



H₂Oregon

Summer 2022
Vol 44, No.3

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28th Annual Summer Classic Conference
SEASIDE, AUGUST 22-25, 2022

Spirit Mountain Casino Conference
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24th Annual End of Year Operators Conference
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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:

Oregon Association of Water Utilities

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Cover photo by Heath Cokeley
Valley of the Giants near Valsetz, Oregon

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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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H2Oregon is the official publication of the Oregon Association of Water Utilities, and is published quarterly for distribution to representatives of rural and municipal suppliers. Issues are mailed free of charge to member and nonmember rural water/wastewater associations. Articles and photos are encouraged with payment in complimentary copies.

H2Oregon is published for the
Oregon Association of Water Utilities by

Mt. Angel Publishing, Inc.

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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.*

Oregon Association of Water Utilities

Operator of the Year

by Scott Berry, Operations Manager

Heath and I recently had the opportunity to travel to Phoenix, just outside of Medford, to present the OAWU Operator of the Year award to Matais Mendez.

We have been familiar with Matias for several years. I first met him at a Certification Review class quite a few years ago and have been able to observe the trajectory of his career and his service to his community. He has proven himself to be a good steward of the industry and a good leader. It has been said that the true measure of a man comes through during times of crisis. For Matais, that time of crisis happened on the morning of September 8, 2020.

Around 11:00 am a fire of “suspicious origin” started on the north edge of Ashland near the BMX facility and the wastewater treatment plant. Fueled by strong, dry winds, the fire swept north at an alarming rate of travel. By that evening it had traveled from the north edge of Ashland through Talent and Phoenix, and finally lost momentum as it burned into the southern part of Medford. During that one hellish day more than 2600 homes and businesses were destroyed.

Matais’ wife Sonia was out of town during the fire. His sons Aaron, Adan, and Adrean were home that day and their home was in the path of the fire. Matais returned home to make sure his kids were safe, and he then followed them out of town. As soon as he was sure they were safe, he turned around and headed back work. He and his 3-person crew worked many long hours in the weeks and months following the fire. Initially, the biggest hurdle that had to be overcome was the water loss from all the destroyed homes and businesses. Matais and his crew systematically went from service connection to service connection turning off valves in order to stem the hemorrhaging of water. They were able to restore pressure to most areas quickly.

While Matais and his crew were busy taking care of the town, his own home burned to the ground like so many others. Following the loss of more than 2600 homes, building contractors were understandably hard to come by. Matais would not be defeated. He, with the help of his son Adan, gathered tools and resources and got to work rebuilding their family home themselves. They did this all while still putting in the long hours at work necessary to take care of his community and support the long process of recovery.

Matais, over your 20 plus years at the City of Phoenix, you have continued to exhibit dedication and genuine concern for the well-being of the community that you serve with pride. Heath and I were honored to present you with the Operator of the Year award on behalf of OAWU. Your commitment to learning, improving, and leading with grace and humility are a lesson for us all. You represent the best of us and our industry. 💧





Sonic Well Sounders

by Bob Waller, Water Circuit Rider

It is important to measure the water level in our wells on a regular basis. Doing so will allow us to identify and diagnose well-production issues long before they cause serious problems such as water outages and pump damage. Gathering this information and generating a history can give systems an idea as to how long their well will be adequate in providing the water their system needs. Collecting this data over a number of years will reveal any seasonal variations to water levels in the aquifer and show trends on how the well performs when the pump is running the most.

Like some of you our system was required to get static levels annually. We dropped some speaker wire with weights into the well head and used the continuity function on an electric meter and were able to record the water depth. There was always a chance of getting the wire tangled and breaking it or introducing contamination into the well. Working as a Circuit Rider for OAWU I have helped several systems with both static level measurement as well as drawdown and recovery rates. I am always very cautious about introducing anything into a well and use any method at my disposal to ensure whatever I'm dropping in is sanitary. We have seen everything used from an electric water level probe, airline device (bubblers), pressure transducer, wetted steel tape, dropping a rock and timing it 'till it hits water, even a child's fishing pole with a bobber.

At OAWU we have a couple pieces of equipment for getting water levels, one is an electric water level probe, which is a reel of wire with stainless steel weights and a built-in sensor made for getting water levels. The one we have was 300 ft at one time, I may or may not have been the one responsible for that wire being shorter and more compact. Now that our water level indicator is shorter, getting accurate measurements is a bit more of a challenge. The reel has brass grommets every 5 ft so as we are getting the measurements, we guesstimate the distance between the 5ft grommets. This is fine we don't have to be that accurate but there is a better way.

OAWU also has a sonic well sounder. Sonic well sounders use sound waves to measure the depth to water level by bouncing sound waves off the surface of the water. Sonic well sounders are simple to use and provide instant data. There is no risk of contaminating the well because nothing touches the water and there are no probes or wires to hang up. This, in my, opinion is a game changer I have used it in my well and the numbers I have been getting are spot-on. Just a few things to consider as a benefit to using a well sounder are:

- Nothing going into the well, no tangling, or contamination
- Consistent readings in 10ths of feet
- Much easier so we are more likely to use it

There are many well sounders on the market ranging from \$100 dollars to over \$1000 dollars. I don't know how well some well sounders work, so do your research. I know for me and my experience having a tool that is easy to use and allows me to take measurements at different times of the year is great. I just remove the vent pipe from the well head and insert the probe which may extend down about an inch and start taking measurements. I don't have to worry about introducing contamination into a water source, it's a load off my mind. As always, any questions, call OAWU. We are always glad to help. 💧



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Rules, Standards and

by Tim Tice, Projects Manager

For whatever reason a rule is written, there may be multiple opinions surrounding the rule some in favor, some against, and others have no idea the rule exists. With water system operations, rules can be likely categorized in an area towards public health, but some additional rules are also being put in place for better accountability.

Standard operating procedures (SOPs) are designed, outlined, and change to better assist operators to stay on task. Organizing routine tasks can be difficult when a daily routine is certainly not routine.

Tasks that are routine supply a playbook that shapes how part of an operator's day is supposed to look, as well as a review of more pertinent items, and some of these items are attached to compliance. What happens when the routine is disrupted, and disrupted routinely?

