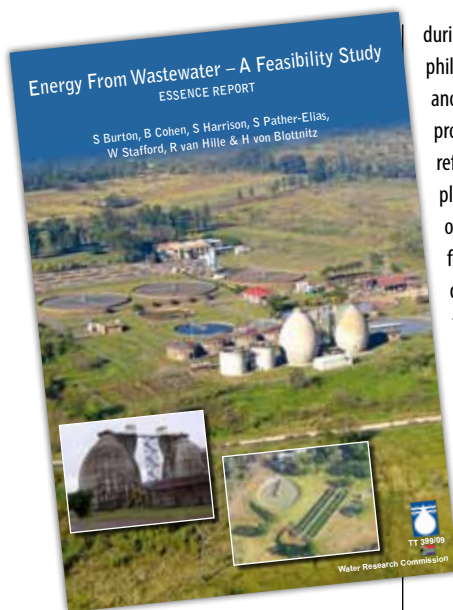


New from the WRC



Report No: TT 399/09

Energy from Wastewater – A Feasibility Study (Essence Report) (S Burton; B Cohen; S Harrison; S Pather-Elias; W Stafford; R van Hille & H von Blottnitz)

The opportunity exists to improve the current wastewater treatment processes by applying new solutions and technologies that can also reduce energy inputs and/or generate energy for other processes. This study explored the various waste streams and assessed the feasibility of appropriate technologies that could be used to generate energy. The assessment considered the net energy generated from wastewater foremost while the conservation of reclamation of water, reduction in disposal of wastes and the generation of byproducts were considered as added benefits.

Report No: 1689/1/09

Enabling Effective Learning in Catchment Management Agencies: Research Report (DJ Roux; K Murray; E van Wyk)

This work arose out of perceived need for basic guiding concepts for enabling effecting learning within catchment management agencies. This report describes the thinking and learning that took place

during the development of the learning philosophy and strategy captured in another WRC Report (TT 421/09). The project aimed to further develop and refine a philosophy and set of principles that will enable the establishment of appropriate learning environments for good ecosystem governance; to develop a strategy that implements this philosophy in a chosen catchment management agency; and to facilitate roll-out and initialise implementation of the strategy in the chosen catchment management agency.

Report No: KV 224/09

Market Analysis for UASB Seeding Granules: Local and International Markets (N Musee & L Lorenzen)

The WRC has sponsored research on the development and cultivation of the upflow anaerobic sludge blanket (UASB) process since the late 1990s. This was in response to the limitations identified by the wastewater treatment industrial sector in the country that inhibit full-scale and wide application of UASB for treating high-strength wastewater. A need to design, fabricate, seed, optimise and commission a pilot-plant for producing UASB granules was identified. The research findings from this plant are envisaged to aid in achieving the long-term goal of designing and developing a full-scale industrial plant.

Report No: KV 230/09

Investigation of hybrid membrane system for purification of wastewaters from the olive industry with simultaneous recovery of valuable components (STL Harrison; CJ Garcin; EP Jacobs)

This report describes laboratory work performed on the development of a hybrid membrane system for the treatment and simultaneous recovery of value-added products from wastewaters generated by the olive industry. These wastewaters

are produced during table olive and olive oil processing in large quantities. The wastewaters present an environmental disposal problem due to their high organic load and high phenolic content. The hybrid membrane system was comprised firstly of an ultrafiltration membrane to separate a valuable low molecular weight phenolic compound, called hydroxytyrosol (HT) from higher molecular weight phenolic compounds (such as tannins). Secondly, a nanofiltration system was investigated to concentrate the HT, and to separate it from salts, organic acids and water, which could then be recycled.

