md MADDENS PLAINS Residual (Assoc.)

Landscape—moderate to gently undulating rises with dells (swamps) on plateau surfaces of Hawkesbury Sandstone. Local relief <40 m. Slopes <10%. Very broad drainage depressions and scattered rock outcrop <15%. Sedgelands, swamp, wet heath, dry heath and isolated stands of open-woodland and scrubland.

Soils—Acid Peats (0) occur in swamps, Gleyed Podzolic Soils (Dg4.31) occur in drainage lines, Siliceous Sands (Uc5.11) and Podzols (Uc2.31) occur on lower slopes, Yellow Earths—Laterites [(KS–Gn2.81, Gn4.81), Lithosols (Uc1.2)] occur on crests.

Limitations—seasonal and permanent waterlogging, low fertility, high erosion hazard, high shrink-swell (topsoil).

LOCATION

Hawkesbury Sandstone plateau surfaces on the eastern edges of the Woronora Plateau. The two major occurrences are at the southern extremity of Maddens Plains and between Burke River and Little River.

LANDSCAPE

Geology

Hawkesbury Sandstone—medium- to coarse-grained quartz sandstone with minor shale and laminite lenses and Quaternary sands, clayey quartz sand with humic matter. Localised exposures of friable sandstone.

Topography

Moderate to gently undulating rises on plateau surfaces with widespread dells (swamps) (Young 1986). Local relief ranges from 10–40 m and slope gradients 1–10%. The dominant landform elements are broad, usually waterlogged, drainage depressions and benches, 300–800 m wide. Localised outcrops of sandstone occur on small isolated hillcrests and ridges.

Vegetation

Uncleared sedgelands and eucalypt woodland. In the most frequently waterlogged areas common species include saw-sedge (*Gahnia* sp.), bog rush (*Schoenus* sp.) and bare twig-rush (*Baumea juncea*). Wet heathlands, which seasonally dry, contain swamp banksia (*Banksia robur*), coastal tea-tree (*Leptospermum laevigatum*) and dagger hakea (*Hakea teretifolia*). Open-woodland is dominated by scribbly gum (*Eucalyptus haemostoma*) occurring on hillcrests and well-drained slopes.

Land Use

Mostly Water Board Catchment area. The peaty soils and sinks of this soil landscape are important for retaining and slowly filtering water into the Sydney and Wollongong water supplies (Young 1986).

Existing Erosion

Sheet erosion occurs on the non-organic soils especially on exposed batters and after fire in wet heath. Isolated gully erosion is evident along some drainage lines, often to bedrock, and is associated with road drainage works.

Included Soil Landscape

Small areas of Faulconbridge **(fb)** soil landscape have been included in this soil landscape.

SOILS

md1—Friable organic peat (topsoil)

Colour	brownish black (10YR 2/2) to black (10YR 2/1)
Texture	peat
Structure	fibrous
pH	4.0–5.0
Stones	nil
Roots	abundant

md2—Loose grey sand (topsoil)

Colour	light grey (10YR 7/1) to pale yellow (10YR 7/4) with red mottles 50%
Texture	sand to loamy sand
Structure	apedal single-grained to weakly pedal, 2–5 mm polyhedral peds
Fabric	sandy
pH	4.0–6.0
Stones	nil
Roots	nil

md3—Earthy yellowish brown light sandy clay loam (topsoil or subsoil)

