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Quality Water



Purpose

This Electronic Newsletter gives consumers basic information about various issues related to Water and Sanitation. Every issue will address different topics on water, sanitation, health and hygiene and / or water conservation and demand management.

Executive Summary: Blue Drop Awards 2010

The Blue Drop System was initiated by the Department of Water Affairs in September 2008 as part of the Drinking Water Quality (DWQ) regulation program to instill public confidence in drinking water. Although only in its second year of existence, the Blue Drop System is proving to be the catalyst for sustained improvement of South African drinking water quality management.

The number of Blue drop requirements increased this year with the addition of a required Water Safety Plan (5%), Asset Management (10%) and DWQ Performance Publication (5%) which accumulatively accounted for 20% of the weighting. Other criteria for Blue Drop Status included:

- Process and Maintenance Competency (10%)
- Efficiency of Drinking Water Quality Monitoring Program (15%)
- Credibility of Drinking Water Sample Analysis (5%)
- Regular Submission of Drinking Water Quality Results to DWA (5%)
- Drinking Water Compliance with the South African National Standard (SANS 241) (30%)
- Drinking Water Quality Failure Response Management (15%)

The City of Tshwane was awarded *Blue Drop Status* for 2010 with a Blue Drop Score of 96.4% which is an improvement from last years score of

95%. In addition the City was awarded a *Blue Drop Excellence Recognition for being one of the top ten municipalities* in the country, coming in at eighth (8th) position. The City of Tshwane also received the following awards:

- *Recognition for Most Presentable Medium Water Treatment Works* for Rietvlei WTW. This is the second year that Rietvlei WTW has won this award.
- The Blue Drop Excellence Award for Outstanding Performance in 2010 for the *Recognition for Excellence in Data Credibility for Blue Drop Certified Data* as provided by the Rietvlei based Drinking Water Laboratory.

787 Systems were assessed by DWA in 2010 and 38 (4.8%) were found to manage their drinking water quality with excellence. Blue Drop Status implies that the DWA has confidence that the municipality is capable of sustaining safe water quality supply and will act responsibly when a deviation in tap water quality is detected through continuous efficient operational and compliance monitoring.

In order to improve our Blue Drop Status in 2011, the City of Tshwane will concentrate on Publication of Drinking Water Quality Performance and improvement of the Water Safety Plan and Asset Management and other protocols.

What are you drinking

The City of Tshwane always strives to ensure that the water consumed by the residents of this city is of exceptional quality. The drinking water in Tshwane is monitored in line with microbiological and chemical parameters from catchment to consumer. The best available technology is used to ensure that the water is of good quality. We have a well-equipped laboratory specifically for drinking water and the results are submitted to the Department of Water Affairs and the Environment (DWAE) regularly.



These results are now being made available to the public at the following internet addresses: www.tshwane.gov.za and www.dwa.gov.za/bluedrop. Go to the MY WATER icon on the menu on the left-hand side of the screen. You can then type in the name of your suburb and search for information on that suburb. Several hits may occur and if you click on the option most likely to be the sample nearest you, you will be able to see if the water complies with the microbiological and chemical standards, and the physical and organoleptic (colour, taste, odour, appearance)

requirements of the South African National Standard for Drinking Water (SANS 241).

The City of Tshwane is committed to ensuring that the water that comes out of your tap is of excellent quality. Therefore every person in Tshwane can drink straight from the tap without fear, knowing that the water is perfectly safe for consumption.

Should you experience any problems with the system, please email your queries to drinkingwater@tshwane.gov.za to help us improve the system.

Quality Water

■ Plumbing and drinking water

The quality of water delivered to your home can be affected by the nature of pipes on your property. Significant adverse health effects have been associated with inadequate plumbing systems in public and private buildings arising from poor design, incorrect installation, alterations and inadequate maintenance. Many factors influence water quality in a building's water pipes and may result in the microbial or chemical contamination of drinking water.

Outbreaks of gastrointestinal disease can occur through faecal contamination of drinking water in buildings, which in turn may arise from deficiencies in roof storage tanks and cross-connections with waste water pipes. For example, poorly designed plumbing systems can cause stagnation of water and provide a suitable environment for the proliferation of legionella (bacteria that are considered potentially pathogenic for humans and cause legionnaires' disease). For more information see the legionella information attached.

Plumbing materials, pipes, fittings and coatings can raise the concentration of heavy metal (eg lead) in drinking water and inappropriate material can be conducive to bacterial growth.

Potential adverse health effects may not be confined to a particular building. Other consumers may be exposed to contaminants through contamination of the local distribution system as a result of cross-contamination of drinking water and backflow.