Report No: 1749/1/09

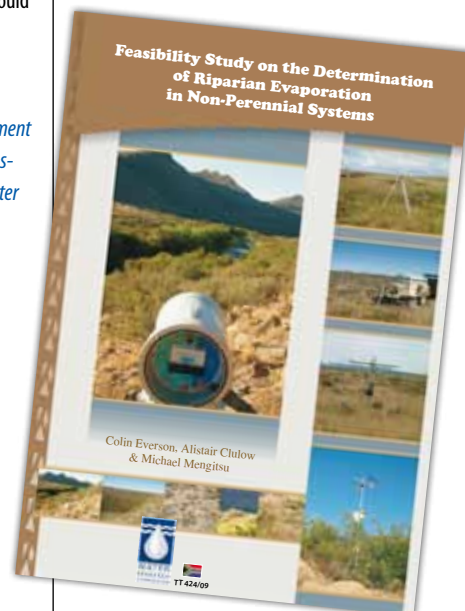
The Feasibility of a Health Risk Assessment Framework to Derive Guidelines for Oestrogen Activity in Treated Drinking Water (NH Aneck-Hahn; C van Zyl; C de Jager)

The WRC has funded research into endocrine disrupting chemicals (EDCs) in water since 1998. South African waters (both treated and raw waters) have recently been found to have oestrogenic activity present in varying concentrations. A previous WRC report proposed a framework to deal with EDCs and protect human health until it is possible to derive more specific guidelines for drinking water in South Africa. This project aimed to determine whether the proposed framework for EDCs is feasible for South African drinking water; to determine criteria to use for test inclusion in the proposed framework; to evaluate the selected battery of tests; and investigate the international status quo with regards to tools for assessing endocrine disrupting techniques other than reproductive effects.

Report No: KV 220/09

A Pilot Study on the Occurrence of Endocrine Disruptive Chemicals in a DDT-Sprayed Area (MS Bornman; EJ Barnhoorn; H Aneck-Hahn)

DDT has been used annually since 1945 in the Luvuvhu River catchment near Thoyoyandou, in Limpopo, for controlling malaria. A broad-spectrum insecticide, DDT is sprayed onto the interior surface of homes to decrease the incidence and spread of malaria by controlling mosquitoes. It is a known endocrine disrupting compound. The objective of this study was to analyse water, sediment and fish tissues for DDT residues and estrogenicity of water as a pilot for a more comprehensive study.



Report No: TT 424/09

Feasibility Study on the Determination of Riparian Evaporation in Non-Perennial Systems (C Everson; A Clulow; M Mengistu)

Non-perennial systems are an important source of water in the semi-arid west of South Africa. A previous WRC study identified the importance of understanding the actual evaporation of riparian vegetation along these non-perennial systems and their link to groundwater systems. This study was aimed at estimating early summer and summer evaporation rates from three distinct vegetation types (two riparian and one dryland)

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along a non-perennial stream for the development of a water assessment methodology.

Report No: 1627/1/09

First Order Assessment of the Quantity and Quality of Non-point Sources of Pollution Associated with Industrial, Mining and Power Generation (RG Heath; HD van Zyl; CF Schutte; JJ Schoeman)

Non-point sources of pollution (or diffuse sources of pollution) play a major role in the degradation of water quality, specifically with respect to salinity, eutrophication, sediments, pathogens, pesticides, and some heavy metals. Thus, attention is increasingly being devoted to the quantification of non-point water source pollution and to identify means to control it cost-effectively at source. In-depth literature reviews on the mining industry, the industrial and power generation sectors were undertaken in an attempt to assist with the first order assessment of non-point sources of pollution from these sectors in South Africa.

Report No: 1772/1/09

Scoping Study on Water Use of Crops/Trees for Biofuels in South Africa (GPW Jewitt; HW Wen; RP Kunz; AM van Rooyen)

The demand for energy is growing rapidly all over the world, resulting in increased searches for alternative sources of fuel. The production of ethanol and diesel from vegetable biomass and oils (i.e. biofuels) has been promoted as an environmentally friendly alternative to oil-based fuels. Impacts on water resources are a major concern in the production of biofuels. In 2007, the WRC instigated a study to assess both the potential growing areas and water use of potential biofuel feedstock in South Africa. Among others, this study set out to identify all crops/trees grown in South Africa that can be used as a biofuel feedstock, assess the available knowledge on water use of these crops/trees; estimate the water requirements of selected crops/trees where information on water use is lacking; determine existing gaps in knowledge regarding water use and crop parameters, and recommend priorities for future research.

