HI2019 Vol.41, No.4

Highlights from the 25th Annual Summer Classic PAGE 6

MARK YOUR CALENDAR! **Upcoming Conferences** PAGES 15 & 21

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Solution Contents 🕷

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Please mail your photo to our office. If we use your photo on the cover you will receive an official OAWU shirt and hat.

We are also seeking articles, clean jokes, Oregon trivia, letters and interesting stories. Please send submissions (no more than two pages in length) to:

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Cover photo by David Branham North Fork of the Santiam River near Detroit

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Send your articles with full color photographs, in digital format if possible, to the address listed above.

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

The Right Hire

Jason Green, Executive Director

What is the broader cost of losing an employee? We regularly see attempts to fill a position to be a real struggle for employers. I think maybe smaller utilities and cities struggle more in this area. Politics, pay, benefits, flexibility, reputation, long-term employment history, challenges and increased responsibility/position, contentment and satisfaction at work all play in the staying motivation and hiring interest. Employee turnover can have both positive and negative impacts (sure glad they're gone or what do we do now?!). I believe it's a positive move to attempt to be supportive of someone wanting to move on. If they don't want to be here, why hinder their search and move? There can be things to learn or change though which may be behind the move and worth the boss looking into... it may even be the boss! There may be employee losses due to simply a poor fit, pay, family needs or location of living (some locations require higher wages just to live there!). An employee departing isn't necessarily good or bad, but is certainly an inconvenience and costs time and money. The unhappy or cranky employee that has threatened to leave or has actually found a new job elsewhere and hasn't left yet — these can be challenging and may also be laced with a recent level of gumption and grit directed at co-workers or the boss — seems sometimes this type gain a late in employment voice and opinion. No matter what type of leaving, criticisms and comments and tale-bearing in a negative, hurtful and manipulative manner is not a classy way to exit nor is it right. I dare not suggest how to leave, because sometimes leaving may be complicated and require the assistance of an attorney for either side. Just that there are many reasons and there is a cost in resources of a vacated position and to fill that position.

OAWU opened its doors in 1977 and since then, there have only been three employees that have retired from the Association. OAWU now has a string of employees all nearing the 15 to 20 year mark. This is a great testimony to the team's professionalism and maturity and to the leadership of the Association Board of Directors. We are now faced with our first long-term employee retirement - Mark Russell says he provided a 3-year notice. I believe the correct version, as I recall, is that he is not able to retire until he is 90 or I retire first! It is a pleasure and joy seeing someone you have successfully worked with for many years retire. I am proud to know Mark and also proud of his work history, capabilities and that he chose OAWU to spend all those years with!

The importance of hiring right, best, the first time seems much more important when we are needing someone with qualifications and fit now and yet, too many times that thought is after the fact when we wished we actually had hired right, best! It is so much better to practice planning ahead in ways of cross-training, getting folks water and wastewater certification levels above their responsibility, writing SOPs and policies, etc. You know, training up and mentoring and having a succession plan... because folks leave. Whether it be voluntarily, forced out, in a good or a terribly bad departure or even in the unexpected way of dying in the harness! Its going to happen

Oregon Association of Water Utilities



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and we best be somewhat prepared! I don't believe there are any real tricks to hiring right. It is a lot of work, a little prayer and some gut, but we all know you get what you put into it! Competitive salaries and benefits, flexibility, salary, benefits (did I mention salary and benefits?), training, security, location, etc. You get what you advertise for and pay for. Make the ad attractive and advertise early, wisely and where you will attract the most attention from those qualified — though there is nothing wrong with being a forklift driver, I don't want 23 experienced forklift drivers applying for my WT III certified operator position nor my accountant! Cover the benefits along with the duties, challenges and opportunities. Be fair, truthful and careful in describing the position and be willing to pay for it! We aren't just looking for a warm body, we are looking for a long term relationship with great personality, honesty, work habits, delivery of goods/tasks... right? Oh, oh! Don't forget HR and BOLI requirements!

We want to see grace and humbleness and fairness in the exit. Likely, you too have listened to your share of



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complaints and sneers from someone who left a job and can't keep quiet about how inept the boss was or how they were so wronged. I don't like to hear this and if it is real, keep it to yourself or go talk to BOLI or an attorney about it please! We also must move through these times carefully, being respectful no matter how or what the departure is and into the advertising, looking for a new replacement without wasting time! It can be a precarious position to be in, especially with someone who has faithfully been your go-to and trusted person for all those years. They may face many challenges while continuing to work for you, and it's not necessarily all about retiring. In their thinking, they may really not want to go - who will do this, that, meet the timeline, take care of this filing, keep the boss from stepping on their own feet and who will make them look good? OK, that was all me, but it is true! Who will do that? Who will be the next person to fill those giant shoes?

Mark Russell has been one of those "Right Hires!" I will miss him! •



Retirement: 3-Year Notice

by Mark Russsell, Office Manager

In April 2017, I gave Jason Green my 3-year notice for retirement: March 31, 2020.

Why such an early notice, you ask? My initial thoughts were to give Jason plenty of time to get used to the idea and to help me get into the mindset of seriously preparing myself for the life of retirement after a full lifetime of working. It recently occurred to me that I could retire now if I chose to. But who ends their career with an awesome association at 19 years? At the end of March, I will be able to say, "I worked for OAWU for over 20 years."

Lasts?

My precious wife and I are celebrating our 37th wedding anniversary in November. She was the first to alert me to the "Lasts." In April, I started my last year with OAWU. It would be my last fulltime job and my last annual independent audit. It would be the last Seaside and Sunriver conference, my last OAWU campout as a staff member, and my last year of filing those wonderful quarterly payroll tax reports and income tax returns. Also, the last proofing of the *H2Oregon* magazine, various brochures/fliers, and the list could go on and on.

SOPs?

You can never have too many SOPs? Right? Months ago, Jason asked (directed) me to update and or create Standard Operating Procedures for the various duties and assignments that I am responsible for. So, the process has been an off and on mission to complete as activities and events have presented themselves. Let me tell you, if we have been with a company for a long time and we really like our job, that there is a lot of information we have in our head that is not written down anywhere. My recommendation to those of us approaching our "lasts" is: start writing those SOPs now.

