

GIH Gifford Hill Land System

Undulating highlands south west of Murray Bridge

Area: 79.0 km²

Annual rainfall: 350 – 440 mm average

Geology: The land is probably underlain by basement rocks of the Kanmantoo Group. Although there was no observed outcrop, weathering rock occurs within a metre of the surface in places. The relief of the landscape also suggests basement influence. The main near surface materials are Tertiary age sediments, mainly clayey sands and sandy clays, with some heavy clays similar to Blanchetown Clay. These are veneered by windblown carbonates which have hardened on exposure in places, forming a calcrete cap which outcrops as sheet rock or is evident from surface stone accumulation. The sandy sediments have been considerably reworked by wind, with the sand being swept up into linear dunes which are draped over the landscape.

Topography: The landscape is essentially a broad undulating low hill with long slopes (up to two km) and gradients of up to 8%. There are two prominent crests, viz. Camel Hill and Gifford Hill. In the north east corner, the escarpment of the Narrinyeri Land System disappears under the Tertiary cover, and slopes here are up to 12%. The main features of the land surface are isolated dune fields draped over the slopes, and stony areas where calcrete is at or near the surface. A major drainage depression runs from north to south through the centre of the System.

Elevation: 169 m (Camel Hill) to 13 m at the outlet of the drainage depression in the south east

Relief: 50 – 100 m

Soils: The landscape is dominated by a variety of shallow to moderately shallow sandy and loamy soils over calcrete, and sandy soils, either deep sands or sand over clay types. There are limited areas of loamy texture contrast soils.

Main soils

Sandy soils

- G4** Sand over dispersive sandy clay loam
- Shallow soils over calcrete and calcareous rubbly soils*
- B7** Sand over sandy clay shallow on calcrete
- B8** Bleached loamy sand over calcrete

Minor soils

Loamy soils

- D2** Sandy loam over thin red sandy clay loam
- F2** Sandy loam over dispersive clay

Sandy soils

- G1** Thick sand over red sandy clay loam
- H3** Deep bleached sand

Calcareous soils and shallow soils over calcrete

- A5** Calcareous sandy loam
- B2** Shallow stony calcareous loamy sand
- B3** Loamy sand over red sandy clay loam on calcrete



Main features: The Gifford Hill Land System is a broad undulating low hill characterized by mainly sandy soils, usually with dispersive clay subsoils, but often (on dunes) sandy to over a metre in depth. These soils are infertile, water repellent and prone to wind erosion. Where clay subsoils are shallow and slopes are more than 4%, water erosion is also a threat. The subdominant soil classes are moderately shallow loamy sands to sandy loams, with or without more clayey subsoils, over calcrete. These usually have a water retention limitation, but are more fertile than the sands. Surface stone and sheet rock make some of these areas non arable. On lower slopes and drainage depressions there are sandy loam texture contrast soils which are potentially productive.

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

SLU	% of area	Main features #
DsC	0.2	Gentle escarpment slopes of 8-12% underlain by basement rocks which outcrop to a minor extent. Main soils: <u>thick sand over red sandy clay loam</u> - G1 (V) and <u>sand over dispersive sandy clay</u> - G4 (L).
GQB GQC	0.8 23.8	Gently undulating to undulating rises formed on Tertiary sediments, capped in places by calcretes. Linear sandhills occupy 10-30% of the land surface. GQB Very gently undulating slopes of 1-4%. GQC Undulating slopes and rises with slopes of 4-8%. Main soils: <u>sand over dispersive sandy clay</u> - G4 (E), with <u>sand over sandy clay shallow on calcrete</u> - B7 (L) and <u>bleached loamy sand on calcrete</u> - B8 (L) where calcrete is at or near the surface, <u>sandy loam over dispersive clay</u> - F2 (M) on lower slopes, and <u>deep bleached sand</u> - H3 (C) on sandhills. The soils are mostly sandy, although deep sands are restricted to the sandhills. Low fertility, water repellence and wind erosion potential are all significant limitations. Perched water tables are likely in wet seasons. Where the clay is shallower than 30 cm, waterlogging reduces productivity.
GVB	13.1	Gentle slopes of less than 4% formed on a complex of Tertiary sediments and calcrete. There is up to 10% surface calcrete. Main soils: <u>sand over dispersive sandy clay</u> - G4 (E), with <u>deep bleached sand</u> - H3 (L), <u>loamy sand over red sandy clay loam on calcrete</u> - B3 (L), <u>bleached loamy sand on calcrete</u> - B8 (L) and <u>calcareous sandy loam</u> - A5 (L). The sandy soils are infertile, water repellent and prone to wind erosion. The loamier soils are more fertile but tend to be shallower.
GWB GWC	8.0 42.1	Gently undulating to undulating rises formed on Tertiary sediments, capped in places by calcretes. Linear sandhills occupy less than 10% of the land surface. GWB Very gently undulating slopes of 1-4%. GWC Undulating slopes and rises with slopes of 4-8%. Main soils: <u>sand over dispersive sandy clay</u> - G4 (E), with <u>sand over sandy clay shallow on calcrete</u> - B7 (L) and <u>bleached loamy sand on calcrete</u> - B8 (L) where calcrete is at or near the surface, <u>sandy loam over dispersive clay</u> - F2 (L) on lower slopes, and <u>deep bleached sand</u> - H3 (M) on sandhills. The soils are mostly sandy, although deep sands are restricted to the sandhills. Low fertility, water repellence and wind erosion potential are all significant limitations. Where the clay is shallower than 30 cm, waterlogging reduces productivity.
GXC	1.0	Gentle escarpment slopes of 6-12% underlain by a complex of basement rocks and Tertiary sediments. Main soils: <u>sand over dispersive sandy clay</u> - G4 (V), with <u>thick sand over red sandy clay loam</u> - G1 (C). These soils are moderately deep but infertile and prone to both wind and water erosion.
QVB QVC	2.9 5.6	Stony slopes and crests formed on calcrete and highly calcareous Woorinen Formation. QVB Very gentle slopes of 2-4%. QVC Gentle slopes of 4-8%. Main soils: <u>bleached loamy sand on calcrete</u> - B8 (E) and <u>sand over sandy clay shallow on calcrete</u> - B7 (E), with <u>sandy loam over thin red sandy clay loam</u> - D2 (L) and <u>calcareous sandy loam</u> - A5 (L). The dominant soils are shallow with restricted water holding capacity and marginal fertility. The land is semi arable - rockiness prevents cultivation in places.



