


WATER LOGGED

SUMMER 2021

A hand is shown from the bottom, holding a glowing digital globe. The globe is composed of a grid of lines and dots, with a bright blue light emanating from its center. The text 'SECURITY AWARENESS' is overlaid on the globe in a bold, white, sans-serif font. The background is dark with a blue and white digital pattern of lines and dots, suggesting a network or data flow.

**SECURITY
AWARENESS**

THE OFFICIAL PUBLICATION OF THE NEVADA RURAL WATER ASSOCIATION

One company.
One community.



Building a future together.

Founded in 1964, Western Nevada Supply has grown successfully over the past five decades by adhering to the philosophy that good service is people-oriented, loyal to its customers and proactive in the community. We're here to make a positive difference in people's lives – whether that means supporting local kids and charitable organizations or providing the highest quality service as a one-stop supplier for contractors and builders throughout Nevada and California.



950 S. Rock Blvd., Sparks, NV • [775] 359-5800 • [800] 648-1230 • www.goblue team.com
 SPARKS • SUSANVILLE • SOUTH LAKE TAHOE • ELKO • CARSON CITY • TRUCKEE • BISHOP • WINNEMUCCA
 Plumbing • Water Works • HVAC • Irrigation • Hydronics • Industrial (PVF) • Tools • Kitchen and Bath Showroom

NEVADA
RURAL WATER ASSOCIATION
Board of Directors

- NvRWA President
Cameron McKay, Kingsbury GID
- NvRWA Vice-President
Nathan Adams, Pioche Public Utilities
- Secretary and Treasurer
Grant Perkins, Panaca Farmstead Association
- Directors
Joe Davis
Moapa Valley Water District
- Jason Wierzbicki
Storey County Public Works
- Associate Director
Barney Arneson, Western NV Supply

Staff

- Executive Director
Stacey Van Diest
- Executive Administrative Assistant
Jaemi Hendrickson
- Training and Technical Assistance Specialists
Joe Mathein
Max Sosa
- Source Water Protection Specialist
Kelli Nevills
- Circuit Rider
Michael Boney
Robert Weyher

SUMMER 2021

WATER LOGGED

THE OFFICIAL PUBLICATION OF THE NEVADA RURAL WATER ASSOCIATION

Features

- Affinity Program4
- A Note From Our Executive Director5
- Water Sector Cybersecurity Brief... ..6-8
- PFAS: The New Emerging Contaminant.10-11
- America's Water Infrastructure Act and Your Water System12-14
- The Deadliest Game: Although Not A Game It Is Deadly Anyway15
- Summer and Water Pollution.....16-17

Advertisers

- Black Mountain Software.11
- Heggen Lentz.....15
- Instrument Technology Corporation.19
- Pittsburg Tank & Tower Group... ..14
- USA Bluebook20
- Western Nevada Supply.....2

Send editorial and advertising inquiries to:
 NvRWA
 363 Fairview Drive
 Carson City, NV 89701
 P: (775) 841-4222 | F: (775) 841-4243
jaemih@nvrwa.org



Our Commitment  Our Profession

Our Mission:
 "To provide the best available technology, resources, support, assistance and training to our members serving Nevada Communities."



Bailey Special Risks has partnered with NRWA to provide cyber security insurance to water and wastewater systems. This exclusive program offers Beazley Breach Response, a unique insurance, loss control and risk mitigation service that notifies and protects the customers who have suffered a data breach.

Coverage Highlights

- Data breach notification and credit or identity monitoring services for up to 100,000 affected individuals, with separate coverage limits for third party claims
- Breach response coverage includes forensic and legal assistance, notification costs, credit monitoring services, loss prevention services and identity theft-related fraud resolution
- Crisis management sublimit for public relations and extraordinary notification expenses
- Low per-incident retentions
- Policy also provides a separate \$1 million limit of liability for privacy, network security and media claims

Contact your State Association today!



NRWA has created partnerships with the Ford Motor Company and the Chrysler Group to offer special fleet discounts to State Rural Water Associations and their utility system members. Member utilities should contact their State Rural Water Association to access the Rural Water Fleet Program. Vehicles may be purchased at your local dealer or through the national fleet auto group at www.nrwafleet.com.

Program Details

- Limited to Water/Wastewater utilities that are current members of a State RWA
- There is no limit to the number of vehicles that can be purchased under the program
- Incentive pricing is deducted off the factory invoice
- Fleet vehicles must be in service for a minimum of 12 months or 20,000 miles
- Vehicles must be registered and operated in the 50 United States

Call your State Association today to get your Fleet Identification Number (FIN)



ServLine is a unique insurance program that will cover water lost with no deductible, repair or replace a customer's water and sewer line in a timely fashion. ServLine is a full service program backed by Hanover Insurance Company and is not a warranty program. The difference is warranty programs only provide water line and sewer line repair products and no leak adjustments.



ServLine:

- Designed exclusively for water systems
- Protects your utility against financial water loss
- Protects customers from financial loss
- Offers customized coverage at local level
- Only available to utilities
- No direct marketing to utility customers

Contact your State Association to sign up today!



NRWA, in collaboration with Mike Keith Insurance and National Insurance Partners, is pleased to introduce the Lifestyle Health Plans 'Healthy Benefits' program to give NRWA members a comprehensive and affordable health benefits option to meet all of the compliance requirements of ACA.



What makes Healthy Benefits different?

- Level-funded major medical plan designs
- Underwritten by "A" rated carriers
- Premium savings averaging 5-15%
- Integrated wellness incentives
- Up to a \$500 deductible credit available to all wellness participants
- Integrated concierge telemedicine, outpatient lab and diabetic supply benefits

To learn more about lifestyle health plans, visit healthybenefitsnrwa.com or contact Jeanie Cunningham at (800) 530-5229 or via email at jeanie@mkeithins.com

The Power of Association

Only the National Rural Water Association can bring together this unique Products and Services Portfolio. Systems can choose from website design and customer communications, to several insurance packages including health plans, data breach services, line and leak coverage, background screening as well as our Rural Water Loan Fund.

All Designed to Meet the Needs of Utilities

This NRWA Products and Services Portfolio Toolbox was designed to assist State Associations and their members with up-to-date information and provide exclusive, beneficial products and services at an affordable cost.

You can find additional information on each product or service on the NRWA website, www.NRWA.org.

For NRWA assistance, please contact:

Dawn Myers
Products & Services Coordinator and Corporate Membership
2915 South 13th Street
Duncan, OK 73533
580.251.9081
dawn@nrwa.org



Affinity Program



The Rural Water Loan Fund (RWLF) is a funding program designed to meet the needs of small water and wastewater utilities. The RWLF provides low-cost loans for short-term repair costs, small capital projects, or pre-development costs associated with larger projects.

Eligible Projects

- Planning costs for infrastructure projects
- Replacement equipment, system upgrades, maintenance and small capital projects
- Energy efficiency projects to lower costs and improve system sustainability
- Disaster recovery or other emergency loans are available

Visit www.nrwa.org, to find out how you can apply for a loan with reasonable interest rates and no processing fees.



RuralWaterImpact.com and MunicipalImpact.com host beautiful, easy-to-use websites for hundreds of towns and water systems across America. As soon as you sign up, the amazing support team gets to work and launches your new website in just 3 days or less! Then make edits or post alerts yourself anytime you like! Need help? No problem – Support is unlimited!