Did I need to give a 3-year notice? No, but it has been fun to tell about it. Has it made a difference? Yes, it's been nice to not feel rushed to get 'stuff' ready for my replacement and I find I am cherishing the lasts with customers, co-workers/friends. This time has gone by too fast and it has been enjoyable to get used to the idea and talk about it more as the end is approaching. Are the SOPs completed? Nah! It's a work in progress, right? Getting closer to finished, however.

Five months, six days, fifteen hours, ten minutes to go. But who is counting? •





The weather this year was fantastic, just a little bit of rain, and the activities were great. Monday's preconference provided great classes and a few extra CEUs to those who attended. The conference was kicked off by an opening session given by OAWU's Executive Director, Jason Green, and a legislative update by Mark Landauer via phone. Tuesday held the evening barbecue with a meet and greet social, exhibitor prize give-away, followed by a fun time at the beach. Wednesday continued with a full day of classes; some took the afternoon off to participate in the annual OAWU Golf Scramble at Gearhart Links. Thursday concluded the conference at noon with some final words and the highly anticipated raffle drawings and cash prizes.

- Thank you to this year's Gold Sponsors, Core & Main and Lakeside Industries; Silver Sponsor, H.D. Fowler; and our Bronze Sponsor, CoBank.
- Beach beverages sponsored, again this year, by Ferguson Waterworks
- Annual golf scramble at Gearhart Links which hosted 10 teams
- At closing session, Thursday, OAWU gave away over \$1,500 in merchandise and \$250 in cash prizes
- Congratulations to this year's WaterPac raffle winner and to the winner of the Jeff Swanson Memorial Scholarship raffle
- The winner of a full registration to the OAWU Sunriver Conference in March 2020 was won by Jack Lindeman from the City of Reedsport

Mark your calendar for next year's OAWU Summer Classic in Seaside, Oregon August 17-20, 2020. See



in Seaside, Oregon





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OAWU's Annual Golf Scramble

Seaside, Oregon • Gearhart Links Golf Course • August 21, 2019



The day started off with a chill, some rain, and a little wind. As the day progressed it became pleasantly warm; it was a perfect day to hit the links for this year's scramble. The staff at the Gearhart Links Golf Course were accommodating, friendly, and professional helping to make the day even more enjoyable.

Ten teams challenged the course this year, making for a great competition. No one was safe from the errant drive, misjudged chip shot, or the mocking one received when their shot landed two fairways over; we must also admit that there were many great players and many awesome shots on the course again this year. The banter helped build camaraderie throughout the scramble.

Special thanks to – EJ our sponsor for first place this year; to Owen Equipment, RDO Equipment Co., FlowHawks, and NAPCO for being this year's hole sponsors and for their support of the attendees and the Association.

Congratulations to all the teams who played this year, but especially to the teams that placed.

The winners of the golfing competition games were:

- Longest Putt #1 Craig Smith
- Longest Putt #2 Chris Stark
- KP Men's Bob Waller
- KP #1 Don Miller
- KP Women's Jessica Bentz
- Longest Drive Men's #1 Scott Hanna
- Longest Drive Women's #1 Terri Beam
- Longest Drive #2 Craig Smith

Special thanks go out to Jeff Crowther (Wastewater Technician), Heath Cokeley (Circuit Rider/Programs Manager), and Bob Waller (Circuit Rider) who helped make sure the scramble went off without a hitch.

Mark your calendar for OAWU's next Summer Classic at Seaside August 19–22, 2020. It is a great location to enjoy while you earn CEUs and network with the Associate Members and your peers.





Revisiting Witching

by Scott Berry, Operations Manager

Several years ago, I wrote an article for H2Oregon titled "Witching or Wishing." After having several discussions about the topic of witching for water over the past few weeks, I decided it was time for another look at the topic.

When I was very new to the water industry, I was introduced to the phenomena know as water witching. This practice was purported to be able to show where the underground water pipes were located. It looked interesting and the guy showing me how to do it said he was sure it worked. However, he was not sure enough to show me where the pipe was and then turn me loose on the backhoe without doing a lot of slow hand-digging, as is prudent in any underground excavation. I remained skeptical and over the years I kept asking those in the industry about this practice and started doing some research on my own.

Whether you call it Witching, Dowsing, Rhabdomancy, or Divination, it's all the same practice. Some say it has roots in the Bible and that Moses was the first practitioner (Numbers 20 9:11) or that it originated in 1540 in the publication De re Metallica by Georgius Agricola. The questionable nature of the phenomenon has drawn suspicion since the beginning. There has always been a struggle between skeptics and believers, neither group being able to persuade the other by reasoning or experiments. Numerous times, dowsing has been tested scientifically without producing any significant positive results.

Over the centuries there have been many theories as to how it works. Everything from E-Rays (from German *Erdestrahlen*, earth-rays) that are believed to originate within the earth and penetrate the crust to form an invisible latticework of lines. Local circumstances such as underground streams, minerals, and geographical formations are also said to cause fields that radiate from the ground. These fields are believed, by some, to affect health, animal behavior, human "auras", plant growth, and many other things. The believers will emphatically tell you that these fields can be easily detected and demonstrated with the use of a dowsing rod. Skeptics will say that there is no scientific basis to support the existence of these fields and that they can *only* be demonstrated using a dowsing rod.

Dowsers fancy a notion that they call 'polarity'. All E-rays and other obscure energy fields have this polarity, either positive or negative. The meaning of polarity differs depending on which dowser is asked; some say it refers to the effects the fields have on humans, others say it refers to electrical polarity.

"Man's capacity for self-delusion is infinite." –Dr. Elie A. Shneour, Biosystems Research Institute.

In the multitudes of studies that have been done on this topic over the past five centuries, it has been proven that the "positive" results of dowsing are attributable to three key factors:

The Ideomotoric Effect

Take a paper clip and tie a 12-16 inch thread to it. Rest your elbow on the table, hold the loose end of the thread with your fingers and let the paper clip swing like a pedulem right above the table. Hold still and try not to move your arm at all.

Now visualize that the paper clip moves back and forth but do not move your arm. Does the pendulum swing? If not, concentrate harder because it *will* eventually move.

Ideomotoric Effect is a subconscious movement governed indirectly by your expectations rather than conscious muscle activity. In the case of dowsing rods, a very small movement away from equilibrium causes great fluctuations in the rods. Rods do not move by themselves!

