

# Health Impact Assessment: Proposed Cleanup Plan for the Lower Duwamish Waterway Superfund Site

## EXECUTIVE SUMMARY

September 2013

Photo: Patrick Robinson, *West Seattle Herald*





## Executive Summary and Recommendations

Photo: Linn Gould, Just Health Action

### BACKGROUND

More than a century of industrial and urban wastes have contaminated Seattle's Duwamish River. The Environmental Protection Agency (EPA) placed the Lower Duwamish Waterway on the Superfund List in 2001. On February 28, 2013, EPA released its *Proposed Plan* for cleanup of the site. EPA accepted public comment on the Plan until June 13, 2013.

The Plan calls for capping in place or removing highly contaminated river sediments, plus enhanced and natural recovery for moderately or low-level contaminated sediments. Resident fish and shellfish will be less contaminated but probably still unsafe for human consumption, even after the 17-year period of active cleanup and monitored recovery.

### HEALTH IMPACT ASSESSMENT (HIA)

Three partner organizations—UW School of Public Health, Just Health Action, and the Duwamish River Cleanup Coalition/Technical Advisory Group—conducted a Health Impact Assessment of EPA's *Proposed Plan*.

This assessment did not examine alternate cleanup scenarios, although most of the HIA findings and recommendations are probably transferable to whatever remedy EPA selects for its final cleanup decision.

The HIA focused on four vulnerable populations whose health and well-being might be affected by the proposed cleanup. The HIA was guided by Resident and Tribal

Advisory Committees, individual community advisors, and a Liaison Committee, with representatives from EPA, other agencies, and potentially responsible parties. Focus groups were conducted with Duwamish Tribe members and urban subsistence fishers.

### WHOSE HEALTH MIGHT BE AFFECTED BY THE CLEANUP?

**Local residents:** Two residential neighborhoods, South Park and Georgetown, border the Duwamish River and Superfund site. A high percentage of residents are foreign-born and people of color, particularly in South Park. Average household income in both neighborhoods is much lower than the county average, and poverty rates are higher.

Health status is relatively poor compared to the rest of Seattle, with higher existing rates of child asthma hospitalization, diabetes, cardiovascular disease, and lung cancer. There are also more industrial emissions, contaminated sites, and vehicular pollution than in the rest of the city.

**Affected Tribes:** Three Native American Tribes are affected by the cleanup. The Duwamish Tribe's ancestral lands include the Duwamish River watershed. The Muckleshoot and Suquamish Tribes are federally recognized Tribes with treaty-guaranteed, usual and accustomed fishing places in the central Puget Sound region. Both Tribes actively manage seafood resources on the Duwamish River.

There are no publicly available health data for these Tribes. However, census and health data for Native Americans in Washington State and King County reveal high levels of health problems and risk factors including poverty, unemployment, infant mortality, smoking, obesity, diabetes, heart disease, cirrhosis, asthma, and mental distress.

**Subsistence fishers:** Many people fish on the Duwamish River for salmon, which are non-resident fish and considered relatively safe to eat. However, some people catch resident fish and shellfish as a food source. This population includes Asian and Pacific Islanders; a variety of immigrant communities and people of color; low-income, homeless, and food-insecure populations; and urban American Indians and Alaska Natives (aside from the affected Tribes).

**Workers in local industries:** The Duwamish River Valley is home to Seattle's and King County's largest concentration of industry, including the Duwamish Manufacturing Industrial Center and Port of Seattle. The manufacturing, wholesale trade, transportation, warehousing, and utilities industries in this area employ at least 50,000 workers. In general, these jobs pay good "family" wages.

## HOW MIGHT HEALTH BE AFFECTED BY THE CLEANUP?

The proposed cleanup will reduce health risks from seafood consumption and contact with sediments and the shoreline. However, residual contamination in sediment, fish, and shellfish will still be higher than Puget Sound background after cleanup, and EPA predicts resident seafood will still be unsafe for human consumption. The necessary fishing advisories will be more restrictive than elsewhere in Puget Sound, will be required for at least 40 years, and could persist in perpetuity.

- **Contaminant dispersion during construction**

The health concerns related to cleanup construction activity include possible escape of contaminants outside construction zones. The magnitude of this appears low, however, if environmental dredging technologies, best management practices, and skilled operators are employed.

- **Local residents**

Most local residents do not eat resident fish from the river, but many visit beaches. EPA predicts the cleanup will approach but may not meet goals for arsenic contact on some publicly accessible beaches. The existing health risk and any risk after cleanup should be limited and manageable with wash facilities at public beaches.