Types of pipes used

Galvanised pipes

Galvanising involves the use of molten zinc to make pre-formed steel pipes corrosion resistant. However, in old buildings the zinc probably contains high levels of lead, which is a common impurity. Galvanised pipes are still common in older homes and many commercial buildings. Symptoms of corrosion are the following:

- High levels of zinc or iron in tap water
- "Metallic" taste of the water
- Poor water flow due to mineral build-up
- Discoloured water (brown, red or yellow)

Lead pipes

Some old homes and the service lines from the water mains to these homes still have lead pipes. Lead is unusual among drinking water contaminants in that it seldom occurs naturally in water supplies like rivers and lakes. Lead enters drinking water primarily as a result of the corrosion, or wearing away, of materials in the water distribution system and household plumbing that contain lead. These materials include lead-based solder used to join copper pipe, brass taps and chrome-plated brass taps and, in some cases, pipes made of lead that connect your house to the water main (service lines). The presence of lead in tap water suggests serious pipe corrosion, which must be corrected for health reasons. For more information see the lead information attached.

Copper pipes

Copper in the pipes in household plumbing dissolves in water. The longer water has stood idle in these pipes, the more the copper that is absorbed by the water. (Newer homes with copper pipes may have a bigger problem. Over time, a coating forms on the inside of these pipes, which may insulate the water from the copper in the pipes.)

How to avoid drinking tap water with a high copper content:

In newer homes, the coating on the inside of pipes has not yet had a chance to develop. Thus, every time the water has not been used for more than six hours, for example overnight or during the day when people are at work or school, taps have to be flushed before their water is used for drinking or cooking. This can be achieved by letting the cold water tap run until you feel the water gets colder, usually 30 to 60 seconds. (Use this water to clean floors or carpets, or water plants.) In addition, since hot water dissolves copper more quickly than cold water, do not draw water for drinking or cooking from the hot water tap. If you need hot water for cooking or drinking, take water from the cold tap and heat it. It is especially important not to use water from the hot water tap for making baby formula. High copper concentrations in water will only occur when the water is unstable. For more information on water stabilisation, see the water stabilisation information attached.

To ensure that drinking water in a building is safe, good plumbing practices must be applied. Therefore, ensure that –

- pipes carrying either water or waste are watertight, durable, smooth and unobstructed on the inside and protected against anticipated stress;
- cross-connections between the drinking water supply system and the waste water removal system do not occur; and
- waste is discharged without contaminating drinking water.

It is important that plumbers are appropriately qualified, have the competence to undertake the necessary installation and servicing of plumbing systems to ensure compliance with SABS/SANS standards, and use only SABS-approved materials. The City of Tshwane purifies water in a conventional way, resulting in water that is stable and meets SANS 241 water specifications.

Quality Water

■ Colour of drinking water

What colour is water?

Ordinarily we think of water as being blue. When artists paint bodies of water they generally colour them blue or blue-green. While water does reflect blue-green light at great depths, it should appear colourless in the home.

If tap water is blue or blue-green, there are foreign substances in the water. Infinitely small microscopic particles add colour to water. Colloidal suspensions and non-colloidal organic acids as well as neutral salts also affect the colour of water. The colour in water is primarily of vegetable origin and is extracted from leaves and aquatic plants. Water draining from swamps has the most intense colouring. The bleaching action of sunlight plus the aging of water gradually dissipates the colour, however. All surface waters possess some degree of colour. Likewise, some shallow wells, springs and an occasional deep well can contain noticeable colouring. In general, however, water from deep wells is practically colourless.

When water is rated as having a colour of five units, it means the colour of this water is equal in intensity to the colour of distilled water containing 5 mg of platinum as potassium chloroplatinate per litre. Highly coloured water is objectionable for most process work in the industrial field because excessive colour causes stains. While colour is not a factor of great concern in relation to household applications, colour in drinking water lacks aesthetic appeal. Further, when excessively coloured water is used for clothes washing it can cause staining. The SANS 241 drinking water standards recommend that drinking water have a colour of less than 20 mg/ℓ. In general, colour is reduced or removed from water through the use of coagulation, settling and filtration techniques.

The City of Tshwane purifies water in a conventional way, resulting in water that is sparkling clear and safe to drink, and meets the SANS 241 water quality specifications.

■ Microbiological Aspects

The potential health consequences of microbial contamination are such that its control must always be of paramount importance and never be compromised. The microbiological safety of Tshwane's drinking water is secured by multiple barriers, from catchment to consumer. These include the protection of water resources, proper selection and operation of a series of treatment steps, and management of the distribution system to maintain and protect the quality of treated water.

In general, the greatest microbiological risk is associated with ingestion of water that is contaminated with human or animal (including bird) faeces. Faeces can be a source of pathogenic bacteria, viruses and protozoa. Faeces-derived pathogens are the principal concern in setting health-based targets for microbial safety. Microbial water quality often varies rapidly and over a wide range. Short-term peaks in pathogen concentration may increase the risk of disease considerably and may trigger outbreaks of waterborne disease. Furthermore, by the time microbial contamination is detected, many people may have been exposed. For these reasons, we cannot depend solely on end product testing, even when frequent, to ensure the microbial safety of drinking water.

