



ClearValue's Merman™ - POE Device – Removal of Manganese and Iron

The earth is 2/3 water; our bodies are 2/3 water. Pure drinking water is critical to human health and to a long healthy life. Unfortunately, those responsible for our drinking water purity operate with sovereign immunity. Yes, that is right, if a municipality should make a mistake and thousands die from impure drinking water, the municipality is immune. Further, those that are responsible for drinking water regulations, the state regulators and the US EPA, are unfortunately political organizations. When a drinking water regulation is finally past, the science proving the need for the regulation is decades old and the implementation process for the regulation is 4 to 6 years old. And, even then, nearly

3 decades later, should the municipality error, the municipality is exempt from liability due to the sovereign immunity laws. There are many contaminants in tap water which are harmful to human health. Those would include: micro-organisms, toxins, carcinogens, teratogens and neurotoxins. Micro-organisms are present from at least one of growth in the distribution piping from the drinking water plant or well, growth in the piping at the customer site, and contamination from less than complete purification at the drinking water plant. First, at the drinking water plant – biological contamination is measured in nephelometric units (NTU). This is while the municipal drinking water plant is only required to produce 0.3 NTU water, which is 0.3 pounds of micro-organisms per million pounds of water (about 120,000 gallons) which is about a 1 percent remaining concentration of bacteria and viruses. That means that 1 percent of the bacteria and viruses present in the raw water make it to the distribution system. Unless killed by the disinfectant, these bacteria and viruses will make it to your tap. To the extent that the disinfectant does not kill bacteria and viruses, biological films grow in the piping. And, if your municipality does not disinfect with chlorine, so will arrive the next stomach flu.

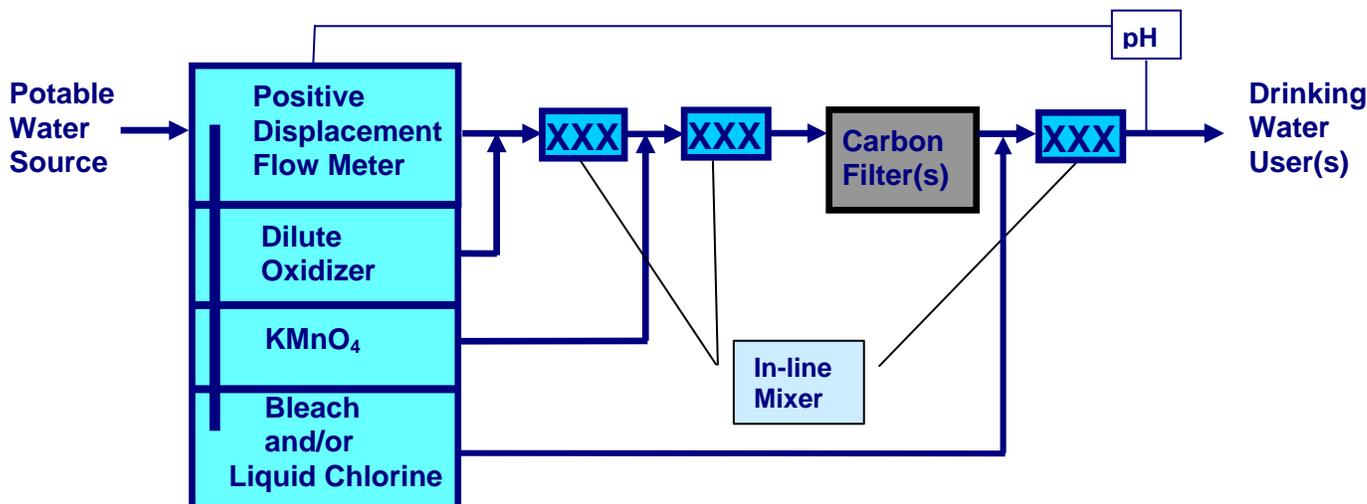
Toxins, carcinogens and teratogens are actually created in the drinking water during the purification process. Natural organic matter (NOM) enters the water from the watershed, being measured as total organic content (TOC) in the water. Man made toxins may also enter the water; these are also measured as TOC. The problem with TOC is its reaction with the disinfectant, a well known reaction known as nucleophilic substitution. Chlorine, ammonia, ozone and chlorine dioxide chemically attach to TOC, thereby creating a molecule which is at least one of toxic, carcinogenic and teratogenic. Further, from a common sense perspective, disinfectants are used to kill, kill bacteria. So it is no surprise that the attachment of a disinfectant to a food source (TOC) creates toxins, carcinogens and teratogens.

What is truly scary in drinking water are neurotoxins. Neurotoxins include all heavy metals, including lead, arsenic, mercury and aluminum. While most heavy metals are from the raw water itself, aluminum is placed in the water during purification. Alum, aluminum sulfate, is used to remove contaminants from the water. However, Alum, invented by the Egyptians over 3,000 years ago, dissolves as soluble aluminum in the drinking water. Soluble aluminum, the aluminum ion, is a known cause of neurological disorders such as: Alzheimer's and Parkinson's disease; ADD; Dementia; and Depression. And, believe it or not, due to the aluminum lobby, there is no regulation on the amount of aluminum in drinking water. In cases wherein heavy metals are an issue, ClearValue's POE Device includes a second filter cartridge which contains a sulfur media. This sulfur media removes, filters, the heavy metals from the water.

