

UNDERSTANDING THE COSTS WHEN YOU FAIL TO PROTECT DRINKING WATER RESOURCES

INTRODUCTION TO CROSS CONNECTION CONTROL AND BACKFLOW PREVENTION

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ON BEHALF OF THE PNWS-AWWA CCC COMMITTEE

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American Water Works Association
Pacific Northwest Section

THE DEDICATED FOLKS WITH THE ANSWERS!

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- Bill Bernier – Washington State Department of Health
- Molly Keller – Oregon Health Authority



TOPICS OF THIS PRESENTATION

- Gateway into topics of cross connection control programs and related backflow prevention measures and related equipment and tools
- What could be the possible consequences of not protecting your public water system from cross connections
- Potential regulatory noncompliance issues
- Potential legal ramifications
- Public health perception and possible emergencies
- Emergency response, investigation and mitigation
- Potential related hard and soft costs



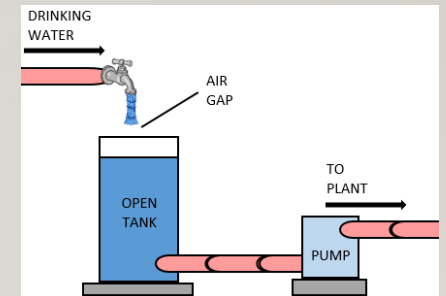
WHAT IS A CROSS CONNECTION?

- Definition: any actual or potential physical connection between a public water system or the consumer's water system and any source of non-potable liquid, solid, or gas that could contaminate the potable water supply by backflow
- All public water systems experience backflow either due to backpressure or backsiphonage
- Examples: thermal expansion (water heaters), main line breaks, irrigation system (booster pump), tall buildings (over 30 feet), high flow rates including fires, garden hose(?)
- Once water flows into a customer's service line, it is considered "used" water and should not be allowed to flow back into the public water system



WHY IS CROSS CONNECTION CONTROL SO IMPORTANT?

- **PROTECTION OF THE PUBLIC HEALTH!**
- Major part of a multibarrier approach to protect the public health through protection of a public water system (i.e. backflow prevention, disinfection, water quality monitoring, etc.)
- Cross connections are the #1 leading cause of waterborne disease outbreaks according to the CDC
- Ensures protection at the consumer's tap (commercial and residential)
- Designed to prevent the return of used water to the public water system
- Required by Drinking Water Rule for all states that maintain Primacy



WHO IS REQUIRED TO HAVE A CCC PROGRAM

- All Community public water systems are required to have an active cross connection control program and non-transient non-community water systems must have protection
- Definition of a public water system: 15 or more connections or 25 or more people served more than 60 days per year
- Most state Rules recognize systems 3300 in population and larger as required to implement their own program with designated personnel or an approved alternative
- Smaller systems may use a “satellite” program operator as they lack staff and funding
- Non Community systems are typically very small but should still protect from backflow



WHAT IF I DON'T HAVE A PROGRAM?

- Your customers are at considerable risk of contamination leading to mild to severe adverse health issues
- Without a dedicated adequate program, your system (and you) can be subject to expensive legal ramifications
- Regulatory noncompliance
- May not be able to acquire state revolving fund loans for system improvements and expansion
- Could face operator sanctions up to and including loss of license



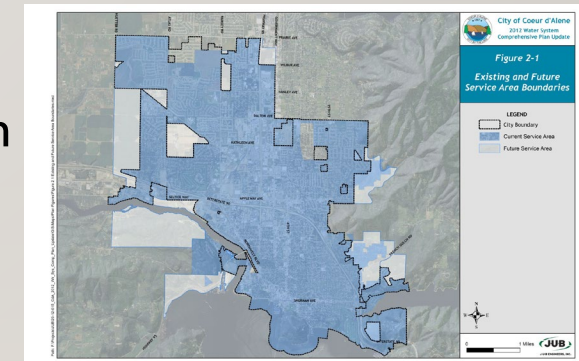
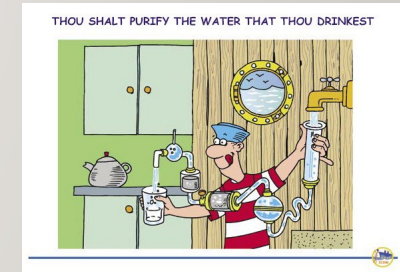
WHAT IF I DON'T WANT TO RUN A PROGRAM?

