



Lower Duwamish Waterway Cleanup



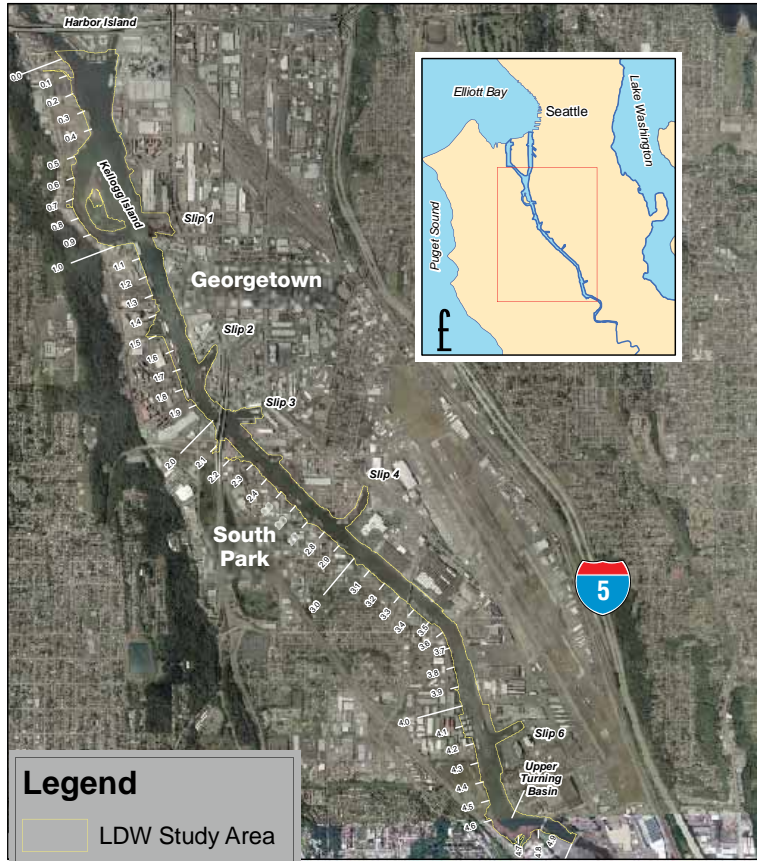
Fact Sheet

Planning for Cleanup

Learn about the draft cleanup alternatives for the Lower Duwamish Waterway, and how you can have a say in how cleanup moves forward!

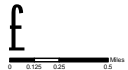
Lower Duwamish Waterway – Resources and Challenges

The U.S. Environmental Protection Agency (EPA) and the Washington State Department of Ecology (Ecology) are reviewing a draft study of cleanup alternatives for the Lower Duwamish Waterway, submitted by the Lower Duwamish Waterway Group, a partnership of City of Seattle, King County, Port of Seattle, and The Boeing Company. EPA and Ecology oversaw the preparation of the study and will direct final changes in consideration of public comments. We are asking for public input on a wide range of options to reduce toxic pollutants in the waterway. Past and present activities have left a legacy of chemical pollution in the waterway and in the sediment (mud at the bottom). This pollution comes from many sources, including industries along the waterway and stormwater runoff from upland activities, streets, and roads. The pollutants we are most concerned about include polychlorinated biphenyls (PCBs), dioxins and furans, carcinogenic polycyclic aromatic hydrocarbons (cPAHs), arsenic, and other chemicals. Many of these chemicals stay in the environment for a long time and have built up to unhealthy levels in the waterway and in the fish and shellfish that live there all year long. Because of these health risks to people and animals exposed to contaminated sediments, in 2001-2002, EPA and Ecology listed the 5-mile, 441-acre Lower Duwamish Waterway under the federal Superfund law and Washington's Model Toxics Control Act.



Legend

- LDW Study Area
- River Mile Marker



What's Wrong with the Lower Duwamish Waterway?

