



# H<sub>2</sub>Oregon

Winter 2021  
Vol 44, No. 1

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A publication of Oregon Association of Water Utilities  
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Winter 2022  
Vol. 44, No. 1

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Near Lake of the Woods, Highway 140

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# Influential Leadership

by Jason Green, Executive Director

Such a great topic to consider and so easily passed over. How do I influence others? In a positive or a negative manner—family, friends, co-workers, employer, boss? Do I take the time to consider the depth of influence, such as life-long or short term; directive or suggestive; living/working by example influence rather than speaking and preaching? Do you enjoy the challenge of being a positive influence? Do we make the time to get to know our “subject” with this purpose and intent in mind? As a supervisor or employer, our influence may be immediate with corresponding expected results or it may be more of an invested, patient habit and goal over several years to purposely have influence, help, challenge, grow and mold in a mentor-type approach with someone knowing or maybe not. A retired Port of Vancouver Manager worked on me for several years before I had any such idea of his influence and goal to encourage and instruct me in business, negotiations, managing and leadership knowledge and skills. I respected and loved the man, his truth and integrity, his willingness to share, and to help. Wish I had another eight years of purposeful influence as the recipient.

Within this brief article, might I also inquire—where and who and how have you been influenced? Are you currently working a career because of someone who encouraged you and influenced you? Did you join the military or attend college because of your uncle, aunt, father, or mother—because they suggested and encouraged or because you did not want to emulate their life? Are your thoughts held more middle, left or right from your experiences, knowledge, or others having influenced you? I have read that greater influence may come from hearing a passionate and convincing speaker who masterfully conveys a message to their listeners than does reading and studying data and details. I find this both amazing and dangerous.

I have few memories from my earliest years, maybe as a five-year-old. Others are pictures with older family members sharing the story behind the photo which then becomes my own “memory.” One vivid memory, growing up in Sandlake, were regular walks on the beach with my mother’s father. Valentine Daggett was from large stock, happy, hardworking, and lovable. A truck driver who later worked in the Tillamook Creamery making cheese. I admired him and looked forward to seeing him. A Butter Brickle ice cream bar and a ride in the old Volkswagen to Tierra Del Mar to walk on the hard, wet sand. I recall his leather Redwing moc toe boots. The right foot pointed a little farther to the right. The step and his gait while holding my hand. Fifty-two or so years later I purchase a pair of those boots, lace them up and look down. I have always liked those boots, for some reason, and then it all came flooding back from the memories. I phoned my mother, and she enjoyed the recount of Val, my grandfather, and his boots in the sand. Maybe an influence why I like those boots? I don’t know, but a fond memory.

How are we influenced? Do we know when? Do we welcome the good and keep away from those who negatively influence and fall into the ditch? Is it true that birds of a feather flock together? Are we regularly thinking positively in how we live or work and our influence (and reputation) of others? At work, do we take time to really get to know the person, their strengths, and weaknesses and how we might come alongside or influence. Are they accepting or stiff-necked and arrogant? Can we, will we patiently work with them and grow with them ourselves? So much to consider. Grandchildren now, how am I influencing this one by taking him fishing (see photo)? What will be the value of my time with others, co-workers, employees, employers, family and loved ones. I’ve heard we are like a written book or written epistle, what’s in your book that others might read?

Best wishes! 💧





# Valves

*by Keith Bedell, Wastewater Technician*

Know the types of valves in your system and what they do. The most commonly used valve in water and wastewater is the gate valve, but there are many more that are used for isolation and controlling flow. Gate valve, butterfly valve, knife valve, slide/slucice gate valve, mud valve, globe valve, pinch valve, duckbill valve and plug valves are some of the types of valves used in water and wastewater treatment plants. The gate valve has a wedge which normally has a resilient seat, made with a rubber or elastomer compound for a good seal. The gate valve has a full-port waterway with little flow or pressure loss. Gate valves are usually best for isolation, not for throttling flow, either open or closed all the way.



Butterfly valves are quarter turn that are used for controlling or isolating flow and are often used with an actuator connected to a programmable logic controller (PLC) allowing automated control of flow. Knife valves are used for isolation of liquids and slurries. Several of the uses are in lift stations where rags and debris can get clogged in the valves during operation. Knife valves can cut through the material and still get a good seal for isolation. Slide/slucice gate valve is used to control flow between tanks/basins or storage ponds. The mud valve is located at the bottom of a tank or basin and is used to drain the storage vessel. Globe valves have many uses, but they have a high level of head loss. Globe valves can be used for isolation, but they are best used where throttling of flow is needed. They are used as pressure sustaining (maintain a constant upstream pressure) or pressure relief (open to relieve pressure) valves, also to maintain a constant downstream pressure when there is high pressure in a system, such as 125 psi in a distribution system and want to maintain 80 psi downstream for customers.

Pinch valves have a rubber or elastomer sleeve or tube between two metal housings that is “pinched” together which returns to a full flow through when it is released. They can be operated manually, by air or with actuators. They are good for solids and slurries because the product only comes in contact with the sleeve. Duckbill valves are unique, one-piece, elastomeric components that act as backflow prevention devices or one-way valves or check valves that look like a duck bill. Uses are to allow one direction flow such as a stream discharge from a wastewater treatment effluent, and between two tanks. Plug valves are quarter turn and can be used for isolation or throttling. The configuration can be flow through, in a tee setup or as a cross depending on the needs. With the tee the flow can be sent in two different directions dependent on where we want the fluid, or it can be used to shut off the line.

