ENSURING TAP WATER IS SAFE FOR LIFETIME HUMAN CONSUMPTION

UMGENI WATER'S MISSION:

"To provide effective and affordable bulk water, bulk sanitation and related solutions to local Government in accelerating the water sector's national developmental agenda"

Recent reports have suggested that contaminated raw water may be making its way into reticulation systems. This is not the case. Umgeni Water issues a categorical assurance that the potable water in your tap supplied by Umgeni Water is safe for human consumption and other domestic uses. This assurance is being provided with a view to allaying fears that the quality of treated water may be compromised due to the extent of contamination of raw water.

Raw water extracted from source, and irrespective of the extent of contamination, is rigorously treated to meet legislative requirements before it leaves the water treatment works.

The core business of Umgeni Water is to supply bulk potable water to its customers, which are: eThekwini Metropolitan Municipality, Ugu, iLembe, Sisonke and uMgungundlovu District Municipalities and Umsunduzi Local Municipality.

These municipalities reticulate the treated water supplied by Umgeni Water to the end users, which are households, businesses and industries.

As a state-owned enterprise, Umgeni Water is responsible for safeguarding human health as far as all the treated water is concerned. The quality of water supplied by Umgeni Water is suitable for human consumption and for all domestic purposes, and will not result in any risk to the health of the consumer over a lifetime of consumption.

Q. What happens if Umgeni Water is unable to supply water that meets the legislated national standard:

A. Umgeni Water has a legal obligation to inform the relevant municipality, which has to inform the Minister of Water Affairs and Forestry. This is to ensure that:

- *Reasonable steps are taken to inform affected consumers that the Municipality is unable to provide potable water of the prescribed quality, with reasons for the situation;*
- *Consumers are advised about precautions that they need to take;*
- *Consumers are informed about the time-frames within which the affected water supply will again meet the required standard.*

The water quality management programme of Umgeni Water is achieved through:

- *an ISO (International Standards Organisation) 9000 certified water quality monitoring programme,*
- *a SANAS (South African National Accreditation System) 17025 accredited water testing laboratory,*
- *water quality compliance and auditing programmes,*
- *effluent quality, sludge quality, receiving environment quality assessment programmes, and monthly and annual water quality status reporting,*
- *ISO 9000 certified water treatment works and*
- *ISO 9000 certified dam management sites.*

QUESTIONS AND ANSWERS

Q. Is it safe to drink tap water?

A. Tap water supplied by Umgeni Water consistently meets the South African National Drinking Water Standards (SANS 241) and is safe to drink.

Q. Do I need to filter my water?

A. People obtaining water from Umgeni Water receive water complying with national drinking water standards and do not require additional water filtering to meet health requirements.

In areas where safe drinking water is not yet supplied to consumers, commercially available point-of-use filters can be used, but they are expensive. Home filtration units produce clean water, but not necessarily microbiologically safe water, depending on the nature of the filter medium. The addition of a small amount of chlorine is required to ensure that the water is safe to drink. Regular replacement of a water filter is very important from a health perspective.

Q. Is water with chlorine safe to drink?

A. Umgeni Water adds chlorine to disinfect all its water to ensure that it is safe to drink and contains no bacteria that are harmful to your health. A small amount of chlorine is allowed to remain in the water that is supplied to your tap. These small amounts of chlorine prevent bacteria regrowing in your pipes, and are not harmful to your health. Water with no chlorine remaining could become recontaminated with potentially harmful bacteria, which could make consumers ill.

Q. Does Umgeni Water have sufficient expertise to manage the water purification process?

A. Each waterworks is managed by a suitably qualified works manager, process controllers and operators. In addition, Umgeni Water has process engineers and chemists/biological scientists who provide expert advice and assist with troubleshooting and process improvements.

Q. What should I do if my water is milky in colour when I turn on the tap?

A. If your water appears milky or cloudy, it recommended that you pour a glass of water, and

- *If the water clears from the bottom upwards, it suggests that there is dissolved air in the water and that the cloudiness poses no health risk;*
- *If the water clears from the top downwards, there may be a possible water treatment or reticulation problem, and you are recommended to contact your municipality.*

Q. Can Umgeni Water's Treatment Plants treat poor quality raw water?

A. Umgeni Water has some of the most sophisticated technology, such as the use of ozone and activated carbon, available at its treatment plants to handle any possible contaminant.

