

COV Coromandel Valley Land System

Gently rolling rises and low hills in the Belair - Coromandel Valley - Happy Valley area

Area: 29.5 km²

Annual rainfall: 580 – 840 mm average

Geology: The land is underlain by basement rocks, although significant areas are veneered by younger materials. The basement rocks include sandstones, siltstones, tillites, shales, quartzites and calcareous shales of the Sturt Tillite, Belair Subgroup and Saddleworth Formations, and siltstones, fine sandstones and minor quartzites and dolomites of the Saddleworth, Balhannah and Castambul Formations. These are within a metre of the surface over about 60% of the area. Significant areas are covered by a veneer of Tertiary sands and sandy clays. Both the basement rocks and the Tertiary sediments have been lateritized at some stage, as indicated by deep weathering profiles rich in ironstone. Most of the deep weathering material has been eroded away, residual deposits being confined to flat topped summit surfaces. There are also remnants of younger Hindmarsh Clay on these old land surfaces. Locally derived alluvial deposits occur on narrow creek flats and minor lower slope depositional areas.

Topography: The Coromandel Valley Land System is a dissected peneplain. The area appears to have been a more or less flat plain located at the foot of the abrupt Brownhill - Ackland Hill escarpment. The plain was at least partly overlain by Tertiary sediments, and subsequently deeply weathered and lateritized, probably during late Tertiary times. A fall in sea level probably initiated erosion, creating the present landscape of moderately steep hillslopes and narrow creek flats, associated with water courses flowing in a general westerly direction. Remnants of the old plain are now apparent as relatively flat topped crests (summit surfaces).

Elevation: 150 m at Happy Valley Reservoir, to 340 m in the north east

Relief: Up to 50 m

Soils: Most soils are less than a metre deep over weathering basement rock. These occur on hillslopes. Texture contrast profiles are predominant, with sandy loam to loam surfaces (depending on sandiness of the parent rock), over red or brown clayey subsoils. Shallow stony soils with no subsoils are limited in extent. Deep ironstone soils are common on flat topped crests (remnant land surfaces), while a range of calcareous soils, sandy loam texture contrast soils and cracking clays also occurs on these landscapes. Deep mainly sandy loam over clay soils are typical of creek flats and lower slopes.

Main soils

Soils formed in weathering basement rock

- K2** Acidic loam over clay – over red clay (**K2a**), over brown clay (**K2b**) or over dispersive clay (**K2c**)
- D1** Shallow loam over red clay
- K4** Acidic sandy loam over brown clay

Minor soils

Soils formed in weathering basement rock

- C2** Shallow gradational red loam over calcareous rock
- K1** Acidic gradational red loam
- L1** Shallow stony loam (**L1a**) or sandy loam (**L1b**)



*Soils formed on deeply weathered and / or lateritized rocks***J2** Brown ironstone soil**K1/J2** Red ironstone soil**F1/K4** Acidic sandy loam over brown clay on kaolinized rock*Soils formed on Tertiary sandy clays and sandstones***G2** Bleached sand over sandy clay loam**G3** Thick sand over clay**M3** Gravelly sandy loam*Soils formed on heavy clay sediments***A6** Gradational calcareous clay loam**E1** Black cracking clay**F2** Sandy loam over poorly structured brown clay*Soils formed in alluvial outwash sediments***F1** Sandy loam over brown clay – on kaolinitic sediments (**F1a**), on clayey alluvium (**F1b**) or on sandy alluvium (**F1c**)**M1** Deep sandy loam**Main features:**

The Coromandel Valley Land System comprises three main components. Rolling to moderately steep hillslopes underlain by basement rocks have mainly sandy loam to loam soils with clayey subsoils. They are mostly fertile, moderately well drained and moderately deep. Relict flat topped crests have a variety of sandy soils, ironstone soils (both of low fertility), cracking clays, calcareous loams and sandy loam over dispersive clay soils. These are more fertile but prone to waterlogging and seasonal cracking. Creek flats are characterized by deep sandy loam over clay soils. Most of the land is now urbanized or in reserves, and thus alienated from agriculture. Remaining rural land is in scattered pockets.