Health Risks to People and Animals

- Most health risks to people come from eating resident fish, crabs, and clams from the waterway; state and local health departments warn against eating crabs, shellfish, or bottom-feeding fish from the lower waterway. Salmon, which move quickly through the waterway, are less affected by site contamination.
- Repeated direct contact with contaminated sediments in some waterway areas may pose health risks, though it is safe today to play in most public areas, such as Duwamish Waterway Park.
- Chemicals in some areas affect animals that live in the mud such as worms and clams and pose risk for river otters and other wildlife.

Future Vision for the Duwamish Waterway

- Cleaning up contaminated sediments and reducing sources of pollution to result in a healthier environment for the fish and other animals that live in the waterway, and the people who live, work, and play here.
- Reduced risk for people eating seafood from the Lower Duwamish.
- Cleanup that supports community hopes for restoring habitat, adding public access, encouraging recreation, and retaining economic vitality.
- We will all benefit from a cleaner waterway in the future that continues to support navigation, industry, and commerce, including 100,000 jobs in the 8 square miles around the waterway.

A Lot is at Stake

- Cleanup of the waterway will take time, money, and patience – the options include tradeoffs to spur discussion before a specific cleanup plan is proposed.
- Your voice, as a member of the community and this region, is critical to help make decisions about the Duwamish cleanup.
- It's time to learn more, ask questions, provide your ideas now, and prepare to review the proposed cleanup plan in early 2012.
- Things to think about: What do you think are the most important considerations for evaluating cleanup alternatives? How would you like to be able to use the river in the future? What are your concerns about how the cleanup might impact you or your community?

Things to Watch

Controlling upland pollution sources – Reducing the pollution entering the waterway is critical to avoid new pollution and to help keep cleaned-up areas from becoming polluted again. Runoff from polluted upland sites and everyday urban activities continues to impact the waterway. Ecology has completed Source Control Action Plans for 15 of 24 basins that drain to the waterway. These plans call for more than 450 actions to reduce sources of pollution to the waterway. Many of these actions are under way, including 13 cleanup orders to investigate and clean up contaminated facilities nearby, and working to reduce sources from municipal, industrial, and sewer/stormwater outfalls.

Early action areas – Several hot spot areas will be cleaned up first. Two early cleanups were conducted; three more are in progress (see map on opposite page). Cleaning up early action areas first will reduce PCB contamination by about half.

Cleanup of the rest of the waterway – That's what you are reading about here – the draft Feasibility Study for cleaning up the rest of the waterway. Options for cleanup and how they measure up – that's the big story.