- Send text alerts
- Post Forms & CCRs
- Easy to Update
- Bill Payment Info
- Mobile Friendly
- Unlimited Support

Sign Up Today!
14 Day Free Trial • Friendly Support • Money-Back Guarantee
Go to RuralImpact.com or MunicipalImpact.com or call 1(888) 551-4815

A Note From Our Executive Director

Stacey Van Diest, NvRWA Executive Director

What a year so far, I cannot believe it is more than half over. First, I would like to thank each one of you who attended the NvRWA 2021 Virtual training and technical conference. Although out of the 'norm' this year's event was a success!! NvRWA is planning an in-person event for 2022 and we hope to see all of you face to face next year.

You may have noticed some new faces at NvRWA. I want to welcome back Jaemi Henriksen, my Executive Assistant and office manager, Max Sosa has joined the NvRWA team and is currently our Wastewater Technician, Mike Boney is back in the Water Circuit Rider position along with Robert Weyher. Robert has an extensive Engineering background, Joe Mathein is stepping into the full-time position of the EPA Training and Technical Assistance Specialist, and Kelli Nevills is our Source Water Protection Specialist. I want to remind all of you that NvRWA provides NO COST, on-site training, remote training, and on-site technical assistance.

You may have noticed the reduction of remote online training classes, because of the feed back we get from you all, NvRWA has began to bring training to you, on-site at your system. If you would like to have NvRWA bring on-site training to you, let us know. We have also began scheduling Fire Hydrant repair workshops. Currently we have three locations, Carson City July 28th, August 11th in Winnemucca, and August 12th in Elko. We will be sending out email notifications with details, as these classes near,

so be sure to check your emails and watch our website, www.nvrwa.org, for these training opportunities. If you would like to host a training class at your site let us know. Also, we appreciate your input and feedback, please let us know what training topics you are most interested in.

NvRWA recognizes the potential for supply shortages. If you are experiencing any issues with getting chemical supplies or parts please let NvRWA, staceyv@nvrwa.org, know. You may see a survey in your email regarding supply chain issues. Please take a couple minutes to fill it out whether you are having issues or not.

WaterPro Conference is around the corner. National Rural Water Association hosts an annual Water Professionals conference and this year it will be held in Milwaukee Wisconsin, September 13-16. This event is open to all water professionals and this year StormCon, stormwater management professionals, will be held simultaneously with a combined exhibitor hall. If you are interested in the WaterPro Conference or would like to attend, you can find that information at: www.nrwa.org/annual_events/. On this page you will also find information regarding the Rural Water Rally.

NvRWA has your best interest mind. We are here to support you and the best part, it's at NO COST.

NvRWA NOW OFFERS SMOKE TESTING

Why do you need to do smoke testing on your collection system?

If you aren't doing it, you need it! Smoke testing is a simple & inexpensive way to find Inflow & Infiltration to your collection system from ground water & rain events. I & I causes hydraulic overloading in your plant, it can bring in massive amounts of grit & dirt into your treatment plant & cause you to have to construct a new plant years before it is really necessary. It can also cause water to backup into homes & cause sanitary sewer overflows. You may have it increase the size of sewer interceptors to carry excess water to the plant. Sanitary sewer overflows are violations & also a health risk, as well as possibly polluting groundwater & waterways.

To learn more about what to look for, the benefits and how to get started with NvRWA Smoke Testing, contact the NvRWA office for details.



Water Sector Cybersecurity Brief

Max Sosa, NvRWAWastewater Technician

How to Use This Brief:

The EPA developed this brief in cooperation with the Association of State Drinking Water Administrators' Security Committee to help state staff (or their designated assistance providers) start a conversation with utilities about cybersecurity. Information gathered from the questions on this page can help you to understand a utility's current cybersecurity practices and point them toward resources to enhance their program. You may also leave the next two pages with the utility as a reminder of your discussions.

Those pages provide recommendations for building a cybersecurity program and responding to cyber-attacks.

Water Sector Cybersecurity Brief For States

Implementing cybersecurity best practices is critical for water and wastewater utilities. Cyber-attacks are a growing threat to critical infrastructure sectors, including water and wastewater systems. Many critical infrastructure facilities have experienced cybersecurity incidents that led to the disruption of a business process or critical operation.

Cyber Threats to Water and Wastewater Systems Cyber-attacks on water or wastewater utility business enterprise or process control systems can cause significant harm, such as:

- Upset treatment and conveyance processes by opening and closing valves, overriding alarms or disabling pumps or other equipment
- Deface the utility's website or compromise the email system
- Steal customers' personal data or credit card information from the utility's billing system; and
- Install malicious programs like ransomware, which can disable business enterprise or process control operations. These attacks can: compromise the ability of water and wastewater utilities to provide clean and safe water to customers, erode customer confidence, and result in financial and legal liabilities.

Benefits of a Cybersecurity Program

The good news is that cybersecurity best practices can be very effective in eliminating the vulnerabilities that cyber-attacks exploit. Implementing a basic cybersecurity program can:

- Ensure the integrity of process control systems;
- Protect sensitive utility and customer information;
- Reduce legal liabilities if customer or employee personal information is stolen; and
- Maintain customer confidence. Challenges for Utilities in Starting a Cybersecurity Program Many water and wastewater utilities, particularly small systems, lack the resources for information technology (IT) and security specialists to assist them with starting a cybersecurity program.

Utility personnel may believe that cyber-attacks do not present a risk to their systems or feel that they lack the technical capability to improve

their cybersecurity. Be assured, however, that basic cybersecurity best practices can be carried out by utility personnel without specialized training, and user-friendly resources are available to help. You just must know how to start and where to look!

10 Questions for a Cybersecurity Dialogue with a Utility*

Does your utility:

1. Keep an inventory of control system devices and ensure this equipment is not exposed to networks outside the utility?
 - Never allow any machine on the control network to "talk" directly to a machine on the business network or on the Internet.
2. Segregate networks and apply firewalls?
 - Classify IT assets, data, and personnel into specific groups, and restrict access to these groups.
3. Use secure remote access methods?
 - A secure method, like a virtual private network, should be used if remote access is required.
4. Establish roles to control access to different networks and log system users?
 - Role-based controls will grant or deny access to network resources based on job functions.
5. Require strong passwords and password management practices?
 - Use strong passwords and have different passwords for different accounts.
6. Stay aware of vulnerabilities and implement patches and updates when needed?
 - Monitor for and apply IT system patches and updates.
7. Enforce policies for the security of mobile devices?
 - Limit the use of mobile devices on your networks and ensure devices are password protected.
8. Have an employee cybersecurity training program?
 - All employees should receive regular cybersecurity training.
9. Involve utility executives in cybersecurity?
 - Organizational leaders are often unaware of cybersecurity threats and needs.
10. Monitor for network intrusions and have a plan in place to respond?
 - Be capable of detecting a compromise quickly and executing an incident response plan.

For more information about each of these questions, see Water ISAC 15 Cybersecurity Fundamentals for Water and Wastewater Utilities at <https://www.watersac.org/fundamentals>.

Taking the Next Step with a Utility

If utility staff can knock each of these questions/answers out of the park, then the utility has a good cybersecurity program in place. However, if the response to these questions is "No," "Not sure," or "How about this weather?" then encourage the utility to use the next page to start building a cybersecurity program.

Implementing A Cybersecurity Program at Your Water or Wastewater Utility

Cybersecurity Worksheet Use this worksheet as recommendations for an effective cybersecurity program. Talk to your IT service providers and others who manage your IT systems about how to carry out these actions at your utility.

