

# Pre-/Post-test Module 2: Evaluating Environmental and Health Risks

## Instructor Copy, with Answer Key

### Pre/Post-test

**NOTE: post-test contains Self-assessment questionnaire**

**Self-assessment: Answer this only during the post-test.**

In reference to the Evaluating Environmental and Health Risks module, please choose all that apply:

- a. Specifically useful for my work. If so, you can describe how here (optional):  
\_\_\_\_\_  
\_\_\_\_\_
- b. Quick refresher
- c. Offers me knowledge about a topic I am less familiar with
- d. Gives me confidence to increase my skills in and understanding of community engagement related to land reuse sites
- e. Motivates me to learn more about land reuse sites and ways I can be engaged
- f. Not needed for my work
- g. None of the above
- h. Other (please specify) \_\_\_\_\_  
\_\_\_\_\_

**Minimum Passing Score: 70% (7 out of 10)**

**Allow multiple retakes? (Y/N) Yes**

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1. **Toxicity of a chemical contaminant depends on (select the best answer):**
  - a. Dose (the amount of substance that enters the body), route of exposure, duration of exposure (frequency), proximity to exposure
  - b. Dose (the amount of substance that enters the body), route of exposure, duration of exposure (frequency), individual factors (health status, sex, genetics, etc.)

- c. Dose (the amount of substance that enters the body) route of exposure, duration of exposure (frequency), shape and structure of the substance (three-dimensional shape of a molecule), proximity
- d. Dose (the amount of substance that enters the body), route of exposure, duration of exposure (frequency), individual factors (health status, sex, genetics, etc.), shape and structure of the substance (three-dimensional shape of a molecule)

**Answer: d.**

**Rationale:** Toxicity describes the degree to which a substance is poisonous or can cause injury. Toxicity depends on a variety of factors: dose (the amount of substance that enters the body), duration, route of exposure, shape and structure of the substance itself (the three-dimensional shape of a molecule), and individual human factors such as differences in health status, sex, and genetics.

2. **In land reuse site assessment and cleanup, people from multiple disciplines can be involved, such as environmental professionals, health professionals, planners, toxicologists, and epidemiologists.**
- a. True
  - b. False

**Answer: a.**

**Rationale:** If a land reuse site is being evaluated for contamination, you may work with environmental professionals who work for regulatory agencies, toxicologists, health assessors, planners, and other environmental or health professionals. In 2017, for example, ATSDR funded 25 State Health Agencies to respond to harmful exposures in communities and educate the public on exposure protection. ATSDR and State agency partners have conducted health assessments on thousands of land reuse sites. During this process, ATSDR or a State partners may review environmental data to determine potential adverse health effects on people who may live near or access a Land Reuse Site.

3. **A Phase I Environmental Assessment (ESA) is also called: (Select all that apply)**
- a. Due diligence
  - b. Initial client consult
  - c. All Appropriate Inquiry
  - d. Initial environmental sampling effort

**Answer: a. and c.**

**Rationale:** The two primary phases of the ESA process are designed to increase the level of understanding of the site condition. Environmental Site Assessment (ESA) Phase I is sometimes referred to as “due diligence” or “all appropriate inquiry.” It identifies potential environmental concerns.

4. **Which of the following are aspects that are part of a Phase I ESA? (Select all that apply)**
- a. Geology and hydrogeology review
  - b. Review of aerial photographs and Sanborn maps
  - c. Soil and water samples
  - d. Development of site sampling plan
  - e. Interviews with neighbors and past site owners

**Answer: a., b., and e.**

**Rationale:** A Phase I ESA is primarily a site history overview and typically does not involve sampling of environmental media. A Phase I ESA provides an introductory framework for evaluating a site's potential environmental contaminants. A geology/hydrogeology review (a.), review of aerial photographs and Sanborn maps (b.), and interviews with neighbors and past site owners (e.) are all activities that are typically conducted during a Phase I ESA. Soil/water sampling and development of a site sampling plan may be conducted during a Phase II ESA but are not part of a Phase I ESA.