Construction-related increases in air and noise pollution, and in rail and truck traffic, could affect the

health of local residents. However, with the anticipated construction strategy, updated fuel standards, and standard EPA policies, there should be limited impact on local residents, beyond the existing high levels of pollution and traffic.

Cleanup construction will generate new jobs, with beneficial impacts on health for those employed. It is uncertain whether or how many jobs will be given to local residents.

Environmental improvements from the cleanup will increase aesthetics of the river and surrounding areas. This may spur reinvestment in Georgetown and South Park. Community revitalization could stimulate a number of beneficial phenomena including physical improvement of housing, streetscapes, and open space, growth in community businesses and services, and increased employment and reduced crime.

Gentrification often occurs alongside community revitalization and is already occurring in Georgetown and South Park. Any cleanup-spurred reinvestment will contribute to this trend. Gentrification can bring health-favorable community benefits. However, without intervention, these are most likely to benefit higher-income residents, and harmful impacts are most likely to affect lower-income residents.

- **Affected Tribes**

Tribal health consequences of chemical contaminants are likely to be substantially worse than projected by EPA risk assessment and predictive models. These models only account for biomedical disease outcomes and do not incorporate fundamental aspects of Tribal health and well-being, such as the importance of accessibility to local natural resources, maintenance of cultural traditions, and the significance of self-determination. The EPA risk assessment also does not consider that river-related risks are compounded by existing Tribal health disparities and cumulative risks from chemical and non-chemical stressors.

Furthermore, although the cleanup will create a cleaner environment for all, inequity between the general population and the Tribes may actually increase. Resident seafood consumption will be relatively safe at a rate typical for the general population rate (e.g., one meal per month), but not at the Tribes' seafood consumption rates.

Institutional controls, such as fish advisories, restrict how much seafood can be safely harvested. These restrictions may violate Tribal fishing rights. They also may affect food security, prompting some Tribal members to eat less healthful foods. Physical health

may still be affected, since some Tribal members may harvest fish in spite of warnings, to protect their cultural and spiritual health.

It is highly likely that habitat renewal will benefit Tribal health, because the environment and species of cultural importance will be enhanced. This will allow more ceremonies on the river, as well as pride, ownership, and empowerment, all of which are important determinants of Tribal health.

- **Subsistence fishers**

Fishing practices could be affected substantially during and after active cleanup. Urban subsistence fishing is poorly characterized, but people fish in many local waters, including the Duwamish River, and in spite of advisories and posted signs. Reasons for fishing and for choosing locations include a wide variety of cultural, traditional, practical, and aesthetic influences.

It is very likely that some fishers and their families will be exposed to chemical contaminants in seafood during and after the cleanup. Fishing activity might decrease during active cleanup, but it is likely that some people will continue to fish there. Many alternative locations are also subject to fish advisories, particularly within close travel distances. After the active cleanup, the cleaner and restored habitat may further entice fishing. Although seafood will pose less health risk at that point, the persisting risks could still be substantial for people with high rates of fish consumption.

Some subsistence fishers who are not able to fish elsewhere or purchase fish will likely experience food and nutritional insecurity. A fish diet has health benefits, particularly for children, and these benefits can be lost if fish consumption is reduced. Other protein sources cost more than self-caught fish, leading to economic hardship. A dietary void could be filled with cheaper, less healthful choices.

Social and cultural traditions could be disrupted if fishers reduce or discontinue fishing. There is not enough information to assess how likely this would be, but the loss of social ties could be an important impact on health and well-being.

These potential impacts on subsistence fishers would pose disproportionate harm for lower-income people, people of color, immigrants, and non-English speakers, and particularly for children.

- **Institutional controls**

Institutional controls (ICs) are administrative measures to prevent people and the environment from being exposed to remaining contamination, using legal tools and informational tools such as fishing advisories. Our

assessment of affected Tribes and subsistence fishers identified some important health issues related to ICs. We also identified broader issues that were not considered in the *Proposed Plan* and that could affect health and cleanup costs.

The *Proposed Plan* does not appear to follow EPA guidance to evaluate ICs as rigorously as any other response alternative. For example, the EPA Feasibility Study included hundreds of pages about various cleanup alternatives, but only seven pages about ICs, plus only three pages in the 82-page “Detailed Cost Estimates” Appendix. The estimated cost of ICs is relatively low compared to an example of enhanced community outreach (Palos Verdes Shelf Superfund Site) that was featured in the EPA *Environmental Justice Analysis* accompanying the *Proposed Plan*.

