LAL LAL WATER SUPPLY CATCHMENT LAND CAPABILITY FOR RURAL TOWNSHIP DEVELOPMENT: DUNNSTOWN

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DUNNSTOWN: LAND CAPABILITY ASSESSMENT

This report follows a request by the Shire of Buninyong for land capability information for residential development (0.4 ha min. lots) in the township of Dunnstown and environs.

Topography

Dunnstown lies on the western bank of Granite Creek with dissected, undulating basalt plains to the east, and less dissected extensive plains to the west and south. To the north of the town there is a minor escarpment which rises to Mt. Warrenheip. This escarpment forms the edge to the last basalt flow from Mt. Warrenheip.

Soils

The soil types in the area around Dunnstown have been identified in a previous report: "A study of land capability in the Shire of Buninyong" by P. J. Jeffrey (SCA) 1980.

The major soil type in the area is a red/brown gradational formed on Quaternary basalt, close to the relic volcanic cones. There are mottled yellow duplex soils in some of the drainage lines.

The red gradational soil consist of a very dark reddish brown, strong crumb structured, friable clay loam grading into weathered basalt at depth (variable, but generally 150 cm+). Percolation of water through the soil should not be restrictive except along drainage lines and other depressions when these areas are saturated. Further investigations of soil permeability are being carried out.

Methodology for land capability assessment.

A preliminary assessment of the study area was made by members of the Land Protection Service and a regional officer of the Department of Conservation Forests and Lands.

It was concluded that given the generally gentle slopes in the vicinity of Dunnstown and the relatively uniform nature of the soils, the area suitable for residential development can be defined by excluding areas of poor drainage or seepage. Thus drainage lines, dams and other areas where surface water concentrates have been identified on the accompanying maps. The major water features are delineated by a solid line and red shading. Other low points in the landscape and minor areas of water concentration are shown by broken lines and orange shading. The information was derived from site inspections based on interpretation of black and white aerial photographs at a scale of approximately 1:25 000 and topographic sheets at the same scale. This information was transferred onto an uncontrolled base at a scale of 1:5 000 using a map base of 1:2 500, supplied by the Shire of Buninyong. This land capability map supercedes an existing land capability map at 1:2 500, dated 4.2.80.

A non-development zone of 60 m wide has been delineated each side of the major lines of water concentration which is recommended as the minimum distance that any development, particularly effluent disposal fields, should be set back from drainage line zones. This distance allows for the detention of effluent and natural purification before reaching areas of high water concentration or streams.

All areas prone to water concentration are to be avoided in order to ensure the efficiency of a ground septic waste disposal system and avoid possible contamination of surface waters which might result from hydraulic failure.

Therefore areas defined by broken lines and orange shading should be avoided by any proposed development and any set-back requirements would be at the discretion of the Shire with prior consultation with the relevant officer from the Department of Conservation, Forests and Lands.

The steeper slopes to the north of Dunnstown have also been delineated. Because of increased stoniness and shallow soil depth, a greater area on these slopes may need to be set aside for effluent disposal because of the reduced water holding capacity of the soil and potential surfacing of effluent.

The simple 3 class capability map is an amalgamation of a geomorphology map and relevant cadastral information. A number of soil permeability tests and other soil observations are being carried out to increase knowledge of the area which will enhance the data portrayed on the final map.

Test Results

Hydraulic Conductivity (permeability) tests have been carried out in the area. There were 4 main test sites in the area (see figure 1) which are summarised below in Table 1. The values are in metres/day (metres^3/metres^2/day) which can be converted to litres/day if required.

According to the "Guidelines for Land Capability Assessment" manual (Rowe et al, 1980), referring to the ratings table for on-site effluent disposal systems, all the geometric mean values fall within class 2 - 3, which indicates a low to moderate level of limitation.

However, although all the sites have high soil permeability values, other criteria may be equally important. For example, at Site 2, although the soil is permeable (but currently drained) the depression area would concentrate moisture, particularly in the critical wet months. A shallow depth to an impermeable layer would also restrict the available water capacity of soil and effluent trenches in the depression would act as drains unless preventative measures were taken. Therefore site position of an effluent disposal field is as important as the inherent permeability of the soil.

