The Florida Flow

Volume 3, Issue 2 July 2006 ***Florida Water Quality Association***

UPCOMING EVENTS

WQA MidYear Leadership Conference
Park City, Marriott
Park City, Utah
September 6-8, 2006

FWQA Fall Educational Sessions
Friday November 3, 2006
Sanford, Florida

WQA Aquatech USA 2007
Conference Dates: March 27-31, 2007
Exhibition Dates: March 28-30, 2007
Orange County Convention Center
Orlando, FL

FWQA Annual Convention
June 7, 8, and 9, 2007
Caribe Royale Resort
Orlando, Florida

FWQA Board Meeting Schedule

Friday August 4, 2006
Lakeland Yacht Club
Lakeland, FL

Friday November 3, 2006
Comfort Suites
Sanford, Florida

Minutes of any board meeting are available upon request
All FWQA members are welcome at Board Meetings.

Presidents Message – Ted Dyer

The summer is again upon us, and we have just completed a very successful convention. I want to thank everyone that helped make this year's convention such a huge success. For those that were unable to attend, you missed the fun of not attending our seminars, and gaining new knowledge to make your businesses more successful. Plans are currently underway for our fall one day seminar, and will be held in early November just off I -4, in the Sanford area.

I encourage all members to look around, and bring in a new member from the area where you work and live to help expand our membership. If you currently are not a member, please consider joining and help support the organization that continues to watch our state and local governments for any new rules or regulations that could make it impossible to continue to operate our business's as we currently operate.

As always we encourage everyone to become active, and we are always looking for any ideas that could help made our association grow. I am looking for help on several committees for the next year, and our next board of directors meeting is on Aug 4, 2006 in Lakeland, everyone is welcome!
Anyone looking to become more involved, please e-mail me at ted@dycowatersystems.com, or call (941) 378-5533.

WHY SOFT WATER?

Lawrence Jessup

Water is called “hard water” if it contains calcium and magnesium ions, because these ions leave a hard scale and crust on the surface of items that come in contact with this water. 85% of the water in the U.S today has or contains hard water. No natural water supply is completely free of hardness. This hard water can have a negative impact on household appliances, water heaters and industrial equipment, not only in just equipment failure, but in energy costs to operate them as well as replacement and maintenance costs for repair.

Hard water if left untreated will begin to create large-scale deposits and staining on pipes and plumbing fixtures, eventually clogging plumbing and shortening the life of appliances. Most water analysis reports will commonly designate the hardness of water in grains per gallon (gpg). Water containing a hardness of less than 1 grain per gallon is considered soft water, 1-7 gpg is considered slight to moderately hard and water containing 7gpg or over is considered hard to very hard. One important trouble area is the way the hardness reacts with soaps and detergents, in laundry operations hard water leaves soap curds and detergent deposits on fabrics. This dulls the colors and creates a gray to yellowish appearance on white linens. The curds will tend to cling to the fabric material and fibers as well, allowing the threads to become brittle and retarding the strength thus shorting the life of the fabric.

Studies conducted on the effects of hard water used in both gas and electric hot water heaters show an increase in energy costs ranging from 22-30% higher than those heaters used with a soft water feed.

Any increase of heat to a water supply above the original temperature can cause lime scaling to occur. This happen because the hardness mineral is less soluble in hot water than in cold. The mineral deposits can cause more serious problems in boiler, air conditioning systems, and engine cooling systems, by reducing their efficiency and increasing their down times due to the high amount of scaling that takes place.

In a study conducted by the Water Quality Research Council, they installed water softeners in six Chicago-area motels for a 12-month period of time. This was to determine the economic savings motel operators might expect through the use of softened water. The results of this study showed that within the first year of operation, the motels saved enough money to cover the cost of the equipment. All future savings were added to profits. The savings varied between the motels, but averaged from 6 to 29% throughout. Cost saving data was obtained through monthly financial reports prepared by each of the motels participating in the study. The cost savings benefits evaluated were classified in three major classes.

1. Savings on cleaning material used in general housekeeping.
2. Savings in general maintenance—plumbing supplies, repairs, labor.
3. Savings in maid services—total time and cost.

