



## New Lake Sampling Equipment is Paying Dividends for Drinking Water Treatment Processes

Water quality data is one of the most important tools used to ensure the quality of the water produced in a drinking water plant. The District collects data at almost every point in the treatment process to help make decisions on how to treat the water most effectively so it arrives at the tap safe to drink. For example, we sample and analyze the water when it is finished to ensure that it meets all state and federal regulatory standards. We continuously sample the turbidity of the water after it goes through our filters to make sure the filters are functioning properly and removing particulates in the water. We assess the water as it comes into our plant to determine the appropriate amount of treatment chemicals to use according to the water quality. But we

also sample the water in the lake directly in front of our water intakes before we pump the water into our treatment plant.

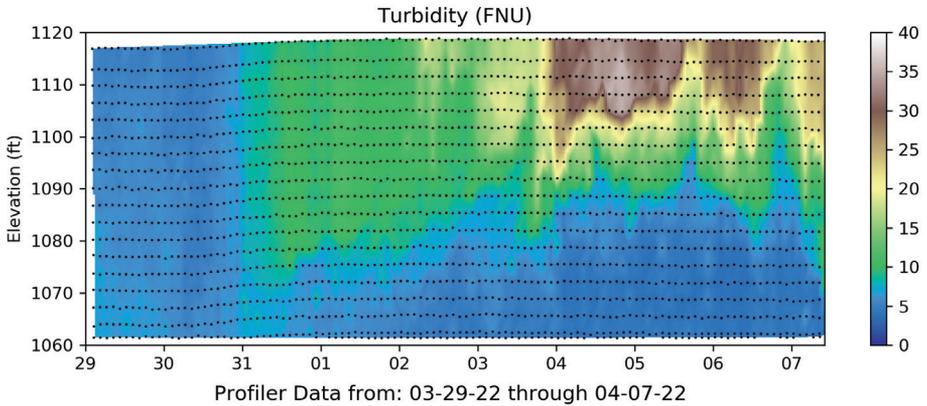
Some of the parameters that we use to assess the water in Beaver Lake include temperature, dissolved oxygen, turbidity, pH, and conductivity. For these parameters, one of the tools we use is called a data sonde [sänd]. Sondes are environmental sampling tools that typically have a suite of sensors, and in our case, these measure water quality. For many years we have used a data sonde in front of our water intakes on Beaver Lake as part of a sampling project. The sonde collects water quality data from the water surface of the lake all the way to the bottom in what is called a water quality profile. These profiles

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*(Figure 1) Data sonde winch system*

*New Lake Sampling Equipment* continued from page 1



*(Figure 3) Vertical Profiler Turbidity Data During Recent Storm Event*

give us a picture of how the water quality changes vertically in the lake. The data collected is used to make decisions about from what depth water is pumped, what sort of treatment interventions may be required, and sometimes help us predict rates of change in water quality, particularly turbidity which is the cloudiness of the water.

Last March, Beaver Water District purchased a new data sonde that could be automatically deployed using a winch system (*Figure 1*) installed on our intake structure (*Figure 2*) called an auto-profiler. Our previous sonde had to be deployed by hand which limited the number of profiles we could realistically do in a given amount of time. The new auto-profiler is set up to run continuously, taking a profile of the water column every two hours. The data is sent automatically via cell signal for our retrieval at the water plant. This higher resolution of data has given us the ability to see changes in lake water quality at our intakes in near real time.

One of the most interesting developments out of this new tool concerns spring flooding events in the Beaver

Lake Watershed. Heavy spring rains and flooding tend to carry a lot of sediment into the lake, turning it a muddy brown. This sediment requires more resources and chemicals during treatment to turn it into the crystal-clear water that flows from the tap. The interesting thing is that the concentration of sediment or turbidity in the water column from spring flooding is not the same from the surface to the bottom of the lake. Warm spring rains and cold lake water can lead to flood waters staying more toward the surface of the lake. The opposite can also hold true if the temperature conditions are reversed. The figure above (*Figure 3*) depicts turbidity in Beaver Lake from a recent storm event that resulted in a tornado causing damage in Fayetteville and Springdale. The vertical or y-axis represents the elevation (depth) in Beaver Lake at our intake and the horizontal or x-axis is the time of the event. The bluer colors of the figure represent less turbid or more clear conditions while the browner colors represent higher turbidity. Turbidity in the lake began changing shortly after the storm passed

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## MESSAGE FROM THE CEO

*M. Lane Crider P.E., LEED AP*

### Phishing Tales and other Paradoxes

Growing up, I spent many days wading and fishing in the West Fork of the White River and lots of summer nights trying to catch a big catfish out of one of the many ponds on our family farm. There was a seemingly endless supply of bait to be had...from crickets, worms, or an occasional crawdad, to liver for the catfish, and, if we could keep them out of the tree limbs for very long...a handful of Rapala minnows or Roostertail spinner baits. A good deal of time during those childhood fishing excursions was spent worrying more about what might bite me than what might bite my bait! Between the legitimate concern about encountering a cottonmouth and the less legitimate fear of “monster” gar, an occasional fish could be pulled triumphantly from the water. Never in my wildest imagination though, could I have ever imagined that, as an adult, I would be more concerned about “phishing” than fishing, or what the seemingly endless ripple effect of very “exhaustible” resources could have on our water supply.

