

UMVOTO

EARTH | WATER | SCIENCE | LIFE



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“The seven words that describe Umvoto are **wisdom gained through understanding, using knowledge and sharing experience to excel; **curiosity**, to ask questions and keep learning every day; **adventure**, and the importance of being bold while managing risks; **relationships** with oneself, colleagues, clients, and our personal choices; **respect** for the opinions and feelings of others, environment and financial constraints; **patience** to take one day at a time while focusing on the bigger picture; **stamina** and flexibility to stay in the race.”**

- Rowena Hay





1 About Umvoto



Umvoto was established by Rowena as a water resource development and management consultancy in 1992. The Company plays a key role in the successful exploration, resource estimation and environmentally sustainable implementation of turnkey groundwater supply schemes.

Internationally recognised for having one of the largest dedicated groundwater teams in Southern Africa, Umvoto also works in Disaster Risk assessment and Reduction (DRR), Applied Geology, Geoinformatics and Remote Sensing among other specialisations

Working in conjunction with the core team is a long-established local and international network of non governmental and corporate advisors.

Umvoto is a trusted partner in some of the most exciting projects and programmes in resource development and related fields. The team contributed to and helped implement the National Water Act (No. 36 of 1998), National Environmental Management Act (No. 107 of 1998), Integrated Coastal Management Act (No. 24 of 2008), Mineral and Petroleum Resources Development Act (No. 28 of 2002), Promotion of Administrative Justice Act (No. 3 of 2000), Disaster Management Act (No. 57 of 2002), South Africa's National Gender Policy Framework (2002) and National Development Plan 2030 (2012).

Data handling, processing and documentation undertaken on Umvoto projects are thorough and meticulous. The expertise of the integrated team of earth, water, life and environmental scientists, is brought to bear on projects which are cost-effectively managed in compliance with ISO-9001 standards, with an eye on future best practice. The Umvoto team strives not only to meet and exceed client requirements in terms of project deliverables, but also provides earth- science research and consulting services of a standard required for international peer review.



Key Services

Umvoto is an all-encompassing earth-science consultancy offering a broad variety of services to our growing portfolio of clients.

Umvoto undertakes a holistic approach to finding environmentally and socially sustainable solutions for clients which are both cost-effective and scientifically rigorous. Our earth-science research and consulting services aim not only to meet client expectations but also address environmental and socio-economic challenges inherent in the work we do – and to make a positive and sustainable impact.



