SAL Sandilands Land System

Elevated plains, slopes, and rises

Area: 183.9 km²

Landscape: Elevated plains, slopes, and rises. The system is primarily a raised area underlain by

Proterozoic age bedrock. There is little to no surface expression of this bedrock. Most soils are underlain by clayey sediments, most often silty light clay, which has formed in situ from the bedrock. Many soils contain fine quartz fragments which is a weathering product of the

underlying rock – some soils are very gritty.

Accessions of wind-deposited carbonate dust have infused into profiles in relatively recent geological times. Many profiles are calcareous throughout; and many contain hard carbonate fragments. Wind-deposited calcareous loess (Woorinen Formation) overlies older sediments in some areas; and calcrete (Bakara Calcrete) has formed below many profiles.

Annual rainfall: 400 - 465 average

Main soils: D3-D2 loam over red clay

C4-C3 gradational clay loam

shallow loam over clay on calcretegradational calcareous clay loam

A5-A4 calcareous loam

Minor soils: B3 shallow loam on calcrete

B2 shallow calcareous loam on calcrete

Main features:

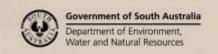
The land system is mostly arable, however, a few soils are too stony and shallow to be cropped. The most common soils are various soils with clayey subsoils. Soils underlain by calcrete at shallow depth are also relatively common. Loamy and clay loamy surface soils are the most common throughout the system. Many soil profiles contain hard carbonate fragments, while fine quartz fragments also occur in many soils. The presence of hard carbonate fragments and/or calcrete at shallow depth, limits profile water holding capacity and hence its productive potential.

Many soils have clayey subsoils, which are typically dispersive at least in the lower subsoil, and there are numerous clay loamy to light clayey subsoils which are also dispersive. Such subsoils restrict soil internal drainage and can lead to waterlogging conditions, particularly when situated in low lying areas. Dispersive and hard subsoils also limit potential root exploration of such layers.

Calcareous soils restrict 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. This is particularly true for soils with highly calcareous surfaces.

There is some potential for water erosion for soils on sloping land. Care needs to be taken with surface management in these areas to minimise the risk of water erosion, especially with texture contrast soils.

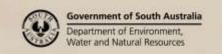
Many soils across the system have raised subsoil salinity levels; in many cases upper subsoil salinity levels are relatively high. In most instances, this is probably due to an accumulation of cyclic salt in soil profiles, although, the effects of salinity at the land surface on some slopes is the result of saline seepage. Correspondingly, it is likely that most lower subsoils have accumulations of sodium which are toxic to the majority of crop roots.





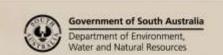
Soil Landscape Unit summary: Sandilands Land System (SAL)

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IVA O.8 Main soils: gradational calcareous clay loam A6 grading to calcareous loam A5-A4, with extensive areas of loam over red clay D3, and possibly with areas of gradational clay loam C3-C4. Also with minor areas of shallow calcareous loam on calcrete B2 grading to shallow loam on calcrete B3 and shallow loam over clay on calcrete B6. IVA – rise surface/elevated plain (slopes 0-1.5%). IVB – rise (slopes 0.5-2%). IYA 1.6 Land dominated by calcareous soils formed in clayey sediments. IYB 5.8 Main soils: gradational calcareous clay loam A6 grading to loam over red clay D3 and rubbly calcareous loam A5-A4. Also with some shallow calcareous loam on calcrete B2 grading to shallow IYE 0.2 loam on calcrete B3 and shallow loam over clay on calcrete B6.			IOA – somewhat elevated plain with some vague drainage lows (slopes 0-1%).
 IVB	IVA	4.3	
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 IYB IYB IYB IYC IYB IYB	IVA	16	
 IYC 1.9 calcareous loam A5-A4. Also with some shallow calcareous loam on calcrete B2 grading to shallow IYE IVE <l></l>			
IYE 0.2 loam on calcrete B3 and shallow loam over clay on calcrete B6 .			
	IYZ	5.5	IYA – elevated plain with some drainage lows (slopes 0-1%).