A summary of the financial results revealed the following savings within the areas mentioned above. Total net savings for all the motels were $ 19,045.00 ranging from savings of $1,377.00 to a high of $5,880.00. The percentages saved ranged from 6% to 28.5%. The largest dollar savings were in the cost of maid services by reducing the number of hours worked. The largest percentage of savings was registered in plumbing repair costs. Over half the motels required no plumbing repair once they switched to soft water. The plumbing cost savings amounted to $ 5,134 for the six motels. The percentage savings on cleaning supplies ranged from 18% to 82%, and dollar savings came to $2,000.00.

Reducing the effects of hard water is a simple process and can easily be achieved through the ion exchange principle. The process of ion exchange will normally require a fiberglass or steel media tank with approx.

2/3 high capacity, poly-styreyne resin beads inside. These resin beads are kept in a neutral state by replaceable sodium cations. Hard water containing calcium and magnesium enters the water softener tank and passes over the resin bed, as it flows through the bedded material, the hardness ions in the water are pulled toward the individual resin beads. The resin beads have a stronger attraction to the hardness ions than those of the sodium charged ions. This will cause the hardness ions to be attached to the surface of the resin bead, replacing an equal number of sodium ions. The water exiting the resin tank now contains sodium bicarbonate ions instead of the original calcium bicarbonate (hardness) ions it entered the tank with. Thus, creating water is termed "Soft Water". After large amounts of the hardness ions have been deposited on the resin bed, covering all of the possible exchange sites, the unit can no longer soften water and needs to be regenerated (recharged).

To recharge the softener bed, we need to reverse the process as described above. To do this we must influx a high amount of sodium ions to replace the now calcium saturated resin bed. When a strong solution of sodium ions or brine solution is passed over the bed, the sheer number of sodium ions, forces the calcium to leave the attachment sites on the resin bead over powering the calcium. The resin bed becomes balanced with the sodium ions and is now ready to begin a new exchange process of hardness removal.

To estimate the time between the regeneration process, The total resin capacity and hardness in grains per gallon must be determined. Each cubic foot of resin contains approximately 30,000 gpg of capacity. By dividing the hardness in gpg by the total cubic foot capacity a total gallon of throughput can be determined.

Example: 30,000 (1cu.ft.) / 10 (grains of hardness) = 3000 gallons between regenerations

The inverse of this to determine the total number of cubic feet required, would be to multiply the total hardness in grains per gallon by the total gallons of water used per day (or operating period required).

Example: 3000 gallons per day required x 10 grains of hardness = 30,000 grains capacity needed (or 1cu.ft.)

To control the regeneration process, a number of control valves are available through various manufacturers. Although these valves differ in design and material, the function and operation are all similar and it becomes personal preference as to the manufacturer chosen. These control valves will perform the regeneration process automatically based on time or gallons of throughput.

Along with the media tank and control valve, to complete the system, a salt brine tank is used to store dry salt to be used for the regeneration of the resin beads. Common NaCl is added to the salt tank on a regular basis. The control valve on the softener will add the appropriate amount of water to the salt tank to dissolve the salt crystals and create a brine solution. To recharge one cubic for of resin, 8-15# of salt is required. At 15# of salt, full capacity will be returned to the resin beads for hardness removal. Consequently at 8# of salt, minimal capacity will be returned and only 22,000 grain capacity per cubic foot will be obtained. Therefore if 8# is chosen for economical salt savings, the above equation must be adjusted to reflect this.

Almost all of the control valves available will allow for the customer to adjust the brine refill to the salt tank. It will require 3.2 gallons of water to dissolve 8# of salt brine, and approximately 6 gallons to make 15# of salt brine. When making this adjustment it is required that you know the flow rate of the water entering the brine tank, this will allow you to set the time required to make the desired amount of salt brine.

The use of water softeners in home, business and industry is now more the norm than the exception. Although the need for further water treatment may be required for different applications, in most cases soft water has proven to be a very effective and cost saving method for handling water treatment needs. It is more important however, to make sure you use a Certified Water Specialist when considering the purchase of a water softener system.

