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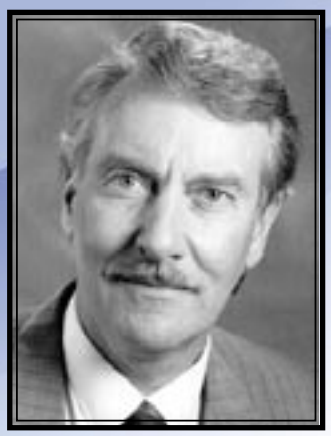
Newsletter of the Water Research Commission

In This Edition





WISA-MTD Honorary Award 2005

Prof Ron Sanderson of the UNESCO Associated Centre for Macromolecules, Department of Chemistry and Polymer Science, University of Stellenbosch was presented with the WISA-MTD Honorary Award 2005 in full recognition of his role to advance and support membrane science and technology in RSA.

This academic is currently serving a dual role: the Director: UNESCO Associated Centre for Macromolecules and Materials at the University of Stellenbosch and Director: Institute for Polymer Science, University of Stellenbosch. He holds a BSc (UCT, 1964); BSc (Hons) (UCT, 1965) and a PhD (Polymer Science) from the University of Akron (USA), with an above average of 93%.

Prof Sanderson's main areas of research are controlled and living polymerisation, nanomaterials, analytical techniques, materials science education. He is also involved with training in polymer and membrane science, collaboration in polymer science and technology transfer.

This innovative researcher has received many accolades: Centre of Expertise for membrane studies (WRC award, 1988); William Sage Award for the Plastic and Rubber Institute (1989); Chemical Manufacturer's Association Award (Shared with Prof E.P. Jacobs, 1993); Unesco Associated Centre for Macromolecules and Materials (1997) and Centre of Excellence for Polymer Science by Sasol Polymers (1998).

This scientist has authored□

Congratulations, Prof Sanderson. The WRC is proud to be associated with you.

Baldwin – Making a Difference

When Baldwin Khosa commenced his studies at Technikon Pretoria, now called the Tshwane University of Technology (TUT), he did not realize that he would make such a significant difference in peoples' lives. After completing his B Tech degree in 2000, he enrolled for an M Tech degree in the Department of Crop Sciences, conducting a research project with a focus on nutrition. His project was concerned with the relationship between agriculture and food in the poor rural communities of Ga-Molekane and Sekuruwe near Potgietersrus in Limpopo Province.

Part of his work included the introduction of a simple micro-irrigation system for use in the production of vegetables in home gardens. Baldwin encountered some resistance to the use of grey water for irrigation purposes, but he explained to community members that it was "a safe practice so long as the required precautions were taken."

Currently, Baldwin is studying towards a doctoral degree as part of a project funded by the WRC. His D Tech will involve participatory technological development which involves farmers in agenda setting and on-farm experimentation. He is conducting his research on the production of green maize at Dzindi Irrigation Scheme near Thohoyandou in the Thulamela Local Municipality of Limpopo Province. "My study will yield technological innovations that will enable farmers to generate more money from maize than they do at present", said Baldwin. "The objective of my work is to develop a production package specifically for green maize producers. Selling maize green is far more lucrative than selling it as grain, but the quality criteria for green maize are stricter. The technology being developed together with farmers at Dzindi can be expanded to other farmers as well."

This WRC-funded project will be completed at the end of 2007. Prof Annandale And Dr Martin Steyn (University of Pretoria) support the crop modelling component of the project, and Dr Frank Vanassche (University of Limpopo) assists with field measurements. Baldwin's supervisor, Prof Wim van Averbeke of The Department of Crop Sciences, Tshwane University of Technology, is the project leader and an enthusiastic mentor to Baldwin. "The WRC is a supportive organization at the cutting edge of technology," says Wim. "We appreciate the support and leadership of such an organization."

Research Manager of KSA 4 and Head of Cross-Cutting Domain: Water & Society, Dr Andre Sanewe, says "Baldwin has excelled in his studies and is a credit to both Tshwane University of Technology and the Water Research Commission".

