HLU Hallelujah Hills Land System

Area: 81.3 km^2

Landscape: Steep low hills and undulating rises with very shallow rocky soils. The hills are mostly north-west to south east trending ridges and are broadly dissected by Burra Creek tributaries.

Annual rainfall: 275 – 410 mm average

Geology: The land system straddles a fold of Proterozoic Adelaide Geosyncline rocks. From the centre outwards the Formations encountered include: Wilyerpa Formation, Appila Tillite, Saddleworth Formation Woolshed Flat Shale and Skillogalee Dolomite. Other minor strata also occur.

Main soils:
L1 (39%) Shallow soil on rock (Rocky Rudosol-Tenosol)
A2 (29%) Calcareous loam on rock (Paralithic Calcarosol)
A3 (11%) Deep moderately calcareous loam (Calcic Calcarosol)

Minor soils:
A4 (7%) Deep (rubbly) calcareous loam (Hypercalcic-Lithocalcic Calcarosol)
C2 (7%) Gradational loam on rock (Shallow Red Dermosol-Kandosol-Calcarosol)
M1 (4%) Deep sandy loam (Brown-Grey-Red Kandosol-Tenosol)

Summary: The Hallelujah Hills land system consists of Steep low hills and undulating rises with very shallow rocky soils on Proterozoic sedimentary rocks. Shallow soils are dominant and are mostly calcareous, but non-calcareous soils occur on non-calcareous parent materials.

Soil Landscape Unit summary: Hallelujah Hills Land System (HLU)

SLU	% of area	Component	Main soils	Prop#	Notes
AAD	18.4	Steep low hills	L1	D	Bare steep low hills with much rock outcrop and very shallow, calcareous rocky sandy loam soils. Slopes range from 30% to 60% Relief is less than 90m. Non-arable. Main soils: Shallow stony soils on rock **- L1**.
ACB	1.5	Rolling rises	C2A2	D	Hills and rises with clay loamy gradational soils formed on limestone. **ACB** Rolling rises. Relief is 9-30m, slopes are 10-30%. **ACH** Rolling rises with eroded watercourses. Relief is 9-30m, slopes are 10-30%. Main soils: Gradational loam on rock -**C2** and Calcareous loam on rock **– A2**.
ACH	0.9	Rolling rises	C2A2	D	
ADH	8.0	Rolling rises Non arable	A2L1	V	Non-arable rocky rises formed on limestones and calc-siltstones such as Skillagollee Dolomite with very shallow loamy soils. **ADH** Rolling rises as above, with eroded watercourses. Relief is 9-30m, slopes are 10-30%. **ADh** Rolling rises as above with eroded watercourses and scalding. Relief is 9-30m, slopes are 10-30%. Main soils: *Non-arable areas:* Calcareous clay loam on rock – **A2** and Shallow stony soils on rock **- L1** *Arable areas:* Calcareous clay loam on rock – **A2** and
		Arable	A2C2	L	
ADh	3.2	Rolling rises	A2L1	D	

					gradational red clay-loam over clay (Red clayey pedaric Dermosols) - **C2**.
AKA	8.7	Undulating rises	L1A2	D	Hills and rises with very shallow rocky calcareous soils formed on coarse-grained rocks of the Pre-Cambrian Burra Group including the Rhynie Sandstone and Skillagollee Dolomite. **AKA** Undulating rises. Relief is less than 30m, slopes are 3-10%. **AKB** Rolling rises. Relief is 9-30m, slopes are 10-30%. **AKD** Steep low hills. Relief is less than 90m, slopes are 30-60%. **AKH** Rolling rises with eroded watercourses. Relief is 9-30m, slopes are 10-30%. Main soils: Shallow stony soils on rock **- L1** and Calcareous loam on rock – **A2**.
AKB	9.7	Rolling rises	L1A2	D	
AKD	12.0	Steep low hills	L1A2	D	
AKH	2.8	Rolling rises	L1A2	D	
EHB	8.5	Rise	A2C2	E	Rises and pediments on calcareous siltstones and limestones. **EHB** Gently sloping rises and fans. Slopes: 1-3%, relief: 9-30m. **EHE** Rises and creek flats. **EHH** Undulating rises and fans. Slopes are 3-10%, relief is less than 30m. Gullying affects up to 20% of land. Main soils: *Rises:* Calcareous clay loam on rock – **A2**, gradational red clay-loam over clay - **C2** and Shallow stony soils on rock **- L1**. *Fans and flats:* Deep moderately calcareous loam - **A3** and Deep (rubbly) calcareous sandy loam **-A4**.
		Fan	A3A4	E	
EHE	0.6	Rise	A2L1	E	
		Flat	A3A4	E	
EHH	1.0	Rise	A2C2	E	
		Fan	A3A4	E	
EVH	6.8	Rise	A2C2	E	Rises and fans complex with shallow calcareous soils formed on fine-grained calcareous rocks and deep gradational soils. **EHH** Undulating rises and fans. Slopes are 3-10%, relief is less than 30m. Gullying affects up to 20% of land. **EVm** Undulating rises with 5-10% of land is gullied, and up to 50% is scalded. Slopes are 3-10%, relief is less than 9-30m. Main soils: *Rises:* Calcareous clay loam on rock – **A2** and Gradational loam on rock -**C2**. *Fans:* Deep moderately calcareous loam - **A3** and Deep (rubbly) calcareous sandy loam **-A4**.
		Fan	A3A4	E	
EVm	4.1	Rise	A2C2	E	
		Fan	A3A4	E	
KLB	5.8	Fan	A4A3	D	Gently undulating fans with clay loamy calcareous soils. Slopes are 1-3%, relief is less than 9m. Main soils: Deep (rubbly) calcareous sandy loam **-A4** and Deep moderately calcareous loam - **A3**.
KQm	1.0	Fan	A3A4	D	Fans with mostly calcareous gradational soils. Over 50% of land is scalded and up to 20% is gullied. Soils are moderately saline throughout the profiles. Main soils: Deep moderately calcareous loam - **A3** and Deep (rubbly) calcareous sandy loam **-A4**.
XAB	4.1	Creek flat	M1 A3	D	Creek flats with a range of alluvial soils. **XAB** Creek flat with mixed alluvium. Eroded watercourses with stable banks. **XAZ** Creek flat. Soil surfaces are scalded with up to 50% of land affected. Main soils: Deep alluvial loam - **M1** and Deep moderately calcareous sandy loam - **A3**.
XAZ	2.9	Creek flat	M1 A3	D	

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**) **OR** Shallow stony loam (Calcareous, Paralithic, Leptic Tenosol) (**L1**)

A3 Deep moderately calcareous (sandy) loam (Calcic Calcarosol)
Calcareous (sandy) loam topsoil grading into loamy-clay loamy subsoil without a significant CO_3 build-up 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 build-up in the subsoil. Often rubbly. Soil usually >120 cm in depth.

C2 Gradational loam on rock (Calcic / Hypercalcic Red Dermosol)
Loam to clay loam grading to a friable red clay with soft Class I carbonate within 50 cm, grading to weathering rock within 100 cm.

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.

Further information: DEWNR Soil and Land Program