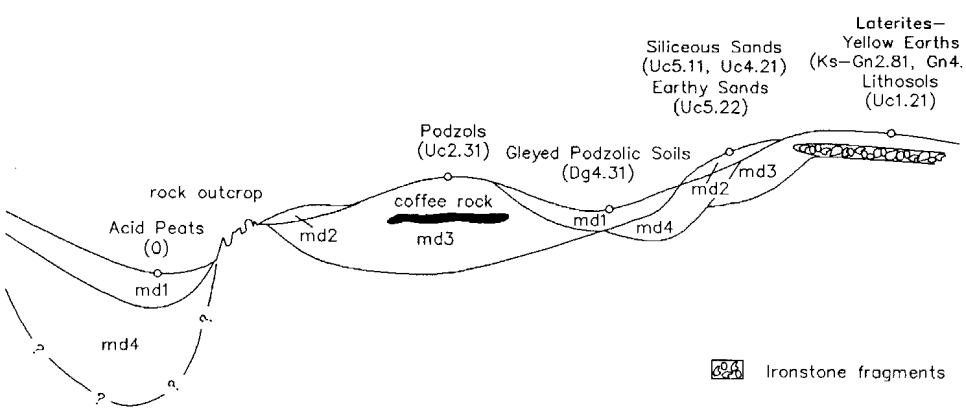
Colour	bright yellowish brown (10YR 6/6) to yellow orange (10YR 8/6)
Texture	light sandy clay loam to sandy clay loam
Structure	weakly pedal 2–5 mm polyhedral peds to apedal single-grained
Fabric	earthy and rough-faced, porous
pH	4.0–6.0
Stones	nil
Roots	nil

md4—Mottled gleyed clayey sand (subsoil)

Colour	light grey (10YR 8/1) to dull yellow orange (10YR 7/2) with orange mottles 40%
Texture	clayey sand to sandy clay loam
Structure	apedal massive
Fabric	earthy
pH	3.0–4.5
Stones	nil
Roots	nil

Occurrence and Relationships

Drainage depressions and poorly drained benches. Up to 180 cm of organic peat **(md1)** [Acid Peats (0)] overlies >200 cm mottled gleyed clayey sand **(md4).** The boundary between soil materials is sharp [Gleyed Podzolic Soils (Dg4.31)]. Total soil depth varies between 150 cm and 500 cm.



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

Periphery of drainage depressions and poorly drained benches. Up to 100 cm of loose grey sand **(md2)** overlies <80 cm **md4** [Siliceous Sands (Uc5.11)] or overlies <80 cm earthy yellowish brown light sandy clay loam **(md3)** [Gleyed Podzolic Soils (Dg4.31)]. Boundaries between soil materials are gradual. The total depth varies from 100–200 cm.

Well-drained slopes. Up to 80 cm **md2** overlies **md3.** The boundary between soil materials is gradual [Siliceous Sands (Uc5.11, Uc4.21) and Earthy Sands (Uc5.22)]. Total depth is 100–200 cm.

Very well-drained positions (upper slopes). Up to 40 cm **md1** overlies <60 cm **md3.** The boundary between soil materials is sharp. In some locations there is a coffee rock pan [Podzols (Uc2.31)]. The total depth is 100–200 cm.

Hillcrests and upper slopes. Up to 50 cm of **md3** occurs with abundant ironstone and rock fragments [Laterites-Yellow Earths (KS–Gn2.81, Gn4.81)]. In some instances soil depth is very shallow [Lithosols (Uc1.2)].

LIMITATIONS TO DEVELOPMENT

Soil Limitations

md1 Very high organic matter
Strongly acid
Low wet bearing strength
High shrink-swell
Sodicity

md2 Low available water-holding capacity
Strongly acid
High aluminium toxicity
Low fertility
Sodicity

md3 Low available water-holding capacity
Strongly acid
High aluminium toxicity
Low fertility
Sodicity
Stoniness

md4 Low available water-holding capacity
Strongly acid
High aluminium toxicity
Low fertility
Sodicity
Waterlogging

Fertility

The fertility is very low. The peaty topsoils are strongly acid with high organic matter. The subsoil materials have very low nutrient status, are often extremely acid and are often permanently waterlogged.

Erodibility

md2, md3, md4 have low erodibility as they consist of well-drained coarse sands. **md1** has low erodibility consisting of coarse sand grains bound together by organic matter.

Erosion Hazard

The erosion hazard for non-concentrated flows is slight to very high. Calculated soil loss during the first 12 months of urban development ranges up to 65 t/ha for topsoil and 80 t/ha for exposed subsoil. Soil erosion hazard for concentrated flows is very high.

Surface Movement Potential

Stable. Except for **md1** all materials are sufficiently coarse grained to be considered stable.

Landscape Limitations

Seasonal and permanent waterlogging
Permanently high watertables
Low fertility

Urban Capability

Generally high to severe limitations for urban development.

Rural Capability

Generally high to severe limitations for regular cultivation or grazing.