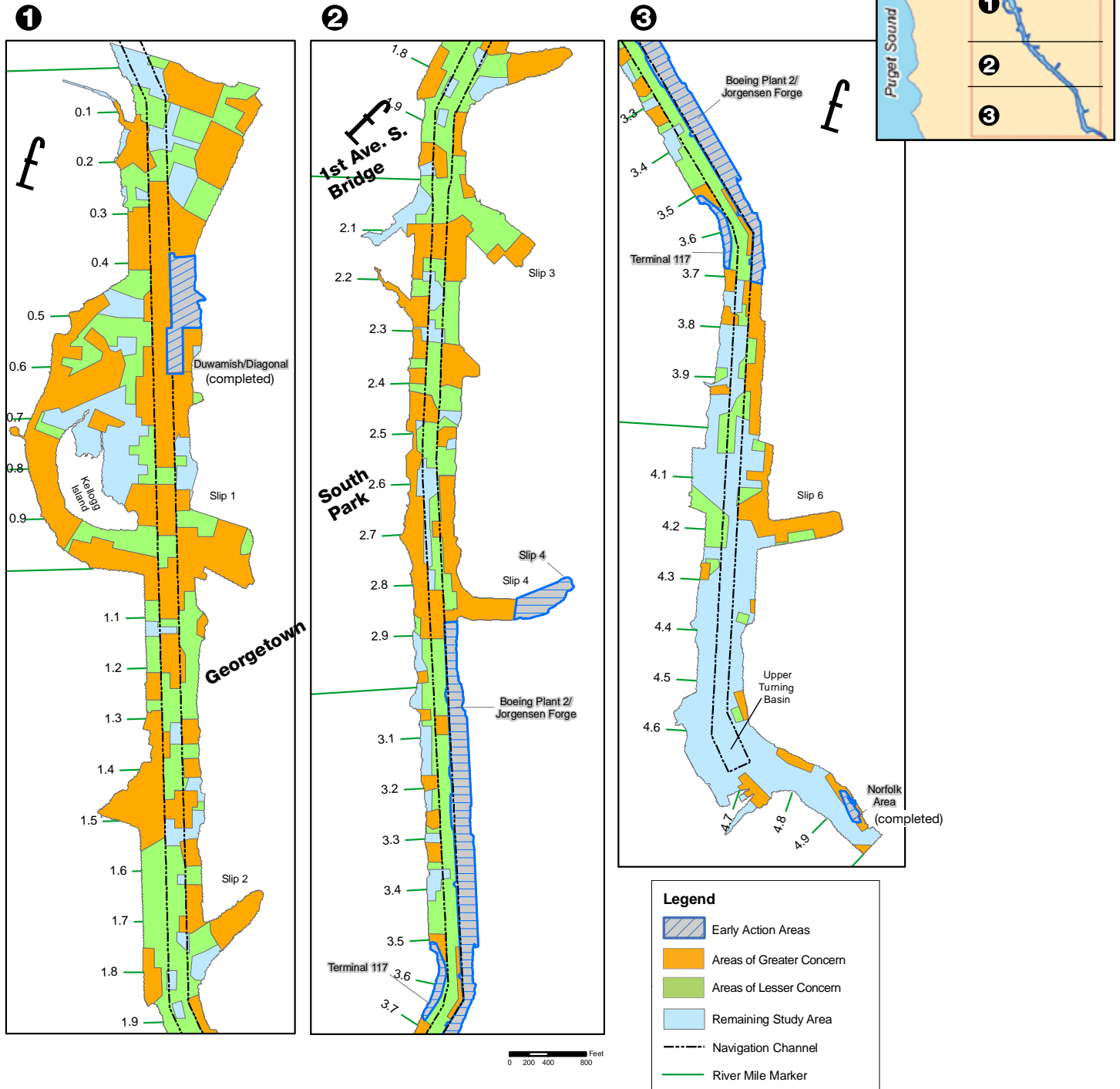


Where is the Pollution - and How Bad is It?

Chemicals of concern include:

- Polychlorinated biphenyls (PCBs)
- Polycyclic aromatic hydrocarbons (PAHs)
- Dioxins/furans
- Arsenic and other metals
- Phthalates

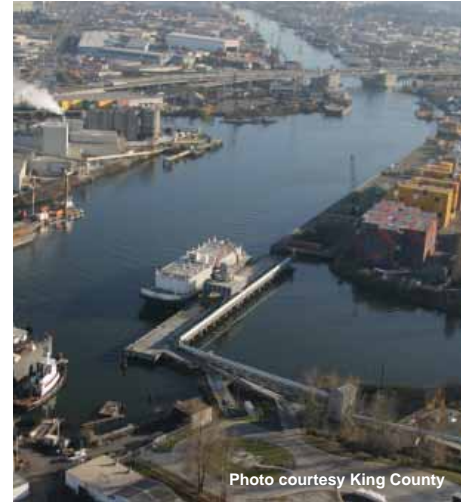
This 3-part map of the waterway shows sediment areas with chemical pollution that we may need to address. The draft Feasibility Study describes the options we could use to clean up these areas.



Cleaning Up the Duwamish Waterway – How Do We Do It?

