COLORADO MUNICIPAL LEAGUE

100TH ANNUAL CONFERENCE

JUNE 21-24 | BRECKENRIDGE, CO

Building Resilience in Your Drinking Water & Wastewater Utilities

Creating a Culture of Health to Build Your TMF Capacity

Who are we?

- Colorado Department of Health and Environment
- Water Quality Control Division
- Local Assistance Unit

Kyra Gregory

Who are you?

- Region
- population size you serve
- What worries you about the future of your water/wastewater utility?
- What roadblocks are you encountering with financial management and emergency management?

Roadmap

What is a Culture of Health
1
Technical
Managerial
Financial
2
Review 7 steps of emergency management
3
Special Focus: Security
4
Asset Management
5
Wrap-up & Resources
6

Why are we here?

- What is resilience?
  - Ability of systems to cope with stressors while continuing to maintain key functions or structures

- Create resilience in your utility and community
- Prepare you for your next emergency
- Help you plan for your financial future
- Leave with tools, templates, resources

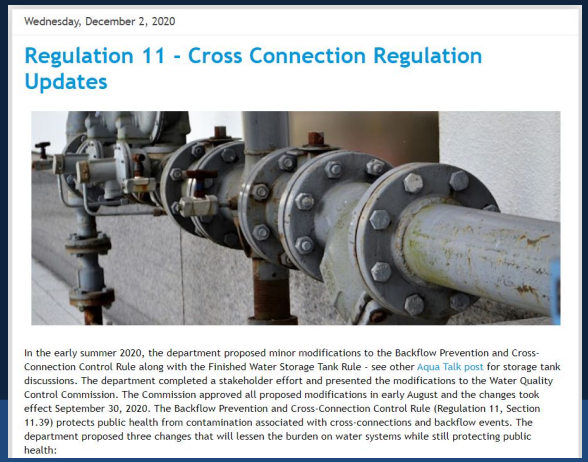
Thank you!

Our Common Goal?

- Protect and restore Colorado's water quality for public health, the environment, and future generations
  - Protect the barriers to contamination
  - Implement regulations and BMP
  - Know and work with your partners
  - Ask the tough questions
  - Focus on the goal

How to stay in the know?

- Aqua Talk → blog replacing newsletter



Wednesday, December 2, 2020

Regulation 11 - Cross Connection Regulation Updates

In the early summer 2020, the department proposed minor modifications to the Backflow Prevention and Cross-Connection Control Rule along with the Finished Water Storage Tank Rule - see other Aqua Talk post for storage tank discussions. The department completed a stakeholder effort and presented the modifications to the Water Quality Control Commission. The Commission approved all proposed modifications in early August and the changes took effect September 30, 2020. The Backflow Prevention and Cross-Connection Control Rule (Regulation 11, Section 11.39) protects public health from contamination associated with cross-connections and backflow events. The department proposed three changes that will lessen the burden on water systems while still protecting public health:

Search This Blog

Search

Subscribe to the Aqua Talk Blog

Email address...

Submit

How to stay in the know?

- Sign up for division emails

🔍 Search: wqcd engagement

Engagement email notifications

Sign up for email notifications and select which areas of interest you want to receive emails about.

Emergency Management

1. ID Threats

2. ID Areas of vulnerability

3. Build Resilience & Protection

4. Make Plans & Train

5. Implement Your Plan

6. Recover

7. Hotwash

Threats to your utility

- Fire
- Flood
- Drought
- Mudslide
- Storm event
  - High winds
  - Snow
  - Below freezing temps
- Tornado
- Pandemic
- Physical security attack
- Cybersecurity attack
- Contamination event
- Equipment/infrastructure failure
- Waterborne disease outbreak

Threats to your utility

- Inventory of assets
- How are they vulnerable
- Measures to take to increase redundancy

Conduct a Drinking Water or Wastewater Utility Risk Assessment

Vulnerability Self-Assessment Tool – Web Enabled (VSAT Web) 3.0

- Designed for
  - mobile devices
  - personal computers
  - runs on most Internet browsers.
- No VSAT Web User data is stored by or visible to EPA!

Guidance for Small Community Water Systems on Risk and Resilience Assessments under America's Water Infrastructure Act

Table 1a: Physical Barriers (Malevolent Acts)[1]

Asset Category: *Physical Barriers* **Examples of Assets in this Category:** Encompasses physical security in place at the CWS. Possible examples include fencing, bollards, and perimeter walls; gates and facility entrances; intrusion detection sensors and alarms; access control systems (e.g., locks, card reader systems); and hardened doors, security grilles, and equipment cages.	
Malevolent Acts Select the malevolent acts in the left column that pose a significant risk to this asset category at the CWS.	**Brief Description of Impacts** If you select a malevolent act in the left column as a significant risk to the *Physical Barriers* asset category, briefly describe in the right column how the malevolent act could impact this asset category at the CWS. Include effects on major assets, water service, and public health as applicable.
☐ Assault on Utility – Physical	
☐ Contamination of Finished Water – Intentional	

Table 1b: Physical Barriers (Natural Hazards)[4]

