

# ALM Alma Land System

Pediments and rises in the Alma area

**Area:** 93.6 km<sup>2</sup>

**Annual rainfall:** 420 – 505 mm average

**Geology:** The bulk of the Land System is formed on clayey sediments of Pleistocene age, but in the north are older clayey sediments of Tertiary age. Some of the clayey materials are derived from the deep weathering of basement rock. The sediments are covered by a veneer of soft carbonate of aeolian origin. On the crests of some rises, possibly old remnant land surfaces, the carbonate has hardened to sheet or rubbly forms.

**Topography:** The Alma Land System comprises an extensive rise formed on Tertiary clay or deeply weathered rock in the north, gently inclined outwash fans along the eastern side and very gently inclined fans in the south. The rise is up to 40 m high with slopes of 3-8%. The fans have slopes of up to 8% on their upper margins, but flatten out in a westerly direction to 1%. Water courses on the steeper fans are commonly eroded.

**Elevation:** 290 m in the north eastern corner to 110 m in the south west

**Relief:** Maximum relief is 40 m

**Soils:** Deep loamy to clayey, fertile soils are characteristic of the System

#### Main soils

- D3** Hard loam over dispersive red clay - Common on fans and drainage depressions
- D2** Hard loam over red clay - Common on fans and drainage depressions
- C3** Gradational clay loam - Common throughout
- A6** Deep calcareous clay loam - Limited on plains
- E2** Red cracking clay - Limited on fans

#### Minor soils

- E3** Brown cracking clay - fans and rises
- C1** Gradational loam - plains
- B4** Shallow clay loam - rises
- B2** Shallow calcareous loam - rises

**Main features:** The Alma Land System comprises gently to very gently inclined slopes with mostly deep medium to fine textured soils with high inherent fertility. Apart from poor surface structure (hard setting and sealing) in texture contrast soils (30% of the area), and some shallow soils over calcrete (less than 5% of the area) on rises, there are no significant limitations to agricultural land use. There is potential for erosion on moderate slopes however, and appropriate management is needed. Existing erosion of water courses must be controlled.



