SAB Sanderson Bay Land System

Coastal rises in the south-western corner of Kangaroo Island mostly consisting of old calcreted dune topography. The system covers the coastal rises from Sanderson Bay to near Cape du Couedic.

Area: 25.8 km^2

Annual rainfall: 600 - 750 mm average

Geology: The area is mostly calcreted calcarenite (Pleistocene age Bridgewater Formation) overlain by sandy deposits. Minor more recent deposits of shelly material (Holocene age Gantheaume Sand member of the St.Kilda Formation) overlie calcreted calcarenite above some clifftops. Areas occur where the calcarenite has been 'dissolved': such areas have either deep sands, especially in depressions, or texture contrast soils, especially on rises. Where texture contrast soils occur, Pliocene-Quaternary age clayey sediments are found: these are underlain and derived from Early Cambrian age Kanmantoo Group meta-sediments. Rock exposures of Kanmantoo Group Middleton Sandstone occur in the cliffs near Cape du Couedic. Exposures of Middle Cambrian age Stun Sail Boom Granite and Remarkable Granite occur as coastal cliffs, and as a few small and bare inland domes. These areas include the coastal outcrop of granite which forms the famous geological feature known as 'Remarkable Rocks'.

Topography: Mostly an old jumbled dune topography overlying rises and slopes. A few drainage depression areas occur. Slopes varying from 0-15%, but are typically from 2 - 8%. Coastal cliffs define almost all of the coastline. Coastal cliffs vary in height from 20 m to 130 m.

Elevation: Elevation varies from 10 m to just over 150 m. Typical elevations are from 50 m to 130 m

Relief: Relief is typically 20 m to 30 m, but varies from 10 m to just over 50 m

Main Soil: **B3-B8-H3-M1** Sandy soil on calcrete

Other Soils:

H3-I1	Deep sands
B2-H2-A3	Calcareous soils on calcrete
H1-B1	Shelly soils
G3-G4-K4	Texture contrast soils
B2-B1-B3	Very shallow organic soil on calcrete

Main Features: Most soils are infertile and sandy, and are therefore quite fragile. The wind erosion risk would be high if the native vegetation cover were ever removed. Many soils are only shallow on a calcrete base. The system is covered with native scrub, so nature conservation is the main priority here.

Soil Landscape Unit summary: Sanderson Bay Land System (SAB)

SLU	% of area	Main features #
CFB	1.7	Semi-arable slopes with texture contrast soils. Rise area where calcrete has been 'dissolved'. Main soils: mostly thick loamy to sandy topsoil over brown light clay; soils can be underlain by weathering rock at moderate depth **G3**-**K4** (*Brown Chromosol-Sodosol*). **CFB** – slopes (2-5%, 2e)
M-A	1.9	Non-arable sheet calcrete areas. Exposed areas on clifftops. Main soils: mostly not soil, but exposed calcrete outcrop (**RR**). With areas of very shallow, dark and organic, usually calcareous loamy to sandy soil on calcrete: some soils may be shelly **B2**-**B1**-**B3** (*Petrocalcic Rudosol*). **M-A** – gently undulating areas
MdB MdYA	0.5 0.5	Non-arable calcreted old dune topography: mostly shallow soils; often calcareous. Main soils: shallow, with some moderate depth, sandy to loamy soil on calcrete; often calcareous throughout: **B2**-**B3** with **A3**-**M1** (*Petrocalcic Calcarosol* and *Petrocalcic Tenosol*). Some shelly soils on calcrete occur **B1**-**H1** (*Petrocalcic Shelly Calcarosol-Rudosol*). **MdB** – slopes (3-10%, 2-3e) **MdYA** – old low jumbled dunes (<5m high)
MgB MgYB	1.0 3.2	Non-arable calcreted old dune core topography: mostly shallow soils. Main soils: shallow to very shallow sand to sandy loam on calcrete **B8**-**B3** (*Petrocalcic Tenosol*). With minor to limited areas of shallow to very shallow calcareous loamy sand to sandy loam on calcrete **B2** (*Petrocalcic Calcarosol*). Possibly with minor areas of shelly soil (**B1**). **MgB** – slopes and rises (3-10%, 2-3e) **MgYB** – mostly old jumbled dunes (5-15m high, 2e)
MiE MiYB	0.1 43.0	Non-arable calcreted old dune core topography: mostly moderate depth soils. Main soils: moderate depth sandy loam to light sandy loam, often bleached, on calcrete: shallow and deep soils can also occur **M1**-**B3** (*Petrocalcic Tenosol*). With some moderate depth calcareous sandy loam to light sandy loams on calcrete: shallow soils can also occur **A3**-**B2** (*Petrocalcic Calcarosol*). Minor to limited occurrences of shelly soil can occur; usually deep to moderate depth **H1** (*Shelly Calcarosol-Rudosol* and *Petrocalcic Shelly Calcarosol-Rudosol*). Minor areas of bare granite outcrop occur in the vicinity of Remarkable Rocks (**RR**). **MiE** – depression **MiYB** – mostly old jumbled dunes (5-15m high)
MlB MlE MlYB MlYE	5.6 3.6 8.3 5.8	Non-arable calcreted old dune topography: mostly moderate depth and deep soils. Main soils: moderate depth loamy sand, often bleached, on calcrete **H3** (*Petrocalcic Tenosol*). With deep loamy sands, often with a bleached layer **H3** (*Tenosol-Podosol*). Also, there can be moderate depth calcareous loamy sand to light sandy loam soils on calcrete **H2**-**A3** (*Petrocalcic Calcarosol*). Minor to limited areas of deep to moderate depth loamy sand to light sandy loam shelly soils can occur **H1** (*Shelly Calcarosol-Rudosol* and *Petrocalcic Shelly Calcarosol-Rudosol*). **MlB** – slopes (3-12%, 2-3e) **MlE** – drainage depression areas **MlYB** – old jumbled dune topography (5-15m high, 1e) **MlYE** – old jumbled dune topography (5-15m high) overlying steeper land (slopes 2-15%, 2e)
MmC	8.2	Non-arable calcreted old dune topography: mostly moderate to shallow depth soils with some non-calcreted soils with clay subsoil. Main soils: moderate to shallow depth loamy sand, usually with a bleached subsurface layer, on calcrete **H3**-**B8** (*Petrocalcic Tenosol*). With patches of sandy to loamy topsoil over brown light clay where the calcrete has been 'dissolved' **G3**-**G4** (*Brown Chromosol-Sodosol*). Also, some deep sands may occur **H3** (*Tenosol*). **MmC** – rises and slopes (4-15%, 3-2e)
PqB PqC PqE	1.0 1.2 2.7	Semi-arable areas: mostly texture contrast soils with clay subsoils; with some soil on calcrete, and some deep sands. Weathered rock underlies these land units, usually at a depth of more than 1m. Main soils: thick to very thick sandy to loamy topsoil, often bleached, on brown clay **G3** (*Brown*

