Wisconsin Rural Water Journal

Summer 2023

Constructive Criticism
Issues with Leaking Valves
Fire Flows
What is TMDL?
Water Storage Facility Inspections

WRWA Outdoor EXPO 2023

www.wrwa.org

In Every Issue

FEATURES

OFFICIAL PUBLICATION OF THE WISCONSIN RURAL WATER ASSOCIATION

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Wisconsin Rural Water Association, 350 Water Way, Plover, WI 54467.

Message from the President

Dean Bergstrom,
WRWA President, Cumberland

As I write this message, we are already past the summer equinox and the summer days are now getting shorter as we move forward. It's hard to believe that with all the snow that Wisconsin received this past winter, that we could be so dry during the month of June already. Yards are burning up due to the lack of moisture. Hopefully things turn around soon!

The WRWA Board of Directors recently met for our annual board retreat/reorganizational meeting. At the meeting, we always look deeply into the long-term planning, future goals and the financials of the organization. One of the big topics was the recent purchase of more property to the west of the current WRWA office. In the future, we plan to clear the property and make more area for our annual outdoor expo event. Unfortunately, it will not be ready for this year's event, which is August 24, 2023, but it will hopefully be ready for us to utilize in 2024. We are excited for the opportunity to expand the outdoor expo in the future.

I hope you are all hitting your projects head-on this summer and able to complete them before winter is upon us. As always, if you need any assistance, please don't hesitate to call your WRWA circuit rider, as they are always there to help. Until next time, stay cool and stay safe!

Dean

Chris Groh,
WRWA Executive Director

Message from the Executive Director

Summer 2023

Summer is the time for vacations, but it is also time for most of the work you do all year. Hopefully you are not getting on a lawnmower this Summer when you should be looking into maintenance of your water and wastewater systems. The lack of construction projects this year can be alleviated by doing the background work on funding, planning, inventories and other things that need to be done before projects get started. It is pretty hard to do those things from the seat of the mower or while trimming the cemetery. Those are things that are also important, but your skills would be vastly underused if that's happening.

PFAS testing is happening now for most of you. Get those samples in early so when you get your results, you can proceed with the next steps. If you have no hits, quickly go to your DNR rep and get your further PFAS monitoring tests waived. That short bit of work will save hundreds of dollars of testing expense. If you get a hit of PFAS, but it's under the state limit, you most likely may have to continue testing. Again, contact your DNR rep to see what the next step is. In this instance you will also have to develop a response to your customers on what that low result means to them. Customers could react from "OK, I don't care then" to "I don't want any at any level." You and your counsel's ability to explain the situation will determine how this goes.

The lead and copper rule inventory due date is coming up quick. This is really no joke and you should be working on this inventory to the exclusion of other things. If you don't know how to get started, please call your Rural Water Circuit Rider and they will get you going. If you are totally not able to get started, you can contact one of our partners, like 120Water, who can help you get going or totally do the inventory for you. There are many levels of help and it's all available for you.

Summer is for vacations, but it can be a busy time too. If you tackle your chores in Summer, you will be less busy in winter while plowing snow, shoveling snow, blowing snow and salting the icy sidewalks around town. Maybe you want to take your vacation in Winter, maybe someplace where there is no snow?! *Chris*

We get letters and emails!

We'd love to hear from you…

To WRWA staff,

I attended the training for Lead and Copper Rule Revisions Updates and PFAS/PFOA sampling on April 18, 2023, in Hilbert WI. The training was excellent and prepared me for the next years of sampling for our school at Zion Lutheran of Morrison. The class was very interactive, and all of my questions were answered by the instructors Kelly and Tony. The instructors even offered to come out to our site if we have any issues.

Thank You,
Stephen Gifford, Drinking Water Operator
Zion Lutheran School of Morrison

The Village of Withee would like to express our appreciation for the WI Rural Water Association as we dealt with the unexpected passing of our long-time Director of Public Works, Troy Hatlestad, on 12/29/2022. He was the sole operator of our water plant and ran the public works department with only a part-time summer employee. We had no emergency plan for that situation.

I emailed Chris Groh, Executive Director, that morning and within a couple of hours, Circuit Rider, Todd Weich, and Energy Efficiency Circuit Rider, Dan Wundrow, were scheduled to come to Withee to assess the situation and help plan how to cover the plant. They put us in contact with the City of Owen's DPW, Chad Smith, who with the City of Owen's council approval, agreed to oversee our water plant and file the DNR paperwork until we could hire a new DPW. Todd continued to check in on the plant, came to our Board meeting to give input, and helped construct the DPW job position ad. Dan helped run our SCADA computer system, figured out how the reports were done, and continued to advise also. We are probably not aware of every way they helped, but the main message is that they were there in our time of need.

Words cannot express how thankful we are for everything they did.

Sincerely,
Ellen Niemi, Clerk/Treasurer, Village of Withee

To whom it may concern,

This letter is regarding the information, help and guidance I received from the Wisconsin Rural Water Association. More specifically from one of their circuit riders, Annetta Von Rueden.

She has been on site many times for the Village of Necedah. She has shared the knowledge of how to properly take specific water samples as well as how to correctly fill out the required paperwork for these samples. She assisted us with locating the source of water loss as well. Most recently, I have received help from her with the Consumer Confidence Report. This was knowledge and options I otherwise would not have had access to. I am fairly new to my position and find this type of sharing of information and knowledge irreplaceable.

Sincerely,
Jon Hanson
Village of Necedah Public Works Coordinator

Kelly,

I just wanted to thank you for stopping out and giving us a refresher on the whole water sampling process. I haven't had to organize one for a larger business in a while, so it was very helpful. It seemed a little overwhelming at first trying to make sure I had all the correct tests by the correct date. Showing me how to navigate the website will definitely help me out with that.

You were able to capture my attention on a subject I typically find a bit boring (sorry), so kudos. Thanks again!!

Thanks,
Andrea Clapp
Carney Contracting

Dear Chris & Board,

Wanted to thank you all for the tremendous honor in receiving member business of the year. Very humbling to receive something that big after 50 years of doing this. Great to know we're still assisting customers though training and our fiduciary approach to each job.

Thank you.

CTW Corporation

I contacted the WRWA as we suspected a potential leak in our water system. Our circuit rider, Todd, had us scheduled quickly and identified 2 separate leaks.

He was extremely knowledgeable, informative, and friendly. Not only did he detect the leaks but came back the day of the dig to ensure that no additional leaks were present. He is also returning with the needed equipment to teach us how to repair a leaking hydrant.

We couldn't be more thankful for his help and guidance.

Casey Vold

Land O' Lakes Sanitary District

GOLF OUTING WINNERS

A special thanks to all for making this event possible!

TEAM:
First Waterworks
Rick Viviani
Chris Mirwald
Dylan Shultz
Derek Baker

CONSTRUCTIVE CRITICISM (SANITARY SURVEYS)

By Kelly Thomas

Be sure to review your prior sanitary survey report (from 3 years ago) and be sure that you have corrected any previous deficiencies.

Doctor's appointments and dentist appointments. These appointments are always something a person likes to put off because of the anxiety thinking about the potential outcome. In many cases, these appointments are scheduled in advance. If you are heading to the doctor's office already "knowing" that the doctor is going to tell you to drink less, quit smoking, and exercise more. . . why don't we just do it, so the doctor does not have to tell us to do those things? The dentist may tell you to brush and floss more often. But you already knew that.

As a society, we dislike being told to do the obvious things that we know we should already be doing. However, for some, it takes professional advice to spark us into making better life decisions. Sometimes we need to be told that if you do not take care of yourself or "maintain" yourself, your body may start to break down.

Unlike annual doctor and dentist appointments, DNR sanitary surveys are triennial (every 3 years). In fact, Section NR 809.35, Wis. Adm. Code, requires the DNR to perform sanitary surveys at municipal drinking water systems at least once every three years. But like doctor and dentist appointments, these appiontments are made prior to the arrival of the DNR for inspection.

The DNR will evaluate the technical, managerial, and financial aspects of your water system. They will likely request to visit every component of your water system, including wells, pumping stations, treatment plants, water storage structures, and booster stations. Be ready to take the DNR inspector on a "tour" to each location requested no matter the weather conditions. The inspector will likely review your daily routine and maintenance records, monitoring protocols, ordinance implementation and financial reports. Be sure to have any other staff available who can answer questions to satisfy the DNR requests. Save some time on inspection day by gathering all the paperwork and other information that the DNR inspector may request ahead of time.

Be sure to review your prior sanitary survey report (from 3 years ago) and be sure that you have corrected any previous deficiencies.

At the end of "inspection day," your DNR rep will discuss the results as well as a plan and timetable for correcting any noted deficiencies.

Please don't wait to be told "how to operate" your own water system every 3 years at your sanitary survey. Take what you have learned from previous sanitary surveys and convert that knowledge to your general operating practices. Continued maintenance and record keeping go a long way in maintaining every capacity of your water system.

If you fear that you may not be "ready" for a sanitary survey, contact your WRWA circuit rider and request them to conduct a mock sanitary survey for you. Be prepared for our circuit rider to offer constructive criticism of how to survive the sanitary survey. This unofficial survey is a service we can provide for no fee.

*Here are some terms the DNR uses that you may find on a sanitary survey report:

"Significant Deficiencies" indicates noncompliance with one or more Wisconsin Administrative Codes and/or represents an immediate health risk to consumers. This includes, but is not limited to, defects in design, operation, or maintenance of a public water system. It also includes a failure or malfunction of or issue with the water source or the treatment, storage, or distribution system that the department determines is introducing contamination into the water delivered to consumers or that is posing a health risk to consumers.

"Deficiencies" are problems in the drinking water system that have the potential to cause serious health risks or represent long-term health risks to consumers. These deficiencies may indicate noncompliance with one or more Wisconsin Administrative Codes.

"Recommendations" are intended to address problems in the drinking water system that hinder a public water system from consistently providing safe drinking water to consumers.

"Non-conforming Features" are drinking water system features that met code requirements at the time of a water system's construction but do not meet current code. These are technically not deficiencies, but they are noted in the survey because they will need to be corrected when the system completes upgrades in the future. However, if the department determines that a health risk exists due to the non-conforming feature, the department may require correction sooner, per s. NR 811.01, Wis. Adm. Code.

