CTO Cape Torrens Land System

A large land system consisting of stony slopes and crests, creeks and drainage areas, and remnant ironstone plateau surfaces.

Area: 224.4 km^2

Annual rainfall: 615 – 815 mm average

Geology: The majority of the system is underlain by early Cambrian age Kanmantoo Group metasandstones. These rocks are typically harder than those of the adjacent 'Snelling' land system. Soils formed on metasandstones occur on slopes, crests and gullies below the level of remnant ironstone plateau surfaces. Ironstone plateau areas have soils formed on mottled deeply weathered clay, typically capped by ironstone gravel. Low lying areas are typically formed on clayey sediments: soils can be formed directly in these sediments or in overlying alluvial sands. Some low lying areas contain layers of colluvial ironstone gravel. Some very wet creek flats have peaty deposits. Minor shell sand deposits occur on upper cliff slopes and clifftops. One area of calcreted calcarenite occurs above a clifftop.

Topography: The land system is dominated by creeks and associated stony slopes. Also included are many remnant plateau surfaces; steep rocky gullies, including coastal gullies; sporadic low lying plains; and the highest coastal cliffs on Kangaroo Island. Drainage is to the north and west. Most of the catchment areas in this land system are separated from the catchments of the Main Kangaroo Island Plateau by the high plateau area to the south upon which the Playford Highway lies. Slopes range from 0% to over 100%, but typically lie within the range of 0% to 30%.

The major and distinct sub-areas included in this land system are as follows:

1. The catchment of the upper Western Rivers: from slopes adjacent to the upper Western River (east branch) in the east, to the sloping land around the upper and middle Western River and tributaries (south and west branches).
2. The catchment area covering the large unnamed creek system between Snug Cove and the Playford Highway: which finally joins up to the De Mole River very near its mouth.
3. The coastal slopes, gullies, crests and cliffs around Cape Forbin and Cape Torrens, to the west of Cape Torrens, and a few areas between Snug Cove and Western River Cove.
4. The catchment area of the upper De Mole River.
5. The lowland drainage areas to the west of the De Mole River between the Cape Torrens Conservation Park and the Playford Highway.
6. The upper catchment area of the unnamed creek system in the north of the Flinders Chase National Park: which finally drains into the Ravine des Casoars in the west.

Elevation: Almost 300 m in the central south of the system near the Playford Highway to sea level at the base of coastal cliffs. Typical elevations are between 100 m and 260 m

Relief: Relief ranges from 0m to 100 m; but normally ranges from 20 m to 60 m

Main soils:

K4	Acid sandy loam over brown clay on weathered rock
J2	Ironstone soil
F1-**G5**	Acid sandy loam to sand over brown clay

Minor soils:

L1	Shallow rocky soil
I2	Wet highly leached sand
J3a-b	Shallow soil on ferricrete
M1b	Deep sandy loam with ironstone gravel
N1	Peat
M1a	Deep sandy loam
N3-**M2**	Wet deep gradational loam
N3-**F1**	Wet acid loam over grey clay
K1-**K2**	Acid gradational loam, to loam over brown clay, on weathered rock

Main features: A large proportion of the land system is covered by native scrub, some within conservation parks: so nature conservation is a priority in these areas. Other areas are used for farming or forestry. The highest rainfall area on Kangaroo Island, with an annual average of more than 900 mm, occurs in the southeast of the system around the upper reaches of the Western River (south branch). Topsoils are mostly loamy, with some sandy areas. The main soil type found is a texture contrast soil, often stony, formed on weathered rock. Due to the relatively impermeable clayey subsoils and substrates found over much of this land system, waterlogging is the major issue. This is exacerbated by the high annual rainfall. Many soils are strongly acidic throughout: surface soil acidity can be relatively easily controlled with applications of lime, however, amelioration of subsoil acidity is much more difficult. Ironstone gravel reduces fertility where it occurs, primarily by 'fixing' phosphorus. Sandy soils typically have low waterholding capacities and low fertility. When bare, sloping ground is at risk of water erosion, and sandy soils are at risk of wind erosion. Where surface stones occur they can interfere with farming practices. Soils containing stone fragments or ironstone gravel, or those underlain by weathered rock or ferricrete, have reduced water holding capacities. Patches of saline seepage occur on a few creek flats.

