# Construction and Industry

# CHMM

## Certified Hazardous Materials Manager (CHMM) Exam

# Latest Version: 6.1

## Question: 1

Your company needs to properly dispose of waste containing asbestos. Which of the following waste disposal methods would be the most appropriate for asbestos-containing waste?

A. Incineration
B. Encapsulation
C. Surface impoundments
D. Ocean dumping

**Answer: B**

Explanation:
Encapsulation involves enclosing hazardous waste in a solid material like concrete to prevent the hazardous waste from releasing into the environment Encapsulation is used for solid and semi-solid wastes that contain asbestos.

## Question: 2

You performed air samples for heavy metal exposure last week and just received the following results:

- Lead: 0.06 $mg/m^3$
- Copper dusts and mists: 0.5 $mg/m^3$
- Zinc oxide fume: 4.5 $mg/m^3$

Based on the analytical data, rank the heavy metals from the most concerning exposure to the least concerning exposure.

A. Zinc oxide fume; copper dusts and mists; lead
B. Lead; zinc oxide fume; copper dusts and mists
C. Lead; copper dusts and mists; zinc oxide fume
D. Zinc oxide fume; lead: copper dusts and mists

**Answer: B**

Explanation:
Lead is the most concerning heavy metal exposure because it is the only one that exceeded OSHA's PEL of 0.05 $mg/m^3$. Zinc oxide fume is the second most concerning because with an OSHA PEL of 5 $mg/m^3$, its concentration got to 90% of its occupational limit value, while copper dusts and mists (OSHA PEL = 1 $mg/m^3$) only got to 50%.

## Question: 3

When directly caused by a hazardous material, which of the following situations requires a telephone report to the National Response Center (NRC)?

A. Four hundred liters of oil spill into a river.
B. The general public is evacuated for one hour.
C. A person receives an injury requiring first aid.
D. A highway is closed for half an hour.

**Answer: B**

Explanation:
According to 49 CFRI 71.15 (b), a telephone report is required whenever any of the following occurs as a direct result of a hazardous material:
I. A person is killed.
II. A person receives an injury requiring admittance to a hospital.
III. The general public is evacuated for one hour or more.
IV. A major transportation artery or facility is closed or shut down for one hour or more.
V. The operational flight pattern or routine of an aircraft is altered.

## Question: 4

What is source reduction?

A. Any procedure or action that allows a facility to reduce the amount of solid or hazardous waste that it would typically produce
B. Any procedure or action that allows a facility to convert hazardous waste into something that a consumer can use
C. Any procedure or action that allows a facility to manage less waste than it would typically be required to manage
D. Any procedure or action outside the recycling or treatment process that allows a facility to release less pollution or hazardous waste into the environment or the waste stream than it would typically release

**Answer: D**

Explanation:
Source reduction, which is also known as pollution prevention, refers to any procedure or action outside the recycling or treatment process that allows a facility to release less pollution or hazardous waste into the environment or the waste stream than it would typically release. Waste minimization refers to any procedure or action that allows a facility to reduce the amount of solid or hazardous waste that it would typically produce (Choice A). Recycling refers to any procedure or action that allows a facility to convert hazardous waste into something that a consumer can use (Choice B). Waste reduction refers to any procedure or action that allows a facility to manage less waste than it would typically be required to manage (Choice C). It is important to note that a procedure does not necessarily have to belong to a single category and that a procedure may fall into more than one of these categories in some cases.

## Question: 5

In your hazardous waste management facility, you need to receive a shipment of sodium peroxide and acetic acid. Since you know that any readily oxidizable organic material (e.g., acetic acid) can react violently with sodium peroxide, you need to separate these hazardous materials appropriately. Which of the following would be an appropriate method of separation?

A. No means of physical separation is required as long as there is signage present indicating that the hazardous materials must not be mixed together.
B. No means of physical separation is required as long as both hazardous materials are in undamaged and proper containers.
C. The hazardous materials must be physically separated from each other by means of a dike, berm, or wall.
D. The hazardous materials must be physically separated from each other by means of a permanent structure like a building.

**Answer: C**

Explanation:
According to 40 CFR 264.177, a storage container holding hazardous waste that is incompatible with any waste or other materials stored nearby in other containers, piles, open tanks, or surface impoundments must be separated from the other materials or protected from them by means of a dike, berm, wall, or other device. A permanent structure like a building would not be appropriate since that would place people in harm's way.

## Question: 6

You need to determine if the airborne concentration of crystalline silica dust (molecular weight = 60.1 g/mol) in a work area is a concern. If the total dust is measured at 0.03 ppm, is an exposure of crystalline silica dust at or above 0.05 mg/m3 (OSHA PEL) possible?

