Your Drinking Water Analysis Explained

IT IS VERY IMPORTANT THAT YOU READ THIS DOCUMENT

Dear Customer,

Many thanks for choosing IAS Laboratories as your water testing provider. We here at IAS Laboratories want to ensure you receive the best possible service from our laboratory. We have compiled information on each of the tests contained in our drinking water lists, to make it easy for you to understand your results.
There may be tests listed below that you do not have on your report, as we carry out many different suites so don't worry about this. Please take the time to read this carefully. If you have failed any tests, then you will need to contact us and we will discuss your options.

We follow the European guidelines SI 122 of 2014, Drinking Water Regulations for limits and they are as follows:

Test Parameter	Maximum Allowed Level, SI 122 of 2014	Units
Aluminium	**200**	µg/l Al
Ammonium	**0.3**	mg/l NH_4
Total Coliforms	**0**	MPN per 100ml
Colour	**Acceptable to consumers & no abnormal change**	Pt-Co
Conductivity	**2500**	µS/cm at 20ºC
E-Coli	**0**	MPN per 100ml
Iron	**200**	µg/l Fe
Manganese	**50**	µg/l Mn
Nitrite	**0.5**	mg/l NO_2
pH	**Should be more than 6.5 and less than 9.5**	pH Units
Sulphate	**250**	mg/l SO_4
Turbidity	**Acceptable to consumers & no abnormal change**	FTU
Nitrate	**50**	mg/l NO_3
Enterococci	**0**	cfu/100ml
Total Viable Count (TVC)	**No abnormal change**	cfu/ml
Lead	**10**	µg/l Pb
Copper	**2**	mg/l Cu
Sodium	**200**	mg/l Na
Chloride	**250**	mg/l Cl
Calcium	**No Limit Specified**	mg/l Ca
Magnesium	**No Limit Specified**	mg/l Mg
Potassium	**No Limit Specified**	mg/l K
Zinc	**No Limit Specified**	mg/l Zn
Phosphorus	**No Limit Specified**	mg/l P
Free Chlorine	**No Limit Specified**	mg/l
Alkalinity	**No Limit Specified**	mg/l Ca CO_3
Fluoride	**0.8**	mg/l F
Arsenic	**10**	ug/l As

The European Guidelines do not give a maximum value for the Total Hardness/Lime on water, however the following is a guideline to what your levels mean:

Result	Effect on Water
0 – 50 mg/l $CaCO_3$	Soft
51-100 mg/l $CaCO_3$	Moderately Soft
101-150 mg/l $CaCO_3$	Slightly Hard
151 – 250 mg/l $CaCO_3$	Moderately Hard
251-350 mg/l $CaCO_3$	Hard
Over 350 mg/l $CaCO_3$	Very Hard

pH - Recommended: 6.5 – 9.5 pH Units

A measure of the acid or alkaline content of water, pH values range from 0 to 14, with pH 7.0 considered neutral (neither acidic nor alkaline). The lower the pH value the more acidic the water, and the higher the pH value the more alkaline the water. The pH of drinking water normally ranges from 5.5 to 9.0. At pH levels of less than 6.5, corrosion of water pipes may occur, releasing metals into the drinking water. This is undesirable and can cause other concerns if concentrations of such metals exceed recommended limits.

Ammonia - Recommended: <0.30 mg/L

Ammonia in water (NH_3) is a gas, usually expressed as Nitrogen, and is extremely soluble in tap water and water supplies. Ammonia is a colourless, gaseous compound with a sharp distinctive odour. It is the natural product of decay of organic nitrogen compounds. Ammonia in tap water supplies often is a result of runoff in agricultural areas where fertiliser (organic or chemical) has been applied to the ground. The presence of the ammonium cation in raw water may result in drinking-water containing nitrite. This creates the condition known as methemoglobinemia (sometimes referred to as "blue baby syndrome"), in which blood lacks the ability to carry sufficient oxygen to the individual body cells. Filters are commercially available that remove ammonia from water.

Colour - Recommended: Should be Low

Colour is not a health-related parameter. Colour in drinking water may be due to the presence of coloured organic substances, metals such as iron, manganese and copper or highly coloured industrial/ agricultural wastes. Although presence of colour in drinking water is not directly related to health, it can be used as an indication of pollution if water is noted to changes colour. Filters are commercially available to remove colour from water.

Conductivity - Recommended: <2,500 µS/cm

Conductivity is a measure of a waters ability to conduct an electric current. It is related to the amount of dissolved minerals are in the water. Changes in conductivity over time would indicate changing water quality.

