

HAL Halidon Land System

(Based on the descriptions by A. K. McCord in "A Description of Land in the Southern Mallee of South Australia"), and by Potter, Wetherby and Chittleborough (1973) in "A Description of the Land in County Albert, County Alfred and Part of County Eyre, South Australia". Dept. of Agric. S.A. Soil Cons. Branch LD1).

Gently undulating plain with dunefields scattered from Mindarie east to the Victorian border.

Area: 333.4 km²

Annual rainfall: 275 – 310 mm average

Geology: The land is underlain by Tertiary Loxton / Parilla Sands, capped by a discontinuous layer of Blanchetown Clay equivalent. These sediments are in turn capped by calcrete which would once have formed a continuous sheet, but which has been partly eroded or dissolved leaving remnants as benches scattered across the landscape. Across all of these elements are deposits of aeolian Molineaux Sand occupying about a third of the land surface.

Topography: There are four distinctive components to the topographic pattern. The predominant features are broad almost level flats with only minor sandy and very occasional stony rises. Within the flats are conspicuous isolated depressions. Stony rises or broad benches project above the level of the plain. Dunefields of small, medium and large sandhills, together with sand spreads are distributed across the landscape.

Elevation: 40 - 100 m

Relief: 5 - 20 m

Soils: The soils fall into three broad categories, depending on position in the landscape. On flats and depressions are sandy to sandy loam soils with more clayey subsoils, underlain by Tertiary sediments. On sandhills are deep sands and on stony areas, soils are shallow over calcrete.

Main soils

Flats and depressions

- C1** Gradational loamy sand
- G2** Thick sand over dispersive red sandy clay
- D3** Sandy loam over red dispersive clay

Sandhills

- H2** Deep orange sand

Minor soils

Flats and depressions

- G1** Loamy sand over red sandy clay loam

Sandhills

- H3** Deep bleached sand

Stony benches and flats

- B2** Shallow calcareous sandy loam
- B3** Shallow gradational loamy sand



Main features: The Halidon Land System comprises a mixture of broad flats and depressions with deep fertile soils, stony rises and flats with productivity limited by restricted water holding capacity, and sand hills and spreads with infertile erosion prone soils. The soils of the flats are well suited to cropping although boron toxicity may reduce yields. Their horticultural suitability is limited by impaired deep drainage where Blanchetown Clay underlies the soil. The shallow stony soils are also likely to be underlain by Blanchetown Clay, limiting their irrigability. The sandy soils have low agricultural value, but (apart from the high sandhills) should not have any major limitations to horticultural uses.

