

New Guidebook Helps Find Better Treatment Solutions



Many peri-urban and rural communities in South Africa are dependent on small water treatment plants for their drinking water. Choosing the right type of technology for the application is one of the crucial steps in ensuring the sustainability of the service. To assist decision-makers in making the right choices, the Water Research Commission (WRC) has published a new guidebook on the selection of small water treatment systems for potable water supply to small communities.

Small water treatment plants are defined as water treatment systems (usually with a capacity of less than 2,5 Mℓ/day) installed in areas which are not adequately serviced and do not normally fall within the confines of urban areas. They are, therefore, mostly used in rural and peri-urban areas and include chlorination plants for water supplies from boreholes and springs, small treatment systems for rural communities, treatment plants of small municipalities and treatment plants for establishments such as

rural hospitals, schools, clinics and forestry stations.

Today, there are many local and international technology designs to choose from. As the authors of the new WRC guidebook point out, however, very little may be known of these systems in terms of cost, efficiency and the applicability to the intended application, especially in the case of novel and emerging systems. Supplier information may be sketchy, or promising new technologies have not yet been fully evaluated under South African conditions.

According to the guidebook authors, the selection of suitable technologies for small communities is very important. "These systems are crucial in ensuring safe water to the communities on a sustainable basis."

While some small water treatment systems have been evaluated during selected WRC projects, this guidebook offers a more comprehensive look at all the small water treatment choices available in South Africa. A database comprising 1 100 small water treatment plants has been

compiled. This database provides information on the applicability, efficiency, operational use and cost aspects of the water treatment technologies so that the user can make technical comparisons between different solutions that exist.

Use of the guidebook is not limited to the selection of treatment technologies for new treatment plants; it can also assist in assessing the appropriateness of present technology applications for achieving compliance with drinking water quality standards under the site-specific circumstances encountered by an existing plant.

It is recognised that socio-economic factors are just as important as technological considerations when selecting the most appropriate water treatment technology. Thus socio-economic guidelines, based on research community experience with such or similar water treatment technologies are provided to assist the guidebook user in determining the appropriateness of identified technologies for specific small community use.

According to the authors, another important aspect in ensuring the sustainability of a system is following the correct operation and maintenance procedures. "Although most suppliers of small water treatment plants provide their clients with some operation and maintenance guidelines, these may not be exhaustive, or certain important generic aspects may not be covered. Specific attention should be given to operation and maintenance aspects and, where the treated water is distributed in a pipe network or has to be stored, the presence of a disinfection residual is required in all circumstances."

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The guidebook comprises three sections. In Section 1, the scope and intended use of the guidebook is

described, together with an emphasis on the important technological and socio-economic issues. This is followed by Section 2 in which the procedures to be followed for selecting appropriate technologies for specific applications are described, starting with establishment of the need for the small water treatment system and information on the water source to be treated.

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The user then produces a shortlist of available technologies that will meet these raw water requirements. These technologies are then evaluated and compared with each other by means of the technology information database. Different evaluation criteria are used to determine which treatment system will be the best for the user's specific needs.

Section 3 provides the data that is necessary for performing the above evaluation and selection procedure. A list of relevant research and evaluation reports is also included to allow the user to obtain more detailed information on the technologies contained in the database.

“When comparing costs of alternative technologies, the focus should be on cost-efficiency (i.e. the cost to achieve certain treatment goals) rather than on the absolute cost of the technology,” the authors point out. “Lifecycle costing provides the most effective tool for cost-efficiency of alternative treatment technologies.”

DEALING WITH MANAGEMENT

While the guidebook addresses the need for technical information on available and emerging small water treatment technologies, it is becoming more evident that a major problem with the sustainability of these plants lies with management aspects, the authors point out. “More applied research is needed on the identification and addressing of management issues that may result in poor performance of treatment plants, and ultimately, non-compliance with recognised local and international norms and standards.”

The WRC has recognised the importance of improving management practices especially at small water treatment plants, and is funding two projects on addressing these issues at present. The one project is aimed at compiling a manual and training aid for such plants, while the other project is focusing on the compliance of non-metropolitan potable water providers as well as management guidelines and norms. A third project on the development of a management tool for the efficient operation and maintenance of small water treatment plants has also started.

To order the WRC Report, *Selection of Small Water Treatment Systems for Potable Water Supply to Small Communities* (**Report No: 1443/1/07**), the socio-economic report (**1443/12/07**) or the guidebook

(**Report No: TT 319/08**), contact Publications at Tel: (012) 330-0340, Fax: (012) 331-2565 or E-mail: orders@wrc.org.za