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		IYB – slopes with some drainage lows/drainage ways (slopes 0.5-2.5%): some vague gilgai
		microrelief in the southwest unit.
		IYC – slopes with some drainage lows/drainage ways (slopes 1-4%).
		IYE – relatively low lying plain (slopes $0-1\%$). IYZ – rise surface with some to a few drainage lows (slopes $0-1.5\%$).
ObD	0.04	
ObD	0.04	Sand over clay sand dunes. Main soils: thick sand over clay 63 grading to sand over clay 64 and loam over rad clay 63.
		Main soils: thick sand over clay G3 grading to sand over clay G4 and loam over red clay D3 . ObD – low dune.
OID	2.0	
QlB	2.8	Land dominated by shallow soil on calcrete. Main soils: shallow calcareous loam on calcrete B2 , grading to shallow loam over clay on calcrete B6
		and shallow loam on calcrete B3 . With loam over red clay D3 grading to gradational clay loam C4
		and gradational calcareous clay loam A6 , in lows.
		QIB – low rises to rises (slopes 0-3%).
QnB	1.0	Land dominated by shallow soil on calcrete.
QnBw	0.1	Main soils: shallow calcareous loam on calcrete B2 and extensive areas of shallow loam on calcrete
QIIDW	0.1	B3 grading to shallow loam over clay on calcrete B6. Minor areas of loam over red clay D3 may
		occur in lows, and minor areas of <i>calcareous loam</i> A4-A5 may also occur.
		QnB – rise to low rise (slopes 0-2%).
		QnBw – low lying plain/lower slope (slopes 0-2%).
QoB	0.2	Land dominated by shallow soil on calcrete.
QoB QoC	0.2	Main soils: shallow calcareous loam on calcrete B2 grading to shallow loam on calcrete B3 and
QoZ	0.1	shallow loam over clay on calcrete B6 . With some loam over red clay D3 grading to gradational
QUZ	0.1	calcareous clay loam A6 and calcareous loam A5-A4 .
		QoB – slopes (slopes 0.5-2%).
		QoC – rise/lower slopes (slopes 1-6%).
		QoZ – rise surface (slopes 0-1%).
RAA	0.2	Land dominated by shallow soil on calcrete.
RAB	0.2	Main soils: shallow loam over clay on calcrete B6 grading to shallow loam on calcrete B3 and
IX/ID	0.4	possibly shallow calcareous loam on calcrete B2 . With some loam over red clay D3 grading to
		gradational calcareous clay loam A6 , and some calcareous loam A5-A4 .
		RAA – somewhat elevated plain (slopes 0-1%).
		RAB – lower slopes (slopes 0.5-1.5%).
RFB	0.4	Land dominated by shallow soil on calcrete.
RFBw	0.1	Main soils: shallow loam over clay on calcrete B6 grading to shallow loam on calcrete B3 and
		possibly shallow calcareous loam on calcrete B2 . Minor areas of loam over red clay D3 may occur in
		lows.
		RFB – rise (slopes 0.5-2.5%).
		RFBw – lower slopes (slopes 0.5-2%).
RHA	3.3	Land where loamy texture contrast soils dominate, many of which are underlain by calcrete.
RHB	1.1	Main soils: shallow loam over clay on calcrete B6 and extensive areas of loam over red clay D3
		grading to gradational clay loam C4 and gradational calcareous clay loam A6 . And with some
		calcareous loam A5-A4 .
		RHA – elevated plains with drainage lows (slopes 0-1%)
		RHB – slopes (slopes 0.5-4%).
SAA	0.2	Land dominated by soils formed in non rubbly calcareous loess.
		Main soils: non rubbly calcareous loam A4-A5.
		SAA – elevated plain and upper slopes (slopes 0-1.5%).
SbA	0.1	Land dominated by soils formed in rubbly calcareous loess.
		Main soils: rubbly calcareous loam A5-A4. With some gradational calcareous clay loam A6 grading
		to loam over red clay D3 .
		SbA – slight lower slope (slopes 0-1%).
SdB	0.9	Land dominated by soils formed in rubbly calcareous loess.
		Main soils: rubbly calcareous loam A5-A4. With some gradational calcareous clay loam A6 grading
		to loam over red clay D3 , and with some shallow calcareous loam on calcrete B2 grading to shallow
		loam on calcrete B3 and shallow loam over clay on calcrete B6 .
		SdB – slopes (slopes 0.5-3%).
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Detailed soil profile descriptions:

