

# GUR Gurrai Land System

(Based on the description by A. K. McCord in "A Description of Land in the Southern Mallee of South Australia")

Gently undulating plains scattered through the Wilkawatt - Marama - Peebinga area

**Area:** 615.9 km<sup>2</sup>

**Annual rainfall:** 285 – 375 mm average

**Geology:** The land is underlain by Tertiary Loxton / Parilla Sands, with a veneer of Blanchetown Clay over much of the area. These sediments are calcareous at the surface due to the leaching in of windblown carbonate rich dust. More recent deposits of Molineaux Sand blanket almost half of the land surface.

**Topography:** The landscape is a very gently undulating plain. The main components are flats formed directly on Tertiary sediments, and low to moderate (occasionally high) jumbled sandhills. There are occasional non sandy rises formed on Tertiary sediments.

**Elevation:** 70 - 90 m

**Relief:** 5 - 15 m

**Soils:** The soils are either sandy (deep sand or sand over clay) or clay loamy. Soil variations reflect the nature of the underlying sediments. Blanchetown Clay gives rise to loamy and clay loamy soils, Parilla Sand gives rise to sandy soils.

## Main soils

### *Sandhills*

**H3/H2** Deep sand

### *Flats*

**C4/D3** Clay loam over red clay

**G1** Loamy sand over sandy clay loam

## Minor soils

### *Flats*

**D5** Loamy sand over red clay

**F2** Sandy loam over poorly structured brown clay

### *Rises*

**G3** Thick sand over clay

**Main features:** The Gurrai Land System comprises broad loamy and less frequently sandy flats, interspersed with low to moderate and occasionally high jumbled sandhills. The soils of the flats are moderately deep and fertile, although prone to boron toxicity and waterlogging. They are satisfactory cropping soils, but unsuitable for irrigation. The sandhills have deep, infertile sandy soils susceptible to water repellence and wind erosion and are not generally suited to dryland cropping, although the lower sandhills are arable if appropriate precautions are taken. The sands are suitable for irrigated horticulture, but the complex distribution pattern of sandhills and heavy flats makes management very difficult. There is potential for the proliferation of seepage problems which occur naturally in places under dryland conditions.



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

SLU	% of area	Main features #
HmA HmB HnA	9.6 0.4 22.6	<p>Flats and rises underlain mainly by Blanchetown Clay, with variable low sandhills.</p> <p><b>HmA</b> Flats with less than 10% sandhills and minor wet depressions.</p> <p><b>HmB</b> Rises with less than 10% sandhills.</p> <p><b>HnA</b> Flats with 10-30% low sandhills and minor wet depressions.</p> <p>Main soils: <u>clay loam over red clay</u> - <b>C4/D3</b> (V-E) and <u>loamy sand over sandy clay loam</u> - <b>G1</b> (C), with <u>sandy loam over poorly structured brown clay</u> - <b>F2</b> (L) and <u>loamy sand over red clay</u> - <b>D5</b> (M) on flats and rises, with <u>deep sand</u> - <b>H3/H2</b> (M-C) and <u>thick sand over clay</u> - <b>G3</b> (M) on low sandhills. The predominantly loamy flats are relatively fertile and have moderately deep to deep soils. Their main limitation is probable boron toxicity associated with Blanchetown Clay close to the surface. Waterlogging may be expected in wet seasons, especially in depressions or where there are hollows in the underlying clay. These areas can be marginally saline. The sandy soils are less fertile, but depending on the thickness of sand are also less likely to suffer from boron toxicity or waterlogging. Poor deep drainage makes this land generally unsuitable for horticulture.</p>
OTE OTF OTG OTI OTJ OTQ OTf	3.8 8.5 4.6 5.9 41.6 2.5 0.5	<p>Dunefields of mostly low to moderate jumbled sandhills overlying the main landscape. The sandhills are formed on Molineaux Sand which overlies older Tertiary sediments.</p> <p><b>OTE</b> 60-90% high sandhills.</p> <p><b>OTF</b> 60-90% moderate sandhills.</p> <p><b>OTG</b> 60-90% low sandhills.</p> <p><b>OTI</b> 30-60% moderate sandhills.</p> <p><b>OTJ</b> 30-60% low sandhills with minor wet swales.</p> <p><b>OTQ</b> 30-60% low sandhills with minor wet, marginally saline depressions.</p> <p><b>OTf</b> 30-60% low sandhills superimposed on rises.</p> <p>Main soils: <u>deep sand</u> - <b>H3/H2</b> (V-E) on sandhills, with <u>clay loam over red clay</u> - <b>C4/D3</b> (C-E), <u>loamy sand over sandy clay loam</u> - <b>G1</b> (L-M), <u>sandy loam over poorly structured brown clay</u> - <b>F2</b> (L-M), <u>loamy sand over red clay</u> - <b>D5</b> (M) and <u>thick sand over clay</u> - <b>G3</b> (M) on flats or slopes between the sandhills. The deep sandy soils of the sandhills are infertile and prone to water repellence and wind erosion. The large sandhills of <b>OTE</b> are especially vulnerable and are unsuitable for farming. The low sandhills are arable with appropriate management, but the moderate sandhills are marginal for cropping. The sandhills are generally suitable for irrigated horticulture, but their close association with heavier and less irrigable flats makes management difficult. Seepage problems are likely to develop on flats adjacent to irrigated sandhills. Wet and marginally saline flats occur in dryland situations in places, mainly in <b>OTQ</b>.</p>

## # 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:***Sandhills and sandy rises***H3/H2** Deep sand (Calcareous, Arenic, Bleached-Orthic / Yellow-Orthic Tenosol)

Medium thickness loose brown sand with a paler coloured or bleached A2 layer becoming browner with depth and grading to a moderately calcareous loamy sand to clayey sand below 100 cm, although depth depends on erosional history.

**G3** Thick sand over clay (Hypercalcic, Brown Sodosol)

Thick loose sand to loamy sand with a bleached sub-surface layer, abruptly overlying a coarsely structured brown sandy clay, calcareous with depth

*Flats***C4/D3** Clay loam over red clay (Calcic, Red Dermosol / Sodosol)

Thin, often hard setting, clay loam to loam overlying a strongly structured dark red clay with minor soft carbonate from about 25 cm, grading to Blanchetown Clay. The thickness of the clay is variable and can be less than 50 cm over Parilla Sand.

**D5** Loamy sand over red clay (Calcic, Red Sodosol)

Thin firm loamy sand, abruptly overlying a coarsely structured red clay, calcareous with depth

**G1** Loamy sand over sandy clay loam (Calcic, Red Chromosol / Sodosol)

Thick brown sand with a paler coloured or bleached A2 layer, abruptly overlying a columnar structured red sandy clay loam to sandy clay, weakly calcareous with depth and grading to Parilla Sand at about 100 cm.

**F2** Sandy loam over poorly structured brown clay (Calcic, Brown Sodosol)

Medium thickness firm sandy loam over a coarsely columnar sandy clay, calcareous with depth, grading to Blanchetown Clay from about 100 cm.

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

