



WWF'S WEDNESDAY WATER FILE

HOW TO SECURE SAFE DRINKING WATER

31 January 2018

As Day Zero edges closer, people are stockpiling water from shops and springs. The idea of designated collection points is an uncomfortable thought, and so many people are looking at alternative emergency sources such as rain water tanks, pools and boreholes. These sources make a lot of sense for toilet flushing and washing, but what about drinking and cooking?

1. How do I know if my borehole or rain water is safe to drink?

Untreated water contains various invisible microbes such as bacteria, viruses and protozoans (e.g. Giardia and Cryptosporidium). These harmful microbes can cause diseases as well as diarrhoea and vomiting. Unlike the pre-treated water that comes out of our taps, if water has not been treated it's best to assume it is not safe to drink. The only way to know if untreated sources – whether rain water or groundwater – are safe to drink is to have a water sample tested in a registered laboratory. You can also use hydrogen-sulphide home tests to indicate whether it has harmful bacteria.

2. Why must I test my untreated water if I want to drink it, and how do I do this?

You do not want any bacteria in your drinking water. Bacteria are the biggest danger and in any emergency situation these must be treated first. You need to look at the water chemistry to see what the salt, metal or heavy metal content is. The list of elements to check for is long (over 40) and each one has to be considered based on its concentration and health implications. The correct test to use is the South African National Standards or SANS 241. Water suppliers, like municipalities or disaster-response teams, use this test every day to check our drinking water. So keep in mind, your water quality could change – especially stored rain water after a heavy storm. Rather be cautious and treat your water.

3. Is it still safe to drink tap water as we draw water from the bottom of the dams?

Tap water remains a safe drinking water resource as long as it continues to comply with national water standard requirements. While the water at the bottom of dams is often of a poorer quality because of particles that concentrate and settle, it takes extra effort and care to abstract and treat this water - which remains the responsibility of the City of Cape Town. Full weekly drinking water tests at dams, boreholes, treatment works and designated taps are run on our behalf, and treatment is adapted as required. Cape Town's water quality can be reviewed on their water quality site. However, during water outages, pipes will stand empty and there is a risk of soil water flowing into the pipes at places where there are cracks. So when the taps are turned back on, be careful about drinking it. Basic treatment, like boiling, is advised in places where water interruptions have happened in our taps. It will be the responsibility of the City, to alert us if water quality changes and if certain neighbourhoods are experiencing problems.

4. What about bottled and spring water?

Typically bottled water is one of the safe sources to turn to. If you want to be assured that the bottled water has been tested, then look for the SANBWA label – the South African National Bottled Water Association. SANBWA tests and confirms that its members meet health standards. Another popular water source for many residents is spring water from iconic sites such as Newlands and Muizenberg springs. They are not part of the Cape Town water system and are thus not regularly tested by authorities. Interest groups may test the water from time to time and currently many people drink it without treatment. Ultimately, however, the regular drinking of this water without treatment is left to your own judgement and it is at your own risk.

5. Why shouldn't I drink water straight out of my rainwater tank?

Although pure rain water is clean enough to drink, the water collected in rain water tanks has been recovered from your roof and gutters which likely will have bird or rat droppings as well as leaves and dust which contains chemicals from air pollution. This water should be cleaned and disinfected before drinking.

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6. What is wrong with drinking untreated borehole or wellpoint water?

Groundwater outside of cities is often safe to drink, but it is wise to assume that all borehole and wellpoint water in Cape Town should be treated before it would be suitable as drinking water. Typical problems in Cape groundwater are high iron and/ or high salt levels, as well as microbes from overflowing or leaking wastewater systems and from homemade pit latrines where a hole is dug in the ground. Be aware that a Day Zero situation may result in a breakdown of our sanitation system and you and your neighbours may resort to creating their own pit latrines. As the Day Zero scenario stretches, there may be a growing risk of sewage contamination, so be sure to include a sound microbial treatment method. Water from streams and wetlands should be treated with equal caution.

7. What is the easiest way to make water safe to drink?

The most important is to make sure that water is free of microbes (bacteria, viruses and protozoa) to prevent diarrhoea outbreaks. Chemicals dissolved in the water (such as nitrates) are a less acute health threat when you are only drinking this water for a short time. People with compromised immune systems, babies and the sick should use bottled or tap water as far as possible. The simplest and safest way to ensure the microbial safety of drinking water is to boil it. You need to give it a long boil for at least three minutes to ensure that the microbes are killed. Remember, that if you are using alternate sources after Day Zero – this treatment is only necessary for the volumes of water you are going to drink or cook with.

8. What other methods are on offer?

There are many ways to treat water, and the performance among different methods varies extensively. Sometimes a combination of methods is advised for water sources with high risk of both microbial and chemical contamination (such as groundwater, river and wetland water). A set of common methods is shown here. For more information, see the table below.