About The Author: Lawrence Jessup is an Applications Engineer with Crane Environmental of Venice Florida. Primarily designing Reverse Osmosis Systems for Industrial Applications, in addition to all necessary water treatment equipment needs. Formally President of Inaqua International an OEM/wholesaler of water treatment equipment, Mr. Jessup is a Certified Water Specialist level 6 and A Certified Installer. He has worked in all areas of the Water Treatment Industry since 1984.

References:
Water Treatment Fundamentals Study Guide
Water Quality Research Council Cost savings from Softened Water

Censky promotes POU/POE products as a low-cost alternative to bottled water

Peter Censky, executive director of the Water Quality Association (WQA), was recently interviewed for a public radio broadcast on bottled and treated water options.

The story, "Water World" ran during the "Marketplace Money" segment of American Public Media's national broadcast, July 29 and 30, 2006. Over 200 stations and the Sirius satellite radio network carried the broadcast.

In the interview, Censky comments on the range of prices available in the water treatment market for point-of-use (POU) and point-of-entry (POE) products. He says that home filtration systems may be the way to go for families looking to save over time, on the cost of bottled water.

"The amount of water that you can get treated through [a POU/POE] device before you have to change-out the filter is a great deal more, so in the end, that turns out to be the lower-cost option over a longer period of time," Censky said.

A **transcript** of the Marketplace Money feature is available on American Public Media's Web site at http://marketplacemoney.publicradio.org. A podcast and Real Player sound file from the broadcast is also available for download from the site.

Ray Cross issues a $300,000 challenge to benefit WQRF

Long-time WQA member Ray E. Cross, Water Specialist Emeritus, gave the Water Quality Research Foundation (WQRF) a financial boost during WQA Aquatech USA, while issuing a challenge to other WQA members.

Celebrating attendance at his 60th consecutive convention, Cross announced his decision to bequeath up to $300,000 of his estate to the WQRF Endowment Fund in the form of a challenge grant to all WQA members. For every new dollar contributed to WQRF through April 1, 2007, Cross will match it, up to $300,000.

"It has been a long held dream of mine to provide something within the water industry that will benefit all of mankind. The Water Quality Research Foundation Endowment Fund can be this lasting legacy to help protect and expand the future of the water quality improvement industry for the benefit of everyone," Cross said in a written statement released during the convention.

"My goal ... is to increase the WQRF Endowment Fund by a grand total of $600,000 and to guarantee that much-needed, ongoing funding for education and scientific research is always available," Cross said.

He was on hand during WQA Aquatech USA's Opening General Session, when Dr. Duane "Doc" Nowlin announced the challenge grant, and encouraged attendees to "Be generous." Nowlin is a St. Paul, Minnesota-based consultant. A WQA member for many years, he served as president in 1988 and is now active on the WQRF Board.

After Nowlin's remarks, staff collected $18,700 in donations. Coupled with the over $11,000 collected in conjunction with dues renewals, the tally is up to nearly $30,000 so far.

FWQA Steps up and Donates $2,500 to the Water Quality Research Foundation...

Your FWQA Board of Directors voted to support the Water Quality Research Foundation with a $2,500 donation. All members are encouraged to contribute whatever amount they can toward this cause to help in raising funds for the betterment of our industry. Remember for ever $1.00 you give it's like giving $2.00 with the Ray Cross Challenge.

"The Foundation supports the research that proves to consumers and to legislators that our industry's water treatment products benefit and provide real value to all water customers. Research that we support opens new doors for the industry and substantiates with unbiased studies the efficacy of our systems.

"Without the funding to support research, our industry would inevitably wither away and die. The WQRF wants to help you protect — and expand — the future of your business and your industry. We want the Water Quality Research Foundation to be the foundation of your future."

Jack Lorenzen
Director - WQRF, Past President - WQA (1991)
President/CEO - Quality Water Services, Inc.
Lincoln, Nebraska

For more information on the Water Quality Research Foundation, or to donate, contact WQA at 630-505-0160.

WHO publishes updated *Guidelines for Drinking-Water Quality*

The World Health Organization (WHO) released an updated, Web-based version of ***Guidelines for Drinking-water Quality***, June 22, 2006.