This is consistent with a pattern identified by the U.S. Government Accountability Office (GAO) in a 2005 review of EPA’s IC practices. The GAO determined that EPA has increasingly relied on ICs over time but inconsistently considers all the necessary factors to ensure that planned controls will be adequately implemented, monitored, and enforced.

The implementation of ICs will add a psychosocial stressor for Tribal and subsistence fisher populations that is likely to have health ramifications on top of existing health risks in these populations. In addition, the application of ICs increases already existing inequities among vulnerable populations by expecting them to modify their behavior when cultural, spiritual, or food security reasons prohibit change.

The proposed ICs are a public health intervention, intended to modify health behaviors. Any such intervention should use evidence-based best practices to characterize alternatives, select the intervention, identify possible unfavorable or inequitable outcomes, and plan an evaluation strategy. To date, the EPA has failed to meet standard expectations of public health practice, as well as their own IC guidance.

- **Local workers**

The major potential health impact of concern relates to employment. Employment is one of the strongest favorable determinants of health and well-being. The cleanup will produce construction jobs and expenditures that could benefit the regional economy, although only a limited subset of Duwamish businesses and workers might benefit directly.

It is plausible that the proposed cleanup could add to existing unfavorable pressures on local industries, with net loss of jobs or reduction in hours of employ-

ment. Existing pressures include: an improving regional economy but reportedly unfavorable business environment; international trade and competition with other ports; constraints of the Duwamish area and appeal of alternative locations; encroachment and conversion of industry-zoned land; commercial real estate trends and speculation; and urban development.

Allocation of cleanup costs is still undecided and uncertain. The costs could be substantial relative to business resources, especially for smaller businesses, and could result in job elimination or reduced worker hours. Business perceptions and uncertainties about the cleanup could affect business behavior, with effects on employment. However, both adverse and beneficial effects of cleanup-related perceptions are plausible.

Existing businesses and employment could benefit substantially if the cleanup reversed the constraints and stigma of a blighted river and if this stimulated industry revitalization and economic robustness. The cleanup will probably not lead to substantial industry revitalization on its own. However, in parallel with other efforts, it could stimulate interest in revitalization and create opportunities for industry to build new connections to pursue shared goals of revitalization.

## WHAT'S MISSING FROM THIS PICTURE?

Identifying information gaps is an important goal for any HIA, almost as important as identifying health impacts.

- **Institutional controls**

One important gap is the limited planning for institutional controls, as discussed. The health consequences of residual chemical contamination and institutional controls following cleanup are potentially substantial, and these could pose disproportionate harm for the Tribes and lower-income subsistence fishing households. It is not possible to adequately assess these potential health impacts, given the gaps in information.

- **Source controls**

Another important gap in the Plan is the lack of formal connection to a source control plan. The cleanup goals for contaminant reduction, and the certainty of achieving those goals, depend critically on the timing and extent of source controls. It is not possible to fully assess the potential health impacts of residual contamination without knowing the timing and extent of source controls. Adding clear source control goals and objectives to the Plan, and defining required source control programs and actions, could reduce uncertainty and contribute to improved health outcomes by defining requirements to reduce pollutant loading to the site.

## OPPORTUNITIES

Seattle is at the cusp of a new era. Beginning with the cleanup, and accompanied by source control and natural restoration efforts, the Duwamish River and surrounding area have a chance to become a regional asset and symbol of pride, rather than an environmental stigma. There will be opportunities to turn river cleanup and restoration into a national model for healthful and sustainable coexistence of industry, Tribes, and community. It will be a challenging task to find the optimal balance between economic, traditional, subsistence, and recreational uses. However, the alternative—turning away from this opportunity—will create challenges and problems of its own. In this report, we provide recommendations to pursue equitable and sustainable revitalization.

We propose that the City of Seattle, King County, and the Port of Seattle convene a Duwamish Valley Revitalization Task Force with broad stakeholder representation to explore options for sustainable coexistence of industry with Tribes and community. Experiences in other places could provide models for this effort. The Great Lakes restoration efforts offer an excellent model for public-private collaboration. The vision statement of the Council of Great Lakes Industries, representing major industries and businesses, provides an enviable model and goals for other industry coalitions to consider.

## EQUITY

It is critical that there be meaningful and collaborative participation with the affected communities in all efforts to prevent harm from the cleanup, maximize benefits, and promote health equity.