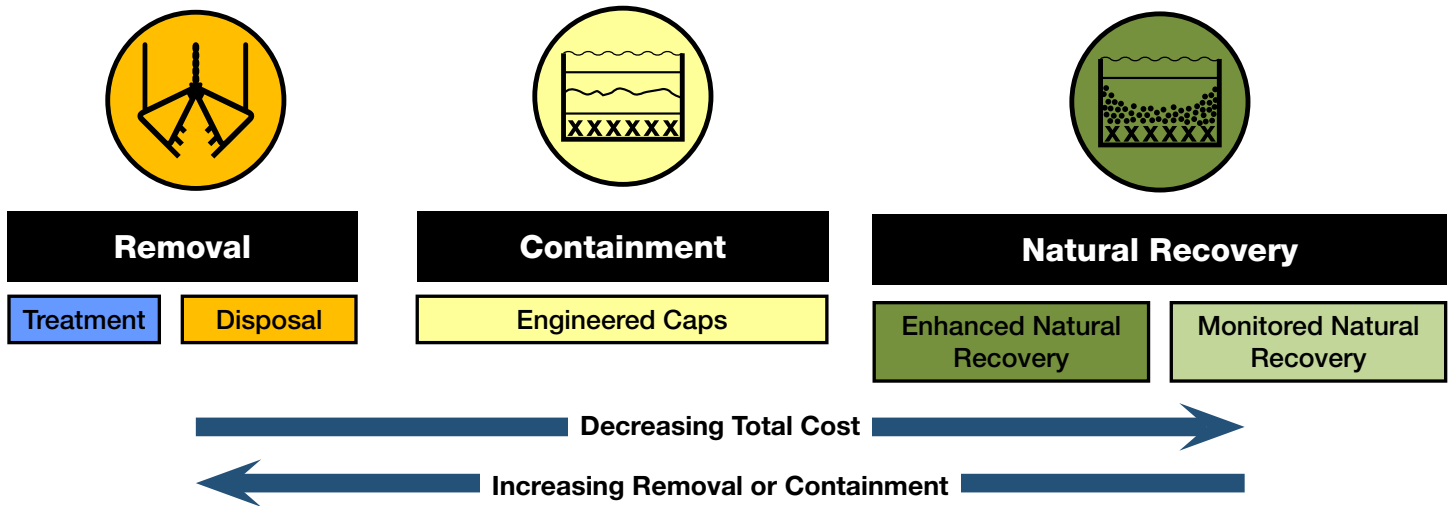
The goal of cleanup is to reduce the pollution in the waterway to levels that will protect people and animals. The draft Feasibility Study outlines the different methods available for cleanup, and describes a wide range of ways to combine those methods into cleanup alternatives. It evaluates these alternatives against regulatory requirements and compares predictions of how well they would work, their side effects, how long they would take, and how much they would cost.

The waterway is big, complex, and dynamic. On average, more than 100,000 metric tons of new sediment comes downstream from the Green River and settles in the waterway each year. This is enough to fill 12,000 dump trucks. Some areas of polluted sediment in the waterway are already being covered up with the cleaner sediment coming from upstream. Tidal influence from Elliott Bay is also significant. The waterway and surrounding land are used in many different ways, creating different impacts. With this complexity, we will need a range of methods to solve the problem.



Methods for Managing Contaminated Sediments

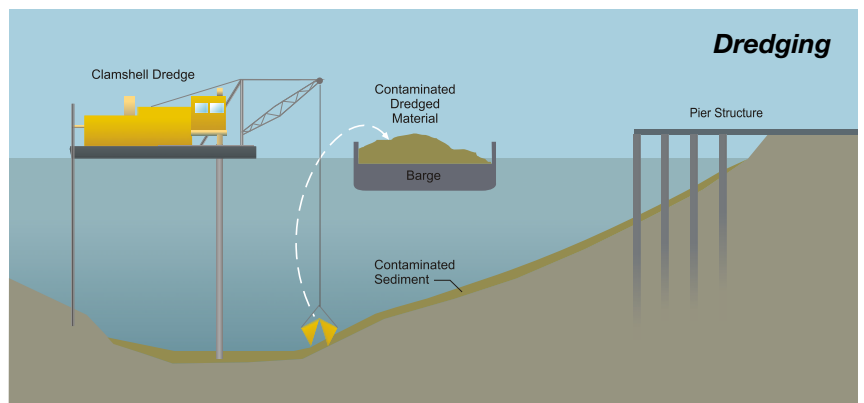
Several cleanup methods can be used to clean up contaminated sediments in the waterway. Some methods rely mostly on construction, such as **dredging** and **capping**. Others rely more on the **natural flow** of cleaner sediments from upriver.

