



Groundwater Report Handover

On 5 November 2003 Prof LR Brown (Project leader) of Technikon SA (TSA) officially handed over Report No 1115/1/03: *Assessment of Environmental Impacts of Groundwater Abstraction From Table Mountain Group (TMG) Aquifers on Ecosystems in the Kammanassie Nature Reserve and Environs* to Mr Kevin Pieterse: Director: Water Resource Management at the WRC.

The report represents a culmination of a collaborative effort from various scientists: botanists, ecologists, hydrogeologists and climatologists. Prof Brown thanked the WRC for its foresight in funding this project. Mr Pieterse thanked the project team for their efforts and TSA for hosting the function. He stated further that such research was the "lifeblood" of the South Africa's water knowledge hub, the WRC.



Left to right: Prof Brown (TSA); Dr Henning (Director: Library, TSA); Mr Kevin Pieterse (WRC) and Prof Rautenbach (University of Pretoria)

Legal Eagle @ the WRC

When a long-cherished childhood fascination is transformed into a career path, the rewards that go with it are boundless. This is the case of the WRC's legal eagle, Ms Sunita Kalan, who was welcomed into the fold of the WRC as Manager: Intellectual Property. The WRC has experienced a growth in Intellectual Property (IP) in the form of patents, trademarks, designs, and copyright works, including software programmes. Sunita's main function will be to manage and administer the WRC's IP portfolio.

Sunita studied at the University of the Witwatersrand and obtained her BSc (1995) and her LLB (1998) degrees. She served articles of clerkship with Adams & Adams, a firm of attorneys, from 1999 until she was admitted as an attorney in August 2001. She remained at Adams & Adams as a professional assistant in their patent renewal department until October 2003. This young lady has also met most of the requirements necessary to qualify as a registered patent attorney.

When she is not scrutinising legal contracts, she enjoys watching a good movie or reading a bestseller. "I am looking forward to the challenges that lie ahead," says this enthusiastic legal professional, who enjoys the "warm, friendly family atmosphere" that exists at the WRC.

Sunita, we at the WRC welcome you and hope that your stay will be long and rewarding.



Mr Duncan Hay receiving the award from Chris Liebenberg, Chairman of Nedcor

Eastern Cape Estuaries Management Programme Wins Award!

The Eastern Cape Estuaries Management programme recently won "Overall Winner: Established Project" award in the 2003 Green Trust Awards. These awards focus on recognizing innovation and dedication to environment and conservation projects. The WRC was a core funder of this project, which is a culmination of five years of intensive work.

Newsletter of the Water Research Commission

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Adams Values

A woman who exudes confidence and who has an aura of professionalism enveloping her- That was my impression when I first met Janine Barbara Adams. Janine, an ecologist with recognised expertise on the freshwater requirements of estuarine plants, is currently a Senior Lecturer at the University of Port Elizabeth (UPE), Department of Botany, and has enjoyed a close association with the WRC.

"I have been funded by the WRC since my MSc. I completed my PhD study on a WRC project on the freshwater requirements of estuarine plants. My research has continued in this field and is used for setting the ecological water requirements of estuaries. I am grateful to the WRC for making it possible to attain my goals and, in so doing, to help me to make a difference to the country and to the environment," says Janine.

Janine was appointed Team Leader of the estuarine reserve group in 1999. This group is responsible for the development and testing of methodologies for ecological reserve determinations to allow implementation of the National Water Act (NWA). So how did Janine become the expert that she is today? Multi-tasking is not a new concept to this eminent scientist. She has published 20 articles in scientific journals, 42 reports and presented over 45 talks at national and international conferences. She has supervised 3 PhD studies, and is currently supervising 5 postgraduate research projects. She has also developed State of the Environment indicators for estuaries through the SA-ISIS Project (South African Integrated Spatial Information Systems).

It comes as no surprise that this enterprising young woman was invited by the WRC as one of the young researchers to give a lecture at the prestigious Biennial Stander Memorial lecture series in October 2000. Her topic was "Why Freshwater flowing to the sea is not wasted; the Importance of South Africa's estuaries". Her most recent achievement is her qualification as one of UPE's top twenty researchers.

