

# **BUCKLAND SOIL REPORT**

## **Reconnaissance Soil Map Series of Tasmania**

**A Revised Edition**

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**Tasmania**  
**2000**

**of Divisional Report 13/57 Buckland**

By J. Loveday & G.M Dimmock  
C.S.I.R.O Division of Soils, Adelaide, 1958

**Buckland Report**

and accompanying 1:100 000 Buckland  
Soil Reconnaissance map



DEPARTMENT of  
PRIMARY INDUSTRIES,  
WATER and ENVIRONMENT



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## **ACKNOWLEDGEMENTS**

This report and accompanying map are revised versions of original work by CSIRO (Loveday J. & Dimmock G.M, 1958). We gratefully acknowledge the original work of Loveday & Dimmock and the CSIRO Division of Soils, Adelaide for supporting this project.

We would like to acknowledge the contribution of the following groups and individuals who have assisted with the reprinting and updating of this report and accompanying map.

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## **PREFACE**

### **The Reconnaissance Series**

Over a 27 year period (1940 - 1967), the CSIRO Division of Soils, Adelaide undertook a series of reconnaissance (small scale) soil surveys and some more detailed (large scale) soil surveys of the agricultural land in Tasmania. However, most of these reports are out of print and of limited availability, the terminology is dated and inconsistencies in map units exist across map sheets. In 1997, the Department of Primary Industries, Water and Environment (DPIWE) and the Natural Heritage Trust, put together a project to correlate and reprint the maps and reports and to extend this information and its value as a tool for sustainable land management, to a variety of potential users.

This report is part of the “Reconnaissance Soil Map of Tasmania” series which were published at a scale of 1 inch to 1 mile (1:63 360). The reconnaissance series has been expanded to include the soil maps that were not part of the original “Reconnaissance Soil Map of Tasmania” series but mapped at scales of 1 inch to 1 mile and 1 inch to 2 miles (1:126 000). These maps have been reformatted and reprinted by the DPIWE at a scale of 1:100 000 to be consistent with more recent soil mapping scales (eg South Esk 1:100 000 soil map (southern half), Doyle, 1993), the land capability mapping series and the current Tasmanian Land Tenure map series.

It is not the aim of this project to remap the areas covered by the Reconnaissance series or to change the intensity of mapping, but to correlate, standardise and enhance existing information and provide the public and DPIWE staff with more consistent, reliable and accessible soil resource information.

### **Correlation of the Buckland Reconnaissance Soil Map**

#### **Defining Map units**

In attempting to correlate soils across the reconnaissance soil maps around the State differences in the nature of the map units have caused some problems. Map units on the initial maps investigated (Longford, Quamby and South Esk), essentially depicted broad scale “soil associations”. These associations identified and described a dominant soil and a range of minor soils which were generally associated with recognisable landscape features. For example the Eastfield Association, dominated by the Eastfield Soil Profile Class (SPC), includes a range of minor soils such as the Panshanger SPC and the Bloomfield SPC which are found on rolling to steep dolerite hills.

In other parts of the State, including the Buckland sheet, the map units of the Reconnaissance Soil Maps have been generally defined on the basis of Great Soil Groups (Stace *et al.*, 1968) and parent material, eg Podzolic Soils on Dolerite. In many instances a dominant or representative soil has been identified and where adequate existing data is available it is possible to define an SPC for that soil. In such cases it is sometimes possible to correlate with SPCs defined elsewhere. However

because of insufficient data for the minor soils it is not possible to define and correlate the minor soils around the State. Therefore there is a unit “Podzolics on Dolerite” and another “Eastfield Association” both of which are dominated by the Eastfield SPC but which may have different minor soils. To correlate these two units based on the dominant soil only, would be incorrect and misleading. Instead the original map unit name has been retained. Where a dominant soil has been identified, the map unit has been assigned a number eg Podzolics on Dolerite 1 (Pd1), with the identified dominant soil outlined in the report and on the legend of the map.

In some instances sufficient data exists to determine that a particular polygon or group of polygons, i.e areas which are enclosed by specific boundaries, have a different dominant soil to others of a similar map unit name. However the data is insufficient to allow the precise definition of that soil. These map units have been assigned a numerical value (e.g Pm1 & Pm2). The distinction between these polygons and polygons where a dominant soil has been defined (eg Pd1), is apparent by the absence of a defined dominant soil in the report and on the legend of the map.

Due to resource constraints only a limited amount of time could be spent investigating these less well defined soils and map units. Hence the term “insufficient data” occurs widely throughout the legend. The correlation of the Reconnaissance Soil Maps has highlighted how little information is available for some of Tasmania’s major soils.

## **The Buckland Map**

The Buckland Reconnaissance Soil Map adjoins the Sorell map (Spanswick, 1999c) on its southern boundary, the Brighton (Spanswick *et al.*, 2000c) on its western boundary and the Hobart map (Spanswick *et al.*, 2000d) on its south western corner. For an index map of the 1:100 000 Reconnaissance Soil Surveys of Tasmania, see Appendix 7.

### **Soil Taxonomic Units**

A soil taxonomic unit is a general term for a grouping of soils based on similarities of the soils within the group, and differences compared with other groups. Map units consist of defined areas of contiguous soil taxonomic units. As outlined previously the soil taxonomic units used by Loveday & Dimmock in this survey are Great Soil Group (Stace *et al.*, 1968). This has been replaced where possible by Soil Profile Class (SPC) as this will standardise taxonomic units across the Buckland map and be consistent with taxonomic units used within the more recent South Esk Soil Map and by other States. An SPC is a group or class of soil profiles within a map unit which have similar morphological characteristics, and may have similar chemical properties (Gunn *et al.*, 1988). The SPCs were constructed through the use of existing reports, historical soil data in the DPIWE soil database and additional field work. A key to soil horizon designations used within the SPCs is provided in Appendix 1. The lines separating horizons within the SPC reports are shown by broken and solid lines. The broken lines show a diffuse or gradual change to the next horizon whereas the solid lines show a clear or abrupt transition. If the horizon transition is unknown a larger broken line is used. The SPCs generally include land capability classifications, for a description of these classes refer to K.E. Noble (1992). Where we could not produce an SPC for a map unit, due to a lack of information, type profiles of a dominant soil,

where identified by Loveday & Dimmock on the original map, have been added to the report, wherever possible.

### **Map Edits**

Loveday & Dimmock mapped some of the polygons in the eastern half of the sheet as more than one type of map unit. For example a single map unit may be labelled both “Pd” and “Pd with Bd”. This is really a complex unit. However because the occurrence of Pd with Bd is in only a part of the polygon it is not possible, without significant additional field work and aerial photograph interpretation, to split this unit and other units like it. Therefore, we have left these units as is. They are identified on the paper maps and in a notes column attached to the polygon attribute table of the digital maps. This information has also been stored as a separate point coverage, however the coordinates used for the label points are only estimations taken from a visual interpretation of their location on the original published map.

The map units in this survey also include soil complexes. A soil complex consists of two or more dominant soils which occur in an intricate pattern that can't be separated at this scale of mapping without unwarranted effort.

There are two maps for this report in circulation. The map that accompanies this report has polygons coloured according to the different map units identified. The second map, which is intended solely for DPIWE in-house circulation, has map units coloured according to the Australian Soil Classification for the dominant SPC within each unit. No colour is assigned to a map unit if a SPC has not been identified.

### **Legend**

Where possible the dominant soil of each map unit has been classified to soil order using the Australian Soil Classification (Isbell,1996). Soils have also been classified according to Great Soil Group (Stace *et al.*, 1968).

## **Edits to the Buckland Report**

The Buckland report has been reformatted to provide a more consistent structure with other similar reports. The soil terminology used within the Buckland report has been updated to be consistent with the Australian Soil and Land Survey Field Handbook (McDonald *et al.*, 1990), old imperial measurements have been converted to the metric system and sentence structure has been changed where it did not read with clarity. Edits and additional information about the soils within map units have been recorded within the main body of this report. All the changes made to the report are shown in italics.

No changes have been made to Land Use within this report. This information is out of date and is an area that has been identified as requiring further work.

## **Laboratory Analysed Data**

CSIRO laboratory data is available for some of the dominant soils identified on this map. Readers should be aware that some of the laboratory methods used by C.S.I.R.O in the 1950s and 1960s differ from the methods used in more recent DPIWE laboratory analyse. All CSIRO sites within this report have the character “H” at the beginning of the profile number eg H68. An outline of the different methods used is located in Appendix 2.

## **Future Work**

Correlation of the soils identified on this map with others in southern Tasmania has been extremely difficult due to the lack of existing soil profile data, the complexity of geology and local climate and topography variations. Except for the soils formed on basalt and dolerite, very little is known about the soils within this map sheet. Consequently a number of areas exist where additional work would be valuable.

### ***Alluvial Soils***

The alluvial soils are important agriculturally, however very little is known about their properties or appropriate management. The soils within this unit vary considerably from recent alluvium of the modern floodplain to older more leached soils of the terraces and alluvial fans. These soils are used intensively for agriculture. Further work is needed to differentiate the soils of this unit and provide land users and planners with more detailed information about their properties and behaviour under different land uses.

### ***Soils on Triassic and Permian Sediments***

The soils of the Permian and Triassic mudstone, sandstone, shale and siltstone are variable. This variation is a reflection of the complex bedding of the Permian and Triassic lithologies and the variation in topography and climate. Many of the soils formed on the Permian and Triassic sediments are sodic to varying degrees, making them prone to dispersion and, on steeper slopes, erosion. These soils are currently used for grazing, forestry and urban development. More work is required on these soils as their erosion risk has important land use implications.

### ***Brown Soils on Dolerite***

These soils occupy only a small area on this map sheet and are generally found as a complex with podzolic soils on dolerite. Only one site was described by DPIWE within this unit. The information from this site north of Orford suggests that the brown soils on dolerite within this area do not correlate with the dominant soil described on the Brighton and Hobart Soil Reconnaissance Maps. Instead these soils appear to be a transitional soil between the brown soils on dolerite and the podzolic soils on dolerite. More work is needed within this unit to determine if they correlate.

### ***Land Use***

As mentioned previously no edits have been made to the Land Use section of this report. A more detailed description of land use and vegetation within the Buckland area may be found in Davies (1988), Land systems survey of southern Tasmania. A land capability survey of the Nugent 1:100 000 sheet, of which the Buckland soil map

covers the northern half, should be available to the public at the end of the year 2000. This survey will provide more information on land use within this map sheet.

### ***Accuracy of Maps***

Base data on the original Buckland Reconnaissance Soil Map was supplied by the Department of Lands and Survey, Hobart, in 1942. The original map used the Transverse Mercator Projection with co-ordinates displayed in yards. Soil boundaries were delineated by stereoscopic interpretation of aerial photographs. The old paper soil maps were transferred to electronic form in the early 1990s with the co-ordinate system converted to the Australian Map Grid, however no projection was recorded. Accuracy checks of the Buckland digital map have revealed a range of spatial errors. The coastline was incorrect and rivers and estuaries have changed position over time. However the major source of spatial error on all the Reconnaissance Soil Maps has been caused by the absence of rectification of the aerial photographs during delineation of line work. Hence, Ground Control Points (GCP) in some areas on the map sheet, eg hilltops, do not match current true ground positions.

We have not had the resources or time to address all the inaccuracies within this map sheet. Corrections have been made to the coastline only and users need to be aware that in some areas the boundaries of map units may be out by considerable distances.

### **Appendices**

A series of appendices have been attached providing additional information relevant to this report and the accompanying soil map. Much of this information was either unavailable or not recorded with the original report by Loveday & Dimmock .

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Figure 1:

## RECONNAISSANCE SOIL MAP OF TASMANIA

### SHEET 76 - BUCKLAND

by

J. Loveday and G.M. Dimmock

#### 1. INTRODUCTION

*This report forms part of the "Reconnaissance Soil Map of Tasmania" series. The original soil map which is the main feature of this report was released at a scale of 1:63 360. The revised version of the map accompanying this report is at a scale of 1:100 000. The maps are issued in this preliminary form essentially for local use. Discussion of the soils is limited to a brief explanation of the map, and further information is left to intended future publications. The survey of the Reconnaissance series is being intensified and the maps when finally published may be in revised form. However in most cases, although the soil units are likely to be re-defined, major soil boundaries will be altered only slightly.*

#### 2. PHYSICAL ENVIRONMENT

##### 2.1 Geology & Geomorphology

Apart from small patches of a few square km each near Orielton, Runnymede, Buckland, and along the coast near Triabunna and Rheban, the area has a rugged hilly terrain. The highest point is Mt. Hobbs (820m) in the north west of the map with much of the surrounding area above 300m. There are two relatively flat basin-like areas at Runnymede and Buckland, surrounded by hills. Small streams are numerous, the majority of them flowing into the Prosser River which flows eastward to the coast.

The most widespread rock is Jurassic dolerite, which intruded Permian and Triassic sandstones and mudstones. The sandstones are extensive in the northern part of the sheet. Small remnants of Tertiary basalt occur near Orielton, Nugent and Buckland. River terraces and more recent alluvium fill the broader valley floors, while along the coast there are narrow gently sloping plains of alluvial material. Near Rheban, on the coast, a recent sand accumulation has almost enclosed a lagoon and marsh area. Slopes above about 460m in the north-western and south-eastern parts are covered by Pleistocene solifluction deposits.

## **2.2 Climate**

An annual rainfall between *500 and 630mm* is recorded in the south-west and at Buckland, but in the more elevated regions in the north-west and south-east the rainfall is between *760 and 1010mm*. There are no temperature recording stations in the area. However the mean annual temperature throughout is probably in the vicinity of *11° C*. Inland valleys and basin areas are subject to severe winter frosts.

## **2.3 Land Use**

Much of the area is forested and provides only rough grazing for sheep. More intensive agriculture is practised in scattered small areas, notably at Orielton, Runnymede, Levendale, Buckland, Nugent, Orford, Rheban and Triabunna. The cutting of firewood is an important activity throughout, and in the more elevated country of higher rainfall there is some timber suitable for milling.

### **3. SOIL MAP UNITS AND SPC'S**

#### **3.1. Soils on Basalt**

##### **3.1.1 Krasnozems with Hydromorphic Soils on Basalt (K) (2.5 km<sup>2</sup>)**

Krasnozems on basalt occur in a single area at Nugent. Slopes vary from gentle to steep and are often stony. On the freely-drained sites the soil is a deep friable clay with a strongly developed granular structure, particularly in the surface horizon. The colour varies from red-brown (*Copping Clay Loam*) to dark brown (*Bender Clay Loam*), the red-brown types being generally deeper and less stony than the dark brown.

On some slopes slumping has occurred producing benches and it is on these that the hydromorphic soils have developed due to restriction of the drainage. These soils are very variable with mottled, sometime sticky clay subsoils. Ferruginous gravel may be present in the subsurface.

#### **Land Use**

Most of the area has been cleared of its original eucalypt forest vegetation, and is now used for mixed farming.

