

# H<sub>2</sub>Oregon

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Vol. 36, No. 3

Summer Classic XX  
Seaside, OR  
August 18–21, 2014

*A publication of Oregon Association of Water Utilities*



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## CONTENTS

Responsible Consequences by Jason Green, Executive Director .....	3-4
System O&M Manuals Required .....	4
In Memoriam: Tim Bunnell .....	5
Special Thanks to 2014 Sponsors .....	5
The New Guy by Jeff Crowther, Wastewater Technician .....	6
Reflections of a Time Line by Jack Hills, Source Water Specialist .....	8-9
Groundwater by Mike Collier, Training Specialist/Operations .....	10-11
Sizing Up the Blue & White Collars by Tim Tice, Projects Manager .....	12
Scholarship Awarded to Garrett Ross .....	13
Quiz Corner .....	13
as•so•ci•a•tion by Hans Schroeder, Circuit Rider .....	14-15
Tank Maintenance Basics by Scott Berry, Circuit Rider/Program Manager .....	17
Upcoming OAWU Conferences .....	18
Watch Those Little Cash Registers by Heath Cokeley, Circuit Rider .....	19
The Jeff Swanson Memorial Scholarship .....	21
2014 Training Schedule .....	21
Optimizing Your Sludge Judging Results by Rick Allen, BioLynceus .....	22-23
Additional OAWU Benefits & Services .....	24
Ford Fleet Pricing .....	24
Need to Review Water or Sewer Rates? OAWU Can Help! .....	25
NRWA Revolving Loan Fund .....	25
OAWU Summer Classic XX Registration Form .....	27
An Old Familiar Tune Throwing My Loop by Michael Johnson .....	28
Membership Application Form .....	29
Membership Roster .....	30-32

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Bancorp Insurance .....	18	Owen Equipment .....	16
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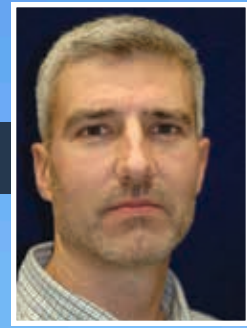


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Oregon Association of Water Utilities

# Responsible Consequences

by Jason Green, Executive Director



I recall being instructed along the lines — for every action, there is a consequence or reaction. My father especially demanded I learn to be responsible in decisions, actions and duties, and to never blame others for my actions. I was expected to think through to the consequences prior to action, not that I would regularly practice such, it required purpose of thought and honesty with one's self and formation of habit! These thoughts, standards and practices are not regularly seen today and foreign to many, like an unknown language. Shameful, brings to mind a mutiny or rats jumping from a sinking ship — no responsibility and lacking in character and leadership. There is a huge price to be paid in the lack of these character faults (at some point we will pay). These traits can be learned as an adult, but require many disasters and relationships left along the road of instruction and humility.

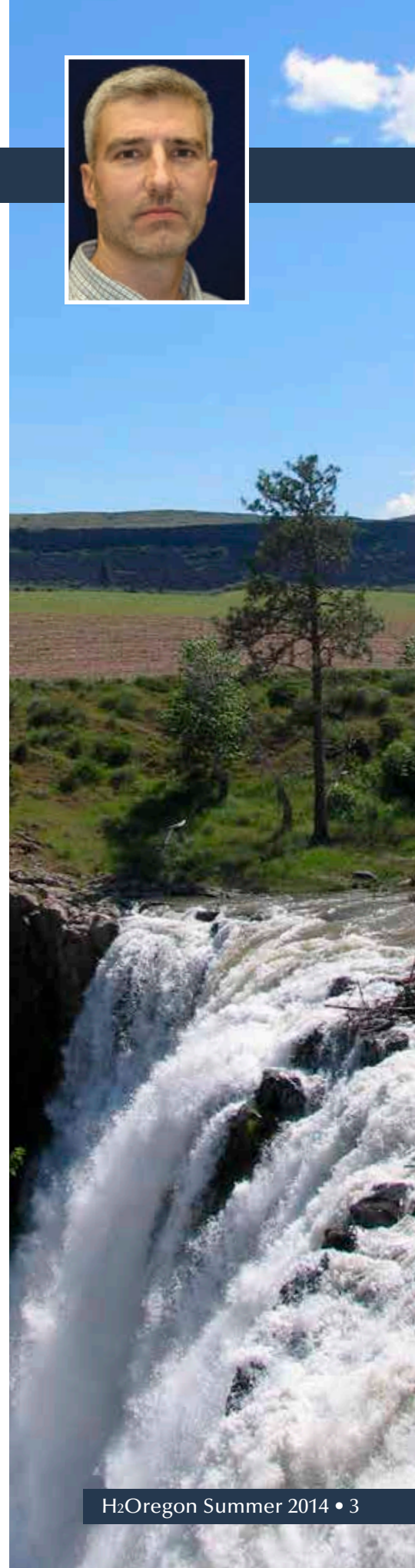
With three lovely daughters, I am reminded of discussions concerning choices and what occurs if a particular wrong or disobedient decision were to be made. Early on, one of my sweet daughters, fully aware the decision she was making was wrong, measured the consequences and told me matter of fact, doing it was worth the resultant discipline and consequences. At the time, it was amusing, but I saw myself clearly in my daughter. Consequences may be seen immediately or years later and may also include a penalty of sorts. My mother always said, "your sins will find you out!" For many of us, myself included, it often requires years to begin to learn our own mind and the deception of our ways! I regularly share with my staff that one of a leader's traits is to get to know self, learn your own strengths and weaknesses, habits and your ways and most importantly,

learn to be brutally honest with self. Few subordinates can or will ever be completely honest with you about you if you're placed in a leadership role.

In relationships and regarding other's property, there is the simplicity of courtesy and respect due to others. I was instructed that a person is to be respectful to others and their property. As a young boy, this was especially expected towards a lady and people older or elderly. Hold a door open, speak with respect and courtesy, let others hold the spotlight or attention, listen first (or be seen and not heard), place others as more important than yourself and respect your mother at all costs. Along with this, if borrowing something, I was responsible for its well-being and/or replacement if lost or broken. Simple expectations. Fair standards. It was an unspoken practice to always return that which was borrowed on or before the promised date and in better condition than when first obtained. Today I seem to see a new adage of borrowing to be similar to "drive it like you stole it."

I believe the afore mentioned examples remain great traits to contemplate and instill in others, to habitually practice and result in respect, protection of character and relationships. I recently had the opportunity to "borrow" something, a retreat of sorts I have been given permission to enjoy and attempt each year since 1988. It is a remote location with marvelous views, splendid fishing, possible hunting or shooting, hiking, photography and the sound of wildlife and a river deep within magnificent vertical canyon walls. A memory making, one-of-a-kind place; solitude that allows one to search the soul and deep thoughts eat up portions of early morning walks.

*continued*





Time seems to stand still as considerations that change life's direction, as I've experienced, weigh heavy on the mind. An awe-inspiring, wondrous creation of a place. I have always treated this as a privilege and taken great care to leave the place and facilities in better condition, or at least in a cleaner condition, than when I arrived. I was shocked and angered on this trip. Somewhere in the recent past, trust and respect of the place, property and kindness of the caretakers had been thrown to the wind. Others were not responsible and proved untrustworthy thus, the caretakers placed limitations and restrictions on access and opportunities. I was saddened.

Seek to make responsible, moral, ethical and legal decisions and actions that will yield positive and fruitful consequences. Whether it is with an audience or behind closed doors where nobody can see us, responsible decisions and actions should always be our standard. I was angered, not because of my personal loss or restriction of privileges, but because someone(s) took advantage of the generosity, kindness and trust of this most kind and generous caretaker. Respect of another and their property was not given due place. Rather, exhibited were taking wrongful advantage, abuse, carelessness, disrespect and scoffing which resulted in serious consequences to everyone. It brings to mind the story of grace — yet while we were enemies... My best to you! 🍀

# System O&M Manuals Required

## *Have you completed your state-required Operations & Maintenance Manual?*

Oregon Association of Water Utilities has prepared a full day class to assist operators in outlining an operations and maintenance manual per the Oregon Administrative Rule 333-061-0065 which requires each water system to develop an operations and maintenance manual.