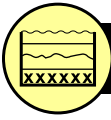


Removal

Physical removal or dredging of contaminated sediments. Options to deal with the dredged material after removal include:

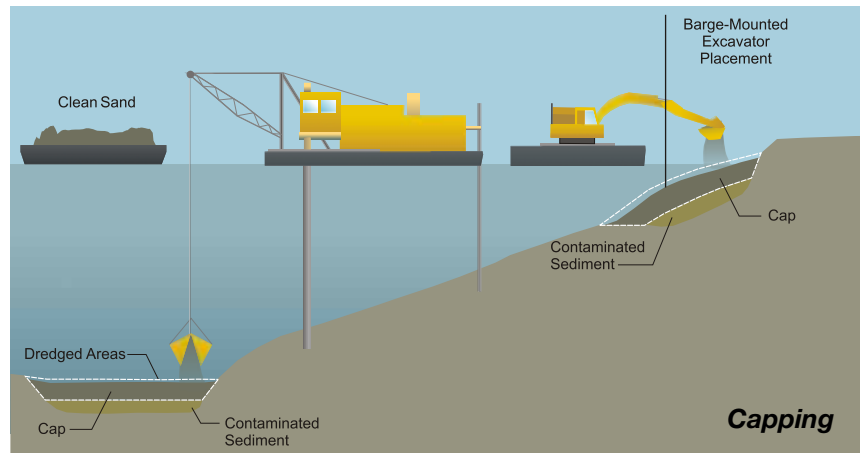
- Treatment and disposal
- On-site (e.g., in a contained in-water disposal facility) or off-site disposal (e.g., in a permitted landfill)





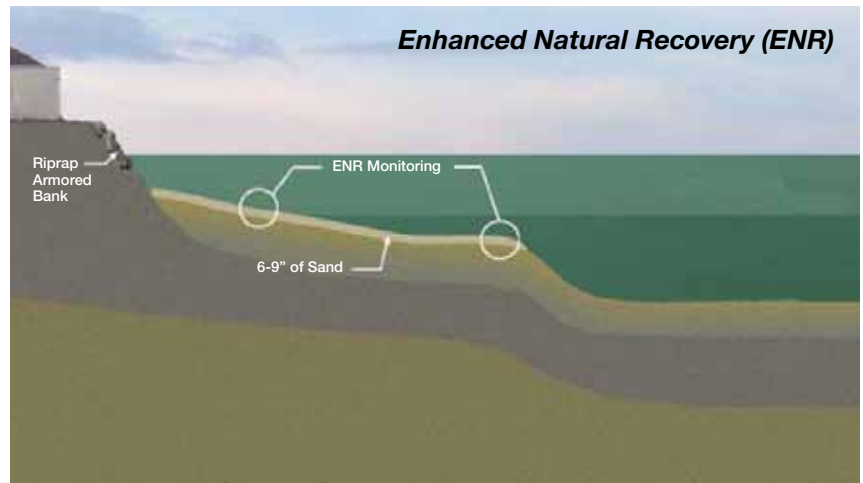
Containment

Containment or capping (covering with clean material) of contaminated sediments, typically using layers of sand, gravel, and rock designed to contain and isolate the pollution

