

A Defensible Framework for Post-Wildfire Smoke Damage Claims

In today's wildland–urban interface (WUI) losses, the question is often more complex than simply “burned versus not burned.” An increasing number of claims involve non-thermal impacts, including smoke infiltration and the deposition of combustion byproducts in structures that remain standing. These losses are inherently more complex because contamination is often invisible, unevenly distributed and vulnerable to misinterpretation.

For insurers, the challenge is both straightforward and high stakes: How do you make an accurate, defensible coverage and scope decision when the science continues to evolve and the evidence is nuanced?

A disciplined forensic approach—grounded in industrial hygiene principles, aligned with consensus guidance and thoroughly documented—is essential to producing conclusions that withstand scrutiny.

Start With Exposure, Not Assumptions

The concepts, principles and procedures outlined in the American Industrial Hygiene Association (AIHA) Technical Guide for Wildfire Impact Assessments represent current best practice and frame the issue correctly: evaluation begins with a forensic inspection, not predetermined conclusions.



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The impact of wildfire smoke and contaminants on structures and health is largely governed by what environmental scientists refer to as “fate and transport”—the processes that determine how contaminants are emitted, dispersed, transformed and ultimately deposited. Following a WUI wildfire, heavy metals and semi-volatile organic compounds (SVOCs) may adsorb or condense onto particulates, making soot, char and ash potential indicators of contamination.

During active fire conditions, smoke plumes rise and travel based on wind patterns, temperature and terrain. Areas closest to the fire generally experience the highest airborne contaminant

concentrations. As smoke travels farther from the source, contaminants dilute, chemically transform and redistribute between gases and particulates.

At the same time, deposition processes—including settling, impaction and surface absorption—determine where and how contaminants accumulate on buildings and indoor surfaces. These outcomes are influenced not only by environmental conditions such as wind, temperature and humidity, but also by topography and building-specific factors including ventilation systems, open or closed windows, appurtenant structures and structural details.

Together, these dynamics establish a predictable pattern: properties closer to a fire are more likely to experience heavier and more complex contamination, while properties farther away typically experience lighter and more variable impacts. This time-and-distance relationship forms the basis for classifying wildfire impact zones — such as burn zone, near field (.06 to 6.2 miles) and far field (6.2 miles and beyond) — and helps guide appropriate response strategies.

Given the broad range of chemicals that may be present after a wildfire, it is not feasible to test for every substance in the environment. Decisions regarding whether testing is necessary, and what to test for, should therefore be based on what is reasonable, feasible, hazard-relevant and plausibly present at concentrations capable of demonstrating impact, structural damage or potential health hazards.

Infiltration and Exposure Pathways

Wildfire residues — including ash, soot and char — may enter structures through:

- Envelope leakage around doors, windows and penetrations
- HVAC systems and pressure differentials
- Occupant activities during or after the event

Once deposited, these materials may contribute to exposure through:

- Inhalation, including resuspension of particulates
- Dermal contact
- Incidental ingestion

Critically, while the health effects of airborne smoke exposure are well established, the long-term implications of settled wildfire residues remain less certain. That uncertainty does not justify overreach; rather, it reinforces the need for structured, evidence-based evaluation.

Susceptibility Drives Decision Thresholds

Not all occupancies carry the same level of risk. Claims involving the following require heightened sensitivity to potential exposure, even at lower contamination levels:

- Schools
- Healthcare facilities
- Assisted living environments
- Infants, elderly occupants, or immunocompromised individuals

For insurers, this creates a practical reality: the same laboratory result may support different conclusions depending on the receptor profile and occupancy type. A defensible evaluation depends on demonstrating that these contextual factors were thoughtfully considered.

Sampling: Where Claims Are Won or Lost

Sampling and laboratory analysis are often the pivotal issue in disputed wildfire claims. Sampling is essential not only for confirming impact, but also for validating remediation effectiveness. When conducted properly, it provides objective and reproducible evidence. When conducted poorly, it creates ambiguity, inconsistency and litigation risk.

A defensible sampling strategy should:

- Follow recognized peer-reviewed consensus guidelines and industry standards, including: American Industrial Hygiene Association (AIHA) Technical Guide for Wildfire Impact Assessments, IICRC/RIA/CIRI Technical Guide for Wildfire Smoke Damage Restoration, ASTM D5755, ASTM E1792, ASTM D4840
- Include multiple sampling locations within each living space, including areas proximal and distal to likely entry points
- Extend to exterior areas, attics, garages and ancillary structures where appropriate

Equally important is interpretation. Wildfire residues must be distinguished from background environmental dust and confounding sources such as urban particulates or prior occupancy activities. The mere presence of particulates is not, by itself, dispositive. Attribution remains the central issue.

