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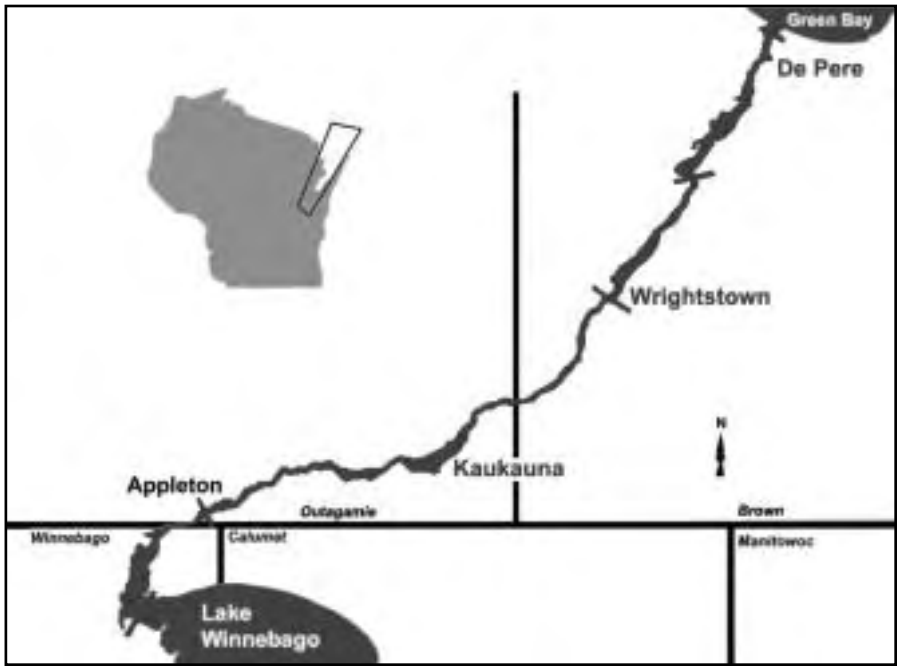
Proposed Plan Summary for Cleanup of the Lower Fox River and Green Bay Site

Northeast Wisconsin **October 2001**



Lower Fox River Site Location Map

▼ IN SUMMARY…

DNR and EPA propose these alternatives for the following Fox River reaches and Green Bay.

Little Lake Butte des Morts
Dredge and off-site disposal
Cost: $58 million

Appleton to Little Rapids
Monitored natural recovery
Cost: $10 million

Little Rapids to De Pere
Dredge and off-site disposal
Cost: $31 million

De Pere to Green Bay
Dredge and off-site disposal
Cost: $170 million

Green Bay
Monitored natural recovery
Cost: $40 million

Total Cost: $309 million

More detailed information about the proposed cleanup alternatives begins on page 8.

This proposed plan summary[1] identifies proposed cleanup alternatives recommended by the Wisconsin Department of Natural Resources and U.S. Environmental Protection Agency for the Lower Fox River and Green Bay site[2]. It provides the reasons for these recommendations and describes other alternatives considered.

DNR and EPA invite public input on the cleanup proposals. This summary describes how the public can provide input. Based on new information obtained through public comments, the agencies may modify the proposed alternatives or select others described here or in the feasibility study.

[1] Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act requires the publication of a notice announcing the proposed plan and a brief analysis. It also requires an opportunity for a public hearing and comment period. This proposed plan summary summarizes the *Proposed Remedial Action Plan* issued in October 2001 and information detailed in other site-related reports available in the administrative record.

[2] The official site name as proposed on EPA's Superfund National Priorities List is the Fox River NRDA/PCB Releases site.

Site Description

The Lower Fox River and Green Bay site includes the 39-mile Fox River from Lake Winnebago to the City of Green Bay and Lake Michigan's Green Bay.

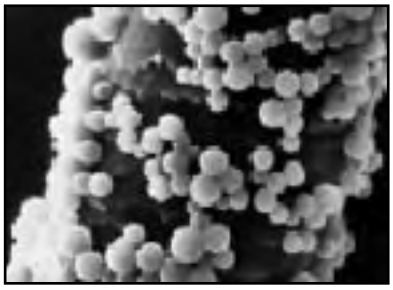
The Fox River varies in depth, current, PCB sediment concentrations and distributions, lock and dam structures, and other properties. As such, DNR and EPA divided the river into four river "reaches," and Green Bay into "zones." Operable unit or OU, a term used in EPA's Superfund program to denote a distinct cleanup area, is used interchangeably with river reaches and Green Bay zones in site documents. The river reaches and bay zones and the corresponding operable units are:

Little Lake Butte des Morts Reach	**OU1**
Appleton to Little Rapids Reach	**OU2**
Little Rapids to De Pere Reach	**OU3**
De Pere to Green Bay Reach (Zone 1)	**OU4**
Green Bay Zones 2-4	**OU5**

PCBs, or polychlorinated biphenyls, are a chemical family of more than 200 different chlorinated aromatic compounds.

PCBs were used in carbonless copy paper, electrical equipment, hydraulic fluids and other industrial products. Most of the PCBs in the Fox River and Green Bay sediment resulted from the manufacture and recycling of carbonless copy paper. EPA banned most uses of PCBs in 1977. PCBs exhibit a resistance to wear and chemical breakdown. But these same properties that made PCBs valuable in industry make them harmful to the environment because they accumulate in the fatty tissue of fish and other animals, including humans. In animals, numerous scientific studies have linked PCB exposure to reproductive failures, impacts upon the nervous and immune systems, and cancer. In people, PCBs have been linked to slowed learning in children and reduced ability to fight infection. EPA has classified PCBs as probable human carcinogens (cancer-causing chemicals).

