

REB Red Banks Land System

Footslopes and plains (at the base of steeper slopes). This system is bordered by slopes and gullies on the upland side (running down from higher plateau areas); and by either the sea or the Cygnet lowland plains on the opposite side. The system is named after the red clayey cliffs which can be seen from Kingscote glowing orange-red with the afternoon sun across Nepean Bay.

Area: 8.5 km²

Annual rainfall: 475 - 500 mm average

Geology: This land system is underlain by late Pleistocene age Hindmarsh Clay. This is a red-brown to orange, non-calcareous, structured sandy clay sediment with green mottling which has been deposited as a result of colluvial and alluvial processes. At the base of the northern coastal cliffs, soft red and green mottled 'weathered sandstone-like' sediments can be seen below the Hindmarsh Clay. Bands of quartz fragments, ironstone nodules and some phyllite or meta-sandstone occur. Some carbonate has accumulated in the upper sections of the Hindmarsh clay: probably derived from wind-blown accretions, and accumulations washed down from higher ground. In the northern coastal cliffs there is a sharp break between the carbonate bearing clay and the non-calcareous clay below this. Areas of calcrete capping are also seen in the upper clay.

In the very south-east of this system there is a small area of Pleistocene age Bridgewater Formation calcarenite. This calcarenite is capped by calcrete and underlain by consolidated carbonate sand. This wind-blown deposit forms a remnant dune.

Some areas, especially close to the adjacent steeper slopes, are underlain by Cambrian age rock: meta-sandstone in the south-east section of this system or phyllite elsewhere.

Topography: Footslopes and plains. Level to gently undulating plains to gently undulating rises. Slopes are between 0% and 3%. These plains and footslopes are cut by small gullies. (However, many gullies on the slopes above end when they reach the border of this system and become depositional outflow areas; some even form small alluvial fans.) Coastal cliffs and slopes occur, which are usually around 10m high and are cut by steep gullies. (The deepest gully areas are eroded down to the soft 'weathered sandstone-like' sediments). There are narrow quartz sand beaches on this northern coast; while pebbly and sandy narrow beach areas and rocky strips occur adjacent to the tidal flats south of American River.

Elevation: From around 30 m to sea-level

Relief: Typically 20 m. Down to 10 m, or up to 30 m in places

Main Soils: **F2-F1a** Loamy to sandy sodic texture contrast soil
F1b Loamy to clay loamy sodic texture contrast soil

Minor soils: **K4a-D7** Stony texture contrast soil on weathered phyllite
K2-D1 Stony texture contrast soil on weathered meta-sandstone
F1c Loamy over clay loamy sodic texture contrast soil
J2-J1 Ironstone soil over weathered meta-sandstone
B2 Shallow calcareous soil on calcrete



Main Features: This land system is mostly arable. Topsoils are mostly loamy. Main soils have loamy topsoil over sodic clayey subsoil. Drainage is poor due to subsoils being sodic and having low permeability. This results in increased run-off and reduced stored soil water available for plant use. Raised salinity levels in the subsoil or lower subsoil are common. Many soils have fine carbonate in their lower subsoils or subsoils.

Soil Landscape Unit summary: Red Banks Land System (REB)