Elements of a Municipal Drinking Water System Sanitary Survey

- ☐ Source
- ☐ Treatment
- ☐ Distribution System
- ☐ Finished Water Storage
- ☐ Pumps, Pump Facilities, Controls
- ☐ Monitoring and Reporting
- ☐ Water System Management and Operations
- ☐ Operator Certification

Stay safe. Stay healthy. –Kelly

*DNR Document: "Preparing for a Municipal Drinking Water System Sanitary Survey"

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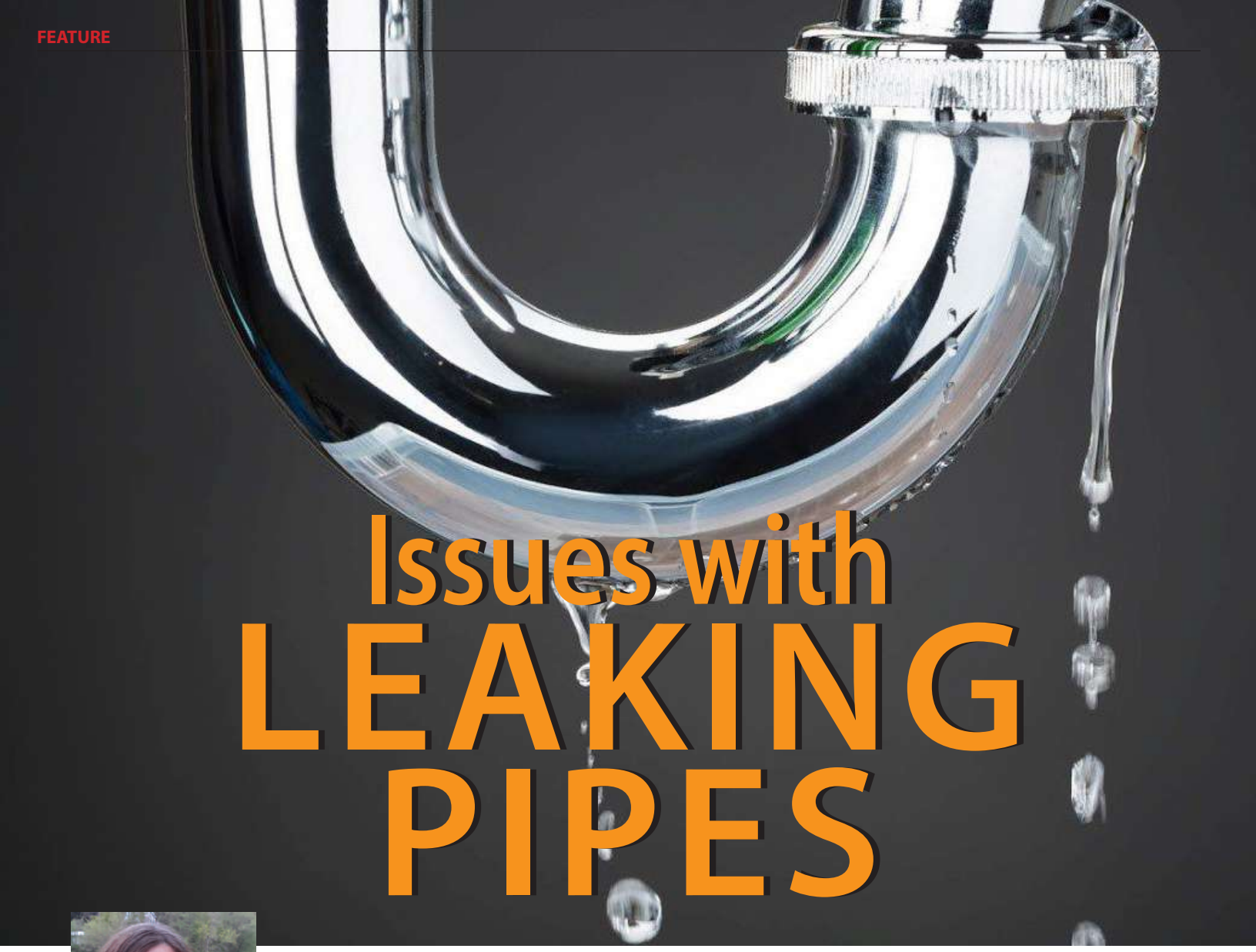

Issues with LEAKING PIPES

Annetta Von Rueden,
WRWA Water Circuit Rider

There are several leak detection practices depending on costs and availability of equipment.

It is tough out there. The cost of everything keeps increasing with no end in sight. At least for the imminent future. Operating and managing a water utility must be accomplished with strategy.

Water leaks can be a huge problem that water utilities face, costing a significant amount of money if left untreated. Leaking pipes are an industry wide problem that is as old as the industry itself.

There are several leak detection methods that allow operators to find leaks without digging. These methods range from simple techniques to high-tech options.

Finding leaks has been challenging since the day's pipes have been installed in the ground. When a pipe springs a leak, either from corrosion, poor installation, or from being struck, it may not be noticed right away. The hissing of water as it escapes from the pipe is quiet, dampened by the dirt and mud around it, covered by several feet of soil. It can take days, weeks, more often several months before the water works its way up to the surface. Frequent observations are water bubbling up out of the ground, or landscape around the leak is much greener, surfacing through a crack in the concrete or pavement, or running down a curb line. Remember if the system is sitting on bedrock, "often times" the water will follow the path of least resistance – down. You may hear the leak, but never see it.

Water loss due to pipe leaks can cause significant impacts. It is estimated pipe leaks can run unattended for a long time before they are discovered and repaired. All of that water loss is substantial and costly to the utility.

The consequence isn't just the lost water. Substantial power resources are dedicated to pumping water. Especially pumping up to a higher elevation or higher zone in the distribution system. Power that comes with greenhouse gas costs. These associated costs can be very expensive. Usually, it's not just the cost of the water loss.

The most valuable asset of a water utility is in the infrastructure. Monitoring the pipe system on a regular basis is essential for detecting and repairing underground leaks before they develop into large leaks and possible breaks causing substantial damage is critical for maintaining a sound distribution system.

Being able to find and repair leads quickly can also mean enhanced customer service, avoiding unexpected water disruptions in water service to the customer.

Implement a regular maintenance schedule. An effective leak detection program allows water utilities to locate leaks when they are small and haven't had a chance to cause a significant amount of damage to the surrounding area and infrastructure, driving down maintenance costs and decreasing non-revenue water loss. This is especially true where water pipes are being used way beyond their expected replacement time.

There are several leak detection practices depending on costs and availability of equipment. Methods have developed with the introduction of listening devices. Listening sticks consists of a long metal rod with a round head made up of rubber or wood. The operator places the edge of the rod onto a pipe and puts their ear to the top of the listening stick, then listens for sounds that indicate a water leak along the pipe. Another listening device is a magnet that attaches to a valve head or hydrant while the sound of a leak travels where it can be heard through earphones.

To use a correlator, sound sensors are placed onto a pipe at two points to detect and record sound given off by a leak. The correlator then pinpoints the leak by running the sound data through an algorithm that assesses the difference in the sound and frequency of each sensor.

Acoustic technology has become the most practical and reliable technique for locating and monitoring water leaks.

Efficiency comes into place with leak detection. Not only is it helpful to the planet, but there are considerable cost savings that go along with it.

If you suspect a water leak, give your WRWA Circuit Rider a call and they can come out with their leak detection equipment for an evaluation and help locate the leak.

It's all about saving money. ***Annie***

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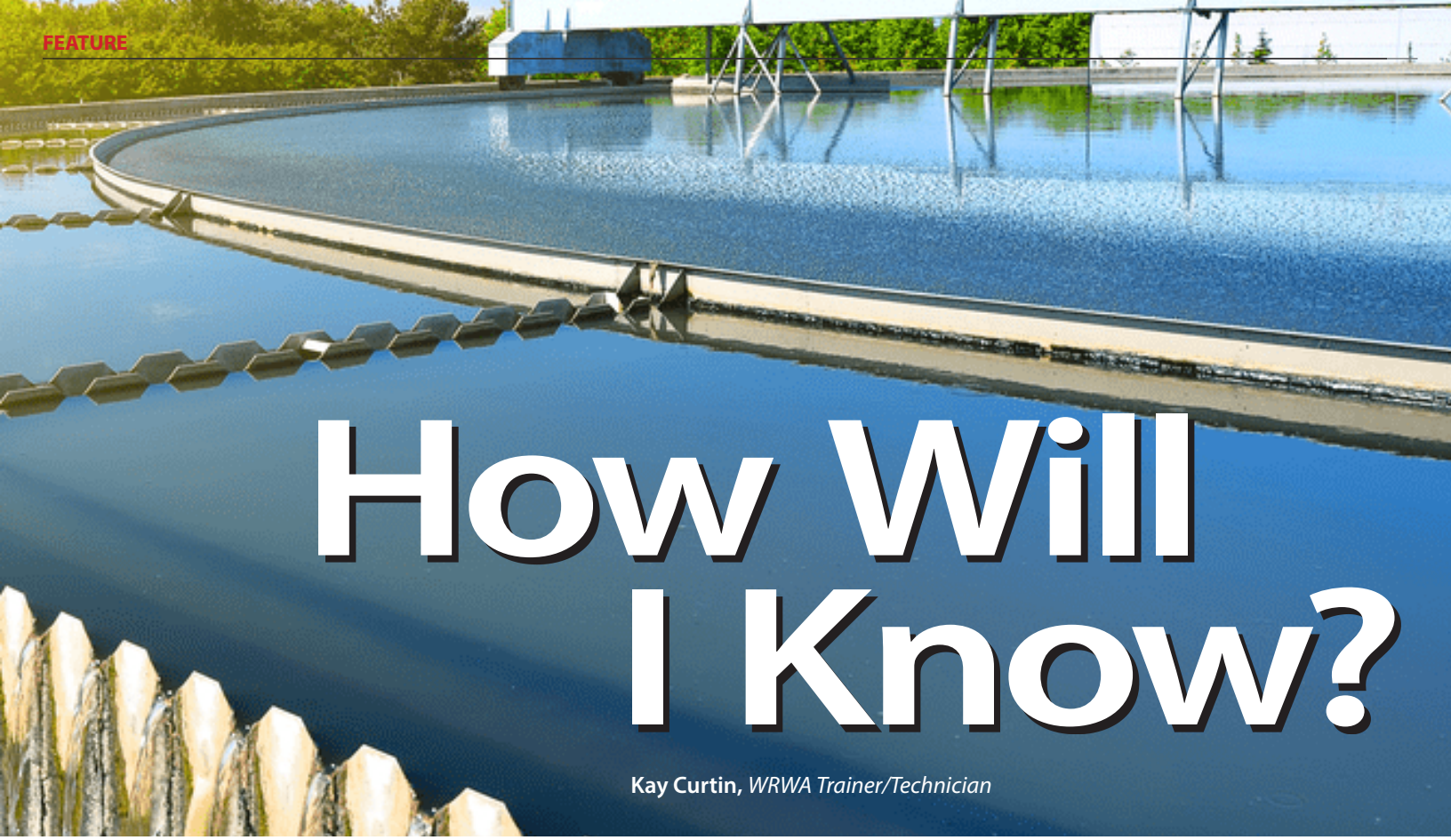

How Will I Know?