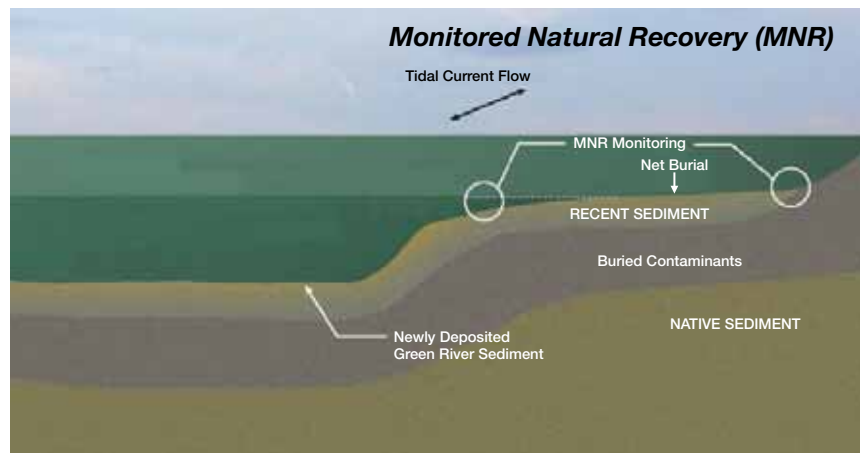


Natural Recovery

Enhanced natural recovery using a thin layer of sand to cover the pollution and speed up natural recovery



Monitored natural recovery, which relies on the natural flow of cleaner sediments from upriver to cover contaminated sediments in the lower waterway, and includes long-term monitoring



Monitoring and Adaptive Management

Monitoring to track pollution levels in the sediments, water, and fish and shellfish before, during, and after construction. More cleanup will be required if monitoring shows pollutant levels are not decreasing as expected.

Other actions (also called Institutional Controls) are needed to reduce people's exposure to remaining contamination. These include: health advisories to limit eating resident seafood from the waterway and restrictions on activities such as digging or anchoring in specified areas.

Consider the Cleanup Alternatives

The purpose of the draft Feasibility Study is to examine a range of cleanup approaches. Each alternative uses a mix of methods to achieve cleanup goals. The higher numbered alternatives require active cleanup (e.g., dredging or capping) over more of the river, using lower chemical concentrations as trigger levels for cleanup. The lower numbered alternatives place more emphasis on monitored natural recovery. The “removal emphasis” alternatives use mostly dredging, while the “combined technologies” alternatives use less dredging, and more capping and enhanced natural recovery. All estimates of cleanup areas and contaminant reductions are preliminary and may change in the final Feasibility Study, based on agency review. Here is how you can get familiar with the alternatives. You can find much more detail about all of these alternatives in the draft Feasibility Study online at www.ldwg.org.

		Removal Alternatives					Combined Alternatives			
*Alternative 1, No Further Action, includes Early Action Areas only at cost of \$66 million		2R (with onsite disposal option)	3R	4R	5R (with treatment option)	6R	3C	4C	5C	6C
Cleanup Technologies Applied in Waterway (Acres)	Site-wide Monitoring and Institutional Controls	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Monitored Natural Recovery	146 ac.	119 ac.	62 ac.	19 ac.		119 ac.	62 ac.	19 ac.	
	Enhanced Natural Recovery						9 ac.	15 ac.	50 ac.	92 ac.
	Capping						10 ac.	23 ac.	24 ac.	51 ac.
	Dredging or partially dredging, then capping	30 ac.	57 ac.	114 ac.	157 ac.	299 ac.	38 ac.	76 ac.	83 ac.	156 ac.
	*Early Action Areas	29 ac.	29 ac.	29 ac.	29 ac.	29 ac.	29 ac.	29 ac.	29 ac.	29 ac.
Years to Construct	4 yrs	6 yrs	13 yrs	19 yrs	38 yrs	4 yrs	7 yrs	8 yrs	18 yrs	
Time to Long-term Predicted Concentrations	24 yrs	26 yrs	18 yrs	24 yrs	43 yrs	24 yrs	22 yrs	18 yrs	23 yrs	
Cost (without Early Action Area costs; add \$66 million to these costs to obtain total costs)	\$230 million	\$290 million	\$440 million	\$600 million	\$1.3 billion	\$220 million	\$290 million	\$310 million	\$650 million	

