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INDUSTRY INSIGHT

Thorne Zurfluh, engineering manager APE Pumps

MAGALIES WATER fights upstream to secure downstream supply

SANS 241 EVOLVES PUTTING RISK AHEAD OF LISTS

SHOCKPROOFING INFRASTRUCTURE

GREEN DROP REPORT:

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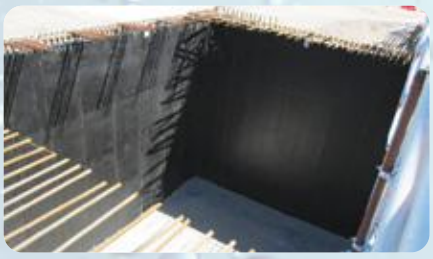

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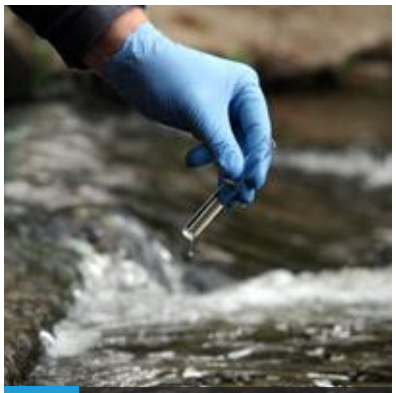

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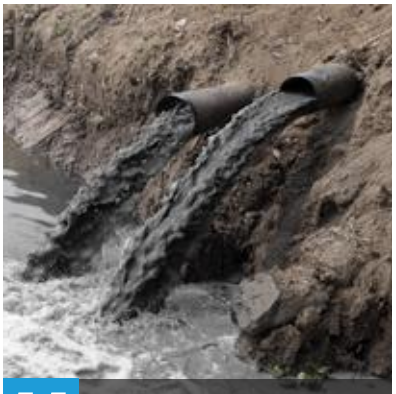

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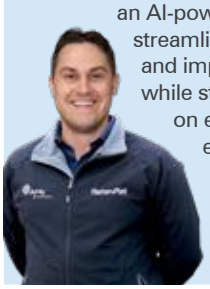

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Water&Sanitation Africa

Managing Editor: Kirsten Kelly
kirsten@infrastructurenews.co.za
Journalist: Duncan Nortier
Digital Manager: Chelsea Gillespie
digital@infrastructurenews.co.za
Designer: Beren Bauermeister
Contributors: Dr Lestern Goldman, Dr Harisson Pienaar, Duncan Nortier
Advertising Sales: Sindi Moni
c +27 (0)82 212 4574
sindi@infrastructurenews.co.za

Publisher
Infrastructure News
47 Grove Road, Orange Grove, Johannesburg
Gauteng, 2192
Tel: +27 (0)83 433 4475
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kirsten@infrastructurenews.co.za

Water Institute of Southern Africa

WISA's Vision
Inspiring passion for water

WISA Contacts:
HEAD OFFICE
Tel: 086 111 9472(WISA)
Fax: +27 (0)11 315 1258
Physical address: 1st Floor, Building 5, Constantia Park, 546 16th Road, Randjiespark Ext 7, Midrand
Website: www.wisa.org.za

BRANCHES
Eastern Cape:
Branch Contact: Dan Abrahams
Company: Aurecon
Tel: +27 (0)41 503 3929
Cell: +27 (0) 81 289 1624
Email: Dan.Abraham@aurecongroup.com

Gauteng
Branch Lead: Zoe Gebhardt
Cell: +27 (0)82 3580876
Email: zoe.gebhardt@gmail.com

KwaZulu-Natal
Chairperson: Lindelani Sibiya
Company: Umgeni Water
Cell: +27 (0)82 928 1081
Email: lindelani.sibiya@umgeni.co.za

Limpopo
Chairperson: Mpho Chokolo
Company: Lepelle Northern Water
Cell: +27 (0)72 310 7576
Email: mphoc@lepelle.co.za

Western Cape
Chairperson: Natasia van Binsbergen
Company: AL Abbott & Associates
Tel: +27 (0)21 448 6340
Cell: +27 (0)83 326 3887
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Back to basics

South Africa has no shortage of world-class water laws, policies and standards. Yet the crisis persists. The problem is not what we have written down, but what we are failing to do every day.

Our water sector is often described as being in crisis. Failing wastewater works, rising non-revenue water, pollution in rivers, and communities without reliable supply have become familiar headlines. But beneath this sits an uncomfortable truth: we are not consistently getting the basics right.

This is not because we lack guidance. On paper, South Africa is exceptionally well equipped. The Water Services Act, national norms and standards, regulatory tools like Blue Drop and Green Drop, and technical standards such as SANS 241 form one of the most robust water governance frameworks in the world. The issue is execution.

Recent Green Drop results reinforce this point. While they highlight declining wastewater performance, they are symptoms of a deeper problem: a failure to consistently apply what we already know.

Across the country, the fundamentals of water management are being neglected. Pumps are run to failure instead of maintained. Leaks go undetected. Reservoirs are not properly managed. Process control slips, affecting water quality. Data is not collected, trusted, or used to guide decisions.

These are not complex failures. They are failures of routine discipline.

Part of the challenge is that the basics are not exciting. Routine maintenance, accurate measurement and disciplined operations rarely make headlines. It is far more appealing to develop a new policy or invest in the latest technology. When systems fail, the instinct is often to reach for complex, high-tech solutions.

But this is the wrong response.

No technology can compensate for neglected fundamentals. Monitoring systems mean little if data is ignored. New infrastructure delivers limited value without proper maintenance. Complexity layered onto weak foundations only makes systems harder to manage.

In many ways, this mirrors sport. The best teams win by executing the basics consistently. When those fundamentals slip, performance drops, regardless of talent.

The same applies to water.

No amount of policy reform or infrastructure investment will compensate for poor day-to-day operations. A treatment plant will fail without proper maintenance. A new pipeline will not reduce losses without pressure management and leak repair. Technology can support performance, but it cannot replace discipline.

Getting back to basics means focusing on what should already be standard practice. Routine maintenance must be non-negotiable. Flows, pressures and quality must be measured accurately. Skilled operators must be supported and held accountable. Data must inform daily decisions.

It also requires a shift in mindset. Too often, success is measured by what is built, not how well it works. The real value of water infrastructure lies in consistent, reliable performance.

There is no shortcut. The fundamentals are not glamorous, but they are decisive.

South Africa needs better execution.

In sport, when performance drops, teams return to the basics. The water sector would do well to do the same. ●

Kirsten

You said it in *WASA*

The opinions and statements shared by thought leaders in the water industry to Water&Sanitation Africa.

"At Magalies Water, the output per unit, specifically energy and chemical spend, is increasing due to deteriorating raw water quality, which is forcing the plants to work harder while producing less. Previously, the same amount of energy and chemicals could reliably produce, for example, 50 Ml/day, but now, with higher nutrient, metal, and microbial loads, that same input may yield only a fraction of the original quantity of compliant treated water. Increased chemical dosages are required for treatment, maintenance is more frequent (due to source water eutrophication and system inefficiencies due to invasive plants), and yet the throughput must be reduced to safeguard water quality." **Phindile Mahlangu, scientific services manager, Magalies Water**

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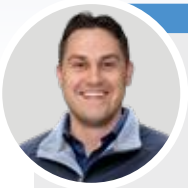

"Pumps are only one component of a larger system where motors, piping, valves and operating conditions all interact. Therefore, pump selection can become challenging because engineers must consider flow rate, head, pressure, fluid characteristics, system design and operating conditions, all of which influence how a pump will perform in practice. An incorrect pump can negatively affect overall performance and increase operating costs where there is excessive energy consumption, increased wear and frequent failures." **Thorne Zurfluh, engineering manager, APE Pumps**

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"South Africa does not lack talent. We have skilled engineers, dedicated scientists, and process controllers who are constantly upskilling, people who show up and carry the system even when the system doesn't carry them back. Yet too many are working with one hand tied behind their backs. Decisions are delayed, resources are trapped in slow processes, and institutional support is inconsistent. When leadership is absent, even the most skilled professional becomes a spectator to a slow-motion disaster. Accountability isn't just about finding someone to blame when things go wrong. It's about building a system that enables people to do things right." **Dr Lester Goldman, CEO, WISA**

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"The Green Drop findings are a warning, but they are also a call to action. The WISA 2026 Biennial Conference is not simply another conference; it is an opportunity for the water sector to collectively 'rethink amanzi' and translate professional knowledge into coordinated, accountable action. If WISA and its members use this platform effectively, the conference will mark a turning point from deterioration towards recovery in South Africa's wastewater systems." **Dr Harrison Pienaar, chairman, WISA**

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"SANS 241 makes provision for groundwater use in rural areas where water quality is generally unpolluted. In these cases, monitoring frequency and the number of required tests are reduced, with a focus on parameters specific to borehole systems. Every borehole system must have a comprehensive risk assessment of the raw water, final water, and key points in the distribution network. A full SANS 241 analysis is still required every second year with a reduced list of parameters required twice a year. Where several boreholes feed into one supply, the revised SANS 241 allows operators to monitor the combined water quality at the reservoir, rather than sampling every individual borehole." **Leanne Coetzee, specialist consultant, Waterlab and the previous chairperson of the South African Bureau of Standards (SABS) national committee – SABS/TC147, Water**

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"The amended SANS 241 demands more from the water sector. Instead of asking whether everything on a prescribed list has been tested, the standard now requires entities to justify their monitoring programmes based on a thorough understanding of their supply system and its catchment. Did you test everything you were supposed to? Do you understand your system well enough to justify why you tested what you did? Monitoring programmes must now be robust enough to ensure that testing is relevant, targeted and fit for purpose, while also ensuring that all necessary parameters are adequately covered." **Micole Martens, director, Talbot**

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"A South African-specific approach is essential because standards must reflect local conditions and risk profiles. Certain contaminants, such as residual HIV-related pharmaceuticals, may be more relevant in South Africa than in other regions, while other internationally prioritised contaminants may not pose the same level of concern in South Africa. Local context therefore matters. South Africa's catchments, treatment challenges, public health pressures and infrastructure constraints are unique and must be properly understood. Locally developed standards enable more accurate prioritisation of risks, rather than relying on imported frameworks that may overlook critical issues specific to the South African environment." **Liane Henman, contracts liaison manager, Talbot**

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"PPPs are also often misunderstood as a way for municipalities to procure infrastructure, but the model is fundamentally different. Rather than buying an asset, municipalities are procuring a service over the life of the contract. The private partner is responsible for designing, financing, building, operating and maintaining the infrastructure, and is only paid when it delivers the agreed output, such as water and sanitation services that meets the agreed quality and standards. This shifts the focus from once-off capital delivery to long-term performance, reliability and accountability, ensuring that infrastructure continues to function as intended well beyond commissioning." **Dhevan Govender, general manager: Business Development (Water and Sanitation), EnviroServ**

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"In practice, a water use license is required where a proposed activity could have a significant impact on a water resource or on other users. This includes activities such as abstracting water from rivers or groundwater, storing water, discharging waste into water systems, altering a watercourse, or using water for industrial, mining or agricultural purposes. The licence sets out the terms and conditions under which the water may be used, including limits, monitoring requirements and environmental protections." **Francois Joubert, partner, Fasken**

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"There are not many water treatment companies that have the appetite to set up regional offices in other African countries. We believe our growing footprint enables us to deliver reliable water treatment solutions while responding quickly to the diverse challenges across African markets. We are also extremely excited about our Tanzania and UAE presence and have set our sights on South America too." **Chris Ashmore, CEO, Watericon**

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"Plastic pipes form the backbone of modern water reticulation and sanitation systems. With South Africa currently consuming approximately 94 900 tonnes of PVC pipes and around 52 000 tonnes of HDPE pipes annually, the sector plays a significant role in supporting service delivery. Demand for these materials is structurally linked to economic growth and infrastructure development. As GDP expands, so too does the need for reliable piping systems to support housing, industry, mining and municipal services." **Jan Venter, CEO, SAPPMA**

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MAGALIES WATER FIGHTS UPSTREAM TO SECURE DOWNSTREAM SUPPLY

The Hartbeespoort Dam is a highly eutrophic impoundment within the Crocodile River (West) catchment, where excessive nutrient loading from partially treated wastewater effluent, industrial discharge and diffuse urban runoff drives persistent algal blooms, invasive macrophyte proliferation and deteriorating water quality

Operating at the tail end of the heavily polluted Crocodile West River Catchment, Magalies Water is confronted with one of the most compromised raw water matrices in South Africa. But through internal control processes, science, innovation and a focus on source water security, the water utility continues to deliver safe, compliant drinking water.

Magalies Water abstracts raw water from a network of interconnected systems in Limpopo, North-West, and Gauteng, with its primary sources being four major dams: Bospoort, Roodekopjes, Vaalkop and Roodeplaat. These dams are fed by key rivers including the Hex River, Crocodile River, Elands River and Pienaars River. Together, these systems form part of the broader Crocodile West Catchment, which is one of the most economically active and heavily utilised water systems in South Africa.

"A defining characteristic of several Magalies Water's abstraction points is that they are located downstream of the catchment system. This means the water has already passed through multiple upstream activities before reaching the dams. As water flows downstream, it carries the cumulative burden of runoff, industrial discharge and wastewater effluent from tributaries, urban areas and industries. By the time it reaches Magalies Water's systems, the raw water is often significantly more polluted than upstream," explains Phindile Mahlangu, Scientific Services Manager, Magalies Water.

Diffuse pollution – the release of pollutants from widespread, varied activities rather than a single system – is also one of Magalies Water's biggest challenges. Rapid urbanisation and the growth of informal settlements without formal waste management systems compound the issue. So does climate change. Drought conditions concentrate contaminants, while heavy rainfall events wash pollutants into rivers and dams through stormwater systems.

At the same time, the problem is being reinforced by failing wastewater infrastructure. Mahlangu adds that the recent Green Drop Report shows an even further decline in municipal wastewater treatment infrastructure. "This has resulted in partially treated effluent being discharged into our systems."

Hartbeespoort Dam

The effects of upstream pollution are precisely what Magalies Water is working to address through its appointment by the Department of Water and Sanitation (DWS) as the implementing agent for the Hartbeespoort Dam remediation

Phindile Mahlangu, Scientific Services Manager, Magalies Water

The Roodeplaat Dam is part of the Magalies Water supply network, and is primarily used to supply bulk potable water to the City of Tshwane

The Elands River forms part of the broader Crocodile West Catchment and supplies water to the Vaalkop Water Treatment Works

programme, which forms part of the broader Crocodile West Catchment Water Resource Management Project. This work is not limited to the dam itself but extends across the entire upstream catchment.

"Any gains from upstream interventions ultimately flow back to us downstream, where we abstract the water, allowing us to clearly see both the impact of our efforts and the value of investing in the catchment," explains Mahlangu.

At a catchment level, Magalies Water is undertaking water quality monitoring, pollution profiling and source tracking. This involves analysing water quality data to identify pollution hotspots and trace contaminants back to their origin, enabling the regulator to take enforcement action.

Within the dam itself, interventions focus on restoring ecological balance and improving water quality. This includes removing invasive aquatic vegetation, which thrives in nutrient-rich conditions driven by excessive nitrogen and phosphorus loads. These nutrients, largely from wastewater effluent, drive eutrophication, resulting in algal blooms, invasive plant proliferation and deteriorated water quality.

Magalies Water has also implemented in-lake treatment technologies, including nanobubble and bioremediation interventions, to increase dissolved oxygen levels and reduce nutrient concentrations. This technology is designed to improve water quality within the dam, although its effectiveness is constrained by the continuous inflow of polluted water from upstream.

Importantly, the organisation recognises that in-dam interventions alone are not enough. While remediation efforts can improve conditions locally, the long-term solution lies in reducing pollution at source, particularly by improving wastewater treatment performance in upstream municipalities and strengthening regulatory enforcement. Without this, the dam remains heavily polluted.

At Hartbeespoort Dam, Magalies Water is not just monitoring water quality, it is leading a full-scale catchment remediation effort on behalf of the Department of Water and Sanitation

Integrated water resource management

This reality is also reshaping the role of water boards. Historically, water boards operated primarily as bulk suppliers. "Water boards can no longer operate in isolation," says Mahlangu. "We need an integrated approach across the entire water supply value chain, from source to tap."

