# $H_2O$regon

Winter 2013
Vol. 35, No. 1

## 35th Annual Management & Technical Conference March 4–8, 2013

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# H2Oregon

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*OAWU's mission is to provide service, support and solutions for Oregon water & wastewater utilities to meet the challenges of today & tomorrow.*

# Directional Ramblings

***by Jason Green, Executive Director***

How is it 2013? It amazes me how quickly the days, weeks and months pass into years. My parents will both turn 70 this year; I am thankful they are both healthy and sharp. Today, my time with Pop is especially treasured as we enjoy fishing, hunting, cribbage and shooting pool several times each week. Though slowing slightly, Pop remains hard charging and extremely competitive with a "can-do" and "let's get the work done" attitude; never idle. Instilled upon my young mind were life lessons in action coupled with statements such as:

*Early to bed and early to rise… If you want it done right… Hard work is good for the body… If it's worth doing… Think before you… Actions always have a … Doing something wrong is wrong, it's not a mistake… Work first, play… Always give 110%… Keep your feet dry and your Bible read… Hard work keeps an honest man… Keep your powder dry and rifle at ready… Make the first shot… Character and reputation are of greatest importance… Your word is…*

A time to recall the past, in the present, with opportunity to reflect upon the sayings and their meanings from my father. And maybe, just maybe, anther opportunity for future use. Will I be too egotistical, self-centered, arrogant or proud to consider lessons from another's experience and wisdom, especially my father's? Listen, learn, apply while I have the chance. There will never be another 2013 for me.

Little we can do to capture the present as it so quickly slips from our grasp into the past. Its like enjoying the moment of a child growing up. Except for the memories, a letter, a photograph or a home movie, the present is fleeting. We have many choices and opportunities present and future. These will result in positive or negative consequences. I am often reminded of what we speak and do, once said or done, can not be undone. Its like a fall - once committed, there is little to do, you are going down and not many fall gracefully. We may be able to smooth things over, but its not the same as the first go. We are all given one shot, not often two and so it is with each beginning day. Make it a great day. Indeed, a challenge to each of us.

I will close these ramblings with a special note of interest to system member employees with dependents considering or enrolled in full-time college. The OAWU Jeff Swanson Memorial Scholarship Fund was established at the OAWU Annual Conference in 2011. This scholarship fund was initiated by the OAWU Board of Directors in memory of long time Circuit Rider, Jeff Swanson. Jeff passed away July 4, 2009 while courageously fighting esophageal cancer and in the harness (working!). Jeff had many gifts with which he shared with others and much of the previous two paragraphs were echoed by him. A contagious and warm personality, a positive outlook, an intelligent mind and provoking yet caring conversationalist. He was an extremely hard worker with the greatest of character examples founded on truth, justice and responsibility. Jeff consistently challenged himself and others to learn, learn, learn and then share with others. Its a great life-long habit to be implemented today! The Jeff Swanson Memorial Scholarship application may be downloaded at www.oawu.net or obtain a copy by contacting the office. The OAWU Board of Directors reserves the number of scholarships and amounts until the selection process is complete; awards are for one single year. The OAWU Board of Directors will be evaluating scholarship candidates with announcements in March 2013.

May each of us make time to reflect upon our life, lessons learned, and consider those with whom we each have influence. Wishing you the very best in 2013.

# Clean Out Those Pipes

*by Heath Cokeley, Circuit Rider*

How do you clean your main lines? I would venture to guess that most water utilities in Oregon have some type of flushing program even it is not written down. It may be as simple as; "we have a few dead end mainlines and we run the blow off every few months to force the water to turn over". It may be a little bit more complicated, maybe the system needs to be flushed quarterly or even parts of it every month. If this is the case, then what are you flushing it for? Are you getting stagnant water complaints or not getting detectable chlorine residuals at the end of the line? Why the system is being flushed matters a great deal when deciding how to flush it.

If only flushing to turn water over, then just turning a blow-off or fire hydrant on may work, but if flushing for sediment or scale removal that will change the ball game a bit. If flushing for sediment removal, try to get the water up and moving to about three feet per second (fps) in the main line. This will require that the blow-off is only being fed from one direction and this can be accomplished by shutting off the other valves that feed that area. To do this it is necessary to know the size and the length of the pipe that needs to be flushed. For instance, for 1000 feet of 6 inch pipe to be flushed at 3 fps a blow-off will need to flow at 264 gallons per minute (gpm) for a little over 5 and a half minutes in order to achieve full water turnover. Of course, running it a bit longer will help to ensure full turnover.

If the goal is to scale the inside of the pipe the water needs to be running at about 5 fps. I felt it would be difficult to explain the calculations in this magazine article, but if you are interested in them e-mail me at hcokeley@oawu.net and I will send you a copy of a spreadsheet I made that can do those calculations. In the spreadsheet just type in the size of pipe, the length it runs, and the desired flushing velocity and it will do the rest of the math for you. While this method of flushing is useful and is currently the least expensive method of flushing, it may not achieve the desired affects in all cases. Though flushing at a rate of 5 fps is the scaling velocity it may not remove all material from the inside of the pipe as it depends on the thickness of the scale and how well it is adhered to the inside of the pipe.

Other methods, such as using a pig (typically a bullet shaped object made of foam, steel, plastic, polyurethane or silicon) to remove biofilms and other debris from the inside of your water pipes can be used. Pigging got its name from the oil and gas industry, when they first used a metal bullet shaped object to clean their pipes out it made a squealing noise much like a pig and the name stuck. To achieve pigging in this fashion it requires the pipe be dug up and cut into in order to insert the pig and again to pull it back out. Because the pig is only sized for an exact pipe diameter the pig cannot transfer from one pipe size to another or through joints in the pipeline, which is problematic.

The newest form of pigging to just recently make it to the United States is called ice pigging. As suspected this method utilizes ice to clean lines out, but not a solid chunk of ice. It is more like a slushy of ice that is made in a truck onsite at the system and then pumped into the mainline. The ice scours the inside of the pipes as it moves through the system. The two major advantages to this form of pigging is that it can be injected into the system through things like fire hydrants or other valves that

come to the surface and it is removed the same way, plus it can go through fittings and from one pipe size to another. Like I said, this technology has only recently made it to the United States, but has yet to make it to Oregon. The only Company I know of, at this time, that has this technology is Utility Services and if interested please contact Jeff Austin. The more systems that express an interest in utilizing this form of pipe cleaning the quicker Oregon may be able to get a unit.

The method chosen to clean water distribution lines is all going to go back to the system's specific needs. Heavy biological growth or high iron and manganese scaling problems may need a mechanical method of cleaning, like pigging or ice pigging. If the water is relatively clean you a flushing program might suffice. A good way to evaluate this is to look at the amount of material that is on the pipe walls when cutting into a pipe to do repairs. No matter what method is chosen to clean the pipes, remember, we are just a phone call away for any questions you may have. Good luck and I'll see you down the road.

*Whose water will take home the title of*

## "Oregon's Best Tasting Water"?

**Contest Rules:**

Entrants must be an OAWU Member and in State Compliance.

Bring a clear, clean container of no more than one gallon (mason jars work well) of your system's drinking water to the Annual OAWU Conference in Sunriver.

Entries must be submitted to the OAWU registration desk located in the Great Hall by 3:00 pm on Tuesday, March 5, 2013.

A panel consisting of non-partisan judges will determine the winning Ground and Surface water entries based on clarity, smell, and taste.

The overall "BEST DRINKING WATER" will go to the national drinking water contest in Washington, D.C.

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# Massaging Morale

*Hans Schroeder, Circuit Rider*

Is everyone relieved that the election is over? Did all of your candidates win? How about State, County and City issues? I am sure that most of you are not going to answer "yes" to 100% of those questions.

One of the more important things to remember right now is: the morale shift within the different city departments. Even though your liaison might not have changed, another department's may have and there are going to be some adjustments within the next few months. So remember when you walk into the Police Department, City Hall, or the Public Works Department that some of your co-workers' attitudes may not be the same as they have been in the past.

If morale gets low within your work environment, it can have drastic impacts on, not only the employee that is stressed, but also on you. When their morale goes down it may cause you to have to pick up the pace and start doing part of their job.

One does not have to be a supervisor to build morale within a work environment. First, they need be a good team player. Listen and watch coworkers, if they are having a difficult time and are feeling too many stresses on the job, see if there is something that can be done to help relieve some of those stresses. Maybe it's taking on one of their tasks for a week or even just listening to them. Remember this is only a temporary fix so don't get caught up in the issues that a coworker is having and let it drag down your morale as well.

If you are the department head, another great idea is to go over the employees' goals that they have for the next month, year and biennium. It may help them feel like they are part of the team if they know you are there to listen to their ideas and implement them as the city's goals. This also shows the council and the employee that you care for them and can help obtain, not only the city's goals, but also your employee goals.

Allow your employees to go to some training seminars. This will help them learn new skills and possibly give them ideas on how they can more efficiently complete their daily tasks. If this is not in the city budget, check with the organization who is giving the training, a lot of times there are grants or scholarships available to defer the costs.