QhE	2.5	Drainage depressions underlain by Tertiary sediments, commonly calcreted. There are low stony benches throughout, and up to 20% surface calcrete. Main soils: <u>loamy sand over red sandy clay loam on calcrete - B3 (E)</u> , <u>sandy loam over thin red sandy clay loam - D2 (C)</u> and <u>calcareous sandy loam - A5 (C)</u> , with <u>shallow stony calcareous loamy sand - B2 (L)</u> on benches. The shallow soils over calcrete have limited waterholding capacity and are commonly too shallow and stony for cultivation. The deeper soils are potentially productive with no significant limitations, other than their intimate association with shallower soils.
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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:

G4 Sand over dispersive sandy clay (Calcic, Brown Sodosol)

Medium to thick loose grey sand with a bleached A2 layer, abruptly overlying a brown, yellow and red mottled coarsely structured sandy clay loam to sandy clay, calcareous from about 50 cm, grading to Tertiary sediments.

B7 Sand over sandy clay shallow on calcrete (Petrocalcic, Brown Chromosol)

Medium to thick loose grey sand with a bleached A2 layer, abruptly overlying a brown, yellow or red massive sandy clay loam to sandy clay over sheet calcrete at about 40 cm.

H3 Deep bleached sand (Basic, Arenic, Bleached-Orthic Tenosol)

Very thick bleached sand, organically darkened at the surface, grading to a yellow sand over clayey sand at depths ranging from 70 to 200 cm.

B8 Bleached loamy sand over calcrete (Petrocalcic, Bleached-Leptic Tenosol)

Medium to thick loamy sand with a paler coloured A2 layer over sheet calcrete at depths ranging from 10 to 50 cm.

B2 Shallow stony calcareous loamy sand (Petrocalcic Calcarosol)

Medium thickness calcareous sandy loam over sheet calcrete within 20 cm.

B3 Loamy sand over red sandy clay loam on calcrete (Petrocalcic, Red Chromosol)

Medium thickness loamy sand over a red massive sandy clay loam on calcrete at about 40 cm.

F2 Sandy loam over dispersive clay (Calcic, Brown Sodosol)

Thin to medium thickness firm loamy sand to sandy loam abruptly overlying a coarsely structured dispersive brown mottled sandy clay loam to clay, calcareous from about 20 cm, grading to Tertiary sediments from about 60 cm.

D2 Sandy loam over thin red sandy clay loam (Hypercalcic, Red Chromosol)

Medium thickness sandy loam overlying a red sandy clay loam grading to soft carbonate from about 25 cm, grading to Tertiary sediments from about 60 cm.

A5 Calcareous sandy loam (Hypercalcic / Supracalcic Calcarosol)

Calcareous loamy sand to sandy loam becoming more clayey and calcareous with depth over fine to rubbly carbonate within 40 cm, grading to clayey Tertiary sediments or (occasionally) basement rock within 100 cm.

G1 Thick sand over red sandy clay loam (Hypercalcic, Red Chromosol)

Very thick reddish brown sand to loamy sand, overlying a thin reddish brown massive sandy clay loam, highly calcareous at the base, grading to weathering metamorphosed sandstone at about 100 cm.

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