The WRC was instrumental in promoting the formation of CERM (Consortium for Estuarine Research and Management) and has been the main funder of CERM's research initiatives. One important study was on the importance of the river-estuary interface zone. The latest project, which is investigating the information requirements for the implementation of resource-directed measures in estuaries, will end early in 2004. It has involved the Coastal Research unit of Zululand; University of Natal, Durban; UPE, University of Cape Town and the CSIR. The project leader is none other than Dr Adams. This project has already yielded important outputs: a database on the responses of estuarine biota to water quality changes, an updated importance rating of South African estuaries and lastly, the understanding of the response of biota to flow alteration and mouth condition in KZN temporarily open/closed estuaries. Janine was the co-ordinator of the estuarine group that put together the methods of resource-directed measures for estuaries. This allows for the implementation of the NWA which requires that the ecological reserve of estuaries be set before licences for water utilisation can be issued.

The WRC is committed to knowledge transfer and capacity-building. Janine is one of the many researchers who doubles as a facilitator of knowledge transfer. She uses her research

expertise to develop students to ensure that they can add to the knowledge in this vital area of water management. A major component of Janine's dreams is to see her students develop and to extend her work in the process. She would also like to see her team members and herself gaining international recognition for their work. In the near future, I am sure that such aspirations may seem to be a matter of *deja vu*.

It follows naturally that such a caring environmentalist will assume the role of motherhood with ease. She is able to execute a precarious balancing act: that of researcher and family person. Her additional roles as wife and mother to two young daughters (5 and 8-year old) are made possible by a highly structured support base (a committed husband and a dedicated mother-in-law) as well as a creative sense of logistics. An ability to work on a flexi-time basis is a further boon to cramming an impossible schedule into "bite size" 24-hour packages. Part of such skills must stem from networking in a multi-disciplinary research environment. The ability to work with people from various backgrounds, learn, make compromises and adjust one's outlook and be flexible runs parallel with the planning that makes up a mother's daily schedule, which is subject to change at any time.

Janine was inspired and motivated by interacting with the steering committees during her initiation into the *modus operandi* of the WRC. The various people from many disciplines have made research from a multi-disciplinary perspective second nature to Janine. This provided a basis for networking and a consequent delivery of quality research- research that can make a difference to vital areas of the country. Steve Mitchell, Director: Water-Linked Ecosystems said, "Estuaries are key nodes in the South African environment. They are attractive both scenically and recreationally and so provide the nucleus for development. At the same time, they are extremely productive ecologically. One important function they provide is an essential link in the lifecycle of the fish species important in the inshore fishery, which has substantial value in terms of work and wealth creation."

Janine has proved a strong and articulate researcher with wide understanding of the importance of estuaries. She has also successfully coordinated the overall estuarine research and implementation programme to address the needs of national legislation.

Janine, the WRC is proud to be associated with you. We appreciate the magnitude of your contribution, which strengthens the base of the water-centred knowledge hub of South Africa which we seek to be.



Janine Adams (seated, third from left) with her students

WRC Hands Over Annual Report to Minister

On 2 October 2003 the CEO of the WRC, Dr Rivka Kfir, handed over the WRC Annual Report to the Minister of Water Affairs and Forestry, Mr Ronnie Kasrils. The function was held at the Sheraton Hotel, Pretoria and invited guests included Deputy Ministers, Directors-General, Chairpersons of Parliamentary Committees, Directors of the WRC, CEOs of organizations such as WISA and the media.

The Chairperson of the WRC Board, Prof H Kasan, acted as host as well as Master of Ceremonies at this gala event.

Dr Kfir, in her presentation, emphasized the highlights of WRC achievements during the past financial year. Highlights included ground-breaking water research and development in the key strategic areas as well as in the cross-cutting domains of the WRC.