Basic relationships between Soil Landscape Units:

Rocky cliff slopes:
- **WB**

Formed on weathered rock:
- **AN** rocky slopes
- **CA** stony to rocky slopes
- **CF** stony slopes and plateau surfaces
- **CE** stony drainage depressions
- **BI** stony drainage areas on 'softer' rock
- **CB** stony with ironstone gravelly slopes and plateau surfaces

Formed on deeply weathered sediments with ironstone gravel and/or ferricrete:
- **FP** plateau surfaces with ironstone gravel
- **FX** plateau surfaces with ironstone gravel and ferricrete
- **Fs** slopes with sandy soils on ferricrete

Formed on unconsolidated and/or deeply weathered sediments:
- **FU** low lying plains with ironstone gravel and loamy soils
- **HK** low lying plains with loamy soils
- **HC** drainage depressions with loamy soils
- **Xx** drainage depressions with peaty and loamy soils
- **Ly** low lying plains and drainage areas with sandy soils

Shell sand deposits:
- **WG** sandy deposits on cliff slopes, slopes, and as low dunes

Old dune areas:
- **Mi** calcreted calcarenite with sandy soils

Soil Landscape Unit summary: Cape Torrens Land System (CTO)

SLU	% of area	Main features #
ANm ANF ANZ	4.3 1.1 0.4	Rocky gullies and gully slopes. Main soils: shallow rocky soil **L1** (*rocky Tenosol*); with minor to extensive stony texture contrast soil **K4** (*Brown Kurosol-Chromosol-Sodosol*). **ANm** – rocky gullies, gully slopes, and/or upper gully slopes (slopes 3-100% typically 10-50%, 5-6e, 1-2w) **ANF** – coastal gullies (slopes 30-100%, 6e, 1-2w, 3-2y). Some of these slopes have tall eucalypts and soils formed over softer micaeous metasandstone and/or phyllite rock, as per similar areas in the adjacent 'Snelling' land system area. **ANZ** – exposed peaks: crests and upper slopes (slopes 10-30%, 2-1w, 4-5e, 3-2y). Possibly with some patches with shell sand spreads when adjacent to shell sand deposits. Summary: areas too rocky and steep for agricultural use.
BIE	0.1	Slopes and drainage lines with mostly relatively fertile stony gradational soil. Main soils: loam grading into heavier textures on weathered rock **K1** (*Brown Dermosol*); and loam over brown clay on weathered rock **K2** (*Brown Chromosol-Sodosol-Kurosol*) and/or sandy loamy stony texture contrast soil **K4** (*Brown Kurosol-Chromosol-Sodosol*). **BIE** – drainage depressions and upper drainage slopes (slopes 3-8%, 3e, 3-4w, 2-3y) Summary: stony areas, but quite fertile, with native vegetation dominated by tall eucalypts (sugar gums?). Soils are formed over softer micaeous metasandstone and/or phyllite rock, as per similar areas in the adjacent 'Snelling' Land System area.