Kay Curtin, *WRWA Trainer/Technician*

Arm yourself with knowledge of your system. Find that O & M manual and learn how your plant operates. Use calibration verification frequently.

In the past few weeks, I've been called to several wastewater treatment plants that are not meeting limits, in trouble, or just plain dead. One of the first things that I ask is "What is the dissolved oxygen (DO) in the plant? DO is the most important analysis that is required for biological treatment plants, whether they're activated sludge, ponds, RBCs, membrane filtration or MBBRs. You have aerobic bacteria breaking down the waste in your plant, and they require free oxygen to survive and do their jobs. Invariably, the operators will tell me that the plant is operated by the in-line DO meters and plant automatic controls, so it surely is correct. Both the salesman and former operator Old Bob said so.

Then I brought my handheld DO meter to their plant, carefully calibrated it using temperature and barometric pressure with altitude correction and took DO readings right next to their in-line probes. The in-line meters and probes were far, far off the mark. Each time, the operators of plants that were dependent on controls using in-line probe readings had no idea how to make changes to the readings of their meters or to other automated controls of their plants. In each case, they had to call in an electronics specialist, sometimes waiting for days for their arrival.

In their defense, most were new operators that had received little or no training on their systems. The O & M manuals were nowhere to be found. They did not have hand-held DO meters and weren't allowed to purchase one as their village boards or city officials didn't think it was necessary as there were in-line meters that ran the plant. One told me that she didn't understand why they needed operators - the plant ran itself!

One of the most important terms that you need to know as a wastewater operator (or a lab technician) is CALIBRATION VERIFICATION. This is when you use a traceable reference standard to verify the reading of an instrument. Lab technicians know that they need to verify their analyses with known standards. You need to do the same thing with the on-line instruments that are used for your plant operation. Just because your plant was started up five years ago and everything calibrated at that time, doesn't mean that it is now. Those probes reside in nasty conditions. Pushing a "calibrate" button on an in-line meter does not mean that it is calibrated. For a DO calibration table, contact me, or use the chart at https://dnr.wi.gov/topic/labcert/documents/methods/DO_Sat_Table.pdf.

As Whitney Houston sang in 1985 - "How Will I Know?" OK, so I'm once again dating myself. Google it if you must: https://www.youtube.com/watch?v=m3-hY-hlhBg And no, sadly, Whitney wasn't talking about DO meters. She was just a common pop star, not a wastewater star like you. But you get my point: You need to use a known reference. In the case of DO, a calibrated hand-held meter using temperature and barometric pressure with altitude adjustment. In the case of in-line pH, a calibrated hand-held pH meter, using two or more buffers to calibrate it. The same

with ORP, MLSS, ammonia nitrogen, effluent orthophosphate, or any other instruments that are used for your plant operation, especially if automation is involved. Otherwise, it's like driving your brand-new pickup (that costs more than your home) without any dashboard instrumentation. Future disaster is guaranteed.

Once we rectified the readings of the probes and started operating the plants accurately and efficiently, the problems went away. What I'm trying to point out is this: Arm yourself with knowledge of your system. Find that O & M manual and learn how your plant operates. Use calibration verification frequently. Don't trust anyone that says that something will operate itself. Go to WRWA classes, and for heaven's sake, listen to Kay and Jesse. And Whitney.

– Kay–

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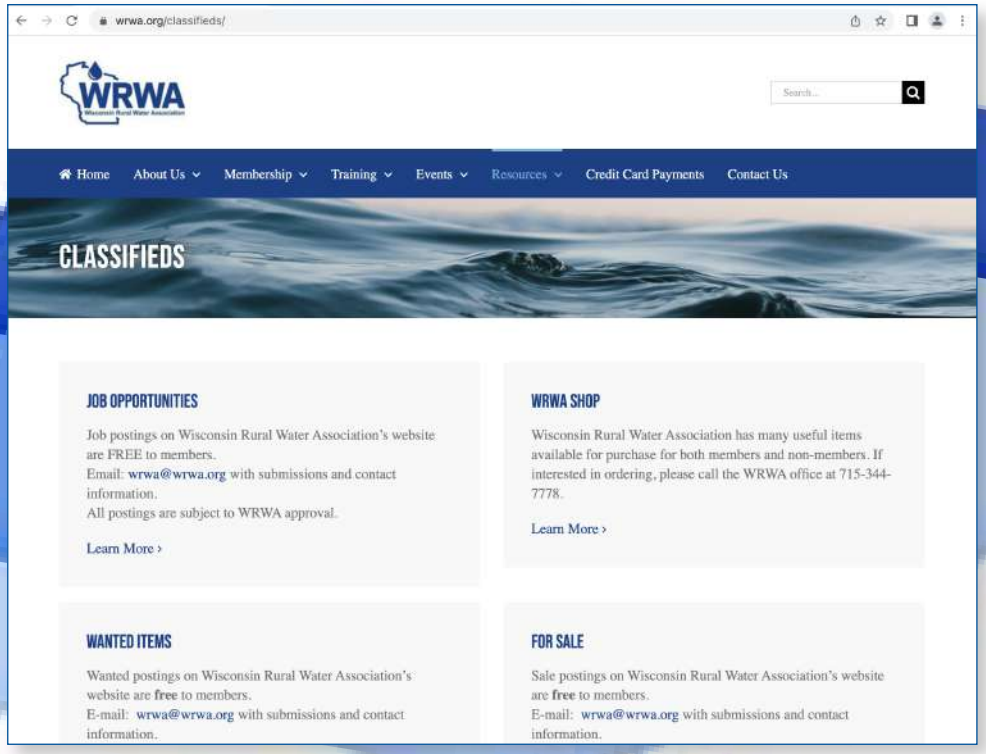
WRWA Classifieds is now online.
Check us out: www.wrwa.org/classifieds/



Wisconsin Rural Water Association

WRWA MEMBERSHIP (Annual Fee)

*WIP (individual)	$45
Transient	$65
OTM & NN System	$155
Septage Haulers/Plumbing Co.	$155
Less than 1,000 people served	$330
1,001 – 2,500	$410
2,501 – 6,000	$480
6,001 – 10,000	$550
Over 10,000	$615
Associate	$550
Corporate	$1,540
Corporate Gold	$2,880

JOURNAL ADVERTISING RATES

	MEMBER		NON-MEMBER	
Black & White Advertising	1-Time	Yearly	1-Time	Yearly
Full page	$430	$1,555	$575	$1,970
Half page	$315	$1,130	$395	$1,265
Quarter page	$215	$800	$270	$860
Business card	$160	$575	$200	$600

	MEMBER		NON-MEMBER	
Color Advertising	1- Time	Yearly	1-Time	Yearly
Inside front cover	$670	$2,430	NA	NA
Outside back cover	$800	$2,540	NA	NA
Full page	$575	$1,970	$770	$2,670
Half page	$370	$1,265	$575	$1,965
Quarter page	$270	$860	$400	$1,400
Business card	$200	$600	$335	$1,000

*For information on advertising & the benefits of membership at the different levels, please contact Renee at the WRWA office: 715-344-7778 or rkoback@wrwa.org. *Must be employed by a WRWA system, associate, or corporate member, retired and state or federal employees*

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Fire Flows

By Todd Weich

It's that time of year again. Spring has come and gone, and summer is here. What does that mean? Construction projects are in full swing! Some of you have construction projects planned and happening this year; others may have done a water main project previously. So, I want to touch upon fire flows and hydrants.

Let's start with fire flows. One thing I can't stress enough is when you do a water upgrade you should also consider fire flows. If you loop your system and change pipe material or diameter size, it will affect your fire flows from your fire hydrants. When planning a water system upgrade, look at what's around for buildings and what consider potential developments in the future.

Something else to keep in mind: "NR 811.70 (6) FIRE PROTECTION: The minimum flow requirement for water mains serving fire hydrants is 500gpm at 20 psi residual pressure at ground level at all points in the distribution system." They also state that "It is recommended that the actual fire flow design be based on the capacity of any fire pumper which may be connected to the water main and the type of services or buildings to be protected. It is also recommended that the local fire department be consulted to discuss needed fire flows before constructing water system improvements." With new developments and fire hydrants popping up every day, don't be afraid to contact your local fire department and see what their ideal pressure would be for their pumpers. Another thing to keep in mind while adding new fire hydrants to new developments is that there must be a fire hydrant located every 300 – 650 feet (NR 811.71(1). This is due to the simple universal fact of firefighting practice and the standard amount of hose on the fire trucks. If you do encounter a fire hydrant within your municipality that does not meet the requirements of NR 811.70 (6), you must either color code the hydrant or tag it but also notify the fire department in writing that said fire hydrant may not be used in the case of a fire due to the lacking ability in pressure until additional upgrades have been made and flow tests prove it to be above the requirement for fire protection.

The National Fire Protection Association (NFPA) also has slight requirements. NFPA 291:

What is the height of a fire hydrant NFPA?

All fire hydrants shall be set to finished grade with the lowest outlet thereof no less than 18 inches above grade and with no less than 36 inches of unobstructed area for the operation of hydrant wrenches on all outlets and the control valve.

NFPA 291 provides guidance on fire flow tests and markings of hydrants in order to determine and indicate the relative available fire service water supply from hydrants and to identify possible deficiencies which could be corrected to ensure adequate fire flows as needed.

If you have made changes and would like to perform some fire flows, contact your Circuit Rider for details and technical assistance in performing them.. *Todd*

OTM-NN Small Water System Sampling Requirements

Hello Everyone,

Today I want to talk about the importance of always checking your water sample requirements just so you don't miss an important sample that your water system is required to take. Checking your water system's sample requirements is key to staying in compliance with the WI-DNR regulations.

