



# Cal/OSHA Worker Safety and Health Requirements for Fire Cleanup Workers

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# California Fire Cleanup: Overview

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- Cal/OSHA Consultation
- Wildfire Smoke
- Wildfire Cleanup Hazards
- Health Hazards During Fire Cleanup
- Hazardous Waste Operations



# Cal/OSHA Jurisdiction

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- Cal/OSHA has jurisdiction over places of employment in California.
- Fire damaged or destroyed homes and buildings where employees are working are places of employment.
- Employers are required to furnish a place of employment that is safe and healthful and protects employees.

# Cal/OSHA Jurisdiction Cont.

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- Fire cleanup work and cleaning of fire-damaged structures is not exempt household domestic service.
- Workers who perform fire cleanup and reconstruction work are under Cal/OSHA's jurisdiction and regulations.
- Homeowners who hire workers to do fire cleanup may be employers who are subject to Cal/OSHA regulations and penalties.
- Hire only state-licensed and registered contractors. Please visit: [www.cslb.gov](http://www.cslb.gov).

# Cal/OSHA Consultation

- Free service to the employer community
- No fines, penalties, or citations
- We do not share our findings with Cal/OSHA Enforcement
- Confidential
- Employer will receive a written report summarizing our evaluation
- The written report is not a citation
- Employer must agree to correct identified hazards



Consultation  
Services



Cal/OSHA Consultation

# Wildfire Smoke (5141.1)

## Scope - Application

- This section applies to workplaces where:
  - (A) The current Air Quality Index (current AQI) for PM<sub>2.5</sub> is 151 or greater, regardless of the AQI for other pollutants; and
  - (B) The employer should reasonably anticipate that employees may be exposed to wildfire smoke

<https://www.airnow.gov/>



# Wildfire Smoke (5141.1)

## EXCEPTIONS

- Buildings with **filtered mechanical ventilation**, and doors and windows remain closed
- **Vehicles with filtered cabin air**, and doors and windows remain closed
- Employer proves **lower than 151 AQI exposure**
- **Less than one hour** of exposure
- **Firefighters** engaged in wildland firefighting



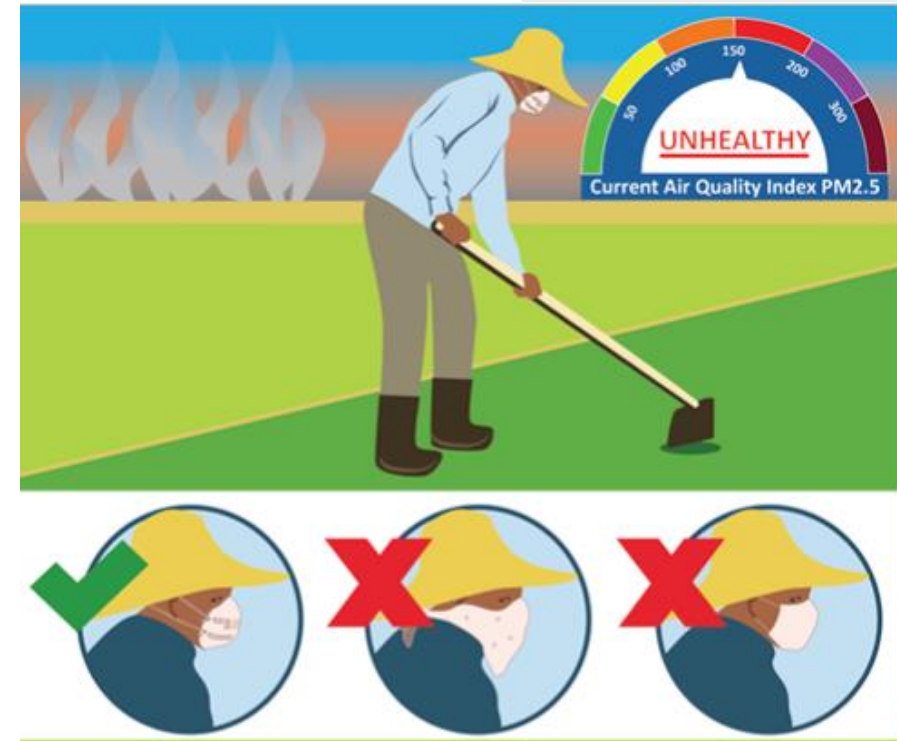
# Wildfire Smoke (5141.1)

