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Superfund Cleanup Stirs Troubled Waters

By ANTHONY DePALMA

LYNDHURST, N.J. — This is not what a Superfund site is supposed to look like. There are no rusting barrels, no antifreeze-green slime oozing up from the ground. There's just a deep bend in the serpentine Passaic River, a gaggle of pushy Canada geese and a lone rower in a single scull making good time on the calm, dark waters.

Yet Mile Marker 10.9 on the Passaic is most definitely a toxic hot spot. Testing late last year showed that five acres of shallow mud flats in the river here were highly contaminated with mercury, toxic chemical compounds called PCBs and dioxin, which is known to cause cancer. The discovery has sent environmental officials and a small army of corporations scrambling to remove thousands of cubic yards of sediment with plans to seal the rest beneath a permanent cap, all within the coming year.

That the hidden dioxin deposit was detected at all and the remediation put on such a fast track are results of an ambitious effort by the Environmental Protection Agency, which runs the federal Superfund program, to zero in on toxic targets that had been passed over for decades because they were too big, too costly and just too difficult to tackle.

More than three decades after the program was established by Congress to clean up the most heavily polluted sites in the country, either by forcing those responsible to pay or by covering the cost with money from a special fund, the agency is now taking on the most expensive and most technically complex cleanups ever attempted — large stretches of urban waterways where the pollution is out of sight.

But there are lingering doubts about the best ways to handle such immense cleanups. “The public wants this stuff picked up and hauled away,” said Michael A. Barbara, the technical consultant for the businesses that are being held responsible for cleaning up the Passaic. “But the reality is that sometimes the process of stirring up this stuff does more harm than leaving it in place.”

Even the most notorious hazardous-waste dumps on land pale beside the prospect of cleaning

up miles of riverbed — in which the slightest movement can stir up long-buried wastes that tides, floods, even motorboat traffic can spread upstream and down. Trying to predict how everything will work is so complicated that preliminary planning alone can cost more than an entire land-based cleanup.

But after years of study and some smaller pilot projects that met with varying degrees of success — and failure — the E.P.A. is finally tackling some of the most heavily polluted waterways. Many are in the New York-New Jersey area, which, since the beginning of Superfund, has had the greatest number of polluted sites.

Besides the Passaic, there is the major cleanup of PCBs, polychlorinated biphenyls, in the Hudson River, now in its final phase after a long period of government indecision and of resistance by General Electric, which consistently argued that the best approach was to simply leave the pollutants buried on the river bottom. In the last two years, under pressure from community groups and environmental organizations like Riverkeeper, the E.P.A. has added to the list the heavily polluted Gowanus Canal, in Brooklyn, and Newtown Creek, on the Brooklyn-Queens border.

Across the country, large cleanups are expected to begin soon in Oregon and Washington State, and remediation continues on the Housatonic River in Massachusetts and Connecticut.

Environmental officials say they have learned through trial and error that it can be far more effective to take an entire river system into account, rather than proceeding piecemeal. For example, this idyllic-looking stretch of waterfront in Lyndhurst is just a tiny part of the Passaic River Diamond Alkali Superfund site, which now also includes all of Newark Bay and the lower 17 miles of the river. Planning and cleanup work is going on elsewhere on the Passaic, but officials hope that addressing this hot spot with innovative technology now could speed the entire project.

Under the Superfund's "polluter pays" approach, companies that are responsible for the pollution can be forced to pay for the cleanup. But with rivers like the Passaic, which has been used by hundreds of businesses to dump industrial wastes for more than two centuries, identifying those responsible can be a legal nightmare. According to the E.P.A., more than 70 businesses will have to pay for the Passaic cleanup, which could cost more than \$3 billion.

In June, the agency reached an agreement with dozens of private companies to pay for removing 16,000 cubic feet of heavily contaminated sediment from the Lyndhurst hot spot. The area will then be capped and monitored until the agency selects a final cleanup plan for the entire stretch.

