



CITY OF CAPE TOWN  
ISIXEKO SASEKAPA  
STAD KAAPSTAD

# Groundwater FAQs

(Last update: 4 August 2020)

Visit [www.capetown.gov.za/thinkwater](http://www.capetown.gov.za/thinkwater) for all drought-related information.

**Disclaimer:**

This document is subject to frequent updating and should be regarded as a living document which aims to provide clarity on groundwater and related information.

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### General

#### Groundwater abstraction programme

The groundwater abstraction programme aims to supplement drinking water supplies in Cape Town through the careful abstraction of groundwater for potable water purposes and to rely less on dams that depend on rainwater, snow, ice and run-off.

Currently, on average only 0,5% of the bulk supply comes from groundwater. The City hopes to boost drinking water from groundwater to 30%.

#### 1. What is groundwater?

Ground water is water that is underground, opposed to surface water which is above ground such as dams, rivers, wetlands and estuaries.

#### 2. What are aquifers?

An aquifer is a body of rock that can hold water or permit appreciable water movement through them. This water, which comes from rain, melting snow and ice, collects or flows beneath the earth's surface, filling the open spaces in soil, sediment and rocks.

#### 3. What is a wellfield?

A cluster of boreholes used collectively to supply sufficient groundwater to a user or users.

#### 4. What is Managed Aquifer Recharge?

The artificial injection or infiltration of water underground through strict and well managed conditions. Managed Aquifer Recharge (MAR) has many benefits; storage, increase yields, improve water quality and serves as environmental protection barriers.

#### 5. Which aquifers are the City targeting?

Around 0,5% of the City's current supply comes from the Atlantis Aquifer which has been in operation for 40 years. The Atlantis Aquifer scheme also consists of a MAR component.

The City is busy with upgrades to the scheme which will increase supply. The additional water will contribute to the bulk supply by 2021.

In the early 2000s, the Table Mountain Group Aquifer (TMGA) was identified as a potential source of groundwater.

Baseline monitoring commenced in 2010 at various locations. Consequently, seven (7) wellfields were identified as potential targets, namely: Voelvlei; Wemmershoek; Berg River Valley; Nuweberg and Klipfontein; Helderberg Basin; Steenbras and Southern Planning District ([Refer to figure 1](#)).

In 2017, the City undertook to explore Steenbras, Nuweberg and Klipfontein.

First water target dates are 2020 for the Steenbras Wellfield and 2022 for the Nuweberg and Klipfontein Wellfields.

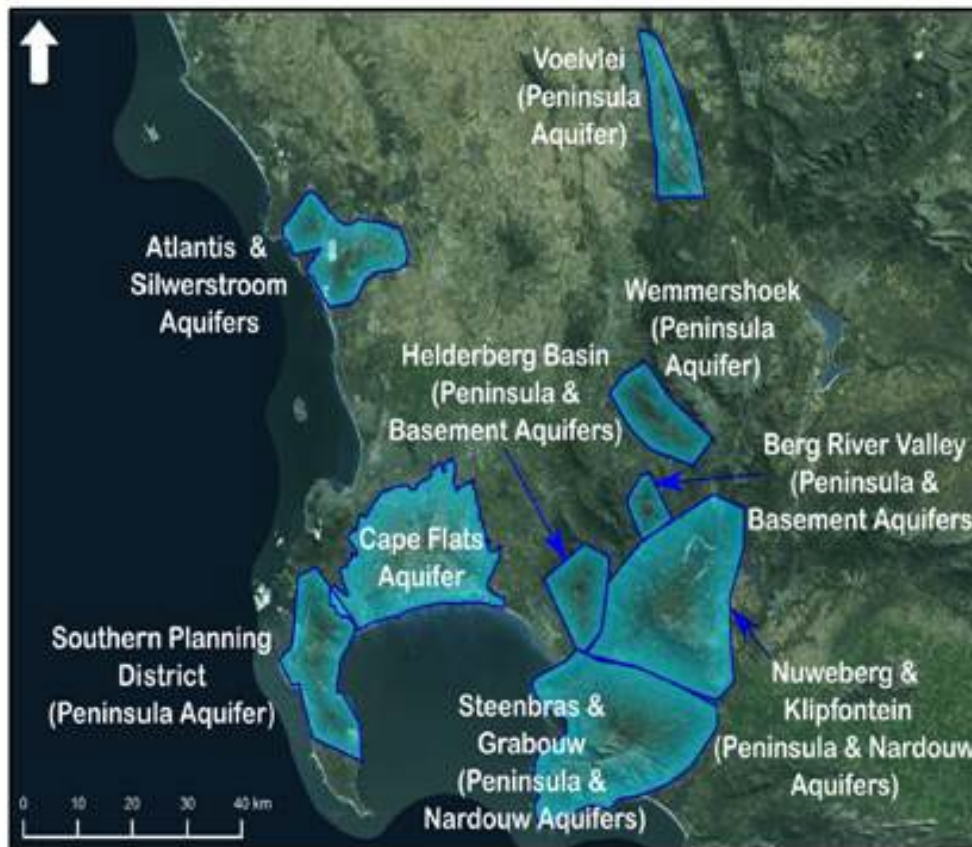
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The monitoring at the other sites will continue and aid in a better understanding of the aquifer.

Furthermore, in 2017 the City also started exploration in the use of the Cape Flats Aquifer (CFA), which subsequently was identified as a potential wellfield by the National Department of Water and Sanitation in 2016.

