

Name	Dr Machiel Steynberg	Organisation	AJ Wilson and Associates International
Qualifications	Ph.D., University of the Free State – 1995 Fellow of WISA		
Country Experience	South Africa; Lesotho; Maldives		

Summary of experience

Dr Steynberg was employed by Rand Water in January 1983 as scientist in the Hydrobiological section. He held several positions within the division including that of Manager: Biological Sciences, responsible for managing staff and infrastructure which delivered a service and did applied research regarding all biological related issues effecting Rand Water's business. Dr Steynberg was responsible for a new initiative "Water Technology Training". Competence orientated "On-the-job training" for all technical positions within Rand Water was the primary focus. This was done in the spirit of partnership between the General Manager Scientific Services -, General Manager Human Resources divisions and line management.

Dr Steynberg obtained his Ph.D. at the University of the Orange Free State with the thesis: "Pre-oxidation: A unit process to limit algal-related water quality and purification problems". He presented several papers at local and overseas conferences and is the author of international publications and Water Research Commission reports. Dr Steynberg also presented a keynote address at a specialist conference in Prague during May 1997 and organised an international workshop on solutions of algal related problems at the IAWQ conference in Vancouver, Canada. Dr Steynberg also acts as referee for the international water journal, Water Research and was also appointed as external examiner or co-promoter for several M.Sc. and Ph.D. students. He was a member of the American Water Works Association Standards Methods sub-committee for analytical methods and of the editorial board of the International Water Association. Dr Steynberg was also chair of the Water Institute of Southern Africa's Education and Training division as well as the International Water Association's Standards and Monitoring Specialist group.

In addition to be an **accredited internal auditor for ISO 17025**, Dr Steynberg also qualified as an **accredited assessor at TED** and was also **accredited as international Investment-In-Excellence facilitator**.

During the last two years at Rand Water, Dr Steynberg's performance in terms of managerial performance targets, was rated as Outstanding (93% and 95% respectively).

Dr Steynberg is now the **Director of Inquisitive Quality Consulting** and also acts as **auditor for the National Regulator of the Department of Water Affairs during special investigations. He also acted as Lead Inspector during the Blue Drop & Green Drop Certification (Lead Inspector for the period 2009 to 2014)**. During the 2013 cycle, he was responsible for the Free State Blue Drop report and also assisted with the 2013 National Blue Drop Report. Recently he was also involved with priority training in the Eastern Cape in an attempt to improve the water quality produced by water services providers. **At present Dr Steynberg is also involved with the compilation of the statistical framework used for the compilation of the National Blue Drop Report for the Minister of Water and Sanitation.**

The Joe Gqabi District Municipality made use of Dr Steynberg experience in water quality management to assist them to comply too the Blue Drop Certification requirements. ***By following a specific protocol under the guidance of Dr Steynberg, the Joe Gqabi District municipality were awarded two Blue Drops in 2011 and in 2012.***

Dr Steynberg is also a member of the Rapid Response Unit and is actively involved in the DWA Eastern Cape initiative to assist specific Water Service Authorities to improve water services. ***The specific approach used to assist the Water Services Authorities, together with active participation of the institutions, improved scores from as low as 3 % to the order of 50 %.***

At present Dr Steynberg is responsible for the Water Quality and Process Control Quality assurance programme as well as process optimisation at the newly constructed Metolong Water Treatment Works in Lesotho, constructed as part of the Millennium Project funded by the USA.

Selected projects

SPECIFIC BLUE DROP SYSTEM AND SANS 241 EXPERIENCE

Acted as Lead Blue Drop Inspector for national assessments since 2008. During these audits extensive use is made of the BDS to collect data for the Blue Drop Assessment.

Assisted several Eastern Cape Water Services Authorities to set up a Blue Drop System for their area of responsibility.

Member of the SANS technical committee for the compilation of SANS 241:2006

Presenter of the SANS 241:2015 course for the application of SANS 241:2015.

SPECIFIC WATER QUALITY EXPERIENCE

Receive international recognition for Ph D.

Author and co-author of 25 national and international papers.

Author and co-author of several posters.

Project leader for 4 Water Research Commission projects.

Member of several Water Research Commission Steering Committees.

Deliver a keynote address at the international symposium of the joint specialist group of the International Association for Water Quality and the International Water Services Association.

My expert services are frequently requested by the Institute for Water Quality Studies (DWAF) as well as the Water Research Commission.

Managed the accreditation application, which resulted in the Accreditation Status being granted to the Analytical Facilities in July 1999.

Invited by the University of Rosario, Argentina to act as Guest Lecturer during September 1999.

Task leader of the Standards & Monitoring task force of the International Water Association.

External Examiner for M Sc and Ph D students.

Spearheading the National Task force for Blue-green Algae and algal toxins.

Initiated the use of water quality indexes in Scientific Services, Rand Water.

Initiated and chairing a multidisciplinary group in Rand Water on water quality management. The activities of this group has led to more cost effective designs of reservoirs, which will ensure improved maintenance of water quality.

Member of the American Water Works Association editorial committee for the publication "Standard Methods for the examination of water and waste water."

Represents Rand Water on the SABS water standards / ISO committee.

