



# Chlorine and Water Disinfection

Chlorine-based disinfection provides a broad defense against microorganisms that can cause waterborne illness such as cholera, hepatitis and typhoid. Most communities can afford to use this form of water treatment. It is one of the few disinfectants that will provide lasting residual protection from the treatment plant, through the distribution system and on to the consumer's tap.

When properly used, chlorine improves overall drinking water quality. It can remove unpleasant tastes and odors that are sometimes present in raw water and it controls microorganisms such as bacteria, mold, algae and fungi that may otherwise grow on the distribution system pipes. Most importantly, chlorine can help ensure that drinking water is free of many disease-causing organisms.

Generally, waterworks regulated by Saskatchewan Environment are required to maintain a level of 0.1 milligram per litre (mg/l) free chlorine OR 0.5 mg/l of total chlorine in water distribution systems for long lasting protection.

Although chlorine disinfects drinking water it also reacts with traces of other material or particles (in particular organic matter such as decaying trees and leaves) in the water and forms trace amounts of substances known as disinfection by-products. The most common of these are known as trihalomethanes or THMs. The benefits of disinfection with chlorine far outweigh the possible health risks of disinfection by-products (such as THMs) or the risks of ineffective or absent treatment. Individuals concerned about disinfection by-products and specifically THMs should note that water which meets Saskatchewan's drinking water quality standards does not need further treatment by the consumer to be safe. A separate fact sheet on THMs is available from Saskatchewan Environment.

Alternatives to using chlorine for disinfection include ozone and ultraviolet light, but these alternatives cannot provide residual disinfection or lasting protection. All disinfection alternatives do not necessarily produce THMs but always produce some type of by-products. If a disinfection alternative such as ultraviolet light is used, a secondary disinfectant that provides lasting protection is still required.

Although it is effective against many types of microorganisms, chlorine disinfection is not practical for controlling protozoa such as *Cryptosporidium* and *Giardia*. Other treatments and processes are used to remove or inactivate these types of organisms. However, without disinfection, infectious microorganisms would be much more common in our drinking water. Disinfection is essential in order for waterworks owners to provide a good quality and safe drinking water.

EPB211A 1M/2003



Saskatchewan  
Environment

Environmental  
Protection  
Branch