

2. LAND CAPABILITY ASSESSMENT

2.1 *Mapping the land*

Land is a complex entity in which many features vary continuously over the landscape. It is possible to distinguish and measure some of them (e.g. slope, proportion of rock outcrop) but some areas are less easily determined and may have to be inferred from others (e.g. site drainage).

Certain land features have a greater effect on land use than others, and in most cases a limited number will account for most of the variation in performance of the land for specific uses.

Areas of land which are reasonably uniform with respect to such key features will have similar capability and can be expected to respond uniformly to management.

If areas of land which have a limited range of variability in those features are identified and mapped, the resultant map provides the basis for land capability assessment. Each map unit with its limited range of variability will have a particular capability for a specified use and will differ from other map units which have different levels of the land features.

In this study, the geology of the parent material and landform were the primary criteria for mapping. Further subdivisions of the land were based on slope and drainage characteristics.

Fifteen map units have been identified, mapped and described. The different types of land were recognised from stereo photo interpretation of 1:25 000 scale aerial photographs, aided by field inspections. Some land features were measured (e.g. slope of land, colour and depth of soil), some estimated on the basis of simple field tests (e.g. pH, texture and "Unified Classification" of the soil) and others inferred (e.g. flood risk) at each sample point. Map unit descriptions were compiled from site data and are presented in Appendix I. The map unit boundaries were transferred to a photo mosaic at a scale of 1:13 500.

A number of publications were consulted during field work and in preparation of this report. These are listed under Reference Material.

2.2 Assessing the capability of the map units

The capability of the map units has been assessed according to capability rating tables (shown in Appendix II) which have been drawn up for a variety of activities.

A land capability rating table lists those land features which affect the ability of the land to support a specified activity. The potential range of the affect that each land feature has on the use of the land is divided into five classes, Class 1 being the most favourable condition, and Class 5 the least favourable (Table 2.1).

The capability rating is derived by comparing the value of each relevant land feature of the map unit description with the classes in the rating table. This provides an indication of the extent to which each feature will limit the use of that map unit for the specified activity.

Table 2.1 Land Capability Classes

Class	Capability	Limitation	General Description
1	Very good	None to very slight	Areas with a high capability for the proposed activity or use. The limitations of long term instability, engineering difficulties or erosion hazard do not occur or they are very slight. Standard designs and installation techniques, normal site preparation and/or management should be satisfactory to minimise the impact on the environment.
2	Good	Slight	Areas capable of the proposed activity or use. Slight limitations are present in the form of engineering difficulties and/or erosion hazard. Careful planning and/or the use of standard specifications for site preparations, construction and follow-up management should minimise developmental impact on the land.
3	Fair	Moderate	Areas with fair capability for the proposed activity or use. Moderate engineering and/or high erosion hazard exist during construction. Specialized designs and techniques are required to minimise developmental impact on the environment.
4	Poor	Severe	Areas with poor capability for the proposed activity or use. There are considerable engineering difficulties during development and/or a high erosion hazard exists during and after construction. Extensively modified design and installation techniques, exceptionally careful site preparation and/or management are necessary to minimise the impact on the environment.
5	Very poor	Very severe	Areas with very poor capability for the proposed activity or use. Limitations, either long term instability hazards, erosion or engineering difficulties cannot be easily overcome with current technology. Severe deterioration of the environment will probably occur if the activity or use is attempted in these areas.

Each land feature is considered separately and the "Capability Class" of that map unit determined by the most limiting land features.

The map units have been rated for the following activities:

BUILDING FOUNDATIONS:	standard post and strip foundations.
ABSORPTION FIELDS:	effluent disposal from septic tanks through tile drain fields.
SECONDARY ROADS:	fully kerbed, channelled and sealed.
GRAVEL ROADS:	formed, surfaced, cutoffs and culverts.
ACCESS TRACKS:	unformed, unsealed, limited use.
SHALLOW EXCAVATIONS:	level house sites and services.
FARM DAMS:	earthen embankment, to 2000 m ³ capacity.
SEWAGE LAGOONS:	earthen storage tanks for sewage.
INTENSIVE CULTIVATION:	short rotation, cultivation down the slope, mechanical weed control, row cropping.
PATHS & TRAILS:	walking tracks and bridle paths.

The capability ratings for each activity are listed in Appendix I.

The capability of each of the map units has also been assessed for the following types of residential developments:

URBAN:	subdivision into contiguous housing blocks smaller than 0.2 ha, with kerbed and sealed roads, stormwater drainage and sewerage. House sites may require benching if slab foundations are needed.
BUSH BLOCKS:	subdivision into bush blocks of 2-12 ha, commonly around 4 ha. Each block requires a house site, (benching if a slab foundation is needed), tile drain absorption field for effluent disposal, an access track and some new gravel roads between the blocks. Roof-fed water tanks supply household needs.
SMALL FARMLETS:	subdivision into blocks of about 4 ha each requiring a house site, (benching if a slab foundation is needed), a tile drain absorption field for effluent disposal, a dam site for stock and domestic water supply, an access track and some new gravel roads between the blocks.
LARGE FARMLETS:	subdivision into blocks larger than 12 ha, each requiring a house site, (benching if a slab foundation is needed), tile drain absorption field, dam site(s) for stock and domestic water supply and access tracks.

The capability ratings for each map unit for the various residential uses were thus derived from the following activities:

- URBAN:** building foundations shallow excavations secondary roads
- BUSH BLOCKS:** building foundations shallow excavations (if needed) absorption fields gravel roads access tracks
- SMALL FARMLETS:** building foundations shallow excavations (if needed) absorption fields gravel roads access tracks farm dams
- LARGE FARMLETS:** building foundations shallow excavations (if needed) absorption fields access tracks farm dams

The capability ratings for these residential uses was derived by consideration of the limitations on each of the constituent activities; the most severe limitation determining the capability rating. Where the land feature imposing the most severe limitation was unlikely to vary significantly over the map unit, that limitation determined the capability rating directly. However, some land features do vary within the map unit, e.g. slope. If one of these land features imposed the greatest limitation, then the larger the proposed allotment size, the greater the likelihood of locating a better than average site for a house, dam or road. Thus, some up-grading of capability ratings has been made for the uses involving larger allotments.

The capability ratings of the various activities, for subdivision, and comments on the likely effects of subdivision on the town water supply for each map unit are presented in Appendix I. The capability of the land for intensive cultivation and for the various types of subdivision, grouped on the basis of type of use, is presented in Section 4.

2.3 Interpreting the land capability information

The capability ratings for the various activities are expressed in the following manner:

Activity	Rating	Major limiting features of the land
Farm dams	Poor	high percolation rate.

This indicates that a dam on this map unit is unlikely to hold water, and that there is a severe limitation on the use of this land for farm dams. From this, steps to overcome the limitation may be advised (e.g. plastic liner) or else a decision made to locate uses requiring farm dams on another map unit which has a higher capability.

The capability ratings for residential use list the type of use, the capability rating and the major limiting activities.

For example:

Subdivision type	Rating	Major limiting activities
Bush block	Fair	absorption fields; access tracks

In this example, moderate limitations to the use of the land for bush block subdivision are imposed by the capability of the land for effluent disposal and for access tracks. Reference to the individual ratings for these activities will indicate which land features are responsible and any steps to overcome the limitations can then be devised.

Comparison of capability ratings of all map units for a specified use is facilitated by the tables in Section 4. Separate tables for intensive cultivation and for each type of residential development list all map units, the proportion of the study area, the capability rating and the land features which affect (i) the activity, and (ii) the town water supply, for each map unit.