Mercury Contaminated Sediment Sites: A Review Of Remedial Solutions

Contact

National Risk Management Research Laboratory

Citation:

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Description:

Mercury (Hg) can accumulate in sediment from point and non-point sources, depending on a number of physical, chemical, biological, geological and anthropogenic environmental processes. It is believed that the associated Hg contamination in aquatic systems can be decreased by imposing effective management and monitoring strategies of contaminted sediment. Environmental project managers face several challenges in the management of contaminated sediment sites, primarily due to the large volumes of sediment that are typically involved. The complexities and high costs associated with characterization and cleanup are magnified by evolving regulatory requirements and the difficulties inherent in tracking the contaminants in aquatic environments. Generally, four basic options for remediation of contaminted sediments exist for environmental project managers; they are: (1) Containment in-place, (2) Treatment in-place, (3) Removal and containment, and (4) Removal and treatment. Existing technologies for remediating Hg-contaminated sites focus primarily on highly polluted areas, and are not suitable for remediating vast, diffusely polluted sediment areas where pollutants occur at relatively low concentrations. The speciation of Hg, which concerns the identification and quantifying of specific forms of Hg, is a critical determinant of its mobility, reactivity, and potential bioavailability in Hg-impacted sediment-water systems. Common Hg-contaminated sediment remediation strategies include dredging, capping and natural attenuation. Since each remedial action can result in a change in the physical, chemical and biological conditions of the sediment, it is expected that the speciation and transport properties of Hg might change as the result of implementing a remedial action. However, the effectiveness of such remediation practices has not been adequately assessed and long-term reliability has not been proven. The aim of this poster is to discuss the characterization, assessment, and approaches for the cleanup of mercury contaminated sediments from past industrial operations, contaminated rivers, lakes, swamps, coastal areas, and gold and mercury mines. Case studies include characterization, assessment, and remediation efforts made at

Lavaca Bay, Texas, Onondaga Lake in Syracuse, New York, Lake Turingen, Sweden, Sulphur Banks Mercury Mine near Clear Lake, California, a mercury cell chlor-alkali plant in the Southeastern U.S. and other characterization and assessment efforts at the Nura River and Lake Balkyldak in Kazakhstan.

Purpose/Objective:

To discuss the characterization, assessment, and approaches for the cleanup of mercury contaminated sediments from past industrial operations, contaminated rivers, lakes, swamps, coastal areas, and gold and mercury mines.

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