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 class, or to have a thumb drive mailed to you, contact your Association for further information. 🍀



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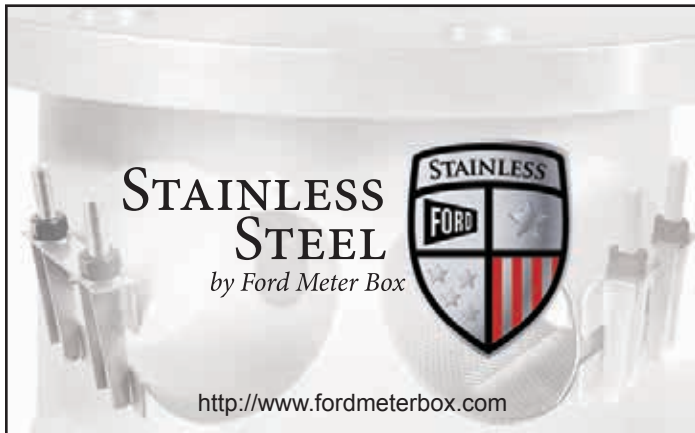
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# In Memoriam Tim Bunnell

Timothy Edward Bunnell, OAWU Treasurer, passed away April 11, 2014. He was 60 years old.

A service was held in Harrisburg April 26. Donations may be made to Harrisburg Key Bank for the Tim Bunnell Harrisburg High School Softball Fund.

Tim served on the OAWU board for ten years. He will be missed by OAWU members and staff.



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# The New Guy

*by Jeff Crowther, Wastewater Technician*

Let me introduce myself, my name is Jeff Crowther and I'm the new Wastewater Circuit Rider here at OAWU. The title of "The New Guy" was handed down to me by Hans and Mike since they came onboard with the association at approximately the same time. According to Hans, Mike was hired twenty-six hours after him. So, technically Mike was The New Guy until April 1st, when I came on.

At first I thought "New Guy? I am way too old to have that title." But then began the realization that, although I have twenty-five years of public works experience, there is still a lot more for me to learn with this crew and the association. So truly, I am the New Guy.

We have all been the new guy at some time in our career. You may have even had the title more than once. I would like to encourage those of you who are just beginning their careers in the water/wastewater industry to take advantage of the knowledge of your senior staff. Strive to learn the ins and outs of your systems and educate yourselves to become the best in our industry. Take advantage of the learning opportunities given to you. Now for those individuals that are in a senior or supervisory position encourage your newly hired staff and provide them the tools necessary to succeed. These new guys are going to be your legacy.

I am learning a new career with the association, as the Wastewater Circuit Rider, that is quite diverse. I will be learning about lagoon operations, membrane filter plants, and sequencing batch reactors to broaden my knowledge base. Because no two systems are the same or operated in the exact same way, I find myself learning about many different processes and technical equipment (laboratory and mechanical).


All of the operations staffers that I meet along the way are eager to share their experiences with me so that I may guide the next system with the knowledge and experience I have gained on my travels. I believe that training and classroom education are important elements for our learning within this industry. But I feel that networking between systems is just as important.

Please give me a call or shoot me an e-mail if you have a unique system that is operating well or if you have solved a problem within your system that may help another agency that is struggling with the same or similar problem. I also would like to hear from folks that may have a process problems or situation that I can assist them with and/or provide some guidance to help solve a problem.

So with the title of "The New Guy", I look forward to seeing all of you as I travel the state and also at the upcoming Summer Classic Conference in Seaside this August. ♦




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# Reflections of a Time Line

*by Jack Hills, Source Water Specialist*

How often have you been stopped in your tracks and intentionally reflected on the past events in your life? Do we often get so caught up in our day to day activities and responsibilities that we forget to consider where we've been and where we are going? Yes. I am guilty.

I suppose it is becoming "retirement age" that has stopped me in my tracks and made me reflect on the past and consider the future. Briefly looking back, I've experienced a pretty normal life, if one can classify such a thing. Relationships with those who have crossed my path are the most memorable; from childhood buddies, schools, college, employers, and of course my wife and family too, but that's another chapter.

Those childhood pals, with whom I built earthen dams, go-carts, clubhouses complete with dugout basements and string-line telephones, forts in the forest and rafts on the lake, lifelong friendships were created. Some are now gone. Some gave their ultimate sacrifice for you, for me and our country's freedom during the '60s. Some still kicking up their heels on the square dance circuit.

Employer relationships always seemed to develop into family style; maybe because I worked mainly in smaller organizations or offices. What a privilege to have company parties that included employees with

their children and bosses who valued these families.

After college, in the 70's and the Clean Water Act, design and construction of water and wastewater infrastructure kept me busy for the rest of the century, from public works, engineering firms, to construction contracting. Waterlines, sewer lines, and sub-division housing expanded, eliminating private wells and septic tanks in rural areas. Then at the turn of the century Y-2-K turned out to be a non-event. I guess I should dump out stockpiled bottles of water now.

Next the transportation departments went all out on repairing and building bridges and I was drawn into monitoring and documenting public construction contracts until I had note books filled with papers stretching clear around my cubicle. I decided to get back to the contractor side of things which may not have been a wise choice in retrospect, as the 2008 downturn took out a number of contractors and for the first time in my career I was terminated!

Well it didn't take long to find another great group to work with in the water and wastewater industry, I came across OAWU's need for a Source Water Specialist. Again, I've been employed by a wonderful organization who greatly values and takes care of, not only its employees and their families, but the members



who support and are served by the company. I cannot say enough for the camaraderie of TEAM OAWU, as the logo on our shirts show. In my tenure, the time line continues and some others have reached their time to look differently toward the future called “retirement”, a decision I have dreaded to consider because I don’t care for change. We cannot stop the clock and time marches on, so inevitably those milestones are reached or pass us by and we have to make the tough decision anyway.


I haven’t made that decision yet but time has a way of making you stop and reflect on where you’ve been, what you’ve done and then turn and look up ahead to consider the remainder of the path. I so appreciate not only our TEAM OAWU, but also those members and associate members with whom I’ve worked over the years. Remember, when you need help, call TEAM OAWU. 🍃



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# Groundwater

*by Mike Collier, Training Specialist/Operations*

Often times I hear misconceptions about what “groundwater” is. I think I will begin with what it is not; it usually is not an underground river that the driller just happened to have found. I say usually because sometimes there are actual underground rivers in volcano tubes or in limestone karst where tubes were created due to the solubility of the rock. One way to think of a typical groundwater supply is to imagine a sponge, if a sponge is placed into a bowl of water the water will soak into the sponge material. In a similar way the pores in the ground can be filled by water.

Another way to think about a groundwater supply is to think of a bucket of dry sand, the dry pore space of the sand is filled with water halfway up the bucket. (A quick side note, if you have heard the term water table, this bucket half filled with water and sand is a good example. You can think of water table as a line where the atmospheric pressure is equal to the pressure head in the soil.) From the top it may still look like a bucket of dry sand, but if a hole was punched into the bottom of the bucket some water would begin to pour out.

There are three main types of groundwater supplies, we have confined, unconfined, and perched aquifers. An unconfined aquifer is typically filled by a more local water supply and is at greater risk for contamination because it is more of an open system. Think of the sand in a bucket example that was stated above – this would be an unconfined aquifer, whatever you pour into the bucket will soak down into the sand and be added to the water that is already in the bucket – there will be a direct connection between the surface

and the water that is in the pore space somewhere below the surface.

A confined aquifer is usually a little more protected and the water typically originates from a location farther away. When speaking of a confined aquifer the pressure in the aquifer is typically different from what it would be if the water was just in an unconfined system. The confining layer in a confined aquifer is a layer of low permeability – water, or other fluids, will take a long time to flow through the material. The water in this aquifer usually comes from a re-charge location further away and due to the time it has been traveling through the ground, many of the contaminants have sorbed onto soils and no longer pose a risk for human consumption. However, it has had more time to build up the soluble material and may be either harder or softer than the water from the typical unconfined aquifer. Again picture the bucket example, only this time you have filled half the bucket with sand and water, then place a layer of clay in, and finally filled it the rest of the way with sand. Any additional water that is poured into the bucket will fill the top layer of sand, but will not mix with the water that is in the lower layer of sand below the clay.

