

OLA Oladdie Hills Land System

Area:	233.2 km ²								
Landscape:	Rocky, often very steep, ranges, mainly east of Eurelia								
Annual rainfall:	280 – 365 mm average								
Geology:	Tapley Hill Formation calc-siltstones, Saddleworth Formation siltstone and dolomite and Appila Tillite.								
Topography:	Steep, strongly dissected low hills and rises formed on siltstones and calc-siltstone, whereas the tillite forms a more massive central "core" of rounded rocky hills. The eastern edge of the range is a very steep fault scarp which abuts the gently sloping plains of the Johnburg and Orroroo Land Systems. The western edge is characterised by lower rises and pediments. Most of the country is too steep, rocky and rough for any agricultural use other than grazing. Access is difficult due to steep slopes and narrow ridges and valley floors. Calcareous basement rocks often are associated with highly erodible silty soils which occur on sheet eroded and scalded, broad inter-montane valleys.								
Elevation:	The range rises to 720 m at the highest point, from the eastern plains which extend up to 450 m asl. Most of the range is around 600 m.								
Relief:	270 m on the eastern edge, around 30 m on the western side, where it merges with the Eurelia Land System								
Typical soils:	Shallow gravelly calcareous loam and silty loam soils (Rudosols, Tenosols or Calcarosols) occur on steeply dissected country over calcareous basement rock. Shallow red loam to clay soils (Dermosols, Kandosols, Tenosols) occur in rolling hilly country on fine grained rocks such Ulupa siltstone (Pwu).								
Main soils:	<table> <tr> <td>L1 (33%) Shallow soil on rock</td> <td>(Rocky Rudosol-Tenosol)</td> </tr> <tr> <td>RR (21%) Bare rock</td> <td></td> </tr> <tr> <td>A2 (17%) Calcareous loam on rock</td> <td>(Paralithic Calcarosol)</td> </tr> <tr> <td>D1 (15%) Loam over clay on rock</td> <td>(Shallow Calcic-Hypercalcic Red Chromosol)</td> </tr> </table>	L1 (33%) Shallow soil on rock	(Rocky Rudosol-Tenosol)	RR (21%) Bare rock		A2 (17%) Calcareous loam on rock	(Paralithic Calcarosol)	D1 (15%) Loam over clay on rock	(Shallow Calcic-Hypercalcic Red Chromosol)
L1 (33%) Shallow soil on rock	(Rocky Rudosol-Tenosol)								
RR (21%) Bare rock									
A2 (17%) Calcareous loam on rock	(Paralithic Calcarosol)								
D1 (15%) Loam over clay on rock	(Shallow Calcic-Hypercalcic Red Chromosol)								
Minor soils:	<table> <tr> <td>C2 (6%) Gradational loam on rock</td> <td>(Shallow Red Dermosol-Kandosol-Calcarosol)</td> </tr> <tr> <td>D2 (4%) Loam over red clay</td> <td>(Calcic-Hypercalcic Red Chromosol-Sodosol)</td> </tr> </table>	C2 (6%) Gradational loam on rock	(Shallow Red Dermosol-Kandosol-Calcarosol)	D2 (4%) Loam over red clay	(Calcic-Hypercalcic Red Chromosol-Sodosol)				
C2 (6%) Gradational loam on rock	(Shallow Red Dermosol-Kandosol-Calcarosol)								
D2 (4%) Loam over red clay	(Calcic-Hypercalcic Red Chromosol-Sodosol)								
Summary:	The Oladdie Hills Land System is a range of steep, dissected hills formed on Pre-Cambrian siltstones and massive tillites, forming a steep scarp against the Johnburg Land System to the East and the Eurelia Land System to the west. Soils are mostly shallow, often calcareous, with gradational texture profiles. Shallow red soils occur on fine grained rocks in places.								



Soil Landscape Unit summary: Oladdie Land System (OLA)