The WRC @ the SABC Career Faire

The WRC, together with DWAF, is participating in the SABC Career Faire. This roadshow will be held in 10 centres throughout South Africa. The first event commenced at the Expo Centre, Johannesburg on 15-17 February. The WRC printed copies of the popular career guide, *Water @ Work* and these will be distributed at this event. This event is expected to attract 350 000 learners and 15 000 educators. The other centres are:

Event Details: SABC Careers, Education & Training Faire 2005

Region	Date	Venue
Jo'burg	15 – 17 February 2005	The Expo Centre
Pietermaritzburg	1 – March 2005	Pietermaritzburg Showground's
Rustenburg	15 – 17 March 2005	Civic Centre
Port Elizabeth	5 – 7 April 2005	Feathermarket Square
Welkom	19 – 21 April 2005	Oppenheimer Theatre
Pretoria	10 – 12 May 2005	Pretoria Showgrounds
Cape Town	24 – 26 May 2005	Good Hope Centre
Polokwane	31 May – 2 June 2005	Polokwane Showgrounds
Kimberley	2 – 4 August 2005	Tabernacle
Witbank	16 – 18 August 2005	Witbank Cultural Centre

Learners at he WRC-DWAF stand in Johannesburg

The WRC @ SciTech

The WRC, together with DWAF, participated at the SciTech exhibition which was held at the Pretoria Showgrounds from 28 February- 5 March. One of the components of the exhibition was a career focus. The career guide *Water @ Work* as well as a special edition of *The Water Wheel* commemorating National Water Week were distributed to learners at this event.

The WRC @ the WISA Membrane Workshop

The WRC was a co-sponsor of the WISA Membrane Workshop which was held on 13-15 March 2005 at the Protea Wilderness Resort. Many WRC project leaders presented papers and conducted workshops. It was also a successful networking forum. The WRC had an exhibition stand and many WRC reports were ordered.

Seminar on policy development and implementation in the water sector: Reflection and learning

The seminar was jointly developed by CSIR Environmentek, DWAF and the WRC. It will take place on 5-7 April 2005 at the CSIR International Convention Centre, Pretoria. The costs of registration, course material, and catering will be covered by the WRC. Delegates are responsible for travel and accommodation costs. For more information contact: Dr Heather Mackay (heatherm@wrc.org.za) or Dr Dirk Roux (droux@csir.co.za).

Honour for Dr Mitchell

On 18 February 2005 Dr Steve Michell, WRC Director (KSA 2) was elected Senior Fellow by the WISA Council. This rare and prestigious honour has been bestowed on fewer than 25 individuals thus far. This entitles Dr Mitchell to use the designation SFWISA behind his name.

New editor for *The Water Wheel*

Lani Holtzhausen joined the WRC on 21 February 2005 as the new editor of *The Water Wheel*. Lani studied journalism at the Pretoria Technikon. Her first port of call was the *Daily Dispatch* (Queenstown, Eastern Cape). After a year, she worked for *Engineering News*. But, it was the water sector that proved to be her true calling. Three years later she was appointed editor of *Water, Sewage & Effluent*, which specialized in water and sanitation issues in southern Africa. Whilst serving as editor, Lani received 4 prestigious awards, including the Sappi/MPASA PICA award. "Another highlight was that I won the media award from the South African Association of Consulting Engineering in 2003. I was also chosen as a finalist in the World Bank's Water Media Network competition for water journalists in 2003. As a prize I got a sponsored trip to attend the Third World Water Forum in Kyoto, Japan. This was my first visit to this wonderful country and a truly amazing experience," says Lani.

The *Water Wheel* is the WRC's public understanding of water science publication. Lani's biggest challenge is "developing *The Water Wheel* so that it becomes an invaluable tool in bridging the chasm between the wonderful work that scientists and researchers do and the layman's understanding of how research and knowledge impacts on their lives."

