

KAW Kadina-Wallaroo Land System

Mostly stony plains, with some low lying plains, depressions, and slopes

Area: 129.4 km²

Landscape: Plains, with some slopes and depressions. Low lying plains occur adjacent to the coast. The system is underlain by bedrock at depth, but this is typically overlain by several metres of red blocky clay (Hindmarsh Clay). Most of these clayey sediments are overlain by calcreted calcareous sediments (Bakara-Ripon Calcrete and ancient Bridgewater Formation) and younger calcareous loess (Woorinen Formation). These wind deposited sediments are often relatively thin: calcrete layers are often directly underlain by clay, and calcareous loess deposits can be less than a metre thick overlying clay. The calcareous loess often includes hard carbonate rubble. A drainage depression within the Wallaroo township, and another south of Wallaroo, are evidence of ancient surface drainage from former times when rainfall was greater. Most modern drainage is subsurface. A small area overlain with mallee sand dunes (Molineaux Sand) occurs in the south of the system.

Annual rainfall: 345 – 380 mm average

Main soils:

B2	<i>shallow calcareous loam on calcrete</i> (around 45% of area)
A5-A4	<i>(rubbly) calcareous loams</i> (around 39% of area)
A6	<i>gradational calcareous clay loam</i> (around 14% of area)

Other minor soils cover approximately 1% of the land system area, while mine spoil covers another approximately 1%.

Main features: The system is mostly arable, although many soils are shallow and stony. The most common soil is a shallow calcareous loam on calcrete. Soil with hard carbonate rubble and shallow soil on calcrete have reduced effective waterholding capacities, and hence reduced production potentials. Also surface rubble interferes with some farming operations. Calcareous soils limit the availability of certain nutrients: deficiencies of the major nutrient phosphorus and the trace element zinc are common, while deficiencies of the trace elements manganese and iron are possible. Temporary trace element deficiencies can occur in cold and wet conditions with susceptible crops. Toxic accumulations of boron and sodium occur in many subsoils or substrates. Toxic elements especially occur where a clayey subsoil or substrate restricts drainage. Many soils have a slight build up of salinity in their lower subsoils, and some saline seepage occurs in low lying areas. The powdery calcareous loamy surfaces present in most soils have significant potential for wind erosion.



Soil Landscape Unit summary: Kadina-Wallaroo Land System (KAW)

SLU	% of area	Main features
IKA IKE	0.1 0.5	Plains and depressions with soils formed in clayey sediments and rubbly calcareous loess. Main soils: <i>gradational calcareous clay loam A6</i> and extensive areas of <i>rubbly calcareous loam A5-A4</i> . IKA – relatively low lying plain (0-1%). IKE – depression/drainage depression (slopes 0-1.5%).
IRA	12.7	Plains with most soils formed in clayey sediments. Main soils: <i>gradational calcareous clay loam A6</i> . With limited to common areas of <i>calcareous loam A5-A4</i> , and <i>shallow calcareous loam on calcrete B2</i> . IRA – level to gently undulating plains (slopes 0-1%).
QHA QHP	0.7 1.2	Calcreted plains. Main soils: <i>shallow calcareous loam on calcrete B2</i> . QHA – level stony plains (slopes <1%). QHP – low lying stony plains with marginal salinity (slopes <1%).
QJA QJB QJK	15.2 3.4 6.3	Plains and slopes dominated by shallow calcreted soils. Main soils: <i>shallow calcareous loam on calcrete B2</i> . With limited to common areas of <i>rubbly calcareous loam A5-A4</i> , and <i>gradational calcareous clay loam A6</i> . QJA – level to gently undulating plains (slopes 0-1%). QJB – slopes (slopes 1-3%). QJK – somewhat low lying plains (slopes <1%).
QKA QKB QKP QKQ	27.1 2.0 5.1 0.2	Plains and slopes dominated by shallow calcreted soils. Main soils: <i>shallow calcareous loam on calcrete B2</i> . With limited to common areas of <i>calcareous loam A4-A5</i> . QKA – level to gently undulating plains (slopes 0-1%). QKB – slopes (slopes 1-3%). QKP – low lying plains with marginal salinity (slopes <1%). QKQ – lower slopes with marginal salinity (slopes 1-3%).
QRA QRB	0.5 1.9	Plains and slopes dominated by shallow calcreted soils. Main soils: <i>shallow calcareous loam on calcrete B2</i> . With limited to common areas of <i>shallow sandy loam on calcrete B3</i> . QRA – level to gently undulating stony plain (slopes 0-1%). QRB – slopes (slopes 1-3%).
SbA	5.8	Plains dominated by soils formed in rubbly calcareous loess. Main soils: <i>rubbly calcareous loam A5-A4</i> . With limited to common areas of <i>gradational calcareous clay loam A6</i> . SbA – gently undulating plains (slopes 0-1%).
SRA	14.9	Plains dominated by soils formed in calcareous loess. Main soils: <i>calcareous loam A5-A4</i> . With limited to common areas of <i>shallow calcareous loam on calcrete B2</i> , and <i>gradational calcareous clay loam A6</i> . SRA – gently undulating plains (slopes 0-1%).
SkA	1.4	Plains dominated by soils formed in rubbly calcareous loess Main soils: <i>rubbly calcareous loam A4-A5</i> . With limited to common areas <i>calcareous siliceous sand H2</i> on low mallee dunes and sandy rises. SkA – level to gently undulating plains with 10-30% low sand dunes and sandy rises.
-S-	0.6	Mine spoil heaps.
WFE1 WFU1	0.3 0.02	Recently deposited coastal sand. Main soils: <i>carbonate sand H1</i> and/or <i>calcareous siliceous sand H2</i> . WFE1 – non arable low jumbled dunes (5a). WFU1 – low lying coastal flats (or coastal bench) with some low coastal dunes and some saline seepage (3-4a); calcrete is likely to occur at moderate depth.

Classes in the 'Soil Landscape Unit summary' table (eg. 2-1e, 3w, 2y, etc) describe the predominant soil and land conditions, and their range, found in Soil Landscape Units. The number '1' reflects minimal limitation, while increasing numbers reflect increasing limitation. Letters correspond to the type of attribute:

a - wind erosion e - water erosion f - flooding g - gullyng
r - surface rockiness s - salinity w - waterlogging y - exposure



Detailed soil profile descriptions:**Main soils:**

- B2** *shallow calcareous loam on calcrete* [Petrocalcic Calcarosol]
Grey brown calcareous loam and sandy loam, overlying calcrete at shallow depth. Subsoils can be a heavily textured as clay loam. Found on level and gently undulating land, and on slopes.
- A5-A4** *(rubbly) calcareous loams* [Regolithic Hypercalcic-Lithocalcic Calcarosol]
Grey brown calcareous loam and sandy loam, grading to clay loamy and loamy subsoil with abundant fine carbonate. These profiles often contain significant amounts of hard carbonate rubble, and are often very rubbly. Profiles can be underlain by calcrete at moderate depth. Many profiles are underlain by clayey sediments (Hindmarsh Clay) within 120 cm of the surface (soil **A5**). Often found on slight highs in slightly undulating land.
- A6** *gradational calcareous clay loam* [Pedal Hypercalcic-Supracalcic Calcarosol]
Grey brown to red brown calcareous loams and clay loams grading to reddish clay with abundant fine carbonate. This is underlain by red blocky clay (Hindmarsh Clay proper). Profiles often contain some hard carbonate rubble. Typically found in slight lows on slightly undulating land.

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