Report No: 1668/1/09

Guidelines for the Assessment of the Compliance of South African Potable Water Supply with Accepted Drinking Water Quality Standards and Management Norms (Maggy Momba; Chris Swartz & Larry Obi)

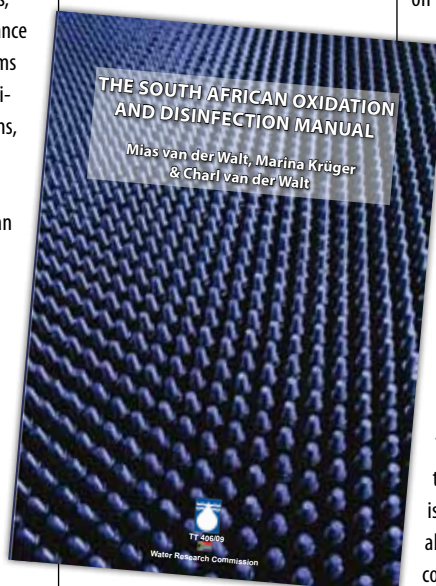
This study aimed to establish the compliance of South African potable water providers with the required water quality guidelines and a set of other operational and management norms, identify the reasons for non-compliance and suggest solutions to any problems experienced which prevented compliance with these guidelines and norms, and communicate these solutions to municipal management. The focus was on smaller and non-metropolitan water suppliers.

Report No TT: 422/09

Towards the Realisation of Free Basic Sanitation: Evaluation, Review and Recommendations (N Mjoli; G Sykes; T Jooste)

Access to basic sanitation as a right is enshrined in the South African Constitution. Municipalities have a constitutional mandate of ensuring access to water and sanitation services for all, including the poorest households. Despite the drafting of a Free Basic Sanitation strategy in 2004, the process of approval for this strategy has been slow as government realised that provision of Free Basic Sanitation was more complex than Free Basic Water.

The aim of this study was to assess the experience of municipalities in the implementation of Free Basic Sanitation services and to develop economic and financial models for sustainable service provision. Based on the findings of the study recommendations were made for improving the delivery of Free Basic Sanitation to the poor.



Report No: TT 406/09

The South African Oxidation and Disinfection Manual (Mias van der Walt, Marina Krüger and Charl van der Walt)

The purpose of this manual is to assist the reader in making a logical selection in matching the water treatment challenges with appropriate treatment processes and technology. First the reader is introduced to some of the literature available on the subject, followed by a more detailed description of the most commonly found water treatment and distribution system challenges, source characterisation and water quality standards. Other chapters discuss available treatment processes, occupational health and safety aspects and consumer health aspects, among others.

Report No: KV 231/09

An Investigation into the Relative Impact of Small-scale Mining Operations on the Contamination

of Water Resources (Antoine Mulaba-Bafubandi & Bhekie Mamba)

While small-scale mining has socio-economic advantages such operations, if not properly managed or controlled, have a potential to cause environmental damage, particularly with respect to the contamination of water resources. This project investigated the possible impact of small-scale mining on the contamination of surrounding water resources. Artisanal and small-scale gold, coal, clay, platinum group metal, diamond and sandstone operations were considered.

Report No: TT 408/09

Guidelines for the Sustainable Operation and Maintenance of Small Water Treatment Plants (Chris Swartz; Godfrey Mwiinga; Mike Marler; Verena Meyer; Mbhuti Hlophe; Rachi Rajagopal; Kenny Charles)

The selection and implementation of the correct water treatment system is only a first step in ensuring sustainable supply of potable water to small communities. Of even greater importance for sustainability of supply is the following of the correct operational and maintenance procedures. This report offers a series of technical and management guidelines, the latter including soft issues at small water treatment plants that often present major challenges with the sustainability of these plants.

