

## Wedge soil – texture-contrast soil in strongly weathered gravelly colluvium from Cambrian greywacke

### Site description

*Occurrence:* At medium altitude (300-550 m) in the southwest forests near Lake Gordon

*Parent Material:* Colluvium derived from Cambrian greywacke

*Landform:* Hilly and steep slopes

*Drainage Class:* Well drained

*Vegetation:* Mixed forest with *Eucalyptus obliqua*, *Nothofagus cunninghamii*, *Cenarrhenes nitida* and *Phyllocladus aspleniifolius*



### Distinguishing Soil Properties

#### *Profile Features:*

- Texture-contrast profile
- Peaty surface horizon
- Strong coarse blocky peds in subsoil

#### *Chemical and physical features*

- Very high total C, high total N and low total P in topsoil (0-30 cm)
- Very low nutrients in subsoil
- Low SO<sub>4</sub>-S throughout profile
- Very low ability to retain added P (very low P retention) in upper horizons
- Permeability – moderate

### Similar soils

- Soil 6.1, Forest Soils of Tasmania has a thicker A2 horizon, weaker peds, and high erodibility



## Soil Degradation Potential

| FACTOR                   | RATING OF DEGRADATION POTENTIAL |
|--------------------------|---------------------------------|
| Erodibility:             | Moderate to high                |
| Compaction and puddling: | Moderate                        |
| Mixing:                  | Moderate                        |
| Nutrient depletion:      | High (N, P and S)               |
| Landslides:              | Slight                          |
| Flooding:                | Negligible                      |

## Site Productivity

Moderate productivity, becoming limited at higher altitude and on exposed sites. Soil nutrient reserves are very low. Productivity probably depends in part on nutrients in rainfall.

## Soil Management

These soils are generally stable and normal Forest Practices Code provisions will generally ensure good soil and water conservation outcomes. As most of the nutrients are held in the O and A1 horizons special care must be taken to keep these horizons intact.

## Native Forest Logging and Regeneration

### LOGGING AND CLEARING:

Soils are not suitable for wet-weather conventional logging; many slopes are more suitable for cable logging

### PREPARATION FOR REGENERATION:

Burning is required for good germination, but very hot burns could lead to loss of nutrients since these are mostly held in the organic-rich surface layers.

### SILVICULTURAL CONSIDERATIONS:

After disturbance and fire nutrients may become more limiting than 0-30 cm soil analyses indicate. Relatively long rotations may be required.

## Suitability for Plantations

**Marginally suitable** for plantations because of very low nutrients in subsoils and the limited capacity of peaty topsoils to supply nutrients over a long period.

## Profile

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*Date:* 09 January 2001

*Location:* Coupe WE31B, east side of Strathgordon Island Road

*Map reference:* Sheet 4225 (McPartlan) 439560 5258820

*Landform:* Midslope of hillside 250 m long

*Vegetation:* *Eucalyptus obliqua*, *Nothofagus cunninghamii*, *Cenarrhenes nitida*, *Phyllocladus aspleniifolius*, *Leptospermum* sp., *Monotoca glauca* and minor *Acacia mucronata*

*Parent material:* Strongly weathered colluvium derived from Cambrian greywacke

*Drainage:* Well drained

*Slope:* 20°

*Aspect:* Southwest

*Altitude:* 350 m

*Photographs:* PDM 1(1)-01-2 (site); 1(2)-01-25 (profile)