As far back as I can recall my time in the workplace, organizing, prioritizing, and using tools to keep focused has been a challenge. Back burner tasks piled high and wide is a recipe for disaster. How do we rectify our daily tasks to reduce the tasks that are put off?

Franklin Covey helps people in all walks of life methods to keep oneself organized, build leadership, and educates on doing what matters. This is not an endorsement by any means, just another tool in our box to stay better organized.

Two aspects of a daily routine are task management and time management. Task management becomes automated, but not routine when data is not collected. Time management becomes skewed when it takes longer than normal or when a task goes to the back burner. All of us are subjected to tasks and time management. As to how successful we are, depends on how structured we can remain.

Task Management involves figuring out those tasks that have a deadline, and deadlines may or may not be subjected to a rule. An example of a task with a deadline is "routine" coliform sampling. Notice the term routine to describe as compared to other sampling criteria. A task without a deadline may be line flushing, and or hydrant

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Tasks

testing. These tasks are recommendations and do not have a rule associated with a timeline.

Time management is a bit trickier to figure out. Most of the time I feel I have plenty of time, when in reality, a hurried pace is necessary to complete a task. A single tool that supports my efforts towards task and time management is a review sheet. This is an ever-evolving single page document that is adjusted “routinely” to help me stay on task. Routinely as it relates to a timeframe for me is weekly.

One suggestion is to allow (force) thirty minutes at the end of each day to prepare the next day’s schedule and when the day begins start with the list. The list should only include those tasks that “must” be completed the next day. As your day begins, carry a composition book or a scheduling app and notes on your phone with you and as you do your task, write it down and accompany each task with a timeline for completion. This simple approach (difficult to continue) will deliver a snapshot into what gets completed and the reasons why a task wasn’t completed. More often than not, we assume

a task will take less time than first considered, and it is these adjustments that fine tune our everyday approach towards efficiency.

Efficiency is a measure of a relationship between input (tasks to be completed) versus output (tasks completed). The primary measurement between the two is the allotment of time given and how a specific time is measured against the actual time. Theory versus reality!

When efficiency begins to decline many aspects need review, but continual decline can be surmised as a lack of either monetary or human resources. To encourage someone to begin a daily diary, noting the tasks and time towards completion this will add to what an operator already does each day. A daily diary over a period of time can become another tool for you. It aids in defining both those good and bad days, will sponsor ideas in potential added monetary or human resources, and verify how efficiently the team is performing.

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Beer

Heath Cokeley, Programs Manager/Circuit Rider

Ok, be honest, did you start reading this article merely because the title was “Beer?” Well, now that I shamelessly dragged you into this article by throwing out a word that will make many water and wastewater operators stop and say hey, that sounds good, let’s talk about the oldest form of water treatment. Alcohol. Beer has been around for a long time. It’s believed at least 7,000 years and, in that time, it has been responsible for a lot of things. In a world before we understood the dangers of waterborne diseases, beer and other alcoholic beverages were a safe alternative to drink. That’s not to say, we didn’t have some water treatment along the way, it’s just believed that many things that were done, such as the Romans sometimes filtering the water through sand or using alum, was likely done to make the water look better, and not because they understood they were removing things that may make you sick.

If you have read any of my other articles, you know I like quotes. One quote I have always found humor in is one attributed to Benjamin Franklin that reads “in wine there is wisdom, in beer there is freedom, in water there is bacteria.” The reason I have found humor in that quote for so many years is I realize that humanity has known about the little bugs we now call bacteria since at least the mid-1600s with the invention of the microscope. My problem is more that when Anton Van Leeuwenhoek first saw these little critters in his microscope in 1676, he called them animalcules. The first time I can find them being referred to as bacteria was in 1838 and that name wouldn’t become common until the 1870s with the publication of Louis Pasteur’s germ theory. Franklin died April 17th, 1790, but I digress.

We know that beer was used frequently in the ancient world as rations for labor, for instance it is believed that individuals building the pyramids in Egypt received more than a gallon of beer per day. I know many are probably thinking, I can’t drink a gallon or more of beer a day and still get anything done, but we must realize that this beer was how many got their needed nutrients for the day as well as their drink. Brings new clarity to the saying, a meal in a can...., doesn’t it?

We know the Egyptians and other ancient cultures made beer and used it to pay for labor because they kept records of this. What is not known for sure is how to brew beer was first discovered. A theory is: a piece of bread, or something containing yeast, to start the fermentation process fell into a container holding grains soaking in water. Add some heat and time/right conditions and the rest, as they say, is history.

Even though we don’t know for sure how brewing beer was first invented, we do know this: **Microbes have been responsible for the deaths of countless millions of people, but they have also been responsible for not just the invention of beer, but many other leaps in human ingenuity throughout time.**

So much so that it could be said that life just wouldn’t be the same without them. I know, that could probably be viewed as a bad wastewater operators’ joke, but if you don’t believe me, just try running your plant without them.

I hope you picked up something useful or at least were entertained by this article with the title of “Beer” and with that, I will see you down the road. 💧



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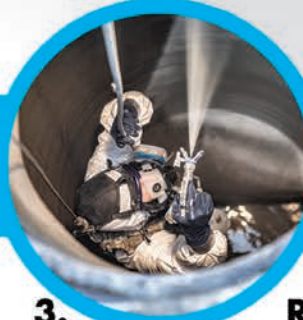
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Ordering the Right Chemical Feed Pump

by Hans Schroeder, Circuit Rider



Finding the proper sized chemical feed pump doesn't need to be a shot in the dark. There are some simple steps and calculations that can be done to accurately "dial it in." I'm going to break it down step-by-step to hopefully simplify the process.

There are a few "givens" we need to know:

- Chlorine solution strength
- Dilution ratio
- GPM or GPD to be treated

First, we need to identify the chlorine solution strength. Let's say we will be using 12.5% sodium hypochlorite (liquid bleach).

1%=10,000 mg/L or (ppm), so 12.5% equals 125,000 mg/L ($10,000 \times 12.5$)

Diluting one gallon 12.5% chlorine at a 4:1 ratio with water will equal 5 gallons of solution.

