



Technical Guide for Wildfire Restoration

Version 1: November, 2025

Contents

Foreword 2

Wildfire Chemistry and Restoration 3

BURN ZONE 4

NEAR FIELD 6

FAR FIELD 8

Foreword

This white paper presents the current and common methodology of prudent wildfire restoration practices on behalf of the Institute of Inspection, Cleaning, and Restoration Certification (IICRC), the Restoration Industry Association (RIA), and the Cleaning Industry Research Institute (CIRI), whom represent thousands of restoration companies and professionals who have returned families to their homes safely and effectively for decades using proven, science-based methodologies in accordance with peer reviewed industry standards.

It has come to the attention of our organizations that a growing unfounded sentiment is emerging, suggesting that homes affected by wildfire smoke and its byproducts are categorically uncleanable and unrestorable. According to this viewpoint, wildfire damaged homes should be stripped down to the studs and rebuilt. This unsupported belief is not grounded in science, established work standards, or represented by the common, reasonably prudent and proven restoration practices utilized in the restoration community.

The idea that the disposal of porous materials and soft items, as opposed to the prioritization of cleaning a structure post-wildfire, appears to lack support from any authoritative industry guideline document. The California Air Resources Board, the United States Environmental Protection Agency, the South Coast Air Quality Management District, the California Department of Public Health, nor any other public health agency make recommendations that occupants of wildfire smoke infiltrated residences should dispose of all of their furnishings and personal items nor demolish and rebuild their homes.

Wildfire smoke, together with its volatile and semi-volatile compounds and metals, adsorbs or condenses on the surfaces of particles that infiltrate structures and settle on the surfaces of interior materials. This is a superficial occurrence that can generally be cleansed. Specialized cleaning methodologies have been successfully used to remove infiltrated and deposited wildfire smoke residues and other potentially hazardous contaminants to typical background levels for decades by the thousands of professional cleaners and restorers our organizations represent.

While disposal may be considered where cleaning costs surpass the item's value or where heavily impacted porous materials such as apparel, bedding, infant items, and toys exhibit hand to mouth contact risks, the presumption that all materials and structures are unrestorable is inconsistent with science, successful restoration projects and accredited industry standards.

