

The following information summarizes a preliminary 'fact sheet' on the Advance HIA Report on the findings and recommendations of the HIA to date. This will be followed by a Final HIA Report, to be submitted to EPA in June 2013 prior to the closing of the public comment period on the proposed Plan.

The Duwamish HIA

The HIA examines potential health effects of the Proposed Cleanup Plan on four distinct populations with strong connections to the Duwamish River:

1. Local residents
2. Tribes
3. Non-tribal subsistence fishers
4. Workers in local industries.

Potential health effects and causal pathways examined for these populations include:

- Construction effects
- Restrictions on Tribal rights or practices
- Restrictions on non-tribal fisher practices
- Residential and industry gentrification
- Beneficial effects (and opportunities) for Tribes, residents and businesses.

HIA Findings

Findings of anticipated beneficial and adverse health effects of EPA's Proposed Plan include:

Effects on Residents

South Park and Georgetown are closest to and most impacted by the Superfund site. They are lower-income and more ethnically diverse than the Seattle and King County average, and have among the highest environmental exposures and cumulative health impacts in the city.

The likelihood and magnitude of adverse impacts from air and noise pollution, rail and truck traffic, and dispersion of contaminants during construction are low. Some health benefits from employment in cleanup jobs are likely, particularly for unemployed or lower-income residents. Chemical contamination on beaches until cleanup goals are met may have an impact on beach users. There is potential for both adverse and beneficial effects due to further gentrification and revitalization spurred by cleanup.

Effects on Tribes

Three Tribes use the Duwamish River for fishing and ceremonial purposes. Tribal concepts of health are different than the conventional definition used by EPA, which only considers cancer and other disease rates.

Residual contamination left after cleanup may not only cause health disparities to continue or worsen for Tribal fish consumers, but also contribute to adverse health impacts associated with lack of access to natural resources, interference with cultural traditions, and loss of self-determination. Fishing advisories and related "institutional controls" may further impact the community's health by interfering with treaty rights, and causing food insecurity and poor nutrition.

Effects on Subsistence Fishers

Subsistence fishermen who use the Duwamish River include Asian and Pacific Islanders and other immigrant communities and people of color; low-income, homeless and food-insecure populations; and urban American Indians and Alaska Natives (aside from the three Tribes discussed above).

Fishing advisories on the Duwamish are expected to be more restrictive than elsewhere in Puget Sound if cleanup goals are not met, as predicted. Subsistence fishermen who do not have the ability to fish elsewhere or purchase comparably healthy food will need to choose between exposure to chemical contamination and food and nutritional insecurity, both of which will disproportionately impact low-income people and are of particular concern for the health of affected children. For many immigrant fishermen, fishing is associated with social and cultural traditions, which may be disrupted, resulting in impacts on well being and mental health and erosion of social capital.

Recommendations to EPA on Proposed Plan

- Use proven environmental dredging technologies and practices; plan truck and rail transport routes with affected communities; use the cleanest engines, fuels, and other "green remediation" techniques during cleanup.
- Provide cleanup job training and placement assistance to affected community residents.
- Employ signage and washing stations at local beaches until the cleanup health goals are met.
- Collaborate with Tribes to address tribal health impacts not included in EPA's risk assessment.
- Restore Tribes' traditional resource use in accordance with Tribal Treaty rights; ensure that Institutional Controls associated with the Superfund site are temporary, not permanent.
- Collaborate with current and future subsistence fishermen to develop institutional controls and compensatory measures that ensure access to clean and safe fish and fishing practices.
- Recognize and employ strategies that serve to enable and empower the region's diverse fishing populations to make informed choices.

Additional Recommendations

In addition to recommendations to EPA on improving the anticipated health effects of its Proposed Cleanup Plan, the HIA recommends:

- Local governments, agencies and organizations minimize the adverse effects of gentrification by promoting and protecting home ownership, preserving and creating affordable housing, coordinating reinvestment by forming an agency/community partnership, and ensuring equity in all new development projects.
- Local governments and other responsible parties establish a "Revitalization Fund" to enhance Tribal health, until advisories associated with the Superfund site are lifted.