- Drinking Water Rules mandate a proactive CCC Program
- Do I have to run a program? Yes, whether directly or indirectly
- Systems do have the option of using satellite program operators and/or contractors
- Who can run a program? CCS in Washington and Oregon, DW Operator in Idaho
- Who can test? A BAT licensed in each particular state
- Reports, especially failing test reports, must be submitted in a timely manner
- Annual Summary Reports!



REGULATORY CONSEQUENCES OF NOT HAVING A VALID PROGRAM

- Non Compliance with state Drinking Water Rules
- States can implement fines to the public water system
- Under sanitary surveys can be determined as a significant deficiency
- Water System Plans may not be approved
- States can disapprove system expansion for development/growth
- Deficiencies have to be listed in annual CCR
- May have consequences related to SRF eligibility



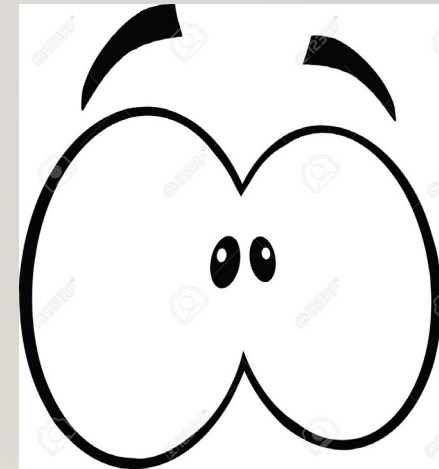
POTENTIAL LEGAL RAMIFICATIONS OF NOT HAVING A PROGRAM

- Businesses could experience interruptions and loss of revenue
- Potential property damage
- Customers and businesses may file civil and possible criminal lawsuits against the public water system if a significant backflow event were to occur
- Possible civil lawsuits against the operator(s) for failure to act in a reasonable and prudent manner to protect the public health
- Loss of system credit bureau rating for future debt service
- Water system may file lawsuits against the customer who caused damage/contamination



PUBLIC HEALTH PERCEPTION

- Due to failure to provide public education and knowledge, the public perceives cross connection control as a wasted and costly government conspiracy
- Costs generally fall to the customer for assembly ownership, maintenance and testing
- Customers are upset at another cost associated with home or business maintenance
- Operator typical response when asked why is “it is required by the state”
- Potential loss of consumer confidence in the public water system if an event occurs



WHAT HAPPENS WHEN A BACKFLOW INCIDENT OCCURS

- Customers call about taste and/or odor issues and possible health complaints
- Customers, especially businesses, will usually contact local health jurisdictions
- If a large enough event, can attract local news attention and possibly end up on national news (Example: Corpus Christi Texas)
- Must notify the state regulatory authority
- Emergency response will immediately be required
- Likely a boil water public notice will be required
- If significant illness or death occurs, expect lawsuits



COMMON CUSTOMER COMPLAINTS

- Taste, color and odor complaints (musty or metallic taste, odd colors such as green or pink, foul smell like petroleum or rotten eggs)
- Gastrointestinal issues (slight aches to severe cramping)
- Diarrhea and/or vomiting
- Flu like symptoms (aches and pains, vomiting and diarrhea, tired)
- Skin irritation and burns (dry itchy sensation to actual lesions on the skin surface)
- Damage and discoloration of laundry
- Possible plumbing damage



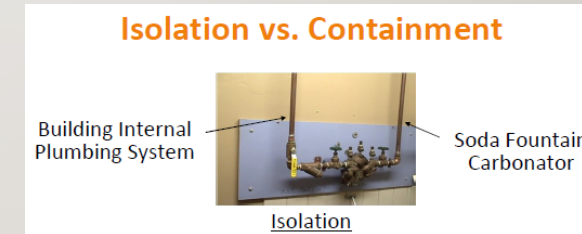
MITIGATION MEASURES

- Immediate investigation, system isolation and suspected point of contamination water quality testing
- Immediately contact your regional compliance officer for assistance
- Boil water notice for affected portions of the system as advised by compliance officer
- Shock disinfection measures of affected system as directed (25 mg/L for 24 hrs?)
- Flushing, flushing and then some more flushing
- New water quality samples taken after disinfection and flushing
- Possible repeat samples after 24 hours to confirm water quality compliance