CABx CAC CACg CACx CAD CABn CACn	0.7 5.8 2.5 1.0 2.4 0.4 0.3	Rocky slopes. Main soils: stony texture contrast soil **K4** (*Brown Kurosol-Chromosol-Sodosol*); with shallow rocky soil **L1** (*rocky Tenosol*). **CABx** – exposed coastal slopes (slopes 1-3%, 2-3e, 3w, 3y) **CAC** – slopes and crests (slopes 2-12%, 3-2e, 3w) **CACg** – slopes with drainage lines (slopes 3-10%, 3e, 3w, 2-1g) **CACx** – coastal slopes (slopes 4-12%, 3e, 2-3w, 3-2y) **CAD** – slopes, often with drainage lines (slopes 10-30% typically 10-20%, 4e, 2-3w, 2-1g) *More fertile well-watered slopes with tall stringybark trees*: **CABn** – slopes (slopes 1-3%, 2e, 3-4w) **CACn** – slopes (slopes 3-12%, 3e, 3-4w) Summary: rocky slopes.
CBB CBBa CBBx CBC CBCa CBCg CBCx CBZ CBZa CBZx	8.0 2.9 0.2 0.6 0.7 0.1 0.05 3.5 0.7 1.0	Plateau surfaces and slopes (mostly upper) with soils formed on weathered rock and some ironstone soils. Main soils: mostly texture contrast soil formed on weathered rock **K4** (*Brown Kurosol-Chromosol-Sodosol*); and ironstone soil, typically with medium thickness ironstone gravel **J2** (*Ferric Brown Kurosol-Chromosol-Sodosol*). Minor to common areas of areas of texture contrast soil without ironstone gravel **F1**-**G5** (*Brown Kurosol-Chromosol-Sodosol*) can occur, especially in slight depressions. Minor to limited areas of shallow soil on ferricrete **J3**a (*Petroferric Tenosol*) may occur. **CBB** – mostly upper slopes with loamy, or sometimes sandy, surface soils (slopes 1-4%, 2-3e, 4-3w) **CBBa** – upper slopes, crests, or sloping plateau surfaces with mostly sandy topsoils (slopes 1-3.5%, 2e, 4-3w) **CBBx** – exposed coastal slopes (slopes 1-3%, 2-3e, 4-3w, 3-2y) **CBC** – near coastal slopes (slopes 2-8%, 3w, 3-2e, 2y) **CBCa** – slopes with mostly sandy topsoils (slopes 2.5-12%, 3-2e, 3-4w, 1y) **CBCg** – near coastal slopes with drainage lines (slopes 2-8%, 3w, 3-2e, 2y, 2-1g) **CBCx** – exposed coastal slopes (slopes 2-8%, 3w, 3-2e, 3y) **CBZ** – plateau surfaces with loamy, or sometimes sandy, surface soils (slopes 0-2.5%, 1-2e, 4-3w) **CBZa** – plateau surfaces with sandy surface soils (slopes 0-2.5%, 1-2e, 4-3w, 2-3a). Less