When Air Quality Index (AQI) reaches **151 or greater,**

- Check AQI at beginning and periodically during each shift
- Employee Communication
- Employee Training
- Reduce employee exposure
- Provide voluntary-use respirators

If AQI is **500 or greater,** respirators are required

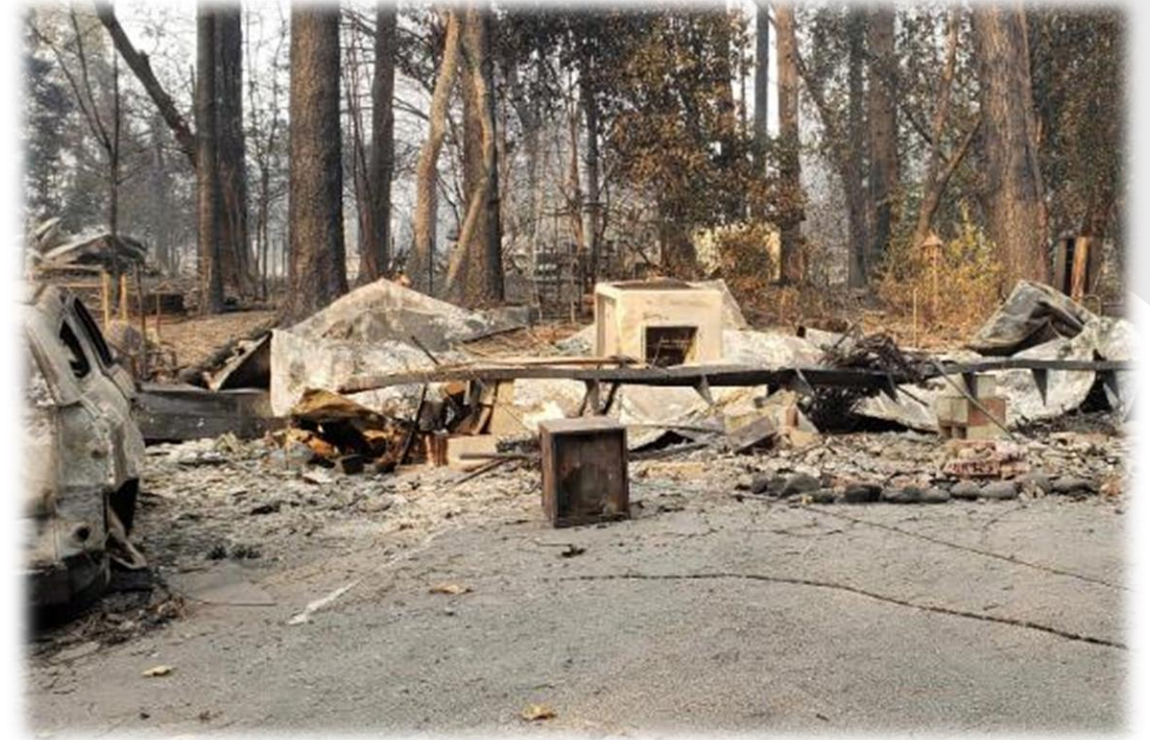
- Respiratory protection program



# Wildfire Cleanup Hazards

## Examples of Safety Hazards

- Fire
- Electricity (e.g., powerlines, wiring, batteries)
- Unstable Structures
- Demolition
- Sharp or flying objects
- Excavations
- Tree Work
- Haulage vehicles
- Drowning (pools, ponds, etc.)
- Other work



# Wildfire Cleanup Hazards Cont.

## Examples of Health Hazards

- Ash, soot, char, smoke particles, and dust
- Other hazardous substances
- Asbestos
- Carbon monoxide
- Hazardous waste
- Heat illness
- Confined Spaces