BACKGROUND:

The Lower Duwamish Waterway is Seattle's primary industrial waterway and the super fund site is approximately the 5.5 mile portion of the 'end' of the Duwamish River which flows into Elliott Bay. Its 32 square-mile drainage area is home to more than 80,000 jobs. Decades of unchecked industrial use and common widespread human activities

have deposited tons of harmful contaminants including PCBs, arsenic, PAHs (polycyclic aromatic hydrocarbons), chlorinated dioxins & furans, metals, and phthalates in the waterway's sediments. Today, contaminants continue to enter the waterway from the air, Green River Duwamish watershed, vehicles passing overhead, surface water runoff and sewer outfalls.

Contamination from nearly 100 years of industrial and commercial activities in the drainage basin has settled into the sediments at the bottom of the waterway. The contaminated sediments pose health risks to:

- People who eat seafood (but not salmon) living in the waterway;
- People who come into contact with sediments along the waterway's banks and beaches;
- Benthic organisms living in the sediments that are important to the waterway's food chain; and
- Some wildlife living in the waterway, including river otters

The Wastewater Treatment Division (along with other divisions of King County) have been participants in the Lower Duwamish Waterway Group (LDWG) for the past 12 years. LDWG consists of the City of Seattle, King County, the Port of Seattle and the Boeing Company.

Since 2000, the LDWG partners have worked under a voluntary agreement with the U.S. Environmental Protection Agency (EPA) and the Washington State Department of Ecology (Ecology) for a coordinated investigation of the Lower Duwamish Waterway (LDW) sediments. This investigation is called a Remedial Investigation/Feasibility Study (RI/FS). The remedial investigation, which began in 2001, was performed to determine the extent of contamination and risks for people and wildlife.

In 2003, to get an early start on reducing risks from the site, LDWG proposed and EPA approved areas for early action sediment cleanup. Actions were taken at three of these most polluted sites (the Norfolk combined sewer overflow outfall and the Duwamish/Diagonal Way outfalls, and Slip 4). Cleanup is underway at Boeing Plant 2. Jorgensen Forge and Terminal 117 are next in line for early cleanup.

Planning for cleanup of the overall river is proceeding in parallel with the early actions. Based on information in the remedial investigation on the extent of contamination and on the associated human and ecological risks, LDWG prepared a feasibility study. The study examined different methods and alternative plans to clean up the contamination and reduce risk. The draft feasibility study was completed in 2009 and reviewed by the public. Based on that input, the draft final study was released on October 18, 2010. Members of the public, agencies, businesses, and tribes submitted more than 1,300 comments during the public comment period. With the input received, EPA and Ecology published a final feasibility study in October 2012.

EPA's Proposed Plan for Cleanup of the Lower Duwamish River

On February 28, 2013 EPA issued the Proposed Plan for the Lower Duwamish Waterway Superfund Site which presents a Preferred Alternative to clean up contamination in the in-waterway portion of the Lower Duwamish Waterway Superfund Site. There are three components to the strategy proposed by EPA and the Washington Department of Ecology (Ecology) for cleaning up the LDW:

- 1) early identification and cleanup of the most contaminated areas in the waterway, referred to as Early Action Areas (EAAs)²;
- 2) controlling sources of contamination to the waterway; and
- 3) cleanup of the remaining contamination in the waterway—addressed in this Proposed Plan—including long-term monitoring to measure the success of the remedy in achieving cleanup goals.

A digital copy of the Proposed Plan for the Lower Duwamish Waterway Superfund Site can be found at: http://www.epa.gov/region10/pdf/sites/ldw/pp/ldw_pp_022513.pdf

Ecology is the lead agency for the second component of the strategy, source control. Ecology and other agencies have made substantial progress towards finding, investigating, and controlling historical and ongoing sources of pollution to the LDW, though more work remains. Appendix A to the Proposed Plan provides Ecology's strategy for its continuing efforts to identify and address sources of contamination to the waterway.

