

SOK South Kilkerran Land System

Plains and slopes, with some depressions and rises

Area: 182.1 km²

Landscape: Plains and slopes, with some depressions and rises. The main part of this system separates the central highland zone from lower lying plains to the west. The northeastern extension of the system consists of plains and elevated plains, with the mallee dunefields to the west and rises and slopes to the east. The central-north part of the system consists of plains, with rises and slopes to the east and a stony depression to the west: drainage is to the west and northwest. The central to southern parts of the system consist of plains, slopes and significant depression areas, with rises and slopes to the east, a slightly elevated plain in the very southeast, low lying plains to the west (the land to the west falls away south of an east-west line through Maitland), and slopes and slight rises in the southwest and south: drainage is to the southwest and south toward the Wauraltee coastal plain. Little surface flow occurs. Most water moves as subsurface flow. Surface evidence of saline seepage becomes more obvious toward the very south of the system. The saline seepage in the very south of the system seems to be confined by (bedrock?) rises to the east and southwest, forcing saline groundwater near to the surface. The saline seepage flow appears to come from the northeast, moving to the southwest and south.

The land system is dominated by relatively thick deposits (>1m) of calcareous loess (Woorinen Formation). These wind-deposited calcareous sediments are underlain by clayey sediments (Hindmarsh Clay/old alluvium), however, there are only a few areas, mostly depressions, where soils are formed in these clays. Some older calcareous loess sediments are now calcreted, with resulting soils forming on calcrete. A few sandy rises and remnants of sand dunes occur in the north of the system (Molineaux Sand).

Annual rainfall: 365 - 440 mm average

Main soils:

- A4-A5** *(rubbly) calcareous loams*
- B2** *shallow calcareous loam on calcrete*
- A6** *gradational calcareous clay loam*

Main features: The land system is mostly arable. The most common soils are moderate depth, often rubbly, calcareous loams. Toxic accumulations of boron and sodium may occur in lower subsoils, largely due to the proximity of this area to the coast and salt-bearing winds, and the relatively low and light rainfall diminishing the potential for leaching. Toxic elements particularly accumulate where a subsoil or lower subsoil is clay loamy to clayey in texture – restricting leaching to some extent. Clayey subsoils and substrates also limit the internal drainage of many soils; this can result in waterlogging in low lying areas. Temporary flooding may even occur in a few low lying patches with clayey subsoils.

Calcareous soils limit the availability of certain nutrients: deficiencies of the major nutrient phosphorus and the trace element zinc are common, while deficiencies of the trace elements manganese and iron are possible. Temporary trace element deficiencies can occur in cold and wet conditions with susceptible crops.

Many surfaces have some potential for wind erosion. Calcareous loams can become powdery and loose after excessive cultivation or trampling by stock. Water erosion is a potential problem on some slopes: there is evidence of rilling in places. Soils with hard carbonate rubble and/or shallow depth to calcrete have reduced effective waterholding capacities, and hence reduced production potentials. Also surface rubble interferes with some farming operations.



Soil Landscape Unit summary: South Kilkerran Land System (SOK)

