

CASE STUDY - MAY 1988
WAUKEGAN HARBOR SUPERFUND SITE

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SITE BACKGROUND

1. **Where is the site located, how large is the site, and what are the major environmental problems and sources of contamination?**

The site occupies approximately 10 acres of Waukegan Harbor and portions of the Outboard Marine Corporation (OMC) property in Waukegan (Lake Michigan), Illinois. Sediments of the harbor are extensively contaminated with polychlorinated biphenyls (PCBs, at concentrations exceeding 10,000 mg/kg dry weight in some places) from chronic releases from OMC.

2. **Under what authority is this project being pursued?**

The Waukegan Harbor site is a federal Superfund site under U.S. Environmental Protection Agency (EPA) lead.

3. **What federal, state, and local agencies have either prime responsibility for the project or provide review and oversight? Did this involvement change over the course of the project?**

EPA has had prime responsibility for activities at the site since discovery of contamination in the early 1970s. Other key participants include U.S. Army Corps of Engineers (COE), U.S. Fish and Wildlife Service (FWS), National Oceanic and Atmospheric Administration (NOAA), Illinois EPA, Illinois Department of Conservation, and Illinois Department of Transportation.

4. **What is the time-frame, current status, and approximate cost of the project?**

Contamination of the site was first observed in the early 1970s. Several investigations have been completed since site discovery [including completion of the remedial investigation/feasibility study (RI/FS) process]. The total cost to date of studies, negotiations, and remedial design is approximately \$1.5 million. A Record of Decision (ROD) was signed in May 1984 for cleanup costs of \$21 million. The case has been in litigation since the signing of the ROD. EPA is currently negotiating a settlement with the potentially responsible party (PRP) to initiate remediation. In March 1985, EPA revised cleanup estimates to \$27 million based on preliminary remedial design. In OMC's 1986 annual report to taxpayers, the company listed \$15 million in environmental liability, suggesting that estimated cleanup costs range from \$15 to \$27 million.

SETTING PRIORITIES

1. **What factor prompted the initial focus on the site? Why was this site given priority over other potential sites in the region?**

This site was given high priority for action primarily for two reasons: 1) very high concentrations of PCBs were present in harbor sediments (in some places exceeding 10,000 mg/kg), and 2) there was a city of Waukegan emergency drinking water intake in the harbor.

2. **How were the magnitude and extent of the problem quantified (i.e., what factor drove the analysis of the problem)?**

PCB contamination of sediments in the harbor drove problem area definition. Data from several sediment surveys (surface sediments and sediment cores) defined the volume of contaminated material in the harbor. In addition to sediment surveys, surface water and fish have been sampled in the harbor, and soils and groundwater at the OMC facility have been sampled.

3. **What factor drove the selection and implementation of remedial action?**

The preferred alternative was selected primarily because of cost considerations for fund balancing. The alternative selected for maximum protection of human health and the environment had an estimated cost of \$75 million. The preferred alternative is a modification of this alternative.

4. **Were specific ranking methods applied to different phases of this project? Which methods were used?**

No ranking methods were used during the course of this project. Hot spots were identified as areas with sediment PCB concentrations in excess of 10,000 mg/kg dry weight.

CHOOSING ALTERNATIVES

1. **Who has formal responsibility for the scoping and final selection of the alternative?**

EPA and its contractor, FWS, and the Illinois EPA had prime responsibility for selecting the preferred alternative.

2. **What major alternatives were considered?**

Approximately 75 alternatives were considered for remediation in Waukegan Harbor. Alternatives were evaluated for *in situ* remediation, incineration, confinement in vaults, and various treatment technologies.

3. What procedure was used to evaluate the alternatives (e.g., cost benefit analysis, evaluation criteria matrix)?

Cost/benefit analysis (including consideration of human health and environmental impacts) was used to select the preferred alternative, with the final decision being driven by fund balancing. The area targeted for remediation was determined based on a combination of cost and environmental modeling. Modeling indicated that natural resources and human health would be acceptably protected with the removal of all sediment contaminated at levels at or above 100 mg/kg PCBs. Participating agencies applied a safety factor of 2 to this estimate, thus deciding to remediate all sediment contaminated with PCBs at concentrations at or above 50 mg/kg dry weight.

4. What alternative was chosen? Was there an overriding regulatory or programmatic requirement that drove the choice of the alternative?

In situ remediation was ruled infeasible early in the remedial evaluation process. The preferred alternative involves removal of sediment from hot spots, solidification, and disposal at a facility approved by the Toxic Substances Control Act (TSCA); and removal of all other contaminated sediment (i.e., with PCBs ≥ 50 mg/kg) and confined disposal on OMC property. Disposal on OMC property will consist of construction of 1) slurry walls to the depth of glacial till hardpan, and 2) an impermeable cap over the disposal areas. Dredging undertaken as part of this project will be coordinated with dredging in the federal navigation channel by the Corps of Engineers, with the net effect that all contaminated sediments (i.e., including those with < 50 mg/kg PCBs) will be removed from the harbor. It is estimated that at the conclusion of remediation, more than 99 percent of the PCBs present in Waukegan Harbor will have been removed.

IMPLEMENTING THE ALTERNATIVE

1. What major legislative or regulatory constraints were encountered during the implementation of the chosen alternative?

Remediation has not yet begun in Waukegan Harbor. The major constraint to remediation was posed by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), which allowed site access only for the purpose of engineering and investigation. CERCLA amendments under the Superfund Amendments and Reauthorization Act (SARA) removed this constraint by allowing for site access during remediation. There have been no constraints to the implementation of the dredging portion of site remediation.

2. What regulations were most useful in pursuing action? How were funds obtained?

Action was first pursued at this site under the federal Clean Water Act (CWA). Authority under the CWA was ill suited for addressing problems associated with Waukegan Harbor (i.e., contaminated sediment and the type of source and contaminant). Funding and the mechanisms for investigating and eventually remediating contamination at this site was

offered through Superfund (especially SARA for the onsite portion of remediation) and TSCA.

3. What mechanisms were established for communicating with local interests and the public? Did public perception of risks affect implementation of the project?

Public involvement during the ROD process included distribution of fact sheets and several public meetings attended by area residents and citizen groups, the Sierra Club, and Lake Michigan environmental groups. Public perception of risk has not affected the project to date. Human health risks from this site were quantified during the course of study and were generally acceptable to public users.

4. How long did it take, or is it expected to take, to implement the alternative?

The alternative has not yet been implemented. Once implemented, it is expected to be complete in 2 years.

5. What criteria were or will be used to measure the success of remediation?

Specifications for the removal of sediment were determined based on the knowledge of the volume (areal extent and depth) of contaminated material. Performance specifications will be strictly adhered to during dredging. Soundings and some additional sediment sampling will be conducted after dredging is complete to ensure that the specified grade lines were achieved.

6. How successful was the alternative in solving the problem identified during the setting of priorities?

Remediation of contamination in Waukegan Harbor has not yet begun.