The EPA, City, and County each have prominent policies that make commitments to consider equity, race, and justice in decision-making. We call upon each to uphold these commitments in planning the cleanup and related actions and in planning for predictable health effects of those actions. We encourage the Port of Seattle to develop and implement a formal social justice policy.

The City of Seattle and King County are potentially responsible parties for the cleanup, and they are also responsible for protecting and improving the health and well-being of all people in their jurisdictions. At face value, cleaning up the Duwamish River will address both responsibilities. However, without targeted interventions, the proposed cleanup could result in unanticipated harms to vulnerable populations, and continue or even exacerbate existing health inequities.

## RECOMMENDATIONS\*

### For EPA, City of Seattle, King County, and Port of Seattle

#### *Equity assurance*

- Ensure equity in all policies and efforts for environment and community development, in accordance with Seattle’s Race and Social Justice Initiative and King County’s Equity and Social Justice Ordinance, and EPA’s Environmental Justice policies.
- We encourage the Port of Seattle to develop and implement a formal social justice policy.
- Establish an Institutional Control Task Force and include a leader from each affected community. The Task Force should use a community-based participatory approach to engage and empower affected populations so that they can participate meaningfully in all stages of any prospective interventions.
- Establish a Revitalization Fund to enhance Tribal empowerment and health, until institutional controls are removed.

#### *Opportunities*

- Convene a Duwamish Valley Revitalization Task Force with broad stakeholder representation to explore options for sustainable coexistence of industry with Tribes and community.

### For EPA

#### *Cleanup plan and liability*

- Selection of the final remedy (cleanup plan) and the process for allocating liability should attempt to reduce or eliminate uncertainty for affected businesses, whenever possible.

#### *Construction measures*

- Negotiate transport routes and associated mitigation measures for cleanup-related truck and rail traffic with potentially affected residents.
- Use modern clean engines or those with best available emission controls, cleanest available fuels, and “green remediation” techniques to minimize air emissions, plus effective noise and light minimization measures during active cleanup.

#### *Jobs for community members*

- Provide cleanup job training and placement assistance to local community members.



Photo: BJ Cummings, Duwamish River Cleanup Coalition/TAG

#### *Institutional controls*

- Apply institutional controls, including educational signage and washing stations, at local beaches until health protective standards are met.
- Institutional controls should go beyond restrictive and informational actions, such as fish advisories. Interventions should emphasize positive alternatives, such as identifying, encouraging, and providing options for safe fishing and healthful fish consumption. There is a clear need for innovative thinking.
- Demographics and fishing patterns will change over time. Efforts to promote safer fishing should be designed to acknowledge that the target audience is more than just people who currently fish on the Duwamish River and should include people who may fish there in the future.
- All efforts to provide information and promote safe and healthful fishing options should: be culturally appropriate for each audience; be designed to help people make informed choices; and engage and empower people to participate meaningfully in planning, implementation, and monitoring for success.
- Follow EPA guidance for institutional controls, especially to evaluate them as rigorously as other alternatives.
- Evaluate the true health impact of institutional controls to vulnerable populations.
- Develop a robust Institutional Control Program Implementation and Assurance Plan to protect all vulnerable populations who consume seafood from the Duwamish River, to be funded by potentially responsible parties as long as institutional controls are in effect.

\* The full *HIA Final Report* and our separate Technical Reports provide more information about each recommendation.

### **Actions to protect Tribal health**

- Collaborate with Tribes to more fully address their health concerns about the river cleanup.
- Restore Tribes' traditional resource use in accordance with Treaty Rights. Institutional controls need to be temporary, not permanent.

### **For City of Seattle, King County, and Port of Seattle**

#### **Local firms and workers**

- Selection of firms for cleanup construction and related activities should, as much as possible, give priority to firms and workers based in Seattle or King County.

#### **Community revitalization**

- Foster local economic strength and sustainable access to basic needs.
- Enhance human and natural habitat in local neighborhoods.
- Increase community engagement by supporting and funding local grass roots initiatives that build social cohesion.
- Coordinate management of future reinvestment and urban development by formalizing a coalition of agencies and community organizations to monitor and guide new development.
- Preserve affordability and produce affordable housing.
- Promote and protect home ownership.

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## **WHERE CAN YOU GET MORE INFORMATION?**

*Advance HIA Report* and Technical Reports:  
<http://deohs.washington.edu/hia-duwamish>

*EPA Proposed Plan*:  
<http://yosemite.epa.gov/r10/cleanup.nsf/sites/lduwamish>

Photo: Derrick Coetzee



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