

HOG Head of Gulf Land System

Coastal and near coastal flats bordering the head of Gulf St. Vincent

Area: 57.8 km²

Annual rainfall: 330 – 340 mm average

Geology: The Land System is mostly underlain by clayey sediments deposited in shallow marine conditions or coastal lagoons. These clays usually contain lenses of soft or crystalline gypsum. Away from the coast they are red, but nearer the coast where they are influenced by shallow ground water tables they are brown, red and yellow mottled. Accessions of fine carbonate have infused into upper layers of sediment: deeper sediment layers (more than 50 cm deep) are often non calcareous. Some soils contain hard carbonate fragments. Close to the coast the clayey sediments can be quite thin and are underlain by siliceous sands at a depth of 50 cm or more. On the eastern side of the land system are minor calcrete outcrops, partly covered by windblown siliceous sand. Surface deposits of gypsum occur as lunettes/rises around old lake beds.

Topography: The land is flat with an overall slope of less than 0.25% toward the coast. The only relief is a low calcrete rise on the eastern side, some low gypsum lunettes adjacent to old lakes (now salt flats), and a few low coastal dunes. As the land grades towards the coast it becomes more saline, as indicated by the vegetation. On the landward side the vegetation is mainly saltbush with increasing proportions of samphire towards the coast. Adjacent to the coastline samphire is the only vegetation, interspersed with bare salt pans. Mangroves occur in the outer tidal zones.

Elevation: 0 - 10 m

Relief: Less than 10 m

Main Soils:

N2	Saline swamp soil (around 50% of area)
A6	Calcareous clay loam to loam (around 22% of area)
D4	Loam over red clay (around 18% of area)

Minor soils:

A4-A5	Rubbly calcareous sandy loam (approximately 3% of area)
A8	Gypseous clay loam (approximately 2% of area)
H2	Drift sand (approximately 1% of area)

Note: around 2% of area is sub-tidal flat with no practical soil

Main features: The Head of Gulf Land System is characterized by low rainfall and marginally to highly saline, often swampy soils. Productive potential is low, light grazing being the only suitable use. Shallow water tables are common throughout. Drainage may lead to the development of acid sulphate conditions.



Soil Landscape Unit summary: 16 Soil Landscape Units (SLUs) mapped in the Head of Gulf Land System:

SLU	% of area	Main features #
QOL	1.5	Low rises, less than 10 m high, formed on sheet and rubbly calcrete and mantled by drift sand deposits. Main soils: <i>shallow calcareous loam on calcrete</i> B2 (Petrocalcic Calcarosols (E)) and <i>rubbly calcareous sandy loams</i> A4-A5 (Lithocalcic-Supracalcic Calcarosols (E)), with non rubbly calcareous loams (soil A4 variant: Calcic-Hypercalcic Calcarosols (C)) and H2 drift sands (Petrocalcic Calcarosol-Tenosol (C)). These small areas are mostly non arable due to the combination of low rainfall and soils which are mostly shallow and stony, or sandy and infertile.
VAD	25.9	Highly saline, samphire and saltbush flats formed on gypseous marine/lagoonal clays. Main soils: <i>saline swamp soils</i> N2 (Hydrosols (E)) and <i>calcareous clay loams and loams</i> A6 (Calcic-Hypercalcic Calcarosols (E)). These flats are too saline and waterlogged for any uses other than light grazing. These soils may be at risk of developing acid sulphate conditions if drained.
VGD VGDw	2.0 0.6	Highly saline, low lying samphire and saltbush flats and depressions formed on gypseous marine/alluvial clays. VGD – low lying highly saline flats. VGDw – highly saline depression/drainage area. Main soils: <i>calcareous clay loams</i> A6 (Calcic-Hypercalcic Calcarosols (V)) with some <i>saline swamp soils</i> N2 (Hydrosols (L)). These flats are too saline and waterlogged for any uses other than light grazing. These soils may be at risk of developing acid sulphate conditions if drained.
VHB VHC	2.6 2.7	Saline flats formed on marine/colluvial clays with some gypsum accumulation in the subsoil. Situated adjacent to the eastern edge of colluvial outwash deposits derived from the Hummock Range escarpment. VHB – marginally saline flats. VHC – saline flats. Main soils: <i>calcareous loams and clay loams</i> A6 (Calcic-Hypercalcic Calcarosols (V)), many with hard carbonate rubble, and <i>loams over red clay</i> D4 (Sodosols (C)). Soil salinity levels together with the low rainfall make this land virtually non arable.
VJF	11.0	Complex of saline to marginally saline flats, salt pans, and gypseous lunettes formed on lagoonal/marine clays with soft and crystalline gypsum accumulations. Main soils on flats: <i>calcareous loams and clay loams</i> A6 (Calcic-Hypercalcic Calcarosols), <i>rubbly calcareous sandy loams</i> A5-A4 (Lithocalcic-Supracalcic Calcarosols) and <i>loams over red clay</i> D4 (Sodosols). On lunettes are <i>gypseous clay loams</i> A8 (Gypsic Hypercalcic Calcarosols); and in salt pans are <i>saline swamp soils</i> N2 (Hydrosols). This land is generally too saline for any uses other than light grazing.
VTB VTF	12.8 5.0	Saltbush flats formed on gypseous marine/alluvial clays. VTB – marginally saline flats with no relief. VTF – marginally saline flats with 20% low gypsum rises. Main soils: <i>loams over red clay</i> D4 (Sodosols (V)), with <i>calcareous clay loams</i> A6 (Calcic-Hypercalcic Calcarosols (L)). <i>Gypseous clay loams</i> A8 (Gypsic Hypercalcic Calcarosols) occur on the rises in VTF. Although the soils are deep and inherently fertile, they are marginally saline. This, together with the low rainfall makes the land virtually non arable.
WEE	0.7	Low coastal dunes with deep calcareous siliceous sands (deep variant of soil H2). These areas are non arable due to high wind erosion risk, infertility, and low rainfall.
WQ-	17.1	Complex of samphire flats and bare salt pans. Main soils: <i>saline swamp soils</i> N2 (Hydrosols). Minor low sandy rises with moderately deep calcareous siliceous sands occur (soil H2). The flats are too saline and wet for any rural uses other than controlled light grazing. Water tables are usually within a metre of the surface. Acid sulphate conditions may develop if these areas are drained.
WT-	9.1	Tidal flats with highly saline soils: mostly covered with samphire.
WP-	2.6	Tidal flats with extremely saline soils: mostly bare salt pans.



