CCF Chalk Cliffs Land System

Area: 67.6 km^2

Landscape: Dissected low plateau remnants with red clayey soils, often with surface gravel lags. "Patterned ground" is typically observed on air photos. These landscapes are older pediment or fan remnants. Small outliers occur in the centre of the Florieton sheet.

Annual rainfall: 220 – 240 mm average

Geology: Deeply weathered Tertiary to Pleistocene plateau remnants are extensive. Low rises formed on Tapley Hill Formation calc-siltstones are common also, which are surrounded by slope deposits. Grampus Quartzite and Pepuarta Tillite Formations outcrop in places.

Main soils:
D4 (30%) Loam over pedaric red clay (Pedaric Red Sodosol-Dermosol)
A4 (16%) Deep (rubbly) calcareous loam (Hypercalcic-Lithocalcic Calcarosol)
A2 (15%) Calcareous loam on rock (Paralithic Calcarosol)
C1 (15%) Gradational sandy loam (Calcic-Hypercalcic Kandosol-Calcarosol)

Minor soils:
A3 (9%) Deep moderately calcareous loam (Calcic Calcarosol)
A6 (6%) Gradational calcareous clay loamPedal (Hypercalcic-Lithocalcic Calcarosol on clayey subsoil)

Summary: The Chalk Cliffs Land System consists mostly of plateau remnants with clayey red soils with surface gravel lags. Low hard rock rises also occur with shallow calcareous soils and deeper gradational calcareous soils on slope deposits and fans.

Soil Landscape Unit summary: Chalk Cliffs Land System (CCF)

SLU	% of area	Component	Main soils	Prop#	Notes
A1h	16.1	Eroded scarp	D4A3	D	Eroded scarps with over 80% of soils formed on unconsolidated /deeply weathered materials (ie. eroded). Over 20% of soils have secondary carbonate, but are not calcareous throughout. **A1h** Rolling rises with eroded watercourses and scalding or sheet erosion. Relief is less than 30m, slope is 10-30%) **A1j** Steep rises with eroded watercourses and scalding or sheet erosion. Relief is less than 90m, slope is 30-60%) Main soils: Clay loam over pedaric red clay - **D4** and Deep moderately calcareous loam - **A3**.
A1j	1.0	Eroded scarp	D4A3	D	
Dal	1.9	Gentle slope	D4A2	D	Gently sloping plains and pediments with pedaric (crumbly), texture-contrast soils with calcareous subsoils over basement within 1 metre of the surface. Soils have clay-loamy surfaces. Moderately gullied (10-20%) and scalded (10-50%). Slopes are 1-3%, relief is less than 9m. Main soils: Clay loam over pedaric red clay - **D4** and Calcareous loam on rock – **A2**.
Dbl	0.6	Gentle slope	D4A2	D	Rises and fans. Most soils are formed over basement rock or have saprolite within one metre of the surface, are
Dbn	0.2	Rolling rises	D4A2	D	

					texture contrast and are calcareous in some part of the profile. Most soils have loam or clay-loam surfaces. Sodosols are dominant texture contrast soils, and are pedaric with more than 20% ferric soils. **Dbl** Gently undulating rises and fans Moderately gullied (10-20%) and scalded (10-50%). **Dbn** Rolling rises and fans. Moderately gullied (10-20%) and scalded (10-50%). Main soils: Clay loam over pedaric red clay - **D4** and Calcareous loam on rock – **A2**.
EFH	3.3	Undulating slope	A2A4	D	Rises and plains with moderately shallow soils overlying hard calcareous siltstones and limestones. **EFH** Undulating rises. More than 20% is gullied (severe). Relief is less than 30m, slopes are 3-10%. **EFl** Gently undulating rises, with up to 20% of land affected by gullying and with up to 50% of land scalded. Slopes are 1-3%, relief is less than 30m. Main soils: Calcareous loam on rock – **A2** and Deep (rubbly) calcareous sandy loam **-A4**.
EFl	2.0	Gentle slope	A2A4	D	
EHm	14.2	Slope	A2	V	Undulating pediments on calcareous siltstones and limestones. Depressions are associated features. Moderately gullied (10-20%) and scalded (10-50%). Relief is less than 30m, slopes are 3-10%. Main soils: ***Pediment slopes:*** Calcareous loam on rock – **A2**. ***Depressions:*** Deep moderately calcareous loam - **A3** and Deep (rubbly) calcareous sandy loam **-A4**.
		Depression	A3A4	L	
FIZz	0.9	Plateau	J1D6	D	Plateau with mostly ironstone gravelly soils. Over 50% of soils have alkaline clayey subsoils. Over 10% are texture contrast soils on saprolite-rock at less 1m with or without ironstone gravel. Moderately scalded (10-50%) Main soils: Ironstone texture contrast soil with calcareous subsoil – **J1** and Gradational calcareous clay - **A6**.
H1Bz	29.7	Flat	C1D4	D	Flat with soils formed in deeply weathered rock or clayey sediments. Most soils are not calcareous throughout and have loamy surfaces. However, more than 20% are gradational and calcareous throughout. Highly scalded (10-50%) and moderately saline throughout soil profiles. Main soils: Gradational sandy loam - **C1** and Loam over pedaric red clay - **D4**.
H5Bz	7.9	Gentle slope	D4	D	Gentle slopes with red clayey texture contrast soils formed on unconsolidated sediments or deeply weathered rock. Ironstone or silcrete gravels are common. Highly scalded (10-50%) and moderately saline throughout soil profiles. Main soils: Loam over pedaric red clay - **D4**.
IVV	4.9	Rise	A6A4	D	Gently undulating rises with soils formed on unconsolidated clay sediments (eg.Blanchetown Clay Formation) or highly weathered rock. Soils have non-sandy surfaces, and are gradational calcareous soils (Calcarosols). More than 30% are highly calcareous with clay subsoil and over 30% are texture contrast with clay subsoil Moderately saline and minor scalding (0-5%)