If morale is down because the employee is feeling like too many family functions are being missed, perhaps you can allow them to flex their schedule a little bit. Everyone knows that family should come before work, but an employee may not feel comfortable missing work or asking to flex their schedule. Make sure employees know that family is important and try to be as flexible as you can with them.

Make sure employees have the tools they need to complete their daily tasks. Ask them monthly, "is there anything, within reason, that you need to make your job easier?" It could be as simple as a new chair for their desk or a new tool to replace the one that is worn out that they are just trying to make do with.

In conclusion, remember morale is a significant part of employee productivity and directly impacts effective management. When a city finds ways to increase employee morale, there will be a positive impact for both the city and the employee. Remember it is twofold between the city and the employee and it will positively impact productivity if the morale is high.

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Max Marcott commented, "This transaction with Engineering America allows continued successful long term service to our valued customers in Oregon, Washington, Idaho and Alaska, and meets both my personal and business visions for the future."

Engineering America is a 100% employee owned business, originally incorporated in 1980. The corporation is headquartered in Oakdale, Minnesota, and has regional offices in Colorado, Kansas, Arizona and now Oregon.

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# What's New for 2013

*by Scott Berry, Circuit Rider/ Programs Manager*

It's always a bit of a challenge to stay abreast of the changes in our regulations. The following is a summary of the substantive rule changes for the coming year. For a complete list, as well as other administrative changes, please consult the Oregon Health Authority website at: https://public.health.oregon.gov/HealthyEnvironments/DrinkingWater/Rules/Pages/rulemaking.aspx

## REVISIONS FOR SUBSTANTIVE CLARIFICATION

The following revisions may have more material effects on some regulated public water suppliers. A brief description is given, including what problem we are solving and who the change will affect.

**OAR 333-061-0036(5)(B)(A), 333-061-0050(4)(A)(E), 333-061-0050(4)(C)(F), 333-061-0050(4)(C)(K) & (L), 333-061-0050(5)(E), AND 333-061-0065(6)(E)**

This rule amendment aligns several significant deficiencies identified in 333-061-0076 with other rules, specifically the sampling and analytical requirements, construction standards, and operation and maintenance requirements. These amendments will affect water systems with conventional or direct filtration (0036(5)(b)(A) & 0050(4)(c)(F)), those required to utilize a treated water sample tap (0050(4)(a)(E)), water systems using cartridge filtration (0050(4)(c)(K) & 0065(6)(e)), water systems using diatomaceous earth filtration (0050(4)(c)(L)), and water systems serving more than 3,300 people and using chlorine as a disinfectant (0050(5)(e)). *Note that all of these requirements are currently required in the EPA Surface Water Treatment Rule guidance manual, and the revisions therefore assure that Oregon requirements are no less stringent than EPA, as required under ORS 448.

**OAR 333-061-0036(5)(C)(D)(II)**

Adds UV transmittance measurement to list of parameters that must be monitored to assure UV reactors are operating within validated conditions. No frequency is specified. UV facilities already must monitor UVT to know the boundaries of their operating envelope. References 0050(5)(k). Currently only affects 2 systems using UV for pathogen inactivation.

**OAR 333-061-0036(9)(A) THROUGH (C)**

Adds language that chlorine residual must also be taken with routine coliform samples. Also adds statement that if chlorine removal treatment is applied, chlorine must be measured at entry point daily to verify all chlorine is removed.

**OAR 333-061-0050(5)(K)(I)**

Adds UV transmittance measurement to list of parameters that must be monitored to assure UV reactors are operating within validated conditions. No frequency is specified. UV facilities already must monitor UVT to know the boundaries of their operating envelope. References 0036(5)(c). Currently only affects 2 systems using UV for pathogen inactivation.

**OAR 333-061-0050(10)**

Aligns our standards for disinfection of facilities following installation or repair to AWWA standard (requires 2 coliform samples be taken). This revision also allows water systems without access to the AWWA standard to follow our rules and still meet the standard, and aligns the rule with the DWAC recommended Best Management Practices document on line breaks. This revision assures that every water system installing or repairing a facility that contacts potable water does so in a manner that fully protects public health.

**OAR 333-061-0070**

Specifies that non-community water systems that have backflow devices in place must conduct a cross-connection

survey and inspection annually as well as testing all backflow devices annually. This protects public health by ensuring that devices that are in place at these systems are maintained. There are no additional reporting requirements. The revision will affect any non-community water systems with backflow protection devices.

**OAR 333-061-0245, OAR 333-061-0250**

Alters the frequency with which DWS offers operator certification tests from twice annually to generally any time they are offered. Also stipulates that DWS will respond to process applications within sixty days and specifies that applications should be submitted sixty days before the anticipated examination date. This will allow DWS to transition completely to computer based exams eventually and allow DWS more flexibility in when it offers examinations. These changes will affect every operator that needs to take an examination, but the effect should be minimal or beneficial.

## Operators of the Year

Do you know an exceptional operator who deserves recognition? Nominate them for Water Operator, Wastewater Operator, Office Manager and/or Manager of the Year, Rookie of the Year.

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# Western States Source

*by Jack Hills, Source Water Specialist*

Were you aware that folks who are concerned with protecting your drinking water sources, not just from your region or state, but from all over the western states, gather bi-annually in a forum to share information and ideas about Source Water Protection? The 2012 Western States Source Water Protection Forum was held in October at Sun Valley, ID and was well represented by the western states.

The conference is attended by state environmental quality and drinking water administrators, rural water associations like your own (OAWU), EPA officials, and other entities that have a stake in protecting the quality of our sources of drinking water. Included, also at this conference, were officials from the Groundwater Protection Council who presented information on the oil and gas industry and hydraulic fracturing related to groundwater issues.

The main objectives of the forum were to share technical information about threats to source water quality, share experiences that may be emulated by others, build relationships between participants, encourage innovative problem-solving, and be inspired to return to our jobs able to apply ideas gained from the forum.

Without going into too much detail, I will briefly mention the scheduled program topics to give you a flavor and scope of the information shared at the forum. The "open forum" was created based on topics that individuals wanted to discuss in small group settings with others of a similar interest. We heard from various water quality departments from throughout the western US about their projects, protection efforts and technical investigations. Investigating the sources and implementing best management practices for high nitrate concentrations were issues in many states. Sharing what various states have for water quality databases, GIS capabilities, and technical expertise was also important topics of the forum. Funding, investment incentives, enabling Source Water Protection, conservation, interdisciplinary partnerships, and agricultural conflict with drinking water were presented. Specific project examples included: showing the techniques, procedures, testing, an evaluation for a nitrate groundwater study, an aquifer protection district and protection of schools that have their own Public Water System.

The program topics and specific project information lead to more specific discussion within small groups of people with similar interests. The diverse topics covered can give an idea of the various needs throughout this western end of the country that are being addressed to protect our source waters. Three sessions of five or six topics amounted to seventeen (17) different discussions. I am going to list each of the topics so you get an idea of the wide range of impacts that Source Water Protection has and how it is affected by so many aspects of our lives. If, rather than quickly reading over the titles, you take a moment to ponder the impact and magnitude of each I'm sure you'll get an idea of the complexity and enormous task that is toward Source Water Protection.

The first session topics were: 1) Addressing Nitrates in Sources of Drinking Water. 2) Providing Incentives for Source Water Best Management Practices (BMP) Implementation. 3) Incorporating Source Water Protection Plans (SWPP) into Watershed Protection Plans. 4) Oil and Gas Impacts. 5) How State Source Water Coordinators Can Engage with USDA on 590 Standard. 6) The Value of State Rural Water Associations and Source Water Protection (SWP) Goals and Achievements.

The second session of topics included: 1) Public Access to SWP, Source Location While Addressing Security

# Water Protection Forum

Concerns/GIS SWA/SWP. 2) Creating Educational Opportunities for Source Water Protection. 3) State Source Water Collaboration. 4) Forest Practices and Water Quality. 5) What are Measurable Outcomes for Source Water?

The third open forum session included: 1) Protecting a Source after Wildfires! 2) Building Resilience Capacity Through/ For SWP, TFM, and Sustainability. 3) Engaging the Reluctant Water System. 4) Sanitary Surveys and Source Water. 5) Assure Properly Constructed Wells (Public and Private). 6) How State Source Water Programs Work with Agricultural Interests.

Well there you have it. Many of the topics may not apply to your own situation, but one may impact you and cause you to consider making Source Water Protection part of your everyday vocabulary. Compare it to "recycling". Remember way back when recycling was a strange and unfamiliar term, but now, through education and implementation, "recycling" is a common everyday practice. As we continue to raise the awareness, provide support, enhance coordination, and increase recognition of the need and the practice of Source Water Protection it will provide a very necessary part of our everyday living: having a clean and abundant supply of drinking water.

As always, if you need any assistance with a Source Water Protection Plan, call us at the OAWU office, 503 837 1212. We are here to meet your needs.


