



THE CONSCIOUS PERSON'S GUIDE TO WATER TREATMENT SYSTEMS

By

Lono Ho'ala

This "Conscious Person's Guide to Water Treatment Systems" is provided to the customers and dealers of **LIVINGWATERS™ ENGINEERED WATER TREATMENT SOLUTIONS** with the permission of Lono Ho'ala – author of the best-selling book "Don't Drink the Water – Until You Read This Book."



INTRODUCTION

“The problem with water treatment systems is that to the consumer they may look alike, but they don’t perform alike. Designing a system to specific water chemistry is critical. This is one area where national advertising and aggressive marketing techniques can’t substitute for professional engineering.

People in this business continually see what happens when people get sold cookie-cutter systems by slick talking salesmen from national chains or they buy systems from home improvement stores. After a few months or years it winds up sitting disconnected in their utility rooms or basements and our dealers have to haul it away.

It is mandatory that equipment design be based on reliable, comprehensive water testing. Not only do components have to be the highest quality possible, they have to be designed to support one another in the unique water environment in which they operate. When it comes to water treatment systems, you truly get what you pay for. Even small mistakes in design can result in the price of equipment being only a small part of a system’s overall cost.”



Lono Ho’ala – Internationally recognized water treatment expert, biochemist, water treatment engineer, and author of the best-selling book on water “Don’t Drink the Water – until you read this book.”

WATER TREATMENT SELECTION GUIDE

Selection of appropriate water treatment equipment can be a complicated issue. No two water sources are alike, and people's needs are varied. No "one-size-fits-all" water treatment appliance can strike an ideal balance between effectiveness and value.

That is the reason **LIVINGWATERS™ Engineered Water Treatment Systems** offer a wide variety of products and a free engineering service to help our customers to get the highest quality water treatment appliance that does the best job for their water at the lowest cost.

Begin by understanding that there are two basic types of water treatment systems. These are known as point-of-entry (POE) and point-of-use (POU).

POINT-OF-ENTRY TREATMENT SYSTEMS

A POE system treats water where the supply enters the home. The result is that treated water is delivered to every tap in your home. Because the volume of water being treated is as much as 10 - 15 times higher than with a POU system, the equipment is large and must be located in a utility room, basement, or other space that is near the point where the cold-water line enters the house.

Naturally, because of the size of the equipment and its complexity, POE systems are far more expensive than POU systems. They also require a plumber familiar with local codes to install them. With certain exceptions, they are not usually designed to provide high quality water for drinking and cooking. Neither are they necessary if the purpose is to remove chlorine from bathing and shower water. Inexpensive shower filters can accomplish this simple task.

On the other hand, POE systems become ideal or even necessary when water problems such as excessive hardness, iron, manganese or nasty smells are present in the water. They may also be necessary if your water comes from a source that is microbiologically unsafe, contains radioactivity, extremely high levels of turbidity, alkalinity, or TDS, contaminants like arsenic or methane gas, or is corrosive. They are also necessary if you live in an area where chloramine (chlorine mixed with ammonia) instead of chlorine is used by water treatment plants to disinfect water. That is because chloramines, unlike chlorine, are very difficult to remove and shower filters are ineffective for this purpose.

Because water chemistry can vary so widely, and the cost of the equipment required to solve such problems can be expensive to install and maintain, it is wise to have any system you purchase be custom engineered for your water's unique chemistry.

A properly designed system will pay for itself in plumbing repairs, laundry and cleaning costs, not to mention aesthetic, health and beauty issues. Besides, nothing detracts from a home's value more than a serious water problem.

If you are interested in a POE system, call your **LIVINGWATERS™ Engineered Water Treatment Systems Dealer** to obtain a free **Water Quality Assessment Report**. Based on the information you provide in a questionnaire, your dealer will recommend appropriate testing. This information, along with your completed questionnaire will be forwarded to our engineering department. We will use that information to engineer a system specifically designed for your water needs. The report will clearly outline what we see as necessary and why, and come complete with a quote as well as product information for each product we recommend.

POINT-OF-USE TREATMENT SYSTEMS

A POU system is usually installed under a kitchen sink where the highest quality water is needed for beverages, cooking, ice, etc. Because they are typically treating only $\frac{1}{2}$ to $\frac{3}{4}$ of a gallon a minute, POU systems are far less expensive so they are easy and affordable for the average person to install and maintain.