# Safety Hazards During Fire Cleanup

## Electricity

- Survey site for electrical hazards
  - Downed power lines, live power, car batteries, home battery systems: <https://www.dir.ca.gov/Title8/2946.html>
  - Note: Consider all downed power lines to be energized
- Qualified Electrical Workers
  - Close proximity to power lines
- Qualified line clearance tree trimmers
  - To conduct tree trimming in close proximity to power lines
- Contact Utility Provider with connection issues
- Keep unqualified workers protected
  - Not in “close proximity” to electrical lines

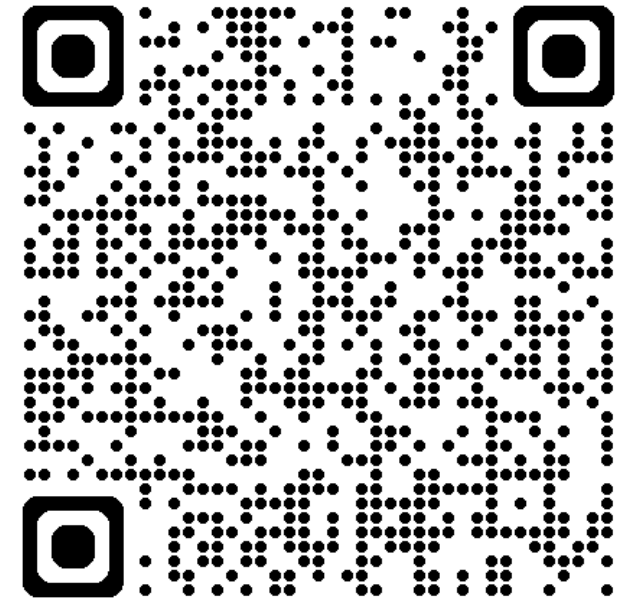


# Safety Hazards During Fire Cleanup

## Electricity

- Water near electrical circuits?
  - Never enter flooded or wet area unless power is off and locked out
  - If water near electrical equipment, turn power off and lock out controls
- Do not turn on site power until inspected by qualified person
- Do not use electrical equipment exposed to heat
- Construction sites
  - GFCI Required or Assured Grounding Program
- Generators (temporary power)

Worker Safety and  
Health During Fire  
Cleanup



<https://www.dir.ca.gov/Title8/sub5.html>  
(2299 to 2989)

# Safety Hazards During Fire Cleanup

## Unstable Structures

(Sections [3203](#) and [3241](#))

- Fire damaged structures unstable
- Caution near hillside damaged structures
- Work area examined by qualified person
- Train workers on specific hazards
- Remove hazards safely
- Ensure Workers protected:
  - PPE [§3380 – §3385](#)



# Safety Hazards During Fire Cleanup Demolition

- Increased risks from damaged structures
- Follow demolition standards
  - Qualified Person (key to process)
  - Written survey: condition of structure
  - Eliminate hazards of all kinds on the property (§1735)
  - Under immediate supervision of qualified person
  - Notify Utilities: control hazards



# Safety Hazards During Fire Cleanup

## Sharp or Flying Objects

- Ensure employees wear required PPE
- Sharp objects
  - Metal and glass
- Falling debris and objects
  - Limbs
  - Pine cones
- Impalement hazards



# Safety Hazards During Fire Cleanup

## Excavations

- New Excavations: Construction
  - CCR, T8 1540-1542
  - <https://www.dir.ca.gov/Title8/sb4a6.html>
  - Training, permits, protective systems
  - Dig Alert: 811 (48 hours ahead of time)
- Sloped/Hillsides with damaged structures
- Holes left behind
  - Removed and burned structures
  - Trees: burned root balls and fallen trees



Hole

# Employer Health and Safety Program: 3203

## Injury and Illness Prevention Program: Nine Required Elements

- Responsibility
- Compliance
- Communication
- Hazard Assessment
- Accident/Exposure Investigation
- Hazard Correction
- Training and Instruction
- Employee access to the IIPP
- Recordkeeping



Cal/OSHA Title 8 Regulations  
<https://www.dir.ca.gov/Title8/3203.html>



# Safety Hazards During Fire Cleanup

## Pre-work site safety – 1511 (b) (Pre-work inspections)

### Prior to presence of employees:

- [www.dir.ca.gov/Title8/1511.html](http://www.dir.ca.gov/Title8/1511.html)
- Survey site conditions
- Identify predictable hazards
- Safeguard the workplace



