SHK Shamrock Land System

Area: 86 km^2

Landscape: Undulating to gently undulating rises and low hills with shallow soils on hard rock. Soils are thin calcareous loams on slopes with deeper soils on lower slopes and occasional pediments and fan deposits.

Annual rainfall: 225 - 350 mm average range, but over 96% receives 250 - 325 mm

Geology: Proterozoic sedimentary rocks of the Adelaide Geosyncline including Appila Tillite, Tapley Hill Formation siltstones and Ketchowla Siltstone. Soft sediments occur on Holocene alluvium/colluvium associated with outwash from the hills. Some calcreted calcareous Pleistocene deposits also occur, especially in the southern part of the land system.

Main soils:

A2	(34%)	Calcareous loam on rock	(Paralithic Calcarosol)
L1	(27%)	Shallow soil on rock	(Rocky Rudosol-Tenosol)
A3	(16%)	Deep moderately calcareous loam	(Calcic Calcarosol)

Minor soils:

A4	(9%)	Deep (rubbly) calcareous loam	(Hypercalcic-Lithocalcic Calcarosol)
B2	(4%)	Shallow calcareous loam on calcrete	(Petrocalcic Calcarosol-Rudosol)
M3	(3%)	Deep gravelly soil	(Gravelly Kandosol-Tenosol)
D4	(3%)	Loam over pedaric red clay	(Pedaric Red Sodosol-Dermosol)

Summary: The Shamrock Land System consists of low hills and rises formed on fine-grained Proterozoic Adelaide Geosyncline rocks with shallow soils. Deep calcareous gradational soils occur on pediments and alluvium.

Soil Landscape Unit summary: Shamrock Land System (SHK)

SLU	% of area	Component	Main soils	Prop#	Notes
AAA	2.5	Rises	L1A2	D	Undulating rises on limestone and calc-siltstone with very shallow loamy soils. Relief is less than 30m, slopes are 3-10%. Main soils: Shallow stony soils on rock **- L1** and Calcareous loam on rock – **A2**.
ADB	2.3	Rolling rises	A2L1	D	Non-arable rocky rises and hills formed on limestones and calc-siltstones such as Wonoka Formation rocks with very shallow loamy soils. **ADB** Rolling rises. Relief is 9-30m, slopes are 10-30%. **ADD** Steep low hills, usually very shallow. Relief is 30-90m, slopes are 30-50%. **ADi** Rolling low hills with eroded watercourses and scalding. Relief is 30-90m, slopes are 3-10%. Main soils: Calcareous loam on rock – **A2** and Shallow stony soils on rock - **L1**.
ADD	4.9	Steep low hills	A2L1	D	
ADi	3.2	Rolling low hills	A2L1	D	

