

## **A Weight-of-Evidence Based Approach to Assessing Recontamination Potential in the River Mile 11 East Area of Portland Harbor**

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**Background/Objectives.** The River Mile 11 East (RM11E) Area is within the Portland Harbor Superfund Site (Portland Harbor) adjacent to the eastern bank of the Willamette River as it flows through Portland Oregon. The RM11E Area and adjacent uplands are used for commercial operations, marine shipping, and upland transportation (roadways and rail). Concentrations of PCBs and dioxins/furans in sediment exceeding remedial action levels (RALs) are present in this area and require active remediation under the Portland Harbor Record of Decision (ROD). Although the chemicals driving the remediation are from legacy sources and activities, a recontamination assessment (RA) was performed to evaluate potential sources of sediment recontamination and confirm that they have been adequately investigated and controlled. EPA is the lead Agency for the in-water cleanup and the Oregon Department of Environmental Quality (ODEQ) is the lead Agency for upland and upriver source control. This RA required assessment of recontamination potential within the framework and requirements of both regulatory programs.

**Approach/Activities.** The RA began by narrowing the list of chemicals of concern (COCs) to a subset of chemicals that would be carried forward into the RA. A recontamination conceptual site model (CSM) was developed that identified three upland pathways (stormwater, groundwater, and riverbank erosion) and four in-water pathways (upriver, resuspension of bedded sediments, porewater, and overwater structures and activities) that pose a potential source of recontamination. These pathways were evaluated using a semi-qualitative weight-of-evidence approach that differed for each pathway depending on the physical characteristics of each pathway and the relevance/amount of available chemical information. The approach taken for this project differs from some sediment RAs because a quantitative loading analysis, using analytical or numerical modeling, was not conducted. This decision was made because the complex hydrodynamics at RM11E create significant uncertainty in modeling results. The approach also recognized and incorporated relevant source control work and decisions completed by ODEQ. For the RM11E Area, ODEQ determined the potential for sediment recontamination is low. This RA built upon ODEQ's work by considering ROD-based criteria as a comparative line-of-evidence of recontamination potential.

**Results/Lessons Learned.** The RA report was submitted to EPA and ODEQ in May 2018 and is anticipated to be finalized this summer. The findings generally supported ODEQ's overall determination that recontamination potential in the RM11E Area is low. However, several areas were identified for further consideration in design. These included 1) the bank above the mean high water line to minimize erosion of bank materials containing COCs; and 2) areas with subsurface sediment contamination that exceeds RALs to minimize potential for exposure, erosion or resuspension. The RM11E area is at a lower reach of a very large river basin and the pathway identified as having the greatest potential for influencing long-term COC concentrations was loading from upriver. For example, the study found that concentrations of arsenic, BEHP, and diesel fuels exceeding cleanup levels within the RM11E Area exist at levels consistent with natural and anthropogenic background (upriver) sources. The study findings illustrate the importance of an effective, ongoing source control program in achieving cleanup objectives under the ROD.