

Restoring the Duwamish: What is at Stake?



Lower Duwamish Waterway - *Background*

- 5-mile river segment listed due to historically contaminated sediments
- Legacy contamination - industrial discharges, stormwater, CSOs
- The Lower Duwamish Waterway Group (King County, City of Seattle, Port of Seattle, and Boeing) – formed in 2000 to work on sediment cleanup
- More than 100 “potentially responsible parties” identified by EPA to date



Lower Duwamish Waterway – Economics

Today, the waterway is home to:

- **100,000** jobs
- **38,000** residents
- **25%** of King County manufacturing
- Businesses that handle **7.2 million tons** each year of domestic and international traffic, valued at **\$7.5 billion**
- **84%** of the industrial lands within the city (5,000 acres)
- Three primary land uses:
 - Commercial (32%)
 - Industrial (26%)
 - Warehousing (23%)
 - Other uses include residential, parks, open space, military and vacant (another 19%)



Duwamish Schedule - Key Dates

- EPA Proposed Plan
- Environmental Justice Analysis
- Ecology Source Control Strategy (Feb)

Record of Decision (Q1 2014)

Remedial Design



Proposed Plan Public Comment (Feb + 105 days)

Negotiate Agreements among PRPs and sign Consent Decree

Begin Construction

Early Actions

Source Control

Early Actions: *Cleanup, Dredging, Source Control*

- Over \$95 million invested in cleanup of 29 acres
- LDWG-initiated early cleanups are predicted to reduce PCB sediment concentrations by ~50%

- **Projects include:**

Completed

- ❖ Duwamish/Diagonal sedimentation remediation (King County)
- ❖ Norfolk CSO sediment remediation (King County)
- ❖ Slip 4 remediation (City of Seattle)



Underway

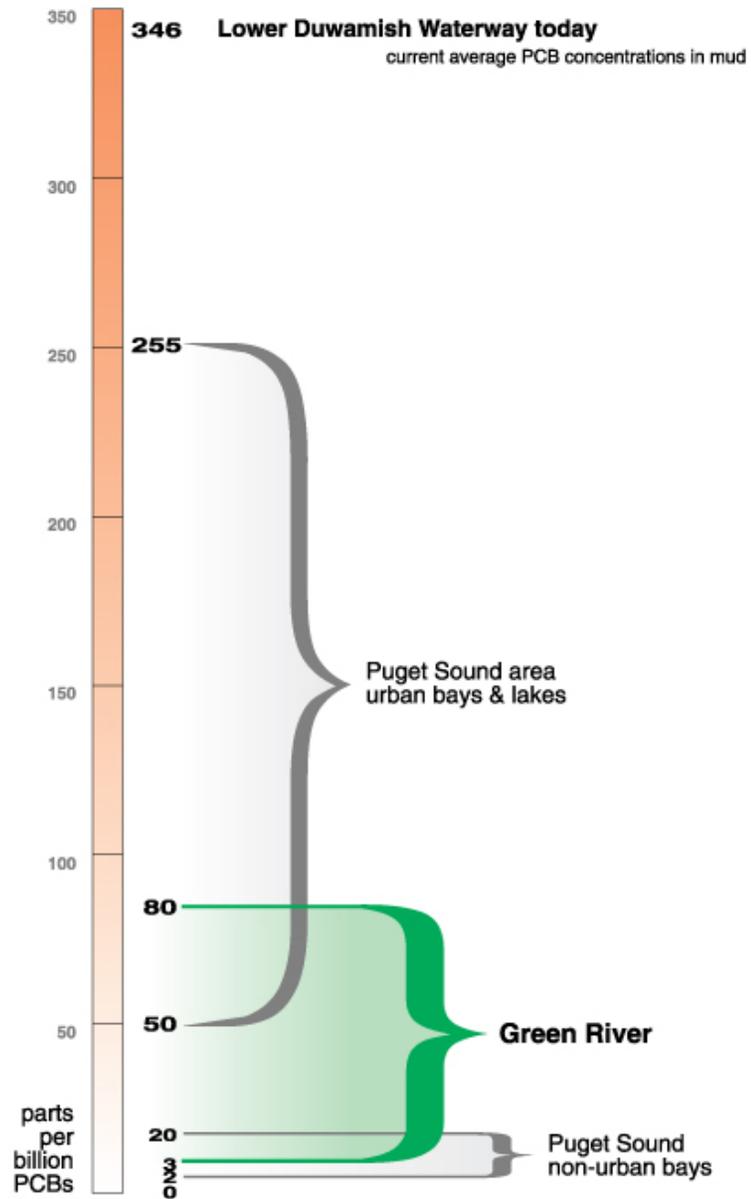
- ❖ Boeing Plant 2 (Boeing)
- ❖ Jorgensen Forge (Jorgensen)
- ❖ T117 (City of Seattle/Port of Seattle)

How does the Duwamish Waterway compare to other areas?