Finally, we have the perched aquifer. This is typically an unconfined aquifer that is sitting on top of a confining layer. The confining layer is typically not very large and the water supplied can be easily over pumped. Perched aquifers also have a tendency to fill during the winter, when the water table is high, and begin to be reduced once the water table is below the perched aquifer. Again imagine the bucket half filled with dry sand, a small bowl put into the bucket and only the bowl is



filled with water, now the rest of the bucket is filled with sand. If you poked a long straw into the sand bucket and tried to suck water out, a majority of the bucket would yield no water, but if you happened to get the straw into the small bowl that was filled with water you would get a small amount of water, but this water would be exhausted quickly.

Now let us briefly go through another aspect of aquifers, this is the material that the aquifer is made of. Aquifers must be both permeable and porous; we get the water out of the aquifer through interconnected water filled pores within the ground substrate. We have fractured basalt – where the water is in interconnected cracks or joints (these would

be cracks, in the parent material, that are typically filled with crushed rocks, sand, and/ or sediment), gravel that was previously a stream channel, alluvial deposits, limestone, volcanic rock, sandstone, igneous and metamorphic rocks, and clay.

In Oregon we typically have volcanic- and sedimentary-rock aquifers of fractured basalt or unconsolidated deposit or alluvial aquifers that consist of sand and gravel.

Where does the water come from? The water comes from a region called the re-charge zone. It is rain, snowmelt, reservoir or river leakage, or from irrigation water originating at a higher elevation that has seeped into the

ground and is now flowing through the cracks or pores found under the ground surface. It will flow through the pores due to gravity and will slow at areas that have low permeability.

Knowing where your groundwater is coming from is important. This information can enlighten us on how easily the water supply may become contaminated, how connected it is to surface water, how long it will take to recover after pumping, and what may be present in the water from the aquifer material itself.

Check your source water assessment to determine where your groundwater comes from. Call OAWU for help. ♦



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# Sizing Up the Blue & White Collars

*by Tim Tice, Projects Manager*

Are you a blue collar worker or white collar? Were you once blue, but now white? Or are you a little of both?

Speaking with a young couple, who are running a water system that is governed by a board, I sensed that they were the board, as well as the cheer-leading squad and maintenance crew. The hurdle for them wasn't getting their heads around the daily tasks, but the follow up paperwork. Even though it is a relatively small water system there is still the dreaded paperwork that is considered the unit of measure for a completed job.

As I saw while visiting with these two people, and have seen in many other water systems that I work with, a recurring theme seems to be a predominant issue, apathy!

I am not sure if the issue should be called apathy, or a demanding schedule, or nonchalant, but we as a nation really do not give two thoughts towards drinking water. Since so many people rely on a water system to provide good clean drinking water, it is easy to go out on a limb and state, "If it weren't for a few people to get the task done, many more of us would be caught in a situation without water."

Intrinsically, the only proof or measurement of a water system properly functioning is the lack of malfunctions. You're tasked with the paperwork and if it is not completed, it is deemed that system operations are not being correctly managed. If the files on daily residual readings of your disinfectant

cannot be found or were not written down, then what proof do we have that the task was completed.

On the other hand, if all the paperwork is correctly completed and the system is falling apart, then what is the perception of the users? A balanced effort falls in the ability to perform both white collar tasks and blue collar tasks. Pending the size of the water system, can someone balance both categories?

Twenty hours each week is reserved for paperwork while an additional twenty hours is field work. Oh, the smiles on your faces if that could be held true! The fact of the matter is we are tasked to perform and our performance is measured. However we complete our tasks, the measure of our success is dependent upon the value of the service we provide.

Balancing an ever changing pendulum is how we deal with system operations. From daily routines to the sporadic report, the back burner cannot become a blazing inferno of procrastinated tasks. We may have to adjust the size of our blue collar to compensate for the additional tasks the white collar is demanding.

Unlike the Lernaean Hydra serpent in Hercules, if we lose our head two more won't grow back, as the demands on us continue to increase. Continued self-evaluation and tenacity are the key ingredients to staying organized, regardless of the color of our collar.

The best that life has to offer! ♦

Oregon Association of Water Utilities



# Scholarship Awarded

Garrett Ross, Jeff Swanson Scholarship recipient, will be graduating in June from Harrisburg High School in Harrisburg, Oregon. He enjoys photography, writing, pottery, drawing, painting, working on his model airport and airplane watching. He serves as his class's president, and is vice president for his school's National Honor Society. In addition, Garrett is involved in Link Crew, Mr. Eagle, and Harrisburg's City Council. With his hard work and dedication in the classroom, Garrett will become his class's valedictorian in the spring. This upcoming fall, Garrett will most likely attend Oregon State University with a major in mechanical engineering. From OSU, Garrett received the college's Academic Achievement Award, an award for \$3,500 that he can renew each year for his tuition. Someday, Garrett aspires to work closely with aviation. This engineering degree is the backstage ticket that will allow him to do just that. Garrett also gained acceptance into University of Oregon's architecture program. He was given a General University Scholarship at \$1,500 from the University of Oregon. If Garrett does not attend Oregon State University for engineering, he will attend the University of Oregon for architecture. He is taking consideration of all his options. ♦



## QUIZ CORNER

- What is the distance between the two points whose coordinates are: (9, 5) and (6, 1)?  
A. 6  
B. 5  
C. 4  
D. 3
- What is the slope of the line going through the above points?  
A. 1/9  
B. 5/6  
C. 4/3  
D. 1/5
- Where would this line intersect the y axis? (when  $x = 0$ ) (0, y)?  
A. -9  
B. -8  
C. -7  
D. -6
- Sample sizes for TSS in wastewater should leave at least \_\_\_\_\_ mg of residual on the filter and no more than \_\_\_\_\_ mg of residual?  
A. 50 and 200  
B. 20 and 300  
C. 10 and 500  
D. 10 and 200
- The pH is a measure of the concentration of \_\_\_\_\_ in a solution.  
A. Hydrogen Ions  
B. Hydrogen molecules  
C. Hydroxide ions  
D. Alkalinity equivalents
- Does sound travel faster through water or air?  
A. Water  
B. Air  
C. It travels at the same speed through both  
D. Sound does not travel through either
- What is the biggest ocean on Earth?  
A. Atlantic  
B. Arctic  
C. Pacific  
D. Indian
- What causes water to move through pores in soil and rocks?  
A. Temperature  
B. Viscosity  
C. Barometric pressure  
D. Gravity
- Which document provides a profile of hazardous substances?  
A. CERCLA  
B. SARA  
C. CFR  
D. MSDS
- What is North America's largest aquifer?  
A. Biscayne Aquifer  
B. Edwards Aquifer  
C. Ogallala Aquifer  
D. Texcoco Aquifer

ANSWERS  
1-B, 2-C, 3-C, 4-D, 5-A,  
6-A, 7-C, 8-D, 9-D, 10-C



# as·so·ci·a·tion

by Hans Schroeder, Circuit Rider

Webster's Dictionary explains exactly what the Oregon Association of Water Utilities strives for.

- : an organized group of people who have the same interest, job, etc.
- : a connection or relationship between things or people
- : a feeling, memory, or thought that is connected to a person, place, or thing

Being a member of OAWU provides a way to network with peers that have the same motive and direction in the water/wastewater industry as you.

The staff of OAWU are in constant contact with one another, we strive to keep each other informed about the systems we are working with and what solutions or problems we have. It is like the old saying goes "two heads are better than one". Each member of our staff has a unique specialty and we know if we need some answers in a particular area which staff member we can call, text or shoot an email to for help.

We also hope if you, in the industry, are having a problem that you feel free to contact the office and put in a request for us to come out and help. You can request a particular staff member if you feel they are better suited to help with your particular situation. We do not have specific territories assigned to us; each staff member covers all of Oregon.

Do you realize what topics we can cover? In water systems we cover cross connection, distribution systems, disinfection, water treatment facilities, operator certification and much more. In wastewater we help with activated sludge treatment, confined space entry, inflow and filtration, pump maintenance and collection systems. The Groundwater/Source Water Specialist deals specifically with drinking water protection. We work with water systems to develop drinking water protection plans that meet all state and federal requirements including management, contingency and new well elements.

