Abstract

With the rise in industrialization, two of the greatest gifts of nature, air and water are getting contaminated. Polluted air and water have become major threats to healthy human existence. Water borne diseases are a major public health concern throughout the world.

Many communities rely on drinking water supplies containing high levels of dissolved salts and/or other contaminants that may present health risks. Most of these communities do not have the revenues to obtain professional services for assistance in solving their water quality problems; nor is there sufficient federal funds to assist these communities. Simple, low-cost treatment methods are often sufficient to bring the community within drinking water standard compliance.

The contaminated water continues to affect millions with diseases like diarrhea, dysentery, typhoid, jaundice, gastro entities, etc. than AIDS and cancer. Though people are receiving the so-called potable drinking water from municipal taps in cities and towns, they are still forced to either boil water or install purifiers. Thus, there is a large potential for purified drinking water in India.

The objective of the research is to develop a relatively low cost, easily affordable and compact kind of a unit for drinking water purification at domestic usage level. The concept of "Reverse Engineering" has been followed for the same. In this project theoretical consideration includes various treatments for the water purification. Mainly for this project three methods are used stepwise. Such as, string wound filtration, UV disinfection, granulated activated carbon filtration.

Attempt has also been made to retain residual chlorine in treated water so that purified water is available even in absence of power supply, and bacterial growth is arrested for a longer period of time compared to conventional water purifiers. With

increasing demand of pure and safe drinking water, many new techniques have emerged in order to provide people with portable water. But those techniques are comparatively very costly and are not affordable to the common man. So in this project, it is developed at a relatively low cost, is easily affordable and compact kind of unit for drinking water purification at domestic usage level. By doing a cost analysis, manufacturing cost of a unit is shown as very low, Rs.1380.00 only for a prototype unit.

This unit contains mainly three components, from which string wound filter is having low cost and highly effective for turbidity removal as compared to conventional filter. Finer particles are progressively trapped as fluid travels to the center of the filter. Allowing for much higher retention capacity than that which is associated with straight surface filter media. Therefore, it is not unusual for a set of cartridge to filter many millions of gallons of fluid before requiring replacement.

Both the chlorine residual and contact time are important for effective disinfection. It is important to have complete mixing. The operator must examine the application and select the best point of feed and the best contact time to achieve the desired results. Here the break-point of chlorination is 3 ml HOCl required for 1 liter of water for maintaining free residual chlorine 0.2 to 0.5 ppm. It is observed from the results that the FRC in the treated water remains within the permissible limit.

By doing water quality analysis, and from the results of experimentation, it is eminent to get good drinking water quality. Bacteriological test indicates that the E.Coli. is not present in the treated water. And also other than the coliform, other organisms are destroyed.

Key Words : Drinking Water Purification , Water quality analysis, Reverse Engineering.