Asset Category: *Physical Barriers* **Examples of Assets in this Category:** Encompasses physical security in place at the CWS. Possible examples include fencing, bollards, and perimeter walls; gates and facility entrances; intrusion detection sensors and alarms; access control systems (e.g., locks, card reader systems); and hardened doors, security grilles, and equipment cages.	
Natural Hazards Select the natural hazards in the left column that pose a significant risk to this asset category at the CWS.	**Brief Description of Impacts** If you select a natural hazard in the left column as a significant risk to the *Physical Barriers* asset category, briefly describe in the right column how the natural hazard could impact this asset category at the CWS. Include effects on major assets, water service, and public health as applicable.
☐ Hurricane	
☐ Flood	

Building Relationship

- How do we connect with outside partners?
  - Local critical infrastructure
    - Know key contacts
    - Set up quarterly or semi-annual meetings (virtual options helpful)
  - Local emergency response
    - Know key contacts
    - Invite for tour
    - Discuss mutual reliance and system specification
    - How does water fit into emergency response?

Building Relationship

- How do we connect with outside partners?
  - Critical customers
    - Know key contacts
    - If the water is out what do they need
    - Ensure they have emergency drinking water plan
  - State emergency response
    - CDPHE - Colorado Department of Health and Environment
      - Drinking Water and Wastewater 24 hour call lines
    - State OEM

CoWARN Colorado's Water/Wastewater Agency Response Network

- CoWARN
  - Utilities helping utilities
  - Mutual Aid Agreement
  - Region 8
  - 🔍 Search: Colorado Water Agency Response

- County-level emergency management
  - 🔍 Search: Colorado Local Emergency Manager

Grants ▾

Training & Exercise ▾

Emergency Management ▾

What resources do you have to plan?

- EPA - based on size and type
- Local Emergency Planning Committee
  - Compare plans with local utilities
- AWWA: M19 Emergency Planning for Water and Wastewater
- Colorado Department of Homeland Security and Emergency Management
  - Colorado Emergency Preparedness Assessment
    - Do with your county
  - Continuity of Operations Plan

What do you do with your plan?

- Training
- Functional Exercise
- All hazards boot camp
- Find training opportunities - EPA, CISA, DHSEM
- Evaluate how to train
  - New employees
  - Seasoned employees
  - Across other critical infrastructure

Response

- Enact your plan
  - evaluate what is working and what needs to shift
- Reach out to your partners
  - Ask for help
  - Keep everyone informed - rely on incident command
  - Work with state and county partners
- Track resources used
  - Personnel - Overtime
  - Emergency equipment and consumables

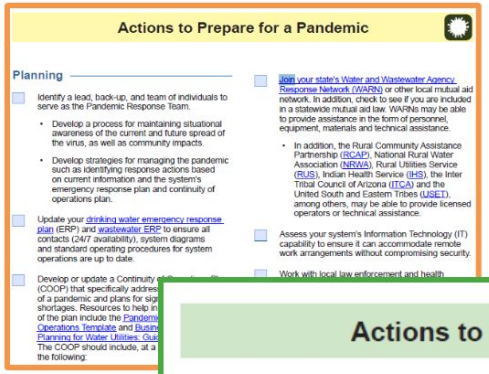
Response Resources

- Water Utility Response On-The-Go Mobile Application
  - Identify and contact emergency response partners
  - Monitor local and national severe weather
  - Review and complete incident-specific checklists
  - Populate, save and email damage assessment forms with photo attachments
  - Access Incident Command System procedures and resources

Response Resources

- Public notification
  - Draft documents and confer with WQCD prior to event
  - ID and contact critical customers
  - ID and contact downstream users
  - Use tools and work with WQCD communications section