To connect with our members we host a variety of trainings throughout the year. Our biggest conference is our Annual Technical and Management Conference held in Sunriver the first week of March. We have classes covering water, wastewater and management topics that are approved for CEUs. There are a ton of vendors there offering the latest in technology, as well as, a variety of freebies. We also have a mean game of cribbage and a ping pong competition going on during the week. If you have never been to Sunriver you should make it a priority to come in 2015.

The second largest training we host is our Seaside conference in August along with some great training and CEU credits you can join us on the beach for a bonfire or our golf tournament at Gearhart Links on Wednesday.

If you are missing CEUs at the end of the year you can join us for our End of Year Operator's Conference in Hood River to get some great training and those last minute CEUs. Also we have other miscellaneous trainings throughout the year so check out the training calendar at: [oawu.net](http://oawu.net).

Over the course of my career I have made great friendships and so many special memories. I don't think that there is an area in Oregon where I haven't made a special friend, even became so very close to many of the operator's families. I could call up



just about any of them and we could go out fishing, hunting, to a graduation or just spend the night and have a great home cooked meal.

Sometimes I am on the road for up to three weeks and a good home cooked meal is a treat. I must say my wife had a medical scare a couple of weeks ago and I can't tell you what a great organization I work for, they let me stay home and make sure she was going to listen to her doctors. Let alone the phone calls from my co-workers and some of the operators, that not only I have grown close to, but also that my family have grown close to.

Another great example of this: it's my daughter Lexi's senior year of high school and she is competing in the Oregon High School Rodeo team. She decided after a tragic accident that took a friend's life that she was going to dedicate her senior year and ride in honor of her. She has her name stitched on every shirt to remind her that Sondi is giving her, and her horse Lilly, the wings they need to make a perfect run each and every time they ride.

Remember *association* is a great word with true meaning, so dedicate yourself to work, but also through the association build great friendships and trust in one another. This association is my family away from home. 🍀

# CONSUMER CONFIDENCE REPORTS

Don't forget your CCR!

Consumer Confidence Reports (CCRs) must be delivered to customers by July 1st.

By rule, a copy of the CCR must also be submitted to Oregon Drinking Water Services (DWS) by July 1st.

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# Tank Maintenance Basics

by Scott Berry, Circuit Rider/Program Manager



Every water tank must be periodically maintained in order to ensure long life of the tank and to protect the quality of the water within the tank. Some tanks, such as the reinforced concrete tanks (often used for ground level or standpipe reservoirs), have lower maintenance costs over the life of the structure when compared with steel tanks. However, every type of tank requires at least some maintenance.

Maintenance can be considered a cost-saving measure. Periodic maintenance is usually much cheaper than the large repairs which will be necessary in unmaintained tanks. The cost of inspection is an insurance policy against premature failure of the tank.

The tank's paint coating requires the most maintenance since it must be replaced periodically. When the coating is not well maintained, the tank will have to be repaired. Repair will usually cost two and a half times more than the cost of a good original coating.

In addition to the financial cost associated with replacing badly maintained coats of paint, the coatings applied on such surfaces are usually lower in quality due to adverse application conditions. Seventy five percent of all coating failures are attributable to poor surface preparation or to improper application of the paint. These failures lead to downtimes during which the tank cannot be used and temporary arrangements need to be made.

Formal coating inspections and the associated maintenance will greatly increase the probability of achieving a successful coat application that will protect for the design life of the system.

Tanks must be inspected at regular intervals as the first step of the maintenance procedure. The purpose of the inspection is to determine if repairs are required and, if so, the exact nature and extent of the work required. Inspection of water tanks is expensive, but the cost is insignificant

compared to the cost of premature failure of the tank.

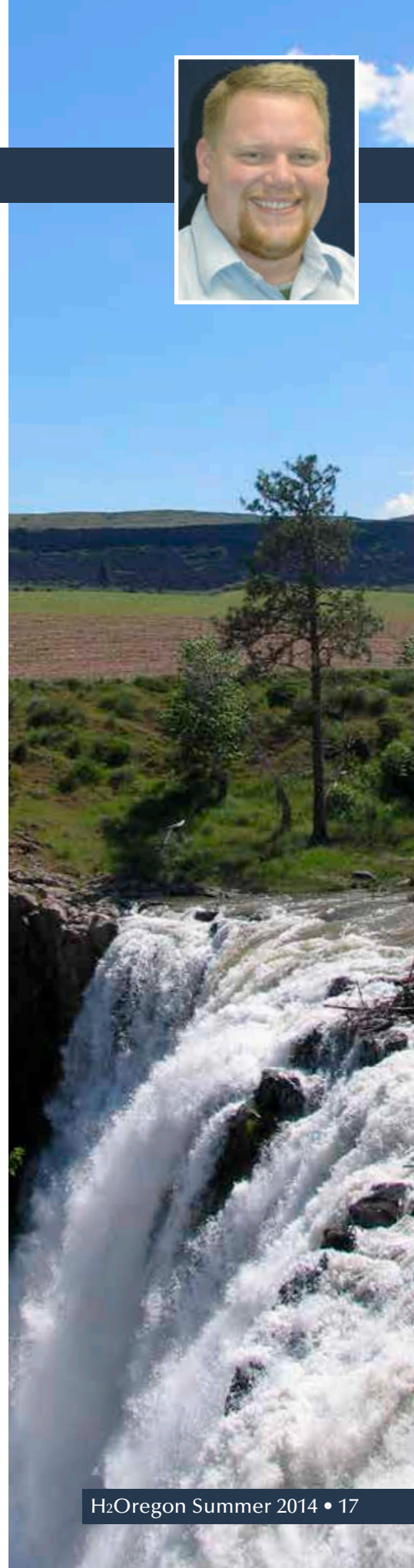
A thorough inspection should be performed every two or three years on the entire structure. Some facilities choose to have annual inspections, as will be discussed later in this section. In addition, inspections should be performed during the construction of new water tanks and during any repair, painting, and disinfection.

Inspection should be considered a mandatory part of the maintenance procedure and should be conducted by an independent expert who will receive no benefit from any maintenance performed on the tank.

The inspector should be well trained by a qualified organization. A professional engineer (see the American Water Works Association Standard D 101) will be able to evaluate the structure, the grouting, the welds, the formulations, the structural alignment, the paint conditions (inside and out), the leakage, the rod adjustment, any settling, and successfully complete a corrosion evaluation in accordance with D 101. The AWWA Standard: Painting Steel Water Storage Tanks includes a brief section on inspection which should be followed, but which is not adequate as a basis for the entire inspection.

The inspector should outline specific maintenance needed to restore the structure to the condition it should be in. This inspection should be the basis for all maintenance of the structure – only maintenance required by the inspector should be performed. In addition, a complete record of inspections and maintenance should be kept.

Following the proper guidelines and selecting qualified engineers and contractors to perform regular inspections will help to avoid serious maintenance problems in the future. 🍋



# UPCOMING OAWU CONFERENCES

## OAWU Summer Classic in Seaside

August 18–21, 2014

Registration form on page 27



## Small System Operator's Conference

Cornelius, November 3–5, 2014



## 16th Annual End of Year Operator's Conference

Hood River, December 9–11, 2014

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# Watch Those Little Cash Registers