Instability and External Attribution Bias

As in the case of L- or Y-shaped rods, the instability of the instrument itself enhances the instrument's credibility. An unstable system is very difficult to keep in equilibrium and deviations must always be compensated for. This unpredictability causes the dowser to believe that he has no control over the rod's movements, which, so far, is correct. It is when the dowser interprets the cause of the movements to be of exterior origin that an illogical conclusion is drawn.

Note that nothing is stated about whether the dowser is right or wrong—but an illogical conclusion is no more than a questionable assumption, which, of course, might be true. What's psychologically interesting is the proneness to think that 'if I can't control the moving instrument resting in my hands, then something else does!' This tendency to attribute a self-caused effect to external sources is called *external attribution*.

Expectations and Suggestive Environments

The influence of expectations on the subconscious and random activities of the system can cause just about any effect. A suggestive environment, for example, supportive and enthusiastic onlookers, makes the positive outcome more probable regardless of contingent physical effects involved. After spending some time in the industry and installing many miles of pipeline, excavating for leaks and service installations, I began to get "better" at witching. The reason for this is that I subconsciously put myself in the shoes of the original pipeline installer and based on my surroundings, ie; the location of ditches, property lines, roads, curbs, trees, rights of way, etc. I subconsciously decided where I would have placed the pipeline and sure enough... That's where the witching sticks said it was.

The primary task of the experimenter is, in the case of dowsing, to try to eliminate the test result's dependence on the subject's expectations, a principle not commonly practiced among dowsers. Why would they try to falsify their own hypotheses when they're already convinced that dowsing works? The answer to this simple question essentially differentiates science from pseudoscience. I believe that rigorous testing is happily abstained from for several reasons: ignorance, lack of knowledge, fright of disconfirming results, and the will to believe. These aspects not only make the mind susceptible to anything, they can also unjustly rule out the validity of proper test results. If a test gives a negative or unexpected result, the test itself is concluded to be erroneous.

I fully expect to be engaged in debate about this article as I'm out in the field visiting with you all. In the spirit of "letting sleeping dogs lay," I'll concede that some of you have a better than average percentage with dowsing rods, though I still believe that it's only because some of you have a better than average understanding of how your system is laid out! •

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Not to be Alarmed,

by Hans Schroeder, Circuit Rider

I've noticed that the PFOA and PFAS discussion has recently surfaced again nationwide. While at a national conference last month I sat through a presentation concerning this topic. The topic is on both national and local news. Currently EPA has established the health advisory level at 70 parts per trillion. And yes, at this time it is noted as a "health advisory." This means that it's on EPA's radar and PFOA and PFAS will have an MCL and MCLG in the future.

Further research shows that it is more predominant in Michigan, the East Coast, and military sites with a history of using PFAS-based firefighting foam. Michigan shows more sites than other areas due to being very proactive in testing for the PFAS chemical. Michigan has tested more than 1,700 public drinking water supplies statewide for PFAS compounds — every public water system, even down to mobile home parks, every tribal water system, every school, and daycare/Headstart with its own well has been tested. Regulators also have tested residential wells in known areas of PFAS contamination.

According to the Portland Water Bureau's website, they tested for 6 types of PFAS in 2014 and 2015 in drinking water from the Bull Run Watershed and the results were all non-detect.

I believe this issue will need to be addressed at both the state and local level through sampling as the EPA continues to look closer at these chemicals.

The content below can also be found at www.epa.gov/pfas/basic-information-pfas.

What Are PFAS?

Per- and polyfluoroalkyl substances (PFAS) are a group of man-made chemicals that includes PFOA, PFOS, GenX, and many other chemicals. PFAS have been manufactured and used in a variety of industries around the globe, including in the United States since the 1940s. PFOA and PFOS have been the most extensively produced and studied of these chemicals. Both chemicals are very persistent in the environment and in the human body – meaning they don't break down and they can accumulate over time. There is evidence that exposure to PFAS can lead to adverse human health effects.

PFAS can be found in:

- Food packaged in PFAS-containing materials, processed with equipment that used PFAS, or grown in PFAS-contaminated soil or water.
- Commercial household products, including stain- and water-repellent fabrics, nonstick products (e.g., Teflon), polishes, waxes, paints, cleaning products,

but to be Aware



and fire-fighting foams (a major source of groundwater contamination at airports and military bases where firefighting training occurs).

- Workplace, including production facilities or industries (e.g., chrome plating, electronics manufacturing or oil recovery) that use PFAS.
- Drinking water, typically localized and associated with a specific facility (e.g., manufacturer, landfill, wastewater treatment plant, firefighter training facility).
- Living organisms, including fish, animals and humans, where PFAS have the ability to build up and persist over time.

Certain PFAS chemicals are no longer manufactured in the United States as a result of phase outs including the PFOA Stewardship Program in which eight major chemical manufacturers agreed to eliminate the use of PFOA and PFOA-related chemicals in their products and as emissions from their facilities. Although PFOA and PFOS are no longer manufactured in the United States, they are still produced internationally and can be imported into the United States in consumer goods such as carpet, leather and apparel, textiles, paper and packaging, coatings, rubber and plastics.

Why are PFAS important?

PFAS are found in a wide range of consumer products that people use daily such as cookware, pizza boxes and stain repellants. Most people have been exposed to PFAS. Certain PFAS can accumulate and stay in the human body for long periods of time. There is evidence that exposure to PFAS can lead to adverse health outcomes in humans. The most-studied PFAS chemicals are PFOA and PFOS. Studies indicate that PFOA and PFOS can cause reproductive and developmental, liver and kidney, and immunological effects in laboratory animals. Both chemicals have caused tumors in animals. The most consistent findings are increased cholesterol levels among exposed populations, with more limited findings related to:

- low infant birth weights,
- effects on the immune system,
- cancer (for PFOA), and
- thyroid hormone disruption (for PFOS).

What is the difference between PFOA, PFOS and GenX and other replacement PFAS?