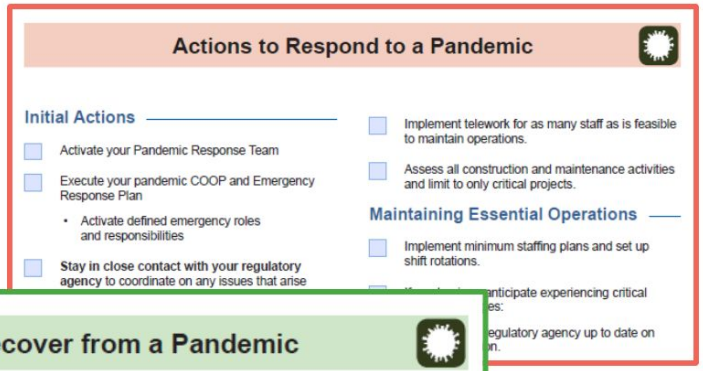
Prepare, Respond, Recover



Actions to Prepare for a Pandemic

Planning

- Identify a lead, back-up, and team of individuals to serve as the Pandemic Response Team.
  - Develop a process for maintaining situational awareness of the current and future spread of the virus, as well as community impacts.
  - Develop strategies for managing the pandemic such as identifying response actions based on current information and the system's emergency response plan and continuity of operations plan.
- Update your drinking water emergency response plan (ERP) and wastewater ERP to ensure all contacts (24/7 availability), system diagrams and standard operating procedures for system operations are up to date.
- Develop or update a Continuity of [illegible] (COOP) that specifically addresses [illegible] of a pandemic and plans for sig[illegible] shortages. Resources to help in[illegible] of the plan include the Pandemic Operations Template and Busine[illegible] Planning for Water Utilities: Gui[illegible] The COOP should include, at a[illegible] the following:
- Join your state's Water and Wastewater Agency Response Network (WARN) or other local mutual aid network. In addition, check to see if you are included in a statewide mutual aid law. WARNs may be able to provide assistance in the form of personnel, equipment, materials and technical assistance.
  - In addition, the Rural Community Assistance Partnership (RCAP), National Rural Water Association (NRWA), Rural Utilities Service (RUS), Indian Health Service (IHS), the Inter Tribal Council of Arizona (ITCA) and the United South and Eastern Tribes (USET), among others, may be able to provide licensed operators or technical assistance.
- Assess your system's Information Technology (IT) capability to ensure it can accommodate remote work arrangements without compromising security.
- Work with local law enforcement and health



Actions to Respond to a Pandemic

Initial Actions

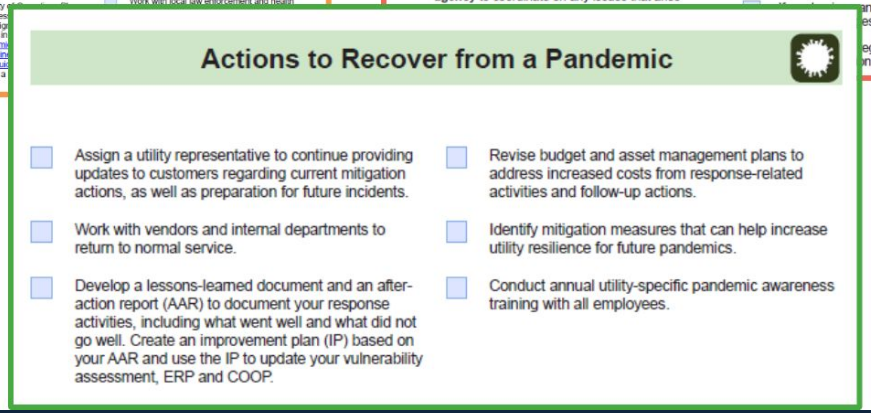
- Activate your Pandemic Response Team
- Execute your pandemic COOP and Emergency Response Plan
  - Activate defined emergency roles and responsibilities
- **Stay in close contact with your regulatory agency** to coordinate on any issues that arise
- Implement telework for as many staff as is feasible to maintain operations.
- Assess all construction and maintenance activities and limit to only critical projects.

Maintaining Essential Operations

- Implement minimum staffing plans and set up shift rotations.

[illegible] anticipate experiencing critical [illegible]es:

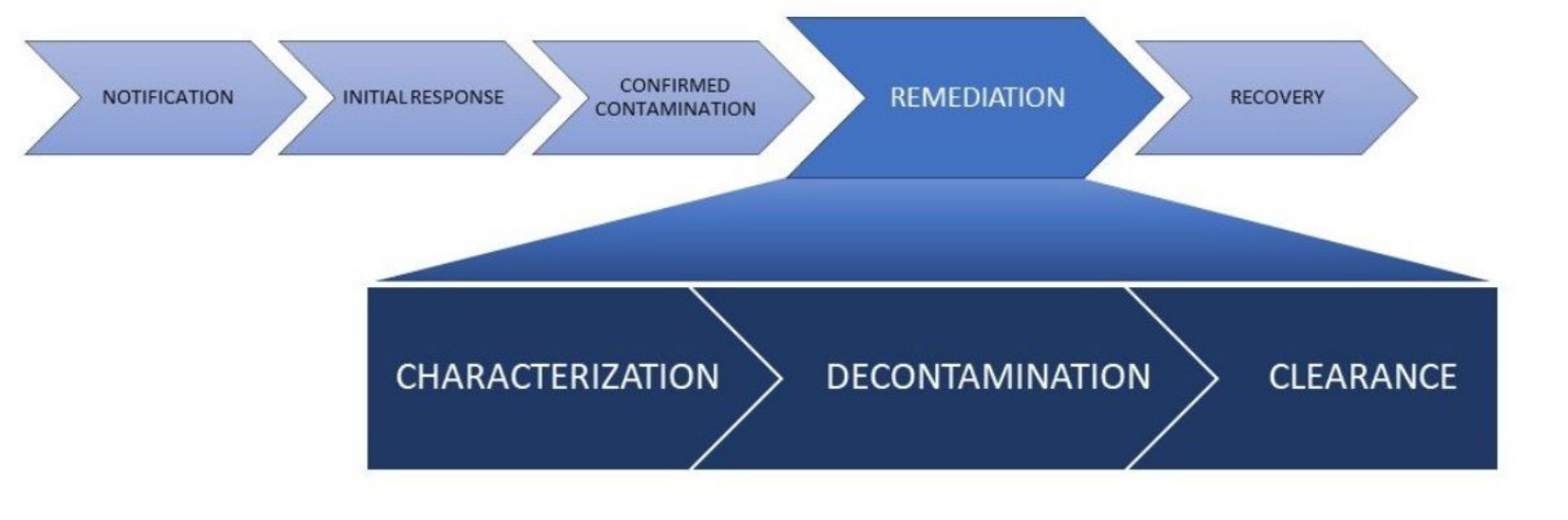
[illegible] regulatory agency up to date on [illegible]n.



