

Chapter 2 Hydrologic design regions of Victoria



2.1 Introduction

This chapter describes the development and use of a simple design procedure for sizing **stormwater** treatment facilities across Victoria for small development projects (e.g. single or small clustered allotments). The procedure does not require any modelling. In addition, the procedure can be used as a simple tool to assess whether a proposed design is of sufficient size. The procedure is based on adjusting the size of the treatment measure from a reference site (Melbourne) to other parts of Victoria to achieve similar levels of pollutant removal.

To determine the **adjustment factors** a set of equations that only requires local Mean Annual Rainfall (MAR) data has been developed. This approach is based on defining nine **hydrologic design regions** within Victoria (four of which are in the Melbourne/Geelong metropolitan area) with adjustment factors for **wetlands, swales, ponds** and bioretention systems.

Melbourne was selected as the reference site. Estimated pollutant reductions from simulations for a range of treatment measures with different configurations for this reference site are presented in later chapters (see Chapters 4–10). These curves can then be adapted using the adjustment factors for use in different sites across Victoria. A required treatment area (i.e. the size of the facility) derived for the reference site (Melbourne) can be converted into an equivalent treatment area that will achieve the same level of treatment elsewhere in Victoria.

The results of this analysis are presented in this Chapter, while more details of the modelling approach and the model output are provided in Appendix B.

2.2 Approach to regionalisation

We have used a continuous simulation approach to help properly consider the influence of **antecedent conditions** on the design of stormwater treatment measures and the wide range of storm characteristics and hydraulic conditions that are relevant to individual treatments. Computer models such as the **Model for Urban Stormwater Improvement Conceptualisation (MUSIC)** (Cooperative Research Centre for Catchment Hydrology 2003), developed to enable continuous simulations of complex stormwater management **treatment trains**, aid in the development of stormwater management strategies and the design (sizing) of stormwater treatment measures.

The following approach was used to develop the hydrologic regions and adjustment factors presented in this chapter and Appendix B.

- 1 A measure of effectiveness was selected for different configurations of various stormwater treatment measures. In this case, the reduction in annual total nitrogen loads was adopted