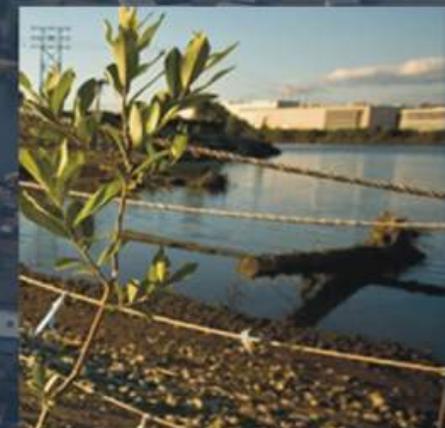
Early actions predicted to get waterway to this level

All alternatives in Feasibility Study predicted to get waterway to this level



EPA Proposed Cleanup

The Lower Duwamish Waterway is important to the Region's Economy, Neighborhoods, and Environment.



EPA Proposed Cleanup

EPA is proposing Alternative “5C-Plus:”

- 7 years of construction
- \$305 million*
- Combination of technologies
- Institutional controls to limit consumption of resident seafood
- Extensive monitoring
- Source control program led by Ecology
- After 20-30 years:
 - Study whether additional cleanup is needed
 - Waive cleanup standards based on natural background

*These costs are not reflective of all of the proposed plan’s elements and will likely be higher.

What EPA's Plan Accomplishes

- **Reduces risk from eating resident seafood by ~90%**
 - Reaches lowest feasible levels quickly (~ 15-20 years)
 - Source control (Led by Ecology) may further lower risk over time
- **Safe for other exposures (beach play; netfishing, etc)**
- **Protects benthic organisms in sediments**
- **Protects higher ecological receptors (e.g., otters)**

What's at stake?

- Taxpayers, utility rate payers, and local businesses will be responsible for paying for the cleanup.
- If we don't get started now, the Lower Duwamish will remain contaminated and there is uncertainty for the public and businesses.
- Some may ask for more dredging, which will increase construction time, elevate risk, increase impacts to the community, and cost more.



LDWG Priorities for the Cleanup Plan

- Reduce risks to human health and the environment through sediment cleanup
- Complete construction as soon as possible and focus dredging to maximize the benefits and minimize the impacts
- Optimize cleanup technologies and commit to extensive follow-up monitoring
- Provide an effective, reliable cleanup plan that does not defer substantive decisions and is supportable and implementable



Protective, Cost Effective, and Timely

EPA's Proposed Plan – a good start

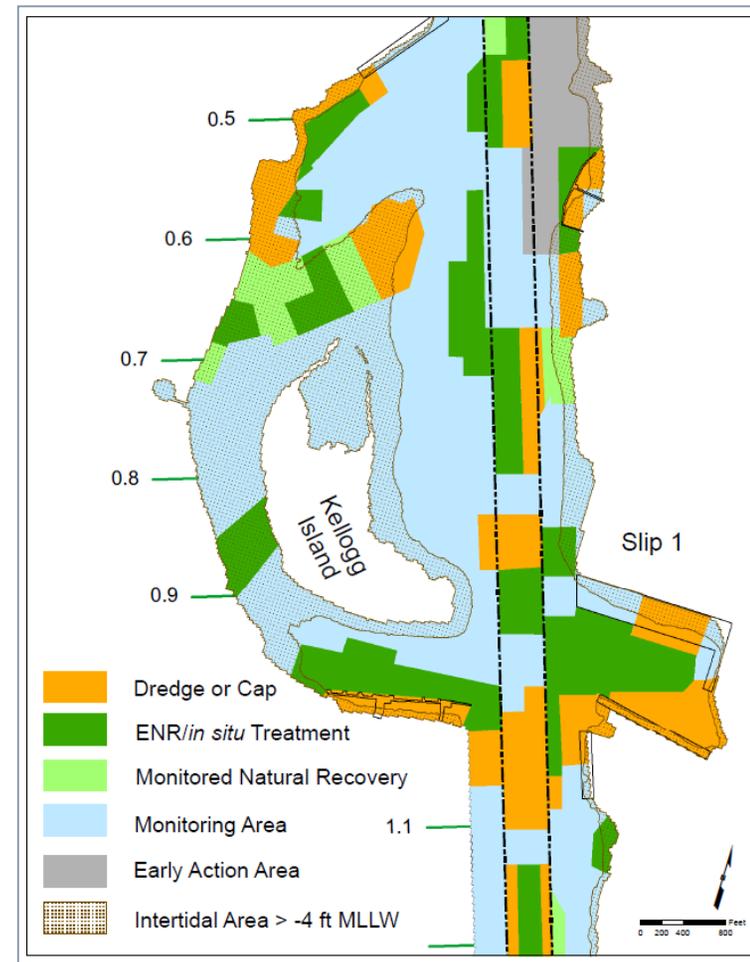
How can it be improved ?