Cybersecurity Worksheet

Action	Notes	Date Completed
Audit IT systems and identify vulnerabilities.		
Keep a list of the highest cybersecurity risks and how they will be addressed.		
Ensure all IT systems have up-to-date antivirus and anti-malware software.		
Install security patches on all IT systems on a monthly basis.		
Implement secure remote access practices.		
Segregate networks and control access to networks based on job function.		
Establish strong password policies.		
Consider "application whitelisting" on critical systems (allow execution of approved files only)		
Improve physical security for IT equipment.		
Segregate business enterprise and process control systems, and require separate credentials for access		
Establish secure policies for mobile devices.		
Develop a contingency and disaster recovery plan for critical IT systems.		
Develop and exercise SOPs for manual operation of utility processes if control systems are compromised.		
Implement redundancies in your system to limit service outages.		
Conduct cybersecurity training for utility staff and contractors.		
Conduct cybersecurity training for utility staff and contractors Improve physical security for IT equipment.		

Water Sector Cybersecurity Brief (continued)

Implementing A Cybersecurity Program at Your Water or Wastewater Utility

Steps for Responding to a Suspected Cyber Incident at a Water or Wastewater Utility:

1. Disconnect compromised computers from the network. Do not turn off or reboot systems.
2. Assess the scope of the compromise and isolate all affected IT systems.
3. Open a ticket with your antivirus software or security service vendor.
4. Assess any potential damage, including impacts to treatment processes or service disruptions.
5. Initiate manual operation of equipment if control systems have been compromised.

6. Distribute any advisories or alerts to customers as needed, including customers whose records may have been compromised.
7. Identify methods to scan all IT assets to eradicate malicious code. Assess and implement recovery procedures.

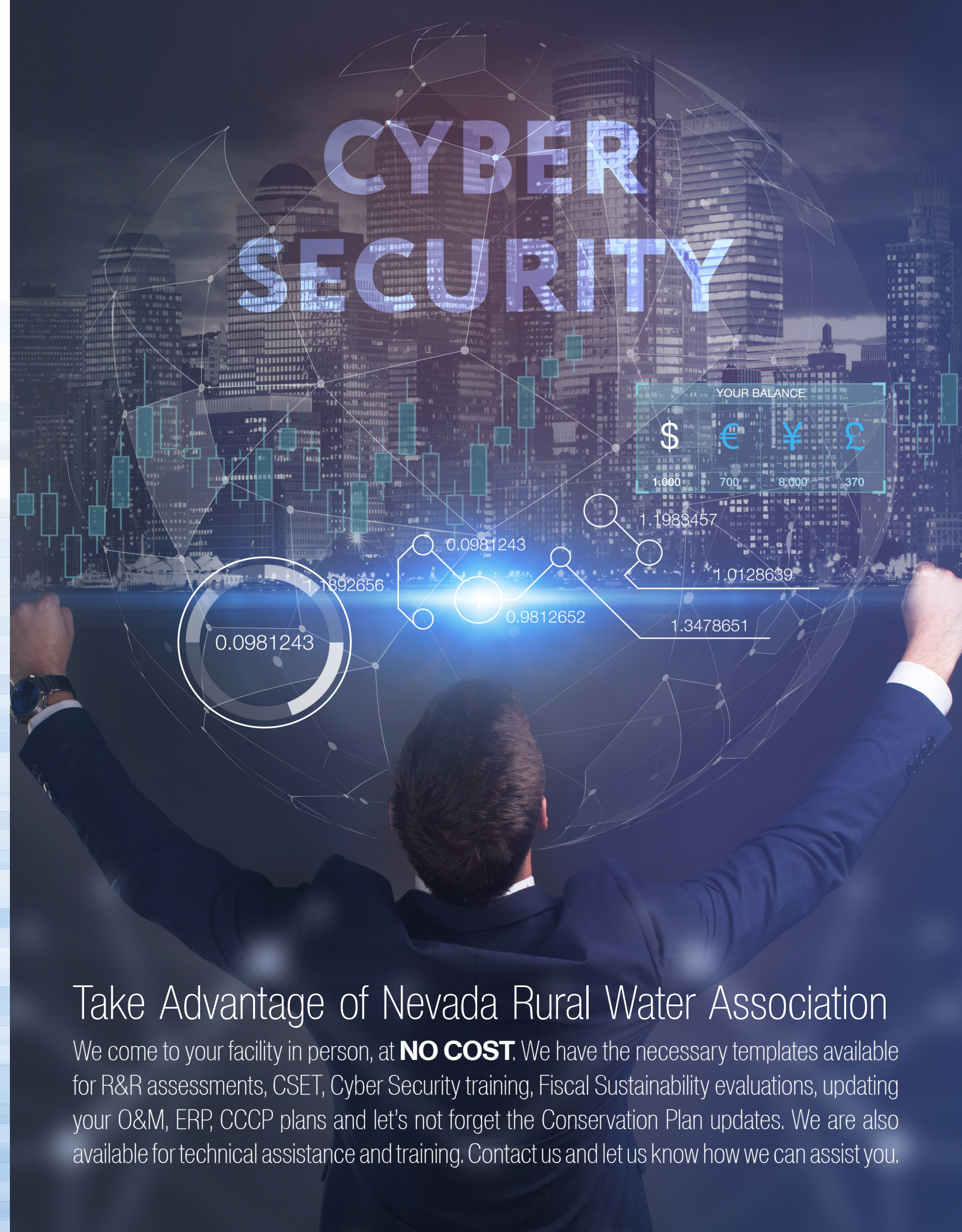
Reporting:

1. Report the incident to local law enforcement and the primary oversight agency (typically, the state).
2. Contact the DHS Cybersecurity and Infrastructure Security Agency (CISA) <https://www.cisa.gov/reporting-cyber-incidents>. CISA can assist your utility with identifying and restoring affected systems, coordinating federal assistance, and improving security.
3. Submit an incident report through Water ISAC (analyst@waterisac.org; 866-H2O-ISAC).

Important Contact Information

Role	Point of Contact	Phone Number	Email
IT service vendor			
Local law enforcement			
State agency			
Cybersecurity and Infrastructure Security Agency (CISA)			https://www.cisa.gov/reporting-cyber-incidents
Water ISAC		866-H2O-ISAC	analyst@waterisac.org

For more information on available cybersecurity guidance and resources: Contact NvRWA at 775-841-4222



Take Advantage of Nevada Rural Water Association

We come to your facility in person, at **NO COST**. We have the necessary templates available for R&R assessments, CSET, Cyber Security training, Fiscal Sustainability evaluations, updating your O&M, ERP, CCCP plans and let's not forget the Conservation Plan updates. We are also available for technical assistance and training. Contact us and let us know how we can assist you.

PFAS: The New Emerging Contaminant

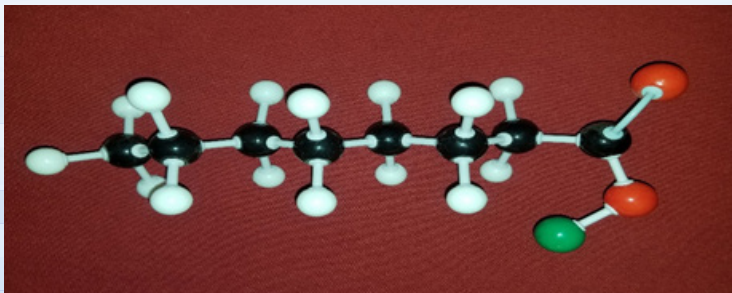
By Michael Boney, NvRWA Wastewater Technical Assistance

PFAS is a general group of chemicals that are used to give a waterproof barrier, non-stick surface, oil repellent surface, and other properties that most of us do not want to live without. This particular group of chemicals has up to 6,000 different chemicals with similar chemical characteristics.