If you are interested in a POU system it is wise to get educated. Even doctors and many water treatment professionals can get confused by all the pseudo-science and hype that sometimes surrounds the claims made for the various styles of POU water treatment systems.

Stay focused on the issues that matter most. Water safety should be your paramount concern. Reliability comes next. The ability to operate effectively without power is third. The following checklists will help you avoid confusion. As you read and think about what we are saying, you should realize it is just plain common sense.

As you review your choices, make notes of claims that seem important. Write them down along with your questions and concerns. When you are ready to make your decision, bring your notes to your dealer or our engineering staff for a reality check.

Your Authorized Dealer



DRINKING WATER SAFETY ISSUES

(RANKED IN ORDER — MOST CRITICAL FIRST)

Yes No Is the system guaranteed to remove at least 99.9999% of all bacteria?

(Very important for people on municipal supplies who want to be safe from broken or leaking water mains or breakdowns or power outages at water treatment plants that often occur forcing “boil-alerts.” Disinfection is especially important for anyone on a private water supply that has ever tested positive for any form of bacteria.)

Yes No Is the system guaranteed to remove at least 99.95% of cysts?

(Because cysts can survive municipal efforts at disinfection and it only takes ingesting one cyst to become very ill, this is very important for all water supplies.)

Yes No Is the system effective at removing lead, mercury, cadmium, chromium, cyanide, uranium, radium, and aluminum?

(Lead ingestion destroys the IQ of your children. Aluminum is linked to the development of Alzheimer’s disease. Because these metals are very common in older water mains and plumbing parts, this capacity is very important for all water supplies. Uranium and radium are common contaminants in well water that can cause kidney damage due to their chemical nature, and are usually found in conjunction with radioactive particles and radon gas that are carcinogenic in higher concentrations.)

Yes No Can the system reduce arsenic to below 1 ppb?

(EPA limit is 10 ppb but this is set too high due to economic considerations. At the EPA limit, 1 person in 500 would be expected to develop cancer. Because arsenic is widespread and occurs in municipal supplies, arsenic removal is very important for all water supplies.)

Yes No Is the system effective at removing chlorine and the disinfection by-products of chlorine?

(Inhalation of chlorine is linked to a greatly increased risk of asthma in children and heart disease in adults. The disinfection by-products of chlorination are known to be potent carcinogens and are now closely regulated by the EPA. As a result, this capacity is very important for municipal water or well water that uses chlorine for disinfection.)

Yes No Is the system effective at removing chloramines and ammonia?

(Because of the cancer risk associated with chlorination, many municipalities are now relying on chloramination (the mixture of chlorine and ammonia) for disinfection because chloramine is very stable in water. Unfortunately it goes right through typical filters including ordinary RO systems and even distillers. Normal shower filters will not remove it. In sensitive individuals it is very irritating to the skin, and can aggravate ulcers or create acid reflux and irritable bowel syndrome in many people. Recent research shows that it is not dissipating from the body and builds up in the tissues of those who drink it. As a result, the ability to effectively reduce chloramine is very important in areas where municipalities use this option for disinfecting water supplies.)

Yes No Is the system effective at removing pesticides and herbicides including atrazine, fuel components like MTBE and perchlorate, PPCPs (pharmaceutical and personal care product residues) as well as VOC's including solvents, tastes and odors?

(Increasingly, dangerous amounts of these pollutants are finding their way into the water supply. No water supply is safe. Pesticide and herbicide use is common in most areas of the country. The Forest Service sprayed ethylene dibromide to control pine beetle infestations throughout the intermountain west. Hormone and other pharmaceutical residues are showing up in the water supplies of many communities. Most municipal treatment systems have no way of removing them. Because even extremely small amounts of these substances can be very dangerous to health, you have to depend on your water treatment system to do it.)

Yes No Is the system effective at removing fluoride?

(For all except the most stubborn and/or ignorant, fluoride in water supplies is now known to be a dangerous toxin. In children it causes an increased uptake in lead, which damages the central nervous system thus impairing the IQ. It interferes with normal thyroid function. It creates permeable gut syndrome. It contributes to arthritis and brittle-bone syndrome in older people. Because fluoride ingestion is not harmless, your water system's ability to remove it is important if your water supply is fluoridated or naturally contains .5mg/L or ppm or higher of fluoride.)

Yes No Is the system effective at removing nitrates?

