HAD Hammatt Dam Land System

Rocky rises with gently undulating pediments and plains

Area: 164.6 km^2

Landscape: Rises and pediments south west and west of Yunta. The northern part is largely stony calcareous rocky rises with associated calcareous pediments. The southern portion is dominated by deeply weathered clayey substrates on which silcrete and ironstone gravelly red soils occur.

Annual rainfall: 220 – 240 mm average

Geology: Wonoka Formation Limestones and Ulupa Siltstones outcrop over the whole land system. Additionally, Umberatana Group siltstones, and Burra Group siltstones are present in the south. However, only about 25% of the landscape is underlain directly by fresh weathering rock. Deep weathering profiles characterize over 40% of the area, with the remaining third covered by unconsolidated alluvial sediments. The land surface is partly calcreted in the south.

Main soils:

A5	Rubbly calcareous sandy loam to clay loam on clay
A6	Gradational calcareous clay loam
C1	Gradational sandy loam
D4	Clay loam to loam over pedaric red clay

Minor soils:

A2	Shallow calcareous loam
A3	Deep moderately calcareous sandy loam to loam
A4	Deep (rubbly) calcareous sandy loam
A8	Gypseous calcareous loam
B2	Shallow calcareous loam on calcrete
C2	Gradational loam on rock
C3	Friable gradational sandy clay loam
D1	Loam to clay loam over friable red clay on rock
D6	Ironstone gravelly sandy loam over red clay
E2	Red cracking clay
L1	Shallow stony loam
M2	Deep friable gradational clay loam
M4	Hard gradational sandy clay loam
RR	Bare rock

Summary: The Hammatt Dam Land System consists of low rises of limestones and calc-siltstones and adjacent pediments. Calcareous and red pedaric texture contrast soils predominate. The southern part of the land system has deeply weathered substrate materials and soils often have ironstone and silcrete gravels.

Soil Landscape Unit summary: 44 Soil Landscape Units (SLUs) mapped in the Hammatt Dam Land System:

SLU	% of area	Component	Main soils	Prop#	Notes
AAA	2.4	Undulating rises	L1RRA2	D	Rises with shallow rocky calcareous soils formed on fine grained rocks. Rock outcrops are common. **AAA** Undulating rises with shallow stony soils and rock outcrop. Relief is less than 30m, slopes are 3-10%. **AAM** Undulating rises as above with 10-50% scalding. Main soils: shallow stony loam **- L1**, rock outcrop - **RR** and shallow calcareous loam - **A2**.
AAM	1.3	Undulating rises	L1RRA2	D	
ADA	4.5	Undulating rises	L1RRD1	D	Non-arable rocky rises (relief to 30 m) formed on limestones and calc-siltstones including Skillogalee Dolomite with very shallow loamy soils. **ADA** Undulating rises with slopes of 3-10%. **ADB** Rolling rises with slopes of 10-20%. **ADM** Undulating rises with scalding and sheet erosion. Slopes are 3-10%. Main soils: shallow stony loam **- L1**, rock outcrop - **RR** and loam over friable red clay on rock - **D1**, with shallow calcareous loam - **A2** and gradational loam on rock - **C2**.
ADB	0.8	Rolling rises	L1RRD1	D	
ADM	2.0	Undulating rises	L1RRD1	D	
AEG	2.5	Undulating rises	L1RR	D	Non-arable rocky undulating rises with slopes of 3-10% and relief of less than 30 m. 10-20% of land has eroded gullies. Main soils: shallow stony loam - **L1** and rock outcrop - **RR**, with shallow calcareous loam on calcrete - **B2**, loam over friable red clay on rock - **D1**, shallow calcareous loam - **A2**.
AYM	2.3	Undulating rises	A2L1RR	D	Undulating rocky rises on fine grained rocks, especially siltstones of the Tapley Hill Formation. Slopes are 3-10% and relief is less than 30 m. 5-10% of the land is scalded. Main soils: Shallow calcareous loam - **A2**, shallow stony loam **- L1** and rock outcrop - **RR**.
DaV	3.3	Gently sloping plains	D1	D	Gently sloping (1-3% slope) slightly scalded plains. Main soils: clay loam over friable red clay on rock - **D1**, with clay loam over pedaric red clay - **D4** and rubbly calcareous clay loam on clay - **A5**.
EVV	3.1	Gently undulating rises	A2	V	Gently undulating rises with slopes of 1-3% and rock outcrops. 10-50% of the land is scalded. Main soils: shallow calcareous loam - **A2**, with rock outcrop - **RR**, rubbly calcareous loam on clay - **A5** and shallow calcareous loam on calcrete - **B2**.
EZC	0.2	Undulating rises	A2A5B2	V	Rises to 30 m high formed on Wonoka Formation limestones and calcareous shale and siltstones. Rock outcrop is extensive. **EZC** Undulating rises with slopes of 3-10%. **EZD** Rolling rises with slopes of 10-30%. **EZV** Undulating rises: slopes of 3-10% and 5-10% scalding. Main soils: ***Rises:*** shallow calcareous loam on rock **- A2**, rubbly calcareous loam on clay - **A5** and shallow calcareous loam on calcrete - **B2**. ***Rocky outcrops:*** rock outcrop - **RR**, with shallow stony loam - **L1**, and shallow calcareous loam on calcrete - **B2**.
		Rocky outcrops	RR	C	
EZD	0.7	Rolling rises	A2A5B2	V	
		Rocky outcrops	RR	C	
EZV	1.3	Undulating rises	A2A5B2	V	
		Rocky outcrops	RR	C	
H5E	0.3	Drainage depressions	D4	D	Plains and drainage depressions formed on unconsolidated sediments or deeply weathered rock. **H5E** Drainage depressions underlain by deeply weathered materials. Ironstone or silcrete gravels are common. **H5o** Plains with moderately gullied drainage lines. Soils are saline with 10-50% bare "magnesia" patches. **H5y** Drainage depressions, 10-20% gullied, with more than 50% of creek flats scalded. Main soils: loam over pedaric red clay - **D4**, with
H5o	1.0	Plains	D4	D	
H5y	3.5	Drainage depressions	D4	D	