First off start by checking your water systems Sampling Requirements through the WI-DNR website at (dnr.wisconsin.gov). Once at your water systems sampling requirements you can check for all your Monthly, Quarterly or Yearly sampling requirements. Most of the time your system requirements do not change unless of a missed sample. If your system has missed a water sample, an additional sample may be required, and can always be checked here through the website. Missing forms or sampling paperwork can also be found on the WI-DNR website.

Most of your sampling requirements will include Monthly and Quarterly Bacteriological sampling, Lead + copper sampling, IOC, SOC, VOC, Nitrate and PFOA/PHOS sampling. Once you have figured out all your sampling needs please reach out to your certified lab and order bottles and complete your sample requirements in the compliance period. I know sometimes it may seem overwhelming but if you have any questions on checking your sample requirements, please give us a call. This is just one handy tool water operators should get into the routine of checking. The WI-DNR website offers a variety of helpful links for operators.

Please don't hesitate to call if you are experiencing any form of technical assistance or WI-DNR compliance issue. We are always happy to assist.

Thank you and have a wonderful day!

George Taylor,
Small Water System Circuit Rider • 715-321-4145 • Gtaylor@wrwa.org

What Is a TMDL?

Jesse Hass,
WRWA Wastewater Technician/Trainer
Wastewater Specialist

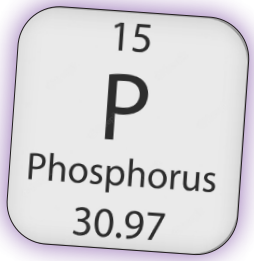
If you are in a TMDL that is currently being developed stay involved. There are also many systems that are not in an area where there will be a TMDL.

What is a TMDL? As defined on the WI DNR TMDL informational page a TMDL is *"a pollution "budget" for a water body or watershed that establishes reductions needed from each pollutant source to meet water quality goals. While some waters may be restored through alternative projects such as Watershed Restoration Plans, many issues are addressed through TMDLs." The WI DNR informational page also states: "A TMDL is developed after consideration of all sources of pollution to an impaired waterbody and is stated as the amount of pollutant that the waterbody can assimilate and not exceed water quality standards. TMDL pollutant loads are determined in consideration of in-water targets that must be met for the waterbody to respond favorably. Targets may be based on promulgated numeric water quality criteria or may be based on narrative criteria developed in consideration of local data and/or nearby reference sites."*

These limits take into consideration point source and non-point source entities. Point sources are systems or entities that have WPDES permits and are discharging to a body of water based on that permit. Municipalities with WPDES permits are considered point sources. Non-point sources are any other sources where rain a snowmelt pick up any waste and deposit them into the water bodies of Wisconsin. A TMDL is designed to have point sources and non-point sources each meet load applications to help impaired water ways.

An example of a loading breakdown was delivered at a TMDL meeting for the Upper Fox/Wolf River watershed that I attended. I'll refer to the Upper Fox/Wolf River TMDL study because I am most familiar with it. The study found that sources of phosphorous coming into the Upper Fox/Wolf River watershed was 60% from Agriculture, 20% from individual permits, 15% from background, and the remaining 5% from Storm Water, also referred to as an MS4. The study for the Upper Fox/Wolf River watershed found that the source of TSS was 92% from Agriculture, 4% from individual permits, 2% background, and 2% storm water. The percentages are interesting to say the least. There are 76 permitted wastewater systems in this basin, 56 are municipal and 20 are industrial. The municipalities are contributing less than 20% of the total amounts of phosphorus to this watershed. For the Upper Fox/Wolf River TMDL most municipalities are looking at a pound per day limit where the estimated mg/l will be around 0.2. This limit will be much lower than the 1 mg/l most systems currently have. The Upper Fox/Wolf River TMDL has been approved and it seems the limits will be implemented at some point over the next few permit cycles.

The information I provided for the Upper Fox/Wolf River TMDL does not apply to everyone, it is just an example of some interesting things I noticed with the Upper Fox/Wolf River TMDL. There are many TMDLs across the state that are in different phases of development. If you are in a TMDL that is currently being developed stay involved. There are also many systems that are not in an area where there will be a TMDL. Some cities will just be given a limit. There will usually be meetings that are held to discuss the impact of the limits you will be receiving. Attend the meetings and pay attention to the DNR website for important dates for meetings and comments. To do some research about your TMDL status you can find information by searching TMDL on the WI DNR website. Knowledge is power, stay engaged in the process. Ask questions about your phosphorus limits and try to get a definitive timetable on implementation of these limits. Before it comes time to meet these limits start gathering data for the best ways to do so. Ask other cities what they are planning to do and what technologies they are considering. If you hear of a technology that is working, try to go see it in operation and ask the operators what they like and do not like about the process.



It is going to be an interesting next 5 to 10 years as most systems try to meet lower phosphorous limits. Stay on top of things, tour plants, and go to classes and conferences to try and be as informed as you can. Meeting any lower limit might be a financial burden for many communities. Do research on different funding options so you know what loans and grant are available for you community. *Jesse*

CORPORATE GOLD MEMBERS

Wisconsin DNR Operator Certification Exams Update

Sam Wettach, *Operator Certification Coordinator – Drinking Water & Groundwater, Wisconsin DNR*

Since the onset of the pandemic in March 2020, Wisconsin DNR's Operator Certification program has adjusted how we offer exams from our previous format. This was due to a need to adapt to the conditions of the pandemic while pursuing a modernization effort to move our exams from paper to computers.

Traditionally, exams facilitated through February 2020 were held four days each year. These included two larger exam days in May and November in Rice Lake, Rhinelander, Eau Claire, Plover, Green Bay, Madison, and Milwaukee. Additionally, two exam days in February in August were held in Plover. During the beginning of the pandemic, DNR worked on developing an exam application process that allowed operators and facilities with an urgent need to apply to take limited capacity exams that complied with public health guidelines. These sessions were all held in Plover December 2020 – December 2021.

In January 2022, we launched our new third-party computer-based exam platform through PSI in partnership with WPI (formerly ABC). Exams were offered either from a personal computer (remote proctor) or in-person at a PSI computer lab. While our exams moved to computers and are facilitated by PSI, the exams have not changed. Wisconsin DNR continues to manage our exam content and study guides and will not be adopting WPI's national exams. More simply, we moved the exams from paper to a computer.

Throughout this first year of exams, the Operator Certification tracked all feedback that was submitted regarding the PSI testing platform, the exam-taking experience both in-person and via remote proctor, and PSI customer service. Additionally, Operator Certification conducted a survey through DNR's Analysis Services program that was sent via email in late February to every person who signed up to take an exam through PSI from January 2022 – February 2023. One of the primary takeaways from the survey was that the remote proctor (online) exam option had resulted in unacceptable experiences for our exam takers.

- Since January 2022, 21% of exam takers who scheduled a remote proctor exam were not able to launch and start their exam largely due to tech issues. All missed exam sessions resulted in loss of all exam fees
- 64% of exam takers took over 30 minutes to launch the remote proctor session (a quarter were ultimately unable to launch their exam)
- 64% of remote proctor exam takers were dissatisfied or very dissatisfied with the overall remote proctor experience
- 79% of all exam takers needed to contact PSI for some level of assistance

With these survey results, previously received feedback from exam takers, and the increased staff time that the Operator Certification program has had to dedicate to address exam issues, DNR determined the remote proctor (online) option was untenable, unsustainable, and that the best option was to remove remote proctor as an exam location option.

Beginning April 1, 2023, all Operator Certification computer-based exams are held at PSI's in-person computer labs. The cities with computer labs include Rhinelander (as of May), La Crosse, Stevens Point, Oshkosh, Green Bay, Madison, Waukesha, Pewaukee, Duluth, MN and Marquette, MI. Please note that while exams are offered six days/week that locations are subject to availability based on open seats and site capacity. You will see available locations when registering your exam through PSI's website after receiving your PSI exam eligibility email from schedule@goamp.com.

Additionally, DNR staff will be hosting a limited number of in-person paper exams in central and northern Wisconsin. We facilitated exams in Plover on May 16th and 17th, Rhinelander on June 20th, and Rice Lake on June 21st. DNR Is finalizing additional dates for this fall that will continue to focus on locations in central and northern Wisconsin due to fewer available PSI locations in those regions. For updates, please follow DNR's Operator Certification Exams page (https://dnr.wisconsin.gov/topic/opcert/exams.html).

I would like to thank all who have provided feedback to DNR, either by email or by survey. Without your feedback, positive and negative, we cannot fully understand how exams are going. Lastly, I strongly encourage anyone to provide feedback as you continue to take exams, whether it's on paper through DNR or on computers through PSI. Any and all feedback can be emailed to DNROpCert@wisconsin.gov.

VFDS

By Dan Wundrow

For those that don't know what VFD stands for it is Variable Frequency Drive. That means it controls the frequency output of the motor.

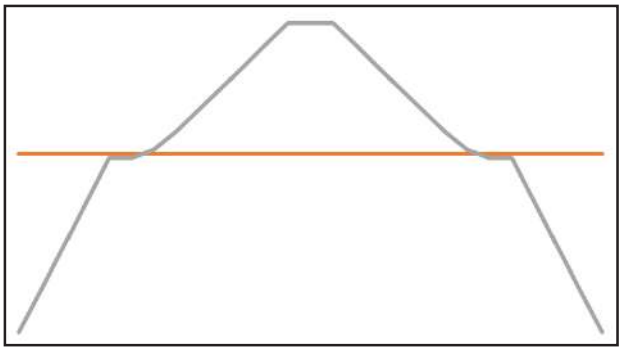
For the last few years, I have assumed the Energy Efficiency role. As of now, I have taken over Jeff LaBelle's territory as Municipal Circuit Rider. Some of you have already had the chance to meet me, and for the rest, I will be stopping around shortly to introduce myself. In the meantime, if you need my assistance, please give me a call (715)563-0188.

For those that don't know what VFD stands for it is Variable Frequency Drive. That means it controls the frequency output of the motor. Changing the hertz (Hz) of the motor will slow the motor down, which will save money as well. Think about your car or truck for a moment. Image your vehicle when you started, it just drove as fast as the motor turned over and you controlled the speed by just pressing on the brake. What you have is a lot of wasted energy. Now think about the gas pedal, you push that down to go faster and let it up to go slower. That is the concept behind a VFD, control the speed first rather than trying to stop the speed.

Over the last few months, I have found that many systems are using them as soft start option rather than energy savings devices. By no means using them as a soft start is a bad thing. That's the great thing about VFDs, they can be used in many different functions and settings. Today, we will talk just a little bit about some other functions a VFD can be used for.