PCB Emulsion



Sediment is loose particles of sand, clay, silt and other substances that settle to the bottom of a body of water.

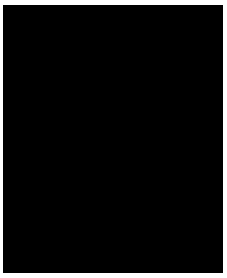
Site History

Between 1954 and 1971, paper mills[3] in the Lower Fox River Valley manufactured or recycled carbonless copy paper containing PCBs. Until the 1970s, the mills discharged the PCBs into the Fox River where they settled into river sediment or were carried out into Green Bay. Due to elevated levels of PCBs in fish tissue and a growing knowledge that PCBs were harmful to people and the environment, DNR issued fish consumption advisories for the river and Green Bay in 1976. These were followed by waterfowl consumption advisories for the river and Green Bay in 1987. The State of Michigan issued fish consumption advisories for Green Bay in 1977. Advisories remain in effect today.

Studies estimate that over 95 percent, or 160,000 pounds, of the PCBs entering Green Bay from numerous sources come from Fox River PCB-contaminated sediment. An estimated 300 to 500 additional pounds are flushed from Fox River sediment every year. PCBs released into Green Bay and Lake Michigan are extremely difficult to remove.

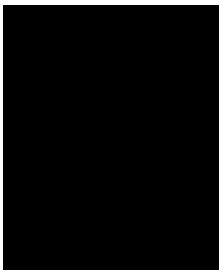
[3] State and federal governments have identified seven companies as potentially responsible parties because they discharged PCBs into the river or because they acquired companies that did. The companies include Appleton Papers Inc., Georgia-Pacific Corp. (formerly known as Fort James Corp.), NCR Corp., P.H. Gladfelter Co., Riverside Paper Corp., U.S. Paper Mills Corp. and WTM I Co. (formerly known as Wisconsin Tissue Mills, Inc.).

Since the mid-1980s, a number of governmental and other organizations have studied the contamination problem. In 1997, six federal and state agencies and tribal governments signed an agreement to work together to clean up and restore the Fox River. That same year, EPA proposed to add the Lower Fox River and Green Bay site to EPA's National Priorities List.



The cleanup and restoration of the Lower Fox River and Green Bay site depend on the independent and collaborative efforts of federal, state, tribal and local agencies, industry, environmental organizations, and the public.

The Superfund law authorizes agencies such as EPA or DNR to allow or oversee a cleanup and it gives several other federal and state agencies and tribal governments — natural resource trustees — authority for restoration of natural resources (e.g., fish, wildlife, public use of waterways) damaged by contamination. At this site, the natural resource trustees are DNR, U.S. Fish and Wildlife Service, National Oceanic and Atmospheric Administration, Menominee Indian Tribe of Wisconsin and Oneida Tribe of Indians of Wisconsin.



DNR and EPA relied on a number of studies in developing the alternatives proposed here. The public is invited to review these documents as they provide greater detail than the information provided in this proposed plan summary.

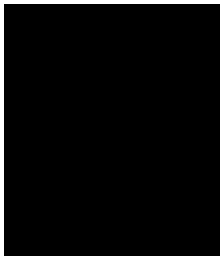
The *Remedial Investigation Report* compiled, reviewed and organized available information on the Fox River and Green Bay's physical characteristics, wildlife and contaminants. Included in the appendices are two reports, the *Data Management Summary Report*, which summarizes data use issues, and the *Time Trends Analysis*, which provides information on PCB concentrations in fish tissue and sediment over time.

The *Baseline Human Health and Ecological Risk Assessment* identified potential risks to people and wildlife from exposure to PCBs and other contaminants in the river and bay. It also developed the cleanup goals used to compare and evaluate the different cleanup alternatives.

The two-volume *Feasibility Study* developed a range of cleanup alternatives and evaluated them against the set of nine criteria described on page 7. It also evaluated a range of sediment cleanup levels to assess their effectiveness in reaching cleanup goals. Included in the appendices are three reports: *Sediment Technology Memorandum, Draft Long-Term Monitoring Plan, and Review of Natural PCB Degradation Processes in Sediment.* The sediment memo summarizes various sediment remediation case studies. The monitoring plan serves as a draft of possible requirements for post-cleanup monitoring. The degradation report provides a literature review of studies on the natural biodegradation processes of PCBs in sediment.

A two-volume *Model Documentation Report* describes sediment bed map construction and the computer models used to estimate the movement and concentrations of contaminated sediment over time in sediment, surface water and wildlife.

The *Proposed Remedial Action Plan* identifies a proposed cleanup plan for each river reach and the bay. It also describes the site history and background, and briefly describes and compares various cleanup alternatives.



DNR and EPA proposed the alternatives described in this summary because they provide the best balance of tradeoffs with respect to a set of criteria required by Superfund regulations.

A remaining criterion, community acceptance, will be evaluated after the public comment period. The agencies will consider comments received during the comment period before choosing a final cleanup plan for the site. DNR and EPA will respond, in writing, to comments in a document called a responsiveness summary, which is part of the *Record of Decision*, or ROD. The ROD is a document formalizing the final cleanup plan. Once this document is final and signed by EPA and DNR, it will be announced in local newspapers, placed in the site information repositories, and posted on agency Web sites. At that time, DNR and EPA expect to meet with potentially responsible parties to discuss their doing the cleanup work.