Q. Where does my drinking water come from?

A. Our drinking water comes from one of two sources, mainly from surface water (rainfall and its runoff into rivers and dams), or groundwater (water that has collected in underground aquifers). These sources may be close to the communities that they serve, or may be some distance away. Therefore, when considering where drinking water is coming from, it is important not only to think about where the water is abstracted from, but also about the whole catchment - the area over which rainfall is caught and drains into a water source.

Raw water is abstracted from the source (dam, river or borehole) and transported to a water treatment works where it is treated using different treatment processes. After treatment, the water is stored in reservoirs or tanks and then distributed to users.

Q. Does Umgeni Water recycle waste water for drinking water purposes?

A. Umgeni Water does not currently directly recycle wastewater for drinking water. However, in some instances treated effluent is discharged by wastewater works upstream of Umgeni Water's supply dams. Natural processes within the dams improve this quality and the Umgeni Water treatment processes ensure that this water is fit for consumption.

UMGENI WATER · AMANZI

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MANAGING WATER FROM SOURCE TO

STEP 1 (Intake)
Raw water is normally gravity-fed from a dam to the water treatment plant (waterworks)

STEP 2 (Pre-Treatment) & 3 (Mixing & Coagulation)
As the raw water enters the plant it is tested to determine the quality of the water before the treatment process can start. Chemicals are added to the raw water to remove the particles. Once the chemicals have been added they pass through flash mixers to ensure uniform mixing of all the chemicals. Powdered Activated Carbon can be added when necessary to remove algal compounds which could give the water a bad taste or odour. Ozone gas is added when necessary to assist with the removal of taste and odour compounds.

STEP 4 (Flocculation)
The water then flows into large settling tanks. Here the coagulant helps to bring the small dirt particles in the water together to form lumps, known as floc, which sink to the bottom of the tank to form a sludge blanket.

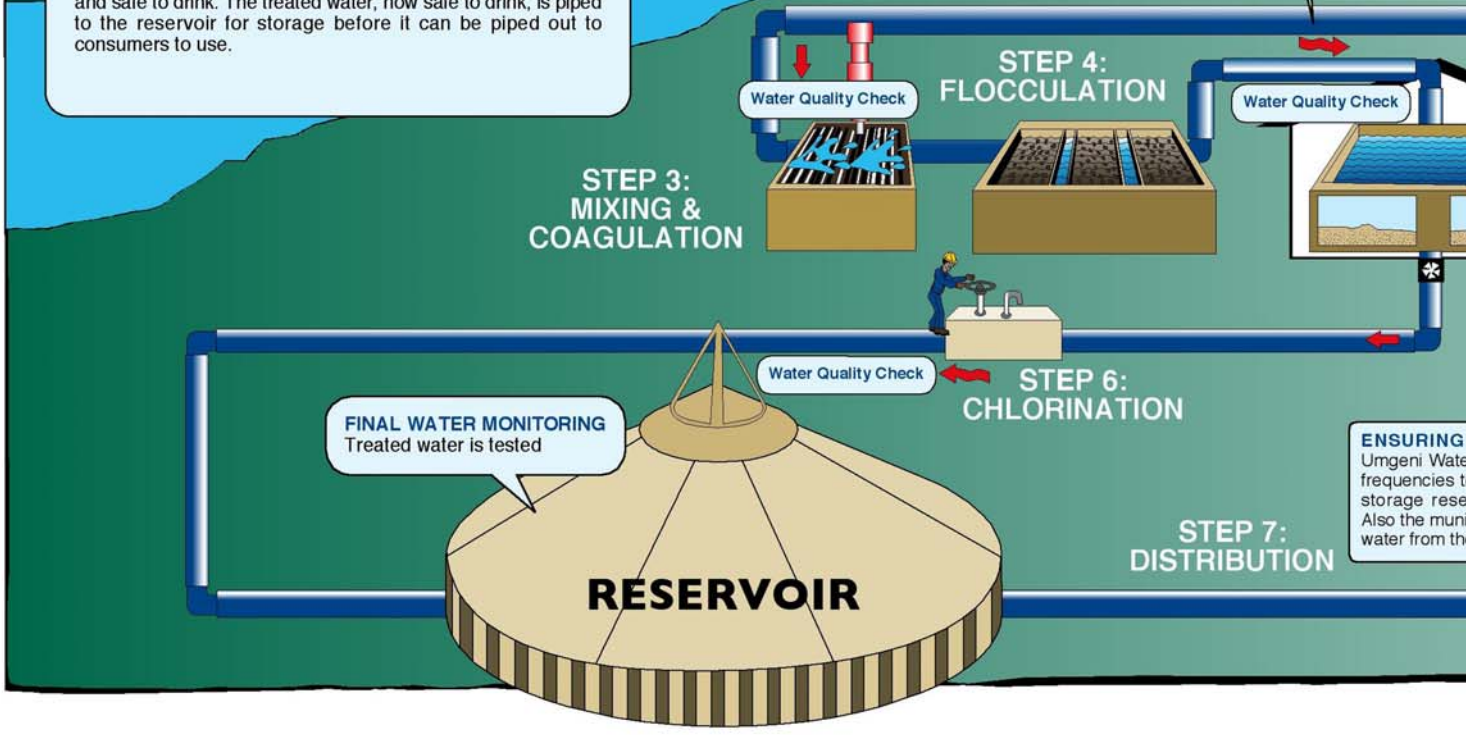
STEP 5 (Filtration)
As the floc settles the purified water flows through the sand filters. A special clean sand in the filters removes any remaining smaller dirt particles as the water filters through it.