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# Operation of Wastewater

*by David Branham, Wastewater Technician*

In the last edition of *H2Oregon* the process of activated sludge troubleshooting was examined. How to use control pressure to make the microorganisms grow faster by increasing the amount of food each microorganism has to eat or by reducing the time that the microorganism needs to stabilize whatever food is ingested. The opposite growth pressure is "oxidative". Oxidative pressure makes the microorganisms grow slower. Reduced waste mass and return rates as well as step-feed/contact stabilization tend to oxidize the biomass, providing oxidative pressure.

In this issue, I'd like to take a look at several operational variables. The following values are typical sludge ages for different types of municipal activated sludge plants with very little industrial waste. Actual loadings must be related to the type of waste and local condition. Sludge age is a control guide that is widely used and is an indicator of the length of time a pound of solids is kept under aeration in the system.

## HIGH-RATE

A high-rate activated sludge plant operates at the highest loading of food to microorganisms; the sludge age ranges from 0.5 to 2.0 days. Due to this higher loading, the system produces a lower quality of effluent than the other types of activated sludge plants. This system is more easily upset than others and requires tighter control and more frequent testing.

## CONVENTIONAL

Conventional activated sludge plants are the most common type in use today. The loading of food to microorganisms is approximately 50 percent lower than in a high-rate plant, and the sludge age ranges from 3.5 to 7.0 days. This method of operation produces a high quality of effluent and is able to absorb some shock loads without lowering effluent quality.

## EXTENDED AERATION

This mode is often used in smaller package type plants or so called complete oxidation systems. These are the most stable of the three processes due to the light loading of food to microorganism ratios, and the sludge age is commonly greater than 10 days. Effluent suspended solids are commonly higher than found under conventional loadings.

Let's take a look at some other modifications of the activated sludge process and the reasons that may be used for changes in the mode of operation. These modifications have been developed to improve operational results under certain circumstances:

- Current or actual loadings are in excess of design loading for conventional operation.
- Wastewater constituents require added nutrients to properly treat waste load.
- Flow or strength of waste varies seasonally.

## MODIFICATIONS OF THE ACTIVATED SLUDGE PROCESS

The next section will describe several modes of operation, including contact stabilization, the Kraus process, step-feed aeration, complete mix aeration, and modified aeration.

## CONTACT STABILIZATION

This mode requires two aeration tanks; the first tank is used for the separate reaeration of the return sludge for at least four hours before it is permitted to flow into the second aeration tank where it is mixed with the primary effluent requiring treatment.

When the solids content of the first tank is mixed with the second aeration tank,

the loadings ratio of food to microorganisms is the same as conventional operation. However, if you only look at the first, aeration tank where the load is applied, the food to microorganism ratio is nearly double the usual load ratio for conventional activated sludge.

Contact stabilization attempts to have organisms assimilate (take in) and store large portions of the influent waste load in a short amount of time (30 to 60 minutes). The activated sludge is separated from the treated wastewater in the secondary clarifier and returned to the reaeration tank. No new food is added during re-aeration, the organisms must use the waste material they collected and stored in the first aeration tank. When the stored food is used up, the organisms begin searching for more food and are ready to be returned to the first tank.

The contact stabilization system, with its off-stream reservoir of organisms in the second tank, avoids a complete solids "wash-out" when high flows occur or a "kill" of microorganisms when toxic wastes reach the plant. When calculating loading guidelines, the solids in the reaeration tank may be ignored. The effluent quality will not be the same as for loadings on the conventional process, but the results from the calculations can be used to operate your plant and to reveal trends.

## KRAUS PROCESS

The Kraus process is a modification of conventional activated sludge. The process is widely used when the wastewater contains a much greater ratio of carbonaceous to nitrogenous material than found in normal domestic wastewater and when activated sludge has poor settling characteristics.

The nutrient imbalance commonly occurs when wastes from canneries or dairies are treated. When the organisms use the entire limiting constituent (nitrogen, for example), they refuse to remove the remaining portions of the other constituents (carbon, for example). Normally, this nutrient deficiency is nitrogenous material, which is readily available in anaerobic digester supernatant or digester sludge to the aeration system will usually supply the proper nutrients to maintain the balance and adds inert suspended solids to assist with liquid-solid separation in the clarifier.

The method of supernatant application is very important in the Kraus process and here again, as in the contact stabilization process, two aeration tanks will be employed. The tank coming from the primary clarifier will be designated as mixed liquor aerator "A" and the second tank coming from the secondary clarifier is the return sludge reaeration aerator "B". In this process the return sludge is sent to the reaeration aerator (B) to be mixed with the digested sludge from a completely mixed digester. In the reaeration tank (B) the digested sludge and the return sludge are mixed, reaerated, and then sent to the mixed liquor aerator (A). The amount of digested sludge introduced to the system is determined by laboratory evaluation of the carbonaceous material removed through the system.

The same controls apply as described for controlling a conventional activated sludge plant. The main objective is to properly balance nutrients; however, other advantages include increased activated sludge settleability and a reservoir of organisms off the main processing stream.

## STEP-FEED AERATION

The difference between step-feed and conventional operation is with conventional activated sludge, the primary effluent and return sludge are introduced at one point only, at the entrance to the aeration tanks. In step-feed aeration the return sludge is introduced separately and, in many cases, allowed a short reaeration period, by itself, at the entrance of the tank. The primary effluent is admitted to the aeration tanks at several different locations. These locations distribute the waste load over the entire aeration tank and reduce oxygen sags in the aerator.

Step-feed aeration distributes the oxygen demand from the wastewater evenly over the aerator instead of concentrating it on the inlet end. Some of the advantages over conventional operation include less aeration volume to treat the same volumes of wastewater, better control in handling shock loads, and the potential for lower applied solids to the secondary clarifiers. When a conventional plant is operating above design loads and/or the secondary clarifiers cannot handle the solids load, switching to step-feed aeration or contact stabilization allows the operator to maintain more solids under aeration with a lower applied solids concentration to the secondary clarifiers. Successful operation requires transfer of wastes into the activated sludge solids in the short time interval before the waste reaches the effluent end of the aeration tank.

The step-feed mode of operation is controlled by many of the same procedures used for the conventional process. An exception to this is the mixed liquor suspended solids determinations must be made at each point of wastewater addition. The purpose of this is to measure the waste content and dilution factor provided by the primary effluent in order to determine the total pounds of solids in the aeration tank.

## COMPLETE MIX

The complete mix mode of operation is a design modification of tank mixing techniques that is made to ensure equal distribution of the applied waste load, dissolved oxygen, and returned sludge throughout the aeration tank. The theory of this modification is that all parts of the aeration tank should be similar in terms of amount of food, organisms, and air. This is accomplished by providing diffuser locations and application locations. Providing similar condition throughout the entire aeration tank allows a food to organism ratio of 1/1 and still produces effluent qualities comparable to conventional operation. Generally, smaller aeration tanks are more completely mixed than larger ones. Usually aeration is more efficient in a complete mix facility. The location of the air headers plays a key role in the mixing process.

## MODIFIED AERATION

Modified aeration is also known as high-rate activated sludge. Frequently, it is used as an intermediate treatment where the discharge requirements demand higher treatment of BOD and suspended solids removals than primary, but not as high as conventional activated sludge.

For modified aeration either raw wastewater or primary effluent are applied to an aeration tank with a detention time of 1.5 to 3 hours and a mixed liquor suspended solids concentration of less than 1,000 mg/L. Air requirements are lower because there are fewer organisms (solids) under aeration as a result of a lower sludge age or lower mean cell residence time. Effluent quality ranging from primary treatment to conventional activated sludge treatment can be achieved by the operator through controlling the air supply, aeration periods, and the pounds of solids under aeration.

And that will wrap up this session on activated sludge modes and operation. In the next article I will be discussing nutrient removal and different process modes that are used to accomplished this.

See ya all down the road! —Dave

**Reference:**

*Operation of Wastewater Treatment Plants*. Fifth Edition. Volume II.

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# Silent Mentors

***by Tim Tice, Projects Manager***

"I don't know if I have an ultimately positive attitude, but I do have an open mind;" a quote that was found when reading through a weekly newsletter by Chris Clarke-Epstein1 provides a jumping off point in changing our lives for the better.

How often do we have a quiet moment (on purpose) to reflect on the daily actions and conversations that we have encountered? Some of you still remember our colleague and friend, Jeff Swanson, and how he would share with some of us, his beliefs and way of life. After chatting with Jeff about the loss of his father, I had a long drive to get home and contemplate our discussion.

A few days later I stumbled upon a prayer that I shared with Jeff via e-mail. Weeks went by without any response and I began to wonder if I had crossed the line. That was the beginning of a new chapter for Jeff and I because when we saw each other next, his first words to me were, "You seem to know me better than I know myself, thank you for the gift!"

This continued chat brought about a realization for us that we had more in common which increased our camaraderie, since we had both lost our dads. Jeff, sharing with me his sense of loss, placed me back in the moment when I said goodbye to my own father. Though easier to handle now, than in1994, Jeff's sharing allowed me to continue to relive the times with my dad, many of them great.