#### ***Correlation***

*Much of this polygon was inaccessible or had been disturbed by rural development. Included within this unit is dolerite colluvium from the surrounding hills. Loveday (1957) correlated this polygon with the Krasnozems around Ragged Tiers on the Sorell Reconnaissance Soil Map. From field observation the soils of this unit appear to correlate with the Copping Clay Loam and the Bender Clay Loam type profiles, Loveday (1957). Description of these two type profiles have been added to the report. No type profile is available for the hydromorphic soils. For a more detailed description of this soil refer to Loveday (1957).*

## Copping Clay Loam Type Profile H79

CSIRO Soil Surveys (1949-70)

### SITE DESCRIPTION

|                         |                         |                                   |
|-------------------------|-------------------------|-----------------------------------|
| Site Number: H79        | Property Name:          | Runoff: Rapid                     |
| Project Code: CSIRO     | Property Owner:         | Permeability: Slowly permeable    |
| Map Scale: 1: 100,000   | Nearest Town: PEMBROKE  | Drainage: Moderately well drained |
| Sheet No: 8412          | Describer: John Loveday | Elevation: 290 m                  |
| Map Name:               | Date Cored: 29 Jan 1954 |                                   |
| AMG Easting: 565418 E   | Rainfall: 790 mm        | Soil Class: COPPING               |
| AMG Northing: 5261068 N | Air Temp (3pm):         | Northcote PPF: Uf5.22             |
| Film No: 3238           | Type of Site:           | Great Soil Group: Krasnozem       |
| Run No: 3               | Type of Desc: Soil pit  | Soil Taxonomy:                    |
| Frame No:               | Soil Samples: Yes       | Land Capability:                  |
| State: Tasmania         | Soil Photos: Yes        | Geological Map:                   |

Location: 1.6km N of Copping township.

Landform: Element gently inclined, upper slope, hillslope; Pattern undulating rises 9-30m 3-10%, hills;  
 Land Surface: Slope angle 7.0 %; complete clearing - pasture but cultivation at some stage;  
 Vegetation:  
 Substrate: basalt;

### HORIZON DESCRIPTIONS

|     |     |      |    |  |
|-----|-----|------|----|--|
| A11 | 0   | 5    | cm | Moderately moist; dark reddish brown (5YR 3/4 moist); clay loam; strong granular structure; weak (moist); few (2-10%) 2-6mm ferruginous nodules; few (2-10%) basalt coarse fragments; 5.9 field pH;    |
| A12 | 5   | 15   | cm | Moderately moist; dark reddish brown (5YR 3/3 moist); clay loam; strong granular structure; weak (moist); common (10-20%) ferruginous; few (2-10%) basalt coarse fragments; 5.9 field pH;              |
| A3  | 15  | 23   | cm | Moderately moist; dark reddish brown (2.5YR 3/4 moist); clay loam; granular structure; weak (moist); many (20-50%) 2-6mm ferruginous nodules; few (2-10%) basalt coarse fragments; 5.9 field pH;       |
| B1  | 23  | 34   | cm | Moderately moist; dark red (2.5YR 3/6 moist); light clay; granular structure; weak (moist); many (20-50%) 2-6mm ferruginous nodules; few (2-10%) basalt coarse fragments; 5.9 field pH;                |
| B21 | 38  | 48   | cm | Moderately moist; red (2.5YR 4/6 moist); heavy clay; granular structure; weak (moist); few (2-10%) <2mm ferruginous nodules; few (2-10%) gravels (20-60mm) basalt; 6.2 field pH;                       |
| B22 | 51  | 61   | cm | Moderately moist; red (2.5YR 4/6 moist); heavy clay; granular structure; weak (moist); few (2-10%) ferruginous; few (2-10%) basalt coarse fragments; 5.9 field pH;                                     |
| B23 | 66  | 81   | cm | Moderately moist; red (2.5YR 4/6 moist); heavy clay; massive structure; weak (moist); few (2-10%) ferruginous; few (2-10%) basalt coarse fragments; 5.2 field pH;                                      |
| B24 | 84  | 99   | cm | Moderately moist; dark red (2.5YR 3/6 moist); heavy clay; massive structure; weak (moist); common (10-20%) basalt coarse fragments; 5.1 field pH;  |
| B25 | 99  | 114  | cm | Moderately moist; red (2.5YR 4/6 moist); heavy clay; massive structure; weak (moist); many (20-50%) basalt coarse fragments; 5.1 field pH;   |
| B31 | 127 | 140  | cm | Moderately moist; yellowish brown (10YR 5/6 moist); light reddish brown (2.5YR 6/4) primary mottles; heavy clay; weak (moist); few (2-10%) basalt coarse fragments; 5 field pH;                        |
| B32 | 152 | 163+ | cm | Moist; light reddish brown (2.5YR 6/4 moist); yellowish brown (10YR 5/6) primary mottles; weak red (2.5YR 5/1) secondary mottles; weak (moist); common (10-20%) basalt coarse fragments; 5.5 field pH; |

Profile Note: "A" krasnozem ; >51cm decomposed basalt increasing down profile; 152-163cm decomposed basalt with clay; copping series. Field pH has been copied from Lab data.

Figure 1 Copping Clay Loam type profile.

# Profile H79 Cont

COPPING Krasnozem Uf5.22 basalt H79/CSIRO/279 565418E 5261068N PEMBROKE

| Sample Layer | Depths Upr Lwr cm cm | pH 1:5 H2O | PH 1:5 CaCl | EC 1:5 dS/m | Soluble Chloride mg/kg | Exchangeable Ca meq | Mg meq | K meq | Na meq | Exch H meq | Al meq | ECEC Sum meq | CEC Meas meq | TEB Sum meq | Base Sat % | ESP % | Ca/Mg Ratio |
|--------------|----------------------|------------|-------------|-------------|------------------------|---------------------|--------|-------|--------|------------|--------|--------------|--------------|-------------|------------|-------|-------------|
| A11          | 0 5                  | 5.9        |             |             | < 100 A                | 21.3                | 6      | 1     | .4 A   | 42.9 B     |        | 71.6         |              | 28.7        | 40         | .6 B  | 3.55        |
| A11          | 0 5                  |            |             |             |                        |                     |        |       |        | 21 C       |        |              |              |             |            |       |             |
| A12          | 5 15                 | 5.9        |             |             | < 100 A                |                     |        |       |        |            |        |              | 38 A         |             |            |       |             |
| A3           | 15 23                | 5.9        |             |             | < 100 A                |                     |        |       |        |            |        |              | 35 A         |             |            |       |             |
| B1           | 23 34                | 5.9        |             |             | < 100 A                | 10.9                | 3.3    | .14   | .38 A  | 22.8 B     |        | 37.52        |              | 14.72       | 39         | 1.0 B | 3.30        |
| B1           | 23 34                |            |             |             |                        |                     |        |       |        | 9.2 C      |        |              |              |             |            |       |             |
| B21          | 38 48                | 6.2        |             |             | < 100 A                |                     |        |       |        |            |        |              |              |             |            |       |             |
| B22          | 51 61                | 5.9        |             |             | < 100 A                | 5.7                 | 5.6    | .13   | .55 A  | 20.8 B     |        | 32.78        |              | 11.98       | 36         | 1.7 B | 1.02        |
| B22          | 51 61                |            |             |             |                        |                     |        |       |        | 8.9 C      |        |              |              |             |            |       |             |
| B23          | 66 81                | 5.2        |             |             | < 100 A                |                     |        |       |        |            |        |              |              |             |            |       |             |
| B24          | 84 99                | 5.1        |             |             | < 100 A                |                     |        |       |        |            |        |              | 27 A         |             |            |       |             |
| B25          | 99 114               | 5.1        |             |             | < 100 A                |                     |        |       |        |            |        |              |              |             |            |       |             |
| B31          | 127 140              | 5.0        |             |             | < 100 A                |                     |        |       |        |            |        |              |              |             |            |       |             |
| B32          | 152 163              | 5.5        |             |             | < 100 A                |                     |        |       |        |            |        |              |              |             |            |       |             |

| Sample Layer | Depths Upr Lwr cm cm | Loss Ign % | Organic Carbon % | Total N % | C/N Ratio | Avail N mg/kg | Air Dry Moi% | Grav Moi% | Total P % | Avail P mg/kg | Extract P mg/kg | Total K % | Avail K mg/kg | Extract K meq |
|--------------|----------------------|------------|------------------|-----------|-----------|---------------|--------------|-----------|-----------|---------------|-----------------|-----------|---------------|---------------|
| A11          | 0 5                  | 22.6       |                  | .61 A     |           |               | 8            |           | .368 A    |               |                 |           |               |               |
| A11          | 0 5                  |            |                  |           |           |               |              |           |           |               |                 |           |               |               |
| A12          | 5 15                 | 20         |                  | .49 A     |           |               | 8.5          |           | .365 A    |               |                 |           |               |               |
| A3           | 15 23                | 16.2       |                  | .343 A    |           |               | 10.          |           |           |               |                 |           |               |               |
| B1           | 23 34                | 12.2       |                  | .204 A    |           |               | 7.8          |           | .322 A    |               |                 |           |               |               |
| B1           | 23 34                |            |                  |           |           |               |              |           |           |               |                 |           |               |               |
| B21          | 38 48                |            |                  |           |           |               |              |           |           |               |                 |           |               |               |
| B22          | 51 61                | 11.2       |                  |           |           |               | 7.4          |           | .238 A    |               |                 |           |               |               |
| B22          | 51 61                |            |                  |           |           |               |              |           |           |               |                 |           |               |               |
| B23          | 66 81                |            |                  |           |           |               |              |           |           |               |                 |           |               |               |
| B24          | 84 99                | 13.2       |                  |           |           |               | 9            |           |           |               |                 |           |               |               |
| B25          | 99 114               | 13.3       |                  |           |           |               | 11.          |           | .278 A    |               |                 |           |               |               |
| B31          | 127 140              |            |                  |           |           |               |              |           |           |               |                 |           |               |               |
| B32          | 152 163              |            |                  |           |           |               | 9.9          |           | .47 A     |               |                 |           |               |               |

| Sample Layer | Depths Upr Lwr cm cm | <-----Extractable-----> |    |    |    |   |        |    |    |  |  | Free Fe % | Extractable |  |  | Total Fe % | Total Avail S % | Dispersion CaCO3 % |      | Particle Size |     |      |  |  |
|--------------|----------------------|-------------------------|----|----|----|---|--------|----|----|--|--|-----------|-------------|--|--|------------|-----------------|--------------------|------|---------------|-----|------|--|--|
|              |                      | Cu                      | Mn | Zn | Fe | B | Fe     | Al | Si |  |  |           |             |  |  |            |                 | GV %               | CS % | FS %          | S % | C %  |  |  |
| A11          | 0 5                  |                         |    |    |    |   | 5.03 A |    |    |  |  |           |             |  |  |            |                 | 7                  | 4    | 20            | 18  | 39 C |  |  |
| A11          | 0 5                  |                         |    |    |    |   |        |    |    |  |  |           |             |  |  |            |                 |                    |      |               |     |      |  |  |
| A12          | 5 15                 |                         |    |    |    |   |        |    |    |  |  |           |             |  |  |            |                 |                    |      |               |     |      |  |  |
| A3           | 15 23                |                         |    |    |    |   |        |    |    |  |  |           |             |  |  |            |                 |                    |      |               |     |      |  |  |
| B1           | 23 34                |                         |    |    |    |   | 6.92 A |    |    |  |  |           |             |  |  |            |                 | 36                 | 16   | 22            | 17  | 35 C |  |  |
| B1           | 23 34                |                         |    |    |    |   |        |    |    |  |  |           |             |  |  |            |                 |                    |      |               |     |      |  |  |
| B21          | 38 48                |                         |    |    |    |   |        |    |    |  |  |           |             |  |  |            |                 |                    |      |               |     |      |  |  |
| B22          | 51 61                |                         |    |    |    |   | 9.79 A |    |    |  |  |           |             |  |  |            |                 | 13                 | 4    | 22            | 23  | 46 B |  |  |
| B22          | 51 61                |                         |    |    |    |   |        |    |    |  |  |           |             |  |  |            |                 |                    |      |               |     |      |  |  |
| B23          | 66 81                |                         |    |    |    |   |        |    |    |  |  |           |             |  |  |            |                 |                    |      |               |     |      |  |  |
| B24          | 84 99                |                         |    |    |    |   |        |    |    |  |  |           |             |  |  |            |                 |                    |      |               |     |      |  |  |
| B25          | 99 114               |                         |    |    |    |   |        |    |    |  |  |           |             |  |  |            |                 |                    |      |               |     |      |  |  |
| B31          | 127 140              |                         |    |    |    |   |        |    |    |  |  |           |             |  |  |            |                 |                    |      |               |     |      |  |  |
| B32          | 152 163              |                         |    |    |    |   |        |    |    |  |  |           |             |  |  |            |                 |                    |      |               |     |      |  |  |

Figure 1 Cont

## Bender Clay Loam Type Profile H80

CSIRO Soil Surveys (1949-70)

### SITE DESCRIPTION

|                         |                         |                                    |
|-------------------------|-------------------------|------------------------------------|
| Site Number: H80        | Property Name:          | Runoff: Rapid                      |
| Project Code: CSIRO     | Property Owner:         | Permeability: Moderately permeable |
| Map Scale: 1: 100,000   | Nearest Town: PEMBROKE  | Drainage: Well drained             |
| Sheet No: 8412          | Describer: John Loveday | Elevation: 396 m                   |
| Map Name:               | Date Cored: 29 Jan 1954 |                                    |
| AMG Easting: 568159 E   | Rainfall: 840 mm        | Soil Class: BENDER                 |
| AMG Northing: 5262896 N | Air Temp (3pm):         | Northcote PPF: Um6.24              |
| Film No: 3178           | Type of Site:           | Great Soil Group: Krasnozem        |
| Run No: 2               | Type of Desc: Soil pit  | Soil Taxonomy:                     |
| Frame No:               | Soil Samples: Yes       | Land Capability:                   |
| State: Tasmania         | Soil Photos: Yes        | Geological Map:                    |

Landform: Element steep, bench; Pattern hills;  
 Land Surface: Slope angle 30.6 %; complete clearing - pasture but never cultivated; Rock Outcrops <2% bedrock exposed, Basalt;  
 Vegetation:  
 Substrate: basalt;

### HORIZON DESCRIPTIONS

|     |    |     |    |  |
|-----|----|-----|----|--|
| A11 | 0  | 4   | cm | Moderately moist; dark brown (7.5YR 3/2 moist); clay loam; granular structure; weak (moist); few (2-10%) basalt coarse fragments; abundant fine (1-2mm) live roots; 6 field pH; diffuse (>100mm) boundary;                           |
| A12 | 4  | 13  | cm | Moderately moist; dark brown (7.5YR 3/2 moist); clay loam; granular structure; weak (moist); few (2-10%) <2mm ferruginous; common (10-20%) stones (60-200mm) basalt; fine (1-2mm) live roots; 6 field pH; diffuse (>100mm) boundary; |
| A13 | 13 | 23  | cm | Dry; dark brown (7.5YR 3/2 moist); clay loam; granular structure; weak (dry); few (2-10%) ferruginous; many (20-50%) basalt coarse fragments; fine (1-2mm) live roots; 6.6 field pH; diffuse (>100mm) boundary;                      |
| A14 | 23 | 38  | cm | Dry; dark brown (7.5YR 3/2 moist); clay loam; granular structure; weak (dry); few (2-10%) ferruginous; many (20-50%) basalt coarse fragments; fine (1-2mm) live roots; 6.4 field pH; diffuse (>100mm) boundary;                      |
| A3  | 38 | 46  | cm | Dry; dark reddish brown (5YR 3/3 moist); clay loam; weak granular structure; weak (dry); few (2-10%) ferruginous; many (20-50%) basalt coarse fragments; 6.4 field pH; diffuse (>100mm) boundary;                                    |
| B21 | 48 | 58  | cm | Dry; reddish brown (5YR 4/3 moist); medium clay; granular structure; weak (dry); many (20-50%) basalt coarse fragments; 6.3 field pH; diffuse (>100mm) boundary;   |
| B22 | 61 | 76+ | cm | Reddish brown (5YR 4/3 moist); medium clay; abundant (50-90%) basalt coarse fragments; 6.5 field pH;   |

Profile Note: Bender clay loam ; Field pH has been copied from Lab data.