One of the most significant challenges faced by society today is the subversion of modern technology for criminal and/or malicious purposes. Cybercrimes, and the efforts to defend against them, are quickly becoming one of the most critical concerns of our time. In the last few years, there have been several examples of successful cyber-attacks on U.S. infrastructure, including a water treatment plant in Florida and the Colonial Pipeline ransomware attack. At Beaver Water District, we are fully committed to mitigating potential risk to phishing attacks and other cybersecurity concerns. All the while, advances in technology allow

us to gather and analyze greater amounts of data than ever before, and use that information to make smarter, more informed decisions. It is a true paradox and the modern-day reality of sustaining our mission to continuously provide safe, economical drinking water to our customers.

Another is the continued ripple effect of the pandemic on the global supply chain. It has become quickly apparent that our modern “just-in-time” supply chain processes are extremely vulnerable to disruption, including treatment chemicals and other materials that the water industry depend on. Fear of production and labor shortages, whether real or speculative, is driving the cost of goods and services to levels unseen in a generation or more. And yet, the availability of infrastructure funding for water, broadband technology, alternative fuel vehicles and transportation, and many other areas has never been greater. The Bipartisan Infrastructure Law (BIL), or Infrastructure Investment and Jobs Act (IIJA) has created a fever-pitched planning effort across the U.S. to utilize every dollar made available, and to some degree has poured fuel on the fire. Opportunity abounds, especially in NWA, but it will take a great deal of effort and intentionality to plan and execute successfully.

We are not fishing a lazy river or peaceful farm pond any longer in north-west Arkansas. We’re navigating strong currents and big waves, but we are blessed with strong leadership with a mindset of teamwork. It is what has made the region successful and what will sustain us into the future...and that’s no fish tale!

# Think Like a Fish

Ray Avery, P.E.  
Information Systems Manager

Social engineering, specifically phishing, accounts for over 80% of reported cybersecurity incidents. The popularity of these attacks has recently increased due to the low cost, ease of deployment, and high success rate. Increased awareness of our security is necessary to better protect our identities, personal finances, jobs, and critical infrastructure from people who wish to disrupt our way of life, regardless of their intent.

The analogy between phishing and fishing is that of an angler throwing a lure into a sea of email users and hoping someone bites. When I was younger, my grandpa loved to fish and tolerated me tagging along. He regularly out fished me by a factor of 10 to 1 and relished in this fact as I grew older. One day after a lot of good-natured ribbing, I finally worked up the courage to ask for some advice. My grandpa replied, "You have to think like a fish." This didn't make much sense to a ten-year-old, but he explained that all I needed was to select a somewhat realistic lure, give it some action, and then set the hook.

## Realistic Lures

Most phishing emails are obviously fake, but when they happen to impersonate a bank you use, a vendor you make purchases from, or your service provider, they become harder to distinguish. Consider the following questions: Does the sender usu-



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ally reach out to you for information about your account outside of business hours? Has your boss previously asked you to click on a link and purchase gift cards for them? The smartest fish will close the distance to a lure and pause while inspecting it. Think like a fish. Recognize lures and then verify their authenticity.

## Give it Some Action

The goal of the social engineer is to get you to provide them with information or install malware on your device before you have had time to think. Just as a fish reacts when it sees its dinner swimming away, we all experience the fear of missing out at some level. Did the sender give a limited time too-good-to-be-true offer? Did the sender inform you that your account would be cancelled unless you clicked a link before a certain date? Think like a fish. Respond appropriately to calls for action. When in doubt pick up the phone or log in to accounts through trusted channels.

## Set the Hook

Even the wisest and most experienced fish get hooked sometimes. If this happens, it is now your mission to mitigate the damage. If you have given away your password, contact your service provider and change your password. If you inadvertently installed malware, contact an IT professional and disconnect your device from the internet. When a fish is hooked it will make a mighty leap and try to shake free. Think like a fish. Realize you made a mistake and fight back.

As the water warms, the white bass will soon be making their run up the tributaries. Keep tight lines everyone!

