



CITY OF CAPE TOWN  
ISIXEKO SASEKAPA  
STAD KAAPSTAD

# DESALINATED SEAWATER



A NEW SOURCE OF WATER FOR CAPE TOWN • MARCH 2020

Making progress possible. Together.



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# Introduction and importance of desalination for Cape Town

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## **Cape Town recently experienced the worst drought in recorded history.**

Due to the uncertainty regarding the impacts of global climate change, it makes sense to diversify our water resources and not solely rely on surface water schemes. The 2015 National Water Resources Strategy stipulated that South Africa must explore all possible water sources, including desalination, in order to support the ever-growing national water demand in our water-scarce country.

To protect ourselves from the negative impacts of drought and severe water restrictions in future, the City has started getting water supply from other available water sources, such as groundwater from aquifers, spring water, water re-use and desalination. As outlined in the City's new Water Strategy, these new water sources will help increase our water supply by over 300 million litres a day over the next 10 years.

Temporary desalination facilities, such as those at Monwabisi and Strandfontein, have added drinking water to our supply network during the drought, and also taught us valuable lessons that can be applied to future permanent desalination plants as part of the City's Water Strategy.

Permanent desalination is planned because seawater is available all the time, whether it rains or not, so it's more reliable than any other water source. About 97% of water on Earth is in our oceans. We can make use of this huge resource through the process of desalination, which makes it drinkable and usable for us. Although desalination is the most expensive supply option and there are environmental issues that need to be well-managed (such as the salty 'brine' it produces as a waste product), it is an important part of the diversified water supply 'mix' going forward.

This leaflet explains desalination and the monitoring processes that are in place to ensure that your water is safe to drink.

# Cape Town is not the only city using desalinated seawater

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Desalination is used around the world, especially in coastal areas with low rainfall, such as Saudi Arabia and Qatar in the Middle East, Sydney and Perth in Australia, and Southern California in America.

Various cities in South Africa have small or medium-size reverse osmosis plants to desalinate water for bulk supply: Mossel Bay, Knysna, Sedgefield, Plettenberg Bay, Bushman's River Mouth, Lambert's Bay, Elands Bay and Richards Bay, among others. This is set to increase in future.



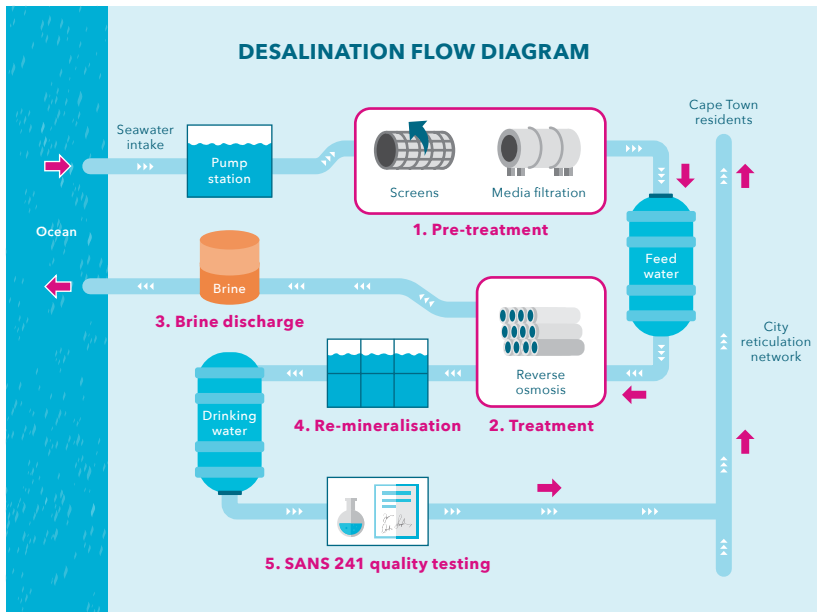
# What is desalination and how does it work?



Desalination is the process of removing salt and minerals from seawater to produce clean, usable and drinkable water.

