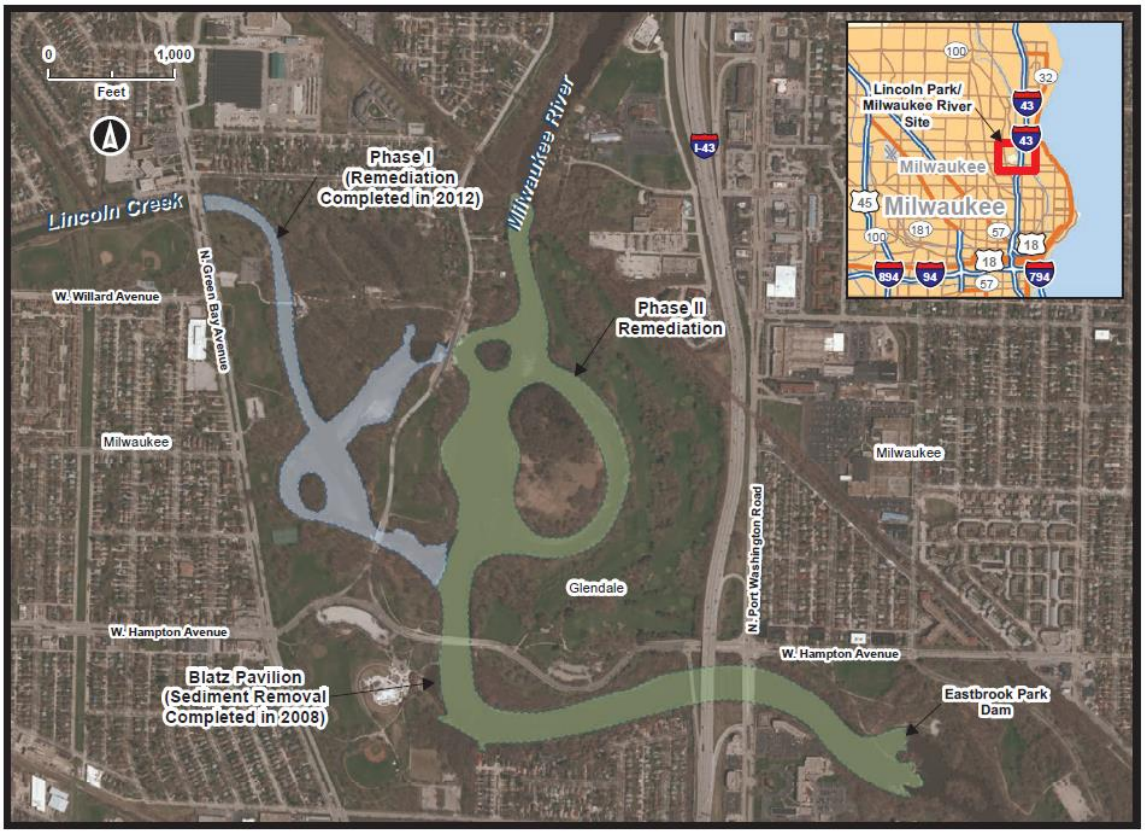
Great Lakes Legacy Act Clean Up Options for the Phase II Lincoln Park/Milwaukee River Channels Project

The U.S. Environmental Protection Agency Great Lakes National Program Office, Wisconsin Department of Natural Resources, and Milwaukee County Parks are studying options to clean up sediment in the Phase II area (Figure 1) of the Lincoln Park and Milwaukee River. The sediment is contaminated with PCBs, PAHs, and NAPL (see definitions and descriptions below) due to the area's long industrial past. This is the third and final portion of the site to be addressed, following the removal of contaminated sediment from adjacent to Blatz Pavilion in 2008 and from the Phase I area in 2011 (Figure 1). Approximately 125,000 cubic yards (or about 9,000 dump trucks) of sediment was removed. Habitat restoration is continuing in the Phase I area with native plantings, protective fencing, and riprap (rocks placed along the shore to prevent erosion).