# Code of Safe Practices – 1509 (site safety rules)

- **Code of Safe Practices related to Employer’s Operations:**

- Fire
- Electricity
- Sanitation (Employees shall cleanse thoroughly after handling hazardous substances)
- Unstable Structures
- Demolition
- Sharp (impalement) or flying objects
- Excavations
- Tree Work
- Haulage vehicles
- Other work



**Fire Clean-up Website**

[Worker Health and Safety during Fire Cleanup](#)

# Safety Hazards During Fire Cleanup

## Fire Safety (1922 and 6155)

- Heat sources from smoldering wood or debris
- Provide fire extinguishers at every cleanup job
- Provide correct extinguishers (A, B, C and D)
  - Battery fires? Lithium Ion-Class B, Lithium metal-class D
- Fire extinguishers required
  - Inside buildings or structures
  - Demolition sites
  - Construction sites

Class of Fire	Description
Class A Fires	Fires in ordinary combustible materials, such as wood, cloth, paper, rubber, and many plastics.
Class B Fires	Fires in flammable liquids, combustible liquids, petroleum greases, tars, oils, oil-based paints, solvents, lacquers, alcohols, and flammable gases.
Class C Fires	Fires that involve energized electrical equipment.
Class D Fires	Fires in combustible metals, such as magnesium, titanium, zirconium, sodium, lithium, and potassium.

# Safety Hazards During Fire Cleanup

## Tree Work

[§3420. Scope and Definition.](#)

[§3421. General.](#)

[§3422. Ropes and Tree Worker Climbing Equipment.](#)

[§3423. Electrical Hazards, General.](#)

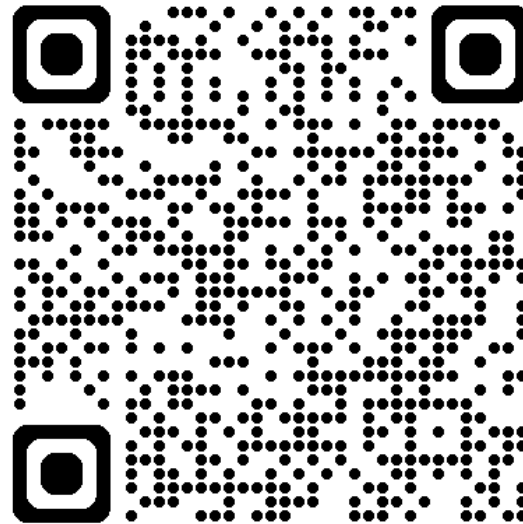
[§3424. Mobile Equipment.](#)

[§3425. Portable Power Hand Tools.](#)

[§3426. Hand Tools.](#)

[§3427. Safe Work Procedures.](#)

[§3428. Stump Cutters.](#)



Tree Work, CCR, T8 3420-3428

<https://www.dir.ca.gov/Title8/sb7g3a12.html>

# Safety Hazards During Fire Cleanup

## Tree Work

- Tree Work: PPE
- Fire Damaged or Dead trees create serious hazards
  - Falling trees, leaners, hangers creating hazards
  - Burned out root ball holes several feet deep- trip and fall hazard
  - Dead trees can fall without wind event
  - Dead trees lose their grip on the soil
  - High winds make dead trees, leaners/hangers a serious hazard

Tree Work, CCR, T8 3420-3428

<https://www.dir.ca.gov/Title8/sb7g3a12.html>



# Health Hazards During Fire Cleanup

## Controls for Harmful Exposures



CCR T8 §5144

Respirators, filters, and cartridges must be NIOSH-approved

To protect workers from exposures at fire cleanup sites, employers must provide, at a **minimum**:

- Elastomeric air purifying respirator equipped with:
  - High-efficiency particulate air (HEPA) filter combined with organic vapor (OV) and formaldehyde cartridge.
  - A N100, R100, or P100 filter can be used in place of a HEPA filter
  - N95s are **not** acceptable
- For areas with **only** burned vegetation and untreated wood, an N95 can be used in place of an elastomeric respirator

# Health Hazards During Fire Cleanup

## Ash, Soot, Dust, Vapors, and Gases

Fire cleanup can expose workers to hazardous substances that damage lungs, skin, and other organs, and result in other harmful health effects.



