

BLC Blind Creek Land System

(Based on the description by A. K. McCord in "A Description of Land in the Southern Mallee of South Australia")

Moderately to highly saline flats scattered around the perimeter of Lake Alexandrina.

Area: 143.1 km²

Annual rainfall: 375 – 455 mm average

Geology: A sheet of grey clay (St. Kilda Formation), often less than a metre thick, occurs across much of the land surface. The clay sheet (deposited in a shallow lake during a relatively recent high sea level stand) overlies buried soils or Bungunnia Limestone capping (at depths of 300 - 400 cm) sandy marls, calcareous sands and sandy limestones of the Ettrick or Coomandook Formations. There are minor occurrences of calcreted Bridgewater Formation (old coastal sand dunes) and alluvial clayey sands to sandy clays projecting through the sediments. Occasional deposits of windblown Molineaux Sand also occur. Saline watertables underlie much of the land at depths often shallower than a metre.

Topography: The several occurrences of the landscape are low lying depressions. The only relief on the flats are occasional low sandhills and sandy rises, scattered very low stony rises and some lunettes associated with old lakes. There is an overall very slight fall in elevation towards the lake and drains have been installed to help remove excess surface water. Large areas are samphire flats with bare salt pans, and most of the flats are at least moderately saline.

Elevation: 0 - 10 m

Relief: 1 - 10 m

Soils: Poorly drained black medium to fine textured soils are characteristic, but sandy soils (with or without clayey subsoils), and shallow stony soils also occur.

Main soils *Highly saline flats*

N2/M2 Wet saline clay loam

N2/F2 Saline sandy loam over black clay

N2/A7 Marly saline calcareous sandy loam

Moderately saline flats

F1/M2 Sandy loam to clay loam over black clay

E1 Black cracking clay

Minor soils *Stony flats*

B5 Shallow black clay loam

Sandy flats

B7 Sand over sandy clay over calcrete

Sandhills and sandy rises

H2 Deep sand

G3 Thick sand over sandy clay

H3 Bleached sand

Stony rises

B2 Shallow loamy sand on calcrete

Lunettes

G2/H3 Bleached sand



Main features: The Blind Creek Land System is a low lying flat plain with saline water tables within a metre or so of the surface over much of its area. The flats are dominated by moderately to highly saline black medium to fine textured soils. Extensive areas support only halophytic vegetation such as samphire, and most of the remaining flats are only semi arable due to the effects of waterlogging and salinity. Minor stony and sandy rises also have limited productive potential due to shallow soil depth or low fertility.

Soil Landscape Unit summary: 11 Soil Landscape Units (SLUs) mapped in the Blind Creek Land System:

SLU	% of area	Main features #
GGB	0.8	Low rises formed on remnant clayey sand to sandy clay alluvial sediments. Main soils: <u>thick sand over sandy clay</u> - G3 (V), with <u>deep sand</u> - H2 (L) and <u>shallow loamy sand</u> - B2 (L). These soils are generally deep but inherently infertile and susceptible to water repellence and wind erosion.
NbA	0.1	Low stony rise formed on sheet calcrete. This small feature is an outlier of the East Wellington Land System. Main soil: <u>shallow loamy sand</u> - B2 (D). The land is very stony and the soils generally shallow and non arable.
O-B	0.5	Moderate sandhills formed on reworked windblown sands. Main soil: <u>bleached sand</u> - H3 (D). These soils are deep but inherently infertile and susceptible to water repellence and wind erosion.
UgR	2.4	Complex of low sand spreads and marginally saline flats. Main soils are <u>deep sand</u> - H2 (E) on rises and soils as for VW_ (below) on flats. The sandy soils are infertile, water repellent and susceptible to wind erosion.
VWB VWC VWI VWJ	6.5 28.8 3.8 8.4	Moderately saline flats formed on clayey sediments of the St. Kilda Formation. There are minor highly saline depressions. VWB Flats with moderately low salinity. VWC Flats with moderate to high salinity. VWI Complex of flats, <10% highly saline depressions and <20% low sandy and stony rises. VWJ Flats with 10-20% saline depressions. Main soils: <u>black cracking clay</u> - E1 (E), <u>sandy loam to clay loam over black clay</u> - F1/M2 (C) and <u>sand over sandy clay on calcrete</u> - B7 (L), with <u>shallow black clay loam</u> - B5 (M-L), and <u>thick sand over sandy clay</u> - G3 (M-L), the latter two being on slightly higher ground. <u>Wet saline clay loam</u> - N2/M2 , <u>saline sandy loam over black clay</u> - N2/F2 and <u>marly saline calcareous sandy loam</u> - N2/A7 occur in saline depressions (M-L). <u>Deep sand</u> - H2 (M) and <u>shallow loamy sand on calcrete</u> - B2 (M) occur on rises. This land is semi arable due to the influence of rising saline water tables. Soils are variably but increasingly affected by waterlogging and soil salinity. On rises, restricted waterholding capacity due to shallow calcrete or low fertility are limitations in the B5 and G3/H2 soils respectively.
ZA- ZC-	20.2 26.9	Saline flats and lunettes. ZA- Moderately to highly saline flats. ZC- Samphire flats with 10-20% bare salt pans. Main soils: <u>wet saline clay loam</u> - N2/M2 , <u>saline sandy loam over black clay</u> - N2/F2 and <u>marly saline calcareous sandy loam</u> - N2/A7 (E-V), with <u>black cracking clay</u> - E1 (M-E) subdominant on moderately saline land. Flats are non arable, and a significant proportion is bare or carries only light cover. Opportunistic grazing is an option, but care must be taken to minimize damage to vegetation. Seeding of these areas to salt tolerant grasses or revegetating with suitable perennials to be considered. Saline flats are at risk of developing acid sulfate conditions. Advice should be sought before any attempt at drainage.
ZL-	1.6	Lunettes. Main soil: <u>bleached sand</u> - G2/H3 (D). Soils are infertile and susceptible to wind erosion.

