

MIP Mission Plain Land System

A low lying system dominated by stony plains. It consists of low lying plains which form a drainage basin

Area: 104.4 km²

Landscape: A low lying system dominated by stony plains. It consists of low lying plains which form a drainage basin. The narrow point in the centre of the system (southeast of Balgowan) forms a watershed. Drainage is to the north and then toward the coast, north of this point; and to the southwest then toward the coast, south of this point – where the system then slopes down to a lower level. Very little modern drainage occurs as surface flow; most occurs as subsurface seepage.

At depth, the system is underlain by clayey sediments (Hindmarsh Clay). Only in two small depression are soils formed directly in this clay. Younger wind-deposited sediments overlie this clay. The oldest calcareous sediments are calcreted, and cover the majority of the system, especially in lower lying areas (Bakara / Ripon Calcrete and ancient Bridgewater Formation). Younger calcareous loess (Woorinen Formation) overlies significant areas, particularly in the south of the system on somewhat higher elevation plains. The youngest sediments are mallee sands (Molineaux Sand) which form low dunes and sandy rises, especially in the north of the system. Saline coastal backswamps also occur in the north of the system.

Annual rainfall: 350 – 390 mm average

Main soils: **B2** *shallow calcareous loam on calcrete*
A4-A5 *(rubbly) calcareous loams*

Minor soils: **B3** *shallow sandy loam on calcrete*
H2 *calcareous siliceous sand*
N2 *saline soils*
A6 *gradational calcareous clay loam*

Main features: The most common soils are shallow loamy soils on calcrete: mostly calcareous throughout. There are some areas where the soils are too shallow to be cropped. Profiles which are shallow and/or contain hard carbonate rubble have limited moisture holding capacity and hence limited production potential. Surface stone also interferes with many farming practices. Fine carbonate in soils limits the availability of certain nutrients.

Subsoil accumulations of boron and sodium occur in this system where clay loamy to light clayey subsoils or substrates occur. These accumulations occur largely because of the proximity of this area to the coast and salt-bearing winds, and low and light rainfall, and low lying topography, diminishing the potential for leaching. Saline seepage associated with saline watertables is widespread in this low lying system. Numerous non arable saline patches occur in the lowest lying areas.



Soil Landscape Unit summary: Mission Plain Land System (MIP)

SLU	% of area	Main features
ICE	0.2	Land with soils dominantly formed in clayey sediments. Main soils: <i>gradational calcareous clay loam A6</i> . And limited to common areas of <i>calcareous loam A5</i> . ICE – drainage depression (slopes <1%).
IDE	0.1	Land with soils dominantly formed in clayey sediments. Main soils: <i>gradational calcareous clay loam A6</i> . IDE – depression (slopes <1%).
QBDg QBK	0.3 0.1	Land dominated by shallow calcreted soils. Main soils: <i>shallow calcareous loam on calcrete B2</i> and extensive areas of <i>rubbly calcareous loam A4-A5</i> . QBDg – coastal slopes (slopes 3-20%). QBK – low lying level coastal plain (slopes <1%).
QbA QbK	6.5 6.9	Land dominated by shallow calcreted soils with mallee sands. Main soils: <i>shallow calcareous loam on calcrete B2</i> , including <i>shallow sandy loam on calcrete B3</i> . With minor areas of <i>calcareous loam A4</i> . With 10-30% <i>calcareous siliceous sand H2</i> on sandy rises: sandy variants of <i>calcareous loam A4</i> can occur on lower dune slopes and on some sandy rise areas. QbA – low lying plains with a few depressions with approx. 10-20% sandy rises (swale slopes <1%). QbK – low lying plains with approx. 20-30% sandy rises (swale slopes <1%).
QHK	3.1	Land dominated by shallow calcreted soils. Main soils: <i>shallow calcareous loam on calcrete B2</i> . Minor to limited areas of <i>shallow sandy loam on calcrete B3</i> can occur in low lying patches. QHK – low lying gently undulating plains (slopes 0-1%).
QKE QKK QKO QKP	9.1 6.7 1.3 6.8	Land dominated by shallow calcreted soils. Main soils: <i>shallow calcareous loam on calcrete B2</i> . With limited to common areas of <i>calcareous loam A4-A5</i> . Minor areas of <i>shallow sandy loam on calcrete B3</i> can occur in low lying patches. QKE – relatively low lying level to gently undulating plain (slopes 0-1%). QKK – relatively low lying gently undulating plain (slopes 0-1%). QKO – low lying level plain (slopes <1%). QKP – relatively low lying gently undulating to level plain (slopes 0-1%).
QNK	1.6	Land dominated by shallow calcreted soils with mallee sand dunes. Main soils: <i>shallow calcareous loam on calcrete B2</i> . With limited to common areas of <i>calcareous loam A4-A5</i> . With 10-30% <i>calcareous siliceous sand H2</i> on low sand dunes and sandy rises: sandy variants of <i>calcareous loam A4</i> can occur on lower dune slopes and on some sandy rise areas. QNK – gently undulating plain overlain by approx. 20-30% low dunes and sandy rises (swale slopes 0-1%).
QPK	2.1	Land dominated by shallow calcreted soils with some mallee sand. Main soils: <i>shallow calcareous loam on calcrete B2</i> . With minor to limited areas of <i>calcareous loam A4</i> . With 10-30% <i>calcareous siliceous sand H2</i> on sandy rises: sandy variants of <i>calcareous loam A4</i> can occur on lower dune slopes and on some sandy rise areas. QPK – relatively low lying plain overlain by approx. 20-30% sandy rises and a few low dunes.
QRP	3.0	Land dominated by shallow calcreted soils. Main soils: <i>shallow calcareous loam on calcrete B2</i> , including <i>shallow sandy loam on calcrete B3</i> . QRP – low lying level plain (slopes <1%).
QTK QTP QTPs	4.1 7.4 3.2	Land dominated by shallow calcreted soils. Main soils: <i>shallow calcareous loam on calcrete B2</i> , including some <i>shallow sandy loam on calcrete B3</i> . With limited to common areas of <i>calcareous loam A4-A5</i> . QTK – relatively low lying gently undulating plains (slopes 0-1%). QTP – relatively low lying to low lying level plain (slopes <1%). QTPs – low lying level plain with marginal salinity and some non arable saline lows (slopes <1%)
QVBg	1.9	Land dominated by shallow calcreted soils.