(Nitrates above 10 ppm impair the blood's ability to carry oxygen. While nitrates are seldom a problem in municipal water systems, it is very important to test for them if you have a well and live near an agricultural area and treat them if high levels are present.)

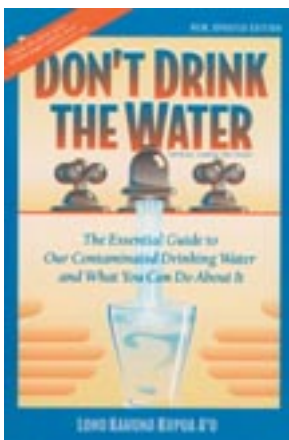
Yes No Does the system preserve the healthy alkaline minerals of calcium and magnesium?

(Most water is naturally hard meaning it contains a certain level of dissolved calcium and magnesium. Calcium and magnesium are very important to the health of the heart, nervous system, and bones, and help lower blood pressure. Most people prefer the taste of mineralized water to that which has been de-mineralized by processes like reverse-osmosis and distillation. Water that contains 10 grains per gallon of hardness contains 171 milligrams per liter of these beneficial minerals in their most bioavailable state.)

Yes No Does the system render the treated water (bacteriostatic) unable to support the growth of microorganisms?

(Important if you want to dispense water into portable bottles and have it stay fresh for periods of time.)

“WHETHER YOUR WATER COMES FROM A PRIVATE WELL OR FROM A MUNICIPAL WATER TREATMENT SYSTEM, IT IS UP TO YOU TO MAKE SURE IT IS SAFE. IF YOU BELIEVE THAT THE GOVERNMENT CAN MAKE YOUR WATER SAFE – YOU DO SO AT THE PERIL OF THOSE WHO DEPEND ON YOU TO BE RESPONSIBLE FOR THEM. THERE ARE MANY PROBLEMS IN OUR WATER SUPPLY. LEAD, ARSENIC, MICROBIOLOGICAL AND CHEMICAL CONTAMINATION ARE JUST A FEW. MORE SURFACE EVERY DAY. NEVER LOSE SIGHT OF THE FACT THAT THE MOST IMPORTANT FUNCTION OF A WATER TREATMENT SYSTEM IS TO KEEP YOUR WATER SAFE! COMPARED TO THAT, EVERYTHING ELSE IS WINDOW DRESSING”.



LONO HO'ALA – WATER TREATMENT EXPERT AND AUTHOR OF THE BEST-SELLING BOOK “DON'T DRINK THE WATER”

AESTHETIC ISSUES

(RANKED IN ORDER — MOST CRITICAL FIRST)

Yes No Does your water have a rotten-egg odor?

(This problem can be caused by sulfates in water supplies interacting with magnesium anode rods in hot water heaters, or because a well is contaminated with sulfur eating bacteria and/or hydrogen sulfide gas. This noxious odor gets into carpets, drapes, sheetrock and other building materials, and can destroy the value of a home. As a result it is important to determine the cause and remove it.)

Yes No Does your water contain excessive levels of iron and manganese?

(Water that contains iron and manganese creates red to brownish-black stains on fixtures and appliances and dingy looking laundry. At higher levels, these compounds are capable of producing a residue that damages plumbing parts like toilet valves and sink faucets, and can destroy appliances like hot water heaters, dishwashers and ice-makers. Because these compounds can also ruin other water conditioning appliances like softeners, oxidizing filters and RO systems your water should be tested before installing other expensive water conditioning equipment.)

Yes No Is your water corrosive?

(Corrosive water not only damages plumbing, it can release high levels of copper into water and this can cause pancreatitis and other digestive difficulties. Many people mistakenly believe that if their water is hard, it is not corrosive. This is not true. If you have a new well or if your home is older and you see blue-green staining on pipes and/or fixtures, you should have your water tested and a mineral analysis performed to determine the degree of corrosivity and the need for treatment.)

Yes No Is your water hard?

(Hard water is water that contains over 5 - 7 gpg (grains per gallon) of hardness-causing minerals — primarily dissolved calcium and magnesium. The primary problem with hard water is that it is expensive. Water that contains 10 gpg of hardness will require three times as much soap to do laundry or dishes as water that contains less than 3 gpg of hardness and cost approximately 30% more to heat. A secondary problem is that hard water creates lime scale deposits on windows, shower enclosures, tubs and fixtures that require caustic chemicals and a lot of hard work to keep clean. Salt-based softeners used to be the only way to deal with this problem but new salt-free technology is now available that can handle this common problem effectively.)