Exposure to Smoke Damage: Context Matters

Guidance from the California Department of Public Health (CDPH) underscores an important principle:

- Presence is not equivalent to exposure or causation
- Exposure is not equivalent to health impact

The CDPH further notes:

“Our current understanding of the health burden of chronic exposures to wildfire smoke pollutants is limited due to lack of measurements over time and difficulties in studying attributable health impacts from those exposures.”

While gaps remain in the scientific understanding of long-term indoor impacts from residual wildfire contaminants, several factors may limit exposure attributable to smoke damage per a [CDPH Public Health Presentation](#) to California Department of Insurance Smoke Claims Task Force in 2025:

- Contaminated surfaces are generally easier to clean than deeply contaminated media such as soil
- Wildfire smoke exposure events are typically limited in duration rather than continuous
- Volatile chemicals often dissipate over time
- Proper cleaning and ventilation may significantly reduce long-term exposure potential

The CDPH also identifies several limitations associated with testing for smoke impacts:

- Few appropriate testing standards exist for smoke-related chemicals inside residences
- PAHs and VOCs may be present at trace levels in air or on surfaces
- No consensus exists regarding health-based thresholds in non-occupational settings
- Contaminants of Potential Concern (COPCs) vary significantly based on materials burned, combustion temperature, and other factors
- No standard practice currently exists for indoor wildfire contaminants comparable to established mold protocols
- Detection of a substance does not necessarily indicate meaningful concentration or risk
- Background levels are often unknown, making it difficult to determine whether contaminants predated the fire event

For example, background levels of lead dust are well documented in many environments. A defensible analysis therefore requires:

- Contextualizing results against regional background conditions
- Evaluating whether wildfire is a plausible source
- Assessing actual exposure pathways

Failing to perform this analysis can lead to over-attribution, unnecessarily expanding scope and materially inflating claims costs.

Documentation Is Your Best Defense

Across jurisdictions, one consistent litigation theme is the adequacy of documentation. A defensible wildfire claim file should include:

- Photographic evidence of conditions
- Clear descriptions of observed residues and damage
- Sampling plans, methodologies, and chain-of-custody records
- The rationale supporting conclusions, including consideration of alternative explanations

As part of an insurer's duty of good faith and fair dealing, competing expert opinions should be evaluated and addressed through qualified experts, not disregarded.

A Practical Framework for Defensible Claims Handling

In wildfire and smoke damage claims, confirming life safety and immediate habitability concerns should be the insurer's first priority. This aligns with core duty-of-care obligations and guidance from organizations such as the AIHA and Environmental Protection Agency (EPA), both of which emphasize that exposure assessment begins with identifying conditions that may pose acute health risks, including airborne particulates, toxic gases or unsafe structural conditions.

From both a claims-handling and defensibility standpoint, this sequencing matters for three reasons:

Duty of Care and Good Faith

Failing to identify and address potentially hazardous conditions early may create exposure to bad-faith allegations, particularly if occupants remain in a contaminated environment.

Exposure Versus Presence

As reinforced in AIHA guidance, the mere presence of combustion byproducts does not automatically equate to harmful exposure. However, that determination requires an appropriate evaluation of acute risk conditions.

Investigation Integrity

Early condition controls, such as restricting access or implementing interim containment measures, can help prevent additional contamination or cross-contamination that may compromise subsequent sampling and causation analysis.

- A repeatable and defensible wildfire claims process should include:
- Safety First: Confirm safe conditions and document hazards.
- Define the Exposure Scenario: Identify pathways, receptors and building conditions.
- Collect Objective Evidence: Implement standards-based sampling where warranted.
- Differentiate Source Attribution: Distinguish wildfire residues from background contaminants.

- Align With Recognized Guidance: Anchor conclusions in AIHA, ASTM, EPA and CDPH frameworks.
- Document the Decision Logic: Ensure conclusions are transparent, supportable and reproducible.

Defensibility Is Built, Not Assumed

Wildfire claims involving smoke infiltration and particulate deposition are inherently complex and increasingly scrutinized. In the absence of bright-line thresholds, defensibility depends less on any single test result and more on the quality, consistency and transparency of the investigative process.

Carriers that rely on qualified industrial hygiene expertise, consensus-based standards, thorough and transparent documentation, are best positioned to support their decisions throughout claims handling, appraisal and litigation.

In this environment, the objective is not simply to reach a conclusion—it is to reach one that can withstand challenge from every side of the claim.

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