Soil Landscape Unit summary: 9 Soil Landscape Units (SLUs) mapped in Coromandel Valley Land System:

SLU	% of area	Main features #
AaC	2.7	Moderately steep slopes (15-25%) up to 50 m high formed on siltstones, fine sandstones and minor quartzites and dolomites. There is minor surface stone. The soils are predominantly loamy with red to yellow clay subsoils forming in weathering rock. On steeper slopes, loamy surface soils are formed directly in rock. Red loamy soils overlying abundant soft to semi-hard carbonate occur on calcareous rocks. Main soils: Acidic loam over red clay - K2a (E) <u>Shallow stony loam - L1a</u> (E) <u>Shallow gradational red loam - C2</u> (L) <u>Acidic loam over brown clay - K2b</u> (L) Although many soils are shallow, there is a significant proportion that are moderately deep, well drained and inherently fertile. Virtually all of this land is urbanized.
AwC	27.7	Moderately steep slopes of 18-30% formed on sandstones, siltstones, tillites, shales, quartzites and calcareous shales. Relief up to 50 m. There is a wide variation in soil profiles due to the diversity of rock types. Shallow soils on rock are common. Most other soils have sandy to loamy surface soils and variably structured and coloured clayey subsoils. Main soils: Shallow loam over red clay - D1 (E) <u>Shallow stony sandy loam - L1b</u> (L) <u>Acidic loam over brown clay - K2b</u> (L) <u>Acidic loam over dispersive brown clay - K2c</u> (L) <u>Acidic sandy loam over brown clay - K4</u> (L) These soils are moderately deep, with moderate to moderately low natural fertility. Drainage is generally satisfactory. Some soils are dispersive and present a tunnel and gully erosion hazard if not properly protected during disturbance. Most land is either urbanized or contained within reserves.
BED	10.7	Gently rolling rises and low hills with relief to 40 m and slopes of 10-18%, formed on siltstones, fine sandstones and minor quartzites and dolomites. Drainage depressions are narrow with well defined water courses. There is usually an abrupt break between creek flats and adjacent hillslopes. Soils are predominantly loamy with red to yellow clay subsoils



		<p>forming in weathering rock. On steeper slopes, loamy surface soils formed directly in rock. Red loamy soils overlying abundant soft to semi-hard carbonate occur on calcareous rocks.</p> <p>Main soils: <u>Acidic loam over red clay</u> - K2a (E) <u>Shallow gradational red loam</u> - C2 (L) <u>Acidic loam over brown clay</u> - K2b (L) <u>Shallow stony loam</u> - L1a (L)</p> <p>These soils are mostly fertile, moderately deep and adequately drained, but mostly occur within urban areas or reserves.</p>
BiD	22.2	<p>Gently rolling rises and low hills with relief to 50 m and slopes of 8-18% formed on sandstones, siltstones, tillites, shales, quartzites and calcareous shales. There is a wide variation in soil profiles due to the diversity of rock types. Shallow soils on rock are common. Most other soils have sandy to loamy surface soils and variably structured and coloured clayey subsoils.</p> <p>Main soils: <u>Shallow loam over red clay</u> - D1 (E) <u>Acidic loam over brown clay</u> - K2b (C) <u>Acidic loam over dispersive brown clay</u> - K2c (L) <u>Acidic sandy loam over brown clay</u> - K4 (L) <u>Shallow stony sandy loam</u> - L1b (M)</p> <p>These soils are moderately deep, with moderate to moderately low natural fertility. Drainage is generally satisfactory. Some soils are dispersive. These are particularly at risk of gully and tunnel erosion when disturbed. The land is either urbanized or surrounded by urban land, but significant areas are yet to be developed.</p>
FgZ	6.4	<p>Undulating upper slopes and crests (summit surfaces) of rolling low hills. They generally occur as strips running along ridges. Slopes range from 2% on crests to 10% on the margins grading to the steeper slopes below. The underlying rocks are deeply weathered kaolinized siltstones and sandstones. The soils are deep over kaolinized and / or lateritized rock. Surfaces are sandy to loamy with variable ironstone gravel. Subsoils are clayey and red or yellow brown. Variations in soils are due to the depth of weathering and the nature of the underlying materials.</p> <p>Main soils: <u>Red ironstone soil</u> - K1/J2 (E) <u>Acidic sandy loam over brown clay on kaolinized rock</u> - F1/K4 (E) <u>Brown ironstone soil</u> - J2 (L) <u>Acidic gradational red loam</u> - K1 (L)</p> <p>These soils are deep and moderately well drained but low in natural fertility. The land is relatively flat and elevated, so it was some of the first land in the area to be taken out of primary production and built on.</p>
FiZ	15.0	<p>The landscapes are formed on deeply weathered kaolinized Tertiary age sands and sandy clays, usually occurring as thin remnants on basement rock. Most of the landscape comprises summit surfaces (the remains of an old lateritic plain), with gently sloping crests, moderately inclined as they slope away to the hillsides below. The soils are sandy surfaced and usually gravelly. Most have yellow to brown clayey subsoils forming in highly weathered sandstones or gravel beds.</p> <p>Main soils: <u>Thick sand over clay</u> - G3 (V) <u>Bleached sand over sandy clay loam</u> - G2 (L) <u>Gravelly sandy loam</u> - M3 (L)</p> <p>These soils are deep but inherently infertile. As for FgZ, these relatively flat and elevated areas were quickly developed as Adelaide's south eastern fringes spread into the hills. Very little of this land remains in primary production.</p>
LFC	3.2	<p>Lower slopes of less than 10%, formed on gravelly clays. Water courses are moderately well defined in broad, shallow depressions. Most soils have texture contrast profiles with sandy to loamy surfaces, often with ironstone gravel, and yellow or brown mottled subsoil clays.</p> <p>Main soils: <u>Sandy loam over brown clay</u> - F1a / F1b (D)</p> <p>These soils are deep but imperfectly drained due to slowly permeable subsoil clays. They are moderately fertile and most are susceptible to acidification. The land is either in Belair Recreation Reserve, or under houses.</p>
LtE	5.6	<p>Drainage depressions formed on medium to coarse grained locally derived alluvium. Soils have thick sandy to loamy surfaces and mottled clayey subsoils.</p> <p>Main soils: <u>Sandy loam over brown clay</u> - F1c / F1b (V) <u>Deep sandy loam</u> - M1 (L)</p> <p>These soils are deep and moderately fertile, but prone to waterlogging. Water courses are susceptible to erosion if banks are exposed. This land is the main creek flat within the</p>



