



Wild Fires & Water Systems
Lessons in Tragedy

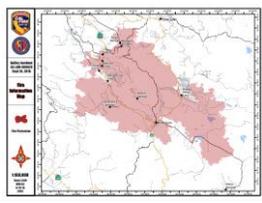
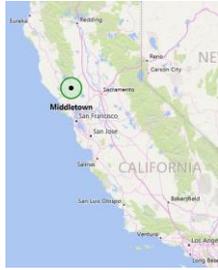


California Fire Case Study
Washington Fires
Working with FEMA
Emergency Response Planning



Callayomi Co. Water District vs Valley Fire

- Population 1,323
- Active Connections 366

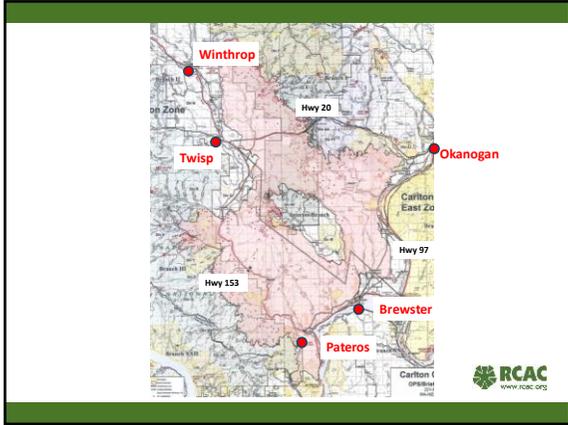







WASHINGTON FIRES

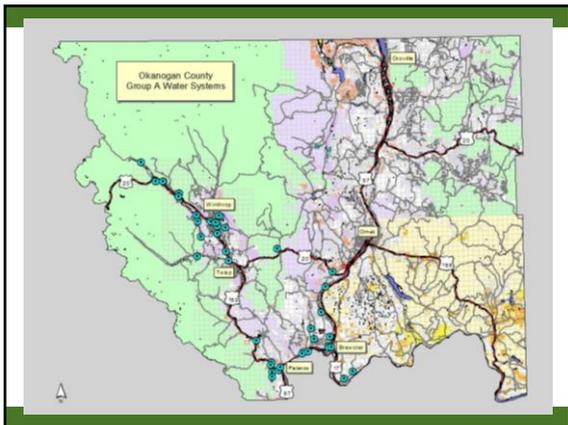




Title 40 CFR 141.202

- Tier 1 Public Notices are required for various occurrences.
- Table 1, item (7) states:

Occurrence of a...waterborne emergency (such as a failure or significant interruption in key water treatment processes, a natural disaster that disrupts the water supply or distribution system...)



Power & Communication Outages



Road Closures

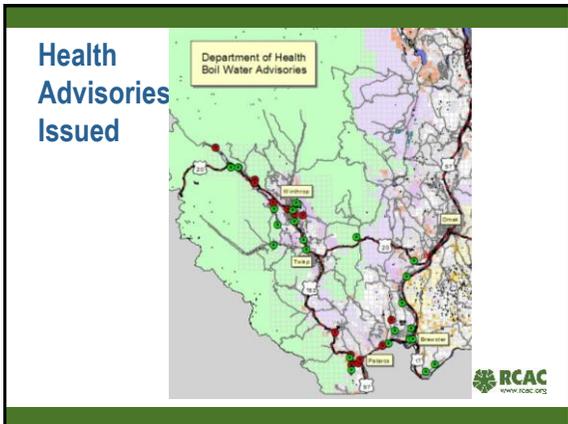


Obvious Fire Damage to Infrastructure











Special Thanks &
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 **Incident Action Checklist – Wildfire**

The actions in this checklist are divided up into three "tip & run" sections and are examples of activities that water and wastewater utilities can take to prepare for, respond to and recover from wildfires. For on-the-go convenience, you can also include the "911 Contacts" section with critical information that your utility may need during an incident.

Wildfire Impacts on Water and Wastewater Utilities

A wildfire is any instance of uncontrolled burning in grasslands, brush or woodlands. Wildfires can be caused by lightning, human carelessness or arson. Wildfires often begin unnoted, spread quickly and present a direct risk to property and infrastructure, in addition to potential degradation of the water supply. In some cases, source water quality issues can persist for 5-10 years following a wildfire. Areas that have experienced a wildfire are also at an increased risk of flash flooding and mudslides because the ground where vegetation has burned away cannot effectively absorb rainwater. Often, post fire impacts (including those impacts resulting from flash floods) are more detrimental to drinking water and wastewater systems than the fire itself. Specific impacts to drinking water and wastewater utilities may include, but are not limited to:

