

# MIR Middle River Land System

A system consisting of drainage depressions and associated slopes, some remnant plateau surfaces, and some gullies. The area includes the Middle River reservoir and the drainage lines which feed into it.

**Area:** 53.6 km<sup>2</sup>

**Annual rainfall:** 615 – 805 mm average

**Geology:** The predominant underlying rocks are early Cambrian age Kanmantoo group sandstones. This includes Middleton sandstone, a grey meta-sandstone, and other Kanmantoo group meta-sandstones, including a yellow coloured sandstone. A majority of soils in this system are formed in weathered versions of these rocks. Deeply weathered clayey sediments form the base of the remnant plateau areas and some sloping areas, especially upper slopes. This Pliocene-Quaternary age regolith or colluvium is characterised by the presence of an ironstone gravelly layer. The ironstone gravel usually overlies the clayey base, however, it is incorporated with the clay in some alluvial situations. Areas of recent loamy alluvium occur in drainage flats.

**Topography:** This land system is based on the drainage lines of the Middle River drainage area, which drain an area of the central plateau via Middle River into the Middle River reservoir, and then into the sea. It covers the creek lines and associated slopes of middle and upper Middle River, Christmas Creek, Starvation Creek and Squashy Creek. Drainage is predominantly via Middle River. Some remnant plateau surfaces form the high points of the system. Slopes are generally between 0 and 20%, however, steeper slopes of up to 100% occur in the gully areas north of the Middle River reservoir.

**Elevation:** From 250 m in the south west of the system, to near 50 m in the lower areas in the gullies below the Middle River reservoir. Elevations are typically between 150 and 250 m.

**Relief:** Relief is as high as 80 m in the steep gully areas, however, it is typically between 10 and 30 m over most of the system.

**Main Soils:** *Texture contrast soils:*  
**K4** Sandy loam over brown clay on weathered rock  
**J2** Ironstone soil  
*Uniformly textured to texture contrast soils:*  
**K1-K2** Silty clay loam-loam over brown clay-clay loam on weathered rock

**Minor Soils:** *Texture contrast soils:*  
**F1** Sandy loam on brown clay  
**G3** Sand over brown clay  
*Uniformly textured soils:*  
**L1** Shallow loam-silty clay loam on rock  
**M1** Deep loamy soil  
**J3** Shallow loamy soil on ferricrete

**Main features:** The main soils are loams over brown clay formed on weathered rock. Much of the system is too wet, flood prone, or steep to be arable. The arable areas occur on the remnant plateau areas and on slopes which are not too wet or steep. Soil acidity is a major limitation. Seasonal



waterlogging is common due to relatively impermeable and often dispersive subsoils. Where ironstone occurs fertility is reduced due to the fixation of phosphorus. Stone fragments are common.