Now that we know our valves, do we maintain them, exercise them, and make sure that they are working properly, or just check on them when one fails? 💧

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# Past, Present, Future

by Tim Tice, Projects Manager

There are many ways to work towards continual improvement of what one does. Training classes, as a simple example, will take an idea, process, or design, break it down to a presentation. The class is chosen to improve the knowledge necessary for the held position. Why a particular class is chosen has many motives, but essentially it is about sharing something new, a way towards improvement.

Employees, by our human nature, have the ability to learn, able to develop both new or improved skill sets and mindsets. Employees come to work with a skill set that was, hopefully, improved from earlier employment or experiences through the workplace. Skill sets give the abilities that show the employee is capable of the handling the job. It is pretty clear early in the process if someone has operated a piece of equipment before.

Mindset is much more of an internal mechanism that continues to evolve and quietly makes us who we are. Our mindset is a set of beliefs that shape how you make sense of the world and ourselves. It influences how we think, feel, and behave in any given situation.<sup>1</sup> Not sure to the percentages of the population, of “fixed” (our abilities are fixed traits that can’t be changed) mindsets versus “growth” (abilities can be developed over time through effort and persistence) mindsets, but I would guess the latter is a bit higher or progress would slow considerably.

I obtained a copy of the “Water Works Operators’ Manual,” by Warren C. Westgarth, March 1953. Reading through it shows that for almost 70 years the nuance of water system operations has remained relatively the same goal, to deliver clean high-quality water to each of our consumers. The introduction points to the manual to give them (operators) a body of text to study for a voluntary certification program to improve their service to the community. The proposed voluntary certification program has evolved into set of regulations developed to assure qualified people are in the position to supply safe drinking water.

In an earlier paragraph, the manual states that “water works operators have shown by their repeated attendance at short courses and conferences, that they desire to learn more in the field.” This shows that prior to any rules, operators have a keen sense of the importance of high standards.

The manual goes on to point out the operator grade requirements, experience, and special training as it relates to today’s S.T.E.M. (science, technology, engineering, and math) courses of study. For the past 70 years, not a lot has changed in regard to education, but has the skill set and mindset transformed?

As leaders in the utility industry, what role do we play in altering or shifting the mindset to preserve the satisfaction and importance of delivering clean water, and at the same time safeguarding our communities by treating the wastewater.

Skill sets are developed through doing and from an earliest age the simplest tool, the crayon, was given to us to begin our growth. Dexterity, creativity,

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<sup>1</sup> <https://www.verywellmind.com/what-is-a-mindset-2795025>



problem solving begin with our hands and continues to develop for years.

What tools can we use to develop, learn, and change the mindset? How we see situations and people in a positive way will begin to set the tone towards a growth mindset. Mix in a steady dose of gratitude and the path to a growth mindset will propel us and possibly bring solutions to any problem. It seems the utility industry has a good supply of individuals with such a mindset. Operators consistently deliver daily fixes to the disruptions of their routines, and maybe that is the most significant goal each day, but is it?

We all learn differently and using those talents from developing our skill sets and mindset we grow and mature. Reaching out, we should be encouraging the growth of our co-workers. When we grow using a grateful and positive approach that attitude in itself can become contagious. That is where the next generation of utility workers will be

fostered. Our everyday duties, done with a smile, can help to sustain our industry with well qualified people for years to come. We all begin with a skill set and evolve with a mindset. Where will each of yours take you or a coworker?

*The best that life has to offer!* ♦



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# The Psychology of Pre

*by Scott Berry, Operations Manager*

Many utilities are still cleaning up after another long and costly fire season. California continues to battle what is being called the most destructive wildfire in history. That, by the way, is the second time this fire season that they have had “the most destructive wildfire in history.”

Over the past several years, we have heard and read extensively about emergency response and disaster preparedness as it pertains to the utility or municipality as a whole. By now you should have a good handle on what types of emergencies are likely to happen in your area. Hopefully you have taken a good inventory of what resources you will need and what you have to offer to other utilities that may be affected. The entire staff should know what their individual roles and responsibilities are to ensure that the utility gets back into operation and providing the services that are critical to the community’s survival.

Everyone, from administrators to the brand-new employee, should take some time and think about what a disaster affecting the area would do to you personally.

Administrators and supervisors should keep every employees need to care for their loved ones, as well as themselves, in mind when developing a preparedness plan. It’s a safe bet that the utility has developed a communication plan that will be used during emergencies. Do you have a communication plan with your family? How will you contact them to let them know you’re safe and to find out how they are if cell phones are not an option due to an overloaded system or disruption of service?

Personal preparation is something that has to take place long before a disaster happens and it has to take into account the mental toll of getting ready, staying ready, responding to, and recovering from, a disaster.

The reality is that the heightened awareness of terrorism concerns us all.

What more Oregonians have come to understand is that terror isn’t always at the hands of some faceless group of people, thousands of miles away, but is also brought on by events with names like the Boxcar, Klondike, and Substation fires; tragic incidents like the train derailment that affected much of the Columbia River Gorge area, and the shootings that continue to plague our nation’s schools and other populated areas. It’s also the anticipation of disasters that never actually happen, but that are predicted and prepared for, which can cause large-scale emotional and mental trauma.

That’s true whether the disaster is anticipated in our hometowns or in faraway places that we only experience through TV or other media sources that bombard us with an overload of information 24 hours a day.