by Heath Cokeley, Circuit Rider



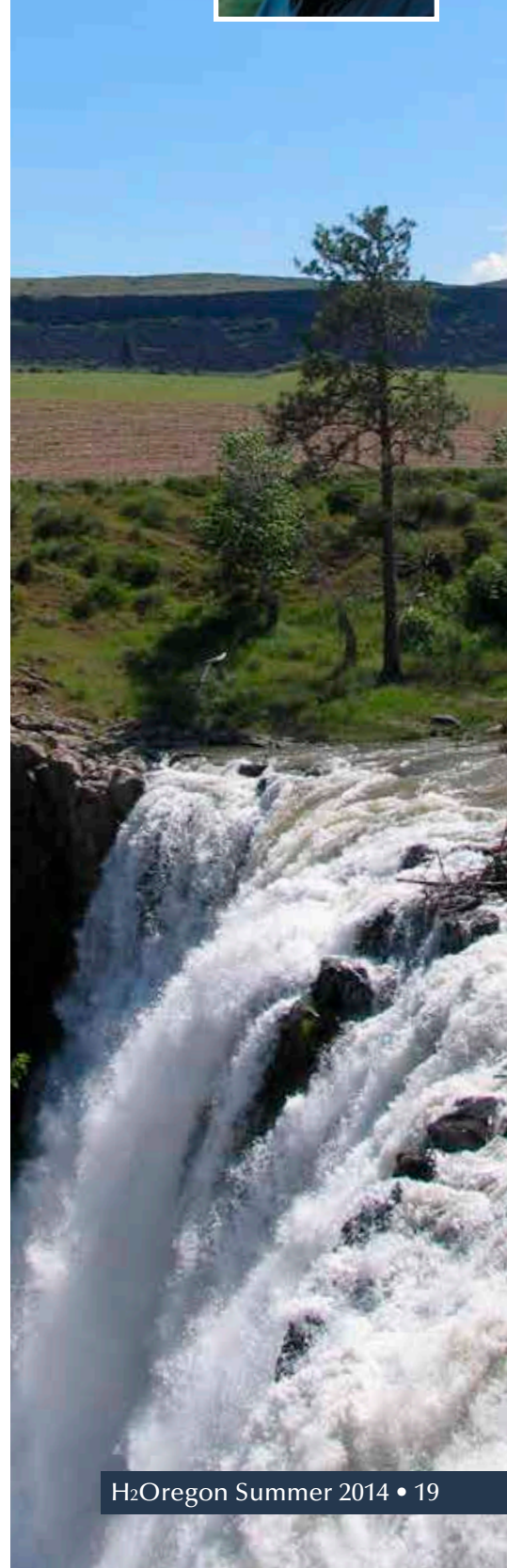
What is the worth of having every meter box opened and inspected each month during routine meter reading? I realize that many systems don't, necessarily, do this anymore with the rise of Automated Meter Read (AMR) systems. Please don't misunderstand what I am saying; I am not suggesting staying away from AMR systems. As with any issue there are always two sides to the story, plusses and minuses, and we need to balance those out for our utility to find the best option. At the water system I worked for, when we first started looking into an AMR system it was fairly straight forward for us. Based on the expected cost of the system it was going to take 4.4 years to pay it off, based on time saved by both, field staff collecting and office staff inputting the data, not to mention the huge public relations boost of fewer miss reads. The biggest selling point for me was the safety aspect. In this system there were many busy roads and the thought of having myself, or worse one of my guys, getting hit by traffic was one of the things that kept me up at night.

We have looked at some of the benefits for having an AMR system, so what are some of the down sides? In my mind, the biggest one is no longer getting eyes on each meter every month. I know myself and my crew found many leaks, big and small, while we were reading meters. Many times the leak wasn't right at the meter; we could just hear it, though it was back from the meter some distance. What about the bottom of the meter blowing out from a freeze. If it is not registering that this flow is going through the meter then you will not know this has happened until someone actually sees it. In a town, where the meters are by the

curb in lawns and people walk by them, this will most likely be noticed fairly quickly, but what about meters in rural areas? These meters could be at the edge of fields or even located in the woods and could leak for some time before being noticed. Something else that makes the AMR system prohibitory for a water system is simply the cost of the AMR system itself. While the meters are fairly inexpensive, in the grand scheme of things, the cost for the equipment to read them is fairly high. This makes the cost easier to bear for the larger systems, as they can distribute that cost across all there residents, but makes it more difficult for a smaller system to justify.

Once again, I am not in the least suggesting that a system not utilize AMR systems as they have many benefits for water utilities. I am simply suggesting having a plan of attack built specifically for your system. This could be looking at all the meters once a year, twice a year, or just after a freeze. This is going to be different from system to system based on the geography and location of your system. No, one size fits all, rule will fit all systems. If all your meters are located in yards near sidewalks this may not be an issue for your system. But if you have some zero use meters or meters located in remote locations it may be a good thing to check them more often. With all that said I hope you can find something helpful to take away from this article.

Remember Consumer Confidence Reports are due July 1, and I hope all your summer projects are going well. If you have any questions or would like a system visit remember one of us circuit riders are just a phone call away and with that, I'll see you down the road. ♦





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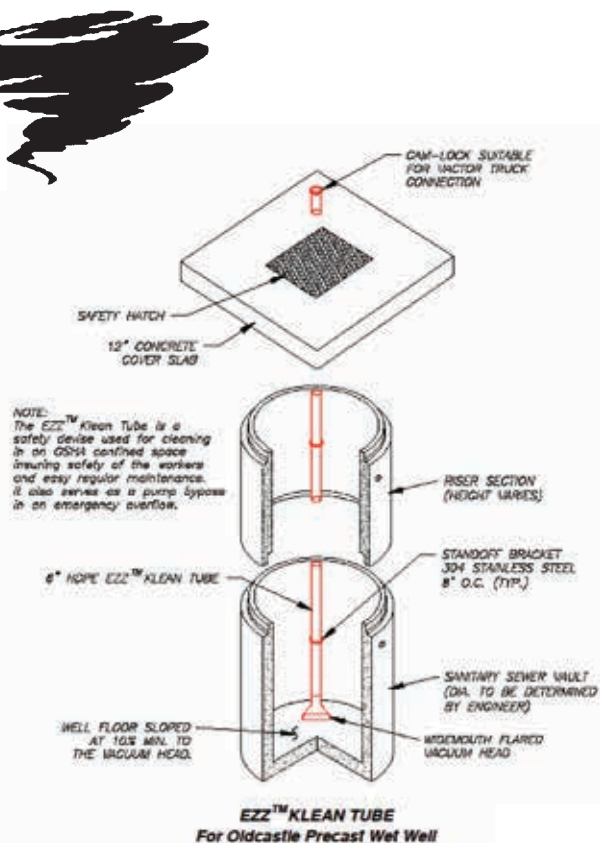
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# The Jeff Swanson Memorial Scholarship

Jeff Swanson passed away on July 4, 2009, from esophageal cancer. Mr. Swanson was an accomplished and passionate Circuit Rider and Programs Manager for ten years at OAWU. He was a great water operator, manager, troubleshooter, treatment plant operator, instructor and a great friend. Jeff had a warm and memorable personality, exceptional integrity, personal character and work ethic. It is to Jeff Swanson's memory that this scholarship is named; he believed that obtaining education was paramount to a person's success and encouraged people to obtain it. As Jeff would often say regarding one's attitude and actions, "Choose to make it a great day!"

An application with further details is available on the OAWU home page at [www.oawu.net](http://www.oawu.net). The scholarship is awarded at the Annual Management and Technical Conference in Sunriver. **Please submit application by December 4, 2014** to: OAWU Scholarship Committee, 935 N. Main St., Independence, OR 97351, Attn: Scholarship 2015. 🍀



## OREGON ASSOCIATION OF WATER UTILITIES 2014 TRAINING & EVENTS SCHEDULE

Date	Class Title	Location	CEU Information	ESAC#	Fee/Free
June 5	SDWA Update	Newport	0.4 Water	2287	FREE
June 10	Control Valves	Island City	0.7 Water/Wastewater	2286	FREE
August 5	Pumps & Pumping	Salem	0.6 Water/Wastewater	TBA	Fee
August 6	SDWA Update	Salem	0.4 Water	2287	FREE
August 7	Pumps & Pumping	Florence	0.6 Water/Wastewater	TBA	Fee
August 18-21	Summer Classic XX Conference	Seaside	2.3 Water/Wastewater	TBA	Fee
August 26-27	Water (WT/WD) Certification Review	Bend	1.4 Water/1.1 Wastewater	TBA	Fee
September 9	Control Valves	Grants Pass	0.7 Water/Wastewater	2286	FREE
September 16-17	Water (WT/WD) Certification Review	Salem	1.4 Water/1.1 Wastewater	TBA	Fee
September 24	Water Operations & Maintenance	Salem	0.6 Water	TBA	Fee
September 25	Developing Your O&M Manual	Salem	0.6 Water/Wastewater	TBA	Fee
October 22-23	Wastewater (WWT/WWC) Certification Review	Salem	1.4 Wastewater/0.6 Water	2295	Fee
November 3-5	Small System Operator's Conference	Cornelius	2.0 Water/Wastewater	TBA	Fee
November 18	Math for Operators	Salem	0.6 Water/Wastewater	2736	Fee
November 19	SDWA Update	Bend	0.4 Water	2287	FREE
December 9-12	16 <sup>th</sup> Annual End of Year Operator's Conference	Hood River	2.0 Water/Wastewater	TBA	Fee

2014 State Water exam dates	Application deadline	Oregon ESAC/CEU accreditation
May 15, 2014	March 15, 2014	Phone/Fax: 503-698-8494
October 16, 2014	August 15, 2014	info@oesac.org <a href="http://www.oesac.com">www.oesac.com</a>
For additional water exam information, please visit <a href="http://public.health.oregon.gov/HealthyEnvironments/DrinkingWater/OperatorCertification/Levels1-4/pages/exams.aspx">http://public.health.oregon.gov/HealthyEnvironments/DrinkingWater/OperatorCertification/Levels1-4/pages/exams.aspx</a>		

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

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

*For more information on any class by OAWU, please contact the office at 503-837-1212, [office@oawu.net](mailto:office@oawu.net) or visit [www.oawu.net](http://www.oawu.net).*

# Optimizing your sludge judging results

Are you holding too many solids in your system?