Main soils:

- **D3-D2** *loam over red clay* [Sodic-Effervescent Hypercalcic-Lithocalcic Red-Brown Chromosol-Sodosol] Red brown to brown medium thickness to thin sandy loam, loam, or sandy clay loam topsoil overlying red to red brown to brown clayey subsoil grading to clay with abundant fine carbonate. Subsoils are typically dispersive. Profiles often include hard carbonate fragments and fine quartz fragments some soils are very gritty. Topsoils can be calcareous and tend to be hardsetting. These profiles are usually underlain by clayey sediments often silty light clays. **D2** variants have clay loamy subsoils.
- C4-C3 gradational clay loam [Sodic Hypercalcic Red-Brown Dermosol]

 Red brown to brown medium thickness to thin clay loamy to clayey topsoil overlying red to red brown to brown clayey subsoil grading to clay with abundant fine carbonate. Subsoils, and especially lower subsoils, are typically dispersive. Profiles can contain some fine quartz fragments, and may contain some hard carbonate fragments. Topsoils can be slightly calcareous. These profiles are usually underlain by clayey sediments. Mostly found in relatively low lying areas. C3 variants have clay loamy subsoils.
- shallow loam over clay on calcrete [Petrocalcic Red-Brown Chromosol-Dermosol]

 Medium thickness to thin loamy to clay loamy topsoil overlying a red to red brown clayey subsoil.

 Subsoils tend not to be dispersive. The profile is underlain by calcrete at shallow depth the calcrete layer is often only relatively thin (30 to 50 cm). The calcrete can be underlain by highly calcareous clayey to sandy sediments. The soil layer directly overlying the calcrete often contains abundant hard carbonate rubble. Profiles can be calcareous throughout.
- A6 gradational calcareous clay loam [Pedal Hypercalcic-Lithocalcic Calcarosol]
 Calcareous grey brown to brown medium thickness to thin loamy, clay loamy or clayey topsoil grading to clayey subsoil with abundant fine carbonate. Fine carbonate content increases with depth. Subsoils are typically dispersive. Profiles are generally underlain by clayey to clay loamy sediments; and can include some hard carbonate fragments.
- A5-A4 calcareous loam [Regolithic Hypercalcic-Lithocalcic Calcarosol]

 Grey brown to brown medium thickness calcareous loamy to clay loamy topsoil grading to loamy to light clayey subsoil with abundant fine carbonate. Profiles often contain abundant carbonate rubble, and can contain some fine quartz fragments. Profiles are often underlain by clayey sediments (often light clays) (soil A5), or lighter textured calcareous sediments (which can be calcareous loess deposits). Subsoils are usually strongly alkaline and are dispersive when clay loamy or light clayey. Usually found on slightly raised areas.

Minor soils:

- shallow loam on calcrete [Petrocalcic Tenosol-Chromosol]

 Brown to red brown loamy to clay loamy soil overlying calcrete at shallow depth. Profiles often contain abundant hard carbonate rubble. Typically found on stony rises.
- shallow calcareous loam on calcrete [Petrocalcic Calcarosol-Chromosol]

 Grey brown to brown calcareous loamy to clay loamy soil overlying calcrete at shallow depth. Profiles often contain abundant hard carbonate rubble. Typically found on stony rises.

Further information: <u>DEWNR Soil and Land Program</u>