		ironstone soils occur in these areas. **CBZx** – exposed coastal plateau surfaces: with some areas covered by shell sand spreads where adjacent to shell sand deposits on upper cliff slopes (slopes 0-2%, 1-2e, 3-4w, 3-2y) Summary: plateau surfaces, often sloping, and upper slopes from which much of the ironstone gravel has been stripped. Waterlogging is a significant problem, especially on plateau surfaces. Native vegetation typically dominated by mallee-eucalypt.
CEE CEO	3.9 0.7	Sloping drainage depressions with mostly soils formed on weathered rock. Main soils: stony texture contrast soil **K4** (*Brown Kurosol-Sodosol-Chromosol*); with deeper texture contrast soils **F1** (*Brown-Grey Kurosol-Sodosol-Chromosol*) especially along drainage lines and in sluggishly drained drainage depression flats. Deep loamy soil **M1**a (*loamy Tenosol*) can occur along drainage lines. Minor areas of peat **N1** (*Organosol*) can occur along very wet drainage lines or in sluggishly drained side arm and upper drainage depression flats. **CEE** – sloping drainage depression (slopes 3-30% typically 3-12%, 4-5e, 5-4w, 2-1f, 2-1s) **CEO** – sloping drainage depressions with minor saline seepage along drainage lines (slopes 1-12%, 4-3e, 5-4w, 2-1f, 2-3s°) Summary: mostly too wet for agriculture use, with drainage lines prone to flooding.
CFA CFB CFC CFCg CFZ CFZx	1.3 0.7 18.5 1.9 1.0 0.04	Stony slopes and plateau surfaces. Main soils: stony texture contrast soil **K4** (*Brown Kurosol-Chromosol-Sodosol*). Minor to limited areas of ironstone soil **J2** (*Ferric Brown Kurosol-Chromosol-Sodosol*) may occur, especially on upper slopes. **CFA** – raised plains/plateau surfaces (slopes 0-1.5%, 1e, 4-3w) **CFB** – slopes: mostly upper slopes and sloping plateau surfaces (slopes 1-3.5%, 2-3e, 3-4w) **CFC** – slopes (slopes 2-12%, 3-2e, 3-4w). Lower slopes especially get quite wet. **CFCg** – slopes with drainage lines (slopes 3-10%, 3e, 3-5w, 2-1g) **CFZ** – plateau surfaces (slopes 0-2.5%, 1-2e, 3-4w) **CFZx** – coastal plateau surfaces (slopes 0-1%, 1e, 3-4w, 3y) Summary: stony slopes and plateau surfaces.
FPZ	1.2	Remnant ironstone plateau surfaces mostly with ironstone soils. Main soils: ironstone soil, typically with thick ironstone gravel **J2** (*Ferric Brown Kurosol-Chromosol-Sodosol*). Minor to common areas of texture contrast soil formed on weathered rock **K4** (*Brown Kurosol-Chromosol-Sodosol*) may occur; and minor to limited areas of deeper texture contrast soil with little to no ironstone **F1** (*Brown Kurosol-Chromosol-Sodosol*) may occur, especially in slight depressions. Minor areas of shallow soil on ferricrete **J3**a (*Petroferric Tenosol*) may occur. **FPZ** – remnant plateau surfaces (slopes 0-1.5%, 1e, 4w) Summary: relatively flat remnant plateau surfaces with mostly thick layers of ironstone gravel overlying clayey subsoils. Insignificant slopes exacerbate waterlogging, which is a major problem; while ironstone gravel adversely affects fertility. Native vegetation dominated by stringybark or mallee-eucalypt.
FUA	4.0	Low lying plains/plateau areas or low lying slight rises, mostly with texture contrast soils, many with ironstone gravel. Main soils: ironstone soil, often colluvial type with ironstone gravel in the subsoil **M1**b-**J2** (*Ferric Brown Tenosol-Kurosol-Sodosol-Chromosol*); with limited to common areas of sandy to loamy texture contrast soil without ironstone gravel **G5**-**F1** (*Brown Kurosol-Sodosol-Chromosol*). Also with wet highly leached sands **I2** (*Podosol*) on flats and slight depressions, typically underlain by clayey substrate and ironstone gravel. Some texture contrast soil formed on weathered rock may occur **K4** (*Brown Kurosol-Sodosol-Chromosol*). **FUA** – low lying plains/plateau areas or low lying slight rises, with sandy to loamy topsoils (slopes 0-1%, 1e, 5-4w) Summary: areas prone to waterlogging for extended periods. Native vegetation typically dominated by stringybark gums.
FXZ	6.6	Remnant ironstone plateau surfaces with ironstone soils, some shallow on ferricrete.