- Decrease construction by two years, reducing impacts to the community and environment
- Achieve the same risk reduction, and faster
- Provide a cost-effective approach to protect taxpayers, ratepayers, and the local economy



Suggested improvements to EPA's Plan

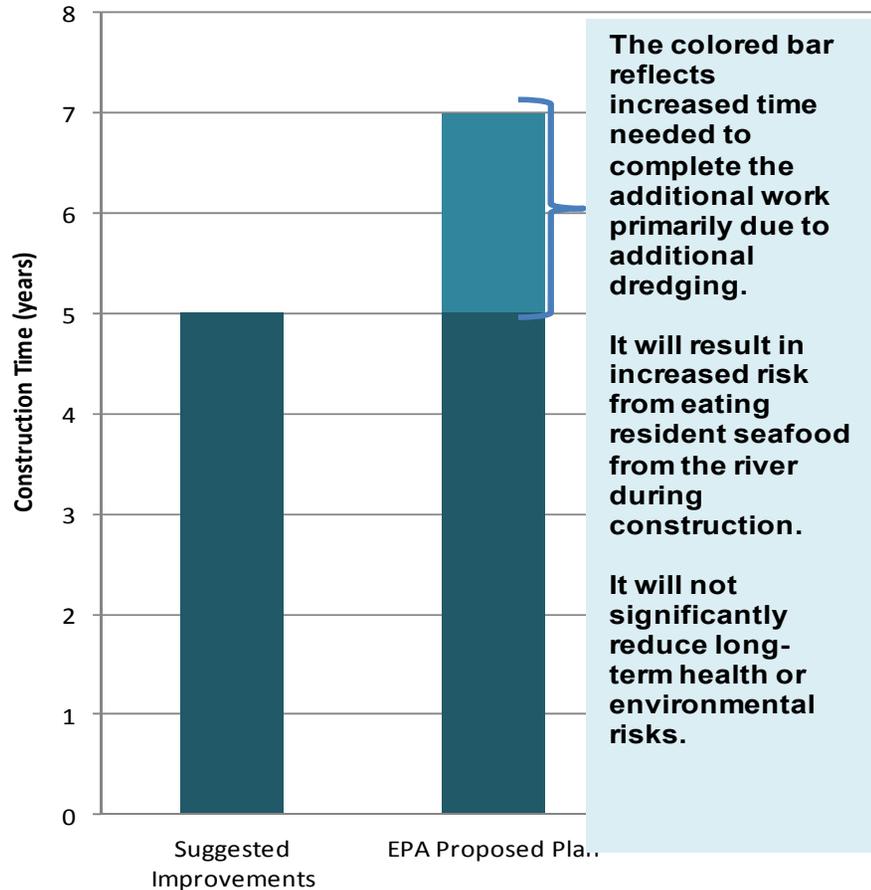
- Protect human health sooner by:
 - Careful, strategic use of dredging
 - Optimized technologies
- Call for strong monitoring and oversight to enable additional actions if needed
 - Increases the certainty of meeting cleanup objectives
- Respond to social justice concerns
 - Reduces human health risk from consumption of resident seafood and community impacts like increased asthma, noise, traffic, and business disruption sooner