$C_1 V_1 = C_2 V_2$

$(125,000)(1 \text{ gal}) = C_2 (5 \text{ gal})$

$(125,000)(1)/(5) = 25,000 \text{ mg/L divided by } 10,000 = 2.5\%$

Now let's assume the well pumps 400 GPM so:

$(400 \text{ gpm} \times 1440 \text{ mins per day}) = 576,000 \text{ GPD}$

Sizing the Chemical Feed Pump:

Assume target dose is 0.4 mg/L

Assume using 2.5% chlorine solution (4:1 mixing ratio)

Assume chemical feed pump is set at 50% to allow for adjustment either up or down

Let V_1 = Volume of chlorine solution pumped per day

$C_1 V_1 = C_2 V_2$

$(25,000 \text{ mg/L}) V_1 = (0.4 \text{ mg/L target dose})(576,000 \text{ gpd})$

$V_1 = (0.4)(576,000) \text{ divided by } (25,000) = 9.2 \text{ gal}$

So, if we will be pumping 9.2 gallons of mixed solution, we would purchase a chemical feed pump rated at 18 gpm. That would give us the recommended range of a setting at 50% on the pump to allow for adjustment up or down.

We have one thing to keep in mind that if we decide to use a stronger chlorine solution in the day tank, the pump would be adjusted to inject less frequent, but a stronger dose. Remember that a 2 parts water to 1 part chlorine is a much stronger dose and not have as much disinfecting strength as 4 parts water to 1 part chlorine solution. So, consider sizing the chemical feed pump accordingly to the desired dosage ratio. A larger output pump with a less potent solution is recommended in most cases to avoid off-gassing and other possible issues.

The OAWU team is always willing to assist in selection and sizing the proper chemical feed pump. Please feel free to contact us at any time. 💧





Wastewater Bacteria Sampling & Results for Compliance

by Keith Bedell, Wastewater Technician

Have you been wondering how you are supposed to interpret your permit for taking and reporting your bacteria samples, either Total Coliforms or E. Coli? Some utilities have more than one Class of water that they treat to, from Class A (less restrictive for what can be done with it) to Class D, and there is also a Nondisinfected Class (which is very restricted).

The requirements, depending on your permit, are one grab sample per week for irrigation to a field or possibly golf course when you are land applying. Where do you take the sample? At the end of the chlorine contact chamber or at the irrigation pump if you have a spot that you can get a good sample. If it doesn't have a specific location assigned in your permit, then can you take a sample as it is being irrigated onto a field at the first sprinkler head? This would give you extra contact time with the chlorine and better disinfection for the effluent.

Possibly in your Reclaimed Water Reuse plan it may state where you have to specifically take the sample. When you get your results back, what do you do if it is over your limit? Does your permit say this for Total Coliforms: *"Monthly log mean (same as geometric mean) may not exceed 126 organisms per 100 ml. No single sample may exceed 406 organisms per 100 ml."*

Or for E. coli which is normally on stream discharge *"Must not exceed a monthly geometric mean of 126, no single E. coli sample may exceed 406 organisms per 100 mL; however, DEQ will not cite a violation of this limit if the permittee takes at least 5 consecutive re-samples at 4 hour intervals beginning within 28 hours after the original sample was taken and the geometric mean of the 5 re-samples is less than or equal to 126 E. coli organisms/100 mL"*, this is not applicable for Total or Fecal Coliforms.

As of 2019 DEQ (Department of Environmental Quality) says that Per *"40 CFR part 136.3, for compliance testing, the sample analysis must be started within 8 hours of sampling. Results must be qualified if the holding times are not met. If the permittee is at a location where having samples analyzed in 8 hours is not possible or impractical, contact your permit inspector for guidance. If the testing is not for compliance purposes, the maximum holding time is 24 hours according to Standard Methods."* If you are just taking samples to see if you are getting your kill with disinfection and trying to optimize your chemical usage, do you not have to report them? Say you have taken your required samples during the beginning of the week, and they come back below permit, but are close, then you decide to take more for your own information, do you have to report them also?

I'm not saying that you should change the procedures that you are doing, just questioning how you can do operational testing without causing yourself to violate your permit. This would be a good discussion with DEQ to see if there is a way to do this while also staying in compliance of their permit. 💧

	Class A	Class B	Class C	Class D	Nondisinfected
Former Level	IV	III	II	Enhanced I	I
Oxidized					
Disinfected					
Filtered					
Turbidity (NTU)					
24-hr mean	2				
5% of time during a 24-hr period	5				
Maximum at any time	10				
Monitoring Frequency	hourly				
Total coliform (organisms/100 mL)					
7-day median	2.2	2.2	23		
Maximum in any sample	23	23			
Maximum in 2-consecutive			240		
Monitoring Frequency	daily	3/wk	1/wk		
E. coli					
30-day log mean				126	
Maximum in any sample				406	
Monitoring Frequency				1/wk	
Beneficial Purposes	More				Less
Conditions on use	Less Restrictive				More Restrictive

Recycled water classes identified in rule, based upon level of treatment.



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The Summer of 2020 *by Joel Hagg*

I have been the water operator at Camp Rilea since August 2011 when the plant, with its 2 wells, came online. OAWU had been part of the startup, including the 50% review process, offering their advice and insight. On many occasions since then, OAWU has been a great source of help and encouragement to me.

Camp Rilea is a training area for the National Guard, with units coming from near and far. Camp Rilea is used by the Army, Astoria Coast Guard, Marines and Special Forces. The Camp is also used by law enforcement, football camps, Cub Scouts, Boy Scouts, “Roller Dolls”, church groups, weddings, and JATC, a lineman school. Camp Rilea is also the Emergency Operations Center for Clatsop County.

Talking with other operators, I have found that many also have unique situations getting to their treatment plant or wells. Camp Rilea’s treatment plant is saddled between two weapons firing ranges. The wells are down range from them in the impact area. Just to the north of the plant is a pop-up range. When conditions are just right, the cracking sounds of weapons fire bounces and ricochets off the storage tank. Fortunately, no bullet holes in the tank yet! To the south are multiple zero ranges. There is a large dune protecting the well-houses, though at one point a truck backed into one of them putting a hole in a wall. I pay close attention to the range schedule for when gates are closed, red bunting flying, I have no desire to low crawl back from the wells.