On top of the legal difficulties of this project, the Passaic is actually a tidal tributary of New York Harbor, meaning that there are two-way tides and a mixture of saltwater and freshwater that propel pollution both ways for miles. And because the Passaic presents a major flood hazard, any possible solutions must not impede the river's flow.

A Shaky Start

Part of the E.P.A.'s reluctance to dive into river cleanups can be explained by the Superfund program's difficult beginnings. As it got under way in 1981, it faced strong opposition from Republicans in Congress and the administration of President Ronald Reagan. When the program finally came up to speed during the Clinton administration, the priority was on upland sites, with rivers all but forgotten.

"It was discussed at the beginning, but clearly it was not the initial priority," said James J. Florio, the former New Jersey governor who as a member of Congress was the principal sponsor of the Superfund legislation. River cleanups, he said, are "very complicated and very difficult, with the possibility that dredging makes things worse."

The industrial opponents of Superfund have long argued that trying to clean rivers is a colossal waste of money. The United States Chamber of Commerce has criticized the program for its "unreasonable liability and cleanup standards," and says on its Web site that the program is "slow, ineffective, very expensive, and has managed to address very few sites."

From the beginning, Superfund's priority was "to keep people out of harm's way," said Steven Cohen, executive director of the Columbia University Earth Institute and a former analyst who helped the E.P.A. carry out the program. Polluted waterways, he said, do not pose a direct pathway of exposure.

The gravest danger in most of these rivers is that the chemical wastes taint organisms in the water that then poison fish that people may consume. More directly, the presence of the pollutants prevents people from fishing or swimming in the rivers.

Eric A. Goldstein, the New York City environment director for the Natural Resources Defense Council, said the E.P.A. performed a kind of triage during the early years of the Superfund. Rusting drums of toxic waste were the priority, even though the level of pollution in rivers was well known.

"Many waterways were simply written off," Mr. Goldstein said.

And the initial experience with river cleanups was not encouraging. One of the earliest projects undertaken was at Richmond Harbor, an inlet of San Francisco Bay. For 10 years, starting in

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spokesman, Mark Behan, said in an e-mail response to questions about the Hudson River project.

Developing Strategies

In the Passaic, there was a thick layer of dioxin from a Diamond Alkali plant in Newark that produced Agent Orange during the Vietnam War, buried beneath 12 feet of sticky sludge that people call “black mayonnaise.” The riverfront factory itself was demolished and buried on site years ago.

Getting down to the level of the dioxin would have stirred up the pollution and sent it streaming up and down the river with the tides. To prevent that, engineers built a steel cofferdam about 750 feet long and 100 feet wide. Several barges were maneuvered inside before the enclosure was completed.

Dredging inside the dam minimized the amount of hazardous material that escaped into the river. The sediment was loaded onto the barge, then screened and sifted and sent through a pipeline to a processing facility. Water is squeezed out and treated. The solids are put on rail cars and sent to Western landfills.

The dredging ended in June, with 41,000 cubic yards of sediment removed. The excavated river bottom is now being restored with clean fill.

Using dams to contain sediments may be possible on a small scale, but the E.P.A. considers all 17 miles of the lower Passaic potentially polluted. Dredging that area bank to bank would create some 11 million cubic yards of waste — enough to fill the Empire State Building eight times. Figuring out where to put it creates yet another problem.

The agency is encouraging the responsible companies to use alternative technologies to neutralize and dispose of contaminated sediment. Those processes, which include soil washing and thermal treatment, are considered promising, but they are untested at such a large scale; if successful, they could be used to treat sediment from the Gowanus Canal and Newtown Creek when those cleanups begin.

Federal officials acknowledge that every remediation method has drawbacks. But as Mr. Cohen, of the Earth Institute, points out, the Superfund program was sold to Congress on the basis of cleanup technology that didn't exist then, and doesn't exist today.

Still, Mr. Cohen said, the program should be considered a success. “If we hadn't had Superfund, we would have 30, 40, 50 million people in the direct pathway of exposure to toxic wastes.”

He believes that there will be more technological advances for cleaning up waterways. “Detoxification of sediment may be beyond our capacity now,” he said, “but someday it won’t be.”