FXZa FXZx FXB	1.1 0.5 0.1	Main soils: ironstone soil with loamy sand to light sandy loam topsoil, typically with thick ironstone gravel **J2** (*Ferric Brown Kurosol-Chromosol-Sodosol*). Minor to extensive areas of shallow soil on ferricrete **J3**a (*Petroferric Tenosol*). Minor to common areas of deeper texture contrast soil with little to no ironstone **F1** (*Brown Kurosol-Chromosol-Sodosol*) may occur, especially in slight depressions on sloping ground. Minor to limited areas of texture contrast soil formed on weathered rock **K4** (*Brown Kurosol-Chromosol-Sodosol*) can occur on the sloping margins of these plateau surfaces. **FXZ** – remnant plateau surfaces/raised plains (slopes 0-1.5%, 1-2e, 4-3w) **FXZa** – plateau surfaces/raised plains with mostly sandy topsoils (slopes 0-1.5%, 1-2e, 4-3w) **FXZx** – high-level coastal remnant plateau surfaces (slopes 0-1.5%, 1e, 3-4w, 3-2y) **FXB** – upper slopes and sloping remnant plateau surfaces (slopes 1-3.5%, 2e, 4-3w) Summary: flat remnant plateau surfaces with mostly thick layers of ironstone gravel overlying clayey subsoils and shallow soils on ferricrete. Ferricrete boulders are strewn on parts of the land surface. The level landscape exacerbates waterlogging, which is a major problem; ironstone gravel adversely affects fertility; shallow soils limit water holding capacity; and where surface coarse fragments occur they interfere with farming practices. Native vegetation dominated by stringybark or mallee-eucalypt.
FsB FsBw	0.2 0.2	Slopes mostly with sandy soils on ferricrete. Main soils: shallow sandy soil on ferricrete **J3**b (*Petroferric Tenosol*) underlain by mottled clayey substrate. With highly leached sands in slight depressions/drainage areas **I2** (*Podosol*); and minor to common areas of sandy ironstone soil **J2** (*Ferric Brown Kurosol-Sodosol-Chromosol*). **FsB** – sloping ground (slopes 1-2.5%, 2-1e, 4-5w) **FsBw** – wetter sloping ground (slopes 1-2.5%, 2-1e, 5-4w) Summary: infertile sandy areas prone to wetness and waterlogging.
HCE HCEn HCEw HCJ HCO HCT	2.5 0.6 1.8 0.5 2.4 0.5	Drainage depressions with mostly deep texture contrast soils. Main soils: deep texture contrast soil **F1**-**G5** (*Brown Kurosol-Sodosol-Chromosol*); with stony texture contrast soil formed on weathered rock, especially on the margins of the drainage depressions **K4** (*Brown Kurosol-Sodosol-Chromosol*). Minor areas of deep sandy loams **M1**a (*loamy Tenosol*) may occur along creek beds; minor areas of wet highly leached sands **I2** (*Podosol*) may occur on creek flats; or minor areas of peaty soils **N1** (*Organosol*) may occur in very wet creek beds. **HCE** – sloping drainage depressions (slopes 1-5%, 3-4e, 5-7w, 2-1f, 2-1s) **HCEn** – more fertile and well-watered drainage depression with native vegetation typically dominated by eucalypt trees (slopes <1%, 2e, 5-4w, 2-1f, 2-1s). **HCEw** – sluggishly drained drainage depression (slopes 0-2.5%, 2-3e, 7-5w, 2-1f, 2-1s) **HCJ** – sloping drainage depressions with signs of erosion/scalding (slopes 1-10%, 4-3e, 5-4w, 2z, 2g, 2-1f, 1-2s) **HCO** – sloping drainage depressions with minor saline seepage (slopes 1-5%, 3-4e, 5-7w, 2-1f, 2-3s^{o}) **HCT** – sloping drainage depressions with saline seepage (slopes 1-6%, 3e, 5-7w, 3s^{+}, 2-1f) Summary: mostly too wet for agriculture use, with drainage lines prone to flooding. Saline seepage occurs along some drainage lines.
HKA HKAn	0.5 1.2	Low lying plains with mostly deep texture contrast soils, some with ironstone gravel. Main soils: deep texture contrast soil **F1**-**G5** (*Brown Kurosol-Sodosol-Chromosol*); and colluvial type ironstone soil with ironstone gravel in the subsoil **J2**-**M1**b (*Ferric Brown Kurosol-Sodosol-Chromosol-Tenosol*) can occur on plains. Minor to limited areas of wet highly leached sands **I2** (*Podosol*) may occur in slight depressions on plains. Stony texture contrast soil formed on weathered rock **K4** (*Brown Kurosol-Sodosol-Chromosol*) can also occur, especially in '**HKAn**' areas. **HKA** – wet low lying plains (slopes <1%, 1e, 5-4w). Native vegetation dominated by low to moderate size stringybark. **HKAn** – relatively well watered, more fertile low lying plains/drainage areas (slopes 0-1.5%, 1e, 4-5w). Native vegetation dominated by tall eucalypts.

