APP Appila Land System

Undulating rises and low hills formed on calcareous siltstones between Appila and Caltowie.

Area: 126.5 km^2

Annual rainfall: 420 – 495 mm average

Geology: Most of the land system is underlain by siltstones of the Saddleworth Formation, although these are substantially covered by locally derived alluvium, as thin layers on pediments and thicker deposits in valley floors. Along the eastern margin of the system is a range of low hills formed on interbedded Appila Tillite, Gilbert Range and Leasingham Quartzites and Kadlunga Slate. All of the geological materials are mantled by a veneer of aeolian carbonates which have accumulated in the subsoil as soft segregations, rubbly concretions or occasionally as sheet rock (calcrete).

Topography: The eastern range which rises between 50 and 140 m above the land to the west is the dominant feature. West of this range the land system comprises a mosaic of gently undulating to undulating rises (slopes less than 10%), with occasional steeper (to 20%) low hills. Between the rises watercourses have carved out shallow valleys which all drain in a generally westward direction on to the plains of the Yarrowie Land System and subsequently into Pine Creek.

Elevation: The lowest point is 290 m at the south west corner. The highest point is Mt. Mary (534 m) on the eastern range.

Relief: Although the eastern range has a maximum relief of 140 m, relief in the rest of the system is less than 50 m, and commonly less than 30 m.

Soils: The soils are mostly deep loamy texture contrast and gradational soils over alluvium, but there are significant areas of shallow soils over rock.

Main soils

A2 Shallow calcareous loam - occurs on rises and is often associated with surface siltstone or calcrete.
D2 Hard loam over red clay - occurs on lower slopes and flats
C3 Deep gradational loam - occurs on lower slopes

Minor soils

A6 Deep calcareous clay loam - occurs on flats and lower slopes
D1 Hard loam over red clay on rock - occurs on rises
C2 Shallow gradational loam - occurs on rises
L1/B3 Shallow stony loam - occurs on steeper rocky slopes

Main features: The Appila Land System comprises mainly arable slopes characterized by deep loamy surfaced texture contrast and gradational soils on pediments and flats and moderately shallow loamy calcareous soils and texture contrast soils over siltstone on rises. Productive potential is moderate to high, limitations being due to low moisture holding capacity on slopes and poorly structured surface soils on lower ground. Most land is susceptible to erosion. There are minor semi to non arable rocky rises throughout.

Soil Landscape Unit summary: 9 Soil Landscape Units (SLUs) mapped in the Appila Land System:

SLU	% of area	Main features #
AAC	2.2	Rocky low hills and hills of 10-30% slope formed on mainly fine grained rocks. Main soils: shallow calcareous loam - **A2** (E) and shallow gradational loam - **C2** (E), with shallow stony loam - **L1/B3** (L). The hills are non arable due to the roughness of the terrain, moderate slopes and shallow stony soils. Rocky outcrops limit accessibility in places. Runoff is rapid and exposure is high, so a significant proportion of rainfall does not infiltrate the soil. However, areas of deeper soils are potentially productive for grazing.
AXB	0.6	Upper slopes and crests of 10-20% slope formed on deeply weathered basement rock or Tertiary sediments and variably capped by ferricrete (ironstone), silcrete or calcrete. Main soils: shallow stony loam - **L1/B3** (V), with shallow calcareous loam - **A2** (C). These small areas are non arable because of their extensive rockiness and shallow, low fertility soils. Deeply weathered, kaolinitic soils are often associated with high levels of stored salts, so recharge of groundwater should be controlled in these areas.
EGB EGC	19.1 23.2	Rises and low hills formed on fine grained rock. **EGB** Very gentle slopes of 1-4%. **EGC** Rises and low hills of 4-12%. Main soils: shallow calcareous loam - **A2** (V), with hard loam over red clay on rock - **D1** (L) and shallow gradational loam - **C2** (L). The rises are fully arable, although moisture shortages limit crops in dry finishes. Reduction in water loss and erosion through runoff is the main management issue, together with fertility maintenance. "Lime - induced" nutrient deficiencies are probable on calcareous soils.
ESD	3.2	Moderately inclined (8-20%) semi arable rises on basement rock. 10-20% of the land is too rocky for cropping. Main soils: shallow gradational loam - **C2** (E) and shallow calcareous loam - **A2** (E), with shallow stony loam - **L1/B3** (L) and hard loam over red clay on rock - **D1** (L). Shallow stony soils and sometimes moderate slopes limit cropping of these areas. The arable land is generally confined to strips between the reefs of rock. Water erosion is a potential problem because of the high runoff from the shallow soils and rocky areas.
JDA JDB JDC JDJ	14.6 32.1 3.9 1.1	Flats, pediments and creek flats formed on fine grained alluvium. **JDA** Flats and plains **JDB** Very gently sloping pediments of 2-4% **JDC** Gently inclined pediments of 4-12%. **JDJ** Eroded creek flats. Main soils: deep hard loam over red clay - **D2** (E) and deep gradational loam - **C3** (E), with deep calcareous clay loam - **A6** (L). Except for the areas immediately adjacent to watercourses, the whole area is arable. Hard setting surface soils are the main management problem, because of their adverse effects on runoff / erosion, workability, seedling emergence and moisture retention. Most soils are reasonably fertile, deep and well drained.

PROPORTION codes assigned to soils within Soil Landscape Units (SLU):

(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 Shallow calcareous loam (Paralithic / Petrocalcic, Calcic / Lithocalcic Calcarosol)
Calcareous stony loam grading to Class III A soft carbonate, Class III B or III C rubble, Class II sheet calcrete and occasionally silcrete, overlying weathering rock within 100 cm.

A6 Deep calcareous clay loam (Pedal, Hypercalcic Calcarosol)
Calcareous clay loam to clay, with a well structured clayey subsoil grading to soft (Class I) carbonate overlying alluvium.

C2 Gradational loam (Supracalcic / Petrocalcic, Red Dermosol)
Medium thickness loam to clay loam grading to a well structured red clayey subsoil, over Class III B or III C carbonate rubble. Weathering rock is within 100 cm.

C3 Deep gradational loam (Calcic / Hypercalcic, Red Dermosol)
Medium thickness loam to clay loam grading to a well structured red clayey subsoil, over soft Class I carbonate over alluvium.

D1 Hard loam over red clay on rock (Hypercalcic, Red Chromosol)
Medium thickness sandy loam to clay loam abruptly overlying a well structured red clay grading to Class I carbonate in the lower subsoil, overlying weathering basement rock within 100 cm.

D2 Hard loam over red clay (Hypercalcic, Red Chromosol)
Medium thickness sandy loam to clay loam abruptly overlying a well structured red clay grading to Class I carbonate in the lower subsoil, overlying alluvial clay.

L1/B3 Shallow stony loam (Paralithic / Lithic / Petrocalcic, Leptic Tenosol / Rudosol)
Shallow stony loam grading to hard rock (*Lithic),* weathering rock (*Paralithic*) or calcrete (*Petrocalcic*) within 50 cm.

Further information: DEWNR Soil and Land Program