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Monitored Natural Recovery Evaluation of Cottonwood Bay/ Mountain Creek Lake Sediments

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ABSTRACT

Monitored natural recovery (MNR) is a sediment response action that involves leaving contaminated sediments in place and relying on ongoing natural processes to reduce environmental risks. MNR relies on physical, chemical, and biological processes to isolate, destroy, or reduce exposure to or toxicity of contaminants in sediment. At the Cottonwood Bay / Mountain Creek Site (Dallas, Texas), dredging was identified as the approved remedy to address contaminated sediment. However, 2014 surface sediment sampling results and an initial evaluation of MNR processes suggested that current surface sediment conditions at the Site are approaching site-specific remedial goals. The objective of this project is to determine whether MNR is an effective and reliable remedy for the Site, which would reduce the volume of sediment required for dredging.

Multiple lines of evidence were evaluated to demonstrate MNR could achieve site-specific remedial goals for Cottonwood Bay/Mountain Creek Lake in a reasonable time frame. These lines of evidence included temporal trends in surface sediment contaminant concentrations, sediment deposition rates and sediment stability, temporal trends in fish tissue concentrations, bioavailability of metals in sediments, and current ecological risks. In March 2015 additional data were collected to complete the evaluation of these MNR lines of evidence, including sediment coring and analysis of chemistry and geochronology, surface sediment AVS/SEM and porewater analyses, and fish tissue chemistry.

Findings from the 2015 evaluation were combined with previous assessments to create a comprehensive conceptual site model that characterizes and quantifies MNR processes at the Site. This presentation will discuss how the historical and 2015 data were used to demonstrate natural surface sediment recovery processes, negligible sediment metals bioavailability, limited ecological and human health risks at the Site, and long-term stability of the remedy. These evaluations demonstrate MNR as an effective and reliable remedial option for Cottonwood Bay and Mountain Creek Lake. Results of the MNR assessment report are under review by the Texas Commission on Environmental Quality (TCEQ). The TCEQ findings also will be discussed during this presentation.