

GLY Glyde Land System

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

Range of low hills extending from Hundred of Glyde to Hundred of Wells

Area: 743.1 km²

Annual rainfall: 440 – 575 mm average

Geology: The system is formed on a massive ancient coastal dune comprising mixed calcareous and siliceous sand which has hardened to calcarenite (Bridgewater Formation). There are extensive sand spreads (Molineaux Sand) overlying the landscape. These tend to be concentrated on the eastern (leeward) side of the range. Small depressions within the range are geologically variable and may be infilled with locally derived outwash sediments, drift sand or swamp sediments.

Topography: The Glyde Land System is an elongate range of rounded low hills with a NNW - SSE orientation. Isolated depressions tend to be aligned in chains parallel to the length of the range. The depressions are swampy in places, particularly in the north where they may be only a few metres above sea level. In the south, depressions are commonly 20-30 m above sea level. Sand deposits are occasionally in low east west dunes, but are more commonly randomly spread over the land surface.

Elevation: 2 m to 74 m

Relief: Maximum relief is 60 m

Soils: Most soils are either shallow loamy sands over calcrete, sometimes with a thin clayey subsoil, or deep to moderately deep sands, often with clayey subsoils. Wet swampy soils are minor.

Main soils

Rises

- H3** Deep bleached sand
- B3** Shallow stony loamy sand over calcrete
- G2** Sand over light sandy clay loam
- B7** Loamy sand over sandy clay loam on calcrete

Minor soils

Rises

- B2** Shallow calcareous loamy sand

Well drained depressions

- G3** Thick sand over friable clay
- H3/G2** Thick bleached sand

Swampy depressions

- N2a/G4** Sand over mottled saline waterlogged clay
- N2b/A7** Wet saline calcareous loam
- N2c** Wet saline clay over sand
- D3** Hard sandy clay loam over dispersive red clay (lunettes)
- G4** Sand over clay



Main features: The Glyde Land System is characterized by low hills with predominantly well drained sandy and shallow stony soils. However, cropping is limited by low fertility, water repellence, wind erosion potential or shallow stony soils, depending on depth of sand cover. Depressions are minor overall, but have better productive potential, although swampiness and salinity are increasing.

Soil Landscape Unit summary: 15 Soil Landscape Units (SLUs) mapped in the Glyde Land System:

SLU	% of area	Main features #
MHB MHC MHY MHo	2.6 58.9 2.8 0.4	<p>Gently undulating to rolling rises and low hills formed on calcreted calcarenite of the Bridgewater Formation, partially overlain by siliceous sand.</p> <p>MHB Gently undulating low rises and flats with 10-30% low sand ridges. Relief is less than 10 m. Some depressions are marginally saline.</p> <p>MHC Undulating to rolling rises or low hills with relief to 60 m and slopes of 3-15%.</p> <p>MHY As for MHC but with 10-30% low sand ridges.</p> <p>MHo As for MHC but with up to 10% saline depressions.</p> <p>There is variable surface calcrete, depending on presence of sand. 10-20% stone cover is common, with outcropping reefs and heavy stone in places. Sand is sometimes in dune form.</p> <p>Main soils: <u>shallow stony loamy sand over calcrete</u> - B3 (E), <u>deep bleached sand</u> - H3 (C), <u>loamy sand over sandy clay loam on calcrete</u> - B7 (C), and <u>sand over light sandy clay loam</u> - G2 (L). <u>Sand over mottled saline waterlogged clay</u> - N2a/G4 (M) occurs in MHo depressions. Key properties:</p> <p>Drainage: Rapidly to well drained (except saline depressions). Fertility: Very low on deep sands to moderately low on stony soils. Physical condition: Surface soils are soft to loose and do not restrict root growth. Where subsoils occur they are friable and not restrictive to root growth. AWHC: Moderate on sandy soils. Very low to low on stony soils, due to shallow depth to hard calcrete. Salinity: Low (except minor saline depressions). Erosion potential: Water: Low to moderate, depending on slope. Wind: High on sand spreads to moderately low on stony ground. Water repellence: Strong on sand spreads. Low to slight on stony land. Rockiness: Nil on sand spreads. Variable to 50%, usually less than 20%. Other: The higher rises are exposed.</p> <p><u>Summary:</u> Deep, low fertility, water repellent and erodible sands with shallow, stony soils of marginal fertility.</p>
MJB MJC MJt	2.7 15.3 4.6	<p>Irregular undulating rises and depressions formed on calcreted calcarenite. There is extensive calcrete outcrop - up to 20% in places, and variable surface stone.</p> <p>MJB Gently inclined low rises with well drained depressions.</p> <p>MJC Rises with generally well drained depressions.</p> <p>MJt Rises with 10-20% depressions most of which are swampy.</p> <p>Main soils: <u>shallow stony loamy sand over calcrete</u> - B3 (E) and <u>shallow calcareous loamy sand</u> - B2 (C) with <u>deep bleached sand</u> - H3 (L), <u>sand over light sandy clay loam</u> - G2 (L) and <u>loamy sand over sandy clay loam on calcrete</u> - B7 (M) on sand rises. <u>Wet saline calcareous loam</u> - N2b/A7 (M), <u>sand over mottled saline waterlogged clay</u> - N2a/G4 (M) and <u>wet saline clay over sand</u> - N2c (M) occur in the swampy depressions of MJt.</p> <p>Key properties:</p> <p>Drainage: Rapidly to well drained, except in minor unmappable swampy hollows which are poorly drained. Fertility: Moderately low to low. Physical condition: No physical limitations to root growth in the soil. AWHC: Very low to moderate, depending on depth to calcrete.</p>