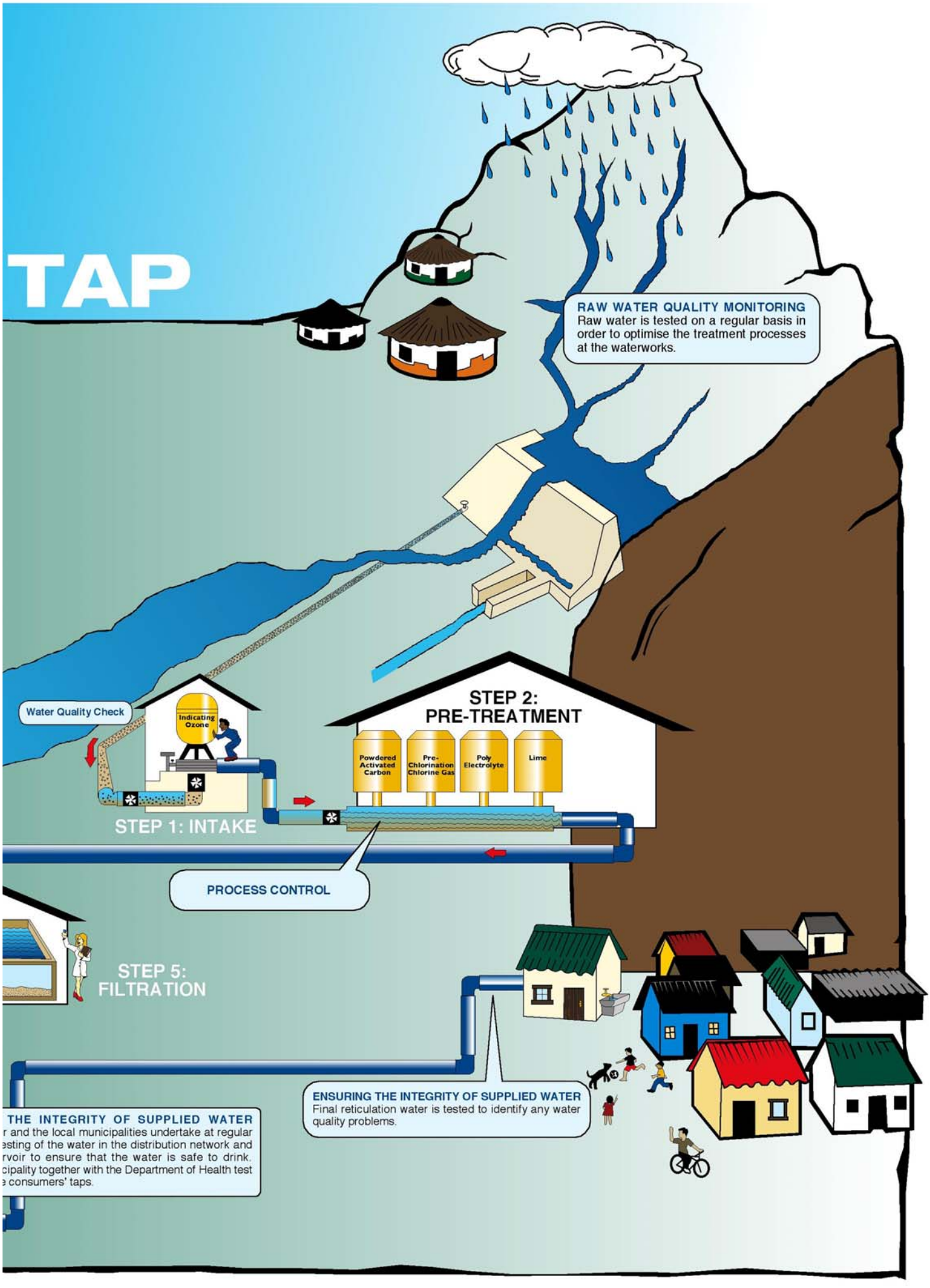
STEP 6 (Chlorination)
After filtration, chlorine is added to prevent the growth of bacteria and other harmful micro-organisms.

