A project designed by the Foth & Van Dyke team to demonstrate effective sediment removal at Deposit N.
The presence of polychlorinated biphenyls (PCBs) in the lower Fox River has long been a concern. PCBs are compounds that were discharged by some area industries in the 1950s, '60s and '70s as part of carbonless copy paper manufacturing, paper de-inking and the recycling process.

PCBs may cause health problems to people who consume contaminated fish. The actual health risk depends on the amount and type of fish consumed. As a result, consumption advisories have been issued and other restrictions imposed on recreational use of the river.

The Wisconsin Department of Natural Resources (WDNR) has identified a small sediment deposit (Deposit N) near the villages of Kimberly and Little Chute as a prime location for a PCB cleanup demonstration project. The project is part of a continuing program by the WDNR, the U.S. Environmental Protection Agency (EPA), local paper companies and others to work together in restoring the Fox River.

**Health Issues**

PCBs attach to sediment in the river and accumulate in the tissues of bottom-feeding organisms, fish, birds and animals, where they have been linked to deformities and reproductive problems. New research also suggests a possible connection between PCBs and lower IQs in children whose mothers consumed PCB-contaminated fish during pregnancy.
It is estimated that 250,000 pounds of PCBs were released into the Fox River. About 160,000 pounds have flowed into Green Bay and Lake Michigan. The balance remains in the Fox River. An estimated 600 pounds reach Lake Michigan yearly. Studies done between 1989 and 1992 show that contaminated sediment in the Fox River is the major source of PCBs in Green Bay.

Project Goal

The goal of the demonstration project is two-fold: to remove PCB-laden sediment from the site using proven technologies that protect human health and the environment, and to help restore part of the river as a result of the sediment removal.

During the project, important information will be gathered regarding:

- Public input on cleanup activities
- Costs of sediment removal, transport and disposal
- Recovery of the river following cleanup

This information will help guide restoration of other areas of the Fox River that contain PCBs.
Why the Deposit N Site?

Studies have identified 34 PCB sediment deposits in the Fox River upstream of DePere. Several factors make Deposit N a good location for a cleanup demonstration project.

First, is the size of the deposit. At nearly three acres, Deposit N is small enough to clean-up in a relatively short time, yet large enough to yield good information that can be applied to other deposits. Second, the deposit is isolated from underwater and land-based obstacles that would make the removal process more difficult. Third, the deposit has one of the highest average concentrations of PCB sediments in the river, about 45 parts per million. Removing the deposit will have a positive impact on the health of the river.

Sediment Removal

A hydraulic dredge will be used to remove sediment from Deposit N. The dredge collects sediment from the bottom of the river using a powerful pump, the same way a vacuum cleaner uses suction to remove dirt from carpet. The dredge 1.) collects water with the sediment, like air in the vacuum cleaner, and pumps this
sediment/water slurry through a discharge pipe to an on shore treatment site.

At the treatment site, screens and hydrocyclones 2.) remove materials like rocks and logs. 3.) Settling agents are added to promote solids/water separation. 4.) Solids are separated in a settling basin. 5.) Water is pumped to an on-site treatment plant before being returned to the river. 6.) A belt filter press removes additional water from the sediment. 7.) Dried sediment is transported by truck for disposal.

**Sediment Disposal**

Treated, dried sediment from Deposit N will be disposed of in a licensed, engineered landfill. The WDNR and the U.S. EPA have developed stringent rules to govern the design and operation of landfills licensed to accept these sediments. The landfill will have comprehensive environmental protection features including a liner, leachate collection and treatment and groundwater monitoring systems. Sediments will be isolated from other landfill wastes.

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**Cross Section of a Landfill and Landfill Liner**

1 - 3 Drainage layers of sand and gravel underneath waste
4 Pipe that collects leachate filtering through waste
5 A plastic liner that contains and directs leachate to a collection pipe
6 Four feet of compacted clay as back-up to the plastic liners
Environmental Protection and Monitoring

To meet stringent state and federal laws, the project will incorporate extensive environmental controls to protect human health, wildlife, water, air and soil.

A special containment system installed around the deposit will ensure that if sediments are resuspended during construction, they will remain within the containment system and be removed in the cleanup process. The containment system consists of a high-density polyethylene (HDPE) curtain anchored to the river bed and buoyed by flotation devices. The curtain will act as a flexible wall, effectively preventing sediments from flowing downstream with the current.

Water quality will be monitored continuously at several locations upstream, downstream and adjacent to the project area. Monitoring equipment will be linked to a computer system to generate an ongoing record of water quality at the site. An alarm system will immediately notify operators of unacceptable conditions.

Similar Project Examples

The sediment removal technology used at Deposit N has been proven safe and effective on other PCB cleanup projects, including:

- Manistique River, Michigan
- Waukegan Harbor, Illinois
- Calumet Harbor, Illinois
- Willow Run, Michigan
- New Bedford Harbor, Massachusetts
- St. Lawrence River, New York
Permitting Process

Local, state and federal laws and permits regulate all aspects of the Deposit N sediment removal project. Public input is an important part of the process. Several permits and assessments are required to complete the Deposit N cleanup including:

- WDNR Chapter 30/31 permits, which regulate dredging, shore land and in-stream activities
- U.S. Army Corps of Engineers (COE) permits, which regulate structures in the waterway and dredging
- A WDNR WPDES permit which regulates wastewater treatment and discharge
- An Environmental Assessment (EA) which describes the overall impacts, benefits and consequences of the project and provides for public input and comment
- WDNR solid waste transport and disposal authorization
- Various local zoning permits
- An access agreement with Inter Lake Papers, a nearby papermaker that is not a source of the deposit, but is cooperating with WDNR on the project

Schedule

Permit work is scheduled to be completed by July 1998 and treatment site construction is scheduled to begin in August 1998. Dredging is scheduled to start in September. Construction and dredging operations will comply with local noise regulations and will be scheduled to minimize disturbance to residents. Project completion is targeted for December 1998.

After the project is completed, the on shore treatment facilities will be dismantled, and the site will be restored to its original condition, graded, seeded and fertilized.

Who is Responsible for and Paying for the Project?

The WDNR is managing the Deposit N project. Funding is being provided by the Fox River Coalition, which includes local municipalities, industries, environmental groups, the U.S. EPA and the WDNR.

Other State & Federal Plans

The Deposit N cleanup is designed to integrate with current WDNR and EPA assessment and restoration activities on the river. In addition, WDNR is working with a wide range of groups including local and tribal governments, industries, federal agencies, environmental groups and others to guide the planning process for restoring the river. We value public input and encourage citizens to attend public meetings on Fox River issues.

How to Stay Informed

Public involvement will help shape the future of the Fox River. To learn more about the Deposit N sediment cleanup demonstration project, access the WDNR web site at www.dnr.state.wi.us/org/water/wm/lower fox. Or contact Bill Fitzpatrick at (608) 266-9267 for more information or to be added to the WDNR project mailing list.

Public meetings will be an important part of the process as well. Meeting notices will appear in local newspapers and on radio and TV.
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Fox River Deposit N Removal Project

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