The EPA takes on the responsibility of passing regulations that keeps the contaminants in the drinking water at a safe level for human consumption. When the levels of the contaminant reach or exceed a level to jeopardize the health of the consumer, the EPA will begin to research for the maximum contaminant level to keep the consumer from adverse health effects after drinking water. The EPA will ask for assistance from the water systems to determine the spread and concentration of the contaminant. Then the EPA will discuss the measures and steps to take.

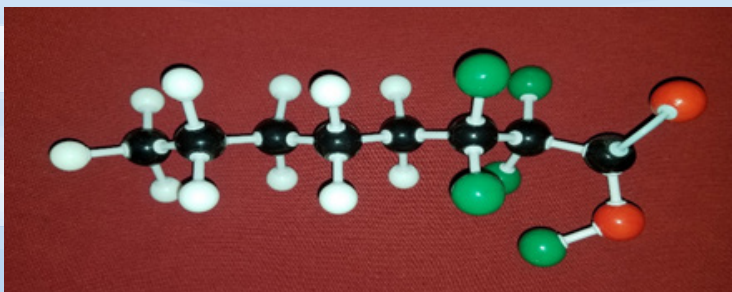
PFAS are split into two different groups of chemicals, PFOA and PFOS. These acronyms are shortened for perfluorooctanoic acid and perfluorooctanesulfonic acid, respectively. These groups are used widely to prevent staining and waterproof carpets, furniture, clothing, and many other uses.

The PFAS can take on two different molecule formulas. They are in the formation of per- or poly-. A molecule in the form of per- is shown below:



The molecule has fluoride atoms (white) attached to the carbon atoms (black). The head end of the molecule has a carboxylate, two oxygen atoms (red) and hydrogen atom (green).

When the molecule is in the form of poly- it has a similar structure as below:



With a similar atom placement as the previous molecule, some of the fluoride atoms (white) are exchanged with hydrogen atoms (green).

The chemical is used by fire fighters to help put out fires that contain hydrocarbons, liquids of a petroleum base that contain hydrogen and carbon. The chemical most often used to suppress the fire is AFFF, Aqueous Film Forming Foam.

As these chemicals soak into the ground, they contaminate the soil and proceed down into the water aquifer of the water system. When the chemical dries, wind picks up the chemical and disperses it into the air and around the world. The chemical is found on all seven continents.

The chemicals have been found to possibly cause adverse health effects. Some of these effects include:

1. Increased cholesterol
2. Increased risk of high blood pressure
3. Increased risk of pre-eclampsia in pregnant women
4. Decreased birth weight
5. Increased risk of kidney cancer
6. Increased risk of testicular cancer

PFAS are man-made. Nature does not have a way to completely break down the chemicals. Therefore, alternative methods must be used to rid the chemicals from the drinking water and wastewater. The treatment techniques used by water and wastewater systems may not be sufficiently engineered to remove PFAS to meet the Health Advisory of EPA set at 70 ppt. This level is not regulated and may not be enforceable. However, some states have taken the Health Advisory and made it the maximum contaminant level by that state's regulations.

Once an MCL is established by the EPA, Nevada will follow the EPA guidelines.

Treatment techniques include:

1. Granular Activated Carbon, GAC
2. Ion Exchange
3. Ozone with assistance from a catalyst.
4. Incineration of sewer sludge

The problem with the above techniques (1-2) is the PFAS are removed from the drinking water onto the media. The attached PFAS has to be removed. With GAC, heat can remove the PFAS from the GAC or the GAC is incinerated. Ion exchange allows for backwash to regenerate the resin. However, the backwash water is overloaded with PFAS. The backwash water can't be returned to the headworks. The reintroduction of the natant into the flow will add more contaminant to be treated. Otherwise, the backwash is sent to the collection system.

Ozone with a catalyst can start to break down the PFAS but not completely.

If the sludge is incinerated, then an incomplete burn will introduce the PFAS into the air.

Sampling for PFAS will follow the laboratory Method 537.1 or 533.

Sampling procedures will require the collection of three samples from each location depending on set up, i.e. if only one well enters the building then three samples are collected; however, if two wells enter the building then five samples are collected; if treatment is done in the same building, then seven samples are collected.

A better explanation of this is as follows:

1. The lab will send four bottles, three empty and one PFAS Free water sample, to the system.
2. The operator will follow the procedures outlined on the sheet and wear the proper PPE.
3. The PFAS Free water will be poured into the bottle labeled, BLANK
 - a. This will give the lab an indication if any PFAS is in the air in each building.
4. Wells are run for five minutes each to place a representative sample of well water into the column.
 - a. Two samples are drawn from the smooth bore sampling tap for each well.
5. If the treatment plant is in the same building, then two samples are drawn from the discharge of the plant.

In the above example, only one BLANK needed to be taken because there was only one building.

The above sampling techniques is only a portion of the requirements for PFAS sampling.

In March 2021, UCMR 5 was passed. UCMR means unregulated contaminant monitoring rule. Between 2022 and 2026, UCMR 5 will start to take effect. Any water system with a population greater than 3,300 will be required to take samples for PFAS. Systems with a population of 3,300 or less will have a sample of 800 systems throughout the U.S. take PFAS samples. This information can be found at <https://www.epa.gov/dwucmr/fifth-unregulated-contaminant-monitoring-rule>.

If your system is affected with PFAS, you can find more information about the drive National Rural Water Association has undertaken for rural water systems at <https://nrwa.org/nrwa-pfas-lawsuit-statement/>.

PFAS are found in many every day used materials, including:

1. Carpet/furniture stain resistant materials or sprays
2. Waterproof clothing and boots
3. Candy wrappers
4. Food wrappers/containers
5. Condiment containers
6. AFFF

Several other items contain the PFAS chemicals. 98% of humans have PFAS in their blood and body.

If you would like more training on PFAS, contact NvRWA to set up training.

BLACK MOUNTAIN SOFTWARE

UTILITY BILLING DONE
**EASIER
FASTER
BETTER**

Easy-to-use, efficient,
time-saving software
solutions for your
everyday needs.



Applications include:

- Utility Billing
- AMR Interface
- Email Bills
- Cash Receipting
- Accounts Receivable
- Service Orders
- Budget Prep
- Accounting
- Payroll
- And many more!

- ✓ Built-in interface with most standard meter reading systems
- ✓ Reliable, professional, "small town" friendly client support
- ✓ FREE on-going support and training



UTILITY BILLING | FUND ACCOUNTING

For more information and to schedule your
FREE online demo, call **800.353.8829**.

www.blackmountainsoftware.com

Proudly serving Nevada from our offices in Montana.

America's Water Infrastructure Act and Your Water System

By Joe Mathein, NWWA Technical Assistance and Training Specialist

By now we have all heard of the AWIA Risk and Resilience assessment requirements and most of us in rural Nevada do not have the requirement to complete a formal R&R assessment. The water systems that are under 3,300 population are not required to submit a formal Risk and Resilience Assessment. There is of course a recommendation from EPA that small systems use this or other guidance to learn how to conduct a risk and resilience assessment.

The new Emergency Response Plan template does include the risk and resilience assessments. Does your system need a capital improvement project? The funding agency may want to see your updated Emergency Response Plan and risk and resilience assessments as well. So, while the pressure is off for small systems under 3,300 in population, this may be a good time to look at what is involved.



What are the Risk and Resilience Assessments Requirements in AWIA?