STEP 7 (Distribution)
Water samples of the newly treated water are routinely collected for testing in the laboratory at the end of the purification process. This is to ensure that the treated water is of excellent quality and safe to drink. The treated water, now safe to drink, is piped to the reservoir for storage before it can be piped out to consumers to use.

PROCESS CONTROL OF WATER TREATMENT PLANTS

Umgeni Water has automated many of its water treatment plants using sophisticated logic control systems (PLC). The whole water treatment process is monitored by on-line analysers on a continuous basis with information logged every five minutes on a SCADA computer system. Samples from each unit process are also analysed by process controllers every two hours to verify many of the automated analysers that are used in the process. Umgeni Water has a team of twenty process engineers and scientists who provide technical advice and undertake independent audits of the various plants on an on-going basis.




TAP
RAW WATER QUALITY MONITORING
Raw water is tested on a regular basis in order to optimise the treatment processes at the waterworks.
Water Quality Check
Indicating Ozone
STEP 1: INTAKE
STEP 2: PRE-TREATMENT
Powdered Activated Carbon
Pre-Chlorination Chlorine Gas
Poly Electrolyte
Lime
PROCESS CONTROL
STEP 5: FILTRATION
ENSURING THE INTEGRITY OF SUPPLIED WATER
Final reticulation water is tested to identify any water quality problems.
THE INTEGRITY OF SUPPLIED WATER
r and the local municipalities undertake at regular
esting of the water in the distribution network and
rvoir to ensure that the water is safe to drink.
cipality together with the Department of Health test
e consumers' taps.

Water sampling using ISO certified monitoring programme

Water quality analysis in SANAS accredited lab

Wiggins Waterworks operated according to ISO certified standards

Q. How does the quality of water supplied by Umgeni Water compare to other countries?

A. The water treated by Umgeni Water is considered to be of excellent quality (>99.9% compliance with SANS 241 over the past 5 years) by national drinking water standards . This equals or exceeds the quality of many first world countries.

Q. Will load shedding affect my water quality?

A. At most of Umgeni Water's treatment plants, backup generators are available to provide power without interrupting the treatment process. In KwaZulu-Natal we are fortunate that most of our waterworks can supply water under gravity, and in extreme cases we could continue running the plant without power for prolonged periods. Umgeni Water is currently liasing with Eskom to exempt waterworks from load shedding.

Q. Is there a possibility of intentional contamination of stored water?

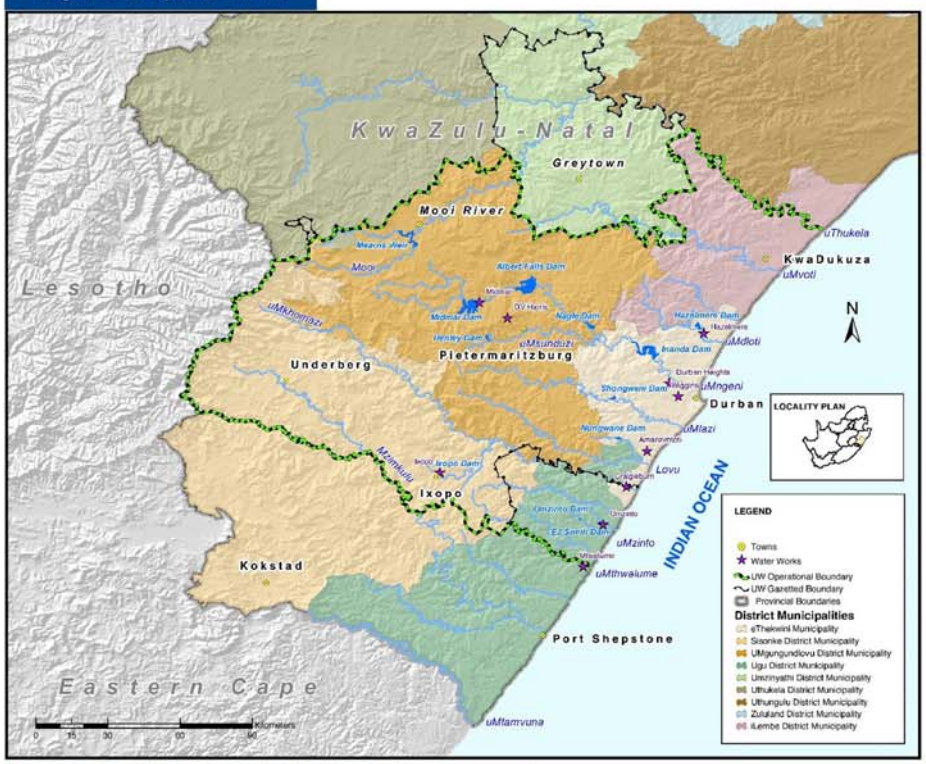
A. Umgeni Water and the municipalities take every possible precaution to secure our treatment works and reservoirs. Vandalism remains a concern, particularly for remote reservoir sites. The risk of intentional contamination, while low, thus exists. Quality sampling programmes ensure any contamination is detected and remedied as quickly as possible.