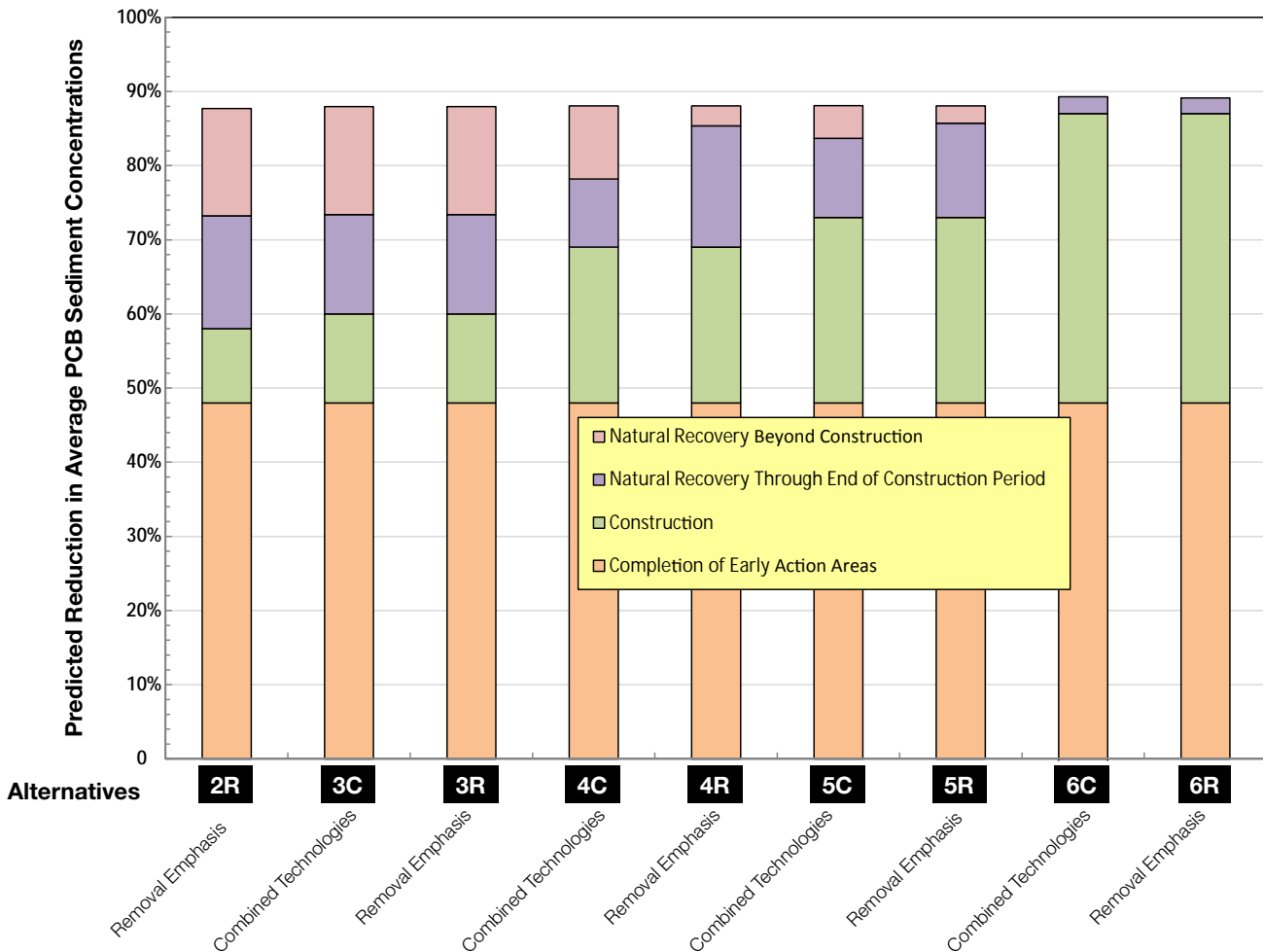
How Do They Compare?

