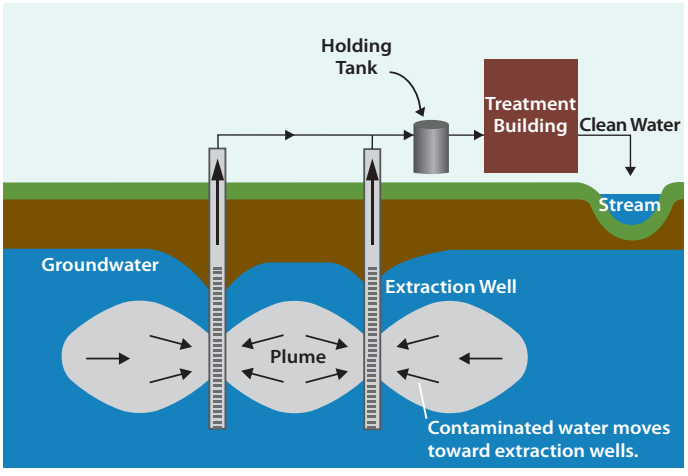
A Citizen's Guide to Pump and Treat

What Is Pump And Treat?

Pump and treat is a common method for cleaning up groundwater contaminated with dissolved chemicals, including industrial solvents, metals, and fuel oil. Groundwater is pumped from wells to an above-ground treatment system that removes the contaminants. Pump and treat systems also are used to "contain" the contaminant plume. Containment of the plume keeps it from spreading by pumping contaminated water toward the wells. This pumping helps keep contaminants from reaching drinking water wells, wetlands, streams, and other natural resources.

How Does It Work?

Pump and treat methods may involve installing one or more wells to extract the contaminated groundwater. Groundwater is pumped from these "extraction wells" to the ground surface, either directly into a treatment system or into a holding tank until treatment can begin. The treatment system may consist of a single cleanup method, such as activated carbon or air stripping, to clean the water. (See *A Citizen's Guide to Activated Carbon* [EPA 542-F-12-001] and *A Citizen's Guide to Air Stripping* [EPA 542-F-12-002].) However, treatment often requires several cleanup methods if the groundwater contains different types of contaminants or high concentrations of a single contaminant. The approach to treatment may be modified as contaminant concentrations decrease.



Example of a Pump and Treat System with Two Extraction Wells.

Once treated water meets regulatory standards, it may be discharged for disposal or further use. For example, treated water may be pumped back underground or into a nearby stream, or a sprinkler system may distribute the water over the ground surface to irrigate soil and plants. Treated water also may be discharged to the area's public sewer system for further treatment at the local wastewater treatment plant. Other wastes produced as a result of treatment, such as sludge or used filters, are disposed of properly.

Is Pump And Treat Safe?

Pump and treat is a safe way to both clean up contaminated groundwater and keep it from moving to other areas where it may affect drinking water supplies, wildlife habitats, or recreational rivers and lakes. Although pumping brings contamination to the ground surface, it does not expose people to that contamination. A pump and treat system is monitored to ensure the extraction wells and treatment units operate as designed. Also, the groundwater is sampled to ensure the plume is decreasing in concentration and is not spreading.

How Long Will It Take?

Pump and treat may last from a few years to several decades. The actual cleanup time will depend on several factors, which vary from site to site. For example, it may take longer where:

- Contaminant concentrations are high, or the contamination source has not been completely removed.
- The contaminant plume is large.
- Groundwater flow is slow, or the flow path is complex.

How Might It Affect Me?

People living or working near the site may see increased truck traffic while the system is being built as drill rigs and construction supplies arrive at the site. They also may hear the machinery used to drill wells

or construct the treatment system. Treatment systems usually are designed to minimize noise while operating. Because pump and treat cleanups can take a long time, systems can be designed so that other site activities may continue during cleanup. For example, the treatment system may be constructed in a location as far as possible from an office building or parking lot. It also may be enclosed by a fence or a shed so that it is less obvious.

Why Use Pump And Treat?

Pump and treat is used to remove a wide range of contaminants that are dissolved in groundwater. Pump and treat typically is used once the source of groundwater contamination, such as leaking drums and contaminated soil, has been treated or removed from the site. It also is used to contain plumes so that they do not move offsite or toward lakes, streams, and water supplies. Pump and treat is the most common cleanup method for groundwater. It has been selected or is being used at over 800 Superfund sites across the country.

Groundwater Pumping Wells

Groundwater Treatment Building

Indoor Treatment Facility

Outdoor Treatment Facility

Example

The Baird and McGuire Superfund site in Massachusetts was contaminated when chemicals stored in tanks leaked into the soil and groundwater. The contaminated groundwater plume flowed offsite, contaminating and closing the town's main water supply. Since 1993, a pump and treat system has been containing the plume and cleaning up groundwater.

Pump and treat began after much of the contaminated soil at the site was excavated for treatment. Eight pumping wells were installed at the site (seven still operate) typically pumping a total of about 127 gallons of groundwater per minute. The treatment plant includes a metals removal system, air strippers, and activated carbon units to remove a wide range of contaminants. It also has filters and a sludge disposal system. Treated water is pumped back underground at the site. Groundwater sampling has shown that treatment continues to protect human health and the environment by containing the plume and removing contaminants. The system is expected to operate well into the future.

For More Information

For more information about this and other technologies in the Citizen's Guide Series, visit:

www.cluin.org/remediation
www.cluin.org/products/citguide

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