

## Chapter 6

### DETAILED DESCRIPTIONS OF LAND SYSTEMS, LAND UNITS AND LAND SUITABILITY

#### 6.1 Overview

Within this chapter, land systems and land units are described in detail and include the following:

1. Description of land systems, including landscape and land units, native vegetation, soil profiles, current land use and representative soil type used for mapping purposes.
2. Descriptions of the representative soil types for the land units (used for mapping purposes) (red) and associated soil types within the land unit (blue). The soil descriptions include:
  - General landscape characteristics,
  - Description of the soil,
  - Summary of the key profile features,
  - Soil restrictions and management prescriptions.
3. Land Suitability Rating Table that provides:
  - The overall suitability class for the fourteen species and the major limiting component, i.e. climate, landscape, soil (see Chapter 3 for more details).
4. Suitability class for each component, i.e. climate, landscape, soil and description of the limiting features of each of the land uses (see Chapter 3 for general interpretation).

Chemical and physical information presented with the soil descriptions has been summarised according to the following criteria;

#### *pH*

Measured in water (see appendix 2)

Extremely acid	<4.5	Slightly alkaline	7.1 - 7.9
Very strongly acid	4.5 - 4.9	Moderately alkaline	8.0 - 8.5
Strongly acid	5.0 - 5.5	Strongly alkaline	8.6 - 9.0
Moderately acid	5.6 - 6.0	Very strongly alkaline	9.1 - 9.5
Slightly acid	6.1 - 6.9	Extremely alkaline	>9.5
Neutral	7.0		

#### *Sodicity*

Non- sodic	Exchangeable Sodium Percentage <6
Sodic	Exchangeable Sodium Percentage 6 - 15
Strongly sodic	Exchangeable Sodium Percentage >15

#### *Soil salinity*

	Electrical Conductivity (dS/m)			
	10 - 20% clay	20 - 40% clay	40 - 60% clay	60 - 80% clay
<b>Very low</b>	<0.05	<0.08	<0.12	<0.18
<b>Low</b>	0.05 - 0.10	0.08 - 0.17	0.12 - 0.25	0.18 - 0.37
<b>Medium</b>	0.10 - 0.25	0.17 - 0.40	0.25 - 0.58	0.37 - 0.85
<b>High</b>	0.25 - 0.45	0.40 - 0.68	0.58 - 1.00	0.85 - 1.5
<b>Very high</b>	0.45 - 0.70	0.68 - 1.05	1.00 - 1.58	1.5 - 2.4
<b>Extreme</b>	>0.70	>1.05	>1.58	>2.4

### ***Dispersion***

Dispersion of dry aggregates is divided into five classes:

- Nil
- Slight
- Moderate
- Strong
- Complete

Where dispersion occurs following reworking of the soil mass, this is noted with a superscript number.

Criteria for establishing the dispersion classes is presented in Appendix 2.

### ***Internal Drainage***

Internal Drainage is divided into four classes:

- Well Drained
- Moderately Well Drained
- Imperfectly Drained
- Poorly Drained

Criteria for establishing the internal drainage classes is presented in Appendix 2.

### ***Hydrophobicity***

Hydrophobicity, or soil wettability, is divided into five classes:

- Nil
- Low
- Moderate
- Severe
- Very Severe

Criteria for establishing the hydrophobicity classes is presented in Appendix 2.

## **6.2 Land Systems**

Within the West Wimmera Shire, 14 land systems and four land elements have been identified:

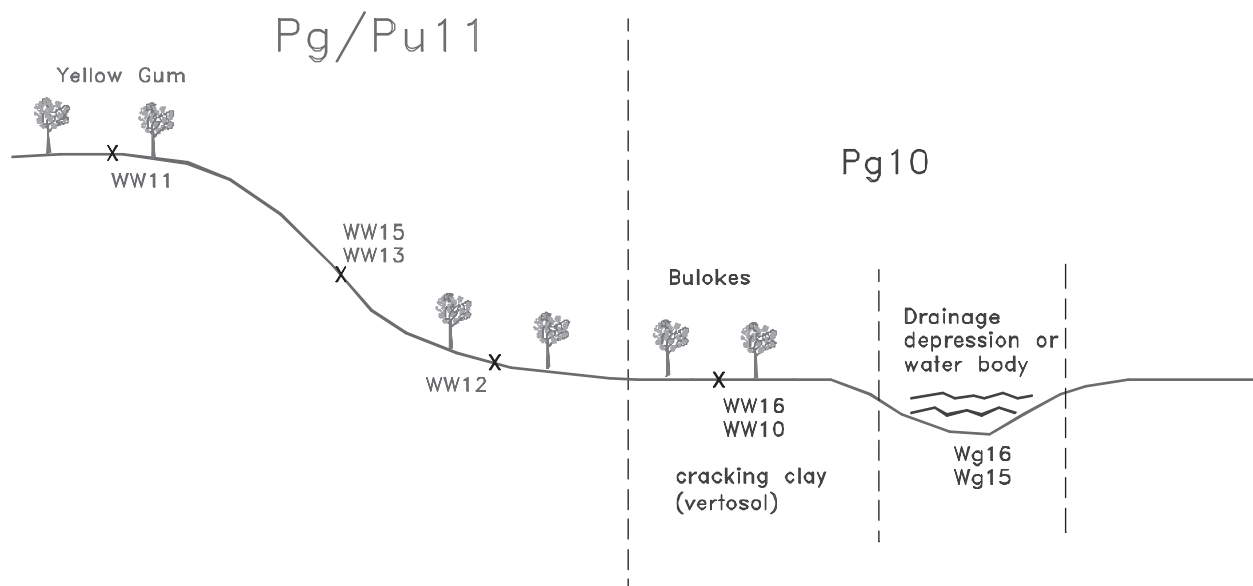
Big Desert -1 land system (WW30, L26, WW28, WW29).....	p.101
Big Desert Transition -2 land system (WW1, L24).....	p.123
Stranded Beach ridges -3 land system (L19, L21, L20, L12, L13, WW21).....	p.137
Northern Cracking Clay Plains -4 land system (L1).....	p.174
Grey and Red Plains and Rises -5 land system (WW5, WW4a, WW4b, WW6).....	p.181
Limestone Rises -6 land system (WW3, WW2, WW24).....	p.205
Self-mulching Clay Plains -7 land system (WW9).....	p.224
Little Desert Transition -8 land system (WW8, WW7).....	p.231
Little Desert -9 land system (WW20).....	p.247
Southern Cracking Clay Plains -10 land system (WW10, WW16, W70*).....	p.252
Yellow Gum Plains and Rises -11 land system (WW11, WW12, WW13, WW15, W71*, W69*, W74*).....	p.266
Red Gum Plains and Rises -12 land system (WW17, WW18, WW19, WW22).....	p.299
Sand Plains and Rises -13 land system (WW26, WW14, WW75).....	p.326
Dissected Tablelands -18 land system (W73, W76#, W72, WW25, W63, WW23).....	p.346
Lunettes -14 land element (WW27).....	p.371
Intermittent Swamps -15 land element (W66, W67).....	p.376

