# PES Peesey Swamp Land System

A saline depression area which separates the 'leg' of the Yorke Peninsula from the 'foot'

**Area:** 97.2 km$^2$

**Landscape:** An extensive saline depression area. It stretches from Hardwicke Bay in the north to Sturt Bay in the south. The swamp is barred from the sea at both ends by jumbled coastal dunes. Probably an old sea channel which separated the 'leg' of the Yorke Peninsula from the 'foot'. It was possibly created by a glacier moving to the northeast in Permian times. The majority of land is too saline for agriculture; but salt mining from evaporation pans has been a significant activity. Some land is too stony for agriculture. All arable land is affected to some degree by saline seepage. Most saline land is only a metre or so above sea level. Nearly all the system is below the 10 m contour. Saline drainage channels enter the south of the swamp from the northeast (in other land systems); while drainage in the swamp area seems to be northward, eventually being blocked by jumbled coastal dunes, where a saline channel runs westward toward Point Turton The easternmost salt lake is named on the 1:50 000 topographic mapsheet: Coondoola Lagoon. Also a saline depression in the east is named Teatree Swamp.

**Annual rainfall:** 405 – 430 mm average

**Main soils:**

**N2** *Saline soils*
**B2** *Shallow calcareous loams on calcrete*
**B1** *Shallow highly calcareous sandy loams and sands on calcrete*
**A8** *Gypseous calcareous sandy loams and sands*

**Minor soils:**

**H1** *Carbonate sands*
**A4** *Calcareous loams*
**A1** *Highly calcareous loams and sandy loams*

**Main features:** Most soils are saline to extremely saline. In the north these swamp soils are dominated by carbonate particles. Conical shells, often in layers, are common in swamp soils. Also gypsum is very common in swamp soils, particularly in the south of the system. Mounds of gypsum-rich deposits ring many saline depressions, and also occur over quite extensive areas. Calcrete occurs extensively over the system, and is only absent where it has been 'dissolved' in depression areas. Many soils are very shallow. Salt lake areas seem to be underlain by gleyed clay loam to light clay lake sediments, often only at moderate depth: these have been overlain by more recently deposited sediments (mostly wind deposited).

Surface textures are mostly loams and sandy loams, with some sands, and some clay loams in depressions. Soils are calcareous to highly calcareous, with some being carbonate dominant especially in the north of the system. Coastal sand dunes are composed of carbonate sand. Most areas are non-arable due to high salinity levels, while others are non arable because they are too shallow, or have deep infertile sands. Arable areas are affected by saline seepage, usually have shallow and stony soils, and are affected by carbonate induced nutrient disorders (in particular phosphorus, manganese, zinc, and to a lesser extent iron). Copper is often deficient in calcareous soils, and cobalt in highly calcareous soils.