The paradox to the discussion was not two friends sharing a conversation, but how the conversation had given gifts to each of us without realizing the offerings were made. Our continued conversation about our fathers made us realize that however far away from each other, prior to the OAWU years; we were rather close in terms of similarity of lives, principles, and beliefs.

One could see how anxious Jeff was and could sense his desire to reprioritize life due to the loss of a loved one. For me, and many of us, we go through stages attempting to answer too many questions in a short time. This may be a security system to assist us in dealing with misfortune. Having gone through what Jeff was experiencing and having stumbled across this prayer during that specific time was either coincidence or destiny, you decide.

The prayer shared that day is titled "Slow me down, Lord", by Wilfred Arlan Peterson, which can easily be searched for on the internet. One cannot comprehend the effect that each of us has on one another, but we can begin to appreciate those in our lives that we encounter. There was a reason for stumbling across that prayer book the day after returning from a long trip and thumbing through the pages to find such a prayer. We provide gifts to each other every day, so let us keep an open mind and make those realizations sooner than later. Let us take a quiet moment and reflect on our daily actions and conversations, hoping that our day has no regrets and that no one is unhappy because of anything we did or failed to do.

These simple gifts we give to each other are a way to silently mentor those who we encounter. Let us continually look for better ways to increase the expectations we have of ourselves, a thought for you to reflect on.

*The best that life has to offer!*

**OAWU System Members Announcement**

The Jeff Swanson Memorial College Scholarship application is available online at:

**www.oawu.net**

# Family First?

*by Mike Collier, Training Specialist/Operations*

"Put your family first" is a phrase that may mean something a little different for each of us, but I believe that the main thrust of the idea behind this phrase is a good and solid principle. Allow me to begin by disclosing that I am a father and husband and am writing this article with that slant. This does not mean that putting family first is not beneficial for others as well, just that I am writing the article from my perspective. So it is okay if you disagree with this article, it has been written only to encourage us to take a look at and question our priorities.

Ok, with that out of the way, let us start to unpack this phrase a little. I will begin by saying who I consider to be my immediate family. That would be my wife and child. Well that was easy enough, now for the tough part. What does it mean to put them first and why should I do it?

One area sometimes placed above family is work. Of course, I hear the argument that by putting work first we are supplying the needs of our family and are, thereby, really putting the family first. I somewhat would disagree with this. I understand that work is important for the survival of the family; we all need to eat. But, has work been chosen over family? This is especially difficult when you have a job that may call you at any moment to take care of an emergency. I guess an extreme way to think about it is to ask "do I use work as an excuse to avoid my family?" If this is the case, then the parental and spousal roles may not be properly fulfilled.

Part of the deal is that jobs come and go, you may change jobs several times during your life and eventually you will, hopefully, be able to retire, but through all of that your family remains the same. Family can't be changed even if you wanted to, so it is better to make the family the best possible situation you can. This may mean we take a job where we make less money, but will be there more often with the family, or take a different position to be less stressed out and be able to concentrate on the family.

Part of putting family first is to be present to give a good example with the work/family/play balance to children. If children never see their parents at home or at their sporting events, then where does their example come from? Allowing a child to work alongside of you at home will show them what it means to work hard and show them that they are important. Spending time with a child can help them build their security in who they are, their place in the family, and in this world. This is assuming that the parent does not use words or actions to tear down the child.

After a long day of work, how much time is spent in front of the TV, at the bar with co-workers or friends, or playing golf? It is estimated that the average household spends at least 3 hrs watching TV every night. The least we could do is to cut this in half and spend the other 1.5 hours helping our kids with homework, playing with them, allowing them to help with a project, or just talking with them. It may end up that life will become more of a joy and more fulfilling as we begin to make changes in with whom and where we spend our time.

Ohh, I almost forgot – we should include our spouse. It is not just children that need our attention. To create a long lasting love relationship in a marriage we must spend time together. Giving children security by fully

appreciating and loving our spouse is one of the greatest gifts. Not to say that we can't have a great family life without a spouse, it just is a lot more difficult.

One can be a great provider, or house maker, but unless they are living life with their children and spouse and listening to what they are truly saying to them, they may be dropping the ball. The home environment must be a safe place for the family to express their wants, needs, and desires – this does not mean that we always give in to demands, but that the family understands where each other are coming from. Otherwise it will not really be a relationship, it will be a dictatorship or just surface relationships (one with no roots).

If family life is falling apart it will impact all the other areas of life. It will make work and work relationships more difficult because there will be more stress and tiredness. If the family is really struggling, find the time and money to seek counseling – (if the counselor is bad, be willing to try a second, people don't have major surgery without getting a second opinion and that is just for the physical – it seems that we should take greater precautions when dealing with mental and emotional needs). It is ok to get help. Swallowing pride to protect the family and being willing to try counseling may be just the ticket needed to improve a family's relationship.

I do think that we all need a little time away from family, but we cannot choose to be selfish with our time. We chose to have a family, so we should be responsible for it and must realize that with this choice we gave away much of our personal time. To fulfill our familial commitment we must sacrifice our personal time to raise the next generation.

We cannot do it all by ourselves. Get support from others, spend time with a father that is respected, one that has the reputation of being a good father, take time to build a relationship and pick their brain. Only hanging out with singles, drunks, or workaholics will make it difficult to become a good parent and spouse. Just like we tell our kids, "the people you spend time with will influence you, whether you like it or not."

This does not mean that there won't be difficulty or hardship – have you ever heard of the prodigal son? The story is more about the parent's reaction to a bad situation and decision, than it is about the son's actions, the father's reaction allows the family to grow through these pains.

Don't worry as much about the "things" (estate you pass on to your family), building their character and work ethic will help them to be much better off and be further along the way to a fulfilling life. To do this we must have a good work ethic and be of good character. A father could work hard and pass 1 million dollars off to a child when he dies. If the child is a selfish brat; he just gave more money to someone that is just going to waste it. Or he could have worked less, giving the child no money at his death, but instilling into them the ideals that will bring true joy to their life (patience, hope, character, faith, mercy, etc.); probably encouraging them to do the same and hence impacting multiple generations to come.

The final thing I will leave you with is: Don't quit on your family – no matter how difficult it gets. Otherwise that will be the example the family has to take with them into the future and they may believe that they weren't worth the effort.

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# OAWU's 2013 Annual Conference Awards

## Water operator of the year:

Based on exceptional accomplishments of an individual during 2012. Criteria for nominee:

1. Employer / System of nominee must be an OAWU member.
2. Employer / System must be in state compliance.
3. Minimum of two years employed with system.
4. Demonstrates leadership in dealing with daily utility operations and/or concerns.
5. Nominee must be State Certified.

## Wastewater operator of the year:

Based on exceptional accomplishments of an individual during 2012. Criteria for nominee:

1. Employer / System of nominee must be an OAWU member.
2. Employer / System must be in state compliance.
3. Minimum of two years employed with system.
4. Demonstrates leadership in dealing with daily utility operations and/or concerns.
5. Nominee must be State Certified.

## Rookie operator of the year:

Based on exceptional accomplishments of an individual during 2012. Criteria for nominee:

1. Employer / System of nominee must be an OAWU member.
2. Employer / System must be in state compliance.
3. Minimum of one year employed with system.
4. Demonstrates leadership in dealing with daily utility operations and/or concerns.
5. Nominee must be State Certified.

## Office Manager/Manager of the year:

Based on exceptional accomplishments of an individual during 2012. Criteria for nominee:

1. Employer / System of nominee must be an OAWU member.
2. Employer / System must be in state compliance.
3. Minimum of two years employed with system.
4. Demonstrates leadership in meeting office / system demands.

Nominee's full name: _____

Employer / system: _____

Nomination category: ☐ Water ☐ Wastewater ☐ Rookie ☐ Office Manager/Manager

Description of nominee's achievements and/or accomplishments:

_____

_____

_____

Please feel free to include copies of awards, certificates, support letters, etc.

Name of person making nomination: _____

System/company name: _____

System/company phone #: _____

Please return nomination form by Friday, February 1, 2013
Send to: OAWU, Nominations Committee
935 N. Main St. 97351 or Fax: (503) 837-1213
Questions, please call (503) 837-1212

# OAWU System Member Annual Conference Scholarship Application

OAWU will be awarding two (2) scholarships for the Annual Management and Technical Conference in Sunriver 2013. These scholarships include registration, conference meals and social functions. Lodging and transportation will be the individual's responsibility. Award decision based upon membership and system need.

Please submit the application form below by January 31, 2013 to:
OAWU, 935 N. Main St. Independence, OR 97351, Attn: Scholarship 2013

Name of Applicant: _____

System: _____

Address: _____ City _____State _____ Zip _____

Phone: (  ) _____ Email: _____

Reason applying for scholarship:

_____

_____

_____

_____

_____

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# OAWU College Student Annual Conference Scholarship Application

OAWU will be awarding two (2) scholarships for the Annual Management and Technical Conference in Sunriver 2013. These scholarships include registration, conference meals and social functions. Lodging and transportation will be the individual's responsibility. Each applicant must be an active college student in water or wastewater. Submit a 500-word typed essay on why you would like to attend our conference and why you chose the water/wastewater industry.

