

AquaBlok® Installation Profile



Site Location: *US EPA Region 4*

Chattanooga Creek, Tributary of Tennessee River, Chattanooga, TN

Project Status: Two Phase Installation - Completed Fall 2007

Setting / Purpose: Freshwater creek and floodplain area. Provide a seal / liner to isolate and sequester the water body from mobile contaminants in surrounding area.

Contaminant(s) of Concern: DNAPL - PAHs (polynuclear aromatic hydrocarbons). Creek bed was experiencing seepage of hydrocarbon-based contaminants.

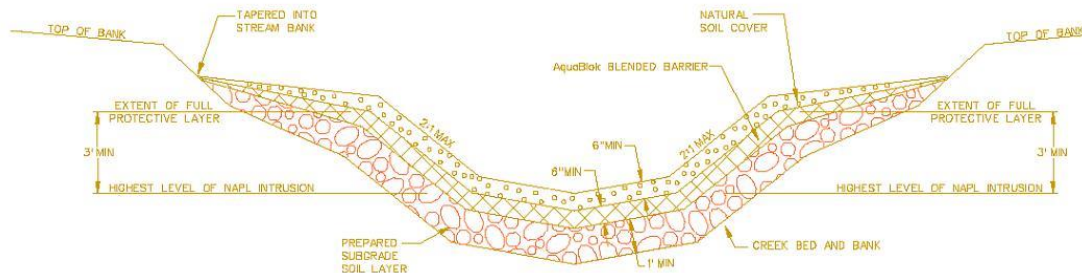


Photo 1 – Prior Excavation of Creek Bed



Photo 2 – DNAPL Seepage in Creek Bed

AquaBlok Cap Design / Site Area: Layer of 3070FW Blended Barrier product was applied in 8” thickness in prepared creek bed and hydrated. A 6” layer of native soil was applied over the cap. Site area was comprised of a 2,000-foot segment of the creek which included an oxbow, for a total of over 175,000 SF.



TYPICAL MODIFIED RESTORATION CHANNEL CROSS-SECTION
NOT TO SCALE

Drawing by: Barge, Waggoner, Sumner & Cannon

AquaBlok Blended Barrier Cap Material: AquaBlok 3070FW Blended Barrier was selected.

Comparison of Blended Barrier™ to AquaBlok Only Capping Material

	AquaBlok Only Cap	Blended Barrier Cap
Cap Composition	Composed of 100% AquaBlokParticles.	Composed of a blend of AquaBlok Particles and locally available aggregate particles.
Hydraulic Conductivity	Displays low hydraulic conductivity, typically $\sim 5 \times 10^{-9}$ cm/s depending on formulation.	Displays a low hydraulic conductivity, typically $\sim 2 \times 10^{-8}$ cm/s depending on formulation.
Placement Options	Placement is made simple with convenient packaging and many equipment options for placement to meet even the most unique project needs.	Aggregate can be obtained from local sources and blended with AquaBlok on-site prior to cap placement. Placement is made simple with convenient packaging and many equipment options for placement to meet even the most unique project needs.
Cost	AquaBlok cost varies depending on site location, cap designs, and cap dimensions.	A cost savings of up to 40% may be realized by using the Blended Barrier Technology relative to the cost of an AquaBlok only cap when used for thicker designs or in high energy environments.

AquaBlok Installation: AquaBlok 3070FW #8 material was shipped to the project site in bulk bags on flat bed trucks and stored on site. The AquaBlok was blended with locally sourced aggregate on site in conventional mixer trucks and driven to the creek. Long stick excavators placed the material directly onto the creek bed. Stakes were placed for thickness measurement, but minimal labor was required for the actual placement.



Photo 3 – Preparation of AquaBlok Blended Barrier



Photo 4 – Application of AquaBlok to Creek Bed

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Site Related Challenges: The project site experienced a number of significant rainfall events over the course of the installation. During the Phase I installation, the site contractor was forced to abandon the site after the Tennessee Valley Authority released water upstream on the Tennessee River and caused the entire work area to become inundated from water moving upstream on the Chattanooga Creek. In addition, site pumps were overwhelmed on at least two occasions and the temporary dams on the creek were breached once.



Photo 5 – View of Total Flood Event



Photo 6 – Finished Creek Section After Flood Event

Current Status: Since the completion of installation in 2007 the barrier has been successful in sequestering potential residual contamination. The EPA has made statements that suggest that there is a potential for additional measures for passive or active product recovery of contaminants that may remain on the site. But the AquaBlok has been characterized as “extremely stable” by Craig Zeller, USEPA project manager for Region 4.



Photo 7 – A view of a section of the creek bed completed in fall of 2006. Photograph taken in August 2007 indicates a rapid recovery of natural stream habitat.



Photo 8 – A close up view of the AquaBlok in the completed section of the creek bed. The product was stained by the clay cover to resemble the natural stream bed.