On the Northwest Coast of Oregon, the summer of 2020 was warmer and drier than “normal.” Along the well-road several days of intense sun had dried out many young fir trees, larger trees had needles and branches turn brown. I had the feeling of foreboding when

in early September, while driving to work, I noticed a smoky sky. The smoke became denser, and it was harder to breathe. Inland was worse, with over 50 public water systems damaged or affected by the fires

Emergency Operations Plans talk about forest fires, but until the summer of 2020 I could not comprehend the reality. During summer, after the rains stop and everything is dry, tracer rounds can start fires. After the risk assessment by Camp Rilea’s forester, I came away with three conclusions. (1) The tree line is 35 feet away from the well houses so it wouldn’t pay to remove any more trees. (2) The outside of the well houses are covered with fiber glass, which is somewhat resistant to fire. (3) Keep the grass mowed around the wells up to the tree line. It became apparent, during my discussions with Camp Rilea’s Department of Public Works Manager that we still

needed to actually do something to protect our wells and provide water close at hand for firefighting. My first thought was to run a water line from the treatment plant up to the wells ending with a hydrant, but that proved too costly for right now. We then thought about the possibility of using the “dump to waste line” running out of the side of the well house, which dumps the 1st well draw to a dry well for 10 seconds. The waste line is controlled by the PLC and a two-way valve inside the well house before changing position and sending the water to the plant for treatment. I discussed with Camp Rilea’s electrician about causing the “dump to waste” line to remain active until we told it to stop.

We decided there were two options, the 1st would be to have the firefighters enter the well house, switch the valve manually, and then turn on several switches. We decided that option could



cause confusion for those trying to get the pump and valve to operate in the number of sequences required. For the 2nd option our electrician would change the control program on the PLC and locate a switch on the outside wall in a locked cabinet. The switch would allow the control of the well to be removed from the water plant (it is about a half mile from the wells). The “dump to waste line” was replaced with a two-inch copper line with a 90-degree fitting and an adapter for fire hose. With that, we had a simple solution for the firefighters to unlock the switch cabinet on the outside of the well house and turn the switch on.

On reflection, have we mitigated the danger of wildfire to our wells? Will it be enough? What else can we do?



The answer to these questions lies somewhere out there and may not be answered until we do have a fire. We have, provided water where it may be most needed to either fight a fire directly or use the water to fill a tanker.

We at least have done something, rather than hoping fire would not come to us next and have done it at a minimal expense using mostly the materials on hand and our own personnel to accomplish the project. 💧



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Understanding a NIST CSF Security

The National Institute of Standards and Technology (NIST) offers risk assessment guidelines that can provide senior leaders and executives with the information they need to understand and make decisions about their organization's current information security risks and information technology infrastructures. Risk is the likelihood of a threat event's occurrence and potential adverse impact should the event occur.

Risk assessments are an important tool for managers. With 30,000 websites hacked daily, and 64% of companies worldwide having experienced at least one form of a cyber-attack, risk assessments provide important information to guide and inform the selection of appropriate defensive measures so organizations can respond effectively to cyber-related risks.

If any of these four scenarios apply to an organization, a risk assessment is in order:

- 1) The organization relies on an IT specialist for cybersecurity. Cybersecurity is not an IT job. It is a security job. They have different objectives.
- 2) Antivirus such as Norton, McAfee, or Bit Defender is the sole form of protection. This simply provides a false sense of security. Antivirus is essentially useless.
- 3) Company leaders who must educate and justify protection to a general manager, managing partners, board of directors, or a governing authority. Unbiased, the assessment will clearly show where vulnerabilities land, where risks lie.
- 4) Believing a cyber-attack will not happen. Organizations of all sizes are at risk. No one is too small. Hackers use automation so size becomes irrelevant for return on investment.

The ultimate objective is to protect all stakeholders. It goes beyond the organization, employees, and vendors. For many, it could be the community, the state, or a region of the country. Everyone an organization touches is a potential stakeholder.

How a NIST CSF Risk Assessment Works

Risk, and its contributing factors, can be assessed in a variety of ways. Quantitative analysis supports cost-benefit analyses of alternative risk responses or courses of action. Qualitative methods assess risk using categories or levels (very low, low, moderate, high, very high). This type of assessment supports communicating risk results to decision makers. Finally, semi-quantitative assessments typically employ a set of principles for assessing risk that uses bins, or representative numbers.

The National Institute of Standards and Technology first provided a Cybersecurity Framework in 2014 and updated it in 2017. Outlining standards, guidelines, and practices to promote the protection of critical infrastructure, the **NIST Cybersecurity Framework** applies to businesses of every size. It gives guidance on managing and reducing cybersecurity risk. What it does not

Function	Category	ID
Identify	Asset Management	ID.AM
	Business Environment	ID.BE
	Governance	ID.GV
	Risk Assessment	ID.RA
	Risk Management Strategy	ID.RM
	Supply Chain Risk Management	ID.SC
Protect	Identity Management & Access Control	PR.AC
	Awareness and Training	PR.AT
	Data Security	PR.DS
	Information Protection Processes & Procedures	PR.IP
	Maintenance	PR.MA
	Protective Technology	PR.PT
Detect	Anomalies and Events	DE.AE
	Security Continuous Monitoring	DE.CM
	Detection Processes	DE.DP
Respond	Response Planning	RS.RP
	Communications	RS.CO
	Analysis	RS.AN
	Mitigation	RS.MI
Recover	Improvements	RS.IM
	Recovery Planning	RC.RP
	Improvements	RC.IM
	Communications	RC.CO

do is provide advanced state-of-the-art administrative controls or technical controls. This is why an Infosec specialist should play an important role on the team. An Infosec specialist will understand the vulnerabilities revealed in the risk assessment and recommend best of breed technology for protection.

The NIST Framework is composed of five functions: Identify, Protect, Detect, Respond, and Recover. The risk assessment occurs in the Identify stage.