Please submit the application form below by January 31, 2013 along with your essay and mail to:
OAWU, 935 N. Main St. Independence, OR 97351, Attn: Scholarship 2013

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Address: _____ City _____State _____ Zip _____

Home Phone: (  ) _____ Email: _____

School Applicant is Attending: _____

Field of Study: _____

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# OREGON ASSOCIATION OF WATER UTILITIES
# 2013 TRAINING & EVENTS SCHEDULE

| Date | Class Title | Location | CEU Information | ESAC# | Fee/Free |
|---|---|---|---|---|---|
| January 22 | Small Water Operator Training Course | Eagle Point | 0.6 Water / 0.4 Wastewater | 2379 | FREE |
| January 24 | Excavation Safety & Confined Space | Independence | 0.6 Water/ Wastewater/Onsite | 2356 | Fee |
| February 12 | Small Water Operator Training Course | Albany | 0.6 Water / 0.4 Wastewater | 2379 | FREE |
| February 19 | SDWA Update | Woodburn | 0.4 Water | 2287 | FREE |
| February 20 | Small Water Operator Training Course | Salem | 0.6 Water / 0.4 Wastewater | 2379 | FREE |
| March 4 | Developing Your O&M Manual | Sunriver | 0.6 Water/Wastewater | 2113 | Fee |
| March 4 | Small Water Operator Training Course | Sunriver | 0.6 Water / 0.4 Wastewater | 2379 | FREE |
| March 4-8 | 35th Annual Management & Technical Conference | Sunriver | 2.0 Water/Wastewater | TBA | Fee |
| March 19 | Well Performance Issues | Salem | 0.4 Water | 2059 | FREE |
| March 19 | Water Permits, Certification, Extension of | Salem | 0.2 Water | TBA | FREE |
| March 27-28 | Wastewater (WWT/WWC) Certification Review | Salem | 1.4 Wastewater/0.6 Water | 2295 | Fee |
| April 4 | V/A Emergency Response | Cornelius | 0.6 Water | TBA | FREE |
| April 9 | Mixed Media Filter O&M for WTP Operators | Roseburg | 0.4 Water | 2058 | Fee |
| April 11 | Control Valves | Salem/Keizer | 0.7 Water / 0.7 Wastewater | 2286 | FREE |
| April 16 | Excavation Safety & Confined Space Entry | The Dalles | 0.6 Water/Wastewater/Onsite | 2356 | Fee |
| April 18 | MIOX Treatment | Salem | 0.2 Water | TBA | Fee |
| April 18 | Math for Operators | Salem | 0.4 Water/Wastewater | 2237 | FREE |
| April 18 | SDWA Update | The Dalles | 0.4 Water | 2287 | FREE |
| April 23 | Water Meters | Roseburg | 0.4 Water | 2069 | FREE |
| April 23-25 | Water (WT/WD) Certification Review | Bend | 1.8 Water/0.7 WW | 2112 | Fee |
| April 25 | Water Meters | Coos Bay | 0.4 Water | 2069 | FREE |
| May 1 | Making Sense of the GW Rule | Boardman | 0.4 Water | TBA | FREE |
| May 7-9 | Water (WT/WD) Certification Review | Salem | 1.8 Water/0.7 WW | 2112 | Fee |
| May 9 | Developing Your O&M Manual | Florence | 0.6 Water/Wastewater | 2113 | Fee |
| May 14 | Water Rights | Salem | 0.4 Water | TBA | Fee |
| May 22 | Lagoon Wastewater Plant O&M | John Day | 0.7 Water | 2355 | Fee |
| May 23 | SCADA Systems | John Day | 0.4 Water | TBA | Fee |
| May 29-30 | Utility Management Certification | Independence | 1.4 Water/Wastewater | TBA | Fee |
| June 5 | Developing Your O&M Manual | La Grande | 0.6 Water/Wastewater | 2113 | Fee |
| June 6 | Math for Operators | Baker City | 0.4 Water/Wastewater | 2377 | Fee |
| June 6 | SDWA Update | La Grande | 0.4 Water | 2287 | FREE |
| June 13 | Water Operations Review | Roseburg | 0.6 Water | TBA | Fee |
| July 9 | Water Rights | Tillamook | 0.4 Water | TBA | Fee |
| July 11 | V/A Emergency Response | Newport | 0.6 Water | TBA | FREE |
| July 17 | SDWA Update | Klamath Falls | 0.4 Water | 2287 | FREE |
| August 7 | Well Performance Issues | Bend | 0.4 Water | 2059 | FREE |
| August 7 | Water Permits, Certification, Extension of | Bend | 0.2 Water | TBA | FREE |
| August 13 | Making Sense of the GW Rule | Island City | 0.4 Water | TBA | FREE |
| August 14 | Excavation Safety & Confined Space Entry | Bend | 0.6 Water/Wastewater/Onsite | 2356 | Fee |
| August 19-22 | Summer Classic XVIIII Conference | Seaside | 1.7 Water/Wastewater | TBA | Fee |
| September 11 | Control Valves | Newport | 0.7 Water / 0.7 Wastewater | 2286 | FREE |
| September 17-19 | Water (WT/WD) Certification Review | Grants Pass | 1.8 Water/0.7 WW | 2112 | Fee |
| September 25-26 | Utility Management Certification | Bend | 1.4 Water/Wastewater | TBA | Fee |
| September 26 | Activated Sludge Process | Springfield | 0.6 Wastewater | TBA | Fee |
| October 8-10 | Water (WT/WD) Certification Review | Salem | 1.8 Water/0.7 WW | 2112 | Fee |
| October 15 | Excavation Safety & Confined Space Entry | Independence | 0.6 Water/Wastewater | 2356 | Fee |
| October 23-24 | Wastewater (WWT/WWC) Certification Review | Salem | 1.4 Wastewater/0.6 Water | 2295 | Fee |
| November 4-7 | Small System Operator's Conference | Florence | 2.0 Water/Wastewater | 2259 | Fee |
| November 20 | Water Operations Review | Grants Pass | 0.6 Water | TBA | Fee |
| December 2-5 | 15th Annual End of Year Operator's Conference | Hood River | 2.0 Water/Wastewater | TBA | Fee |
| December 17 | Developing Your O&M Manual | Fairview | 0.6 Water/Wastewater | 2113 | Fee |
| December 18 | Excavation Safety & Confined Space Entry | Fairview | 0.6 Water/Wastewater | 2356 | Fee |

| 2013 State Water exam dates | Application Deadline |
|---|---|
| May 16, 2013 | March 15, 2013 |
| October 17, 2013 | August 15, 2013 |

*For additional **water exam information**, please visit http://oregon.gov/DHS/ph/dwp/certif.shtml*

| 2013 State Wastewater exam dates | Application Deadline |
|---|---|
| March 29, 2013 (statewide) | February 1, 2013 |
| April 4, 2013 (Pendleton) | |
| Year round, open schedule | |

*For further **wastewater exam information**, please visit http://www.deq.state.or.us/wq/opcert/opcert.htm*

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*Training class dates, class topic and/or locations may be subject to change as needed.*

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# Don't Give Up!

***Throwing My Loop***
***by Michael Johnson***

Easy to say – a bit more difficult to do. To hang in there when it's rough, I mean. It's hard not to give up considering the trials we sometimes face, now isn't it? During our time on earth, we deal with disappointment, tragedy, loss of loved ones, divorce, injury, and illness, just to name a few. I was reminiscing with an old cowboy once, and I'll never forget a statement he made. "I can tell you about life, son," he said. "I can tell you all about life." I leaned forward waiting, and he said, "Life is just one dang thing after another."