RELIABILITY AND VALUE ISSUES

(RANKED IN ORDER — MOST CRITICAL FIRST)

Yes No Will the system operate without electricity?

(The most important job of any water treatment system is to KEEP YOUR WATER SAFE! This is especially important during times when power may be out. No matter how good a system might be, if it requires power to be effective, it is a poor value.)

Yes No Is the system designed so that it cannot deliver unsafe water if a component fails?

(When components like RO membranes and/or UV lights fail, the systems that depend on these components can deliver unsafe water without warning. Because such failures are so common, they make for a very unsafe situation. For that reason without back up of some kind, these systems cannot be relied upon for safe water. Cartridge-based systems that rely on capillary membrane technology don't have this problem and are generally a better choice. If RO is necessary because of water chemistry issues, then a post-filter based on capillary membrane technology is advised.)

Yes No Is the system designed around standard sized components?

(Important if you want to upgrade your existing system as technology changes.)

Yes No Will the system dispense as much water as needed at any one time?

(Most RO systems have a water supply limited to 2 gallons (which is the storage capacity of a 4-5 gallon bladder tank.) Even a membrane rated at 50 gallons per day will only make about a gallon of treated water an hour under normal household conditions. This issue can be very important if you don't want to run out of treated water for cooking, washing vegetables, boiling pasta, etc. as well as drinking purposes)

Yes No Is the system durable?

Yes No Does the system waste large amounts of water?

Yes No Is the system easy to install?

(Can the average homeowner install the system without hiring a plumber?)

Yes No Is the system reasonably easy to maintain?

(Are replacement components easy to obtain and convenient to replace?)

Yes No Is the system reasonably inexpensive to buy?

(Beware of companies that use outside salespeople or multi-level marketing. They must charge high prices to pay for high commissions and marketing costs. Not only is their equipment overpriced, it is often poorly designed or of mediocre quality — in spite of their aggressive marketing hype. Also avoid cheap systems that mount on the end of your faucet or pitcher-style filtration devices and don't rely on refrigerator filters. They are simple class III devices designed with a very cheap grade of granular activated carbon. Such devices may help the water taste better but they quickly breed dangerous levels of bacteria and they can't make your water safe.)

Yes No Is the system reasonably inexpensive to maintain and operate?

(This is a question that requires some professional guidance. A water softener can handle certain levels of iron and manganese, but over certain levels the resin will become fouled and require premature replacement. It may cost more up-front to install a filter capable of removing the iron and manganese, but then you may be able to use a salt-less conditioner that requires no salt that will last without the need for on-going salt for many years. A whole-house RO system may solve high turbidity and sulfate problems, but without appropriate pre-treatment the membranes may scale and require expensive replacement on a too-frequent basis. Poorly designed systems can cost a lot of money to maintain and fail prematurely.)

BASIC SYSTEM CONFIGURATION

Do you want a system that sits on your countertop, or one that is hidden away under the counter? Countertop versions are less expensive. Under counter versions save space and have a separate faucet for dispensing treated water. The best systems also have a meter that shuts off water flow when it is time to consider a filter change. Both employ the same technology.

Countertop System

Under counter System

Do you want a system that preserves healthy alkaline minerals or do you prefer the taste of de-mineralized water?

Alkaline Water

De-mineralized Water

Your **LIVINGWATERS™** dealer can provide you with a wide variety of the best water treatment technologies available. Our industry-leading **SAFEWATER™ TECHNOLOGY** is the only technology in the marketplace that can guarantee water that is SAFE from microorganisms, while offering effective reduction of fluoride, arsenic, chloramine, toxic chemicals and more, and do it without the need for power – just when you need it the most.

Remember that if you have need for a whole house system, or water treatment for your farm or business, your **LIVINGWATERS™** Dealer has access to professional engineering support based on independent and certified professional laboratory testing. This, along with a questionnaire provided by you, insures that any system we design for you will be designed for your water's unique chemistry and your individual requirements.

All **LIVINGWATERS™ Engineered Water Treatment Solutions** employ the latest leading-edge technology but only after it has been thoroughly field-tested and proven. All components are manufactured from the highest-quality materials supplied by America's most reputable firms.

This approach is the best way to insure your system will offer the highest long-term value, and will operate in the most efficient, reliable, and inexpensive way possible.



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