</b> (V), with <u>calcareous loam</u> - <b>A6</b> (L) and <u>red cracking clay</u> - <b>E2</b> (L). These slopes have few limitations with predominantly deep fertile well drained soils and slight to moderate erosion potential.

# 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 / Petrocalcic, Lithocalcic Calcarosol)  
20 - 30 cm calcareous loam grading to rubbly or sheet calcrete by 30 cm, over weathering rock. Rises.
- A6** Calcareous loam (Regolithic / Pedal, Calcic / Supracalcic Calcarosol)  
20 - 30 cm calcareous loam to clay becoming more clayey and calcareous with depth grading to soft (occasionally rubbly) carbonate over alluvium or deeply weathered rock. Flats and rises.
- C2/B4** Shallow gradational loam (Supracalcic / Petrocalcic, Red Dermosol)  
20 - 30 cm loam grading to friable red clay over rubbly or sheet calcrete grading to weathering rock. Rises.
- C3** Gradational clay loam (Hypocalcic / Hypercalcic, Red Dermosol)  
20 - 40 cm well structured clay loam grading to friable red clay with soft carbonate at moderate depth. Lower slopes and flats on alluvium, and rises on Tertiary sediments or highly weathered rock.
- D2/D1** Hard loam over red clay (Calcic / Lithocalcic, Red Chromosol)  
20 - 30 cm hard loam to clay loam abruptly overlying a well structured red clay with soft to rubbly carbonate at about 50 cm, grading to alluvium, or occasionally to weathering siltstone. Flats, occasionally on rises.
- D5** Hard loamy sand over red clay (Calcic / Lithocalcic, Red Chromosol)  
10 - 40 cm hard loamy sand to sandy loam abruptly overlying a well structured red clay with soft to rubbly carbonate at about 50 cm, grading to Tertiary sandstone. Rises.
- E2** Red cracking clay (Self mulching, Red Vertosol)  
20 - 40 cm well structured seasonally cracking red clay becoming more clayey and coarser structured with depth, usually calcareous throughout. Rises, over clayey sediments or deeply weathered rock.
- E3** Brown cracking clay (Epipedal, Brown Vertosol)  
20 - 40 cm well structured seasonally cracking brown clay becoming more clayey and coarser structured with depth, sometimes calcareous throughout. Flats over clayey alluvium.

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

