

REACTIVE CORE MAT installed as NAPL control remedy at Vermont superfund site

A manufactured gas plant operated at the Pine Street Canal site from 1895 to 1966. The plant disposed of wastes from the gasification process, including coal tars, which migrated to a canal on the site. The canal, built in the mid-1800's, served lumber yards in the area. In addition, the sites' history includes activities at a tie-treating facility resulting in DNAPL discharging to the subsurface. As part of many remedial efforts at the site, a sand cap was constructed in 2002 to cover contaminated sediments and restore nearby wetlands.



PROJECT DETAILS

Pine Street Canal Superfund Site

LOCATION

Burlington, Vermont, U.S.A.

PRODUCTS USED

REACTIVE CORE MAT®

ORGANOCLAY® Organic Adsorption Media

Image left to right: Left - Shows measurable DNAPL on the sand cap surface (Winter 2003/2004). Middle - Surface sheen that was observed after the sand cap installation (2005). Right - ORGANOCLAY® REACTIVE CORE MAT® being deployed from a barge. Reactive Core Mat® was deployed in multiple layers in some areas.

CHALLENGE:

Nonaqueous-phase liquid (NAPL) was detected on a limited portion of the completed sand cap at the Pine Street Canal Superfund Site. In addition, sheen was observed on the surface of the canal water. Investigations by the active cap design engineer, ARCADIS, revealed that NAPL had migrated through the sand cap due to consolidation and the effects of vertical hydraulic gradients. In 2006, ARCADIS was retained to prepare an Action Plan for development of a revised remedy to control NAPL migration into the Canal.

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Finished cap.

SOLUTION:

ARCADIS conducted additional site investigations to determine the mechanism of NAPL transport, developed NAPL control alternatives, and conducted predesign treatability testing. The selected alternative was CETCO's REACTIVE CORE MAT® (RCM) with ORGANOCLAY®. Because the Canal sediments and underlying peat were very soft, highly compressible, and contained NAPL, a lightweight cap such as a RCM was preferred. These tests also helped define the capacity of the ORGANOCLAY® to be used in the RCM, which figured to be at least 50 percent by weight. The NAPL-removal capacity was used to determine the number of RCM layers needed for a 30-year minimum design life. In addition to the sediment remedy, NAPL recovery wells were installed upland.

RESULT:

In 2010, 165,000 square feet of ORGANOCLAY® REACTIVE CORE MAT® was successfully deployed as an amendment to a portion of the existing sand cap. Historical flooding occurred at the site in Spring 2011. The Final EPA inspection was conducted in August 2011. Since installation, no NAPL seeps have been observed through the amended cap, and all components are stable following flooding.

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