Per- and polyfluoroalkyl substances (PFAS) are a group of man-made chemicals that have been in use since the 1940s, and are (or have been) found in many consumer products like cookware, food packaging, and stain repellants. PFAS manufacturing and processing facilities, airports, and military installations that use firefighting foams are some of the main sources of PFAS. PFAS may be released into the air, soil, and water, including sources of drinking water. PFOA and PFOS are the most studied PFAS chemicals and have been voluntarily phased out by industry, though they are still persistent in the environment. There are many other PFAS, including GenX chemicals and PFBS in use throughout our economy.

GenX is a trade name for a technology that is used to make high performance fluoropolymers (e.g., some nonstick coatings) without the use of perfluorooctanoic acid (PFOA). HFPO dimer acid and its ammonium salt are the major chemicals associated with the GenX technology. GenX chemicals have been found in surface water, groundwater, finished drinking water, rainwater, and air emissions in some areas.

As part of EPA's draft toxicity assessment, the agency has developed draft oral reference doses (RfDs) for GenX chemicals and PFBS.

How are people exposed to PFAS?

There are a variety of ways that people can be exposed to these chemicals and at different levels of exposure. For example, people can be exposed to low levels of PFAS through food, which can become contaminated through:

- Contaminated soil and water used to grow the food,
- Food packaging containing PFAS, and
- Equipment that used PFAS during food processing.

People can also be exposed to PFAS chemicals if they are released during normal use, biodegradation, or disposal of consumer products that contain PFAS. People may be exposed to PFAS used in commercially-treated products to make them stain- and water-repellent or nonstick. These goods include carpets, leather and apparel, textiles, paper and packaging materials, and non-stick cookware. People who work at PFAS production facilities, or facilities that manufacture goods made with PFAS, may be exposed in certain occupational settings or through contaminated air.

Drinking water can be a source of exposure in communities where these chemicals have contaminated water supplies. Such contamination is typically localized and associated with a specific facility, for example,

- industrial facility where PFAS were produced or used to manufacture other products, or
- an oil refinery, airfield or other location at which PFAS were used for firefighting.

PFOA, PFOS, and GenX have been found in a number of drinking water systems due to localized contamination. You can view more information about exposures to PFAS through drinking water on our Drinking Water Health Advisories for PFOA and PFOS page [www.epa.gov/ground-water-and-drinking-water/ drinking-water-health-advisories-pfoa-and-pfos].

Are there health effects from PFAS?

There is evidence that exposure to PFAS can lead to adverse health outcomes in humans. If humans, or animals, ingest PFAS (by eating or drinking food or water than contain PFAS), the PFAS are absorbed, and can accumulate in the body. PFAS stay in the human body for long periods of time. As a result, as people get exposed to PFAS from different sources over time, the level of PFAS in their bodies may increase to the point where they suffer from adverse health effects.

Studies indicate that PFOA and PFOS can cause reproductive and developmental, liver and kidney, and immunological effects in laboratory animals. Both chemicals have caused tumors in animal studies. The most consistent findings from human epidemiology studies are increased cholesterol levels among exposed populations, with more limited findings related to:

- infant birth weights,
- effects on the immune system,
- cancer (for PFOA), and
- thyroid hormone disruption (for PFOS). •

NRWA Notice

Visit the website below for PFAS class action lawsuit information or to be added to the lawsuit. https://nrwa.org/initiatives/pfas/

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An Easier Approach

by Tim Tice, Projects Manager

The old farmer's saying, "Life is simpler when you plow around a stump!" Can be adapted for many instances, one being how to complete a task. As a better way to get the word out to our membership and be more efficient (pun intended) with the new Energy Efficiency Circuit Rider program, the goal of this article is to share some old ideas with water and wastewater operators and bring them back to the forefront.

Energy (electric bill) is one of the highest cost items in a utility, and motors often consume the biggest share of electricity. One can also look at air conditioning (HVAC), lighting and motion sensors to upgrade, but electrical motors account for 30-40 percent of all electric energy consumption at a utility. Overall, drinking water and wastewater systems account for approximately 2 percent of energy use in the United States.¹

There are several ways to reduce costs. Power measurements can be a tool used to help find ways to reduce energy consumption, by aligning the costs with the culprits that create them.

Where to begin? Invite OAWU to review the motors that transfer water or wastewater for your utility. This review is essentially a three-step process that provides a tool for you and your team to consider if a motor replacement or a control system upgrade is needed.

What does OAWU need to begin the process? Four facts about each motor. The first three are a) size of motor (Hp), b) the operating RPMs of the motor, and c) the daily operating hours. The first two are typically found on the nameplate of the motor; the third is discovered by gallons pumped or hour meters.

The *fourth* item would be monthly electric bills from the electrical meter that serves the motor. A full year of electric bills will allow us to determine a) efficiency of the motor, b) demand percentage (major part of the electric bill), c) savings from motor replacement or addition of a control mechanism.

We would like to share with you some real-life examples that we have discovered by those asking for an energy assessment report.

1 www.epa.gov/sustainable-water-infrastructure/energy-efficiency-water-utilities

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Example One

- 15 HP motor
- \$6,486 annual operating cost
- Efficiency 91 percent (no motor replacement)
- Adding VFD controller \$3,000.00 annual saving

Example Two

- 25 HP motor
- \$19,000 annual operating cost
- Efficiency 52 percent
- \$4,000.00 annual savings (motor replacement)

Once the energy report is completed, we send it to you via e-mail with a follow-up if you wish to proceed to the next step. We will not recommend any change if the return on investment is not worthwhile. We do provide an opportunity to discuss what would be the next step. Whether the next step is a replacement, addition of a controller, or developing the motor and pump replacement into a larger project (booster station remodel), the association trusts the reports can be a tool to prove cost reduction. A report can be used to share information with decision makers to shed light on a way to reduce operating and maintenance costs.

As we shared with you at the beginning of the article, 30–40 percent of operating expenses are linked to power consumption and significant savings can be obtained. Not every motor will see substantial savings, but we won't know until the data is reviewed. The savings have also been seen with large motors in wells or long-run-time aerators in wastewater lagoons.

There are organizations, agencies, and engineers that can assist in design, cost analysis and lending to move a project forward upon completion of the energy assessment. Looking at energy can be the small step into a larger upgrade of your utility. Plowing around the stump is a step in the right direction, but that is only if you know where the stump is. Let us find the stump for you by reviewing your energy culprits. If you wish for additional information or want to get started, you can call the OAWU office or send an e-mail to ttice@oawu.net to get the ball rolling. *The best that life has to offer!* •

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by Bob Waller, Water Circuit Rider

Community Water Systems (CWS) must take lead and copper samples. Most systems are on "reduced monitoring" sampling June 1 through September 30 every three years. The samples must be taken from sites that meet the requirements.