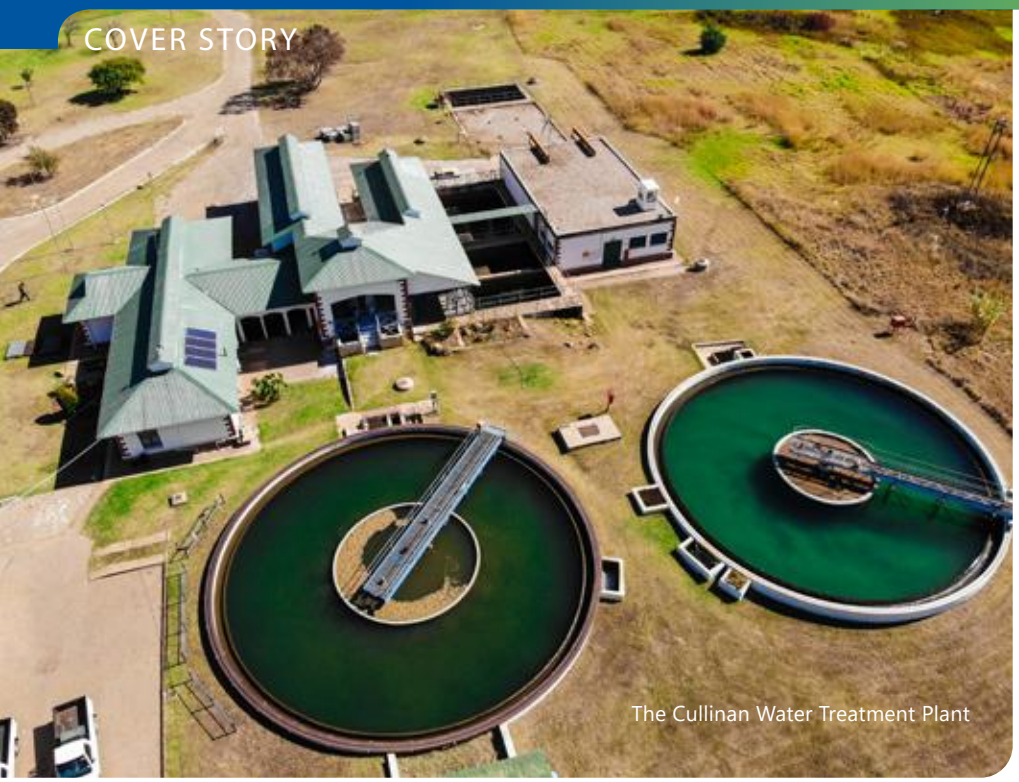
As a water board with strong research, development and innovation capacity, Magalies Water is well positioned to support municipalities with technical expertise, data-driven interventions and fit-for-purpose solutions to improve water quality and system performance. "Magalies Water is increasingly involved in catchment management and remediation as well as municipal support. We aim to help resuscitate water systems at the water service provider or water services authority level. Magalies Water is assisting municipalities with Blue Drop compliance, process audits and the development of water safety plans and Incident Management Protocols. These systems take a holistic view of the entire water value chain, from abstraction and storage to pipelines and the consumer tap, identifying risks and interventions across the system. Bulk water supply is essentially at the beginning of the water value chain for municipalities, and we can help them identify further risks along the chain and optimise their operations," adds Mahlangu.

Magalies Water regularly partners with municipalities and holds community engagement forums on water conservation and demand management, pollution and water quality. They also promote digitisation, smart metering and non-revenue water reduction, recognising that operational inefficiencies and water losses further strain already limited resources.

The rise of emerging risks

While traditional pollutants remain a challenge, a new threat is rapidly gaining attention: contaminants of emerging concern.

These include synthetic chemicals from everyday products that enter water systems through runoff and wastewater. Often unknown and difficult to detect,



The Cullinan Water Treatment Plant

they require advanced analytical methods and specialised expertise.

"The challenge with emerging contaminants is that they are constantly evolving," Mahlangu explains. "You first have to identify them, then understand their impact, and only then determine how to remove them."

For a sector already under financial and operational strain, this adds another layer of complexity.

In effect, drinking water treatment plants are increasingly being forced to compensate for upstream failures, taking on a role they were never designed to fulfil. This has a cascading effect. Higher contamination levels drive up operational costs, increase energy consumption, and accelerate infrastructure wear through intensified strain. Treatment becomes less efficient, more complex and expensive.

"At Magalies Water, the output per unit, specifically energy and chemical spend, is increasing due to deteriorating raw water quality, which is forcing the plants to work harder while producing less. Previously, the same amount of energy and chemicals could reliably produce, for example, 50 Mℓ/day, but now, with higher nutrient, metal, and microbial loads, that same input may yield only a fraction of the original quantity of compliant treated water. Increased chemical dosages are required for treatment, maintenance is more frequent (due to source water eutrophication and system inefficiencies due to invasive plants), and yet the throughput must be reduced to safeguard water quality," explains Mahlangu.

In simple terms, the cost per litre treated is rising because the system must use more energy and chemicals more often to maintain safe drinking water standards amid worsening raw water conditions.

Mahlangu gives an example: "Ammonia enters rivers and dams through partially treated sewage, industrial discharge and agricultural runoff. Many wastewater treatment plants are failing to effectively remove ammonia, and conventional water treatment works are not traditionally designed to remove it, so many systems are struggling. As a result, water treatment plants are forced to adapt, adjusting processes and, in some cases, introducing advanced treatment technologies just to keep water within safe limits."

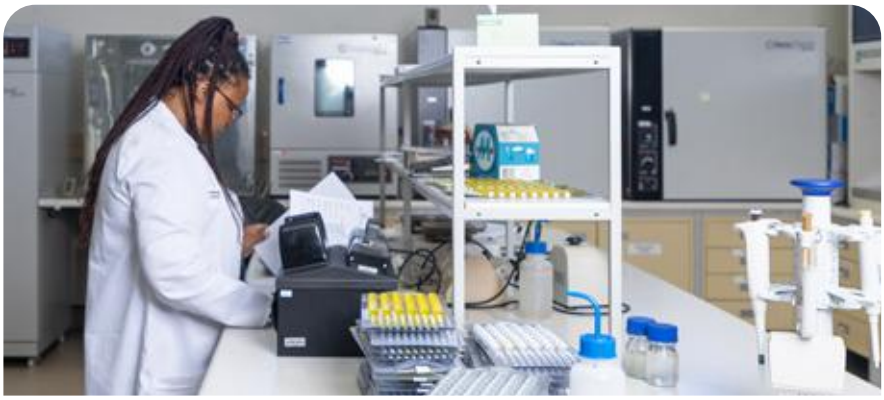
At the same time, ammonia interferes with disinfection processes. When chlorine is added to water containing ammonia, it forms chloramines, which are weaker disinfectants. If not carefully managed, this can compromise the system's ability to control microbial contamination effectively.

Beyond the treatment works, ammonia plays another role, one that is visible to the public. As a nutrient, it fuels the growth of algae and cyanobacteria in dams and reservoirs. This process, known as eutrophication, leads to the familiar problems of green water, unpleasant tastes and odours, and, in some cases, the production of toxins. Systems like Hartbeespoort Dam have become well-known examples of how nutrient loading, including ammonia, can transform a water body into a highly degraded ecosystem.

The proliferation of alien invasive species in nutrient-rich water presents additional problems to bulk water suppliers. "At raw water abstraction points, these plants accumulate at inlet screens, which are designed to prevent debris from entering the treatment works. Historically, these screens dealt with occasional natural debris, such as branches. Today, they are increasingly overwhelmed by dense mats of invasive vegetation. These screens constantly must be removed, cleared and put back," says Mahlangu.

Managing the costs of water treatment

Compounding the technical challenge is the socio-economic reality of Magalies Water's service area. A significant portion of the communities it supplies are indigent, which limits the utility's ability to recover rising treatment costs through tariffs. This creates a difficult balancing



Magalies Water operates an advanced, SANAS-accredited laboratory with extensive analytical capacity, capable of performing a wide range of physicochemical and microbiological tests to support regulatory compliance and ensure the consistent delivery of potable water

Magalies Water hosted students from Tshwane University of Technology at its Cullinan Water Treatment Works in the City of Tshwane, where they gained insight into water purification processes and SANAS-accredited quality assurance systems that produce 16 Mℓ/day of potable water for surrounding communities

act: as raw water quality deteriorates and treatment becomes more complex and expensive, the organisation cannot simply implement high-cost technologies or pass those costs on to consumers. Instead, it is forced to prioritise cost-effective, fit-for-purpose solutions that maintain compliance while remaining affordable, adding another layer of complexity to an already strained system.

The organisation is working closely with the Water Research Commission to develop technologies suited to South African conditions.

"We look for solutions that are nature-based, sustainable and cost-sensitive interventions, such as the adsorption and bio-remediation technology. Magalies Water researches and uses multiple technologies and interventions, as there is no silver bullet for water quality issues. Magalies Water is focusing on proactive maintenance to ensure our systems operate at the highest possible efficiency. We are also analysing all chemicals used in the water treatment system to ensure that all supplied chemicals are of the greatest quality," states Mahlangu.

Compliance

Ensuring compliance with SANS 241 remains central to operations. Magalies Water has invested heavily in its scientific services, achieving approximately 98% accreditation of analytical methods under ISO 17025.

This enables the organisation to produce reliable, accurate water-quality data and maintain high standards of drinking-water compliance.

Supporting this are dedicated teams focused on process optimisation, research and development, and quality management, including ISO 9001 certification at an organisational level. "Implementing ISO 9001 is a strong strategic move for a water utility because it embeds a structured, organisation-wide approach to quality, risk management and continuous improvement. At the same time, ISO 9001 strengthens governance through documented procedures, audit readiness and accountability, while building credibility with regulators, municipalities and consumers by demonstrating a clear commitment to delivering safe, reliable and high-quality water," says Mahlangu.

She adds that South Africa has one of the best drinking water standards in the world. "Its recent amendments follow a risk-based approach, which enhances different risk categories for public safety, as well as catchment and system-specific compliance frameworks."

Source water protection

For Magalies Water, the challenge is clear. It must continue to deliver safe drinking water under increasingly difficult conditions, while advocating for systemic change upstream. This requires collaboration across government, industry and communities, as well as greater public awareness of the value of water. "Our water systems are continuously being polluted," she explains. "The improvement of water quality at an impoundment level, but at the same time, more contaminants are entering the system."

"Water is not just a commodity", Mahlangu concludes. "It is a shared resource that underpins our health, our economic development and our future. Protecting it is everyone's responsibility. People need to understand that what is discharged into the environment does not disappear. It returns, often in a different form, and often at a higher cost. What is done to water resources will ultimately be returned, in this instance, in the form of consumer costs and ecological disruptions."

APE Pumps *blends engineering expertise with AI*

Pump selection is complex, with many factors shaping its performance. APE Pumps is simplifying the process through an AI-powered tool that streamlines data analysis and improves accuracy, while still relying on experienced engineers to interpret results and ensure the pump performs optimally.

1 Pumps are only one component of a larger system where motors, piping, valves and operating conditions all interact

2 Energy efficiency plays a central role in pump selection

"Pumps are only one component of a larger system where motors, piping, valves and operating conditions all interact. Therefore, pump selection can become challenging because engineers must consider flow rate, head, pressure, fluid characteristics, system design and operating conditions, all of which influence how a pump will perform in practice. An incorrect pump can negatively affect overall performance and increase operating costs where there is excessive energy consumption, increased wear and frequent failures," explains Thorne Zurfluh, engineering manager at APE Pumps and Mather+Platt.

He goes on to say that pump selection has traditionally been a time-consuming, manual process, dependent on spreadsheets, system curves and extensive back-and-forth between consultants, suppliers and clients. "This approach leaves room for inefficiency, sub-optimal selections and long lead times – particularly problematic in sectors such as water and power, where downtime carries significant operational and financial risk."

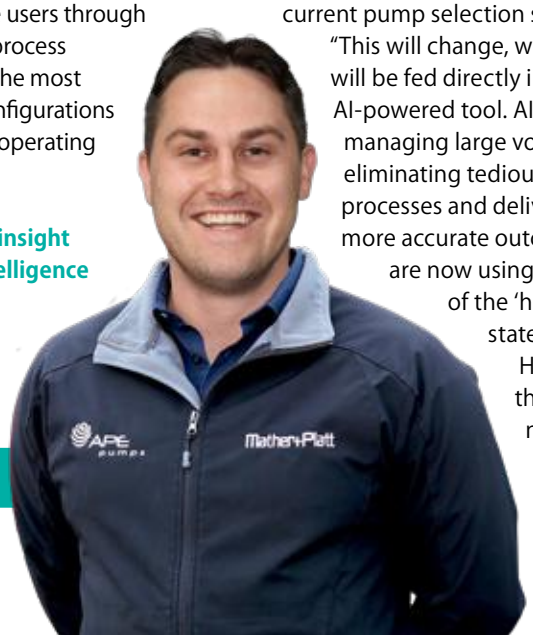
It is precisely these inefficiencies that APE Pumps is targeting through its broader digital transformation strategy. As part of this evolution, the company has developed an artificial intelligence (AI)-powered pump selection tool, designed to guide users through the specification process and recommend the most suitable pump configurations based on specific operating requirements.

Blending human insight with machine intelligence

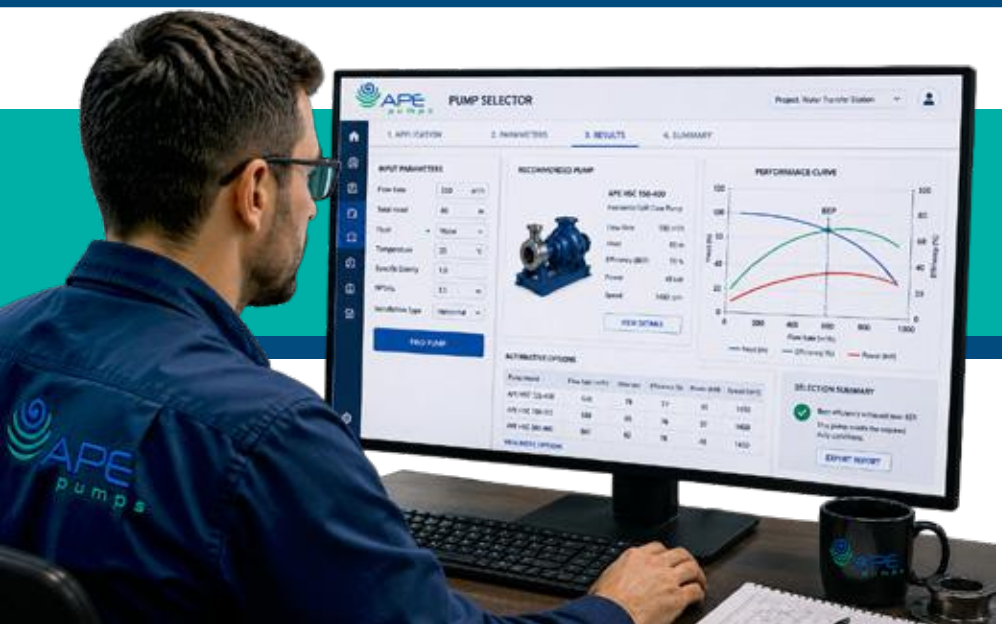
APE Pumps have traditionally used an internal sales sheet to extract information from their customers to understand their needs. From there that data was manually fed into APE Pumps' current pump selection system.

"This will change, where data will be fed directly into the AI-powered tool. AI excels at managing large volumes of data, eliminating tedious manual processes and delivering faster, more accurate outcomes. We are now using AI to do a lot of the 'heavy lifting'," states Zurfluh.

He emphasises that the tool is not intended to replace engineers.



Thorne Zurfluh, engineering manager, APE Pumps



APE Pumps is simplifying the pump selection process through an AI-powered tool that streamlines data analysis and improves accuracy, while still relying on experienced engineers to interpret results and ensure the pump performs optimally

Final pump selections are still reviewed internally to confirm that the output aligns with the actual system requirements and that the pump will perform as expected. In this sense, AI is used to support engineering teams rather than replace them. "It is vitally important to have an in-depth understanding of the data provided and where it can be used rather than merely adding data to calculations. This is where pump selection can go wrong. APE Pumps has therefore positioned key personnel to interpret the outputs from the pump selection tool. We make sure – for example – that the application, speeds and trim is correct."

Across the pump and broader engineering industry, there's a growing skills gap as traditional, hands on expertise in sizing, selecting, and understanding pumps becomes less common, while digital tools become more dominant. In the past, engineers would calculate duty points by hand, work through catalogues, and deeply understand the physics behind pump performance. Today, many people are trained mainly to operate software and rely on it to 'just give the answer,' which can lead to weak fundamentals and poor interpretation of results.

APE's pump selector can help bridge this gap by guiding users through better questions, providing clear technical explanations, and automating complex calculations – but it cannot replace the need for human understanding. "Our skilled engineers validate outputs, challenge questionable results, and make informed decisions – turning AI into an amplifier of good engineering judgment rather than a substitute for it," says Zurfluh.