### Soil Landscape Unit summary: Middle River Land System (MIR)

SLU	% of area	Main features #
AOD	10.4	<p>Rocky gullies.</p> <p>Main soils: <b>K4, K2-K1</b> <u>sandy loams, loams and silty clay loams over brown clay on weathered rock (stony Brown Chromosol-Sodosol-Kurosol)</u>. With some <b>L1</b> <u>shallow loams on rock (rocky Tenosol)</u>.</p> <p><b>AOD</b> – rocky creek gullies and slopes (slopes 10-100%, relief 30-90m, 6-5e, 4-5w)</p> <p>Summary: non arable rocky gullies and slopes.</p>
BkB BkC BkD BkZ BkE	5.3 1.0 0.1 0.3 3.7	<p>Stony slopes and drainage depressions: with soils formed on sandstone.</p> <p>Main soils: <b>K1-K2, K4</b> <u>silty clay loams, loams and sandy loams over brown clay or clay loam on weathered rock (stony Brown Dermosol-Chromosol-Sodosol-Kurosol)</u>. With minor to limited areas of <b>J2</b> <u>ironstone soil (Ferric Brown Chromosol-Sodosol-Kurosol)</u> especially on upper slopes and crests, and minor areas of <b>L1</b> <u>shallow silty clay loams and loams on rock (rocky Tenosol)</u>.</p> <p><i>Slopes and plateau surfaces:</i></p> <p><b>BkB</b> – slopes, lower slopes and some crest areas (slopes 1-4%, 2-3e, 4-3w). Well-watered with tall eucalypts in the south west.</p> <p><b>BkC</b> – slopes with some drainage lines (slopes 3-10%, 3e, 4-3w)</p> <p><b>BkD</b> – slopes (slopes 10-20%, 4e, 4w)</p> <p><b>BkZ</b> – plateau surface (slopes 0-1.5%, 1-2e, 4-3w)</p> <p><i>Drainage areas:</i></p> <p><b>BkE</b> – drainage area: drainage depressions and slopes (slopes 3-10%, 3-4e, 5w, 2°s). Some saline seepage in more sluggishly drained upper drainage depressions.</p> <p>Summary: stony to rocky areas; mostly prone to waterlogging. The clay loamy surface textures are probably the result of the removal by erosion of former sandy loam surface soils. Inherent fertility is levels are relatively good. Tall eucalypts occur in the three well-watered 'BkB' units on slopes adjacent to creek lines in the south west of the system.</p>
CBB CBC CBCg CBE CBO	18.3 2.9 5.4 1.9 30.0	<p>Slopes and creek lines.</p> <p>Main soils: <b>K4</b>, some <b>F1</b> <u>sandy loams and loams over brown clay on weathered rock (stony Brown Chromosol-Sodosol-Kurosol)</u>: the weathered rock mostly occurs by 100cm. With limited to extensive areas of <b>J2</b> <u>ironstone soil (Ferric Brown Chromosol-Sodosol-Kurosol)</u> especially on upper slopes and more gentle slopes. <b>M1</b> <u>Deep loamy soils (loamy Tenosol)</u> occur along drainage flats, with underlying clay at depth: minor to limited in extent. Minor areas of highly leached sands (Podosols) may occur in poorly drained very upper drainage depressions.</p> <p><i>Slopes:</i></p> <p><b>CBB</b> – slopes and crests: usually upper slopes (slopes 1-4%, 2-3e, 3-4w)</p> <p><b>CBC</b> – slopes (3-10%, 3e, 3w)</p> <p><i>Drainage depressions, creek lines and slopes:</i></p> <p><b>CBCg</b> – upper slopes and creek lines (slopes 3-20%, 3-4e, 3w)</p> <p><b>CBE</b> – upper drainage areas: creek lines and slopes (slopes 2-8%, 3e, 4-5w, 2s)</p> <p><b>CBO</b> – drainage areas with some saline seepage: drainage depressions and slopes (slopes 0-12%, 3-4e, 5-4w, 3-2°s)</p> <p>Summary: sloping areas with texture contrast soils formed over weathered rock.</p>



FVB	5.7	Upper slopes and plateau surfaces mostly with ironstone soils. Main soils: <b>J2 ironstone soil</b> ( <i>Ferric Brown Chromosol-Sodosol-Kurosol</i> ). With some <b>K4 sandy loams and loams over brown clay on weathered rock</b> ( <i>stony Brown Chromosol-Sodosol-Kurosol</i> ).  <b>FVB</b> – upper slopes and plateau surfaces (slopes 0-3%, 2-1e, 3w)  Summary: slightly sloping areas.
FXZ	2.0	Plateau surfaces dominated by ironstone soils. Main soils: <b>J2 ironstone soil</b> ( <i>Ferric Brown Chromosol-Sodosol-Kurosol</i> ). With minor to limited areas of <b>J3 shallow soil on ferricrete</b> ( <i>Petroferric Tenosol</i> ). With minor to limited areas of <b>K4 sandy loams and loams over brown clay on weathered rock</b> ( <i>stony Brown Chromosol-Sodosol-Kurosol</i> ).  <b>FXZ</b> – remnant plateau surfaces (slopes 0-2%, 1-2e, 3-4w)  Summary: remnant plateau surfaces.
HCO	12.4	Drainage depression. Main soils: mostly <b>F1 sandy loams over brown clay</b> ( <i>Brown Sodosol</i> ). With <b>K4 sandy loams over brown clay on weathered rock</b> ( <i>stony Brown Sodosol</i> ) on steeper slopes and in some creek bed areas. On drainage flats <b>M1 deep loamy soils</b> ( <i>loamy Tenosol</i> ) often occur. Minor areas of highly leached sands (Podosols) may occur in poorly drained very upper drainage depressions.  <b>HCO</b> – drainage depression often with some saline seepage (slopes 0-8%, 3e, 5-7w, 3-2s) Summary: non arable sluggishly drained drainage depression.
PaZ	0.2	Sandy to sandy loam deposit on plateau surface. Main soils: <b>G3 sand over clay</b> ( <i>Brown Sodosol</i> ); probably with some <b>F1 sandy loam over clay</b> ( <i>Brown Sodosol</i> ). Possibly some soils with ironstone gravel.  <b>PaZ</b> – slightly raised linear deposit on plateau surface (slopes 0-3%, 1-2e, 2w)  Summary: a linear sandy deposit on a plateau edge; probably a glacial deposit.
XI-	0.4	Middle River Reservoir.