SLU	% of area	Component	Main soils	Prop#	Notes
AAH	0.2	Rolling rises	L1	D	Rolling rises with much rock outcrop and very shallow, calcareous rocky sandy loam soils. Relief is less than 30m, slope steepness is between 10 and 30%. Watercourses are eroded and incised. Main soils: <u>Shallow stony soils on rock</u> - L1 . Non-arable.
ABB	1.6	Rolling rises	L1RR	D	Rises with linear rocky quartzite outcrops and shallow rocky soils on interbedded fine-grained rocks. ABB Rolling rises. Relief is 9-30m, slopes are 10-30%. ABC Rolling low hills. Relief is 30-90m, slopes are 3-10%. ABE Steep hills. Relief is 90-300m, slopes are 30-50%. ABH Rolling rises with eroded watercourses. Relief is 9-30m, slopes are 10-30%. ABI Rolling low hills with eroded watercourses. Relief is 30-90m, slopes are 3-10%. Main soils: <u>Shallow stony soils on rock</u> - L1 . <u>Rock outcrop - RR</u> is common.
ABC	1.2	Rolling low hills	L1RR	D	
ABE	3.3	Steep hills	L1RR	D	
ABH	2.6	Rolling rises	L1RR	D	
ABI	1.4	Rolling low hills	L1RR	D	Hills and rises with shallow red texture contrast and clay loamy gradational soils formed on limestone. ACB Rolling rises. Relief is 9-30m, slopes are 10-30%. ACC Rolling low hills. Relief is 30-90m, slopes are 10-30%. ACD Steep low hills. Relief is 30-90m, slopes are 30-50%. ACE Steep hills; soils are shallow and rocky, with rock outcrop common. Relief is 90-300m, slopes are 30-50%. ACH Rolling rises with eroded watercourses. Relief is 9-30m, slopes are 10-30%. ACI Rolling low hills with gullying affecting more than 20% of land. Relief is 30-90m, slopes are 10-30%. ACJ Steep low hills with gullying affecting more than 20% of land. Soils are shallow and rocky, with rock outcrop common. Relief is 30-90m, slopes are 30-50%. ACK Steep hills with gullying affecting more than 20% of land. Soils are shallow and rocky, with rock outcrop common. Relief is 90-300m, slopes are 30-50%. Main soils: <u>Clay loam over pedaric red clay on rock</u> - D1 and <u>Shallow stony soils on rock</u> - L1 . <u>Rock outcrop - RR</u> is common on steeper landscapes.
ACB	0.4	Rolling rises	D1L1	D	
ACC	4.4	Rolling low hills	D1L1	D	
ACD	1.2	Steep low hills	D1L1RR	D	
ACE	1.5	Steep hills	D1L1RR	D	
ACH	1.8	Rolling rises	D1L1	D	
ACI	7.3	Rolling hills	D1L1	D	
ACJ	9.1	Steep low hills	D1L1RR	D	
ACK	8.8	Steep hills	D1L1RR	D	
ADB	3.0	Rolling rises	L1	D	
ADD	1.7	Steep low hills	L1RR	D	
ADH	2.4	Rolling rises	L1	D	
ADh	1.5	Rolling rises	L1	D	
ADI	4.9	Rolling low hills	L1	D	
ADi	0.9	Rolling low hills	L1	D	
ADJ	5.1	Steep low hills	L1RR	D	
ADj	6.0	Steep low hills	L1RR	D	
ADL	4.0	Very steep hills	L1RR	D	



ADP	0.1	Steep low hills	L1RR	D	<p>scalding. Relief is 9-30m, slopes are 10-30% ADI Rolling low hills with eroded watercourses. Relief is 30-90m, slopes are 10-30%. ADi Rolling low hills with eroded watercourses and scalding. Relief is 30-90m, slopes are 10-30%. ADJ Steep low hills with eroded watercourses. Relief is 30-90m, slopes are 30-50%. ADj Steep low hills with eroded watercourses and scalding. Relief is 30-90m, slopes are 30-50%. ADL Very steep hills with scalding and sheet erosion. Relief is more than 90m, slopes are more than 60%. ADP Steep low hills with scalding and sheet erosion. Relief is 30-90m, slopes are 30-50%.</p> <p>Main soils: calcareous loamy, <u>Shallow stony soils on rock</u> - L1; <u>gradational red clay-loam over clay</u> (Red clayey pedaric Dermosols) - C2 and <u>Calcareous clay loam on rock</u> - A2. Non-arable, limited pastoral use.</p>
AKB	0.1	Rolling rises	L1	D	<p>Rolling rises with very shallow rocky calcareous soils formed on coarse-grained rocks of the Pre-Cambrian Burra Group including the Rhyne Sandstone and Skillagollee Dolomite. Relief is 9-30m, slopes are 10-30%.</p> <p>Main soils: <u>Shallow stony soils on rock</u> - L1.</p>
API	1.2	Rolling low hills	L1D1	D	<p>Rolling low hills with eroded watercourses on coarse-grained basement rocks particularly Appilla Tillite Formation. Gullyng affects more than 20% of land. Non arable. Relief is 30-90m, slopes are 10-30%.</p> <p>Main soils: <u>Shallow stony soils on rock</u> - L1 and <u>Loam over pedaric red clay on rock</u> - D1.</p>
DGC	0.3	Undulating pediments	D2D1	D	<p>Rises and pediments with shallow red duplex soils over Brachina formation shale. The soils have sandy clay loam surface textures.</p> <p>DGC Undulating pediments. Relief is less than 9m, slopes are 3-10%. DGH Undulating rises with over 20% of land gullied. Relief is 9-30m, slopes are 3-10%. DGI Rolling rises with over 20% of land gullied. Relief is 9-30m, slopes are 10-30%.</p> <p>Main soils: <u>Sandy Clay Loam over red clay</u> - D2 and <u>Sandy Clay loam over pedaric red clay on rock</u> - D1.</p>
DGH	0.1	Undulating rises	D2D1	D	
DGI	1.1	Rolling rises	D2D1	D	
DNm	0.8	Undulating rises	D2D1	D	<p>Undulating rises with shallow texture contrast soils formed on fine-grained rocks, typically Brachina Shale Formation. The soils have clay loam surface textures. Gullyng affects 10-20% of land and scalding occurs on 5-50%. Relief is 9-30m, slopes are 3-10%.</p> <p>Main soils: <u>Loam over red clay</u> - D2 and <u>Clay loam over pedaric red clay on rock</u> - D1. Associated soils include <u>Red cracking clay</u> - E2.</p>
DQI	1.1	Gently sloping pediments	D1A4B6	D	<p>Gently sloping pediments with pale brown silty, sodic texture contrast soils on rock. 10-50% of land is scalded and over 20% is gullied. Slopes are 1-3%, relief is less than 9m.</p>



