PGE Port Germein Land System

Coastal marshes, samphire flats, dunes, shell grit flats, mangroves and near coastal plains extending from Chinamans Creek to Port Davis.

Area: 295.3 km^2

Annual rainfall 265 – 360 mm average

Geology: Marine and coastal sediments comprising clays, sands and shell beds. Older gypseous clays occur further inland. The land is overlain in places by gypseous deposits and drift sand. Weeroona Island is included in the Land System. This is a quartzite outcrop, the highest point of which (Mt. Ferguson) is the peak of a buried range of hills.

Topography: The Land System consists of a sequence of coastal land forms progressing from tidal mangrove swamps, shell grit beds or sand dunes, through intertidal mud flats, higher level salt flats to samphire flats. Further inland are older flats formed on gypseous clays which in places are overlain by hummocky sand deposits.

Elevation: Most of the Land System is below the 10 m contour, and all except the quartzite relict (Mt. Ferguson) is below 15 m. Mt. Ferguson is 40 m above sea level.

Relief: Apart from Mt. Ferguson, the only relief is provided by coastal sand dunes, inland sand hummocks (3 m maximum) and a two km length of 10 m high coastal cliffs at Redcliff Point.

Soils: Saline clay loams of mud flats, samphire flats and mangrove swamps are dominant. Associated soils include calcareous and non calcareous loams on near coastal flats and deep sands and gypseous loams on rises. Near the coast, deep sands and shell grit beds are common.

Main soils

N2 Saline clay loam

Minor soils

Soils formed on near coastal flats

A3 Calcareous loam
A4 Calcareous sandy loam
C3 Gradational red loam
D4 Loam over friable red clay
M4 Gradational brown loam

Soils formed on rises

A8 Gypseous loam
H2a Deep calcareous sand

Soils formed on coastal sediments

H1a Shell sand
H1b Shell grit
H2b Calcareous sand

Main features: The Port Germein Land System is characterized by coastal and near coastal landscapes with variable soils of limited agricultural value. Apart from the low rainfall, one or more of salinity, waterlogging, low fertility, wind erosion potential and lack of moisture holding capacity restrict productive potential.

Soil Landscape Unit summary: 14 Soil Landscape Units (SLUs) mapped in the Port Germein Land System:

SLU	% of area	Main features #
AUC	0.2	Weeroona Island (Mt. Ferguson), a quartzite rise with slopes of 6-18% and with a rubbly or sheet calcrete capping. Main soils: shallow, stony and calcareous. It is a small area of little agricultural value.
UIW	1.6	Sand rises overlying marginally saline flats. Main soils: calcareous sandy loam - **A4** (E) on the flats and deep calcareous sand - **H2a** (E) on the rises. This land is severely degraded and with a complex of infertile, erosion prone sand hummocks, and saline flats, is of little agricultural value.
VIC	1.0	Saline saltbush and samphire flats formed on lagoonal sediments. Main soils: calcareous loam - **A3** (E) and gradational brown loam - **M4** (E), with loam over friable red clay - **D4** (L). These flats are highly saline and capable of supporting only light grazing.
VLI	1.9	Saline flats formed on lagoonal sediments with scattered low rises. Main soils: calcareous loam - **A3** (E) and gradational brown loam - **M4** (L) on the flats, with deep calcareous sand - **H2a** (E) and gypseous loam - **A8** (L) on the rises. This land comprises highly saline flats and wind erosion prone rises which have little agricultural value.
VTB VTC	3.4 5.6	Marginally to highly saline flats formed on lagoonal sediments. **VTB** Saline saltbush / nitrebush flats. **VTC** Highly saline samphire and saltbush flats, often crossed by tidal channels. Main soils: loam over friable red clay - **D4** (E) and calcareous loam - **A3** (E), with gradational red loam - **C3** (L). These flats are marginally to highly saline with limited opportunities for cropping.
VUI	2.6	Marginally saline saltbush / nitrebush flats formed on lagoonal sediments with scattered sandy and gypseous rises. Main soils: calcareous sandy loam - **A4** (E), with loam over friable red clay - **D4** (C) and calcareous loam - **A3** (C) on the flats and deep calcareous sand - **H2a** (C) and gypseous loam - **A8** (C) on the rises. This land comprises marginally saline flats with limited cropping potential and erosion prone, low fertility sandy and gypseous rises.
WF- WG- WL- WM- WO- WQ- WT-	1.0 2.5 1.1 12.3 31.7 14.5 20.6	**WF-** Coastal dunes and beaches consisting of a mixture of shelly and siliceous sands. **WG-** Coastal dunes and beaches consisting of mainly shell sands. **WL-** Shell grit flats. **WM-** Mangrove swamps. **WO-** Near coastal mud flats, with scattered gypseous mounds, dominated by samphire. **WQ-** Tidal mud flats with sparse or intermittent samphire. **WT-** Lower coastal mud flats subject to tidal inundation with samphire and mangroves along drainage channels. These areas are often characterized by mazes of channels in which tidal ebbs and flows concentrate. Main soils: saline clay loam - **N2** (mud and samphire flats), shell sand - **H1a** (coastal dunes and rises, and some flats), deep calcareous sand - **H2b** (coastal dunes), shell grit - **H1b** (shell grit beds), and gradational brown loam - **M4** (flats on inland margins grading to less saline land). Saline watertables are commonly within a metre of the surface. All of these soil landscape units have severe limitations due to one or more of salinity, waterlogging / inundation, wind erosion potential, fertility and waterholding capacity. At least some of the saline soils are sulfidic and susceptible to the development of acid sulfate conditions.

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:

A3 Calcareous loam (Gypsic, Hypocalcic / Calcic Calcarosol)
Calcareous loam becoming more clayey at depth, with abundant gypsum from 50 cm.

A4 Calcareous sandy loam (Regolithic, Hypercalcic / Supracalcic Calcarosol)
Calcareous sandy loam grading to a highly calcareous sandy clay loam with rubbly Class III A or III B carbonate overlying a sandy light clay continuing below 100 cm.

A8 Gypseous loam (Gypsic, Calcic Calcarosol)
Calcareous and gypseous loam becoming more clayey and gypseous with depth, continuing below 100 cm.

C3 Gradational red loam (Calcic, Red Dermosol)
Medium thickness loam grading to a friable red clay, with abundant gypsum and fine carbonate at shallow depth.

D4 Loam over friable red clay (Hypocalcic, Pedaric, Red Sodosol)
Thin calcareous loam abruptly overlying a friable (sodic and saline) red clay, with abundant gypsum and minor carbonate at shallow depths.

H1a Shell sand (Shelly Calcarosol)
Deep shell sand.

H1b Shell grit (Shelly Rudosol)

H2a Deep calcareous sand (Regolithic, Calcic Calcarosol)
Variable thickness (30 - 200 cm) calcareous red sand.

H2b Calcareous sand (Hypocalcic Calcarosol)
Deep siliceous sand with minor carbonate.

M4 Gradational brown loam (Hypocalcic, Brown Kandosol)
Medium thickness loam, grading to a brown clay loam to clay, gypseous and weakly calcareous from about 50 cm.

N2 Saline clay loam (Hypersalic Hydrosol)
Clay loam over wet and saline grey mottled clay with gypsum. Occurs on mud flats and swamps.

Further information: DEWNR Soil and Land Program