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

SLU	% of area	Main features #
HgE	2.5	Circular or elongate flats and depressions. Main soils are <u>gradational loamy sand</u> - C1 (V) with <u>shallow calcareous sandy loam</u> - B2 (L). The soils are generally deep and relatively fertile with only slight erosion potential. Well suited to cropping.
HqA	44.7	Very gently undulating flats with up to 10% low sandy rises and very minor low stony rises. Underlying sediments are Parilla/Loxton Sands, sporadically veneered by Blanchetown Clay. Main soils: <u>gradational loamy sand</u> - C1 (E) with <u>sandy loam over red dispersive clay</u> - D3 (C), <u>loamy sand over red sandy clay loam</u> - G1 (L) and <u>thick sand over dispersive red clay</u> - G2 (L). These extensive flats have relatively fertile and deep soils with only minor limitations to dryland agriculture. Boron toxicity on the heavier soils and marginal fertility and erosion susceptibility on the sub-dominant sandy soils are the main potential problems. Irrigated crops are less likely to thrive, due to poor deep drainage in soils formed on Blanchetown Clay.
O-A OAE	0.7 6.7	High sandhills of mainly bleached Molineaux Sand. O-A Individual high dunes. OAE 60-90% high dunes with gently undulating swales. Main soils: <u>deep bleached sand</u> - H3 (V) on dunes, and <u>thick sand over dispersive red clay</u> - G2 (C) in swales. These areas are dominated by deep infertile sandy soils prone to water repellence and wind erosion. They are not suited to any type of agriculture. Where cleared they are often eroded and require remedial treatment. Control of rabbits is critical in uncleared or partly cleared sections.
QJZ QOZ	1.7 12.4	Benches, ridges and low rises of a remnant calcreted land surface. There is extensive surface calccrete stone, and up to 30% coverage of low sandhills. QJZ Benches and ridges with less than 10% sandhills. QOZ Benches and ridges with 10-30% sandhills. Main soils: <u>shallow calcareous sandy loam</u> - B2 (E) and <u>shallow gradational loamy sand</u> - B3 (E), with <u>deep orange sand</u> - H2 (M-C) on sandhills. These areas are characterized by shallow stony soils which are generally not arable. The deeper sandy soils, apart from their usual problems (refer UN_ below), are scattered amongst the stony soils, making them more difficult to manage.
RFZ	6.5	Broad elevated flats formed on calccrete, probably an old land surface. Main soils: <u>shallow gradational loamy sand</u> - B3 (V) and <u>shallow calcareous sandy loam</u> - B2 (C). These flats are generally arable although soils are shallow and have limited water holding capacity.
UNF UNI UNK	6.5 2.5 15.8	Dunefields of irregular shaped sandhills and sand spreads superimposed on the main landscape. UNF 60-90% moderate sandhills. UNI 30-60% moderate sandhills. UNK Very gently undulating sand spreads. Main soils: <u>deep orange sand</u> - H2 (E-V) on sandhills, and <u>gradational loamy sand</u> - C1 (C-M) and <u>thick sand over dispersive red clay</u> - G2 (C-M), with <u>sandy loam over red dispersive clay</u> - D3 (L-M) and <u>loamy sand over red sandy clay loam</u> - G1 (M) on flats. The sandhills are susceptible to wind erosion and water repellence, and have low natural fertility. They are marginal cropping soils, but have good irrigation potential. The intervening flats are similar to HqA , but with a higher proportion of sandy surfaced soils.



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:

Flats and depressions

- C1** Gradational loamy sand (Calcic, Red Kandosol)
Medium to thick loamy sand to sandy loam grading to a red sandy clay loam, calcareous with depth over Parilla Sand at about 100 cm.
- D3** Sandy loam over red dispersive clay (Calcic, Red Sodosol)
Medium thickness firm sandy loam to sandy clay loam abruptly overlying a red coarsely structured sandy clay to medium clay, calcareous from about 25 cm, and grading to Blanchetown Clay at about 50 cm. The clay may be as thin as 50 cm over Loxton/Parilla Sand.
- G1** Loamy sand over red sandy clay loam (Calcic, Red Sodosol)
Medium thickness loamy sand abruptly overlying a coarsely structured red sandy clay loam to sandy clay, highly calcareous from about 50 cm, and becoming sandier with depth, grading to Parilla Sand within 100 cm.
- G2** Thick sand over dispersive red sandy clay (Calcic, Red Sodosol)
Thick to very thick sand with a bleached A2 layer, sharply overlying a firm red sandy clay loam to sandy clay, moderately calcareous from about 100 cm and grading to Parilla/Loxton Sand by 150 cm.

Sandhills

- H2** Deep orange sand (Calcareous, Arenic, Brown-Orthic Tenosol)
Very thick orange sand, organically darkened at the surface, weakly calcareous from about 70 cm, and becoming slightly more clayey with depth. Continuing below 150 cm.
- H3** Deep bleached sand (Basic, Argic, Bleached-Orthic Tenosol)
Very thick bleached sand, organically darkened at the surface, over orange clayey sand lamellae in a sandy matrix, continuing below 150 cm.

Stony benches and flats

- B2** Shallow calcareous sandy loam (Petrocalcic, Lithocalcic Calcarosol)
Medium thickness sandy loam over a calcareous light sandy clay loam with abundant calcrete rubble, on calcrete as shallow as 25 cm. Calcrete grades to a very highly calcareous sandy clay loam overlying Loxton/Parilla Sand from about 100 cm.
- B3** Shallow gradational loamy sand (Petrocalcic, Red Kandosol)
Medium thickness loamy sand to sandy loam grading to a red light sandy clay loam, overlying rubbly calcrete at about 25 cm.

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

