Emergency Preparedness Requirements for Wildfire Hazards at Public Water Systems

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Presentation Outline

- Risks of wildfire in Arizona
- Regulations that mandate emergency preparedness to wildfire
- Impacts of wildfire on water supply
Wildfires in Arizona

Arizona has already seen many wildfires in 2021

Bear Fire: 24,067 acres. 50% contained as of July 26
Middle Fire: 2,792 acres. 90% contained as of July 26
Bottom Fire: 6,004 acres. 95% contained as of July 26
Alamo Fire: 4,953 acres. 90% contained as of June 26.
Rock Butte Fires: 802 acres. 80% contained as of June 28.
Walnut Fire: 10,667 acres. Contained as of June 29.
Slate Fire: 11,435 acres. Contained as of July 5.
Painted Fire: 936 acres. Contained as of July 5.
Rafael Fire: 78,065 acres. 95% contained as of July 7
West Chev Fire: 1,170 acres. Contained as of July 14.
Horton Fire: 12,263 acres. Contained as of July 15.
Snake Fire: 130 acres. Contained as of July 15.
Pinnacle Fire: 34,417 acres. Contained as of July 16.
Lime Fire: 2,063 acres. Contained as of July 16.
Backbone Fire: 40,855 acres. Contained as of July 19.
Wildfires in Arizona

Caused by:
- Drought
- Hot temperatures
- Thunderstorms producing dry lightning
Wildfires Preparedness: Regulatory Requirements

3. Safe Drinking Water Act (SDWA)
4. AWIA amendment to Section 1433 of SDWA
5. National Incident Management System (NIMS)
Emergency Operation Plan (AAC 18-4-204)
At a minimum, the emergency operations plan (EOP) shall detail the steps that the community water system will take to assure continuation of service in the following emergency situations:

1. Loss of a source;
2. Loss of water supply due to major component failure;
3. Damage to power supply equipment or loss of power;
4. Contamination of water in the distribution system from backflow;
5. Collapse of a reservoir, reservoir roof, or pumphouse structure;
6. A break in a transmission or distribution line; and
7. Chemical or microbiological contamination of the water supply.
Wildfires Preparedness: Regulatory Requirements

Emergency Operation Plan (AAC 18-4-204)
The EOP shall address the following:

1. Provision of alternate sources of water during the emergency
2. Notice procedures for regulatory agencies, news media, and users
3. Disinfection and testing of the distribution system once service is restored
4. Identification of critical system components that shall remain in service or be returned to service quickly
5. Critical spare parts inventory
6. Staff training in emergency response procedures
Wildfires Preparedness: Regulatory Requirements

ADEQ Reporting Requirements (AAC 18-4-211)
A public water system shall notify the Department, by telephone or facsimile, as soon as possible but no later than 24 hours after the occurrence of any of the following emergencies:

1. Loss of water supply from a source
2. Loss of water supply due to major component failure
3. Damage to power supply equipment or loss of power
4. Contamination of water in the distribution system from backflow
5. Collapse of a reservoir, reservoir roof, or pumphouse structure
6. Break in a transmission or distribution line that results in a loss of service to customers for more than four hours
7. Chemical or microbiological contamination of the water supply.
Wildfires Preparedness: Regulatory Requirements

Safe Drinking Water Act (SDWA)
It is the principal federal law in the United States intended to ensure safe drinking water for the public.

