

WATER TREATMENT

The untreated water in rivers, springs and aquifers is usually clean enough for a number of uses but not good enough to drink. Although the water may look clean, it is not safe for drinking. Untreated water contains bacteria and a host of other micro-organisms and chemicals. If this water is used a number of water-borne diseases such as cholera, typhoid, dysentery and others may result.

To ensure that the water is safe for drinking, the NWC subjects the water to an expensive treatment process, which involves:

- The collection of the untreated water from surface water sources (rivers or streams), or from underground sources (wells or springs) via intake works.
- The water is then taken through pipes to a treatment plant, which is specially constructed and equipped for this purpose. At the treatment plant, expensive equipment and chemicals are then utilised to treat the water that is later distributed to customers.

Although the specific details may vary depending on the type of treatment system available, the water treatment process usually involves five (5) distinct stages. They are:

- **Screening and Aeration**
The water is usually taken from a source and passed through screens for the removal of debris, sticks, stones and other solids. Oxygen is introduced into the water so as to improve the treatment process and to remove odours.
- **Coagulation and Flocculation**
Because there are still small, invisible particles contained in the water before it is treated, chemicals such as aluminum sulphate (alum) are usually added to form what are called "flocs" which bring these particles together. This is coagulation or flocculation. These flocs either float to the surface and are skimmed off or become heavy and settle to the bottom of the settling tank and are removed.
- **Sedimentation**
This is the settling out of dirt particles. Sedimentation prepares the water for the next stage of the treatment process.
- **Filtration**
During the filtration stage, the water is passed through strainer-like filters, some made of layers of sand, gravel, charcoal or synthetic material, that remove remaining small particles and germs.

- **Disinfection**

The final and perhaps most important stage of the treatment process is disinfection, during which chlorine is added to kill any bacteria or other germ present. Enough chlorine is used to make sure that as the treated water is transported to your homes and offices there is a residual amount of chlorine to protect it against any germs it may come in contact with.

The process described above may be shortened or compressed depending on the quality of the raw water source, the available treatment infrastructure, the preferred treatment method or other factor. For instance, water that is taken from the aquifer via wells is usually only disinfected. This is so because this water is usually much purer than surface water because it is filtered naturally through the earth before rising to the surface.

All through the water treatment process the water is tested to make sure that the quality is just right. Some of the water samples that are collected are taken to a laboratory where they are examined to make sure that the water meets the Interim Jamaica Drinking Water Criteria and the World Health Organization (WHO) standards.

Water quality is monitored to quantify the following:

- Nitrites Calcium Total coliform
- Nitrates Sodium Total faecal coliform
- Silica Magnesium Total dissolved solids
- Iron Manganese Total suspended solids
- Phosphates Sulphate Total solids
- Fluoride Chloride Total plate count
- Alkalinity Aluminium Specific conductivity
- Turbidity Colour Chemical oxygen demand
- Biochemical oxygen demand

Health and aesthetics are the main determinants for the safety of water. The NWC uses the Interim Jamaican Criteria developed from WHO guidelines to set the standards for the potability of water. The NWC also conducts research and implements cost-effective solutions for the treatment of Jamaica's water supplies.

Our team consists of a range of chemists, microbiologists, environmental scientists as well as trained laboratory analysts, laboratory attendants, field assistants and administrative staff committed to providing accurate data to ensure the best potable water quality - free from coliform bacteria, free from colour, odour and taste.

Every individual has an important part to play in keeping our water free from unhealthy substances and safe for drinking. The old adage "Prevention is better than cure" must always be applied. Helping to protect our water resources will reduce our water treatment costs. DO THE RIGHT THING... and help to ensure a safe water supply.