Tier 1: Single Family Structures that have any of the following:

- Copper w/lead solder (CLS) constructed after 1982 (constructed between 1983-1988)*;
- lead pipes including lead goosenecks or pigtails (LP);
- or lead service lines (LSL).

Only after a CWS has exhausted Tier 1 sites may it complete its sampling pool with Tier 2 sites.

Tier 2: All types of buildings, including multiple family structures that have any of the following:

- Copper w/lead solder (CLS) constructed after 1982 (constructed between 1983-1988)*;
- lead pipes including lead goosenecks or pigtails (LP);
- or lead service lines (LSL).

Only after a CWS has exhausted Tier 1 and Tier 2 sites may it complete its sampling pool with Tier 3 sites.

Tier 3: Single Family Structures that have:

• Copper w/lead solder (CLS) constructed before 1983.

Only after a CWS has exhausted Tier 1, Tier 2, and Tier 3 sites may it complete its sampling pool with other sites that are representative of the distribution system.

Finding sites that meet these criteria can be difficult. Do you have any lead service lines, Goosenecks, OLD houses? Get out the distribution maps and FIGURE IT OUT. Talk to local plumbers one that has been around for a long time. Talk to the county Property Valuation Administrator (PVA). Also, it wouldn't be a bad idea to have a few extra addresses written down that meet the criteria in case one falls out. Keep in mind you will have to get the site approved by the County Environmental Health Program Administrator/Sanitarian, or OHA.

All sample sites from which first draw samples are collected must be selected from this pool of targeted sampling sites. Sampling sites may not include faucets that have point-of-use or point-of-entry treatment devices designed to remove inorganic contaminants. Does the site have a water softener? How about a point-of-use filtration system? So, when notifying the customers about upcoming lead and copper sampling ask if softeners or other devices have been installed.

Community Water Systems will take samples based on number of people served by the water system. Depending on the status you are on, Standard Monitoring, or Reduced Monitoring. If on reduced monitoring, you are probably taking between 5 and 20 samples. Training the customers to take the samples correctly is critical. We get reduced monitoring status by having customers sample correctly. Use a cold-water kitchen or bathroom tap in single-family residences (no mixing valves!) Take first-draw samples after water has been

How are we doing?

motionless for at least 6 hours (this is known as the stagnation period). Take first water usage of the day OR first water usage after returning home from work. Tell the homeowner to use a sticky note—TRAIN THE HOMEOWNER!!!!

Let's look at some dos and don'ts of lead and copper sampling.

Do

- Do detach any water filters before collecting a sample.
- Do leave the aerator or screen on the faucet.
- Do collect a first draw sample out of the tap after the stagnation period.
- Do use cold water side.
- Do fill water bottle to the neck.
- Do fill out all the paperwork.
- Do let your municipality know the sample is ready.

Don't

- Don't use any water from this faucet for at least 6 hours.
- Don't use a faucet that is not a regularly used site.

- Don't use a faucet that is connected to home water treatment devices such as reverse osmosis, iron filter, or a water softener. You must bypass the water treatment device in order to take an accurate sample.
- Don't forget to fill out the table and paperwork included.

I always let the homeowner know that I would get the results back to them as soon as I received them.

Also, do you have a chemical, change, source water change, treatment process change? This may lead to restarting Lead/ Copper Monitoring.

There is no need to have homeowners acidify samples. You have 14 days to add nitric acid; the lab will normally do this.

Many systems use sites because they always used them. It may be a good time to reevaluate your sample sites. Water systems need to have updated sampling plans with correct Tier Levels on file with their primacy agency. These should be reviewed frequently for accuracy.



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by Jeff Crowther, Wastewater Technician

We all know the difficulty in getting our infrastructure built in the best way providing the greatest value to a jurisdiction, as well as, the public at large. We try to build what we can with our own crews, but often projects are too large or too specialized and require that we use an outside contractor to get the work done.

When we use contractors, the quality of the work is usually very high. Although these firms specialize in this work, as the owner we still have an obligation to verify that we are getting what we pay for. This starts with the contract and specifications we use for the job. We need to make sure that the contract and specifications are specific in what we want to receive, as well as, the tests we plan to run to verify that it was constructed correctly. We should also plan to have a representative of our jurisdiction act as an inspector on the project, confirming that what was in the contract is what was installed and proper backfill and compaction was completed to protect the pipe in the ground, as well as, the road bed and asphalt on top of the improvement. If something is installed incorrectly, or if they don't use the correct amount or type of material, it can greatly impact the useful life of the improvement.

Not only do we need to make sure the inspection is occurring, we should verify it is documented correctly. One of the most important tools available are daily reports. This can be extremely important if a claim is filed either by the contractor or by the jurisdiction. In the unfortunant case that we have to go to court due to a claim, having these daily reports can save a substantial amount of money because we are able to provide a clear picture of the issues the project encountered and what the timeline of these issues were. Any change orders that occur should be clearly documented.

We should also document material types, as-built locations, and various other aspects of our project. This information can help when we are performing maintenance down the road, or if we have warranty issues with any of the installations. Knowing what was installed and when can help us make the correct choice when determining how to move forward with any maintenance issues that may be encountered. •

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2019 TRAINING & EVENTS

Date	Class Title	Location	CEU Information	ESAC#,	Fee/Free
November 4	Effective Utility Management	Grand Ronde	0.6 Water/Wastewater	3984	FREE
November 4–7	2nd Annual Spirit Mountain Casino Operator's Conference	Grand Ronde	2.7 Water/Wastewater	3984	Fee
November 13	Confined Space	Albany	0.3 Water/Wastewater/Onsite	3841	Fee
November 13	Hazardous Communication Standard (Global Harmonization) Albany	0.3 Water/Wastewater	3459	Fee
November 14	Water & Wastewater Field Operations & Safety	Salem	0.4 Water/Wastewater	3568	Fee
November 14	Leak Detection	Salem	0.2 Water/Wastewater	3709	Fee
December 9	Effective Utility Management	Hood River	0.6 Water/Wastewater	3994	FREE
December 9–12	21st Annual End of Year Operator's Conference	Hood River	2.7 Water/Wastewater	3994	Fee