# 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 - gullyng  
r - surface rockiness      s - salinity      w - waterlogging      y - exposure



**Detailed soil profile descriptions:****Main soils:**

- K4** Sandy loam over brown clay on weathered rock (*stony Brown Chromosol-Sodosol-Kurosol*). Medium thickness to thick sandy loam, sometimes loam, or occasionally loamy sand overlying mottled olive-brown or orange-brown clay, which is underlain by weathered rock. The subsoil clay can be dispersive. Thicker topsoils, often with a bleached subsurface layer, can occur in drainage areas. The topsoil often includes some sandstone, quartz, and/or ironstone fragments. The sandstone fragments are often ferruginized. Soil pHs vary from acidic to strongly acidic. Found on slopes and in drainage areas.
- J2** Ironstone soil (*Ferric Brown Chromosol-Sodosol-Kurosol*). Medium thickness to thick sandy loam or sometimes loam overlying mottled olive-brown or orange-brown clay. Ironstone gravel usually overlies the clayey subsoil, or is sometimes incorporated with the upper clayey subsoil in alluvial situations. The subsoil clay can be dispersive. A transition layer of clay loam can occur between the topsoil and clayey subsoil in colluvial/alluvial situations. This soil is usually underlain by a grey, red and orange-brown mottled zone of deeply weathered clay. Soil pHs vary from acidic to strongly acidic. Found on remnant plateau areas, on many slopes, especially upper slopes, and on slopes in some drainage areas. [Sites: 917]
- K1-K2** Silty clay loams to loams over brown clay to clay loam on weathered rock (*stony Brown Dermosol-Chromosol-Sodosol-Kurosol*). Medium thickness to thick silty clay loam, loam or silty loam overlying brown silty clay or silty clay loam, which is underlain by weathered rock. The topsoil is typically quite stony, with fragments of sandstone, quartz and ironstone. There is often a bleached subsurface layer. The subsoil is often dispersive. Soil pHs vary from acidic to strongly acidic. Found on stony slopes around the Middle River reservoir.

**Minor soils:**

- F1** Sandy loam on brown clay (*Brown Sodosol*). Thick to very thick sandy loams over mottled olive-brown to olive clay. Bleached subsurface layers are common. Especially found in sluggishly drained drainage areas.
- L1** Shallow loam to silty loam on rock (*rocky Tenosol*). Sandy loams, loams and silty clay loams, usually with numerous rock fragments, directly overlying weathered rock at shallow to moderate depth. Found in steeper gully areas, and on some lower slopes in other areas. [Sites: 097]
- M1** Deep loamy soil (*loamy Tenosol*). Deep and brown loamy soils; underlain by a clayey substrate. Found in drainage flats.
- J3** Shallow loamy soil on ferricrete (*Petroferric Tenosol*). Shallow sandy loam overlying a ferricrete layer. The sandy loam soil includes ironstone gravel which gets thicker with depth. The ferricrete layer is underlain by a mottled clay substrate. Found in patches on remnant plateau surfaces.
- G3** Sand over brown clay (*Brown Sodosol*). Thick to very thick sand over mottled clay. Found on one specific area on a plateau surface, and in a few sluggishly drained drainage flats.

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