Figure 2 Bender Clay Loam type profile

**Type Profile H80 Cont.**

BENDER Krasnozern Um6.24 basalt H80/CSIRO/280 568159E 5262896N PEMBROKE

| Sample Layer | Depths Upr cm | Depths Lwr cm | pH 1:5 H <sub>2</sub> O | PH 1:5 CaCl | EC 1:5 dS/m | Soluble Chloride mg/kg | Exchangeable Ca meq | Mg meq | K meq | Na meq | Exch H meq | Exch Al meq | ECEC Sum meq | CEC Meas meq | TEB Sum meq | Base Sat % | ESP % | Ca/Mg Ratio |
|--------------|---------------|---------------|-------------------------|-------------|-------------|------------------------|---------------------|--------|-------|--------|------------|-------------|--------------|--------------|-------------|------------|-------|-------------|
| A11          | 0             | 4             | 6.0                     |             |             | 100 A                  |                     |        |       |        |            |             |              | 50 A         |             |            |       |             |
| A12          | 4             | 13            | 6.0                     |             |             | < 100 A                | 30.1                | 9.8    | 2.35  | .31 A  | 56 B       |             | 98.56        |              | 42.56       | 43         | .3 B  | 3.07        |
| A12          | 4             | 13            |                         |             |             |                        |                     |        |       |        | 27.1 C     |             |              |              |             |            |       |             |
| A13          | 13            | 23            | 6.6                     |             |             | < 100 A                |                     |        |       |        |            |             |              | 50.5 A       |             |            |       |             |
| A14          | 23            | 38            | 6.4                     |             |             | < 100 A                | 28.2                | 9.4    | 2.2   | .48 A  | 38 B       |             | 78.28        |              | 40.28       | 51         | .6 B  | 3.00        |
| A14          | 23            | 38            |                         |             |             |                        |                     |        |       |        | 14.6 C     |             |              |              |             |            |       |             |
| A3           | 38            | 46            | 6.4                     |             |             | < 100 A                |                     |        |       |        |            |             |              | 40.5 A       |             |            |       |             |
| B21          | 48            | 58            | 6.3                     |             |             | < 100 A                | 16.9                | 14.3   | 1.13  | .72 A  | 23 B       |             | 56.05        |              | 33.05       | 59         | 1.3 B | 1.18        |
| B21          | 48            | 58            |                         |             |             |                        |                     |        |       |        | 9.4 C      |             |              |              |             |            |       |             |
| B22          | 61            | 76            | 6.5                     |             |             | < 100 A                |                     |        |       |        |            |             |              |              |             |            |       |             |

| Sample Layer | Depths Upr cm | Depths Lwr cm | Loss Ign % | Organic Carbon % | Total N % | C/N Ratio | Avail N mg/kg | Air Dry Moi% | Grav Moi% | Total P % | Avail P mg/kg | Extract P mg/kg | Total K % | Avail K mg/kg | Extract K meq |
|--------------|---------------|---------------|------------|------------------|-----------|-----------|---------------|--------------|-----------|-----------|---------------|-----------------|-----------|---------------|---------------|
| A11          | 0             | 4             | 29.4       | 11.1 C           | .97 A     | 11        |               | 10.          |           | .354 A    |               |                 |           |               |               |
| A12          | 4             | 13            | 29.5       | 8.8 C            | .77 A     | 11        |               | 10.          |           | .228 A    |               |                 |           |               |               |
| A12          | 4             | 13            |            |                  |           |           |               |              |           |           |               |                 |           |               |               |
| A13          | 13            | 23            | 26         | 7.9 C            | .615 A    | 13        |               | 12.          |           |           |               |                 |           |               |               |
| A14          | 23            | 38            | 22.8       | 6.1 C            | .488 A    | 13        |               | 11.          |           |           |               |                 |           |               |               |
| A14          | 23            | 38            |            |                  |           |           |               |              |           |           |               |                 |           |               |               |
| A3           | 38            | 46            | 19.1       | 3.6 C            | .271 A    | 13        |               | 8.6          |           |           |               |                 |           |               |               |
| B21          | 48            | 58            | 14.7       | 1.5 C            |           |           |               | 8.5          |           | .171 A    |               |                 |           |               |               |
| B21          | 48            | 58            |            |                  |           |           |               |              |           |           |               |                 |           |               |               |
| B22          | 61            | 76            |            |                  |           |           |               |              |           |           |               |                 |           |               |               |

| Sample Layer | Depths Upr cm | Depths Lwr cm | Extractable |    |    |    |         | Free Fe % | Extractable |  |        | Total Fe % | Total S % | Avail SO <sub>4</sub> -S mg/kg | Dispersion CaCO <sub>3</sub> % | Particle Size |      |      |     |      |  |
|--------------|---------------|---------------|-------------|----|----|----|---------|-----------|-------------|--|--------|------------|-----------|--------------------------------|--------------------------------|---------------|------|------|-----|------|--|
|              |               |               | Cu          | Mn | Zn | Fe | B mg/kg | Al %      | Si %        |  |        |            |           |                                |                                | GV %          | CS % | FS % | S % | C %  |  |
| A11          | 0             | 4             |             |    |    |    |         |           |             |  |        |            |           |                                |                                |               |      |      |     |      |  |
| A12          | 4             | 13            |             |    |    |    |         | 5.03 A    |             |  | 14 C   |            |           |                                |                                | 8             | 5    | 19   | 27  | 27 C |  |
| A12          | 4             | 13            |             |    |    |    |         |           |             |  |        |            |           |                                |                                |               |      |      |     |      |  |
| A13          | 13            | 23            |             |    |    |    |         |           |             |  |        |            |           |                                |                                |               |      |      |     |      |  |
| A14          | 23            | 38            |             |    |    |    |         | 6.99 A    |             |  | 15.6 C |            |           |                                |                                | 11            | 7    | 21   | 23  | 29 C |  |
| A14          | 23            | 38            |             |    |    |    |         |           |             |  |        |            |           |                                |                                |               |      |      |     |      |  |
| A3           | 38            | 46            |             |    |    |    |         |           |             |  |        |            |           |                                |                                |               |      |      |     |      |  |
| B21          | 48            | 58            |             |    |    |    |         | 7.13 A    |             |  | 15.8 C |            |           |                                |                                | 35            | 15   | 23   | 24  | 29 C |  |
| B21          | 48            | 58            |             |    |    |    |         |           |             |  |        |            |           |                                |                                |               |      |      |     |      |  |
| B22          | 61            | 76            |             |    |    |    |         |           |             |  |        |            |           |                                |                                |               |      |      |     |      |  |

**Figure 2 Cont**

### **3.1.2 Red-brown Soils on Basalt (RBb) (2.5 km<sup>2</sup> )**

Small areas of shallow red-brown soils on basalt ridges or hill tops occur near Pawleena and Nugent. The dominant soil (*Stoneleigh SPC*) has a dark reddish-brown friable clay loam surface, sometimes fine sandy and usually contains basalt floaters and some tiny black ferruginous concretions. The subsoil at about 30cm is a reddish or red-brown clay often friable but sometimes plastic in the moist state. Below about 45cm, the clay merges with decomposing basalt.

#### **Land Use**

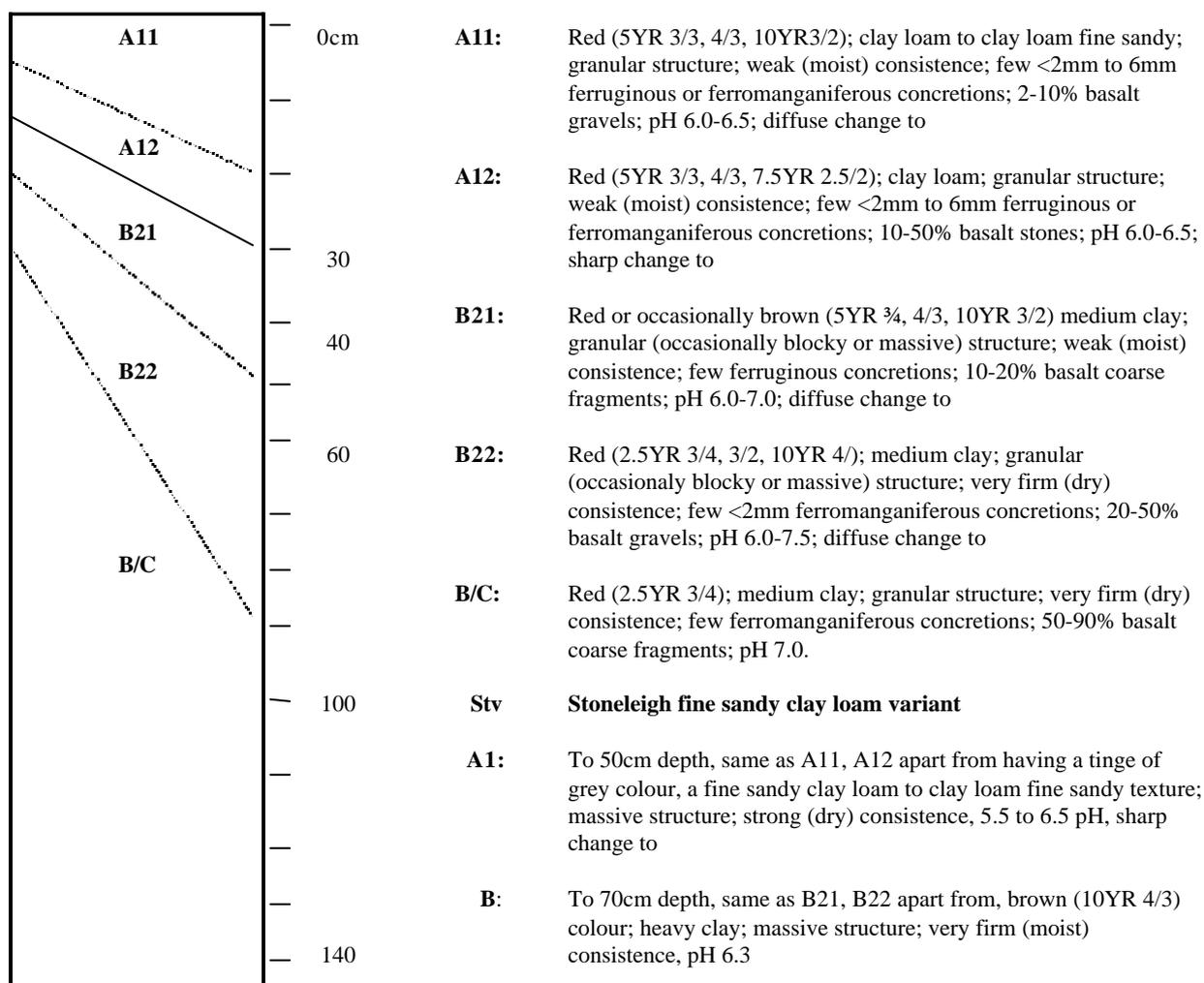
The natural vegetation, which was probably an open sclerophyll forest, has been cleared and mixed farming is now practised.

#### ***Correlation***

*The RBb unit in the south of this sheet correlates with the RBb1 unit first defined on the Sorell Reconnaissance Soil map. Data for this unit have been taken from the Sorell-Carlton-Copping soil map (Loveday, 1957).*

## Stoneleigh Soil Profile Class

|                                  |  |
|----------------------------------|--|
| <b>Concept</b>                   | <b>A stony, shallow, well drained friable reddish brown clay loam surface over a red-brown clay subsoil.</b> |
| <b>Aust. Soil Classification</b> | Red Ferrosol   |
| <b>Great Soil Group</b>          | Prairie soil, chocolate soil.  |
| <b>Principal Profile Form</b>    | Dr   |
| <b>Mapping Units</b>             | RBb  |
| <b>Geology</b>                   | Tertiary Basalt  |
| <b>Landform</b>                  | Upper part and crests of gently sloping hillslopes on low hills  |
| <b>Vegetation</b>                | Mostly cleared   |
| <b>Permeability</b>              | Slowly permeable   |
| <b>Drainage</b>                  | Well drained   |



**Morphological Sites:** CSIRO H81, H68

**Analysed Sites:** CSIRO H81, H68

**Related soil names:** Stoneleigh Clay Loam

**Previously described by:** Lovedav (1957). Spanswick (1999c). Spanswick & Kidd (2000a)

| Soil Profile Class<br>Grid Reference       | Profile<br>Number | Horizon | Sample<br>Depth<br>(cm) | pH<br>water<br>(1:5) | EC<br>(d/sm) | Total<br>P<br>(mg/kg) | Avail<br>P<br>(mg/kg) | Org.<br>Carb.<br>(%) | Total<br>N<br>(%) | C/N<br>Ratio | Ca   | Mg   | Na   | K    | Free<br>Fe | Total<br>Fe |
|--|-------------------|---------|-------------------------|----------------------|--------------|-----------------------|-----------------------|----------------------|-------------------|--------------|------|------|------|------|------------|-------------|
| <b>Stoneleigh</b><br>551814 E<br>5264881 N | H81               | A11     | 0-5                     | 6.7                  |              | 0.172                 |                       | 3.8                  | 0.41              | 9            | 18.9 | 11.2 | 0.9  | 0.31 | 6.01       | 14.2        |
|  | H81               | A12     | 5-13                    | 6.6                  |              | 0.132                 |                       | 3.5                  | 0.37              | 9            | 17.1 | 9.5  | 0.82 | 0.16 | 6.36       | 14          |
|  | H81               | B21     | 13-18                   | 6.9                  |              |                       |                       | 2.4                  |                   |              |      |      |      |      |            |             |
|  | H81               | B22     | 18-30                   | 7.3                  |              | 0.113                 |                       | 1.5                  | 0.28              | 9            | 15.9 | 14.4 | 1.1  | 0.13 | 6.15       | 15          |
|  | H81               | BC      | 30-41                   | 7.3                  |              |                       |                       |                      |                   |              |      |      |      |      |            |             |
| <b>Stoneleigh</b><br>554547 E<br>5264860 N | H68               | A11     | 0-8                     | 5.7                  |              | 0.089                 |                       | 2.6                  | 0.261             | 10           | 8.4  | 1.9  | 0.52 | 0.29 | 6.08       | 18.4        |
|  | H68               | A12     | 8-15                    | 5.8                  |              | 0.079                 |                       | 2.1                  | 0.215             | 10           |      |      |      |      | 4.68       | 18.1        |
|  | H68               | A13     | 15-25                   | 6.1                  |              |                       |                       | 1.6                  | 0.133             | 12           | 10.8 | 0.73 | 0.26 | 0.1  | 5.17       | 18.1        |
|  | H68               | A14     | 28-43                   | 6.3                  |              |                       |                       | 1.1                  |                   |              |      |      |      |      |            |             |
|  | H68               | A15     | 43-53                   | 5.9                  |              |                       |                       |                      |                   |              |      |      |      |      | 6.22       | 20.4        |
|  | H68               | B2      | 58-69                   | 6.3                  |              |                       |                       |                      |                   |              | 13.1 | 1.47 | 0.92 | 0.13 |            |             |
|  | H68               | BC      | 69-84                   | 6.2                  |              |                       |                       |                      |                   |              |      |      |      |      |            |             |

| Soil Profile Class<br>Grid Reference       | Profile<br>Number | Horizon | Sample<br>Depth<br>(cm) | Total<br>Bases | CEC  | BASE<br>SAT<br>(%) | ESP<br>(%) | Ca/Mg<br>Ratio | Gravel<br>(of total)<br>>2000<br>(um)<br>(%) | Sand<br>Coarse<br>>200<br>(um)<br>(%) | Sand<br>Fine<br><200<br>(um)<br>(%) | Silt<br>(%) | Clay<br>(%) |
|--|-------------------|---------|-------------------------|----------------|------|--------------------|------------|----------------|--|---------------------------------------|-------------------------------------|-------------|-------------|
| <b>Stoneleigh</b><br>551814 E<br>5264881 N | H81               | A11     | 0-5                     |                |      | 63                 | 1.8        | 1.69           | 23   | 5                                     | 24                                  | 33          | 27          |
|  | H81               | A12     | 5-13                    |                |      | 63                 | 1.9        | 1.80           | 18   | 3                                     | 21                                  | 30          | 32          |
|  | H81               | B21     | 13-18                   |                | 32.5 |                    |            |                |  |                                       |                                     |             |             |
|  | H81               | B22     | 18-30                   |                |      | 68                 | 2.4        | 1.10           | 16   | 4                                     | 22                                  | 27          | 43          |
|  | H81               | BC      | 30-41                   |                |      |                    |            |                |  |                                       |                                     |             |             |
| <b>Stoneleigh</b><br>554547 E<br>5264860 N | H68               | A11     | 0-8                     |                |      | 43                 | 2.0        | 4.42           | 3  | 17                                    | 28                                  | 32          | 16          |
|  | H68               | A12     | 8-15                    |                | 16.9 |                    |            |                |  |                                       |                                     |             |             |
|  | H68               | A13     | 15-25                   |                |      | 53                 | 1.2        | 14.79          | 5  | 9                                     | 27                                  | 35          | 17          |
|  | H68               | A14     | 28-43                   |                | 17   |                    |            |                |  |                                       |                                     |             |             |
|  | H68               | A15     | 43-53                   |                | 22.8 |                    |            |                | 33   | 13                                    | 30                                  | 38          | 12          |
|  | H68               | B2      | 58-69                   |                |      | 35                 | 2.0        | 8.91           | 31   | 4                                     | 19                                  | 36          | 37          |
|  | H68               | BC      | 69-84                   |                |      |                    |            |                |  |                                       |                                     |             |             |