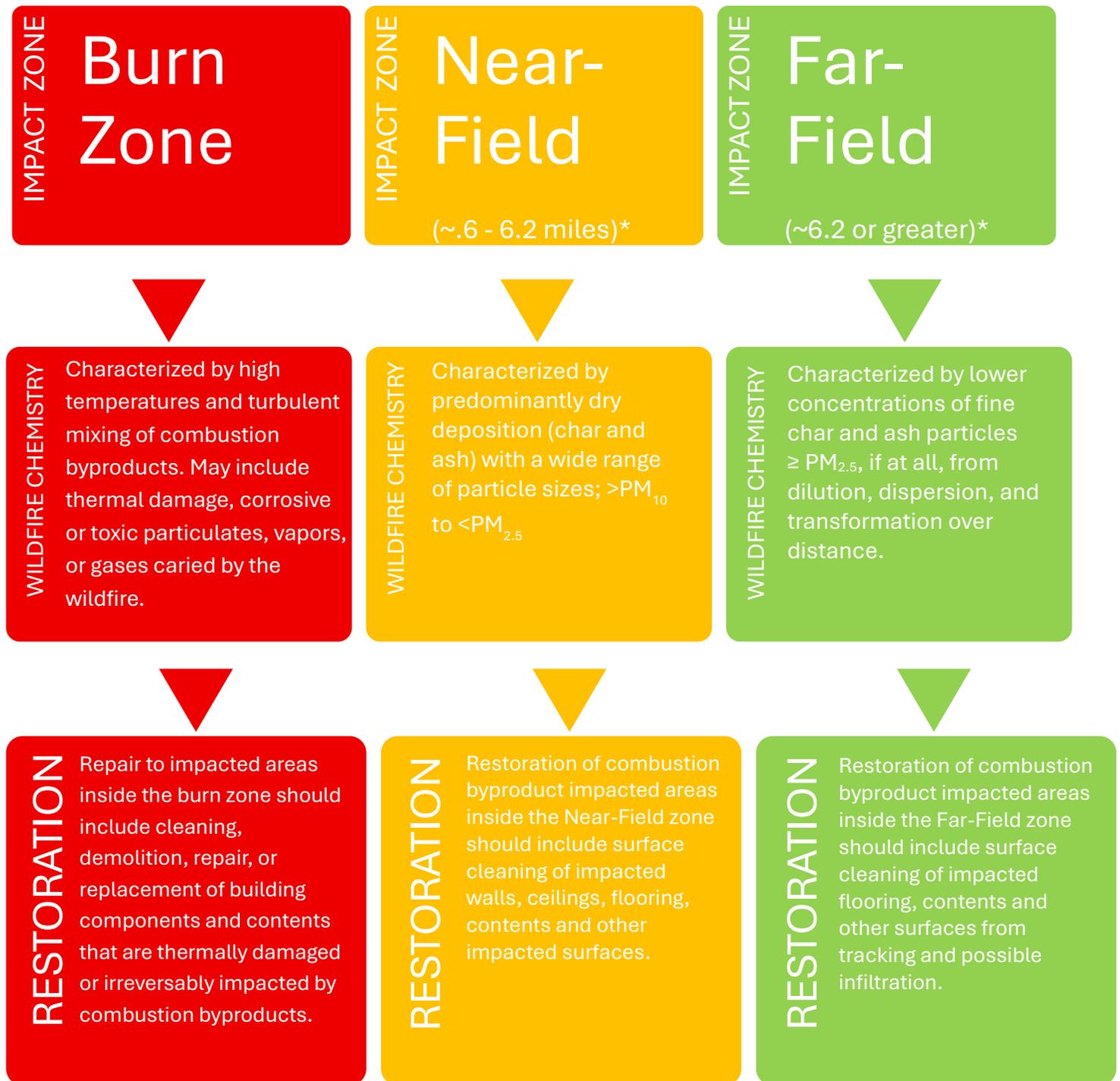
Professional restoration provides significant consumer and public benefits:

- It preserves property and reduces unnecessary demolition.
- It minimizes loss and replacement of contents and personal items.
- It mitigates environmental waste by restoring salvageable materials.
- It provides a science-based pathway to safe reoccupation.

For these reasons, we urge any and all wildfire restoration recommendations be science-based, consensus driven methods that recognize the professional restoration of fire and smoke damaged homes is not only possible but is an established and proven practice. Presented in the below are practical and industry proven methods for effective restoration practices for the wildfire claims. An additional, expanded whitepaper will be produced no later than January 1st, 2026.

Wildfire Chemistry and Restoration

Conceptual Model Parameters for Burn, Near-Field and Far-Field Impact Zones



* Distances are approximate to reflect the plume aging and cooling as particulate travels from the source to the area of impact (see 2018, 2025 AIHA Technical Guide for Wildfire Impact Assessments for the OEHS Professional [AIHA Technical Wildfire Guide], Figure 1.1).

BURN ZONE

Wildfire and Structure Fire Chemistry:

Characterized by high temperatures and turbulent mixing of warm combustion products; can include thermal damage, corrosive or toxic particulates, vapors, or gases carried by the wildfire.

Investigation:

Complete systematic survey of the exterior and interior surfaces including the potential for impact to readily accessible spaces such as attics and crawlspaces (see AIHA Technical Wildfire Guide). Documentation of Soot, Char, and Ash (SCA) pathways and the associated potential for hazardous chemical infiltration should be considered. Structures, assemblies, systems or interstitial spaces that have been partially scorched, have heat impact, or evidence of pressurization may require additional evaluation.

