



Designation: E3312 – 21

Standard Guide for Mitigation of Wildfire Impact to Source Water Protection Areas and Risk to Water Utilities¹

This standard is issued under the fixed designation E3312; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 *Overview*—Wildfires pose a significant risk to water utilities as they can cause contaminants of concern to be released into surface water and groundwater supplies (1).² This can endanger human health if systems were not designed to manage these contaminant loads.

1.2 *Purpose*—Mitigation measures of wildfire effects on sediment loads, trace minerals, and contaminants of concern on runoff in a Source Water Protection Area (2) is an expanding area of study that does not have a full set of regulations at the federal or state level. This guide provides public-sector and private-sector land managers and water utility operators details on how to assess the potential impacts of wildfires on watersheds and measures that can be employed to minimize or abate those impacts prior to a wildfire occurring or after it occurs.

1.2.1 This guide supplements existing watershed and Source Water Protection Area guidance.

1.2.2 This guide will recommend fuel management prior to a wildfire, suppression strategies during a wildfire, and mitigation opportunities for both forests and water treatment systems after the wildfire. It will also support collaboration between involved stakeholders (see Fig. 1 below).

1.2.3 The purpose of this guide is to provide a series of options that water utilities, landowners, and land managers can implement to limit the chance of a wildfire, specifically in a drinking water watershed, and mitigation opportunities to protect drinking water after a wildfire occurs. This guide encourages consistent management of forests to limit wildfire risks to water resources. The guide presents practices and recommendations based on the best available science to provide institutional and engineering actions to reduce the likelihood of a wildfire and the potentially disastrous consequences. It presents available technologies, institutional

controls, and engineering controls that can be implemented by utilities, landowners, and land managers seeking to mitigate the risk of wildfire in a source watershed. With climate change wildfires are an increasing hazard that can affect drinking water supplies. Often water utilities are not prepared for this risk and this guide seeks to support advanced planning.

1.2.4 This guide ties into the ASTM E50 standards series related to environmental risk assessment and management.

1.2.5 The guide does not provide risk assessment, *per se*, but may help set priorities for creating a wildfire resilient watershed.

1.3 *Objectives*—The objectives of this guide are to identify the risks of a source watershed of forest to wildfire and identify actions that can be taken to manage those risks. The guide encourages users to set priorities based upon their associated risk. The guide encourages the user to develop long-term solutions for future wildfire risks.

1.4 *Limitations of this Guide*—Given the different types of organizations that may wish to use this guide, as well as variations in state and local regulations, it is not possible to address all the relevant circumstances that might apply to a particular area. This guide uses generalized language and examples for the user. If it is not clear to the user how to apply standards to their specific circumstances, users should seek assistance from qualified professionals. Risks may vary depending on the entity evaluating the risk. This guide does not take a position on the causes or science of extreme weather, natural disasters, or changing environmental conditions.

1.5 The guide uses references and information from many cited sources on the control, management, and reduction of pre- and post-fire impacts.

1.6 Several national and international agencies served as sources of information on existing and anticipated levels and management of wildfire risks to drinking water supplies including: the Water Services Association of Australia; the U.S. Department of Agriculture; the U.S. Environmental Protection Agency.

1.7 This guide recommends reference to current regulatory information about risks gathered from various state agencies,

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² The boldface numbers in parentheses refer to a list of references at the end of this standard.