Given this non-responsible and poor health scenario for 2/3 of your body, it is no wonder that people buy bottled water at a cost which is 10,000 times the cost of tap water. To solve this challenge and meet a significant human need, ClearValue invented the Potable Water Purification System. This system is a Point of Entry (POE) device which removes from tap water: microbiological contaminants, toxins, carcinogens, teratogens and neurotoxins; this is preformed while controlling hardness deposits. Current systems do not have the performance of ClearValue's system. Systems in the market are based upon either: carbon filtration, reverse osmosis or ion exchange. None of the current systems truly control drinking water purity. Carbon filters leave heavy metals in the water, including aluminum, while removing the disinfectant, thereby creating a potential for bacterial or viral contamination in downstream plumbing and fixtures. Ion exchange systems do nothing to purify the water while placing sodium in the water during removal of calcium and magnesium. Our bodies do not need sodium, yet our bodies need calcium and magnesium; further, it is the calcium and magnesium which provide the "taste" we all enjoy. Finally, the current craze, reverse osmosis systems leave heavy metals in the water while removing all of the nutrients, thereby creating a water which will literally "suck" nutrients out of our bodies, placing those nutrients in our urine.

| HUMAN BODY PARTS | % of Water |
|-----------------------|------------|
| Bodily Average | 68% |
| BRAIN | 75% |
| LUNGS | 86% |
| KIDNY | 93% |
| BLOOD | 92% |
| HEART | 75% |
| LIVER | 86% |
| MUSCLES | 75% |

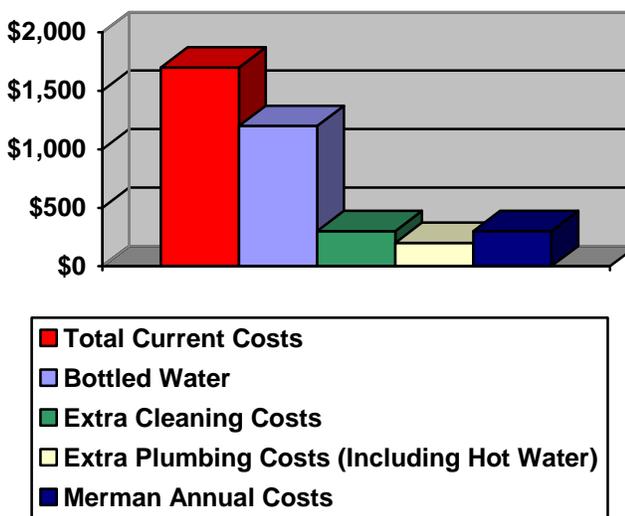
A schematic of ClearValue's Merman™ POE Device (including Mn and Fe removal – U.S. Pat. No. 7,229,550)



The ClearValue POE Device also controls Iron and Manganese, which can stain porcelain fixtures. Iron and manganese are preferably removed by oxidation followed by $KMnO_4$ treatment and filtration.

The ClearValue POE Device purifies water while leaving beneficial nutrients, calcium and magnesium, in the water. The nutrients are then dispersed with Vitamin E, which is also beneficial to our bodies. Being dispersed, the beneficial nutrients cannot deposit in piping or on glassware or on tile. The ClearValue POE device also removes heavy metals, including the aluminum ion. This heavy metal removal is accomplished in a two stage filtration system, wherein the first stage is a carbon filter, similar to those on the market today. The second stage contains an iron-sulfur compound which will attract and remove heavy metals from the water, including aluminum. Finally, the ClearValue POE Device places a disinfectant in the water, bleach or liquid chlorine, in a metered concentration to control biological contamination in downstream plumbing and fixtures.

Merman Operating Cost Comparison - Family of 4



Being a POE device, an entire home, building or subdivision can obtain complete purification from a single unit. The smaller, residential units are retailed at only \$1 per gallon-day of water flow. A family of four using 15,000 gallons per month would only need a CV 1500 POE unit at a cost of \$500. Commercial units are quoted, depending upon water quality and flow requirements.

Maintenance is only required semi-annually, wherein the filter and the disinfectant/dispersant chemical containers are replaced. Residential maintenance is normally \$75 (excluding labor) for a total annual operating cost to the homeowner of about \$150 (sulfur filter cartridges are slightly higher), again excluding labor. Elimination of bottled water costs, reduced cleaning costs and reduced hot water heating costs have the ClearValue POE system at an operating savings of \$300 to \$500 annually for a family of four. The CV 1500 POE is about the size of a suitcase and mounts on the inlet water line to the building or neighborhood.

Take care of your family's health with a Merman™ .
Improve your family's finances with a Merman™ .
Where else can you improve your health and save money at the same time?
Even the water tastes better!