A new NIST publication, *Guide for Conducting Risk Assessments*, focuses exclusively on risk assessment. The guidance covers the four elements of a classic risk assessment: threats, vulnerabilities, impact to missions and business operations, and the likelihood of threat exploitation of vulnerabilities in information systems and their physical environment to cause harm or adverse consequences. Even the questions themselves directly correlate to one of those five categories, and it lists them as critical, high, medium, or low.

In the "Identify" stage the initial assessment occurs. By answering questions, the Infosec specialist asks, the state of the system is revealed. Expect to examine how many machines are involved, who the email provider is, what current protections are in place, and the organization's security maturity.

The organization's security maturity is also examined. Do people reuse passwords? Are passwords shared among a team? Is there one account for the website, or does each involved team member have a unique account? If the answer to any of those questions is yes, then the assessment will call for security awareness training and most likely a password manager as well.

The Infosec specialist should be expected to quickly provide a follow-up report that maps directly to the NIST 800-53 requirements.

There are informative references where all other standards, both national and international – International Standards Organization (ISO), COBIT, CIS and NIST can be studied. For example, awareness and training directly tie to ISO 27001 specifications developed in 2013 (see below).

Awareness and Training (PR-AT): The organization's personnel and partners are provided cybersecurity awareness education and are trained to perform their cybersecurity-related duties and responsibilities consistent with related policies, procedures, and agreements.	PR-AT-1: All users are informed and trained	CIS CSC 17, 18 COBIT 5 APO07.03, BAI05.07 ISA 62443-2-1:2009 4.3.2.4.2 ISO/IEC 27001:2013 A.7.2.2, A.12.2.1 NIST SP 800-53 Rev. 4 AT-2, PM-13
	PR-AT-2: Privileged users understand their roles and responsibilities	CIS CSC 5, 17, 18 COBIT 5 APO07.02, DSS05.04, DSS06.03 ISA 62443-2-1:2009 4.3.2.4.2, 4.3.2.4.3 ISO/IEC 27001:2013 A.6.1.1, A.7.2.2 NIST SP 800-53 Rev. 4 AT-3, PM-13
	PR-AT-3: Third-party stakeholders (e.g., suppliers, customers, partners) understand their roles and responsibilities	CIS CSC 17 COBIT 5 APO07.03, APO07.06, APO10.04, APO10.05

Once identified, weaknesses can often be addressed immediately by changing some basic business policies even before cybersecurity awareness training happens. Suddenly, the risk of a breach is cut in half.

Part of the process will center on determining who the threat actors are. For businesses, most often they are criminal hackers. Any part of the critical infrastructure such as the power grid or water supply face serious threats from nation-states because their goals lie in harm and disruption as well as monetary gain.

Steps Beyond the Risk Assessment

Both initial and ongoing assessments lead an organization to the defensive controls that must be put in place.

As risk assessments are updated and refined, organizations should use the results to update the risk management strategy, incorporate lessons learned into risk management processes, improve responses to risk, and build a solid foundation of threat and vulnerability information tailored to organizational missions/business functions.

The White House National Security Office offers recommendations for five steps organizations can take to protect against ransomware attacks:

1. Multi-factor authentication. This calls for a third credential, typically a six- or eight-digit random number that is generated. It is time-sensitive and is information a hacker can't access.
2. An endpoint detect and response platform (EDR). EDRs use artificial intelligence and machine learning to monitor what the computer is doing. Unlike an antivirus tool, it does not look for a virus signature. Ransomware has no virus signature to identify it. EDRs examine what is happening on the device. If it detects an Excel spreadsheet starting a macro that calls the Windows encryption service, it stops it because it knows that is not usual

behavior. EDRs learn from experience. If an anomaly is occurring, it can quickly be investigated by skilled Infosec specialists.

3. Utilize disk encryption. All data for the organization should be encrypted, especially portable devices.
4. Form a skilled security team. This is not the organization's IT team. The security team should be comprised of professionals who understand cybersecurity and what it entails. This team does not replace IT, it serves a completely different purpose. Many organizations are establishing the role of Chief Information Security Officer (CISO). A CISO is responsible for establishing security strategy and ensuring data assets are protected. CISOs traditionally work alongside the Chief Information Officer (CIO) to achieve information security goals. All leaders need to buy in completely. It is their role to set the tone by walking the talk. Going through superficial motions will not protect the organization.
5. Share and incorporate threat into defenses. Understand what's going on in the criminal, nation-state, and terrorist worlds to stay up to date on defenses. The skilled security team must be charged with this task every day. They must read all alerts which can be dozens a day, and analyze them asking, "Is that a threat to any of our clients? Do we need to respond right now?"

Insist on best of breed products and services and even the administrative controls/procedures. The Infosec team should be researching changes in policy, hold discussions with peers. If it makes sense, we'll make the change. If we find a better EDR, we rip and replace. Best of breed everything.

Lastly, embrace Security Orchestration Automation Response (SOAR). This is orchestration of

everything through an Infosec Command Center - the automated response and the human response. At times, attacks require additional skillsets from sources including vendors. It is not unusual to call upon multiple vendors on a single attack. Practicing SOAR means having all resources at the ready at all times.

In the final analysis, solid security means committing to a security first environment. Organizations must move beyond believing security is a hassle to set up, deploy, and use. The ultimate goal is to minimize the threat vectors. 💧

ABOUT THE AUTHOR

Tom Kirkham is founder and CEO of Kirkham IT. Tom founded IronTech Security to focus on cybersecurity defense systems that protect and secure data for the financial, law, and water utility industries. IronTech focuses on educating and encouraging organizations to establish a security-first environment with cybersecurity training programs for all employees to prevent successful attacks. Tom brings more than three decades of software design, network administration, and cybersecurity knowledge to the table. During his career, Tom has received multiple software design awards and founded other acclaimed technology businesses. He is an active member of the FBI's Arkansas InfraGard Chapter and frequently speaks about the latest in security threats. Watch for Tom's new book: *The Cyber Pandemic Survival Guide - Protecting Yourself From The Coming Worldwide Cyber War*.

Patent Pending for Mini-Composite

Henderson, Ky. — Water distribution systems needing a modest-sized elevated tank will often select a traditional steel multi-column or perhaps a single-pedestal tank. But for an owner desiring a more maintenance-free, lower life-cycle-cost option that also offers speed of construction, a new option has arrived on the market. Pittsburgh Tank & Tower Group (PTTG) has pioneered a composite elevated water tower for tank capacities ranging from 50,000 to 250,000 gallons, with plans for larger sizes. The support shaft for the tower employs stackable pre-cast concrete segments.