Permanent Waterbodies -16 land element.....p.386  
 Swamp and Lake Complex -17 land element.....p.387

- \* No site description, although chemical analysis was conducted (refer to Appendix 4)
- # No chemical analysis

The land systems are divided into land units. Both the land units and land elements are presented on the maps attached to this document and presented in the GIS computer package.

At the beginning of the land systems description, a two dimensional diagram of the land system or land unit is presented. This diagram illustrates the characteristics of the landscape, i.e. dunes, slopes and swales and where in the landscape the soil descriptions were described.



The writing in red indicates the land system or land unit being illustrated and the blue writing is showing the land system or land units that occur adjacent to the land system or land unit in question.

The detailed soils descriptions taken from soil pits or road cuttings are nominated a 'WW', coding, i.e. site number WW1, and sites that were described using auger holes are named 'W', i.e. site number W66. Some sites on land systems 3 and land system 4 were taken from information collected as part of the Lowan Land Inventory and Assessment (Williamson (ed.)1997). This information is coded 'L', i.e. site number L26. The sites (excluding the Lowan (L) sites) are depicted on the land unit maps to show the sites within the West Wimmera Shire.

Not all sites described in the field are presented in this report, as their physical features are similar to those already described. However, some sites did have chemical analysis conducted to show the spatial distribution of specific soil types in the shire (refer to Appendix 4).

Site W70 is located in the Neuarcurr area (Southern Cracking Clay Plains - 10) and should be referred to in this report if development is to occur in this area. Three extra sites have had chemical

analysis conducted for the Yellow Gum Plains and Rises - 11 land systems, to give a spatial representation of the land system. Site W71 is located just east of Gymbowen and W69 just north of Miga Lake. W74 is located on the southern transition of the Little Desert although the soils still represent the solodised solonetz soil type of land system - 11.

### Land Suitability and Land Suitability Maps

Each soil type described in this chapter has land suitability assessments presented for the 14 crops and pastures. Criteria used to determine the suitability is presented in Chapter 3 and rated according to the following class system (Table 6.1).

**Table 6.1.** Crop/Pasture suitability definitions

Class	Description	Definition
1	Suitable	Suited - with no major limitations to production or the environment given best management practice. Types of limitations and management options that fall into this category include stubble retention and minimum tillage for wind and water erosion control, liming to ameliorate topsoil acidity and gypsum to ameliorate sodic topsoils.
2	Generally suitable	Suited - but with some major limitations that increases the risk of production loss or environmental damage, even given best management practice. Types of limitations and management options that fall into this category include rainfall that is higher or lower than the pre-ferred level, surface or sub-surface drainage, deep ripping with gypsum to improve internal drainage, claying to improve soil wettability.
3	Not suitable	Unsuited - due to major production or environmental limitations that significantly increase the risk of production loss or environmental damage, even given best management practice. These limitations are generally too expensive to overcome with current technology or incapable of being modified.

To map the suitability classes for each crop and pasture, the representative soil type (highlighted in red) has been chosen as the most appropriate to depict the land unit(s). The representative land unit is either the most common soil type or occurs on the most common land element (e.g. long gentle slope).

The land suitability for the representative soil type is depicted on the maps presented in the GIS computer package. This presentation includes the classes described in Table 6.1, but also an additional two classes that caters for land units that have soil types with suitability classes different to the representative soil type. The additional two classes are as follows:

**Class 4** Generally suitable (class 2) although some associated soil types within the land unit are unsuitable (class 3).

**Class 5** Unsuitable (class 3) although some associated soil types within the land unit are generally suitable (class 2).