- Infrastructure damage to the facility or distribution system due to proximity to the fire or firefighting activities
- Loss of water quantity due to increased withdrawals for firefighting activities
- Source water quality changes due to increased nutrients and other pollutants, which can result in higher turbidity, algal blooms, potential odor and taste issues, and subsequent higher treatment costs
- Increased sediment in reservoirs as a result of runoff and flash floods from burned areas, which can affect water quality and reduce reservoir capacity and effective service lifespan
- Increased sediment and debris in stormwater runoff following flash floods, impacting water quality and treatment processes
- Decreased water supply downstream, as loss of forest canopy can lead to increased evaporation and reduction in the amount of water stored in snowpack

The following sections outline actions water and wastewater utilities can take to prepare for, respond to and recover from wildfires.

Examples of Water Sector Impacts and Response to a Wildfire

Denver Water responds to impacts from wildfire and flooding

On May 16, 2002, the 11,000-acre Buffalo Creek fire occurred on a tributary to the upper South Platte River, the main source of Denver, Colorado's water supply. While Buffalo Creek itself contributes a very small share of Denver's water supply, it is located directly upstream of the Strathmore Storage Reservoir, the intake point for the Foxfield Treatment Plant – a facility that handles approximately 60% of Denver's water.

Two months after the Buffalo Creek fire, heavy thunderstorms occurred directly over the burned area, causing a flash flood that washed more sediment into the reservoir than had accumulated over the previous 13 years, resulting in an estimated loss of 30 years of the reservoir's planned 50-year life.

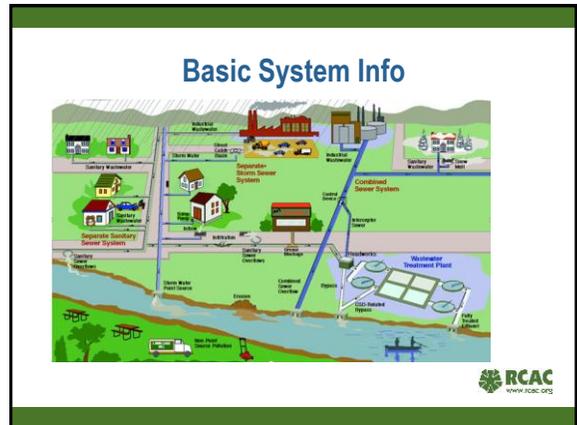
The emergency cleanup costs totaled nearly \$1 million. Denver Water's costs due to increased turbidity totaled



EPA Checklist
• 8 pages
• 3 sections

FEMA tips





Chain of Command

Manager
Executives
Departments
The rest

Events that cause Emergencies

Severity of Emergencies

Level I

Level II

Level III

Emergency Notification

Water Quality Sampling

Effective Communication

DO:	<ul style="list-style-type: none"> ◆ Be prepared ◆ Designate a spokesperson ◆ Provide Complete, accurate, and timely information. ◆ Tell the truth. ◆ Express empathy. ◆ Acknowledge uncertainty and offer to get back with more information later. ◆ Document your communications.
DO NOT:	<ul style="list-style-type: none"> ◆ Speculate on the cause o outcome of an incident. ◆ Blame or debate. ◆ Minimize or brush off concerns of customers. ◆ Treat inquiries from interested parties as an annoying distraction from the real business of emergency response.

Vulnerability Assessment



Response Actions for Specific Events

Example: Power outage

Assessment	The XYZ water system is vulnerable to power outages, experiencing an average of three outages per year that last several hours. The system does not have a back-up generator but has a connection so that a generator can be rented and plugged into the system. Most of the time, storage is able to supply the system for several hours until power is restored.
Immediate actions	<ol style="list-style-type: none"> 1. Assess whether the outage is likely to last more than 6 hours. If no, be on alert for changing conditions and monitor storage tanks. If yes, complete the following steps: 2. Call on availability of back-up generator at JJ's Rentals. 3. Obtain generator if available. 4. Connect generator to system and resume operations. 5. Implement water shortage response actions to inform customers to cut back on water usage until power is restored.
Notifications	<ol style="list-style-type: none"> 1. Power Company – Let them know that a public water system is experiencing an outage and the generator will be turned on until power is restored. 2. JJ's Rentals – Obtain generator 3. Customers – cut back on water usage until power is restored.
Follow-up actions	<ol style="list-style-type: none"> 1. Turn off and disconnect back-up generator 2. Return system to general power supply 3. Inspect reservoirs and pumping facilities to ensure proper operation. 4. Return generator to JJ's.



Alternative Water Sources



Returning to Normal Operation



Training & Rehearsals



Emergency Response Plan Approval



Thank You!

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