# Health Hazards During Fire Cleanup

## Ash, Soot, Dust, Vapors, and Gases

After a fire:

- Burned structures, appliances, plastics, electronics, batteries, compressed gas cylinders, automotive fluids, and vehicles are hazardous and toxic
- Burned and unburned paints (lead based paint), household chemicals, ammunition, and pesticides are hazardous and toxic
- Remaining ash, debris, and underlying soil are contaminated and toxic.

# Health Hazards During Fire Cleanup

## Ash, Soot, Char, Smoke Particles, Dust, Vapors, and Gases

Harmful substances may include:

- Ash, soot, char, and smoke particles
- Emissions from gas powered equipment
- Dusts produced during cleanup, removal, and demolition work.
- Vapors released from damaged containers and pipes or from chemical products used in cleanup and demolition work

Airborne exposures will vary from job to job and day to day

Employers must take precautions to prevent harmful exposures as required under Title 8

# Health Hazards During Fire Cleanup

## Personal Protective Equipment

**§1514. Personal Protective Devices.**

**§3380. Personal Protective Devices.**

**§3381. Head Protection.**

**§3382. Eye and Face Protection.**

**§3383. Body Protection.**

**§3384. Hand Protection.**

**§3385. Foot Protection.**

- Workers may be exposed to hazardous substances if it gets in their eyes or on their skin or hair.
- Decontamination must be completed prior to breaks, eating, & leaving the workplace.
- Employees may expose their families to hazardous substances unknowingly through their work clothes and PPE. Employees should use disposable coveralls and leave the coveralls and all other PPE at the site or have the PPE properly decontaminated at the site.



PPE Equipment  
During Fire Cleanup

# Health Hazards During Fire Cleanup

## Required Training

### Provided to Employees Before Working at a Fire Cleanup Site

- Injury & Illness Prevention Program ([§3203](#))
- Hazard communication ([§5194](#))
- PPE including Tyvek suits, gloves, safety glasses, and any other required PPE ([§3380](#))
- Respirators ([§5144](#))
- Heat Illness ([§3395](#))
- Hazardous Waste and Emergency Response ([§5192](#))
- Asbestos ([§1529](#))
- Lead ([§1532.1](#))
- Confined Space ([§5156 - §5158](#) and [§1950 - §1962](#))

**Employers must determine potential exposures prior to sending employees to burn site**

# Health Hazards During Fire Cleanup

## Controls for Harmful Exposures

- **Exposure can occur through:**
  - Inhalation of debris dust
  - Dermal contact with debris
  - Ingestion of contaminated food products and water
  - Incidental ingestion from contaminated hands (§1526, §1527)
- In order to mitigate the potential health risks, debris management operations need to include environmental and public health officials.

# Health Hazards During Fire Cleanup

## Hazardous Waste Operations (§5192)

Hazardous waste operations include cleaning and removing hazardous materials such as chemicals, ash, soot, char, debris, and contaminated dirt from and around burned structures, vehicles, and synthetic materials.

Employers doing this work must have a written health and safety program to identify, evaluate, and control hazards.



Hazardous Waste Operations  
and Emergency Response  
Cal/OSHA Title 8 Regulation 5192

# Health Hazards During Fire Cleanup Hazardous Waste Operations (§5192)

Written program must include:

- Organization structure
- Comprehensive workplan
- Site-specific safety and health plan
- Safety and health training program
- Medical surveillance program
- Employer's operating procedures for safety and health



Hazardous Waste Operations  
and Emergency Response  
Cal/OSHA Title 8 Regulation 5192

# Health Hazards During Fire Cleanup Hazardous Waste Operations (§5192)

## Site Characterization and Analysis

- Identify site hazards to determine the appropriate safety and health controls needed to protect employees
- Preliminary Evaluation –
  - Prior to entry, a qualified person evaluates the site to help determine employee protections.
  - Immediately after initial entry, a qualified person conducts a more detailed evaluation of the site to further identify hazards and necessary employee protections.