					gradational calcareous clay loam - **A6** and ironstone gravelly sandy loam over red clay - **D6**.
ItB	5.2	Gently undulating rises	A5C1	D	Rises formed on deeply weathered material, often with surface ironstone or silcrete gravel. Relief less than 30 m. **ItB** Gently undulating rises with slopes of 1-3%. **ItC** Undulating rises with slopes of 3-10%. **Itl** Gently undulating rises with slopes of 1-3%. Silcrete boulders are common along the north-western edge. Moderately scalded (10-50%) and gullied (5-10%). **Itm** Undulating rises with slopes of 3-10%. Moderately scalded (5-10%) and gullied (10-20%). **Itn** Rolling rises with slopes of 10-20%. Moderately scalded (5-10%) and gullied. (10-20%). Main soils: rubbly calcareous sandy loam on clay - **A5** and gradational sandy loam - **C1**, with gradational calcareous clay loam - **A6** and gravelly sandy loam over red clay - **D6**.
ItC	0.8	Undulating rises	A5C1	D	
Itl	22.3	Gently undulating rises	A5C1	D	
Itm	1.6	Undulating rises	A5C1	D	
Itn	0.3	Rolling rises	A5C1	D	
IvB	0.3	Gently undulating rises	A5C3E2	D	Rises formed on deeply weathered material, often with surface ironstone or silcrete gravel. Subsoils may be gypseous. Relief less than 30 m. **IvB** Gently undulating rises with slopes of 1-3%. **IvV** Gently undulating rises with slopes of 1-3%, and 10-50% scalded. **IvW** Undulating rises as above. Mod. scalded (10-50%). Relief is less than 30m, slopes are 3-10%. Main soils: rubbly calcareous clay loam on clay - **A5**, friable gradational sandy clay loam - **C3** and red cracking clay - **E2**, with gravelly sandy loam over red clay - **D6**, clay loam over pedaric red clay - **D4** and gradational calcareous clay loam - **A6**.
IvV	2.6	Gently undulating rises	A5C3E2	D	
IvW	4.0	Undulating rises	A5C3E2	D	
JPP	1.3	Plain	D4A5	D	Plains and flats formed on alluvium derived from basement rocks **JPP** Plains with moderately saline soils. **JPV** Gently sloping pediments, 5-10% scalded. Slopes: 1-3%. **JPu** Plains, moderately gullied, severely scalded. **JPyy** Creek flats. Severely gullied (over 20%) and scalded (10-50%). Main soils: loam over pedaric red clay - **D4** and rubbly calcareous loam on clay - **A5**, with deep moderately calcareous loam - **A3**, friable gradational clay loam - **C3**, deep (rubbly) calcareous sandy loam - **A4** and hard gradational sandy clay loam - **M4**.
JPV	3.1	Pediment	D4A5	D	
JPu	0.8	Flat	D4	D	
JPyy	1.9	Creek flat	D4A5	D	
KFA	1.1	Plains	A5	D	Pediments and plains formed on fine grained alluvium. **KFA** Plains with slopes of less than 1%. **KFFz** Plains with saline soils and 10-50% scalding. **KFV** Gently sloping pediments, 1-3% slope. 10-50% scalded. **KFl** Gently sloping pediments, 1-3% slope. Moderately gullied (10-20%) and 10-50% scalded. **KFyy** Drainage depressions. Severely gullied (over 20%) and scalded (over 50%). Main soils: rubbly calcareous clay loam on clay - **A5** with over clay loam over pedaric red clay - **D4**.
KFFz	0.5	Plains	A5	D	
KFV	0.8	Pediments	A5	D	
KFl	1.5	Pediments	A5	D	
KFyy	2.2	Drainage depressions	A5	D	
KOGz	0.9	Gently undulating pediments	A6A5	D	Pediments and drainage depressions formed on fine grained alluvium. Calcareous soils are dominant. **KOGz** Gently sloping pediments, 1-3% slope. Soils are saline, 10-50% of land is scalded. **KOl** Gently sloping pediments, 1-3% slope. Moderately gullied (10-20%) and 10-50% scalded.
KOl	3.9	Gently undulating pediments	A6A5	D	