- It’s the Cascadia Subduction Zone earthquake that hasn’t hit yet, but that we prepare for with seismic retrofits and statewide disaster drills.



# paration

- It's the major windstorm or ice storm that diminishes in scale before damage is done.
- It's the fear of the next cyber-attack.

All these anticipated disasters take their toll, hanging over us like the Sword of Damocles. Like Cicero's Damocles, it's easy for people to feel like there's a threat hanging over their heads. For Damocles, that threat was a sword hanging by a single hair. For Americans today, even the very reasonable preparations that the government and others are making to minimize the possibility and effects of terrorism and natural disasters can cause some people to experience a heightened sense of anxiety, fear, and even impending doom. This is our new reality — the new Sword of Damocles.

It is incumbent upon each and every one of us to get ready and to stay ready so that the communities that rely on us will return to normal as quickly as possible after disaster strikes. That means that all of the utility preparation to be scaled down and discussed with our loved ones so that in the event of an emergency, we are not distracted with worry and can focus on the job at hand.

## Have a GO bag.

This is a bag that either travels with us or is close by and contains all the things that will sustain us and keep us healthy for at least the first 72 hours of a disaster. I have a GO bag at home and one in the pickup that I drive for work, so I'm assured of at least one of them being where I need it to be. I'm a diabetic so a major concern for me is the prescription medications that I need. Every person needs to do their own research and decide what to pack in their GO bag. There are many examples and checklists available at [ready.gov](http://ready.gov).

## Have a plan.

If asked, and sometimes without anyone asking, my wife would tell you that one of my little quirks is that I'm a worst-case-scenario type of guy. After 2 decades as a firefighter and EMT, as well as a reserve deputy and a civilian tour in Iraq, one of the involuntary habits I've picked up is this fun little game I play in my mind called "what if." It goes something like this: my wife Angela and I are planning a little hike. Nothing much; fairly easy terrain; it's November and we're

headed for the foothills of the Ochocos, but the weather is sunny and cool. It's an 8-mile round trip hike that covers some elevation changes and rough terrain.

**What if** a sudden change in weather hits us? I better pack some extra clothes and enough gear to make shelter and fire if needed.

**What if** Angela falls and gets injured? I better pack the first aid kit and I can use my trekking poles to splint a bone if needed.

**What if** we head off the trail to look at something and get turned around? Well, that couldn't really happen because when we talked about where we were going to go, I checked my maps and know every road, stream, and terrain feature in the surrounding area. But still, what if? I better bring my compass, maps, GPS, cell phone and signal mirror.

**What if** I have a blood sugar issue? I'd better bring plenty of food and enough meds for at least one night, nah, better make it two.

**What if** we encounter an adversary with the intent to cause us harm? Got it covered.

That's how that little game goes. It doesn't matter to me that we are passing 5-year-olds with nothing, but a light jacket coming back on the trail, and I'm loaded down like Sir Edmund Hillary getting ready to summit Everest. I bet Tenzing was much nicer about it than Angela was...

The game works the same way for every other situation. What if that pump burns out? What if the treatment plant gets flooded? What if, what if, what if? The more we mentally run through those scenarios in our daily life, the more ready we will be when that eventuality comes to pass. Studies have shown that the way people respond to an event is dependent on training and experience. We will not rise to the occasion; we will sink to our level of training.

In an emergency, it's our job to restore normalcy to our community. In order to do that, we have to take care of ourselves first.

Winston Churchill once said that the secret of his success was "Economy of effort. Never stand up when you can sit down, and never sit down when you can lie down." ♦



# Debrief

*Heath Cokeley, Programs Manager/Circuit Rider*

This is the third and final article in a series of 3 articles I have been writing about emergency response. The first article, “Calm Before the Storm,” discussed what to do to prepare for a disaster. The second article, “The Longest Day,” discussed what to do during and immediately after a disaster. This article is written to cover what can be done after a disaster to learn and maybe be better prepared for another one.

Please know that I am not writing these articles because I am an expert in emergency response, as I can assure you, I am not. I have done all the FEMA required training to be able to act as an Incident Commander, as well as, a number of other trainings that are geared towards emergency response, but those certifications of completion don’t amount to a hill of beans when bad things happen. I am writing these articles because during my career in the water/wastewater industry I have been put into situations where I have needed to respond to emergencies, and I have found those situations far more educational than any of the classes.

Please don’t let me saying that discourage you from seeking training like the FEMA PW 100, 200, 700 and 800 courses that are free online as well as the 300, and 400 in classroom trainings for those of you who may need to act in a higher-level role during an emergency. These and other courses on the subject are still worthwhile trainings they just can not truly prepare you for all the complicated situations that could be thrown at you in an emergency. Much the same way as we can’t successfully write an emergency response plan that will cover every type of an emergency our utility may see and exactly what to do in those situations. The best we can hope for is to write a playbook for the emergencies we may see that has some good solid guidelines and available resources, then strap in, hold on and make the best decisions we can during any situation that comes knocking on our door.

If you have ever been in an emergency response class taught by Scott Berry and myself, you have heard us harp on how important a debrief is after an event. This is not because we get some kind of twisted pleasure out of reliving everything that happened and then picking it apart piece by piece to find both what went well, but more importantly, what didn’t. It is because I truly believe that a mistake is only truly a mistake if you choose not to learn from it. Yes, this can be an awkward process as it can make the people involved in the event feel as though everything they did, and decisions they made, are being scrutinized and that is quite frankly because those decisions are being scrutinized. When done correctly though, that scrutiny is not coming from pointing fingers, but these are the decisions that were made, we now know the outcome and have an idea of what maybe could have been done differently for future reference.