Actions to Recover from a Pandemic

- Assign a utility representative to continue providing updates to customers regarding current mitigation actions, as well as preparation for future incidents.
- Work with vendors and internal departments to return to normal service.
- Develop a lessons-learned document and an after-action report (AAR) to document your response activities, including what went well and what did not go well. Create an improvement plan (IP) based on your AAR and use the IP to update your vulnerability assessment, ERP and COOP.
- Revise budget and asset management plans to address increased costs from response-related activities and follow-up actions.
- Identify mitigation measures that can help increase utility resilience for future pandemics.
- Conduct annual utility-specific pandemic awareness training with all employees.

Recovery:
Decontamination



Recovery Resources

- Federal Funding for Water and Wastewater Utilities in National Disasters (Fed FUNDS)
  - Search for most appropriate funding source
  - Options to combine funding (EPA, HUD, and FEMA)
- Other options
  - USDA
  - SBA disaster recovery loans

Hot Wash

After Action Review, Hot Wash, or Debrief

1. (Purpose) What was supposed to happen?
2. (Results) What did happen?
3. (Causes) What caused the difference?
4. (Implications) What can we learn from this?

Security

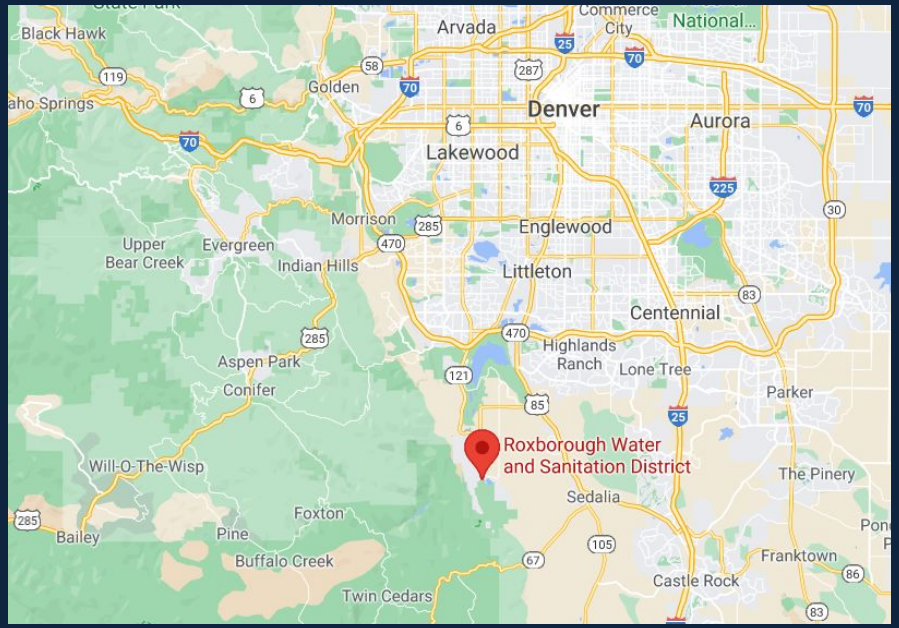
Concerns and Resources for PWS

Security Concerns

- General malevolent acts
  - Vandalism
  - Tampering
  - Violent acts
  - Terrorism attacks
- Cybersecurity
  - Ransomware
  - Malware
  - Phishing

Recent Cyber Attack

Roxborough Water and Sanitation



- Surface water
- Community
- Pop: 10,622

Roxborough Water and Sanitation

- September 2020
- IT department → alarm
- Ransomware
  - W/WW automated control, SCADA, alarms, and billing data
  - Encryption, not theft