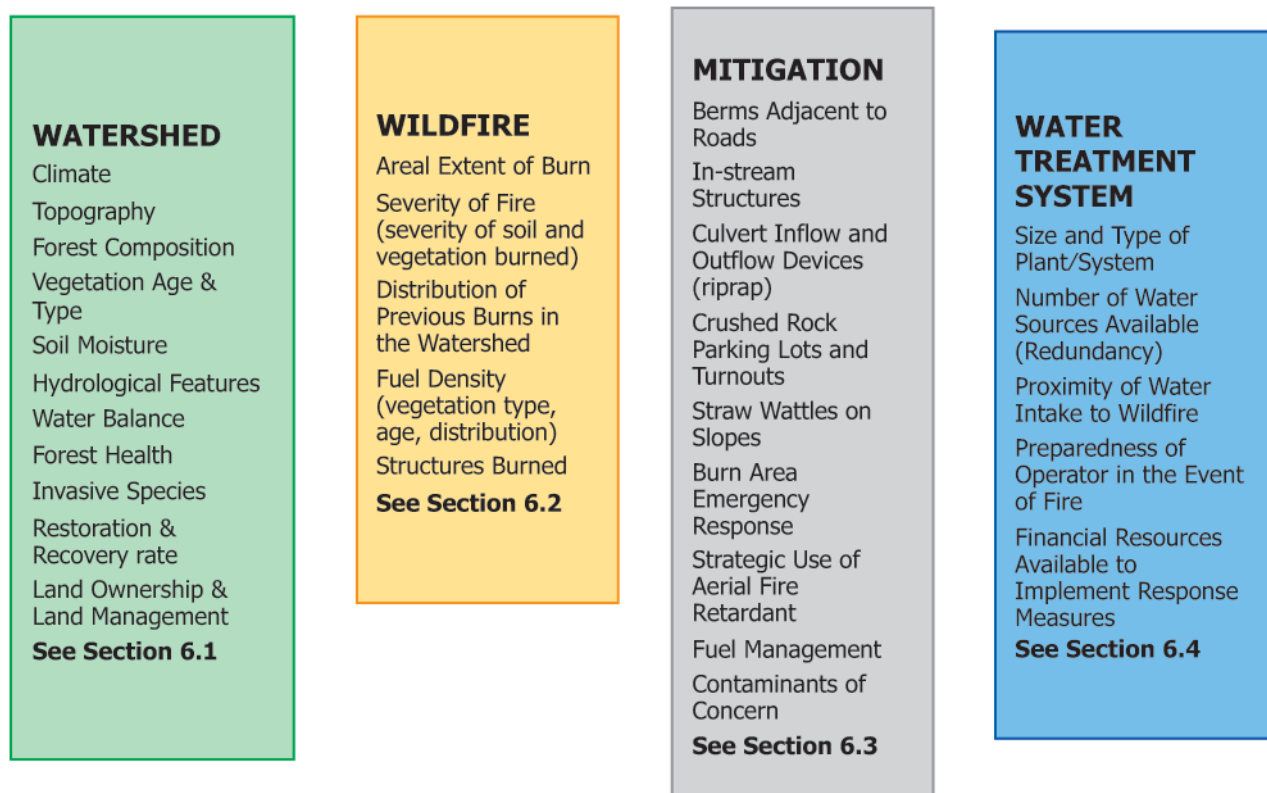


FIG. 1 Place-based characteristics for consideration when assessing threats to water supplies and treatment due to a wildfire (adapted from (3)).

such as departments of environmental protection and water resources boards.

1.8 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.* Adaptation and resiliency measures, however, may be consistent with, and complementary to, other safety measures.

1.9 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 ASTM Standards:³

E3032 Guide for Climate Resiliency Planning and Strategy

E3136 Guide for Climate Resiliency in Water Resources

E3241 Guide for Coordination and Cooperation between Facilities, Local Emergency Planning Committees, and Emergency Responders

³ For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

3. Terminology

3.1 Definitions:

3.1.1 *adaptive capacity*, *n*—the ability of a system, either natural or engineered, to adjust to extreme weather, including climate variability and to moderate potential damages, take advantage of opportunities, or to cope with the consequences.

3.1.2 *climate*, *n*—the average and range of weather conditions in an area. More rigorously, the statistical description in terms of the mean and variability of relevant weather parameters over a period of time long enough to ensure representative values for a month or season.

3.1.2.1 *Discussion*—These parameters are most often surface variables such as temperature, humidity, air pressure, precipitation, and wind.

3.1.3 *contaminants of concern*, *n*—any physical, chemical, biological, or radiological substance found in air, water, soil, or biological matter that has a harmful effect on plants or animals; harmful or hazardous matter introduced into the environment.

3.1.4 *extreme weather events*, *n*—catastrophic storms, high winds, tornadoes, hurricanes, floods, acute water shortages, wildfires, blizzards, heat waves, extreme drought, or any other related instances causing significant injury, loss of life, or property damage.

3.1.4.1 *Discussion*—These phenomena are at the extremes of the historical distribution, including especially severe or unseasonal conditions.