PEK Pekina Land System

Undulating rises and valley flats in the upper catchment of Pekina Creek, Southern Flinders Ranges

Total Area: 68.9 km^2

Annual rainfall: 340 – 475 mm average

Geology: Siltstones of the Tapley Hill Formation and fine sandstones of the Tarcowie Formation, overlain in valley floors by fine grained alluvium.

Topography: The land system covers the upper catchment of Pekina Creek. It includes the flat valley floor and gently inclined outwash slopes formed on alluvium, and undulating rises formed on bedrock. The rises are dissected by minor tributaries of the Pekina Creek.

Elevation: 470 - 620 m

Relief: Up to 30 m

Soils: Poorly structured sandy loam over clay soils are characteristic. Subdominant are gradational loams and calcareous loams.

Main soils

Soils formed on alluvium in lower slopes and in valleys

D3 Hard sandy loam over dispersive red clay

Soils formed on basement rock on rises

D1 Loam over red clay on rock

A2 Shallow calcareous loam

C2 Gradational loam on rock

D7 Sandy loam over dispersive red clay on rock

Minor soils

Soils formed on alluvium in lower slopes and in valleys

C3 Deep gradational loam

D2 Loam over red clay

Main features: The Pekina Land System is characterized by undulating slopes with mainly hard setting dispersive texture contrast soils. These are highly erodible and there is evidence of significant erosion in the past. Amelioration of the problem to reduce runoff, increase infiltration and improve workability and plant establishment is the main soil management requirement. Other soils (mainly calcareous loams and gradational non calcareous loams) have better structure but are often shallow.

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

SLU	% of area	Main features #
DCB DCC	1.5 31.0	Low rises formed on fine grained rocks. **DCB** Low rise with slopes of less than 3%. **DCC** Gentle slopes of 3-10%. Main soils: loam over red clay on rock - **D1** (E), gradational loam on rock - **C2** (E) and shallow calcareous loam - **A2** (E). This land is fully arable with only minor limitations provided that erosion is controlled. Limitations are caused mainly by adverse soil physical conditions including hard setting surfaces, eroded areas and stoniness.
DKB DKC DKW	1.6 13.8 1.4	Rises formed on coarse grained rocks. **DKB** Low rises with slopes of less than 3%. **DKC** Gentle slopes of 3-10%. **DKW** Gentle slopes of 5-10% with sporadic scalding. Main soils: sandy loam over dispersive red clay on rock - **D7** (V), with loam over red clay on rock - **D1** (C) and gradational loam on rock - **C2** (L). This land is arable but characterized by poorly structured sandy soils which are highly erodible, and have hard setting surfaces causing low infiltration rates, poor workability and patchy emergence. Severe scalding reduces productivity in places.
EGC	4.3	Gently inclined rises with slopes to 10% and sporadic rock outcrop formed on fine grained rocks. Main soils: shallow calcareous loam - **A2** (E), loam over red clay on rock - **D1** (E) and gradational loam on rock - **C2** (C). This land is arable although soils are often shallow and alkaline. Rocky outcrops dot the surface and there is a moderate erosion potential.
ETC ETD	1.5 3.8	Rocky rises formed on coarse grained rocks. **ETC** Gently inclined rocky rises with slopes of 3-10%. **ETD** Moderate rocky slopes of 10-20%. Main soils: shallow calcareous loam - **A2** (V) with sandy loam over dispersive red clay on rock - **D7** (C). This is rough semi arable land with significant rocky outcrop and soils which have low waterholding capacities and high erodibilities.
JBB JBC JBE	3.8 6.5 24.4	Outwash fans and drainage depressions formed on alluvium from fine grained rocks. **JBB** Very gentle slopes of 1-3%. **JBC** Gentle slopes of 3-8%. **JBE** Flat valley floors and drainage depressions. Main soils: hard loam over dispersive red clay - **D3** (V), with loam over red clay - **D2** (L) and deep gradational loam - **C3** (L). Poorly structured erosion-prone soils are a feature of this land. Poor infiltration and excessive runoff, restricted workability, temporary waterlogging and patchy emergence are caused by hard setting surfaces and dispersive subsoils. Eroded watercourses, sporadic salinity and acidity are minor problems.
JGH JGJ JGm	3.5 1.2 1.7	Outwash fans and drainage depressions formed on sandy and gritty clay alluvium derived from coarse grained rocks. **JGH** Gentle slopes of 3-7% with eroded watercourses. **JGJ** Drainage depressions (2-4% slope) with eroded watercourses. **JGm** Gentle slopes of 2-4% with sporadic scalding and eroded watercourses. Main soil: hard sandy loam over dispersive red clay - **D3** (D). This land is prone to serious soil structure problems if miss-managed. Scalding, sheet and gully erosion indicate that there has been severe degradation in the past. The predominantly hard sandy surface soils are very difficult to manage.

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, Calcic / Lithocalcic Calcarosol)
Calcareous sandy loam to clay loam, more clayey with depth overlying soft or rubbly carbonate grading to weathering rock within one metre.

C2 Gradational loam over rock (Calcic / Lithocalcic, Red Dermosol)
Medium thickness hard setting loam to clay loam grading to a red well structured clay with variable soft to semi-hard carbonate at depth with weathering rock within a metre.

C3 Deep gradational loam (Calcic / Supracalcic, Red Dermosol)
Medium thickness loam to clay loam grading to a red finely structured clay with variable gravel and stones and minor to moderate soft to rubbly carbonate at depth on alluvium.

D1 Loam over red clay on rock (Calcic / Lithocalcic, Red Chromosol)
Medium thickness hard setting loam to clay loam abruptly overlying a red well structured clay with variable soft to semi-hard carbonate at depth with weathering rock within a metre.

D2 Loam over red clay (Calcic / Hypercalcic, Red Chromosol)
Medium thickness loam to clay loam abruptly overlying a red finely structured clay with variable gravel and stones and minor to moderate soft carbonate at depth on alluvium.

D3 Hard sandy loam over dispersive red clay (Calcic, Red Sodosol)
Medium to thick hard setting sandy loam to clay loam sharply overlying a red coarsely structured dispersive clay, with minor soft carbonate at depth on alluvium.

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D7 Sandy loam over dispersive red clay on rock (Calcic / Hypocalcic, Red Sodosol)
Medium thickness hard setting sandy loam to sandy clay loam sharply overlying a red coarsely structured dispersive clay, calcareous with depth grading to weathering sandstone within one metre.

Further information: DEWNR Soil and Land Program