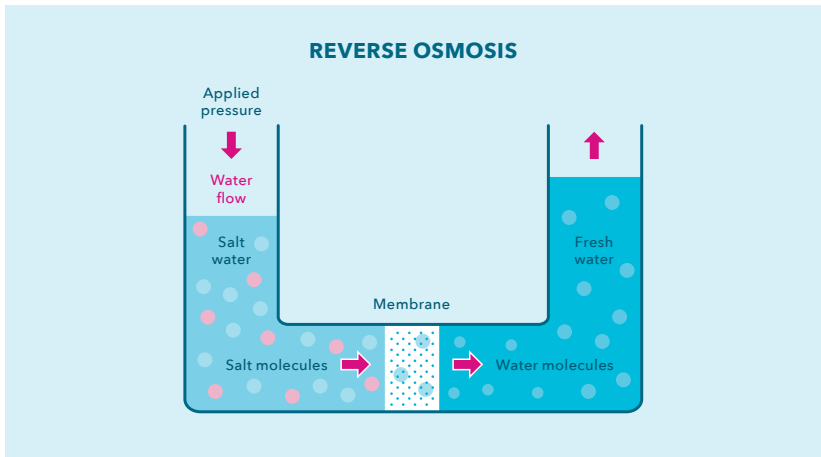
## THE DESALINATION PROCESS USUALLY INCLUDES THESE STEPS:

**1. Pre-treatment.** Seawater is pumped from the ocean and cleaned through a number of pre-treatment steps to remove big and small particles from seawater. These pre-treatment steps include screens to remove big particles (sea shells, sea grass, etc.) and media filtration to remove small particles (sand, fine organics and other suspended particles) by filtering the seawater through several layers of sand.



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**2. Treatment.** The seawater is then fed under high pressure through a very fine membrane with tiny holes, which removes the salt and minerals from the water to create clean drinking water. The holes in these membranes are so small that only particles the size of water molecules can pass through. The salt is then separated from the clean drinking water. This method is used in the temporary desalination plants around Cape Town, and is called **reverse osmosis**. There are other methods of desalination, but reverse osmosis is likely to be used for the permanent desalination in Cape Town, too.

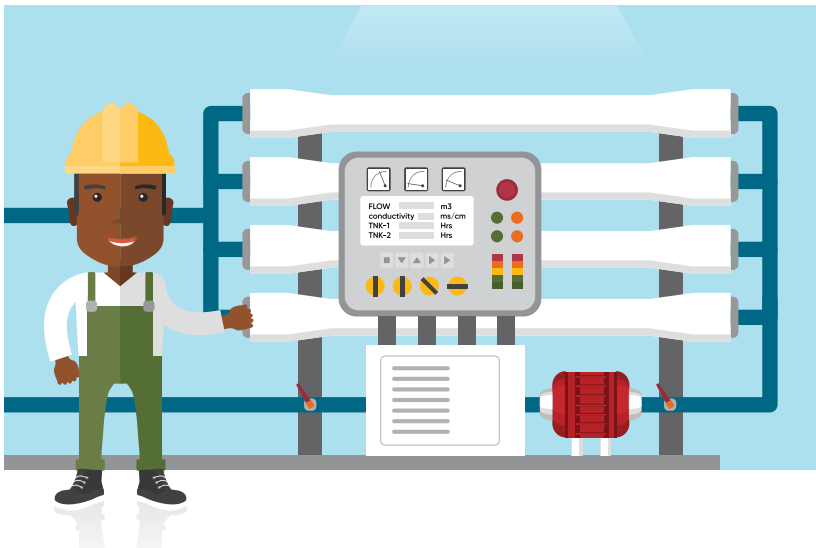


**3. Brine discharge.** The salt and minerals that are removed by the reverse osmosis process are contained in a fluid called brine. In most cases, and with our temporary plants in Cape Town, the brine is pumped back into the ocean, where it mixes and dissipates quickly in the sea. For every 10 litres of seawater used for desalination treatment, 4 litres will be drinking water and 6 litres will go back into the ocean as brine. Brine, therefore, has approximately twice the salt concentration of seawater.

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**4. Re-mineralisation.** Since minerals are also removed in the treatment step, minerals such as calcium need to be added back into the treated water to stabilise it. The drinking water is stabilised to reduce corrosion in the pipelines to your house.

**5. SANS 241 quality testing.** The water is tested according to the national drinking-water quality standard (SANS 241) throughout the desalination process to ensure it is safe to drink.