Evaluated

DNR and EPA considered more than 100 different technologies for addressing PCB-contaminated sediment. Through a complex screening process described in the feasibility study, seven general alternatives, incorporating 25 technologies, were formulated and retained for further evaluation. The cleanup alternatives ultimately proposed for each river reach and Green Bay are derived from one of the alternatives or a combination of the alternatives described below.

A. No Action

This alternative relies on natural processes such as degradation, dispersion and burial to reduce the movement, amounts and/or concentrations of PCB-contaminated sediment. Cost estimates for this alternative include the expense of the sampling needed to maintain consumption advisories. Superfund regulations require that the lead agency use a no-action alternative as a baseline against which to compare other alternatives.

B. Monitored Natural Recovery

As in the no-action alternative, this alternative relies on natural processes to break down, dilute or bury contaminants. However, it also includes a long-term monitoring program to track trends in contaminant concentrations over time in sediment, water, invertebrates (e.g., insects, clams, worms), fish and birds.

In addition, this alternative relies on legal or administrative measures, called institutional controls, to limit access or use of the resource. These controls are likely to include continued fish consumption advisories, but could also include land-use restrictions, dredging moratoriums, domestic water supply restrictions and access restrictions to limit or prevent the exposure to PCB contamination. This alternative can be effective in areas with low concentrations of PCBs or in areas where exposure to contaminants by people or wildlife is low. When used as the sole alternative, costs include expenses associated with monitoring for 40 years and public education programs for fish advisories.

Monitored natural recovery is a component of all proposed alternatives for the Lower Fox River and Green Bay site.

Dredging is the in-water excavation of sediment. Many different types of dredges can be used. Hydraulic (e.g., horizontal auger and cutter head) and mechanical (e.g., clamshell bucket) dredging are common techniques. In designing a dredging project, a number of factors must be considered including physical obstructions, site access, staging areas, potential release of contaminants during dredging and community disturbance.

C. Dredge and Off-Site Disposal

In this alternative, a hydraulic dredge excavates PCB-contaminated sediment of a specific concentration, referred to as a cleanup level. Near-shore property is necessary for temporary equipment staging and docking of dredges. Floating pipelines are constructed to move sediment from the dredging area to the on-shore staging area. Once on shore, sediment can remain or be transported via truck or pipeline for further processing. Either way, sediment is dewatered by mechanical presses or in large ponds in which sediment settles and water evaporates. In this alternative, dewatered sediment is disposed of in a state-approved landfill, and the extracted water is treated and tested to ensure water quality guidelines are met prior to discharge back into the river.

D. Dredge to a Confined Disposal Facility

Under this alternative, contaminated sediment is dredged as described in Alternative C. However, sediment with PCB concentrations below 50 parts per million is placed in a combined disposal facility or CDF. A CDF is an engineered containment structure that provides both dewatering and a permanent disposal location. If a near-shore facility is used, steel pilings or earthen berms are placed along the waterside and the facility is capped with a clean soil cap once it is filled to capacity. If an in-water facility is used, contaminated sediment is placed into a watertight enclosure which is then capped with clean soil. Possible locations for near-shore facilities have been identified in Little Lake Butte des Morts and the De Pere to Green Bay reach. An existing in-water facility in Green Bay has been identified as a possible disposal location. Under this alternative, sediment with PCB concentrations of 50 ppm or more is taken to an off-site location for disposal in an approved local landfill.

E. Dredge and High-Temperature Thermal Desorption

This alternative involves dredging the contaminated sediment as described in Alternative C. However, instead of disposing dewatered sediment in a landfill, it undergoes high-temperature thermal treatment. This technology involves heating sediment to very high temperatures, forcing contaminants in the sediment to evaporate. These volatilized contaminants are collected from the air in the system and disposed of in an approved facility.

F. In Situ (In-Place) Capping

In this alternative, sediment is left in the river bed and is covered with a layer of clean sand overlaid with graded armor, stone and/or rocks of different sizes. The cap provides a barrier that isolates contaminated sediment from the river. A capping alternative typically requires long-term site access restrictions, monitoring and maintenance to ensure the cap remains in place. This alternative requires careful consideration of physical characteristics of the water body as well as recreational and commercial activities. These include dredging of navigational channels, river currents, vessel propeller wash, flow velocity, water depths, and water and ice scour.

G. Dredge to a Contained Aquatic Disposal Facility

This alternative involves dredging the contaminated sediment as described in Alternative C. However, instead of disposal in a landfill, excavated sediment is moved to a natural or excavated depression in the water body and capped as described in Alternative F. This alternative is technically feasible only in Green Bay.

Table 1 identifies the alternatives that were considered for each river reach and Green Bay.

ALTERNATIVES EVALUATED BY REACH AND ZONE

Alternative Description	Lower Fox River Reaches				Green Bay Zones (OU5)			
	Little Lake Butte des Morts (OU1)	Appleton to Little Rapids (OU2)	Little Rapids to De Pere (OU3)	De Pere to Green Bay Zone 1 (OU4)	Zone 2	Zone 3A	Zone 3B	Zone 4
A. No Action	✔	✔	✔	✔	✔	✔	✔	✔
B. Monitored Natural Recovery	✔	✔	✔	✔	✔	✔	✔	✔
C. Dredge and Off-Site Disposal	✔	✔	✔	✔	✔	✔		
D. Dredge to CDF	✔		✔	✔	✔	✔	✔	
E. Dredge and Thermal Treat	✔	✔	✔	✔				
F. Cap	✔		✔	✔				
G. Dredge to Aquatic Facility					✔	✔	✔	

