

# Ten Key Parameters

In Egypt, our water is tested for 51 different substances or "parameters". Some are more important than others in terms of what they tell us about the water. The government has termed the ten drinking water standards of most significance for Egypt as the "10 Key Parameters". They are:

- [Coliforms](#)
- [E.coli](#)
- [Colour](#)
- [Turbidity](#)
- [Hydrogen Ion \(pH\)](#)
- [Aluminium](#)
- [Iron](#)
- [Manganese](#)
- [Lead](#)
- [Trihalomethanes \(THMs\)](#)

## Coliforms

---

### Coliforms

#### Bacteria that should not be in the water supply

#### What are they?

These are a group of bacteria that are found widely in the environment as well as in the gut of warm blooded animals. They should not be in the water supply and are removed by an effective disinfection process. The regulatory standard is 0 per 100ml of water.

#### What does a sample failure mean?

Most coliforms are not harmful in themselves, but their presence in a water sample can indicate that there is a problem with the disinfection process or the structural integrity of the distribution system. All failing samples should be investigated and the outcome reported to DWQR. Failure of a consumer tap sample may be due to the condition of the tap itself, rather than the quality of the water supply

## E.coli

---

### E.coli

#### Bacteria that should not be in the water supply

##### What is it?

*E.coli* (*Escherichia Coli*) is a bacterium, and a member of the coliform group. Sometimes known as faecal coliforms, they are only found in the gut of warm blooded animals, so their presence in drinking water can indicate contamination of the water supply by faecal matter. They are removed by the disinfection process at water treatment works. The regulatory standard is 0 per 100ml of water.

##### What does a sample failure mean?

*E.coli* can cause illness in humans, and any sample failure must be taken very seriously indeed. A detection in the water supply can lead to precautionary measures taken after discussions with health professionals, such as an increase in chlorine concentrations or a temporary instruction to boil water before consumption. Any sample failure must be fully investigated as it could mean there is a problem with the treatment process or the supply system. Failure of a consumer tap sample may be due to the condition of the tap itself, rather than the quality of the water supply.

## Colour

---

### Colour

#### The degree to which the water is tinted

##### What is it?

Colour, in relation to water supplies, has a precise definition. It is a measure of the extent to which the water appears coloured or tinted due to substances dissolved in the water. In Scotland this colouration is usually yellow due to humic substances derived from peat in catchments. Colour is measured on a scale defined by a solution of Platinum Cobalt, also known as degrees Hazen. The compounds which cause colour can be removed by standard water treatment processes, however some smaller supplies in rural communities in Scotland do not yet have this treatment. Colour is an aesthetic parameter and of no health significance, although highly coloured water will be unacceptable to consumers.

## What does a sample failure mean?

Colour is not a health-based standard, so a failure does not have public health implications. At the standard (or Prescribed Concentration or Value, PCV) of 20 milligrammes per litrePt/Co, the water will appear slightly but noticeably coloured to most consumers. Very highly coloured waters will be unacceptable to many consumers, so DWQR expects Scottish Water to optimise treatment process to ensure compliance and plan investment to install colour removal processes where none are present.

## Turbidity

---

### Turbidity

#### The degree to which the water appears cloudy

#### What is it?

Turbidity is an optical property relating to the degree to which suspended particles in the water scatter light. In practical terms it means the extent to which the water appears cloudy or hazy. Highly turbid water is unacceptable to consumers. In Scotland there is a standard (PCV) for turbidity in water of 1 NTU leaving the treatment works and 4 NTU at consumers' taps.

#### What does a sample failure mean?

The standard is primarily an aesthetic one, but high turbidities need to be investigated, especially in water leaving the treatment works, as they could indicate a problem with the treatment process and may mean that the effectiveness of disinfection has been compromised. Failures can occur at consumers' taps for a number of reasons, but the most common cause is the disturbance of sediment in the bottom of corroding iron water mains. Cloudy water is unacceptable to consumers, and DWQR expects Scottish Water to ensure instances are minimised through operational practices and an appropriately targeted programme of water main rehabilitation.

## Hydrogen Ion (pH)

---

### Hydrogen Ion (pH)

#### The degree of acidity of the water

## What is it?

pH is a measure of the degree to which the water is acidic or alkaline. Drinking Water in Scotland should be in the range pH 6.5 to pH 9.5, where pH 7 is neutral. Waters that are naturally low pH, which applies to most Scottish supplies, may need to be conditioned in order to ensure they comply with the Regulatory standard. This is most commonly achieved by adding lime or passing the water through a bed of limestone chippings.

## What does a sample failure mean?

Extreme pH values are undesirable for aesthetic reasons, and there may also be health implications. Low pH waters will tend to be corrosive to pipework and household fittings, and should be avoided.

