May 2015
The WRC operates in terms of the Water Research Act (Act 34 of 1971) and its mandate is to support water research and development as well as the building of a sustainable water research capacity in South Africa.

TECHNICAL BRIEF

Wastewater treatment

Self-regulation of the small wastewater treatment industry

A completed Water Research Commission (WRC) study has developed a new framework of standards and an accreditation system for technologies in the small wastewater treatment sector.

Background

Small wastewater treatment (inclusive of package plants) or SWWTW are a common form of service utility in sewage treatment for smaller communities, and are needed where sewerage reticulation is absent due to inadequate space, difficult terrain, remoteness of areas in need and where standards set are higher than the effluent quality obtained from simple septic tank systems.

The SWWTW industry in South Africa has grown rapidly from a small base and is currently unregulated in terms of process design, construction materials etc. Most of the suppliers are not process experts, but rather entrepreneurs who have funded the development of their product using limited resources.

In this industry, traditionally maintenance contracts were not required by purchasers. Furthermore, some property developers provided the SWWTW suppliers with incorrect flow and strength data on which to base the design, or added extra housing units onto an existing plant without expanding it. The operation and maintenance of these plants have also been neglected.

A typical small wastewater treatment system.

Improving the standard of SWWTW

The aims of this WRC project were to:

- Develop a framework of standards for small wastewater treatment technologies, which is practical for South Africa.
- Assess and recommend how the framework of standards will work within the sector ensuring that duplication is eliminated in the process.
- Develop a conceptual model with key criteria for an independent testing facility of the different technologies, including the evaluation of the feasibility of using existing technologies in South Africa.
- Develop an accreditation system for technologies by the various supplies which will encompass technical and managerial aspects, including a modification of the Green Droplet System that is currently used by the Department of Water and Sanitation (DWS).

This study resulted in the compilation of two reports. Volume 1 explains the development of the proposed framework of standards, a conceptual model for a test facility and an accreditation system for each new technology provided by suppliers. Volume 2, in turn, describes the development of a Green Droplet Accreditation system.

Volume 1 provides an introduction to the framework of standards which could be adapted for use in South Africa, and discusses their strengths and weaknesses, together with the feasibility of scaling them up for use on larger works. It draws from industry know-how as well as Australian, European and United States standards.

The report further examines current South African legislative standards for discharge of treated effluent to the environment, together with the corresponding monitoring

requirements. It further examines the current General Authorisation Discharge Requirements, and makes strong recommendations with respect to:

- The quality of water to be used for lawn irrigation; and
- The issue of satisfactory compliance which needs to be properly defined, including the method of calculation and the percentage of compliance.

A categorisation framework for SWWTW sizes was discussed and a three-tier system recommended after consultation with the industry body SEWPACKSA and the Water Institute of Southern Africa SWWTW division. Furthermore, a proposed SWWTW treatment efficiency testing standard was formulated, inclusive of proposed process design standards.

The intention behind this proposed SWWTW treatment efficiency testing standard is that it would serve as a national standard and would obviate the need for various municipalities to publish their own individual standards or bylaws.

The study did a brief evaluation of the concept of a SWWTW evaluation facility, making recommendations with respect to the requirements, funding of the facility and its operation.

Volume 2 of this study examines the development of the Green Droplet System for SWWTW. The behavioural change espoused in this concept of self-regulation is that the various stakeholders (owner, designer, supplier, operator, and regulator) would see fit to take the right actions proactively to minimise risk to environment, health and reputation.

Thus, the system proposed is a simplified and graded system applicable to different categories of SWWTW.

Further reading:
To order the reports, ***Self-regulation of the package plant/SWWTW industry Volume 1*** (**Report No. TT 620/14**) and *Volume 2* (**Report No. TT 621/14**) contact Publications at Tel: (012) 330-0340, Email: orders@wrc.org.za or Visit: www.wrc.org.za to download a free copy.