I have found many of us in the water/wastewater field tend to be some of our own toughest critics, so when we do screw up, we likely are the first to realize it. Own that mistake and let it be an example to others about how they can do better in a similar situation. While we can't go back and change the mistake or error that was made, we can fix it, repair it, move one, and learn from it.

Obviously, we shouldn't just focus on the bad and what went wrong but talk about the good and why it went well. Which will lay the groundwork and hopefully trust to talk about what didn't work and how to improve upon for the next time.

If I can suggest, please don't let this debrief make you gunshy about making decisions during an event. The absolute worst option is to be so paralyzed with fear that we will make the wrong call that we make no call at all.

Moving the ball down a field, we may realize at some point the direction we are going is the wrong way, but simply back up, look at the new information presented that made us realize that our current path is not the correct one. Then adjust accordingly to keep that ball moving in the right direction.

Some may think it isn't necessary to plan for bad events as others are planning for them and they will take care of things if something happens. I will admit to personally having no faith in that. Why not plan as if we will have no help and then, if it turns out we are wrong, we can be pleasantly surprised?

Thank you for your time in reading these articles, I admit, writing them helped me think through some of my own personal views on emergency response and with that, I will see you down the road. 💧

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# Consider a Conference

*by Mike Collier, Deputy Director, Source Water Specialist*

Continuing education is mandatory for us to maintain our certifications as water and wastewater operators (unless we try to challenge the test for renewal). How can we use this to our advantage and not just be a chore we must do each year or two? Let's look at the different CEU options that are available to us and how they can help us.

There are many different options when it comes to getting our approved CEUs. We could simply pop online and sit through a course that is played through the computer screen. Often these are hard to sit through – it feels like something is lacking. Some of what is missing is the in-person communication between the speaker and the listener, both the verbal and non-verbal. Also, sometimes there are technical issues, we can't get on, the speaker can't get on, they are muted, they can be hard to hear, or there could be internet issues.

There are some books we can read the chapters in and then take quizzes to get some of our CEUs. Again, with this option there is no personal interaction, there is no one to ask questions of and it can really put me to sleep. It reminds me of school reading and is not the most entertaining option. One benefit of this option and some of the online options is that we can do it on our own time, we can do it whenever we want and have the time to do so.

We could go to a few in person classes that are one or more hours. This is a great option and OAWU offers both free and fee in person training. At these we can ask our questions, we get the personal interaction, and we can talk with other operators during breaks, before, or after the class.

There is yet another option, and I think this is typically the most optimal way to get our CEUs. This is to attend a conference. At a conference there are several additional benefits that may not come from the other options. Multiple presentations, all or most of the CEUs in one week, ability for long conversations with product representatives or with other operators. Some extra fun to enjoy the time and additional camaraderie.

Since we have to get our CEUs – we may as well get the most out of the experience. To do it in a way that could really benefit us in our profession and for our future, not just to go through the steps to keep our certifications. 💧

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# UPCOMING TRAINING & EVENTS

Date	Class Title	Location	CEU Information	ESAC#, Fee/Free
March 1–4	44 <sup>th</sup> Annual Management & Technical Conference	Sunriver	3.0 Water/Wastewater	TBA Fee
March 15–16	Wastewater Treatment/Collections Certification Review	Salem	1.4 Wastewater/0.7 Water	4227 Fee
March 17	Water & Wastewater Field Operations & Safety	Salem	0.4 Water/Wastewater	TBA Fee
April 5–6	Water Treatment, Water Distribution Certification Review	Salem	1.4 Water/0.5 Wastewater/Onsite	4036 Fee
April 7	W. Treatment & Dist. Level 3,4 & Filtration Endorsement	Salem	0.6 Water	4034 Fee
April 6	Understanding Requirements for WMCP	Salem	0.3 Water	4351 Fee
April 7	Lock Out Tag Out Safe Operations	Salem	0.3 Water/Wastewater/Onsite	4397 Fee
April 7	Job Site Safety	Salem	0.3 Water/Wastewater	3890 Fee
April 12	Math for Operators	Newport	0.4 Water/Wastewater	4329 Fee
April 12	Preparing for a W System Survey & WW System Inspection	Newport	0.3 Water/Wastewater	4330 Fee
April 14	Distribution Basics	Salem	0.6 Water	4117 Fee
April 27	Developing your Operations & Maintenance Manual	Canby	0.4 Water/Wastewater/0.2 Onsite	4116 Fee
April 27	Leak Detection	Canby	0.2 Water/Wastewater	4396 Fee
April 28	Hazardous Communication Standard (Global Harmonization)	Oregon City	0.3 Water/Wastewater	4193 Fee
April 28	Confined Space	Oregon City	0.3 Water/Wastewater/Onsite	TBA Fee
May 11	Math for Operators	Redmond	0.4 Water/Wastewater	4329 Fee
May 11	Pumps and Pumping	Redmond	0.3 Water/Wastewater/Onsite	4395 Fee
May	EXPO	Rickreall	0.4 Water/Wastewater	TBA FREE
May 26	Confined Space & Job Site Safety	Newport	0.6 Water/Wastewater/Onsite	4331 Fee
May 31- June 1	Water Treatment, Water Distribution Certification Review	Salem	1.4 Water/0.5 Wastewater/Onsite	4036 Fee
June 2	W. Treatment & Dist. Level 3,4 & Filtration Endorsement	Salem	0.6 Water	4034 Fee
June 28	Math for Operators	Umatilla Army Depot	0.4 Water/Wastewater	4329 Fee
June 28	Pumps and Pumping	Umatilla Army Depot	0.3 Water/Wastewater/Onsite	4395 Fee
July 6	Developing Your Operations & Maintenance Manual	Eugene	0.4 Water/Wastewater	4116 Fee
July 6	Leak Detection	Eugene	0.2 Water/Wastewater	4396 Fee
July 19–20	Water Treatment, Water Distribution Certification Review	Redmond	1.4 Water/0.5 Wastewater/Onsite	4036 Fee
August 3	Lock Out Tag Out	Bend	0.3 Water/Wastewater/Onsite	4397 Fee
August 4	Hazardous Communication Standard (Global Harmonization)	Bend	0.3 Water/Wastewater	4193 Fee
August 4	Confined Space	Bend	0.3 Water/Wastewater	TBA Fee
August 9–10	Wastewater Treatment/Collections Certification Review	Salem	1.4 Wastewater/0.7 Water	4227 Fee
August 22–25	28 <sup>th</sup> Annual Summer Classic Conference	Seaside	2.3 Water/Wastewater	TBA Fee
September 13–15	2022 Fall Operators Conference	Florence	2.7 Water/Wastewater	TBA Fee
September 21	Confined Space	Baker City	0.3 Water/Wastewater	TBA Fee
September 21	Job Site Safety	Baker City	0.3 Water/Wastewater	3890 Fee
Oct. 31 – Nov. 3	Spirit Mountain Casino Operator's Conference – 2022	Grand Ronde	2.7 Water/Wastewater	TBA Fee
November 16	Distribution Basics	Salem	0.6 Water	4117 Fee
November 17	Developing Your Operations & Maintenance Manual	McMinnville	0.4 Water/Wastewater/0.2 Onsite	4032 Fee
November 17	Leak Detection	McMinnville	0.2 Water/Wastewater	4396 Fee
December 12–15	24 <sup>th</sup> Annual End of Year Operators Conference	Hood River	2.7 Water/Wastewater	TBA Fee