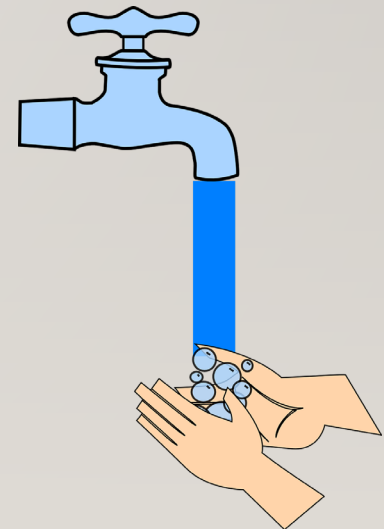
CORRECTIVE MEASURES TO PREVENT FURTHER CONTAMINATION

- Investigation should have identified likely source of contamination
- If an immediate health hazard, terminate service
- Determine level of required service protection
- Work with customer to get backflow protection installed or possibly install at service entrance to property or both (premise isolation)
- Protection must be installed prior to any downstream branches
- Only reactivate service if sure of adequate protection



RETURN TO NORMAL OPERATIONS

- Once water quality samples indicate acceptable compliance, bring the affected portion of the system back online
- Lift any remaining boil water order upon approval by compliance officer
- Only restore service to offending customer once approved protection is in place, tested, inspected and recorded
- Document the incident from first customer complaint to final resolution of emergency and return to normal operations (be detailed)
- Prepare hard and soft costs for potential billing, fees, reparations



WHAT ARE THE HARD COSTS ASSOCIATED WITH BACKFLOW CONTAMINATION?

- Labor associated with response, investigation, flushing, sampling, disinfection, mitigation and return to service
- Water quality sampling costs
- Equipment and material costs
- Administrative costs such as records, billing, publishing and information services
- Potential additional agency response for large emergency such as police, fire, hazmat, etc.
- Documented fees and service charges
- Backflow protection, if installed by system



WHAT ARE THE SOFT COSTS ASSOCIATED WITH BACKFLOW CONTAMINATION?

- Legal fees (attorney and court fees for both sides)
- Fines and levies (levied by the courts and regulatory agencies)
- Recovering consumer confidence (literature and social media)
- Environmental assessments (if found due to contamination)
- Public information and response
- Potential damage to health and welfare (potential long term medical costs associated with illness)
- Other associated costs?

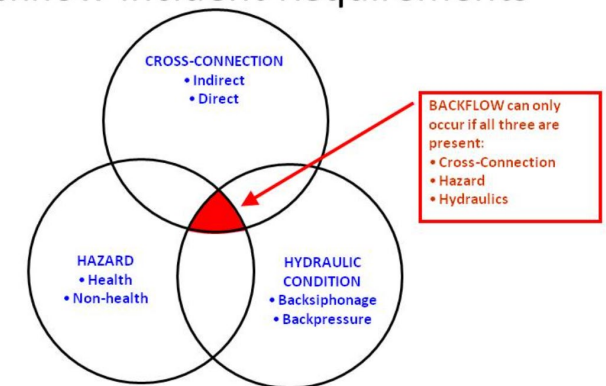


1999 AMERICAN BACKFLOW PREVENTION ASSOCIATION COST STUDY

- Survey results for 92 responding systems were shown
- Systems averaged the time spent for small to large backflow events
- Ranged on average from a minimum of 61 hours up to 494 hours
- Projections, at 2022 average labor rates, costs would range from \$24,000 to over \$179,000
- This is just for the known hard costs for labor, sampling and remediation
- Legal fees and system improvements would be on top of these costs