A digital copy of Ecology's Source Control Strategy (Appendix A to the Proposed Plan) can be found at:

http://www.epa.gov/region10/pdf/sites/ldw/pp/ldw_sc_strategy_draft_final_dec2012.pdf

The third component of the strategy to address pollution in the Duwamish waterway is the additional cleanup of the in-waterway portion of the Site. It is based on four goals, which EPA calls Remedial Action Objectives (RAOs):

RAO 1: Reduce to protective levels the human health risks associated with consumption of contaminated Lower Duwamish Waterway resident fish and shellfish by adults and children with the highest potential exposure.

RAO 2: Reduce to protective levels the human health risks from direct contact (skin contact and incidental ingestion) to contaminated sediments during netfishing, clamming, and beach play.

RAO 3: Reduce to protective levels the risks to benthic invertebrates from exposure to contaminated sediments.

RAO 4: Reduce to protective levels the risks to crabs, fish, birds, and mammals from exposure to contaminated sediment, surface water, and prey.

The Preferred Alternative, which addresses approximately 412 acres, includes the following elements:

- A total of 156 acres of active cleanup, consisting of:
 - 84 acres of dredging or partial dredging and capping (an anticipated total volume of 790,000 cubic yards would be dredged and disposed in an upland landfill);
 - 24 acres of capping, with possible amendment with activated carbon or other contaminant-sequestering agents; and
 - 48 acres of Enhanced Natural Recovery (ENR – placing 6 to 9 inches of clean material over contaminated sediments) with possible amendment with activated carbon or other contaminant-sequestering agents, if these amendments are shown to be effective in pilot tests.

² Cleanups have been completed at three EAAs, and are underway at two more EAAs. More information regarding this can be found in the 'Background' section of this report.

- Further reduction of contaminant concentrations over time in the remaining 256 acres through Monitored Natural Recovery (MNR – relying on natural processes such as burial of contaminated sediments by cleaner sediments from upstream). Long-term monitoring data will determine whether additional cleanup actions will be necessary in MNR areas.
- Institutional controls (ICs) and LDW-wide monitoring to enhance and measure protectiveness, and to protect the integrity of remedial action elements such as capping and ENR, while minimizing reliance on seafood consumption-related ICs to the extent practicable.
- The Preferred Alternative also assumes completion of an additional 29 acres of cleanup in Early Action Areas

After the comment period on the proposed plan, which ends June 13, 2013, the agencies will issue a Record of Decision (anticipated in 2014) to direct cleanup actions and long-term monitoring.

EPA estimates that the proposed cleanup will take about 7 years to implement, with an additional 10 years to reduce contaminant concentrations to their lowest predicted concentrations through natural recovery. The estimated cost of the proposed cleanup (based on the Preferred Alternative summarized above) is \$305 million.

In addition to the Proposed Plan and Ecology's Source Control Plan, EPA has also issued an environmental justice analysis to provide an assessment of the environmental and environmental health impacts of the proposed Superfund cleanup actions on the affected community. This includes an assessment of the outcomes of proposed Superfund actions on the community, and what environmental justice concerns stem from those proposed actions.

Included in this document are data on the burden faced by the community, such as the health status and indicators of health risk in the community, and other exposures to environmental pollution faced by the community living around the LDW. The neighborhoods directly affected by construction-related impacts include the Georgetown neighborhood east of the waterway, and the South Park neighborhood to the west, along with segments of other neighborhoods that flank the length of the LDW. Other individuals work on its shores or use the river for fishing and recreation and are also considered part of the affected community.

A digital copy of the Environmental Justice Analysis, (Appendix B to the Proposed Plan) can be found at:

http://www.epa.gov/region10/pdf/sites/ldw/pp/ej_analysis_ldw_feb_2013.pdf

ATTACHMENTS: None; copies of the Health Impact Assessment are expected to be available for distribution at the committee meeting.