Using a VFD as a soft start seems to be the most common application within the water industry. Which does work well. There can be some problems with this set up still causing water hammer. This can be fixed with a few set point adjustments within the VFD.

This can be achieved by setting the VFD to ramp up at a semi-slow speed that allows water to be pumped up the well casing and meet the check valve. At that point the VFD will speed up over the course of a five-minute period until the well pump overcomes the head pressure of the check valve. This in turn will slowly open the check valve while the VFD still continues to speed up until at full operational speed of 60hz. When the well is ready to turn off, the VFD will start the same five-minute slowdown and allow the check valve to close softly.



The chart to the left shows the VFD speed in gray and the Check Valve pressure in orange. As you can see, the VFD slows down at the check valve opening point until the well pump and check valve are at the same pressure. Then the check valve opens softly and slowly. The same happens when the well pump shuts down. Once the well reaches the check valve pressure, the VFD levels out and allows the Check valve to close softly and slowly.

A VFD can also be set up to operate based off from pressure (psi) rather than hertz. This is not a common or well-known setup. However, if you have a VFD installed, talk with the installer, and ask if they can also set it up to operate on PSI as well. Why would you want this done? Example, during a water tower drain down, VFDs can be switched to PSI, allowing you to set the desired pressure of your system in the VFD. This allows your well pump to maintain the system pressure rather than fully relying on the pressure relief valves to do all the work. I would still recommend installing a few pressure relief valves during a tower drain down as a precaution. Overall, this will help reduce the total overall water loss during a tower drain down.

Now there is still part of me that is an energy geek, so, I must put this in about energy savings. This was during the last energy assessment that I did. Below is a chart showing the energy savings with a well pump. This well pump is a 40-horsepower motor that has an efficiency rating of 94%. The well runs for 18.15 hours per day and the kWh cost is $0.20 per kW. When looking down at the 80% speed you will see that the total annual savings are $10,598. One can see significant savings may be achieved. However, at some speeds there may not be enough head pressure to pump. Each system will need to play with the settings to see what is possible in the real world.

Hp HP	/Eff.	Eff Hp	Conver. to kW	kW Kw	Q Flow	2.3^ kW	Oper Hours	Day kW hr	Days week	kWh Week	Wks WkYr	Yr.kWh kWh Yr.	kWh $ Cost	kWh Year	kW D Fee	kW	Month Demand	Year Demand	Total	Saved Yr.
40	94%	42.6	0.746	31.74	100%	31.7	18.15	576.2	7	4033	x 52	210,450	$0.20	$42,090		32	$0	$0	$42,090	
40	94%	42.6	0.746	31.74	97%	29.6	18.7	553.8	7	3877	x 52	202,280	$0.20	$40,456	$0.00	30	$0	$0	$40,456	*$1,634*
40	94%	42.6	0.746	31.74	95%	28.2	19.1	539.0	7	3773	x 52	196,875	$0.20	$39,375	$0.00	28	$0	$0	$39,375	*$2,715*
40	94%	42.6	0.746	31.74	90%	24.9	20.2	502.4	7	3517	x 52	183,512	$0.20	$36,702	$0.00	25	$0	$0	$36,702	*$5,388*
40	94%	42.6	0.746	31.74	80%	19	22.7	431.1	7	3018	x 52	157,459	$0.20	$31,492	$0.00	19	$0	$0	$31,492	*$10,598*

These are just some of the things that a VFD can do to help with your system and make your job a bit easier. If you have questions about VFDs, please reach out to any one of us and we can help you get on the right path. I hope that this article was helpful. I look forward to meeting many more of you in the upcoming months and years. Have a safe and happy summer. *Dan*

Analyzing Nitrate Trends in Wisconsin

Andrew Aslesen,
WRWA Source Water Specialist

Groundwater Nitrate levels can be viewed four different ways, nitrate concentration as a county average, nitrate concentration in individual wells, nitrate county average trend (increasing or decreasing), or nitrate in individual wells trend (increasing or decreasing).

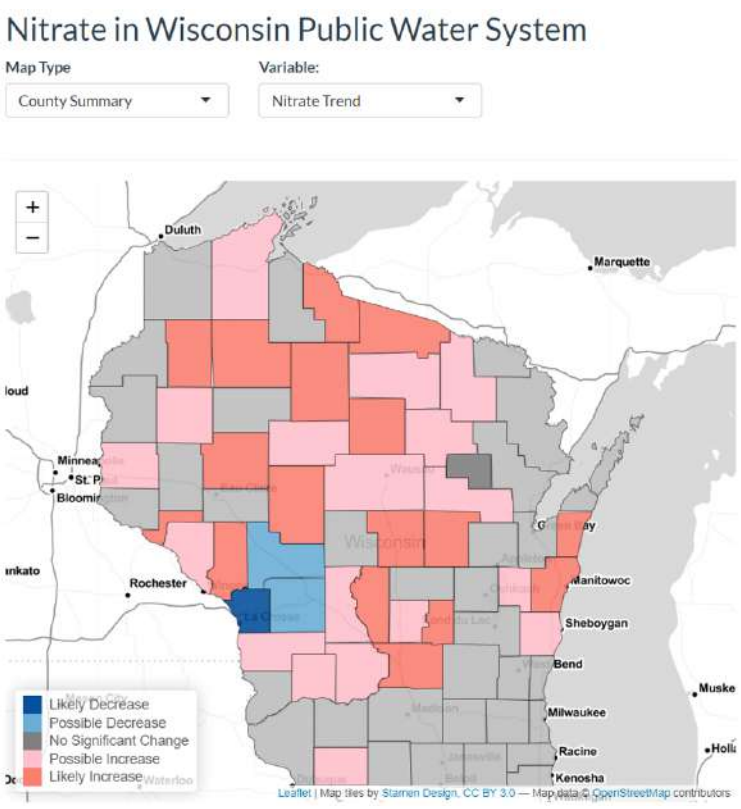
According to the Wisconsin Groundwater Coordinating Council's annual report to the legislature, Nitrate is Wisconsin's most widespread groundwater contaminant. Several reports show that Nitrate contamination of groundwater is increasing in extent and severity in the state. Between 1999 and 2012 the number of municipal systems with raw water samples that exceed the MCL for Nitrate of 10 mg/L increased from just 14 systems to 47 systems and increasing Nitrate trends have been observed in an additional 74 municipal systems. The full Nitrate section of the GCC report can be found on the DNR's website using the following URL: https://dnr.wisconsin.gov/sites/default/files/topic/Groundwater/GCCGWQuality/Nitrate.pdf.

While these statewide trends are important, they aren't necessarily useful for local water managers or decision makers when deciding if they need to spend time, effort, or money on trying to reduce nitrate loading to groundwater in their area. Because of that, I would like to highlight a new tool developed by the Center for Watershed Science and Education in partnership with the DNR, that can be used to view Nitrate trends at a more local level. The tool can be found using the following URL: https://uwsp-watershed-center.shinyapps.io/WI_NITRATE_TRENDS/. Public water systems are required to submit nitrate samples to the DNR at least annually. This includes not only municipal water systems, but all other categories of public water system, which includes Municipal, Other-than-municipal, Transient non-community and Non-transient non-community public water systems. This creates a much larger dataset than municipal wells alone. This tool aggregates this large Nitrate dataset and displays it using a mapping application for easy viewing.

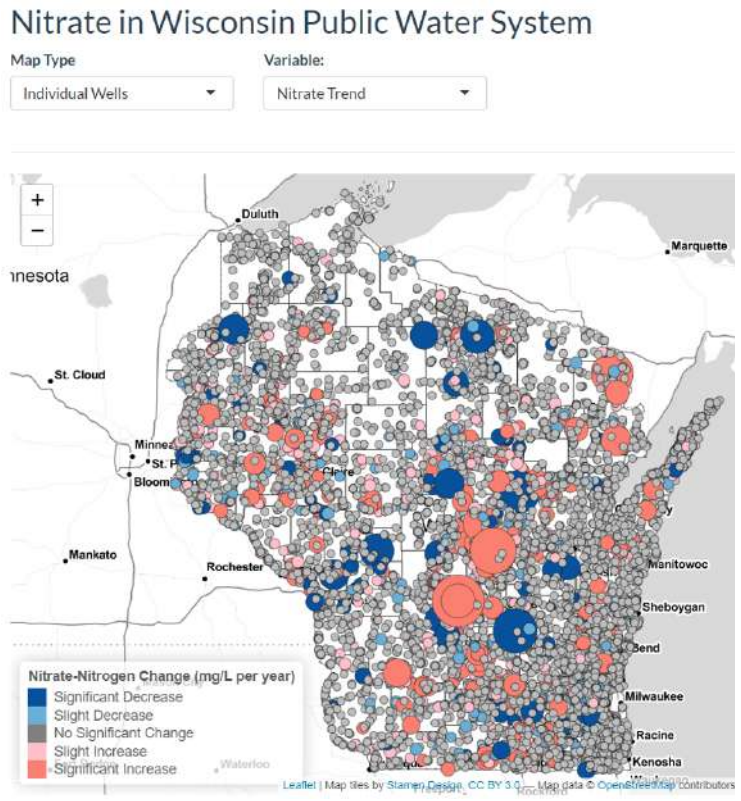
Groundwater Nitrate levels can be viewed four different ways, nitrate concentration as a county average, nitrate concentration in individual wells, nitrate county average trend (increasing or decreasing), or nitrate in individual wells trend (increasing or decreasing). The nitrate concentration viewed at the county average represents the mean annual nitrate concentration of public water systems for 2018. The nitrate concentration viewed as individual wells shows the most recent nitrate concentration on a map as color coded points and gives a drop-down menu where you can select the Wisconsin Unique Well Number to view a graph of annual nitrate concentration. Nitrate trends can also be viewed as a county summary or as individual wells. The County summary of nitrate trends takes a subset of the public wells that have more than 20 years of nitrate results. For each county, a linear model was used to fit a regression line to the mean annual nitrate concentration. A dropdown menu lets you view the trend line for a selected county. A map shows each county in the state as having a likely increasing, possibly increasing, likely decreasing, possibly decreasing or no significant change in nitrate trend.