2020 EVENTS • MARK YOUR CALENDAR!

January 7–8	Water Treatment/Distribution Certification Review	Salem	1.4 Water/0.5 Wastewater/OS	3394	Fee
March 2–6	42nd Annual Management & Technical Conference	Sunriver	2.4 Water/Wastewater	ТВА	Fee
May 13	5th Annual OAWU Expo	Polk County Fairgrounds	0.4 Water/Wastewater	ТВА	FREE
August 17–20	26th Annual Summer Classic Conference	Seaside	2.0 Water/Wastewater	ТВА	Fee
September 28–30	2020 Fall Operator's Conference	Florence	2.0 Water or Wastewater	ТВА	Fee
November 2–5	3rd Annual Spirit Mountain Casino Operator's Conference	Grand Ronde	2.0 Water/Wastewater	ТВА	Fee
December 7–10	22nd Annual End of Year Operator's Conference	Hood River	2.0 Water/Wastewater	ТВА	Fee

Levels 1-4 Water Operator Exams

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

More Resources

Drinking Water Data Online Drinking Water Services https://yourwater.oregon.gov 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 or visit www.oawu.net.

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Water Resilience

by Mike Collier, Deputy Director

It's coming...

Risk and Resilience Assessments and Emergency Response Plans need to be completed and/or updated.

This in from "America's Water Infrastructure Act of 2018," this law requires drinking water systems that serve more than 3,300 people to update their Risk and Resilience Assessments and Emergency Response Plans (ERPs). It is the water system's job to certify the updates with EPA. All this information, deadlines, and the how to is from: www.epa.gov/waterresilience/americas-water-infrastructure-act-2018-risk-assessments-and-emergency-response-plans

Let's quickly look at some of the specifics. The Risk and Resilience Assessments must follow the standards set forth in the Act and shall be completed and certified by the following dates:

- March 31, 2020, if the systems serves 100,000 or more in population;
- December 31, 2020, if the system serves between 50,000 and 100,000 in population;
- June 30, 2021, if the system serves a population between 3,300 and 50,000.

All ERPs must be certified as completed no later than six months after completing and certifying the risk and resilience assessment.

It is important to note that the total population served would include the people in a system you sell water to. So if your system has a population of 2,000 and you sell some water to a neighboring system that serves 1,500 then you would have a total number served over the 3,300 threshold and would be required to completed both the Risk and Resilience Assessment and the ERP (or update if you already have one in place).

The Risk and Resilience Assessments, according to this law, must include:

- the risk to the system from malevolent (malicious) acts and natural hazards;
- the resilience of the pipes and constructed conveyances, physical barriers, source water, water collection and intake, pretreatment, treatment, storage and distribution facilities, electronic, computer, or other automated systems (and the security of such systems) utilized by the system;
- the monitoring practices of the system;
- the financial infrastructure of the system;
- the use, storage, or handling of various chemicals by the system; and
- the operation and maintenance of the system.

The assessment may also include an evaluation of capital and operational needs for risk and resilience management for the system. The EPA is to provide baseline information on malevolent acts of relevance to community water systems no later than August 1, 2019. This information must include acts that may:

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(1) substantially disrupt the ability of the system to provide a safe and reliable drinking water; or

(2) present significant public health or economic concerns to the community served by the system.

The updated ERP shall incorporate the findings from the assessment and shall include:

- strategies and resources to improve the resilience of the system, including the physical security and cybersecurity of the system;
- plans and procedures that can be implemented, and identification of equipment that can be utilized, in the event of a malevolent act or natural hazard threatens the ability of the community water system to deliver safe drinking water;
- actions, procedures, and equipment which can prevent or significantly lessen the impact of a malevolent act or natural hazard on the safety and supply of drinking water, including the development of alternative source water options, relocation of water intakes, and construction of flood protection barriers; and
- strategies to aid in the detection of malevolent acts or natural hazards that threaten the security or resilience of the system.

Community water systems must coordinate with local emergency planning committees established under the Emergency Planning and Community Right-To-Know Act of 1986 (42 U.S.C. 11001 et seq.) when preparing or revising a Risk and Resilience Assessment or ERP under the America's Water Infrastructure Act (AWIA). Systems must also maintain a copy of the assessment and ERP (including any revised assessment or plan) for five years after certifying the plan to the EPA.

I guess the next question would be: once the assessment and/or ERP are completed how do you certify them? Well, the EPA is still working on this one, but basically you can submit the certification by snail mail, email, or online (this option is still in development). They prefer if you use the online option once it is available—with this option they will send a receipt showing that they received your submission save this receipt, it is your proof of certification. After completion of the assessment and ERP systems, serving more than 3,300 in population, must review the assessment at least every 5 years (updating the areas that need it) and certify it with the EPA. As well as reviewing the ERP, updating it with any changes that occurred in the review of the assessment, and certifying it with the EPA at least every 5 years (completing this within 6 months of the assessment certification).

Please contact OAWU for any help you may need in completing these ERPs and assessments.

For additional help go to:

Baseline malevolent acts: www.epa.gov/sites/production/ files/2019-07/documents/baseline_information_ malevolent_acts_508_072519.pdf

How to certify: www.epa.gov/waterresilience/ how-certify-your-risk-and-resilience-assessment-oremergency-response-plan

Vulnerability self-assessment tool: www.epa.gov/ waterriskassessment/conduct-drinking-water-orwastewater-utility-risk-assessment

ERP plan template and instructions: www.epa.gov/ waterutilityresponse/develop-or-update-drinking-waterutility-emergency-response-plan

Fact Sheet: www.epa.gov/sites/production/files/2019-04/ documents/awia_factsheet_04-16-2019_v2-508.pdf

Lastly, the EPA plans to destroy all old vulnerability assessments that were submitted. If you don't have a copy of the one that was submitted and would like to get a copy from the EPA before it is destroyed, you can request that it be sent to you. Submit a letter to the EPA by email to WSD-Outreach@epa.gov on utility letterhead and include the utility name, PWS ID number, address, and point of contact information for the individual who will receive the vulnerability assessment.