		suburbs of Glenalta, Hawthorndene and Coromandel Valley.
TAZ	6.5	Gently undulating summit surfaces with slopes to 5% and no defined surface drainage pattern. Underlying sediments are Hindmarsh Clays. There is weak gilgai development. Soils vary from clays to sandy loams. All soils are calcareous with depth (Class I carbonate) and overlie heavy grey clay with coarse blocky structure within 100 cm of the surface. Main soils: <u>Gradational calcareous clay loam - A6</u> (E) <u>Black cracking clay - E1</u> (E) <u>Sandy loam over poorly structured brown clay - F2</u> (E) The heavier soils are inherently fertile, and all are subject to waterlogging and poor deep drainage due to the effects of the Hindmarsh Clay. Structural problems may occur as a result of seasonal shrinking and swelling of the heavy clays. Although potentially productive, the soils are not well suited to irrigated uses.

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:

Soils formed in weathering basement rock

- C2** Shallow gradational red loam over calcareous rock (Eutrophic, Red Dermosol)
Medium thickness dark reddish brown loam, overlying a reddish well structured loam to clay loam, grading to soft highly calcareous siltstone, or soft carbonate with siltstone fragments throughout at about 50 cm.
- D1** Shallow loam over red clay (Calcic, Red Chromosol)
Medium thickness reddish sandy loam with a pink gravelly A2 horizon, overlying a red well structured clay with occasional soft calcareous segregations at depth, grading to weathering fine sandstone.
- K1** Acidic gradational red loam (Eutrophic, Red Dermosol)
Medium thickness dark brown loam with a paler coloured clay loamy A2 horizon containing abundant ferruginous rock fragments, overlying a red clay with polyhedral structure and increasing rock fragments with depth, grading to soft weathering siltstone at about 100 cm.
- K2a** Acidic loam over red clay on rock (Eutrophic, Red Chromosol)
Medium thickness loam, with a paler coloured and gravelly A2 horizon, overlying a reddish brown to red well structured clay with rock fragments, grading to weathering siltstone or slate by 100 cm.
- K2b** Acidic loam over brown clay (Eutrophic, Brown Chromosol)
Medium thickness brown loam with a paler gravelly A2 horizon, overlying a yellow brown well structured clay grading to weathering siltstone.
- K2c** Acidic loam over dispersive brown clay on rock (Eutrophic, Brown Sodosol)
Thick dark hard setting clay loam with a bleached quartz gravelly A2 horizon, overlying a brownish yellow and brown coarsely prismatic dispersive heavy clay, grading to weathering quartzitic shale at about 100 cm.
- K4** Acidic sandy loam over brown clay on rock (Bleached, Mesotrophic, Brown Kurosol)
Medium to thick gravelly loamy sand to sandy loam, with a bleached and very gravelly A2 horizon, overlying a yellowish brown, red and brown sandy clay to clay grading to weathering medium to fine sandstone by 100 cm.
- L1a** Shallow stony loam (Basic, Lithic, Leptic Tenosol)
Thick gravelly and stony brown loam, sometimes grading to a pinkish very stony clay loam overlying hard siltstone or slate.



- L1b** Shallow stony sandy loam (Basic, Paralithic, Bleached-Leptic Tenosol)
Thick very gravelly loamy sand to sandy loam, overlying a brown gravelly clayey sand, grading to weathering sandstone by 50 cm.