DUNNSTOWN TOWNSHIP

Location of hydraulic conductivity (permeability) determination sites

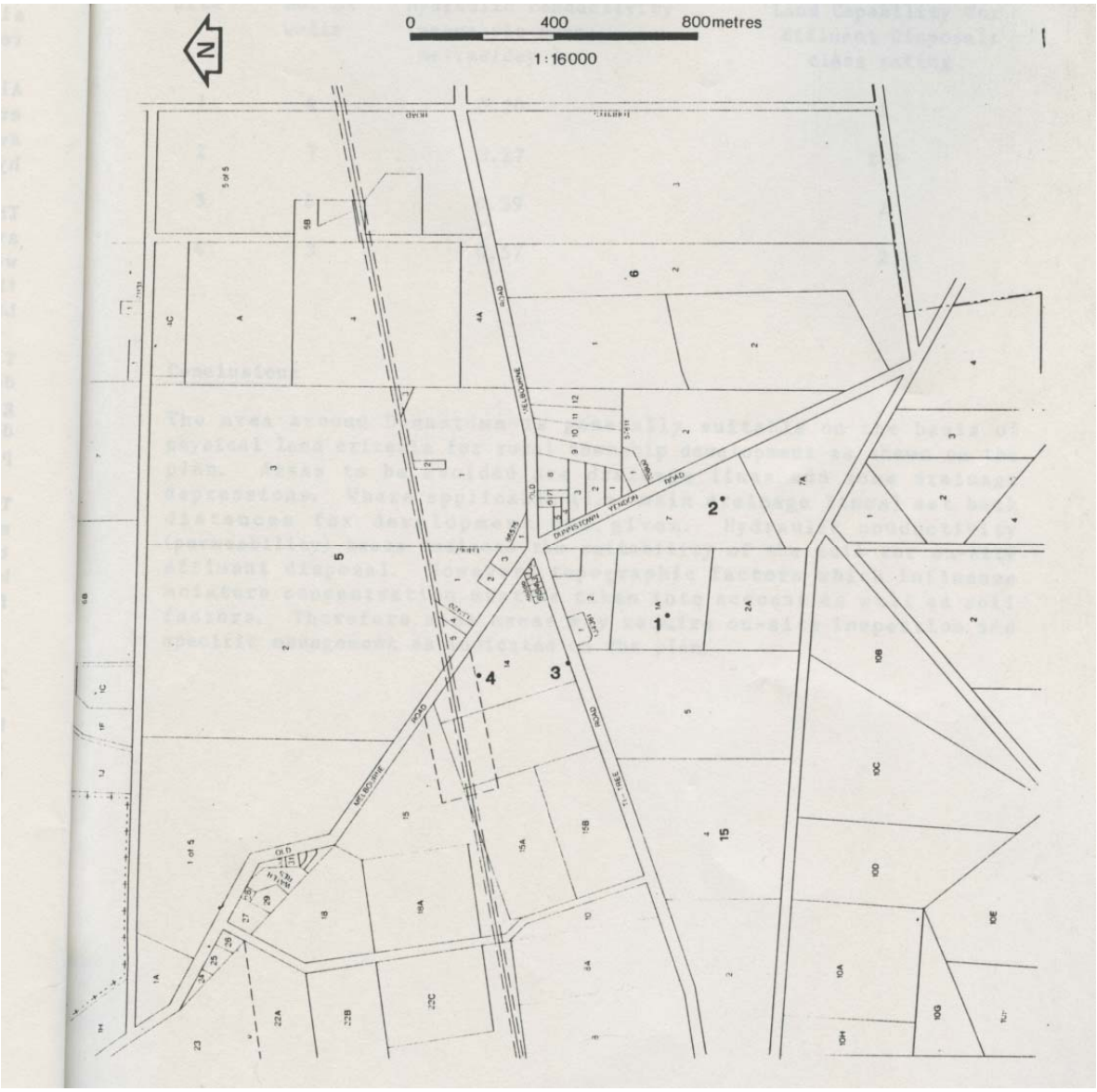

Table 1.

Site	No. of wells	Hydraulic Conductivity (geometric mean: metres/day)	Land Capability for Effluent Disposal: class rating
1	6	0.20	3
2	7	0.27	2-3
3	6	0.39	2
4	3	0.57	2

Conclusions

The area around Dunnstown is generally suitable on the basis of physical land criteria for rural township development as shown on the plan. Areas to be avoided are drainage lines and some drainage depressions. Where applicable (i.e. main drainage lines) set back distances for development are given. Hydraulic conductivity (permeability) tests indicate the suitability of the soil for on-site effluent disposal. However, topographic factors which influence moisture concentration must be taken into account as well as soil factors. Therefore some areas may require on-site inspection and specific management as indicated on the plan.