**Table 1** Analytical data for Stoneleigh SPC

### **3.1.3 Black Soils on Basalt (Blb) (2.5 km<sup>2</sup> )**

These soils are found only on a few basalt remnants in the Orielson valley. Slopes are mostly gentle. The *dominant soil (Sorell SPC)* consists of a dark brownish-grey to black granular clay surface which cracks deeply when dry, this overlies a dark yellowish-grey clay passing to mealy decomposing basalt at about 60cm. This latter horizon may sometimes contain small amounts of free carbonate. Basalt floaters are usually present on the surface and throughout the profile.

Profiles similar to that above, but generally deeper with occasional mottling and fairly frequent carbonate concretions in the lower subsoil are found on basalt alluvium.

#### **Land Use**

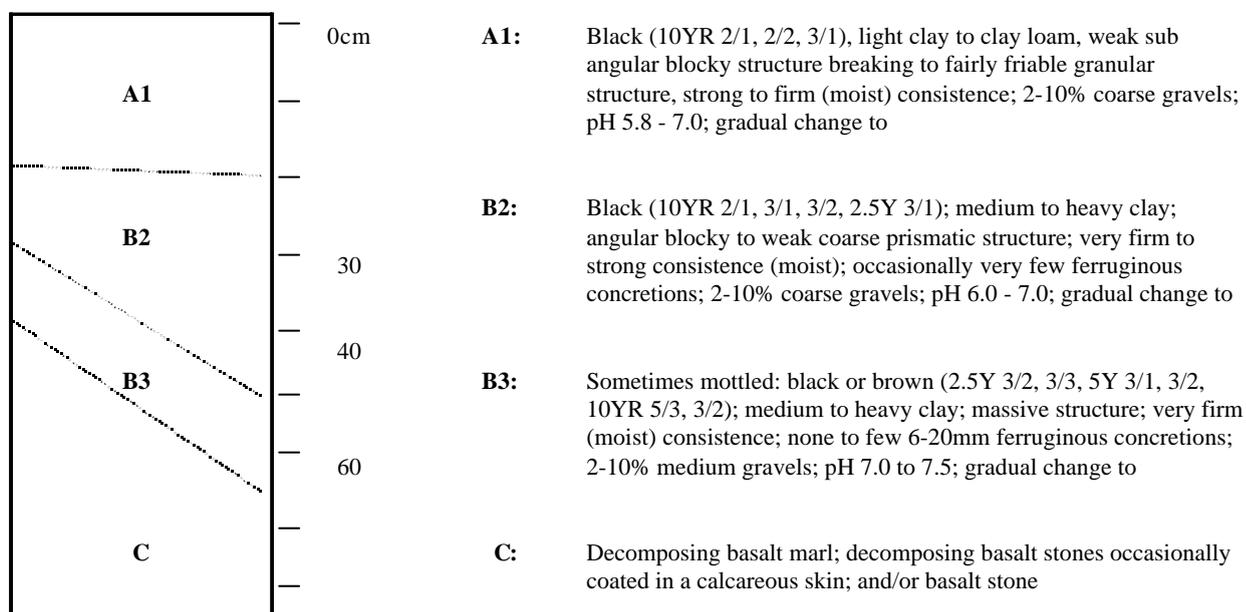
All areas have been cleared and most sown to improved pastures.

#### ***Correlation***

*The dominant soil of this unit correlates with the Sorell SPC. This unit has been renamed Black Soils on Basalt 1 (Blb 1). On the original Sorell Reconnaissance soil map, the basalt area south of Buckland on the property "Sally's Peak" was mapped as Red Brown soils on Basalt. This unit is in fact Black Soils on Basalt and correlates with the Blb1 unit in the south east of the sheet. Chemical data was available for only one site on the Buckland map, (SOILCO 60). Additional chemical data for the Sorell SPC has been copied from analysed sites on the Sorell, Brighton & Hobart Reconnaissance Soil Maps .*

## Sorell Soil Profile Class

|                                  |   |
|----------------------------------|---|
| <b>Concept</b>                   | <b>Shallow black friable clay on upper slopes of basaltic hills</b> |
| <b>Aust. Soil Classification</b> | Black Vertosol or Melanic-Vertic Black Dermosol                     |
| <b>Great Soil Group</b>          | Prairie Soil or Black Earth   |
| <b>Principal Profile Form</b>    | Gn, Ug  |
| <b>Mapping Units</b>             | Blb1 & Blb2   |
| <b>Geology</b>                   | Tertiary Basalt   |
| <b>Landform</b>                  | Upper part of gentle undulating low hills or hills                  |
| <b>Surface</b>                   | Periodically cracking   |
| <b>Vegetation</b>                | Mostly cleared or Savannah Woodland                                 |
| <b>Permeability</b>              | Very slowly to slowly permeable                                     |
| <b>Drainage</b>                  | Moderate to imperfectly drained                                     |
| <b>Land Capability</b>           | Class 4 with a wetness  |



**Morphological Sites:** CSIRO H69, H77, H82, H234; SOILCO 28, 66; CO627

**Analysed Sites:** CSIRO H69, H77, H82

**Related soil names:** Sorell clay

**Previously described by:** Loveday (1957), Spanswick (1999c), Spanswick & Kidd (2000a, 2000b & 2000c)

| Soil Profile Class<br>Grid Reference   | Profile<br>Number | Horizon | Sample<br>Depth<br>(cm) | pH<br>water<br>(1:5) | EC<br>(d/sm) | Total<br>P<br>(mg/kg) | Avail<br>P<br>(mg/kg) | Avail<br>K<br>(mg/kg) | Org.<br>Carb.<br>(%) | Total<br>N<br>(%) | C/N<br>Ratio | Ca   | Mg   | Na  | K    |
|--|-------------------|---------|-------------------------|----------------------|--------------|-----------------------|-----------------------|-----------------------|----------------------|-------------------|--------------|------|------|-----|------|
| <b>Sorell</b><br>546353 E<br>5263077 N | H82               | A11     | 0-4                     | 6.8                  |              | 420                   |                       |                       | 2.7                  | 0.261             | 10           | 20.9 | 18.8 | 2.7 | 0.2  |
|  | H82               | A12     | 4-15                    | 7.1                  |              | 380                   |                       |                       | 2.3                  | 0.24              | 10           |      |      |     |      |
|  | H82               | A13     | 15-28                   | 8.2                  |              |                       |                       |                       | 1.5                  | 0.167             | 9            | 25.2 | 28.8 | 6.9 | 0.14 |
|  | H82               | B2      | 30-41                   | 8.9                  |              |                       |                       |                       | 1.5                  |                   |              |      |      |     |      |
|  | H82               | BC      | 46-56                   | 9.5                  |              |                       |                       |                       |                      |                   |              |      |      |     |      |
|  | H82               | C       | 63-76                   | 9.2                  |              |                       |                       |                       |                      |                   |              |      |      |     |      |
| <b>Sorell</b><br>547711 E<br>5263068 N | H69               | A11     | 0-6                     | 6.2                  |              | 920                   |                       |                       | 4.1                  | 0.39              | 11           | 18.1 | 14.2 | 1.8 | 0.28 |
|  | H69               | A12     | 6-16                    | 6.3                  |              | 950                   |                       |                       | 3.4                  | 0.32              | 11           |      |      |     |      |
|  | H69               | A13     | 19-29                   | 6.9                  |              |                       |                       |                       | 1.8                  | 1.87              | 1            | 16.5 | 18.5 | 3.6 | 0.3  |
|  | H69               | A14     | 29-38                   | 7.3                  |              | 770                   |                       |                       | 1.4                  | 0.154             | 9            |      |      |     |      |
|  | H69               | AC      | 38-48                   | 7.4                  |              |                       |                       |                       |                      |                   |              |      |      |     |      |
|  |                   |         |                         |                      |              |                       |                       |                       |                      |                   |              |      |      |     |      |

| Soil Profile Class<br>Grid Reference   | Profile<br>Number | Horizon | Sample<br>Depth<br>(cm) | Total<br>Bases | CEC   | BASE<br>SAT<br>(%) | ESP<br>(%) | Ca/Mg<br>Ratio | Gravel<br>(of total)<br>>2000<br>(um)<br>(%) | Sand<br>Coarse<br>>200<br>(um)<br>(%) | Sand<br>Fine<br><200<br>(um)<br>(%) | Silt<br>(%) | Clay<br>(%) |
|--|-------------------|---------|-------------------------|----------------|-------|--------------------|------------|----------------|--|---------------------------------------|-------------------------------------|-------------|-------------|
| <b>Sorell</b><br>546353 E<br>5263077 N | H82               | A11     | 0-4                     |                | 54.7  | 78                 | 4.9        | 1.11           | 0  | 2                                     | 27                                  | 27          | 40          |
|  | H82               | A12     | 4-15                    |                |       |                    |            |                | 0  | 2                                     | 25                                  | 26          | 38          |
|  | H82               | A13     | 15-28                   |                |       |                    | 11.3       | 0.88           | 0  | 2                                     | 23                                  | 19          | 51          |
|  | H82               | B2      | 30-41                   |                |       |                    |            |                |  |                                       |                                     |             |             |
|  | H82               | BC      | 46-56                   |                |       |                    |            |                |  |                                       |                                     |             |             |
|  | H82               | C       | 63-76                   |                |       |                    |            |                |  |                                       |                                     |             |             |
| <b>Sorell</b><br>547711 E<br>5263068 N | H69               | A11     | 0-6                     |                | 56.18 | 61                 | 3.2        | 1.27           | 1  | 4                                     | 30                                  | 31          | 28          |
|  | H69               | A12     | 6-16                    |                |       |                    |            |                | 11   | 4                                     | 28                                  | 26          | 39          |
|  | H69               | A13     | 19-29                   |                | 52.4  | 74                 | 6.9        | 0.89           | 18   | 3                                     | 23                                  | 23          | 47          |
|  | H69               | A14     | 29-38                   |                |       |                    |            |                | 8  | 4                                     | 13                                  | 19          | 62          |
|  | H69               | AC      | 38-48                   |                |       |                    |            |                |  |                                       |                                     |             |             |
|  |                   |         |                         |                |       |                    |            |                |  |                                       |                                     |             |             |

**Table 2** Analytical data for Sorell SPC

| Soil Profile Class<br>Grid Reference   | Profile<br>Number | Horizon | Sample<br>Depth<br>(cm) | pH<br>water<br>(1:5) | EC<br>(d/sm) | Total<br>P<br>(mg/kg) | Avail<br>P<br>(mg/kg) | Avail<br>K<br>(mg/kg) | Org.<br>Carb.<br>(%) | Total<br>N<br>(%) | C/N<br>Ratio | Ca   | Mg   | Na   | K    |     |
|--|-------------------|---------|-------------------------|----------------------|--------------|-----------------------|-----------------------|-----------------------|----------------------|-------------------|--------------|------|------|------|------|-----|
| <b>Sorell</b><br>547723 E<br>5264911 N | H77               | A11     | 0-9                     | 5.8                  |              | 820                   |                       |                       | 8.1                  | 0.6               | 14           | 33.5 | 15.7 | 0.86 | 0.34 |     |
|  | H77               | A12     | 9-18                    | 5.9                  |              | 670                   |                       |                       | 6.8                  | 0.5               | 14           | 32.5 | 12.1 | 0.68 | 0.22 |     |
|  | H77               | A13     | 18-25                   | 6.1                  |              | 390                   |                       |                       | 4.8                  | 0.3               | 16           | 28   | 16   | 0.89 | 0.21 |     |
|  | H77               | A14     | 29-38                   | 6.5                  |              |                       |                       |                       | 3.9                  | 0.22              | 18           | 31.9 | 18   | 0.96 | 0.22 |     |
|  | H77               | A15     | 38-48                   | 6.8                  |              |                       |                       |                       |                      |                   |              |      |      |      |      |     |
|  | H77               | B2      | 48-63                   | 7.6                  |              | 360                   |                       |                       | 1.5                  | 0.1               | 15           | 32   | 28   | 1.96 | 0.26 |     |
|  | H77               | BC      | 67-71                   | 8.3                  |              | 1990                  |                       |                       |                      |                   |              |      |      |      |      |     |
|  | H77               | C       | 71-79                   | 8.2                  |              | 1620                  |                       |                       |                      |                   |              |      | 25.3 | 20.9 | 2    | 0.1 |

| Soil Profile Class<br>Grid Reference   | Profile<br>Number | Horizon | Sample<br>Depth<br>(cm) | Total<br>Bases | CEC   | BASE<br>SAT<br>(%) | ESP<br>(%) | Ca/Mg<br>Ratio | Gravel<br>(of total)<br>>2000<br>(um)<br>(%) | Sand<br>Coarse<br>>200<br>(um)<br>(%) | Sand<br>Fine<br><200<br>(um)<br>(%) | Silt<br>(%) | Clay<br>(%) |
|--|-------------------|---------|-------------------------|----------------|-------|--------------------|------------|----------------|--|---------------------------------------|-------------------------------------|-------------|-------------|
| <b>Sorell</b><br>547723 E<br>5264911 N | H77               | A11     | 0-9                     |                | 77.2  | 65                 | 1.1        | 2.13           | 0  | 1                                     | 25                                  | 25          | 40          |
|  | H77               | A12     | 9-18                    |                | 72.9  | 62                 | 0.9        | 2.69           | 3  | 1                                     | 24                                  | 21          | 39          |
|  | H77               | A13     | 18-25                   |                | 66.6  | 67                 | 1.3        | 1.75           | 5  | 1                                     | 25                                  | 28          | 39          |
|  | H77               | A14     | 29-38                   |                | 65.98 | 77                 | 1.5        | 1.77           | 0  | 1                                     | 25                                  | 26          | 47          |
|  | H77               | A15     | 38-48                   |                |       |                    |            |                |  |                                       |                                     |             |             |
|  | H77               | B2      | 48-63                   |                | 68.42 | 89                 | 2.8        | 1.14           | 0  | 1                                     | 21                                  | 23          | 52          |
|  | H77               | BC      | 67-71                   |                |       |                    |            |                |  |                                       |                                     |             |             |
|  | H77               | C       | 71-79                   |                |       |                    | 4.1        | 1.21           | 4  | 7                                     | 29                                  | 33          | 30          |