**Soil Landscape Unit summary:** Peesey Swamp Land System (PES)

| SLU | % of area | Main features # |
|---|---|---|
| QHK<br>QHL<br>QHP<br>QHP1<br>QHT<br>QHTs<br>ZA- | 3.0<br>0.2<br>2.5<br>5.1<br>13.2<br>1.6<br>4.2 | Shallow to very shallow calcareous soils on calcrete.<br>Main soils: shallow calcareous to highly calcareous loam on calcrete (soil **B2**-**B1**). With some deeper mostly saline and gypseous calcareous soils in slight depressions in land units '**QHT**' (minor to limited **A8**-**A4**) and '**ZA-**' (limited to extensive **A8**-**N2**).<br>---<br>**QHK** – gently undulating very stony plain with some saline seepage (slopes 0-1.5%, 3-4s, 5-4r).<br>**QHL** – slight rise (slopes 0-3%, 1-2e, 2-3s, 4r)<br>**QHP** – relatively low lying stony plain with mostly marginal salinity (slopes <1%, 4-3s$^{o}$, 4r).<br>**QHP1** – non-arable relatively low lying very stony plain with mostly marginal salinity (slopes <1%, 4-3s$^{o}$, 5r).<br>**QHT** – low lying marginally saline land/depressions (slopes <1%, 4-5s$^{+}$,4r).<br>**QHTs** – low lying plain with marginal salinity and saline depressions (slopes <1%, 4-5s$^{x}$, 4r).<br>---<br>**ZA-** – salinised flats and depressions (slopes <1%, 4r, 5s). Closely related to the '**Vh**' and '**ZG-**' land units. |
| Maa<br>MaY<br>MaY1 | 0.8<br>3.2<br>0.3 | Mostly calcreted relict parallel low coastal dunes and back plains.<br>Very low rises (relict dunes) and flats with shallow highly calcareous soils on calcrete, and some soils with less carbonate (soil **B1**-**B2**). Minor to limited deeper calcareous soils can occur (soil **A1**).<br>**Maa** – level plain (slopes <1%, 3s, 4-3r): sandier textures.<br>**MaY** – mostly arable stony slight rises, often with very low parallel rises, which are relict coastal dunes (slopes 0-1%, 3s$^{o}$, 5-20% non arable very stony areas, 4-5r).<br>**MaY1** – non-arable very low linear very stony rises, which are relict coastal dunes, and some arable intervening flats (slopes 0-1.5%, 3-2s, 5-4r). |
| WGD<br>WGd<br>WGE<br>WGEn<br>WGK<br>WGk | 2.7<br>1.1<br>1.8<br>0.8<br>0.3<br>1.4 | Coastal dunes.<br>Coastal dunes mostly with *carbonate sand* (soil **H1**). And flats with *shallow highly calcareous sand on calcrete* (soil **B1**) and some deeper *carbonate sand* (soil **H1**).<br>**WGD** – jumbled dunes with approx. 5% flats (dunes mostly 5-15m high, 7-5a, 3-2y).<br>**WGd** – younger jumbled dunes with approx. 30% active and bare patches and 5-10% sandy flats (dunes mostly 5-15m high, 7a, 3y).<br>**WGE** – low linear dunes parallel with the present coastline: approx. 10-20% arable land (dunes <5m high, 2-3s, 5a, 3y).<br>**WGEn** – low linear dunes parallel with the present coastline: semi arable (dunes <5m high, 4-5a, 3y, 2s).<br>**WGK** – very low somewhat jumbled linear dunes with 10-30% flats and some saline seepage (dunes mostly <2m high, 4a, 3-2s, 2y).<br>**WGk** – low to very low jumbled dunes and 10-30% flats with some saline seepage, and with 10-30% bare patches (dunes <5m high, 5-4a, 3-2s$^{o}$, 2y).<br>Summary: mostly non-arable land with infertile and erodible sands dominantly composed of calcium carbonate particles. |
| WKR<br>WKRs<br>WKS | 0.6<br>0.7<br>2.9 | Back plains and depressions.<br>Low lying coastal flats and depressions with highly calcareous soils (soil **A1**), shallow highly calcareous soils on calcrete (soil **B1**) and carbonate sands (soil **H1**).<br>**WKR** – non-arable low lowing back plain/depression with marginal to high salinity (slopes <1%, 3-2w, 4-5s$^{x}$).<br>**WKRs** – non-arable inter-dune depressions (slopes <1%, 3w, 5-4s).<br>**WKRS** – semi arable back plain mostly with marginal salinity (slopes <1%, 2w, 4-3s$^{+}$).<br>Summary: Non-arable to semi arable land with infertile soils dominantly composed of calcium carbonate particles. |
| WT-<br>WU- | 0.2<br>5.2 | Sandy tidal flats.<br>**WT-** – intertidal flats.<br>**WU-** – subtidal to intertidal flats. |
| VhB<br>VhC | 1.5<br>0.9 | Salinised old lake floors. Moderate depth to deep calcareous soils, with some slight rises with shallow soils on calcrete, and some very low gypsum lunettes. |

