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Catalytic Carbon Reduces Odor, Risk of Bed Fires

To reduce the risk of bed fires, the Leavenworth, Kan., wastewater treatment plant switched from using chemically impregnated carbon beds to catalytic-adsorptive carbon in its effort to control hydrogen sulfide odor.

Bed fires can break out when caustic chemicals used to reactivate impregnated carbon beds mix with the activated carbon in the presence of oxygen.

"One bed fire was enough for us," says Timothy Flora, superintendent of water pollution control for the city of Leavenworth. "After that we were open to any alternative that would eliminate the caustic regeneration and risk inherent in impregnated carbon."

Plant staff investigated safer alternatives and in March 1994 began using catalytic carbon beds from Calgon Carbon Corp. that are regenerated with water instead of chemicals. In the regenerating procedure, water is allowed to soak the activated carbon for about one hour. Reaction products, such as sulfuric and sulfurous acids, dissolve in the water and are removed with it. The backwashing cycle is repeated 6 to 12 times, and the acid-filled water from the first few cycles can be treated by draining it into influent at a rate that does not affect wastewater pH. The beds then are blown dry for 12 hours and returned online.

The entire regenerating process for catalytic carbon beds is two days, quicker than for impregnated chemical carbon beds, which usually remain off-line for a week, according to Flora.

The anticipated lifetime of the beds is two years, but the beds at Leavenworth still have one-third of their capacity after 18 months of use, Flora says. Plant personnel expect the beds' lifetime to stretch to four years, especially since staff have been adding a ferrous chloride solution to the headworks to reduce hydrogen sulfide in primary sludge holding tanks. The longer life also compensates for the beds' "slightly higher" capital cost when compared with chemically impregnated carbon beds, Flora says.