If you live close to a desalination plant along the Cape Town coast, the chances are good that your tap water will include some treated desalinated water. This water might taste a bit different to the water you are used to, but it is safe to drink and use.



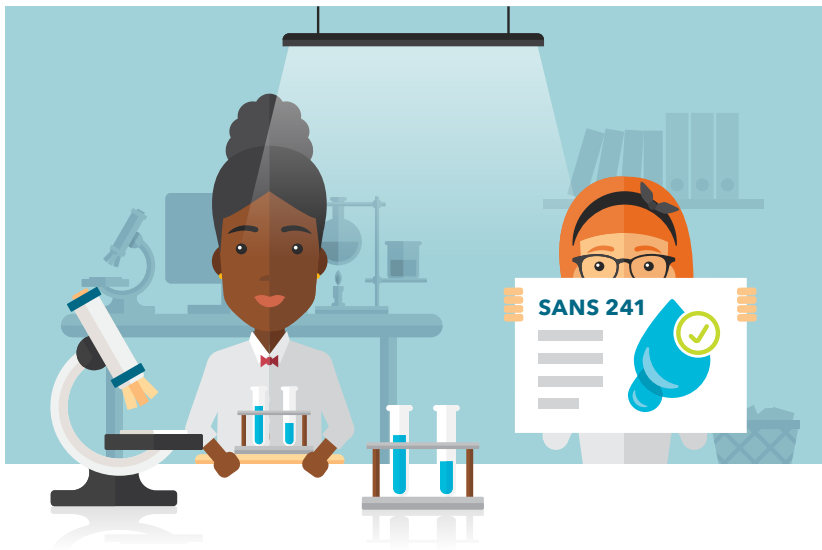
# How can I be sure desalinated water is safe to drink?

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The desalination process uses membranes with very tiny holes, which are an excellent barrier against impurities, such as bacteria and organics, that are sometimes present in seawater. Chlorine is also added to kill any bacteria that might be present in drinking water.

Desalinated drinking water is tested frequently according to the national drinking-water quality standard, called SANS 241, to ensure it is safe to drink before it is pumped into the reticulation pipeline network to go to customers.

The City of Cape Town's Environmental Health Department and Scientific Services also conduct frequent water-quality testing at a number of monitoring points across the city to ensure the water is safe to drink.



# Taste differences in water from various water sources



Depending on the origin of the water and the process used to treat it, there may be slight changes in taste – particularly for those who are sensitive to changes in taste. Some people have more sensitive taste buds than others, so they pick up changes in the taste of water more than others.

## HOW AND WHY DIFFERENT SOURCES OF WATER MAY HAVE DIFFERENT TASTES

Surface water from dams fed by different catchment areas in and around Cape Town	The bulk water from surface water dams can taste slightly different depending on the vegetation and geology in the catchment area that feeds each dam. For example, the rocks and plants growing in the rainfall area feeding into the Wemmershoek Dam are different from the area feeding into the Theewaterskloof Dam, or the smaller dams on Table Mountain.
Spring water/fountains and groundwater from aquifers	Water from groundwater sources tastes like the substances it comes in contact with. For example, the spring water from Table Mountain may taste different to the groundwater from the Atlantis aquifer.
Desalinated water	Desalination removes salts and minerals from water, making it safe to drink. Calcium is added back into the water at a later stage to stabilise the water. Since some people are more sensitive to taste, they might experience a slight 'flatness' in the water.
Geosmin in surface water from dams	Geosmin is a naturally occurring, non-toxic compound that tends to give off an earthy taste and slight odour in water. It sometimes occurs in surface water sources during the summer season. However, the slight taste and odour are completely harmless.



For more information, or to report water-related issues, you can contact the City of Cape Town through **ONE** of these channels (please keep to the channel you choose):

**Online:** [www.capetown.gov.za/servicerequests](http://www.capetown.gov.za/servicerequests)

**Email:** [water@capetown.gov.za](mailto:water@capetown.gov.za)

**SMS:** 31373 (max 160 characters)

**Call:** 0860 103 089

**Visit:** City walk-in centres, see [www.capetown.gov.za/facilities](http://www.capetown.gov.za/facilities)



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