SLU	% of area	Main features #
WAA WAB	2.3 2.7	Non-arable unconsolidated coastal cliffs and slopes, approximately 10m high, composed of structured clayey sediments: and including narrow quartz sand beaches. WAA – slopes with some gullies (30-100% slopes) WAB – cliffs and gullies (>100% slopes) Summary: non-arable coastal cliffs.
MgYa	1.1	Semi-arable low remnant coastal dunes. Main soils: loamy <u>shallow calcareous soil on calcrete</u> B2 (<i>Petrocalcic-Lithocalcic Calcarosol</i>). MgYa – low dune topography (<5m) with <10% saline seepage (2 ⁺ s) Summary: the main issues are low waterholding capacity due to shallow soils and stoniness (calcreted calcarenite fragments), low fertility due to high carbonate content, the risk of wind erosion due to the loose and granular nature of these soils, water repellence, and minor saline seepage.
PkK PkL PkLg	29.3 28.0 13.3	Arable plains and footslopes. Main soils: <u>loamy to sandy sodic texture contrast soil</u> F2-F1a (<i>Grey-Brown Sodosol</i>). PkK – level to gently undulating plains with <10% saline seepage (slopes 0-1%, 2s) PkL – footslopes with <10% saline seepage (slopes 1-3%, 2s) PkLg – footslopes with gullies with <10% saline seepage (slopes 1-4%, 2s) Summary: issues are waterlogging and related sodic subsoils, reduced fertility due to the bleached and sandy nature of these soils, and raised subsoil salinity levels in many areas.
PnL	4.6	Arable footslopes. Main soils: <u>loamy to sandy sodic texture contrast soil</u> F2-F1a (<i>Grey-Brown Sodosol</i>). With approximately 10-20% <u>stony texture contrast soil on weathered phyllite</u> with a sodic clay subsoil K4a-D7 (<i>stony Brown-Grey Sodosol</i>). PnL – footslopes with <10% saline seepage (slopes 2-3%, 2s) Summary: the main issues are waterlogging and related sodic subsoils, reduced fertility due to the bleached and sandy nature of these soils, raised subsoil salinity levels in many areas, and limited areas with some stoniness.
HZA	5.2	Arable plains. Main soils: <u>loamy to clay loamy texture contrast soil</u> F1b (<i>Brown-Grey Sodosol</i>) HZA – gently undulating to level plains (slopes 0-2%) Summary: the main issues are some waterlogging and the related sodic nature of subsoils.
HCO HCT	12.6 0.9	Arable to semi-arable depressions, flats and small alluvial fans. Main soils: <u>loamy to clay loamy sodic texture contrast soil</u> F1b (<i>Brown-Grey Sodosol</i>). With 10-50% <u>stony texture contrast soil on weathered meta-sandstone</u> K2-D1 (<i>stony Brown Sodosol-Chromosol</i>) and <u>ironstone soil over weathered meta-sandstone</u> with sodic clay subsoil J2-J1 (<i>Ferric Brown-Grey Sodosol-Chromosol</i>) and <u>loamy over clay loamy sodic texture contrast soil</u> F1c (<i>Brown Sodosol</i>). Including a low remnant coastal dune area with <u>shallow calcareous soil on calcrete</u> B2 (<i>Petrocalcic-Lithocalcic Calcarosol</i>). HCO – drainage depression, small alluvial fans and low-lying flats with <10% saline seepage (slopes 0-2%, 3 ⁺ s). With 5% low remnant coastal dunes. HCT – depression with marginal salinity (4s) Summary: the main issues are waterlogging, related sodic subsoils, saline seepage, and reduced fertility due to phosphorous fixation where ironstone soils occur. While the minor areas of dune topography have low waterholding capacity due to shallow soils and stoniness (calcreted calcarenite fragments), low fertility due to high carbonate content, the risk of wind erosion due to the loose and granular nature of these soils, and water repellence.



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 - gullyng
r - surface rockiness s - salinity w - waterlogging y - exposure

Detailed soil profile descriptions:

Main Soils:

F2-F1a Loamy to sandy sodic texture contrast soil (*Grey-Brown Sodosol*)

Medium thickness to thick light sandy loam, sandy loam or light loam, with a bleached sub-surface layer of light sandy loam to loamy sand; over olive-brown, grey-brown or olive sodic clay with mottles, and usually with fine carbonate in the lower subsoil or subsoil. Found on flats and slopes in the northern parts of the system.

F1b Loamy to clay loamy sodic texture contrast soil (*Brown-Grey Sodosol*)

Thick to very thick loam, with a sub-surface layer of fine sandy loam to light sandy clay loam which is sometimes bleached; over olive coloured sodic clay with mottles. Found on flats and slopes in the south-east part of the system (south of American River).

Minor soils:

K4a-D7 Stony texture contrast soil on weathered phyllite (*stony Brown-Grey Sodosol*)

Medium thickness to thick sandy loam, with a bleached sub-surface layer of light sandy loam to sandy loam with some phyllite and quartz fragments; over olive-brown sodic clay with mottles; on weathered phyllite. Found on upper slopes near the land system boundary, and at the change to steeper slopes in northern parts of system.

K2-D1 Stony texture contrast soil on weathered meta-sandstone (*stony Brown Sodosol-Chromosol*)

Thick to very thick fine sandy loam to loam, with a sub-surface layer of sandy loam which is often bleached and includes quartz and meta-sandstone fragments; over olive-brown sodic clay; over clay with weathered rock, hard rock fragments and some with minor fine carbonate; often overlying weathered rock; and underlain by hard meta-sandstone rock at depth (eg 150cm). Found on upper slopes near the land system boundary, and at the change to steeper slopes in the south-east part of the system (south of American River).

F1c Loamy over clay loamy sodic texture contrast soil (*Brown Sodosol*)

Thick to very thick fine sandy loam to loam, with a sub-surface layer of sandy loam which is often bleached; over olive-brown to yellow-brown sodic sandy clay loam to sandy light clay. Found in valley flats and alluvial fans in the south-east part of the system (south of American River).

J2-J1 Ironstone soil over weathered meta-sandstone (*Ferric Brown-Grey Sodosol-Chromosol*)

Medium thickness sandy loam, with a bleached sandy sub-surface layer with ironstone fragments and nodules; over olive sodic clay with mottles and including weathered meta-sandstone and quartz fragments; overlying weathered rock; and underlain by hard meta-sandstone rock. Found on flats adjacent to tidal flats in the south-east part of the system (south of American river).

B2 Shallow calcareous soil on calcrete (*Petrocalcic-Lithocalcic Calcarosol*)

Shallow grey calcareous loamy soil with hard carbonate fragments; overlying calcrete or calcrete rubble. This is underlain by consolidated fine carbonate sand. Found on low rises of the remnant due topography in the south-east part of the land system (south of American River).

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