Hydrogeology



Integrated Water
Resource Planning
and Management



Applied Geology



Contamination
and Remediation



Environmental Science
and Climatology

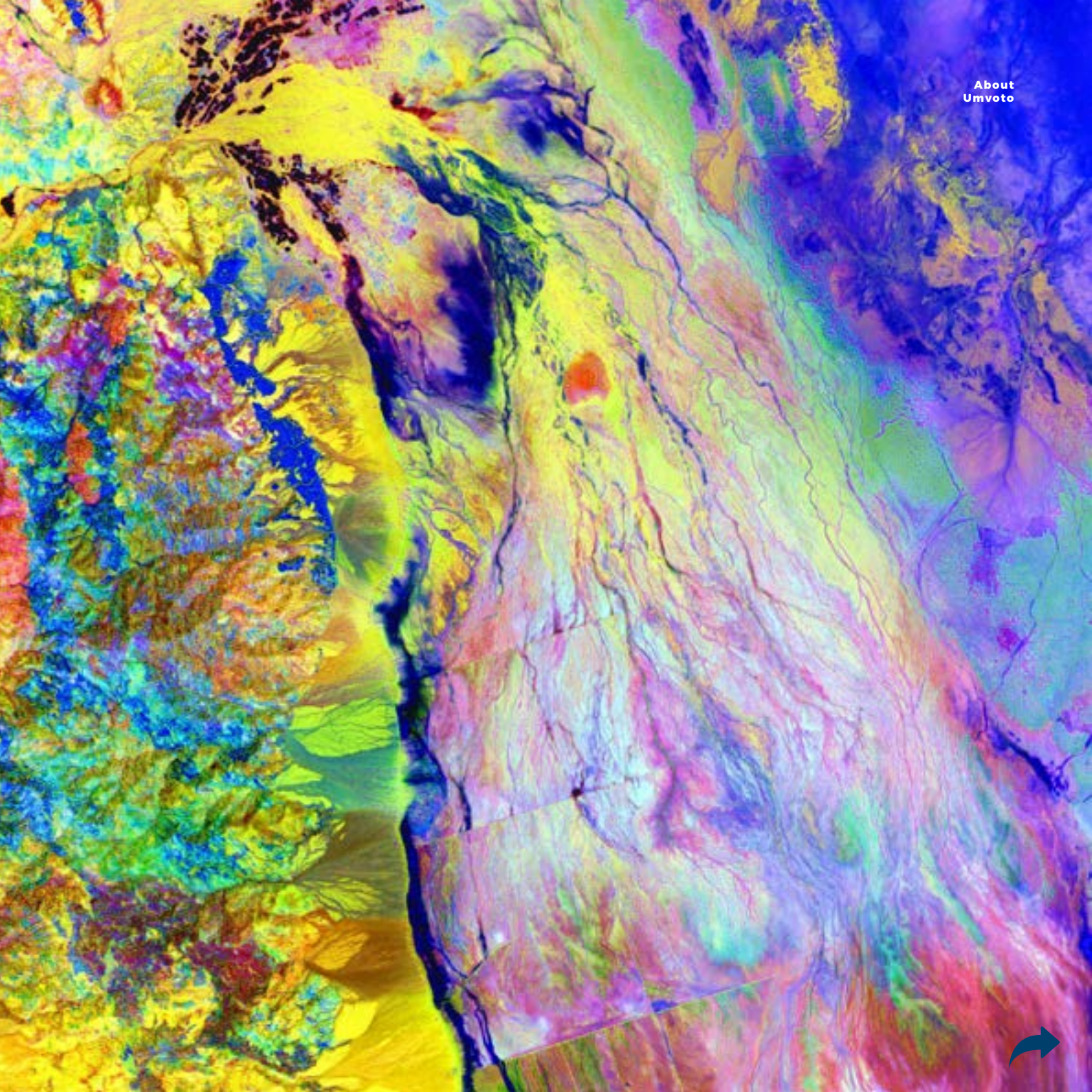


Geoinformatics and
Remote Sensing



Geohazard and
Disaster Risk Reduction







2 Business Environment



The Team

The Umvoto staff comprises three directors, more than thirty technical staff, three administrative staff and usually at least two interns.

In addition, specialist sub-consultants and academics support and advise the team.

Our cohesive team of scientists and professional consultants work within four interrelated departments: Integrated Water Resource Planning and Management, Applied Geology, Environmental Science and GIS & Remote Sensing.

Senior Team Members

Rowena Hay
Managing Director

Kornelius Riemann
Technical Director

Dylan Blake
Associate and Principal Geologist

Tyrel Flügel
Senior Geospatial Analyst

David McGibbon
Senior Geologist

Paul Lee
Senior Environmentalist and Climatologist

Luke Towers
Senior Hydrogeologist

Andrew Gemmell
Senior Hydrologist

Chris Hartnady
Non-executive Director and Specialist Associate

Biographies: umvoto.com/team-bios/



Awards and Accolades



Lechelle Goslin, Winner of the Geological Society of South Africa's John Handley Award for Best Masters Thesis produced at a South African university

Lechelle Goslin, Winner of the Geological Society of South Africa's Corstorphine Medal Award for Masters Thesis of Exceptional Merit, worthy of International Recognition



Umvoto, Finalist and Special Commendation in OpenIX Challenge for Novel Applications of Earth Observation (Sansa/Airbus)

Umvoto, Winner of National Science and Technology Forum Award for Research Leading to Innovation by a Team or Individual in the category 'SMME'



Rowena Hay (Founder and Director of Umvoto), Winner of Water Research Commission Knowledge Tree Award in the category 'Empowerment of Communities'

Michael Hartnady (Umvoto intern and scholarship holder), Winner of the Geological Society of South Africa's John Handley Award for Best Masters Thesis produced at a South African university

Michael Hartnady, Winner of the Geological Society of South Africa's Corstorphine Medal Award for Masters Thesis of Exceptional Merit, worthy of International Recognition



Umvoto, selected for the Cape Town World Design Capital programme of socially transformative projects for work on three municipal groundwater projects in Stanford, Hermanus and Oudtshoorn

Michael Hartnady, Winner of Geological Society of South Africa's Houghton Award for Best Honours Thesis produced at a South African university

Rowena Hay, invited to present the tenth annual Pat Reid Memorial Lecture on disaster risk reduction at the North West University's African Centre for Disaster Studies.