Q. What is my responsibility in Drinking Water Quality Management?

A. There are a number of things that each and every one of us can do to help protect our drinking water supply, including:

- *Be observant within your catchment and look out for activities which may pollute your drinking water source, such as:*
  - *Disposal of sewage, industrial wastewater or solid waste into storm water drains or rivers;*
  - *Excessive application of chemical fertilizers to gardens - rather use natural fertilizers such as compost;*
  - *Cattle dip tanks which may contaminate drinking water sources with biocides.*
- *Report pollution incidents to your local Water Services Authority (Local or District Municipality) or Catchment Management Forum;*
- *Dispose of household chemicals properly and never pour chemicals down the drain or toilet;*
- *Conserve water by using it sparingly around the house.*
- *Attend public meetings to ensure that your community's need for safe drinking water is considered in making decisions about land use, and*
- *Report any suspicious activities or incidents of vandalism of water treatment plants or reservoirs to your municipality.*

Umgeni Water Operational Area



Umgeni Water's waterworks potable water quality compliances for the period of July 2007 - February 2008

Waterworks	Average daily volume treated (Ml/d)	% Total Supply Volume	Compliance		Water Quality Classification
			Chemical	Microbiological	
Durban Heights	505	44.3%	100%	100%	Excellent
Wiggins	273	24%	100%	100%	Excellent
Midmar	217	19.1%	100%	100%	Excellent
DV Harris	41.2	3.6%	100%	100%	Excellent
Hazelmere	43.7	3.8%	100%	100%	Excellent
Amanzimtoti	34.0	3%	100%	100%	Excellent
Umzinto	11.0	1%	100%	100%	Excellent
Craigeburn	6.1	0.5%	100%	99.5%	Excellent
Mtwalume	4.4	0.4%	98.1%	100%	Excellent
Ixopo	2.1	0.2%	100%	100%	Excellent
Ogunjini	1.3	0.1%	100%	100%	Excellent

The quality produced from the waterworks achieved 100% compliance with respect to the chemical and microbiological requirements, with the exception of Craigeburn and Mtwalume Waterworks. The failures at these works were due to a single high turbidity result at Mtwalume Waterworks and *E. coli* result at Craigeburn final water. The microbiogical failure at Craigeburn final was due to inadequate chlorine contact time during the mixing of the pre-treated water from Craigeburn-Saiccor with treated water from Craigeburn Waterworks. Samples collected downstream of the mixing point (at the distribution reservoir) indicated that the water was free from microbiological contamination.

SANS 241 Potable Water Quality Classification:

- Good water quality: ≥ 98% compliance with Microbiological requirements, ≥ 90% compliance with Class I Chemical requirements and ≥ 95% compliance with Class II Chemical requirements.
- Fair water quality: ≥ 97% compliance with Microbiological requirements, ≥ 85% compliance with Class I Chemical requirements and ≥ 90% compliance with Class II Chemical requirements.
- Poor water quality: < 97% compliance with Microbiological requirements, < 85% compliance with Class I Chemical requirements and <90% compliance with Class II Chemical requirements
- Excellent water quality: ≥ 99% compliance with Microbiological requirements, ≥ 95% compliance with Class I Chemical requirements and ≥ 97% compliance with Class II Chemical requirements.