Developments in the new edition include significantly expanded guidance on ensuring the microbial safety of drinking-water — in particular through comprehensive system-specific water safety plans. Information on many chemicals has been revised to account for new scientific findings and information on chemicals not previously considered. For the first time, reviews of many waterborne pathogens are provided.

Guidance on chlorination by-products, developing standards for volatile substances, and several new fact sheets for chemical substances are among the additions.

New sections deal with the application of the *Guidelines* to specific circumstances, such as emergencies and disasters, large buildings, packaged/bottled water, travelers, desalination systems, food production and processing and water safety on ships and in aviation.

The third edition has also been updated to take developments in risk assessment and management into account. The volume includes a framework for safe drinking water and discusses the roles and responsibilities of different stakeholders, including national regulators, suppliers, communities and independent "surveillance" agencies.

Translations in Arabic, Chinese, French, Russian and Spanish will also be made available online.

The first and second editions of the *Guidelines for Drinking-water Quality* were used by developing and developed countries worldwide as the basis for regulation and standard setting to ensure the safety of drinking-water. They recognized the priority that should be given to ensuring microbial safety and provided guideline values for a large number of chemical hazards.

Visit the World Health Organization Web site to download the full document or to download individual chapters.

WQA Task force studies incorporating CWS education program into high schools and vocational schools

A task force has been established to look at integrating certified water specialist (CWS) materials into high schools and vocational schools.

The group's first meeting was May 24, 2006. Vincent M. Kent, CWS-I, CI is chair of the task force. He is a member of the WQA Board of Governors and is president of Abendroth Water Conditioning, Inc. in Fort Atkinson, Wisconsin. Kent initially suggested the project after his work with a local high school.

The task force will examine two test cases that should indicate best practices for incorporating CWS materials into school curricula nationwide. The task force will review the test cases over the next two months.

"Adding certified water specialist education to high schools and vocational schools could demonstrate real-world applications of scientific theory to students. It would also introduce students to the water treatment industry. The benefit for the water treatment industry is that it could gain new service technicians, engineers and scientists who may not have otherwise considered our industry," said Tanya Lubner, PhD. Lubner is director of education for the Water Quality Association.

Initially, the group was brainstorming around how to get more, younger service technicians into the water treatment field, but Lubner said they realized they didn't need to limit it to that position.

"Furthermore, because the most likely pathway for integrating water treatment with high school and vocational school curricula would require interaction with the local water treatment professionals, it provides an opportunity for the water treatment industry to really give back to the community," she said.

The task force is open to comments and suggestions from members that have been involved with local high school and vocational programs. To add input, contact Lubner, WQA's staff liaison to the task force, at 630 505 0160.

Ultraviolet Technology: The Non-Chemical Alternative for Well Water Disinfection

As consumer awareness grows in regard to the quality of water consumed every day from the numerous well water systems across America, the process that is gaining the most attention is that of disinfection.
Scott Russell, Sponsored by **Water Quality Products (WQP)**

The disinfection process is certainly one of the most important steps in achieving a safe pathogen-free source for any daily household drinking water demands. One of the most common misconceptions is that if a water source tests negative for bacteria contamination at any given point, it is assumed that the source will continue to yield favorable results in the future. This is not always the case. Something as brief as a heavy rainstorm, may wash contaminants into previously unexposed sources, altering the condition of the supply. It is important to educate the consumer that the sole responsibility of the quality of his drinking water relies upon cooperation with his local water treatment specialist in regard to periodic water sampling and performing any preventive maintenance required to ensure continual optimum performance from any water treatment equipment.

Currently, several methods of disinfection are available including chlorination, distillation, ozonation and ultraviolet (UV) disinfection. UV technology, although seemingly new as a bacterial safeguard, has been recognized as a means of water disinfection for quite some time. In fact, federal guidelines were established in April of 1966 regarding the specifics for UV equipment as a means of disinfection. Many states have incorporated their own standards for UV equipment that are solely or partially based on the 1966 Policy Statement on the Use of the UV Process for Disinfection of Water. Contact state and local health officials for current guidelines and regulations.