		<p>Salinity: Low generally. Very high in swampy depressions.</p> <p>Erosion potential: Water: Low to moderate. Wind: Low to moderately low.</p> <p>Water repellence: Low to moderate (on sand spreads)</p> <p>Rockiness: Up to 20% calcrete stone and outcrop. Rocks alone make the land semi to non arable.</p> <p><u>Summary:</u> This land is well drained and (except for swampy depressions) is not saline, but is not generally arable due to extensive surface rock and stone, and shallow and low fertility soils.</p>
NGA NGD NGF	3.4 1.5 2.7	<p>Mostly well drained depressions within the MHC range. There are variable low stony rises.</p> <p>NGA Very gently undulating flats with up to 20% low stony rises and no swampy areas.</p> <p>NGD As for NGA, but with up to 30% low sandy rises.</p> <p>NGF As for NGA, but with up to 20% swampy flats.</p> <p>Main soils: <u>thick bleached sand</u> - H3/G2 (E) and <u>thick sand over friable clay</u> - G3 (E) on flats, with <u>shallow stony loamy sand over calcrete</u> - B3 and <u>shallow calcareous loamy sand</u> - B2 (L-M) on stony rises, <u>deep bleached sand</u> - H3 (M-C) on sandy rises, and <u>sand over mottled saline waterlogged clay</u> - N2a/G4 (L) in swamps.</p> <p>Key properties:</p> <p>Drainage: Well drained to poorly drained (in swampy depressions).</p> <p>Fertility: Moderately low to low.</p> <p>Physical condition: No limitations to root growth.</p> <p>AWHC: Moderate.</p> <p>Salinity: Moderately low.</p> <p>Erosion potential: Water: Low Wind: Moderately low.</p> <p>Water repellence: Moderately low.</p> <p>Rockiness Less than 5% surface calcrete.</p> <p><u>Summary:</u> These depressions are limited in extent but have reasonable pasture production potential provided fertility is maintained.</p>
O-A	0.4	<p>High sand hills.</p> <p>Main soil: <u>deep bleached sand</u> - H3 (D). These soils are very infertile, water repellent and extremely susceptible to wind erosion. The land has little productive potential, and would pose a serious degradation risk if used for anything more intensive than light grazing. Most of the area is uncleared.</p>
ZnO ZoO ZpO	1.0 0.2 2.5	<p>Depressions with extensive swampy areas, flanked by minor low lunettes.</p> <p>ZnO Depressions with 20-50% swampy areas and up to 10% stony rises.</p> <p>ZoO Depressions with more than 50% swampy areas and more than 30% sandy rises.</p> <p>ZpO Depressions with more than 50% swampy areas and up to 10% stony rises.</p> <p>Main soils: <u>Sand over clay</u> - G4 (E in ZnO, L in ZoO, C in ZpO) <u>Wet saline calcareous loam</u> - N2b/A7 (L in ZnO, M in ZoO, C in ZpO) <u>Sand over mottled saline waterlogged clay</u> - N2a/G4 (C in ZnO, M in ZoO, L in ZpO) <u>Wet saline clay over sand</u> - N2c (L in ZnO, E in ZoO, C in ZpO) <u>Deep bleached sand</u> - H3 (E in ZoO) <u>Hard sandy clay loam over dispersive red clay</u> - D3 (M) on lunettes throughout.</p> <p>Key properties:</p> <p>Drainage: Depressions – imperfectly to poorly drained. Rises – well drained.</p> <p>Fertility: Low.</p> <p>Physical condition: No soil physical impediments to root growth.</p> <p>AWHC: Moderately low to low.</p> <p>Salinity: Depressions – moderately high to very high. Rises – low.</p> <p>Erosion potential: Water: Low to moderately low. Wind: Low.</p> <p>Water repellence: Low to moderate (rises).</p>