Figure 1. Project Area Overview



What are PCBs?	What are PAHs?	What are NAPLs?
Polychlorinated biphenyls were used in industrial equipment in the U.S. until 1977, and persist in the environment. PCBs accumulate through the food chain, and are linked to health effects including increased cancer risk.	Polycyclic aromatic hydrocarbons are a component of petroleum products among others. PAHs can cause increased cancer risk and other ailments like skin rashes.	Non-aqueous phase liquids are oil products that dissolve slowly in water. NAPLs have an oily appearance and are harmful to fish, wildlife, and people.

Feasibility Study

A document called the Feasibility Study outlines cleanup goals and evaluates the options or "alternatives" for cleaning up contaminated sediment in Phase II. Alternatives are listed in Table 1. Sediment removal is the primary cleanup activity in all the alternatives identified, except for Alternative 1: No Action, which is considered only for comparison. The volume of sediment removed under any of the other alternatives is estimated at 21,000 cubic yards, or about 1,700 dump trucks.

Feasibility is based on six criteria:

1. Compliance with federal, state and local permits and applicable regulatory requirements
2. Long-term effectiveness
3. Short-term effectiveness
4. Engineering and technical ability to implement
5. Cost
6. Stakeholder and Community Acceptance (to be evaluated after public comments are received)

Alternatives Evaluation Criteria and Results

Each alternative was evaluated individually against the first five criteria, and then compared to the other alternatives. The results of the evaluation are summarized in Table 1.

The analysis ranked Alternatives 2 and 4 highest. Based on these rankings and the overall evaluation, Alternative 4, Dry Excavation, Hydraulic Dredging, and Offsite Disposal, is the recommended cleanup alternative. While most of the contaminated sediments would be removed using dry excavation similar to that used in Phase I, this alternative allows the flexibility to use hydraulic dredging to remove sediments where most practical.

The feasibility study also evaluated habitat restoration techniques that may be implemented in combination with the sediment cleanup alternative. These include restoration of disturbed wetlands, bank restoration, and turf and seeding of disturbed areas along the shorelines and in the park. Techniques appropriate to each area disturbed during the cleanup will be refined and developed during the next step, which will be to design the remedy selected in the final feasibility study.

Public Comments

A public information open house will be held on August 20, 2013. Following the open house, public comments received will be compiled and used to reevaluate the recommended alternative. A final proposed alternative will then be selected.

Table 1. Comparative Alternatives Analysis

Remedial Alternative	Description	Complies with Regulations for Implementation	Long-Term Effectiveness	Short-Term Effectiveness	Ability to Implement	Estimated Cost* (Million)
1. No Action	No additional remedial actions would be conducted. This alternative is for comparison only.	Yes	Worst	Low	High	$0
2. Dry Excavation and Disposal of Sediments	Water would be pumped from each area of the river where a contaminated sediment deposit has been identified for removal, and construction equipment would be used to excavate the contaminated sediments from the riverbed. All removed sediments would be transported offsite for disposal.	Yes	High	Moderate	High	$14.3
2a. Dry Excavation and Disposal of Sediments, with Particle Size Segregation	Identical to Alternative 2, with segregation of coarse material (sand, gravel) to decrease the amount requiring offsite disposal.	Yes	High	Moderate	Moderate	$14.6
3. Hydraulic Dredging and Disposal of Sediments	Would utilize hydraulic dredging to vacuum up the contaminated sediments from the river bottom as a slurry. Sediments would be transported offsite for disposal after the water is removed from the slurry.	Yes	Moderate	Moderate	Moderate	$17.3
3a. Hydraulic Dredging and Disposal of Sediments, with Particle Size Segregation	Identical to Alternative 3, with segregation of coarse material (sand, gravel) to decrease the amount requiring offsite disposal.	Yes	Moderate	Moderate	Low	$17.9
4. Dry Excavation, Hydraulic Dredging, and Disposal of Sediments	Combines dry excavation, used to remove most contaminated sediments, with hydraulic dredging used in areas where it is more practical. Removed sediments would be transported offsite for disposal.	Yes	High	Moderate	High	$13.4
4a. Dry Excavation, Hydraulic Dredging, and Disposal of Sediments, with Particle Size Segregation	Identical to Alternative 4, with segregation of coarse material (sand, gravel) to decrease the amount requiring offsite disposal.	Yes	High	Moderate	Moderate	$13.7

*Note: Cost estimates are subject to change.