# Health Hazards During Fire Cleanup

## Hazardous Waste Operations (§5192)

### Site Characterization and Analysis (Cont.)

- Hazard identification - All suspected conditions that may pose serious inhalation or skin absorption hazards (ash, soot, char, debris, chemical liquids, etc.)
- Examples: confined spaces, ash, soot, char, burned debris, flammable liquids, chemical liquids, burned remains of batteries, electronics

# Health Hazards During Fire Cleanup

## Harmful Substances

### Exposure to metals in debris

- Arsenic
- Cadmium
- Chromium
- Mercury
- Copper
- Iron
- Aluminum
- Lead
- Manganese
- Nickel
- Zinc

### Other substances in debris

- Polycyclic aromatic hydrocarbons (PAHs) are carcinogenic
- Polychlorinated biphenyls (PCBs) are carcinogenic; can cause liver damage
- Polybrominated biphenyls (PBBs) may be carcinogenic; can cause liver damage
- Dioxins and furans cause cancer, skin rashes, liver damage

# Health Hazards During Fire Cleanup

## Harmful Substances

### Asbestos

- Asbestos related construction work is regulated under [§1529. Asbestos.](#)
- Insulation, flooring/tiles, roofing materials/shingles, appliances, cement, siding/cladding, and furnishings in fire-damaged structures may contain asbestos.
- Asbestos does not burn—it is concentrated in the debris and ash when structures burn. Asbestos fibers cannot be seen by the naked eye.
- Asbestos can cause lung and other cancers, as well as chronic lung disease. Cancer and other health effects may take years to develop.



# Health Hazards During Fire Cleanup

## Harmful Substances



### Carbon Monoxide

- Gasoline or diesel-powered pumps, generators, and pressure washers are often used during cleanup.
- These machines generate carbon monoxide gas, which is colorless, odorless, tasteless, and potentially lethal.
- It is nearly impossible to tell whether ventilation is sufficient to prevent excessive carbon monoxide buildup without using personal carbon monoxide monitors.
- *Therefore, in most situations, employers must not use gasoline or diesel-powered equipment indoors*

# Health Hazards During Fire Cleanup Hazardous Waste Operations (§5192)

## Site Characterization and Analysis (Cont.)

- Required information prior to allowing employees on a site:
  - Location and approximate size of the site
  - Description of work to be performed
  - Duration of the planned employee exposure
  - Safety and health hazards expected at the site
  - Possible spreading of hazardous substances
  - Availability of emergency responders

# Health Hazards During Fire Cleanup

## Controls for Harmful Exposures (§1528, §5141, §5155)

- **Engineering Controls.** Engineering controls reduce or prevent hazards for workers.
  - Examples: Ventilate and provide filtered air to work areas; High-efficiency particulate air (HEPA) vacuum and wet methods when cleaning ash, soot, and dust
  - Ensure that haulage vehicles/trucks carrying debris to disposal locations are monitored to ensure that they have fully captured the debris, and it is not being released onto roadways during travel.
- **Administrative Controls.** Whenever engineering controls are not feasible or fully compliant, administrative controls shall be implemented if practicable.
  - Examples: Limiting access to hazardous areas, job rotation, and adequate rest breaks



CCR T8 §5141



CCR T8 §5155

# Safety Hazards During Fire Cleanup

## Haulage Vehicles and Traffic Control

Vehicles used during clean-up present hazards:

- Use and maintain in accordance with manufacturer's recommendations
- Inspect daily
- Establish traffic control system to prevent traffic accidents and protect pedestrians
- Comply with Cal/OSHA requirements (§1598 & 1599)



# Health Hazards During Fire Cleanup

## **Controls for Harmful Exposures** (§1528, §5144)



CCR T8 §5144

### **Control by Respiratory Protective Equipment:**

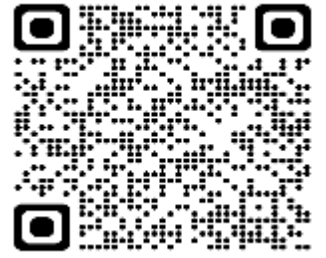
Respiratory protective equipment must be used:

- During the time necessary to install or implement feasible engineering controls;
- Where feasible engineering controls and administrative controls fail to achieve full compliance; and
- In emergencies.

Employers must implement a respiratory protection program.