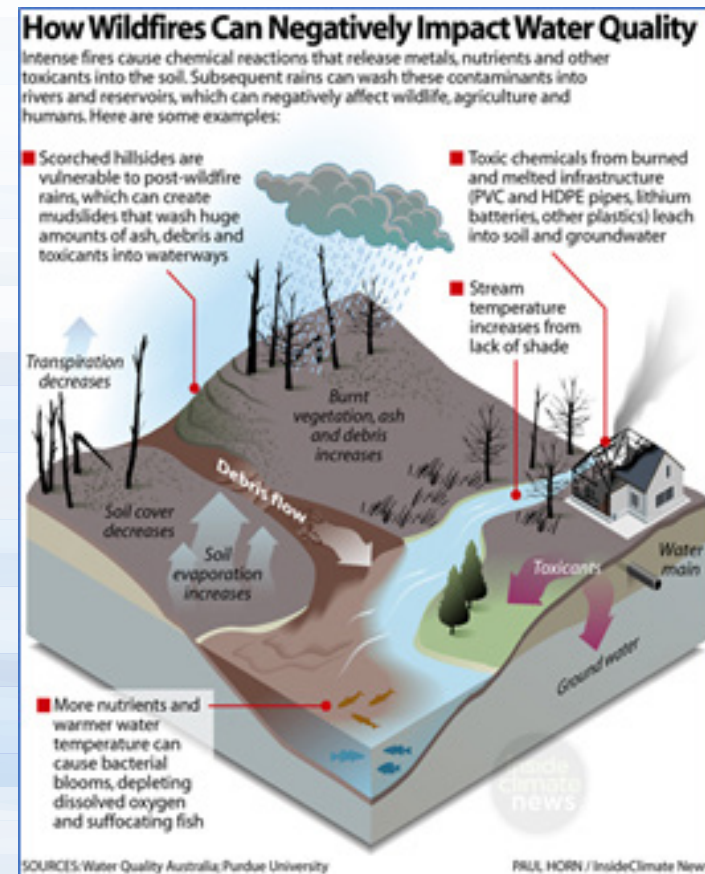
Basically, the risk and resilience assessments are looking at the threats to your water system. ALL THREATS! These are classified in categories as malevolent acts, natural hazard, cyberattack, process sabotage and terrorist acts, including vandalism.

The first step is to assess these acts and place them in a prioritized order. The categorical acts are listed by their significant risk as in a physical assault on the utility; Intentional, as in contamination of finished water; theft or diversion; and cyberattacks on the enterprise system as well as the process controls. The inclusion of accidental contamination of the finished water should also be listed separately.

Once the categories have been identified the next step is to define the impact of each of these acts within their category. At this point the existing physical barriers should be described: fences, perimeter walls, bollards, and additionally, other access control systems such as card readers, locks, hardened doors, and other securities already in place. Be sure not to forget the cyber security systems you may already have in place such as, passwords, firewalls, and VPNs.



Listing natural hazards is also part of the risk and resilience assessment process. The listing of natural hazards should include those that are likely to happen as well as those that have the potential of happening. Again, as in the process from the prior group the severity of impact of each of the natural hazards will be described and the physical barriers that are in place to mitigate the negative effects of these Hazards.



What are Risk and Resilience in a Water System?

From the Guidance for Small Community Water Systems on Risk and Resilience Assessments under America's Water Infrastructure Act "Risk to critical infrastructure, including water systems, is a function of threat likelihood, vulnerability, and consequence".

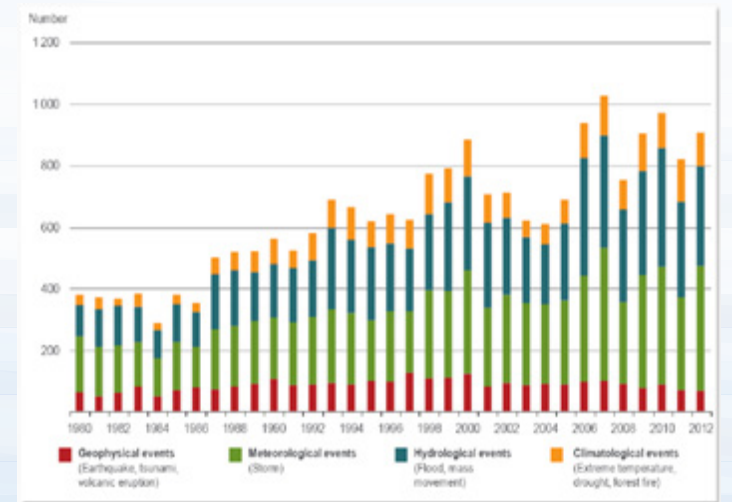
- Threat can be a malevolent act, like a cyberattack or process sabotage, or a natural hazard, such as a flood or hurricane.
- Threat likelihood is the probability that a malevolent act will be carried out against the water system or that a natural hazard will occur.
- Vulnerability is a weakness that can be exploited by an adversary or impacted by a natural hazard. It is the probability that if a malevolent act or a natural hazard occurred, then the water system would suffer significant adverse impacts.
- Consequences are the magnitude of loss that would ensue if a threat had an adverse impact against a water system. Consequences may include:
 - Economic loss to the water system from damage to utility assets
 - Economic loss to the utility service area from a service disruption, and
 - Severe illness or deaths that could result from water system contamination, a hazardous gas release, or other hazard involving the water system.
- Resilience is the capability of a water system to maintain operations or recover when a malevolent act or a natural hazard occurs.
- Countermeasures are steps that a water system implements to reduce risk and increase resilience. They may include plans, equipment, procedures, and other measures."

How does a Community Water System Assess Risk and Resilience under AWIA?

- Select only the malevolent acts from those listed in the table that pose a significant risk to the asset category at the Community Water System, CWS. You may write-in malevolent acts not listed in the table.
 - Focus the selection of malevolent acts on those that are prevalent in the United States (e.g., cyberattacks), can exploit vulnerabilities at the CWS (e.g., known security gaps), and have the potential for significant economic or public health consequences (e.g., contamination).
- For each malevolent act that you identify as a significant risk, briefly describe how the malevolent act could impact the asset category at the CWS. Include major assets that might be damaged or disabled, water service restrictions or loss, and public health impacts as applicable.
- Select only the natural hazards from those listed in the table that may pose a significant risk to the asset category at the CWS. You may write-in natural hazards not listed in the table.
 - Focus the selection of natural hazards on those that are prevalent in the area where

the water system is located, may affect vulnerable water system infrastructure, and have the potential for significant economic or public health consequences related to the CWS.

- For each natural hazard that you identify as a significant risk, briefly describe or provide examples of how the hazard could impact the asset category at the CWS. Include major assets that might be damaged or disabled, water service restrictions or loss, and public health impacts as applicable.

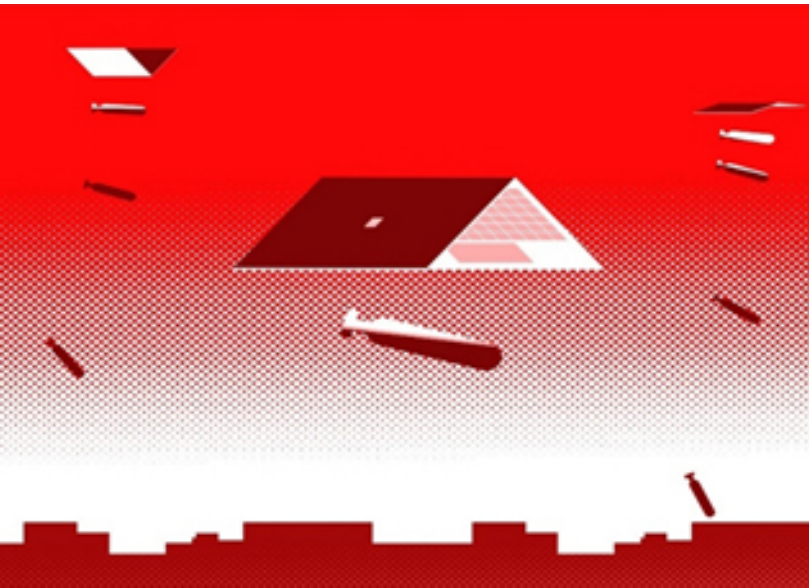


Wow, what didn't that cover? It really isn't that daunting of an assessment. The reality is that the assessment itself gives you the opportunity to review the status and condition of your assets and security measures. The assessment guide also has a template guide or instructions that help to prepare the Risk and Resilience (R&R) assessment and incorporate that assessment into your Emergency Response Plan (ERP). The good thing is that after you have identified your assets, the assessment is only interested in the assets that are at "significant risk".