Table 2 Cont.

| Soil Profile Class | Profile Number | Horizon | Sample Depth (cm) | pH water (1:5) | EC (d/sm) | Total P (mg/kg) | Avail P (mg/kg) | Avail K (mg/kg) | Org. Carb. (%) | Total N (%) | C/N Ratio | Ca | Mg | Na  | K    |
|--------------------|----------------|---------|-------------------|----------------|-----------|-----------------|-----------------|-----------------|----------------|-------------|-----------|----|----|-----|------|
| Sorell             | Soilco 60      | 1       | 0-10              | 6.4            | 0.10      |                 | 16              |                 | 4.65           | 0.4         | 12        | 22 | 25 | 1.8 | 0.26 |
| 558200E            | Soilco 60      | 2       | 30-40             | 6.8            | 0.09      |                 | 7               |                 | 2              | 0.14        | 14        | 21 | 31 | 2.6 | 0.15 |
| 5279800N           | Soilco 60      | 3       | 60-70             | 7.5            | 0.39      |                 | 2               |                 | 1.2            | 0.08        | 15        | 21 | 41 | 5.1 | 0.17 |
|                    | Soilco 60      | 4       | 80-90             | 7.8            | 0.62      |                 | 1               |                 | 0.75           | 0.04        | 19        | 20 | 43 | 6.4 | 0.16 |
|                    | Soilco 60      | 5       | 110-120           | 7.8            | 0.73      |                 | 1               |                 | 0.5            | 0.02        | 25        | 18 | 44 | 7.7 | 0.13 |

| Soil Profile Class | Profile Number | Horizon | Sample Depth (cm) | Total Bases | CEC | BASE SAT (%) | ESP (%) | Ca/Mg Ratio | Gravel (of total) >2000 (um) (%) | Sand Coarse >250 (um) (%) | Sand Fine <250 (um) (%) | Silt (%) | Clay (%) |
|--------------------|----------------|---------|-------------------|-------------|-----|--------------|---------|-------------|----------------------------------|---------------------------|-------------------------|----------|----------|
| Sorell             | Soilco 60      | 1       | 0-10              | 49.06       |     | 100          | 3.7     | 0.88        |                                  | 8                         | 18                      | 21       | 43       |
| 558200E            | Soilco 60      | 2       | 30-40             | 54.75       |     | 100          | 4.7     | 0.68        |                                  | 10                        | 22                      | 14       | 54       |
| 5279800N           | Soilco 60      | 3       | 60-70             | 67.27       |     | 100          | 7.6     | 0.51        |                                  |                           |                         |          |          |
|                    | Soilco 60      | 4       | 80-90             | 69.56       |     | 100          | 9.2     | 0.47        |                                  | 1                         | 16                      | 8        | 78       |
|                    | Soilco 60      | 5       | 110-120           | 69.83       |     | 100          | 11.0    | 0.41        |                                  |                           |                         |          |          |

Table 2 Cont

## 3.2 Soils on Dolerite

### 3.2.1 Podzolic Soils on Dolerite (Pd) (650 km<sup>2</sup>)

*This is the most extensive group of soils on the Buckland sheet. The podzolic soils on dolerite occupy varied topography from rugged stony steep slopes to very gently undulating land. In the latter case, there are often small patches of sandstone and mudstone intimately associated with the dolerite.*

The most common soils (*Eastfield SPC*) have a shallow surface horizon (5-10cm thick) over a bleached subsurface usually with some ferruginous gravel, both surface and subsurface having a fine sandy loam to loamy sand texture. These overlie abruptly a weakly mottled yellow-grey and yellow-brown, usually dense clay subsoil with some ferruginous gravel, and prismatic to blocky structure. The clay passes into an horizon of mealy decomposing dolerite at about a metre. Dolerite gravel and stone are usually present throughout the profile.

Besides the common profile above, there are a number of minor soils, including gritty soils apparently associated with a coarse-grained dolerite. The grit throughout is fragments of decomposing dolerite. Some of these gritty profiles have a bleached subsurface while others do not and the clay subsoil is generally more friable, more brightly coloured and of a lighter texture than in the common profile. There are also some profiles transitional to both the Brown and the Black Soils on Dolerite.

### Land Use

The natural vegetation is largely an open eucalypt forest. A small amount of clearing has been done and the country used for grazing. Some of the gentler slopes could probably be developed to sown pastures but the greater part is too rugged for agricultural use.

### Correlation

*The dominant soil of this unit appears to be the Eastfield SPC. This unit has been correlated with the Podzolics on Dolerite 1 (Pd1) first described on the Sorell Reconnaissance Soil Map.*

*The largest polygon within this map sheet belongs to this map unit and covers approximately 643km<sup>2</sup>. Ground observations within this map have been limited by the size and inaccessibility of much of the area. This unit covers a rainfall range from 600mm to 1000mm and a elevation range of 50m to 600m and consequently the soils are quite variable. On the steep dolerite slopes a very shallow stony texture contrast soil without an A2 was common. As slope angle decreased the soils became deeper and less stony with a bleached A2 horizon dominated by ferruginous gravels becoming evident.*

*Gritty soils associated with coarse grained dolerite were observed around Nugent. The extent of these soils is not known. South east of Nugent, where rainfall generally exceeded 800mm, more friable and gradational profiles were evident. These soils, where free iron is greater than 5% are Ferrosols. Soils similar to the Eastfield but more acidic (sodic eutrophic Kurosols) were also observed within this unit. The lack*

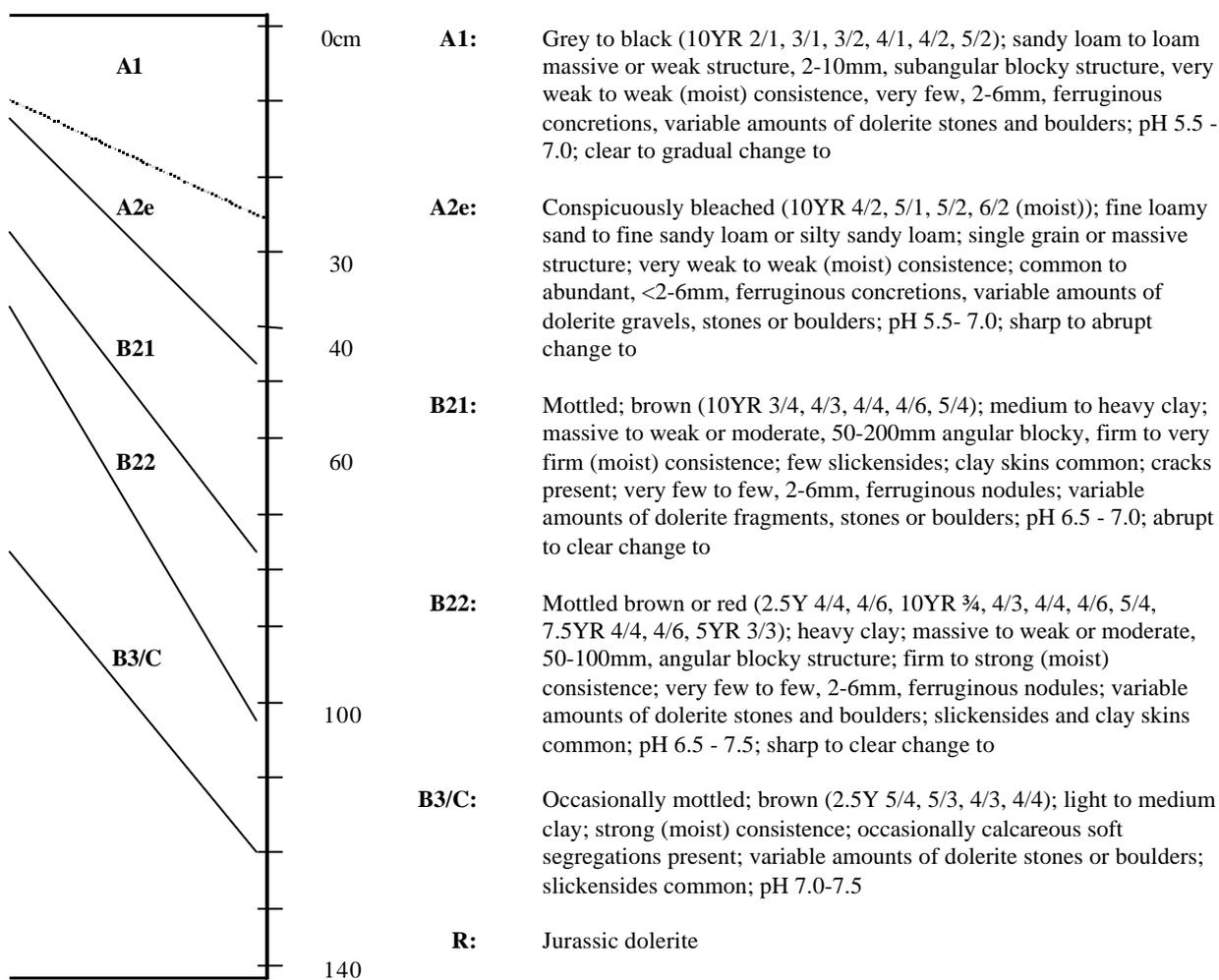
*of Sodosols observed within this unit compared to the north may be more a reflection of the lack of available data. However generally the soils within this unit were neutral to slightly acidic texture contrast soils (bleached-sodic eutrophic Chromosols) which were morphologically and chemically similar to the Eastfield SPC described in the north of the state.*

## Eastfield Soil Profile Class

**Concept** Brown, mottled, texture contrast soils with dolerite fragments throughout, loamy topsoils, sandy sub-surface, with ironstone, and clayey subsoils developed on dolerite hills.

**Aust. Soil Classification** Brown Chromosols and Sodosols  
**Great Soil Group** Grey-Brown Podzolics & Soloths  
**Principal Profile Form** Db, Dd  
**Mapping Units** Ea, Ea-Bo, Ea-Bm, Pd1, Pd1-Bd, Pd1-Bld1  
**Geology** Jurassic Dolerite  
**Landform** Moderate to steeply undulating hills

**Permeability** Slowly permeable  
**Drainage** Imperfectly drained  
**Land Capability** Class 5 or 6



**Morphological Sites:** CSIRO H86, H78, H24, H163, H237, H127: LRRBD L6, 34, 93, 126

**Analysed Sites:** CSIRO H86, H78, H24, H163, H237, H127: LRRBD L12, 43

**Related soil names:** Eastfield Series, Eastfield Sand, Type I, Eastfield SPC, Podzolic on dolerite

**Previously described by:** Stephens et al (1942), Loveday (1957), Doyle (1993), Spanswick & Zund (1999a & 1999b), Spanswick (1999), S & Kidd (2000a, 2000b & 2000c)

| Profile Number | Horizon | Sample Depth (cm) | pH water (1:5) | EC (d/sm) | Total P (mg/kg) | Org. Carb. (%) | Total N (%) | C/N Ratio | Ca   | Mg   | Na   | K    |
|----------------|---------|-------------------|----------------|-----------|-----------------|----------------|-------------|-----------|------|------|------|------|
| I237           | A1      | 0-1               | 7.0            | 0.14      | 0.014           | 13.6           | 0.452       | 30        | 16.8 | 3.8  | 0.77 | 0.58 |
| I237           | A21     | 1-4               | 5.9            | 0.054     | 0.005           | 2.91           | 0.139       | 21        | 5.8  | 3.4  | 0.42 | 0.14 |
| I237           | A22     | 4-9               | 6.0            | 0.042     | 0.002           | 1.64           | 0.079       | 21        | 4.4  | 3.2  | 0.36 | 0.10 |
| I237           | B21     | 10-20             | 6.1            | 0.057     |                 |                |             |           | 12.7 | 14.3 | 0.99 | 0.25 |
| I237           | B22     | 20-33             | 6.4            | 0.06      |                 |                |             |           |      |      |      |      |
| I237           | B23     | 22-48             | 7.2            | 0.063     |                 |                |             |           |      |      |      |      |
| I237           | B24     | 48-61             | 7.6            | 0.083     |                 |                |             |           | 26.2 | 33   | 3.1  | 0.51 |
| I237           | BC      | 61-81             | 8.2            | 0.321     |                 |                |             |           |      |      |      |      |
| I237           | C       | 81-86             | 8.6            | 0.295     |                 |                |             |           | 43.7 | 27.9 | 3.1  | 0.46 |

| Profile Number | Horizon | Sample Depth (cm) | BASE SAT (%) | ESP (%) | Ca/Mg Ratio | Gravel (of total) >2000 (um) (%) | Sand Coarse >200 (um) (%) | Sand Fine <200 (um) (%) | Silt (%) | Clay (%) |
|----------------|---------|-------------------|--------------|---------|-------------|----------------------------------|---------------------------|-------------------------|----------|----------|
| I237           | A1      | 0-1               | 59           | 2.1     | 4.42        | 8                                | 6                         | 36                      | 19       | 18       |
| I237           | A21     | 1-4               | 57           | 2.4     | 1.71        | 10                               | 9                         | 51                      | 22       | 13       |
| I237           | A22     | 4-9               | 59           | 2.6     | 1.38        | 31                               | 18                        | 45                      | 20       | 13       |
| I237           | B21     | 10-20             | 77           | 2.7     | 0.89        | 9                                | 12                        | 25                      | 12       | 49       |
| I237           | B22     | 20-33             |              |         |             |                                  |                           |                         |          |          |
| I237           | B23     | 22-48             |              |         |             |                                  |                           |                         |          |          |
| I237           | B24     | 48-61             | 96           | 4.7     | 0.79        | 6                                | 7                         | 15                      | 5        | 73       |
| I237           | BC      | 61-81             |              |         |             |                                  |                           |                         |          |          |
| I237           | C       | 81-86             |              | 4.1     | 1.57        | 37                               | 16                        | 23                      | 14       | 44       |

**Table 3** Analytical data for Eastfield SPC

| Soil Profile Class | Profile Number | Horizon | Sample Depth (cm) | pH water (1:5) | EC (d/sm) | Total P (mg/kg) | Avail P (mg/kg) | Avail K (mg/kg) | Org. Carb. (%) | Total N (%) | C/N Ratio | Ca   | Mg   | Na   | K    |
|--------------------|----------------|---------|-------------------|----------------|-----------|-----------------|-----------------|-----------------|----------------|-------------|-----------|------|------|------|------|
| Grid Reference     |                |         |                   |                |           |                 |                 |                 |                |             |           |      |      |      |      |
| Eastfield          | Soilco 61      | A       | 0-10              | 5.3            | 0.09      |                 | 6               |                 | 2.5            | 0.11        | 23        | 0.98 | 2.1  | 0.67 | 0.22 |
| 560250E            | Soilco 61      | B2      | 20-30             | 5.6            | 0.02      |                 | 2               |                 | 0.65           | 0.01        | 65        | 0.4  | 0.99 | 0.14 | 0.15 |
| 5267850N           | Soilco 61      | BC      | 40-50             | 5.1            | 0.07      |                 | 1               |                 | 0.7            | 0.02        | 35        | 5.4  | 13   | 1.9  | 0.19 |

| Soil Profile Class | Profile Number | Horizon | Sample Depth (cm) | Total Bases | CEC | BASE SAT (%) | ESP (%) | Ca/Mg Ratio | Gravel (of total) >2000 (um) (%) | Sand Coarse >250 (um) (%) | Sand Fine <250 (um) (%) | Silt (%) | Clay (%) |
|--------------------|----------------|---------|-------------------|-------------|-----|--------------|---------|-------------|----------------------------------|---------------------------|-------------------------|----------|----------|
| Grid Reference     |                |         |                   |             |     |              |         |             |                                  |                           |                         |          |          |
| Eastfield          | Soilco 61      | A       | 0-10              | 3.97        |     | 70           | 11.8    | 0.47        |                                  | 13                        | 41                      | 28       | 16       |
| 560250E            | Soilco 61      | B2      | 20-30             | 1.68        |     | 68           | 5.6     | 0.40        |                                  | 17                        | 43                      | 31       | 13       |
| 5267850N           | Soilco 61      | BC      | 40-50             | 20.49       |     | 78           | 7.2     | 0.42        |                                  | 12                        | 24                      | 18       | 47       |

Table 3 Cont.

