

KNH Knott Hill Land System

Undulating to gently rolling low sandy hills in the Peter Creek - Kuitpo area

Area: 11.4 km²

Annual rainfall: 730 – 890 mm average

Geology: The system is a relict deposit of sandy sediments laid down during the Permian age glaciation. The sediments are often indurated to weak sandstones, generally with distinctive bright yellow, red and grey blotchy colours. Elsewhere they range from unconsolidated clayey sands to sandy clays. There has been extensive reworking by wind and water. Deep sand banks have accumulated in places as a result of wind action, and there are extensive lower slope deposits of alluvial sandy clays deposited by water. There are minor lateritic remnants, where the sandstones have been deeply weathered with associated ironstone formation.

Topography: The landscape straddles a low watershed between the Meadows Creek and Onkaparinga catchments. Most of the surrounding country would once have been covered by glacial sediments, the vast majority of which have been eroded away. However, in the Knott Hill area the sediments have been partially protected from the dissection which eroded them from adjacent landscapes. The System is undulating to gently rolling, with well defined drainage depressions flowing to the west (Peter Creek) and to the east (Meadows catchment). Slopes are mostly less than 16%.

Elevation: 300 m on the lowest land in the east, 230 m on the lowest land in the west, to 360 m in the north.

Relief: Up to 50 m

Soils: The soils are predominantly sandy. Surface soils are thick, with bleached A2 layers. Subsoils are clayey - medium to heavy clays are typical of lower slopes and sandier clays typical of higher ground. There are minor deep sands and ironstone soils on rising ground, and loamy to clay loamy surfaced soils on flats.

Main soils

G3 Thick sand over clay over outwash sediment on lower slopes and flats

G5 Sand over acidic sandy clay formed on sandstone and sandy clay

Minor soils

Soils formed on outwash sediments on dissected lower slopes and flats

F1 Sandy loam over brown clay

M2 Deep grey clay loam

Soils formed on sandstones, sandy clays, lateritized sandy clays and reworked sands

H3 Deep bleached siliceous sand

I1 Highly leached sand

J2 Ironstone gravelly sandy loam over clay

Main features: The Knott Hill Land System is an undulating to gently rolling landscape characterized by bleached sandy soils. Although there are some deep sands, most soils have a clayey subsoil within 60 cm. Although this provides useful water holding capacity, it often impedes drainage,



particularly on lower slopes, where waterlogging is a major limitation to land use. Natural fertility is very low and the low buffering capacity sands are readily acidified. The sandy soils are also susceptible to both wind and water erosion if disturbed or exposed, and some may be water repellent. The mid to upper slopes, where drainage is better, have some viticultural and floricultural potential, but elsewhere, existing uses of improved pastures and plantation forestry (except in drainage depressions) offer the best prospects.

Soil Landscape Unit summary: 5 Soil Landscape Units (SLUs) mapped in the Knott Hill Land System:

| SLU | % of area | Main features # |
|------------|--------------|---|
| FhZ | 0.4 | Isolated crest with slopes of up to 10%, formed on lateritized Tertiary sandy clay. Main soil: <u>Ironstone gravelly sandy loam over clay</u> - J2 (D) These soils are deep and moderately well drained but infertile (phosphate fixation problems). They are highly erodible. They are suitable for perennial horticulture or viticulture. |
| LKC LKE | 35.0 15.5 | Dissected lower slopes, drainage depressions and flats formed on sandy clays and clays derived from the localized reworking of upslope sandstones and sandy clays. LKC Dissected lower slopes of 2-6%. LKE Drainage depressions with slopes of less than 3%. The soils are predominantly sandy with clayey subsoils, but there are some heavier types. Main soils: <u>Thick sand over clay</u> - G3 (V) <u>Sandy loam over brown clay</u> - F1 (M) } mainly in LKE <u>Deep grey clay loam</u> - M2 (M) } These soils are deep but inherently infertile and imperfectly to poorly drained. They are also susceptible to acidification (having low buffering capacities), erosion (to both wind and water) if exposed, and may be water repellent. The land is currently used for plantation forestry (although plantings are avoided in most of LKE due to waterlogging) and grazing, with limited scope for horticultural development. |
| LsA | 7.2 | Flats formed on fine grained alluvium. Slopes are less than 1%. The soils are deep with variable sandy to clayey surfaces, but always with clayey subsoils. Main soils: <u>Sandy loam over brown clay</u> - F1 (V) <u>Deep grey clay loam</u> - M2 (L) These soils are deep but generally imperfectly to poorly drained due to thick slowly permeable subsoil clays. They are moderately fertile but prone to acidification. Saline seepages occur sporadically. Potential for developments other than pastures is limited. |
| PsD | 41.9 | Undulating to gently rolling rises and low hills formed on sandstones and sandy clays. Slopes are 8-16% and relief is up to 50 m. The soils are all sandy, mostly with friable sandy clay subsoils. Main soils: <u>Sand over acidic sandy clay</u> - G5 (V) <u>Thick sand over clay</u> - G3 (C) <u>Deep bleached siliceous sand</u> - H3 (L) <u>Highly leached sand</u> - I1 (M) These soils are moderately deep and generally moderately well drained (except for G3). They are highly infertile and prone to acidification and water repellence. They are also highly erodible. The land is currently used for plantation forestry or grazing, but there is potential for viticulture and floriculture provided that waterlogged areas avoided, erosion controlled and acidity ameliorated. |

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 clay (Bleached-Mottled, Hypocalcic, Brown Chromosol)
Thick firm to hard 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.
- G3** Thick sand over clay (Bleached-Mottled, Eutrophic, Brown Chromosol)
Thick soft sand with a strongly bleached A2 horizon, abruptly overlying a yellowish brown and olive mottled medium to heavy clay (sandy clay in upper 20 cm in 20% of profiles), continuing below 150 cm.
- G5** Sand over acidic sandy clay (Bleached, Mesotrophic, Brown Kurosol)
Thick to very thick loose sand with a bleached and sometimes sandstone gravelly A2 horizon, and a thin brown clayey sand layer at the base, over a friable yellowish brown, grey and red sandy clay grading to soft sandstone within 100 cm.
- H3** Deep bleached siliceous sand (Acidic, Arenic, Bleached-Orthic Tenosol)
Very thick white sand overlying yellow sand, sometimes with sandstone gravel beds.
- I1** Highly leached sand (Fragic, Aeric Podosol)
Grey sand with a very thick bleached A2 horizon, overlying dark brown and yellow massive soft to semi-hard (coffee rock) clayey sand, grading to softer yellow and brown sand to light sandy clay loam from about 80 cm.
- J2** Ironstone gravelly sandy loam over clay (Ferric, Mesotrophic, Yellow Chromosol)
Very thick soft sandy loam with a sandier, bleached and ironstone gravelly A2 layer, over a weakly structured yellow clay with ironstone gravel grading to kaolinitic sandy clay continuing below 100 cm.
- M2** Deep grey clay loam (Melanic, Calcic, Grey Dermosol)
Thick dark grey to black clay loam to light clay with granular structure (sometimes seasonally cracking), overlying a dark grey to black heavy clay with strong blocky structure. The clay is yellower and weakly calcareous with depth.

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