Environmental Protection Agency (EPA) is required to set standards for drinking water quality and oversee all states, localities, and water suppliers that implement the standards.
Wildfires Preparedness: Regulatory Requirements

AWIA amendment to SDWA
America’s Water Infrastructure Act of 2018 (AWIA) requires:

- Risk & Resilience Assessment of potable water systems
- Update of Emergency Response Plan
- Certification of update to USEPA every five (5) years

i. Assess risk to the system from malevolent acts and natural hazards;
ii. resilience of the pipes and constructed conveyances, physical barriers, source water, water collection and intake, pretreatment, treatment, storage and distribution facilities, electronic, computer, or other automated systems (including the security of such systems) which are utilized by the system;
iii. the monitoring practices of the system;
iv. the financial infrastructure of the system;
v. the use, storage, or handling of various chemicals by the system
vi. the operation and maintenance of the system
Wildfires Preparedness: Regulatory Requirements

National Incident Management System (NIMS)
Developed by FEMA, NIMS guides all levels of government, nongovernmental organizations and the private sector to work together to prevent, protect against, mitigate, respond to and recover from incidents.

Designates utility workers as first-responders.

NIMS Components:
1. Preparedness
2. Communications and Information Management
3. Resource Management
4. Command and and Management
5. Ongoing Management and Maintenance
Wildfires Preparedness: Regulatory Requirements

Importance of Resource Typing!
Wildfires Preparedness: Regulatory Requirements

3. Safe Drinking Water Act (SDWA)
4. AWIA amendment to Section 1433 of SDWA
5. National Incident Management System (NIMS)
Impacts of Wildfire on Water Supply

Imminent Threats

Long-term Risks

Water Supply

Water Quality
Imminent Threats to Water System

- Loss of supply
- Loss of infrastructure (pumps, tanks, etc.)
- Loss of electrical power
- Loss of communication/SCADA/telemetry
- Disruption of supply chain
- Staff health and safety
Long-Term Impact on Water Supply

- Changes in the magnitude and timing of snowmelt runoff, which influence filling of water-supply reservoirs
- Increased sediment loading of water-supply reservoirs, shortened reservoir lifetime, and increased maintenance costs
- Could affect groundwater recharge by increasing runoff and reducing infiltration
- Compounds the water shortage caused by drought
Long-Term Impact on Water Quality

- Increased loading of streams with nutrients, dissolved organic carbon, major ions, and metals
- Post-fire erosion and transport of sediment and debris
- Increased nutrients leading to algal bloom
- Adverse impact on aquatic life

**Raw Water quality parameters of concern:**
- Turbidity
- pH
- Alkalinity
- Total dissolved solids
- Color
- Total organic carbon
- Algae
- Toxic chemicals
- Phosphate/nitrate/nitrite

**Finished water quality parameters of concern:**
- Turbidity
- Taste & odor
- Disinfection by-products
- Low-chlorine residual
- Bio-growth
- Low chlorine residual
- Toxic chemicals
Emergency Preparedness/Response:

Examples of Proactive Strategies
• Participate in fire drills with local Fire Dept
• Maintain an adequate defensible space between perimeter fences and brush/trees
• Maintain updated Emergency Response Plan
• Ensure redundancy of equipment and assets
• Save electronic documents/information to remote location; maintain backup hardcopies of critical information
Emergency Preparedness/Response:

Examples of Reactive Strategies

• Contact Fire Department and let them know about key sites at risk along with availability of water
• Fill all storage tanks to capacity
• Terminate electrical power to water facilities that may be in the path of the fire
• Move critical equipment and personnel away from fire safely
• Modify existing staff’s work schedules to allow for appropriate coverage
• Place key personnel and contractors on standby
Summary

- Occurrence of wildfire will likely increase in the future
- Regulations require water systems to mitigate the risks from wildfire and to have emergency response plans in place
- Wildfire can damage/destroy water assets. It can disrupt the water supply, power supply, communication and the supply chain. In addition, it can pose health and safety hazards to the employees
- Wildfire can have long-term impact on both water supply and water quality
- Proactive risk mitigation and emergency preparedness measures may minimize disruption to water services
Wildfires Preparedness: References

- USEPA: https://www.epa.gov/waterutilityresponse/develop-or-update-drinking-water-utility-emergency-response-plan
- National Rural Water Association: https://nrwa.org/issues/disaster-response/
Questions?

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