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:*Highly saline flats***N2/A7** Marly calcareous sandy loam (Calcarosolic, Salic Hydrosol / Regolithic or Marly, Lithocalcic Calcarosol)

Medium thickness black moderately calcareous loam to fine sandy clay loam, overlying shellgrit, semi-hard limestone or soft marl, grading to highly calcareous grey clay. Buried sand over clay soil at 50 cm.

N2/F2 Sandy loam over black clay (Sodosolic, Salic Hydrosol / Calcic, Black Sodosol)

Medium thickness dark grey loamy sand to sandy clay loam, overlying a black sandy clay to heavy clay with coarse prismatic structure, grading to a buried sand over clay soil at 50 cm.

N2/M2 Wet saline clay (Dermosolic Hydrosol / Aquic Vertosol)

Thin (may be absent) dark clay loam over a dark grey stiff clay, becoming lighter grey with yellow mottles at depth. Gypsum crystals and iron segregations are common. Sandier lenses with shells may occur below 100 cm. Highly saline water table usually within 100 cm.

*Moderately saline flats***F1/M2** Sandy loam to clay loam over black clay (Black Chromosol / Dermosol)

Medium thickness hard sandy loam to clay loam over a black blocky heavy clay, becoming greyer with depth. Saline water table may occur at about 100 cm.

E1 Black cracking clay (Pedal, Black Vertosol)

Medium thickness hard black cracking clay with coarse blocky structure, becoming greyer and moderately calcareous with depth overlying a buried sand to sandy loam over clay soil at depths ranging from 30 to 100 cm (average 40 cm).

*Stony flats***B5** Shallow black clay loam (Petrocalcic, Black Dermosol)

Medium thickness clay loam to light clay over a black clay sharply overlying fractured calcrete at about 25 cm. Calcrete grades to semi hard Bungunna Limestone containing a fluctuating saline water table below 190 cm.

*Sandy flats***B7** Sand over sandy clay (Sodic, Lithocalcic / Petrocalcic, Brown / Red Chromosol)

Medium thickness loamy sand with a pale A2 layer abruptly overlying a thin brown or red mottled sandy clay over rubbly or boulder calcrete at about 25 cm. This grades to a softer yellowish sandy clay containing a fluctuating water table.

*Sandhills and sandy rises***H2** Deep sand (Basic, Argic, Brown-Orthic Tenosol)

Very thick light brown sand, organically darkened at the surface with slightly clayey lamellae below 100 cm.

G3 Thick sand over sandy clay (Calcic, Brown Sodosol)

Very thick pale brown loose sand, overlying a yellowish brown and brown mottled sandy clay to sandy clay loam, with soft or slightly rubbly Class III A carbonate from about 85 cm. The profile becomes sandier with depth.

H3 Bleached sand (Basic, Arenic, Bleached-Orthic Tenosol)

Thick bleached siliceous sand, organically darkened at the surface, grading to a yellow sand with depth.

*Stony rises***B2** Shallow loamy sand on calcrete (Petrocalcic Calcarosol)

Medium thickness calcareous loamy sand over calcrete.

*Lunettes***G2/H3** Bleached sand (Grey Sodosol / Bleached-Orthic Tenosol)

Medium thickness dark grey coarse sand grading to a bleached sand. This may extend for over a metre, or there may be a grey mottled sandy clay loam to sandy clay layer up to 25 cm thick as shallow as 30 cm, but this grades back to sand.

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