5. **Which activities are included in a Phase II Environmental Site Assessment (ESA)? (Select all that apply)**
- a. Results of interviews with site owner that document past environmental practices, such as manifest records of hazardous waste transfer, documentation of community concerns, and regulatory reports or enforcement records
  - b. Comprehensive site sampling plans, monitoring well installation tests, drum samples
  - c. A site map that shows evidence of oily stains, drums left on site, and other potential "hot spots"
  - d. Conceptual site model to hypothesize how target analytes would have been released and migrated to the soil or groundwater

**Answer: b., and d.**

**Rationale:** Phase II ESA provides a more complete understanding of the contamination that may be present on the site. If a Phase II ESA is necessary, the following requirements must be met before taking action: Statement of Objectives, Conceptual Site Model (d.), and Written Report. A variety of environmental sampling may occur during the Phase II ESA, which can be dictated by site sampling plans, monitoring well installation tests, and drum samples, among other activities (e.g. soil or groundwater samples) (b.). Results of interviews and a site map showing evidence of oily stains, drums, and hot spots are activities that would typically happen during a Phase I ESA.

6. **A tiered approach to cleanup ensures that the assessment and cleanup of a land reuse site is conducted by environmental or health professionals following their best selection of sampling protocols:**
- a. True
  - b. False

**Answer: b.**

**Rationale:** A tiered approach to cleanup is a state program that incorporates a risk-based approach to cleanup. Tier 1 consists of a qualitative risk-assessment based on general site assessment information. At this stage, data identifies obvious environmental impacts, such as sensitive receptors and significant exposure pathways. Tier 2 utilizes more site-specific data, such as characterization and monitoring, or plume migration. Tier 3 focuses completely on site-specific conditions, such as fate and transport phenomena or risk assessment modeling.

7. **A Public Health Assessment is required at all types of land reuse sites.**
- a. True
  - b. False

**Answer: b., False**

**Rationale:** Since 1986, ATSDR has been required by law to conduct a Public Health Assessment at each of the sites on the U.S. Environmental Protection Agency (EPA) National Priorities List. The aim of these evaluations is to find out if people are being exposed to hazardous substances and, if so, whether that exposure is harmful and should be stopped or reduced. Land reuse sites such as Brownfields are not listed on the EPA National Priorities List and are not required to have a Public Health Assessment.

8. **Risk Assessment includes these steps (select the best answer):**
- a. Site Assessment, Hazard Identification, Exposure Route Identification, Cleanup Plan

- b. Hazard Identification, Cleanup Plan, Risk Characterization, Human Health Threats
- c. Hazard Identification, Dose-Response Assessment, Exposure Assessment, Risk Characterization
- d. Site Assessment, Hazard Identification, Risk Characterization, Cleanup Plan

**Answer: c.**

**Rationale:** The four steps of Risk Assessment are Hazard Identification, Dose-Response Assessment, Exposure Assessment, and Risk Characterization (c.). Hazard Identification indicates what health problems are caused by the contaminants. Dose-Response Assessment quantifies the health problems at different exposures. Exposure Assessment explains how much of the pollutant people are exposed to during a specific time period and how many people are exposed. Risk Characterization describes the extra risk of health problems in the exposed population.

**9. Public Health Assessment incorporates aspects of Risk Assessment and in addition, includes (select the best answer):**

- a. Collection of site samples nearest to sensitive receptors/populations, exposure assessment, toxicologic assessment, risk management recommendations
- b. Exposure assessment, toxicologic assessment, review of health outcome data, recommendations for public health protection
- c. Environmental site assessment, exposure assessment, toxicologic assessment, risk management recommendations
- d. Environmental site assessment, exposure assessment, site sampling plan, toxicologic assessment

**Answer: b.**

**Rationale:** The steps of Public Health Assessment are exposure assessment, toxicologic assessment, review of health outcome data, and recommendations for public health protection (b.). Public Health Assessments determine the nature and extent of contamination through an extensive exposure assessment that identifies exposure pathways, the size and susceptibility of the exposed population, and a comparison of exposure levels to those associated with health effects. In addition, Public Health Assessments evaluate health outcome data for the exposed population (e.g. elevated blood lead levels in a population living near a lead smelter) and draw conclusions about associations of exposures with health effects.

**10. There are several tools and resources available for use in Environmental Site and Public Health Assessments. (Select all that apply)**

- a. Health Impact Assessment
- b. Enviro Detective Site Investigation Tool
- c. ATSDR's Toxicological Profiles
- d. Community Mapping Tools
- e. Enviro Library Search Tool
- f. Risk-o-Mapper Software
- g. Community Health Status Indicator

**Answer: a., c., d., and g.**

**Rationale:** Health Impact Assessment (a.), ATSDR's Toxicological Profiles (c.), Community Mapping Tools (d.), and Community Health Status Indicator (g.) are all tools and resources that can be used in Environmental Site and Public Health Assessments.