



# Thinking of drilling a borehole?

The process of drilling a borehole is often over complicated  
We are here to assist you every step of the way

## STEP 1: Water Survey

**You can decide where you would like the installation to be positioned.** We will provide our assessment and make necessary recommendations should the position you choose not be suitable. There are various ways in which the location of water can be surveyed.

**Water Diviners** use various means of detecting water such as willow branch, rods and water bottles, to name a few. When passing over the water point diviners claim to "feel" the water.

**Hydrogeologists** use geophysical methods to survey the subsurface geology. In urban areas the results can be influenced by cellphone towers, overhead cables and other electrical services.

The suitability of a site will depend on the geology of the area and your water requirements. The geology and level of the water table will determine at what depth water can be found and in which quantities.

## Do you guarantee finding water?

We cannot 100% guarantee that water can be found at a given site but we would hope that through our initial discussions and research before drilling that we would have a clear idea of the ground conditions and likely yield. We would not undertake a job that we felt could not meet your requirements.

The drilling contractor can never guarantee that he will intersect water and therefore it is the client who is at risk for the cost of the borehole, regardless of whether it is wet or dry!

We find that through our experience and knowledge of Cape Town's geology, we can be confident about the expected yield.

## STEP 2: The Drilling Process

After the water survey has taken place, the borehole drilling can proceed at the identified location.

Once the drilling commences, communication with the client is clear and persists at all time. This way the client is updated in terms of the depth of drilling, costs involved and general geological findings.

The drilling rig we use can access your driveway and possibly your garden, provided there is an access point which is 4m wide, 8m high and 6m in length without completely obstructing the road, allowing thoroughfare for vehicle traffic where required.

Since the ground formation varies from area to area, it is difficult to speculate on the depth of a borehole. Suffice to say that most boreholes are between 100m - 150m and sometimes deeper.

### How long does it take to drill a borehole?

It depends on the depth and the type of material which the driller expects to encounter coupled with the hardness of the material found on the way down. If he encounters a lot of rock for example, this is going to lengthen the drilling process. Depending on the depth and rock formation a borehole, it can take anything from a day to three days to drill.

### Is drilling Messy?

When drilling a borehole, material removed has to find its way to the surface. In most situations we initially drill 'dry', and this produces dust. When water is found, slurry emerges from the hole. We work carefully, and do our very best to minimise mess.

### What is ODEX Drilling?

ODEX uses a special hammer drill bit which is designed to be used inside and at the bottom of the steel casing. This drill bit has an eccentric reamer below the steel casing. With this method the hammer pulverizes the material below the casing and then blows it back through the casing to the top of the borehole. As the hammer drives through the material, it also reacts against the interior shoulder beveled inside the steel casing, which pulls the casing down the borehole as the hammer drill is advanced.

### What does it cost to ODEX Drill?

Although ODEX it is a highly efficient method, it is costly as there is a high cost steel, specialist equipment and diesel consumption. Our ODEX rate is R2,000 per meter and includes the cost of the casing for the depth of the Odex drill. There are two additional costs which are associated to Odex drilling which are once off, being the Odex Shoe, R9,000 and welding of the casing @ R3,500

### Is Odex necessary?

The Odex method is used when the ground formation is unconsolidated, such as in clay or decomposed granite. Area's in which there is a high likelihood of requiring this method include, Camps Bay, Hout Bay & Newlands to name a few. It is not always the case, but unconsolidated ground occurs more often than not. There are two other methods that can be deployed

### Are you insured?

We are comprehensively insured with 3rd party liability. However, our terms and conditions state that we are not liable for any damage to property. The onus is on the client to advise the contractor of any services and existing infrastructures on the property.

## STEP 3: Equipping of the borehole

The final stage of the sequence of events is to pump and pipe (reticulate) the water from the successful borehole. The end use of the water will to a large extent determine what type of pumping and reticulation system is to be installed. Of paramount importance to the pump installer are the results of the pumping tests - how much water can be pumped out the borehole for how long a period?

General factors influencing the size of the pump to be installed will be the following:

- The clients' water demand.
- Depth of the hole.
- Actual water yield of the borehole

Depending on the geological formation, there should be a borehole rest period before the pump can be installed. The drilling contractor will advise the client accordingly.

## How long does the pump installation take?

Borehole installation with a pump can take about a day or two. Connected to a tank system, the borehole installation can take a further 2 days.

## Will my borehole need a pump?

Usually, yes. A submersible pump is an electrically operated pump which is located at the bottom of the borehole to bring water to the surface. However, if the underground supply is under pressure, this creates an artesian well where water simply flows out, and which does not require a pump.

## How reliable is a submersible pump?

We only install reliable high-specification equipment. A significant number of operational factors have an influence, for example, low mains voltage, or 'aggressive' water, which is exceptionally acid or alkaline, can have an impact on this. However, replacing a pump is normally a straightforward process—small domestic type pumps, are suspended on a nylon rope to enable it to be brought to the surface. The changeover time will usually take anything from 3 to 5 hours on-site.