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Trained and certified operators are necessary to ensure that the systems are managed in a manner that fully protects public health and the environment. The OARs for certification stipulate that the qualifying experience for applicants for certification as a water treatment plant operator must attain at least half the required operating experience at a public water purification plant that uses complex filtration technology and is not more than one classification lower than the level of certification they are seeking. In other words, if you have only worked for a Class 2 treatment plant, we allow you to apply for a Level 3 certification but not a Level 4 certification. If you move on to a Class 3 plant, then you must have ½ the qualifying experience (at the Level 3 plant) before allowing to apply for a Level 4 certification. Reciprocity from state-to-state ensures that the operator have the operating experience for which they are certified.

For additional information, please visit <http://public.health.oregon.gov/HealthyEnvironments/DrinkingWater/OperatorCertification/Levels1-4/Pages/exams.aspx>

Drinking Water Data Online

<https://yourwater.oregon.gov>

Drinking Water Services

<https://www.oregon.gov/oha/PH/HEALTHYENVIRONMENTS/DRINKINGWATER/Pages/index.aspx>

*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).*



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# The Great Resignation

by Hans Schroeder, Circuit Rider



With all the craziness going on in the world are you retaining your employees? According to the Bureau of Labor and Statistics the number of people leaving their jobs increased from 164,000 to 942,000 in June. After, or well, during the Covid 19 pandemic, some people are calling it “The Great Resignation.”

In an industry that already does not attract the millennials or generation Z candidates how do we retain or attract them to come work in our industry?

First off when teenagers are getting paid \$20/ hr to flip burgers at McDonalds we have to start with a competitive salary. Explaining to them the addition of the benefits into their wages. Remember this can be the “me” generation and many aren’t even thinking of saving for retirement. So, I think this is a point that needs to be sold to them.

Another main reason can be the manager, in a city situation this could be anyone from a city council member that has their own agenda and is hounding an employee to do it their way even though the employee has much more experience and is certified, to a City Manager trying to tell the public works department how to do their job, when I am sure they wouldn’t like the public works department coming in and doing their budget for them, to the head of the public works department. Please remember everyone has a life outside of work and though we don’t mean to bring our personal life to work sometimes just a caring ear can go a long way. My grandma always told me treat others as you would want to be treated, it’s a good philosophy to live by at work and home.

Another main reason people are leaving their career is there is no room for growth! The lawn mowing kid that works part time in the summer and would be a perfect fit needs to know that there are ways he can learn, study, and get different levels of certification in the water or wastewater industry and with that comes more responsibility and pay. A hometown person may have the desire to stay where they feel comfortable and knowing there is an option for a good job that has growth opportunity maybe the key to keeping and advancing someone in our industry. 💧

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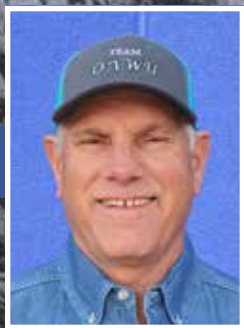
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# Maintaining Water Quali

*by Bob Waller, Water Circuit Rider*



Over the last few months we have had systems request information about water tanks and reservoirs. The questions have ranged from tank repair, replacement, cleaning, tank inspections, and companies capable of this type work.