This request must be completed prior to the date that the system must certify their new Risk and Resilience Assessment to the EPA (see beginning of this article—the dates are based on population served). ♦





by Keith Bedell, Wastewater Technician/Circuit Rider

Tunnel vision, the tendency to focus exclusively on a single or limited goal or point of view, is something that affects us all.

What got me thinking about this was when my wife and I went out to eat at a restaurant with outside seating. We informed the host we would be outside, and we found a nice spot to sit in the shade. No one came by for about 10 minutes, so I went inside and ordered drinks. The bartender couldn't take food orders, it had to be a server. While sitting and waiting we observed the three servers coming and going waiting on other patrons, but not looking around to see if anyone needed anything or if there were new people in the area. They were so focused on certain tables that they didn't notice there were other patrons in the seating area. After another 15, patient, minutes I notified the host and we were able to order food. We were at the point of leaving to go to another establishment, it was obvious that the waiter did not even see us, he was focused only on the tables he had.

Do you sometimes focus on a single problem or project so much that you forget about the big picture? I know that I do, getting caught up in the excitement, productivity, or just trying to finish a project on time can make us forget that we have other important things on our plate. How do we keep track of everything and focus? Post-it notes, computer reminders, reminders on our phone, or, if we are lucky, have an assistant to keep us on track.

There isn't a single way to maintain focus that works for everyone. Just trying to keep the things we must do in perspective to help us stay on track. At the end of the day, look back and see what we have accomplished and where we are at in our daily, weekly and monthly projects. Try to prepare our next day before leaving work so we can relax for the evening, and we will be ready to go first thing the next day. Don't let daily distractions derail. It is easy to get sidetracked by phone calls or visitors. Limit the time we spend conversing with others and stay on topic. Looking back on our accomplishments each day can give us the confidence to keep moving forward.

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Watching Out for the Other Guy

Heath Cokeley, Programs Manager/Circuit Rider

I like motorcycles and that pretty much goes for anything with a motor, but especially motorcycles. My first dirt bike was a little Honda 50. After that I stepped up to a Trail 90, which looking back may not have been much of a step up, but I still have that bike and like it.

After realizing at some point that I got far too stupid to have two wheels in the dirt (my buddies Honda CRF 450 taught me that), I went to four wheels with both quads and trucks. I still like two wheels on the pavement and occasionally off road, but nowhere near as much as I used to.

I tell you all that to tell you this. When I am riding, what is my most important job? You could say it is obeying all the traffic laws and watching for road hazards, but really on a bike the most important thing, in my eyes, is watching out for the other person. Why would that be? Because it is the other person who is going to pull out in front of you, change lanes into you, or just totally fail to see you when they are driving. Is this their fault? Of course, it is, but does that make you any less ran over? That same mentality works in life. If we are observant and carful, we can drastically reduce the number of times we get yourself into a bad situation.

We can take the same approach with a boss or co-worker. Watching out for them and keeping them out of harm's way is going to benefit both parties in the long run. I had a boss one time that told me part of my job is to know what he wants done next before he knows it. So, I took that and did my best to learn from it. I always tried to think a few steps ahead of him so I could have things ready for our projects. That is not possible all the time, but I think any of us who have been on any type of job site can relate. It can be as simple as watching the guy in the hole and having the tool or part he needs next ready for him. For on any job site and especially ones where there is excavation, every position on that job site is vitally important from the Competent Person to the Grunt. And yes, I know some of you are laughing because you fill both those hats and all others in-between.

The bottom line and the point I am trying to make in this article is just watching out for ourselves and making sure our actions are right and appropriate are not enough in today's world. Taking a step back, observing the situation and basing our dissension on those observations could just keep us out from under the tires. I hope you can find something to take away from this article and as always, I will see you down the road. ♦

QUIZ CORNER

1. How many grooves on the edge of a quarter (25 cents) coin?

4.	125	C.	119
B.	112	D.	100

- 2. What is the average life (in play) of a Major League Baseball?
 - A. 1.2 innings (5 outs)C. 2 outs)B. 6 pitchesD. None of the above
- 3. Aerobic organisms give end products of
 - A. CO2 and H2SC. CO2 and H2O
 - B. Methane and H2O D. CO2 and Methane
- 4. Pond loadings may be expressed in
 - A. Acres per pound of BOD
 - B. Acres per day per person
 - C. Pounds of organic acid per day per acre
 - D. Million gallons per acre
 - E. Pounds of BOD per day per acre

5. Calculate drawdown, in feet, if the water level in a well is 20 feet below the ground surface when the pump is not in operation and the water level is 35 feet below the ground surface when the pump is in operation.

A. A. 15 feet	C. C. 35 feet
B. B. 20 feet	D. D. 55 feet

6. What is the most common method used in labs to test for total coliform and E. coli?

A.	A. DMA	C.	C. Colilert
B.	B. Green	D.	D. Lamp

- 7. Calculate the chlorine demand using the following data. The raw water flow is 0.75 MGD, the chlorinator feed rate is 4.0 mg/L, and the chlorine residual is 1.8 mg/L.
 - A. A. 0.8 mg/L C. C. 4.0 mg/L
 - B. B. 2.2 mg/L D. D. 5.8 mg/L
- 8. How much does a bushel of wheat weigh?
 - A. 30 pounds

- D. 90 pounds
- B. 45 pounds
- C. 60 pounds
- ∀N3MEKS J-C' 5-B' 3-C' +-E' 2-∀' 9-C' <u>-</u>B' 8-C



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Changes in Political "Climates" on

by Laura Schroeder and Katie Jourdan

The 2019 Oregon Legislative Session has come to a close. A number of bills have passed through as new laws, some still await further committee review, and still others have failed to survive the legislative channels.

A particularly contentious bill that failed to pass through was House Bill ("HB") 2020 – known as Oregon's "cap-andtrade" bill.

The bill restated the state's policy goal to reduce greenhouse gas ("GHG") emission levels in Oregon to at least 45 percent below the state's 1990 emission levels by the year 2035, and to at least 80 percent below 1990 levels by 2050.

Although the bill was killed in the state Senate, similar bills down the road may turn out differently. A cap-and-trade program has been in the makings in Oregon for the past few legislative sessions.

If implemented, a cap-and-trade system would force water utilities and wastewater programs to implement efficiency measures in order to cap emissions and conserve allowances to trade.