## Aluminium

---

### Aluminium

#### A metal occurring naturally and used in the water treatment process

## What is it?

Aluminium occurs naturally in water supplies where acidic waters dissolve it from soils and rocks. Aluminiumsulphate is also used extensively as a coagulant in order to treat water, and poor control of treatment processes is one of the most common reasons for failures of the PCV for aluminium of 200 microgrammes per litre at consumers' taps.

## What does a sample failure mean?

The PCV for aluminium of 200 microgrammes per litre is primarily set for aesthetic reasons, although extreme concentrations may be damaging to health and especially problematic for those undergoing kidney dialysis. Failures of the standard are usually associated with recent or historic inadequacies of the water treatment process.

## Iron

---

### Iron

#### A metal that occurs naturally and is used in water treatment and for water mains

## What is it?

Iron is present in many water sources, and may be used as part of the treatment process, although less commonly in Scotland. Significant amounts of iron may enter the water supply through inadequate treatment or via corrosion of iron water mains. This latter cause is a particular problem in certain areas, where high concentrations can cause the water to be visually unacceptable to consumers if iron sediment in the main is disturbed.

## What does a sample failure mean?

Health implications of a failure of the iron PCV of 200 microgrammes per litre are likely to be limited, but high iron concentrations will be very apparent to consumers in the form of brown discolouration. Iron failures can be quite localised, depending on water mains material. DWQR expects Scottish Water to ensure instances of discolouration due to iron are minimised through operational practices and an appropriately targeted programme of water main rehabilitation.

# Manganese

---

## Manganese

### A naturally occurring metal found in some water sources

## What is it?

Manganese occurs naturally in some water sources, where it is dissolved from the surrounding rocks and enters the water supply. Appropriate treatment can remove it, but where this is not present manganese can cause black discolouration of supplies. Manganese deposits can coat water mains, causing problems long after the treatment process has been improved. Due to geological factors, manganese tends to be more of a problem in parts of Western Scotland, especially at certain times of year.

## What does a sample failure mean?

Health implications of a failure of the PCV for manganese of 50 microgrammes per litre are likely to be limited, as the water will become unacceptable to consumers in the form of black discolouration long before concentrations reach levels that are of health concern. Where persistent failures of the PCV occur, action may be needed to upgrade the water treatment process and clean deposits from water mains.

## Lead

---

### Lead

#### A metal that may dissolve into water supplies from domestic plumbing

##### What is it?

Lead is not normally present in the water supplied from a treatment works, but may dissolve into the water supply if lead piping is present in plumbing. Lead plumbing tends to be found in older properties as its use was discontinued around 1970. Lead is a neurotoxin and exposure to high concentrations of lead over a sustained period can damage health. Children are particularly vulnerable. Scottish Water is required to treat water to reduce its tendency to dissolve lead where necessary, as well as informing consumers of the risks where a sample fails the standard. The only certain way of reducing exposure to lead is to ensure all lead pipework in a property is removed, including any short lengths of pipe owned by Scottish Water to connect the property to the main. Scottish water are obliged to remove this pipework where a consumer informs them that they have replaced the lead in their plumbing. The current PCV for lead is 25 microgrammes per litre

##### What does a sample failure mean?

When a sample fails for lead, the failure is usually limited to that property as it is caused by the building's plumbing. Removal of any lead pipework in the property for which the consumer is responsible, together with ensuring Scottish Water removes any short lengths it owns, is the best way of resolving the issue. Some local authorities in Scotland allow Home Improvement Grants to be used towards the cost of replacing pipework, although policy varies between councils and resources are limited. In the short term, exposure to lead can be minimised by flushing the tap for a short period if the water has been standing in the pipes for a length of time, such as overnight or if the property has been unoccupied.

## Trihalomethanes (THMs)

---

### Trihalomethanes (THMs)

Compounds that form when chlorine used to disinfect water reacts with naturally occurring organic material in the water

## **What are they?**

THMs are a group of chemicals that include chloroform. They are by-products of disinfection and form when naturally occurring organic material, such as humic acids derived from peat, react with chlorine used to disinfect the water. DWQR expects water to be treated sufficiently to remove the organic compounds that form THMs and the addition of chlorine at the disinfection stage to be tightly controlled and minimised. Deficiencies in either of these respects can cause THMs to form at excessive concentrations. Work is continuing to upgrade treatment works to ensure that all drinking water complies with the THM standard. The PCV for THMs is 100 microgrammes per litre for a sum of four THMs, including chloroform.

## **What does a sample failure mean?**

The standard for THMs is set with a wide safety margin and based on long term exposure, so individual failures of the PCV are unlikely to represent a significant health risk. Having said this, work must continue to ensure that Scottish Water's compliance improves significantly for this parameter