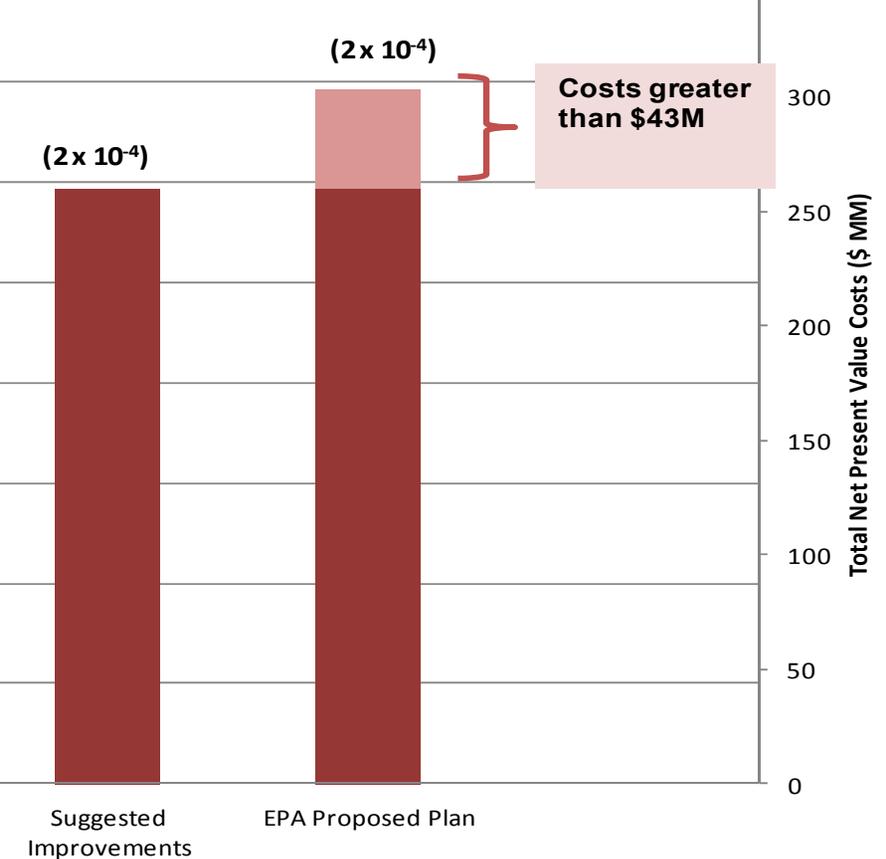
Alternative 5C+

Comparing cleanup options

Construction Times = Period of Elevated Risks



Both options achieve same long term seafood consumption risk reduction (2×10^{-4})



Remedial Alternative

Note: incremental costs and length of construction may be higher due to new cleanup goals in proposed plan.