Kornelius Riemann, Technical Director at Umvoto, Award for Best Paper submitted by a non-member at the Institute of Municipal Engineering of Southern Africa conference, with the title 'Municipal Engineering: Meeting Peoples' Needs'



Umvoto, voted Best Company in Southern Africa for Young Water Industry Professionals and won Professional Development Award at the Water Institute of Southern Africa conference



Andiswa Mlisa, Runner-Up in the Department of Trade and Industry's Technology for Women in Business Award





Umvoto, Finalist in the Africagrowth Institute's SMME Conference and Awards in the category 'Innovation'

Dylan Blake, Special Mention and Runner-Up Award for water research in the category 'Outstanding Young Researcher' at the Water Institute of Southern Africa conference



Rowena Hay, Cape Entrepreneur Winner in the Businesswomen's Association Regional Business Achievers Awards

Umvoto (in association with SA Rock Drills), Finalist in National Science and Technology Forum Awards in the category 'Scientific Innovation by Teams or Companies' for exploration and development of a specialised groundwater resource for the Oudtshoorn area.

Matt Webb, Winner of Entec prize for Best Performance Overall and Cecil Barber Prize for Thesis of Exceptional Merit, exploring the saline- intrusion risk at Gateway Wellfield in Hermanus



Rowena Hay, Runner-Up in the Department of Science and Technology L'Oreal-UNESCO Achiever Award in the category 'Woman Scientists in Industry'



Scientific Papers

Umvoto's technical team is internationally recognised for our leading research and knowledge within various Earth Science fields. The team contributes to peer reviewed journals on an almost monthly basis as well as present their findings at international and national sector focused conferences.

Prominent Clients

Umvoto's reputation for excellence is endorsed by the United Nations and the Commonwealth Secretariat, which are just a few of our high-profile clients. Some others include Aurecon, GIBB, iX Engineers, AECOM, SMEC, WSP, WorleyParsons, RoyalHaskoningDHV, Mott MacDonald, PDNA, Zutari, DRA Global, DRA Nexus and KBR. Umvoto has also worked with departments of the South African government such as Water and Sanitation, Rural Development and Land Reform, Science and Technology, Agriculture, Forestry and Fisheries. The Council for Scientific and Industrial Research as well as the Council for Geoscience and the Water Research Commission are among some others.

Umvoto also provides water resource exploration and management services to the City of Cape Town, Oudtshoorn, Cederberg and Overstrand Municipalities as well as DRR services to various departments within the Western Cape provincial government. We have consulted to international clients and organisations in Malawi, Lesotho, Mozambique, Namibia, Mauritius, Madagascar, Angola, Zambia, Tanzania, Uganda, Kenya, Ghana, Ethiopia, Eritrea, Saudi Arabia, Benin and the Caribbean.



AECOM

aurecon



DRA



ZUTARI
IMPACT. ENGINEERED.

ixengineers
Infrastruktura Ekstremalia



M
MOTT
MACDONALD



UN
environment

GEMS
Water

WWQA
World Water Quality Alliance



Sector Focus



Mining



**Governments and
Municipalities**



Environment



**Industry, Food and
Beverage**



**Construction &
Property Development**



Agriculture







3 **Key** **Services**



Umvoto undertakes a holistic approach to finding environmentally- and socially sustainable solutions for clients which are both cost-effective and scientifically rigorous. Our earth-science research and consulting services aim not only to meet client expectations but also address environmental and socio-economic challenges inherent in the work we do.



Hydrogeology

Umvoto is locally and internationally acclaimed for its expertise in primary, fractured, and karstic aquifers. Our team's knowledge of geological and hydrogeological processes forms the basis for highly successful groundwater resource evaluation, exploration, development, monitoring, modelling and management.

Umvoto's expertise and experience, together with engineering associates, allows them to deliver turnkey projects covering every step, from geological mapping, borehole siting, borehole drilling and testing, wellfield operations and maintenance and aquifer management to water from the tap.

Given the growing concern around water resource contamination and the legal need for due diligence, this expertise is also applied with predictive modelling tools, to determine site contamination and groundwater pollution with a view to design the most appropriate protection and remediation measures.

Surface and groundwater modelling simulate flow and transport processes overland and underground, improving our understanding of these processes and informing decisions that affect them. With a dedicated team of modellers, we deliver solutions tailored to our client and project's needs, integrated within project workflows to obtain the greatest benefit from the modelling process throughout the project lifespan.





