

Seeing the **BIG PICTURE**

Successful organisations are defined by their unique cultures and the dynamic individuals and teams that spearhead their growth. Umvoto Africa is a prime example, and **IMIESA** speaks to four key specialists that are taking the business forward in the complex field of groundwater abstraction and management.

From the onset, in 1992, Umvoto's core specialisation has been groundwater assessments, geological mapping and hydrogeological monitoring techniques. However, over the past three decades, that specialisation has evolved into a multidisciplinary focus that encompasses integrated water resource management, disaster risk reduction, georisk assessment and prevention, geoinformatics and remote sensing. Allied to this is an evolving focus on community education and engagement as part of an overall project management approach to sustainable water use beneficiation.

Technical director Dr Kornelius Riemann has the responsibility of leading a talented team of environmental specialists, hydrogeologists and geologists. He joined Umvoto in 2002 and has made a key contribution on numerous longer-term groundwater projects for municipal clients that include the City of Cape Town and Overstrand Municipality, based in Hermanus.

"Groundwater is our passion and core business; however, as a consultancy, our business approach now extends far beyond the

identification, measurement and monitoring of underground water bodies," says Riemann. "Our scientific expertise and rigour are the foundation, but our vision is much broader. We've adopted a holistic approach to sustainable water resource management with the objective of optimising the resources available for beneficial use. This requires ongoing monitoring and modelling of the resource's responses to natural or induced changes. During this process, we work with clients and communities to develop the most effective implementation model, leading to co-management of the resource.

"Severe droughts have become commonplace in South Africa – Cape Town's narrowly avoided Day Zero event in 2018 being a case in point. As we speak, Nelson Mandela Bay Municipality is currently facing a similar crisis, as are many other regions nationally. We believe groundwater needs to be part of a well-managed response," Riemann continues.

Landmark projects

Umvoto's involvement with the Western Cape

Provincial Government and City of Cape Town began in 2002, working as a member of the professional team on the Table Mountain Group (TMG) Aquifer Feasibility Study and Pilot Project. Groundwater exploration was undertaken at various target sites. These included Steenbras Dam, located in the Hottentots Holland Mountains above Gordon's Bay, Nuweberg near Eikenhof Dam in Grabouw, and Wemmershoek Dam near Franschoek.

Then, in 2017, Umvoto – under various City of Cape Town-appointed engineering consultants – undertook the emergency groundwater development of the Cape Flats Aquifer (CFA), the upgrading of existing wellfields within the Atlantis Aquifer, and the long-term development of the TMG aquifers in areas easily accessible to Cape Town. The scope included implementing and monitoring the borehole drilling and testing contracts, designing wellfield layouts, and analysing the hydrogeological data collected.

Allied to this is Umvoto's involvement in the ongoing development of the Steenbras Wellfield (SW). Intended as a large-scale augmentation (~15-20 million litres per day), the SW is initially focused around the two Steenbras reservoirs to facilitate relatively easy integration with Cape Town's surface water supply infrastructure.

A transdisciplinary approach

"Based on my experience, effective water resource management definitely requires a transdisciplinary approach if projects of this





Luke Towers, MSc
Hydrogeology, Pr.Sci.Nat,
senior hydrogeologist



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Dylan Blake, BSc (Hons)
Geology, Pr.Sci.Nat, associate
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David McGibbon,
MSc Geology, Pr.Sci.Nat,
senior geologist

nature are to successfully come together,” says senior hydrogeologist Luke Towers.

“It’s been a crucial lesson. In response, I’ve learnt how to move outside the realm of my technical expertise to embrace the overall project in all its facets. An example would be gaining greater understanding and appreciation of the socio-economic and municipal engineering environment, especially on the work we do for the City of Cape Town. It’s about sustaining the overall solution,” he continues.

Senior geologist David McGibbon concurs: “We’ve seen water infrastructure projects that have failed because of a piecemeal or siloed approach to implementation. An example would be where the groundwater experts and engineers work independently. Then – through a lack of teamwork and communication, and sometimes funding – the groundwater source never gets connected via pipeline to the end-user. At Umvoto, we’ve proven that working together with all project disciplines, such as consulting engineers and ecologists, gets the job done.”

Adding to this viewpoint, principal geologist Dylan Blake says local municipalities would also benefit from a more integrated approach. Examples include the co-funding and sharing of groundwater resources. “For example, TMG resources and associated structures extend over hundreds of kilometres, so there are points along the way that could be tapped into across municipal boundary lines,” Blake explains. “Sharing regional resources makes sense.”

Career evolution

Riemann, a seasoned professional with decades of experience in Germany and South Africa, says integration of disciplines is not common in industry locally and globally, which makes Umvoto’s approach unique. He says that it has major benefits for younger team members in terms of mentorship and personal development.

In the case of Blake, McGibbon and Towers, each completed a BSc in Geology before progressing to postgraduate studies. Their technical skills have since been sharpened by progressive exposure to project planning, management and execution.

Towers says he always had a keen interest in geology and groundwater. Initially, he worked in the mining sector and during that time registered for an MSc focusing on groundwater. Since he needed a practical project for his thesis, he approached Umvoto for assistance. The rest is history.

Starting as an intern, Towers worked on Umvoto projects in East Africa, which provided great exposure to the company’s interdisciplinary methodology. He has since been employed on Umvoto’s City of Cape Town projects. “That has been a major career highlight, especially during the midst of the city’s drought crisis,” says Towers.

McGibbon has been with Umvoto for seven years. His honours programme included a short course on groundwater, which stimulated his interest. It was while he was waiting at home in George for the results of his MSc in structural geology that his path led him to Umvoto.

“Umvoto was engaged on a project nearby in Oudtshoorn and needed field staff. This appointment led to my fast-tracked career with Umvoto to date, which has also included a stint in Ethiopia. The last three to four years have been spent on Umvoto’s City of Cape Town projects. This has greatly developed my broader-scale thinking on groundwater in terms of aquifer-scale planning, implementation and managed aquifer recharge (MAR),” he explains. “One day, it would be great to apply this experience related to MAR and drought resilience on Umvoto projects across South Africa, as well as internationally.”

Blake’s story is very similar. His interest in coastal and marine geology developed into an interest in aquifer systems. He applied at

Umvoto and to date has some 14 years with the company. “My interest in sedimentology and structural geology was a good fit for the Western and Eastern Cape environments, which are characterised by primary sand aquifers and fractured rock, such as the TMG,” says Blake.

“Because Umvoto is so multidisciplinary, the great aspect about my career is that I can continue developing my core passion in geology and environmental science within the wider context of groundwater as the resource,” he adds. “Other key work areas to date include disaster risk reduction and geohazard studies.”

Technology

Keeping pace with technology has been a key success factor for Umvoto in rolling out its integration philosophy. Some eight years ago, telemetry systems were already put in place on Umvoto’s Hermanus wellfields project and, today, the latest GNSS transmitters provide real-time water-level reports at the SW project.

“The important point, however, is how the flood of spatial data generated by today’s IT tools is managed. Cloud platforms comfortably cope with increased storage space, but the deciding factor is determining which data sets have value. The secret is to avoid over-automation and to balance the new age of data with the fundamentals of science and common sense,” adds Riemann.

“Technology is an invaluable tool; however, nothing replaces applied experience and that’s central to the way we mentor our interns and future business leaders,” Riemann concludes. **35**



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