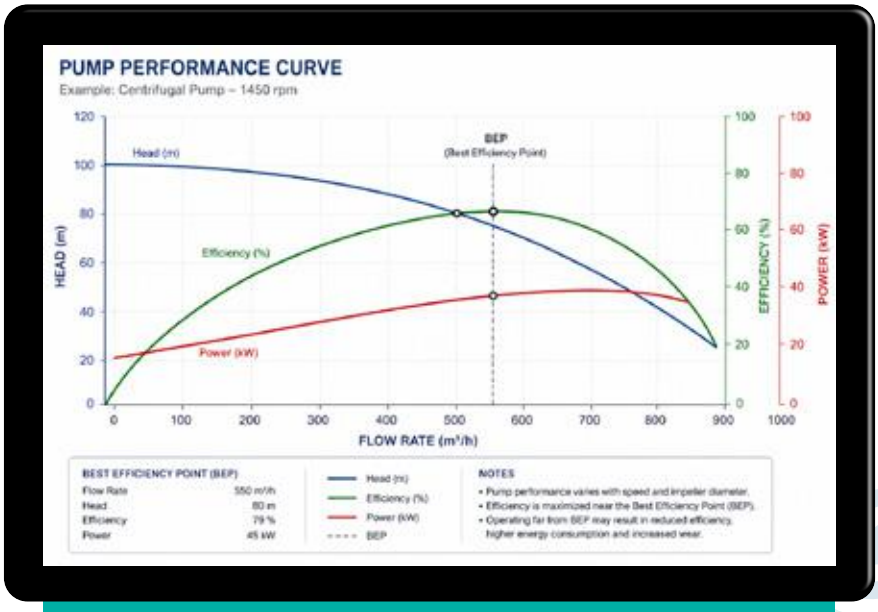
Accurate data

Using accurate data is essential to ensuring the correct pump selection. "While it may seem straightforward, in practice it requires a clear understanding of what data is needed and how to ask for it. Customers often provide incomplete, approximate or misinterpreted information, particularly when system conditions are not fully understood. Engineers therefore need to ask targeted, technical questions to clarify parameters such as flow requirements, system resistance (static and dynamic), fluid characteristics and operating conditions. We have included all of these parameters in the pump selection tool. Without this level of interrogation, there is a risk of working with incorrect data, which can result in an unsuitable pump selection, reduced efficiency and higher operating costs," maintains Zurfluh.

Energy efficiency plays a central role in pump selection. Given that pumping systems are often one of the largest energy users in water, wastewater and industrial applications, even small inefficiencies can translate into significant operational costs over time. Furthermore, with the drive to improve sustainability by reducing carbon emissions, pump selection is becoming increasingly focused on energy efficiency to ensure systems operate optimally while minimising power consumption.

APE Pumps works closely with consultants to fully understand the system in which the pump will operate. Pump performance is directly influenced by system conditions such as pipe layout, friction losses, elevation and system requirements. Without this context, there is a risk of selecting a pump that is either oversized, undersized or mismatched to the application.

Customers are first asked what type of pump they require, with APE Pumps supplying a range that includes multi-stage, split case, vertical turbine, centrifugal and submersible pumps. The next step is to establish the nature of



The tool automatically converts graphs into structured pump data and extracts key details like model and speed – turning a manual process into fast, usable digital insights

As a 74-year-old company, APE Pumps is addressing legacy paper-based processes by moving towards a more integrated, data-driven approach

the fluid being pumped. "From there, we assess the flow and head requirements. In some instances, we find that the system is gravity fed and does not require a pump at all. Flow determines the pump size and informs the pressure needed to overcome system conditions, after which consultants calculate system resistances, taking into account both friction losses and static head," explains Zurfluh.

Digitising pump test data

The AI-driven tool also digitises pump test data. Traditionally, when a pump was tested – either internally or by a third party – the result was a performance curve on paper or in a PDF. Someone then had to manually read points off that curve, select them one by one, and type the data into software so the system could rebuild the curve. This was slow, repetitive, and prone to human error.

With the tool, that process is largely automated. "You upload the performance curve in a digital format, and initially a user still indicates a few points on the graph by clicking on the screen. The AI tool then uses those clicks to interpret the graph's coordinates and convert them into structured data, such as flow, head, and other performance points. Beyond the curve itself, the tool also reads and extracts metadata from the document – things like pump model, speeds, and other test details that previously had to be typed in manually."

All of this structured data is then stored in a way the pump selection platform can use directly. That means it becomes much faster to turn legacy paper or PDF test curves into usable digital models, which improves both efficiency and data quality.

The pump selection tool has been in development for roughly a year and a half and is a core part of APE's push to modernise and improve efficiencies. "The end goal is to bring the tool to market, enabling both customers and end users to interact with it directly," says Zurfluh.

He states that with machine learning, the AI tool will continuously improve its accuracy and usefulness over time. "We plan on the tool being interactive, where it can be asked questions like 'Can I increase my head by 10%, and what changes would be required to achieve this?' The objective is to help customers optimise the performance of their existing pumps. In many cases, they prefer to avoid the cost of replacement and extensive plant modifications,and instead adapt current equipment to meet upgraded plant conditions or changing system requirements."

The AI pump selector does not simply produce a single recommendation; it is designed to present multiple suitable options side by side. Based on the defined duty point and operating conditions, the system proposes a range of pumps and highlights the differences in performance, efficiency and cost through a built-in comparison platform. This allows users to better understand the trade-offs between various configurations rather than relying on a single output. Users are given a description of the suggested pumps, curves and datasheets as well as explanations on why the selected pumps are chosen.

"Going forward, we plan for the tool to include material options and motor selections, enabling customers to evaluate upfront capital costs against expected lifespan, maintenance requirements and energy consumption. By making these variables more visible, the platform supports more transparent, data-driven decision-making. At the same time, it provides a technical rationale for each option, helping both engineers and non-specialist users understand why a particular configuration is recommended," says Zurfluh.

As a 74-year-old company, APE Pumps has some long-standing paper-driven and manual processes. "These legacy approaches work, but they create bottlenecks: people have to re-enter data, interpret handwritten or printed reports, and rely on individual expertise locked up in documents or in someone's head. That slows response times to customers, increases the risk of errors, and makes it hard to get a holistic, data-driven view of what's happening across the business. We are working hard to remove these bottlenecks," states Zurfluh.

Over the past decade APE Pumps has actively embraced digital transformation as a core component of its growth strategy, investing in advanced technologies to modernise its engineering, manufacturing and service delivery functions. This includes the integration of digital tools such as 3D scanning, real-time enterprise resource planning systems and data-driven workflows to improve accuracy, efficiency and transparency across projects.

"In today's business environment, it is no longer optional to consider artificial intelligence; companies need to actively explore and implement AI where it adds value to remain competitive and improve efficiency," concludes Zurfluh. ●

THE GREEN DROP CRISIS:
WE HAVE THE SKILLS, NOW WE NEED THE SYSTEM

South Africa's latest Green Drop Report is more than a dataset. It is a diagnostic of an essential national service in critical condition. Of 848 wastewater treatment works assessed, 396 are in a critical state, while only about a quarter meet required standards.

By Dr Lester Goldman, CEO, WISA

That's not a statistic to skim past. It means that right now, poorly treated or untreated sewage is entering water sources that millions of people depend on for drinking, farming and survival. For too long, we have treated wastewater treatment plants as the 'big toilets' of the country that only attract attention when they overflow.

The crisis is often blamed on ageing pipes and tight budgets. Both are real, but they are symptoms, not the root cause. The harder truth is that infrastructure failures reflect a deeper issue: a fragmented governance model where financial constraints, procurement delays and tariffs that don't reflect actual costs make long-term sustainability almost impossible.

Municipalities are being squeezed from every angle, but some of what's broken is a matter of focus.

The regulatory gap nobody is talking about loudly enough

Many municipalities are still operating as though Regulation 2834, an older framework built around baseline compliance and paperwork, is the standard. It isn't. Regulation 3630, the current framework, demands measurable performance and real service delivery outcomes. The gap between perceived and actual requirements is, in itself, a governance failure.

On the ground, a different story is playing out. South Africa does not lack talent. We have skilled engineers, dedicated scientists, and process controllers who are constantly upskilling, people who show up and carry the system even when the system doesn't carry them back. Yet too many are working with one hand tied behind their backs. Decisions are delayed, resources are trapped in slow processes, and institutional support is inconsistent.

As one process controller in Limpopo put it: "We know how to run these plants. We keep improving. But without support, we can't apply what we know. And when superiors don't even show up to roadshows, you have to ask, why wouldn't they want better water, better staff, better communities?"

When leadership is absent, even the most skilled professional becomes a spectator to a slow-motion disaster. Accountability isn't just about finding someone to blame when things go wrong. It's about building a system that enables people to do things right.

What WISA can and can't do

At WISA, our role is specific but vital. We don't operate plants or have the legislative power to sanction non-compliant municipalities. What we can do is professionalise the sector, set rigorous standards, certify skills and amplify the voices of practitioners. But professional bodies alone cannot fix what governance, funding and enforcement have allowed to deteriorate.

Turning this around requires movement on three fronts simultaneously:

1. Enforced accountability, with real consequences for performance failures at municipal leadership level.
2. Financial realism, funding models and tariffs that reflect the true cost of running and maintaining a modern water system, not the cost of the system we wish we had.
3. Institutional support, giving technical staff the authority and resources to match their expertise.

At WISA, we remain committed to professional excellence and to the practitioners who deliver it every day. Now we need the rest of the system to meet us there.

Because this is not just about wastewater. It is about whether South Africa can protect its water security, public health and future. And on current evidence, time is running out. ●

TURNING INSIGHT INTO ACTION

South Africa's latest Green Drop results reveal a worsening wastewater crisis, with nearly half of systems now in a critical state. More than a warning, the data demands action. The WISA 2026 Biennial Conference offers a platform to move from diagnosis to coordinated recovery across the sector.

By Dr Harrison Pienaar, chairman, WISA

As a professional body with more than 3 500 members across the water value chain, WISA is uniquely positioned to help shift the sector from crisis management to system recovery. The upcoming conference theme – Rethink Amanzi: Securing Our Future – directly responds to the Green Drop trajectory by calling for a fundamental rethinking of how wastewater systems are planned, financed, operated and governed.

First, WISA plays a decisive role in rebuilding capacity, a core failure highlighted by declining Green Drop scores. Many underperforming wastewater treatment works suffer not only from ageing infrastructure but from skills erosion, high staff turnover, and weak technical oversight. Through its rethink capacity conference subtheme, the conference aims to catalyse structured mentorship between experienced practitioners and struggling municipalities, promote professional registration and continuous development, and align training programmes with the real operational challenges faced on the ground.

Second, the crisis demands a new approach to infrastructure renewal and optimisation. Traditional, capital-intensive solutions alone have proven insufficient. Under the rethink infrastructure and rethink efficiency subthemes, WISA will facilitate knowledge exchange on modular upgrades, process optimisation, energy-efficient treatment technologies and realistic standards of service that reflect local constraints, while still protecting receiving water bodies. Showcasing proven, context-appropriate solutions can help municipalities move from non-compliance to incremental improvement.

Third, financing and governance failures sit at the heart of wastewater decline. The funding the flow and rethinking governance subthemes offer space to confront uncomfortable realities: chronic under-pricing of sanitation services, weak revenue collection, and blurred accountability between political and technical functions. WISA's convening power allows policymakers, financiers, and engineers to jointly explore alternative funding models, ring-fencing of wastewater budgets and performance-linked support mechanisms that restore both credibility and sustainability to municipal services.

Fourth, the worsening Green Drop outcomes underscore the need for better data, monitoring, and accountability. Through smart water futures subtheme, WISA aims to promote digital tools for real-time process monitoring, early warning of system failures and transparent reporting. When coupled with professional ethics and independent peer review, these tools can help prevent the silent deterioration that often precedes system collapse.

Finally, wastewater cannot be treated in isolation. Under water for life and climate-resilient water futures subthemes, the conference aims to reinforce the link between failing treatment works, polluted catchments and climate stress. By framing wastewater as both a risk and a resource, WISA aims assist repositioning sanitation within integrated catchment management and water security strategies.

The Green Drop findings are a warning, but they are also a call to action. WISA 2026 is not simply another conference; it is an opportunity for the water sector to collectively 'rethink amanzi' and translate professional knowledge into coordinated, accountable action. If WISA and its members use this platform effectively, the conference will mark a turning point from deterioration towards recovery in South Africa's wastewater systems. ●

SANS 241 evolves:

IT'S NOT THE LIST, IT'S THE RISK

South Africa's updated SANS 241 (the South African National Standard for drinking water quality) signals a fundamental shift in how potable water quality is managed, moving the sector away from tick box compliance towards a proactive, risk-based approach.

SANS 241 defines the minimum requirements for potable water to be deemed safe for human consumption, covering microbiological, chemical, physical and aesthetic water-quality parameters. What this means in practice: water that complies with SANS 241 supports long-term health, reduces risks of waterborne diseases, and ensures that drinking water meets rigorous quality, safety, and taste standards. The standard is reviewed every five years.

"We initially revised the standard, went through two iterations, and circulated it for public comment. The volume of feedback (53 pages of 255 individual comments) received was so significant that we decided to redo the entire standard," says Leanne Coetzee, specialist consultant, Waterlab.

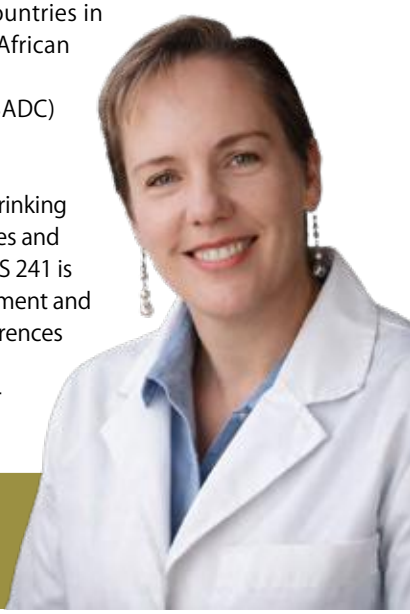
Coetzee was the previous chairperson of the South African Bureau of Standards (SABS national committee – SABS/TC147, Water – that prepared the standard. Debbie Trollip is the current chair of the committee.

Home-grown

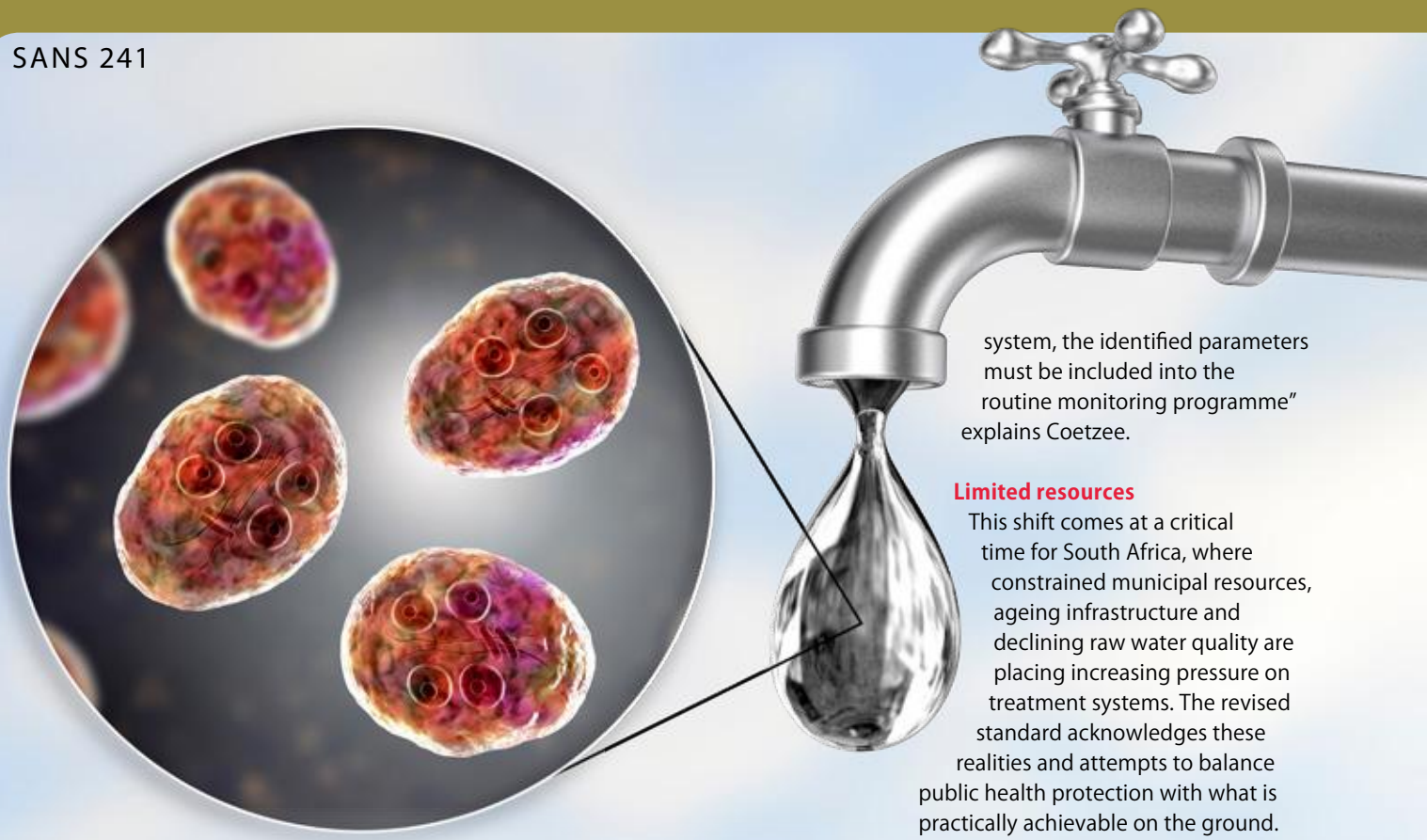
"SANS 241 is unique. While many South African standards are typically adopted from the International Organization for Standardization (ISO), often with minor adjustments for local conditions, SANS 241 is a distinctly home-grown standard. It is referenced in the Regulations relating to Compulsory National Standards and Measures to Conserve Water," explains Coetzee.