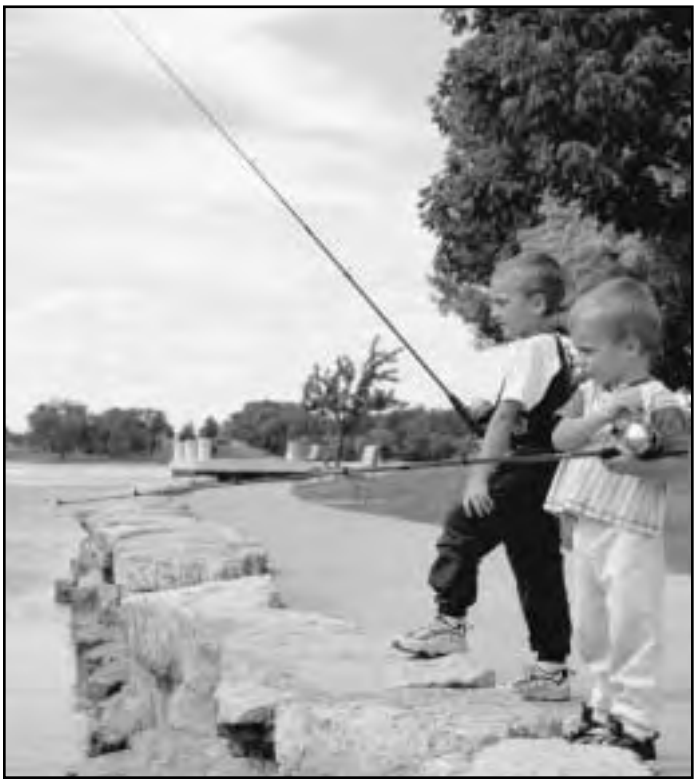
TABLE 1

DNR and EPA conducted a risk assessment to identify which contaminants could harm human health and the environment and to determine the level of cleanup needed. The risk assessment included the following elements:

- Identified harmful contaminants.
- Determined ways people and wildlife might be exposed to those contaminants (called exposure routes).
- Assessed the potential human health effects and impacts to wildlife.

To assess risk to human health, the assessment considered the possible effects (cancer and other health effects) of various chemicals to recreational anglers, high-intake fish consumers, hunters, drinking-water users, local residents, recreational water users and marine construction workers.

For ecological risk, the assessment focused on the impacts to invertebrates (e.g., insects, clams, worms) that live in water or sediment; fish; birds that primarily eat insects or fish; and fish-eating mammals. Tissue data were used to evaluate the existing risk of PCBs and other contaminants. Based on these studies, a sediment cleanup level (see page 7) was selected that would be low enough to protect human health and the environment.



Human Health Risk Findings

The risk assessment found that consumption of fish containing PCBs poses the greatest risks to human health. Consumption of fish containing mercury and DDE was also found to pose some risk.

Eating fish caught from the river or the bay is the main way people are exposed to PCBs. Recreational anglers who consume fish and high-intake fish consumers – people who depend on Fox River or Green Bay fish for a substantial portion of their diet – are particularly at risk. Risks to recreational and high-intake anglers were found to be similar. In general, cancer risks were found to be up to 1,000 times higher for these groups than considered acceptable under federal regulations, and up to 100 times higher than state guidelines. Cancer risks were found to be 20 times higher than the risks of eating fish from Lake Winnebago, a lake where PCBs were not released by paper mills.

The assessment found that risks of other health problems such as reproductive failure, nervous-system impairment in infants and children, and immune system weakening, were nearly 40 and 50 times higher for recreational anglers and high-intake fish consumers, respectively, than considered acceptable under federal guidelines.

The assessment found that reducing the levels of PCBs in sediment is the most effective way to reduce health risks. While fish consumption advisories provide some protection, many people who eat fish are unaware of the advisories. Without the removal of contaminated sediment, it would take more than 100 years before the fish consumption advisories would no longer be needed.

Ecological Risk Findings

As with human health, the risk assessment found that PCBs in sediment posed the greatest risk to the environment compared to other river and bay contaminants. Animals are exposed to PCBs in three ways: eating contaminated food (mainly fish), ingesting contaminated sediment, and absorbing dissolved chemicals through the skin.

The risk assessment found that although PCBs pose some degree of risk to all Lower Fox River and Green Bay wildlife, at highest risk are fish-eating mammals (e.g., mink). Throughout the river, benthic invertebrates (i.e., insects, clams and worms that live in sediment and provide food for other wildlife) are also at high risk. However, the risk assessment found that PCBs pose risk or potential risk to meat-eating birds (e.g., eagles), fish-eating birds and fish in most of the river and bay.

Risks include reproductive failures in fish, deformities to the embryos of fish-eating birds, and reproductive and survival failures in fish-eating mammals. Studies found PCBs in eagle eggs at levels known to cause deformities to young birds. The risk assessment found that reducing the concentrations of PCBs in sediment would reduce risks to wildlife.

A part per million or ppm is a unit of measurement commonly used to express a chemical concentration. One ppm PCB means one part PCB in a million parts of a substance such as water or sediment.

Sediment Cleanup Levels

DNR and EPA selected a cleanup level of 1 ppm for areas where active cleanup is proposed to take place. Studies found that lower cleanup levels would not significantly reduce the time required to eliminate fish advisories or to achieve ecological protection. Cleanup levels higher than 1 ppm would not permit human health and ecological goals to be met for many decades. In river reaches where the proposed cleanup plan calls for dredging, the agencies' goal is to remove all sediment with PCB concentrations above 1 ppm. Based on technological limitations and experience gained from demonstration projects, however, this goal may not be attained everywhere.