Various materials are used for making a water tank including wood, plastics (polyethylene, polypropylene), fiberglass, concrete, stone, steel (welded or bolted, carbon, or stainless). Some tanks like glass-lined or glass-fused-to-steel and epoxy coated tanks usually require specialized companies to do the maintenance, like re-sealing of the glass panels. Also, replacing the cathodic protection in tanks can be important to the life of the investment.

Some maintenance can be done with the reservoir online while others require the system to be off-line and drained. In some cases, an alternate source may be an option, in others a temporary tank may be necessary.

Whatever type of storage the system uses from tanks, reservoirs, cisterns, or something else, OAWU can help to find a company that can do the job. OAWU can help with the inspection of the reservoir, screen, overflow piping, and other parts through a pre-sanitary survey. Our staff maintain lists of companies that can help with many of these issues including building new tanks and maintenance on all sorts of water storage units.

All water systems should have a maintenance schedule for interior and exterior inspection, as well as a schedule for cleaning of potable water storage tanks and reservoirs.

Proper preventative maintenance can save tank owners from extensive and expensive tank repairs. Cleaning biofilm and inorganic residues can collect on





# ty in Storage Tanks

the interior surfaces of potable water storage tanks and can lead to taste and odor complaints, regulatory compliance issues, and system function problems. Ongoing water tank inspections, monitoring, and maintenance can ensure the storage tank continues to meet all applicable regulations. A well-maintained water storage tank can increase tank life expectancy.

So when your system has a need or just a question about water storage give us a call at Oregon Association of Water Utilities.

## CAUTION

**NEVER ENTER STORAGE TANKS!** Unless you are following proper confined space entry protocol.

**WORKING WITH CHLORINE CAN BE HAZARDOUS!** Chlorine can cause damage to the skin, eyes, and



<https://www.youtube.com/watch?v=iztsfMpYQbE> (Diveworks)

respiratory system. Disinfecting a storage tank should only be attempted when familiar with the system and know the hazards associated with working with high concentrations of chlorine. Please wear protective equipment and contact a licensed professional as needed. 💧



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# Tank Inspection Template

PWS Name: _____	PWS ID: _____
Tank Name: _____	Tank ID: _____
Proposed Inspection Date: _____	Actual Inspection Date: _____
Name of Person Filling Out Form: _____	Title of Person Filling Out Form: _____
I certify that this information is complete and accurate:	Date: _____

## Inspector Qualifications (answer to all questions must be "yes")

Name and contact information of inspector (if water system personnel) or inspection company: _____	
<input type="checkbox"/> Yes <input type="checkbox"/> No	Has the inspector completed confined space training?
<input type="checkbox"/> Yes <input type="checkbox"/> No	Did the inspector have a confined space entry permit?

## Overall Tank Condition

	Significant Deficiency	Required Correction	Proposed Completion Date	Actual Completion Date
<input type="checkbox"/> Yes <input type="checkbox"/> No	Does the tank appear to be structurally sound?	If no, what repairs are suggested by the tank inspector? _____	_____	_____
<input type="checkbox"/> Yes <input type="checkbox"/> No	Are there any unprotected openings in the tank (breaches, leaks, daylight coming through tank in spots, etc)	If yes, indicate type of breach and how it should be repaired. _____	_____	_____

## Air Vent

	Significant Deficiency	Required Correction	Proposed Completion Date	Actual Completion Date
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA	Does the tank have a vent separate from the overflow?	If no, indicate proposed correction: _____	_____	_____
<b>Above Ground Tanks (Ground Level or Elevated)</b> <input type="checkbox"/> Check if NA				
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA	<u>Downturned vent</u> : Is the vent at least 24" or 3 pipe diameters above the roof?	If no reconfigure vent to provide proper air gap.	_____	_____
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA	<u>Non-downturned vent</u> : Is there a solid cover down to the bottom of the vent screen?	If no, indicate deficiency and proposed correction: _____	_____	_____
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA	<u>Non-downturned vent</u> : Is the screen at least 8" above the roof surface? What is the height of the start of the screening above the tank? _____	If no, indicate deficiency and proposed correction: _____	_____	_____





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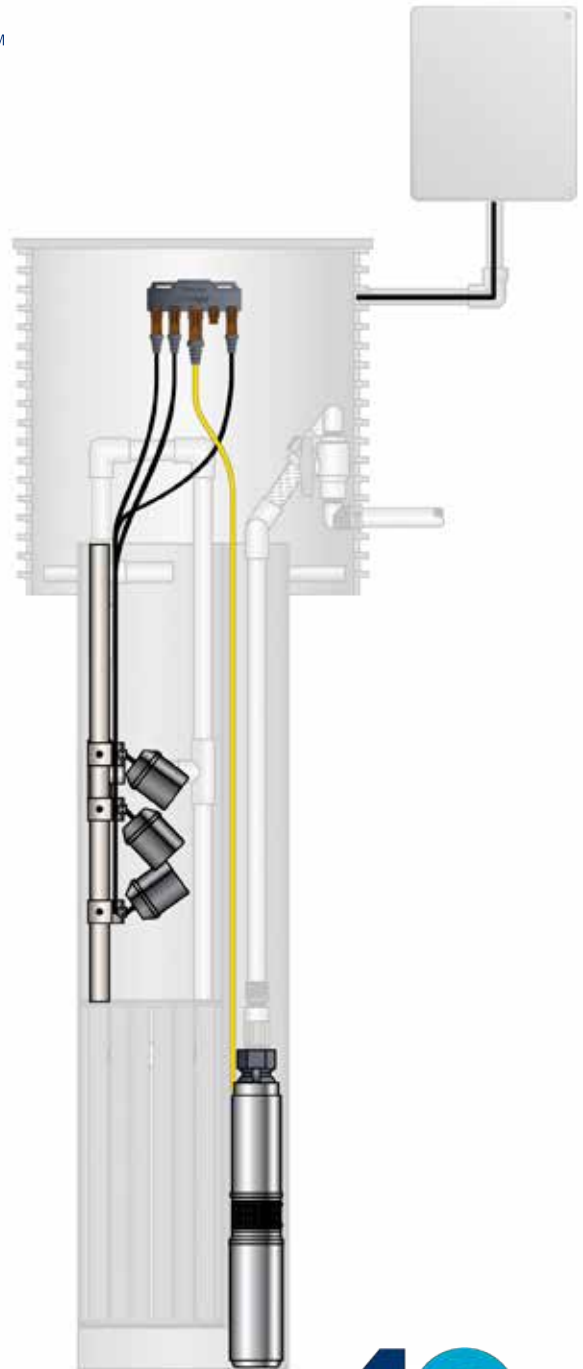
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# Steel Thickness Helps Ensure a Tank's Integrity

