MKI Mount Kitchener Land System

Rough hills in the Kaiser Stuhl area

Area: 15.4 km^2

Annual rainfall: 560 – 750 mm average

Geology: The System is formed on granodiorites and granitic gneisses of the Mount Kitchener Formation, with minor inclusions of metasandstones and schists of the Backstairs Passage Formation of the Kanmantoo Group. There are small isolated areas of local gritty outwash sediments.

Topography: Rolling to steep rough low hills to hills formed on granodiorites and granitic gneisses. Slopes vary from 5% to 10% on some rounded crests and gentle slopes to 80% on the steepest hillslopes. Relief varies from 60 metres to 150 metres. Rock outcrop is very extensive on the steeper slopes. Watercourses occupy narrow gullies. Pediments and creek flats are uncommon.

Elevation: 430 - 600 m (Kaiser Stuhl)

Relief: Up to 150 m

Soils: The soils are mainly shallow, coarse textured, gritty and stony over granitic rocks. Some have clayey subsoils. Deep coarse textured soils occur in depressions and flats.

Main soils

Soils formed on granodiorite / granitic gneiss

K3 Loamy sand over brown to red sandy clay

L1a Shallow stony grit

Soils formed on schist / metasandstone

K4 Loamy sand over brown clay

Minor soils

Soils formed on schist / metasandstone

K5 Gradational loamy sand

L1b Shallow stony loamy sand

Soils formed on alluvium

M1 Deep gradational sand

F1 Sandy loam over brown sandy clay

Main features: The Mount Kitchener Land System is characterized by very rough moderately steep to steep hillslopes. Rocky outcrop and surface stone are widespread. Accessibility is commonly restricted. Spectacular rocky outcrops are a feature of this land. Soils are generally shallow to moderately deep, gritty and coarse textured with low fertility and high erodibility. Potential for most primary production is low.

Soil Landscape Unit summary: 6 Soil Landscape Units (SLUs) mapped in the Mount Kitchener Land System:

SLU	% of area	Main features #
AgC AgE	49.9 30.0	Moderately steep to steep very rough rocky hillslopes formed on granodiorites, granitic gneisses, mica schists and metasandstones. **AgC** Rocky low hills and moderate slopes with relief to 80 m, slopes of 10-30%, and up to 20% surface quartz & granodiorite. **AgE** Very rocky steep hillslopes with relief to 150 m, slopes of 30-80%, and up to 50% surface stone & outcrop. Soils are generally gritty and coarse textured in the surface and shallow over weathering rock. Clayey subsoils may or may not be present. Deeper soils only occur on lower slopes where sedimentary wash has accumulated. Main soils: loamy sand over brown to red sandy clay - **K3** (E), loamy sand over brown clay - **K4** (E) and shallow stony grit - **L1a** (E). The soils are well to rapidly drained, with low inherent fertility, and are either acidic or susceptible to acidification. There are no physical restrictions to root growth (above bedrock), but as this is commonly at shallow depth, waterholding capacities are generally low. The soils are highly erodible, so on these slopes, water erosion potential is high. This land has very low productivity potential.
COD	3.5	Slopes of 10-20% and relatively subdued relief (about 40 m) lying between Kaiser Stuhl to the west and another high granitic hill to the east. Underlying rocks are metasandstones and schists of the Backstairs Passage Formation (similar to Mt. Pleasant Land System). There is up to 10% surface stone and rock outcrop, with sporadic very rocky knobs. Main soils: loamy sand over brown clay - **K4** (E), gradational loamy sand - **K5** (E) and shallow stony loamy sand - **L1b** (E). The soils are moderately well to well drained, have moderately low inherent fertility and are susceptible to acidification. Surface soils are not naturally hard setting, but are prone to compaction. Subsoils (where present) are generally friable. Waterholding capacities are moderate to low depending on the depth to rock. Although soil salinity levels are low, there is potential for sporadic seepage. Water erosion potential is moderately high to high due to the combination of high soil erodibility and moderate slope. Overall productivity potential is moderate, with fertility, acidity and erosion control being the main management issues. Pinus radiata plantations have been established on part of this land.
CPD	15.2	Gently inclined slightly rocky slopes with relief to 60 m and slopes of 5-10% formed on granodiorite and granitic gneiss. There is up to 10% surface quartzite and granodiorite. Soils are generally gritty and coarse textured in the surface and shallow over weathering rock. Clayey subsoils may or may not be present. Deeper soils only occur on lower slopes where sedimentary wash has accumulated. Main soils: loamy sand over brown to red sandy clay - **K3** (E) and shallow stony grit - **L1a** (E). The soils are well drained, with low to very low inherent fertility and high potential for acidification. Surface soils are not naturally hard and subsoils where present are friable. Shallow depth to rock is the main limitation to rooting depth, so waterholding capacities are moderately low to low. Potential for water erosion is moderately high. Although not particularly steep, this land is uneven and stony with shallow to moderately deep coarse textured and gritty low fertility soils. Productive potential is low.
LIC LIE	0.8 0.6	Lower slopes (LIC) and drainage depressions (LIE) formed on gritty coarse grained outwash sediments. There is sporadic watercourse erosion. Main soils: deep gradational sand - **M1** (V) and sandy loam over brown sandy clay - **F1** (C). The soils are well to moderately well drained. Perched water tables may occur on the subsoils, but these are usually deep. Inherent fertility is low, and the soils are prone to acidification. There are no physical limitations to root growth although sands are prone to compaction. Waterholding capacities are moderate. There is moderate potential for water erosion.

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:

F1 Sandy loam over brown sandy clay (Eutrophic, Brown Chromosol)
Thick sandy loam with a bleached A2 layer over a brown mottled sandy clay, continuing below 100 cm.

K3 Loamy sand over brown to red sandy clay (Haplic, Mesotrophic, Brown / Red Chromosol)
Thick gritty and gravelly loamy sand to sandy loam overlying a brown or red gritty sandy clay loam to clay subsoil, grading to weathering granodiorite or granitic gneiss by 70 cm. Extensive throughout.

K4 Loamy sand over brown clay (Bleached-Sodic, Eutrophic, Brown Chromosol)
Thick grey brown loamy sand with a bleached and gravelly A2 horizon, overlying a dark brown, yellow and red mottled clay with strong fine blocky structure, grading to weathered sandy schist or micaceous sandstone by 100 cm. Occurs on Kanmantoo Group rocks.

K5 Gradational loamy sand (Mesotrophic, Grey Kandosol)
Medium thickness grey sand to sandy loam with up to 50% rock fragments, overlying a massive grey brown silty clay loam with abundant rock fragments, grading to weathering schist by 100 cm.

L1a Shallow stony grit (Basic, Paralithic, Bleached-Leptic Tenosol)
Thick gritty and gravelly loamy coarse sand to coarse sandy loam, grading to weathering granodiorite within 50 cm. Occurs throughout, particularly in rocky areas.

L1b Shallow stony loamy sand (Paralithic, Leptic Rudosol)
Thick dark brown loamy sand, with up to 50% rock fragments, overlying sandy schist or micaceous sandstone at about 50 cm. Occurs on Kanmantoo Group rocks in rockier areas.

M1 Deep gradational sand (Bleached-Sodic, Eutrophic, Brown Kandosol)
Very thick brown sand with bleached and rusty mottles, grading to a massive brown clayey sand to light sandy clay loam at about 100 cm, over coarse textured alluvium. Common on lower slopes and in drainage depressions.

Further information: DEWNR Soil and Land Program