Despite the existence of World Health Organisation (WHO) Guidelines for Drinking Water Quality, Australia Drinking Water Guidelines, the United States Environmental Protection Agency the Drinking Water Directive (European Union) Drinking Water Regulations, there has always been a need for an African drinking water standard. SANS 241 is often adopted by countries in the Southern African Development Community (SADC) region.

Unlike many international drinking water guidelines and directives, SANS 241 is a shorter document and frequently references the WHO Drinking Water Guidelines,



Leanne Coetzee, specialist consultant, Waterlab and the previous chairperson of the South African Bureau of Standards (SABS national committee – SABS/TC147, Water)



particularly for health-based limits that are continuously updated by experts.

"We do not want to reinvent the wheel," adds Coetzee.

Thinking risk

The latest version of SANS 241 puts an emphasis on proactive risk management. People using the standard need to shift from 'following a table' to placing risk at the centre of water quality management.

"One of the committee's biggest concerns is getting people to think in terms of risk, rather than simply ticking off values in a table," states Coetzee. "Historically, many water providers have focused on meeting numerical limits in the standard's tables. However, this approach often led to situations where critical non-compliance issues were masked by strong performance in less important parameters."

The new approach challenges this mindset. Water service providers are now required to start with a comprehensive risk assessment. This includes analysing raw, treated and critical points within the distribution network, as well as onsite assessment of the catchment for potential contamination sources such as informal settlements, agricultural runoff or industrial activity.

"A proper risk-based assessment under SANS 241 is not confined to laboratory data alone, but combines analytical results with what is physically observed on the ground," says Coetzee.

By physically inspecting upstream activities such as informal settlements, agriculture, industry or livestock, risks are identified that are not yet reflected in the water quality results. This ensures that monitoring programmes are proactive and tailored to the specific conditions of each water supply system.

"Monitoring programmes will change based on risk assessments as they must be specific to a water supply system including its catchment area. Table 2 in SANS 241 sets out the system-specific risk defined parameters that may need to be monitored in a drinking water supply. Unlike Table 1, which lists mandatory parameters that must always be tested, Table 2 is driven by risk. It includes a wide range of chemical, organic and aesthetic parameters that must be monitored as part of the risk assessment. If identified as a potential risk within a specific water supply system, the identified parameters must be included into the routine monitoring programme" explains Coetzee.

"The latest version of SANS 241 puts an emphasis on proactive risk management. People using the standard need to shift from 'following a table' to placing risk at the centre of water quality management."

Limited resources

This shift comes at a critical time for South Africa, where constrained municipal resources, ageing infrastructure and declining raw water quality are placing increasing pressure on treatment systems. The revised standard acknowledges these realities and attempts to balance public health protection with what is practically achievable on the ground. Instead of conducting unnecessary tests, the risk-based approach forces entities to focus on the tests that are needed.

Coetzee gives a practical example: "As river systems become increasingly polluted, treating drinking water becomes more challenging, with a corresponding rise in organic contamination in drinking water plant catchment areas. While SANS 241 identifies the protozoan parasites that should be monitored, testing can be costly – a single Cryptosporidium analysis by a SANAS 17025 laboratory can cost a municipality up to R8 000. As a result, the standard emphasises the importance of maintaining low turbidity levels as a practical way to reduce the risk of pathogens entering drinking water."

This pragmatic, risk-based approach also influenced decisions around the scope of the standard. The technical committee would have liked to include more organic contaminants into the standard (such as Haloacetic acids), but decided against this due to a lack of local laboratory capacity. "An additional list of organic contaminants have been included in an annex, with the intention of incorporating them into the next revision once laboratories are better equipped," states Coetzee.

She adds that sending water samples overseas or to distant laboratories with greater testing capacity offers limited value, particularly when results take weeks to return. While they may

indicate, for example, what occurred in a catchment, the delay removes the opportunity for immediate response, by which time the water has already been consumed.

"There is ongoing concern around the financial burden these tests place on entities, and we have taken this into account by refining the standard to focus on what is truly necessary. The intention is not to reduce oversight, but to prioritise meaningful monitoring that addresses real risks. However, public health remains non-negotiable, and the standard cannot be compromised at the expense of safe drinking water," states Coetzee.

Important terms, definitions and clauses

When navigating the standard, it is critical that all definitions are read. Rural boreholes are no longer treated the same as a water treatment plant in terms of water quality monitoring requirements.

A water supply system (WSS) is defined as an asset system that includes the raw water abstraction point, the water treatment plant (WTP) up to the final water, and the distribution network up to the point of delivery to consumers. Within the same supply area, water quality can vary due to factors such as geographical location, infrastructure age, distance from the WTP, supply from multiple WTPs, or a combination of these. Each distinct water quality zone should therefore be managed as a separate WSS, with distribution network sample points selected to accurately represent each system.

A borehole system is an asset system that utilises groundwater of low water quality variability, where disinfection is practised, serving a maximum population of 5 000 people. Sampling points of a borehole system includes the final water and a limited number of distribution network sample points.

"SANS 241 makes provision for groundwater use in rural areas where water quality is generally unpolluted. In these cases, monitoring frequency and the number of required tests are reduced, with a focus on parameters specific to borehole systems. Every borehole system must have a comprehensive risk assessment of the raw water, final water, and key points in the distribution network. A full SANS 241 analysis is still required every second year with a reduced list of parameters required twice a year. Where several boreholes feed into one supply, the revised SANS 241 allows operators to monitor the combined water quality at the reservoir, rather than sampling every individual borehole," notes Coetzee.

However, systems that utilise groundwater where water quality varies, or serves populations exceeding 5 000 people, are classified as Water Supply Systems and should meet the standard requirements for a water supply system.

Additions and changes

Coetzee points out that when non-compliance occurs, there is often uncertainty around the appropriate response. To address this, the standard now includes a section on management of non-compliant results, providing more explicit direction on how to respond. When a water quality result is non-compliant, the non-compliant result must be investigated to determine the risk. The nature and urgency of the required investigation will vary depending on the risk posed, or indicated by, the non-compliant parameters.

One of the most notable technical changes is the tightening of limits such as in the case of turbidity. The turbidity

Clean, safe drinking water isn't just a regulatory box to tick – it's a social imperative, a health necessity, and ultimately foundational to the dignity and well-being of every community.

standard used to be 5 NTU for aesthetic purposes and 1 NTU as the operational limit. Now the requirement is 1 NTU. This means municipalities should target much lower turbidity levels – around 0.5 NTU or even 0.3 NTU for the final water– to keep risk low and avoid drifting into non-compliance. In this framework, 1 NTU is treated as an incident threshold: if turbidity exceeds 1 NTU, it is classified as an incident and must be managed accordingly.

"Another important addition is the renewed emphasis on protecting infrastructure. Parameters such as alkalinity, hardness and calcium carbonate stability, previously excluded from the core standard, are now highlighted as essential for preventing corrosion and pipe damage. This reflects a broader understanding that water quality is not only about health, but also about maintaining the integrity of distribution systems," notes Coetzee.

A number of new or expanded parameters have been introduced, largely to strengthen the risk-based approach and better reflect emerging contaminants and treatment realities.

One of the key additions is intestinal enterococci, which serves as an additional microbiological indicator, particularly in brackish or saline water systems. If water has a conductivity over 154 mS/m, intestinal enterococci must be tested. This complements E. coli and provides a more robust indication of faecal contamination risk in certain conditions. There is no longer a need to test for total dissolved solids as conductivity can be used to provide an estimate thereof.

Some new organics are included in the standard such as benzene, atrazine, and dichlorodiphenyltrichloroethane (DDT), all of which are linked to industrial activity or agricultural runoff or are classified as persistent organic pollutants and are assessed based on catchment-specific risk.

There has also been a refinement in how colour is measured, with the introduction of both apparent colour and true colour. Apparent colour reflects what the consumer actually sees at the tap (aesthetic risk), while true colour is measured after filtration and is more indicative of the dissolved components in the water(operational risk). This change recognises the importance of both aesthetic and operational water quality.

There is also increased attention on disinfection byproducts, such as bromate, particularly in systems using advanced disinfection methods like ozone or onsite hypochlorite generation. These compounds can form during treatment and pose long-term health risks if not properly managed.

Importantly, SANS 241 also introduces a list of parameters of concern in an annex. These are not yet mandatory but highlight emerging contaminants such as pharmaceuticals, pesticides, and PFAS. Their inclusion signals where the standard is likely heading and encourages utilities to start incorporating them into risk assessments where feasible.

Ultimately, the revised SANS 241 standard signals a maturation of South Africa's water quality framework. It recognises that ensuring safe drinking water is not about blindly following a table, but about understanding and managing risk in a complex and evolving environment. Clean, safe drinking water isn't just a regulatory box to tick – it's a social imperative, a health necessity, and ultimately foundational to the dignity and well-being of every community.

UNDERSTANDING WATER SYSTEMS, NOT JUST TESTING THEM

1 Drinking water test kits with the Talbot laboratory team
2 Talbot has invested in new LC-MS testing to tackle contaminants of emerging concern (CECs)

According to water security specialists – Talbot – the new SANS 241 is more than just a standard. It redefines drinking water management and is a tool for managing risk in a water-scarce future.

"South Africa's water landscape is changing, and with it, the way water quality is measured, managed and assured. The latest revision of SANS 241 reflects this shift, placing far greater emphasis on risk-based assessment rather than routine, tick-box compliance," explains Micole Martens, director, Talbot.

A local approach

SANS 241 stands apart as a locally developed standard specifically designed to address South Africa's unique water quality challenges, rather than simply adopting international guidelines.

While it draws on global best practice, particularly the World Health Organisation (WHO) guidelines for health-based limits, it is structured around local realities.

"A South African-specific approach is essential because standards must reflect local conditions and risk profiles. Certain contaminants, such as residual HIV-related pharmaceuticals, may be more relevant in South Africa than in other regions, while other internationally prioritised contaminants may not pose the same level of concern in South Africa. Local context therefore matters. South Africa's catchments, treatment challenges, public health pressures and infrastructure constraints are unique and must be properly understood. Locally developed standards enable more accurate prioritisation of risks, rather than relying on imported frameworks that may overlook critical issues specific to the South African environment," says Liane Henman, contracts liaison manager, Talbot.

"South Africa has a strong track record of developing robust, well-considered legislative frameworks, and this standard is no exception. SANS 241 offers a practical model that other developing countries facing similar challenges, particularly across Africa, could use as a valuable reference point," affirms Martens.

A risk-based approach

Monitoring programmes are now designed around mandatory process risk parameters, which must always be tested, and system-specific risk-defined parameters, which are selected based on

Micole Martens, director, Talbot

Liane Henman, contracts liaison manager, Talbot

SANS 241: 2025 has adopted a risk-based approach

catchment conditions and identified risks. "For laboratories, changes to this standard have been long overdue. This means that laboratories no longer test every possible parameter by default, but rather prioritise those that pose a credible risk to a particular water supply system," adds Henman.

She goes on to explain that this is an absolute game changer for the sector: "For example, if the water source is a borehole and has a low probability of containing parasites, this expensive test can be excluded from the testing regime."

Adaption needed

The amended SANS 241 demands more from the water sector. Instead of asking whether everything on a prescribed list has been tested, the standard now requires entities to justify their monitoring programmes based on a thorough understanding of their supply system and its catchment. "Did you test everything you were supposed to? Do you understand your system well enough to justify why you tested what you did? Monitoring programmes must now be robust enough to ensure that testing is relevant, targeted and fit for purpose, while also ensuring that all necessary parameters are adequately covered," states Martens.

Henman notes that many operators are accustomed to being told exactly what to test, following a simple tick-box approach. A risk-based framework, however, encourages deeper engagement-requiring questions to be asked, decisions to be justified and systems to be properly understood, which can feel unfamiliar and uncomfortable at first.

In this context, Talbot has always actively partnered with clients, rather than simply executing standard tests. This involves engaging directly with organisations to understand the specific influences affecting their water systems, from source water characteristics to operational conditions. By analysing available data to identify trends and outliers, Talbot can help design monitoring programmes that are not only compliant, but targeted and practical, ensuring that testing is both fit-for-purpose and justified.

Cost

Martens notes that while the amendments to SANS 241 may require higher initial investment, particularly as organisations gain a clearer understanding of their systems and establish baseline data, this approach supports improved cost efficiency over the longer term. Costs, she argues, should be weighed against the value of improved risk management and incident prevention. "A monitoring programme that fails to prevent water quality incidents is far more expensive in the long run, often resulting in reactive and unnecessary expenditure."

Although the transition may be more demanding initially, it enables more targeted testing, reduces the need for emergency interventions and strengthens confidence in decision-making. "Central to this shift is a well-designed risk assessment, which ensures that monitoring programmes are tailored to the specific conditions of each water system. By moving away from routine, repetitive testing and focusing only on relevant parameters, organisations can eliminate unnecessary costs while ensuring that expenditure is justified, defensible and aligned with real risks," says Henman.

Contaminants outside the standard

Not all contaminants are included in SANS 241, and this is largely by design rather than omission. One of the biggest gaps relates to organic contaminants, particularly emerging pollutants. While some, such as benzene, atrazine and dichlorodiphenyltrichloroethane, have been included, a far broader list was considered during the revision process but ultimately not incorporated into the main standard. The primary reason for this is the limited ability within South Africa to test for these compounds consistently and reliably. Many of these analyses require specialised methods, equipment

and expertise that are not yet widely available, making routine compliance testing impractical at a national level.

Instead of being ignored, these contaminants have been placed in an annexure as 'parameters of concern'. This includes substances such as PFAS, pharmaceuticals and certain advanced disinfection by-products. These are recognised as potential health risks, but they are not yet mandatory for routine monitoring. Their inclusion in the annexure serves as a signal to the sector that these contaminants are important and likely to be incorporated into future revisions as local testing capability improves.

New capacity

However, Talbot is steadily building specialised expertise to test for contaminants of emerging concern (CECs). "These analyses require significant technical and financial investment. Talbot anticipated changes required with regards to water quality testing and has been actively building the required capacity, proactively strengthening our capabilities ahead of regulatory requirements," says Henman.

Talbot recently launched their Industrial Water Security Hub at Dube Trade Port, KwaZulu-Natal establishing a dedicated facility designed to support advanced and complex environmental analyses, including CECs. The new facility is in the process of finalising rollout and validation of new analytical methods, strengthening Talbot's capability and capacity to support this testing. By combining advanced laboratory capability with engineering and data-driven insights, Talbot is strengthening its ability to help clients design monitoring programmes that are not only compliant, but relevant, defensible and aligned with real system risks.

> The standard now requires entities to justify their monitoring programmes based on a thorough understanding of their supply system and its catchment

"We are excited about the amendments to SANS 241. We can assist our clients in determining which testing is most applicable to their needs, allowing us to become a valuable partner in strengthening water security. This shift also opens the door to deeper partnerships. Laboratories are no longer just there to produce results, but to actively contribute to improved water safety outcomes. While the risk-based approach is new and will bring challenges, it ultimately enables stronger decision-making and a far more meaningful understanding of our water systems," concludes Martens.

PPPs can shockproof infrastructure

By turning water infrastructure contracts from a once-off capital project into a continuously managed, performance-driven service, public–private partnerships (PPPs) can make infrastructure far more resilient.

Within this framework, EnviroServ, a SUEZ company, brings the technical expertise and operational capability to ensure assets are not only delivered, but consistently maintained, optimised and held to performance standards throughout their lifecycle.

Dhevan Govender, general manager: Business Development (Water and Sanitation), EnviroServ believed that this model is central to addressing South Africa's infrastructure challenges. "I have worked in both the public and private sector and remain a strong advocate for PPPs. South Africa urgently needs large-scale infrastructure to tackle the water crisis, yet municipalities face funding, skills and procurement constraints. PPPs bridge these gaps, unlocking investment, expertise and long-term service delivery. PPPs effectively embed long-term performance, funding and accountability into a single contractual framework."