This bubbly young lady has a few innovations up her sleeve. One exciting idea is developing a "water web" page, featuring a review of a few interesting water and science websites.

As a yet unrehabilitated workaholic, Lani manages to squeeze in some time for jogging, her two "floppy-eared spaniels", her family and the typical pastime of journalists and editors – reading!

Lani, the WRC welcomes you and your bright and fresh ideas. We wish you well and hope that your stay at the WRC will be a long and rewarding one.

What's New

Report No 1118/1/04 (Contractor: CSIR)
A pilot study to demonstrate implementation of the national microbial monitoring programme

To assess the status and trends of faecal pollution of South Africa's surface water, a national microbial monitoring programme was proposed as early as 1994. In 1996 a conceptual design for microbial quality monitoring of surface water, on a national basis, was compiled by the Institute for Water Quality Studies (IWQS) of the Department of Water Affairs and Forestry (DWAF), and Environmentek (CSIR). During the following two years the proposed monitoring design was evaluated during pilot-scale studies. The refined monitoring design was used as a basis for a National Microbial Monitoring Implementation Manual produced by the WRC in 1999.
This project involving the actual implementation of the developed National Microbial Monitoring Programme (NMMP) was initiated in several regions in South Africa including registration of local monitoring programmes, commencement of sampling and water sample analysis, data handling, data dissemination, data quality assessment and ongoing marketing. The lessons learned and the experiences gained during the pilot-scale implementation of the monitoring programme have been incorporated in the revised NMMP Implementation Manual, the main deliverable for this project that was published and is used by DWAF.

Report No 821/1/04 (Contractor: UKZN)
A study of viable-but-non-culturable pathogens in water

The use of plate counts as a standard bacteriological method has been criticized as not being a good estimator of the total number of bacteria present because pathogenic bacteria enter into a viable –but-non-culturable (VBNC) state as a result of starvation, temperature fluctuations, saline environments or the presence of chemicals. The cells then remain dormant until environmental conditions become favourable. The ability of the cells to enter this state means that they may go undetected on laboratory medias. They do not form colonies and therefore pose a health risk.
The objectives of the project were to evaluate the application of traditional and molecular methods for the detection of VBNC pathogens in surface and groundwater, to determine the fate and survival strategies of VBNC pathogens and to assess the virulence properties of the pathogens.

Report No 749/1/04 (Contractor: UKZN)
Modelling as a tool in integrated water resources management: Conceptual issues and case study applications

One of the ultimate objectives of WRC-funded programmes on water resources is that the benefits of the technologies generated should feed back to the public and should contribute to the formation of catchment-related policy. This project enshrined this objective and was advantaged by the fact that it took place over the period when the Water Act of 1998 was being formulated and progressed well after this Act was passed. In this regard this project investigates Integrated Catchment Management (ICM) approaches as they transformed with the Water Act. Findings from ICM investigations and specialist field work were used in making further improvements to the ACRU model and the supporting climatic and soils database. The re-developed model was then applied to case studies to investigate several scenarios. Case studies carried out by different team members were presented in this project. This study led to the formulation of a follow-up study on the establishment of an installed hydrological modelling system for Catchment Management Agencies (K5/1155) which is now in its final stages.

Report No 1184/1/04 (Contractor: Umgeni Water)
Manual for testing of water and wastewater treatment chemicals

There were three main objectives of this project: Assess the various procedures used in Southern Africa to evaluate the different chemicals used in water and wastewater treatment; identify the critical determinants for evaluation of water and wastewater treatment chemicals and recommend standard procedures for testing these and produce a manual for all Southern African water and wastewater authorities to use for evaluation of the chemicals used in water and wastewater treatment. Initially a literature survey was conducted in order to gather all available test procedures for an identified list of water and wastewater treatment chemicals. This was followed by consultation with a number of the main role players in the water and wastewater industry in southern Africa regarding the test procedures which they use. This has resulted in a manual that provides testing procedures for most of the chemicals used in water and wastewater treatment in southern Africa, that are generally fairly simple to conduct and which are reliable and repeatable. It is hoped that this manual will offer the first step towards providing standardized procedures for the evaluation of water and wastewater treatment chemicals and will assist in providing the technical background for future legislation governing the use of these chemicals.