SLU	% of area	Main features
ICO	0.5	Land dominated by soils formed in clayey sediments. Main soils: <i>gradational calcareous clay loam A6</i> . With limited to common areas of <i>calcareous loam A5-A4</i> . ICO – drainage depression (slopes <1%).
IKA IKK	0.8 1.2	Land dominated by soils formed in clayey sediments and calcareous loess. Main soils: <i>gradational calcareous clay loam A6</i> , and extensive areas of <i>rubbly calcareous loam A5-A4</i> . IKA – low lying plain/depression (slopes 0-1%). IKK – depression (slopes 0-1%).
ILO ILT	0.5 1.0	Land dominated by soils formed in clayey sediments. Main soils: <i>gradational calcareous clay loam A6</i> . With limited to common areas of <i>rubbly calcareous loam A5</i> , and <i>shallow calcareous loam on calcrete B2</i> . ILO – gently undulating low lying plain/depression (slopes 0-1%). ILT – drainage depression with areas of marginal salinity (slopes <1%).
IRE IREg	1.5 0.1	Land dominated by soils formed in clayey sediments. Main soils: <i>gradational calcareous clay loam A6</i> . With limited to common areas of <i>calcareous loam A5</i> , and <i>shallow calcareous loam on calcrete B2</i> . IRE – depression/drainage depression (slopes <1%). IREg – sloping drainage depression (slopes 1-3%).
QAA QAK QAL	0.2 20.1 1.4	Land dominated by calcreted soils and soils formed in calcareous loess. Main soils: <i>shallow calcareous loam on calcrete B2</i> , and extensive areas of <i>calcareous loam A4-A5</i> . With minor areas of <i>gradational calcareous clay loam A6</i> in lows/depressions. QAA – low rise (slopes 0-1.5%). QAK – level to gently undulating plains (slopes 0-1.5%). With some very vague drainage lows in the large southern unit draining toward the southwest and south. QAL – rises and slopes (slopes 0.5-4%).
QCA	0.9	Land dominated by calcreted soils and soils formed in rubbly calcareous loess. Main soils: <i>shallow calcareous loam on calcrete B2</i> possibly including some <i>shallow sandy loam on calcrete B3</i> , and extensive areas of <i>rubbly calcareous loam A4-A5</i> . With minor areas of <i>gradational calcareous clay loam A6</i> in lows/depressions. QCA – elevated gently undulating plains (slopes 0-1%).
QIA	1.0	Land dominated by calcreted soils. Main soils: <i>shallow calcareous loam on calcrete B2</i> . With limited to common areas of <i>gradational calcareous clay loam A6</i> . With minor to limited areas of <i>rubbly calcareous loam A5</i> . QIA – somewhat low lying gently undulating plains (slopes 0-1%).
QTP	4.5	Land dominated by calcreted soils and soils formed in rubbly calcareous loess. 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> . QTP – relatively low lying level plain with areas of marginal salinity (slopes <1%). With some very vague drainage lows. To the south, and via a drainage channel to the southwest, the land slopes away to the Wauraltee coastal plain.
SBA SBB SBLg SBMc	7.5 0.1 6.9 0.2	Land dominated by soils formed in non rubbly calcareous loess. Main soils: <i>calcareous loam A4-A5</i> . With minor areas of sandy variant <i>calcareous loam A4</i> on very low sandy rises in 'SBA' unit. With minor areas of <i>gradational calcareous clay loam A6</i> in lows/depressions. SBA – relatively low lying gently undulating to level plains (slopes 0-1%). SBB – low rise (slopes 1-2.5%): is an old dune rise. SBLg – slopes and rises with relatively long slopes, with some drainage ways and a few drainage lines (slopes 0.5-3.5%). SBMc – slopes with contour banks (slopes 2-5%).