What is UV?
UV energy is germicidal especially at the level of 2,537-Angstrom units or more commonly known as 254 nm (nanometers). Its effect is the result of the ability of the UV light to penetrate the organisms cytoplasmic membrane (protective layer) and attack the deoxyribonucleic acid (DNA) structure. The DNA is photochemically altered, damaging the cell by disabling its self-reproductive abilities, rendering the cell lifeless.

Why Use UV?
UV disinfection offers many practical advantages over other current methods of water treatment. UV light is a point of contact disinfection process. What this means is that no additional chemicals are required for the process, the taste of the water is not altered in any way by this process. In fact nothing is added to the water and nothing is taken away from the water, whereas with the use of chlorine there is growing concern of harmful side effects and the by-products produced such as trihalomethanes. It is impossible to over treat water with UV; the more UV exposure, the higher the safety margin. There is minimal maintenance required for a typical UV system (typically, they are serviced annually). Power consumption is minimal with the average 10 gpm household UV system costing approximately $2.50 each month in electricity cost.

UV equipment is so compact and easy to install it is perfect for confined spaces and easily adaptable to new and existing water systems. Comparatively, UV systems are economical for the consumer not only in the initial investment but also in routine maintenance.

Typical Household System
UV equipment comes in all shapes and sizes. Equipment is designed to mount either horizontally or vertically. Some options available today include quartz wiper systems, which allow quartz sleeve maintenance without removing the sleeve. UV intensity monitors are another option available. These monitors show the amount of UV energy inside the reaction chamber at any given time. Most UV monitors are designed that when a low reading occurs, devices such as solenoid valves are activated and shut off the water supply. Other options include elapsed time meters, remote alarm connections and flow controls.

UV systems designed for the home should be built to last. Most whole house systems are composed of the following components.

- Minimum 30,000 Micro-Watt/cm2 UV dosage at the end of lamp life.
- 304 SS pressure vessel.
- Heavy duty quartz sleeve.
- Low pressure UV lamp.
- Standard pipe fitting connections.
- Flow controls to maximize UV exposure time.

- Audio and visual alarms to provide quick assurance of operation.
- Easy access for mounting and maintenance service.

There are additional options available such as quartz wiper assembly, UV intensity monitors, solenoid valve and remote alarm connections.

Installation

Installation of a UV disinfection system is easy. The system always is installed after any other water treatment equipment including pressure tanks, filters, water softeners and RO systems. Installation occurs right before the piping breaks off to distribute water throughout the house.

When installing the UV system, it is important to bear in mind the service requirements of the system. Allow enough service area to remove the UV lamp and the quartz sleeve. Also remember to locate the system near an electrical outlet (GFI outlets are recommended). Follow any mounting instructions for the equipment. Use plumbing unions to connect the equipment to pipes. This allows easy replacement or service in the future. Use shut off valves before and after the equipment to isolate the equipment and minimal water drainage during service. A boiler drain valve on the piping at the bottom of the unit will create a quick drainage of the UV disinfection chamber.

Once the necessary plumbing connections have been made, it is time to install the quartz sleeve. The quartz sleeve protects and insulates the lamp from the water and cold temperatures. The quartz sleeves are available in two distinct types—domed and open—referring to the quartz sleeve style. Domed quartz has one open end; its shape resembles a test tube. An open quartz sleeve has two open ends. Install the sleeve into the equipment (refer to the owners manual for specifics); if the quartz is domed, one O-ring will be necessary to complete the water-tight seal and if the quartz is open, two O-rings will be required (one for each end).

Then it is time to test the system to ensure all seals and plumbing connections are watertight. Do not plug the system in until you have verified that there are no leaks.

Next, install the UV lamp. UV lamps have connection pins on either one or both ends. Handle UV lamps by the bases (ceramic sections) to ensure that no fingerprints or contaminants get on the lamp surface. (If a UV lamp does not appear clean, use rubbing alcohol and a cotton cloth to clean it.) Insert the UV lamp into the quartz sleeve and make all electrical connections. Re-apply any access covers to complete installation.

After installation, it is important to sanitize all downstream piping prior to start-up.