EPA's Proposed Plan – a good start

New cleanup requirements will challenge success

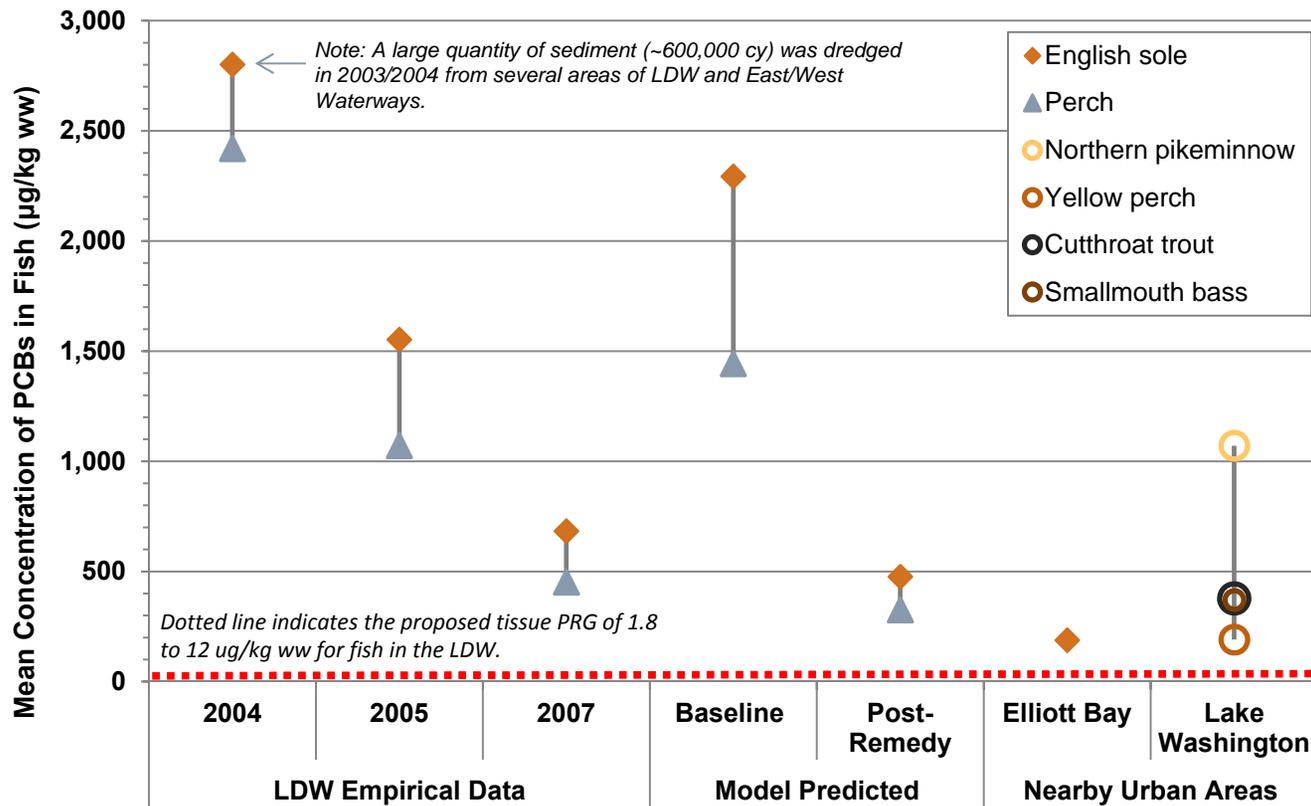
Unachievable cleanup requirements may delay the start of cleanup.

- Natural background goal for sediment cleanup
- Fish tissue cleanup goal are below levels seen in other local urban waters, such as Lake Washington
- Water quality cleanup goals are lower than the upstream Green River, and other area rivers such as the Snohomish and Puyallup