So is there a valid reason for us to continue – to not yield? Absolutely. In fact, there are many. There is a key to finding those reasons. It all begins with one thing. One of the best actions we can take for ourselves – and those we love – is to develop a particular skill and/or ability we might call "resiliency," or "perseverance," or "mental strength." While we are learning about arithmetic, reading, spelling, and geography, and life in general, it would be most helpful to learn about "try," and what that word really means. The bad news is you will probably have to learn this on your own, as it is not taught anywhere from first grade through Ph.D. (Ain't that a shame.) I can only help you a bit because I'm still learning about "it" myself. Not knowing a lot about a subject however, has never prevented me from giving advice on the matter, so here is Life Lesson 101…

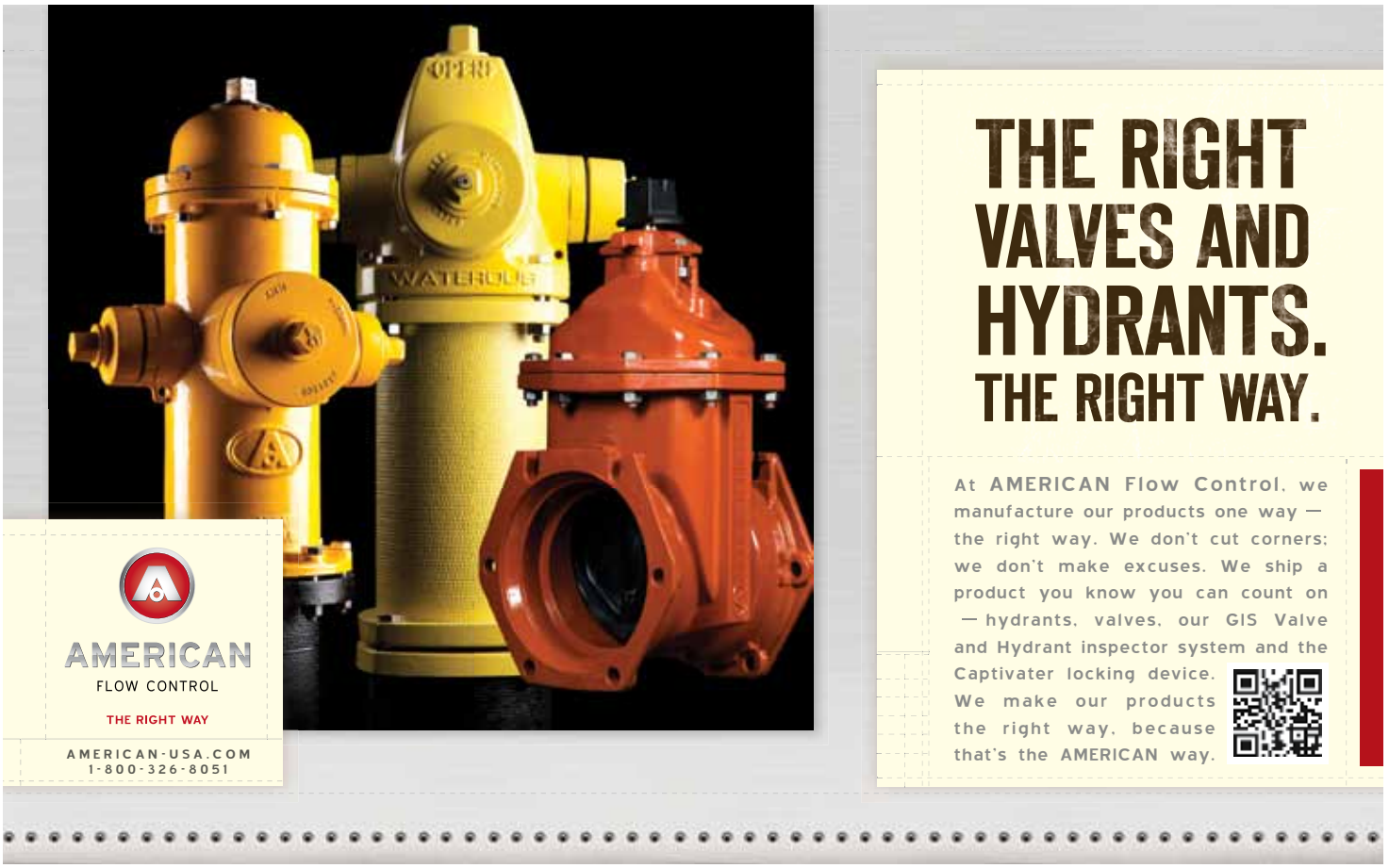
We all know what success is, right? It's about having a good job or a lot of money, it's about hitting the baseball most often or the greatest distance, or it's about making the game winning shot, or roping the fastest, right? How about being a famous actor? It's about success! Isn't it? You know, I'm beginning to wonder.

If we look at things a bit differently, it's not about success at all. It's about dealing with failure. And since most of us are good at failing, that's something we can all do, right? So don't think me silly here, but if we get really good at failing – and we don't give up – wonder what might happen? Read on…

Truth is Pete Rose was the best career hitter ever. Truth also is Pete made the most outs. Babe Ruth hit 714 home runs, but he struck out 1330 times. Nolan Ryan struck out more people than anybody, but he walked more batters than anyone in the history of baseball. Michael Jordan says he missed the game-winning shot far more than he ever made it. Most all actors go on hundreds and hundreds of auditions before they ever get a part. Because of failure, all seasoned ropers eventually learn they must be smooth instead of fast. Fast (or "good") only comes after failure. We have to make a handful - a large handful - of mistakes to arrive at something sublime.

I'm not just playing a numbers game about famous people here. For over thirty years, I have been interviewing successful business owners who started from scratch. When I ask them how they did it, guess what every single one of those entrepreneurs tell me? They tell me about all their failures.

Bull riders buck off more than not. Hall of Fame hitters fail 7 of 10

times. The most famous quarterbacks only complete half their passes, actors are rejected more than accepted…but all of them keep on!

But of all those examples, I am the best.

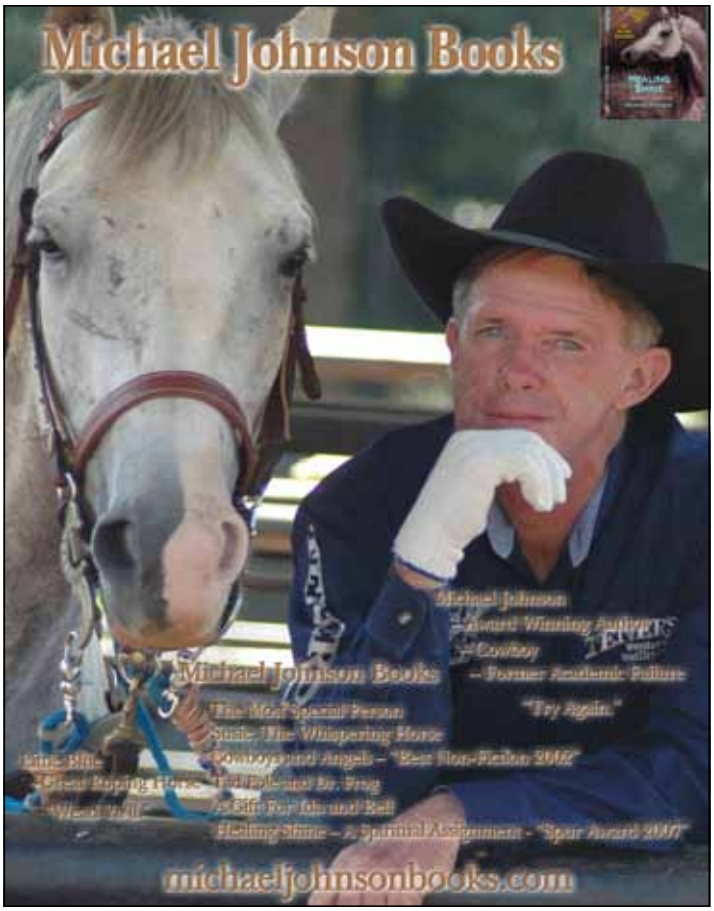
In my lifetime, I have taken academics very seriously (okay, not always). I have taken work seriously, golf seriously, roping, horse training, writing, and cooking very seriously. Yet in all that time, if I'm honest (this hurts a bit) I have never had a success. Never was a star at the office, never won a big tournament or a big roping (almost did, but we know what that counts…nada), never wrote a best seller, and don't have my own cooking show. And what did all that effort get me? Why should I keep on? Because…

The Lord allowed me to marry a good woman who loves me like my mother did, a good dog who would give his life for me, my wife, or either grandchild, three horses who would run all day if I only asked, and we all live on the farm we dreamed of as children. He gave me the best friends in the world, and wood ducks on my pond. All that and not one single success on my part – all that after a lifetime of what some would call failure. See, I got good at it. That failure thing I mean.

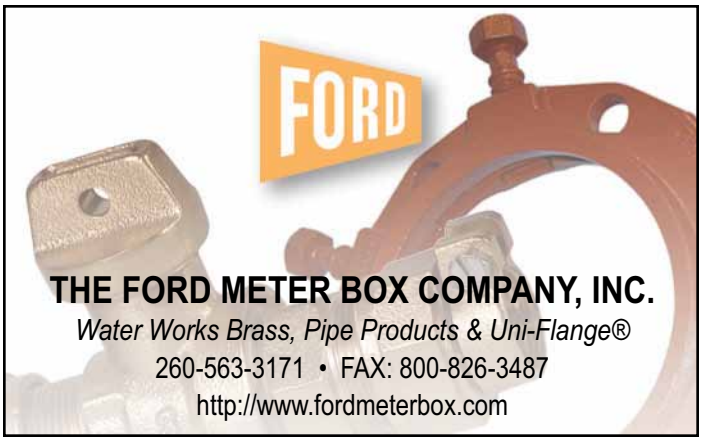
*"Most of the important things in the world have been accomplished by people who kept on trying when there seemed to be no hope at all."*
— Dale Carnegie

*"Never give up. And never, under any circumstances, face the facts."*
— Ruth Gordon

Amen to that. — Michael Johnson







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# Bio-Augmentation vs. Bio-Stimulation

### What is Bio-Augmentation?

It is the introduction of cultured microorganisms into the environment for the purpose of enhancing bioremediation of organic contaminants. (www.environmentallawyers.com/Environmental-Resources-Glossary.cfm)

### What am I actually buying?

As you may already know there are many products on the market today being sold as a microbial or bacterial formula. Some are actually microbial, some are enzyme, some are chemical surfactants and some may have all the above. Some will not have any microbes in them at all! How do you, as the purchaser, know what is the best product for your application?