A. No. The concentration of total dust is lower than the PEL for crystalline silica.
B. Yes. The concentration of total dust is higher than the PEL for crystalline silica.
C. The total dust concentration does not include crystalline silica dust, so it does not tell you anything about crystalline silica dust.
D. No. Crystalline silica dust is too heavy to ever become airborne.

**Answer: B**

Explanation:
Since the measurement of the total dust concentration in the air encompasses measuring all airborne particulate matter, comparing workplace exposure levels to the total dust concentration present can indicate if there is a potential overexposure or not.

The first step in determining the answer is to convert all values to the same unit. The conversion from $mg/m^3$ to ppm is done using the following equation:

- $\text{ppm} = \frac{(mg/m^3 \times 24.45)}{(MW)}$

Using the crystalline silica dust concentration of interest (0.05 $mg/m^3$) along with its molecular weight (MW) yields:

- $\text{ppm} = \frac{(0.05 \times 24.45)}{(60.1)} = 0.02 \text{ ppm}$

## Question: 7

The Resource Conservation and Recovery Act (RCRA) is

A. a federal statute that grants the Environmental Protection Agency (EPA) the ability to identify the individuals that are responsible for the hazardous release of a substance, the ability to compel the individuals responsible to clean-up the release even if the individuals are no longer using the site, and the ability to fund clean-up operations if it is impossible to identify and/or compel the individuals who are responsible.
B. a federal statute that grants the EPA the ability to establish hazardous waste regulations so that they can monitor and control hazardous waste throughout the waste stream.
C. a federal statute that requires oil facilities to have plans in place to prevent, fund, and clean- up oil spills.
D. a federal statute that is designed to encourage each facility to reduce the amount of pollution that the facility generates by requiring the facility to disclose to the public information about the amount of pollution that the facility creates.

**Answer: B**

Explanation:
The Resource Conservation and Recovery Act (RCRA) is a federal statute that grants the EPA the ability to establish hazardous waste regulations so that they can monitor and control hazardous waste throughout the waste stream. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) is a federal statute that grants the EPA the ability to identify the individuals that are responsible for the hazardous release of a substance, the ability to compel the individuals responsible to clean-up the release even if the individuals are no longer using the site, and the ability to fund clean-up operations if it is impossible to identify and/or compel the individuals who are responsible (Choice A). The Oil Pollution Act is a federal statute that requires oil facilities to have plans in place to prevent fund, and clean-up oil spills (Choice C). The Pollution Prevention Act is a federal statute that is designed to encourage each facility to reduce the amount of pollution that the facility generates by requiring the facility to disclose information about the amount of pollution that the facility creates to the public (Choice D).

## Question: 8

You work for a company that is a Large Quantity Generator (LQG) facility. You just performed personnel training for all 150 employees. When will they all need to be given their refresher training?

A. Nine months from the training date
B. Two years from the training date
C. Six months from the training date
D. A year from the training date

**Answer: D**

Explanation:
Hazardous waste personnel at LQG facilities must receive annual refresher training.

## Question: 9

A risk assessment procedure in which an individual or an organization attempts to examine the different ways that an individual may be exposed to a substance is known as

A. a dose-response assessment
B. an exposure assessment.
C. hazard identification.
D. risk characterization.

**Answer: B**

Explanation:
A risk assessment procedure in which an individual or an organization attempts to examine the different ways that an individual may be exposed to a substance is known as an exposure assessment. A dose-response assessment (Choice A) is a risk assessment procedure in which an individual or an organization attempts to determine the smallest amount of a substance that an individual may be exposed to before that substance will cause a specific adverse effect. Hazard identification (Choice C) is a risk assessment procedure in which an individual or an organization attempts to determine the effects that a substance may have on an individual. Risk characterization (Choice D) is a risk assessment procedure in which an individual or an organization attempts to determine the maximum amount of a substance that an individual may be exposed to on a daily basis before that individual will be likely to suffer an adverse effect.

## Question: 10

You work for a large agricultural company that uses lots of fertilizer on the crops. Which of the following impacts on water resources could fertilizer have?

A. Increases soil erosion, which can cause flooding or drainage issues
B. Inhibits algae growth in nearby bodies of water
C. Causes eutrophication to occur
D. Makes lead poisoning more likely to occur

**Answer: C**

Explanation:
When too much fertilizer is used and runs off into water, the phosphorous present in fertilizer causes aquatic plants like algae to grow rapidly. The rapid growth causes, among other things, a depletion of the dissolved oxygen in water that fish need to survive. The lack of oxygen causes the death of animal life. This process is known as eutrophication.

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