He notes that this long-term, performance-driven approach is underpinned by lifecycle costing, which is built into the PPP framework. "Life cycle costing is a way of looking at the total cost of providing a service over the PPP's contract term, rather than just focusing on the upfront price tag of building infrastructure. In water and wastewater for example, that means asking: what will it cost not only to design and construct a treatment plant, but also to operate it, maintain it, replace critical components, and eventually hand it back to the utility. Instead of a narrow 'project cost', it becomes a full journey view of the asset and the service it delivers."

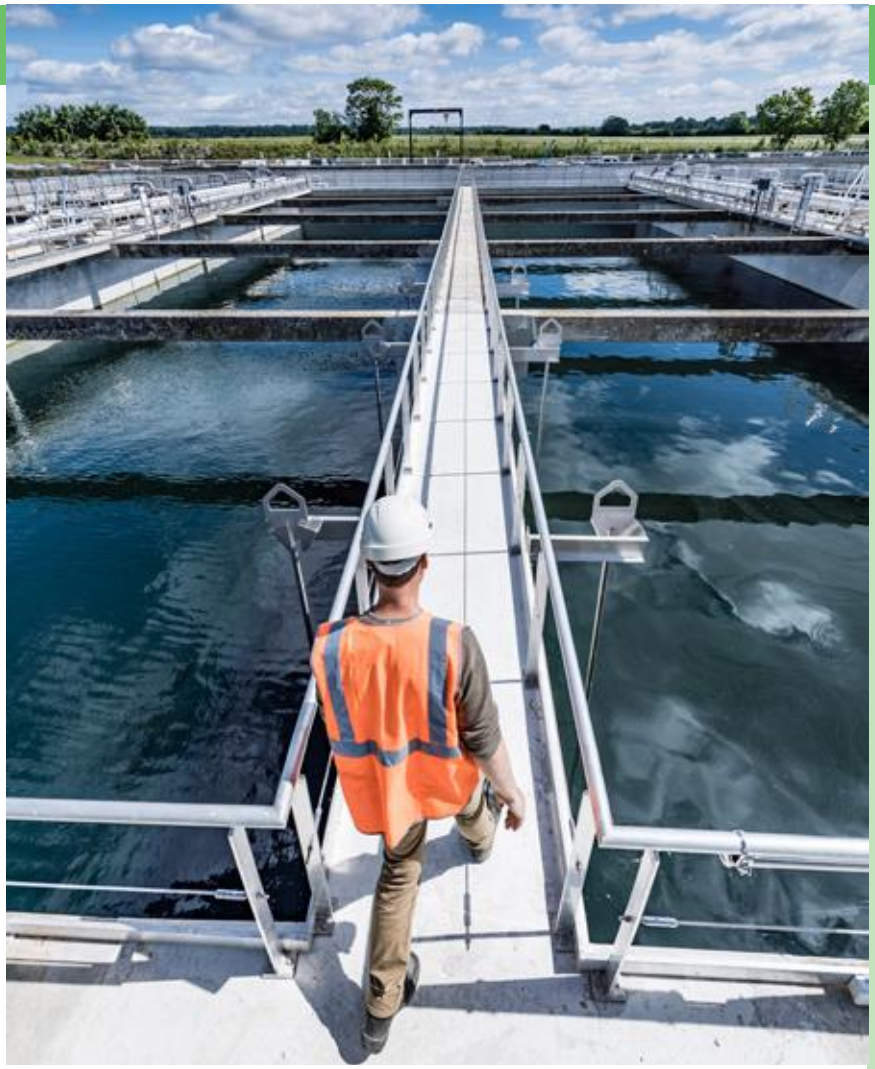
Dhevan Govender, general manager: Business Development (Water and Sanitation), EnviroServ

Because PPPs are structured around long term performance rather than once off construction, the private partner is contractually obliged to deliver a set volume and quality of water or sanitation services for the full term of the agreement, and only gets paid when that output is delivered. This 'pay for performance' model, underpinned by life cycle costing and clear penalties for non compliance, effectively guarantees a more reliable and predictable water supply than traditional build and walk away projects.

Misconceptions

Govender maintains that there are three key misconceptions about PPPs:

- that PPPs are a form of privatisation



- that PPPs are about procuring an asset
- that there is always an unfair allocation of risk for either the public or private sector

He explains that PPPs are often wrongly equated with privatisation, when in reality the public sector retains ownership, regulatory control and oversight. The municipality remains the water services authority, sets tariffs and standards, and ultimately receives the asset back at the end of the contract. The private sector's role is to design, finance, build, operate and maintain the infrastructure for a defined period, under strict contractual and performance conditions.

"PPPs are also often misunderstood as a way for municipalities to procure infrastructure, but the model is fundamentally different. Rather than buying an asset, municipalities are procuring a service over the life of the contract. The private partner is responsible for designing, financing, building, operating and maintaining the infrastructure, and is only paid when it delivers the agreed output, such as water and sanitation services that meets the agreed quality and standards. This shifts the focus from once-off capital delivery to long-term performance, reliability and accountability, ensuring that infrastructure continues to function as intended well beyond commissioning," he adds.

The third misconception is around risk. In practice, PPPs are structured to allocate risk to the party best equipped to manage it. The private partner takes on significant delivery and performance risk, including financing, construction, operational efficiency and meeting output specifications. Payment is typically linked to performance, meaning the private sector is only paid when it delivers the required service standard. At the same time, certain risks remain with the public sector, particularly those linked to its mandate, such as providing effluent feedstock or maintaining broader system integrity. The public sector is often called upon to provide guarantees. From a private sector perspective, there needs to be confidence that payments will be honoured over the life of the contract, which is where mechanisms such as payment guarantees, credit enhancements and, in some cases, government-backed support become critical in enabling meaningful progress in South Africa's water sector reform. The model is therefore built on balanced risk sharing, not risk dumping.

Expertise

Looking ahead, Govender believes PPPs will play an increasingly important role in ensuring water security, particularly as cities face aging infrastructure, rapid population growth and rising demand.

However, there is a clear shortage of institutional expertise when it comes to structuring PPPs, particularly within the public sector. "Many municipalities lack the technical, legal and financial skills required to develop bankable projects, resulting in poorly defined scopes, weak feasibility studies and contracts that fail to attract private sector participation."

On the private side, experience is often concentrated among a limited number of players, which further constrains the market. Without the right skills to structure, assess and manage these partnerships, viable

projects are either delayed or fail to progress beyond concept stage.

To address this, the Water Partnerships Office has been established to support project preparation and improve the quality of PPPs entering the market. Its role includes assisting municipalities with feasibility studies, standardising processes, and helping to package projects in a way that meets National Treasury requirements and attracts investment. "This is a critical intervention, as it begins to close the skills gap and create a more consistent pipeline of credible, well-structured PPP opportunities," adds Govender. "There are unfortunately no short cuts; feasibility studies and fair, robust contractual frameworks must be in place to attract private investment."

Making PPPs work

In addition to guarantees, every PPP needs termination clauses as they define what happens if the agreement needs to be ended early due to non-performance, financial distress or unforeseen events. In long-term infrastructure projects, these clauses provide clarity and protection for both parties by outlining the conditions under which termination can occur and the associated financial implications.

Viability gap funding (VGF) has also been introduced to PPPs. In practice, VGF bridges the gap between what a project can earn through user charges or municipal payments and the actual cost of delivering the service. This support can take the form of an upfront capital contribution, ongoing subsidies or blended finance mechanisms.

Importantly, VGF does not replace private sector investment. Instead, it de-risks the project and improves its bankability, enabling private partners to participate while still ensuring affordability for users. In this way, it allows socially necessary but financially constrained projects to move forward.

Transparency is also critical to the success of PPPs, particularly in a sector as sensitive as water and sanitation. Because these projects involve public funds, long-term contracts and essential services, there must be clear visibility on how decisions are made, how risks are allocated and how performance is measured.

"Ultimately, a transparent process builds trust among stakeholders, including communities, regulators and investors. It also strengthens accountability, ensuring that both public and private partners deliver on their obligations. Without transparency, PPPs risk being misunderstood or misrepresented, which can undermine public confidence and delay much-needed infrastructure delivery," explains Govender.

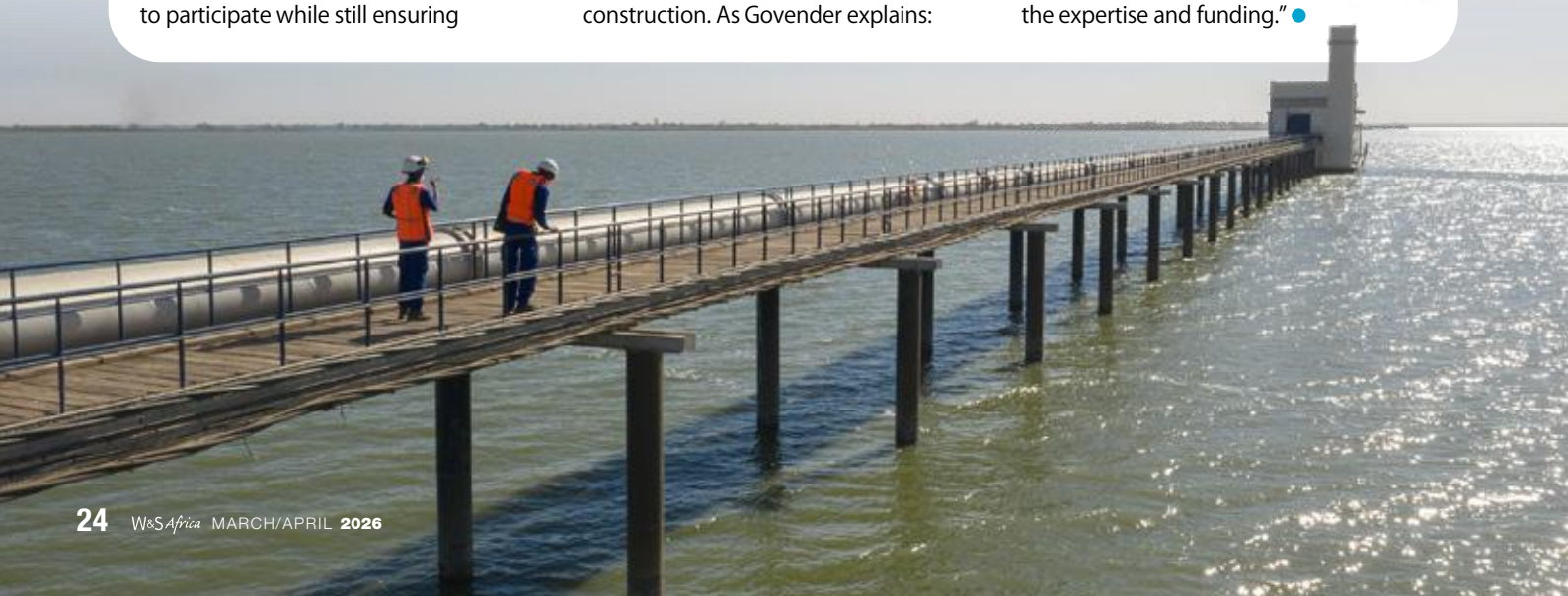
Recent amendments to Section 16 of the Public Finance Management Act are intended to streamline the approval process for PPP projects with a contract value below R2 billion. "This is a positive development and well suited to smaller-scale projects," says Govender. "However, for the country's larger metropolitan municipalities, the full lifecycle cost of major infrastructure – such as a wastewater treatment plant, including design, construction, operation and maintenance over the term of a PPP agreement – will typically exceed the R2 billion threshold."

Moving forward

EnviroServ, through its association with SUEZ, brings deep, specialised experience across the full water and wastewater value chain, not just construction. As Govender explains: "SUEZ is a global leader in the water and waste management sectors with a strong global track record. In 2025, the Group supplied 67 million people with safe drinking water and served 14 million people through waste collection services. SUEZ has built 10 000 water and waste treatment plants around the world, over 2 850 wastewater plants as well as 260 desalination plants. That means EnviroServ can draw on proven technologies and operating models for exactly the kinds of complex, long term solutions South African municipalities now need, from non revenue water reduction to upgrading and optimising existing wastewater treatment works."

Unlike short term engineering, procurement and construction contractors that build and walk away, EnviroServ's model is to stay in for the long haul through concessions and long term operation and maintenance contracts. That aligns with the PPP principle of procuring a service, not just an asset, and ensures that plants are operated and maintained to a guaranteed standard over the life of the contract. The company's focus on localising expertise and partnering with South African contractors also means capacity is built within the country rather than imported temporarily.

The public sector needs to consider the cost of not implementing water and sanitation PPP projects. Reliable water and sanitation services are a prerequisite for investment, with industries requiring guaranteed supply before committing capital. "What is the cost of having no water? If municipalities cannot guarantee water and sanitation services, investors will simply go elsewhere," warns Govender. "Municipalities have the vision and mandate while the private sector has the expertise and funding."



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THE RIGHT TO WATER USE: PROGRESS, GAPS AND PATHWAYS FORWARD

South Africa's water governance framework is built on one of the most progressive constitutional foundations in the world. Yet the gap between the lawful right to use water and practical delivery remains one of the country's most pressing challenges. **Kirsten Kelly** talks to **Francois Joubert** – a partner at Fasken – about water rights.

Section 27(1)(b) of the Constitution of the Republic of South Africa, 1996, states that everyone has the right of access to sufficient water, placing a clear obligation on the state to respect, protect, promote and fulfil this right.

What is access to sufficient water?

Defining what constitutes 'sufficient water' is far more complex than it appears in law. While the Constitution establishes the right, the regulatory framework attempts to qualify and quantify it. The Water Services Act 108 of 1997 (WSA) defines the minimum standard of basic water supply as 25 litres per person per day, or six kilolitres per household per month. This supply must be accessible within 200 metres of a household, delivered at a minimum flow rate of 10 litres per minute, and provided with sufficient reliability so that no consumer is without water for more than seven full days in any year.

The Act defines basic water supply as 'the prescribed minimum standard of water supply services necessary for the reliable supply of a sufficient quantity and quality of water to households, including informal households, to support life and personal hygiene'.

"In practise, I would say that sufficient water means reliable, safe and accessible water for personal and household use. In reality, however, in a water stressed region like South Africa with service delivery failures across many municipalities, these standards are often not met. Ageing infrastructure, insufficient maintenance and capacity constraints within municipalities have led to widespread

FRANCOIS JOUBERT, PARTNER, FASKEN

With more than 28 years of post-admission legal and corporate experience Francois Joubert provides clients with legal, strategic and commercial/transactional advisory services in the natural resources, ESG, renewable energy, land use planning, power, oil and gas, mining and industrial related sectors.

supply interruptions. In some communities, residents experience water outages lasting weeks or even months, far exceeding the allowable service interruptions outlined in regulation," says Joubert.

He notes that the impact falls most heavily on the poor and vulnerable. "The result is that access to water in many areas remains a theoretical right rather than an operational reality."

Environmental protection

Water of sufficient quantity must be provided to households, but equal emphasis must be placed on quality, as required by both the Constitution and reinforced by the WSA.

Therefore, the National Water Act (NWA) imposes a strict 'duty of care' on landowners, occupiers, and persons in control of land to prevent water pollution. Specifically, Section 19 of the Act mandates that reasonable measures be taken to prevent pollution of water resources from occurring, continuing, or reoccurring due to activities on their land. Activities that threaten water quality must be mitigated and managed to protect ecosystems and downstream users.

"This means that industries such as mining and agriculture must implement robust water management systems, monitor their impacts and take responsibility for remediation where pollution occurs. This principle is closely aligned with broader environmental legislation and reflects the constitutional right to an environment that is not harmful to health or wellbeing," notes Joubert.

He adds that if this duty of care applies to ordinary citizens, it should apply even more stringently to the State. "As the custodian of public resources and the recipient of taxpayer funding, government carries a heightened obligation to safeguard water resources, maintain infrastructure and ensure consistent service delivery. This includes preventing pollution, enforcing compliance and investing in systems that guarantee reliable access to safe water for all."

Section 24 of the Constitution guarantees everyone the right to an environment not harmful to their health or well-being. The National Environmental Management Act (NEMA) creates a broad, powerful 'duty of care' for anyone who owns, controls, occupies, or uses land where an activity

causes, has caused, or is likely to cause significant pollution or environmental degradation, including harm to water resources.

Under this framework, regulators can apply the principle of joint and several liability, meaning that multiple responsible parties can each be held fully liable for the cost of preventing, stopping, or remediating the harm. In practice, this allows authorities to pursue any one or more of the responsible parties – for example, a landowner, an operator, or a polluting company– for the full extent of the reasonable measures required, leaving those parties to sort out contributions between themselves. This approach is intended to ensure that environmental and water-resource impacts are actually remedied, rather than lost in disputes about who is more at fault, and aligns with the constitutional right to an environment that is not harmful to health and well-being.