## Borehole Yield Testing

### What is a yield test and should I have it done?

A yield test determines the amount of water in the borehole and the rate at which it can be pumped. It is useful to have a yield test done in order to determine the correct size of your submersible pump. A well selected submersible pump will give you many years of good service. After the testing is completed, a certificate indicating that the yield is tested, is provided

### Will the borehole yield always be the same?

The yield of a borehole is not always constant. Precipitation conditions above the ground will determine the availability of water in the borehole. Natural fluctuations in the weather systems such as seasons and drought will impact on the yield of a borehole. It is better to drill your borehole in the driest time of the year as that often gives one an indication of the worst-case scenario.

## Do I need filtration?

The answer to this question depends on the results of your water analysis tests. If your water test results show no adverse content, we would recommend an ultra violet filter at the point of use if you intend to drink it. However, if you are pumping directly into an irrigation system for example, usually no filtration is required, though a pH adjustment may be necessary to protect your irrigation equipment.

Other forms of filtration for example, might be if your test results show high levels of iron, manganese, lead, or any one of a host of other metals, or if your water is excessively hard or soft.

## What is a pressure vessel and do I need one?

A pressure vessel is a pressurized cylinder which attempts to maintain equilibrium of even water pressure (Bar) across a system which has several or many points of use. If your storage tank pump is going to deliver water to 3 or more points of delivery, using water at one point may cause a sudden drop in pressure at another point. If you're using equipment which is pressure sensitive or critical, maintaining even system pressure (Bar) across your network may be essential.

## Do I need a tank and if so what size?

For most scenarios we always recommend a water storage tank. This tank, or series of tanks may be sited above or below ground. Installing storage tanks offer distinct advantages over pumping directly from a borehole. The heart of your system is your borehole. It is often the single most costly item in the system and is beneficial not to have this pump switching on and off every time there is demand. Instead it is better to pump your well or borehole water to a tank -, from which your water is then delivered to your network via a tank pump.

Tank size is calculated as a portion of your water requirements. For example, if you need 2 500 litre's a day and your system suddenly develops a problem, you either have to do without water until the system has been repaired, or you must switch back to mains water - if you have mains. A 2,500 litre tank means you can continue using your water, and have a day in which to isolate and fix the problem.

Suddenly finding yourself without water may be inconvenient if the water is simply for a home situation, but if you're pumping water for commercial use, this could be costly to your business. Having a storage tank enables you to continue using your water, reduces stress on your borehole or well pump by not have it operating

constantly - and provides you with better control over your entire system.

## How will my borehole water compare with mains water?

As far as the supply itself is concerned, water is pumped from the borehole at a constant 'mains' pressure, typically 2-4 bars. With an adequate supply, there is no requirement for storage tanks. The pump supplies water 'on demand', and a pressure-operated switch cuts off its electricity when it is not working, to ensure economic running. We run pipework to your building exactly as a rising mains supply would be connected, so in general your water is a 'fit and forget' installation.

## What is groundwater recharge?

When the water level of the borehole drops it is recharged with water entering the borehole from the cracks and fissures or aquifer. Water under the surface of the earth (groundwater) occurs in cracks and fissures in hard rock formations across approximately 89% of the RSA. The other 10% is underlain by loose sands (also called primary aquifers) where the water occurs in openings between sand grains.

## How can Borehole Water be contaminated?

Borehole water can be naturally contaminated by minerals, chemicals, bacteria and viruses. However, human activity usually has the greatest impact upon shallow ground water quality as a result of:

- Excessive or inappropriate use of fertilizers, animal manures, pesticides and insecticides
- Poorly constructed and maintained septic tanks and other liquid waste disposal systems
- Pit toilets
- Leaking fuel and chemical tanks
- Intensive agriculture, industry or mining
- Leaching from waste disposal areas
- Accidental spills of chemicals
- Feedlots and kraals
- Other contaminants such as nitrate, arsenic, pesticides and petroleum products are of health concern, particularly if bore water is used for drinking or watering vegetables.

It is not always possible to tell if your borehole water is contaminated. However some signs of potential trouble are:

- A low pH (acid water);
- A chemical or petrol smell;

- Soap suds around sprinkler outlets;
- A change in water colour; and
- Dying or wilting plants.

It is possible to do a simple test for pH (acidity) by using either a swimming pool test kit or pH test strips. This will show if the borehole water has the ability to dissolve either man-made or naturally occurring substances in the soil.

Borehole water with a low pH (acidic) of less than 5 should be professionally tested to ensure that they are safe to use.

## How long will a new borehole last?

Several generations at least. Our boreholes are lined with tough plastic pipe or Steel Casings (Depending on the formation of the hole) to the bottom, which allows water to flow into the borehole and prevent the borehole from collapsing.

