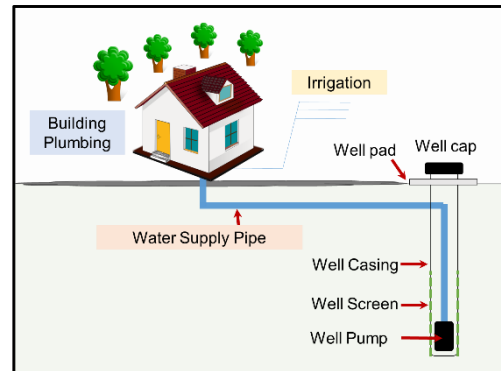


After a Wildfire:

Water Safety Considerations for Private Wells



Damage and Contamination Caused by Wildfires

Wildfires can directly damage private wells and springs causing an immediate health and safety risk to their users. Water testing after wildfires has revealed contaminated drinking water, sometimes exceeding hazardous waste limits. A thorough inspection of the well and water systems is needed before trying to use the water. If the building or property has been burned, make sure the fire debris is cleared before inspecting the water system.

Signs of contamination may include the loss of water pressure, discolored water, heat damage to water systems inside and outside buildings, broken and leaking pipes, valves, tanks, irrigation systems, and yard hydrants. Chemical contamination can occur due to the water system and the heating or burning of the water system materials themselves, including plastics. If the water system lost pressure, microorganisms and chemicals may have entered the system.

Persons impacted by wildfire should seek specific advice from their local health department.

A Water System Damage Inspection Should be Conducted and Include:

- The wellhead or well house.
- The well casing, cap or seal.
- Above ground piping or structures.
- Spring box.
- Pressure tanks.
- Filters or water treatment system.
- Wiring or electrical components What is the condition of the storage tanks, vents, or overflow pipes?
- Is there standing water in the tanks?
- Is there any evidence of melted plastic components?
- Is there any evidence of pressure loss in the system? 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 any ash or wildfire debris near the water system?
- Does it seem like any ash, soot, or debris has entered any part of the water system?
- Do you notice any other damage related to the fire?

Repairs should be completed by a licensed and bonded well contractor or pump installer. The contractor should follow appropriate protocols for repressurizing the system, avoiding backflow or cross-connections, disinfecting the service lines, and confirming the quality of water by certified testing before putting the system back online.

Using Water

Use a different water source, such as bottled water, until water testing proves the water is safe for all uses. The installation of external water tanks with periodic deliveries is sometimes preferred, but this requires confirming that the indoor plumbing is not contaminated.

If the source of the contamination can be determined, isolate it. If the water system needs to be flushed, be careful to contain the runoff if possible or direct it to a channel to avoid erosion and minimize spreading the contamination. Before you use the water, it is important to verify that there is no microbiological or chemical contamination.

If the building uses a septic tank, care must be taken not to flood the septic system with flushing water. This can irreparably damage the septic system requiring repair or replacement.

What Should the Water Be Tested For and Where?

- Volatile organic compounds or VOCs such as US EPA Method 524.2. The methods used should include chemicals found in past wildfires: Acetone, benzene, chlorobenzene, ethyl benzene, ethyl-*tert*-butyl ether (ETBE), methylene chloride, methyl ethyl ketone (MEK), methyl-*tert*-butyl ether (MTBE), naphthalene, styrene, tetrahydrofuran (THF), *tert*-butyl alcohol (TBA), toluene, vinyl chloride monomer (VCM), and total xylenes. Laboratories should also examine the water for other chemicals listed in the method.
- Semi-volatile organic compounds or SVOCs such as SW-845 US EPA Method 8270E.
- Turbidity, pH, conductivity, color, nitrate, Coliform bacteria.
- Testing for heavy metals like lead, copper, zinc, iron, and others may also be considered.
- At a minimum, water samples should be representative of 1) the well, and 2) water supply line that conveys water to the building.

Before sampling, the water **MUST** stagnate or be still. This allows chemicals to leach from damaged well materials into the water. If the stagnation time is not long enough, the laboratory will be unable to detect contamination. Proper sampling procedures and equipment are necessary. 72 hours was the Tubbs Fire and Camp Fire stagnation period.

Using Your Water While You Wait for Test Results

Avoid drawing the potentially contaminated water into the building until you are certain it is not contaminated. If contamination is present, use of the water may contaminate plumbing. Questions about whether certain in-building water treatment devices could be used to make the water safe are addressed a separate Center for Plumbing Safety document.

What Laboratory Should I Use?

Contact the health department for a list of approved water testing laboratories. Laboratories typically provide results within 3 to 14 days, and faster turnaround times increases cost.

What Do I Do If I Have No Water?

If you have a usable drinking water storage tank, water can be hauled by a licensed vendor. This water however **MUST** be tested to determine if it is safe. Contact the health department for the list of approved vendors.

What Should I Do About Testing My Building Plumbing?

Persons impacted by wildfire should seek specific advice from their local health department. A separate guidance document can also be considered from the Center for Plumbing Safety regarding water safety in buildings.

Acknowledgement and Resources

Persons impacted by wildfire should seek specific advice from their local health department as they have direct experience about the situation and health threats in their community. This document is a combination of materials prepared for communities affected by wildfires in California and Oregon such as the Santa Cruz Health Department, Butte County Health Department and the Oregon Health Agency. This work was partially supported by US EPA grant R836890 and Purdue University. As more information about wildfire caused contamination becomes available this guidance may be revised. Additional resources include:

- Wildfire caused widespread drinking water distribution network contamination, 2020, <https://doi.org/10.1002/aws2.1183>
- Drinking water contamination from the thermal degradation of plastics: implications for wildfire and structure fire response, 2020, <https://doi.org/10.1039/D0EW00836B>
- Water safety attitudes, risk perception, experiences, and education for households impacted by the 2018 Camp Fire, California, 2021, <https://doi.org/10.1007/s11069-021-04714-9>