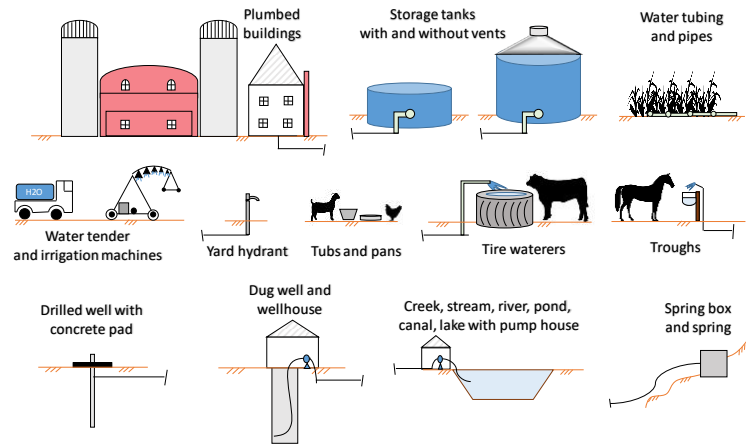


*After a Wildfire:*

## Water Safety Considerations for Agriculture Water Systems



### Damage and Chemical Water Contamination Caused by Wildfires

Wildfires can directly damage agricultural water systems causing a health and safety risk. Water tested after wildfires has revealed chemically contaminated drinking water. A thorough inspection of impacted water systems is needed before system use.

Signs of potential contamination include a power outage, loss of water pressure, discolored water, heat damage to components inside and outside buildings, broken and leaking pipes, valves, tanks, irrigation systems, etc. The main sources of chemicals in piped water after fires are plastic heat damage, debris entry, and smoke entry into water systems. Chemicals can enter water systems through water tank vents, physically damaged assets like pipes and tanks. Chemicals can leach from heat damaged plastics into clean water and make it unsafe. Chemicals can also deposit into open containers (troughs, waterers, etc.).

***Advice should be sought from local department of agriculture and extension agencies.***

### A Water System Damage Inspection Should be Conducted and Include:

#### *Things to Look For...*

- The wellhead, well house, spring box, intake.
- The well/spring casing, caps, and seals.
- Wiring and electrical components.
- Above ground piping or structures
- Water treatment system.
- Pressure tanks, storage tanks, vents, overflow pipes, troughs, tubs, waterers.
- Standing water in tanks.
- Melted plastic components.

#### *Questions to Consider*

- Is there evidence of pressure loss? One way to check this is to turn on an exterior faucet to see if there is water flowing or you hear air escaping from the system.
- Is there ash or wildfire debris in or near the water system?
- Does it seem like any ash, soot, or debris has entered any part of the water system?
- Do you notice other damage related to the fire?

Complex repairs should be completed by licensed and bonded water system contractors. Contractors should avoid backflow and cross-connections. Contractors should follow appropriate protocols for repressurizing the system. When needed, water system assets should be chlorine disinfected (i.e., minimum of 300 mg/L for 3 hours) before return to service. Care is needed to safely handle and dispose of this superchlorinated water. This water can cause chemical burns and damage plants if not handled properly.

### What Should the Water Be Tested For and Where?

Chemical water testing is NOT necessary at every water system location. Testing is recommended at representative locations where contamination is possible and a concern. Water should be screened for chemicals listed on [www.PlumbingSafety.org](http://www.PlumbingSafety.org).

- At least 53 volatile organic compounds or VOCs should be screened with U.S. EPA Method 524.2. Samples MUST be collected using special dark-colored glass vials filled all the way without any air. If an air bubble is visible when tilting the bottle, the sample is not adequate, as some of the compounds will evaporate.
- Other chemicals that could be screened for include semi-volatile organic compounds called SVOCs with SW-846 U.S. EPA Method 8260 and dark-colored glass bottles. Heavy metal water tests may be helpful with U.S. EPA Method 200.7 and require special bottles. The laboratory will provide you the bottles and directions.
- *Plastic containers cannot be used for VOC or SVOC samples.* Plastic containers will change the water sample. The best VOC and SVOC samples are those where the water system has stagnated for 72 hours based on public drinking water system practice, not samples from flowing water. Stagnation allows chemicals inside the water system to leach into clean water. If the sample stagnation time is not long enough, the laboratory will be unable to detect contamination if it is present.

## Using Water

An alternate water source should be used until damaged systems are inspected, and, if damaged, flushed, disinfected, repaired or replaced, and retested. The use of contaminated water may spread contamination.

## Cleaning, Flushing, and Aeration can help Remove Potential Chemicals

Flushing and aerating water can help remove some chemicals from impacted water and water systems. Small items can be cleaned or discarded. Testing after the 2023 Maui Wildfires indicated that these actions reduced VOCs in large assets (tanks, ponds, etc.). Smaller assets (drinking bowls, water troughs, etc.) contained higher VOC levels when not flushed or aerated properly. Washing tanks, tubs, troughs, and waterers with dish soap can help remove smoke particulate that may be present. Soap should only be used when the materials will not be damaged. For example, soaps may damage rubber gaskets. Soap may also leave scum. Do not use soap on closed assets that are not open to visual inspection without thorough rinsing to eliminate residues. Do NOT use industrial cleaners for drinking water system components, which can be toxic, can be harmful if consumed, and can damage components.

## What Laboratory Should I Use?

Contact your local department of agriculture for a list of approved water testing laboratories. Laboratories provide results within 3 to 14 days. Faster turnaround times may not always be possible, and have increased cost.

## What Do I Do If I Have No Running Water?

Make sure to bring water from a potable water source, not a system with contamination. Store the safe water in an approved contamination-free tank that will not allow smoke in.

## What Should I Do About Testing My Building Plumbing?

Health departments are responsible for household drinking water (and sewer) issues on private property. A separate document at [www.PlumbingSafety.org](http://www.PlumbingSafety.org) describes drinking water safety in buildings after a wildfire.

## Acknowledgement and Resources

Information was based on firsthand experience by Purdue University researchers while helping the Hawaii Department of Agriculture after the 2023 Maui Wildfires. Additional info can be found at [www.PlumbingSafety.org](http://www.PlumbingSafety.org).

- Wildfire damage and contamination to private drinking water wells, 2023, <https://doi.org/10.1002/aws2.1319>
- Water safety attitudes, risk perception, experiences, and education for households impacted by the 2018 Camp Fire, California, 2021, <https://doi.org/10.1007/s11069-021-04714-6>
- Drinking water contamination from the thermal degradation of plastics: implications for wildfire and structure fire response, 2020, <https://doi.org/10.1039/D0EW00836B>
- Wildfire caused widespread drinking water distribution network contamination, 2020, <https://doi.org/10.1002/aws2.1183>