The 1 ppm cleanup level represents PCB concentrations to be removed from the river, rather than the level safe for fish consumers or wildlife. This safe concentration is called the sediment quality threshold. Studies show that this level will not be reached until after dredging and a period of monitored natural recovery. In portions of the river and bay where no dredging is proposed, the studies show that the threshold will eventually be reached by natural processes alone.

Cleanup Alternative Evaluation Criteria

Superfund regulations require that the lead agency evaluate and compare possible cleanup technologies using the following nine criteria:

Threshold Criteria

1. **Overall protection of human health and the environment.** Assessment of the degree to which the cleanup alternative eliminates, reduces or controls threats to public health and the environment.
2. **Compliance with applicable or relevant and appropriate requirements.** An evaluation of whether or not the alternative complies with all other state and federal regulations, environmental or otherwise.

Balancing Criteria

3. **Long-term effectiveness and permanence.** The ability to maintain reliable protection of human health and the environment over time once cleanup goals have been met.
4. **Reduction of toxicity, mobility or volume through treatment.** An evaluation of how well a cleanup alternative reduces the harmful nature of the chemicals, the ability of the chemicals to move from the site into the surrounding area, and the amount of contaminated material.
5. **Short-term effectiveness.** The ability to protect human health and the environment in the short term. This criterion also considers the risks to workers and nearby residents in implementing the alternative.
6. **Implementability.** An assessment of how difficult the cleanup alternative will be to construct and operate and whether the technology is readily available.
7. **Cost.** A comparison of the costs of each alternative, including capital, operation and maintenance costs.

Modifying Criteria

8. **Support agency acceptance.** The degree to which the support agency agrees with the proposed alternative.
9. **Community acceptance**. The degree to which the local residents support the proposed alternatives. Community acceptance is evaluated after the comment period.

Sediment tends to accumulate in Little Lake Butte des Morts. Nine sediment deposits in this reach contain nearly 4,000 pounds of PCBs. About 90 pounds of PCBs move from Little Lake Butte des Morts to the Appleton to Little Rapids reach annually. Studies show that PCB concentrations in fish tissue are not significantly changing over time.

Proposed Cleanup Alternative – Dredge and Off-Site Disposal (Alternative C2)

DNR and EPA evaluated the alternatives outlined in Table 1 against the nine criteria described on page 7. As a result of this evaluation, the dredge and off-site disposal alternative is proposed. It includes the following:

- Excavating sediment with PCB concentrations greater than 1 ppm with a hydraulic dredge and disposing of the contaminated sediment in an approved landfill (to be identified later).
- Securing property for equipment docking and staging, sediment dewatering, water treatment, sediment storage and truck loading.

The goal for this reach is to remove nearly 800,000 cubic yards of PCB-contaminated sediment containing 3,700 pounds of PCBs and mercury. Dredging is expected to last about 6 years. Then a long-term monitoring program will be put in place to track the concentrations of PCBs in various media (e.g., water, sediment, wildlife).

As a result of dredging and a period of natural recovery, fish advisories should be unnecessary for recreational anglers within nine years of dredging completion. Ecologically safe levels are expected to be met in 14 to 29 years.

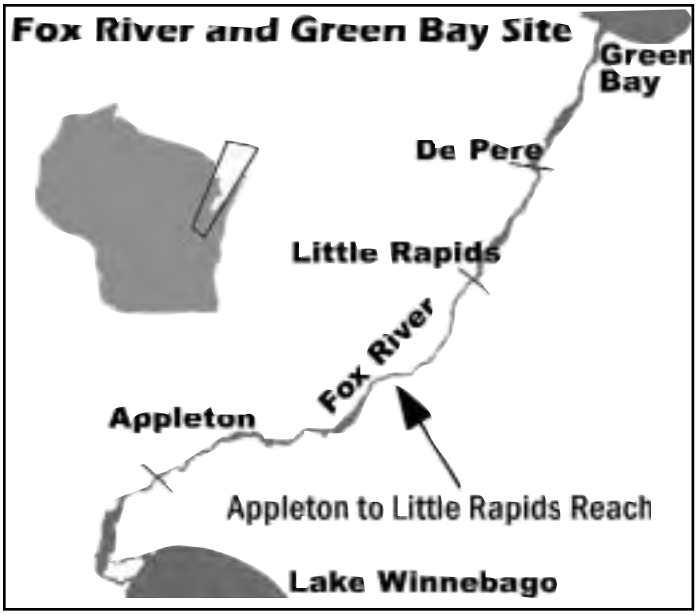
For a more complete description of this alternative and comparison to the other alternatives considered, please consult the proposed plan and feasibility study.

LITTLE LAKE BUTTE DES MORTS REACH (Operable Unit 1)

■ Fully meets criteria
▣ Partially meets criteria
☐ Does not meet criteria

	Alternative A No Action	Alternative B Monitored Natural Recovery	Alternative C Dredge and Off-Site Disposal (C1/C2)*	Alternative D Dredge and On-Site Disposal to a CDF	Alternative E Dredge and Thermal Treatment	Alternative F In Situ Containment (Capping)
Overall protection of human health and the environment	☐	☐	■	■	■	▣
Compliance with applicable or relevant and appropriate requirements	☐	▣	▣	▣	▣	▣
Long-term effectiveness and permanence	☐	☐	■	■	■	▣
Reduction of contaminant toxicity, mobility, or volume through treatment	☐	☐	■	■	■	▣
Short-term effectiveness	☐	☐	■	▣	▣	▣
Implementability	■	■	■	▣	▣	▣
Cost (in millions)	$4.5	$9.9	*C1: $108.1 C2: $ 57.6	$59.4	$161	$81.9
Support agency acceptance	*EPA agrees with proposed alternative C2.*					
Community acceptance	*Will be evaluated after the public comment period.*					

*C1 includes passive dewatering; C2 includes mechanical dewatering



The Appleton to Little Rapids reach is roughly 20 miles long and comprises a series of channels and pools controlled by seven dams and locks. Water tends to flow more rapidly in this reach than in Little Lake Butte des Morts and much less sediment has accumulated here than in the other river reaches. In fact, this reach tends to lose more sediment downstream than it accumulates. Twenty-two sediment deposits contain approximately 200 pounds of PCBs.