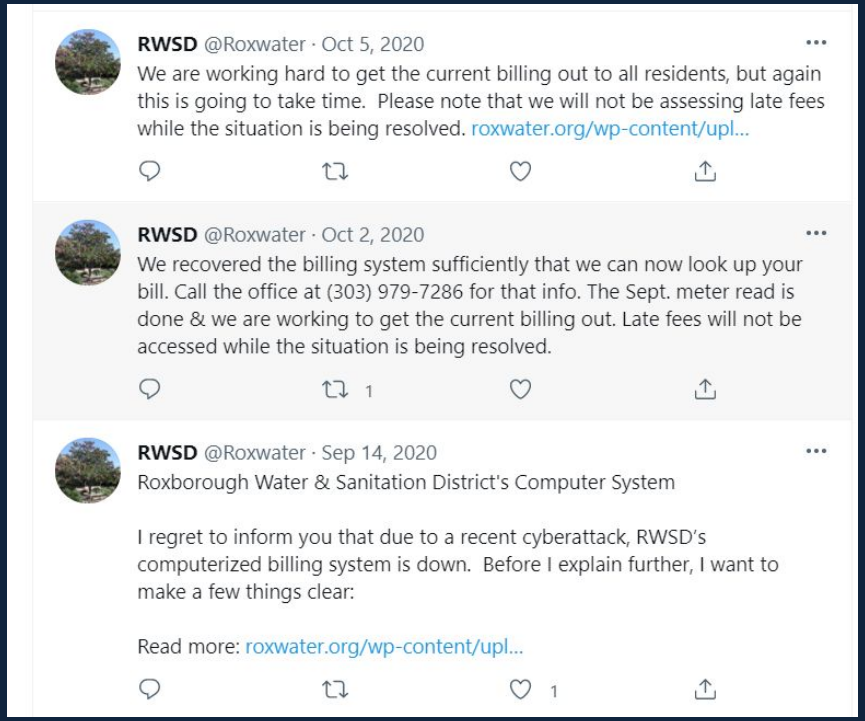
Roxborough Water and Sanitation

"Our number one priority was making sure we could provide safe water and efficient wastewater treatment operations for our members,"

1. Manual operations
2. Visual inspections and tank level checks
3. Inform state and federal partners
4. Hire experts
5. Rebuild systems
6. Pay the criminals - insurance

Roxborough Water and Sanitation

7. Communicating with customers



RWSD @Roxwater · Oct 5, 2020

We are working hard to get the current billing out to all residents, but again this is going to take time. Please note that we will not be assessing late fees while the situation is being resolved. roxwater.org/wp-content/upl...

RWSD @Roxwater · Oct 2, 2020

We recovered the billing system sufficiently that we can now look up your bill. Call the office at (303) 979-7286 for that info. The Sept. meter read is done & we are working to get the current billing out. Late fees will not be accessed while the situation is being resolved.

1

RWSD @Roxwater · Sep 14, 2020

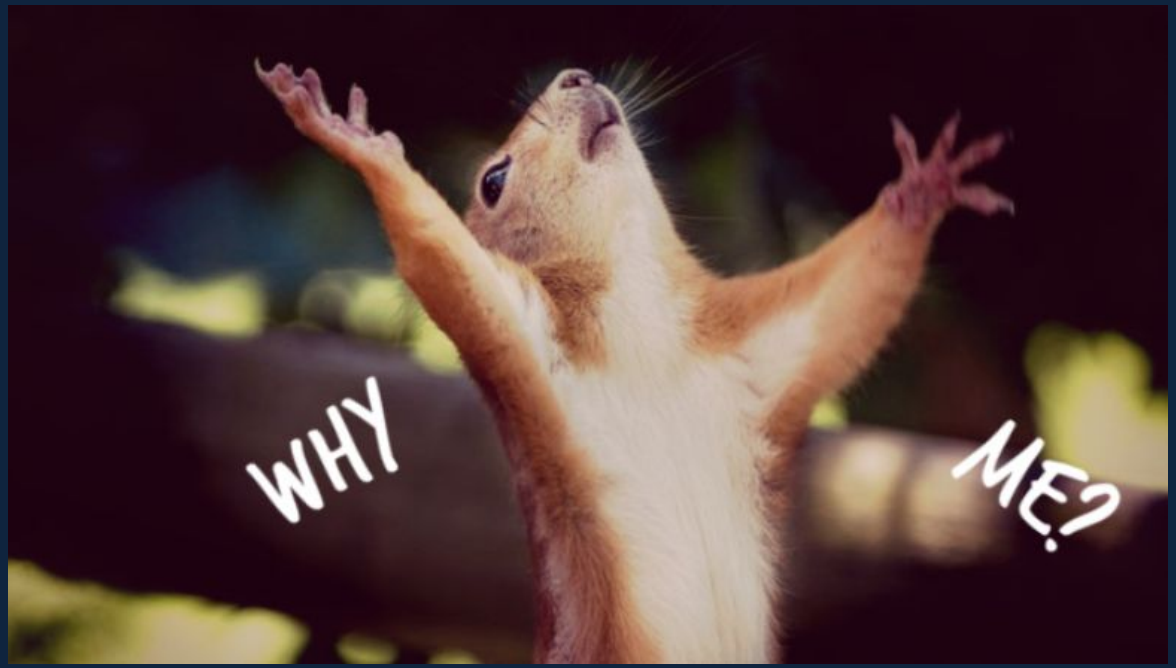
Roxborough Water & Sanitation District's Computer System

I regret to inform you that due to a recent cyberattack, RWSD's computerized billing system is down. Before I explain further, I want to make a few things clear:

Read more: roxwater.org/wp-content/upl...

1

Roxborough Water and Sanitation



Resources

WQCD - New Security Website

Drinking Water Security Response Toolbox

- Water Quality
  - Search or request records
  - Water quality engagement
  - Regulations, policies, and guidance
  - Drinking water consumer info & data
  - Drinking water resources for water systems
    - Compliance assurance
    - Facility design
    - Facility operator certification
    - Grants and loans
    - Guidance and forms

This toolbox is designed to help water utilities plan for, prevent, and guide responses to security threats including general malevolent acts, cyberattacks, tampering, and violent acts.