### **3.2.2 Black Soils on Dolerite (Bld) (5 km<sup>2</sup> )**

As with the brown soils on dolerite, this group is not well-represented. The soils occur chiefly in the Orielton valley and grade northwards into the podzolic soil group. One profile was also observed on the east coast south of Rheban. They are found on moderate, usually rather stony slopes, particularly on those facing east and north-east. Because of their limited area and transitional nature, well-defined groups of soils cannot be described. Surface colour varies from dark brownish-grey to black and texture from fine sandy loam to clay. The subsoil at about 15cm is a dark olive-brown clay usually with some dolerite grit and gravel. With depth the colours lighten to yellow-grey or yellow-brown, and in some profiles below 75cm powdery free carbonate occurs amongst the horizon of decomposing dolerite.

#### **Land Use**

The original eucalypt forest vegetation, consisting largely of blue gum has now been mostly cleared and the areas used chiefly for grazing.

#### ***Correlation***

*The dominant soil of this unit correlates with the Belmont SPC. No chemical data was available for the Belmont SPC on the Buckland map. Chemical data has been extrapolated from the Sorell, Brighton & Hobart Reconnaissance Soil Maps.*

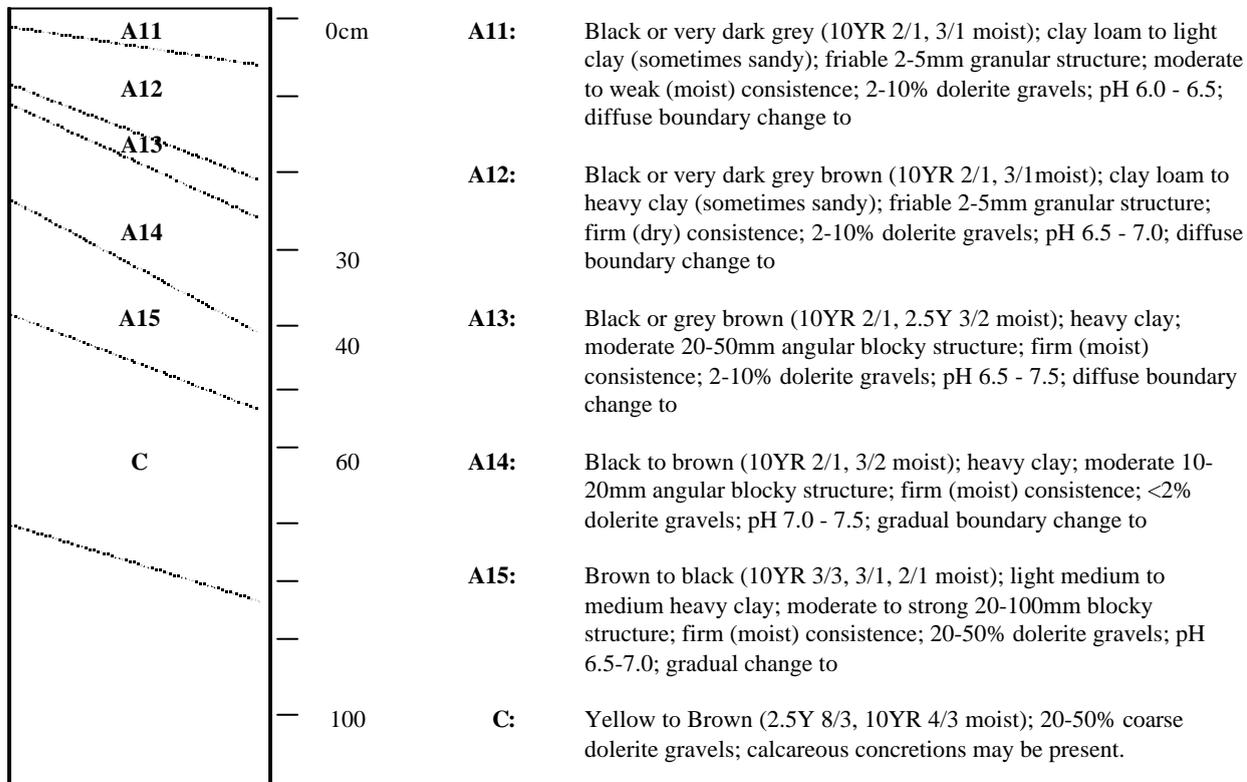
## Belmont Soil Profile Class

**Concept** Black cracking minimal textural differentiation soils with a clay loam to clay surface and clay subsoil, carbonate often present in subsoil and decomposing rock. Limited to a general extent of 40km from Hobart

**Aust. Soil Classification** Black Dermosol  
**Great Soil Group** Black Earth or Praire Soil  
**Principal Profile Form** U or G  
**Mapping Units** Bld1, Bld1-Bd1, Bld1-Pd1  
**Geology** Jurassic Dolerite  
**Landform** Steep to gentle sloping hills

**Vegetation** Savannah woodland, mostly cleared  
**Surface Conditions** Coarse fragments common  
**Permeability** Slow to moderately permeable  
**Drainage** Moderately well drained

**Land Capability** Class 4



**Morphological Sites:** CSIRO H70, H22, H174, H173, H126; SOILCO 31

**Analysed Sites:** ; CSIRO H70, H22, H174, H173, H126

**Related soil names:** Belmont Clay loam, Black soils on dolerite

**Previously described by:** Lovedav (1957). Spanswick (1999). Spanswick & Kidd (2000a, 2000b & 2000c)

| Profile<br>Number | Horizon | Sample<br>Depth<br>(cm) | pH<br>water<br>(1:5) | EC<br>(d/sm) | Total<br>P<br>(mg/kg) | Org.<br>Carb.<br>(%) | Total<br>N<br>(%) | C/N<br>Ratio | Ca   | Mg   | K    | Na   |
|-------------------|---------|-------------------------|----------------------|--------------|-----------------------|----------------------|-------------------|--------------|------|------|------|------|
| H174              | A11     | 0-2                     | 6.3                  | 0.179        | 0.039                 | 10.9                 | 0.798             | 14           | 40.8 | 4.5  | 2.3  | 0.26 |
| H174              | A12     | 2-9                     | 6.5                  | 0.107        | 0.025                 | 7.4                  | 0.483             | 15           | 39.5 | 4.3  | 1.7  | 0.24 |
| H174              | A13     | 9-23                    | 6.9                  | 0.086        | 0.013                 | 2.8                  | 0.204             | 14           | 38.4 | 7.1  | 1.1  | 0.52 |
| H174              | B21     | 23-38                   | 7.1                  | 0.077        |                       | 1.5                  | 0.114             | 13           |      |      |      |      |
| H174              | B22     | 38-51                   | 7.6                  | 0.077        | 0.009                 | 1.1                  | 0.091             | 12           | 45.7 | 12.6 | 0.2  | 1.3  |
| H174              | B23     | 51-63                   | 8.0                  | 0.077        |                       | 0.71                 | 0.069             | 10           |      |      |      |      |
| H174              | B/C     | 63-71                   | 8.2                  | 0.077        |                       | 0.5                  | 0.052             | 10           | 41.6 | 7.4  | 1.4  | 0.15 |
| H174              | C       | 71-81                   | 8.3                  | 0.098        |                       | 0.39                 | 0.034             | 11           |      |      |      |      |
| H70               | A11     | 0-8                     | 6.2                  |              | 0.017                 | 4.9                  | 0.44              | 11           | 18   | 8.25 | 0.98 | 1    |
| H70               | A12     | 8-18                    | 6.6                  |              |                       | 3.9                  | 0.34              | 11           |      |      |      |      |
| H70               | A13     | 18-25                   | 6.8                  |              | 0.018                 | 2.8                  | 0.228             | 12           |      |      |      |      |
| H70               | A14     | 28-42                   | 7.6                  |              |                       | 1.49                 | 0.168             |              | 21.1 | 19.1 | 0.25 | 5.3  |
| H70               | AC1     | 42-51                   | 8.4                  |              | 0.018                 |                      |                   |              |      |      |      |      |
| H70               | AC2     | 51-61                   | 8.7                  |              |                       |                      |                   |              |      |      |      |      |
| H70               | C       | 66-81                   | 8.9                  |              | 0.2                   |                      |                   |              | 14.2 | 12   | 0.17 | 6.9  |

| Profile<br>Number | Horizon | Sample<br>Depth<br>(cm) | BASE<br>SAT<br>(%) | ESP<br>(%) | Ca/Mg<br>Ratio | Gravel<br>(of total)<br>>2000<br>(um)<br>(%) | Sand<br>Coarse<br>>200<br>(um)<br>(%) | Sand<br>Fine<br><200<br>(um)<br>(%) | Silt<br>(%) | Clay<br>(%) |
|-------------------|---------|-------------------------|--------------------|------------|----------------|--|---------------------------------------|-------------------------------------|-------------|-------------|
| H174              | A11     | 0-2                     | 72                 | 0.4        | 9.07           | 0  | 9                                     | 28                                  | 17          | 28          |
| H174              | A12     | 2-9                     | 76                 | 0.4        | 9.19           | 3  | 10                                    | 31                                  | 16          | 31          |
| H174              | A13     | 9-23                    | 86                 | 0.9        | 5.41           | 6  | 7                                     | 27                                  | 11          | 53          |
| H174              | B21     | 23-38                   |                    |            |                |  |                                       |                                     |             |             |
| H174              | B22     | 38-51                   | 93                 | 2.0        | 3.63           | 13   | 6                                     | 23                                  | 8           | 65          |
| H174              | B23     | 51-63                   |                    |            |                |  |                                       |                                     |             |             |
| H174              | B/C     | 63-71                   |                    | 2.8        | 5.62           | 40   | 29                                    | 21                                  | 11          | 41          |
| H174              | C       | 71-81                   |                    |            |                |  |                                       |                                     |             |             |
| H70               | A11     | 0-8                     | 64                 | 2.3        | 2.18           | 3  | 18                                    | 31                                  | 21          | 26          |
| H70               | A12     | 8-18                    |                    |            |                | 18   | 19                                    | 31                                  | 20          | 24          |
| H70               | A13     | 18-25                   |                    |            |                | 25   | 25                                    | 28                                  | 16          | 28          |
| H70               | A14     | 28-42                   | 90                 | 10.5       | 1.1            | 7  | 18                                    | 21                                  | 10          | 47          |
| H70               | AC1     | 42-51                   |                    |            |                | 15   | 17                                    | 16                                  | 3           | 44          |
| H70               | AC2     | 51-61                   |                    |            |                | 29   | 20                                    | 11                                  | 4           | 40          |
| H70               | C       | 66-81                   |                    | 20.7       | 1.18           | 53   | 47                                    | 19                                  | 13          | 15          |

**Table 3** Analytical data for Belmont SPC

| Soil Profile Class<br>Grid Reference    | Profile Number | Horizon | Sample Depth (cm) | pH water (1:5) | EC (d/sm) | Total P (mg/kg) | Org. Carb. (%) | Total N (%) | C/N Ratio | Ca   | Mg   | K    | Na   |
|---|----------------|---------|-------------------|----------------|-----------|-----------------|----------------|-------------|-----------|------|------|------|------|
| <b>Belmont</b><br>519902 E<br>5271375 N | H173           | A11     | 0-2               | 6.3            | 0.092     | 0.2             | 8.3            | 0.539       | 15        | 24.9 | 12.7 | 0.99 | 0.38 |
|   | H173           | A12     | 2-10              | 6.5            | 0.08      | 0.13            | 5.8            | 0.39        | 15        | 23.8 | 14   | 0.36 | 0.57 |
|   | H173           | A13     | 10-18             | 6.7            | 0.071     |                 | 4.1            | 0.316       | 13        |      |      |      |      |
|   | H173           | A14     | 18-29             | 7.2            | 0.08      | 0.13            | 2.6            | 0.202       | 13        | 27.5 | 20.6 | 0.3  | 1.4  |
|   | H173           | A15     | 29-41             | 7.6            | 0.08      | 0.007           | 1.7            | 0.14        | 12        | 28.9 | 25.2 | 0.28 | 1.7  |
|   | H173           | AC1     | 41-48             | 8.0            | 0.11      |                 | 1.4            | 0.11        | 12        |      |      |      |      |
|   | H173           | AC2     | 48-58             | 8.2            | 0.131     |                 | 1.3            | 0.11        | 12        | 28.4 | 27.9 | 0.29 | 2    |
|   | H173           | C1K     | 58-66             |                |           |                 |                |             |           |      |      |      |      |
|   | H173           | C2K     | 66-76             | 8.9            | 0.369     |                 | 0.98           | 0.038       | 26        |      |      |      |      |
| H173                                    | C3k            | 76-81   | 9.0               | 0.313          |           |                 |                |             |           |      |      |      |      |
| <b>Belmont</b><br>528567 E<br>5248360 N | H22            | A11     | 0-13              | 6.8            |           | 100             | 4.3            | 0.381       | 11        | 28.5 | 17.2 | 0.32 | 0.94 |
|   | H22            | A12     | 13-25             | 7.2            |           | 70              | 3.3            | 0.202       | 16        | 33.1 | 18.4 | 0.16 | 1.37 |
|   | H22            | A13g    | 25-48             | 7.7            |           | 50              | 1.26           | 0.095       | 13        | 27   | 22.7 | 0.09 | 1.8  |
|   | H22            | A3g     | 51-61             | 8.4            |           |                 | 0.52           | 0.035       | 15        |      |      |      |      |
|   | H22            | Ck      | 61-89             | 8.8            |           |                 | 0.2            | 0.022       | 9         | 32.2 | 28.2 | 0.09 | 3.9  |
|   | H22            | Rw      | 89-109            | 8.7            |           |                 |                |             |           |      |      |      |      |

| Soil Profile Class<br>Grid Reference    | Profile Number | Horizon | Sample Depth (cm) | Total Bases | CEC   | BASE SAT (%) | ESP (%) | Ca/Mg Ratio | Gravel (of total) >2000 (um) (%) | Sand Coarse >250 (um) (%) | Sand Fine <250 (um) (%) | Silt (%) | Clay (%) |
|---|----------------|---------|-------------------|-------------|-------|--------------|---------|-------------|----------------------------------|---------------------------|-------------------------|----------|----------|
| <b>Belmont</b><br>519902 E<br>5271375 N | H173           | A11     | 0-2               |             |       | 69           | 0.7     | 1.96        | 0                                | 5                         | 28                      | 20       | 34       |
|   | H173           | A12     | 2-10              |             |       | 75           | 1.1     | 1.70        | 0                                | 6                         | 31                      | 18       | 36       |
|   | H173           | A13     | 10-18             |             |       |              |         |             |                                  |                           |                         |          |          |
|   | H173           | A14     | 18-29             |             |       | 86           | 2.4     | 1.33        | 5                                | 6                         | 26                      | 10       | 60       |
|   | H173           | A15     | 29-41             |             |       | 92           | 2.8     | 1.15        | 7                                | 7                         | 22                      | 6        | 65       |
|   | H173           | AC1     | 41-48             |             |       |              |         |             |                                  |                           |                         |          |          |
|   | H173           | AC2     | 48-58             |             |       |              | 3.4     | 1.02        | 12                               | 10                        | 21                      | 5        | 63       |
|   | H173           | C1K     | 58-66             |             |       |              |         |             |                                  |                           |                         |          |          |
|   | H173           | C2K     | 66-76             |             |       |              |         |             |                                  |                           |                         |          |          |
| H173                                    | C3k            | 76-81   |                   |             |       |              |         |             |                                  |                           |                         |          |          |
| <b>Belmont</b><br>528567 E<br>5248360 N | H22            | A11     | 0-13              |             | 58.66 | 80           | 1.6     | 1.66        | 1                                | 7                         | 34                      | 15       | 40       |
|   | H22            | A12     | 13-25             |             | 60.43 | 88           | 2.3     | 1.80        | 2                                | 5                         | 29                      | 11       | 50       |
|   | H22            | A13g    | 25-48             |             | 55.49 | 93           | 3.2     | 1.19        | 0                                | 9                         | 25                      | 11       | 57       |
|   | H22            | A3g     | 51-61             |             |       |              |         |             | 1                                | 11                        | 22                      | 13       | 49       |
|   | H22            | Ck      | 61-89             |             |       |              | 6.10    | 1.14        | 0                                | 23                        | 22                      | 23       | 30       |
|   | H22            | Rw      | 89-109            |             |       |              |         |             | 18                               | 34                        | 21                      | 16       | 19       |

