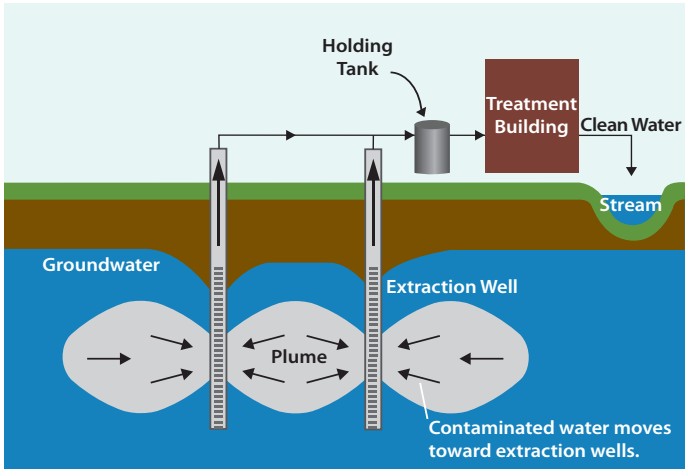
Community Guide to Pump and Treat

What Is Pump and Treat?

Pump and treat is a common method for cleaning up contaminated groundwater containing chemicals such as industrial solvents, metals and fuel oil. Groundwater is pumped from wells or trenches to an aboveground treatment system that removes the contaminants. Pump and treat systems also help keep the contaminant plume from spreading by pumping contaminated water toward the wells. This pumping helps prevent contaminants from reaching drinking water wells, wetlands, streams and other natural resources.

How Does It Work?

Pump and treat methods usually involve installing one or more wells to extract the contaminated groundwater. Groundwater is pumped out of the ground from these "extraction wells" either directly into a treatment system or into a holding tank until treatment can begin. If the groundwater contains different types of contaminants or high concentrations of a single contaminant, the treatment system may include several different cleanup methods. The approach to treatment may change as contaminant concentrations decrease. Examples of treatment methods used as part of a pump and treat system include granular activated carbon, air stripping and bioreactors. (See community guides to *Air Stripping*, *Bioremediation*, and *Granular Activated Carbon Treatment*.)



Example of a pump and treat system with two extraction wells.

Once treated water meets regulatory standards, it may be reused or discharged. Depending on the site, treated groundwater may be discharged to a nearby stream or river or back underground through injection wells or trenches. A sprinkler system can distribute treated water over the ground surface so that it seeps into the soil. The water also may be discharged to the public sewer system, or in some cases, reused.

Other wastes produced as a result of treatment, such as sludge or used filters, are disposed of properly.

How Long Will It Take?

Pump and treat may last from a few years to several decades. The cleanup time will depend on how long it takes to pump all the contaminated groundwater necessary to treat the plume or keep it from spreading. This will depend on several factors that vary from site to site. For example, pump and treat will take longer where:

- Contaminant concentrations are high.
- The contamination source has not been completely removed.
- The contaminant plume is large.
- Groundwater cannot be pumped at a fast rate.
- Groundwater flow is slow, or the flow path is complex.

Is Pump and Treat Safe?

Pump and treat generally is considered 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 above the ground surface, it does not expose people to the contamination. The

pumped groundwater is contained in piping and tanks until it is treated. 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 Might It Affect Me?

You may notice increased truck traffic when construction equipment and materials come to the site. You also might hear drilling rigs and other equipment during construction. Operation of pump and treat systems generally will not disrupt your community as noise levels are low.

Why Use Pump and Treat?

Pump and treat systems remove a wide range of groundwater contaminants. Pump and treat typically is used once the source of the 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 or water supplies. Pump and treat systems have been selected for use at hundreds of Superfund sites and other cleanup sites across the country.

Groundwater pumping wells

Groundwater treatment building

Indoor treatment facility

Outdoor treatment facility

Example

Groundwater at the Firestone Tire and Rubber Superfund site in Georgia became contaminated due to chemicals spilled during manufacturing. After removing storage tanks and contaminated soil, a pump and treat system was installed to treat the groundwater plume.

Twenty-five pumping wells were installed. The treatment plant included an oil-water separator, fixed-bed adsorbers and air strippers to address a range of contaminants. Treated groundwater was discharged to the Salinas River. The pump and treat system operated from 1986 to 1992, when cleanup levels for the contaminants of concern were met. The system removed nearly 500 pounds of contaminants. The system was decommissioned in 1995, but groundwater sampling continued until 1998 to confirm success.

For More Information

- About this and other technologies in the Community Guide Series, visit: https://clu-in.org/cguides or https://clu-in.org/remediation/
- About use of cleanup technologies at a Superfund site in your community, contact the site's community involvement coordinator or remedial project manager. Select the site name from the list or map at http://www.epa.gov/superfund/sites to view their contact information.

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