The numerous locks and dams and the natural physical structures—such as bedrock beneath many of the areas where contaminated sediment has accumulated—pose challenges to cleanup operations.

Proposed Cleanup Alternative – Monitored Natural Recovery (Alternative B)

DNR and EPA evaluated the alternatives outlined in Table 1 against the nine criteria described on page 7. As a result of this evaluation, the monitored natural recovery alternative is proposed. It includes the following:

- A 40-year monitoring program to measure PCB and mercury levels in water, sediment, invertebrates, fish and birds.
- Institutional controls (e.g., fish advisories) to limit human and environmental exposure to contaminants until the cleanup objectives are reached.

Studies estimate it will take 40 to 70 years for risks posed to recreational anglers to reach acceptable levels and from 70 to more than 100 years to meet safe ecological levels, depending on the species.

DNR and EPA consider this alternative appropriate for this reach because:

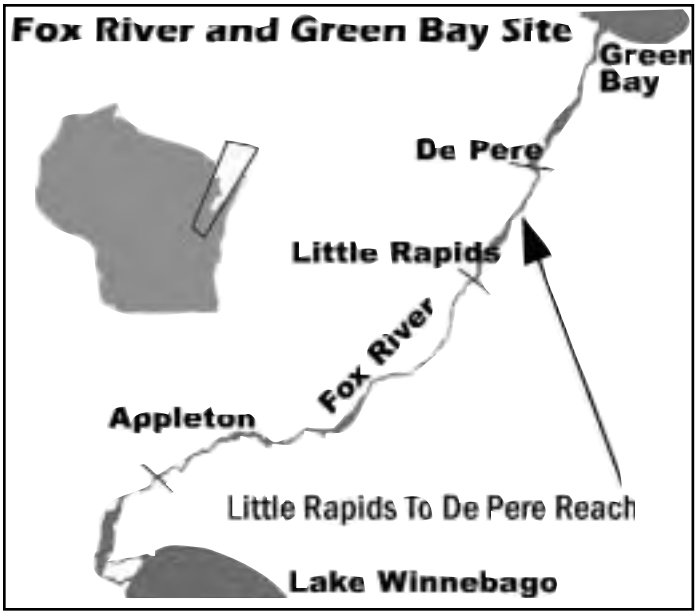
- Twenty-five percent of this reach's total PCB mass was removed during 1999 and 2000 dredging at Deposits N and O.
- Physical characteristics (e.g., bedrock) and the locks-and-dams system and a lack of possible staging areas present significant barriers to dredging or capping.

A possible modification to the proposed alternative is the dredging of sediment with PCB concentrations greater than 1 ppm from Deposit DD (located just upstream of the Little Rapids to De Pere reach) and the disposal of the contaminated sediment in an approved landfill. This would reduce the PCB mass in this reach by about 30 percent.

For a complete description of this alternative and comparison to the other alternatives considered, please consult the proposed plan and feasibility study.

APPLETON TO LITTLE RAPIDS REACH (Operable Unit 2)

■ Fully meets criteria ▣ Partially meets criteria □ Does not meet criteria	Alternative A No Action	Alternative B Monitored Natural Recovery	Alternative C Dredge and Off-Site Disposal	Alternative E Dredge and Thermal Treatment
Overall protection of human health and the environment	□	▣	▣	▣
Compliance with applicable or relevant and appropriate requirements	□	▣	▣	▣
Long-term effectiveness and permanence	□	▣	■	■
Reduction of contaminant toxicity, mobility, or volume through treatment	□	□	■	■
Short-term effectiveness	□	▣	▣	▣
Implementability	■	■	▣	▣
Cost (in millions)	$4.5	$9.9	$17.1-36.7	$18.7-49.1
Support agency acceptance	*EPA agrees with proposed alternative B.*			
Community acceptance	*Will be evaluated after the public comment period.*			



The Little Rapids to De Pere reach is about 6 miles long with water depths ranging from 6 to 18 feet. Four sediment deposits that lie over a large area contain nearly 2,200 pounds of PCBs. Water flow allows sediment to accumulate in this reach.

Proposed Cleanup Alternative – Dredge and Off-Site Disposal (Alternative C2)

DNR and EPA evaluated the alternatives outlined in Table 1 against the nine criteria described on page 7. As a result of this evaluation, the dredge and off-site disposal alternative is proposed. The proposed alternative is similar to that of Little Lake Butte des Morts and includes:

- Excavating sediment with PCB contamination greater than 1 ppm with a hydraulic dredge and disposing of the contaminated sediment in an approved landfill (to be identified later).
- Securing property for equipment staging.
- Constructing a pipeline to an off-site facility to be used for sediment dewatering in ponds, water treatment, and sediment disposal in an adjacent landfill.