9. How do I store my drinking water safely?

It is essential to store your drinking water safely, so that it does not become contaminated again. Clearly label any drinkable water, collected and stored in clean (sterile) plastic/ glass/ stainless steel containers. You can use a baby bottle disinfectant (e.g. Milton) to sterilise your containers. Keep in a cool dark place to avoid any microbial or algal growth. It is also preferable to use food grade plastic which is determined by the number within the three-arrow triangle that classifies the type of plastic. Food grade means that no harmful BPA will leach into the water over time. The BPA-free plastics are those with numbers 1, 2, 4 and 5. Make sure that your clean water is sealed with a closed lid so that nothing can get in. Your hands also need to be clean when you handle it, as well as any scoop or funnel that you might use to get water out of your clean water storage container.

10. Where can I get more information?

The World Health Organisation (WHO) provides many documents describing household treatment on their website. Drinking water quality guidelines can be found here and treatment of water following emergencies and disasters on these pages. The Centers for Disease Control and Prevention, or CDC, provides fact sheets on "Making Water Safe".

DAY ZERO PREP - THIS WEEK'S BUCKET LIST:

- **Ensure that you have enough CLEAN STORAGE CONTAINERS for drinkable water - and a dark, cool place to store them**
- **If you are likely to use an alternate source for drinking (rain water or groundwater) make sure you have a sample of that water TESTED at a registered laboratory (SANS 241) - if you are going to share a neighbour's borehole, you can offer to get the test done (sooner rather than later)**
- **Start thinking now about the TREATMENT METHOD that is best suited to you, your water sources and your needs and make sure you have what is needed**

For more information

- Cape Town's Water Quality
- Common Methods for Treating Water
- WHO: Safe Storage and Treatment of Household Water

- Drinking Water Quality Guidelines
- Household Water Treatment and Safe Storage Following Emergencies and Disasters
- Making Water Safe in an Emergency
- Waterborne Diseases

[Click here for information on SANAS-accredited water testing laboratories](#)

*WWF is grateful for the participation of the following experts in compiling this Wednesday Water File:
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COMMONLY AVAILABLE DRINKING WATER METHODS FOR THE HOUSEHOLD

FACTORS TO CONSIDER	WATER TREATMENT METHODS							
	BOILING	FILTRATION			DISINFECTION		ATMOSPHERIC WATER GENERATOR	DISTILLATION
		ACTIVATED CARBON WATER PURIFIER	ANY FILTERS WITH LESS THAN 1 MICRON ABSOLUTE PORE SIZE	REVERSE OSMOSIS	CHLORINE (UNSCENTED HOUSEHOLD BLEACH)/ IODINE	CHLORINE DIOXIDE		
TREATMENT OF MICROBES (bacteria, viruses, protozoa)	Highly effective	Not effective*	Effective for protozoa, less so for viruses and bacteria	Effective	Effective for bacteria and viruses, less so for protozoa	Effective for bacteria and viruses, moderately effective for protozoa	Highly effective	Highly effective
TREATMENT OF CHEMICAL CONTAMINANTS (such as iron, pesticides, salinity)	Not effective	Low effectiveness	Low - moderate effectiveness	Highly effective	Not effective	Not effective	Highly effective	Highly effective
COST	Cost of energy to boil	R200 to R1500 plus filter replacement	R1500 to R3000	From R1 000 to R100 000 depending on volumes to be treated	R30 to R300	R300 to R800	R18 000 upwards	Homemade: cost of energy to boil; bought R 2 800
ACCESSIBILITY	Easy but it needs energy	Easy. Ensure regular filter changes	Easy. Ensure regular filter changes	Accessible, but needs high pressure pump to function	Easy. Retailer and online but check instructions	Moderate. Available as tablets on-line. Check user reviews	Moderate. (Current demand exceeds supply)	Household easy: online design description, but limited volume yield; buy online
WATER SOURCE	All freshwater sources	Tap, spring, chlorine pool water	Chlorine pool, rain water, tap, spring	All sources, including sea water	Tap, spring, rain water tank, chlorine pool	All freshwater sources	Air	All sources, including sea water
EXAMPLES OF BRANDS**	Use your own pot and stove	Brita jugs, average undercounter kitchen filter	Ceramic filters like Silver Streak Water Filtration, Stefanie	Puritech, AllofWater, APEC, Home Master	Jik, Milton, Rothco potable tablets	WaterMaker, Micropur, Aquamira	Water from Air	Household: use your own pot and stove; see yacht water makers

* Use another method to treat for microbes **FIRST**, use carbon filters **ONLY** as the last treatment step, to eliminate odours/improve taste.

** There are a wide range of brands, some of which combine treatment methods. WWF mentions brands to direct people's research, not to endorse them

***All safety procedures must be adhered to