Auditor for National Regulator of the Department of Water Affairs during special investigations and the Blue Drop Green Drop Certification programme.

Pre-review publications for the S A Water publication and for the International Association for Water Quality.

Initiated several firsts for Rand Water and South Africa:

- Proficiency scheme registered under ISO 43.
- Computerised algal related water quality problem diagnostics packages.
- CFD modelling of Rand Water intake tower, Katze Dam intake tower.
- Epidemiological protocol for the drinking water industry in South Africa (completed in December 2002).

SPECIFIC WATER INFRASTRUCTURE ASSESSMENTS EXPERIENCE

While employed at Rand Water, Dr Steynberg spent a lot of time at optimising different water purification unit processes to prevent biological related water quality problems. This included rapid sand filtration operation to prevent the penetration of algae, invertebrates and protozoa such as *Cryptosporidium* and *Giardia*. Managing the microbiological safety of large storage reservoirs and using complex computer aided model to model the ideal flow patterns through the reservoirs were also part of his responsibilities.

After resigning from Rand Water, Dr Steynberg was a member of the South African team (2005 – 2006) that assisted the Maldives Government after the tsunami, to write water quality legislation and to evaluate water supply systems.

Since 2007 the DWAF regulator has made use of the services of Dr Steynberg via WISA to audit more than 32 drinking water and waste water plants in Limpopo, Free State, North West and Eastern Cape.

In 2008 Asante & DWAF made use of Dr Steynberg's experience to audit an additional 7 plants in the Ukhahlamba District Municipality. During this intervention Dr Steynberg was responsible to do priority training.

DWAF and Ukhahlamba District Municipality requested Dr Steynberg to consolidate all drinking water plant and waste water audits done in 2003 and 2009 into a low cost / high impact refurbishment plan. Dr Steynberg assisted the Ukhahlamba District Municipality with the compilation of Water Safety plans and to prepare for Blue Drop Certification Assessments.

As member of the ERF and the RRU, Dr Steynberg was and is still involved at several Water Services Authorities in an attempt to improve the level of their water services. Dr Steynberg was a member of a multi-expert RRU team working in seven identified Water Service authorities in the Eastern Cape in an attempt to improve water and effluent quality as well as water services in general (A DWA-Eastern Cape initiative).

SPECIFIC SKILLS TRANSFER EXPERIENCE

In 1999 Dr Steynberg was tasked to develop a Water Technology Training Unit for the Scientific Services Division of Rand Water. The purpose of this unit was to ensure proper induction and training of all staff. In addition the unit was responsible to ensure that all staff in Rand Water is correctly skilled with regards to the core business of Rand Water i.e. water purification, distribution and quality.

The Water Technology Training unit was up and running within 6 months. Induction courses and specialist courses were designed and presented to address the skills needs as identified with a skills assessment. Although learners rated these courses high (>85 %), the impact thereof in the workplace was not satisfactory. Despite the fact that 7 % of the manpower budget and 120 hours per person were spend on training, a culture of learning was not clearly visible in the division.

At the same time a manpower plan assessment indicated that staff at the age of 50 and older has most of the core knowledge and experience and that these staff members are most likely to leave the organisation within the next few years. It was therefore decided to change the function of the Water Technology Training Unit from being knowledge focussed (only training, courses and qualifications) to be more Skill Transfer focussed. To facilitate this new direction three core programmes was launched in the division:

1. Mind Power is a programme (in association with Neurolink) indicating to learners how their brains work and how to use more potential of their brain (The value rated by learners to be > 90 %).
2. A life skills programme (Investment-In-Excellence) indicated to learners that their unlimited potential is shaped by their thinking (The value rated > 89 %)
3. A coaching programme (designed by Mindset) was launched to fast track the transfer of critical knowledge, skill, experience and attitude from the experts to the protégés (Preliminary rating > 70 %)

The coaching programme together with the Water Technology Training courses resulted in a learning culture being experienced in the division. A vacancy could be filled with the required competence and the overall level of understanding of the Water Business significantly increased.

Dr Steynberg was not only active in the design, facilitation and management of the above programmes, but also played an active role in associated activities:

1. Acted as chairperson for the Training Division of the Water Institute of Southern Africa.
2. Member of the task team of the Water Chamber of the LGWSETA, representing the South African Association of Water Utilities.
3. Qualified as assessor at the National Department of Education.
4. Achieved international accredited status for the facilitation of the Investment-In-Excellence programme.
5. Became an Associate of Neurolink and was licensed to present the Mind Power programme.
6. Conducted Impact Assessments on all training activities.
7. Course designed and presented by Dr Steynberg include Councillor Induction, several laboratory

method courses, Water Awareness and Induction, Laboratory optimisation and a special course on the implementation of SANS 241:2015

During 2004 Dr Steynberg was invited by the Mauritius Water Authority to do skills assessments and to compile training programme. During 2005 and 2006 Dr Steynberg was tasked by the South African Water Sector and DWAF to assist the Maldives Water and Sanitation Authority in drafting drink water and effluent guidelines as well as to do a skills assessment and suggest a comprehensive training programme for staff.

During 2008 Dr Steynberg, in association with Asante is involved with priority training of operators in the Eastern Cape in an attempt to improve the water quality.