PTI Point Tinline Land System

Old calcreted dunes and plains on Kangaroo Island's southern coast. The system is bordered by the sea to the east, shell sand dunes to the south and west, and by plains, rises and lagoons to the north. The system is named after Point Tinline, which is situated on the western side of D'Estrees Bay.

Area: 231.6 km²

Annual rainfall: 530 – 610 mm average

Geology: Most of the area is covered by Pleistocene age Bridgewater Formation calcreted

calcarenite. This material covers older sediments. This area was once sea floor, with an island or islands just west of present day Seal Bay. The process of formation of this area can be visualised as follows: the land was covered by wind-deposited shell sand dunes; these dunes were subject to leaching, which caused carbonate to accumulate below the surface; the surface sand was then blown off, exposing the layer of enriched carbonate to the elements; then exposure to wetting and drying caused the cap of the enriched carbonate layer to harden into calcrete, giving the present condition of calcrete capped calcarenite on

which shallow soils have formed.

A few areas of recent shell sand dunes occur along the coast: Semaphore Sand and

Gantheaume Sand members of St. Kilda Formation.

A small area of older sediments is exposed on a rise just south-west of Murray Lagoon, where the thin calcrete cap has been 'dissolved', revealing Pliocene-Quaternary age clayey

colluvium, covered by sandy topsoil.

Topography: Old jumbled dunes, plains and depressions. In some depression areas the calcrete has been

'dissolved', resulting in deeper soils which usually overlie a massive enriched carbonate

layer.

Elevation: From sea level to 80 m on the rise just west of Seal Bay. Mostly plains and flats are 10 - 20

m above sea level; and dunes are form 20 - 60 m above sea level.

Relief: Mostly from 10 - 20 m. Reaches a maximum of 40 m on the slopes of the rises just west of

Seal Bay.

Main Soil: B3-B2 Shallow to very shallow soil on calcrete

Minor Soils: B7 Shallow to very shallow texture contrast soil on calcrete

H3-B8-G3-B7 Moderate to shallow depth sandy soil on calcrete

A1-B1 Moderate to shallow shelly soil on calcrete

H1 Shell sand

Shallow to very shallow shelly soil on calcrete

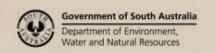
B3-B2-B1 Very shallow organic soil on calcrete

C1-A4 Deep to moderate depth loamy to sandy soil

G4-G3 Sandy topsoil on sodic clay

Main Features: The land system is mostly non-arable due to shallow rubbly soils. Native scrub covers most

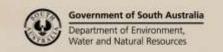
of this area. Nature conservation is the main priority here.





Soil Landscape Unit summary: Point Tinline Land System (PTI)