					Main soils: <u>Sandy Loam over clay on rock</u> - D1 , <u>Deep (rubby) calcareous sandy loam</u> - A4 and <u>Shallow sandy loam over red-brown clay on calcrete</u> - B6 .
EDI	0.8	Rolling rises	C1L1	D	Rolling rises with red sandy to loamy surfaced gradational soils on quartzites and siltstones. Over 20% of land is gullied and 0-5% is scalded. Relief is 9-30m, slopes are 10-30%. Main soils: <u>Gradational sandy loam</u> - C1 and <u>Shallow stony soils on rock</u> - L1 .
EHG	1.0	Gently undulating valley floor	D7L1A2	D	Rises and pediments on calcareous siltstones and limestones such as those of the Tapley Hill Formation, Wonoka Formation and the ABC Range Quartzite of the Wilpena Group. The soil-landscape units are also associated with Bunyeroo Formation shales with some outwash contribution from calcareous Wonoka Formation calc-siltstones. EHG Gently undulating valley floor with shallow calcareous soils on Nucaleena Formation Limestone. Drainage lines are incised and gullying is common. Relief < 9m, slopes 1-3%. EHH Undulating pediments and rocky rises with moderately shallow soils on calc-siltstone and limestone. Slopes are 3-10%, relief < 30m. Gullying affects up to 20% of land. EHI Pediments and rocky rises; 10-20% of land is affected by gullying; scalding affects around 5%. <i>Rocky Rises:</i> Scalding and sheet erosion affects 20-50% of land, especially in proximity to severely gullied drainage lines. Relief is 9-30m, slopes are 10-30%. <i>Pediments:</i> Gently sloping plains with slightly deeper, silty calcareous soils over calc-siltstones. Relief is less than 9m, slopes are 3-10%. EHm Undulating low rises on calcareous basement rock with deeper calcareous soils on lower slopes & drainage depressions. Scalding is moderate to severe on lower slopes. Relief is less than 30m, slopes are 3-10%. Severely scalded (40-50% of land affected) and gullied (20% of land affected). Main soils: <i>Rises, crests:</i> <u>Calcareous loam on rock</u> – A2. <i>Lower slopes:</i> <u>Calcareous loam on rock</u> – A2 and <u>Shallow stony soils on rock</u> - L1. EHv Gently sloping pediments and rocky rises. Pediments have more than 50% scalded land and 10-20% gullied. Slopes are 1-3%. Rises have 5-10% gullied land and over 50% scalded. Main soils: <u>Loam over poorly structured clay on rock</u> - D7 , <u>Shallow stony soils on rock</u> - L1 and <u>Calcareous loam on rock</u> – A2 . Some cropping occurs where shallow rock and gullies can be avoided. Poor structure in D7 subsoils restricts root growth and low moisture storage in shallow soils limits productivity. Calcareous soils will affect balanced nutrient availability for some crops.
EHH	1.3	Undulating pediments	A2	V	
		Rocky outcrops	RR	L	
EHI	2.6	Rolling rises	A2L1	V	
		Pediments	A2	C	
EHm	3.2	Undulating rises	A2L1	V	
		Undulating pediments	A2	C	
EHv	4.5	Pediments	A2	V	
		Rocky rises	A2L1	C	
ELI	1.1	Rolling rises	L1C2B2	D	



