

LMV Lower Murray Valley Land System

The division between the Upper Murray Valley and the Lower Murray Valley Land Systems at Morgan is purely arbitrary, as there is a gradation in the type of landscape elements along the length of the river.

Area: 457.7 km²

Annual rainfall: 235 – 375 mm average

Geology: The System includes the Murray River flats, and the slopes and cliffs created by the downcutting of the river. The dominant sediment of the flats is the Coonambidgal Formation, a deposit of clays and silts laid down under low energy conditions. More recent sediments associated with modern activity of the river overlie the Coonambidgal materials near the channel. These include mixed sands, silts and clays. The slopes are cut into older Tertiary sediments, mainly Loxton / Parilla Sands, capped intermittently by Blanchetown Clay, and usually blanketed by highly calcareous Woorinen Formation materials which have either been blown or washed in. Consolidated Morgan - Mannum Limestone is the material usually exposed in the more or less vertical cliffs. Overlying both slopes and flats are deposits of Molineaux Sand. These are more frequent on the slopes.

Topography: The topographic pattern includes several main elements:

- Predominantly wet flats, including the modern river channel, billabongs and swamps.
- Miscellaneous terraces above current water level, or drained flats below river level.
- Slopes and cliffs ranging from gentle grades of less than 10% to moderately steep slopes many of which are severely eroded by water flowing from the highlands above. Variable sandhills and spreads are common on the slopes. Near vertical cliffs are common along some stretches of the river.

Elevation: 0 - 40 m

Relief: Up to 30 m

Soils: Grey clays dominate the river flats, overlain by sands in places. A range of sandy and calcareous sandy loams occurs on the cliffs and slopes running down to the river.

Main soils

Terraces, flats and swamps

E3/M2 Dark grey clay
N3 Miscellaneous swamp soil

Slopes

A4a Rubbly calcareous sandy loam
A4b Calcareous sandy loam
H2b Sand over calcrete
G1 Loamy sand over red sandy clay loam

Sandhills and sand spreads on flats and slopes

H2a Deep sand



Main features: The Lower Murray Valley Land System is a complex landscape of wetlands and older terraces, with slopes and cliffs running up to the adjacent highlands. The soils are highly variable. Clayey types on fine grained alluvium predominate on the terraces. These have been extensively reclaimed for irrigated pastures and fodder production. Other flats are associated with billabongs and swamps of little or no agricultural use but with high water resource, conservation and recreation value. The slopes created by the long term downcutting of the river have a range of sandy to sandy loam soils over highly calcareous subsoils. These are widely used for horticulture, except where they are too steep or eroded.

Soil Landscape Unit summary: 20 Soil Landscape Units (SLUs) mapped in Lower Murray Valley Land System:

SLU	% of area	Main features
A-I	3.6	Limestone cliffs.
SEC	4.0	Slopes and cliffs defining the edge of the river valley. Most slopes are overlain by low sandhills or sand spreads. SEC Gently inclined lower slopes. SXC Moderate slopes with up to 30% low sandhills and sand spreads. SXD Moderately steep slopes with up to 30% low sandhills and sand spreads. SXI Moderately steep slopes with erosion gullies. SXII Steep slopes with erosion gullies. UDo Slopes with 60-90% high sandhills. UDp Slopes with 60-90% moderate sandhills. UDs Slopes with 30-60% moderate sandhills. UDu Slopes with sand spreads. Main soils: <u>rubbly calcareous sandy loam</u> - A4a , <u>calcareous sandy loam</u> - A4b , <u>sand over calcrete</u> - H2b and <u>loamy sand over red sandy clay loam</u> - G1 on slopes with <u>deep sand</u> - H2a on sandhills and spreads. Provided that they are not too steep, slopes have high productive potential for irrigated crops. Soils mainly deep and well drained. Main limitations: wind erosion potential on sandier soils, water erosion potential on steeper slopes, and restricted waterholding capacity on some shallower soils. Cultivation should be avoided on the steeper slopes, and the eroded slopes of SXII are not suited to any agricultural activity without substantial remedial and preventative management.
SXC	13.5	
SXD	4.2	
SXI	7.1	
SXII	10.4	
UDo	0.3	
UDp	0.1	
UDs	0.8	
UDu	0.3	
UrH	0.3	
UrJ	0.6	UrH 30-60% high sandhills. UrJ 30-60% low sandhills. Main soil: <u>deep sand</u> - H2a on rises with soils as for the flats as described below. The sandy soils are infertile and prone to wind erosion, but being deep and well drained are suitable for irrigation. The soils of the flats have variable irrigation suitability depending on drainage and salinity, but flats associated with sandhills are susceptible to seepage problems.
Xg-	3.5	River flats and terraces. This land is mostly wet.
Xh-	10.4	Xg- Terraces with up to 20% swamps and 30% low sandhills.
Xi-	15.0	Xh- Complex of more than 75% billabongs with swamps and low terraces.
Xm-	1.8	Xi- Reclaimed swamps.
Xn-	11.5	Xm- Low terraces with less than 25% swampy depressions and up to 30% low sandy rises.
Xr-	10.2	Xn- Complex of 25-75% billabongs, swamps and low terraces.
Xs-	1.7	Xr- River channel.
Xv-	0.7	Xs- Swamps. Xv- Complex of sandbars, swamps and billabongs. Main soil terraces and reclaimed swamps: a <u>dark grey clay</u> - E3/M2 . <u>Miscellaneous swamp soils</u> - N3 occur on wetter land. With the exception of Xm-, Xi- and Xg-, these landscapes are predominantly or entirely wetlands with water resource and / or conservation value. They have little direct agricultural development potential. The clayey soils of the terraces and reclaimed swamps are inherently fertile and when drained support highly productive pastures, mostly for dairying.



Detailed soil profile descriptions:*Terraces and reclaimed flats***E3/M2** Dark grey clay (Grey / Black Vertosol / Dermosol)

Medium thickness dark greyish brown to black friable clay loam to clay grading to a dark grey to black heavy clay, over brown clay with layers of rotted reeds, becoming greyer with depth and continuing below 100 cm. Water table occurs at depths of between 60 and 100 cm.

N3 Miscellaneous swamp soil (Oxyaquic / Redoxic Hydrosol)

Variable wet soil

*Slopes***A4a** Rubbly calcareous sandy loam (Lithocalcic / Supracalcic Calcarosol)

Medium thickness calcareous loamy sand to sandy loam becoming more clayey and calcareous with depth over Class IIIC / IIIB carbonate within 30 cm, grading to a very highly calcareous sandy clay loam.

A4b Calcareous sandy loam (Hypercalcic Calcarosol)

Medium thickness sandy loam becoming more clayey and calcareous with depth over a Class IIIA carbonate layer within 30 cm grading to a very highly calcareous sandy clay loam to sandy clay.

H2b Sand over calcrete (Calcareous / Petrocalcic, Red-Orthic Tenosol)

Medium to very thick sand, calcareous with depth over rubbly calcrete.

G1 Loamy sand over red sandy clay loam (Hypercalcic, Red Sodosol)

Thick loamy sand over a red to brown massive sandy clay loam, highly calcareous from about 55 cm.

*Sandhills and sand spreads on flats and slopes***H2a** Deep sand (Calcareous, Arenic, Red-Orthic Tenosol)

Very thick reddish to brownish sand, generally with soft carbonate accumulations and slight clay increase at variable depths depending on erosional history, but commonly more than 100 cm.

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

