

EXECUTIVE SUMMARY

A large number of small water treatment systems installed in South Africa are subject to failure during its life, some even right from the planning stages of the project. According to feedback at a recent conference held in East London (Appropriate Practice Conference, March 1999), of a number of more than 50 small treatment systems that were installed in Southern Africa, only a small percentage of these plants are performing to requirements and can be considered as successful water supply projects. This implies first and foremost that these communities for whom the plants are installed are still not involved and their support and participation not obtained during the initial phases of a water supply project. It is of utmost importance that the communities must accept the technologies and that the technology must work for the community.

A number of guideline documents have been drawn up about various aspects of rural water supply, and on the different technologies used in rural water treatment plants (WRC Reports No. 231/1/93, KV 58/94, TT 68/95, 449/1/95, 450/1/97, and 354/1/97; various Technical Guides by die CSIR Division of Water Technology). However, none of these guides specifically addresses the pitfalls that should be guarded against when designing small treatment systems, and which often lead to failures. It has been shown that these pitfalls in design can lead to numerous problems with the sustainability of the plants (Swartz, 1998).

Moreover, while the various manuals have proven to be valuable in allowing engineers, authorities and communities to plan and design small water treatment systems for rural communities, they do not specifically address the very important aspect of community involvement in the planning stages of a project as prerequisite to successful operation and sustainability of these plants. It is important that the water supply projects must be planned to standards that meet the requirements of approving authorities and financing agencies.

There was, therefore, a need for guidelines for planning and design of small rural water treatment plants, that specifically identify those aspects and pitfalls which should be avoided in the design of these plants, and that contain as main part of the document the very important guidelines on how to obtain community support and participation in the project.

Because many of the treatment systems designed by engineers for rural applications are over-designed or inappropriate (too sophisticated; the community does not accept the technology), there was a need to also provide information on "simpler" and indigenous technologies which can be used to ensure community participation and cost-reduction of the systems.

Aims of the project

The aims of the project were as follows:

- a. To understand why small water treatment systems for rural communities often fail, and applying this information in the planning and design of new small water treatment plants, thereby preventing failures of future plants.

- b. To provide design guidelines for rural water treatment technologies, in order that
 - these systems will not be over-designed and hence unaffordable
 - the systems will be sustainable, *i.e.* will have the support and involvement of the community and dedicated commitment from the persons responsible for operation and maintenance of the plants
 - user-friendly maintenance programs can be drawn up
- c. To create an understanding of the unit processes employed in small rural water treatment plants.
- d. To provide practical and useful guidelines on how to obtain full involvement and participation from the communities when a new treatment system is planned or an existing treatment system is to be upgraded.
- e. To provide information on indigenous water treatment technologies.

A major input towards the compilation of these guidelines for planning water treatment systems for rural communities was the presenting of a national workshop on small water systems during August 2002. The workshop attempted to bring together all the role players in the field of small water systems in Southern Africa to discuss the important issues regarding failure of small treatment systems that are installed across the country, and problems that are experienced with ensuring the sustainability of the systems. Recognized experts and role players in the field of small water systems (either on institutional or technological level or both) were invited to give presentations at the workshop, to present current viewpoints and their experiences, and to stimulate discussion. These papers were also intended to be used in compiling this guidelines document for planning and design of small water systems, with the main focus then on sustainability of treatment systems for rural communities.

The workshop was held at the Birchwood Executive Hotel near Johannesburg on the 22nd and 23rd of August 2002. The title of the workshop was “**Workshop on the Sustainability of Small Water Systems in Southern Africa**”. The two-day event was attended by 96 persons from all spheres of the water treatment field, and included delegates from African and overseas countries.

The program of the workshop appears in Appendix A to the report. The first session served to set the scene and identify the issues relating to sustainability of small water treatment systems. In the second session, an overview was given by speakers on what is needed and what is available. The overseas perspectives were presented in the third session, with presenters from the USEPA (USA), Cameroon, Zimbabwe and Uganda providing their views. During the last session of the first day a facilitated discussion and planning session was held with the aim of forming an appropriate structure (association) for small water systems in Southern Africa. The session was facilitated by the Water Research Commission and led to the identifying of objectives for the new association to be formed, listing of organization type preferences and a list of proposed functions of such an association. These aspects are also given in Appendix A.