Restoration:

General Structure

- Ensure the structure is safe to enter. A qualified expert (e.g., structural engineer) should be retained when evidence suggests that structural members have been affected by heat or direct flame.
- Restoration to smoke impact inside the burn zone may involve cleaning, demolition, repair, odor management or replacement of building components and contents.
- Separate and isolate work areas with polyethylene sheeting to prevent the spread of wildfire combustion byproducts during restoration.
- High-Efficiency Particulate Air (HEPA) filtration and pressure differentials that do not employ outdoor air should be utilized and operational during restoration. When work areas are isolated, negative air machines should be utilized to maintain a negative pressure differential within work areas compared to adjacent areas.
- High alkalinity in fire byproducts in or near the burn zone should be considered in the detergent selection.
- Based on the impact assessment, determine the level of Personal Protection Equipment (PPE) required. This may include respirators with appropriate filter cartridges, gloves, hard hats, puncture-resistant footwear protection, eye protection, and coveralls. Occupational and Environmental Health and Safety (OEHS) Professionals and restorers should consult the National Institute for Occupational Safety and Health (NIOSH) guidance on selecting air-purifier respirators (NIOSH, 2018).

Interior , Contents, and Garage

- Structures and contents that are not directly affected by fire, do not show heat impact, and display minimal or no visible signs of wildfire byproduct contamination or odors can generally be restored using a dry-cleaning soot sponge wiping technique, vacuuming with a HEPA filter, damp wiping or a combination of these processes.

Attic

- Restore attic space surfaces, such as HVAC ducting and equipment surfaces, wood framing, plywood flooring, and other affected surfaces, using HEPA vacuuming, damp wiping with mild detergent and water, or a combination of these processes. When impacted, some types of insulation (e.g. rock wool, mineral wool, fiberglass, cellulose, etc.) are difficult to adequately restore and can require replacement. Other types of insulation materials such as open- and closed-cell foams, reflectively coated insulations (e.g., duct board, thermal energy barriers, etc.) may be restored.

Exterior

- Water washing can remove most fire residue from outdoor surfaces impacted by fire byproducts (e.g., hose or pressure washer). CAUTION: use of high-pressure water can cause damage to paint, finishes, wood, stucco, and concrete.
- For stubborn stains, apply a detergent and water mixture, and brush clean the surface. High alkalinity in fire byproducts in or near the burn zone should be considered in the detergent selection.

Mechanical Systems

- Detailed assessment, if required of HVAC system, should be performed by a qualified HVAC assessor. Surface sampling post fire has no relationship to particle infiltration, which is correctly evaluated by aerosol sampling comparisons between the system supply and return.
- Restoration of the HVAC system mechanical components and duct system should be performed by an appropriately qualified HVAC cleaning professional. Refer to the current edition National Air Duct Cleaning Association (NADCA) *Standard for Assessment, Cleaning & Restoration of HVAC Systems*.

NEAR FIELD

(.62 – 6.20 miles from the fire perimeter)

Wildfire and Lower Potential Structure Fire Chemistry:

Characterized by predominant high volume of dry deposition (char, ash) with a wide range of particle sizes; >PM₁₀ to <PM_{2.5}

Investigation:

Systematic survey of the exterior and interior surfaces of structures that have sustained visible downwind exterior and interior smoke plume impact. The investigation should document the scope and extent of infiltration pathways into accessible spaces and contents and the potential for confined space pressurization impact through exterior penetrations. In some cases, the inspection may justify additional testing for the purposes of assessing event related damage and not just impact.

Restoration:

General Structure

- Restoration to smoke impact inside the Near-Field zone may involve surface cleaning of impacted walls, ceilings, flooring, contents and other surfaces.
- Isolate work areas with polyethylene sheeting to prevent the spread of wildfire particles and cross contamination during restoration.
- High-Efficiency Particulate Air (HEPA) filtration and pressure differentials should be utilized and operational during restoration in a manner that does not cause an infiltration of outdoor air.
- High alkalinity in fire byproducts in the Near-Field should be considered in restoration methodology.
- Based on the impact assessment, determine the level of PPE required.

Interior , Contents, and Garage

- Structures and contents can generally be restored using a dry-cleaning soot sponge wiping technique, vacuuming with a High-Efficiency Particulate Air (HEPA) filter, damp wiping or a combination of these processes.