Industry experts are often recommending that you perform a sludge judging of your system. This is something that professionals recommend you complete at least once per year in lagoon systems. It is a common daily practice in activated sludge plants so they can determine the amount of solids wasting that needs to be completed to keep the plant at optimal operations.

In lagoon operations, it is imperative that you know how much sludge has accumulated in your lagoon(s) and the volume of increase over the last year, two years or more. If you do not know the sludge levels in your system, how do you know if your lagoons are working optimally or at all. One indication that your lagoons are not working is if you can see solids/sludge above the water line. Hopefully, you are not seeing this, but if you are, action is required immediately.

Other than visible solids above the water line, there are several other things that can indicate you are holding too many solids. One of these is odor complaints. Recently a midsize town in Wyoming was instructed by the state department of environmental quality that they were getting too many odor complaints and the city needed to dredge their lagoon.

Another indication you may be holding too many solids is your BOD and TSS levels are bumping against your discharge limit every month. Or your TSS to BOD levels are outside of the recommended norm of one and a half (1.5) to one (1).

In some cases, you may be required by your state regulators to dredge your lagoon. If you do not know the levels or the consistency of your sludge, this may happen sooner than you think. Some states are starting to legislate the amount of solids you can hold in your lagoon. We have seen maximums of 15% of holding capacity and in other cases the maximum you can hold is 18 inches.

How can you optimize your sludge judging results? Be consistent whenever possible. Try to sludge judge your system annually if not more often. I prefer to see this

task completed semi-annually. I recommend that you use a disinterested third party when they are available. Some options may be the wastewater circuit riders from your local Rural Water associations. I highly recommend that you hire the services of your local state chapter of the Rural Water Association. I have used the services of these organizations in many states for several years and have found them to be professional and reliable. Some of these associations charge for sludge judging and some do not. I also recommend that whenever possible you use the same person every time. We know of a few independent people who perform sludge judging as a business. If needed, please contact us for names and contact information. Some companies may offer to perform sludge judging for free, they hope to get your business when it shows you need to dredge.

If you decide to do your own sludge judging, then here are a few things to consider. When you get ready to sludge judge, be sure to turn off your aeration at least 24 hours before you perform the judging. Lay out a grid to work from during the process. I recommend that you take at least 20 samples per surface acre to determine where there may be peaks and valleys in the sludge layer. By taking at least 20 samples, you may see areas that are short circuiting in your system. These areas will need to be rectified as soon as possible.

Keep accurate notes. Make sure to log the total sludge layer, the clear water, the amount of black, gray, brown and tan sludge in the tube at each location. Each of these layers will help you determine how well your system is working. In some cases, I have seen clear water between each of the sludge layers. Take lots of photographs, this will help you if you ever have to prove the amount of build-up in your system.

You will need to have the material tested for percent solids. This information will help you determine the estimated cost of mechanical dredging. If your Rural Water Association does not have a calculator, Wyoming Rural Water has one. It is a nice calculator for determining the average cost for sludge removal.



If you find that you are holding too many solids in your system, then you should take action immediately to improve solids reduction. There are many options available that can help you with this very important issue. I recommend that you work closely with your circuit riders to decide which option or options will be best for your system. You may need to change how you are operating and managing your system. Managing the solids in your system needs to begin where your system starts, not just at the lagoon.

If immediate removal is needed, then your only option may be to mechanically dredge. If you have time, Bio-Augmentation may be a solution you could use. Although, most circuit riders are not allowed to recommend specific products, they do have knowledge about what they have seen working in your area.

If you need more information or have any questions contact me, Rick Allen, via phone at (303) 888-2008 or via email at [rick@environmentaltrainer.com](mailto:rick@environmentaltrainer.com). 🍏



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OAWU has built a solid reputation for providing water and wastewater systems with factual, user-friendly, and defensible Rate Studies. Our rate studies, once implemented, have allowed many systems to obtain Capitol Improvement funding from various private and government lending agencies. An OAWU rate study can also provide a plan for systems to gain the capitol to “pay as you go” by outlining a strategy to maximize and streamline revenue and thereby allow water/wastewater system administrators to forecast projects that may be funded in-house. OAWU will provide you a professionally compiled rate study and supporting documentation that will allow you and your council or board to adopt new rates necessary to meet your system needs.



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*Director - Rural Water PWS*

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# OAWU SUMMER CLASSIC XX • AUGUST 18–21, 2014 CONFERENCE AND PRE-CONFERENCE REGISTRATION

Please use one form for each person attending (photocopy additional forms as needed).

Full Name \_\_\_\_\_

Name preferred for name badge \_\_\_\_\_

Water Op. Cert. # \_\_\_\_\_ / \_\_\_\_\_ Wastewater Op. Cert. # \_\_\_\_\_ / \_\_\_\_\_

System / Company \_\_\_\_\_

System Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

System Phone \_\_\_\_\_ System Email \_\_\_\_\_

## Pre-Conference (Monday)

Course	Fee	Subtotal
Small Water System Training Course (0.6 Water CEUs) System ID #41-_____	FREE	_____
Effective Utility Management (0.6 W/WW CEUs)	FREE	_____
Backflow Assembly Tester Certification (0.6 Water CEUs)	\$100	_____
<b>PRE-CONFERENCE TOTAL</b>		_____

## Full Conference (Tuesday–Thursday)

Conference Registration	Early Bird (postmarked by July 22)	Standard (postmarked after July 22)	Subtotal
OAWU Member	\$260	\$270	_____
Non-Member ( <i>non-members receive a one-year individual membership with conference registration</i> )	\$335	\$345	_____
<b>TOTAL REGISTRATION FEES</b>			_____

Additional Meals for spouses or guests	Quantity	Fee	Subtotal
Tuesday Evening BBQ	_____	\$20	_____
Tuesday Lunch	_____	\$20	_____
<b>TOTAL ADDITIONAL MEALS</b>			_____

Wednesday Golf Scramble Registration	Quantity	Fee	Subtotal
Golf Players (up to 4): Name: _____ Name: _____ Name: _____ Name: _____	_____	\$75 per player (includes lunch)	_____
<b>TOTAL GOLF REGISTRATION FEES</b>			_____

## TOTAL CONFERENCE FEES

☐ Please Invoice

☐ Payment Enclosed: Check # \_\_\_\_\_ ☐ Purchase Order: PO # \_\_\_\_\_

☐ Please Charge ☐ VISA ☐ MasterCard ☐ AMEX Card # \_\_\_\_\_

Name as shown on card \_\_\_\_\_ Expiration Date \_\_\_\_\_

Signature \_\_\_\_\_ Card Security Code \_\_\_\_\_

Card billing address with zip code \_\_\_\_\_

### SEND REGISTRATION FORM AND FEES TO:

Mail: OAWU, 935 N. Main Street, Independence, OR, 97351 | email: [office@oawu.net](mailto:office@oawu.net) | Fax: 503-837-1213

Oregon Association of Water Utilities

H2Oregon Summer 2014 • 27

## Throwing My Loop by Michael Johnson

It is now. An old familiar tune, I mean. For the longest time, I couldn't hear it 'cause I didn't know it was there or where to look. Like that old Don Williams song, I suppose – wasted a lot of time looking in all the wrong places. Now, it seems I hear it everywhere I go. It's all in the listening and watching, you know – knowing what to listen for. Been looking for it so long. Haunts me – “What makes us rise? What helps us? How do you reach the kid? How do you reach the horse?” And so many times, I've wondered about my obsession with that. What was it in me that made me look so hard? Now I know... 'cause when I started finding it – knowing what to listen for – the music was just so sweet. So sweet sometimes it made your teeth hurt.