Institutional responsibilities and governance

"The State – through the Department of Water and Sanitation (DWS) – acts as the custodian of the country's water resources. The DWS has the legislative mandate to ensure that the country's water resources are protected, used, developed, conserved, managed and controlled in a sustainable and equitable manner for the benefit of all South Africans," explains Joubert.

South Africa's water governance structure distributes responsibilities across multiple spheres of government. Municipalities carry the primary responsibility for delivering water and sanitation services to communities, while national government sets policy, regulates the sector and intervenes only under specific circumstances.

This layered system is designed to protect local autonomy while ensuring oversight. However, when municipalities fail to meet their constitutional obligations, intervention mechanisms can be slow and procedurally complex.

Legal frameworks do allow for national government to assume certain municipal functions in extreme circumstances. "Yet these processes involve strict procedural safeguards and can take considerable time to implement, delaying urgent solutions for communities facing water shortages. A mayor, for example, cannot be dismissed without following massive constitutional and statutory processes," states Joubert.

He adds that there are long-standing institutional structures in place that can improve service delivery. "Irrigation boards and water user associations have historically played a key role in managing water resources efficiently, particularly in agricultural regions. Many stakeholders argue that strengthening these institutions, rather than centralising control, could provide more effective water management in certain contexts."

Water use licenses

In a South African context, even though water is a shared public resource that can be used by everyone in the country, there are instruments in place to ensure that water is used sustainably. These include existing water use, general authorisations and water use licenses (WUL).

A WUL is a legal authorisation issued by DWS that allows an individual, company or institution to use water for a specific purpose. It forms part of the regulatory framework established under the NWA.

"In practice, a WUL is required where a proposed activity could have a significant impact on a water resource or on other users. This includes activities such as abstracting water from rivers or groundwater, storing water, discharging waste into water systems, altering a watercourse, or using water for industrial, mining or agricultural purposes . The licence sets out the terms and conditions under which the water may be used, including limits, monitoring requirements and environmental protections," states Joubert.

To obtain a WUL, an applicant must submit a formal application to DWS.

The process typically involves technical assessments, public participation, and consideration of factors such as environmental sustainability, existing lawful users, and the broader public interest before a decision is made .

Ultimately, a WUL is a key mechanism for ensuring that water, as a scarce and shared national resource, is used in a controlled, equitable and sustainable manner. "Government has introduced reforms aimed at fast-tracking WUL applications, with measures seeking to reduce decision-making timeframes to just a few months in order to support strategic infrastructure and economic development. In many cases, we have seen a considerable improvement," says Joubert.

Under the NWA, not all water use requires a WUL. The Act provides for certain exempted or permitted use categories, provided specific conditions are met.

Existing lawful use applies where a person or entity, in certain circumstances, was already using water legally before the NWA came into effect in 1998, and that use continued within the required timeframes for registration of the existing use. In such cases, the user may continue using water under the same conditions, even without a licence, although the use may need to be registered and could later be subject to licensing or restrictions.

General authorisations allow certain types of water use without a licence, provided they fall within defined limits and conditions set by the NWA and does not trigger any water use as provided for under Section 21 of NWA. These are typically low to medium-impact activities where the risk is known, predictable and manageable. While a licence is not required, users must still comply with conditions and often need to register the use. General authorisations are straightforward to obtain.

Schedule 1 use are small-scale, low-impact uses that are automatically permitted. They typically include

Water security is no longer viewed as a purely an environmental impact issue. It has become a core business risk that can influence financing, regulatory approval and a company's long-term licence to operate.

reasonable domestic use, small-scale gardening, and watering of animals for personal use. The idea is that these uses are unlikely to significantly affect water resources or other users, so they do not need formal authorisation.

"One can say that together, these exempted categories create a tiered water use system. Low-risk uses (Schedule 1) are automatically allowed, moderate-risk uses are controlled through general authorisations, and higher-risk or more complex uses require a full water use licence. This approach helps balance accessibility with the need to protect and manage South Africa's limited water resources," maintains Joubert.

The growing importance of ESG

This structured, risk-based approach to water use regulation also aligns with the growing global focus on environmental, social and governance (ESG) principles. As water becomes an increasingly constrained and scrutinised resource, financial institutions and investors are placing greater emphasis on responsible water stewardship when assessing projects.

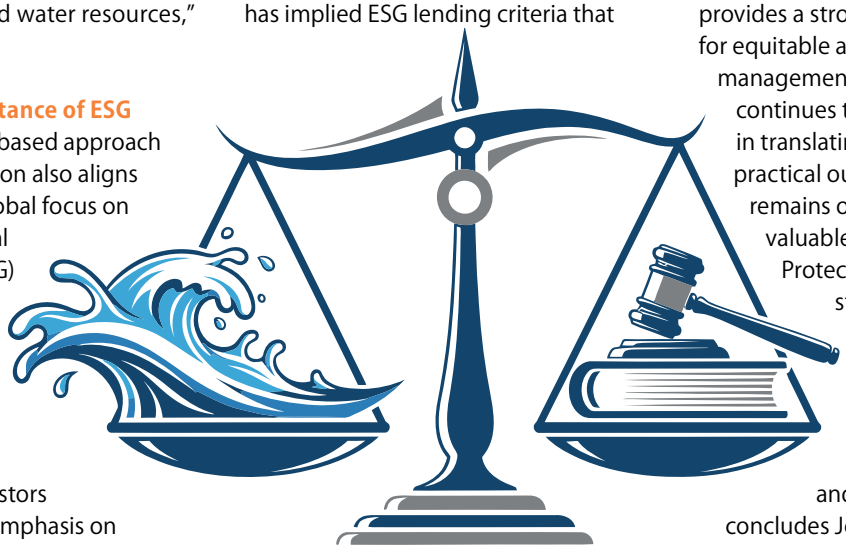
Companies seeking funding must often demonstrate that their operations manage water sustainably, protect the existing and future water use of surrounding communities and align with international frameworks such as the United Nations - Equator Principles, United Nations Principles for Responsible Investment, the Initiative for Responsible Mining Assurance and other responsible investment principles. This protects funders from reputational risk and financial losses.

"Almost every reputable financier now has implied ESG lending criteria that explicitly reference climate change, biodiversity protection, and responsible, sustainable water resource management and risk management – all of which form an integral part of a transparent, responsible, and meaningful lending assessment process," says Joubert.

He adds that in most cases, industries whose operations pose a risk to a community's access to safe, sufficient and affordable water are taking accountability very serious. "Companies have made great efforts to align their water management principles, procedures and policies with global sustainable development goals (SDGs). The most successful projects demonstrate a sustainable and accountable approach."

Water security is no longer viewed as a purely an environmental impact issue. It has become a core business risk that can influence financing, regulatory approval and a company's long-term licence to operate.

"South Africa's water legislation provides a strong legal framework for equitable access and sustainable management. Yet the sector continues to face major challenges in translating these principles into practical outcomes. Ultimately, water remains one of South Africa's most valuable and vulnerable resources. Protecting it will require both strong governance and innovative partnerships that recognise water not only as a constitutional right, but as the foundation of social and economic stability," concludes Joubert.



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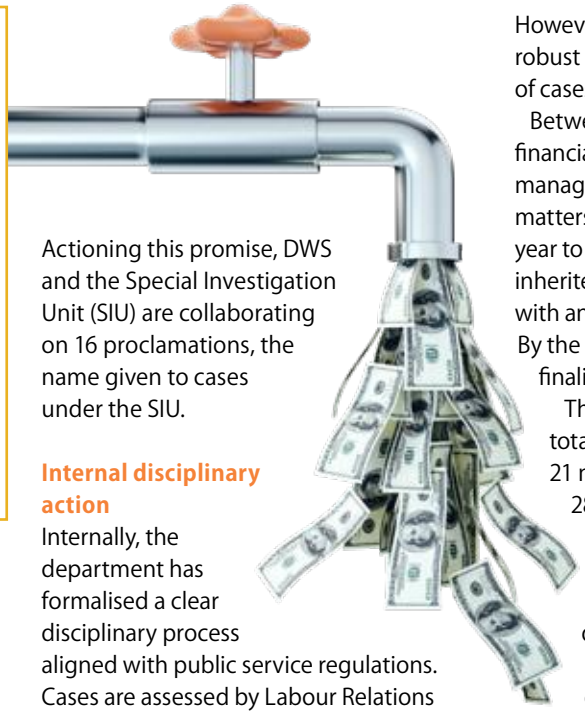
CORRUPTION IN THE SYSTEM: **DWS TIGHTENS ITS GRIP**

South Africa's water crisis is often framed in terms of low investment, lack of maintenance, and non-revenue water, but an underlying problem, sometimes the driver of these issues, is corruption and fraud within the water sector. **By Duncan Nortier**

In the Minister of Water and Sanitation's own words, "this Department of Water and Sanitation (DWS) has historically been affected by financial mismanagement, irregular expenditure, and weak internal controls." Under her tenure as minister, there has been heightened scrutiny of municipalities, and the Department has adopted a zero-tolerance approach to corruption. This has manifested in punishing offenders through suspensions, dismissals and, where appropriate, criminal prosecution. And with the added teeth that the National Water Amendment Bill aims to provide the department, this will likely continue.



Actioning this promise, DWS and the Special Investigation Unit (SIU) are collaborating on 16 proclamations, the name given to cases under the SIU.

Internal disciplinary action

Internally, the department has formalised a clear disciplinary process aligned with public service regulations. Cases are assessed by Labour Relations to determine whether sufficient evidence exists, after which they may be resolved through progressive discipline, such as warnings, or escalated to formal hearings. Employees are afforded the right to respond to allegations, representation during hearings, and the ability to appeal outcomes. This process is supported by internal governance mechanisms, including a Consequence Management Committee and regular oversight by executive leadership.

However, while the framework appears robust on paper, the volume and duration of cases suggest ongoing systemic strain.

Between the 2023/24 and 2025/26 financial years, the Department has been managing a steady flow of disciplinary matters, many of which are carried over year to year. In 2024/25, 22 cases were inherited from the previous financial year, with an additional 27 new cases reported. By the end of that period, 18 had been finalised, leaving 31 still in progress.

The trend continues into 2025/26. A total of 31 cases were carried over, with 21 new cases added. As of March 2026, 28 cases had been finalised, while 24 remained in progress. Notably, only a portion of these resulted in sanctions, with others closed due to resignation, retirement, or death, an issue that continues to complicate accountability efforts.

Sanctions imposed for financial misconduct show a reliance on corrective rather than punitive measures. In 2024/25, just two dismissals and two suspensions without pay were recorded, alongside several warnings. In contrast, 2025/26 saw an increase in total sanctions issued (21 cases), but the majority were still final written warnings rather than dismissals. This raises ongoing questions about whether disciplinary outcomes are sufficiently stringent to deter

misconduct, particularly in cases involving financial irregularities.

In addition to financial cases, the Department is also dealing with a significant number of non-financial misconduct cases. For 2025/26, 40 such cases were recorded, with 23 finalised and 17 still in progress.

Sanctions in these cases similarly skew towards suspensions combined with final written warnings, though there have been instances of demotion and at least one case resulting in a not guilty finding.

Pattern recognition

Financial misconduct is often repeated, resulting in a pattern of behaviour rather than a single instance and is largely linked to:

- Irregular expenditure
- Fruitless and wasteful expenditure
- Fraudulent subsistence and travel claims
- Procurement irregularities, including failure to award bids to the highest-scoring suppliers
- Unauthorised remunerative work outside the public service

These trends point to weaknesses in procurement controls, financial oversight, and ethical compliance, areas that have long been under scrutiny in the public sector.

SIU referrals: progress and complexity

A key component of the department's disciplinary workload stems from referrals by the Special Investigating Unit (SIU). These cases often involve complex, high-value contracts and can take years to resolve.

For example, disciplinary action linked to the Vaal River East Sub-System project involved multiple officials at different levels, with mixed outcomes ranging from dismissal to no action, depending on the evidence presented. In other cases, such as the Giyani Water Project, disciplinary processes intersect with ongoing litigation and criminal investigations, further delaying resolution.

Several SIU investigations, including those related to initiatives like 'War on Leaks' and 'Drop the Block', remain ongoing, with expected completion dates extending into mid-2026.

Overall, the Department reported 51 finalised disciplinary cases and 41 still in progress as of March 2026, spanning both financial and non-financial misconduct.

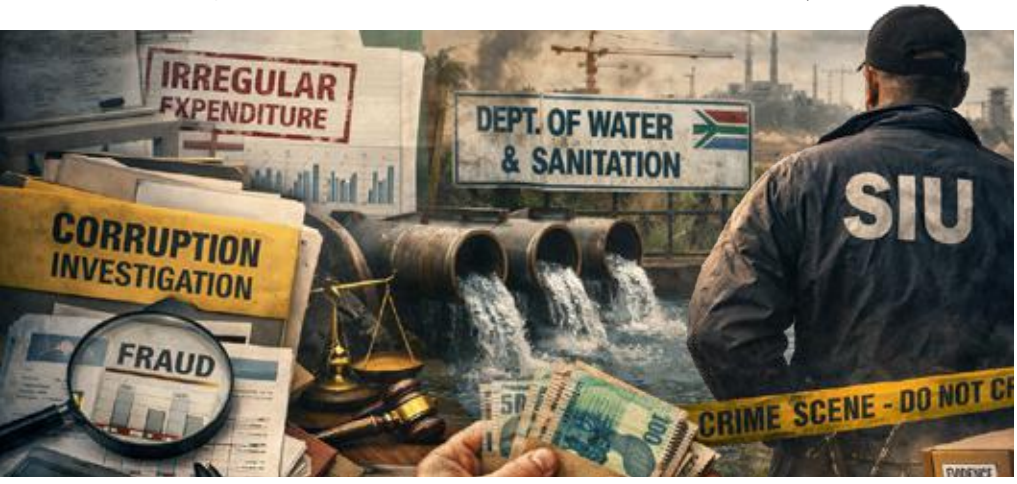
While there is evidence of progress, particularly in the increased number of cases being finalised, the persistent backlog, coupled with relatively lenient sanctions in many instances, suggests that consequence management remains a work in progress.

This underscores a broader challenge facing the public sector: balancing procedural fairness with the need for timely and decisive action. As scrutiny intensifies, the effectiveness of disciplinary systems will be a key indicator of institutional integrity and a deciding factor in restoring public trust.

External measures

As previously stated, the department is also working alongside the SIU as a means of prosecuting the more serious criminal cases.

These ongoing investigations span major infrastructure and service delivery projects, including those linked to Lepelle Northern Water, the Rooiwal Wastewater Treatment Works in Tshwane, and water and sanitation services in eThekwini, as well as projects in municipalities such as Masilonyana and Dihlabeng. These cases frequently involve large-scale contracts where weak supply chain management has allowed costs to escalate far beyond initial budgets. Completed investigations into projects such as the Vuwani pipeline, COVID-19-related procurement at Amatola Water Board, and contracts awarded to major service providers have resulted in a mix of disciplinary, civil, and criminal referrals. However, the SIU's inability to prosecute directly means that accountability depends on coordination with other law enforcement and judicial bodies, where delays continue to limit the effectiveness of consequence management.



To address these systemic risks, the SIU has recommended stricter supplier vetting, including mandatory tax compliance and company registration checks, as well as enhanced disclosure of conflicts of interest by both suppliers and public officials. Additional measures include strengthening oversight of tender evaluation and adjudication processes, improving documentation and recordkeeping systems, and centralising the management of officials' external business interests. Greater investment in training on supply chain management and ongoing enforcement of anti-corruption legislation are also seen as critical. Together, these reforms aim to close governance gaps, protect public funds, and ensure that infrastructure investment translates into reliable and functional water services. ●

SOLVING **COMPLEX WATER CHALLENGES** ACROSS **BORDERS**

Founded over a decade ago, Watericon is a full service water treatment company. Headquartered in Johannesburg, its roots are firmly local, but its ambition is global. **Kirsten Kelly** talks to **Chris Ashmore** – CEO of Watericon – about operating a business beyond South African borders.

"We have established operations in Ghana, are expanding into Tanzania, and have an Abu Dhabi base too. Over the past decade, we have successfully completed turnkey projects in Botswana, Ivory Coast, Senegal, Nigeria, Democratic of Congo, Saudi Arabia, Eswatini, Zambia and Tanzania.

The model is not to open offices everywhere, but to establish strong regional bases in Southern Africa, Western Africa, Eastern Africa and the Middle East, capable of servicing neighbouring countries," explains Ashmore.

Local presence

Many African countries have developed 'local content' policies to foster domestic economic growth. They want foreign businesses to establish a local office, register a local entity, or have a physical presence to operate, pay taxes, and comply with local laws.