By Erin Schmitt

---

Steel tanks are sturdy structures. But even the sturdiest structures need to be evaluated regularly to make sure they remain structurally sound and are not deteriorating to the point where they could collapse. Professional inspectors can perform ultrasonic testing to check the integrity of the steel.

Ultrasonic testing (UT) is almost like an ultrasound, but for steel structures. Inspectors use a machine that sends an ultrasonic wave through the steel. The waves bounce back to the probe to give accurate measurements. The readings are automatic.

If possible, a tank owner or operator should provide tank blueprints or schematics to the inspectors before any evaluation begins. Sometimes the blueprint lists original steel thickness, thus providing a baseline to compare new measurements. If the blueprint measurement states the manufacturers used a half-inch steel for the base of a tank, and the latest UT reading indicates the steel is now only a quarter-inch thick, the steel is likely deteriorating.

Not all schematics will mention the original steel thickness measurements. However, it will provide the tank dimensions and the manufacturer's name. With that information, it's possible to call the tank manufacturer and ask them for the original measurements.

If tanks are inspected on a recommended three-to-five-year basis, UT and dry film thickness (DFT) measurements, when applicable, should be completed every time. Having a record will allow for future comparisons.

DFT readings can also be taken using mil measurements. Mil is a unit of measurement equal to one-thousandth of an inch. If a tank is going to be sandblasted or painted, knowing the DFT readings is useful.

UT readings should be done for all steel tanks, regardless of whether they are still in service or not. A seriously deteriorating structure is a danger to anyone and anything nearby because it could come crashing down.

Although UT readings should ideally be performed for every tank, some styles of tanks and tank materials cannot be measured easily.

Tanks most susceptible to steel deterioration are riveted, due to their age. Typically, steel tanks' exteriors will start deteriorating due to lack of maintenance and environmental exposure to saltwater and or emissions.

On dry inspections, it's possible to measure steel thickness inside the tank, including on the floor and rafters. There are also ROVs in the marketplace that take UT measurements with tanks in service.

For a ground storage tank, pay more attention to the base shell and floor. A structure's integrity starts at its foundation. Tank roofs are also prone to rust and steel thinning. The exteriors are weathered by precipitation, while the interiors are affected by condensation rising, exposing the steel to moisture and chlorine gasses. An epoxy liner can help solve the latter problem.

Monitor tanks with thinning steel. If a tank has a lot of rust, that means the coating protecting the steel is gone. If a customer is suspicious that their tank is deteriorating, additional readings can be performed using a lift to thoroughly measure each part of the tank.

Measurements will vary depending on the tank style, manufacturer, capacity, and type. The thickest steel is usually reserved for the bottom of a ground storage tank. Steel tends to be thinner toward the roof. Depending on tank style and capacity, readings can be pretty consistent throughout the bowl, roof, and shells on an elevated tank, but the steel is thicker in the legs.

Maintaining your tank to prevent metal loss from corrosion will help protect the tank's structural integrity. The best way to avoid any metal loss is to ensure the tank's interior and exterior are properly coated. Storage tanks should be regularly inspected, maintained, and repaired as needed. That can include fresh coats of paint and, on the interior, placing a liner to prevent the metal from interacting directly with the water. 💧

*Erin Schmitt is technical writer/media director for Pittsburg Tank & Tower Group.*



