PGK Pooginook Land System

Very gently undulating plains with low dunefields north of the River Murray between Overland Corner and Weston Flat.

Area: 522.4 km^2

Annual rainfall: 240 – 255 mm average

Geology: The land system is underlain by a more or less continuous layer of Bakara Calcrete. The calcrete is dense and close to the surface in limited areas, and elsewhere is either in rubbly form or is capped by softer Woorinen Formation carbonates which themselves are commonly nodular or rubbly. The landscape is overlain by deposits of windblown Molineaux Sand which covers about a third of the total land area.

Topography: The land system is a gently to very gently undulating plain with some low rises. The main topographic features are the overlying sand deposits which generally occur in fields of low, rounded, more or less parallel east - west ridges. There are minor areas of moderate irregular shaped dunes.

Elevation: 30 - 80 m

Relief: Up to 10 m

Soils: The soils are mainly sandy loams, usually calcareous, over variable soft and hard carbonate layers. Deep sands are common, on sandhills.

Main soils

Flats and low rises

A4	Rubbly calcareous sandy loam
B2	Calcareous sandy loam over calcrete
A4/C1	Red gradational sandy loam

Sandhills

H2	Deep sand

Main features: The Pooginook Land System comprises very gently undulating plains of mainly moderately deep calcareous loamy sand to sandy loam soils with variable rubble contents, limited areas of very shallow stony soils, and extensive sandhill country with deep infertile and erosion prone soils. The System is on the extreme northern limits of cropping in the Murray Mallee. Low rainfall is the main limitation to agricultural productivity. From a soil point of view, productivity is limited by low to moderately low fertility depending on sandiness and erosional history, low water holding capacity and wind erosion potential.

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

SLU	% of area	Main features #
QMA QME	27.0 0.1	Flat to very gently undulating calcrete plain, with extensive surface stone and outcropping sheet rock. Low rounded, generally linear sandhills cover up to 10% of the area. **QMA** Plains with up to 10% sandhills. **QME** Depressions with no sandhills. Main soils: calcareous sandy loam over calcrete - **B2** (D) with deep sand - **H2** (M) on sandy rises. These flats are very stony with shallow soils, which are largely non-arable. Much of the land is uncleared, or has been allowed to regenerate. The sandhills, although marginally arable, are generally too small and scattered to support cropping. They are commonly at risk of wind erosion.
QNA	24.1	Very gently undulating flats formed on rubbly calcrete, but with less than 10% very stony land. There are minor (less than 10%) low sandy rises. Main soils: rubbly calcareous sandy loam - **A4** (V) with red gradational sandy loam - **A4/C1** (L). Calcareous sandy loam over calcrete - **B2** (M) and deep sand - **H2** (M) occur on stony flats and sandhills respectively. This land is almost fully arable, although most soils have restricted waterholding capacity. Other limitations include moderately low fertility and stoniness in places.
QOB	1.8	Flat to very gently undulating calcrete plain with extensive surface stone and outcropping sheet rock. Low rounded, generally linear sandhills cover 10-30% of the area. Main soils: calcareous sandy loam over calcrete - **B2** (V) with deep sand - **H2** (C) on sandy rises. These flats are very stony with shallow soils which are largely non arable. Much of the land is uncleared, or has been allowed to regenerate. The sandhills, although marginally arable, are generally too small and scattered to support cropping. They are commonly at risk of wind erosion.
QVB	1.7	Gently undulating low rises formed on mixed sheet and rubbly calcrete with about 30% stony areas, and overlain by up to 10% low sand hills. Main soils: rubbly calcareous sandy loam - **A4** (V), with calcareous sandy loam over calcrete - **B2** (C) on very stony areas, and deep sand - **H2** (M) on low sand hills. This land is transitional between **QMA** and **QNA** in terms of stoniness, and the typical soils are shallow, with between 10-30% of the area too stony for cropping. The main limitation on the arable land is restricted waterholding capacity. The sandy rises are prone to wind erosion, and are less fertile than the heavier soils.
SkA	4.1	Very gently undulating flats formed on soft to rubbly carbonates of the Woorinen Formation and overlain by up to 30% low sand hills. There is patchy but generally minor surface stone. Main soils: red gradational sandy loam - **A4/C1** (V), with deep sand - **H2** (C) on low sand hills and rises. From a soil point of view, this land is potentially productive due to higher proportion of deeper soils than elsewhere in the System. The land is fully arable, although some soils have limited waterholding capacity. There are moderate amounts of salt in the subsoils. The sandy rises and sandhills have low fertility and are prone to wind erosion.
UJJ	3.0	Complex of low rounded sandhills with a general E-W orientation, overlying stony calcrete flats. Main soils: deep sand - **H2** (E) on sandhills and rubbly calcareous sandy loam - **A4** (E) and calcareous sandy loam over calcrete - **B2** (C) on flats. This land is similar to **UMJ** but sandhills tend to be smaller and the flats are stonier. Consequently productive potential is reduced. Low fertility, wind erosion potential and lack of sufficient waterholding capacity are the main limitations.
UMF UMG UMJ	1.3 1.9 35.0	Flat to gently undulating land where sandhills occupy more than 30% of the area. The sandhills are generally low and linear with roughly east-west orientation. They rarely cover more than 50% of the land surface. However there are small areas of closely spaced moderate sandhills. Sandhills spacing varies from 200 to 400 m, and height rarely exceeds 9 m. **UMF** About 60% moderate irregular shaped sandhills. **UMG** About 60% broad low rounded irregular sandhills. **UMJ** 30-60% low parallel sandhills. Main soils: deep sand - **H2** (V-E) on sandhills, with red gradational sandy loam - **A4/C1** (C) and rubbly calcareous sandy loam - **A4** (C) on flats and rises between the sandhills. These areas are characterized by low fertility soils prone to wind erosion, and water repellence is a problem in some years. The sandhills are rarely large enough to warrant fencing out, but nevertheless require careful management to avoid drift. The flats and swales are similar to **QNA**.

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

(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, Lithocalcic Calcarosol)
Medium thickness calcareous loamy sand to sandy loam, more clayey with depth, over rubbly Class III C carbonate, grading to a very highly calcareous sandy clay loam with little rubble from about 50 cm.

A4/C1 Red gradational sandy loam
(Hypercalcic / Supracalcic, Red Kandosol OR Hypercalcic / Supracalcic, Epibasic Calcarosol)
Loamy sand to sandy loam grading to a moderately calcareous reddish sandy clay loam over Class III A or III B carbonate at about 60 cm. Nodular carbonate grades to very highly calcareous sandy clay loam with depth.

B2 Calcareous sandy loam over calcrete (Petrocalcic Calcarosol)
Medium thickness calcareous loamy sand to sandy loam grading to a highly calcareous rubbly light sandy clay loam over sheet calcrete within 50 cm.

H2 Deep sand (Arenic, Red-Orthic Tenosol / Red Kandosol)
More than 80 cm sand to loamy sand (sometimes slightly to moderately calcareous) grading to a reddish calcareous clayey sand to sandy clay loam with variable carbonate at depth.

Further information: DEWNR Soil and Land Program