Maintenance

Most UV systems are designed for the ease of service. Maintenance is usually limited to an annual change out of the UV lamp and cleaning of the quartz sleeve. Depending on the water quality and pretreatment equipment, the quartz sleeve cleaning may be more frequent.

UV lamps typically need to be replaced every 9,000 hours or approximately once a year. The reason for this is that while the UV lamp is in operation creating the UV waves, the mercury vapor that is produced inside the UV lamp oxidizes and plates itself to the interior. Over time this process diminishes the amount of UV energy that can be transmitted by the lamp and through the water. At the end of 9,000 hours, a typical UV lamp is emitting approximately 40 percent less UV energy than it did at 100 hours of operation. When finished, properly dispose of UV lamps; most manufacturers have recycling programs.

Quartz sleeves should be cleaned at least once a year. It is important for the quartz to be as clean as possible as any particles or scale may refract the UV rays and prevent proper transmission into the water. It is possible to clean the quartz sleeve with a dry cotton cloth, but sometimes dish detergent may be required. If there is mineral build up or scaling, use citric acid (usually found in a hardware/plumbing store). If the quartz sleeve is unable to be thoroughly cleaned, then it must be replaced.

Completing the System

Water softeners and UV. One of the more common water problems is hardness, a problem that produces white/gray scale deposits to the interior surfaces of household plumbing such as faucets, water heaters and other surfaces the water may come in contact with including UV disinfection systems. Water softeners are used to remove hardness (calcium and magnesium) and other minerals from the water supply. The water softener is applied as pretreatment. If the hardness levels are too high and no softener is installed, the calcium and magnesium may bond to the quartz sleeve over time reducing the ability of the UV energy to radiate throughout the reaction chamber. Water softeners offer the consumer higher quality water, while at the same time enhance the performance of any water treatment equipment. It is important to remember that when a softener is installed on a chlorinated line, more often than not filters are put in place to remove the chlorine as it will damage some of the media used in softeners. This means there is no longer a means of disinfection on that system. A UV system will give adequate protection from possible bacterial growth in this scenario.

Reverse osmosis and UV. Point of use RO equipment is capable of producing very high quality water but at a slow rate. Because of the low water output, the water produced is stored in a holding tank. A small point of use UV system will ensure that the water flowing from the holding tank is free from any harmful bacteria. UV applied to pretreatment of an RO system assists in preventing premature bacterial fouling or failure of the RO membrane. By providing the UV pretreatment, the consumer can expect long-term cost savings by extending the life and effectiveness of the RO membrane.

Filters and UV. Most well water applications utilize at least one filter in the delivery process of the water. Usually this filter will be a sediment filter (a minimal 5-micron rating is recommended for use with UV systems) or of the type guarding against any loose particles/suspended solids in the water system. It also is common to find a carbon filter in use to reduce any unwanted tastes or odors that may be present. Filters as well as other standard equipment are excellent breeding grounds for bacteria. UV treatment installed after any filter will safeguard against unwanted harmful bacteria.

Conclusion

The application of a household UV system does not necessarily stem from a positive bacteria test. Installation of a UV system offers the consumer the satisfaction and reassurance that necessary measures have been taken to ensure that the water has been treated to disinfect against harmful bacteria that may be present in the drinking water supply.

Scott Russell is the residential products manager at Ideal Horizons. He has more than six years experience in residential UV applications with a strong technical background in both electrical and mechanical issues. Russell can be reached at Ideal Horizons, 212 Ideal Way Poultney, VT 05764; 802-287-4485; fax 802-287-4486; www.idealhorizons.com.</< span>

References: Department of Health, Education and Welfare; Public Health Service—Division of Environmental Engineering and Food Protection, Policy Statement on the Use of the UV Process of Disinfection of Water, 1966. Jesse Rodriguez, An Introduction to UV Disinfection, 1996

Source: *Water Quality Products* December 1999

FWQA Committees

It's that time of year again when FWQA committees are set up for the new year. There is always an opportunity for your participation. Please consider a committee membership it's a great way to network and to learn more about the industry. If you are interested in serving contact Suzanne Trueblood at 863-644-6622 or FLWQA@aol.com, or any Board member and let them know the committee you want to join.

Convention	Golf Tournament	Public Relations
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