kn KURNELL Aeolian (Associated)

Landscape—gently undulating to rolling coastal dunefields and relict dunes on Quaternary sand. Local relief to 15 m. Slope gradients <15%. North-south oriented dunes with convex narrow crests, broad gently inclined concave swales and isolated swamps. Extensive heathland.

Soils—deep (>200 cm) sandy Podzols (Uc2.31, Uc2.32, Uc2.34) on dunes and in swales. Organic Acid Peats (O) in swamps.

Limitations—extreme wind erosion hazard, highly permeable soils, very low fertility, moderate shrink-swell (subsoil) and permanently high watertables.

LOCATION

Windblown sands and dunes on the Windang Peninsula on the Coastal Plain.

LANDSCAPE

Geology

Quaternary (Pleistocene) windblown medium- to fine-grained well sorted marine quartz sand.

Topography

Transgressive north-south oriented dunes 5–15 m high, with convex narrow crests. Local relief is <20 m. Slopes <15%. Where residential development has occurred, beach ridges have been levelled and swampy swales filled.

Vegetation

Extensively cleared with pockets of heathland which include native heath, spiny-headed mat-rush (*Lomandra longifolia* sp. *longifolia*), and darwinia (*Darwinia fasicularis*). Coastal banksia (*Banksia integrifolia*) and coastal tea-tree (*Leptospermum laevigatum*) occasionally form scrub thickets.

Land Use

Walking tracks, golf course, residential areas.

Existing Erosion

No appreciable erosion where slopes are low and a substantial ground cover is maintained.

Included Landscape

Small areas of Disturbed Terrain **(xx)** occur.

SOILS

Dominant Soil Materials

kn1—Loose brownish grey sand (topsoil)

Colour	brownish grey (10YR 5/1) to (10YR 8/1)
Texture	sand
Structure	apedal single-grained
Fabric	sandy
pH	5.0–6.5
Stones	nil
Roots	nil

kn2—Mottled greyish brown sand (subsoil)

Colour	greyish brown (7.5YR 4/2) to brownish grey (10YR 6/1) with faint yellow mottles >30%
Texture	sand
Structure	apedal, single-grained
Fabric	sandy
pH	5.5–7.0
Stones	nil
Roots	nil

kn3—Brown soft sandy iron pan coffee rock

Colour	brown (10YR 4/6) to bright yellowish brown (10YR 7/6)
Texture	sand to loamy sand
Structure	apedal massive
Fabric	sandy to earthy
pH	5.5–7.0
Stones	nil
Roots	nil

kn4—Loose bright yellowish brown sand (subsoil)

Colour	bright yellowish brown (7.5YR 6/6) to brown (10YR 6/6)
Texture	sand
Structure	apedal, single-grained to weakly cohesive
Fabric	sandy to earthy
pH	4.5–6.0
Stones	nil
Roots	nil

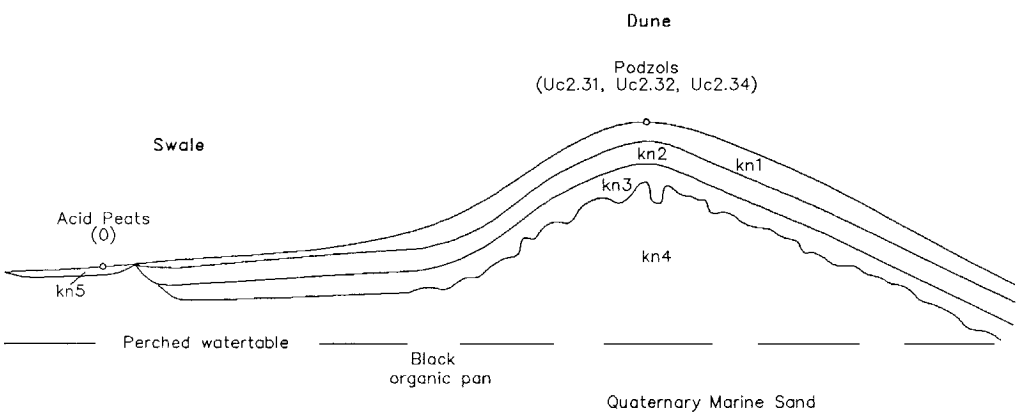
kn5—Black sticky peat (subsoil)

Colour	black (10YR 3/1)
Texture	silt loam to silty clay loam
Structure	apedal massive
pH	4.5–6.0
Stones	nil
Roots	common

Occurrence and Relationships

Dunes. Up to 80 cm of loose brownish grey sand **(kn1)** overlies <15 cm of coffee rock **(kn3).** Up to 130 cm yellow brown sand **(kn4)** overlies <50 cm mottled greyish brown sand **(kn2).** The boundaries between **kn1** and **kn3** are even, and **kn2, kn3** and **kn4** are sharp and irregular [Podzols (Uc2.31, Uc2.32, Uc2.34)]. Total depth is >250 cm.

Swales. Up to 25 cm of brown sand **(kn1)** overlies <25 cm black sticky peat **(kn5)** [Acid Peats (0)], often resulting in perched watertables.



■ *Schematic cross-section of Kurnell soil landscape illustrating the occurrence and relationship of the dominant soil materials.*

LIMITATIONS TO DEVELOPMENT

Soil Limitations

kn1 Low available water-holding capacity
Low fertility

kn2 Low available water-holding capacity
Low fertility

kn3 Low available water-holding capacity
Hardsetting surface
Very low fertility

kn4 Low available water-holding capacity
Very low fertility
Strongly acid
High potential aluminium toxicity

kn5 Low available water-holding capacity (dry)
Hardsetting (dry)
High organic matter
Strongly acid
High potential aluminium toxicity
Shrink-swell

Fertility

Soil fertility is low to very low. Nutrient status is low as is CEC and available water-holding capacity. Roots are generally restricted to soil occurring above **kn3**, a coherent coffee rock pan.

Erodibility

The soil materials have very low erodibility. The soil materials **kn1, kn2, kn3** are stable well-drained coarse sands, **kn4** has coarse sand grains weakly held together by iron compounds and **kn5** by organic matter.

Erosion Hazard

The erosion hazard for non-concentrated flows is slight. Calculated soil loss during the first 12 months of urban development ranges up to 5 t/ha for topsoil and 35 t/ha for exposed subsoil. Soil erosion hazard for wind erosion and concentrated flows is extreme.

Surface Movement Potential

Slight to moderate reactivity occurs with peat; otherwise, stable.

Landscape Limitations

Permanently high watertables
Highly permeable soils
Extreme wind erosion hazard
Very low fertility

Urban Capability

Generally moderate limitations for urban development. High to severe limitations on sand dunes.

Rural Capability

Generally high to severe limitations for regular cultivation and grazing.