**Table 4 Cont**

### **3.2.3 Brown Soils on Dolerite (Bd) (8 km<sup>2</sup> )**

This is a group of soils which, though extensively developed elsewhere, is represented in this sheet only by a few small scattered areas, particularly around Triabunna, where they are closely associated with podzolic soils on dolerite and distributed about equally with them. They also occur in the Runnymede and Buckland districts as small patches, particularly on north-east facing slopes amongst extensive areas of the podzolic soils from which they have not been mapped separately. Slopes are moderate to steep and often stony.

Because the soils are in small areas and often transitional to other soil groups, a generalised description cannot be given. Several profiles examined had dark brown to greyish-brown loam with fine sand surface horizons overlying brown to reddish-brown firm to friable clay subsoils at 10-15cm. Other profiles showed more marked textural differentiation with a fine sandy loam or sandy loam surface over a clay subsoil.

#### **Land Use**

The soils carry an open eucalypt vegetation with a ground cover of native grasses and sags, and are used as rough grazing for sheep.

#### ***Correlation***

*The extent of the Brown soils on dolerite within this map sheet is very small. However initial work within this unit suggests that these soils do not have the texture contrast evident in the soils in the north of the State (Spanswick & Zund, 1999a & 1999b & Doyle 1993). No SPC is available for the dominant soil within this map unit due to insufficient data.*

### 3.3 Soils on Mudstone

#### 3.3.1 Podzolic Soils on Mudstone (Pm) (8km<sup>2</sup>)

These shallow soils are found in a few small widely scattered areas, sometimes in close association with dolerite soils from which it was impossible to map them apart at this scale.

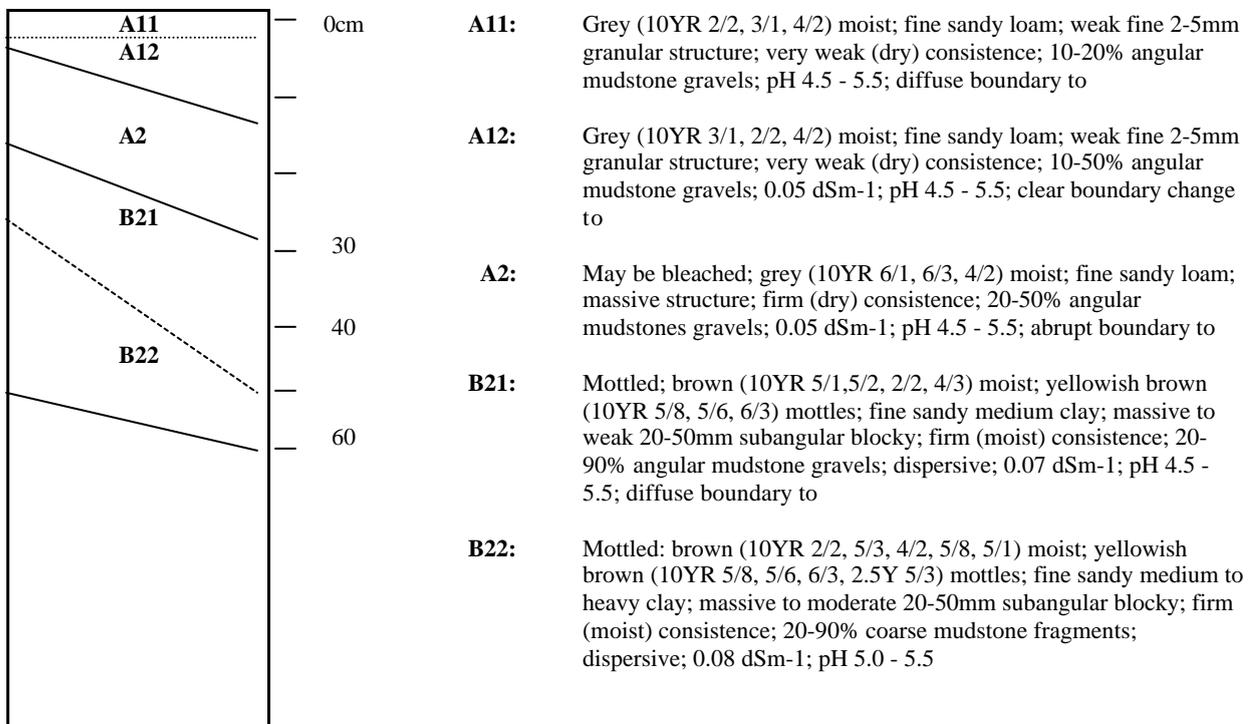
They have a grey-brown fine sandy loam surface overlying a very light grey silty subsurface with mudstone fragments. The subsoil at 18 - 25cm is a yellowish-grey clay to silty clay loam with mudstone fragments passing to hard rock at about 40cm.

#### *Correlation*

*The podzolics on mudstone on this map are found in three main locations. In the south west of the sheet near Pawleena, the dominant soil is a shallow Kurosol which correlates with the Forcett SPC. The soils within this area have formed on sandy Permian siltstone with some interbedding of sandstone. In the north west of the sheet the inaccessibility of the area and the lack of data prevented any correlation, no changes have been made to this unit and it maintains it's original name and code (Pm). The third location of podzolic soils on mudstone occurs on the Tasman Highway east of Buckland. The podzolic soils on mudstone within this area have formed on what was termed by Gullines (1982) as the Woodbridge glacial deposits. This area also contains large quantities of dolerite colluvium. The soils within this area appear to be brown ferric chromosols, they do not correlate with the Pm1 unit in the south west. The Podzolic soils on mudstone in this area have been renamed Pm3.*

## Forcett Soil Profile Class

|                                  |  |
|----------------------------------|--|
| <b>Concept</b>                   | <b>Shallow stony acidic soils, with a brown to grey weakly structured surface over a bleached, hardsetting subsurface over a weak to moderate structured clay subsoil.</b> |
| <b>Aust. Soil Classification</b> | Dystropic brown or grey kurosol  |
| <b>Great Soil Group</b>          | Grey brown podzolics or soloth   |
| <b>Principal Profile Form</b>    | Dy , Db  |
| <b>Mapping Units</b>             | Pm1, Pm2   |
| <b>Geology</b>                   | Permian sandy mudstones with interbedded shales and sandstones   |
| <b>Landform</b>                  | Coluvial slopes  |
| <b>Vegetation</b>                | Dry Sclerophyll forest, <i>E. saliciflora</i> , <i>E. risdoni</i> , <i>E. tasmanica</i> , <i>E. viminalis</i> & in moister situations <i>E. obliqua</i>                    |
| <b>Surface Conditions</b>        | Hard setting and stony   |
| <b>Permeability</b>              | Slow to very slow  |
| <b>Drainage</b>                  | Poor to imperfect  |



**Morphological Sites for Sorell:** CSIRO H154, H221, H199, H225; SOILCO 33

**Analysed Sites for Sorell:** CSIRO H154, H199, H221, H225

**Related soil names:** Podzolics on Mudstone

**Previously described by:** Loveday (1957), Spanswick (1999), Spanswick & Kidd (2000a, 2000b & 2000c)

## 3.4 Soils on Sandstone

### 3.4.1 Podzol and Podzolic Soils on Sandstone (205 km )

Siliceous sandstones occupy considerable areas in the northern half of the sheet, and one small area of feldspathic sandstone occurs near Triabunna. Slopes vary from gentle to steep with fairly frequent rock outcrops and sometimes prominent cliffs. Basins of restricted drainage with alluvial soils have developed in sandstone areas behind dolerite bars along many of the streams, the two largest being at Buckland and Runnymede.

On the siliceous sandstones, podzolic soils and podzols are about equally distributed. The podzolic soils have a grey to grey-brown sand or loamy sand surface over a bleached sandy subsurface. There is a fairly sharp break between this and the underlying subsoil which is a variously mottled grey-brown, yellow-brown, yellow grey and light grey firm sandy clay loam to sandy clay. Colours lighten with depth and there may be a gradual change in texture to clayey sand before passing to decomposing sandstone between 60-120cm. The podzols have a dark grey to dark brownish-grey sand or loamy sand surface over a bleached sandy subsurface, with a sharp change below this to a dark-coloured organic pan. This may be cemented to varying degrees and up to 15cm thick or may be merely a thin coating of dark grey-brown loose sand, in either case overlying a mottled light-coloured clay or sandy clay. There is a gradual transition between this and decomposing sandstone at 90 to 120cm.

The podzolic soils on feldspathic sandstone are similar to those on siliceous sandstones except for their generally browner colour. Many areas of alluvium associated with basins of restricted drainage but too small to map separately have been included with the sandstone soils; a description of them is given under "Soils of Alluvial Deposits".

### Land Use

Some of the gentler slopes have been cleared for orchards and pastures but the greater part of the soils still carries the natural sclerophyll forest vegetation. Some of the existing pastures could be improved but most of the remaining country is too steep and rocky for agriculture.

### Correlation

*The podzolics and podzols on sandstone are the second largest map unit within this sheet. This unit has been very broadly mapped with one polygon covering over 149km<sup>2</sup>. The soils within this unit have formed on Triassic lithologies as well as Quaternary wind blown deposits. The landforms within this unit include steep colluvial slopes, small dunes, poorly drained basins and alluvial flats.*

*Field observation found that like the Sorell Reconnaissance Soil map, coarse and fine textured podzols and podzolics are evident within this unit. The coarse textured quartz podzols are generally associated with windblown deposits. The finer textured podzols were found on a range of topographic positions and substrates. The development of a Bh &/or Bhs horizon (accumulation layer of organic matter or sesquioxides) varied considerably within the fine textured podzols with no observable determining factor, except maybe poor drainage.*

*A similar variability was seen in the podzolics with many profiles having a tenic horizon. A tenic horizon is similar in appearance to the Bh or Bhs horizons seen in the podzols except there is no cementation just a strengthening of colour, probably what Dimmock and Loveday referred to as a “dark grey coating around loose sand grains”. A podzolic which correlates with the description given by Loveday & Dimmock was found in only one location, south of Buckland. At this site the soil was a mottled eutrophic brown kurosol, morphological and chemical data for this site has been added to the appendices of this report, however the extent of this soil within this map sheet is not understood and is an area where further work is required. This unit has been renamed Pss1, and correlates with the Pss1 unit first defined on the Sorell Reconnaissance Soil Map. The soils of this unit have formed from a predominantly siliceous parent material under a rainfall of generally less than 750mm a year. No SPC is available for this unit due to insufficient data.*

*Two polygons, one in the south-west and the other in the south-east, maintain their original name and code (Pss). Both these polygons occur in high relief and rainfall areas of the map sheet, due to the inaccessibility of these polygons and the lack of detailed geological data we have been unable to determine enough additional information to differentiate them from other Pss units.*

### **3.5 Undifferentiated Alluvial Soils**

#### **3.5.1 Soils of Alluvial Deposits (75 km<sup>2</sup>)**

These soils include recent alluvium, soils on older terraces and on alluvial fans. The main occurrences are in the Orielson valley, the Runnymede and Buckland basins and the coastal areas at Triabunna, Orford and south from Rheban. There are also a number of smaller strips along various streams.

The soils vary considerably and it is difficult to define any but broad groups. Some of these are:-

- i. Black soils - These are scattered throughout the various patches of alluvium, but are most common in the Orielson valley and the Runnymede basin. A typical profile has a black blocky to granular clay or clay loam surface over a dark yellow-grey clay passing gradually to yellowish-grey clay at depth. There is often some yellow-brown mottling associated with the poor internal drainage.
- ii. Soils with marked horizon differentiation - These soils have a grey-brown to dark grey-brown surface colour and textures of loamy sand, sandy loam, fine sandy loam and silty loam. There is nearly always a bleached subsurface which frequently has yellow-brown flecks and blotches and sometimes ferruginous concretions. This is underlain by a variously mottled yellow-brown and yellow-grey dense clay or sandy clay subsoil. Free carbonate is occasionally present as concretions or powdery material below about 45cm. Scattered waterworn gravels are found throughout many profiles and often form a complete horizon below 75cm. One profile about 5km south of Orford was observed in which the clay subsoil had a strong columnar structure, with domed tops to each of the columns.

- iii. Strips of alluvium in the sandstone areas frequently have poorly-drained profiles; many have deep sandy surface horizons with bleached subsurfaces overlying at about 75cm sandy clay to clay subsoils which usually show prominent bluish-grey and yellow-brown mottling. One instance of a ground water podzol was noted with a black sandy organic pan at 60cm and a water table beneath. The soils are important agriculturally and practically no areas remain undeveloped.

### ***Correlation***

*No work was undertaken in this unit due to the complexity of the soils. More information about the alluvial soils within this map sheet may be found in Davies (1988) Land systems map of southern Tasmania*

## **3.6 Soils on Solifluction Deposits**

### **3.6.1 Yellow-brown Soils on Solifluction Deposits (33 km<sup>2</sup> )**

These soils are developed in the north-western corner of the sheet and around Prossers Sugarloaf in the south-east, above an altitude of about 460m, on a mixture of dolerite boulders, stratified weathered material and rock fragments. Depths of more than 4.5m of this material have accumulated in some places. Slopes vary from gentle to steep.

The soils are usually very stony and the surface often has a mantle of stones 15cm or more deep. The surface horizons of the soils vary from grey-brown sandy loam to dark reddish-brown clay loam, with much dolerite gravel and stone. At about 30cm there is a horizon of yellowish-brown to bright yellow-brown friable sandy clay loam to clay with stones and gravel, which may continue to 90cm or more.

### **Land Use**

The natural vegetation is a wet sclerophyll forest largely uncleared, except for a few lower slopes.

