

ENVIRONMENTAL REMEDIATION

Cleaning up the environment is an important focus of the green economy. Sites that are polluted because of industrial activity, the use of pesticides and fertilizer, or the release of other pollutants must be cleaned up in order to redevelop them or return them to their natural state.

Prior to the performing of modern environmental regulation, many companies simply released hazardous materials into the environment. They would dump chemicals and other pollutants onto unused land or into lakes, rivers, and streams. Sites also would become polluted through accidents or improperly functioning equipment. Polluted sites that can be cleaned and redeveloped are known as brownfield sites.

What is environmental remediation?

Environmental remediation is the removal of pollution or contaminants from water and soil. These waste products / toxic substances are removed for the protection of human health, as well as to restore the environment.

Site assessment

Remediation projects usually begin with a site assessment to determine the costs of the project, as well as the technology that would be the most appropriate for the particular site. Assessments must be made to identify any potential hazards to the workers who will be working on the project and to assess the impact that pollution might have on the local community, as well as its overall environmental impact.

Once a site is suspected of being contaminated there is a need to assess the contamination. The historical use of the site and the materials used and produced on site will determine:

- The assessment strategy
- Type of sampling
- Chemical analysis to be done.

Often nearby sites are also contaminated even where the current land use seems harmless. For example, a car park may have been levelled by using contaminated waste in the fill. Also important is to consider off site contamination of nearby sites often through decades of emissions to soil, groundwater, and air. Topsoil as well as surface and groundwater of nearby properties should also be tested, both before and after any remediation. This is a controversial step as:

- No one wants to have to pay for the clean-up of the site;
- If nearby properties are found to be contaminated it may have to be noted on their property title, potentially affecting the value;
- No one wants to pay for the cost of assessment.

Types of environmental remediation

Environmental remediation is carried out on various environmental media, including soil, sediment, groundwater, and surface water. Water remediation includes both groundwater and surface water, whereas soil remediation includes topsoil, subsoil, and sediment. Soil and water remediation may be conducted separately or together, depending on the type and extent of the pollution.

Water remediation is the process of removing contaminants from water. Surface water in lakes, streams, and rivers can be directly contaminated by pollutants released directly into the water or by runoff from the ground. Groundwater can become polluted by contaminants leaching through the soil and sediment above it or as the result of industrial practices such as mining or drilling for natural gas and oil.

Soil remediation refers to strategies that are used to purify and revitalize the soil. Soil contamination is caused by many of the same factors that cause groundwater contamination. Often, the soil and groundwater are contaminated from the same source and both must be remediated at the same time. Soil contamination can result from chemical spills, industrial activity, and the use of certain fertilizers and pesticides.

Remediation technologies

Remediation technologies are many and varied but can be categorised into ex-situ and in-situ methods.

- In-situ remediation methods treat the contamination on the site without removing soil
- Ex-situ remediation involves excavating soil or sediment and treating it, before returning it to its original state.
- Excavation
- Pump and treat
- Thermal desorption
- Solidification and stabilization
- Oxidation
- Nanoremediation
- Soil vapour extraction
- Bioremediation

PRACTICE

1. Explain in English:

• remediation	• site assessment	• ex-situ
• brownfield site	• pollutant	• off site contamination

2. Answer the questions.

1. What can cause site pollution?
2. What can be remediated?
3. Name some remediation technologies.

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http://en.wikipedia.org/wiki/Environmental_remediation

http://www.bls.gov/green/environmental_remediation/remediation.htm