Fish tissue cleanup goal

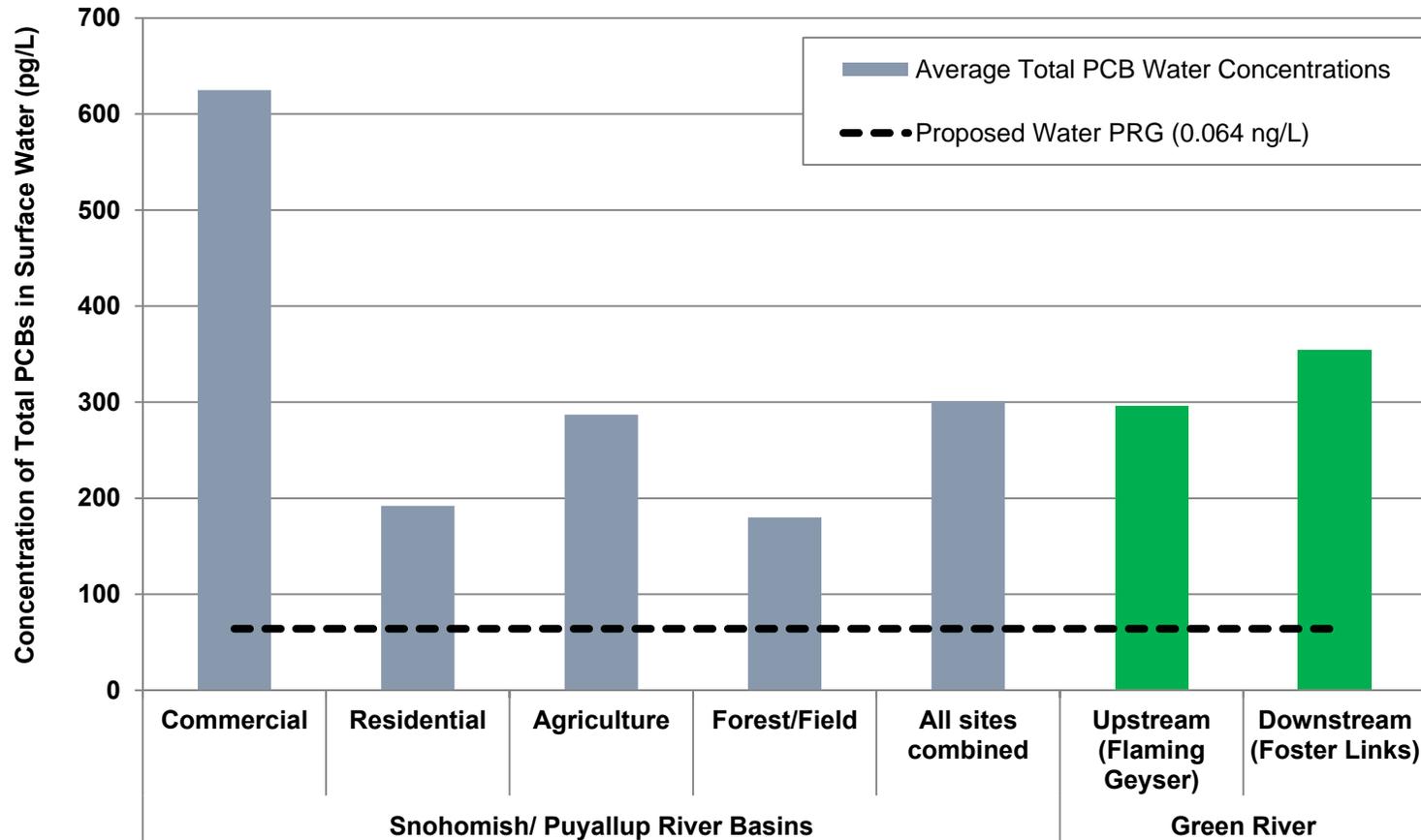
Lower than Lake Washington

Fish Tissue Concentrations in the LDW and Surrounding Urban Areas



Water quality goal

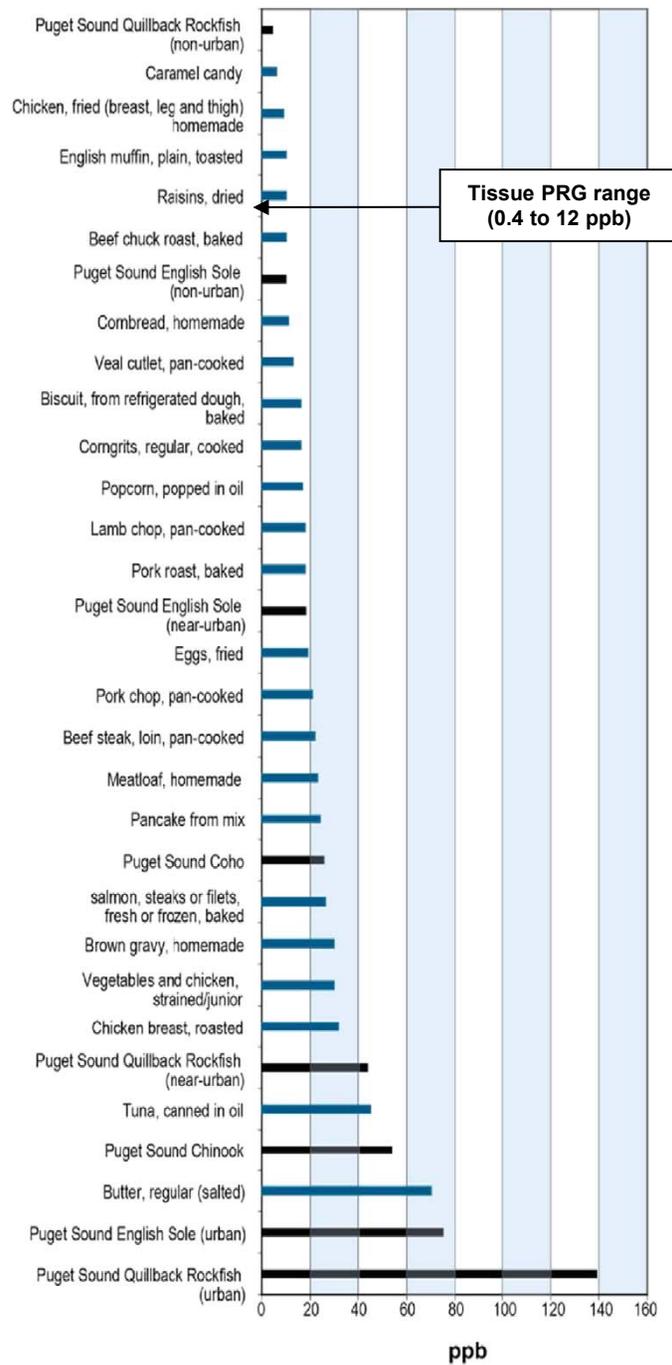
Cleaner than Green River



Summary

- It is important to get started to eliminate uncertainty for our community and businesses and to quickly reduce health and environmental risk.
- The sediment, water quality, and fish tissue goals in the proposed plan are unachievable, which jeopardizes ability to begin cleanup.
- Additional dredging of isolated contamination increases human health risk, delays the final cleanup, and does not produce lower risk to people or to the environment.
- LDWG wants to invest wisely.
 - Maximize most effective cleanup opportunities
 - Minimize public health impacts
 - Implement quickly with least disturbance to the community

Supporting Slides



Source: Ecology (2012) citing Puget Sound Action Team 2007
 Note: Samples include fish from Puget Sound and results are reported in micrograms per kilogram sampled. Commercial foods were sampled as part of the U.S. Food and Drug Administration's total diet study and market-basket survey. In most cases, data are limited by small sample sizes.

Environmental Justice Considerations

- EPA's EJ Purpose:
 - Identifies disproportionate environmental effects compared to other similar communities
 - Identifies how the cleanup alternatives will affect those disproportionate adverse impacts
- Findings:
 - There is no alternative that can make it safe to eat unlimited resident seafood
 - Recommends mitigations for impacts both during and after construction activities
- Limitations of Analysis:
 - Does not emphasize that the cleanup significantly improves the river and lowers risks from eating seafood
 - Risk from eating fish post cleanup will not be disproportionate; conditions will be similar to other urban waterways

Remedy Concern	How Addressed in LDWG Key Elements Memo	How Addressed in EPA Remedy (Proposed Plan)