SLU	% of area	Main features #
M-A	0.1	Non-arable sheet calcrete areas.
M-B	0.1	Main soils: mostly not soil, but calcrete outcrop (RR). With areas of very shallow loamy to sandy
M-C	0.02	soil on calcrete: this soil is usually dark and organic, and can be non calcareous, calcareous, or
		occasionally shelly B3-B2-B1 (<i>Petrocalcic Rudosol</i>).
		M-A – level to slightly sloping (0-3%, 1e)
		M-B – slopes (3-10%, 2e) M-C – slopes (10-20%, 3e)
MpA	0.6	Non-arable to semi-arable calcreted areas: with shallow to very shallow soils.
MpD	0.1	Main soils: shallow loamy to sandy topsoil over sandy to clay loamy subsoil, often with a
MpE	0.03	calcareous layer, on calcrete B3-B7 (<i>Petrocalcic Sodosol-Chromosol-Tenosol</i>). With minor to
MpYA	0.03	limited areas with loamy to sandy topsoil, often rubbly, over brown sodic clay loam to clay,
Wipizi	0.4	which is highly calcareous in the subsoil or lower subsoil G4-G3 (<i>Brown Sodosol</i>).
		\mathbf{MpA} – gently undulating to level plain (1e)
		MpD – slopes (10-20%, 4e, 2g)
		MpE – depressions
N/ - A	44 -	MpYA – low calcreted dunes on rise (dunes <5m: slopes 1-6%, 2-3e)
MgA	41.7	Non-arable calcreted areas: with shallow to very shallow soils.
MgB	0.2	Main soils: shallow rubbly loamy to sandy soil, mostly with non-calcareous surfaces, on calcrete
MgC	0.7	B3-B2 (<i>Petrocalcic Tenosol-Calcarosol</i>). Minor areas of loamy to sandy topsoil over sodic sandy
MgE MgVA	0.4	clay loam, on calcrete at shallow depth, on non-dune areas B7 (<i>Petrocalcic Sodosol-Chromosol</i>).
MgYA MgVP	5.8 17.2	\mathbf{MgA} – gently undulating to level calcreted plain/flat, often with isolated low calcreted jumbled
MgYB MgYC	14.2	dunes (<5m, 1e)
Migic	14.2	MgB – calcreted slope (1-4%, 2e)
		MgC – rise (slopes: 4-12%, 3e)
		MgE – calcreted depression
		MgYA – mostly low calcreted jumbled dunes (<5m, 2e)
		MgYB – mostly calcreted jumbled dunes (5-15m, 3e)
		MgYC – mostly high calcreted jumbled dunes (>15m, 4e)
MjYC	3.1	Non-arable sandy and calcreted areas: with moderate depth to shallow bleached sandy soils and
		shell sand soils.
		Main soils: moderate to shallow depth bleached sand on calcrete H3-B8 (sandy Petrocalcic
		Tenosol). With moderate depth to shallow shell sands A1-B1 (Petrocalcic Shelly Calcarosol).
		Minor to limited deeper shell sands (H1).
MLE	0.2	MjYC – high jumbled dunes (>15m, 2e)
MbE MbYB	0.2	Non-arable calcreted areas: with moderate depth to shallow shelly soils. Main soils: mostly moderate depth to shallow fine shell sand on calcrete A1 P1 (Petrocalcic
MbYC	0.7	Main soils: mostly moderate depth to shallow fine shell sand on calcrete A1-B1 (<i>Petrocalcic</i>
MOTC	0.1	Shelly Calcarosol). With some deeper soils (H1).
		MbE – depression
		MbYB – jumbled dunes (5-15m)
3.6.1.	_	MbYC – high jumbled dunes (>15m, 2e)
MdA	0.4	Non-arable calcreted areas: with shallow to very shallow calcareous soils.
MdC	0.3	Main soils: shallow rubbly loamy to sandy calcareous soil on calcrete B2 (<i>Petrocalcic Calcarosol</i>).
MdE	0.5	With minor to limited shallow rubbly loamy to sandy non-calcareous soil on calcrete B3
MdYA	0.5	(Petrocalcic Tenosol). With deeper and sandier soils in some depressions and on some lower
MdYB	3.4	slopes: H3-G3 and/or A1 (sandy Petrocalcic Tenosol-Sodosol-Chromosol and/or Petrocalcic Shelly
MdYC	0.6	Calcarosol) [see 478].
		MdA – gently undulating to level calcreted plain/flat (1e)