Integrated Water Resource Planning and Management

Underpinning Umvoto's monitor-model-manage approach to both surface water and groundwater resources is a solid foundation of field knowledge and hands-on experience, with an emphasis on ground-truthing exploration hypotheses and wellfield management. Umvoto has led our competitors in implementing an adaptive management approach to groundwater resource evaluation and development in South Africa by developing systems for both evaluating surface water-groundwater interaction and integrating groundwater into existing surface water planning tools.

Umvoto has experience in a range of hydrological investigations, including hydrological impact assessments and stormwater management planning. This allows Umvoto to assess the potential impacts of watercourse flows on developments, the impact of developments on watercourses, and to advise on the associated mitigation and management measures.

The Umvoto team's experience with the National Water Act of South Africa and associated legislation supports strategic approaches in water resource development studies, vital to license applications, associated aquifer sustainability, as well as public liaison, securing public buy-in and preparing risk-based environmental impact assessments.



Contamination and Remediation

To meet the growing concern around water resource and soil contamination Umvoto offers the full suite of assessments building on our expertise in geological and hydrogeological processes. Umvoto's strength is our proven experience in soil, surface water and groundwater assessments; the interactions between these; and the associated impacts and required mitigation and management measures.

Umvoto has experience in most priority contaminants, with capability in due diligence, desktop and intrusive assessments (including soil sampling, monitoring well drilling and sampling), remediation, contaminant fate and transport modelling and environmental monitoring. This experience helps our various industrial clients identify, prevent, mitigate and remediate environmental impacts to limit their environmental, reputational, and financial risks.





Geoinformatics and Remote Sensing

Umvoto's GIS team plays an integral support role to other departments while offering GIS and Remote Sensing services directly to external parties. The GIS team actively uses GIS and Remote Sensing to better understand the environment, either as part of ongoing scientific research or to better meet our client's needs.

Umvoto undertakes in-house research and development to solve challenges unique to our clients and to ensure better delivery of outputs which support decision making throughout all stages of a project. One such example is the novel use of Global Navigation Satellite Systems (GNSS) to monitor for surface deformation related to groundwater abstraction from confined aquifers in South Africa. By combining Umvoto's earth science expertise with GIS and Remote Sensing, we regularly produce scientifically sound geodatabases which are frequently used by the scientific community.

Umvoto routinely provides geospatial solutions in support of groundwater exploration, environmental planning and mapping, geo-hazard assessment as well as urban planning. The team has extensive expertise in spatial analysis, suitability assessments, terrain mapping and hydrological modelling.



Disaster Risk Reduction (DRR)

Umvoto's founder Rowena Hay has prepared United Nations sanctioned guidelines for African community leaders to support environmental protection, poverty reduction and adaptation to climate change. In collaboration with Dr Chris Hartnady, she contributed to the UNEP guidelines on mainstream DRR for sustainable African development.

Umvoto has also undertaken a Capacity Needs Assessment for Disaster Risk Management for the Kingdom of Lesotho and a Situational Analysis of DRR Policies and Practices in Malawi. The team has authored a series of educational booklets for the United Nations International Strategy for Disaster Reduction (UNISDR) on various aspects of DRR, such as gender, land use, poverty, water and environment, as well as prepared material to promote and support DRR in Namibian Schools.

Umvoto has also consulted to several municipalities implementing the United Nations Environment Programme's (UNEP) Awareness and Preparedness for Emergencies at Local Level.





Geohazard Analysis

Umvoto has extensive experience in quantifying geohazards and their associated risks, both natural and man-made. These risk analyses and assessment services are sought by provincial, national and international clients, including the Commonwealth Secretariat and the United Nations. Our risk reduction service supports the integrated disaster management planning (developing early warning systems and hazard monitoring) required by South Africa's Disaster Management Act.

Umvoto's experience with geohazards includes seismic risk assessments for infrastructure such as pipelines and mine developments.

Umvoto has also compiled and run advanced probabilistic and deterministic risk simulation models. Our research has been shared with a number of United Nations international programmes for Disaster Risk Reduction (DRR) and Sustainable Development, as well as the Global Earth Observation Programme.

Through involvement in climate change studies in 2011, Umvoto completed a study into sea level rise and flooding risks associated with climate change for vulnerable coastlines in the Western Cape, before developing a monitoring and evaluation system for the Western Cape Climate Change Response Strategy and Action Plan.