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1. What capacity blower is required to ventilate a manhole 54" in diameter and 49' deep, if 8 are changes are required every 60 minutes?
  - A. 13 CFM
  - B. 104 CFM
  - C. 6231 CFM
  - D. 249 CFM
2. The invert of a pipe is located
  - A. According to the pipe manufacturer's specifications
  - B. At the inside bottom of the pipe
  - C. At the inside cross section
  - D. At the outside bottom of the pipe
3. How tall is the Hoover dam?
  - A. 324 feet
  - B. 586 feet
  - C. 726 feet
  - D. 247 feet
4. What is the average annual rainfall in Valsey, Oregon?
  - A. 40.81 inches
  - B. 76.56 inches
  - C. 96.04 inches
  - D. 127.71 inches
5. Which of the following is a good example of a preventative maintenance procedure?
  - A. Replacing a broken pump seal
  - B. Locking and tagging out and equipment before repair
  - C. Realigning a pump shaft on a damaged pump
  - D. Cleaning and lubricating a gate valve
6. A pump curve plots the relationship between the system head and the...
  - A. Fluid temperature
  - B. Flow
  - C. Impeller type
  - D. Casing type
7. What is water vapor doing when it changes to water?
  - A. Evaporating
  - B. Condensing
  - C. Precipitating
  - D. Freezing
8. What controls whether water is a gas, liquid, or solid ice?
  - A. the shape or size of the cup
  - B. where it has been stored
  - C. if it is being used for irrigation
  - D. what its temperature is
9. Where does condensation occur in the water cycle?
  - A. Clouds forming
  - B. Ocean water changing to water vapor
  - C. Water flowing down a river
  - D. Underground water soaking into rocks and soil
10. How can water vapor in the air return to Earth?
  - A. It evaporates and is blown by the wind
  - B. It evaporates and forms clouds
  - C. It condenses then precipitates
  - D. It sticks to any warm surface it comes in contact with

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



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# Modifying Written Easements When Maintaining, Replacing, & Moving Infrastructure

By Laura Schroeder and Nicole Vetter

## Introduction

Easements are a necessary part of operating water infrastructure such as wastewater treatment facilities, wastewater pumping stations, pipelines, and reservoirs. Easements are required to install pipelines on private property and underneath public roads. These easements may take the form of permits or licenses from a public entity. In addition, access easements across private property may be necessary to reach wells or storage structures.

Acting proactively to modify terms of existing easements and licenses before engaging in maintenance, repair, or replacement activities will avoid unhappy citizens, trespass, claims of inverse condemnation, or fines from a public entity. This article will discuss some general principles as to modifying written easements when engaging in infrastructure development and making improvements.

## Easement Considerations

First, if a written easement agreement exists, check the agreement for provisions related to amending the easement. If these provisions exist, modifying the easement requires compliance with those terms to avoid violating the agreement. The next step is to evaluate the project based upon what is permitted under the written easement. Will your project cause minor or major deviations from what is allowed by the terms of the written easement? Whether a deviation will be permitted depends on the nature and scope of the easement's purpose.<sup>1</sup> This is important to determine because certain modifications to easements are legally permitted without subsequent negotiation while other modifications that go beyond a small adjustment will require renegotiation of the written agreement.

<sup>1</sup> *Motes v. PacifiCorp*, 230 Ore. App. 702 at 712.

Under existing law, an easement holder cannot materially increase the burden or impose new types of burdens on the property where the easement is located. However, Courts have generally decided that changes that accommodate new technological developments or anticipated needs do not require renegotiation because Courts "give effect in a practical manner to the purpose of the grant."<sup>2</sup> For example, Courts have permitted a conversion of an open canal into a pipeline and a railroad track to a logging road.<sup>3</sup>

If a written amendment is required by the terms of the easement, make the modification in writing, and then record the writing. The writing may take two forms, either (1) expressly voiding and superseding all prior agreements; or (2) by changing one provision and recording an amendment that specifies the change to a specific term while leaving the rest of the agreement intact.

## Conclusion

Small adjustments or changes to accommodate technological development and anticipated needs will not require renegotiation of the written agreement. If the project will require more extensive modifications then a renegotiation and a written amendment will avoid problems, saving both time and money. ♦

*Laura Schroeder founded Schroeder Law Offices, P.C. in 1991. Schroeder Law Offices represents water rights clients in six western states and consults internationally. Nicole Vetter is an associate attorney with Schroeder Law Offices and is licensed to practice in Oregon. You can read more about this topic and other water rights issues at Schroeder Law Offices' Water Law Blog, [water-law.com/blog/](http://water-law.com/blog/). Schroeder Law Offices also hosted several fee webinars on water law topics, available for viewing at [www.water-law.com/webinars/](http://www.water-law.com/webinars/).*

<sup>2</sup> *Bernard v. Link*, 199 Ore. 579 at 592-593.

<sup>3</sup> *Id.*

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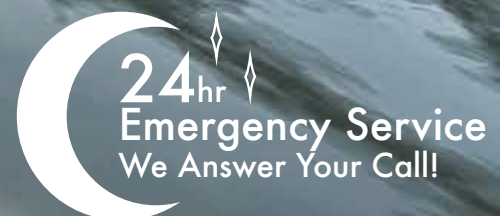
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Member Name: \_\_\_\_\_

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

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

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

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

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

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

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

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

## Type of System:

☐ Water ☐ Wastewater ☐ Both

## Membership Category      Membership Dues

- |  |                                |
|--|--------------------------------|
| <input type="checkbox"/> Regular Member    | \$ _____<br>See schedule below |
| <input type="checkbox"/> Associate Member  | \$500.00                       |
| <input type="checkbox"/> Individual Member | \$100.00                       |

## Regular Member Dues Schedule

1 to 100	\$75 + 42 cents per connection
101 to 500	\$85 + 42 cents per connection
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### Associate Member

An Associate Member shall be any organization, individual or corporation, supplying services or equipment to water and wastewater utilities. An Associate Member shall have one vote. Annual Dues \$500.00 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 \$100.00 per year

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- Direct mailings about upcoming training courses in your area
- 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
- Positive contacts with other organizations
- Camaraderie with water and wastewater professionals
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- System performance evaluation and options
- Additional programs and services
- Disaster response assistance and planning



MB22

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