I saw the young fellow the other day – standing in the parking lot of the local Feed and Seed surrounded by kids, all of whom were waiting to sign up for the dummy roping. The store was having one of those customer appreciation days with burgers and games. I waited for a time, then approached him during a break. “Do you go to school here?” I asked.

"No sir," he said, offering his hand and a smile. "I graduated from Oklahoma State a few years ago. I'm a salesman. I have the Mid-South Region, and I mostly make these shows."

“How did you get in this business?” I asked. I always ask that of every salesman I meet. I’m fascinated with salesmen. You can learn so much from them...even the young ones.

“Certainly because of my degree in Ag from OSU,” he said, “but mainly because of one class. I took this class called Ag Sales, and it changed my life.” (I heard a few notes.)

“And what did you do in Ag Sales that was so helpful?” I asked.

“The class had a good deal of information,” he said, “but it was the teacher, Dr. Kim Anderson, who made such a difference.” (Now all the band was warming up.)

"Tell me about that teacher," I said.

“Just so many things,” he began. “I was a shy kid, nervous and all that when I began, but this teacher – he made the class enjoyable. He looked at us, called us by our names, and seemed to have some kind of faith that we could do well. He wasn’t what you would call “easy,” but he could make you want to do your homework. You just knew if you did what he said, it would help you in life. As the year went on, I felt myself ‘coming out of my shell’ so to speak. I became more comfortable giving presentations. I guess you might say he helped me ‘open up,’ and believe in myself. I began to see what sales was really all about – it’s not so much about ‘selling’ people things as it is helping others get what they want and need. My confidence grew and next thing you know, here I am traveling all over the southern U. S. earning my daily bread doing what I love.”

As I sat there in that sunny parking lot, I could hardly hear that young man sharing his story...because the band was in full swing now - playing that same old tune I've heard so many times. That same tune special teachers in my life played for me.

Here are some of the notes...

“Here’s what we are going do now,” they say. Next thing you know – because they believe in you - you’re doing it.

They are always glad to see you.  
Teachers who don't know the tune never  
see you at all.

They are not easy – but they can create a desire in you to do the work, because you know the work will help you.

Some play for humans, some for horses,  
and some for working dogs. But they are



all playing the same song. Their music convinces us that we can.

Maybe I was a little harsh when I said earlier I was looking for it in all the wrong places.

Maybe I should have read Freud and Jung and all those others when searching for what really helps us, but how I wish I had listened for the music earlier in life. That song I hear when someone starts to tell me what changed their life. It's always the same story about...

Someone who included them.

Someone who liked them.

Someone who believed in them.

Someone who took the time to work with them.

Someone who caused them to feel differently about themselves.

Someone who made them more.

At least after all these years, I hear it now. Every time I ask some person, "How did you get here? How did you get all this?" the band starts to play. And such sweet music it is...

Now I hear it everywhere I go. 🍋



# MEMBERSHIP APPLICATION

Name: \_\_\_\_\_

Address: \_\_\_\_\_

City/State: \_\_\_\_\_

County: \_\_\_\_\_ ZIP: \_\_\_\_\_

System Email: \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

Operator: \_\_\_\_\_

Contact Person: \_\_\_\_\_

Number of Hook-ups: \_\_\_\_\_

Were you referred? By whom \_\_\_\_\_

## Type of System:

☐ Water ☐ Wastewater ☐ Both

## Membership Category Amount of Dues

<input type="checkbox"/> Regular Member	\$ _____ See schedule below
<input type="checkbox"/> Associate Member	\$400.00
<input type="checkbox"/> Individual Member	\$75.00

## Regular Member Dues Schedule

1 to 100	\$75 + 29 cents per hookup
101 to 500	\$80 + 29 cents per hookup
501 to 1,000	\$90 + 29 cents per hookup
1,000 and up	\$100 + 29 cents per hookup
Maximum dues is	\$920.00

**Mail payment to: OAWU**  
**935 N. Main Street**  
**Independence, OR 97351**

or Submit:

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Card #: \_\_\_\_\_

Expiration Date: \_\_\_\_\_

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Name on Card: \_\_\_\_\_

Signature \_\_\_\_\_

**MB14**

## Membership Types

### Regular Member

A Regular Member shall be any water or wastewater utility, public or private, engaged in the production, distribution or reclamation of water. A Regular Member shall have one vote.

*Annual Dues - See Dues Schedule*

### Associate Member

An Associate Member shall be any organization individual or corporation, supplying services or equipment to wastewater utilities. An Associate Member shall have one vote. For Associate Member Benefits, please contact OAWU.

*Annual Dues \$400.00 per year*

### Individual Member

An Individual Member shall be an individual involved in the water/wastewater industry or a user of such utilities. The membership is informational in nature and shall be non-voting.

*Annual Dues \$75.00 per year*

## Benefits of Membership

- On-site technical assistance
- Various free training programs
- Discounts on training courses
- Discounts on Annual Conference registration
- Access to on-site training program
- Subscription to quarterly *H2Oregon* magazine
- Direct mailings in your area about upcoming training courses
- Summaries of legislative issues
- Legislative representation at state and federal level
- Associate Member Services and Products Guide
- Access to technical assistance library
- Access to technical and testing equipment for loan
- Voting rights in Association affairs (Regular & Associate Members)
- Positive contacts with other organizations
- Camaraderie with water and wastewater professionals
- Operator Of Record services
- Job referrals, announcements and searches
- Well testing
- Plan review
- System performance evaluation and options
- Additional programs and services
- Disaster response assistance and planning





# MEMBERS



62nd Court Mutual Water Company  
 Adair Village, City of  
 Adams, City of  
 Adrian, City of  
 Agate Water Company  
 Albany Rifle & Pistol Club  
 Alpine Crest Improvement Dist.  
 Amigo Villa Water Service, Inc.  
 Amity, City of  
 Ananda Center at Laurelwood, Inc.  
 Arch Cape Service District  
 Arlington, City of  
 Arrah Wanna Water Company  
 Arrowhead Mobile Home Park  
 Aspen Lakes Utility Company, L.L.C.  
 Athena, City of  
 Aumsville, City of  
 Aurora, City of  
 Avion Water Company  
 Baker City, City of  
 Bandon, City of  
 Banks, City of  
 Barlow Water Improvement District  
 Barlow, City of  
 Bay City, City of  
 Bay Hills Water Association  
 Beaver Water District  
 Bella Casa Mobile Home Park  
 Bend Research Inc.  
 Bend, City of  
 Benton County Service District  
 Berndt Creek Water Corp.  
 Black Butte Ranch  
 BLM Eugene  
 Blue River Water District  
 Blue Spruce Mobile Estates  
 Bly Water & Sanitary Dist.  
 Boardman, City of  
 Bonanza, Town of  
 Boring Water District #24  
 Brandy Bar Landing, Inc.  
 Breitenbush Hot Springs  
 Bridge Water District  
 Brooks Community Service District  
 Brownsville, City of  
 Buell-Red Prairie Water District  
 Bunns Village Properties, LLC  
 Burns, City of  
 Burnside Water Association  
 Butte Falls, Town of  
 Camp Rilea  
 Camp Tapawingo  
 Camp Yamhill  
 Canby Utility  
 Cannon Beach, City of  
 Canyon City, Town of  
 Canyonville, City of  
 Carlton, City of  
 Cascade Head Ranch Dist. Improv. Co.  
 Cascade Locks, City of  
 Cave Junction, City of  
 Cedarhurst Improvement Club, Inc.  
 Century Meadows Sanitary System, Inc.  
 Century Meadows Water System, Inc.