Applied Geology

Umvoto's geological team has hands-on experience in a broad range of geological applications. The understanding of surface and subsurface geology forms the basis for successful understanding of environmental and integrated surface and groundwater processes. The exceptional skills in structural geology and sedimentology, use of remote sensing and observation for mapping of complex terrains and monitoring of earth processes (e.g. seismotectonics) supports the Umvoto team to deliver turnkey projects covering every step from groundwater exploration to delivery from the tap, opportunities for conjunctive surface and groundwater development and management, understanding of geohazards and the risks that communities face and those they pose to the environment. Understanding People and Place in context of any Purpose starts with understanding the earth processes and patterns. Modern geology in practice.





Environmental Science and Climatology

Umvoto consults to both governmental and private entities seeking environmental impact assessment and guidance for mining and property development applications. The team members are all registered practitioners with the Environmental Assessment Practitioners Association of South Africa (EAPSA) and qualified to provide specialist support in regulatory processes such as Environmental Management Plans (EMPs), Environmental Impact Assessments (EIAs), License Audits, Performance Assessments, and Mining Right Applications. The Umvoto Environmental Control Officers are trained to provide supervision on site and ensure regulatory compliance of all activities.

Umvoto offers the full suite of ecological freshwater services, specialising in Water Use Licenses, to the monitoring and assessment of riverine and wetland ecosystems, with input from in-house geologists, hydrogeologists, hydrologists and GIS personnel. This to best provide an early warning system to detect environmental risks and respond proactively. To that end, Umvoto provides field work and designs ecological stations in urban as well as remote and challenging areas for the monitoring of environmental conditions and potential impacts.

The ecological data recorded at these eco-sites include surface stream flow, groundwater depths, chemistry of ground and surface water, soil moisture, biological health indicators for aquatic ecosystems, vegetation surveys, and abstraction impacts on water resources, all of which are important in terms of understanding the impacts of human activities on the natural environment.

The Environmental Science and Climatology department also specialises in the design and construction of meteorological weather stations for recording conditions in areas where there is an impact on surface and groundwater recharge and air quality. The team members have assembled and operated weather stations in various environments, from the ice of Antarctic to the desert of the Danakil Depression in Ethiopia.

The Umvoto team has expertise in water resource monitoring and management using sophisticated Supervisory Control and Data Acquisition (SCADA) and telemetry systems. Umvoto aims to ensure ecologically sustainable water resource development ranging from large-scale urban wellfields; agricultural, industrial, and commercial supply systems; and provide drought resilient solutions for urban planning, property and agricultural development.





4 **Company** **Strengths**



Team

Umvoto comprises an exceptional team of scientists and environmental consultants known for their technical brilliance, scientific rigor and feet-on-the-ground humanity. The importance of attitude as much as aptitude and application, is highly regarded within the organisation and has been the very fabric of Umvoto since inception. Management supports staff gallantly in their pursuits while allowing autonomy for personal growth, to realise the best for both themselves and the company. The senior staff complement is supported by a group of emerging third-generation leaders, many of whom joined the company through the award-winning internship programme.

Knowledge Capital Inhouse Funded Research

Umvoto prioritises dedicated research in areas of interest to the company and the team of scientists, whether directly related to commissioned projects or initiated and funded internally. Building a comprehensive database and remaining at the cutting-edge of the latest developments and technological advancements in the earth sciences, has undoubtedly been the hallmark of our success.

Regular publication of peer-reviewed journal articles and scientific papers is encouraged, and team members regularly present their findings at international conferences. The quality and credibility of research conducted by the team is highly regarded and cited by the scientific community.



Internship Programme

Since 2002, Umvoto's internship programme has provided practical work experience and professional training to more than 100 post-graduate students. Our award-winning internship programme immerses interns in day-to-day business operations from the get-go, allowing the opportunity for participants to prove themselves and potentially form part of the permanent staff.

Umvoto has relationships with tertiary institutions such as the University of Cape Town, Cape Peninsula University of Technology, University of Fort Hare, Tshwane University of Technology, Stellenbosch University and the University of Venda. Students interning at Umvoto from abroad have been from the United Kingdom, Canada, France, and Germany.

Industry Relationships

Since 1992 Umvoto has built strong relationships based on mutual trust with clients, decision-makers, academia, institutions and organisations, both locally and abroad. This long-established network of industry experts brings their own valuable skills, contacts and associates that form meaningful partnerships which affect the greater good. This pooling of resources creates an environment where the combined result far exceeds the sum of its parts.



EARTH | WATER | SCIENCE | LIFE



“Anyone who can solve the problems of water will be worthy of two Nobel prizes – one for peace and one for science.”

— *John F. Kennedy*





UMVOTO

umvoto.com



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