THE BENEFITS OF INDOOR WATER EFFICIENCY FOR ON-SITE SYSTEM PERFORMANCE.

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Abstract

The most common sewage treatment technology in unsewered parts of Australia is the septic system (septic tanks with absorption field effluent disposal). A combination of inappropriate design, poor management and inadequate planning controls has resulted in these systems manifesting high failure rates. Septic system failure is widespread in NSW, with many systems failing to meet chemical and microbiological standards for effluent discharge.

Reducing hydraulic loads to septic systems has the potential to alleviate or reduce the magnitude of system failures; or to extend the effective system life allowing time for alternative sanitation options to be explored. This paper reports on a water end-use analysis undertaken in the unsewered village of Clunes, New South Wales, Australia and draws conclusions about indoor water use. End-use analysis indicated that residential water efficiency could result in sizeable reductions in hydraulic load to septic systems. The potential for extending the effective life of absorption trenches through water efficiency is discussed, along with other financial benefits to householders. There are major opportunities for implementing water efficiency in the village and potential for significant septic system performance improvement through water efficiency.

Keywords
indoor water efficiency; greywater reuse, hydraulic load; septic systems; water consumption modelling; water end use analysis;

1 Introduction

1.1 Current on-site situation

Approximately 12% of Australia's population are not connected to a sewer network (Geary & Gardener, 1996) and rely on on-site sewage treatment systems to treat their domestic wastewater. The most common type of on-site system is the septic system, comprising a septic tank and absorption trench or field.

The current study focuses on Clunes on the north coast of New South Wales, an unsewered village with an approximate population of 500. The majority of households discharge their wastewater to septic systems (Geolink Group, 1996). The surface stratum in Clunes is predominantly red krasnozem with underlying Lismore Basalt. Precipitation exceeds evaporation during seven months of the year (January to July) and almost half of the area's average 2,300 mm annual rainfall occurs in the first three months of the year (Geolink Group, 1996).

1.2 Septic system failure

The failure of septic systems to meet chemical, microbiological and other treatment standards is well documented in Australia (Jeppesen & Solley, 1994; Geary & Gardener, 1996). The principal reasons for septic system failure are: inappropriate system design (including undersized systems and those unsuited to the site or application); poor management and maintenance of systems; and inadequate planning and regulatory controls.

A postal survey of on-site system performance in Clunes was conducted by Geolink in 1996. Based on the survey, Geolink concluded (and confirmed through post survey site inspections) that 70% of