KOo	0.9	Drainage depressions	A6A5	D	**KOo** Drainage depressions with gullied water course and severe scalding on creek flats. **KOrz** Undulating pediments, slopes 3-10%. Severely gullied (over 20%) and more than 50% scalded. Soils are saline. **KOV** Gently sloping pediments, 1-3% slope. 10-50% scalded. Main soils: gradational calcareous clay - **A6** and rubbly calcareous clay loam on clay - **A5**, with clay loam over pedaric red clay - **D4** and deep (rubbly) calcareous sandy loam - **A4**.
KOrz	1.8	Undulating pediments	A5	D	
KOV	1.8	Gently undulating pediments	A6A5	D	
KQV	1.2	Pediments	A5	V	Complex of gently sloping pediments and basement rock rises with mostly calcareous gradational soils. Slopes are 1-3% on pediments and 3-10% on rises. Main soils: rubbly calcareous clay loam on clay - **A5** with clay loam over pedaric red clay - **D4** on pediments, and shallow calcareous loam - **A2** with shallow calcareous loam on calcrete - **B2** and rock outcrop - **RR** on rises.
		Rises	A2	C	
KVB	3.8	Gently sloping plains	A6	D	Gently sloping plains and fans formed on calcareous outwash sediments derived from basement rock. More than 90% of soils are calcareous. **KVB** Gently sloping plains with slopes of 1-3%. **KVLz** Gently sloping plains with saline soils. Moderately gullied (10-20%) and 10-50% scalded. **KVV** Gently sloping fans with slopes of 1-3%. Moderately scalded. Main soils: gradational calcareous clay loam - **A6**, deep (rubbly) calcareous sandy loam **- A4** and deep moderately calcareous loam - **A3**, with rubbly calcareous clay loam on clay - **A5**, hard gradational sandy clay loam - **M4** and loam over pedaric red clay - **D4**.
KVLz	1.5	Gently sloping plains	A6	D	
KVV	0.6	Fans	A4A3	D	
KYB	3.0	Gently sloping plains	A4A3	D	Plains with slopes of 1-3% formed on medium textured alluvial sediments. **KYB** Gently sloping plains. **KYV** Gently sloping plains, 10-50% scalded. Main soils: deep (rubbly) calcareous sandy loam **- A4** and deep moderately calcareous sandy loam - **A3**.
KYV	0.5	Gently sloping plains	A4A3	D	
XOC	0.6	Swampy flats	M2A6 A8	D	Swampy flats with deep clay loamy soils, commonly calcareous or gypseous. Main soils: deep friable gradational clay loam - **M2**, gradational calcareous clay loam - **A6** and gypseous calcareous loam - **A8**.