Preparing for malevolent acts

Malevolent acts, such as vandalism, tampering, violent acts, cybersecurity attacks, and terrorism attacks, pose a threat to water/wastewater utilities and are sometimes overlooked in Risk and Resilience Assessments as well as Emergency Response Planning efforts. Malevolent acts can affect your critical infrastructure by creating contamination events or by slowing or stopping your facility's ability to function. This toolbox will help you prevent, detect, prepare for, and respond to tamping events and violent acts.

- Planning resources: The department gathered resources to help your system prepare and respond to malevolent acts.
- Guidance: Report and Respond to Tampering Events or Security Threats.
- Join Colorado's Water/Wastewater Agency Response Network (CoWARN).
  - To apply as a member or associate representative, email the following to the CoWARN Website Administrator:
    1. Name of your utility/organization.
    2. Name, email, and phone number of a primary contact (once registered you will be able to add more contacts).
  - In addition, all water/wastewater utilities must have an Authorized Official sign and submit the Mutual Aid Agreement in order to become a CoWARN member.
    1. Download and view the Mutual Aid and Assistance Agreement.
  - Call 1-877-518-5608 to report malevolent acts or threats just as you would call to report hazardous substance spills or incidents that pose a risk to public health at any time. See the above guidance for more information on reporting processes.

Reporting Requirements

- Reg 11.2(1): “tampering events must be reported to the department.”
- Tampering
  - Contamination of PWS
  - Interfere with PWS
  - Unacceptable risk to human health

Reporting Requirements

- Notify department ASAP, but no later than 10 a.m. of the next calendar day
  - Tampering
  - Suspected tampering
  - Receipt of tampering threat by the system

Reporting Requirements

- Provide written notice within five calendar days to the department
  - Explaining the circumstances of the occurrence.
  - How will you provide safe drinking water?
  - How will you prevent this from happening again?

WQCD - Incident Report Form

COLORADO
Department of Public Health & Environment

Tampering, Threat, & Incident Report

Water Quality Control Division - Safe Drinking Water Program

PWSID

Your answer

PWS Name

Your answer

Tampering, Threat & Incident Report

Water Quality Control Division – SaveDrinking Water Program

1. Contact Information

PWSID_____
First Name _____
Title_____
PWS Address_____
_____
City_____
State_____
ZIP Code_____

PWS Name_____
Last Name_____
Work Phone_____ Work Ext._____
Mobile Phone_____
E-mail Address _____
Are you the ORC YES NO
If yes move to section 3
If no proceed with section 2

2. ORC Contact Information (or Point Personnel for the Incident)

First Name _____ Last Name_____
Work Phone_____ Work Ext._____ Mobile Phone_____
_____
E-mail Address _____

3. Type of Incident

Incident Start Date_____ Incident Start Time _____

Please circle/highlight the type of incident:
Contamination Property damage Personal assault Bomb threat
Threat of any of the above
Other_____

EPA - Free Assessment and TA

Free Cybersecurity Assessment and Technical Assistance

Cybersecurity is a broad term that refers to the security of computer network infrastructure and data. A cyber attack is an attempt to undermine or compromise the function of a computer network or system, or an attempt to track the online movements of individuals without their permission.

What are the expected outcomes?

All individual utility information gathered during the assessment will be protected and remain confidential. Trends in the anonymized, aggregated data will be shared with other utilities and agencies so that lessons learned from the assessments may benefit all.

Participating utilities can expect to receive a straightforward overview of their vulnerabilities and suggested best practices to reduce risks to their business enterprise, SCADA, and communications systems. Additionally, the utility will develop their cyber action plan with HWG and work to implement any recommended best practices.

What does the utility need to prepare before the assessment and technical assistance?

The assessment will require input from management, IT, operations/control staff and engineers as appropriate. The utility will also need to compile and provide any existing system documentation/diagrams, policies, and procedures.

Asset Management

Asset Management

- What is an asset?
  - Equipment, buildings, land, people, and other components needed to receive, treat, deliver w/ww
  - Large, expensive, and long-lived
  - Often buried
  - Essential to protect public health and the environment

Asset Management

- Inventory
  - What assets do you have?
  - Where they are located?
  - How long they are going to last?
  - How much it's going to cost to repair, rehabilitate, or replace them?
- Financial projections
  - Do your rates and other revenue generating mechanisms cover the costs of safely providing drinking or clean water?

5 Core Questions

1. What Is the current state of the utility's assets?
2. What Is the utility's required sustained level of service?
3. Which assets are critical to sustained performance?
4. What are the utility's best "Minimum Life-Cycle Cost", Capital Improvement Plan (CIP), and Operations & Management (O&M) strategies?
5. What is the utility's best long-term financing strategy?