Based on the data, 17 counties show a likely increasing trend, and another 18 counties show a possible increasing nitrate trend while only one county shows a likely decreasing trend, and two other counties show a possible decreasing trend. Those counties are La Crosse, Monroe and Jackson Counties respectively. This data analysis tool supports the conclusion of the GCC report that groundwater nitrate concentrations in the state are increasing. If your municipal well is showing an increasing trend in Nitrate, you should consider taking some action to mitigate nitrate contamination before it becomes a problem. WRWA's Source Water Protection program can help, feel free to reach out any time if you have questions or want to talk about nitrate; Andrew Aslesen, WRWA Source Water Specialist at Aaslesen@wrwa.org or calling 715-321-3451."

Andrew

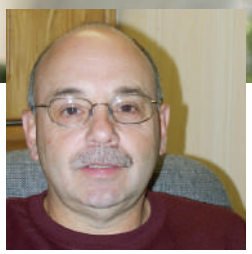


Picture 1: Nitrate concentration viewed as a county trend.



Picture 2: Nitrate concentration trend in individual wells.

WHY WON'T WE CHANGE?



Vince Matarrese,
Advanced Safety Technology, Inc.
President

Numbers will go up as long as there is no enforcement of the rules. This is one of the reasons why we won't change and follow the rules.

According to NIOSH, from 2011-2020, transportation events accounted for 73% of worker deaths that occurred at road construction sites during the 10-year period (919). In 63% of these transportation events at road construction sites, the worker was struck by a vehicle (577).

371 of the 577 workers were struck by a forward-moving vehicle, 123 by a backing vehicle.

Pickup trucks and SUVs accounted for 169 worker deaths at road construction sites from 2011-2018, followed by automobiles (149), machinery (146), semi-trucks (141), and dump truck (89).

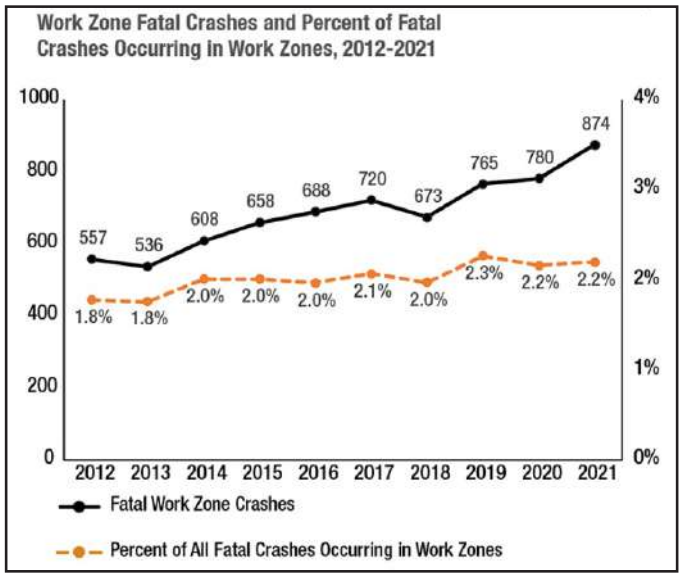
Numbers will go up as long as there is no enforcement of the rules. This is one of the reasons why we won't change and follow the rules.

From 2011-2018, 68 percent of the workers who were killed were employed as:

- Construction laborers (253)
- Heavy and tractor trailer drivers (142)
- First-line supervisors of construction and extraction workers (96)
- Highway maintenance workers (96)
- Construction equipment operators (81)

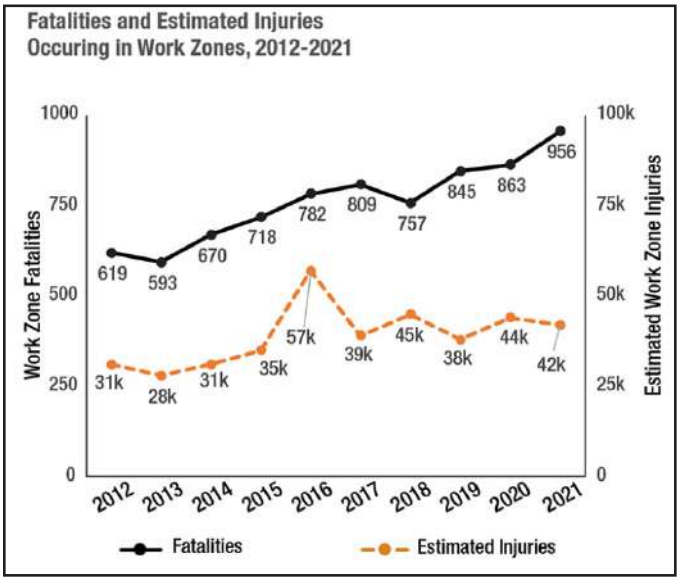
From 2011-2018, 864 workers killed at road construction sites worked in private-sector construction. Of those, 68% worked for either heavy and civil engineering construction companies (470) or specialty trade contractors (119).

Over the 10 years from 2011-2018, 144 workers **(14%)** killed at road construction sites worked in the **government sector**, with roughly equal numbers working for state (73) and **local governments** (68).



Over the past 10 years, fatal crashes in work zones have **increased** from 557 in 2012 to 874 in 2021. The percent of all fatal crashes that occur in

work zones has also increased slightly, from 1.8 percent in 2012 to 2.2 percent in 2021. (Source: NHTSA FARS)



Over the past 10 years, work zone fatalities have increased from 619 in 2012 to 956 in 2021. This equates to nearly three persons per day being killed in work zones in 2021. Approximately four out of every five work zone fatalities involve a driver or passenger of a vehicle. Meanwhile, estimated injuries in work zones have also increased, from 31,000 in 2012 to 42,000 in 2021. In 2021, this equates to approximately 112 injuries per day in work zones. (Source: NHTSA FARS, GES, and CRSS)

Wear The Proper Clothing (Class 3 or above)! Follow the Manual On Uniform Traffic Control Devices (PART 6. TEMPORARY TRAFFIC CONTROL). **https://wisconsindot.gov/Pages/doing-bus/local-gov/traffic-ops/manuals-and-standards/wmutcd/wmutcd.aspx**

ANSI/ISEA 107 2015 for High-Visibility Safety Apparel And Accessories

Type R ("roadway") – Occupational HVSA for Roadway Use

Type R HVSA provides daytime and nighttime visual conspicuity enhancement for workers in occupational environments which include exposure to traffic (vehicles using the highway for purposes of travel) from public access highway rights-of-way, or roadway temporary traffic control (TTC) zones or from work vehicles and construction equipment within a roadway temporary traffic control (TTC) zone.

Type P ("public safety") – Occupational HVSA for Emergency and Incident Responders and Law Enforcement Personnel

Type P HVSA provide daytime and nighttime visual conspicuity enhancement for emergency and incident responders and law enforcement personnel in occupational environments which include exposure to traffic (vehicles using the highway for purposes of travel) from public access highway rights-of-way, or roadway temporary traffic control (TTC) zones, or from work vehicles and construction equipment within a roadway temporary traffic control (TTC) zone or from equipment and vehicles within the activity area. Type P HVSA provides additional options for emergency responders, incident responders and law enforcement who have competing hazards or require access to special equipment.

Performance Class 3 (Type R or P)

Performance Class 3 can offer greater visibility to the wearer in both complex backgrounds and through a full range of body movements by mandatory placement of background, retroreflective and combined-performance materials on sleeves and pant legs (if present). Regardless of the area of materials used, a sleeveless garment or vest alone shall not be considered Performance Class 3.

THINGS TO REMEMBER

A supervisor who is knowledgeable in traffic control principles should be responsible for work zone setup.

- The supervisor should walk or ride through the work zone to make sure it is set up properly.
- Halt the work until unsafe conditions related to temporary traffic control have been eliminated.
- Document the work zone setup and changes that were made. Take pictures!
- Close the road completely and reroute traffic where feasible.
- Increase the size of the lateral buffer zone to reduce worker exposure to passing motorists.
- Emphasize the use of proper high-visibility safety apparel.

Cover or take down warning signs when workers are not present. Every week I see flagger ahead signs or lane closed, nobody is present and the lane is open. This is one of the reasons why motorist's do not pay attention to signs. And yes, phones do contribute to this also.

Be safe this summer. Remember, it's all about going home. Vince

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WRWA
Outdoor Expo 2023

Join us on...
Thursday August 24, 2023

Outdoor Equipment Exhibits
and
Educational Product Demonstrations.

ACTIVITIES

- Product Demonstrations
- Equipment Demostrations
- Expo Raffle
- Vendor Activities
- And Much More!

WRWA Outdoor Expo 2023 Agenda

Thursday August 24, 2023
(6 Municipal Water and 6 Wastewater Credits)

Office Building Classroom

8am – 9am	Transitioning from MDV Program to Water Quality Trading and Risk Management How to transition over time from the MDV program to water quality trading and managing risk. Mark O'Leary, *Resource Environmental Solutions - RES (WRWA Corporate Gold Member)*
9am – 10am	Monoform Plus Rehabilitation of underground utility components impacted by degradation. Matt Huston, *HK Solutions Group (WRWA Associate Member)*
10am – 11am	CISA 101: Physical and Cyber Resources for Water/Wastewater Operators Discussing the physical and cyber resources CISA field personnel can deliver at no cost. Bill Nash, John Busch, and David Melby, *Cybersecurity and Infrastructure Security Agency*
11am – 12pm	Duckweed's Role in Lagoons Describing the pros and cons of duckweed and highlighting methods to control or prevent it. Ben Shakman, *Triplepoint Environmental*
12pm – 1pm	Working Lunch and Product Demonstrations (outside)
1pm – 2pm	Proper Selection and Maintenance of Valves and Actuators Factors to ensure optimum performance of valves and actuators. Mike Barreau and Everett Russell, *Dorner Company (WRWA Corporate Member)*

Technology Center Classroom

8am – 9am	Active Mixing in Potable Water Tanks Benefits of mixing in potable water tanks including preventing ice and thermal stratification. Tony Belden, *Great Northern Environmental (WRWA Associate Member)*
9am – 10am	South Milwaukee Water Emergency A timeline of events and resulting impacts to a water distribution system from storm damage. Ben Huffman, *South Milwaukee Water Utility (WRWA Water Utility Member)*
10am – 11am	When Sip Happens Looking at the importance of performing regular maintenance to ensure asset reliability. Dan Popehn, *KLM Engineering (WRWA Corporate Gold Member)*
11am – 12pm	Latest Technology in Well Casing Repair Discussing new technology in well casing patches. Mike Judkins and Peter Bennin, *Water Well Solutions Wisconsin LLC (WRWA Corporate Gold Member)*
12pm – 1pm	Working Lunch and Product Demonstrations (outside)
1pm – 2pm	Water Tower Agreements: Standing up to the Cell Phone Company Steps utilities can take to secure long-term revenue at market rates from cell phone companies. Dale Romsos, *VMC LLC and Julia Potter, Boardman Clark (WRWA Associate Member)*