Soils formed on deeply weathered and / or lateritized rocks

- J2** Brown ironstone soil (Ferric, Mesotrophic, Brown Kandosol)
Medium thickness loamy sand to sandy loam with abundant ironstone gravel, grading to a brownish yellow and red clay with ironstone fragments, over light grey and red kaolinitic clay at about 100 cm.
- K1/J2** Red ironstone soil (Ferric, Mesotrophic, Red Dermosol)
Medium thickness reddish brown sandy loam to sandy clay loam with a paler coloured and ironstone gravelly A2 horizon, overlying a yellowish red to brown clay loam grading to medium clay with polyhedral structure. The clay grades to a pale grey kaolinitic silty clay loam forming in deeply weathered siltstone or sandstone deeper than 200 cm.
- F1/K4** Acidic sandy loam over brown clay on kaolinized rock (Bleached, Mesotrophic, Brown Kurosol)
Medium to thick gravelly loamy sand to sandy loam, with a bleached and very gravelly A2 horizon, overlying a yellowish brown, red and brown sandy clay to clay grading to soft kaolinized sandstone by 100 cm, continuing below 200 cm.

Soils formed on Tertiary sandy clays and sandstones

- G2** Bleached sand over sandy clay loam (Mesotrophic, Brown Chromosol)
Thick grey sand with a bleached A2 horizon containing ironstone and sandstone gravel, overlying a brown, yellow and red sandy clay loam to clay, grading to weakly cemented Tertiary sandstone within 100 cm.
- G3** Thick sand over clay (Eutrophic, Brown Chromosol)
Thick grey sand to loamy sand with a bleached and ironstone gravelly A2 horizon, overlying a yellow and red sandy clay to clay with ironstone gravel, grading to a grey and red mottled sandy clay forming in indurated sandstone deeper than 200 cm.
- M3** Gravelly sandy loam (Regolithic, Bleached-Orthic Tenosol)
Thick grey gravelly loamy coarse sand to coarse sandy loam with a bleached A2 horizon containing more than 50% quartz gravel and cobbles, overlying a yellow gravelly sandy clay loam grading to gravel and stone beds in a clay matrix.

Soils formed on heavy clay sediments

- A6** Gradational calcareous clay loam (Endohypersodic, Pedal, Calcic Calcarosol)
Thick moderately calcareous dark brown clay loam, overlying a dark brown highly calcareous clay with subangular blocky structure and increasing soft carbonate with depth (Class I carbonate). The soil grades to Hindmarsh Clay at 100 cm.
- E1** Black cracking clay (Epicalcareous-Endohypersodic, Self-mulching, Black Vertosol)
Medium thickness very dark grey moderately calcareous light clay with fine blocky structure, overlying a black to dark grey coarsely prismatic heavy clay becoming paler coloured and more calcareous with depth. Hindmarsh Clay is evident from about 70 cm.
- F2** Sandy loam over poorly structured brown clay (Calcic, Brown Sodosol)
Medium thickness grey brown massive sandy loam to sandy clay loam with a bleached and sandier A2 horizon, overlying a brown, grey and yellow mottled heavy clay with coarse prismatic structure. There is abundant soft carbonate from 55 cm, grading to Hindmarsh Clay from 70 cm.

Soils formed in alluvial outwash sediments

- F1a** Sandy loam over brown clay (Bleached-Mottled, Mesotrophic, Brown Kurosol)
Thick greyish loamy sand to sandy clay loam with a bleached and ironstone gravelly A2 horizon, overlying a brownish yellow, brown and red well structured clay, grading to kaolinitic and ironstone gravelly clay continuing below 200 cm.



- F1b** Sandy loam over brown clay (Bleached-Mottled, Hypocalcic, Brown Chromosol)
Thick loamy sand to sandy clay loam with a strongly bleached A2 horizon, overlying a yellowish brown, grey and red mottled clay grading to fine grained alluvium, weakly calcareous at base.
- F1c** Sandy loam over brown clay (Bleached-Mottled, Eutrophic, Brown Chromosol)
Thick dark brown loamy sand to light sandy clay loam with a bleached A2 horizon, overlying a yellow brown and grey brown sandy clay with coarse prismatic structure, grading to a grey, brown and yellow mottled clayey sand.
- M1** Deep sandy loam (Regolithic, Brown-Orthic Tenosol / Eutrophic, Brown Kandosol)
Thick brown sandy loam, overlying a grey to brown silty sand to silty clay loam with weak prismatic structure, grading to variable sandy, gritty and clayey alluvial sediments.

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

