

WLC Willochra Land System

Area:	376 km ²
Landscape:	Broad alluvial plains of the Willochra creek and tributaries with mostly fine textured calcareous soils on alluvium associated with the floodplain and tributaries. Soils associated with outwash from ranges are red clayey soils or highly calcareous loamy soils.
Annual rainfall:	230 – 250 mm average in the northern and eastern edge of the plain, up to 300 mm in the southern part around Wilmington and district.
Geology:	Quaternary alluvium consisting of fluvial and lacustrine deposits.
Topography:	Broad alluvial plains with the Willochra Creek forming the main drainage channel. Some swampy areas occur with many small meandering channels forming complex mazes. Some reworked sands form low dune and hummocks in places. Gypseous lunettes occur as low crescent shaped rises adjacent to small clay pans.
Elevation:	190 m asl at the northern extremity of the Willochra plain, rising gradually to 280 m asl just south-east of Wilmington, a distance of 75 km. Slopes are less than 1%.
Relief:	Level plains with low relief. The Willochra Creek channel is usually cut a few metres deep into the floodplain. Occasional dunes, hummocks and rises are no more than 5 metres above the surrounding plain.
Soils:	<p>Deep brown calcareous clay loam to clay (Calcic and hypocalcic clayey brown Calcarosols, Tenosols and Rudosols) occur on broad flood-over plains, closest to the main creek channels.</p> <p>Crusty loam to clay loam over friable red clay with gypsum and soft carbonate segregations (pedaric Sodosols/Chromosols) occur in association with:</p> <p>Calcareous clay loam grading to highly calcareous clay with many soft segregations and rubble (hypercalcic and supracalcic Calcarosols) occurs mostly on pediment remnants which form rises along the edges of the plain.</p> <p>Gypseous sandy loam grading to clay loam soils (Tenosols) occur on lunettes which are closely associated with:</p> <p>Dark grey clay loam to clay, grading to darl clay with soft carbonate (calcic Vertosols/Dermosols) on dry lake floors.</p> <p>Red sand dunes and hummocks (Tenosols) occur along either side of the main Willochra Creek north-east of Quorn, where fluvial sands have been blown out of the dry creek bed or left as overbank deposits which have been locally reworked into dunes.</p>
Main soils:	<p>D4 (29%) Loam over pedaric red clay (Pedaric Red Sodosol-Dermosol)</p> <p>A5 (16%) Rubbly calcareous loam on clay (Supracalcic-Lithocalcic Calcarosol on clay)</p> <p>A6 (14%) Gradational calcareous clay loam (Pedal Hypercalcic-Lithocalcic Calcarosol on clayey subsoil)</p> <p>M2 (13%) Deep friable gradational clay loam (Red-Brown-Grey- Black Dermosol)</p> <p>D2 (11%) Loam over red clay (Calcic-Hypercalcic Red Chromosol-Sodosol)</p>
Minor soils:	E2 (8%) Red cracking clay (Red Vertosol)



Summary:

The Willochra Land System is an elongate north-south mostly level alluvial plain. The ephemeral Willochra Creek meanders through it, with swampy areas in places. The soils range from brown calcareous loams and clays to crusty red duplex soils which are prone to scalding. Red sands reworked from overbank deposits form into dunes in places.

Soil Landscape Unit summary: Willochra Land System (WLC)