WRWA Outdoor Expo 2023

EXPO INDIVIDUAL REGISTRATION INFORMATION

August 24, 2023 - WRWA State Office/Technology Center
350/351 Water Way, Plover, WI
East of Highway 39/51 and north of County Highway B

GENERAL INFORMATION
WRWA Outdoor Expo will be held Rain or Shine

Water/Wastewater training CEC's offered
FREE safety T-Shirt with paid attendance

INDIVIDUAL REGISTRATION FORM

System/Firm_____

Attendee Name_____ DNR Cert. # _____

Attendee Name_____ DNR Cert. # _____

Attendee Name_____ DNR Cert. # _____

Attendee Name_____ DNR Cert. # _____

Address_____

City_____ State_____ Zip_____

Phone_____email_____

Cancellation date August 4, 2023

Pre-Registration

Attending ___ x $85 = _____

Onsite Registration

Attending ___ x $95 = _____

Send payment and form to: WRWA, 350 Water Way, Plover, WI 54467

TO PAY BY CREDIT CARD

Go to www.wrwa.org - MUST fax completed form(s) to (715) 344-5555 or email the completed form(s) to wrwa@wrwa.org

Questions Please Cal WRWA at (715) 344-7778

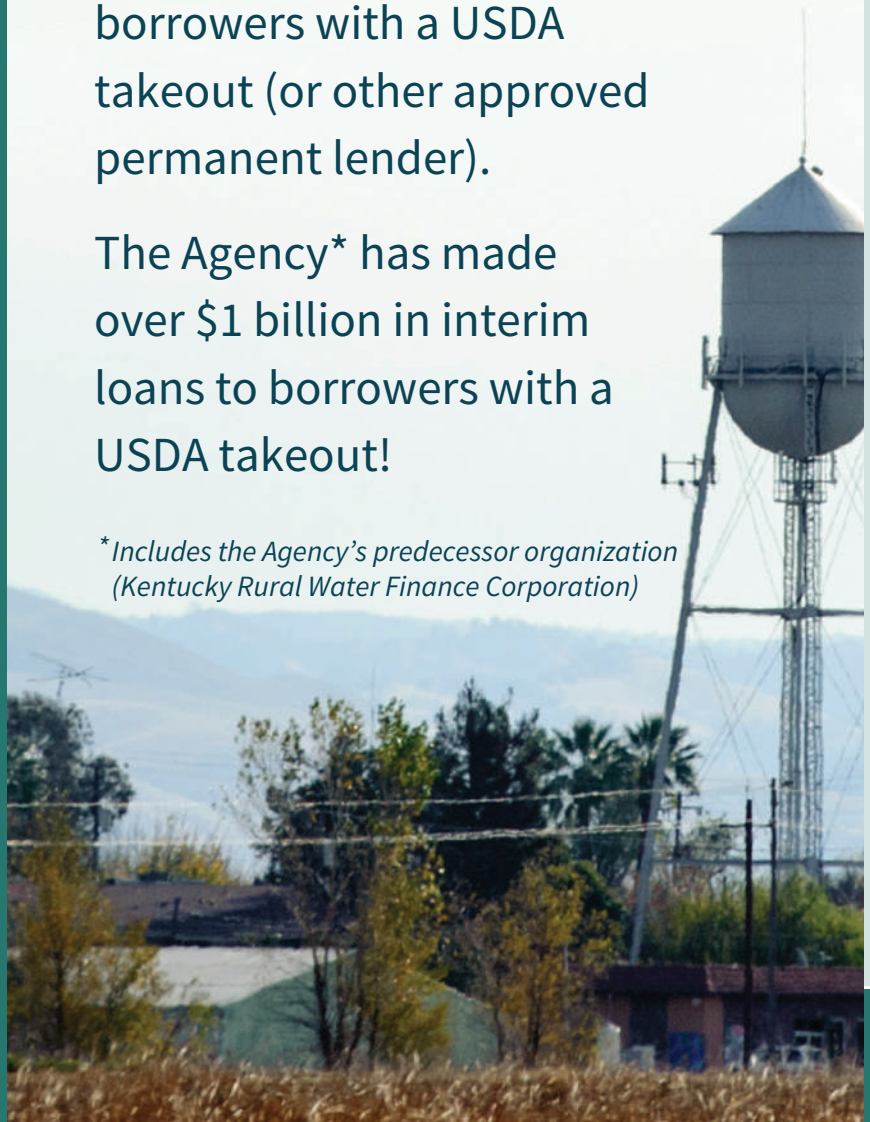
Rural Water
FINANCING AGENCY

Wisconsin Rural Water Association supports Rural Water Financing Agency

The Rural Water Financing Agency provides interim construction funding to borrowers with a USDA takeout (or other approved permanent lender).

The Agency* has made over $1 billion in interim loans to borrowers with a USDA takeout!

Includes the Agency's predecessor organization (Kentucky Rural Water Finance Corporation)



STREAMLINED PROCESS

1. Submit an application online via ruralwaterfinance.com
2. Legal document preparation
3. Construction bidding, USDA takeout letter
4. Interim loan closing, funds available for disbursement
5. Construction completion, USDA loan closing/interim loan payoff

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Please reach out to one of the contacts below to learn more.

Chris Groh, Executive Director
Wisconsin Rural Water Association
cgroh@wrwa.org
715.340.2055

Gary Larimore, President & CEO
Rural Water Financing Agency
g.larimore@krwa.org
270.535.5921

Nick Roederer, Managing Director
Raymond James (Program Underwriter)
nick.roederer@raymondjames.com
502.741.3686

Kristen Millard, Director
Raymond James (Program Underwriter)
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Water Storage Facility Inspections

By Seth Petersen

What a winter! I can speak from experience, dealing with a winter like this last one and trying to do your regular duties is very challenging. Reduced staffing and limited budgets can make removing snow that satisfies the public's expectations feel like a lost cause. As we transition from a brutal winter into summer, we have received a few phone calls about water tower inspections. With that in mind, I would like to spend a minute discussing the Who's, When's and How's of water tower inspections.

WHO?

I would like to start off by describing an important **"who"** that might get missed during water storage facility inspection preparations… Please let your DNR Representative know that you will be taking your tank offline a minimum of 48 hours prior to doing the inspection per NR 810.14.

NR 810.14 outlines the codes regarding water tower inspections. Any water system with a water storage facility that is larger than 10,000 gallons is required to follow these codes, you know who you are… The code requires that the utility use a professional tank inspection firm or a registered professional engineer to perform an inspection. Their maintenance shall include removal of sediment and biofilm prior to the evaluation of structural, mechanical, and coating systems. Please be prepared to make repairs as necessary to ensure good working conditions. Don't send the Village Clerk up there with a flashlight and a camera unless they are experienced in paint inspection!

WHEN?

The **"when"** of water storage facility inspections is a minimum every 5 years and/or as required by WIDNR. You must perform a complete drain down inspection of the water storage facility every other 5-year inspection or at a minimum every ten years. The utility is also required to perform a yearly inspection of the vent, overflow screens and hatches. In my experience, most communities have the yearly inspection performed by the same person or firm that will be doing the 5-year inspections. Hopefully, they offer a yearly inspection and report that continues to track the condition of your tower.

HOW?

The **"how's"** of water storage facility inspections are described below. Please note, again, that these inspections are required to be done by a professional tank inspection firm or by a registered professional engineer.

Drain down inspections are at least every 10 years. This inspection is accomplished by completely draining down the tank and cleaning any sediment in preparation for inspection. Following inspection, the tank needs to be disinfected in accordance with one of the methods in AWWA Standard C652-02. A minimum of 2 successive safe samples, taken at 24 hour intervals, need to be obtained before the tower can be put back in service. Obviously, every storage tank and system are different. Please work out the procedure for draining, maintaining system pressure, filling the tank and where you are going to take your samples with your inspectors and staff prior to draining the tank! If there is a free chlorine residual of at least 0.1mg/L when the result of the first safe sample is reported, you may only need to take one sample. Please speak with your DNR representative regarding this process.

Float down or partial drain inspections are accomplished using a disinfected inflatable raft. The process is accomplished by lowering the tank water level below the normal low operating level to expose the sidewalls of the tank. The beauty of this process is that the tank may remain online. The float down process allows the inspectors to get up close to the interior of your reservoir and perform multiple tests on the coating and structure. While the inspection is being performed a minimum of 0.5mg/l chloring residual should be maintained. All equipment used in the process should be disinfected. A minimum pressure of 35psi needs to be maintained during the process so please be careful with how low you drop tower water levels. Following this inspection there needs to be 2 bacteriologically safe samples obtained. One sample following the inspection and one 24 hours later.

Diver and Robotic inspections are described separately in the code but are a very similar process. These types of inspections are especially useful if there is minimal sediment, the reservoir is in good condition and has been inspected regularly. Both types of inspections can be performed while the facility is in service but a minimum of 0.5mg/l chlorine residual shall be maintained during the inspections. All equipment used for potable water must be disinfected with a 200ppm chlorine solution. Sediment should be removed prior to inspections. The top of concrete ground reservoirs should be soaked with water and the interior check for water leaks and a minimum of 2 bacteriologically safe samples need to be obtained from the tank after the inspection, one following the inspection and one 24 hours later.

The final step in the inspection process is submitting the inspection report to your DNR regional drinking water staff person. The contractor should fill out an inspection form and you need to make sure it gets to your DNR water supply engineer. You should include any reports, pictures, and videos when you submit the inspection form.

As the costs for water storage reservoir renovations keep going up and up, keeping up with the condition of your reservoir is essential. Please reach out to your WRWA Circuit Rider with questions or assistance with your inspections. WRWA Circuit Riders are very experienced with this process and enjoy helping you out. Now that we have gotten that done, I hope you get a chance to get out and enjoy summer! Let me know when we are playing golf!

Seth

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A Day in The Life of a Wastewater Operator

By Tony Roche

Being a wastewater operator is not an easy job. Wastewater treatment plants and collection systems come in all shapes and sizes, and as an operator it is your job to keep things running smoothly. Whether you operate a 0.1 MGD system or a 10 MGD system there are many tasks to keep you busy throughout the day.