There are recommendations and strategies for completing both the R&R assessment and updating the ERP. The R&R guide and the ERP both include templates that make the listing and categorizing of your assessments intuitive and organized by function. The categories of your assets range from pipes and valves to storage tanks and well and booster stations to the SCADA systems that control the operations. The assessment also provides examples of the different types of malevolent acts and helps you to categorize them by priority of importance as well as the severity of their failure.

Again, the R&R assessment looks at all assets and evaluates the risk, the physical barriers, the probability of attack, and the severity of the loss of that asset. These guides also help to assist in recognizing your existing security measures and help to define those areas that are deficient and can be improved upon.

America's Water Infrastructure Act and Your Water System (continued)



The templates in the R&R guide are labeled and cover all the assets a community water system could have. Your system may only need the basic templates, source water, pipes and constructed conveyances, storage and distribution facilities, and electronic, computer or other automated systems. You don't have to reinvent the assessment categories and how they are assessed. The realization that it could happen is forward thinking. Thinking it will never happen is short sighted and asking for trouble.

Whether you are required to submit an assessment by June 30th or not, this is an exercise that not only evaluates the security of your system, it also gives an active and up to date listing of your assets and their current conditions. Remember, if you are considering any projects that may require funding from an agency of the government, the R&R assessment will be a requirement as well as an updated ERP, which includes the R&R assessment.

One more thing, The EPA also recommends using the Vulnerability Assessment Tool for the systems that are not required to submit the R&R assessment. This tool is similar and some of you may have used this tool in the past to perform the former Vulnerability Assessments that were once required.

VSAT is a tool that can be used by water utilities to conduct an AWIA-compliant risk assessment • VSAT can be used to assess risk and resilience from malevolent threats and natural hazards and evaluate improvements for increased security and resilience

- EPA designed VSAT Web 2.0 to help water systems comply with AWIA • VSAT can be accessed at: <https://vsat.epa.gov>

All information can be found on: <https://www.epa.gov/waterresilience/americas-water-infrastructureact-risk-assessments-and-emergency-response-plan>

How protected is your system?

The reality is that as and operators of water systems we have little or no spare time to dedicate to an assessment that isn't required. Nevada Rural Water can assist you with this. Keep in mind that someday your system will need funding, and you will have the additional task of performing the R&R assessment on top of all the other application requirements.



Take advantage of Nevada Rural Water Association, a local and reliable resource, we come to your facility in person, at NO COST. We have the necessary templates available for R&R assessments, CSET, Cyber Security training, Fiscal Sustainability evaluations, updating your O&M, ERP, CCCP plans and let's not forget the Conservation Plan updates. We are also available for technical assistance and training. Again, all for NO COST. The Nevada Rural Water Association has professionals that are available to meet with you at your system or at your convenience. Contact us and let us know how we can assist you.

STRUCTURE. & INTEGRITY.

CREWS AVAILABLE GLOBALLY

www.pttg.com

INSPECTIONS	REPAIR	TANKS
Wet Dry ROV In-Service Cleaning	Code Updates Paint Insulation	Elevated Ground Relocation Erection Dismantles

NEW TANKS - Rick DiZinno (270) 826-9000 ext. 2601
EXISTING TANKS - Jordan Pyles (270) 826-9000 ext. 4601

The Deadliest Game: Although Not A Game It Is Deadly Anyway

By Rick Allen, NvRWA Training and Technical Assistance Specialists, Drinking Water

Are you still playing Russian Roulette?



In many of my travels and conversations it is becoming more and more apparent that our wastewater workers are not doing everything they can to protect their health and safety.

In the year 2020, so far, we have lost at least 6 wastewater operators or collection personnel. Although all the particulars of each incident are not known at this time, in my opinion the loss of even one public works employee due to the deadly gas Hydrogen Sulfide (H₂S) is unacceptable.

The testing and monitoring equipment that is available today should help to alleviate any catastrophes from happening.

This year, we have reports of a wastewater supervisor falling through a catwalk on the east coast to her death in the wastewater plant. Preliminary reports indicated that the catwalk had been damaged due to H₂S and moisture created on the infrastructure.

In the fall of 2020, two operators were found in the sludge holding building at the wastewater plant. The suspected cause of death was again H₂S gas in the building.

Three collection line workers were also killed in the last year when they were trapped under a manhole in the Midwest from a suspected H₂S issue.

WITH THE TESTING AND MONITORING EQUIPMENT AVAILABLE TODAY FOR OUR UTILITY WORKERS, THERE IS ABSOLUTELY NO REASON ANY EMPLOYEE SHOULD BE ENDANGERED DUE TO H₂S, METHANE, LEL (Lower Explosive Limit Gas) OR LOW Oxygen (O₂) IN ANY SYSTEM.

Every water, wastewater, electrical or other underground utility worker MUST make sure the monitoring equipment is available, turned on and calibrated to protect our workers.

HEGGEN LENTZ ENGINEERING

Ingrid Heggen, PE
Principal Engineer

3080 North Lake Blvd
PO Box 1913
Tahoe City, CA 96145
ingrid@heggenlentz.com
M: 775.224.5739
O: 530.584.2599

This does not just apply to underground utilities, but it also applies to any confined/enclosed spaces you may enter. The one that many utilities are still missing in today's world are in every building standing on your property.

Every digester building, sludge holding building, dewatering station, enclosed aeration basin, office, transfer station headworks, disinfection station or building, discharge area and the list goes on and on.

What I am saying is that every square inch of your public owned utility can create these deadly gases. Every building should be monitored and alarmed to prevent accidents. Every worker should always be required to wear a portable 4-gas monitor from the time they arrive on site until they leave.

Workers should face disciplinary action if they do not wear them or turn down or off the alarm. Yes, workers have been known to turn down the volume or the turn off the alarm because the noise was bothering them.

All monitoring equipment, stationary or mobile, must be calibrated on schedule.

All infrastructure should be inspected for damages caused by the sulfuric acid created by H₂S when it contacts moisture. These inspections should be completed quarterly in my opinion, but OSHA may impose less stringent of monitoring requirements.

Every time you enter a utility building or area and you choose not to have your 4-gas monitor turned on, you are making a **LIFE AND DEATH DECISION!** The decision is yours!

One of the best management practices I have witnessed was in the Seattle area, several years ago. Before entering the lift station structure, every employee tested the atmosphere with his own handheld monitor. The results of each test were then logged onto a log sheet attached to the wall. Even the employee who was on site but not entering the building was required to log his data.

I have been teaching classes about wastewater for 20 years and I still have to emphasize that every utility worker (wastewater or water) working in this county for any size of system must be provided with a hand held 4-gas monitor. The cost of a few thousand dollars for a monitor to protect your co-workers is insignificant compared to the call you will have to make if somebody dies.