Report No 1138/1/04 (Contractor:Sineke Developments (Pty) Ltd
Potential of sustainable irrigation in Black developing communities

The aim of this project was to determine community circumstances that, if overlooked, will impact negatively on established irrigation schemes, leading to failures of development initiatives. Two small-scale irrigation schemes, Keat's Drift and Esiphongweni, both located in KZN, were analysed for the purposes of this study. The study shows that irrigated agriculture among black communities has mainly consisted of government controlled schemes. Post 1994, financial and in-kind assistance have been growing towards promoting local/community management of these schemes as most of them had been controlled by government. Training on irrigation infrastructure has mainly been conducted on maintenance and not on the effective use of the irrigation system(s). Gender biases experienced in most development initiatives have ignored women in most irrigation scheme development stages. Full participation of women, in particular the predesign stages, is critical but difficult to achieve. The study further indicates that women are involved in the most laborious work within irrigation schemes, while men are only involved in opening and closing pump and controlling pests using pesticides. There is a need to find an appropriate balance between the productive roles of the members of the scheme. Given the socio-economic circumstances of black communities in SA, irrigation development will continue to be supported by funding agencies. It is these agencies that must be sensitive to issues/factors that may or may not be quantifiable – which ultimately lead to success or failure of the irrigation scheme.

Report No 1084/1/04 (Contractor: DIT)
Development of biological treatment technology for the remediation of edible oil effluent

Information on biological treatment of vegetable oil effluent is scant, and this project aimed at developing a treatment protocol for a combined aerobic-anaerobic process. Studies conducted using an aerobic-anaerobic sequencing batch reactor with a total hydraulic retention time of 24 hr gave an average of 75% reduction of COD and more than 90% removal of fats, oils and greases (FOG). Based on these results, a laboratory-scale activated sludge effluent treatment process was designed and operated with two bioreactors (aerobic and anaerobic) in series. Over the study period, the optimum performance achieved was 75% removal of COD, 107 mg/ℓ reduction in phosphate and more than 95% reduction in FOG. The project also illustrates one of the strengths of the alternative 'cleaner production' approach of waste reduction at source. A major part of the original research programme planned by the researchers was for biological phosphate removal from the effluent, which would have entailed expensive end-of-pipe treatment technology. This need was eliminated completely when the factory concerned, for processing reasons, changed from using phosphoric acid to an alternative oil refining method using caustic soda. This is a good example of a process modification or chemical substitution reaping environmental benefits in respect of the effluent generated - a generic option routinely considered in cleaner production protocols.

Report No TT 235/04 (Contractor: Rhodes University)
Contribution of aquaculture to rural livelihoods in South Africa: A baseline study

Representatives of different stakeholders agreed that a baseline and scoping study was required to determine the contribution of aquaculture to rural livelihoods and to identify priorities for further research. During the personal survey, stakeholders and participants in rural aquaculture projects were visited and interviewed in five provinces, namely the Limpopo, Mpumalanga, Kwazulu-Natal, Eastern Cape and Western Cape Provinces. The contribution of aquaculture to the livelihoods of rural communities was found to be negligible. Of the five provinces surveyed, only two (the Western Cape and the Limpopo Province) had functioning projects. The results of the survey suggest that the establishment of a rural aquaculture sector, which can utilise the potential aquatic resources in a sustainable way for the benefit of rural communities, will be entirely dependent on sustained public sector led intervention. On the basis of the findings of the study, five possible research projects have been identified: GIS database of suitable areas for rural aquaculture including small water bodies and environmentally sensitive exclusion zones; supplementary species for cage culture for trout farmers in the Western Cape Province; culture-based fisheries in small and large dams; recreational fishery development in rural areas and evaluation of the role of provincial fish hatcheries and training facilities.

