

BUM Bumbunga Land System

Depression between the Hummock Range and Black Point Hill Range, dominated by a major salt lake system.

- Area:** 85.5 km²
- Annual rainfall** 660 - 950 mm average
- Geology:** The Land System is an old lake floor comprising gypseous clays. Fine grained gypsum deposits, resulting from the reworking by wind of crystalline gypsum on exposed lake beds, overlie the sediments.
- Topography:** The Land System is essentially a lacustrine plain comprising low lying salt lakes and older lake beds at a higher elevation. Superimposed on the plain are modern lunettes bordering the eastern and southern sides of the salt lakes, and gently undulating rises which may be older lunettes. Along the eastern side adjacent to the Black Point Hill Range are gently inclined outwash fans.
- Elevation:** The highest point is 108 m on the crest of an old lunette. The salt lakes at the southern end of the system are about 80 m above sea level.
- Relief:** Maximum relief is 25 m, from lunette crests to salt lake bed
- Soils:** Most soils are loamy, with more clayey subsoils. Many are calcareous throughout. Wet saline soils occupy large swampy areas.

Main soils

- A6a** Calcareous clay loam - rises, fans and flats
D2/D4 Loam over (pedaric) red clay - flats and fans
C3 Gradational clay loam - rises, fans and flats
N2 Saline swamp soil - swamps

Minor soils

- A4** Rubbly calcareous loam - stony rises
A6b Calcareous clay loam on alluvium
A8 Gypseous calcareous loam - lunettes
B3 Shallow stony loam - stony benches
D2 Loam over red clay on alluvium - fans
D2/G1 Sandy loam over red clay with rubble - flats
D3 Loam over dispersive red clay - flats
G1 Sand over red sandy clay loam - rises

- Main features:** The Bumbunga Land System is dominated by Lake Bumbunga and associated modern and older lunettes and higher level flats. Marginal to high salinity is a characteristic of most land, either due to high gypsum contents, or to the influence of near surface saline water tables. Most soils are deep and friable with moderate to high natural fertility, but cropping is only feasible on higher ground where saline effects are acceptably low.



Soil Landscape Unit summary: 10 Soil Landscape Units (SLUs) mapped in the Bumbunga Land System:

SLU	% of area	Main features #
KA	9.7	Very gently inclined outwash fans with slopes of 1-2% formed on fine grained alluvium. Main soils: <u>calcareous clay loam</u> - A6b (E) and <u>calcareous clay loam on alluvium</u> - C3 (E) with <u>loam over red clay on alluvium</u> - D2 (L). The land has good agricultural potential, having deep, fertile and generally well drained soils. There are minor to moderate limitations associated with boron toxicity, salinity and alkalinity.
QKA	5.6	Very gently undulating low benches formed on sheet and rubbly calcrete with variable surface cover of calcrete stones. Main soils: <u>shallow stony loam</u> - B3 (E), <u>rubbly calcareous loam</u> - A4 (E) and <u>sand over red sandy clay loam</u> - G1 (C). This land has moderate to high limitations for agriculture due to its predominant shallow stony soils and difficulty of working. Patchy finishes to the season can be expected due to large variations in soil moisture holding capacity.
TOB	17.0	Gently inclined rises with slopes of 2-5% formed on gypseous clays (possibly old lunettes). Main soils: <u>gradational clay loam</u> - C3 (E) and <u>calcareous clay loam</u> - A6a (E), with <u>loam over (pedaric) red clay</u> - D2/D4 (L). The rises are fully arable and have only minor limitations associated with fertility and boron toxicity. There is minor potential for water erosion on more sloping areas.
VHB VHC	2.1 1.1	Flats formed on old clayey and gypseous lake floor sediments. VHB Marginally saline flats. VHC Highly saline (non arable) flats. Main soils: moderately saline and highly saline variants of <u>rubbly calcareous loam</u> - A4 (E) and <u>calcareous clay loam</u> - A6a (E), with <u>gradational clay loam</u> - C3 (L). This land has limited agricultural potential due to moderate to high salinity and associated problems of boron toxicity and waterlogging. A further limitation is low water holding capacity caused by the predominant stony soils.
VIB	10.9	Flats with limited areas of low rises (old lunettes), characterized by saltbush - bluebush - samphire vegetation, formed on old lake bed clayey sediments. Main soils: moderately to highly saline variants of <u>calcareous clay loam</u> - A6a (E), with <u>gradational clay loam</u> - C3 (C), <u>loam over dispersive red clay</u> - D3 (L) and <u>rubbly calcareous loam</u> - A4 (L). The land is only semi arable due to moderate to high salinity and associated problems of boron toxicity, alkalinity and waterlogging. Good early rains leach salts sufficiently to allow establishment, but in a dry or late season cropping is risky on this land.
VJF	3.1	Marginally to highly saline flats, formed on old lake bed clays, with 20% salt lakes, most of which have associated gypsum lunettes. Main soils: as for VIB (V), with <u>calcareous clay loam</u> - A6a (M) and <u>gypseous calcareous loam</u> - A8 (M) on lunettes, and <u>saline swamp soil</u> - N2 (L) in salt lakes. This landscape complex has minimal cropping potential due to the highly saline near surface water table. This water table is at the surface in the scattered salt flats which are characteristic of the unit. The lunettes are only marginally suitable for cropping because of the high gypsum content of the soil.
VPH	18.8	Very gently undulating plain formed on old lake bed sediments, with slopes of less than 1%, characterized by scattered small salt lakes. Main soils: <u>loam over (pedaric) red clay</u> - D2/D4 (V), with <u>sandy loam over red clay with rubble</u> - D2/G1 (L) and <u>calcareous clay loam</u> - A6a (L). This land is arable (except for the minor salt lakes), with the main limitations being due to its low lying position and associated accumulations of subsoil salt and boron.
ZD-	20.5	Extremely saline depressions, seasonally inundated, and either bare or with a variable cover of samphire. Main soil: <u>saline swamp soil</u> - N2 . This land has no agricultural value.
ZL-	11.2	Gypsum lunettes. Main soils: <u>gypseous calcareous loam</u> - A8 (E), with <u>gradational clay loam</u> - C3 (C), <u>calcareous clay loam</u> - A6a (L), and <u>loam over dispersive red clay</u> - D3 (L). On the mid to upper slopes of the lunettes where gypsum is close to the surface, agricultural productivity is limited mainly by fertility considerations. Elsewhere however, (except in minor swampy depressions) the soils are deep, well drained and moderately fertile, with only slight limitations due to boron toxicity, salinity and alkalinity. Gypsum is quarried from this landscape.



