



ENVIRONMENTAL TREATMENT: Natural

Shaw Air Force Base, S.C.

Natural treatment processes, also sometimes known as monitored natural attenuation, use natural, everyday processes to clean up contaminated soil and groundwater. In short, natural treatment allows Mother Nature to clean herself under careful monitoring.

HOW DOES IT WORK?

Natural treatment takes advantage of naturally occurring biological, chemical and physical processes to clean soil and groundwater contaminated with chemicals. These processes may include biodegradation, phytoremediation, sorption, dispersion, dilution, chemical reactions and volatilization. Soil and groundwater are closely monitored during the process to verify the cleanup is progressing as anticipated.

WHAT ARE THE BENEFITS?

Natural treatment is a less expensive method of cleaning up soil and groundwater compared to other methods and can achieve cleanup results in the same amount of time. It can also be used with other cleanup methods to speed remediation. In some cases, this is known as “enhanced bioremediation.” Natural treatment is used at cleanup sites all over the United States.

Since the method relies on nature to passively clean up soil and groundwater, worker exposure to contaminants is rare. Remedial system construction is also minimal.

Natural treatment is sometimes mislabeled as the “do-nothing” approach to site cleanup. The truth is that natural attenuation is a proactive approach that focuses on the verification and monitoring of natural cleanup processes rather than relying totally on “engineered” processes.

Before natural treatment is proposed for any site, samples of soil and groundwater are collected and evaluated to document that natural treatment is occurring and to estimate the effectiveness of natural processes in reducing contaminant concentrations over time. At sites where contamination poses an imminent risk to people or the environment or where a large plume shows no signs of stabilizing, natural treatment is not used as the only cleanup method.

For those sites where natural treatment is selected as the preferred remedy, Air Force engineers and scientists closely monitor the soil and groundwater by taking regular samples to examine whether the natural processes are effectively containing and destroying contamination and therefore protecting human health and the environment. Protection of human health and the environment is the top priority of the environmental restoration program at all stages of the cleanup process.

WHERE IS NATURAL TREATMENT USED AT HERE?

Locally, the Air Force is using natural treatment at two sites where the majority of groundwater contamination has already been removed by other active cleanup methods, and just a small amount of contamination remains. Natural treatment is cleaning benzene from site OU-1 (Fuel Site #1) and trichloroethylene and perchloroethylene from site OU-2C (Groundwater Site #1). Here, natural treatment works better at fuel sites with benzene, but not very well at sites with other contaminants. Site treatment is overseen by the South Carolina Department of Health and Environmental Control.

NATURAL TREATMENT PROCESSES INCLUDE:

- Biodegradation uses natural microbes in soil and groundwater to digest chemicals in groundwater. This process can be improved by changing underground conditions to better suit microbes.
- Phytoremediation uses plants such as trees and grass to clean chemicals from groundwater. As roots take out nutrients from soil and groundwater, they break down chemicals into less harmful products.
- Sorption involves the containment of contaminated water by using soil and sediment particles. As the groundwater flows by, the soil acts like a sponge, keeping chemicals from contaminating other areas.
- Dispersion and dilution lowers the concentration of contaminants as water flows away from the source, just like a beam of light that gets dimmer as it moves from its source. Naturally occurring chemical reactions in soil and groundwater can also change chemicals in the groundwater into less harmful chemicals.
- Volatilization is the process where chemicals evaporate into gases while still in the soil. These gases then move to the surface where they are destroyed by the sun.

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U.S. Environmental Protection Agency: www.epa.gov
South Carolina Department of Health & Environmental Control: www.scdhec.gov