Chaparral Mobile Ranch  
 Charles Tracts Water Company  
 Chehalem Mt. Sun Ridge Association  
 Chenoweth Water PUD  
 Chiloquin, City of  
 Christmas Valley Domestic Water  
 Cimmarron City Water Co., Inc.  
 Circle C Improvement District  
 Clarks Branch Water Association  
 Clatskanie, City of  
 Clayton Creek Water Association  
 Cline Butte Utility Company  
 Cline Falls Mobile Home Park  
 Cloverdale Sanitary District  
 Cloverdale Water District  
 Coburg, City of  
 Colton Water District  
 Columbia City, City of  
 Columbia Hills Homeowners Association  
 Columbia River PUD  
 Conagra Foods  
 Condon, City of  
 Coquille, City of  
 Corbett Water District  
 Cornelius, City of  
 Country Club Water District  
 Country View Mobile Estates  
 Covanta Marion, Inc.  
 Cove Orchard Water Association  
 Cove, City of  
 Crater Lake National Park  
 Crescent Water Supply & Improvement District  
 Creswell, City of  
 Crooked River Ranch Water Company  
 Crystal Springs Water District  
 Culver, City of  
 Dallas, City of  
 Dane Clark Water District  
 Dayton, City of  
 Dayville, City of  
 Deception Creek Mobile Park  
 Deer Creek Estates Water Assn.  
 Deerhorn Community Water Association  
 Depoe Bay, City of  
 Deschutes River Improvement District  
 Deschutes Valley Water District  
 Detroit, City of  
 Dexter Oaks Mobile Home Park  
 Dexter Sanitary Service  
 Diamond Peaks Tract 1355  
 Diamond Summit Association  
 Dietz Airpark Water System  
 Donald, City of  
 Drain, City of  
 Drifters Mobile Home Park  
 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  
 Fall Creek Water District  
 Falls City, City of  
 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  
 Gervais, City of  
 Gilchrist Water Co., LLC  
 Gladstone, City of  
 Gleneden Sanitary District  
 Glenmorrie Co-op Association  
 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 Ronde Sanitary District  
 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  
 Hillsboro, City of  
 Hines, City of  
 Hood River, City of  
 Hopewell Water Company  
 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  
 La Casa Mia  
 La Pine Utilities, City of  
 Labish Village Water Commission  
 Lady Creek Water System  
 Lafayette, City of  
 Laidlaw Water District  
 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  
 Little Beavers Preschool  
 Long Creek, City of  
 Lostine, City of  
 Lowell, City of  
 Luckiamute Domestic Water Co-op  
 Lyons-Mehama Water District  
 Madras, City of  
 Madrone Hill MHP  
 Malin, City of  
 Manzanita, City of





# MEMBERS



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  
Nesika Beach-Ophir Water District  
Neskowin Regional Sanitary Authority  
Neskowin Regional Water District  
Netarts Water District  
Netarts-Oceanside Sanitary Dist.  
Newberg, City of  
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  
Odell Sanitary District  
Odell Water Company  
Olney-Walluski Water Association  
OPRD Main Office- Salem  
Orchard Heights Water Association  
Orchard Point Mobile Homes  
Oregon Shores Beach Club, Inc.

Oregon Water Wonderland II Sanitary District  
Orient Drive Mobile Estates, LLC  
Otter Rock Water District  
Pacific High School  
Paisley, City of  
Paradise/ Rogue Meadow WS  
Parkdale Water Company, Inc.  
Parrett Mountain View Estates  
Perrydale Domestic Water Association  
Pete's Mt. Water Company, Inc.  
Philomath, City of  
Phoenix, City of  
Pilot Rock, City of  
Pine Grove Water Dist.  
Pinecrest Water Company  
Pioneer Park Water Co-op  
Pioneer Village Water Company, Inc.  
Pleasant Valley Water Company  
Pleasant View Water Company  
Polehn Heights Water Association, Inc.  
Ponderosa Pines Water Company  
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  
Rimrock West Improvement District  
River Meadows Improvement District  
River Point Farms, LLC  
Riverbend-Riverbank Water District  
Riverfront RV Park  
Rivergrove Water District  
Riverside Water District  
Riverview Trailer Park  
Riviera Mobile Park  
Roats Water System, Inc.  
Roberts Creek Water District  
Rock Creek Water District  
Rockaway Beach, City of  
Rocky Pointe Marina  
Rogue Community College  
Rogue Lea Estates MHP LLC  
Rogue River, City of  
Rogue River-Siskiyou National Forest  
Roseburg Forest Products Co.  
Round Lake Water Utilities  
Rufus, City of  
Running Y Utility Company  
Sandy, City of  
Salem, City of  
Salmon River Mobile Village

Sam's Valley Elem. School Dist. #6  
Scappoose, City of  
Scenic Fruit Company  
Scio, City of  
Scofield Mobile Home Court  
Scotts Mills, City of  
Scravel Hill Water Co-op  
Seal Rock Water District  
Seneca, City of  
Shangri-La Water District  
Sheridan, City of  
Sherwood, City of  
Siletz, City of  
Silver Falls School District 4J  
Sisters, City of  
Skylane Farm  
Skyview Acres Water Co-op  
Sodaville, City of  
South Fork Ranch Homeowners, Inc.  
South Fork Water Board  
South Hills Water System, Inc.  
Southwest Lincoln County Water District  
Southwood Park Water District  
Spirit Mountain Gaming, Inc.  
Spray, City of  
Springbrook Water Association  
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.  
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Suburban East Salem Water District  
Sumpter, City of  
Sunridge Estates  
Sunriver Water LLC  
Sunset Acres Water Improvement Co.  
Sunset Lake RV Park  
Sunset Water Systems, Inc.  
Sutherlin, City of  
Sweet Home, City of  
Talent, City of  
Terrace Mobile Plaza  
Terrebonne Domestic Water District  
The Dalles, City of  
Three Rivers School District  
Tierra Del Mar Water Company  
Tigard, City of  
Tillamook Bay, Port of  
Tillamook County Creamery Association  
Tillamook, City of  
Timber Water Association  
Toledo, City of  
Tollgate Water Co.  
Tone Water  
Trappist Abbey  
Tri City Water & Sanitary Authority  
Troutdale, City of  
Tualatin Valley Water District  
Tumalo Rim Water Impr. Dist.  
Turner, City of

Twin Rocks Sanitary District  
Tygh Valley Water District  
Ukiah, City of  
Umatilla, City of  
Umpqua Basin Water Assn.  
Union, City of  
Unity, City of  
US Army/ COE, Cottage Grove Lake Office  
Vale, City of  
Valley View Water Co-op  
Valley View Water District  
Veneta, City of  
Vernonia, City of  
VMWID  
Waldport, City of  
Wallowa Lake Co. Service District  
Wallowa, City of  
Warm Springs, Conf. Tribes Reservation of OR  
Warren Water Association  
Warrenton, City of  
Wasco, City of  
Water Wonderland Improvement District  
Watseco-Barview Water District  
Wedderburn Sanitary District  
Weiss HOA, Inc.  
Welches Water Company  
Weldon Mobile Home Park  
West Hills Water Company  
West Linn, City of  
West Slope Water Dist.  
West Yamhill Water Company  
Western Heights Water Association  
Westfir, City of  
Weston, City of  
Westport Water Association  
Wheeler, City of  
Whispering Pines #4  
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.  
Zig Zag Water Cooperative, Inc.

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Scott Dammeyer  
Dave Frahm  
Bell Ron

Hannen Scot  
Zach Huff  
Kyle Bauer  
Ron Harrod  
Jason Gosling

OPRD Main Office-Salem  
Tollgate Water Co.

Hydra-Stop  
CUES  
Nelson Environmental Inc.

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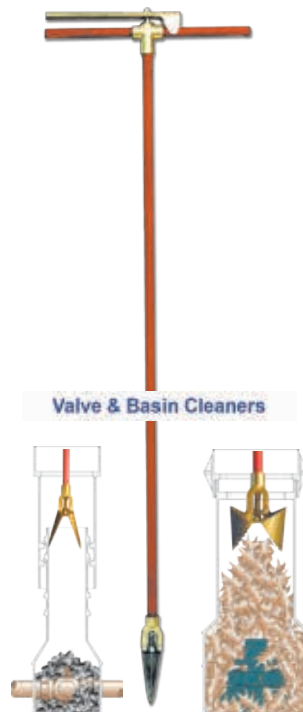


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