# Nicole “Nikki” Holloway selected into the Top 10 Young Pros.

Each year, Water & Wastes Digest accepts nominations of Young Professionals under the age of 40 to recognize rising talent in the industry and encourage leadership from the next generation of workforce. All Young Professionals will be featured in the May issue of Water & Wastes Digest, which is distributed at American Water Works Association ACE conference. There were over 70 nominations this year, and the District is proud to announce that our Laboratory Supervisor Nicole (Nikki) Holloway was selected into the Top 10 Young Professionals. Please check [www.wwdmag.com/youngpros](http://www.wwdmag.com/youngpros) throughout the next several weeks for



highlights on all those selected for the Top 10 Young Pros.





Beaver Water District  
bwdh2o.org

## Drinking Water Week 22

May 1-7, 2022



American Water Works Association  
awwa.org

## Welcome Lauren Harrison!



Please join us in welcoming Lauren Harrison as the Executive Administrator to the District.

Lauren is a graduate of Hendrix College with a Bachelor of Arts in English, with a minor in Secondary Education. She has a background in local utilities, having previously worked for one of BWD's customer cities, and is passionate about providing access to clean, safe drinking water.

Lauren lives in Bentonville where she enjoys baking, reading, hiking, gardening, attending concerts, and many other activities that Northwest Arkansas has to offer.

*Retiring from*



**Beaver Water District**



Mark Hogan was looking off into the future during his retirement party! Thank you so much for your 20 years of service to the District.

Just a few days shy of 27 years – the lab will not be the same without you! Congratulations Cindy Harp on your retirement.



Kayla Mhoon is looking forward to growing some tomatoes and catching some fish! This will be a piece of cake after taking care of the board meetings and the employees in the administration building for 13 years.

**Congratulations to all our recent retirees.**



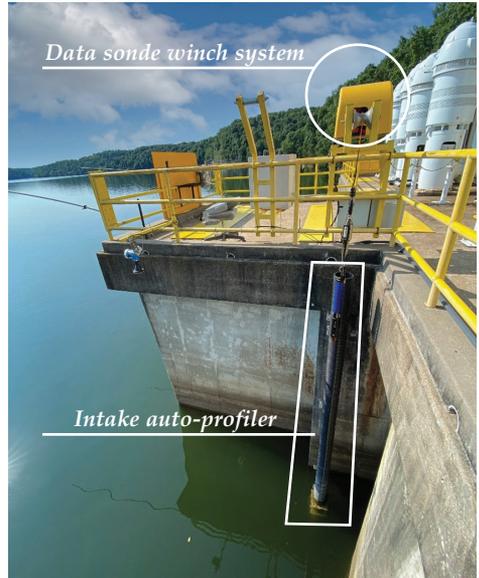
*Is this really addressed to you?*

We hope you are enjoying the newsletter but realize that a lot has changed; people have retired, gotten married, etc. If the name on the envelope is incorrect, please contact us at (479) 756-3651 or [education@bwdh2o.org](mailto:education@bwdh2o.org) so that we can update our list.

*New Lake Sampling Equipment* continued from page 2

through the area during the morning on March 30th. However, the largest change did not occur until April 4th. This lag is due to the time it takes sediment to be transported through the watershed and in the upper reaches of Beaver Lake before it arrives at our intakes. This information is useful to operators at the District who can make better informed decisions about when to adjust chemical doses and could result in water being drawn from a different elevation to reduce treatment costs.

Our new auto-profiler was commissioned a year ago and has already shown us some areas where it will be helpful. We are still learning and adapting our processes to successfully use this new tool and are anticipating future projects where this data will be invaluable.



*(Figure 2) Data sonde winch system and Intake auto-profiler*

## 2021 Annual Water Quality Report Available

Beaver Water District must meet national, health-based standards for drinking water to fulfill its primary mission, which is to produce safe, potable water. That means the District must comply with the Safe Drinking Water Act (SDWA) passed by Congress in 1974 and amended in 1986 and 1996. The SDWA's purpose is to protect public health by regulating the nation's public drinking water supply.

The U.S. Environmental Protection Agency (EPA) sets standards for drinking water to protect against naturally occurring and man-made contaminants. Maximum contaminant levels for the standards are set by the EPA

and are enforced locally by the Arkansas Department of Health.

Beaver Water District prepares an annual report each year that includes a variety of analytical results. The analysis is conducted by the staff in the Beaver Water District Laboratory and the Arkansas Department of Health Laboratory. In addition to the Annual Water Quality Report, a section containing data for the most requested parameters titled "Finished Water Quality Results" is posted monthly to the website. Both reports can be found at the following link: [www.bwdh2o.org/regulatory-compliance](http://www.bwdh2o.org/regulatory-compliance).

# I spy these water items

There are so many water-related items we see every day. Can you spot the items at the bottom of the page in the picture? The numbers indicate how many times each item appears.



- 2
- 1
- 3
- 3
- 2
- 3
- 4



American Water Works Association

# Drinking Water Week 22

May 1-7, 2022



Beaver Water District

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