

Agri *Resource*

Mineral Composition

Chlorine and Water Quality

When discussing the mineral composition of water, chlorine is the most well-known mineral. Chlorine, used as a germicide, produces a sustained residual disinfection action. Chlorine also functions to reduce unwanted taste and odor and controls biological growth by eliminating slime bacteria, molds and algae. Lastly, chlorine can destroy hydrogen sulfide and remove ammonia and other nitrogenous compounds that hinder disinfection and create an unpleasant taste.

Physical Factor that may Influence Chlorine Disinfection in Potable Water

pH: Chlorine is most effective when the pH of water is at 7.4, thus it is important to maintain water pH between 7.2 and 7.6.

Total Dissolved Solids and Suspended Solids: The amount of solids dissolved in the water (primarily minerals) should be maintained well below 1,500 ppm, if possible. Solids in water that are not dissolved (suspended solids) are likely to react with added chlorine. These solids may include rust particles and organic matter. When chlorine oxidizes organic matter, numerous chemical compounds are produced and the chlorine is no longer readily available to kill bacteria. Water should be well filtered to remove as many solids as possible.

Water from the tap should be tested for total solids and total dissolved solids to aid in estimating the amount of chlorine needed to properly disinfect the water.

Total Alkalinity: The alkalinity in water helps to maintain a constant water pH. The proper water pH allows the added chlorine to be most effective at killing bacteria.

Free Available Chlorine: When first setting up a water treatment system and at regular intervals afterwards, the water at the point of use should be tested for free available chlorine. If the amount of available chlorine, as measured at the point of use is not between 0.2 and 2.00 ppm, there is no assurance that the water system is being adequately protected from microorganisms. The chlorine may be consumed entirely before coming into contact with reservoirs of bacteria further down the water distribution system.

“Shocking the system,” sometimes referred to as superchlorination, oxidizes organic matter in the system and eliminates bacteria and algae that may be hiding in pipes, filters and pumps. The goal of shocking, or superchlorination, is to remove all the material in the water system that keeps chlorine from being available to kill bacteria in the water. The sum of the free available chlorine and combined available chlorine should approximate the amount of chlorine being used to treat the water.