SdPe	0.2	Land dominated by soils formed in rubbly calcareous loess. Main soils: <i>calcareous loam A5-A4</i> . With limited to common areas of <i>gradational calcareous clay loam A6</i> possibly grading to <i>loam to clay loam over red clay D2-C3</i> , and <i>shallow calcareous loam on calcrete B2</i> grading to <i>shallow sandy loam on calcrete B3</i> . SdPe – relatively low lying level plain with drainage lines and rilling, and some areas of saline seepage (slopes <1%).
SeK SeT	0.6 1.3	Land dominated by soils formed in rubbly calcareous loess. Main soils: <i>calcareous loam A4-A5</i> . With limited to common areas of <i>gradational calcareous clay loam A6</i> in lows, and <i>shallow calcareous loam on calcrete B2</i> . SeK – gently undulating plain (slopes 0-1%). SeT – depression with areas of marginal salinity (slopes 0-1%).
SFA SFB	1.3 0.1	Land dominated by soils formed in non rubbly calcareous loess and clayey sediments. Main soils: <i>calcareous loam A5-A4</i> . With limited to extensive areas of <i>gradational calcareous clay loam A6</i> grading to <i>loam over red clay D2</i> on the sloping unit 'SFB'. With minor areas of <i>siliceous sand H2</i> and/or sandy variant of <i>calcareous loam A4</i> on sandy rises in the 'SFA' unit. SFA – largely relatively low lying gently undulating plains with some vague drainage lows (slopes 0-1%). SFB – lower slight slope (slopes 0.5-2.5%).
SjA SjB	3.4 2.9	Land dominated by soils formed in rubbly calcareous loess with some mallee sand deposits. Main soils: <i>calcareous loam A4-A5</i> . With limited to common areas of <i>siliceous sand H2</i> and sandy variant of <i>calcareous loam A4</i> on sandy rises and adjacent areas. With minor areas of <i>gradational calcareous clay loam A6</i> in lows/depressions. SjA – elevated gently undulating plains (slopes 0-1%). SjB – slight slopes (slopes 0-2%); with some areas of thin sand spread derived from the adjacent dunefield area to the west.
SMA SMA _s SMB	12.8 15.8 0.5	Land dominated by soils formed in calcareous loess. Main soils: <i>calcareous loam A4 (A5 soil may occur, especially in the 'SMB' unit)</i> . With minor areas of <i>shallow calcareous loam on calcrete B2</i> (likely to be limited areas in 'SMA _s ' unit). Also in the northern 'SMA' unit there is evidence of a few old sandy rise remnants: these have <i>calcareous loam A4</i> soils with uniform sandy loam texture profiles. There can be minor areas of <i>gradational calcareous clay loam A6</i> in lows/depressions. SMA – somewhat elevated gently undulating plains and slight slopes (slopes 0-2%). SMA _s – gently undulating to level plains with very vague drainage areas (slopes 0-1.5%). SMB – low rises and slopes (slopes 1-2.5%).
SVA SVK SVKa SVKx SVP	5.2 1.6 2.7 1.3 1.9	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 – relatively elevated gently undulating plains (slopes 0-1.5%). SVK – somewhat low lying gently undulating plains with vague drainage lows (slopes 0-1%). SVKa – somewhat low lying gently undulating plains with vague drainage lows (slopes 0-1%). With minor areas of sandy variant <i>calcareous loam A4</i> on very low sandy rises. SVKx – somewhat elevated level plain (slopes <1%). SVP – relatively low lying level plain with areas of marginal salinity (slopes <1%). To the southeast, the land slopes away to a drainage depression of the Urania Gap and then onto the coastal plains in the southwest.



Detailed soil profile descriptions:**Main soils:****A4-A5** (*rubbly calcareous loams*) [Regolithic Hypercalcic-Lithocalcic Calcarosol]

Grey brown calcareous loamy or clay loamy topsoil, grading to clay loamy, light clayey, or sometimes loamy subsoil with abundant fine carbonate. These profiles often contain significant amounts of hard carbonate rubble, and can be very rubbly. A few profiles are underlain by clayey sediments (Hindmarsh Clay) within 120 cm of the surface (soil **A5**). A common variant has approximately 30cm of grey loamy topsoil abruptly overlying yellow to yellow brown clay loamy subsoil.

B2 (*shallow calcareous loam on calcrete*) [Petrocalcic Calcarosol]

Grey brown to brown calcareous loam or clay loam, with loamy to clay loamy subsoils, and calcrete at shallow depth. Found on rises, plains and slopes.

A6 (*gradational calcareous clay loam*) [Pedal Hypercalcic-Supracalcic Calcarosol]

Grey brown to brown calcareous clay loams, or sometimes loams grading to reddish, brown, yellowish, or sometimes grey clay with abundant fine carbonate. This is underlain by a clayey substrate (Hindmarsh Clay/old alluvium). Profiles can contain some hard carbonate rubble. Typically found in depression and drainage depressions.

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

