

# PAR Parawa Land System

Plateau extending from Silverton (east of Cape Jervis) to Wilson Hill (west of Victor Harbor)

**Area:** 120.7 km<sup>2</sup>

**Annual rainfall:** 660 – 905 mm average

**Geology:** The landscape is underlain by metamorphosed sandstones and siltstones of the Backstairs Passage Formation. These rocks are commonly deeply weathered with a thick layer of kaolinitic material, sometimes containing massive ferricretes, and always with ironstone gravels. This deeply weathered material is thickest on the flat topped spine of the Land System where least erosion has occurred. Toward the edges of the System where dissection has been greatest and slopes are steepest, fresh weathering rocks are at or near the surface. Locally derived medium to fine grained outwash sediments have accumulated in drainage depressions which occupy about 10% of the area.

**Topography:** The Land System includes the crest and upper slopes of the Parawa Plateau, an elevated block forming the southern part of the Fleurieu Peninsula. It is a remnant of an ancient ferricrete high plain which has progressively been eroded away. The relatively flat strip of land along the east – west oriented spine of the System is more or less un-eroded. The degree of dissection increases with increasing distance from the spine. Dissection slopes are gentle to moderate, rarely steeper than 20%. There are occasional "breakaway" features where a resistant ferricrete capping on the flat crests suddenly gives way to a dissected slope. Watercourses draining the slopes typically occupy narrow depressions which are usually poorly drained.

**Elevation:** Elevation of the summit surface varies from 370 m in the central and western parts to 220 m in the east. Lowest slopes range from 140 m in the east to 250 m in the west.

**Relief:** Maximum relief is 60 m

**Soils:** The majority of soils are either shallow to moderately deep over fresh weathering rock, or deep over highly weathered rock. Texture contrast or gradational soils with sandy loam to light clay loam surfaces are equally common. Shallow stony soils are limited to steeper slopes. Deep loamy to clay loamy texture contrast or gradational soils over alluvium occur in creek flats.

## Main soils

*Soils formed on deeply weathered basement rock*

**J2** Ironstone soil on ferricrete

**J2/K1** Gradational loam

**J2/K2** Loam over red clay

**J2/K4** Sandy loam over brown clay

*Soils formed on fresh weathering basement rock*

**K1** Gradational loam

**K4** Sandy loam over brown clay



Minor soils

*Soils formed on hard basement rock*

**L1** Shallow stony loam (**L1a**) or sandy loam (**L1b**)

*Soils formed on alluvial sediments*

**F1** Sandy loam to clay loam over brown clay

**N3** Dark wet clay loam

**N1** Peat

*Soils formed on ferricrete*

**J3** Shallow loamy sand over ferricrete

**Main features:**

The Parawa Land System is a high plateau comprising three distinctive elements. The most common (accounting for almost 75% of the area) are gentle to moderate slopes grading away from the spine of the System. Soils are moderately deep to deep with moderately low to moderate fertility and satisfactory drainage. All are acidic. The land has the potential to support productive pastures, and the less exposed parts are suitable for horticulture. Cool humid weather and high winter rainfall are not suitable for field crops. The exposure of much of the land to high winds affects all types of field and horticultural crops. The crest of the plateau occupies less than 20% of the area. Deep ironstone soils are typical. These are imperfectly drained, highly leached and have high phosphate fixing capacity. The land is well suited to pastures, but less favourable for other uses. Narrow creek flats flowing away from the crests are typically swampy. Although wet, there is little evidence of salinity. They provide valuable end of season green feed.