AYA	18.4	Undulating rises	A2L1	D	Hills and rises on fine-grained rocks, especially siltstones of the Tapley Hill Formation. **AYA** Undulating rises with shallow calcareous loam on calcareous siltstone or other fine grained rocks, or bare rock. Relief is less than 30m, slopes are 3-10%. **AYH** Rolling rises with eroded watercourses, with 10-20% gullied and around 5% scalded. Relief is 30-90m, slopes are 10-30%. Main soils: Calcareous loam on rock – **A2** and Shallow stony soils on rock - **L1**.
AYH	8.6	Rolling rises	A2L1	D	
EFB	5.7	Gently undulating rises	A2L1	D	Rises on calc-siltstones, typically of the Tapley Hill Formation. **EFB** Gently undulating rises. Relief is 9-30m, slopes are 1-3%. Main soils: Calcareous loam on rock – **A2** and Shallow stony soils on rock **- L1**. High carbonate content will cause nutrient imbalances in some crops. Low moisture retention is a constraint to plant growth in most seasons. **EFG** Gently undulating rises with up to 20% gully erosion. Relief is 9-30m, slopes are 1-3%. Main soils: Calcareous loam on rock – **A2** and Shallow stony soils on rock **- L1**.
EFG	6.3	Gently undulating rises	A2L1	D	
EHm	2.7	Undulating low rises	A2L1	D	Undulating low rises and pediments on calcareous siltstones and limestones such as those of the Tapley Hill Formation. Relief is less than 30m, slopes are 3-10%. Severely scalded (40-50% of land affected) and gullied (20% of land affected). Main soils: Calcareous loam on rock – **A2** and Shallow stony soils on rock **- L1**.
ELB	0.8	Gently undulating rises	A2L1	D	Rises-pediment complexes with shallow soils formed on Grampus Quartzite or Ketchowla Siltstone Formations and alluvium. **ELB** Gently undulating rises. Slopes 1-3%, relief 9-30m. **ELD** Rolling rises. Slopes are 10-30%, relief is less than 30m. Main soils: Calcareous loam on rock – **A2** and Shallow stony soils on rock **- L1**.
ELD	0.6	Rolling rises	A2L1	D	
EVC	3.3	Slope	A2	V	Undulating slopes and ridges with rock outcrops and shallow calcareous soils formed on fine-grained calcareous rocks. Slopes are 3-10%, relief is less than 9-30m. Main soils: Calcareous loam on rock – **A2** and Shallow stony soils on rock **- L1**.
		Ridge	L1	C	
EZB	1.8	Gently undulating rises	A2L1B2	D	Rises with mostly shallow calcareous soils on weathered siltstones of the Tapley Hill Formation and the Tarcowie Siltstone. Fans are associated landforms.
EZD	0.4	Rolling rises	A2L1B2	D	

EZH	1.4	Undulating rises	A2L1B2	D	**EZB** Gently undulating rises with rocky outcrops. Up to 5% of land is gullied and/or scalded. Subsoils are moderately saline. Slopes: 1-3%, relief: less than 30m. **EZD** Rolling rises. Relief is 9-30m, slopes are 10-30%. **EZH** Undulating rises with rocky outcrops. Gullying affects 10-20% of land, scalding affects around 5%. Slopes are 3-10%, relief is less than 30m. Main soils: Calcareous loam on rock – **A2**, Shallow stony soils on rock **- L1** and Shallow calcareous loam on calcrete - **B2**.
JPoo	0.8	Creek flats	D4A3	D	Pediments and plains with texture contrast soils formed on outwash sediments derived from basement rocks. Calcareous in some part of the profile. More than 20% of soils are pedaric (fine crumbly structure in subsoils). **JPoo** Creek flats. Severely gullied and mod scalded. **JPY** Creek flats, 10-50% scalded. **JPy** Creek flats. Moderately gullied, severely scalded. **JPyy** Drainage depression. Severely gullied (over 20%) and scalded (over 50%). Main soils: Clay loam over pedaric red clay - **D4** and Deep moderately calcareous loam - **A3**.
JPY	1.6	Creek flats	D4A3	D	
JPy	1.1	Creek flats	D4A3	D	
JPyy	1.0	Drainage depression	D4A3	D	
KFb	1.9	Gently sloping fans	A3	D	Fans with calcareous gradational soils and more than 20% red pedaric texture contrast soils. **KFb** Gently sloping fans. Slopes: 1-3%, relief: <9m. Fans moderately scalded (10-50%) and saline, rises less so. **KFY** Valley floor with deep moderately calcareous loam or loam over crumbly red clay. Mod. scalded (10-50%). Main soils: Deep moderately calcareous loam - **A3**.
KFY	2.5	Valley floor	A3	D	
KgFF	2.3	Eroded flat	A3M3	D	Flats with over 50% gradational calcareous soils of which most have more than 20% gravel or stone (non-pedogenic). Severely gullied. Main soils: Deep moderately calcareous loam - **A3** and Deep gravelly soil -**M3**.
KQb	10.9	Fan	A3A4	V	Fans and basement-rise complexes with mostly calcareous gradational soils. **KQb** Gently undulating fans and rises, moderately gullied (10-20%) and up to 10% salinity. K**QC** Undulating fans and rises. Slopes are 3-10%, relief is less than 9m. **KQc** Undulating fans, moderately gullied (10-20%) and up to 10% salinity. Slopes 3-10%, relief less than 9m. **KQJ** Drainage lines with shallow rises on fan and basement-rise complexes. 0-5% of land on pediments is scalded and 10-20% is gullied. The soils have moderately salinity throughout the profiles. Main soils: ***Fans:*** Deep moderately calcareous loam - **A3** and Deep (rubbly) calcareous sandy loam **-A4**. ***Rises:*** Calcareous clay loam on rock – **A2** and Shallow stony soils on rock - **L1**
		Rise	A2L1	C	
KQC	2.4	Fan	A3A4	V	
		Rise	A2L1	C	
KQc	0.9	Fan	A3A4	D	
KQJ	3.9	Fan	A3A4	E	
		Rise	A2L1	E	