					Slopes are 1-3%, relief is less than 30m. Main soils: Gradational calcareous clay loam - **A6** and Deep (rubbly) calcareous sandy loam **-A4**.
IxV	1.7	Gently undulating	A5A4	V	Gently undulating rises and flats with soils formed on unconsolidated clay sediments (eg. Blanchetown Clay Formation) or highly weathered rock. Soils have non-sandy surfaces, and are gradational calcareous soils (Calcarosols). Over 50% gradational calcareous soils with clay subsoil on deeply weathered materials; with or without ironstone gravel and over 20% texture contrast soils. Moderately saline and minor scalding (0-5%) Main soils: ***Rises:*** Rubbly calcareous loam on clay - **A5** and Deep (rubbly) calcareous sandy loam **-A4**. ***Flats:*** Clay loam over pedaric red clay - **D4**.
		Flat	D4	C	
JPU	2.4	Flat	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). **JPU** Flats, 10-50% scalded. **JPp** Plains. Severely scalded (over 50%). **JPq** Gently sloping fans. Severely scalded (over 50%). Slopes are 1-3%, relief is less than 9m. Main soils: Clay loam over pedaric red clay - **D4**, Gradational calcareous clay loam - **A6** and Deep moderately calcareous loam - **A3**.
JPp	4.8	Flat	D4A6	D	
JPq	1.3	Gentle slope	D4A6	D	
JZv	1.8	Fan	D4A3	V	Gently undulating fan-basement rock complex with gently sloping fans with red texture contrast soils and 20-30% rocky rises with shallow texture contrast soils. 10-50% of land on pediments is scalded, and gullying affects 10-20%. Slopes are 1-3% on pediments and 3-10% on rises. Main soils: ***Fans:*** Clay loam over pedaric red clay - **D4** and Deep moderately calcareous loam - **A3**. ***Rises:*** Calcareous loam on rock – **A2**.
		Rise	A2	L	
KLB	0.3	Fan	A3A4	D	Gently undulating pediments with clay loamy calcareous soils. Slopes are 1-3%, relief is less than 9m. Main soils: Deep moderately calcareous loam - **A3** and Deep (rubbly) calcareous sandy loam **-A4**.
QjU	5.0	Rise	B2	E	Majority of soils are shallow over calcrete and over 40% are Calcarosols and over 40% are non-Calcarosols. Main soils: ***Rises:*** Shallow calcareous loam on calcrete - **B2**. ***Flats:*** Clay loam over pedaric red clay - **D4** and Deep moderately calcareous loam - **A3**.
		Flat	D4A3	E	

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

- D Dominant in extent (>90% of SLU)
- V Very extensive in extent (60–90% of SLU)
- E Extensive in extent (30–60% of SLU)
- C Common in extent (20–30% of SLU)
- L Limited in extent (10–20% 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.

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.

A6 Gradational calcareous clay loam (Pedal Hypercalcic-Lithocalcic Calcarosol on clayey subsoil)
Calcareous loams to clay loams grading into brown-red clay. Often rubbly.

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.

C1 Gradational sandy loam (Calcic-Hypercalcic Kandosol-Calcarosol)
Friable sandy to loamy topsoil grading into massive red-brown alkaline loamy to clay loamy subsoil.

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

D6 Ironstone gravelly sandy loam over red clay (Ferric(?) Red Chromosol)
Loamy texture contrast soil with some ironstone gravel and a red alkaline clayey subsoil.

J1 Ironstone soil with calcareous lower subsoil (Ferric Calcic Brown Sodosol-Chromosol-Dermosol)
Ironstone gravelly soil with brown alkaline clayey subsoil which has a calcareous layer within the profile.

Further information: DEWNR Soil and Land Program