Over the previous 40 years, CETs had become popular for large tanks of 250,000 to 3 million gallons or so. But they weren't cost-effective for smaller tanks.

Concrete for each circular segment can be poured at ground level — either on-site or off-site, depending on location and size of structure — which greatly reduces the amount of construction work at elevated heights to enhance safety and quality. The pre-cast segments are then raised by crane and locked into place, resulting in less build time. The concrete support shafts range from

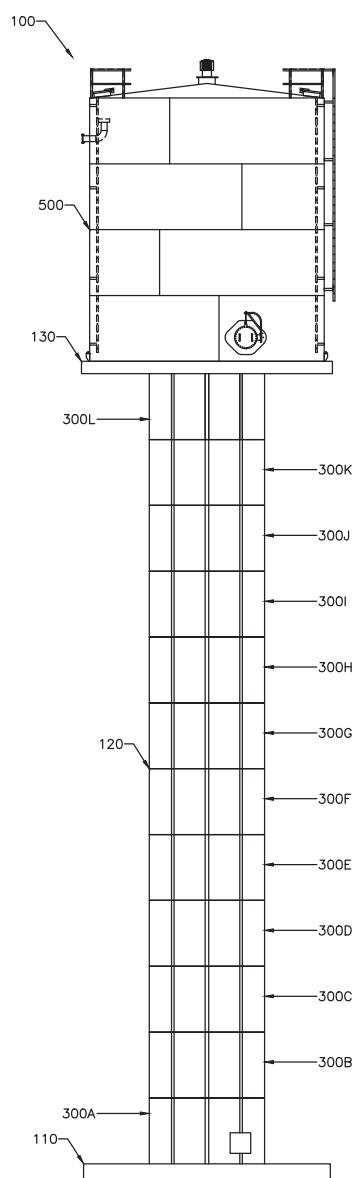


FIGURE 1
WELDED

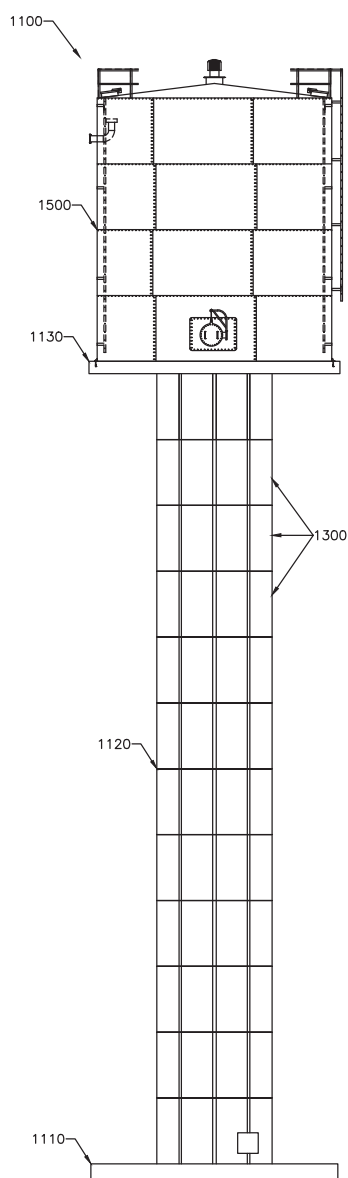


FIGURE 2
BOLTED

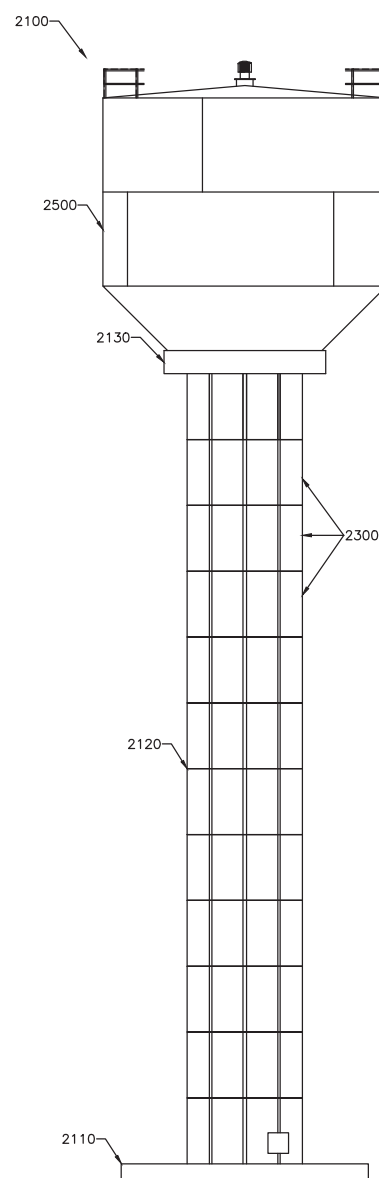


FIGURE 3
WELDED

Elevated Tank Process *By Chuck Stinnett*

8'0" to 16'0" outside diameter and typically are 8'0" in height, and comply with AWWA D100, D103 and D107 standards, as applicable.

A patent is pending for this product, which PTTG President Ben Johnston and his engineering staff developed for making composite elevated tanks (CET) practical and cost-effective for smaller applications.

These Precast CETs offer several advantages, including:

- Safety is enhanced by fewer manhours worked at elevated heights.
- Quality is improved by constructing at ground level.

- Greater security against vandalism and less exposure to attractive-nuisance liabilities.
- Use of local concrete.
- Readily available to be raised, lowered or even relocated.
- Lower carbon footprint than an all-steel structure.