# Health Hazards During Fire Cleanup

## Controls for Harmful Exposures



CCR T8 §5144

### Respiratory Protection.

Before employees enter fire cleanup sites, employers must identify and evaluate respiratory hazards

- Identify chemical and physical properties of air contaminants
- Reasonably estimate employee exposures
- Where it is not possible to identify or reasonably estimate employee exposure, the atmosphere should be considered immediately dangerous to life and health (IDLH\*)

\*Immediately dangerous to life or health (IDLH) means an atmosphere that poses an immediate threat to life, would cause irreversible adverse health effects, or would impair an individual's ability to escape from a dangerous atmosphere and requires the use of self-contained breathing apparatus or supplied air respirator

# Health Hazards During Fire Cleanup

## Controls for Harmful Exposures



NIOSH Certified  
Equipment List



# Health Hazards During Fire Cleanup

## Controls for Harmful Exposures

### Respirator Warnings

- Providing employees with incorrect respirators violates title 8 and will endanger the employees
- Bandanas, surgical masks, and other types of unapproved masks do not protect against dusts, gases, or vapors and do not protect the lungs
- N95s **do not** protect against dangerous vapors, gases, IDLH conditions, etc.
- N95s are **inadequate for** asbestos, lead, and certain other chemicals
- Air-purifying respirators do not provide oxygen and are not intended for use in structural firefighting or other extremely hazardous situations, such as working in confined spaces or around large chemical spills

# Health Hazards During Fire Cleanup

## Hazardous Waste Operations (§5192)

### Personal protective equipment (PPE)

- Provide and ensure use of appropriate PPE
  - Respirator: half mask respirator with a HEPA filter combined with organic vapor-formaldehyde cartridge
    - N95s are not acceptable
  - Protective equipment:
    - Hardhat
    - Eye protection
    - Hearing protection
    - Full-body Tyvek or equally effective coveralls with head cover
    - Gloves
    - Foot protection and covers

# Health Hazards During Fire Cleanup

## Personal Protective Equipment (PPE)

In burned areas, employers must train employees on hazards. Employers must provide and ensure employees use correct personal protective equipment, including respirators, body protection with booties and head coverings (e.g. Tyvek®), safety shoes, gloves, safety glasses/goggles, hardhats, and other personal protective equipment as needed.



PPE Equipment  
During Fire Cleanup



# Health Hazards During Fire Cleanup

## Heat Illness Prevention (§3395 & §3396)

There must be a written Heat Illness Prevention Plan on site.

Employees must be provided with:

- Potable drinking water
- Access to water
- Appropriate rest breaks
- Training on the Heat Illness Prevention Plan and procedures



Heat Illness Prevention in  
Outdoor Places of Employment  
Cal/OSHA Title 8 Regulation 3395

# Health Hazards During Fire Cleanup

## Decontamination and Hygiene Procedures

### Decontamination Procedures

- Remove PPE in regulated areas
- Do not take contaminated PPE off the site
- Properly dispose of hazardous materials

### Hygiene Procedures

- Wash hands and face thoroughly after removing PPE prior to eating, drinking, smoking
- Ensure there is no dust on shoes or clothing before entering vehicles
- Shower and change clothing and shoes when you get home



# Additional Resources

- **Worker Safety and Health During Fire Cleanup**  
[www.dir.ca.gov/dosh/wildfire/worker-health-and-safety-during-fire-cleanup.html](http://www.dir.ca.gov/dosh/wildfire/worker-health-and-safety-during-fire-cleanup.html)
- **Respiratory Protection During Fire Cleanup**  
[www.dir.ca.gov/dosh/fire resp protection.html](http://www.dir.ca.gov/dosh/fire_resp_protection.html)
- **Personal Protective Equipment During Fire Cleanup**  
[www.dir.ca.gov/dosh/wildfire/Protective-Equipment-During-Fire-Cleanup.html](http://www.dir.ca.gov/dosh/wildfire/Protective-Equipment-During-Fire-Cleanup.html)
- **Wildfire Cleanup Training Tool**  
[www.dir.ca.gov/dosh/documents/Wildfire-Health-Safety/WCTT-Effective-Training.pdf](http://www.dir.ca.gov/dosh/documents/Wildfire-Health-Safety/WCTT-Effective-Training.pdf)



# Questions?

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