Attic

- If impacted, restore attic space surfaces, such as HVAC ducting exteriors and equipment surfaces, wood framing, plywood flooring, and other affected surfaces, using HEPA vacuuming, damp wiping with mild detergent and water, or a combination of these processes. When impacted, insulation performance (R-Value) is not generally reduced. However, some types of insulation (e.g. rock wool, mineral wool, fiberglass, cellulose, etc.) are difficult to adequately restore and can require replacement. Other types of insulation materials such as open- and closed-cell foams, reflectively coated insulations (e.g., duct board, thermal energy barriers, etc.) may be restored.

Exterior

- Washing can remove most fire residue from outdoor surfaces impacted by fire byproducts (e.g., hose or pressure washer). CAUTION: use of high-pressure water can cause damage to paint, finishes, wood, stucco, and concrete.
- For stubborn stains, apply a detergent and water mixture, and agitate cleaner on the surface. High alkalinity in fire byproducts in the Near-Zone should be considered in the restoration methodology.

Mechanical Systems

- Detailed assessment, if required of HVAC system, should be performed by a qualified HVAC assessor. Surface sampling post fire has no relationship to particle infiltration, which is correctly evaluated by aerosol sampling comparisons between the system supply and return.
- Restoration of the HVAC system mechanical components and duct system should be performed by an appropriately qualified HVAC cleaning professional. Refer to the current edition National Air Duct Cleaning Association (NADCA) *Standard for Assessment, Cleaning & Restoration of HVAC Systems*.

FAR FIELD

(6.20 – 625 miles from the fire perimeter)

Wildfire Chemistry:

Characterized by lower concentrations of fine char and ash particles \geq PM2.5, if at all, from dilution, dispersion, and transformation over a long distance.

Investigation:

Systematic survey of the exterior and interior surfaces of structures that have sustained visible downwind exterior and interior smoke plume impact. The investigation should document the scope and extent of SCA pathway infiltration into accessible spaces and contents and the potential for confined space pressurization impact through exterior penetrations. In limited cases, the inspection may justify additional testing for the purposes of assessing event related damage and not just impact.

Restoration:

General Structure

- Restoration to smoke impact inside the Far-Field zone may involve surface cleaning of impacted flooring, contents and other surfaces.
- Dependent on impact, it may be necessary to separate and isolate work areas with polyethylene sheeting to prevent the spread of wildfire particles during restoration.
- High-Efficiency Particulate Air (HEPA) filtration and pressure differentials should be utilized and operational during restoration in a manner that does not cause an infiltration of outdoor air.
- Based on the impact assessment, determine the level of PPE required.

Interior, Contents, and Garage

- Structures and contents can generally be restored using a dry-cleaning soot sponge wiping technique, vacuuming with a High-Efficiency Particulate Air (HEPA) filter, damp wiping or a combination of these processes.

Attic

- If impacted, restore attic space surfaces, such as HVAC ducting exteriors and equipment surfaces, wood framing, plywood flooring, and other affected surfaces, using HEPA vacuuming, damp wiping with mild detergent and water, or a combination of these processes. When impacted, insulation performance (R-Value) is not generally reduced. However, some types of insulation (e.g. rock wool, mineral wool, fiberglass, cellulose, etc.) are difficult to adequately restore and can require replacement. Other types of insulation materials such as open- and closed-cell foams, reflectively coated insulations (e.g., duct board, thermal energy barriers, etc.) may be restored.

Exterior

- Washing can remove most fire residue from outdoor surfaces impacted by fire byproducts (e.g., hose or pressure washer). CAUTION: use of high-pressure water can cause damage to paint, finishes, wood, stucco, and concrete.
- For stubborn stains, apply a detergent and water mixture, and agitate cleaner on the surface. High alkalinity in fire byproducts in the Near-Zone should be considered in the restoration methodology.

Mechanical Systems

- Detailed assessment, if required of HVAC system, should be performed by a qualified HVAC assessor. Surface sampling post fire has no relationship to particle infiltration, which is correctly evaluated by aerosol sampling comparisons between the system supply and return.
- Restoration of the HVAC system mechanical components and duct system should be performed by an appropriately qualified HVAC cleaning professional. Refer to the current edition National Air Duct Cleaning Association (NADCA) *Standard for Assessment, Cleaning & Restoration of HVAC Systems*.