WM-	3.7	Tidal flats with mangroves.
WU-	2.3	Subtidal flats: mostly inundated.
ZA-	0.3	Saline land. Slight rise of remnant land surrounded by samphire flats and salt pans. Main soils: <i>rubbly calcareous sandy loams</i> A5-A4 (Lithocalcic-Supracalcic Calcarosols (E)) with <i>calcareous loams to clay loams</i> A6 (Calcic-Hypercalcic Calcarosols (E)).

PROPORTION codes assigned to soils within Soil Landscape Units (SLU):

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|--|---------------------------------------|
| (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 descriptions:

Main Soils:

- N2** *Saline swamp soil* (Hypersalic Hydrosol)
10 - 20 cm calcareous sandy loam to clay loam over a grey brown very highly calcareous clay loam, often with a rubbly calcrete layer at 25 cm, grading to a saturated grey, brown and yellow mottled clay from 50 cm. Dark, highly organic layers occur in the tidal zone soils. Extensive in swamps, salt/samphire flats, and tidal zones.
- A6** *Calcareous clay loam to loam* (Calcic-Hypercalcic Calcarosol)
10 - 20 cm calcareous clay loam to loam becoming more clayey and calcareous with depth grading to a reddish, brown or olive clay with crystalline gypsum. Common on flats.
- D4** *Loam over red clay* (Pedaric Red Sodosol)
10 - 20 cm loam abruptly overlying a friable red clay, with gypsum crystals and minor soft carbonate from 40 cm continuing below 100 cm. Extensive on saltbush flats.

Minor soils:

- A4-A5** *Rubbly calcareous sandy loam* (Lithocalcic-Supracalcic Calcarosol)
10 - 25 cm calcareous sandy loam over a rubbly Class IIIC or IIIB carbonate layer becoming less rubbly with depth grading to a brown and red mottled gypseous clay usually below 100 cm. Limited on rises.
- A8** *Gypseous clay loam* (Gypsic Hypercalcic Calcarosol)
10 - 15 cm brown clay loam (usually calcareous) becoming more clayey and calcareous with depth over a grey brown clay with gypsum from 50 cm. Extensive on lunettes.
- H2** *Drift sand* (Petrocalcic Calcarosol-Tenosol)
Up to 100 cm of calcareous to non calcareous reddish siliceous sand usually with a slight clay build up at depth overlying sheet or rubbly calcrete. Erosion has caused extreme variation in thickness to calcrete. **B2** or **B8** soils occur where sands are shallow over calcrete. Limited on rises.

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