KVB	3.4	Fan	A3A4	D	Fans and plains formed on calcareous outwash sediments derived from basement rock. More than 90% of soils are calcareous throughout (Calcarosols). **KVB** Gently sloping fans. Slopes: 1-3%, relief: <9m. **KVC** Undulating fans. Slopes are 3-10%, relief is less than 9m. **KVE** Creek flat. Main soils: Deep moderately calcareous loam - **A3** and Deep (rubbly) calcareous sandy loam **-A4**.
KVC	0.3	Fan	A3A4	D	
KVE	0.8	Creek flat	A3A4	D	
XFT	3.4	Eroded creek	M3M1	D	Eroded creek with gravelly alluvium on hilly land. Main soils: Deep gravelly soil -**M3** and Deep alluvial loam - **M1**.

PROPORTION codes assigned to Soil Landscape Unit (SLU) components:

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:

A2/L1 Shallow calcareous loam (Paralithic, Hypercalcic / Lithocalcic Calcarosol)(**A2**)
Gradational calcareous sandy loam over clay loam on weathered rock.
OR Shallow stony loam (Calcareous, Paralithic, Leptic Tenosol)(**L1**)
Shallow calcareous sandy loam on rock.

A3 Deep moderately calcareous (sandy) loam (Calcic Calcarosol)
Calcareous (sandy) loam topsoil grading into loamy-clay loamy subsoil without a significant CO_3 buildup in the subsoil (<20% CO_3 in subsoil). Pediment type Calcarosols.

A4 Deep (rubbly) calcareous loam (Hypercalcic-Lithocalcic Calcarosol)
Calcareous sandy-clay loamy topsoil grading into loamy-clay loamy subsoil with a significant CO_3 buildup in the subsoil. Often rubbly. Soil usually >120 cm in depth

B2 Shallow calcareous loam on calcrete (Petrocalcic Calcarosol-Rudosol)
Shallow, grey to reddish calcareous sandy to clay loamy soil on calcrete. This includes calcareous Petrocalcic Rudosols.

D4 Loam over red friable clay (Calcic, Pedaric, Red Sodosol)
Thin to medium thickness fine sandy loam to loam over a finely structured friable red clay, calcareous from about 50 cm, grading to fine or medium grained alluvium.

L1 Shallow stony loam (Paralithic, Leptic Tenosol)
Shallow stony loam, often calcareous throughout or with depth, overlying weathering rock shallower than 50 cm.

M1 Alluvial loam (Orthic Tenosol)
Very thick loam with variable gritty or more-clayey lenses, formed over recent alluvium.

M3 Deep gravelly soil (Gravelly Kandosol-Tenoso)
Deep uniform loamy alluvial soils with at least 50% gravel in the major part of the profile.

Further information: DEWNR Soil and Land Program