In his address the Minister said, "The Water Research Commission is all about generating and transferring water-centred knowledge, which is key to satisfying the sector's continuous need for enhanced decision tools, skills and technologies."



Dr Kfir handing over the WRC Annual Report to Honourable Minister Kasrils

The WRC @ the IWA Conference

The IWA conference took place at the Cape Town International Conference Centre from 14-19 September 2003. The WRC played a vital role in the Health-Related Water Microbiology component of the conference. This component was managed by Prof Willie Grabouw, who is closely related to the WRC in his capacity as project leader for numerous WRC-funded projects. Research Manager and Head of Crosscutting domain: Water and Health, Ms Annatjie Moolman arranged and facilitated a workshop on the safe use of herbicides and pesticides and alternatives to prevent pollution.

The WRC also sponsored 20 registrations for students from previously disadvantaged backgrounds.

In addition, the WRC exhibited at this conference and, as a result, a large number of orders for WRC research reports were placed by delegates, both local and international.



3 of the 20 students whose registration fees were sponsored by the WRC

The WRC @ the IRNCID Workshop

The Iranian National Committee (IRNCID) organised an international workshop on "Drought Management Strategies" on 13-14 July 2003 in Tehran. The objective of the workshop was to bring together experts, professionals and practitioners to exchange experiences of their respective countries regarding combating droughts. The workshop, inaugurated by Dr Reza Ardakanian, Deputy Minister of Energy and Chairperson of the IRNCID, was attended by over 200 delegates. One of the many papers presented was "Drought Management in South Africa" by Dr Gerhard Backeberg, Director: Water Utilisation in Agriculture at the WRC.

Workshop proceedings can be obtained by contacting IRNCID on irncid@neda.net.ir.



Dr Gerhard Backeberg (seated left) at the workshop

What's New

Report No 1019/1/03

Factors that influence adult blackfly (Diptera: Simuliidae) survival along the lower Orange River, South Africa

This report presents results of studies on this pest in all its ramifications: size and physiological state of larvae and newly emerged adults; determining the longevity and physiological state of newly emerged adults under various test conditions; plants that these pests rest and feed on; and the effect of light intensity, humidity, temperature and wind speed on adult host-seeking and blood feeding. Such studies are crucial since it is estimated that blackflies account for losses of up to R88 million per annum in the livestock industry alone.

Report No TT 202/02

Predicting water quality and biotic response in ecological reserve determinations

This manual is designed to instruct consultants and water resource managers in the use of the tools developed in the WRC project K5/956 "Development of numerical methods for assessing water quality in rivers, with particular reference to the Instream Flow Requirement process". The numerical method that has been developed enables predictions of stream flow-concentration relationships to be made for some key water quality variables in rivers. In addition, a set of steps is presented which aids in inferring the effect that changes in water quality may have on the aquatic biota.

Report No 1202/1/03

Researching, developing and testing payment strategies for the lower income groups at four selected communities in order to manage charges for water use

The non-payment of water accounts could be attributed to various factors such as poverty, a culture of non-payment and a lack of knowledge about water treatment cost and the way in which revenue is utilised. This study attempted to uncover relationships among these factors and to involve different role players in a participative investigation. The research also sought to monitor the changing attitudes of water consumers in four selected low-income communities to the right of access to water and the payment of water services.

Report No 1004/1/03

Field testing of real-time continuous flow and water quality monitoring instrumentation

This study was conducted over three phases: the first phase was to identify the available equipment, communication systems and suppliers; the second phase dealt with the identification of the sites and installation of equipment; the third phase involved the testing of the equipment and communication systems under field conditions. The project focused on addressing the lack of guidelines with respect to the instrumentation operational requirements and the cost of operating continuous monitoring equipment.

Report No 965/1/03

Ultrafiltration capillary membrane process development for drinking water

This report is the last of a series of reports on WRC-supported research projects aimed at the development of a new membrane filtration process for treating water from non-saline sources for drinking purposes. Although ultrafiltration membranes are not as productive as microfiltration membranes are, and are operated at a slightly higher transmembrane pressure, ultrafiltration is slowly becoming the preferred process because of the smaller pore size of ultrafiltration membranes. Based on this research, an ultrafiltration system has been developed to supply small communities with potable water. The system is currently being commercialised.