Reports can be ordered at orders@wrc.org.za



The WRC @ the Workshop on African Water Laws

The WRC played a pivotal role at the workshop on African Water Laws held in Kempton Park on 26-28 January 2005. The workshop focused on:

- Understanding the existence and effectiveness of customary water arrangements for rural livelihoods
- Identifying the range of options for statutory arrangements to better recognize customary arrangements for effectively contributing to rural livelihoods
- Formulating conclusions and recommendations for: policy dialogue, implementation, further research/publication and curriculum development

The WRC sponsored the dinner as well as the printing of the workshop papers. The WRC also exhibited relevant WRC publications. Dr Heather Mackay (Research Manager: WRC) and Maritsa Uys presented a talk titled *Developing a Research Agenda for Water Law in South Africa: The Water Research Commission's New Programme of Research on Water Law and Governance*.

Delegates at the workshop

The WRC and National Water Week

WRC CEO Dr Rivka Kfir presents Lungile Mthembu, the winner of this year's Women in Water Award for Research under 35 years, with a prize of R10 000 from the WRC while Minister of Water Affairs & Forestry Buyelwa Sonjica looks on

As part of National Water Week the WRC produced a special edition of *The Water Wheel*, which was distributed to high schools in the country. This publication also offered learners an opportunity to enter a quiz based on water-related facts and to win great prizes.

The Women in Water Awards, held on 18 March 2005, honoured and celebrated the hard work of women and highlights:

- The participation of professional and community-based women
- The key role that women play in poverty eradication, education and sustainable development in both the urban and rural settings.

There were five categories:

- Management and policy
- Researcher over 35 years old
- Researcher under 35 years old
- Community development
- Education and awareness

The WRC sponsored the prize for the researcher under 35 category. The prize was won by Ms Lungile Mthembu of Umgeni Water.

On 23 March 2005 DWAF held the Annual Baswa Le Meetse (Youth in Water) Awards. The WRC provided learners with copies of the special edition of *The Water Wheel* as well as the career guide *Water @Work*.

The 3rd International Conference on Ecological Sanitation

23-26 May 2005, Durban, South Africa

Why the EcoSan conference?

The Millennium Development Goals were agreed to in 2000 when all United Nations member states pledged to reduce by half the proportion of people without access to safe drinking water by 2015. At the WSSD in 2002, it was further agreed to reduce by half the proportion of people without basic sanitation by 2015. The development of appropriate technical options and implementation methods plays a pivotal role in meeting these objectives. What progress has been made towards meeting these objectives?

About South Africa

South Africa is committed to eradicating its water supply and sanitation backlogs by 2008 and 2010 respectively. The country has also firmly grasped the ecosan challenge, with tremendous advances being made in this field. Since 1997, when the first projects were initiated, approximately 20 000 ecosan toilets have been implemented, with eThekwini Municipality (Durban) accounting for the largest number. Delegates will be afforded the opportunity to visit some of these projects in the area.

20 students as well as young researchers involved in the field of water supply and sanitation will be afforded the opportunity to receive a free registration to the conference. This opportunity is a result of a sponsorship made by the WRC in its quest for capacity-building in the vibrant water sector in South Africa.

Catchment Research Group – Research Opportunity

A Participatory Modelling Process for Catchment Management Planning: Kat River, Eastern Cape

2005 - 2008

Applications are invited for a research post leading to a Masters or PhD degree in the area of Catchment Management Planning in the Department of Geography (Catchment Research Group) at Rhodes University. The successful candidate will be involved in the development and application of the AWARE model (Action Research and Watershed Analyses for Resource and Economic sustainability) and associated role playing game as part of a catchment management planning process. This study forms part of a Water Research Commission project, entitled "*A Stakeholder-driven Process to develop a Catchment Management Plan for the Kat River Valley" (K5/1496)*. For more information visit the WRC website www.wrc.org.za or contact Dr Heather Mackay 012-3309029 heatherm@wrc.org.za