

Evaluating Sediment Transport at Navy Contaminated Sediment Sites: Case Studies

Patricia White (CH2M HILL, Boston, MA, USA)

Amy Blake, Bart Chadwick and Stacey Curtis (SPAWAR Systems Center San Diego, CA, USA)

Craig Jones (Sea Engineering Inc., Santa Cruz, CA, USA)

The Navy is developing guidance on evaluating sediment transport at contaminated sediment sites, and using sediment transport information to support sediment management decisions. The framework developed in the interim guidance document (June 2004) was applied at three demonstration sites: Naval Station Newport in Newport, Rhode Island; Hunters Point Shipyard (HPS) in San Francisco, CA; and Bremerton Naval Complex (BNC) in Bremerton, WA. The demonstrations focused on addressing one or more of the most common sediment management questions encountered at these sites, which are as follows:

- Could erosion of the sediment bed lead to the exposure of buried contamination?
- Will sediment transport lead to the redistribution of contamination within the site, or movement of contamination off site?
- Will natural processes lead to the burial and isolation of contamination by relatively clean sediment?
- If a site is actively remediated, could sediment transport lead to the recontamination of the site?

The site demonstrations were conducted for different purposes, and at three different points in the remedial investigation/feasibility study (RI/FS) process. A Tier 1 evaluation was conducted for Gould Island at Naval Station Newport to support the RI. A Tier 1 evaluation is based on readily available RI data and relies on relatively uncomplicated data analysis methods. The Tier 1 results were used in conjunction with other RI findings to address the relevant sediment management questions and determine whether a more detailed, site-specific Tier 2 evaluation was needed to support the FS. A Tier 2 evaluation, which requires site-specific data collection and more complex data evaluation methods, was completed at HPS to support the development and evaluation of remedial alternatives in the FS. This evaluation included the development of a model to predict changes in contaminant concentrations in the sediment bed over time based on various remedial scenarios. A Tier 2 evaluation was also conducted at BNC after long-term monitoring data indicated that the monitored natural recovery component of the remedy was not performing as expected. The objective of the Tier 2 sediment transport study was to evaluate whether the erosion and transport of contaminated sediments from adjacent areas or offsite areas could be responsible for higher than expected contaminant concentrations in remediated areas, including potential effects of prop scour. The Tier 2 data from BNC were used to refine the conceptual model of sediment transport at the site and guide discussions regarding potential additional remedial actions, if necessary. Results from these demonstrations and lessons learned will be incorporated into the final version of the guidance document, which will be published in 2006.