When your shift starts (if you work a strait shift or a rotating shift) there are rounds to be taken. Checking your samplers at the start of a shift is a good way to start the day. Take a look at the contents of your samples and remember to document important things like sampler temperature, sample collection time, sample volume, and anything unusual about your samples (odd color, odor, contents). Documentation is so important! I cannot stress that point enough. Keeping written records will help you track unusual events and can help you identify trends or patterns if your system experiences an upset of some kind. Other duties to perform on your rounds should include things like documenting flows (influent, effluent, return activated sludge volume, waste activated sludge volume, chemical usage volumes, primary sludge withdrawal, digester feed, digester withdrawal, sludge storage tank volume). Documenting equipment run times (hours) and rates (blower SCFM and pump GPM) is also very important. You will get to know your pump rates very well and if you see things like decreasing pump rates it should trigger you to do some investigation. I remember seeing pumps rates diminish on return activated sludge pumps in October when the leaves began to fall, and that usually signaled that the pump impeller was clogged with leaves…

As your day progresses it is very important to do process control checks. Breaking out your good old buddy the Sludge Judge and documenting sludge blanket depths in your primary and secondary clarifiers is a great process control tool and should be done every day. Remember it is a good idea to maintain a blanket depth of 1 foot or less in your final clarifiers. If you see your blanket depths increase it may indicate that you have a blown seal on your sludge pumping mechanism. Another very important process control check is documenting the dissolved oxygen content in your aeration basins. Remember that aeration provides both mixing and oxygen! You need good mixing to ensure that wastewater contents (like BOD) come into contact with the microorganisms in your mixed liquor. You also need to supply proper amounts of oxygen – it is a good idea to provide the minimum amount of oxygen necessary because adding too much is essentially flushing money down the drain.

Another very important process control tool in an activated sludge plant is the 30-minute settling test. This test mimics the operation of your final clarifiers and should give you an accurate representation of what is happening in your clarifiers. To perform a settling test, you

will need to take a mixed liquor sample at the very tail end of your aeration basin and gently shake it before you pour the contents into a settleometer. If you violently shake your sample you will break up your floc particles and not have an accurate representation of your mixed liquor. When you perform your settling test it is a good idea to document sludge levels every 5 minutes all the way to the 30-minute mark. If your sludge settles very rapidly ("like a rock") it could be indicative of old sludge, and you may also have poor quality effluent. If your sludge does not settle hardly at all (i.e., 800 mL) it could mean you are carrying too many solids in aeration, or it could mean you have excessive amounts of filamentous bacteria. If you have poor settling sludge, try running a diluted settling test. To do this, take your MLSS sample and pour half into the settleometer and fill the rest with treated effluent. If settling improves it suggests that you are carrying too many solids and need to waste. If your settling does not improve then it is time to bust out the microscope and take a look at your mixed liquor. If you see a ton of "spaghetti strings" you have a filament problem. Remember you need some filaments (they help form the backbone of your floc structure) but having too many will interfere with your settling. I could spend all day talking about process control but remember that process control is the tool that you have in your toolbox that will help you provide a happy environment for the microorganisms in your plant.

When your daily process control checks are complete (if you have enough time), then it is a good idea to do some preventative maintenance on your equipment. The preventative maintenance that you perform will depend on the size of your system and what kind of equipment you have. If you have sludge thickeners (drum or gravity belt) it is a good idea to wash down the equipment after you have completed your thickening. If you let sludge harden inside your drums or on the belts it can become very difficult to clean later. Staying on top of your lubrication schedules is also very important. Remember to check your O & M manuals for lubrication needs (e.g., type, volume, and frequency) and document all maintenance!!! Document every time you do maintenance because you should not have to commit maintenance to your memory. Also remember this – over greasing is just as bad (maybe even worse) than under greasing equipment. Other preventative maintenance tasks can include cleaning or replacing air filters on blowers and HVAC equipment and changing belts on any belt driven equipment.

Days go by quickly for wastewater operators because there is so much to be done! Just remember to always keep safety in mind. No job is worth getting injured and remember the most important thing is making it home to your family at the end of your shift. Have a great summer and make time for some 12-ounce curls!

Tony

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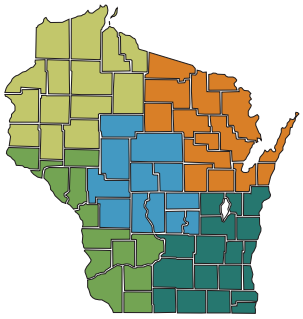

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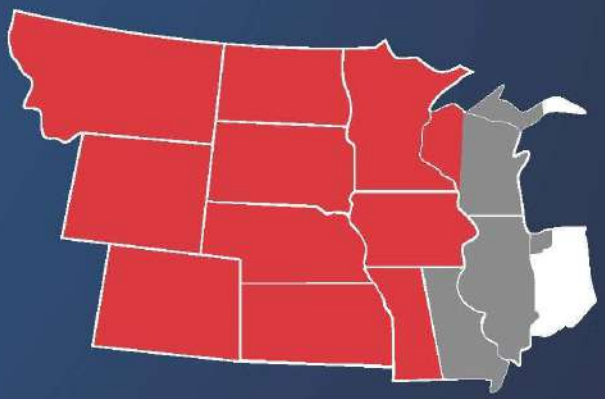

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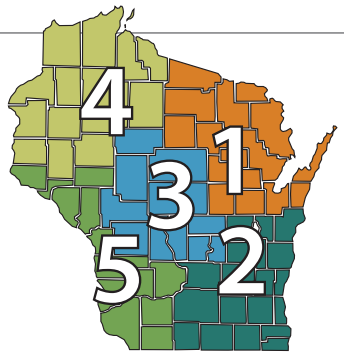

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Blair
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Blue River
Boscobel
Bridgeport Sanitary District
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Dodgeville
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Elmwood
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Fairchild
Fall Creek
Fennimore
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Genoa
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Holmen
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Ironton
Kieler Sanitary District #1
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La Valle
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Linden
Linden Sanitary District No. 1
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**Pinewood Court Inc.
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Rewey
Richland Center
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Rockland
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Shullsburg
Soldiers Grove
South Wayne
Spring Green
Spring Valley
**St. Croix Improvement, Inc.
St. Joseph Sanitary District #1
Stoddard
Strum
Trempealeau
Viola
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West Baraboo
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West Salem
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UP THE CREEK

Ken Blomberg,
WRWA past Executive Director

Back in the day, when I worked for a living with Rural Water, I spent many hours on the road traveling across the state. Twenty-five years logging thousands of miles, brought me great memories visiting most of the communities that make up Wisconsin.

During the summer months, I'd gravitate on occasion to the shores of our two Great Lakes and Mississippi's River Road. Not only were temperatures cooler near those bodies of water, but there was something therapeutic about spending down time sitting along the banks of our state's greatest water resources.

Today, now in retirement, I still find myself drawn to the rivers and lakes closer to our home along the creek. A family favorite is the nearby Wisconsin River and Lake DuBay - a large reservoir that was created just before WWII. The lake's namesake is buried and rests for eternity along its banks.

The inscription on his grave marker reads, "Son of a Menominee Indian Princess, Son-in-Law of Chief Oshkosh – Treaty Maker, Interpreter, Indian Trader, Firm Friend of White Man." Those words grace a large, polished granite headstone of John Baptiste DuBay, who lived in the area from 1810 – 1887 and was buried in nearby Knowlton Cemetery. As the crow flies, that's just a few miles north of our place, on the opposite side of the Wisconsin River. A state historical marker in his honor also stands along our side of the river, near a cranberry bog and county campground, both named DuBay.

The sign talks about the remnants of this fur trader and frontiersman's trading post, that lie at the bottom of the lake also bearing his name – and according to locals, the flowage created by damming the Wisconsin River in 1942, also covered a cemetery near the post. The dam was primarily created to generate power for paper mills to the south and provide flood control in the spring. As a result, it backed up over 6,700 acres, created more than 42 miles of shoreline and takes in the flow of 12 inlet streams. There's plenty of open water for speed, sail and pontoon boaters, while its backwaters and islands are home to fishers and hunters.

Lake DuBay has become our summer home of sorts – since the boss and I long ago gave up the dream of a cabin "up north", trading that idea instead for a floating cottage on the sprawling body of water in our own backyard. It was on her birthday, number forty, that we took the plunge, so to speak. "Mom's Boat" was christened and ever since, evening and weekend pontoon outings on the lake have provided the necessary escape from our daily routine. Over the years, whether fishing, swimming, or just plain touring, we've learned to love all the huge lake has to offer.

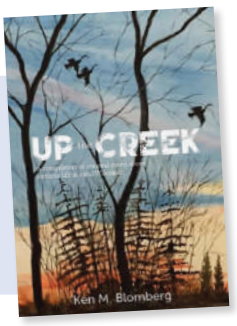
Fishing opportunities abound, with nearly every native game fish species at hand – the exception being sturgeon and trout. But in the case of sturgeon, one need only to look downstream, just over the dam - as they're known to bump their snouts on the gates. Recently, white bass - of the Wolf River variety - have shown up in creels of fishermen seeking walleye and panfish. My good friend DNR Dale, and others in the know, aren't too keen on the idea of these recent invaders. You see, this unauthorized plant may cause havoc down the line, when competition for forage fish ensues.

As for our family, we spend most of our fishing capital on smallmouth bass and walleye. Working the shore may do well to stay close to home and give DuBay a try.

When fishing gets slow, we might head for a burger or fish fry at a lakeside bar. More often, it's grilling brats on the pontoon, or watching the sail boat races or water ski shows at South Beach. Then there's always the simple pleasure of looking for driftwood on the shoreline.

At the time the lake was fashioned with a dam and dike in 1942, the original headstone for its namesake was replaced by a beautiful piece of Wausau granite, thanks to George Mead Sr. of Consolidated Papers, Inc. I'm not sure why I drove past the gravesite for so many years without stopping, but since the day it happened, my appreciation for the area's history has certainly been rekindled and the name DuBay has taken on new meaning.

Autographed copies of Blomberg's *Up the Creek, Letters from Art and Wisconsin Bird Hunting Tales* are available from the author at **eaupleinekennels@gmail.com.**



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Office Closed for Christmas Eve (1/2 Day)	December 22, 2023
Office Closed for Christmas Day	December 25, 2023
WRWA Annual Conference (La Crosse)	March 26 - 29, 2024

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