SLU	% of area	Component	Main soils	Prop#	Notes	
JFk	1.0	Plains	D2D4C1	D	<p>Pediments with mostly red texture contrast soils with clay loam surfaces, calcareous soils occupy more than 20% and other gradational soils occupy more than 10%.</p> <p>JFk Plains with around 50% scalded land and over 20% gullies. Main soils: <u>Loam over red clay - D2</u>, <u>Loam over pedaric red clay - D4</u> and <u>Gradational sandy loam - C1</u>.</p> <p>JFV Gently sloping pediment. Scalds occur on < 50% of the land. Main soils on mid-upper pediment slopes: <u>Clay Loam over red clay - D2</u>. Subdominant soils include <u>Rubbly calcareous loam on clay - A5</u> and <u>Red cracking clay - E2</u>.</p> <p>The foot slopes of the pediments have sodic soils and exhibit more scalding.</p> <p>Main soils on foot slopes: <u>Clay loam over pedaric red clay - D4</u> and are <u>Loam over poorly structured red clay - D3</u>, with subdominant soils A5 and E2 as above.</p>	
JFV	1.0	Pediment	D2	V		
		Foot Slopes	D4D3	C		
JIu	7.3	Plains	D1D4A5	D	<p>Plain with clay loamy surfaced, pedaric red texture contrast or clayey pedaric red uniform textured on gently sloping pediments & plains. Gravelly & sandy alluvial soils occur in creek beds. Slopes are 0-2%, relief is less than 9m.</p> <p>Main soils: <u>Loam over clay on rock- D1</u>, <u>Loam over pedaric red clay - D4</u>, and <u>Gradational calcareous clay - A6</u>.</p>	
JNA	0.3	Plains	D4D2A5	D	<p>Pediments and plains with non-stony pedaric, texture contrast soils with calcareous subsoils. Surface textures are clay loamy most commonly.</p> <p>JNA Plains. Slopes are less than 1%, relief is less than 9m.</p> <p>JNk Plain; 10-20% affected by gullying and 40-50% scalded. Scalding may be more than 50% locally.</p> <p>JNl Gently sloping pediment plain; gullying affects up to 50% of land, most severe along watercourses. Scalding affects nearly 50% of land. Slopes are 1-3%, relief is less than 9m.</p> <p>JNo Creek flat 10-20% affected by gullying and 40-50% scalded. Scalding may be more than 50% locally.</p> <p>JNu Level plain; 5-10% scalded. Slopes are less than 1%, relief is less than 9m.</p> <p>JNy Level plain; 10-50% scalded and patchy dryland salinity affects up to 50%.</p> <p>JNY Drainage line with eroded banks, stable now.</p> <p>JNy Drainage line with around 50% scalded land, 10-50% dryland salinity affected.</p> <p>Main soils: <u>Loam over red clay - D2</u>, <u>Loam over pedaric red clay - D4</u> and <u>Rubbly calcareous loam on clay - A5</u>. Red clay soils (E2) occur in minor association.</p>	
JNk	2.1	Plain	D4D2A5	D		
JNl	1.6	Gently sloping pediments	D4D2A5	D		
JNo	0.4	Creek flats	D4D2A5	D		
JNu	21.6	Plains	D4D2A5	D		
JNu	2.1	Plains	D4D2A5	D		
JNY	5.9	Drainage line	D4D2A5	D		
JNy	0.9	Drainage line	D4D2A5	D		
KCk	0.6	Plains	C3A3	D		<p>Plains on outwash sediments with gradational soils with sandy clay loam surface textures. Soils are mostly not calcareous throughout. The land is severely gullied, with more than 50% affected. Scalding is minor, less than 5% is scalded. Salinity affects 10-50% of land. Slopes are 0-1%, relief is less than 9m.</p> <p>Main soils: <u>Friable gradational sandy clay loam - C3</u>, <u>Deep</u></p>



					<u>moderately calcareous sandy loam - A3</u> and <u>Deep (rubbly) calcareous sandy loam -A4</u> . Additionally, <u>Deep gravelly soil -M3</u> is found associated with creek flats.
KGY	0.9	Creek flat	C3C1	D	Creek flat with sandy surface-textured red gradational soils with calcareous subsoils. 10-50% of land is scalded. Main soils are: <u>Friable gradational sandy clay loam - C3</u> and <u>Gradational sandy loam - C1</u> .
KLB	0.2	Gently undulating pediment	A5	D	Pediments and plains with clay loamy calcareous soils. KLB Gently undulating pediment Slopes are 1-3%, relief is less than 9m.
KLU	0.3	Plains	A5	D	KLU Plains, 5-10% scalded. Slopes: 0-1%, relief is less than 9m. Main soils: <u>Rubbly calcareous clay loam on clay - A5</u> . Minor soils include: <u>Calcareous clay loam on rock - A2</u> , <u>Gradational red-brown clay loam over rock-C2</u> and <u>Shallow calcareous loam on calcrete - B2</u> .
KMB	0.5	Gently sloping pediments	A5D4	D	Pediments on which gradational calcareous soils are dominant, and in combination with red texture contrast soils occupy >90% of the land. KMB Gently sloping pediments. Slopes: 1-3%, relief is less than 9m.
KMV	5.6	Gently undulating rises	A5D4	D	KMV Gently undulating rises; up to 5% gullied, 5-10% scalded. Slopes are 1-3%, relief is 9-30m. Main soils: <u>Rubbly calcareous clay loam on clay - A5</u> and <u>Loam over pedaric red clay - D4</u> .
KRY	38.3	Flood plains	M2A6 D4	D	Alluvial plains with mostly red clay soils and more than 20% calcareous soils. 5-10% of land is scalded. Main soils: <u>Deep friable gradational clay loam - M2</u> , <u>Gradational calcareous clay - A6</u> and <u>Loam over pedaric red clay - D4</u> . <u>Red cracking clay - E2</u> and <u>Loam over red clay - D2</u> are minor components.
KUV	2.4	Gently undulating pediments	E2C3D4	V	Gently undulating pediments and associated drainage lines with cracking clay soils with uniform or gradational texture profiles and calcareous subsoils.
		Drainage line	E2C3D4	L	Main soils: <u>Red cracking clay - E2</u> , <u>Friable gradational clay loam - C3</u> and <u>Loam over pedaric red clay - D4</u> .
XJS	0.2	Floodplain	M3M1	D	Floodplains with deep, gravelly, medium-textured (loam) alluvial soils. Main soils: <u>Deep gravelly soil -M3</u> and <u>Deep alluvial loam - M1</u> .
XOA	2.2	Flood plain	M2A6 C3	D	Flood plain, swampy and marginally saline, with clayey calcareous soils on alluvium. XOA Floodplain.
XOC	2.1	Flood plain	M2A6 C3	D	XOC Swampy floodplain.
XOE	2.1	Flood plain	M2A6 C3	D	XOE Floodplain, marginally saline, with eroded watercourse. Main soils: <u>Deep friable gradational clay loam - M2</u> , <u>Gradational calcareous clay - A6</u> and <u>Friable gradational clay loam - C3</u> .
XRA	0.2	Dry lagoon floor	E1E3C5	D	Dry lagoon floor with fine-textured soils on alluvium. Main soils: <u>Black cracking clay - E1</u> , <u>Brown or grey cracking clay - E3</u> , and <u>Gradational dark clay loam - C5</u> .
ZL-	0.2	Lunettes	A8	D	Lunettes around the margins of dry lagoons. The lunettes are low rises with a curved linear shape. Main soils: <u>Gypseous calcareous loam - A8</u> .

