

WFD Wakefield Land System

Plains of the lower reaches of the River Wakefield between Bowmans and Port Wakefield

Area: 81.8 km²

Annual rainfall: 325 – 350 mm average

Geology: The land system is formed over alluvial silty clays and clays, often containing soft to crystalline gypsum, and minor soft secondary carbonate. The clays are red, but on the modern river flats, the sediments are siltier and darker in colour. Superimposed on the alluvium are sporadic gypsum and drift sand deposits. In the west are some small areas of remnant calcretes occurring on rises protruding through the sediments.

Topography: The land system is a flat plain with a gradient of less than 0.25%. The River Wakefield occupies a flat up to 500 m wide, lying slightly below the surface of the older alluvial plain. In the west are scattered remnant calcrete rises up to 20 m high with slopes of up to 7%. The only other topographic features are very low sand and gypsum rises less than 2 m high.

Elevation: 30 m in the east to 0 m

Relief: Maximum relief is 20 m

Soils: Most soils are deep with loamy surfaces and friable clayey subsoils. Sandier and gypsum rich soils occur on minor rises.

Main soils

D4 Loam over friable red clay - plains

C3 Gradational red clay loam - plains

Minor soils

M2 Gradational black silty clay loam - river flats

A8 Gypseous loam - gypsum hummocks

A4 Rubbly calcareous sandy loam - rises

H2 Drift sand - rises

C1 Gradational sandy loam - margins of plains

Main features: The Wakefield Land System is dominated by alluvial plains with deep, fertile and well structured soils - red on the main plain and black on the river flats. The main limitation to agricultural productivity is low rainfall and the associated lack of leaching in the soils. Consequently, soil salinity levels are moderately high. The lower reaches are prone to flooding after prolonged heavy rain in the catchment. Minor features of the land system are stony rises and very low sand and gypsum spreads.



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

SLU	% of area	Main features #
JLA JLP	75.1 5.8	Flood plains of the River Wakefield, with meander channels, formed on gypseous clays. JLA Plains with occasional low sandy and gypseous rises. JLP Marginally saline plains at the mouth of the river. Main soils: <u>loam over friable red clay</u> - D4 (V) with <u>gradational red clay loam</u> - C3 (C) and <u>gypseous loam</u> - A8 (L) and variable sands (M) on rises. These soils are deep, well structured and moderately fertile. Productivity is mainly limited by low rainfall and associated moderate salinity levels in the soil (lack of leaching). Average EC _{1:5} at 50 cm is 1.8 dS/m. These levels increase towards the river mouth in JLP .
KCA	1.9	Complex of alluvial flats with low stony and sandy rises. Main soils: <u>loam over friable red clay</u> - D4 (E) with <u>gradational red clay loam</u> - C3 (L) on flats, and <u>gradational sandy loam</u> - C1 (C), <u>rubbly calcareous sandy loam</u> - A4 (C) and <u>gypseous loam</u> - A8 (M) on rises. This land is transitional between the rises of the Beaufort Land System and the Wakefield flats. Soils are mixed, with fertility and restricted moisture holding capacity the main limitations apart from low rainfall.
QOB QOC	3.8 4.0	Rises formed on sheet and rubbly calcrete and mantled by drift sand deposits. QOB Low rises less than 10 m high with slopes of less than 2%. QOC Rises to 20 m high with slopes of 2-7%. Main soils: <u>rubbly calcareous sandy loam</u> - A4 (E) and <u>drift sand</u> - H2 (C). These small areas are semi arable due to the combination of low rainfall and soils which are mostly shallow and stony, or sandy and infertile.
U-K	1.1	Low sandy rises with a variable depth of sand over soils as for JLA. Wind erosion and low fertility are the main limitations.
XMJ	8.3	Flats adjacent to the River Wakefield. These are generally slightly lower than the surrounding alluvial plains. Main soil: <u>gradational black silty clay loam</u> - M2 (D). These soils are deep and fertile and generally well structured. The flats are subject to flooding.

PROPORTION codes assigned to soils within Soil Landscape Units (SLU):

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| (D) Dominant in extent (>90% of SLU) | (C) Common in extent (20–30% of SLU) |
| (V) Very extensive in extent (60–90% of SLU) | (L) Limited in extent (10–20% of SLU) |
| (E) Extensive in extent (30–60% of SLU) | (M) Minor in extent (<10% of SLU) |



Detailed soil profile descriptions:

- A4** Rubbly calcareous sandy loam (Regolithic, Supracalcic / Lithocalcic Calcarosol)
10 - 15 cm calcareous sandy loam to clay loam grading to a Class III B or III C carbonate rubble layer at 35 cm, becoming less rubbly with depth and overlying clayey sediments from 85 cm.
- A8** Gypseous loam (Gypsic, Calcic Calcarosol)
10 - 15 cm brown loam to clay loam (usually calcareous) becoming more clayey and calcareous with depth over a grey brown silty clay loam to light clay with gypsum from 50 cm.
- C1** Gradational sandy loam (Calcic, Red Kandosol)
10 - 40 cm sandy loam grading to a red sandy clay loam, calcareous from 40 cm over alluvium at 100 cm.
- C3** Gradational red clay loam (Calcic, Red Dermosol)
10 - 20 cm clay loam grading to a well structured red clay, calcareous from 50 cm over clayey alluvium, often with gypsum crystals, from 85 cm.
- D4** Loam over friable red clay (Calcic, Pedaric, Red Sodosol)
5 - 15 cm loam to clay loam abruptly overlying a very well structured friable red clay, calcareous from 45 cm grading to a gypseous clay from 75 cm.
- H2** Drift sand (Petrocalcic Calcarosol / Petrocalcic, Red-Orthic Tenosol)
Up to 100 cm red siliceous sand (calcareous or non calcareous) usually with a weak clay build up at depth overlying sheet or rubbly calcrete. Erosion has caused extreme variation in thickness to calcrete.
- M2** Gradational black silty clay loam (Hypocalcic, Black Dermosol)
15 - 25 cm black silty clay loam grading to a well structured black clay.

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