This article is an attempt to enlighten you on some of the differences between products. It is not all encompassing, but general in nature. Let me first say that most of these products may work to some degree, but there may be down side effects if you are not careful.

### How do I know what is in the product?

The first thing to do is, ASK. What are some of the questions you need to know?

Ask for an MSDS and label or tech sheet for the product. Check things like pH and Personal Protection. Most microbes do not live long in environments below 5 pH or above 9 pH. Read the label. Does it say enzyme or catalytic enzyme product? Does it make claims to liquefy any materials on contact (see Bio-Stimulants below)? Remember that anything that is turned to liquid hits your plant immediately.

Ask to see a list of microbes and the populations in the product. Most manufacturers will not give you a list by genus and species, but they should be able to provide a type and CFU count (i.e. aerobic at 3 million per gallon, anaerobic at 2 million per ml., etc.). You can also ask for a species richness diversity of the microbial/bacteria in the product. Now here is where the challenge begins if you are comparing products. Which product has more microbiology in it, a product with 1 billion colony forming units (CFU) per gallon or a product with 1 million CFU per milliliter? Here is a hint; there are approximately 3,785 milliliters in a gallon!

### Liquid versus Dry microbial products:

Which is better? It depends on who is selling it to you. The liquid companies think they are best and the dry companies think they are the best. Here is what I know about biology. There are three things required to keep microbiology alive. They are food, temperature and water? And if aerobic they also need oxygen. We have found through our research that if any of these go away, the microbes go dormant or die. Once dormant they each have different time lines on becoming active again once


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the environment changes. Some dormant microbiology may actually become food for the indigenous microbiology in the environment. Thus, they may become a bio-stimulant (See definition below), instead of bio-augmentation.

### So what are Bio-Stimulants?

The addition of nutrients to polluted waste or ground in order to enhance the remedial activity of microorganisms (Science Dictionary Definition of Bio stimulation, Environment).

Bio-Stimulants come in many forms and vary by the results you are trying to accomplish. Molasses or sugar are considered a food source for biology, kind of like giving your 6 year old 5 chocolate candy bars before bed. Kind of gets things excited for a while, but the activity can be short lived.

I have seen dog food added to increase the amount of BOD in a system that lacks in bug (microbial) food to stay alive. Methanol is another bio-stimulant used to increase biological activity and sometimes for ammonia removal. Another program would include using high carbon sources to accomplish the same results.

And then we get into enzymes, surfactants, degreasers and citrus oils, etc.. Many make claims to liquefy other compounds (grease, sludge, solids) on contact. Although enzymes are the result of biological activity, they are often considered a bio-stimulant or catalyst because they may stimulate indigenous bacteria to work harder. If the indigenous bacteria you need are present in your system bio-stimulation might make a difference. If the bacteria/microbes you need are not there, then stimulation may not be successful.

Degreasers, surfactants and citrus oils also have grease liquefying properties. There are many issues that can occur when using products that liquefy grease or solids on contact. One is that the liquefied grease arrives at your head works immediately and if you have a healthy population of filamentous bacteria, you could end up with massive amounts of foaming. Remember that up to 80% of the cost of treating grease is at the wastewater plant.

This is one of the reasons that many major, mid-sized and small cities have banned the use of these materials in grease interceptors and restaurants. Some cities will allow the addition of live biological products (Bio-Augmentation) but not enzymes, surfactants or degreasers.

In conclusion, there are many products in the industry being marketed as microbial or bacterial. You should make sure that you know what you are buying. Buy from reputable companies and remember that there is very little black and white in the microbe world. Most things are varying shades of gray. For any additional information, feel free to contact Rick Allen at rick@biolynceus.com or 970-586-339.


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# QUIZ CORNER

Match Game for 1-5: Match the definition with the correct terms.

1. Gradual downward flow of water
2. The natural water cycle
3. Water lost by foliage
4. Water trapped in sedimentary rocks
5. The addition of water into a groundwater system

A. Recharge
B. Infiltration
C. Transpiration
D. Hydrologic Cycle
E. Connate Water

6. **What is the process called when snow evaporates directly to the gaseous stage, skipping the water stage?**
   A. Sublimation
   B. Collaboration
   C. Evapotransporation
   D. Condendovaportion

7. **What is the name of the bond that binds the hydrogen nucleus to the central oxygen atom by a pair of electrons in water molecule?**
   A. Hydrogen bond
   B. Covalent bond
   C. Polar bond
   D. Ionic bond

8. **A small area of dark gray/like sludge in an aeration tank can be due to aeration equipment failure or**

   _____

   A. The introduction of a septic side stream
   B. Low BOD
   C. Absence of bacteria
   D. The fact that mixing is to turbulent in that location

9. **What is the most effective way to solve a Nocardia foam problem in your activated sludge system?**
   A. Pump sodium chloride into your reactors (aeration tanks)
   B. Spray the foam with degreasing compound
   C. Raise the pH of the wastewater to 10 or higher
   D. Decrease the MCRT (increase wasting) skim the foam off the surface and dispose of it

10. **What are the two most important safety concerns when entering a confined space?**
    A. Corrosive chemicals and falls
    B. Bad odors and claustrophobia
    C. Extreme air temperatures and slippery surfaces
    D. Oxygen deficiency and hazardous gases

11. **Which form of hypochlorite is the most dangerous to handle?**
    A. Sodium
    B. Fluoride
    C. Calcium
    D. Chlorine

12. **Where was the Western States Source Water Protection Forum Held this year?**
    A. Sunriver, OR
    B. Estes Park, CO
    C. Sun Valley, ID
    D. Lake Tahoe, CA

13. **Rain water is the purest form of water?**
    A. True
    B. False

***ANSWERS***
*1-B, 2-D, 3-C, 4-E, 5-A, 6-A, 7-B, 8-A, 9-D, 10-D, 11-C, 12-C, 13-A*


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This class will assist the water and wastewater system operator in outlining the specific points in developing the draft of the O&M manual. Step by step, each attendee will create their draft as it relates to their utility system during class. The e-file may then be completed back at the system office.

Class cost is $155, or if you are unable to attend a class you may purchase a thumb drive with e-files for $155.

To sign up for the October class, or to have a thumb drive mailed to you, contact your Association for further information.

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For more information and registration please go to www.oawu.net. Also, for those that wish to attend OAWU's annual business meeting, it will be held at Sunriver Tuesday, March 5th at 5:30pm in Landmark rooms I & II.

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Phone: _____ Fax: _____

Operator: _____

Contact Person: _____

Number of Hook-ups: _____

Were you referred? By whom _____

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|---|---|
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|---|---|
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***Annual Dues - See Dues Schedule***

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Dexter Oaks Mobile Home Park
Dexter Sanitary Service
Diamond Hill RV Park
Diamond Peaks Tract 1355
Diamond Summit Association
Dietz Airpark Water System
Donald, City of
Drain, City of
Drifters Mobile Home Park
Driftwood Mobile Estates
Dufur, City of
Dumbeck Lane Water Association
Dundee, City of
Eagle Point, City of
East Yamhill Rural Water Company
Eastmont Water Company
Eastshore Water Improvement District
Echo, City of
Elkton, City of
Enterprise, City of
Estacada, City of
Eugene Mobile Village
Fairview Water District
Fairview, City of
Falcon Cove Beach Water District
Falcon Heights Water & Sewer District
Falls City, City of
Fall Creek Water District
Fern Ridge School Dist. 28J-10
Fern Valley Estates Improvement Dist
Fernridge Mobile Estates
Fir View Water Company
Fischer's Place Mobile Home Park
Fishhawk Lake Recreation Club, Inc.
Florence, City of
Forest Park Mobile Village
Fossil, City of
Garden Valley Water Assn
Garibaldi, City of
Gaston, City of
Gates, City of
Gearhart, City of
Georgia Pacific-Wauna
Gervais, City of
Gilchrist Water Co., LLC
Gladstone, City of
Glendale, City of
Gleneden Sanitary District
Glenmorrie Co-op Association
Glenridge Improvement District
Glide Water Association
Goble Water Association
Gold Beach, City of
Gold Hill, City of
Government Camp Water Company
Grand Prairie Water Supply Company
Grand Ronde Community Water Association
Grand View Mobile Home Park
Granite, City of
Grants Pass, City of
Green Oaks Mobile Ranch
Greenhoot Properties
Gresham, City of
Haines, City of
Halfway, City of
Hall's Trailer Court
Halsey, City of
Harbor Water PUD
Harrisburg, City of
Hebo Joint Water/Sanitary Authority
Heceta Water District
Heppner, City of
Hidden Valley Mobile Estates Impr. Dist.
High Lostine Owners Association
Highland Water District
Hiland Water Corporation
Hines, City of
Hood River, City of
Hopewell Water Company
Horizon View Hills Water, Inc.
Hubbard, City of
Hunnell Hills Water System
Huntington, City of
HWY 58 Trailer Park
Ice Fountain Water District
Idanha, City of
Idleway Improvement District, Inc.
Imbler, City of
Independence, City of
Indian Meadow Water Company
Interlachen Water PUD
Ione, City of
Irrigon, City of
Island City, City of
Jackson County Parks
Jacksonville, City of
Jewell School District
John Day Water District
John Day, City of
Johnson Creek Water Services Company
Junction City, City of
Juniper Mobile Home Park
Keizer, City of
Kelly's Brighton Marina LLC
Kelso Water Association
Keno Water Company, Inc.
K-GB-LB Water District
Kingswood Heights Water Association
Klamath Falls, City of
Klippel Water, Inc.
Knappa Water Association
Knoll Terrace MHC
L.A. Water Cooperative
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La Pine Special Sewer District
La Pine Water District
Laidlaw Water District
Lady Creek Water System
Lafayette, City of
Lake Grove Water District
Lakeshore Estates
Lakeside Water District
Lakeside, City of
Lakeview, Town of
Lakewood Utilities, LTD
Lamontai Improvement District
Lamplighter Water Association
Lane County Parks
Langlois Water District
Lark Meadows Water Association
Laurelwood Water User's Co-op
Lawrence Subdivision Water Association, Inc
Lebanon, City of
Lexington, Town of
Lincoln City, City of
Long Creek, City of
Lostine, City of