		Summary: relatively fertile areas; prone to waterlogging.
LyA LyB LyK LyE LyO LyT	1.4 0.2 0.5 0.8 0.5 0.2	Mostly deep sandy alluvium. Main soils: wet highly leached sand **I2** (*Podosol*), typically underlain by a clayey substrate and possibly ironstone gravel. And sandy texture contrast soil, usually with thick topsoil **G5** (*Brown Kurosol-Sodosol-Chromosol*). Ironstone soils also typically occur on plains: in particular colluvial type with ironstone gravel in the subsoil **M1**b-**J2** (*Ferric Brown Tenosol-Kurosol-Sodosol-Chromosol*). **LyA** – low lying alluvial plains (slopes 0-1.5%, 1e, 5w, 2-1s) **LyB** – sloping drainage areas (slopes 1-3%, 2-1e, 5w) **LyK** – low lying alluvial plains with some saline seepage (slopes 0-1.5%, 5-7w, 1e, 3-2s°) **LyE** – drainage depressions and drainage flats (slopes <1%, 7-5w, 2-1e, 2-1s) **LyO** – drainage depression with some saline seepage (slopes <1%, 7w, 2-1e, 3-2s°) **LyT** – drainage depression with extensive saline seepage (slopes 0-1.5%, 7w, 2-1e, 4-3s⁺) Summary: wet and infertile areas with native vegetation typically dominated by banksia and/or stringybark in less waterlogged areas.
MiB	0.1	Old calcarenite coastal rise. Main soils: mostly moderate to shallow depth sandy soil on calcrete **B8**-**H2**-**A2** (Petrocalcic Tenosol-Calcarosol). Possibly some soils are calcareous. **MiB** – coastal rise (slopes 1-4%, 2-3e, 1w, 3y) Summary: old coastal dune area with calcreted calcarenite.
WGP WGE WGN	0.3 0.01 0.1	Recent shell sand deposits. Main soils: shell sand (Shelly Rudosol). **WGP** – cliff slopes (slopes mostly >100%, 3y) **WGE** – low dunes above upper cliff slopes (3-8%, 1w, 1e, 3y) **WGN** – slopes and drainage lines with relatively thin sand spreads overlying stony to rocky soil (slopes 8-15%, 4-3e, 2-3w, 1-2y). Calcrete may occur. [The designation of this unit is particularly uncertain.] Summary: shell sand deposits in the form of sand spreads/or even some low dunes. Shell sand overlies bedrock or older soils.
WBB	2.3	Coastal cliffs. **WBB** – rocky coastal cliffs (slopes >100%) Summary: cliffs heights range from 20m in the east to 260m high in the west.
XxS	4.6	Creeks with mostly peaty soils and gradational loams. Main soils: thick to very thick peaty soil **N1** (*Organosol*), overlying grey to pale yellow sandy clay loams and light clays with gley and mottled colours, occur along swampy creek flats. And gradational loams also occur **N3**-**M2** (*Grey Dermosolic Hydrosol*), typically with thin to medium thickness peaty surfaces, particularly on the margins of creek flats and on creek flats. Texture contrast soil can occur **N3**-**F1** (*Grey Kurosolic Hydrosol*) especially on margins of the creek flats; as do highly leached loamy soils **I2** (*Podosol*) overlying grey clayey substrates in sluggishly drained upper drainage depression flats. Minor to common areas of stony texture contrast soil formed on weathered rock occur on steeper slopes on the margins of these drainage areas **K4** (*Brown-Grey Kurosol-Sodosol*). **XxS** – creeks: dominated by wet creek flats (slopes 0-5%, 7w, 2e, 2f) Summary: wet drainage depressions with swampy patches.