The goal for this reach is to remove nearly 600,000 cubic yards of PCB-contaminated sediment. Dredging is expected to take about 5 years. Once complete, a long-term monitoring program will be put in place to measure concentrations of PCBs and mercury in various media (e.g., water, sediment, wildlife).

As a result of dredging and a period of natural recovery, fish consumption advisories are expected to be unnecessary for recreational anglers within 30 years. Ecologically safe levels are expected to be met in 22 to 43 years.

For a more complete description of this alternative and comparison to the other alternatives considered, please consult the proposed plan and feasibility study.

LITTLE RAPIDS TO DE PERE REACH (Operable Unit 3)

■ Fully meets criteria
▣ Partially meets criteria
□ Does not meet criteria

	Alternative A No Action	Alternative B Monitored Natural Recovery	Alternative C Dredge and Off-Site Disposal (C1/C2)*	Alternative D Dredge and On-Site Disposal to a CDF	Alternative E Dredge and Thermal Treatment	Alternative F In Situ Containment (Capping)
Overall protection of human health and the environment	□	□	■	■	■	▣
Compliance with applicable or relevant and appropriate requirements	□	▣	▣	▣	▣	▣
Long-term effectiveness and permanence	□	□	■	■	■	▣
Reduction of contaminant toxicity, mobility, or volume through treatment	□	□	■	■	■	▣
Short-term effectiveness	□	□	■	▣	▣	▣
Implementability	■	■	■	▣	▣	▣
Cost (in millions)	$4.5	$9.9	*C1: $90 C2: $30.9	$47.4	$34.6	$57.8
Support agency acceptance	*EPA agrees with proposed alternative C2.*					
Community acceptance	*Will be evaluated after the public comment period.*					

*C1 includes mechanical dewatering; C2 includes passive dewatering

The De Pere to Green Bay reach is about 7 miles long. Water depth in the main channel ranges from 6 to 24 feet. Over 90 percent of the Fox River's PCB contaminant mass is in this reach. The sediment is not in separate deposits, but rather in a large continuous mass of sediment of varying depths and contaminant concentrations. It is estimated that this reach contains over 58,500 pounds of PCBs.

Proposed Cleanup Alternative – Dredge and Off-Site Disposal (Alternative C2)

DNR and EPA evaluated the alternatives outlined in Table 1 against the nine criteria described on page 7. As a result of this evaluation, the dredge and off-site disposal alternative is proposed. It includes the following:

- Excavating sediment with contamination greater than 1 ppm with a hydraulic dredge.
- Securing property for equipment staging (the Bayport and former Shell facilities are possible locations).
- Constructing a pipeline to an off-site facility for sediment dewatering in ponds, water treatment, and sediment disposal in an adjacent landfill.

The goal for this reach is to remove nearly 6 million cubic yards of PCB-contaminated sediment containing approximately 58,100 pounds of PCBs. Dredging is expected to last about 7 years. Once dredging is complete, a long-term monitoring program will be put in place to measure concentrations of PCBs and mercury in various media (e.g., water, sediment, wildlife).

As a result of dredging and a period of natural recovery, fish consumption advisories are expected to be unnecessary for recreational anglers within 45 years. Ecologically safe levels are expected to be met in 20 to 45 years.

For a more complete description of this alternative and comparison to other alternatives considered, please consult the proposed plan and feasibility study.

DE PERE TO GREEN BAY REACH (Zone 1 or Operable Unit 4)

■ Fully meets criteria ▣ Partially meets criteria □ Does not meet criteria	Alternative A No Action	Alternative B Monitored Natural Recovery	Alternative C Dredge and Off-Site Disposal (C1/C2)*	Alternative D Dredge and On-Site Disposal to a CDF	Alternative E Dredge and Thermal Treatment	Alternative F In Situ Containment (Capping)
Overall protection of human health and the environment	□	□	■	■	■	▣
Compliance with applicable or relevant and appropriate requirements	□	▣	▣	▣	▣	▣
Long-term effectiveness and permanence	□	□	■	■	■	▣
Reduction of contaminant toxicity, mobility, or volume through treatment	□	□	■	■	■	▣
Short-term effectiveness	□	▣	■	▣	▣	▣
Implementability	■	■	■	▣	▣	▣
Cost (in millions)	$4.5	$9.9	*C1: $660.6 C2: $169.6	$505.1	$750.9	$357.1
Support agency acceptance	*EPA agrees with proposed alternative C2.*					
Community acceptance	*Will be evaluated after the public comment period.*					

*C1 includes mechanical dewatering; C2 includes passive dewatering

Green Bay extends from the mouth of the Fox River to the northern shores of Big Bay de Noc, about 120 miles away. It is estimated that the bay contains over 800 million cubic yards of sediment containing approximately 150,000 pounds of PCBs. This constitutes roughly 70 percent of the PCBs in the Lower Fox River and Green Bay system. Although fish advisories for many species remain in effect in Green Bay, fish studies indicate that PCB concentrations in fish tissue are decreasing over time.

A significant impediment to cleanup is the relatively low concentrations of PCBs spread over a large area in a very large large volume of sediment. This would require an extremely large disposal facility or multiple facilities.

Proposed Cleanup Alternative – Monitored Natural Recovery (Alternative B)

DNR and EPA evaluated the alternatives outlined in Table 1 against the nine criteria described on page 7. As a result of this evaluation, the monitored natural recovery alternative is proposed. This alternative is similar to that of the Appleton to Little Rapids reach and includes:

- A 40-year monitoring program to measure PCB and mercury levels in water, sediment, invertebrates, fish and birds.
- Institutional controls (e.g., fish advisories) to limit human and environmental exposure to contaminants until cleanup objectives are reached.