The CFA will also consist of a MAR component to improve quality and increase supply. First water contributing to the bulk water supply is scheduled for 2021, in increments.

***The aforementioned wellfields are illustrated in Figure 1 below.***



### 6. How much water is the City planning to abstract?

The City plans to abstract a total groundwater volume of 105M l/d. The table below illustrates the volume per aquifer/wellfield. The number of boreholes in each wellfield will depend on the volume obtained, during drilling, to achieve the target set in the Water Strategy.

Aquifer	Wellfield	Volume (Ml/d)
<b>Atlantis Aquifer</b>	Witzands	
	Silwerstroom	6
<b>Table Mountain Group Aquifer</b>	Steenbras	25
	Nuweberg	15
	Klipfontein (aka Groenlandberg)	20
<b>Cape Flats Aquifer</b>		45

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### 7. Is groundwater abstraction based on scientific research?

Groundwater abstraction is based on scientific principles and detailed research, sometime undertaken years before development.

Six phases must be completed to access and manage this resource safely and sustainably:

- a) **Mobilisation:** The project team checks whether existing water can be used more efficiently, and examines the relationship between rainwater and groundwater. It also investigates how the aquifer system can supply and store water, and if necessary, how water quality can be improved.
- b) **Planning:** Existing studies and borehole inventories are sourced and refined. Borehole positions are planned to ensure anticipated optimal yield. Experts (scientists, engineers and so on) also assess water quality, surface water features, flood lines, water-related infrastructure, and land ownership and use. They take into account roads and services, potential reservoirs, connections to the existing water distribution network, and power supplies.
- c) **Exploration:** This involves exploration drilling, water sampling and analyses, including an aquifer stress test. The latter is a controlled field experiment to estimate the system's hydraulic properties – how the water is moving under pressure in the aquifer. Exploration boreholes provide invaluable information about the geology and aquifer and serves as ongoing monitoring boreholes thereafter.
- d) **Production:** This phase entails the drilling, testing and equipping of the production boreholes.
- e) **Extended close-out phase:** Water is pumped into the existing network. The monitoring and management systems started during the mobilisation phase are now refined to ensure that the aquifer is used optimally and sustainably in the long-term.
- f) **Monitoring:** Monitoring is an ongoing activity that assists with the management of the scheme and ensures compliance. This activity continues even after a wellfield is decommissioned.

### 8. How does the City decide where – how does this affect the environment?

A number of scientific methods were used by an appointed Hydrogeologist (registered with a professional body) to identify borehole locations.

These locations were also screened by independent freshwater and terrestrial ecologists, the City's Water Resilience Environmental Control Officer (WRECO), the City's Biodiversity Management Branch and Environmental Control Officers (ECO's).

At every site, a duty of care would apply and sensitive features or areas are avoided and disturbance minimised. The City is required to comply with the approved environmental management programme and method statement, over and above the duty of care.

### 9. What legislation is applicable for groundwater abstraction?

In South Africa, environmental legislation is largely housed in the [National Environmental Management Act \(NEMA\)](#), which sets out environmental principals, co-operative environmental governance and integrated environmental management.

Any development that triggers a listed activity contained in the NEMA Environmental Impact Assessment (EIA) Regulations, typically requires an EIA to be undertaken, with the requirement for an environmental authorisation to be issued prior to commencement.

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However, due to the Disaster Declarations issued in terms of the [Disaster Management Act \(Act 57 of 2002\)](#), the provincial and national environmental departments (DEA & DP and DEFF, respectively), issued NEMA Section 30A Directives to allow the CCT to expedite project commencement and implementation.

In addition to the above, authorisation of water use is guided by Sections 21 and 22 of the [National Water Act \(Act 36 of 1998\)](#) (NWA). In terms of groundwater abstraction and wellfield development, there are numerous factors to consider when determining the appropriate specialist studies required.

### **10. How does licensing work and what will happen if the aquifers run dry?**

It is the responsibility of the National Department of Water and Sanitation (DWS) to assess impacts and award licences on the basis of the information available and submitted as part of the water use licence application.

The water use licences include specific conditions relating to water use, aquifer management and monitoring, which directs how the City utilises and manages the groundwater resources.

Furthermore, the licensee is responsible for the establishment of a Monitoring Committee. The Monitoring Committee is a body whose main focus is to monitor the impacts of the abstraction of groundwater from boreholes by the water user on the environment.

This will include monitoring compliance with the licences issued by the Department of Water Affairs and Sanitation to the Licence Holder, and providing a forum where concerns can be raised, discussed and resolved.

The monitoring committee will include different stakeholders in order for it to be well represented in all spheres. Compliance with the licence conditions will ensure that over-utilisation does not occur.

### **11. How do you monitor groundwater abstraction?**

In accordance with the Water Use Licence issued to the City, a monitoring protocol has been developed, which includes the following:

- Flowmeters must be installed to measure the abstraction with the monthly abstraction volume recorded against date and time;
- Waterlevels must be monitored monthly (through designated monitoring boreholes), with the reading recorded against date and time;
- Monitoring of water quality (chemistry) quarterly, with field readings to be taken at time of sampling and recorded against date and time;
- The water samples collected should be submitted to a reputable, accredited laboratory for chemical analysis;
- The monitoring data should be stored in an acceptable format, in a database with sufficient backup, and provided to the National Department on an annual basis;
- Analysis to be completed by a Hydrogeologist (registered with a professional body).

### **12. Are aquifers sustainable?**

Aquifers are sustainable, provided the development and management thereof adheres to prescribed scientific methodology.