

# STATE OF COLORADO

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Dedicated to protecting and improving the health and environment of the people of Colorado

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Colorado Department  
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## Wildfire Recovery Guidance for Water Quality Issues

### Risks from Flooding

Burned areas are subject to flooding from precipitation, which may result in mudslides and excess debris in flowing waters, lakes and reservoirs. Stream flows will increase after the fire due to a combination of factors. Moderate- to high-severity burn areas in high precipitation zones will produce the largest increases in runoff. People in burn areas should take care to avoid traveling or camping in areas where there may be a risk of flash flooding. An increase in flood flows may temporarily prevent access to private property and recreational opportunities. Additional information can be found at [http://www.fs.fed.us/rm/pubs/rmrs\\_gtr114/rmrs\\_gtr114\\_293\\_314.pdf](http://www.fs.fed.us/rm/pubs/rmrs_gtr114/rmrs_gtr114_293_314.pdf).

### Drinking Water

Drinking water provided by public drinking water systems that are affected by the fire may have a smoky taste or odor. This drinking water is filtered and disinfected and, despite the smoky taste or odor, is safe to drink. If you have specific concerns, please contact your particular water system.

Private drinking water wells may be affected in some wildfire areas. Wells at undamaged homes should be safe, unless they were affected by a fuel or other chemical spill. If your home was damaged, or if you have any other concerns about the safety of your well water, test the water before consuming it.

### Recreational

Stream flows will increase after the fire due to a combination of factors. Moderate- to high-severity burn areas in high precipitation zones will produce the largest increases in runoff. The water quality from this runoff will be affected as evidenced by discoloration from the ash and eroded soils, and the volume of various types of debris. The ash composition will be primarily organic (vegetative material), but also could contain asbestos, mercury, lead and other potentially toxic chemicals from homes and businesses. The suspended soil material contains naturally occurring components that will settle out in back eddies and downstream reservoirs. The debris will be composed of forest materials that can lodge in stream channels and cause dangerous conditions. Avoid stream channels during precipitation.

Long-term fire retardant components have low, short-term toxicity and very low risk of long-term, delayed toxicity to humans based on the published literature and chemical data sheets available. There is potential for other chemicals to enter waterways during precipitation after a wildfire. A common-sense approach to recreating in or on our streams and rivers is to avoid contact if there is doubt regarding what is in the water. Additional information can be found at <http://www.fs.fed.us/rm/fire/wfcs/documents/cleanup.pdf>

### Fish Consumption

When a forest fire burns on the landscape, increased mercury levels are deposited over time into local lakes and streams, representing a short-term source of atmospheric mercury. Several in-lake mechanisms influence whether an increase in methylmercury will be detected in fish tissue after a fire. Fire-related impacts on nutrient

loading, dissolved organic carbon concentrations, lake productivity, food-web dynamics and water temperatures will influence the rate at which fish accumulate mercury in their tissues. Depending on these water body characteristics, increased concentrations of fish tissue mercury may be noticeable within three years of a fire. The Colorado Department of Public Health and Environment and the Colorado Parks and Wildlife will coordinate to monitor fish tissue mercury concentrations in lakes and reservoirs in the burned areas over the next several years. Additional information regarding fish consumption advisories can be found at <http://www.cdphe.state.co.us/wq/FishCon/index.html>.

The various components of fire retardants should not enter the food chain at levels that can result in either short- or long-term effects. Additionally, there is no expectation that the highly water-soluble components will accumulate in organisms in the environment.

### **Aquatic Life**

Following a wildfire, there may be serious impacts on aquatic life in affected streams as the result of deterioration in water quality. These changes may include increases in temperature, turbidity, suspended sediment, dissolved metals, salinity, nutrient concentrations, algae and alkalinity. Wildfires remove vegetation, leaving burn areas susceptible to erosion. Runoff during rain following a wildfire may wash exposed soil, which may contain elevated concentrations of metals, nutrients or minerals, into streams. Fire retardants also may be transported in runoff. Where the canopy cover of a stream has been reduced, the increase in temperature, as well as nutrients in runoff, may greatly increase algae growth in surface waters. Wood ash contains carbonate and bicarbonate, which increase the alkalinity of surface water. The U.S. Forest Service has conducted research on the impacts to aquatic life in the following articles:

<http://www.fs.fed.us/rm/boise/research/fisheries/fire/FAE%20Papers/MinshallFEMFinal.pdf>

<http://www.treeseearch.fs.fed.us/pubs/33222>.

### **Agriculture**

The Montana State University Extension Agriculture and Natural Resources Program published the online booklet "Information for Landowners Coping with the Aftermath of Wildfire." Chapter 3 of this publication focuses on the potential water quality concerns for livestock watering:

<http://msuextension.org/publications/OutdoorsEnvironmentandWildlife/4455.pdf>.

If you need additional information, please contact the Water Quality Control Division at 303-692-3500.