The alternatives evaluated in the draft Feasibility Study were evaluated using both federal (EPA) and state (Ecology) criteria. Threshold criteria must be met first: 1) protect human health and the environment, 2) comply with federal and state environmental laws and regulations, and 3) monitor compliance with these standards. Then the evaluation looks at:

- Long-term effectiveness and permanence
- Reducing toxicity, mobility, or volume through treatment
- Short-term effectiveness
- Ability to be implemented
- Cost

Key Things to Think About

- Alternatives 2 through 6 include varying amounts and types of construction. All are predicted to **reduce contamination by up to 90% in the long term**, and reach similar levels of risk reduction, but with different time frames.
- Alternatives with more **dredging** will give more certainty in the long-term, but with more short-term impacts (disturbance, emissions, traffic, etc.); they take longer and cost more.
- Alternatives with more **capping and enhanced natural recovery** have less short-term impacts and cost, but increase the need for long-term management and monitoring.
- Alternatives with more **monitored natural recovery** have the lowest short-term impacts and cost, but with the most uncertainty, and the greatest need for long-term management and monitoring.
- **Treatment** of dredged sediments could reduce the volume of sediment needing disposal but it increases cost. Though evaluated with one alternative, it could be used with others.



Who Is Involved?

Your regulatory agencies are working together –

- U.S. Environmental Protection Agency (EPA) – responsible for making cleanup decisions under federal Superfund law
- Washington Department of Ecology (Ecology) – responsible for making cleanup decisions under state Model Toxics Control Act and leading effort to control upland sources of pollution

Studying the waterway cleanup options –

- Lower Duwamish Waterway Group (LDWG), a partnership of City of Seattle, King County, Port of Seattle, and The Boeing Company, working under EPA and Ecology oversight

Responsible for paying for cleanup –

- To be determined, but including public agencies, businesses, and property owners

Providing community and natural resource perspectives –

- Duwamish River Cleanup Coalition (DRCC) – EPA and Ecology-funded community advisory group active in local community outreach
- Native American Tribes – advising EPA and Ecology on tribal resource protection
- Natural Resource Trustee Agencies – responsible for ensuring the protection and restoration of natural resources

Voices from the community and region –

- Community, conservation, business, and civic groups – providing input on the cleanup options
- YOU – learning more and providing your thoughts and concerns to be considered by EPA and Ecology as they propose a specific cleanup plan in 2012

Your health agencies –

Providing information on protecting you and your family from health risks ([www.doh.wa.gov/ehp/oehas/fish/consumpadvice.htm#Lower Duwamish Waterway](http://www.doh.wa.gov/ehp/oehas/fish/consumpadvice.htm#Lower_Duwamish_Waterway); and www.epa.gov/region10/pdf/sites/ldw/doh_factsheet_nov2007.pdf)

How You Can Make a Difference

Waterway pollution and health risks, and the cleanup options to reduce those risks, are difficult and complex. This fact sheet gives a short explanation to help you understand the cleanup options.

- More detail is available online (www.ldwg.org) in the full length Feasibility Study and its executive summary. Give your input by email or the online comment form. Or check the hard copies at EPA offices and Seattle Public Libraries (Downtown and South Park)
- EPA, Ecology, the Lower Duwamish Waterway Group, and Duwamish River Cleanup Coalition, will be out in the community at neighborhood meetings and events to answer questions and hear your thoughts and concerns about the draft Feasibility Study.
- Public meetings on Tuesday, **December 7** (Concord Elementary School, 5:00-8:00 p.m.) and Thursday, **December 9** (South Seattle Community College, 3:30-8:00 p.m.)
- Contact the Duwamish River Cleanup Coalition for information about upcoming workshops at: www.duwamishcleanup.org or 206-954-0218
- Comments invited until **January 14, 2011**. No matter how you comment, all input will be considered by EPA and Ecology.

Please note: comment period extended to January 14, 2011

For More Information

Visit EPA at: www.epa.gov/region10/duwamish.html or Ecology at: http://www.ecy.wa.gov/programs/tcp/sites/lower_duwamish/lower_duwamish_hp.html



Comments and questions can be directed to EPA's community outreach coordinators, Suzanne Skadowski, 206-553-6689, skadowski.suzanne@epa.gov, or Renee Dagseth, 206-553-1889, dagseth.renee@epa.gov



Send your comments on the cleanup alternatives by email to: r10Lowerduwamish@epa.gov

Or



Comment online at www.ldwg.org