PROPORTION codes assigned to Soil Landscape Unit (SLU) components:

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:

- A3** Deep moderately calcareous (sandy) loam (Calcic Calcarosol)
Calcareous (sandy) loam topsoil grading into loamy-clay loamy subsoil without a significant CO₃ buildup in the subsoil (<20% CO₃ in subsoil). Pediment type Calcarosols.
- A5** Rubblly calcareous loamy sand on clay (Supracalcic-Lithocalcic Calcarosol on clay)
Calcareous loamy sand topsoil grading into loamy-clay loamy subsoil on a clayey substrate. Usually rubbly. Clayey substrate occurs at >60 cm and <120 cm.
- A6** Gradational calcareous clay loam (Pedal Hypercalcic-Lithocalcic Calcarosol on clayey subsoil)
Calcareous loams to clay loams grading into brown-red clay. Often rubbly.
- A8** Gypseous calcareous loam (Gypseous Calcarosol)
Calcareous soil with a Gypsic horizon) (>20% visual gypsum in a horizon which is at least 10 cm thick). Found on lunettes, flats, etc.
- C1** Gradational sandy loam (Calcic-Hypercalcic Kandosol-Calcarosol)
Friable sandy to loamy topsoil grading into massive red-brown alkaline loamy to clay loamy subsoil.
- C3** Gradational clay loam (Calcic / Hypercalcic Red Dermosol)
Loam to clay loam grading to a friable red clay with soft Class I carbonate within 50 cm, grading to alluvium within 100 cm.
- C5** Gradational dark clay loam (Calcic-Hypercalcic Brown-Grey-Black Dermosol-Calcarosol)
Dark clay loams over abundant 'soft lime'. >10% carbonate is the cut off between this and M2 soils.
- D1** Loam over red clay on rock (Hypercalcic / Calcic, Red Chromosol / Sodosol)
Medium thickness hard gravelly loam over a red clay, friable and finely structured (D1), to hard, coarsely structured and dispersive (D7), calcareous with depth, grading to weathering basement rock within 100 cm.
- D2** Hard loam over red clay (Calcic / Hypercalcic, Red Chromosol)
Hard setting sandy loam to clay loam (with variable quartzite stones) abruptly overlying a well structured red clay with soft Class I carbonate at depth.
- D3** Hard clay loam over dispersive red clay (Calcic, Red Sodosol / Sodic, Calcic, Red Chromosol)
Medium thickness hard clay loam with up to 50% quartzite stones over a coarsely prismatic dispersive red clay, calcareous with depth over stony and clayey alluvium.
- D4** Loam over red friable clay (Calcic, Pedaric, Red Sodosol)
Thin to medium thickness fine sandy loam to loam over a finely structured friable red clay, calcareous from about 50 cm, grading to fine or medium grained alluvium.
- E1** Black cracking clay (Black Vertosol)
- E2** Red cracking clay (Epicalcareous, Epipedal, Red Vertosol)
Dark strongly structured clay grading to a well structured red calcareous medium to heavy clay continuing below 100 cm. Often containing gypsum segregations in subsoil.
- E3** Brown or grey cracking clay (Brown-Grey Vertosol)
- M1** Alluvial loam (Orthic Tenosol)
Very thick loam with variable gritty or more-clayey lenses, formed over recent alluvium.
- M2** Deep friable gradational clay loam (Red-Brown-Grey-Black Dermosol)
Deep well structured red clay loamy soil.
- M3** Deep gravelly soil (Gravelly Kandosol-Tenosol)
Deep uniform loamy alluvial soils with at least 50% gravel in the major part of the profile.

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