*Australian Soil Classification:* **Humose-bleached Dystrophic Brown Kurosol**

|    |           |  |
|----|-----------|--|
| Oh | 0-20 cm   | Very dusky red (2.5YR2.5/2) (moist) peat; very weak strength; moderate 2-5 mm crumb structure; abundant fine and medium roots; NaF 0/5.  |
| A1 | 20-30 cm  | Dark reddish brown (5YR3/2) (moist) humic coarse sandy loam; very weak strength; 10% angular gravels 2-50 mm diameter; weak 1-5 mm crumb structure; abundant fine and medium roots; NaF 0/5.   |
| A2 | 30-63 cm  | Pinkish grey (7.5YR6/2) (moist) gravelly silty clay loam; firm strength; 25% angular gravels 10-100 mm diameter; moderate 5-20 mm angular blocky structure; many fine and medium roots; NaF 0/5.   |
| B2 | 63-120 cm | Strong brown (7.5YR4/6) (moist) gravelly light medium clay; very firm strength; 30% angular gravels 20-500 mm diameter; strong angular 20-100 mm angular blocky structure, breaking to moderate 5-20 mm subangular blocky structure; common fine and medium roots, mainly between peds; abundant distinct dark brown clay-humus cutans on ped surfaces; NaF 0/5. |

## Laboratory Analyses

| Horizon | Depth (cm)  | pH (H <sub>2</sub> O) | Total C (%) | Total N (%) | C/N  | Colwell P (mg/kg) | Total P (mg/kg) | P retn. (%) | SO <sub>4</sub> -S (mg/kg) | Water-stable aggreg. (%) |
|---------|-------------|-----------------------|-------------|-------------|------|-------------------|-----------------|-------------|----------------------------|--------------------------|
|         | <b>0-30</b> | 3.8                   | 6.38        | 0.14        | 45*  | 6                 | 93              | 0           | 0.4                        | n.d.                     |
| Oh      | 0-20        | 3.4                   | n.d.        | n.d.        | n.d. | n.d.              | n.d.            | n.d.        | n.d.                       | n.d.                     |
| A1      | 20-30       | 3.6                   | 17.5        | 0.42        | 42*  | 11                | 157             | 0           | 3.7                        | 24                       |
| A2      | 30-63       | 3.9                   | 1.83        | 0.03        | 58*  | 1                 | 65              | 4           | 0.1                        | 52                       |
| B2      | 63-120      | 4.3                   | 1.19        | 0.04        | 31   | n.d.              | 113             | 38          | 8.9                        | 54                       |

| Horizon | Depth (cm)  | Exch. Ca (cmol(+)/kg) | Exch. Mg (cmol(+)/kg) | Exch. K (cmol(+)/kg) | Exch. Na (cmol(+)/kg) | CEC (cmol(+)/kg) | BS (%) |
|---------|-------------|-----------------------|-----------------------|----------------------|-----------------------|------------------|--------|
|         | <b>0-30</b> | 0.31                  | 2.17                  | 0.23                 | 0.23                  | 16.8             | 18     |
| Oh      | 0-20        | n.d.                  | n.d.                  | n.d.                 | n.d.                  | n.d.             | n.d.   |
| A1      | 20-30       | 0.90                  | 4.18                  | 0.44                 | 0.43                  | 40.3             | 15     |
| A2      | 30-63       | 0.12                  | 0.42                  | 0.10                 | 0.07                  | 4.6              | 15     |
| B2      | 63-120      | 0.06                  | 0.75                  | 0.25                 | 0.16                  | 13.0             | 9      |

Analytical methods were those of Blakemore et al. (1987), Laffan et al. (1996) and Rayment and Higginson (1992), with variation of methods for C, N and SO<sub>4</sub>-S (details available from P. D. McIntosh, Forest Practices Board).

\* These very high C/N values indicate that much of the C may be in the form of charcoal.

## **References**

- Blakemore, L. C.; Searle, P. L. and Daly, B. K. 1987. Methods of chemical analysis of soils. *New Zealand Soil Bureau Scientific Report 80*.
- Laffan, M. D.; Grant, J and Hill, R. 1996. A method for assessing the erodibility of Tasmanian Forest Soils. *Australian Journal of Soil and Water Conservation* 9: 16 – 22.
- Rayment, G. E, and Higginson, F. R. 1992. Australian Laboratory Handbook of Soil and Water Chemical Methods. Incarta Press, Melbourne. 330p.

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## **Citation**

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