Classes in the 'Soil Landscape Unit summary' table (eg. 2-1e, 3w, 2y, etc) describe the predominant soil and land conditions, and their range, found in Soil Landscape Units. The number '1' reflects minimal limitation, while increasing numbers reflect increasing limitation. Letters correspond to the type of attribute:

a - wind erosion	e - water erosion	f - flooding	g - gullying
r - surface rockiness	s - salinity	w - waterlogging	y - exposure

Detailed soil profile descriptions:

Main soils:

K4 Acid sandy loam, or occasionally loam, over brown clay on weathered rock (*Brown Kurosol-Chromosol-Sodosol*). Medium thickness to thick sandy loam or occasionally loamy sand, sometimes with a bleached subsurface layer, over clayey subsoil which is often silty and typically contains weathered rock fragments. Weathered rock layers occur at moderate or shallow depth: shallower soils typically occur on steeper slopes. Topsoils are often water repellent; and typically contain metasandstone and/or quartz fragments, and can contain some ironstone. The metasandstone fragments are often ferruginized, especially on more gentle slopes. Subsoils are yellow brown, olive brown or olive yellow with mottled colours typically increasing with depth: clayey lower subsoils can be bleached. Upper subsoils are sometimes sodic/dispersive. A clay loamy transition layer with ironstone gravel can occur between topsoil and subsoil. Soil pH is acidic to strongly acidic. Typically found on slopes and crests. Native vegetation is typically dominated by mallee/banksia/sheoak and/or stringybark.

J2 Ironstone soil (*Ferric Brown Kurosol-Chromosol-Sodosol*). Medium thickness to thick topsoil, overlying yellow brown to pale yellow clayey subsoil with mottled colours increasing with depth. Ironstone gravel very often occurs in the topsoil; as occasionally do quartz fragments. Topsoils are often water repellent. In lower lying situations where colluvial deposition has occurred, and there is a clay loamy to light clayey transition layer between topsoil and subsoil, this transition layer or even the subsoil below contains ironstone gravel. Also this transition layer can be bleached. Subsoils are tight, but break down to very small (<2 mm) moderate strength lenticular/polyhedral structural units: typical of acidic ironstone soils. Clayey substrates are grey to pale yellow with striking red and brownish yellow mottled colours. Soil pH is acidic or strongly acidic. Found on upper slopes and plateau surfaces. Native vegetation is typically dominated by mallee/banksia/sheoak and/or stringybark.

F1-**G5** Acid sandy loam to sand over brown clay (*Brown Kurosol-Sodosol-Chromosol*). Medium thickness to very thick sandy loam to loamy sand (or occasionally loam), often with a bleached subsurface layer, overlying clayey subsoil. There may be a clay loamy to light clayey transition layer between topsoil and subsoil. Subsoils are yellow brown to light grey with mottled colours. Subsoils are often sodic/dispersive, especially in low lying areas and on lower slopes. Soil pH is acidic to strongly acidic. Typically found in drainage depressions, gentle slopes, low lying plains, and on some plateau surfaces/upper slopes. Native vegetation is dominated by cup gum, banksia, stringybark, or swamp wattle/melaleuca/reeds in very wet conditions.

Minor soils:

L1 Shallow rocky soil (*rocky Tenosol*). Shallow sandy loam, or occasionally loamy sand, often grading into silty clay loam or silty light clay which can be sodic and includes weathered rock fragments; overlying weathered metasandstone at shallow depth. Numerous metasandstone and sometimes quartz fragments occur in the profile. Topsoils are often water repellent. A bleached subsurface layers commonly occur. Soil pH is acidic to strongly acidic. Typically found on the steeper slopes. Native vegetation is typically dominated by drooping sheoak, mallee and/or eucalypt trees; with cup gum and/or melaleuca on wet slopes.