### ***Correlation***

*The soils of this unit generally correlate with the Miscellaneous Soils Mapping Unit 1 first described by Doyle (1993). A broad SPC has been defined for the Yellow Brown Soils however variability from the SPC can be expected with profiles having thicker peaty top soils and yellower subsoils in areas of restricted drainage. As no data was available for this unit the SPC has been extrapolated from available data on surrounding soil maps.*

## **3.7 Soils of Recent Sands**

### **3.7.1 Soils of Recent Sands (2.5 km<sup>2</sup> )**

Immediately to the south of Rheban is an area of low sand ridges aligned parallel to the coast similar to the sand ridges at Marion Beach and Seven-mile Beach. A smaller area fronts the coast at Orford. The soils vary from undifferentiated slightly calcareous sands adjacent to the beach, to weakly podzolized sands on the ridges farthest from the beach, in which there is a definite bleached sandy subsurface and a light brownish-yellow sandy subsoil.

#### ***Correlation***

*No work was undertaken within this unit.*

## **3.8 Lateritic Soils**

### **3.8.1 Lateritic Soils (2.5 km<sup>2</sup> )**

One area of these soils was noted in the Buckland basin, considered to have been developed on lake sediments similar to those of the Launceston Tertiary Basin, with which the soils have much in common. A typical profile has a sandy surface and subsurface horizons with concretionary ferruginous gravel in the subsurface overlying a yellow-brown short clay, with red and grey mottling and ferruginous gravel. This continues to considerable depth with a gradual lightening in colour to a light grey clay with occasional red and yellow mottling.

#### ***Correlation***

*No work was undertaken within this unit due to their limited extent and agriculture use.*

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## Appendix 1

### List of Key Soil Horizon Designations Used in SPC's

**Horizons** (some of which may be subdivided eg, A11 and A12)

- A1** Topsoil, zone of maximum biological activity, usually dark in colour.
- A2** Grey, generally sandy, sometimes bleached, eluvial horizon (less clay, organic matter and sesquioxides than horizons above and below).
- A3** Transitional horizon between A and B horizon and more similar to A than B horizon.
- B1** Transitional horizon between A and B horizon and more similar to B than A horizon.
- B2** Main subsoil horizon, either:-
  - 1) clay, humus or sesquioxide accumulations or
  - 2) maximum pedological development such as structure or colour.
- B3** Transitional horizon between B2 and C horizon and having significant amount of clay to still be classed as part of the solum.
- BC** As above.
- C** Weathered parent material and partially weathered rock from which the soil has formed.
- D** Buried horizon which is unlike the pedological organisation of the overlying horizons.
- R** Bedrock.
- P1** Primarily undecomposed organic matter (peat).
- P2** Primarily decomposed organic matter (peat).

### Horizon Suffixes Used

- e** conspicuously bleached horizon, for example A2e.
- g** Gleyed horizon caused by very poor drainage.
- h** accumulation of humified, well decomposed organic matter.
- j** sporadically bleached horizon, for example, A2j.
- k** accumulation of carbonate.
- t** accumulation of silicate clay (illuviation).
- w** weakly developed B horizon, ie, colour or structured B horizon, little or no illuviation.

For full horizon definitions refer to MacDonald *et al.* (1990). This figure has been modified from Doyle (1993), p 118.

## **Appendix 2**

### **Analytical Methods for CSIRO sites**

The following methodology was taken from Graley (1961). The analytical methodology used in Graley (1961) has been assumed to be similar for this report.

The methods of analyses used were essentially those of piper (1947) but with the following modifications:

pH was determined using a glass electrode and the system described by Raupach (1954).

Phosphorus is reported as “total” P dissolved by four hours boiling with concentrated hydrochloric acid. It was determined by a colorimetric method using butanol to extract the ammonium phosphomolybdate prior to its reduction with stannous chloride to the blue complex.

“Free” ferric oxide was determined using a modification by Haldane (1956) of Jeffries’ method.

Particle size distribution was determined on a number of samples by the International pipette method and on others by the rapid plummet balance method (Marshall, 1956) after dispersion of the soil using “calgon” (Hutton, 1955). Use of the pipette method is indicated in the tabulated data by quoting the results of the silt and clay fractions to one decimal place and of the plummet method to the nearest whole number. Coarse and fine sands are quoted to the nearest whole number for both methods.

Exchangeable metal cations were extracted by leaching with normal ammonium chloride and the leachate examined by titration with E.D.T.A for calcium and magnesium (Bond and Tucker, 1954 and Hutton, 1954) and by the “Eel” flame photometer for potassium and sodium (Stace and Hutton, 1958).

Exchangeable hydrogen has been determined by both the paranitro phenol (to pH 7.0) and meta-nitrophenol (to pH 8.4) methods of Piper (1942) but the total exchangeable cations recorded are the sum of the metal ions and exchangeable hydrogen to pH 8.4.

Values are reported for fractionation of the coarse and fine sands from certain samples. These were determined by sieving through five inch sieves with hand shaking for twenty minutes.

### **Analytical methods for DPIWE sites**

Soil pH and electrical conductivity were measured in a 1:5 soil:water ratio.

Clay mineralogy was determined by the Tasmanian Department of Mines using X-ray diffraction.

Exchangeable Aluminium and Acidity was measured using method 15G1 described by Rayment and Higginson (1992).

Organic Carbon was measured using the Walkley and Black method described in Rayment and Higginson (1992).

Available phosphorus was measured using method 9B2 described by Rayment and Higginson (1992) based on Murphy and Riley (1962).

Air-dry moisture content has been expressed as a percentage based on method 2A1 described by Rayment and Higginson (1992).

Total nitrogen was measured using an auto analyser following method 7A2 in Rayment and Higginson (1992).

Copper, Zinc, Manganese and Iron was measured using method 12A1 described in Rayment and Higginson (1992).

Exchangeable Calcium, Magnesium, Sodium and Potassium was measured by ammonium chloride at pH 7.0 using method 15B3 in Rayment and Higginson (1992).

## Appendix 3

### Rating table for analytical properties

#### General analytical properties

|                          | Very low | Low     | Medium  | High     | Very High |
|--------------------------|----------|---------|---------|----------|-----------|
| Organic Carbon (%)       | <1       | 1-2     | 2-4     | 4-8      | >8        |
| Total Nitrogen (%)       | <0.1     | 0.1-0.2 | 0.2-0.4 | >0.4     |           |
| Total Phosphorus (mg/kg) | <100     | 100-200 | 200-500 | 500-1000 | >1000     |
| CEC (meq/100g soil)      | <6       | 6-12    | 12-25   | 25-50    | >50       |
| Base Saturation (%)      | <20      | 20-40   | 40-60   | >60      |           |

**Note:** Organic matter content can be estimated by multiplying organic carbon contents by 1.724.

#### Colwell Extractable Phosphorus and Potassium

| Light soils (sandy loams) | Low  | Medium  | High |
|---------------------------|------|---------|------|
| P (mg/kg)                 | <10  | 10-35   | >35  |
| K (mg/kg)                 | <100 | 100-200 | >200 |
|                           |      |         |      |
| Heavy soils (clays)       | Low  | Medium  | High |
| P (mg/kg)                 | <30  | 30-80   | >80  |
| K(mg/kg)                  | <150 | 150-300 | >300 |

#### Salinity

|         | None | Slight  | Moderate | High    | Very High |
|---------|------|---------|----------|---------|-----------|
| (dSm-1) | <0.2 | 0.2-0.7 | 0.7-1.2  | 1.2-3.0 | >3.0      |

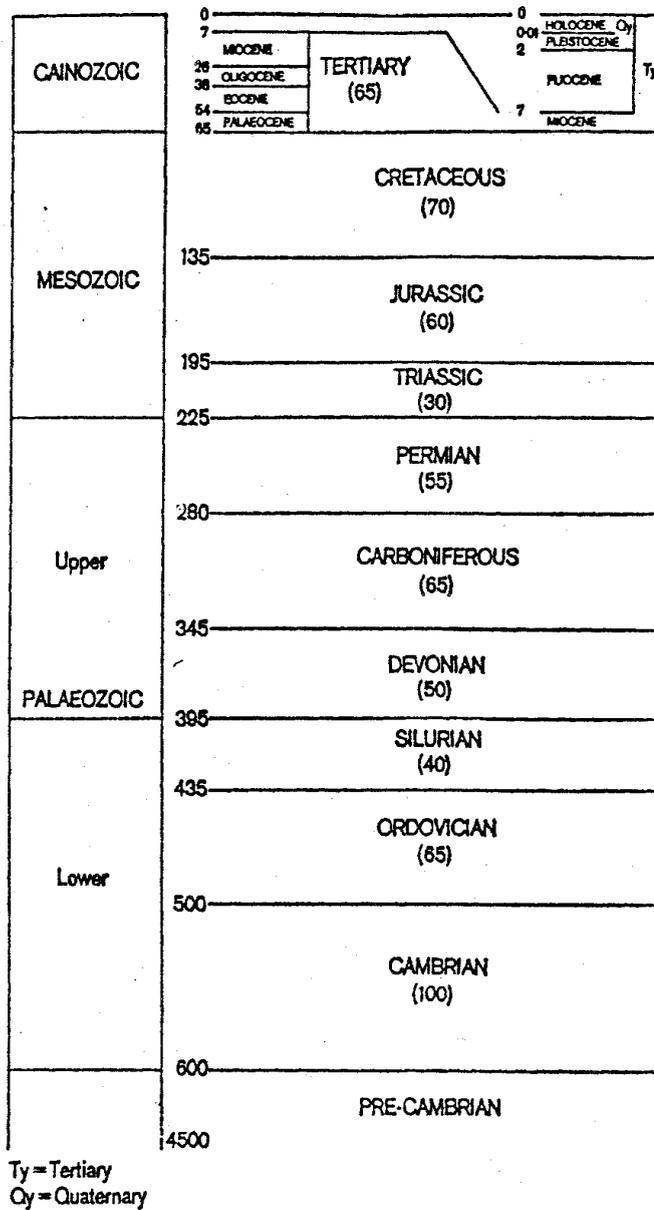
#### Soil Acidity

|                 | Slightly | Moderately | Strongly | Extremely |
|-----------------|----------|------------|----------|-----------|
| pH(water) range | 6.5-6.0  | 5.9-5.3    | 5.2-4.5  | <4.5      |

This table has been taken from Doyle (1993) p115

# Appendix 4

## Geological Timeline

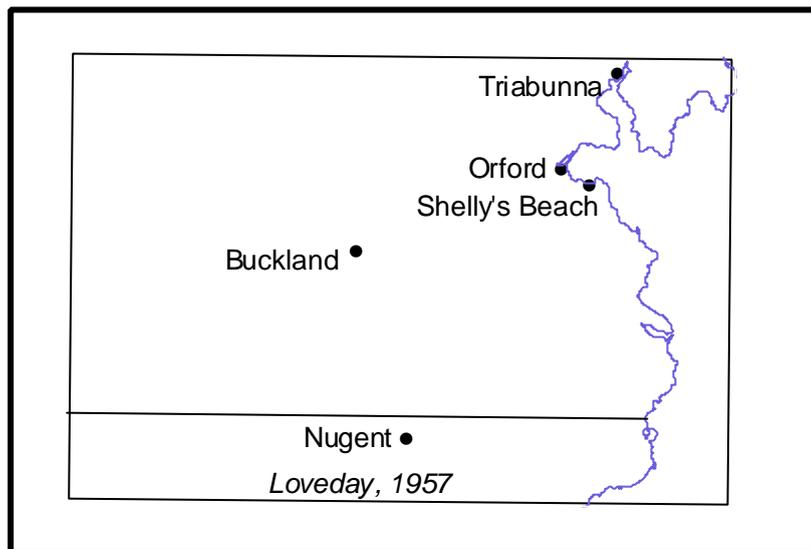


Taken from Brooks J.R.V., and Whitten D.G.A., (1972) Dictionary of Geology . Published by Penguin, England.

## Appendix 5

### Index Map Showing Detailed Surveys occurring on the Sorell Reconnaissance Map

The Sorell-Carlton-Copping soil map (Loveday, 1957) covers the area south of the line above Nugent.



## Appendix 6

### List of Reports in the Reconnaissance 1:100 000 Soil Map Series

Cowie, J.D. (1959), Reconnaissance soil map of Tasmania. Sheet 68, **Oatlands**. Div. Rep. Div Soils CSIRO Aust. 4/59; Scale 1:63 360

Doyle, R.B. (1993), Soils of the **South Esk** Sheet Tasmania (southern half) Reconnaissance Soil Map. DPIF Soil Survey Series of Tasmania No 1. Scale 1:100 000

Dimmock, G.M. (1956), Reconnaissance soil map of Tasmania **Flinders Island**. Div. Rep. Div. Soils CSIRO Aust. 8/56; Scale 1: 63 360

Dimmock, G.M. (1960), Soil reconnaissance of the area between the **Tomahawk and Ringarooma Rivers**, N.E Tasmania. Tech memo. Div. Soils CSIRO Aust. 7/60; Scale 1:63 360

Dimmock, G.M. (1961), Reconnaissance soil map of Tasmania. Sheet 74, **Ellendale**. Div. Rep. Div. Soils CSIRO Aust. 5/61; Scale 1:63 360

Dimmock, G.M. (1964), **Beaconsfield** Soil Survey. CSIRO (unpublished); Scale 1: 100 000

Hubble, G.D. (1951), Reconnaissance survey of the **Coastal Heath Country, N.W** Tasmania. Div. Rep. Div. Soils CSIRO Aust. 10/51 ; Scale 1:126 720

Leamy, M.L. (1961), Reconnaissance soil map of Tasmania, Sheet 61. **Interlaken** Div. Rep. Div. Soils CSIRO Aust. 6/61; Scale 1:63 360

Loveday, J. (1955), Reconnaissance soil map of Tasmania, sheets 22 and 28 - **Table Cape and Burnie**. Div. Rep. Div. Soils CSIRO Aust. 14/55; Scale 1:126 720

Nicolls, K.D. (1955), Soils, geomorphology and climate of an area between the **Lagoon and Arthur Rivers**, West Coast of Tasmania Div. Rep. Div. Soils CSIRO Aust. 7/55; Scale 1:126 720

Nicolls, K.D. (1957), Reconnaissance of the soils around **Georgetown**, Tasmania. Tech. Memo Div Soils CSIRO Aust 3/57; Scale 1: 126 720

Spanswick S.B. and Zund P. (1999a), Revised **Longford** Reconnaissance Soil Map of Tasmania. Department of Primary Industry Water and Environment, Tasmania. Scale 1:100 000.

Spanswick S.B. and Zund P. (1999b), Revised **Quamby** Reconnaissance Soil Map of Tasmania. Department of Primary Industry Water and Environment, Tasmania. Scale 1:100 000.

Spanswick S.B.. (In prep), Revised **Sorell** Reconnaissance Soil Map of Tasmania. Department of Primary Industry Water and Environment, Tasmania. In press. Scale 1:100 000.

Spanswick S.B. and Kidd D.B. (In prep), Revised **Brighton** Reconnaissance Soil Map of Tasmania. Department of Primary Industry Water and Environment, Tasmania. In press. Scale 1:100 000.

Spanswick S.B. and Kidd D.B. (In prep), Revised **Hobart** Reconnaissance Soil Map of Tasmania. Department of Primary Industry Water and Environment, Tasmania. In press. Scale 1:100 000.

Stephens, C.G. and Hosking, J.S. (1932), A soil survey of **King Island**. Bull. No 70 CSIRO Aust; Scale 1:126 720.

## Appendix 7

### Index Map of the 1:100 000 Reconnaissance Soil Surveys of Tasmania