Watericon established offices in Ghana over two years ago. "Our expansion into Ghana strengthens our ability to support industries that are vital to the region's growth. We supply high-quality water treatment chemicals to major mining operations and work alongside leading power producers to ultimately ensure reliable and efficient operations," adds Ashmore.

The company is currently establishing Tanzanian operations with on-ground support staff and a dedicated chemical blending facility.

Beyond Africa, Watericon is setting up a 9 000 m^2 facility in the United Arab Emirates (UAE) as a launchpad into the Gulf, Middle East and North Africa. "The UAE presents a different environment:

Chris Ashmore, CEO, Watericon

highly regulated, heavily documented and compliance driven. Every structural modification can require multi-level approvals. Standards are stringent, inspections frequent and operational oversight intense. But the opportunity is significant. The region's mega desalination projects dwarf most African installations," explains Ashmore.

He has spent a significant amount of time in the UAE, Ghana and Tanzania to assess both the risks and opportunities before setting up regional bases. "In the water sector, having feet on the ground is critical to maintaining oversight, resolving challenges promptly and keeping projects on track."

Across Africa, mining licenses and industrial permits are increasingly linked to how water is managed and discharged, forcing companies to invest in compliant, reliable systems. Operating a water treatment company across Africa and the Middle East region means navigating a complicated and often paradoxical water landscape. While these regions are frequently associated with water scarcity, some areas face the opposite problem: too much contaminated water, and the lack of infrastructure to treat and dispose of it ethically. Sewage spills, acid mine drainage, pollution, and dust all create unique challenges when it comes to wastewater treatment. Environmental regulations add another layer of complexity. Water

ABOUT WATERICON

Watericon is a full-service water treatment company offering custom-engineered plants to pre-packaged modular units, supported by a full supply of water treatment chemicals and backed by a SANAS accredited laboratory for water analysis. It also offers operations and maintenance services, delivering a complete turnkey solution.

There is a research and development team that focuses on turning lab insights into practical, commercial water-treatment solutions. Watericon also has a fleet of modular rental plants, (ranging from 100 m^3/h to 10 Mℓ/day) that can be taken directly to customer sites to test real feedwater and validate treatment concepts before full-scale investment. These pilots can be configured with technologies like membranes, and ion exchange, allowing the team to refine the process and costs under actual operating conditions.

Since mining remains one of the strongest opportunities across Africa, Watericon also has a team of metallurgists that look at the treatment of mining effluent.

treatment companies that can help industrial clients reduce freshwater usage, recycle wastewater, or implement zero-liquid discharge systems not only help them meet regulatory requirements but gain a competitive edge.

Ashmore adds that challenges include limited infrastructure, unreliable power supply, and transport and supply chain limitations. "To operate in Africa, treatment companies must invest in back-up power solutions, and build a transport network to get modular plants, chemicals and equipment to remote areas. Some specific operational challenges include highly variable turbidity levels in source water, requiring dynamic treatment protocols to dose chemicals correctly."

Work in Africa is often beset with logistics delays, shifting import regulations and port backlogs that can derail projects. There can be exchange rate volatility and delayed payments. Currency constraints such as limited access to foreign currency, can significantly impact project costs, procurement timelines and overall financial viability in many African markets. Containers can sit at port for weeks or months if documentation requirements change mid-shipment. Elections in certain countries can temporarily disrupt ports altogether. Many countries have intermittent energy supply. These realities demand patience, capital resilience and careful partner selection. In countries such as Senegal and Ivory Coast, operating in predominantly French-speaking environments can present communication challenges, making it essential to partner with local teams that are fluent in the language and able to bridge cultural and technical gaps.

"It's key that we develop and train local skills," says Ashmore. "We believe in

fostering young talent and empowering communities to take ownership of sustainable water management solutions."

The competitive landscape in Africa is shifting rapidly. Chinese, Indian, and Turkish companies are entering African markets aggressively, often with scale advantages and strong financing backing. In mining and large infrastructure projects, Chinese engineering, procurement and construction (EPC) contractors can deliver at scale few others can match.

However, Ashmore notes that across many African markets there is a strong preference for partnering with South African companies, given their proven work ethic, depth of skills, technical capabilities and experience working in challenging operating environments. He adds that South African companies are also competitive in terms of pricing and overall project cost efficiency, especially when compared to European counterparts. "Watericon focuses on identifying and solving a client's specific pain points – the difficult water and effluent challenges that impact production, compliance or recovery – and then designing tailored solutions around those."

Watericon's experience operating across Africa has strengthened their ability to navigate complex operating environments, equipping them with the resilience, flexibility and problem-solving capabilities needed to deliver reliable solutions in South Africa. "We often operate in very remote locations in various African countries, where a missing part or product cannot be easily retrieved. This means planning must be meticulous, with the right equipment, chemicals and spares available from the outset to avoid costly downtime and ensure that operations continue uninterrupted. The same disciplined approach has been applied to projects in South Africa," explains Ashmore.

Financing, technology and AI

There is a growing demand for financed water infrastructure across the African continent.

Industrial clients are increasingly favouring operational expenditure models over capital investment. In response, Watericon has expanded its rental fleet and financing capacity, supporting build-own-operate structures and long-term cubic metre payment models.

The trend reflects a broader shift: water treatment is no longer only about compliance. It is about reuse, process optimisation and cost recovery.

"Looking ahead, data integration and AI-driven plant optimisation are emerging priorities," says Ashmore. With online monitoring systems and global plant data sets, predictive maintenance and performance optimisation become possible. Instead of reacting to failure, operators can anticipate it. Instead of guessing at process instability, plants can draw on data from hundreds of similar systems worldwide.

"At the same time, Watericon's approach to innovation remains pragmatic. The company built its early success not by inventing new technologies, but by executing proven technologies better, faster and more cost effectively."

"There are not many water treatment companies that have the appetite to set up regional offices in other African countries. We believe our growing footprint enables us to deliver reliable water treatment solutions while responding quickly to the diverse challenges across African markets. We are also extremely excited about our Tanzania and UAE presence and have set our sights on South America too," concludes Ashmore.

For Watericon, the focus remains clear: solve complex problems, build regional hubs, maintain financial discipline and expand deliberately.

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FIRE PROTECTION ASSOCIATION OF SOUTHERN AFRICA

South Africa faces a projected urban population growth of 63% to over 70% by 2030–2035, which will place additional strain on existing water and sanitation systems

NO ROOM FOR COMPROMISE: PROTECTING QUALITY IN PLASTIC

In a country where reliable water and sanitation infrastructure remains both a pressing need and a long-term national priority, the role of the Southern African Plastic Pipe Manufacturers Association (SAPPMA) has never been more critical.

As South Africa prepares for renewed infrastructure investment and increasing urbanisation, ensuring the quality and longevity of plastic piping systems is essential. SAPPMA, a voluntary, self-regulating, non-profit association representing plastic pipe manufacturers and key stakeholders across the industry, with membership comprising the majority of leading players in Southern Africa, continues to lead from the front.

"Plastic pipes form the backbone of modern water reticulation and sanitation systems. With South Africa currently consuming approximately 94 900 tonnes of PVC pipes and around 52 000 tonnes of HDPE pipes annually, the sector plays a significant role in supporting service delivery. Demand for these materials is structurally linked to economic growth and infrastructure development. As GDP expands, so too does the need for reliable piping systems to support housing, industry, mining and municipal services," says Jan Venter, CEO of SAPPMA.

Positive outlook

While the economy has entered a period of prolonged stagnation and is expected to continue through 2026 to 2030, there are signs of gradual recovery on the horizon. Forecasts suggest average annual GDP growth of around 2% between 2025 and 2035, with a more conservative 2.2% projected for the early 2030s. A more infrastructure-friendly political environment, potentially in the form of a GNU 2.0 by 2029, could

"Infrastructure is only as strong as the materials used to build it. By ensuring consistent quality in plastic pipes, we are not just supporting the industry. We are helping to secure South Africa's water future."

Jan Venter, CEO of SAPPMA

further stimulate investment in civil infrastructure. This, in turn, bodes well for the plastic pipe industry, particularly from 2028 onwards when new build activity is expected to accelerate.

At the same time, South Africa faces a growing urban population, projected to rise from the current 63% to over 70% by 2030 – 2035. This rapid urbanisation will place additional strain on existing water and sanitation systems, many of which are already in urgent need of maintenance and upgrades.

The dual challenge of rehabilitating ageing infrastructure, while expanding capacity, underscores the importance of high-quality, durable piping solutions. However, as market conditions become more challenging (driven in part by high virgin polymer prices and economic pressure), the risk of sub-standard manufacturing practices increases. This is a concern that Jan Venter, CEO of SAPPMA, has consistently highlighted.

"During times of economic pressure, there is always a temptation for some manufacturers to cut corners to remain competitive. This is precisely when quality assurance becomes even more critical. Inferior pipes may offer short-term cost savings, but they inevitably lead to long-term failures, higher maintenance costs, and ultimately, compromised service delivery," he warns.

SAPPMA's mandate is to safeguard the integrity of the plastic pipe industry by enforcing strict adherence to national and international standards. Through its rigorous audit processes, product testing and member compliance requirements, the association ensures that only high-quality, fit-for-purpose pipes bearing the SAPPMA logo are used in critical infrastructure projects.

South Africa currently consuming approximately 94 900 tonnes of PVC pipes and around 52 000 tonnes of HDPE pipes annually

Venter adds, "Quality is not negotiable. Every pipe installed in a water or sanitation system must perform reliably for decades. Our role at SAPPMA is to hold manufacturers accountable and to provide assurance to engineers, municipalities and the public that our members meet the highest standards."

Beyond compliance, SAPPMA also plays a vital role in education and industry advocacy. By engaging with engineers, specifiers and government stakeholders, the association promotes best practices in pipe selection, installation and maintenance. This holistic approach helps to ensure that infrastructure investments deliver maximum value over their lifespan.

Looking ahead, the outlook for the plastic pipe industry is cautiously optimistic. While HDPE demand has remained relatively flat since 2022/23, anticipated growth in mining and civil infrastructure from 2028 onwards is expected to provide a much-needed uplift. Similarly, the ongoing need for maintenance and the anticipated surge in new infrastructure projects will continue to drive demand for PVC pipes. Yet, as the industry grows, the importance of maintaining quality standards cannot be overstated. In a sector where failure can have far-reaching consequences for public health, environmental sustainability and economic development, the work done by SAPPMA serves as an indispensable guardian of quality and accountability.

"Infrastructure is only as strong as the materials used to build it. By ensuring consistent quality in plastic pipes, we are not just supporting the industry. We are helping to secure South Africa's water future," Venter concludes.

Plastic pipes form the backbone of modern water reticulation and sanitation systems

GREEN DROP REPORT: THE STATE OF WASTEWATER IN NUMBERS

South Africa's wastewater systems are under growing pressure. The latest Green Drop Report reveals declining performance, rising risk, and mounting infrastructure challenges, with nearly half of treatment works now classified as critical.

SCALE OF THE GREEN DROP REPORT

- 998 wastewater treatment works (WWTW) audited
- 144 Water Services Authorities (WSAs) assessed across all 9 provinces
- 3 699 pump stations evaluated
- 73 762 km of sewer pipelines assessed
- 174 Technical Site Assessments (TSAs) conducted (physical inspections)

WHAT IS THE GREEN DROP CERTIFICATION PROGRAMME?

The Green Drop Report is a national regulatory assessment published by the Department of Water and Sanitation that evaluates the performance, compliance and risk of wastewater management systems across South Africa. It is designed to influence institutional behaviour and drive continuous improvement in the management of wastewater networks and treatment systems.

WHAT'S NEW IN THE GREEN DROP REPORT?

For the first time, Non-sewered Sanitation (NSS) and Water Efficient Sanitation Solutions (WESS) concepts were incorporated into the audit. This inclusion expands the scope of the assessment beyond conventional, centralised wastewater treatment systems to recognise alternative sanitation technologies, particularly in areas where traditional sewer infrastructure is not feasible.

A breakdown of WSAs and WWWs per province

Province	Water Service Authorities (WSAs)	Wastewater treatment works (WWTWs)
Eastern Cape	14	125
Free State	19	95
Gauteng	9	61
KwaZulu-Natal	14	148
Limpopo	10	65
Mpumalanga	17	75
Northern Cape	26	75
North West	10	44
Western Cape	25	160
Total	**144**	**848**

National Summary of the Non-Sewered Sanitation/ Water Efficient Sanitation Solutions

Non-Sewered Sanitation and Water Efficient Sanitation						
Province	Households using dry sanitation	Volumes emptied (m^3/month)	Records of trucks collecting and emptying			Method of disposal / treatment
			Not applicable	Yes	No / No proof	
Eastern Cape	68 316	5 886	18	8	99	Tankers to WWTWs; sewer network collection
Free State	131 036	NI	24	NI	71	Tankers to WWTWs
Gauteng	644 571	73 417	27	20	14	Tankers to WWTWs; discharge at manhole
KwaZulu-Natal	17 679	228	68	33	47	Tankers to WWTWs
Limpopo	167	NI	20	2	43	Tankers to WWTWs
Mpumalanga	60 817	8 356	20	15	40	Tankers to WWTWs
Northern Cape	15 510	2 876	23	2	50	Tankers to WWTWs; urine diversion system (one system)
North West	53,528	NI	9	NI	35	NI / N/A
Western Cape	95 000	555	97	10	53	Tankers to WWTWs; Borchard's Quarry FSM facility (CoCT)
Total	**1 086 624**	**91 318**	**306**	**90**	**452**	—

DROP IN GREEN DROP CERTIFICATIONS

A wastewater system qualifies for Green Drop Certification when it achieves an overall **Green Drop score of 90% or higher**, reflecting strong performance across key areas such as treatment efficiency, risk management, technical capacity, and regulatory compliance.

14 systems achieved Green Drop certification (≥90%)

This is down from:

- **22 (2021)**
- **60 (2013)**
- **40 (2011)**

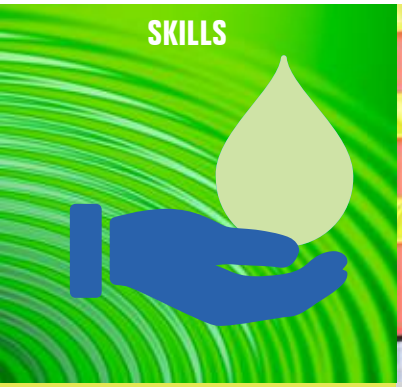
2024 Green Drop Certified Systems

	Province	Municipality	Treatment Plant
1	Gauteng	City of Ekurhuleni	Benoni
2			Carl Grundlingh
3			Daveyton
4			Herbert Bickley
5			JP Marais
6			Welgedacht
7		Midvaal Local Municipality	Bantu Bonke
8			Ohenimuri
9	Mpumalanga	Steve Tshwete Local Municipality	Blinkpan
10	Western Cape	Saldanha Bay Local Municipality	Hopefield
11			Paternoster
12			Shelly Point
13		City of Cape Town	Wesfleur Domestic
14		Witzenberg Local Municipality	Op-die-berg

DECLINING HIGH-PERFORMANCE SYSTEMS

- There has been an increase in the percentage of systems in a critical state of performance, from 39% (334 systems) in the 2022 Green Drop Report to 47% (396 systems) in the 2025 Green Drop Report
- The percentage of systems in excellent or good (above 80%) state of performance declined from 14% (118 systems) in the 2022 Green Drop Report to 8% (66 systems) in the 2025 Green Drop Report

This means that nearly half of WWTWs in South Africa are non-compliant and not performing well, with a clear shift of systems from poor into critical condition, indicating a worsening trend rather than stability. When both poorly performing and critical systems are considered together, 61% of all WWTWs fall below the minimum required level, highlighting not only the scale of underperformance but also the growing pressure on already strained infrastructure and the increasing risk this poses to environmental and public health outcomes.



58%

of wastewater treatment works have sent staff for training in the past two years, up from 38% in 2021.

The worst-performing municipalities have the lowest training participation, reinforcing a cycle of underperformance

While pockets of excellence remain, the overall trajectory highlights an urgent need for coordinated investment, stronger governance and sustained technical support to stabilise and rebuild South Africa's wastewater sector.

R13.34 billion

identified by Very Rough Order of Measurement (VROOM) analysis that is to restore wastewater infrastructure nationally to functional condition. VROOM is a national estimate of rehabilitation cost, not a detailed budget. It is used to prioritise capital investment intervention.

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SEWAGE TO SOLUTION: THE CIRCULAR ECONOMY OPPORTUNITY

Wastewater contains untapped resources that, if reclaimed, could power agriculture, global sanitation, and its own treatment to help meet United Nations's Sustainable Development Goals, according to a review published in Frontiers in Science in February 2026.

Every year, the global community produces about 359 billion m3 of wastewater, enough to fill the Garriep Dam, South Africa's largest dam, 68 times over.

Half of global wastewater is discarded, with the rest expensively and inefficiently treated for re-use. Emerging microbially powered tech could reclaim these resources from the drain, save money, and reduce environmental harm.