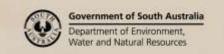




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MdC – rise (slopes 4-	•	
MdE – depression/sw		
	alcreted dunes (<5m, 2e)	
II	eted dunes (5-15m, 3e)	
	calcreted dunes (>15m, 4e)	
MaB 0.2 Non-arable calcreted	areas: with shallow to very shallow shelly soils.	
MaC 0.1 Main soils: shallow sar		
MaYA 0.2 sandy to loamy calcard	aYA 0.2 sandy to loamy calcareous to non-calcareous soil on calcrete B2-B3 (<i>Petrocalcic Calcarosol-</i>	
Tenosol).		
MaB – concave slope	s (mostly 2-4%, 2e)	
MaC – slopes (4-12%	3e)	
MaYB- mostly calcre	ted dunes (5-15m, 3e)	
1	alcreted low-lying areas: with shallow and deep soils.	
II :	bly sandy to loamy soil which is calcareous to non-calcareous on calcrete	
	carosol-Tenosol). With deeper sandy to loamy calcareous soil C1-A4	
	ome soils can be shelly (B1-A1).	
MeE – depressions; o	ften with low dunes.	
MeYA – low-lying: lo	w dunes and flats (dunes: <5m, 1-2e)	
	calcreted areas: with moderate depth to shallow bleached sandy soils.	
	derate to shallow depth bleached sand on calcrete H3-B8-G3-B7 (sandy	
Petrocalcic Tenosol-So	dosol-Chromosol). With some deeper soils.	
	, , , , , , , , , , , , , , , , , , ,	
MiYB – jumbled dun	es (5-15m)	
MiYC – high jumbled		
PkE 0.1 Arable to semi-arable		
	amy topsoil over brown sodic clay, with fine carbonate in the lower subsoil	
). With minor to limited shallow soil on calcrete B7 (<i>Petrocalcic Sodosol</i> -	
Chromosol-Tenosol).	,	
PkE – depression flat,	'swale	
PIB 0.2 Arable to semi-arable	slopes and depressions.	
	amy topsoil, often rubbly, over brown sodic clay loam to clay, which is	
	e subsoil or lower subsoil G4-G3 (<i>Brown Sodosol</i>). Minor to limited	
	e B7 (Petrocalcic Sodosol-Chromosol-Tenosol).	
PIB – low rise (slopes	1-3%, 2-1e)	
PIC – slopes with som	e depression areas (slopes 1-6%, 3-2e, 2g, 2s)	
WGD 0.2 Non-arable coastal sh	ell sand dunes.	
WGE 0.1 Main soils: shell sand s	soil H1 (Shelly Rudosol).	
WGD – jumbled coas	tal dunes (5-15m, 7a)	
	coastal dunes (<5m, 5-7a)	
WT- 0.03 Rocky reefs.		

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 Soil:

B3-B2 <u>Shallow to very shallow soil on calcrete</u> (*Petrocalcic Tenosol-Calcarosol*)

Shallow to very shallow rubbly loamy to sandy soil on calcrete. Sometimes calcareous throughout; often with a calcareous subsoil layer just above the calcrete; and sometimes with a bleached subsurface layer. Old dunes, plains, rises and depressions.

Minor Soils:

B7 Shallow to very shallow texture contrast soil on calcrete (*Petrocalcic Sodosol-Chromosol-Tenosol*)

Shallow to very shallow loamy to sandy topsoil, usually with a bleached layer, over brown often sodic sandy clay loam to light clay, on calcrete. Oldest dune areas and rises; often associated with deeper sodic-texture contrast soils with clay subsoil.

H3-B8-G3-B7 Moderate to shallow depth sandy soil on calcrete (sandy Petrocalcic Tenosol-Sodosol-Chromosol)

Moderate depth to shallow sandy soil with a bleached layer, and sometimes with a clay loamy subsoil, on calcrete. Old dune areas, rises and depressions.

A1-B1 Moderate to shallow shelly soil on calcrete (Petrocalcic Shelly Calcarosol)

Moderate to shallow depth fine dark grey to grey shell sand on calcrete. There is usually a pronounced organic build-up in surface layers. Some carbonate has leached from surface layers, and reprecipitated in subsoil layers. Dunes and depressions.

H1 Shell sand (Shelly Rudosol)

Deep fine shell white-grey sand soil. Found on recently deposited dunes.

Shallow to very shallow shelly soil on calcrete (Petrocalcic Shelly Rudosol)

Shallow to very shallow fine white-grey shell sand on calcrete. Recent drifts of shelly material covering old dune areas and rises.

B3-B2-B1 Very shallow organic soil on calcrete (Petrocalcic Rudosol)

Very shallow dark and organic rich, rubbly loamy to sandy soil on calcrete. Sometimes calcareous. Found on wind-swept coastline where the land surface is a mosaic of bare calcrete outcrop and calcrete covered with a thin veneer of soil.

C1-A4 Deep to moderate depth loamy to sandy soil (Tenosol-Calcarosol)

Loamy to sandy topsoil, often with hard carbonate fragments, over highly calcareous loamy to sandy subsoil. The carbonate enriched subsoil can sometimes be hard and massive, forming a 'soft' pan. Depressions.

G4-G3 Sandy topsoil on sodic clay (*Brown Sodosol*)

Medium thickness to thick sandy or sometimes light sandy loam topsoil, sometimes with hard carbonate fragments, over brown sodic clay. Fine carbonate accumulation occurs in the lower subsoil. Plains/swales and rises.

Further information: <u>DEWNR Soil and Land Program</u>