Report No 573/1/02

Water use and water use efficiency of fodder crops under irrigation: Part 1 - Annual subtropical crops

This report presents a comparison of water use of different pasture crops to determine if a single set of irrigation guidelines can be used for all pastures. It also highlights the water production functions as a tool to determine the economic optimum irrigation level for the different crops and to identify alternative crops which are best suited for dryland and

irrigation conditions. The water use of five annual subtropical crops (soybean, cowpeas, maize, fodder sorghum and pearl millet) was determined in two consecutive seasons in a trial conducted under a rain-shelter on the Hatfield Experimental Farm of the University of Pretoria.

Report No 668/1/03

Determination of dissolved organic loads in raw and other sewage water in terms of the ratio between filtered Chemical Oxygen Demand (COD) and Dissolved Organic Carbon (DOC)

The project investigated the relationship between Chemical Oxygen Demand (COD) and Dissolved Organic Carbon (DOC) at various points in sewage works, in order to establish the potential usefulness of DOC as an on-line parameter for controlling wastewater treatment plant operations. The observed COD/DOC ratios in sewage influent samples varied widely, for example, due to differing industrial effluent contributions. The ratios at different stages of treatment through to the final treated effluent also did not correlate well. It was concluded that the variability observed does not allow in-line measurement of DOC to be used as a consistent stand-alone substitution for COD determinations in sewage treatment plant control.

Report No 816/1/03

The application of triploid grass carp as biological control agent for the over-abundant growth of aquatic weeds in irrigation canal systems

The report deals with four major areas: investigation of the suitability of a concrete-lined irrigation canal as grass carp habitat; testing of efficacy of sterile grass carp as bio-control agent on filamentous algae; evaluation of the economic feasibility of this biological approach against the current chemical, physical and mechanical control methods; a management plan for the operational application of triploid grass carp as bio-control agent in irrigation canals is proposed. These investigations of this investigation revealed that biological control with sterile grass carp will be more economical than the currently applied control methods of herbicidal and mechanical or physical control.

Other New WRC Reports

1173/1/03 Purification of waste water with crown ethers anchored on a solid support (University of the Free State).

1131/1/03 Identifying examples of successful cost recovery approaches in low income, urban and peri-urban areas (Sigodi Marah Martin Development Consultants).

904/1/03 Seasonal climate predictions with a coupled atmosphere-ocean general circulation model (University of Pretoria).

KV 141/03 Impact on invasive alien vegetation on dam yields.

1115/1/03 Assessment on environmental impacts of groundwater abstraction from Table Mountain Group (TMG) aquifers on ecosystems in the Kammanassie nature reserve and environs (Technikon SA).

1287/1/03 A monitoring and evaluation manual for municipal water and sanitation management (Mcintosh Xaba & Associates).

1308/1/03 Resource monitoring procedures for estuaries for application in the ecological reserve determination and implementation process (CSIR).

TT 210/03 An assessment of the trickle feed system as a tool for implementing the free basic water policy (Lenehan Consulting).

849/1/03 Geomorphological research for the conservation and management of Southern African Rivers Vol 1: Geomorphological impacts of river regulation.

849/21/03 Geomorphological research for the conservation and management of Southern African Rivers Vol 2: Managing flow variability: The geomorphological response.

TT 174/02 Guidelines for *Legionella* levels in water: A code of practice (CSIR)

1055/1/03 On-site and laboratory investigations of spoil in opencast collieries and the development of acid-base accounting procedures (University of the Free State).

1055/2/03 Acid-base: Accounting techniques and evaluation (ABATE): Recommended methods for conducting and interpreting analytical geochemical assessments at opencast collieries in South Africa (University of the Free State).

TT 216/03 Making water work for villages (Lenehan Consulting).

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