COLORADO

State Office of Risk Management

Department of Personnel & Administration

Wildfire Smoke: Safety Guidance for State Agencies & Employees

The Colorado State Office of Risk Management (SORM) is dedicated to protecting state employees who may be exposed to wildfire smoke in the course of their duties. SORM's recommendations for any state agency directing state employees to work in wildfire conditions in Colorado include:

- Identification of harmful conditions
- Team communication planning
- Training and instruction
- Control of harmful exposures

Wildfire smoke presents hazards that state agencies and workers in affected regions should understand and consider before deploying units into the field. Smoke from wildfires contains chemicals, gases, and fine particles that can threaten life and safety. These particles can irritate the lungs and cause serious or even fatal health problems.

Personal protective equipment (PPE) and training are highly recommended for the safety of state employees working in regions and areas with active wildfire conditions. Specifically, training and PPE are warranted wherever the Current Air Quality Index (Current AQI) for PM2.5 is 151 or greater. Current AQI represents data collected over time in order to reflect air conditions as accurately as possible. It is also recommended that agencies put in place a respiratory protection plan and program for employees who are working in any area with measured PM2.5 at 300 AQI or above.

The current AQI is divided into six categories shown in the table below.

Air Quality Index (AQI)	
Categories for PM2.5	***Levels of Health Concern***
0 to 50	Good
51 to 100	Moderate
101 to 150	Unhealthy for Sensitive Groups
151 to 200	Unhealthy
201 to 300	Very Unhealthy
301 to 500	Hazardous

SORM encourages agencies and employees to review the following guidelines with information and resources for protecting state workers exposed to smoke (PM2.5) from wildfires.

Identification Of Harmful Exposures

Agencies should sign up for notifications from the sites listed below and determine employee exposure to PM2.5 for worksites near wildfires before each shift. Supervisors for affected workers should continue to check sites periodically as needed to protect the health of state

employees throughout the workday. You can sign up for air quality alerts here or make use of the following resources.

1. Check AQI forecasts and the current AQI for PM2.5 from:
   - Colorado Department of Public Health & Environment Air Quality site
   - Fire.AirNow.gov
2. Check reported fire incidents in Colorado:
   - Inciweb (Incident Information System)
   - USDA Forest Service Fire Mapping
   - Rocky Mountain Area Coordination Center
3. Measure PM2.5 levels at the worksite and convert those levels to the corresponding AQI by using a direct-reading particulate monitor. Below is a table for converting micrograms per cubic meter to AQI when using direct reading instruments to determine employee exposure to wildfire smoke.

PM2.5 in Micrograms per Cubic Meter (µg/m3)	Air Quality Index (AQI) Categories for PM2.5
0 to 12.0	0 to 50
12.1 to 35.4	51 to 100
35.5 to 55.4	101 to 150
55.5 to 150.4	151 to 200
150.5 to 250.4	201 to 300
250.5 to 500.4	301 to 500

4. Make use of additional Air Quality Resources
   - U.S. Forest Service Wildland Air Quality Response Program
   - NOAA National Weather Service Air Quality Forecast
   - Denver Air Quality Site
   - Regional Air Quality Council
   - Purple Air

Communication

It is recommended that state agencies establish and implement a system for communicating wildfire smoke hazards in a form readily understandable by all affected employees, including provisions that will encourage employees to inform the agency of wildfire smoke hazards at or near a worksite.

The communication system should include effective procedures for informing employees of the current AQI for PM2.5 as well as protective measures available to employees to reduce wildfire smoke exposures. The system should also account for how state employees will inform their supervisor or agency of worsening air quality at the worksite as well as any adverse symptoms they or their coworkers are experiencing that may be the result of exposure to smoke from wildfires.

Communication planning should account for how employees with language barriers, permanent disabilities, or medical conditions such as heart disease and respiratory illnesses like asthma, chronic bronchitis, or reduced lung function. The communication plan should also account for how employees will inform supervisors of their status even in hazardous smoke conditions. Finally, it is suggested that state agencies coordinate their efforts to expand the number of monitors offering AQI readings to improve the accuracy of forecasts from web sites listed above.

Training and Instruction
Agencies should provide employees with effective training and regular instruction for preventing, mitigating, and managing possible exposure to PM2.5 or smoke (e.g., when and how to seek medical treatment). It is strongly recommended that instruction be given as frequently as needed to update employees on any changes and include as much of the following as possible.

1. The health effects of wildfire smoke
2. The right and ability to obtain medical treatment
3. The use of agency-provided and community resources for mitigating exposure to smoke
    - Direct reading of particulate monitors
    - Enclosed, accessible structures near the worksite
    - Recognizing building HVAC/filtration systems and their protective qualities
    - Vehicles that can be used to reduce AQI below 151 through air filtration
    - What to do in case engineered mitigation measures and protocols fail
4. How employees can obtain the current Air Quality Index (AQI) for PM2.5 online
5. How to use the agency's two-way communication system
6. Who to call for medical attention
7. Proper use of respirators approved by the National Institute of Occupational Safety & Health (NIOSH)

SORM's Employee Safety Services (ESS) Unit can provide basic training in fire response, evacuation, particulate monitor reading, rescue, and respirator use. ESS is also available to consult on the development of agency-specific protocols and training.

Control Of Harmful Exposures To Employees

1. **Emergencies**: Agencies should establish emergency response, rescue and evacuation protocols for employee units working in and around wildfires.
2. **Engineering controls:** Agencies should reduce employee exposure to PM2.5 to less than a current AQI of 151 by engineering controls whenever feasible. Engineering controls might include the identification of enclosed buildings, structures, or vehicles where the air is filtered. If engineering controls fail to reduce exposure to PM2.5 to less than a current AQI of 151 (e.g. because ventilation systems lose power), then

agencies and supervisors should work to reduce employee exposures as much as possible. For more information on Heating Ventilation and Air Conditioning filtration systems please see the Environmental Protection Agency's Wildfires and Indoor Air Quality page.

3. **Administrative controls:** Whenever engineering controls are not feasible or do not reduce employee exposures to PM2.5 to an AQI less than 151, the agency should implement administrative controls. Administrative controls might include relocating work to an area where the current AQI for PM2.5 is lower, changing work schedules (focused on shortening individual/team exposure), reducing work intensity, or providing additional rest periods away from the affected area.

4. **Control by respiratory protective equipment:** When engineering controls or administrative controls are not feasible or when working outdoors, agencies should consider voluntary use of respirators where the current AQI for PM2.5 is greater than 151, but does not exceed 300. Each agency should provide respirators for voluntary use and encourage employees to use them.

Disclaimer and Contact Information

The above guidance is neither directive nor comprehensive. It is intended to provide a starting point for agencies and supervisors with an interest in further supporting the health and welfare of employees working under wildfire smoke conditions. This guidance does not apply and is not intended to address chemical or other exposures impacting air quality.
If questions arise as to the efficacy of any of the recommendations listed above or employees encounter situations in the field that do not appear to be covered or consistent with this guidance, please reach out to SORM at dpa_safety@state.co.us.

Thanks and Recognition

SORM wishes to thank the Wildfire Taskforce members for their valued expertise, continued support, and contributions to this guidance.

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