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| | | Main soils: calcareous loam, often gypseous on plains and slight depressions (soil **A4**-**A8**), *shallow calcareous loam on calcrete* (soil **B2**) on stony slight rises, and some sandy gypseous soils (soil **A8**) on lunettes.<br>**VhB** – low lying old lake floor areas with marginal salinity (slopes <1%, 2w, 4s$^{o}$, 3-2r).<br>**VhC** – low lying old lake floor areas with marginal to high salinity (slopes <1%, 3w, 4-5s$^{+}$, 3-2r).<br>Closely related to the '**ZA-**' and '**ZG-**' land units. |
| ZL- | 4.4 | Very low gypsum lunettes, often as a series of mounds, and with some highly saline depressions.<br>Main soils: mostly sandy gypseous soils (soil **A8**) on lunettes, with *saline soil* (**N2**) in depressions.<br>**ZL-** – very low gypsum lunettes with some highly saline flats (5-7s, 3a). |
| ZG- | 2.1 | Saline old lake floors. Very low lunettes and slight depressions with moderate depth to deep soils, and some slight rises with shallow soil on calcrete.<br>Main soils: gypseous calcareous soils (soil **B8**) on plains, depressions and very low lunettes, *shallow calcareous loam on calcrete* (soil **B2**) on stony slight rises, and some gypseous *saline soil* (soil **N2**) in some depressions.<br>**ZG-** – saline depressions with mounded gypsum lunettes which are often very low (slopes <1%, 3w, 5-7s). |
| ZX- | 7.6 | Complex of very low gypsum lunettes and saline depressions.<br>Main soils: gypseous soil on very low lunettes and on flats (soil **A8**), and *saline soil* (soil **N2**) in depressions.<br>**ZX-** – complex of low mounds and depressions (slopes <1%, 3-7w, 7-5s, 3-2a). |
| ZBw<br>ZB-<br>ZC-<br>ZD- | 6.2<br>2.2<br>5.2<br>18.2 | Saline depressions and salt lakes.<br>Main soils: *saline soil* (soil **N2**): most containing gypsum. Carbonate dominant soils are extensive in the northern part of Peesey Swamp. Conical shells are also a common constituent of these soils, especially in the northern parts of Peesey Swamp.<br>**ZBw** – saline land with channels flowing north and east (slopes <1%, 4-3w, 7-5s, 3-2a): with very slight mounds.<br>**ZB-** – shallow saline depressions (slopes <1%, 4w, 7-5s): often with some very slight mounds.<br>**ZC-** – shallow highly saline depressions/salt lake (slopes <1%, 5-7w, 8-7s): sometimes with some very slight mounds.<br>**ZD-** – salt lakes (slopes <1%, 7w, 8s). |

# Classes in the 'Soil Landscape Unit summary' table (eg. 2-1e, 3w, 2y, etc) describe the predominant soil and land conditions, and their range, found in Soil Landscape Units. The number '1' reflects minimal limitation, while increasing numbers reflect increasing limitation. Letters correspond to the type of attribute:

a - wind erosion e - water erosion f - flooding g - gullying
r - surface rockiness s - salinity w - waterlogging y - exposure

**Detailed soil profile descriptions:**

**Main soils:**

**N2** *Saline soils* [Hypersalic-Salic Hydrosol, often with Gypsic subsoil horizons]
Saline to extremely saline soils, usually with clay loamy to light clayey textures in extremely saline depressions, and with loamy to clay loamy textures in the less low lying saline to highly saline areas. Commonly underlain by calcrete at shallow depth. Gypsum and salt crystals commonly occur. Shells are also common. Gleyed soil colours are typical, especially in the lowest lying areas.

**B2** *Shallow calcareous loams on calcrete* [Hypervescent-Ceteric Petrocalcic Calcarosol]
Shallow to very shallow calcareous soils with textures of loam and sandy loam. Often very stony.

**B1** *Shallow highly calcareous sandy loams and sands on calcrete*
[Supravescent Petrocalcic Calcarosol and Shelly Petrocalcic Calcarosol]
Shallow to very shallow highly calcareous soils with textures of loam, sandy loam or sand. Soils can be dominated by carbonate particles; the sandy variants are all carbonate dominate. Often very stony.

**A8** *Gypseous calcareous sandy loams and sands* [Gypsic Calcarosol]
Gypsum-rich soils, mostly moderate depth to deep. Found on some flats on low lying saline areas, but especially on very low lunette mounds which are can cover quite extensive areas. Surfaces textures range from sandy to clay loamy, and subsoil textures from sandy clayey. These soils have high salt levels and are mostly non-arable.

**Minor soils:**

**H1** *Carbonate sands* [Shelly Rudosol-Calcarosol]
Deep infertile sands on jumbled coastal dunes. Soils are dominated by carbonate sand particles.

**A4** *Calcareous loams* [Hypervescent-Ceteric Hypercalcic-Lithocalcic Calcarosol]
Deep to moderate depth calcareous sandy loams and loams surfaces grading to loamy and clay loamy subsoils. Profiles often contain hard carbonate fragments. Usually found on gently undulating arable land in very slight lows between very slight stony rises.

**A1** *Highly calcareous loams and sandy loams*
[Supravescent Hypercalcic-Lithocalcic Calcarosol and Shelly Hypercalcic-Lithocalcic Calcarosol]
Deep to moderate depth highly calcareous sandy loams, loams, and clay loams surfaces grading to loamy or clay loamy subsoils. Profiles can contain hard carbonate fragments. Mostly found in marginally saline depressions in the north of the system.

**Further information:** DEWNR Soil and Land Program