					<u>clay-loam over clay (Red clayey pedaric Dermosols) - C2</u> and <u>Shallow calcareous loam on calcrete - B2</u> .
EWI	0.2	Rolling rises	L1C2RR	D	Rolling rises with shallow red, uniform or gradational texture soils formed on tillite, siltstone or quartzite. Rocky outcrops are common. Ironstone gravelly sometimes. More than 20% of land is gullied and is therefore non-arable. Relief is 9-30m, Slopes are 10-30%. Main soils: <u>Shallow stony soils on rock - L1</u> and <u>Gradational loam on rock - C2</u> . Bare rock – RR is common.
EZH	0.7	Undulating rises	A2A5B2	V	Undulating rises with rocky outcrops with mostly shallow calcareous soils on weathered siltstones of the Tapley Hill Formation and the Tarowie Siltstone Slopes are 3-10%, relief is less than 30m. Gullying affects 10-20% of land, scalding affects around 5%. Main soils: <i>Rises:</i> <u>Calcareous loam on rock – A2</u> , <u>Rubby calcareous loam on clay - A5</u> and <u>Shallow calcareous loam on calcrete - B2</u> . <i>Rocky outcrops:</i> <u>Bare rock – RR</u> .
		Rocky outcrops	RR	C	
JKM	0.4	Undulating pediments	D1A3A5	D	Undulating pediments with mostly sandy loam surfaced red duplex soils and calcareous gradational soils. 10-20% of land is gullied and 10-50% is scalded. Soils are moderately saline throughout with 10-50% highly saline (magnesia) patches. Main soils: <u>Sandy loam over clay on rock- D1</u> , <u>Deep moderately calcareous sandy loam - A3</u> and <u>Rubby calcareous loam on clay - A5</u> .
JXB	0.6	Gently undulating pediments	D2	V	Pediments with texture contrast soils in complex with rocky rises. Most soils have clay-loam surfaces. JXB Gently undulating pediments in complex with rocky rises. Slopes are 1-3%.
		Rocky rises	D1	C	
JXF	0.1	Plains	D2	V	JXF Plains in complex with rocky rises. Gullying affects 10-20% of land and 0-5% is scalded. JXG Gently undulating pediments in complex with rocky rises. Gullying affects 10-20% of land. Slopes are 1-3%. JXH Undulating pediments in complex with rocky rises. Slopes are 3-10%. Gullying affects 10-20% of land. JXI Gently undulating pediments in complex with rocky rises. Gullying affects 10-20% of land on pediments, and less than 5% on rises. Scalding affects 10-50% of pediments. Rocky rises have less than 5% scalded land. Slopes are 1-3%.
		Rocky rises	D1	C	
JXG	2.7	Gently undulating pediments	D2	V	
		Rocky rises	D1	C	
JXH	1.1	Undulating pediments	D2	V	
		Rocky rises	D1	C	
JXI	0.5	Gently undulating pediments	D2	V	Main soils on pediments: <u>Loam over red clay - D2</u> , <u>Loam over clay on rock- D1</u> soils are associated with rocky rises.
		Rocky rises	D1	C	

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 CO₃ buildup in the subsoil (<20% CO₃ 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 CO₃ buildup in the subsoil. Often rubbly. Soil usually >120 cm in depth
- A5** Rubbly calcareous loamy sand on clay (Supracalcic-Lithocalcic Calcarosol on clay)
Calcareous loamy sand topsoil grading into loamy-clay loamy subsoil on a clayey substrate. Usually rubbly. Clayey substrate occurs at >60 cm and <120 cm.
- 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.
- B6** Shallow loam over red-brown clay on calcrete (Petrocalcic Red Chromosol-Kandosol)
Shallow texture contrast or gradational soil. Usually hard setting loamy to clay loamy (sometimes sandy) topsoil over a red clayey (sometimes clay loamy) subsoil on calcrete. Surface soil can be slightly calcareous.
- 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.
- D1** Loam over red clay on rock (Hypercalcic / Calcic, Red Chromosol / Sodosol)
Medium thickness hard gravelly loam over red clay, friable and finely structured, calcareous with depth, grading to weathering basement rock within 100 cm.
- D2** Hard loam over red clay (Calcic / Hypercalcic, Red Chromosol)
Hard setting sandy loam to clay loam (with variable quartzite stones) abruptly overlying a well structured red clay with soft Class I carbonate at depth.
- D7** Loam over dispersive red clay on rock (Calcic / Hypercalcic, Red Sodosol)
Medium to thick hard sandy loam to clay loam sharply overlying a coarsely structured dispersive red clay, calcareous with depth, grading to highly weathered kaolinized siltstone.
- L1** Shallow stony loam (Paralithic, Leptic Tenosol)
Shallow stony loam, often calcareous throughout or with depth, overlying weathering rock shallower than 50 cm.
- RR** Bare rock.

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