To further reduce future maintenance, these precast CETs offer several options for tanks that don't require initial or future painting, including glass-fused-to-steel tanks, as well as, welded stainless, bolted stainless, or bolted galvanized steel tanks. ♦

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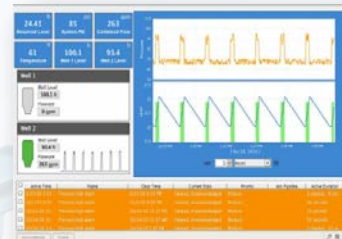
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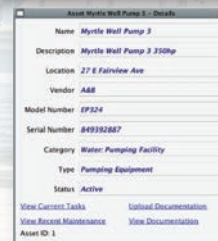
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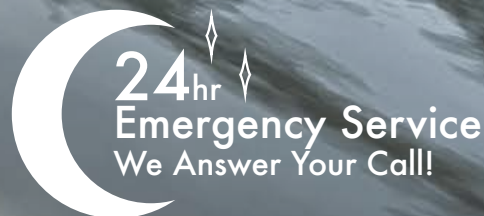
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A. 10 inches of water
B. 100 inches of water
C. 10 feet of water
D. 1 inch of water
2. The USA (48 lower contiguous states) receives approximately _____ of water in the form of precipitation each day?
A. 1 trillion gallons
B. 4 trillion gallons
C. 14 trillion gallons
D. 140 trillion gallons
3. Determine the force (in lb.) against an 8-inch diameter plate with a gauge that reads 5 psi.
A. 1.75 lb.
B. 252 lb.
C. 378 lb.
D. 36,173 lb.
4. What is the difference between a gas and a liquid?
A. Water is a liquid, and air is a gas.
B. A liquid is incompressible while a gas is compressible.
C. Water at high temperatures (steam) is a gas and is very similar to air.
D. Both are incompressible.
5. How many gallons does a dairy cow drink to produce a gallon of milk?
A. 1
B. 3
C. 4
D. 6
6. If all the water on Earth was put into a single one-gallon jug, how much is suitable to drink?
A. 4 ounces
B. 8 ounces
C. One teaspoon
D. One tablespoon
7. In the card game cribbage, the odds of getting a perfect hand of 29 points in a two-player game is?
A. 1 in 15,000
B. 1 in 216,000
C. 1 in 649,000
D. 1 in 100
8. 1 part per trillion is equivalent to 1 second in _____ years.
A. 100
B. 1700
C. 9557
D. 32000

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



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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/Onsite	4634 Fee
August 9–10	Wastewater Treatment/Collections Certification Review	Keizer	1.4 Wastewater/0.7 Water	4227 Fee
August 22–25	28th Annual Summer Classic Conference	Seaside	2.3 Water/Wastewater	TBA Fee
September 21	Confined Space	Baker City	0.3 Water/Wastewater/Onsite	4634 Fee
September 21	Job Site Safety	Baker City	0.3 Water/Wastewater	4635 Fee
Oct. 31 – Nov. 3	Spirit Mountain Casino Operator's Conference	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	24th Annual End of Year Operators Conference	Hood River	2.7 Water/Wastewater	TBA Fee

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Legal Options for Shutting Off Water for Non-Payment

By Schroeder Law Offices

Water utilities regulated by the Public Utilities Commission (“PUC”) in Oregon may disconnect water service to customers that do not pay their water bills¹, however, the utility must provide advance notice to customers prior to disconnection. For water utilities and municipalities not regulated by the PUC, the PUC “shut off” rules can provide guidance for developing rules or ordinance(s) for non-payment disconnection.

Under PUC regulations, before service can be disconnected, the utility must provide the customer with two advanced written notices. These notices are known as the “15-calendar day disconnection notice,” sent 15 days prior to disconnection, and the “7-calendar day disconnection notice,” sent 7 days prior to disconnection (“Notices”)². The Notices must be printed in a bold, readable font using plain, simple language.

The Notices must include³: (1) the name and contact information for the utility⁴; (2) the date when the customer’s water service will be disconnected; (3) the grounds for disconnection, i.e. non-payment; (4) provide the balance of the overdue bill; (5) advise the customer may avoid disconnection by paying the balance; (6) that the customer may dispute the disconnection by making contact with the PUC “Consumers Services Section,” providing contact information for the PUC; (7) provide information about eligibility for a time-payment agreement (unless the customer has failed to pay under an existing time payment agreement); and (8) advise that once service is disconnected, the utility will reconnect service only after the customer reapplies for service and pays all applicable charges. Beyond the Notices, the utility must make a good faith effort to contact an adult resident at the billing address within 48 hours prior to

disconnection⁵. The utility is prohibited from disconnecting service on a Friday, weekend, or holiday.

There are additional requirements when a utility is disconnecting water service to tenants in a master-metered, multi-dwelling service. For example, a utility must provide duplicates of the 7-calendar day disconnection notice to each unit at the address and the utility must notify the PUC “Consumer Services Section” at least seven calendar days before disconnecting service⁶.

It is important to note that PUC regulated water utilities are required to offer payment plans to customers unless the amount owed by the customer is related to failure to comply with an existing time-payment plan, theft, tampering, or unauthorized water use⁷. Under PUC rules there are two plans the utility must offer: the Levelized Payment Plan and the Equal Pay Arrearage Plan. Once a customer agrees to either of these plans, the customer must make the initial payment within one business day. If the customer does not make their initial payment, the utility is free to disconnect service, after providing a 7-calendar day disconnection notice.

Disconnection is always a last resort. Moreover, even for non-PUC regulated water utilities and municipalities, adopting rules or ordinances in advance of disconnection, which follow the guidance of the PUC rules, is the recommended alternative to proceeding to disconnection “as needed” or on an “ad hoc” basis, which is never recommended. ♦

Schroeder Law Offices, P.C., was founded by Laura A. Schroeder and represents water-rights clients in six western states and consults internationally. This article was drafted with the assistance of associate attorney Nicole K. Vetter. 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/>.

1 OAR 860-036-1500

2 OAR 860-036-1520 outlines how such notices must be delivered to customers.

3 OAR 860-036-1510(1)-(3)

4 OAR 860-036-1100(2) outlines the specific contact details required.

5 The utility must keep records to document how and when contact was made or attempted and if no contact can be made the utility must leave a note in a conspicuous place to inform the customer that service was disconnected. OAR 860-036-1530.