Use of natural recovery for non-human health risk drivers and providing flexibility for urban chemicals (i.e., phthalates) and transient signatures (i.e., benzoic and phenolic compounds)*	Allow 10 years for non-human health risk-drivers to achieve Washington State Sediment Quality Standards. Additional allowance for urban and transient chemicals (higher trigger concentrations).	Similar, but limits the use of recovery by using lower RALs for certain chemicals; no allowance for urban and transient chemicals.
Cap and ENR performance (stability)**	Use where feasible with armoring as necessary (e.g., placement of material with larger grain size). Monitoring, maintenance and repair.	Armor as necessary. Limit use to areas with low scour potential. Employ subsurface RAL to limit use of capping and ENR.
Reduce the availability of bioaccumulating contaminants (PCBs, dioxins/ furans) ***	Reduce through carbon amendments in ENR areas. Maximize the use of these less invasive technologies.	Similar, but limit ENR only to areas with low contamination regardless of carbon amendment use.
Exposure of subsurface contamination from scour or seismic events**	Use armoring in areas with high scour potential (Category 1). Monitor areas with lower scour potential (Categories 2 and 3) and perform contingency actions if necessary.	Incorporate a subsurface remedial action level to remove buried contamination regardless of stability or bioavailability. Limited use of ENR.
Approach for achieving natural background cleanup level of 2 ppb for PCBs *	Provide a technical impracticability waiver prior to remediation. Models predict that long-term concentrations will asymptote to approximately 40-50 ppb for PCBs.	Provide technical impracticability waiver after years of monitoring and review of site conditions for possible additional actions.
Resident Seafood Tissue Goals *	Develop likely achievable tissue targets and monitor progress towards these targets.	Set enforceable tissue cleanup level at background (which is unattainable in urban area based on all available information).
Surface Water Goals*	Surface water quality is managed by other programs.	Set enforceable surface water cleanup levels at the Federal HH recommended water quality criterion (0.064 ng/L), within the range of laboratory method blanks.

*LDWG concern; ** EPA concern; *** LDWG request and EPA adjustments