Studies estimate it will take more than 100 years for monitored natural recovery and institutional controls to reduce the human health and ecological risks to acceptable levels. However, studies estimate that even a dredging or capping alternative would likely require more than 100 years for risk reduction.

For a more complete description of this alternative and comparison to other alternatives considered, please consult the proposed plan and feasibility study.

GREEN BAY (Zones 2-4 or Operable Unit 5)

■ Fully meets criteria ▣ Partially meets criteria ☐ Does not meet criteria	Alternative A No Action	Alternative B Monitored Natural Recovery	Alternative C Dredge and Off-Site Disposal	Alternative D Dredge and Off-Site Disposal	Alternative G Dredge to Aquatic Disposal Site
Overall protection of human health and the environment	☐	☐	☐	☐	☐
Compliance with applicable or relevant and appropriate requirements	☐	☐	☐	☐	☐
Long-term effectiveness and permanence	☐	▣	▣	▣	▣
Reduction of contaminant toxicity, mobility, or volume through treatment	☐	☐	■	▣	▣
Short-term effectiveness	☐	▣	▣	▣	▣
Implementability	■	■	☐	☐	☐
Cost (in millions)*	$18.0	$39.6	$11-$507.2	$166.5-$2,254.1	$124-$2,107.4
Support agency acceptance	*EPA agrees with proposed alternative B.*				
Community acceptance	*Will be evaluated after the public comment period.*				

* Because of anticipated implementation issues, not all Green Bay zones were evaluated for all alternatives and cleanup levels. For example, $11 million under Alternative C represents the costs for this alternative in only Zone 3A. The reader should consult the feasibility study for zone-by-zone analyses and cost estimates.

DNR and EPA are interested in your comments on the proposed cleanup alternatives. The agencies will consider public comments before selecting a final cleanup remedy for the Lower Fox River and Green Bay site. You may use the space below to write your comments, then fold and mail this form. Comments must be postmarked by December 7, 2001. Comments may also be sent via email to Edward Lynch at FoxRIFS@dnr.state.wi.us. If you have questions, please contact any of the individuals listed on page 15.

OPTIONAL INFORMATION

Name _____

Affiliation _____

Address _____

City _____ State _____ Zip _____

Place
Postage
Here

Edward K. Lynch, P.E.
Fox River Project Manager
Wisconsin DNR (RR/3)
101 South Webster St.
P.O. Box 7921
Madison, WI 53707-7921

INFORMATION AND AGENCY CONTACTS

INFORMATION REPOSITORIES

Appleton Public Library
225 North Oneida St., Appleton, WI
Phone: (920) 832-6173
Location: Reference area 2nd floor (Outside study room)

Brown County Library
515 Pine St., Green Bay, WI
Phone: (920) 448-4381 Ext. 394
Location: Telephone reference area, 2nd floor

Door County Library
107 South Fourth Ave., Sturgeon Bay, WI
Phone: (920) 743-6578
Location: Reference section bottom shelf

Oneida Community Library
201 Elm St., Oneida, WI
Phone: (920) 869-2210
Location: Adult reference section

Oshkosh Public Library
106 Washington Ave., Oshkosh, WI
Phone: (920) 236-5200
Location: Reference section

DNR WEBSITE

http://www.dnr.state.wi.us/org/water/wm/lowerfox/

CONTACTS

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101 South Webster St.
P.O. Box 7921
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77 West Jackson Blvd.
Chicago, IL 60604-3590
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(312) 353-6646
(800) 621-8431 Ext. 36646

TIVE RECORDS

Wisconsin Department of Natural Resources
Lower Fox River Basin Team
801 East Walnut St.
Green Bay, WI
Contact: Kelley O'Connor (920) 448-5133
Please call for an appointment
Office Hours: 8:00 a.m. – 4:30 p.m.

EPA – Region 5
Records Center
7th Floor
77 West Jackson Blvd.
Chicago, IL
(312) 886-0900
Office Hours: 8:00 a.m. – 4:00 p.m.

Wisconsin Department of Natural Resources
Bureau for Remediation and Redevelopment
3rd Floor
101 South Webster St.
Madison, WI
Contact: Ed Lynch (608) 266-3084
Please call for an appointment
Office Hours: 8:00 a.m. – 4:30 p.m.

AND PUBLIC MEETING DATES

PUBLIC COMMENT PERIOD

October 5 to December 7, 2001

Comments can be mailed or E-mailed to Edward Lynch at the address below. Comments must be postmarked by December 7, 2001.

Edward K. Lynch, P.E.
Fox River Project Manager
Wisconsin DNR (RR/3)
101 South Webster St.
P.O. Box 7921
Madison, WI 53707-7921

E-mail: FoxRIFS@dnr.state.wi.us

PUBLIC MEETING DATES

October 29, 2001
Holiday Inn Select
150 Nicolet Rd. (US 41 and College Ave.)
Appleton

October 30, 2001
Oneida Radisson Convention Center
2040 Airport Rd.
Green Bay

Agenda for both days:

4:30 p.m. ***Open House***
DNR and EPA available to talk with residents. Residents can provide oral or written comments.

6:30 p.m. ***Formal Presentation***
Presentation of proposed plan and question and answer

7:30 p.m. ***Public Comments***
Oral comments will be accepted.

EPA

Official Business
Penalty for Private Use - $300

U.S. Environmental Protection Agency
Region 5
Office of Public Affairs (P-19J)
77 West Jackson Boulevard
Chicago, IL 60604-3590

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