I2 Wet highly leached sand (*Podosol*). Very thick loamy sand to light sandy loam with dark brown accumulations of organic, aluminium, and iron compounds in a subsoil layer. In some drainage depressions surface texture is loam, and subsoil texture ranges up to light clay (related to **N3**-**M2** and **N3**-**F1** soils). Organic/aluminium/iron subsoil accumulations can range from soft segregations to continuous pans; and bleached horizons typically occur above and below theses layers. These soils typically overlie pale yellow light clays with mottled colours, which is often capped with a layer of ironstone gravel. Soil pHs are strongly acidic; and these soils are highly infertile. Found on

low lying plains and drainage depressions. Native vegetation is often dominated by banksia and very low mallee.

J3a-b Shallow soil on ferricrete (*Petroferric Tenosol*).
J3a (loamy Petroferric Tenosol): shallow loamy soil overlying ferricrete (sheet or boulder laterite) or a very thick and dense layer of ironstone gravel, which effectively marks the end of the root zone for non woody plants. Soil pHs are acidic to strongly acidic. Native vegetation is typically dominated by mallee/banksia/sheoak and/or stringybark. Found on remnant plateau surfaces and upper slopes. This soil is basically a shallow variant of the **J2** soil, with a more dense layer of ironstone.
J3b (sandy Petroferric Tenosol): shallow sandy soil with a bleached subsurface layer overlying ferricrete (sheet or boulder laterite). Soil pHs are strongly acidic; and these soils are highly infertile. Native vegetation is typically dominated by low stringybark and mallee. Found on sloping land associated with a rise.

M1b Deep sandy loam with ironstone gravel (*Ferric Tenosol*). Typically deep to moderate depth sandy loam, light sandy loam or loamy sand, with thick ironstone gravel in lower layers. Bleached layers can occur above and within the ironstone gravel layer. This is underlain by often pale coloured clayey substrate, which can be sodic/dispersive in the upper layer. Found in low lying areas where ironstone gravel and topsoil material from higher levels have accumulated.

N1 Peat (*Organosol*). Thick to very thick dark coloured highly organic soil found in very wet creek flats, with loamy peat texture. This typically overlies grey to pale yellow sandy clay loam to light clay with grey (blue/green) and mottled colours.

M1a Deep sandy loam (*loamy Tenosol*). Deep to moderate depth sandy loam, loam, or sometimes loamy sand. Bleached subsurface layers can occur. These soils can be dark coloured and organic-rich throughout. Found along drainage lines.

N3-**M2** Wet deep gradational loam (*Grey Dermosolic Hydrosol*). A thin to medium thickness surface layer of dark highly organic loamy peat, overlying a medium to thick layer of dark loam, which grades into a olive brown to pale yellow (bleached) clay loam or sandy clay loam with grey and mottled colours, which in turn grades into a bleached pale yellow or light olive grey, or olive yellow light clay with grey and mottled colours, often with a spongy feel. The subsoil can be sodic/dispersive. Soil pHs are strongly acidic. Native vegetation is often dominated by hakea(?) in very wet areas; and sheoak and/or banksia, or even small eucalypts in wet areas. Found on creek flats and the margins of creek flats.

N3-**F1** Wet acid loam over grey clay (*Grey Kurosolic Hydrosol*). Dark sandy loam to loamy sand topsoil, overlying an olive brown to grey clay with grey and mottled colours, which overlies a yellow silty clay substrate of kaolin clay with white (bleached) areas. The clayey subsoil can be sodic/dispersive. Soil pHs are strongly acidic. Found on the margins of creek flats. Small to medium sized eucalypts can occur on these soils.

K1-**K2** Acid gradational loam, or loam over brown clay, on weathered rock (*Brown Dermosol-Chromosol-Kurosol-Sodosol*). Medium thickness loam, grading into or overlying dark brown to dark yellow brown silty loam to silty light clay; which grades into or overlies weathered phyllite or 'soft' micaeous metasandstone at shallow to moderate depth. Soils typically contain slight to moderate amounts of small stone fragments. Topsoils can be repellent. Soil pHs are acidic to strongly acidic. Native vegetation is typically dominated by tall sugar gums. Found on sloping land adjacent to the 'Snelling' Land System.

Further information: DEWNR Soil and Land Program