



by Chris Lee,
Safety Consultant

Model Program: Outdoor Worker Exposure to Wildfire Smoke

Regulatory Requirement

Every employer in California who has outdoor employees exposed to wildfire smoke must establish and implement a program at their work sites where the current Air Quality Index (AQI) for PM 2.5 is 151 or greater, and the employer should reasonably anticipate that employees may be exposed to wildfire smoke.

Exemptions

Some workplaces and operations are exempt from this regulation. They include enclosed buildings or structures in which the air is filtered by a mechanical ventilation system, and the employer ensures that windows, doors, bays and other openings are kept closed to minimize contamination by outdoor or

unfiltered air. Also included are enclosed vehicles in which the air is filtered by a cabin air filter and the employer ensures that windows, doors and other openings are kept closed to minimize contamination by outdoor or unfiltered air. Exemptions are permitted for employers able to demonstrate that the concentration of PM 2.5 in the air does not exceed



a concentration that corresponds to a current AQI of 151 or greater by measuring PM 2.5 levels at the work site in accordance with Appendix A. An exemption is also permitted for employees exposed to a current AQI for PM 2.5 of 151 or greater for a total of one hour or less during a shift, or for firefighters engaged in wildland firefighting.

Note: Both Appendix A and Appendix B (related to training requirements to be discussed later in this program) can be found at the end of Title 8, Section 5141.1, at www.dir.ca.gov/title8/5141_1.html.

The requirements for establishing, implementing and maintaining an effective Protection from Wildfire Smoke program are contained in California Code of Regulations Title 8, Section 5141.1, and consist of the following key elements:

- Identification of harmful exposures
- Communication
- Training and instruction
- Control of harmful exposures to employees

Proper use of this model program requires that an appropriate individual within the employer's organization review each of the required elements and modify them, as appropriate, to tailor this to the employer's operation.

Overview of the Hazards

Although there are many hazardous chemicals in wildfire smoke, the main harmful pollutant for people who are not very close to the fire is "particulate matter" (PM), tiny particles suspended in the air.

Particulate matter can irritate the lungs and cause persistent coughing, phlegm, wheezing or difficulty breathing. Particulate matter can also cause more serious problems, such as reduced lung function, bronchitis, worsening of asthma, heart failure and early death.

People over 65 and people who already have heart and lung problems are the most likely to suffer from serious health effects.

The smallest and usually the most harmful particulate matter is called PM 2.5, because it has a diameter of 2.5 micrometers or smaller.

Definitions

Current Air Quality Index (Current AQI):

The method used by the U.S. Environmental Protection Agency (EPA) to report air quality on a real-time basis. Current AQI is also referred to as the "NowCast," and it represents data collected over time periods of varying length in order to reflect present conditions as accurately as possible. The current AQI is divided into six categories, as shown in the table below, which was adapted from Table 2 of Title 40 Code of Federal Regulations, Part 58, Appendix G.

NIOSH: The National Institute for Occupational Safety and Health of the U.S. Centers for Disease Control and Prevention. NIOSH tests and approves respirators for use in the workplace.



Air Quality Index (AQI)	Levels of Health Concern
<i>Categories for PM 2.5</i>	
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

PM 2.5: Solid particles and liquid droplets suspended in air, known as particulate matter, with an aerodynamic diameter of 2.5 micrometers or smaller.

Wildfire Smoke: Emissions from fires in “wildlands” as defined in Title 8, Section 3402, or in adjacent developed areas. (That regulation defines wildlands as “sparsely populated geographic areas covered primarily by grass, brush, trees, crops or combination thereof.”)

Element No. 1: Identification of Harmful Exposures

The employer shall determine employee exposure to PM 2.5 for work sites covered

by this program before each shift and periodically thereafter, as needed to protect the health of employees, by any of three (3) methods.

One, check AQI forecasts and the current AQI for PM 2.5 from the U.S. EPA AirNow website, the U.S. Forest Service Wildland Air Quality Response Program website, the California Air Resources Board website or the local air quality management district website.