**Soil Landscape Unit summary:** 10 Soil Landscape Units (SLUs) mapped in the Alma Land System:

SLU	% of area	Main features #
KAA	18.0	Very gently inclined outwash fans with slopes of 1-2% formed over Pleistocene clayey sediments. Main soils: <u>gradational clay loam</u> - <b>C3</b> (V) with <u>deep calcareous clay loam</u> - <b>A6</b> (C), <u>hard loam over (dispersive) red clay</u> - <b>D3/D2</b> (L) and <u>brown cracking clay</u> - <b>E3</b> (M). The soils are deep, inherently fertile and generally well structured. There is minimal erosion hazard. Productive potential is high.
KJA	15.5	Very gently inclined outwash fans with slopes of 1-2% formed on medium textured sediments. Main soils: <u>gradational loam</u> - <b>C1</b> (V) and <u>deep calcareous clay loam</u> - <b>A6</b> (E). These soils are less clayey than elsewhere on the plains in the Alma Land System. They are deep, moderately fertile and unlikely to present any physical barriers to root growth.
KUB KUC KUG KUH KUJ	1.8 1.2 27.3 8.3 0.9	Outwash fans formed on clayey sediments. <b>KUB</b> Slopes of 2-3% with minor water course erosion. <b>KUC</b> Slopes of 3-8% with minor water course erosion. <b>KUG</b> Slopes of 2-3% with eroded water courses. <b>KUH</b> Slopes of 3-8% with eroded water courses. <b>KUJ</b> Drainage depressions with eroded water courses. Slopes are 2-3%.  Main soils: <u>hard loam over (dispersive) red clay</u> - <b>D2/D3</b> (E) and <u>red cracking clay</u> - <b>E2</b> (E), with <u>gradational clay loam</u> - <b>C3</b> (C), <u>deep calcareous clay loam</u> - <b>A6</b> (M) and <u>gradational loam</u> - <b>C1</b> (M). These slopes have deep fertile soils, although poor structure in the D2/D3 soils presents problems of excessive runoff, workability restrictions and patchy emergence, while the cracking clays tend to become sticky and difficult to work when wet. However, provided erosion is controlled, this land has high productive potential.
TBB	14.0	Gentle slopes of 2-3% formed over clayey sediments or deeply weathered basement rock. There is minor gully erosion in water courses.  Main soils: <u>brown cracking clay</u> - <b>E3</b> (E), <u>gradational clay loam</u> - <b>C3</b> (E) and <u>hard loam over (dispersive) red clay</u> - <b>D2/D3</b> (C), with <u>deep calcareous clay loam</u> - <b>A6</b> (L) and <u>shallow clay loam</u> - <b>B4</b> (M). These soils are fertile, deep and generally well structured (although D2/D3 soils have hard, sealing surfaces). The clayey soils have well structured surfaces, but tend to become sticky and intractable when wet. Overall productivity potential is high. Erosion potential is moderately low.
TCB TCC	1.2 11.8	Upper slopes and low rises formed over clayey sediments or deeply weathered fine grained basement rock. The substrate is commonly capped by sheet or rubbly calcrete. There is up to 10% surface calcrete. <b>TCB</b> Low rises with slopes of 2-3%. <b>TCC</b> Rises to 40 m high with slopes of 3-8%.  Main soils: <u>gradational clay loam</u> - <b>C3</b> (E) and <u>brown cracking clay</u> - <b>E3</b> (E), with <u>shallow clay loam</u> - <b>B4</b> (L), <u>shallow calcareous loam</u> - <b>B2</b> (M) and <u>hard loam over red clay</u> - <b>D2</b> (M). These soils are mostly deep, fertile and generally well structured. Shallow soils over calcrete occur over about 25% of the area, but have favourable properties in other respects. Productivity potential is high.

# 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:**

- A6** Deep calcareous clay loam (Pedal, Hypercalcic Calcarosol)  
15 - 30 cm calcareous clay loam to light clay grading to a highly calcareous brown well structured medium clay with abundant soft carbonate from about 50 cm, continuing below 100 cm.
- B2** Shallow calcareous loam (Hypercalcic / Petrocalcic Calcarosol)  
15 - 20 cm calcareous loam to clay loam grading to a very highly calcareous light brown clay loam to clay over semi-hard to hard carbonate at about 45 cm.
- B4** Shallow clay loam (Petrocalcic, Red Dermosol)  
20 - 30 cm clay loam grading to well structured dark red clay on sheet calcrete at about 40 cm.
- C1** Gradational loam (Hypercalcic, Red Kandosol)  
20 - 35 cm loam grading to a red weakly structured clay loam, with abundant soft carbonate from about 55 cm, continuing below 100 cm.
- C3** Gradational clay loam (Hypercalcic, Red Dermosol)  
15 - 30 cm clay loam to light clay grading to a well structured red medium clay with abundant soft carbonate from about 50 cm, continuing below 100 cm.
- D2** Hard loam over red clay (Calcic, Red Chromosol)  
20 - 50 cm hard fine sandy loam to clay loam abruptly overlying a well structured and friable red clay with fine carbonate accumulations from about 60 cm.
- D3** Hard loam over dispersive red clay (Calcic, Red Sodosol)  
20 - 30 cm hard clay loam abruptly overlying a coarsely structured and dispersive red clay with fine carbonate accumulations from about 60 cm.
- E2** Red cracking clay (Red Vertosol)  
Dark reddish brown well structured and seasonally cracking calcareous light to medium clay, grading to a coarsely structured calcareous red brown heavy clay continuing below 100 cm.
- E3** Brown cracking clay (Brown Vertosol)  
Dark brown well structured and seasonally cracking calcareous light to medium clay, grading to a coarsely structured calcareous brown heavy clay continuing below 100 cm.

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