Backflow Incident Requirements



EXAMPLE: CORPUS CHRISTI TEXAS & VALERO

- Corpus Christi is a coastal city along the gulf coast in southern Texas
- The public water system serves over 500,000 customers in the greater metropolitan area
- Treats over 28 billion gallons annually through surface water treatment
- Valero Energy Corporation operates a refinery in the city industrial district
- Ergon Asphalt and Emulsions was also named in the lawsuit as they supplied the supposed contaminate that was believed may have backflowed into the water system
- The city involved the Texas AG's office in 2019 after their initial 3 year legal pursuit
- A settlement was proposed in 2021 but has yet to be completed



EXAMPLE: CORPUS CHRISTI – WHAT HAPPENED?

- Believed there was a credible threat that an asphalt emulsifier may have been backpressured into the water system, potentially contaminating the drinking water, likely from the Valero Refinery or Ergon Asphalt Plant, in Dec. 2016
- City initiated a citywide ban on drinking the water fearing widespread contamination for over 316,000 affected residents as boiling the water would not clear the contamination
- City residents scrambled to buy bottled water, cleaning out all available supplies
- Ban lasted 3 days, with many businesses closing their doors due to lack of clean water
- Testing showed no initial contamination and company would not immediately share chemical formulation, but investigation determined no BFA protection existed at plant
- Proposed \$2.6 million dollar settlement to City (\$1.3 mil) and TCEQ (\$1.25 mil)
- Several affected businesses have filed suit for \$1 million a piece in damages/fees



OTHER EXAMPLES

- Commerce City, Colorado 2012 – unprotected direct connection to sewer for a water softener, \$927,000 in damages awarded
- City of Lockport, New York 2015 - \$9,718 in damages received from private contractor for illegal use of hydrant resulting in hydroseed contamination
- St. Louis, Missouri 2015 – Legionnaires disease outbreak, killing 12 elderly residents, attributed to 129 year old water facility, seeking \$4.8 million in funding for replacement
- Fort Worth, Texas 2016 – Depressurization event led to system wide contamination event, closing many businesses, costs still undetermined
- West Linn, Oregon 2008 – Bacteria discovered in Stafford Primary School Building, and the certified lab used was suspended for inaccurate test results and ineffective quality assurance measures, affecting more than just the district, damages undetermined



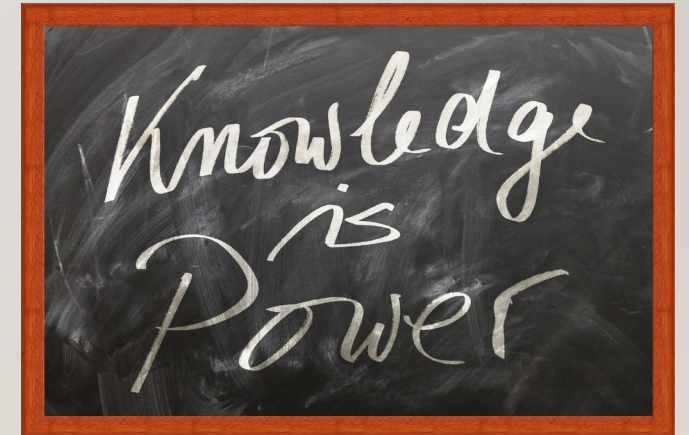
HOW WOULD YOU CALCULATE YOUR COSTS?

- Factors that should be included:
 - Labor and equipment to investigate, sampling, flushing, remediation
 - Cost of multiple samples
 - Any costs related to public notification
 - Provisions to customers such as bottled water , etc.
 - System modifications
 - Regulatory and legal fines, fees and judgements
 - Efforts to regain public confidence
 - A regional system experienced an incident and accumulated over \$350k in costs



IN CONCLUSION

- Please have a proactive, approved cross connection control program and use it!
- Do everything you can to protect your customers and limit your liability
- If in doubt, check with your regulatory agency or neighboring public water systems
- Make sure you have proper, complete and detailed records
- Complete your applicable Annual Summary Reports
- **DO YOUR PART TO PROTECT THE PUBLIC HEALTH!**



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- THANK YOU!
- QUESTIONS
- tpickel@cdaid.org