Two, obtain AQI forecasts and the current AQI for PM 2.5 directly from the U.S. EPA, California Air Resources Board or local air quality management district by telephone, email, text or other effective method.

Three, measure PM 2.5 levels at the work site and convert the PM 2.5 levels to the corresponding AQI in accordance with Appendix A. An exception to this third method: It does not apply where an employer assumes the current AQI for PM 2.5 is greater than 500 and uses that assumption to comply with Element No. 4, subpart 4 (b), further below.

Element No. 2: Communication

As required by Section 3203 (Section 1509 for construction), the employer shall establish and implement a system for communicating wildfire smoke hazards in a form readily understandable by all affected employees, including provisions designed to encourage employees to inform the

employer of wildfire smoke hazards at the work site without fear of reprisal. The system shall include effective procedures for informing employees of the current AQI for PM 2.5 as identified in element No. 1 and protective measures available to employees to reduce their wildfire smoke exposures. It shall also include effective procedures for encouraging employees to inform the employer of worsening air quality, and of any adverse symptoms that may be the result of wildfire smoke exposure such as asthma attacks, difficulty breathing and chest pain.

Element No. 3: Training and Instruction

As required by Section 3203 (Section 1509 for construction), the employer shall provide employees with effective training and instruction. At a minimum, this shall contain the information in Appendix B. The main areas include:

1. The health effects of wildfire smoke
2. The right to obtain medical treatment without fear of reprisal
3. How employees can obtain the current Air Quality Index (AQI) for PM 2.5
4. The requirements in Title 8, Section 5141.1, about wildfire smoke
5. The employer's two-way communication system

It shall also include effective procedures for encouraging employees to inform the employer of worsening air quality, and of any adverse symptoms that may be the result of wildfire smoke exposure such as asthma attacks, difficulty breathing and chest pain.



6. The employer's methods to protect employees from wildfire smoke
7. The importance, limitations and benefits of using a respirator when exposed to wildfire smoke
8. How to properly put on, use and maintain the respirators provided by the employer

More detailed information regarding these eight (8) training and instruction areas can be reviewed in the Section 5141.1 regulation.

Element No. 4: Control of Harmful Exposures to Employees

In emergencies, including rescue and evacuation, sub-elements No. 2 and No. 3 do not apply.

Regarding engineering controls, the employer shall reduce employee exposure to PM 2.5 to less than a current AQI of 151 by engineering controls whenever feasible, for instance by providing enclosed buildings, structures or vehicles where the air is filtered. If engineering controls are insufficient to reduce exposure to PM 2.5 to less than a current AQI of 151, then the employer shall reduce employee exposures as much as feasible.

In terms of administrative controls, whenever engineering controls are not feasible or do not reduce employee exposures to PM 2.5 to less than a current AQI of 151, the employer shall implement administrative controls,

if practicable. Such implementations may include relocating work to a location where the current AQI for PM 2.5 is lower, changing work schedules, reducing work intensity or providing additional rest periods.

For control by respiratory equipment, where the AQI for PM 2.5 is equal to or greater than 151 but does not exceed 500, the employer shall provide respirators to all employees for voluntary use in accordance with Title 8, Section 5144 (Respiratory Protection), and encourage employees to use respirators. Respirators shall be NIOSH-approved devices that effectively protect the wearers from inhalation of PM 2.5, such as N95 filtering facepiece respirators. Respirators shall be cleaned, stored, maintained and replaced so that they do not present a health hazard to users. Employers shall use Appendix B of this program to train employees regarding the voluntary use of respirators. Note: For voluntary use of filtering facepieces, such as N95 respirators, some of the requirements of Section 5144 do not apply, such as fit testing and medical evaluations.

Also, where the current AQI for PM 2.5 exceeds 500, respirator use is required in accordance with Section 5144. The employer shall provide respirators with an assigned protection factor, as listed in Section 5144, such that the PM 2.5 levels inside the respirator correspond to an AQI less than 151.