QVK	5.1	Main soils: <i>shallow calcareous loam on calcrete B2</i> , including some <i>shallow sandy loam on calcrete B3</i> . With limited to common areas of <i>rubbly calcareous loam A4-A5</i> . QVBg – slopes: drainage areas with drainage channels (slopes 1-2.5%). QVK – relatively low lying level plain (slopes <1%). With minor areas of low sandy rises.
SVA SVK SVLg	9.2 12.1 2.1	Land dominated by soils formed in calcareous loess. Main soils: <i>calcareous loam A4-A5</i> . With limited to common areas of <i>shallow calcareous loam on calcrete B2</i> . SVA – somewhat low lying gently undulating plains (slopes 0-1%) SVK – relatively low lying gently undulating plains with some ill-defined drainage lows (slopes 0-1%). SVLg – slight slopes with some drainage lines (slopes 0.5-2%).
UIF	0.8	Dunefields with >30% mallee sand dunes Dune soils: <i>calcareous siliceous sand H2</i> . Swale soils: <i>calcareous loam A4-A5</i> . UIF – low lying plains overlain by 60-90% sand dunes.
UaC UaD	0.4 0.2	Single mallee/carbonate dominant sand dunes. Main soils: <i>calcareous siliceous sand H2</i> grading to <i>carbonate sand H1</i> . UaC – sand dunes. UaD – low sand dunes.
UbK	0.1	Land overlain by > 30% mallee/coastal sand spreads. Main soils: <i>shallow calcareous loam on calcrete B2</i> grading to <i>shallow highly calcareous sandy loam on calcrete B1</i> overlain in parts by calcareous siliceous sand or possibly carbonate sand spreads (some possibly deep enough to give a <i>calcareous siliceous sand</i> with calcrete at moderate depth H2). UbK – low lying plain overlain by > 30% sand spreads.
WGE	0.2	Carbonate sand deposits. Main soils: <i>carbonate sand H1</i> with some <i>shallow carbonate sand on calcrete B1</i> in flats. WGE – low jumbled coastal dunes.
WO-	3.6	Samphire flats: coastal backswamp. Main soils: <i>coastal saline soil N2b</i>
ZA- ZB-	1.6 0.5	Saline depressions. Main soils: <i>saline soil N2a</i> . ZA- – saline depressions. ZB- – highly saline depressions.



Detailed soil profile descriptions:**Main soils:**

- B2** *shallow calcareous loam on calcrete* [Petrocalcic Calcarosol]
Grey brown to red brown calcareous loams, sandy loams, clay loams, or occasionally loamy sands, overlying calcrete at shallow depth. Subsoil texture can be a heavy as light clay. Heavier textures typically occur in the lowest lying areas. The lightest textures occur adjacent to sandy rises and low sand dunes. Profiles often contain significant amount of hard carbonate rubble. Found on low lying plains.
- A4-A5** (*rubby*) *calcareous loams* [Regolithic Hypercalcic-Lithocalcic Calcarosol]
Grey brown calcareous loams and clay loams grading to clay loamy or light clayey subsoil often with abundant fine carbonate. Can be underlain by calcrete at moderate depth. A few are underlain by clayey sediments (Hindmarsh Clay) within 120 cm of the surface (soil **A5**). Often found on somewhat higher elevation plains. Sandy variants are found on some lower dune slopes and on some sandy rise areas.

Minor soils:

- B3** *shallow sandy loam on calcrete* [Petrocalcic Tenosol or sometimes Petrocalcic Red Chromosol]
Red brown to brown non calcareous to slightly calcareous loams, sandy loams, or occasionally loamy sands, overlying calcrete at shallow depth. Subsoil texture can be a heavy as light clay. The lightest textures occur adjacent to sandy rises and low sand dunes. Profiles often contain significant amount of hard carbonate rubble. Found on some of the lowest lying areas in vague drainage areas.
- H2** *calcareous siliceous sand* [Arenic Calcarosol]
Deep to moderate depth brown calcareous sand. Can be underlain by calcrete at moderate depth. Found on dunes and sandy rises.
- N2** *saline soils* [Salic-Hypersalic Hydrosol].
N2a: calcareous clay loamy and loamy saline soils which occur in depressions. The soils are often underlain by calcrete at shallow depth.
N2b: calcareous silty clay loams and silty light clays overlying calcrete at shallow to moderate depth which occur in coastal backswamps. Profiles typically contain shell fragments.
- A6** *gradational calcareous clay loam* [Pedal Hypercalcic Calcarosol]
Grey brown to red brown calcareous clay loams and loams grading to reddish clay with abundant fine carbonate and sometimes with some hard carbonate rubble. Found in depressions.

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