"Globally, our wastewater contains over 800 000 GWh of chemical energy, equivalent to the annual output of 100 nuclear power plants. It's also rich in nutrients used in agricultural fertilisers, which, if reclaimed, could supply 11% of global demand for ammonia and about 7% for phosphate," says lead author Prof Uwe Schröder at the University of Greifswald, Germany.

This new review by an international team of researchers explores how technologies using electricity-generating bacteria could help reclaim resources currently being flushed away.

However, the researchers argue that deploying this on a larger scale will need a broad coalition of researchers, water providers and policymakers to overcome its challenges, which range from the over-regulation of circular economics to engineering obstacles.

> **"Globally, about 3.5 billion people cannot access dignified sanitation. Expanding wastewater treatment could help improve living conditions for many of the world's poorest people, as well as prevent ecological damage. METs could be a local solution to turn harmful sewage into a valuable resource."**

A circular economy of energy and nutrients

The researchers discuss microbial electrochemical technologies (METs) as a more efficient way to treat wastewater, using microbes known as electrogenic bacteria.

While microbes are already used to treat wastewater through anaerobic digestion, this approach converts just 28% of chemical energy to electricity. By contrast, METs can be integrated into these systems to boost energy recovery and improve overall treatment efficiency.

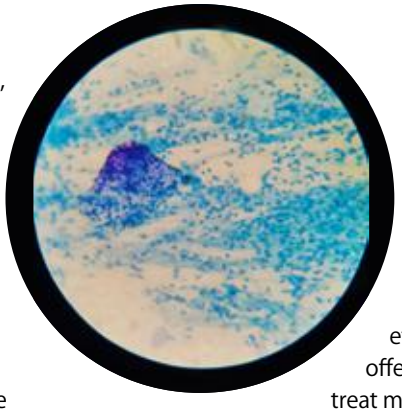
These bacteria transfer electrons to their surroundings, creating an electrical current when they are connected to electrodes in a fuel cell. In laboratory settings, they can convert up to 35% of wastewater's chemical energy into electricity. The authors say that, in principle, the power generated could even help run the water sector itself, which currently accounts for around 4% of global energy use.

The microbes can also help to extract nutrients from wastewater, cleaning it for further use. Critical fertiliser ingredients are typically produced in these energy-intensive or unsustainable processes. Removing these compounds from wastewater would have the double benefit of reclaiming valuable resources

The global community produces about 359 billion cubic meters of wastewater annually, enough to fill the Garriep Dam, South Africa's largest, 68 times over

and reducing pollution, as releasing nutrient-rich wastewater can cause algal blooms in waterways, which starve fish of oxygen.

"These are valuable chemicals that we cannot afford to throw away. After removal, the resulting water can be reused in many ways, like watering crops or industrial cooling. It could then be further treated to produce drinking water," says co-author Dr Elizabeth Heidrich from Newcastle University, United Kingdom.



Microbes within wastewater are overlooked and could yield new ways of utilising waste as a resource

METs have proved efficient in pilot trials, offering the opportunity to treat more water under a wider range of conditions. For example, a urine-powered MET called Pee Power® was trialled at the Glastonbury Festival in 2015, one of the world's largest outdoor music festivals. It has since proved successful in longer-term field trials in Uganda, Kenya, and South Africa. The system converts wastewater to electricity, powering lighting around the toilets to reduce safety risks in areas without an electricity supply.

"Globally, about 3.5 billion people cannot access dignified sanitation. Expanding wastewater treatment could help improve living conditions for many of the world's poorest people, as well as prevent ecological damage. METs could be a local solution to turn harmful sewage into a valuable resource," says co-author Prof Ioannis Leropoulos from the University of Southampton, who also serves as a director of MET-C, which is commercialising the microbial fuel cell technology.

Urine powered electricity has been piloted for lighting outdoor toilets

Overcoming obstacles

Despite their potential, these technologies face challenges to widespread adoption. Tight regulatory frameworks are often not suited for circular economies that repurpose waste. For example, in many countries, urine-derived fertiliser cannot be used for growing food or animal feed.

There are also engineering obstacles in ensuring that the MET materials maintain high performance when running continuously.

"While it would be a stretch to imagine powering our homes with wastewater, METs could enhance existing water treatment processes. Rolling METs out widely would be especially beneficial for heavily loaded types of wastewater or in places where existing treatment is too expensive or doesn't reach everyone," says co-author Prof Falk Harnisch, from the Helmholtz Centre for Environmental Research, Germany. ●

The microbes can also help to extract critical fertilizer elements from wastewater

There may be many other niche applications, from recycling nutrients in hydroponic systems to powering self-sustaining sensors that detect pollution.

SDG 6

The researchers argue that, by enhancing both sanitation and resource recovery, METs present a compelling solution to address the Sustainable Development Goal (SDG) 6 to ensure availability and sustainable management of water and sanitation for all.

1

2

South Africa's water sector is under growing pressure to deliver efficiency, compliance, and resilience in the face of increasing scarcity and rising costs. Against this backdrop, Xylem's launch of its Dissolved Air Flotation (DAF) solutions signals a step forward in how wastewater is treated, reused, and valued.

This recently launched technology introduces a compact, modular, and highly efficient pre-treatment system designed to remove suspended solids from wastewater streams across a wide range of industries. DAF is designed to "slot into" existing treatment processes. It can operate as a standalone solids-separation step or complement downstream biological, filtration, or reuse systems to help achieve site-specific compliance and reuse objectives.

Broadening the water solutions portfolio

Xylem is well known for its pumps in the South African market, and DAF is an expansion of its services. "DAF is an entry point into a wider portfolio of industrial solutions that we will be slowly introducing into the market," explains Tshepang Dolamo, business development and industrial solutions engineer at Xylem.

DAF was chosen as the first of these offerings because it aligns with the needs of the South African market. It is modular and designed to support existing wastewater treatment systems, and is available in both permanent and rental configurations, providing flexibility within South Africa's infrastructure and capital constraints. The rental offering, coupled with its modular nature, allows organisations to scale treatment capacity without committing to large upfront investments.

This flexibility also assists in less downtime. "Whenever you need to take out your system for repairs, you can always call on us to bring in a complete replacement system, plug, and play. You do not have to see any interruptions in terms of your production," Dolamo adds.

How DAF works: precision through microbubbles

Xylem's DAF systems use Hellbender™ pumps to release microscopic air bubbles that, following appropriate coagulation and flocculation, attach to suspended and destabilised colloidal particles, facilitating their separation from the water phase, which can be skimmed away.

The DAF technique efficiently removes total suspended solids (TSS), fats, oils, and greases (FOG), and particulate-associated biochemical oxygen demand (BOD) from wastewater streams. These systems offer an effective solution for a wide range of applications, including:

- Thickening of biosolids
- Product recovery from wastewater
- Treatment of industrial wastewater to meet site discharge limits
- Polishing of biological treatment effluent (algae and phosphorus removal)
- Pretreatment to reduce loading on downstream biological treatment systems
- Clarification of biosolids downstream of aerobic and anaerobic treatment
- Removal of FOG
- Temporary treatment of biosolids during harvest seasons
- Removal of metals and fines
- Recovery of proteins from slaughterhouse wastewater

DAF uses well-established physics principles to produce this microbubble flotation.

Ruan Nel, lead field engineer at Xylem, explains, "It uses the principle of Henry's law; we attach very fine microbubbles onto particles that decrease the density of the particles and force them to float." Once floated, contaminants form a sludge layer that is mechanically removed, while clarified water exits below for reuse or discharge.

"The clean water will go underneath and then either be recycled into your system or discharged safely, depending on municipal limits," he says.

Chetan Mistry, strategy and marketing manager at Xylem Water Solutions and Service (WSS) in Africa, Middle East, Türkiye and India

1. The DAF unit is designed to fit into existing processes with both rental and permanent solutions
2. Impurities rise and are skimmed off leaving clean water to flow underneath
3. Tshepang Dolamo, business development and industrial solutions engineer at Xylem
4. Ruan Nel, lead field engineer at Xylem

The result is a highly efficient pre-treatment step that significantly reduces downstream treatment loads. "In combination with coagulation and flocculation, you can increase efficiency up to 98%," notes Nel.

Compact design, high impact

One of the most compelling advantages of DAF is its compact footprint. Nel adds, "When designed for the right application, a DAF system can replace or complement traditional gravity clarifiers while typically requiring around 25% of the space."

This is particularly valuable in South Africa, where many treatment plants are space-constrained or operating beyond their original design capacity. The systems are also engineered for stability and consistency, a key factor in water treatment performance. "

In water treatment, hydraulic stability is critical," he explains. "DAF systems are designed to operate under controlled flow conditions, delivering stable performance and consistent treatment efficiency even under variable loading," he adds.

Globally, DAF technology has already demonstrated its value across multiple sectors, from petrochemicals to food processing and municipal treatment.

"In food and beverage, we deal with fats, oils, and grease. In the petrochemical sectors, the removal of emulsified hydrocarbons. In mining heavy metals and suspended solids," Dolamo explains.

Case studies presented during the launch highlighted strong performance outcomes. In one poultry processing application, DAF systems achieved:

- 92% reduction in chemical oxygen demand (COD)
- Up to 94% clarification efficiency
- 92% reduction in total suspended solids (TSS)

However, both Dolamo and Nel emphasise that the technology is most effective when integrated into broader treatment strategies. "When you have complex wastewater streams, you need to combine different unit operations to provide a consolidated solution," says Dolamo.

Designed for real-world conditions

Importantly, Xylem's approach goes beyond equipment supply, focusing on full lifecycle support and site-specific optimisation. "When you come to us and say, 'I need to treat water,' we then look at water analysis, flow rates, and total suspended solids before tailoring a solution," Nel explains.

This engineering-led approach ensures that systems are correctly sized and configured, avoiding overdesign and unnecessary costs.

"Achieving the right surface loading rates and consistent sludge concentration depends on stable operation and correct system control," he adds.

The systems are highly automated, which significantly reduces operational complexity," Nel explains. "Routine monitoring is still required, but automated controls manage the process continuously, delivering consistent performance without constant manual intervention.

Chetan Mistry, strategy and marketing manager at Xylem Water Solutions and Service (WSS) in Africa, Middle East, Türkiye and India (AMETI), elaborates further," Xylem's expert staff, together with experienced partners, tailor each solution to site requirements. Depending on the project scope, this can include supplying and integrating process equipment such as mixer tanks, pumps, and solids handling components, with access platforms and ancillary infrastructure delivered in coordination with site owners or contractors. Our technicians can support onsite teams or provide managed operational services where required.

Enabling water resilience in a constrained environment

As water stress intensifies across South Africa, the ability to treat and reuse water efficiently is becoming a strategic necessity rather than a compliance exercise. DAF's ability to recover materials, reduce pollutant loads, and enable reuse aligns directly with this shift.

Dolamo notes, "If we have a system such as dissolved air flotation, then you stand a better chance of having water that you can reuse." This is vital to industries attempting to reduce their water footprint and reliance on municipal systems.

Mistry adds, "We are very excited to bring cutting-edge DAF solutions to our local customers. Xylem has introduced our DAF solutions to several other markets, where they have become a big hit among companies of diverse sizes. South African organisations in the private and public sectors can now also leverage DAF to expand their choices for wastewater treatment and recycling." ●

SECURING SOUTH AFRICA'S WATER FUTURE

Vega's instrumentation is engineered for accuracy, vital to South Africa's current needs

Climate change, rapid urbanisation, ageing infrastructure, and escalating demand are placing unprecedented pressure on water boards and metropolitan municipalities. To build resilience, South Africa must accelerate the adoption of smarter, data-driven water management strategies.

South Africa's largest metros: Johannesburg, Tshwane, Ekurhuleni, Cape Town, eThekwini, Nelson Mandela Bay, and Mangaung face unique but interconnected water challenges:

1 Ageing infrastructure and high-water losses

Many metros operate with decades-old pipelines, reservoirs, and pump stations. Leaks and bursts are frequent, and without accurate level and pressure monitoring, early detection is difficult.

2 Rapid urbanisation

Cities like Johannesburg and Cape Town continue to grow faster than infrastructure upgrades can keep pace, increasing pressure on bulk supply systems.

3 Climate variability

If anything, Cape Town's "Day Zero" crisis demonstrated how quickly a metro can reach the brink. Meanwhile, Gauteng relies heavily on the Vaal River System, which is increasingly stressed.

4 Limited new water sources

With nearly all available water already allocated, metros must prioritise conservation, efficiency, and real-time monitoring to stretch existing supplies.

Measuring and monitoring

To secure long-term water supply, metros and water boards are focusing on a few key priorities. Cutting non-revenue water remains critical, with accurate measurement helping to detect leaks, manage pressure, and control reservoir levels.

Real-time monitoring is also gaining traction, allowing operators to respond faster to failures and carry out proactive maintenance. At the same time, improving treatment and distribution processes helps reduce waste, energy use and chemical consumption.

Protecting strategic water source areas remains essential, while renewed investment in infrastructure signals a stronger focus on resilience and future supply security.

Instrumentation as a safeguard

VEGA's instrumentation is engineered for accuracy, reliability and long-term performance, all qualities essential for water boards and municipalities facing mounting operational pressures.

1 Smart level measurement for reservoirs and bulk storage

VEGA's radar sensors, such as the VEGAPULS 6X, provide noncontact, maintenance-free level measurement unaffected by condensation, foam, or temperature fluctuations. This ensures accurate reservoir monitoring, enabling better demand forecasting and reducing overflows.

South Africa needs to be looking at securing its water by adopting fit-for-purpose technology

2 Pressure monitoring for leak detection and network stability

VEGABAR pressure transmitters help utilities maintain stable pressure zones. Sudden pressure drops or spikes can indicate leaks or bursts; early detection saves millions of litres.

3 Optimised treatment plant performance

From sedimentation tanks to chemical dosing systems, VEGA's sensors support precise process control, reducing waste and improving treatment efficiency.

4 Monitoring of strategic water source areas and dams

Long-range radar technology enables safe, accurate monitoring of dam levels, river flows, and catchment behaviour, critical for drought planning and flood mitigation.

5 Digital integration for smarter water management

VEGA's instruments integrate seamlessly with SCADA and IoT platforms, giving water boards real-time visibility across their networks.

Technology as a cornerstone of water security

As South Africa confronts intensifying water scarcity, conservation is no longer optional; it is a national imperative. The country's metros and water boards need reliable, high-precision data to manage every drop. VEGA's advanced level and pressure measurement technologies provide the accuracy, durability, and intelligence required to build a more resilient water future. ●

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ADVICE TO PURCHASER OF PLASTIC PIPING SYSTEMS

When procuring plastic piping systems, purchasers are advised to ensure that all products and manufacturers meet the highest quality and compliance standards to ensure the product meets the design life requirements. The following considerations and requirements are recommended and to be stated in any RFQ (request for quotation).

MANUFACTURER TO SUPPLY THE FOLLOWING:

- ISO 9001 QMS (Quality Management System) Certificate or Quality Management Plan of the production facility with a copy of the latest Quality Audit Reports to be submitted throughout the supply period
- Product Certification (e.g. SANS ISO 4427-2 if HDPE, SANS 966-1 if uPVC, etc.)
- Raw material Certification (e.g. SANS ISO 4427-1 if HDPE)
- Certificate of analysis (COA) of polymers used
- Certificate of conformance (COC) of products
- Undertaking not to use any bought-in recycled material
- Laboratory test results, in accordance to the certification bodies' Specific Permit Conditions (SPC), for each supplied pipe batch shall be submitted
- Full traceability of the pipe Batch Number to the raw material used
- SAPPMA Membership Certificate with a copy of the latest SAPPMA Audit Reports throughout the supply period

ALL PRODUCTS TO BE INSPECTED ON DELIVERY AND THE FOLLOWING CHECKED FOR COMPLIANCE:

- Pipe to be marked in accordance with the relevant standards, with the logo of the certification body and SAPPMA clearly visible.
- Pipe to be inspected for dimensions (OD, wall thickness and ovality) and damage (scratches, gouges, cracks, missing rubbers, etc.)

THE FOLLOWING SHOULD ALSO HAVE AN IMPACT ON YOUR CHOICE OF SUPPLIER:

- Is the manufacturer open to unannounced inspections during production?
- Is the quoted price realistic in terms of current polymer prices? (Beware of tenders where the selling price in R/kg is suspiciously low)

THE FOLLOWING BUSINESSES AND INDUSTRIES CAN QUALIFY FOR A SAPPMA MEMBERSHIP:

- Pipe & fittings manufacturers
- Raw material suppliers
- Consultants
- Construction companies
- Municipalities
- Water Boards
- Contractors & Installers
- Individuals

SAPPMA

southern african plastic pipe manufacturers association

CONTACT US FOR MORE INFORMATION ABOUT SAPPMA MEMBERSHIP AND BENEFITS

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