Iron - Recommended: <200 µg/L

Iron in drinking water can be objectionable because it gives a rusty colour to laundered clothes and may affect taste. Frequently found in water due to large deposits in the earth's surface, iron can also be introduced into drinking water from iron pipes in the water distribution system. Making up at least 5 percent of the earth's crust, iron is one of the earth's most plentiful resources. Rainwater as it infiltrates the soil and underlying geologic formations dissolves iron, causing it to seep into aquifers that serve as sources of groundwater for wells. As little as 0.3 mg/l can cause water to turn a reddish brown colour.
Iron is not hazardous to health, but it is considered a secondary or aesthetic contaminant however **too much of any mineral can lead to toxicity in the body so if your sample has failed it's important to get treatment**.
Essential for good health, iron helps transport oxygen in the blood.

Manganese - Recommended: <50 µg/L

Manganese in drinking water supplies can cause a number of problems. At concentrations above 150 ug/L, manganese stains plumbing fixtures and laundry and produces undesirable taste in drinks. Manganese may cause microbial growths in the distribution system. Even at concentrations below 50 ug/L, manganese may form black coatings on water distribution pipes.
High levels of Manganese may also be found with iron. Manganese can produce dark brown or black staining in concentrations as low as 0.05 mg/l. Laundry washed in this water will likely become stained. There are a number of warning signs that will indicate manganese in water. Water that is unclear or hazy looking; Tap water may also contain a black sediment. **Again, too much of any mineral can lead to toxicity in the body so if your sample has failed it's important to get treatment**

E Coli - Recommended: 0 cfu/100 ml Sample

E. coli is a type of faecal coliform bacteria commonly found in the intestines of animals and humans. *E. coli* is short for *Escherichia coli*. The presence of *E. coli* in water is a strong indication of recent sewage or animal waste contamination. Sewage may contain many types of disease-causing organisms. These bacteria can be removed by UV filtration or chlorine addition to water. There should be zero presence of E-Coli in water. E-Coli can be harmful to humans if found in water. *E. coli* in drinking water is one of hundreds of strains of the bacterium *E. coli*. This strain produces a powerful toxin and can cause severe illness. Infection often causes severe bloody diarrhea and abdominal cramps including non-bloody diarrhea. Frequently, no fever is present. **If your water has 1 or more E.coli present the water is NOT suitable for drinking.**

Some rare strains of E. coli, particularly the strain 0157:H7, can cause serious illness. Recent outbreaks of disease caused by E. coli 0157:H7 have generated much public concern about this organism. E. coli 0157:H7 has been found in cattle, chickens, pigs, and sheep.

Enteroccoci - Recommended: 0 cfu/100 ml Sample

These organisms originate in faeces, both animal and human and is a strong indication of recent sewage or animal waste contamination.

Total Coliforms - Recommended: 0 cfu/100 ml Sample

The most basic test for bacterial contamination of a water supply is the test for total coliform bacteria. Total coliform counts give a general indication of the sanitary condition of a water supply. Total coliforms include bacteria that are found in the soil, in water that has been influenced by surface water, and in human or animal waste. Coliform bacteria can be harmful and if coliform bacteria are present in your drinking water, your risk of contracting a water-borne illness is increased. Although total coliforms can come from sources other than faecal matter it's important to check your well is sealed up so nothing is getting into it as this can be a source of coliform contamination.

If your water has 1 or more Total Coliforms present, the water is NOT suitable for drinking.

Total Viable Count - Aerobic Colony Count – 22ºC and 37ºC – Recommended: 20 for 48hr 37ºC and 100 for 72hr 22ºC
The 22ºC test indicates the amount of microbes at room temperature and the 37ºC test represents how many would be present at body temperature. In isolation elevated colony counts rarely indicate an immediate risk to human health. They can however give an indication of the overall microbial quality of the water.

Turbidity - Recommended: Should be low

Turbidity is a measure of the relative clarity or cloudiness of water. Turbidity in water is caused by suspended and colloidal matter, such as clay, silt, finely divided organic and inorganic matter, and plankton and other microscopic organisms. Turbidity is considered a health-related parameter because the particles can shelter bacteria from chlorine/UV disinfection and act as a food source for micro-organisms. Water with high turbidity may increase the amount of chlorine required for disinfection and the possibility of water-borne illness. Turbidity will also be high if there is a presence of metals such as Iron in the water.

Nitrite -Recommended: <0.15 mg/L: Nitrate - Recommended: <50 mg/l NO_3

Nitrates and nitrites are a major constituent of fertilisers. Fertilizers are used more and more commonly in today's farming industry especially in hi intense hi production farms. Nitrites are cause for concern in infants under 6 months of age and farm animals. They affect the blood's ability to carry oxygen. Once the nitrite enters the blood stream and binds to the haemoglobin, oxygen cannot be carried, and "blue-baby" syndrome (bluish tint to skin due to lack of oxygen) occurs, as well as shortness of breath, increased sensitivity to illness, heart attacks, and possibly death by asphyxiation. This is not as severe in older children and adults.