5 Core Questions

- Create asset management team to answer questions
  - Decision makers
  - Management
  - Key operations personnel (ORC)
  - Technical Assistance Provider (LAU, EPA, RCAC, CRWA)
  - Engineers
  - Planners
  - Key maintenance staff

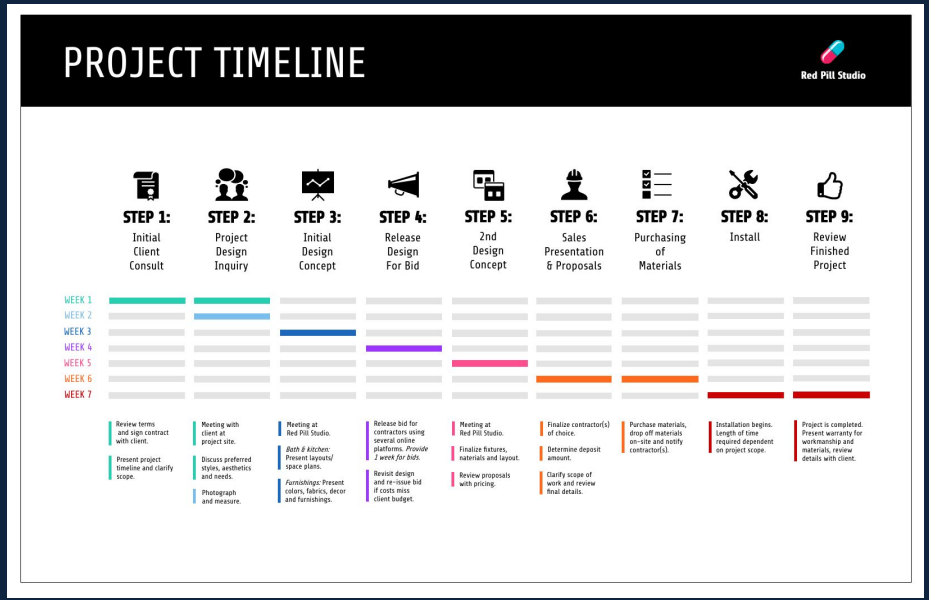
5 Core Questions

- Resources: Asset Management Team
  - EPA building an asset Management Team
  - EPA asset Management for Local Officials
  - WQCD W/WW Contract Operator Hiring Guide: defining roles and responsibilities
  - WA: Small Water System Management Program Guide

Asset Management - Where to start?

Project plans

- Establish vision and mission
- Create team roles and responsibilities
- Define due dates for short term projects so you can meet your long term goals!
- Templates online!