The City of Tshwane consistently works at ensuring drinking water safety. Management of microbial drinking water safety requires system-wide assessment to determine the potential hazards (biological, chemical, physical and radiological agents) that can affect the system. The City of Tshwane also

has controls in place to reduce or eliminate the hazards, and does operational monitoring to ensure that barriers in the system are functioning efficiently. In addition to faeces-borne pathogens, other microbial hazards are monitored.

Some microorganisms grow as biofilms on surfaces in contact with water. With a few exceptions, such as legionella, these organisms do not cause illness in healthy people, but they can cause a nuisance through the generation of tastes and odours or discolouration of drinking water supplies. Microbial growth following drinking water treatment is often referred to as "regrowth". It is typically evident when heterotrophic plate counts (HPCs) in water samples increase. An elevated HPC occurs especially in stagnant parts of piped distribution systems, in domestic plumbing, in some bottled water and in some plumbed-in devices such as carbon filters and vending machines.

While water can be a very significant source of infectious organisms, many of the diseases that are waterborne may also be transmitted through other routes, including person-to-person contact, aerosols and food intake. Depending on circumstances and in the absence of waterborne disease outbreaks, these routes may be more important than waterborne transmission.

The City of Tshwane purifies water in a conventional way, resulting in water that is safe to drink. Your tap water will satisfy your daily requirements, and meets the SANS 241 water quality specifications.

■ Hardness of drinking water

Hardness is the sum of the harmless calcium and magnesium ions in drinking water. Hard water has more than about 80 to 100 milligrams per litre (mg/ℓ) hardness expressed as CaCO₃ (calcium carbonate). Such water can cause scale deposits in pipes, kettles or irons. Soft water has less than 100 mg/ℓ hardness as CaCO₃. (If 80 is less than 100, hard and soft water fall in the same range, which is confusing.) Soft water is better to wash with because it lathers better, although it can corrode pipes. Softened water is believed to cause high blood pressure in some people and therefore it should only be used for washing and not for drinking purposes.

Quality Water

■ Adding salt to your dishwasher

Although hard water is healthy to drink it makes dish washing difficult, as it forms a scum layer on the water. Therefore dishwashers use water softeners that replace the calcium and magnesium ions with sodium ions. The sodium comes from the salt that you add to the dishwasher.

To find out how much salt you need to add, you must convert the hardness in milligrams per litre (mg/l) to the units indicated in the manufacturer's manual. These units are usually French or German degrees of hardness or in mmol/l alkaline earth ions.

1 mg/l CaCO₃ = 0,056 German degrees

1 mg/l CaCO₃ = 0,10 French degrees

1 mg/l CaCO₃ = 0,01 mmol/l alkaline earth ions.

For example: If the water has a hardness of 80 mg/l CaCO₃, convert this to German degrees by multiplying 80 by 0,056 = 4,48 German degrees. If the manual gives the hardness as French degrees, multiply 80 by 0,10 to get to French degrees = 8. To convert to mmol/l, multiply 80 by 0,01 = 0,8 mmol/l.

Once you have the hardness in the correct units, consult the manufacturer's manual to find out the amount of salt required.



■ Home treatment devices

The "jam-jar" test

Request factual information when confronted by salespeople who prey on your peace of mind. Some suppliers of home water treatment devices use scare tactics and ambiguous statements to market domestic water filters, often misleading consumers into purchasing expensive devices for supposed health reasons. Some, for instance, demonstrate colour change in tap water as opposed to the absence of colour change in their filtered water. The demonstration unit comprises two canned

fruit bottles with an iron and aluminium electrode in each bottle. These electrodes are connected to a power source. As tap water contains a certain amount of dissolved salts, it is able to conduct a current when the power is turned on. This causes one of the two electrodes to dissolve in the water, changing the water colour and causing visible particles to form. However, it is not the water, but the electrode itself that causes the change in colour and the formation of visible particles. The filtered water used in the control setting has a low concentration of dissolved salts. As a result, the water is

unable to conduct a current, hence there is no reaction.

Facts: Potable water is an important source of essential trace elements in your daily diet. Prolonged use of water from which these elements have been removed could be dangerous to your health.

Warning: Home treatment systems have a limited lifespan and must be maintained in accordance with the directives of suppliers. If not, these units may cause the quality of the treated water to deteriorate.

REPORT -

no water supply; water pipes burst; leaking meters; and blocked street sewers
to 012 358 2111/9999 or 080 1111 556 (toll-free)

Industrial effluent enquiries: 012 358 9067/9078/9999

Pollution spill response service: 012 358 9067/9078/9999