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Lowell, City of
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Lyons-Mehama Water District
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Madrone Hill MHP
Malin, City of
Manzanita, City of
Mapleton Water District
Maupin, City of
McKay Acres Improvement District
McKenzie Palisades Water
McMinnville Water & Light
McNulty Water PUD
Medford Water Commission
Merrill, City of
Metolius Meadows Prop. Owners Assn.
Metolius, City of
Midland Water Association
Mill City, City of
Milo Adventist Academy
Minikahda Water District, Inc.
Mitchell, City of
Modoc Point Sanitary District
Molalla, City of
Monmouth, City of
Monroe, City of
Monument, City of
Moran Water System Association
Moro, City of
Mosier, City of
Mossy Brae Water District
Mt. Angel Abbey
Mt. Angel, City of
Mt. Ashland
Mt. Bachelor, Inc.
Mt. Vernon, City of
Mulino Water Dist. #23
Myrtle Creek, City of
Myrtle Point, City of
Nantucket Shores Water Company
NeahKahNie Water District
Nehalem, City of
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Neskowin Regional Sanitary Authority
Neskowin Regional Water District
Netarts Water District
Netarts-Oceanside Sanitary Dist.
New Bridge Water Supply District
Newport, City of
North Corvallis Mobile Home Park
North Hill Water Corporation
North Plains, City of
North Powder, City of
Northwest Newberg Water Association
Nyssa, City of
Oak Lodge Water District
Oakland, City of
Oakridge, City of
Oaks Mobile Home Park
Oceanside Water District
Ochoco West Water & Sanitary Authority
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Orchard Heights Water Association
Orchard Point Mobile Homes
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Otter Rock Water District
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Paradise/ Rogue Meadow WS
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Parrett Mountain View Estates
Perrydale Domestic Water Association
Pete's Mt. Water Company, Inc.
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Phoenix, City of
Pilot Rock, City of
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Pleasant View Water Company
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Port of Morrow Commission
Port Orford, City of
Power City Water Co-op
Powers, City of
Prairie City, City of
Prineville, City of
Pristine Water Source, LLC
Quincy Water Association
Rainier, City of
Redmond, City of
Redwood Water Service, Inc.
Reeder Ranch, Inc.
Reedsport, City of
Rhododendron Water Association
Richland, City of
Rickreall Community Water Association
Riddle, City of
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River Meadows Improvement District
River Point Farms, LLC
Riverbend-Riverbank Water District
Rivergrove Water District
Riverside Water District
Riverview Trailer Park
Riviera Mobile Park
Road's End Water District
Roats Water System, Inc.
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Rock Creek Water District
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Rocky Pointe Marina
Rogue Community College
Rogue Lea Estates MHP LLC
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Rogue River-Siskiyou National Forest
Roseburg Forest Products Co.
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Running Y Utility Company
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Sam's Valley Elem. School Dist. #6
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Scenic Fruit Company
Scio, City of
Scoffield Mobile Home Court
Scotts Mills, City of
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Seneca, City of
Shangri-La Water District
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Sherwood, City of
Shorewood Estates
Siletz, City of
Silver Falls School District 4J
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Sodaville, City of
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South Fork Water Board
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Squaw Creek Canyon Development
St. Paul, City of
Staffordshire Water System, Inc.
Stanfield, City of
Star Satellite Improvement District
Steeves Mobile City
Storlie Water Company Inc.
Sublimity, City of
Suburban East Salem Water District
Sumpter, City of
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Sunriver Water LLC
Sunset Water Systems, Inc.
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Sweet Home, City of
Talent, City of
Terrace Mobile Plaza
Terrebonne Domestic Water District
The Dalles, City of
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Tillamook, City of
Tillamook County Creamary Association
Timber Water Association
Timberline Rim Water Company
Tingley Lake Estates
Toledo, City of
Trappist Abbey
Tri City Water & Sanitary Authority
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Tumalo Rim Water Impr. Dist.
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Wallowa, City of
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Warrenton, City of
Wasco, City of
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Watseco-Barview Water District
Wedderburn Sanitary District
Welches Water Company
Weldon Mobile Home Park
West Hills Water Company
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West Yamhill Water Co.
Western Heights Water Association
Westfir, City of
Weston, City of
Westport Water Association
Wheeler, City of
Wickiup Water District
Willamette Water Company
Willamina, City of
Wilson River Water District
Wilsonville, City of
Wi-Ne-Ma Christian Camp, Inc.
Winston-Dillard Water District
Wood Village, City of
Woodburn, City of
Yachats, City of
Yamhill, City of
Yoncalla, City of
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Young's River Lewis & Clark W.D.
Youth With A Mission
Zig Zag Water Cooperative, Inc.

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Brent Butler
Paula Carson
Jamie Clark
Ted Claussen
Mike Cole
Mike Dahlberg
Tony Degn
Bill Diemer
Derek Free
Zachary L. Freiwald
Mathew Garrett
Chris Germond
Brian M. Ginter
Howard Hamilton
Brandon Johnson
Scott McKinney
Keith Pendell
Bill Radford
Kent T. Schnell
Alexei Selshanko
Dan Spiering
Chris Stark
Michael Stebbins
Leroy Whitecotton
Camp Rilea
Ukiah, City of
Laidlaw Water District
Knoll Terrace MHC

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Barton, Scott
Bateman, James
Beauchemin, James
Behnke, Bryce
Biamont, Tony
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Block, Delhie A.
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Brainard, Thomas E.
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Burton, Howard
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Carroll, Jacqueline
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Clark, Mike
Claussen, Ted
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Coleman, Chuck
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Davenport, Ray
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Davis, Willie Jr.
de Paz, Geo
Desroche, Ron
Diemer, Bill
Dillard, Bob
Dobie, Kevin
Dolbow, Elizabeth
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Downey, Michael
Dunn, Francis M. Jr.
Durfee, Kenneth C.
Eichel, Dain B.
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Erbele, Hank
Estrada, David
Farris, Randy
Fish, Doyle
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Forseth, Steve
Foster, Rob
Free, Derek
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Lund, Darrell
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Malley, Susan
Mangini, Jered
Mathews, Eric
McClenathan, Mike
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McKevitt, John
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Turner, Susan
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Wilson, Roger
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Woody, Max
Younger, Lewis S.

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American Flow Control
American Leak Detection
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Backflow Management, Inc.
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Branom Instruments Co.
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Ch2M Hill - Lebanon
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Corrpro
Ditch Witch Northwest
DN Tanks
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HACH Company
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Logics, LLC
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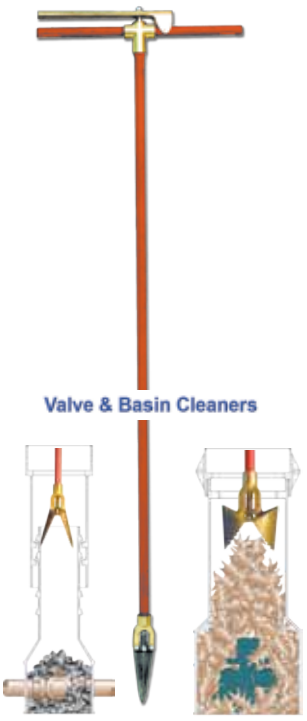



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