**Soil Landscape Unit summary:** 6 Soil Landscape Units (SLUs) mapped in the Parawa Land System:

SLU	% of area	Main features #
AkC	1.8	<p>Moderately steep slopes, usually south facing, formed on metasandstones and metasiltstones. Slopes are 15-25% with relief to 40 m. Rock outcrop and surface stone are limited.</p> <p>Main soils: <u>Sandy loam over brown clay</u> - <b>K4</b> (E)</p> <p><u>Gradational loam</u> - <b>K1</b> (E)</p> <p><u>Shallow stony loam</u> - <b>L1a</b> (L)</p> <p><u>Shallow stony sandy loam</u> - <b>L1b</b> (L)</p> <p>Soils are moderately fertile, although acidic, well drained and have reasonable water holding capacity. More than half of the area is uncleared. Grazing is the main use.</p>
CNC CND	7.9 62.1	<p>Undulating to gently rolling mid to upper slopes of the Parawa plateau, formed on meta-sandstones and metasiltstones, often highly weathered and kaolinized. Slopes range from 3% to 18%. Relief is up to 60 metres. Drainage depressions are well defined and often swampy (Soil Landscape <b>LIE</b>). There is minor rock outcrop and surface stone.</p> <p><b>CNC</b> Undulating upper slopes and rises with relief to 30 m and slopes of 3-10%.</p> <p><b>CND</b> Gently rolling slopes with relief to 60 m and slopes of 10-18%.</p> <p>The soils are moderately deep to deep. They have sandy loam to clay loam surfaces with variable (often considerable) ironstone gravel. Subsoils are clayey, yellow brown to red in colour, and variably structured. Ironstone may also occur in subsoils.</p> <p>Main soils: <u>Sandy loam over brown clay</u> - <b>K4</b> and <b>J2/K4</b> (E) on weathered metasandstones</p> <p><u>Gradational loam</u> - <b>K1</b> &amp; <b>J2/K1</b> (C) } on weathered metasiltstones</p> <p><u>Loam over red clay</u> - <b>J2/K2</b> (L) }</p> <p><u>Ironstone soil on ferricrete</u> - <b>J2</b> (L)</p> <p>Soils have moderately low (sandy types) to moderately high (loamy types) fertility, and are mostly well to moderately well drained. The ironstone soils are least fertile (with high phosphate fixation capacity), and most susceptible to waterlogging. All soils are prone to acidification. All the land is potentially arable, but little is cropped due to the combination of high rainfall, cool maturation conditions and exposure. Pasture productivity is potentially high, and there is some scope for irrigated horticulture.</p>



FfZ	16.9	<p>Rounded summit surfaces of rolling low hills developed on metasiltsstones and metasandstones. The underlying rocks are kaolinized and ferruginized. Slopes range from 2% on crests to 20% on steeper side slopes, but are usually less than 10%. The landscapes are usually long and narrow as they follow the ridges of the hills. Surface ironstone is common. The soils are deep. The surfaces are sandy to loamy with abundant ironstone gravel. The subsoils are clayey, yellow and brown in colour, and poorly structured. Ironstone boulders often occur in soil profiles.</p> <p>Main soils: <u>Ironstone soil on ferricrete</u> - <b>J2</b> (E) } on highly weathered metasandstones  <u>Sandy loam over brown clay</u> - <b>J2/K4</b> (C) }  <u>Gradational loam</u> - <b>J2/K1</b> (L) } on highly weathered metasiltsstones  <u>Loam over red clay</u> - <b>J2/K2</b> (L) }  <u>Shallow loamy sand over ferricrete</u> - <b>J3</b> (L) on break-away features</p> <p>These soils have moderately low natural fertility (partly due to ironstone induced phosphate fixation and partly due to degree of weathering and leaching). They are mostly deep but often imperfectly drained. All the land is on highly exposed crests. Although productive pasture soils, potential for more intensive uses is limited.</p>
LIE	9.6	<p>Swamps in narrow drainage depressions. Underlying sediments are alluvial silts and clays derived from adjacent slopes. Many areas have tea tree thickets. The dominant feature of these soils is their wetness. Medium to fine textured surfaces are usual, with mottled heavy clay subsoils.</p> <p>Main soils: <u>Dark wet clay loam</u> - <b>N3</b> (E)  <u>Sandy loam to clay loam over brown clay</u> - <b>F1</b> (E)  <u>Peat</u> - <b>N1</b> (L)</p> <p>These flats are too wet for any uses other than grazing. When the land is cleared, watercourses are susceptible to erosion.</p>
LsE	1.7	<p>Narrow drainage depressions formed on medium to fine grained sediments. This land is topographically similar to <b>LIE</b>, but less swampy, although still subject to waterlogging.</p> <p>Main soils: <u>Sandy loam to clay loam over brown clay</u> - <b>F1</b> (V)  <u>Dark wet clay loam</u> - <b>N3</b> (C)</p> <p>Although deep and fertile, these soils are generally too wet for uses other than grazing. Watercourses are susceptible to erosion.</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:

*Soils formed on fresh weathering basement rock*

- K1** Gradational loam (Eutrophic, Brown Dermosol)  
15 - 40 cm dark brown loam to clay loam with a paler brown gravelly clay loam A2 layer, grading to a yellowish red to orange clay with strong polyhedral structure and increasing rock fragments with depth. Weathering metamorphosed siltstone or phyllite occurs at about 100 cm.
- K4** Sandy loam over brown clay (Bleached, Eutrophic, Brown Kurosol)  
10 - 35 cm loamy sand to sandy clay loam with a gravelly and bleached A2 layer, overlying a yellow brown or brown, well structured clay grading to weathering metasandstone by 100 cm.
- L1a** Shallow stony loam (Paralithic, Leptic Tenosol)  
20 - 45 cm dark brown loam with a paler brown clay loam A2 layer containing up to 50% rock fragments, grading to metamorphosed siltstone or phyllite by 50 cm.
- L1b** Shallow stony sandy loam (Paralithic, Bleached-Leptic Tenosol)  
30 - 55 cm stony sandy loam with a stony bleached A2 layer, grading to weathering metasandstone by 50 cm.



*Soils formed on deeply weathered basement rock*

- J2** Ironstone soil (Ferric, Eutrophic, Brown Kandosol)  
10 - 30 cm grey brown sandy loam to sandy clay loam with a paler coloured and ironstone gravelly A2 layer, overlying an ironstone gravelly yellow sandy clay loam grading to a yellowish brown and red clay with variable ironstone fragments, and becoming red and grey mottled from about 70 cm.
- J2/K1** Gradational loam (Eutrophic, Brown Dermosol)  
15 - 40 cm dark brown loam to clay loam with a paler brown gravelly clay loam A2 layer, grading to a yellowish red to orange clay with strong polyhedral structure over soft kaolinitic highly weathered metamorphosed siltstone or phyllite, continuing below 200 cm.
- J2/K2** Loam over red clay (Eutrophic, Red Kurosol)  
10 - 30 cm fine sandy loam to loam with variable ironstone gravel, over a red or brown finely structured clay, grading to kaolinitic deeply weathered fine grained rock from about 100 cm.
- J2/K4** Sandy loam over brown clay (Bleached, Eutrophic, Brown Kurosol)  
15 - 35 cm grey brown loamy sand to sandy clay loam with a gravelly and bleached A2 layer, overlying a yellow brown or brown well structured clay grading to highly weathered kaolinized metasandstone.
- J3** Shallow loamy sand over ferricrete (Acidic, Ferric-Petroferric, Bleached-Leptic Tenosol)  
Less than 50 cm loamy sand with a bleached, ironstone gravelly A2 layer, overlying massive or nodular ferricrete, grading to highly weathered kaolinitic basement rock.

*Soils formed on alluvial sediments*

- F1** Sandy loam to clay loam over brown clay (Bleached, Eutrophic, Brown Chromosol)  
25 - 55 cm hard grey brown loamy sand to sandy clay loam with a strongly bleached A2 layer, over a yellow brown, grey and red mottled clay with strong coarse blocky structure, grading to fine grained alluvium.
- N1** Peat (Acidic, Hemic Organosol)  
Deep black rotted organic matter or highly organic loam, seasonally or permanently saturated.
- N3** Dark wet clay loam (Melanic, Dermosolic, Redoxic Hydrosol)  
20 - 60 cm dark grey clay loam, with a paler coloured A2 layer, overlying a grey and dull yellow brown clay with strong blocky structure. The soil is saturated for most of the time.

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