PqCy	5.6	*Chromosol-Sodosol*): some of these soils have gradational boundaries between topsoil and subsoil, especially in drainage depressions **M1b** (Brown Dermosol). Patches of shallow to moderate depth sandy soil on calcrete occur **B8**-**H3** (*Petrocalcic Tenosol*). Also, areas of deep sand occur, especially in depressions **H3** (*Tenosol*). **PqB** – slopes (2-5%, 2e) **PqC** – slopes (5-15%, 3e) **PqE** – drainage depression and lower slopes, with some wet closed depression areas (2-1e, 3-4w) **PqCy**– old jumbled dune topography and slopes (slopes 4-15%, 3-2e). Minor areas of granite outcrop occur.
WAB	3.9	Coastal cliffs. Usually with rock covered by a relatively thin layer of calcarenite. There are rock outcrops and often a rocky base to the cliffs: Kanmantoo Group meta-sandstones and Remarkable granite. **WAB** – mostly calcarenite cliffs (slopes >100%).
WBA WBB	0.3 0.6	Rocky coastal cliffs and slopes. Cliffs usually capped by calcarenite. Rock is mostly middle Cambrian age granite. This unit includes the famous 'Remarkable Rocks' granite outcrop. **WBA** – rocky coastal slopes and cliffs (slopes >30%). Stun Sail Boom granite at Cape Younghusband and nearby. **WBB** – rocky cliffs (slopes mostly >100%). Remarkable granite at 'Remarkable Rocks' and nearby.
WGD WGE	0.7 0.6	Non-arable shell sand areas. Main soils: deep shell sand soil **H1** (*Shelly Calcarosol-Rudosol*). With some moderate to shallow depth shell sands on calcrete, especially where sand spreads occur **H1**-**B1** (*Petrocalcic Shelly Calcarosol-Rudosol*). **WGD** – mostly jumbled coastal dunes (5-15m high) **WGE** – low jumbled coastal dunes and sand spreads (<5m high)

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:

B8-**B8**-**H3**-**M1** Sandy soil on calcrete (*Petrocalcic Tenosol*)
Thin to medium thickness grey loamy sand over yellow loamy sand, on calcrete at moderate to shallow depth. Many of these soils have a bleached sandy layer below the grey topsoil; sometimes this bleached layer lies directly on calcrete and the yellow loamy sand layer is not present. Mostly found on old dune topography.

Other Soils:

H3-**I1** Deep sands (*Tenosol* or *Podosol*)
Thin to medium thickness grey loamy sand, often overlying a bleached sandy subsurface layer, over a yellow loamy sand subsoil. Some soils have dark coloured segregations of accumulated iron and organic compounds within the yellow subsoil layer: such podsolized soils always have a bleached sandy layer present. Old dune topography and in depression areas.

B2-**H2**-**A3** Calcareous soils on calcrete (*Petrocalcic Calcarosol*)
Shallow to moderate depth sandy to loamy calcareous soil on calcrete. Old dune topography.

H1-**B1** Shelly soils (*Petrocalcic Shelly Calcarosol-Rudosol* and *Shelly Calcarosol-Rudosol*)
Sandy to light sandy loam soil mostly composed of fine shelly material. These soils can be underlain by calcrete at shallow to moderate depth, or extend to depth. Recently deposited coastal dunes and old dune topography.

G3-**G4**-**K4** Texture contrast soils (*Brown Chromosol-Sodosol*)
Medium thickness to very thick sandy to loamy topsoil over brown light clay. The clay subsoil can be sodic. Weathering Kanmantoo Group meta-sandstones can occur at moderate depth below some soils. Found on rises and some depression areas where the calcarenite layer has been 'dissolved'.

B2-**B1**-**B3** Very shallow organic soil on calcrete (*Petrocalcic Rudosol*)
Very shallow, dark and organic rich, rubbly loamy to sandy soil on calcrete. Often calcareous or shelly. Found on wind-swept clifftops where the land surface is a mosaic of bare calcrete outcrop and calcrete covered with a thin veneer of soil.

Further information: DEWNR Soil and Land Program