



## WWF'S WEDNESDAY WATER FILE

# GETTING TO GRIPS WITH GROUNDWATER

24 January 2018

*In this second weekly update to help people in Cape Town take practical steps to prepare for Day Zero, we talk about groundwater. Collected rainwater and groundwater are critical 'off-mains' sources of water that are now helping households reduce the demand for bulk water, and will be even more important when the taps are turned off. Groundwater is a hidden resource that is a national asset and belongs to all South Africans. As Cape Town already has 22 000 registered boreholes, it's a privately accessed resource and, by default, under the influence and 'management' of thousands of users. With the City's new water restrictions limiting personal use below 50 litres a day from 1 February, groundwater use is increasingly under the spotlight.*

### **1. Where do we find groundwater in Cape Town?**

Groundwater is found beneath much of Cape Town and feeds the springs around the city. The geology (type of rock) under your property determines whether or not there is likely to be an aquifer (underground water supply). If you are on sand, calcrete or hard-fractured sandstone there is likely to be groundwater. If you live on thick clay or granite, you are unlikely to have enough groundwater to pump. Cape Town has three major aquifers: the Table Mountain Group (TMG) aquifer found beneath the mountain and high-lying suburbs, the Cape Flats aquifer, and the Atlantis aquifer.

### **2. What is the difference between a well point and a borehole?**

Well points tap into loose sand aquifers. They are generally shallow, have a narrow diameter pipe and are quick to install. A borehole can vary from a few metres to hundreds of metres deep. A borehole is drilled at a much wider diameter than a well point, into either loose sand or hard rock using a larger drilling rig.

### **3. Who controls how much groundwater you're allowed to use?**

The national Department of Water and Sanitation (DWS) controls all aspects of water use. This includes how much groundwater you can take out and what to use it for. The City also has a say in what you are allowed to use this water for under their by-laws and the water restrictions. If you want to insert a well point or drill a borehole, you have to first apply to the City and then register your borehole or well point once it is drilled. And, unless you have been given a license by DWS, you are not allowed to pump more than 400 m<sup>3</sup> per hectare per year in Cape Town - which is about 1000 litres a day (that equals to only about 100 L per day on a 1000m<sup>2</sup> stand/erf). This volume may be reduced by a government gazette before Day Zero.

### **4. What can you use groundwater for?**

You are allowed to use groundwater for basic garden and household use but you may not use it on a commercial scale or sell it. At Level 6 water restrictions the City discourages you from using groundwater to water your garden but rather to save it for flushing toilets. Life beyond Day Zero will present exceptional circumstances, and we hope that emergency by-laws will be brought in to enable Capetonians to use and share groundwater with neighbours for more uses in order to relieve the burden on the City's emergency Points of Distribution (PoDs).

### **5. Is it safe to drink groundwater?**

Under normal circumstances, drinking water should come from treated mains water. It is not safe to use untreated groundwater to drink without testing it, and in many cases treating it. In order to know how to make groundwater safe to drink (potable) you will need do a laboratory test for salts, metals, nutrients and bacteria (preferably the full SANS241). This costs about R2000. The acidity or pH level of the water also affects what the water can be used for. When you take a sample it's very important that your first purge (pump out) the borehole, use a sterile container and don't touch inside the container or the lid (this can introduce bacteria). Once you know the water quality, you can find out how to treat it and make it safe to drink under emergency conditions. In many cases, this will require very basic treatment. Our Water File next week will talk about home treatment methods.

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## 6. Where will the city access new sources of groundwater?

The City is planning to abstract 80 million m<sup>3</sup> from the Cape Flats aquifer, 30 million m<sup>3</sup> from the Atlantis aquifer and 40 million m<sup>3</sup> from the TMG aquifer before the end of this year. The shallow Cape Flats and Atlantis aquifers will come on stream first and this groundwater will be treated and added into our bulk supplies. The TMG, a huge aquifer which underlies the mountain ranges of the Western Cape into the Eastern Cape, has the potential to deliver more than the initial amount into bulk water and development of this large aquifer will continue for a few years. The TMG well fields are mainly outside the metropolitan area near Grabouw.

## 7. Is our groundwater also going to run out?

Like any renewable resource, if we take OUT more than is going IN over the long term, groundwater can run out. Because groundwater is a large store of water, it takes longer than rivers and dams to feel the effects of drought. But to ensure that there is a fair share of this hidden resource for everyone for a long time, we need to measure how much we use, monitor the water levels and be sparing. We should make the most of aquifers as an important water store in the city (aquifers are nature's dams!). We can do this by making sure that when the rains come, as much rain and storm water is able to infiltrate underground through drainage basins.

## 8. What about the new rules from DWS on metering?

On 12 January 2018 DWS introduced new rules which say all private boreholes must be metered and that the amount of groundwater abstracted must be recorded on a weekly basis and submitted to the DWS. While it is necessary to monitor what we want to manage, many people are concerned that this rate of reporting is unmanageable. A second new rule also states that we must use this resource sparingly and not for 'business as usual'.

## 9. What are the dangers of using too much groundwater?

If a lot of groundwater is abstracted close to the coast there is a danger of seawater 'intruding' into the aquifer - salt water fills the aquifer and this water can't be used by homeowners or farmers unless it is desalinated back to freshwater. As a coastal city, Cape Town has to monitor and manage this risk if boreholes are drilled below sea level. When we pump groundwater the water table drops and boreholes pumping close to each other can interfere with each other and bring down the water table even more. In extreme circumstances where lots of groundwater is removed, the aquifer itself can collapse and land subsidence occurs. Our current groundwater store has been built up over decades by rainfall. We all want to use this store for the long term, so it's going to be critical that we develop a plan for homeowners, businesses and the city to have their fair share and use it within sustainable limits.

**THE ONLY WAY WE CAN DELAY DAY ZERO IS BY DRASTICALLY REDUCING OUR WATER USE NOW.**

## DAY ZERO PREP - THIS WEEK'S BUCKET LIST:

### If you have a borehole or well point:

- **Make sure your PUMP is in good working order. When was your pump last serviced? Do you have necessary spare parts? Now is the time to think ahead, get it serviced and make sure you can rely on it.**
- **If you haven't done a water quality test within the last six months, TEST your water QUALITY at an SANAS-registered laboratory. As a minimum you need to know the levels of total dissolved solids (TDS), pH, nitrate, iron, E. coli and coliform bacteria. A full drinking water test is the SANS241 test.**

### If you don't have a borehole but your neighbour does:

- **Start talking to them about sharing emergency access to their groundwater after Day Zero.**

### For more information

<http://bwa.co.za/laypersons-guide>

<http://www.wrc.org.za/> (Groundwater: the myths, the truths and the basics)

<http://www.gwd.org.za/books/where-does-groundwater-come>

<http://www.wrc.org.za/Knowledge%20Hub%20Documents/Research%20Reports/TT303-07.pdf>

<http://anrcatalog.ucanr.edu/pdf/8085.pdf> (How to sample a borehole)

*WWF is grateful for the participation of the following experts in compiling this Wednesday Water File:  
Marlese Nel (University of the Western Cape), Fanus Fourie (Department of Water and Sanitation), Roger Parsons (Groundwater Division of the Geological Society of South Africa), John Holmes and Chris Hartnady (Umvoto Africa).*