

WAC 296-841-20005 Exposure evaluations. (1) Conduct an exposure evaluation to determine or reasonably estimate whether an employee is or could be exposed to either of the following:

- (a) An airborne contaminant above a permissible exposure limit (PEL) listed in Table 3; or
- (b) Other airborne hazards, such as biological hazards.

Note:

- 1. When evaluating air contaminants, keep in mind that oxygen deficient conditions may also occur due to:
 - a. Processes such as fermentation, decomposition of organic matter, or combustion of fossil fuels.
 - b. Displacement by another gas such as nitrogen or carbon dioxide.
- 2. Rules for specific substances may contain additional requirements for determining employee exposure.
- 3. Samples from a representative group of employees may be used for other employees performing the same work activities, when the duration and level of exposure are similar.

(2) Conclude that an atmosphere is immediately dangerous to life or health (IDLH) when you cannot determine or reasonably estimate employee exposure.

(3) Do all the following when you perform your evaluation:

- (a) Determine the form of the airborne contaminant, such as dust, mist, gas, or biological agent.
- (b) Make sure you do not use the amount of protection provided to employees by respirators as a factor in determining whether employees are exposed to an airborne hazard.

(c) Make sure any air monitoring results used to determine employee exposures are based on personal air samples taken from, or representative of, the employee's breathing zone.

You may use area sampling to screen for the presence of an airborne contaminant; however, results from area sampling cannot be used if they do not adequately represent exposure of affected employees.

(d) Include potential emergency and rescue situations that may occur, such as equipment or power failures, uncontrolled chemical reactions, fire, explosion, or human error.

(e) Include workplace conditions such as work processes, types of material, exposure control methods, work practices, and environmental conditions.

(f) Address extended work periods. For work shifts longer than eight hours, evaluate the continuous eight-hour portion of the shift expected to have the highest average exposure concentration.

(4) Use either of the following types of documentation to conclusively demonstrate that employee exposure cannot meet or exceed any PEL for the airborne contaminant during any reasonably anticipated conditions:

- (a) Personal air samples that represent an employee's usual or worst-case exposure during the entire shift; or
- (b) Specific information about products, materials, or activities that provides for an estimate of the level of employee exposure such as safety data sheets (SDSs), observations, previous air sampling results, other measurements, calculations, or pesticide labels.

Note: You should use methods of sampling and analysis that have been validated by the laboratory performing the analysis.

(5) Use the following formula to evaluate employee exposure to two or more substances that have additive health effects:

$$E_m = \frac{C_1}{L_1} + \frac{C_2}{L_2} + \dots + \frac{C_n}{L_n}$$

The symbol	Is the ...
E	Equivalent exposure for the mixture. When the value of E is greater than 1, an airborne hazard is present.

The symbol	Is the ...
C	Concentration of a specific airborne contaminant.
L	TWA ₈ , STEL, or ceiling limit for that airborne contaminant, from Table 3, Permissible Exposure Limits (PELs) for Airborne Contaminants.

- Note:**
1. When results from your exposure evaluation indicate an airborne hazard, follow requirements in WAC 296-841-20010 through 296-841-20020 of this chapter.
 2. When changes occur that increase the level of exposure to an airborne hazard, you may need to conduct a new exposure evaluation to make sure exposure controls and other protective measures are sufficient.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. WSR 17-18-075, § 296-841-20005, filed 9/5/17, effective 10/6/17. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060 and 29 C.F.R. 1910 Subpart Z. WSR 14-07-086, § 296-841-20005, filed 3/18/14, effective 5/1/14. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. WSR 07-05-062, § 296-841-20005, filed 2/20/07, effective 4/1/07; WSR 04-18-079, § 296-841-20005, filed 8/31/04, effective 11/1/04; WSR 03-20-115, § 296-841-20005, filed 10/1/03, effective 1/1/04.]