The Neighborhood "Cap" on Emissions

Oregon's neighbor state, California, adopted the Global Warming Solutions Act in 2006, to reduce statewide GHG emissions to 1990 levels by the year 2020.

In 2017, California adopted Chapter 135 to extend the state's cap-and-trade program goal from 2020 to the year 2030.

California's cap-and-trade program establishes a "cap" on GHS emissions through the issuance of a limited number of permits, or "allowances." Businesses are allowed to buy and sell – "trade" – these allowances at a market price. The result: a financial incentive to reduce emission activities.

Is the Ship Sinking?

The California cap-and-trade program faced one big dilemma: none of the other states had established such a program. As a case of first impression, it is little surprise that critics find fault in the state's daring venture.



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the Horizon

A 2018 paper, published through the Harvard Kennedy School of Government, weighed in on issues with California's cap-and-trade program.

A Look at the Damages

The paper outlined several issues, including price levels and allowance overallocation.

Price Levels

The social cost of carbon is defined as the estimated economic harm from GHG emissions, converted to dollars per one ton of CO2 emitted. Another relevant factor to price setting is "leakage," which represents the shift in economic activity when caps cause businesses to relocate and displace their emissions. California's failure to address social costs and emission leakage could result in inaccurate allowance scales and exiled industries.

Allowance Overallocation

Overallocation of emission allowances potentially floods the emission "trade" market and undermines the ultimate goal of GHG emission reduction.

Some stakeholders propose setting expiration dates on "banked" allowances to help regulate how many allowances are in the market at once.

Is There a Storm Brewing?

Despite the demise of Oregon's HB 2020 cap-and-trade program, the recurring push to reduce GHG emissions will likely result in continued efforts to pass a cap-and-trade bill similar to California's program.

An awareness of where California erred is essential to proactively mitigate similar issues in Oregon. Inevitably, water utilities and wastewater programs will be forced to increase efficiency and reduce emissions to stay afloat. •

Schroeder Law Offices, P.C., was founded by Laura Schroeder and represents water-rights clients in six western states and consults internationally. You can read more about this topic and other water rights issues at Schroeder Law Offices' Water Law Blog, http://water-law.com/home/blog/.

Katie is a summer law clerk at Schroeder Law Offices. She will be completing her final year of law school in spring of 2020.

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The Thing Called Grace

Throwing My Loop by Michael Johnson

Grace: defn.—(gras)—love not deserved. noun

That's what the dictionary says. Love not deserved. Here's mine...

Grace: defn.—(gras)—love not deserved. Very strange thing. If bestowed on you, never to be forgotten. Life altering. Normally considered abstract principle, but is not. Attaches itself permanently to real and powerful events in one's life. Always accompanied by a big surprise.

I sit on my porch these days in the late afternoon, and I think about things. Seems like we are in a difficult time. So much discord. So much unhappiness. Jesus said we were supposed to be good to each other. Has that been rescinded and I didn't get the word? Turmoil in the world—yes. But there is something else out there. I look out across the pasture all the way to the tree line in the distance and I know beyond what I can see, there is something else out there, too. The thing called "grace" is out there. I know it is.

The year was 1974. About to graduate with my doctorate in psych; pressure was intense. Just after finishing my year-long internship/residency in a Dallas hospital, I needed to complete my final semester courses, pass oral and written comprehensives, finish the dissertation, and complete one more task perhaps more important than most...pass the state board exam for psychologists. The test was given rather infrequently in those days, and one had to make arrangements well in advance to be on the list of test-takers. Mine was scheduled on a Saturday at 8:00 A. M. if I remember correctly. No problem. I would leave the university on Friday afternoon, get a room, and enter the lion's den on Saturday morning to see if I could emerge unscathed. (Think Daniel passes the

exam.) I set sail for Austin, Texas on that Friday afternoon almost 300 miles to the south. Things went just swimmingly until I reached the town of Waco some three hours later, and I noticed the temperature gauge on my old truck had some bad news. Reading very hot, my radiator decided to leave us approximately 100 miles short of that Austin destination. Hmmm.

On the outskirts of town, I saw a small mechanic shop on the right.

The sign said "Closed." Not a surprise as the time was 5:30 on Friday afternoon. There was a small white house attached to that little shop, and since I couldn't think of anything else to do, I knocked on the door. A small, elderly man answered and he said, "We are closed."

"I understand," I said. "But I just need to talk to you for a minute." After listening to

my story, he said, "Well, all right. I'll take a look at it for you."

After his inspection, the verdict came forth. "I can fix it," he said.

"Not anything major, but I need a part to do that—and the store that has that part is not the kind of place we can get to open on a late Friday afternoon. I can have your truck ready tomorrow."

My heart sank. I explained to the old fellow that unfortunately this exam was not the sort of thing you could be late for. Further, when I applied for a mental health position somewhere in the next few weeks, telling potential employers I was "on the list" to take the state board exam wouldn't help. They would say, "Great. When you pass it and have your license in hand, come back and we can talk."

So we just sat there for a time, and he said, "What are you going to do?" I said, "Well,

NATIONAL

if you don't mind, I would like to sit here a bit and try to figure that out." He said I was welcome to sit as long as I liked and went in the house. I have no idea how long I sat there lost in thought weighing my non-existent options, but I do remember clearly being startled when I realized that old fellow and his wife were standing in front of me.

"I will have your truck ready tomorrow," he said. "You can pick it up on your way back through."

"On my way back through from where?" I asked.

"From taking your exam," he said—and his wife stepped forward and put the keys to their car in my hands.

See? That is the thing called "grace." Powerful and everlasting.

Always accompanied by a big surprise.

Stunned would be an understatement at that moment. "You're going to let me take your car on a 200 mile round trip?" I asked.

"Yes," the old fellow said. "We weren't planning on going out tonight. We do have two conditions however. One being we want you to be very careful with our car."

"You have my word on that," I said. "What's the other thing?"

"We want you to pass that test," he said.

So now I sit on my porch and think about times when hope seemed lost...but it wasn't. It's not now. There is still hope. I also think about Blanche DuBois, the character in Tennessee William's play, A Streetcar Named Desire. At the play's end, Blanche says, "I have always depended on the kindness of strangers."

I know what she means.

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