6 OAR 860-036-1550 details these additional requirements for disconnection of water service to tenants.

7 OAR 860-036-1420

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System O&M Manuals Required

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

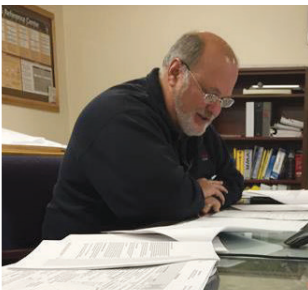
Oregon Association of Water Utilities has prepared a full day class to assist operators in outlining an operations and maintenance manual per the Oregon Administrative Rule 333-061-0065 which requires each water system to develop an operations and maintenance manual.

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

Class cost is \$160, or if you are unable to attend a class you may purchase a thumb drive with e-files for \$160. To sign up for the class, or to have a thumb drive mailed to you, contact your Association for further information. 💧



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The Time of Rowdy

Throwing My Loop
by Michael Johnson

He came into my life just when I needed him most. I was living alone then and welcomed the company. Just weaned and best described a ball of fuzz, the little blue merle seemed just as happy to be with me as I was with him. Like two new friends do when they are both young, we played constantly and had the best of times. On occasion, however, my new friend would tire of our games and hide. Needing a break from me, he would disappear. I would search the house to no avail. Finally, I found him hiding way back in the countless stacks of my books that were piling up in my house in those days, and I remember thinking, "Well, if my books don't sell, at least my dog will have a really nice place to hide." Fourteen years ago now. There is no way the previous sentence can be true. Can't be fourteen years.

Somewhere in those early days, I saw a trainer on television using small pieces of hot dog wieners as rewards for his dog. I thought that was the coolest thing. (I had no idea training a dog would be so easy.) So as soon as possible, Rowdy and I were the proud owners of his own personal package of weenies. Next thing you know, we are heading down the road to a roping—with the Row Cow in my lap eating the entire package. Like most bad decisions in life, it seemed such a good idea at the time. (To say Rowdy got sick is one of the funniest understatements of my life.) Hey, no one

told me you can't feed an entire package of weenies to a puppy. Trust me when I tell you our vet, Dr. Kyle Pratt explained that little piece of knowledge in a way that I could really understand the complete stupidity of such an act. Dr. Pratt kept him for three days. Every time I called him to see if the pup was going to make it, he would say, "Like I told you before, Rowdy will tell us. We don't know yet." Two days later I'm driving home from Atlanta, Georgia to Oklahoma when my cell rings. Dr. Pratt says, "I know you are driving 80 to get here. Just slow down."

"The pup didn't make it?" I asked.

"The pup made it," he says. "I'm going to keep him one more day, so slow down."

"Any other advice when he comes home?" I said.

"Yes," he says. "Try to keep him away from his owner. He's an idiot. And don't ever give Rowdy another weenie!"

And Rowdy grew to be a fine cow dog. Fearless, he went after cattle with wild and reckless abandon. If he got kicked by some big bull, while flying through the air you could see him moving his body fighting to get back to that bull and mix it up some more. Skilled trainers say their dogs can recognize eleven commands. Rowdy had



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one down pat... "Get him!" The other ten not so good. I decided at least one of us should learn some manners. We signed up for a stock dog clinic in Amarillo conducted by the master, Oren Barnes.

There were twelve participants in the class. Six women and their dogs, and five guys with theirs. These 11 dogs – and their companions – had won a number of competitions, and these dogs were so smart they could do algebra. And then there was me and Rowdy...who did not know one thing about math or training a dog. Nothing. No problemo. Not knowing how to do something never stopped Rowdy and Miguel from doing anything. But there was one thing. Even though we lacked any skill at this herding dog business whatsoever, Rowdy had a black wild rag around his neck tied just so...and so did I. We looked great! We both thought that was important because we just assumed you have to look good to work cows good. Clinic starts and well, things pretty much went down hill from there.

Mr. Barnes began the day with a fascinating lecture about the history of working dogs. Then he says, "Today, we will begin with a young dog who is aggressive, and hasn't had much training."



I'm thinking, "Man, how cool is that? I have a dog just like that. Rowdy and I can learn all kinds of things."

Then Mr. Barnes says, "Okay, Michael bring Rowdy in."

I almost fainted.

There were 12 Barbados sheep huddled together in the center of the large round pen where Mr. Barnes was standing. Feeling like a parent at a recital, I walked in with Rowdy. He immediately bolts breaking free from his collar. With one soaring leap, Rowdy lands in the center of the huddled masses and sheep butts go everywhere. Rowdy has them on the run now. After free-wheeling around the pen for several minutes, Rowdy comes over and sits down right in front of me and says, "Pretty good for my first time, huh, Pop?" I wanted to die.

With the kindness of angels, Mr. Barnes took control and soon all was well. The day proved to be one of the best in my life and in Rowdy's, too. At the end of that day – only because everyone else was so much better than us—Rowdy and I were named "Most Improved Team," and presented with a 50 pound sack of dog food. One of my most cherished awards I've ever been given...until Rowdy ate it all in the next few days.

And the days went by and they gathered speed. Rowdy and me flying down the road headed to too many ropings to remember. I wish I had written them all down. Well, not all of them – just the ones when I won something. That way I could sit on the porch and read them now, and by using that process, become in my own memory a much better cowboy than I ever was in real life.

He went everywhere with me. I would tie him to the trailer at ropings so he could sit outside, and ask some child sitting in a lawn chair—by the arena fence watching her mother and dad rope—to keep an eye on Rowdy for me. They were only too happy to oblige. Once after about two hours into the roping, I rode over and asked a little girl, "How is Rowdy doing?" She stood up and after smoothing her dress, said in her best "third grade class presentation" voice, "I've been checking on him frequently, and I'm happy to tell you that Rowdy is doing very, very well-ly."

And the days went by and they gathered speed. And now? Now I come to the place where I break my vow. When I began some 20 plus years ago, I was saddened by the unhappiness in the world. I decided that when I would write, the words would be uplifting for people. I would not write about the negative things in life, but rather stories of hope about people, and horses, and dogs who helped me in my life.

And now I break my vow. Now...

Rowdy
Nino Que Amo
(Child that I Love)
Dec. 1, 2005 – Dec. 8, 2019

"To see the light, we must endure the burning."
—Alfred Lord Tennyson

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MB22

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