© Rick Allen, BioLynceus, LLC September 15, 2020

Summer and Water Pollution

By Kelli Nevills, NvRWA Source Water Protection Specialist

Summer's here! On a warm summer day, nothing is quite as thirst quenching as a cool drink of water, or as refreshing as a cool dip in the water. Until the water is contaminated, that is. Pollution, primarily from the more urbanized areas around our lakes, streams, and rivers, has become a problem for Nevada's waters. Pollution takes many forms, and can include litter, sediment, nutrients, oil and grease, and pathogens.

As you sip a glass of cool, clear water as you read this, and you may think water pollution is a problem . . . somewhere else. But while most Americans have access to safe drinking water, potentially harmful contaminants—from arsenic to copper to lead—have been found in the tap water of every single state in the nation. (<https://www.nrdc.org/resources/threats-tap-widespread-violations-water-infrastructure>).

People use Nevada's rivers, lakes, and reservoirs for many different forms of recreation. Some recreational activities take place in or on the water, such as swimming, boating, fishing, and whitewater rafting. Other activities are enhanced by being close to water, such as hiking, nature viewing, and hunting. Increases in outdoor recreation have taken place at a rapid rate. This along with severe drought and temperature conditions in our State have put tremendous stress on Nevada's source water. As the temperature warms up, more people are out on our waterways and recreational areas. You might not think that water temperature is considered an important water-quality measurement. Temperature is not a chemical and it doesn't have physical properties you can see. But, if you ask a fish if the temperature of the water it is living in is important, it would respond yes! In natural environments, temperature is not too much of a concern for aquatic life since the animals and plants in the water have evolved to best survive in that environment. It is when the temperature of a water body changes, either by a natural event or by a human-induced event, that the fish break out in a sweat and start to worry. Temperature is also important because of its influence on water chemistry. The rate of chemical reactions generally increases at higher temperature. Water, particularly groundwater, with higher temperatures can dissolve more minerals from the surrounding rock and will therefore have a higher electrical conductivity. It is the opposite when considering a gas, such as oxygen, dissolved in the water. Think about how much "bubblier" a cold soda is compared to a warm one. The cold soda can keep more of the carbon dioxide bubbles dissolved in the liquid than the warm one can, which makes it seem fizzier when you drink it.

Seasonal Changes In Lakes and Reservoirs

Temperature in lakes and reservoirs is related to the dissolved-oxygen concentration in water, which is very important to all aquatic life. Many lakes experience a "turning" of its water layers when the seasons change. In summer, the top of the lake becomes warmer than the lower layers. You've probably noticed this when swimming in a lake in summer - your shoulders feel like they're in a warm bath while your feet are chilled. Since warm water is less dense than colder water, it stays on top of the lake surface. But, in winter some lake surfaces can get very cold. When this happens, the surface water becomes more dense than the deeper water with a more constant year-round temperature (which is now warmer than 16 | Water Logged | Summer 2021

the surface), and the lake "turns", when the colder surface water sinks to the lake bottom. Water temperature plays an important role in almost all water science. Water temperature exerts a major influence on biological activity and growth, influences water chemistry, can affect water quantity measurements, and governs the kinds of organisms that live in water bodies. Climate change will probably increase the frequency and intensity of low river flows, affecting both water quantity and water quality. Although climate change impacts on water quantity are widely recognized, the impacts on water quality are less known.



Lawn Care and Water Quality

Oh, the lush green lawns of summer. Lawns are ecosystems that impact surface and groundwater systems. The grasses found in lawns clean the environment by absorbing gaseous pollutants and intercepting pesticides, fertilizers, dust, and sediment. Irrigation water properly applied to lawns remains on site to recharge water supplies. In addition, grasses release oxygen and reduce glare, noise, and those hot summer temperatures. However, the need to protect surface and groundwater quality is a serious environmental issue. Good landscape design can prevent or minimize erosion and runoff. Good design provides for buffers and natural vegetated areas near streams, wetlands, and other fragile areas. It also minimizes the development of gullies, the redirection of streams, and the unnecessary disruption of the natural landscape, especially around drainage ditches, and stream banks.

Every lawn maintenance decision you make in managing a turf area will influence the ecosystem of the site. Best Management Practices, or BMPs, are a series of cultural practices designed to maximize resources while minimizing risk to the environment. Improper fertilization practices can pose a risk to groundwater quality. Knowing how a plant uses nutrients and the fate of nutrients in the soil, you can implement a fertility program that will benefit the turf and minimize risks to water sources. Remember, you're not just watering your lawn.



Nitrogen and Phosphorous

Water is uniquely vulnerable to pollution. Known as a "universal solvent," water is able to dissolve more substances than any other liquid on earth. It's the reason we have Kool-Aid and brilliant blue waterfalls. It's also why water is so easily polluted. Toxic substances from farms, towns, and factories readily dissolve into and mix with it, causing water pollution. So does all that summer recreation.

What are the Effects of Water Pollution?

To put it bluntly: Water pollution kills. In fact, it caused 1.8 million deaths in 2015, according to a study published in *The Lancet*. Contaminated water can also make you ill. Every year, unsafe water sickens about 1 billion people. And low-income communities are disproportionately at risk because their homes are often closest to the most polluting industries. ([https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(48\)90915-5/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(48)90915-5/fulltext))



Waterborne pathogens, in the form of disease-causing bacteria and viruses from human and animal waste, are a major cause of illness from contaminated drinking water. Diseases spread by unsafe water include cholera, giardia, and typhoid. Even in wealthy nations, accidental or illegal releases from sewage treatment facilities, as well as runoff from farms and urban areas, contribute harmful pathogens to waterways. These toxins can cause health issues from cancer to hormone disruption to altered brain function. Children and pregnant women are particularly

at risk. Even swimming can pose a risk. Before you take that dip, consider this: Every year, 3.5 million Americans contract health issues such as skin rashes, pinkeye, respiratory infections, and hepatitis from sewage infested waters, according to EPA estimates. When water pollution causes an algal bloom in a lake or reservoir, the proliferation of newly introduced nutrients stimulates plant and algae growth which in turn reduces oxygen levels in the water. This lack of oxygen suffocates the plants and animals and creates a "dead zone" where waters are essentially devoid of life. In certain cases, these harmful algal blooms can produce neurotoxins that affect wildlife. Harmful algal blooms (HAB's) release toxins that contaminate drinking water, causing illnesses for animals and humans.

Ecosystems are also threatened by debris which can strangle, suffocate, and starve animals. Much of this debris, such as plastic bags, soda cans, get swept into the sewers and storm drains and eventually out to our streams, rivers and lakes, turning our source waters into trash soup and floating garbage piles. Discarded fishing gear and other types of debris are



responsible for harming more than 200 different species of aquatic life.

It's easy to sit back and point the finger at the big polluting companies, but we are all accountable to some degree for today's water pollution problem. As you take another sip of that clear water in your hand, contemplate the cost of pollution. An Environmental Working Group report has

found that the brunt of this cost falls on small, rural communities, where a disproportionate amount of residents are living in poverty. (<https://www.ewg.org/research/nitratecost/>) Nevada covers 110,567 square miles, with a 2019 estimated population of 3,080,156 people – 281,883 of those living in rural Nevada (USDA-ERS). Researchers found that freshwater pollution by phosphorus and nitrogen costs government agencies, drinking water facilities and individual Americans costs the US at least \$4.3 billion annually. (<https://tinyurl.com/sciencedaily2008>)

A new study published on January 9, 2018 by *Environmental Health Journal* estimates the national cost of getting sick from recreating in polluted water is \$2.9 billion nationwide. In fact, this study estimates Americans enjoy recreating (swimming, paddling, boating) in the water four billion times every year. Now that is a lot of love for the water, and it really speaks to the importance of Nevada Rural Water's mission of protecting and enjoying our lakes, rivers and reservoirs and our great outdoors. (<https://ehjournal.biomedcentral.com/articles/10.1186/s12940-017-0347-9>)

Fortunately, there are simple ways you can prevent contamination or at least limit your contribution to it.