PROPORTION codes assigned to soils within Soil Landscape Units (SLU):

(D) Dominant in extent (>90% of SLU)	(C) Common in extent (20–30% of SLU)
(V) Very extensive in extent (60–90% of SLU)	(L) Limited in extent (10–20% of SLU)
(E) Extensive in extent (30–60% of SLU)	(M) Minor in extent (<10% of SLU)

Detailed soil profile descriptions:

- A4** Rubbly calcareous loam (Regolithic, Supracalcic / Lithocalcic Calcarosol)
Calcareous sandy loam to clay loam grading to rubbly Class III B or III C carbonate or calcrete within 30 cm, over softer clayey carbonate.
- A6a** Calcareous clay loam (Regolithic / Pedal, Hypercalcic Calcarosol)
Calcareous clay loam grading to a more clayey subsoil with a soft Class I carbonate layer within 50 cm, generally overlying gypseous clay.
- A6b** Calcareous clay loam on alluvium (Pedal, Hypercalcic Calcarosol)
Calcareous sandy clay loam to clay loam, becoming more clayey and calcareous with depth, grading to clayey alluvium within 100 cm.
- A8** Gypseous calcareous loam (Hypergypsic Calcarosol)
Very highly calcareous loam to clay loam grading to soft gypsum beds at about 50 cm.
- B3** Shallow stony loam (Petrocalcic, Leptic Tenosol)
Sandy loam to clay loam with calcrete fragments and nodules over sheet calcrete at about 25 cm.
- C3** Gradational clay loam (Gypsic, Hypercalcic / Calcic, Red Dermosol)
Medium thickness clay loam grading to a well structured red clay with soft Class I or III A carbonate from about 40 - 50 cm, overlying clayey sediments which are often gypseous.
- D2** Loam over red clay on alluvium (Sodic, Calcic, Red Chromosol)
Medium thickness loam to clay loam over a well structured red clay, calcareous with depth, grading to fine grained alluvium.
- D2/D4** Loam over (pedaric) red clay (Hypercalcic, Red Chromosol / Pedaric, Red Sodosol)
Medium thickness sandy loam to clay loam abruptly overlying a well structured red clay with soft Class I carbonate from about 60 cm grading to a (gypseous) clay.
- D2/G1** Sandy loam over red clay with rubble (Lithocalcic, Red Chromosol)
Sandy loam sharply overlying a red poorly structured sandy clay with rubbly Class III C carbonate at shallow depth.
- D3** Loam over dispersive red clay (Calcic / Hypercalcic, Red Sodosol)
Loam to clay loam sharply overlying a red prismatic clay with Class I carbonate at about 50 cm.
- G1** Sand over red sandy clay loam (Calcic, Red Chromosol)
Thick loamy sand over a massive red sandy clay loam, calcareous with depth.
- N2** Saline swamp soil (Gypsic, Hypersalic Hydrosol)
Wet clay loamy soil grading to gypseous clay.

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