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 Shallow calcareous loam (Paralithic, Hypercalcic / Lithocalcic Calcarosol)
Calcareous stony loam grading to soft or rubbly carbonate over weathering dolomite or calc-siltstone within 50 cm.

A3 Deep moderately calcareous sandy loam to loam (Regolithic, Calcic Calcarosol)
Calcareous loam to sandy loam grading to a loamy to clayey subsoil without a significant carbonate accumulation in the subsoil, grading to medium to fine grained alluvium.

A4 Deep (rubbly) calcareous loam (Regolithic, Hypercalcic / Lithocalcic Calcarosol)
Calcareous sandy loam to clay loam grading to a very highly calcareous sandy clay loam to light clay with variable rubble, continuing below 120 cm.

A5 Rubbly calcareous sandy loam to clay loam on clay (Regolithic, Hypercalcic / Lithocalcic Calcarosol)
Calcareous sandy loam to clay loam grading to a very highly calcareous rubbly sandy clay loam to light clay, over a clayey substrate deeper than 60 cm, but within 120 cm.

A6 Gradational calcareous clay loam (Pedal, Hypercalcic / Supracalcic Calcarosol)
Calcareous loam to clay loam grading to a well structured very highly calcareous (sometimes rubbly) clay, over a red clayey substrate within 120 cm.

A8 Gypseous calcareous loam (Regolithic, Gypsic Calcarosol)
Soft highly calcareous silty loam becoming more clayey with depth and with increasing soft and crystalline gypsum.

B2 Shallow calcareous loam on calcrete (Petrocalcic, Calcic / Lithocalcic Calcarosol)
Stony calcareous sandy loam to loam, often with a very highly calcareous more clayey subsoil, over sheet calcrete within 50 cm. This grades to rubbly carbonate over weathering basement rock within 150 cm.

C1 Gradational sandy loam (Hypercalcic, Red Kandosol)
Friable sandy to loamy topsoil grading to massive red-brown alkaline loamy to clay loamy subsoil, highly calcareous with depth, over alluvium.

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.

C3 Friable gradational sandy clay loam (Calcic / Hypercalcic Red Dermosol)
Loam to clay loam grading to a friable red clay with abundant soft Class I carbonate within 50 cm, overlying alluvium within 100 cm.

D1 Loam to clay loam over clay on rock (Hypercalcic / Calcic, Red Chromosol)
Medium thickness hard gravelly loam over a friable and finely structured red clay, calcareous with depth, grading to weathering basement rock within 100 cm.

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

D6 Ironstone gravelly loam over red clay (Ferric, Red Chromosol)
Ironstone gravelly sandy loam to loam abruptly overlying a red weakly to moderately well structured clay grading to highly weathered alluvial sediments.

E2 Red cracking clay (Epicalcareous, Epipedal, Red Vertosol)
Dark strongly structured clay grading to a well structured red calcareous medium to heavy clay continuing below 100 cm. Gypsum segregations often occur in subsoil.

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

M2 Deep friable gradational clay loam (Calcic, Red / Brown Dermosol)
Friable loam to light clay grading to a well structured red or brown dark clay, calcareous with depth, over alluvium.

M4 Hard gradational sandy clay loam (Calcic, Brown / Red Dermosol / Kandosol)
Hard setting sandy loam to sandy clay loam grading to a poorly structured to massive hard red or brown sandy clay to clay, weakly to moderately calcareous with depth, over alluvial sediments.

RR Rock outcrop.

Further information: DEWNR Soil and Land Program