Resource: EPA Small Systems

Asset Management: A Handbook for Small Water Systems

One of the Simple Tools for Effective Performance (STEP) Guide Series

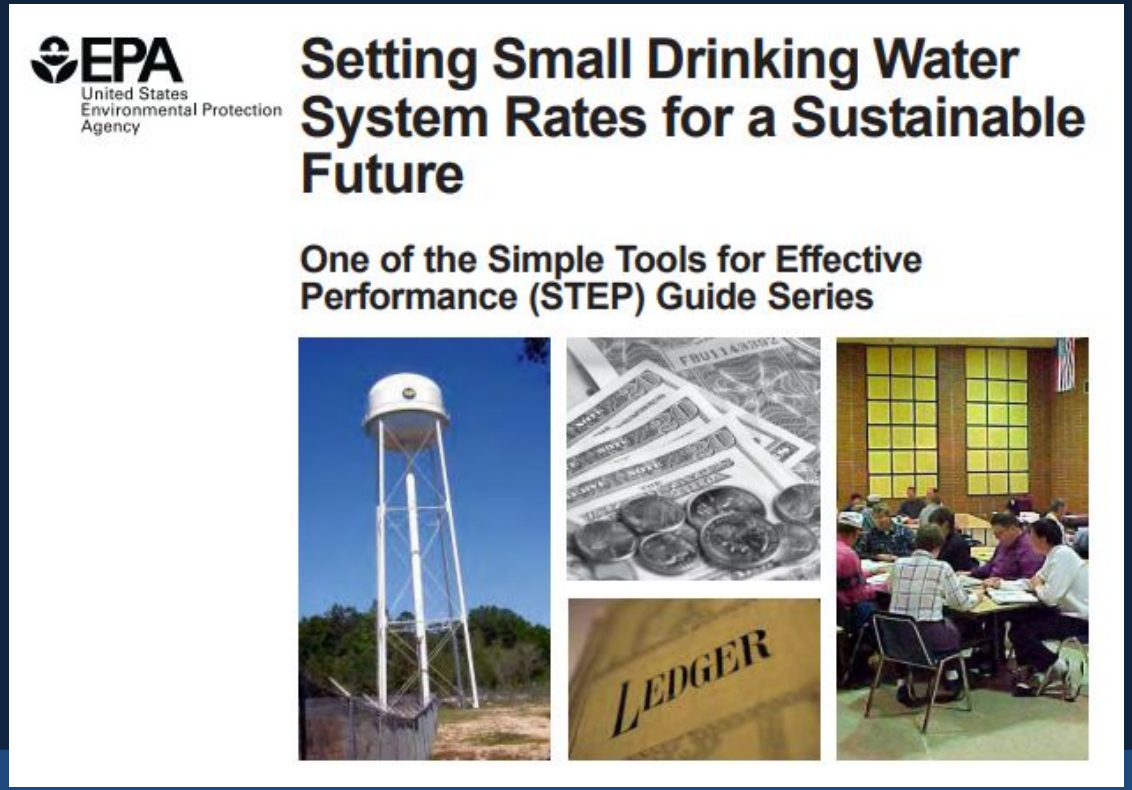
Resources: EPA Small Systems

EPA
United States
Environmental Protection
Agency

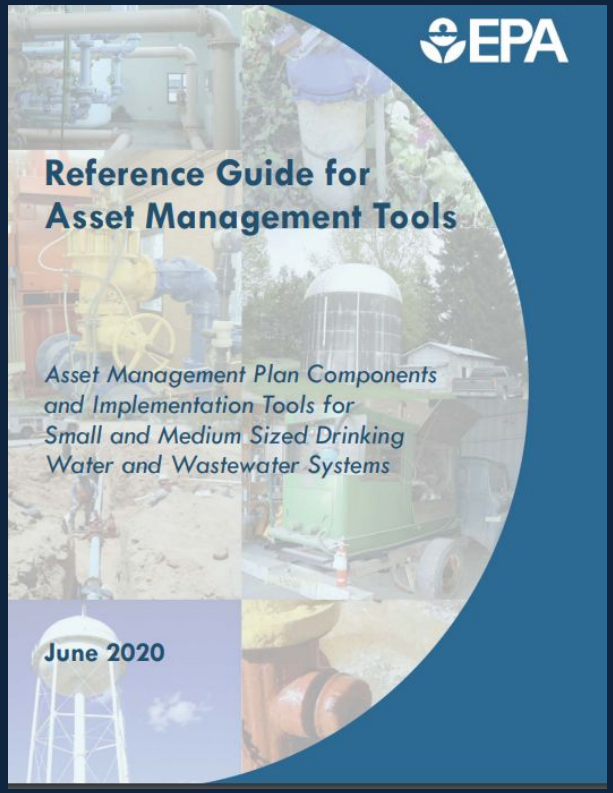
Taking Stock of Your Water System

A Simple Asset Inventory for Very Small Drinking Water Systems

Resource: EPA Small Systems



Resource: EPA Resource Guide



Level of Service

Component Description

How a system operates and manages its assets to meet customer expectations is called its *Level of Service (LOS)*. LOS determines the amount of funding and time required to maintain, renew and upgrade water system infrastructure. Changes to the LOS will have an impact on funding requirements and staffing.

This component should describe:

- ✓ Measurable internal goals, which define system operations and performance.
- ✓ Measurable external goals, which directly impact customers.
- ✓ How the system's performance toward its LOS goals is communicated to the customers, including the methods and frequency of communication.
- ✓ How the system receives information from customers regarding the satisfaction with the LOS and the LOS goals.

This information may be taken directly from the system's existing LOS Agreement (i.e., a document outlining the system's LOS goals), or may be developed specifically for the asset management plan.

The LOS component can discuss any goals the system and customers decide are relevant and important, as long as all regulatory requirements are met. The system should communicate progress made towards meeting the external LOS goals to the public on at least an annual basis. This information can be conveyed to customers through the annual Consumer Confidence Report (CCR) or through public webpages.

Implementation Tools

EPA, *Lean and Water Toolkit: Achieving Process Excellence Through Water Efficiency*

- **Chapter 5: Lean and Water Beyond the Factory Floor** includes a discussion on **Engaging with the Community**, which explains that engaging proactively with the community on water conservation can be an effective way to mitigate water-related business risks.
- **Visit:** https://www.epa.gov/sustainability/lean-water-toolkit-contents-and-acknowledgements

Kansas, *AM KAN Work! An Asset Management and Energy Efficiency Manual*

- **Chapter 4: Level of Service** discusses developing a LOS Agreement, balancing LOS and cost, measuring and adjusting the LOS Agreement, energy efficiency and LOS and communicating the LOS Agreement.
- **Cost:** $65, which includes a hardcopy of the manual, as well as shipping costs. Free if you attend a sponsored asset management training workshop.
- **Contact:** Amelia Springer, Kansas Department of Health and Environment (amelia.springer@ks.gov)

San Diego Public Utilities Department, Customer Satisfaction Survey

- After reviewing the questions, format and information collected via San Diego's **online survey**, systems can design their own customer satisfaction survey. Questions and formats can be adapted from the example, with modifications or additional questions to make the survey most useful for the system and its LOS goals.
- **Visit:** https://www.sandiego.gov/public-utilities/sustainability/water-conservation/water-survey

Login
Create Account
Water Finance Clearinghouse
Home
About
Resources
Funds
Map
Learning Modules
Submit Feedback or Resource
Search...
Search Resources
Search Funds
Map Search

QUESTIONS?

Discussion

What topic from this presentation will be the most beneficial to you and your system?

Contact Information

To request coaching visit from our team

🔍 Search Terms: CDPHE drinking water training opportunities

- Once at the CDPHE site Click on the link “Request free customized coaching and training assistance”

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