Chloride - Recommended: <250 mg/L

Chlorides in groundwater can be naturally occurring in deep aquifers or caused by pollution from sea water, brine, or industrial or domestic wastes. Chloride concentration above 250 mg/l can produce a distinct taste in drinking water. Where chloride content is known to be low, a noticeable increase in chloride concentrations may indicate pollution from sewage sources.

Sulphate - Recommended: <250 mg/L

The aesthetic objective for sulphate in drinking water is 250 mg/L, based on taste. Because of the possibility of adverse physiological effects at higher concentrations, treatment should be employed if concentrations exceed 500 mg/L.

Sodium - Recommended: <200 mg/L

Drinking water generally tastes bad at sodium concentrations above 200 mg/L. Sodium is not considered a toxic element. Adults normally consume up to 5 grams of sodium a day. Although the average intake of sodium from drinking water is only a small fraction of that consumed in a normal diet, the intake from this source could be significant for people suffering from hypertension or congestive heart failure who may require a sodium-restricted diet.

Aluminium - Recommended: <200 µg/L

Aluminium is the most abundant metallic element and constitutes about 8% of the Earth's crust. It occurs naturally in the environment. Disturbance of the deposits may increase aluminium levels at the tap and lead to undesirable colour and turbidity. The concentration of aluminium in natural waters can vary significantly depending on various factors. Dissolved aluminium concentrations in waters with near-neutral pH values usually range from 0.1 to 50 µg/litre but rise to 500–1,000 µg/litre in more acidic waters or water rich in organic matter.

Hardness

Result	Effect on Water
0 – 50 mg/l $CaCO_3$	Soft
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Over 350 mg/l $CaCO_3$	Very Hard

Hard water is water that has high mineral content (in contrast with *soft water*). Hard water has high concentrations of Calcium and Magnesium. Hard water is generally not harmful to one's health but can pose serious problems in industrial and home electrical appliances. In domestic settings, the hardness of water is often indicated by the *non*-formation of suds when soap is agitated in the water sample.

We recommend if you have hard water that you contact your local water treatment company. By telling them the result they should be able to resolve the issue.

Copper - Recommended: <2 mg/L
Copper is not particularly toxic to humans (indeed, it is an essential dietary requirement) and medicinal doses up to 20 mg/l are not unknown. However, astringent tastes in water can be caused by levels above 1 mg/l Cu. A problem associated with high levels of copper in water is galvanic corrosion of tanks.

Lead - Recommended: <10 µg/L
Lead is one of the most commonly determined heavy metals. It accumulates in body tissue and can be a toxic cumulative poison. Its occurrence in drinking water can be from leaching from ores; effluent discharges or from water pipes in older properties.

Chloride - Recommended: <250 mg/L
Chloride exists in all natural waters, the concentrations varying very widely, it does not pose a health hazard to humans and the principal consideration is in relation to taste. Because sewage is such a rich source of chloride, a high result may indicate pollution of a water by a sewage effluent.

Calcium - Recommended: No Limit Specified
This element is the most important and abundant in the human body and an adequate intake is essential for normal growth and health. The maximum daily requirement is of the order of 1 - 2 grams and comes especially from dairy products. There is some evidence to show that the incidence of heart disease is reduced in areas served by a public water supply with a high degree of hardness, the primary constituent of which is calcium, so that the presence of the element in a water supply is beneficial to health. Despite the potential health benefits of calcium abundance there are problems associated with hardness, as discussed above.

Magnesium - Recommended: No Limit Specified
Like calcium, magnesium is abundant and a major dietary requirement for humans (0.3-0.5 g/day). It is the second major constituent of hardness and can lead to issues caused by hardness as listed above.

Potassium - Recommended: No Limit Specified
Increased intake of potassium does not lead to health issues. Potassium is found in many artificial fertiliser formulations, but tends to be "fixed" in soils and is not that easily leached out. There are no implications of toxicity.

Zinc - Recommended: No Limit Specified
Zinc is essential to man but if ingested in gross amounts it can cause nausea or vomiting.

Phosphorus - Recommended: No Limit Specified
Phosphorus does not have any significant health related issues if present.

Alkalinity -Recommended: No Limit Specified
The alkalinity of a natural water is generally due to the presence of bicarbonates formed in reactions in the soils through which the water percolates. There are no known health risks caused by high levels, though highly alkaline waters may affect taste.

Fluoride - Recommended: <0.8 mg/L
Fluoride in water arises almost exclusively from fluoridation of public water supplies and from industrial discharges. Health studies have shown that the addition of fluoride to water supplies in levels above 0.6 mg/l F leads to a reduction in tooth decay in growing children and that the optimum beneficial effect occurs around 1.0 mg/l.

If you have failed any tests, then you will need to contact us as soon as possible and we will discuss your options. You are welcome to contact IAS on **059 9721022**.