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www.epa.gov/superfund/sites
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EPA

A Citizen's Guide to Activated Carbon Treatment

The Citizen's Guide Series

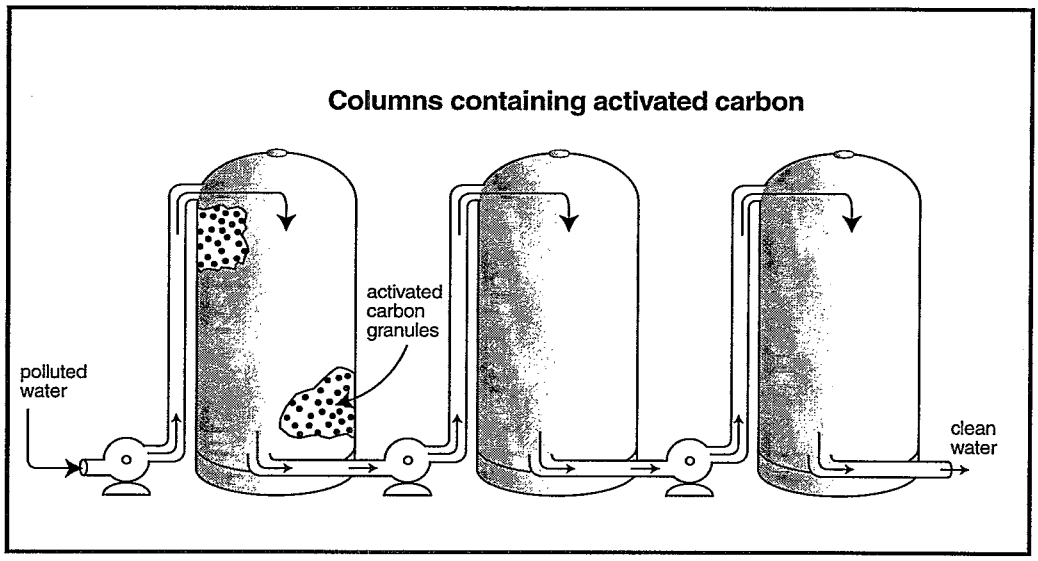
EPA uses many methods to clean up pollution at Superfund and other sites. If you live, work, or go to school near a Superfund site, you may want to learn more about these methods. Perhaps they are being used or are proposed for use at your site. How do they work? Are they safe? This Citizen's Guide is one in a series to help answer your questions.

What is activated carbon treatment?

Activated carbon is a material used to filter harmful chemicals from polluted air and water. It looks like tiny granules of black sand. As polluted water or air flows through an activated carbon filter, chemicals *sorb* or stick to the surface and within the pores of the granules. Most tap water filters and fish tank filters at home contain activated carbon and work the same way. Activated carbon filters are often used as part of a pump and treat system to clean up polluted groundwater (See *A Citizen's Guide to Pump and Treat* [EPA 542-F-01-025]).

How does it work?

An activated carbon filter generally consists of one or more containers or *columns* of granules. It is designed to sorb the specific hazardous chemicals found at a site. Water or air is usually pumped through a column from the top down, but upward flow also is possible. As the polluted water or air flows through the column, the chemicals sorb to the porous surface



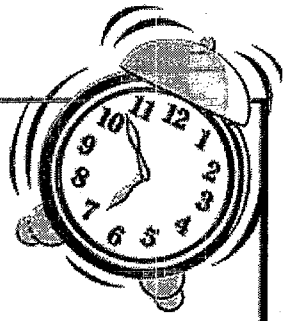
of the granules. The water or air that exits the column is cleaner than the water or air that entered it. If the water or air isn't clean enough, it is pumped into another column or cleaned using another method.

When the available surface of the activated carbon fills up with chemicals, the carbon is said to be *spent*. Spent carbon must be replaced or cleaned so the filter can be reused. If spent carbon is replaced, the carbon and the sorbed chemicals are burned or disposed of in an approved landfill. Cleaning spent carbon involves heating the carbon and pumping clean air through it. The heat loosens the chemicals from the carbon, and the air sweeps them out of the column. Air pollution control equipment then collects the chemicals, which are disposed of or destroyed.

Is activated carbon treatment safe?

Activated carbon treatment is quite safe to use. The columns are equipped with detectors that alert cleanup workers 1) if leaks occur; and 2) when it is time to replace the activated carbon. The columns are cleaned or replaced with care to avoid releasing chemicals. Larger filters are often preferred because they do not have to be replaced as often as small ones.

How long will it take?



The time it takes to complete activated carbon treatment depends on several factors:

- amount of polluted water or air
- type and amounts of harmful chemicals present
- size and number of columns

Depending on the site, cleanup can take just a few days or as long as many years. Since activated carbon treatment is often used with other cleanup methods, the length of time may depend on how fast the other methods work.

Why use activated carbon treatment?

Activated carbon treatment can provide good results for a wide range of chemicals like fuels, PCBs, dioxins, and radioactive wastes. It also can remove some types of metals, if they are present in small amounts.

Activated carbon treatment can be cheaper than other cleanup methods. However, activated carbon does not destroy chemicals. The chemicals and spent carbon eventually must be disposed of in a landfill or removed from the carbon and destroyed by other methods.

For more information

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or call them at
(703) 603-9910.

Further information also can be obtained at **www.cluin.org** or **www.epa.gov/superfund/sites.**

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