Comparison of Lower Duwamish Waterway Baseline Tissue Results with Historical Data and Remedial Conditions

Susan McGroddy (Susanm@windwardenv.com), Kathy Godtfredsen, Suzanne Replinger, and Thai Do (Windward Environmental, Seattle, WA, USA) David Schuchardt, Peter D. Rude, and Allison Crowley (City of Seattle, Seattle, WA, USA)
Jeffrey Stern and Debra Williston (King County, Seattle, WA, USA)
Brian Anderson and Joe Flaherty (The Boeing Company, Seattle, WA, USA)
Joanna Florer (Port of Seattle, Seattle, WA, USA)

Background/Objectives. The Lower Duwamish Waterway (LDW), located in Seattle, Washington, is a 5-mile estuarine site that was listed as a Superfund site in 2001 and as a Washington State Model Toxics Control Act site in 2002.The Record of Decision (ROD) for the LDW was released by the US Environmental Protection Agency (EPA) in late 2014. Since then, the Lower Duwamish Waterway Group (LDWG) has been engaged in baseline sampling of sediment, tissue, surface water, and porewater, as well as other activities, to ready the site for design sampling and remedy construction. The baseline data, collected following the completion of early actions within the LDW, serve as the foundation to compare pre- and post-final remedy conditions, provide one measure of effectiveness of early remedial actions, and allow an assessment of the predictive ability of the Food Web Model (FWM).

Approach/Activities. The remedial investigation (Windward 2010) presented tissue data for human health risk drivers in target resident seafood: fish (English sole and shiner surfperch), crab (Dungeness and slender crab), and clam (eastern softshell), including temporal trends when data were available. As part of baseline sampling, these species were collected throughout the LDW in 2017–2018 and analyzed for polychlorinated biphenyls (PCBs), dioxins/furans, carcinogenic polycyclic aromatic hydrocarbons (cPAHs), and arsenic. These data provide: 1) a comprehensive assessment (snap shot) of tissue data following the completion of early remedial actions and prior to the implementation of the site-wide remedy to serve as baseline for future comparisons, and 2) a comparison for target tissue levels (derived for risk communication) of human health risk drivers listed in the ROD.

Results/Lessons Learned. Early remedial actions have substantially reduced sediment PCB concentrations in the LDW. This presentation will evaluate the tissue data collected after these actions to assess their effect on PCB concentrations in fish and crab tissue. The empirical data will be compared to FWM predictions to evaluate the ability of the FWM to predict the effect of reduced sediment contamination on tissue. An analysis of these results will be presented within the context of the conceptual site model, the sediment remedy, concentrations in surface water, source control, and risk communication. Other tissue results, including trends in arsenic and cPAH concentrations in clams, will also be discussed.