		Rockiness: Nil to minor on flats. Up to 20% surface calcrete on rises. <u>Summary:</u> Impeded drainage and increasing salinity limit the productivity of these areas. Improvements can be achieved through the establishment of salt tolerant pastures.
ZS-	1.0	Highly saline swamp. This land is either bare or carries a sparse cover of samphire. A highly saline watertable is at or near the surface. Main soils: <u>wet saline calcareous loam - N2b/A7 (E)</u> , <u>sand over mottled saline waterlogged clay - N2a/G4 (C)</u> , and <u>wet saline clay over sand - N2c (C)</u> .

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:

Rises

- B2** Shallow calcareous loamy sand (Petrocalcic Calcarosol)
Up to 40 cm calcareous loamy sand to sandy loam with variable calcrete rubble overlying calcreted calcarenite.
- B3** Shallow stony loamy sand over calcrete (Petrocalcic, Leptic Tenosol)
Loamy sand to loam with variable rubble and slight clay increase with depth overlying calcreted calcarenite shallower than 50 cm.
- B7** Loamy sand over sandy clay loam on calcrete (Petrocalcic, Brown Chromosol)
Medium to thick brown loamy sand with a bleached A2 layer abruptly overlying a brownish weakly structured friable sandy clay loam to sandy clay over calcreted calcarenite.
- G2** Sand over light sandy clay loam (Petrocalcic, Brown Kandosol / Sodosol)
Thick to very thick sand with a bleached A2 layer overlying a yellow light sandy clay loam with calcrete at variable depth.
- H3** Deep bleached sand (Basic, Arenic, Bleached-Orthic Tenosol)
Thick to very thick bleached sand, organically darkened at the surface over yellow sand continuing below 100 cm.

Well drained depressions

- G3** Thick sand over friable clay (Eutrophic / Lithocalcic, Brown Chromosol)
Thick to very thick bleached sand to loamy sand with an organically darkened surface abruptly overlying a friable yellowish brown and red sandy clay, with or without soft or rubbly carbonate accumulations.
- H3/G2** Thick bleached sand (Bleached, Petrocalcic, Brown Chromosol)
Very thick sand with a bleached A2 layer over a variable thickness brown sandy clay loam with calcrete from about 100 cm.

Swampy depressions

- D3** Hard sandy clay loam over dispersive red clay (Hypercalcic, Red Sodosol)
Medium thickness hard sandy clay loam abruptly overlying a coarsely structured dispersive red heavy clay, with abundant soft carbonate from about 50 cm, grading to an olive grey heavy clay with slickensides from about 75 cm. Minor on lunettes.



- G4** Sand over clay (Lithocalcic / Petrocalcic, Brown Sodosol)
Medium thickness sand sharply overlying a coarsely structured dispersive brown and yellow mottled clay over rubbly or sheet calcrete.
- N2a/G4** Sand over mottled saline waterlogged clay (Hypercalcic / Lithocalcic, Grey Sodosol)
Medium thickness loamy sand abruptly overlying a grey and yellow brown mottled clay (seasonally saturated), with rubbly to soft carbonate at depth.
- N2b/A7** Wet saline calcareous loam (Calcarosolic, Salic Hydrosol)
Grey very highly calcareous loam grading to a pale grey clay loam over a white very highly calcareous silty clay loam by about 30 cm, with a water table within 100 cm.
- N2c** Wet saline clay over sand (Petrocalcic, Calcarosolic, Salic Hydrosol)
Thin highly calcareous dark clay over a very highly calcareous pale mottled clayey sand with sporadic weak calcrete pans and water table within 100 cm.

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