- Reduce your plastic consumption and reuse or recycle when you can.
- Properly dispose of chemicals, oils and non-biodegradable items to keep them from going down the drain.
- Maintain your car so it doesn't leak oil, antifreeze or coolant.
- Better landscaping practices that reduce runoff and avoid applying pesticides and herbicides.
- Pick up your dog's poop.
- If you pack it in, pack it out!

One of the most effective ways to help protect our waters is to support Nevada Rural Water Association, Nevada's primary organization that is committed to bringing clean water solutions to Nevada's rural communities. Tap into Nevada.



NEVADA RURAL WATER ASSOCIATE MEMBERS

BIOLYNCEUS LLC

Kathy Kelly
(970) 586-3391

BLACK MOUNTAIN SOFTWARE, INC.

Heather Neff
(800) 353-8829

BROADBENT & ASSOCIATES, INC.

Scott Keeseey
(775) 322-7696

CAROLLO ENGINEERS

Karen Steed
(702) 792-3711

CASHMAN EQUIPMENT

Mike McGraw
(702) 633-4683

DAY ENGINEERING

Dean Day
(775) 293-1743

EJ USA, INC.

Kirk Stoltzner
(509) 209-0353

ENERGY LABORATORIES, INC.

Shari Endy
(406) 252-6325

FORD METER BOX

Kolby Campbell
(916) 402-6120

G3 ENGINEERING

Jim Billings
(916) 797-1880

HUBBELL - QUAZITE/HOTBOX

Greg Isaacson
(760) 305-3149

HYDRO RESOURCES WEST

Shane Nelson
(775) 623-5259

INDUSTRIAL SERVICE & SUPPLY

T.G. Bliss
888-253-7122

INSTRUMENT TECHNOLOGY CORPORATION

Stan DuBois
(800) 519-1998

LANDERS CONSULTING, INC.

Mike Landers
(415) 302-1883

LUMOS AND ASSOCIATES

Mike Hardy
(775) 827-6111

MASTER METER, INC

Jennifer Nunez
(817) 842-8000

MCGINLEY & ASSOCIATES, INC

Joseph McGinley
(775) 829-2245

PITTSBURG TANK & TOWER

Kris Wilkerson
(270) 826-9000

POOL/PACT

Zaria Hanses
(775) 885-7475

RESOURCE CONCEPTS, INC.

Jill Sutherland
(775) 883-1600

RYAN PROCESS, INC.

Dave White
(925) 837-0670

SCHROEDER LAW OFFICE, P.C.

Therese Ure
(775) 786-8800

SHAW ENGINEERING

Steve Brigman
(775) 329-5559

SIGNA MECHANICAL

Joseph Tortorello
(949) 548-1125

SIERRA ENVIRONMENTAL MONITORING

Joe Nava
(775) 857-2400

SPB UTILITY SERVICES, INC

Kirk Peterson
(775) 329-7757

SPIESS CONSTRUCTION COMPANY

Barry L. Matchett
(800) 292-6260

SUEZ ADVANCED SOLUTIONS

Sarah Johnson
(678) 705-6702

SUNRISE ENGINEERING, INC.

Joe Phillips
(435) 652-8450

TECHNOFLO SYSTEMS

Steve Huth
(559) 783-1207

TESCO CONTROLS, INC.

Jerry Horst
(916) 395-8800

USA BLUEBOOK

Earlene Langston
(847) 377-5162

WESTERN ENVIRONMENTAL TESTING LAB

Nick Ross
(775) 355-0202

VIVAX METROTECH

The vLoc3 Series of Utility Locators, Uncompromising Performance for Damage Prevention

The vLoc3 series of utility locators introduces new innovative tools for locating buried utilities assuring damage prevention while gathering information for analysis.



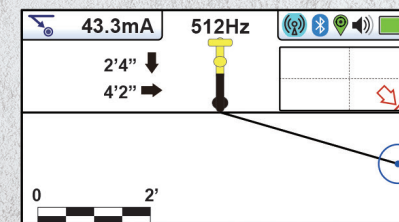
vLoc3-Pro Receiver

- Color-coded EM distortion warnings
- Offset vector locate mode
- Optional receiver/transmitter link
- Cloud-based data warehousing
- Internal data logging
- Optional Bluetooth connectivity

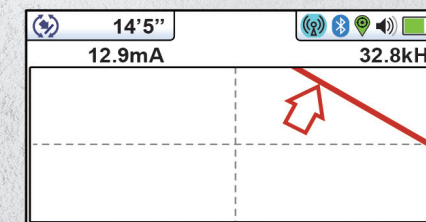


vLoc3-5000 Receiver

- Internal Bluetooth and GPS
- Sheath to earth fault locating (with A-frame accessory)
- Distortion Alert assist in recognizing signal bleed-over
- Offset vector locate mode
- Optional receiver/transmitter link
- Cloud-based data warehousing

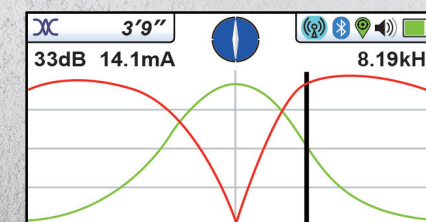


^ **Vector Locate** - shows orientation, line position, and distance relative to the locator in 3D

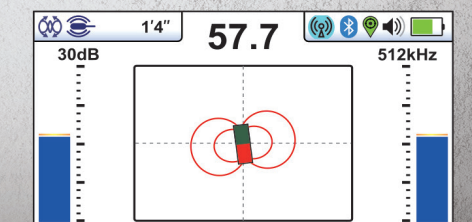


< **Plan View Screen** - displays the theoretical line in 2D from above ground in omnidirectional mode

v **Sonde Screen** - arrow guidance showing direction to the sonde and depth of cover



> **Transverse Plot Screen** - is used to display the peak and null to compare distortion shape



ITC

Call us for a no obligation on-site demonstration!

INSTRUMENT TECHNOLOGY CORPORATION

Ph: (800) 519-1998 • sales@instecorp.com

Suppliers to the Subsurface Utility Engineering Community Since 1995

CLOGGED PUMPS?

Tackle wipes and large debris with these solutions from USABlueBook!

FOR SMALLER APPLICATIONS AND LIFT STATIONS

Goulds GFK and GFV Series Sewage Pumps

- Non-clog impellers handle wipes and 2" solids

FlowRake Rag Catchers

- Catch and retain flushables



**OPERATOR
DESIGNED**



**USABlueBook
EXCLUSIVE**

FOR LARGE MUNICIPAL LIFT STATIONS

Deming Demersible Chopper Pumps

- Slice the most troublesome solids into small pieces

StationGuard Manual Bar Screens

- Capture damaging wipes and debris

DEMING®



**OPERATOR
DESIGNED**



USABlueBook®
GET THE BEST TREATMENT™

GET PRODUCT DETAILS AT
usabluebook.com/NoMoreClogs

800.548.1234 • usabluebook.com