Photo 1. Loader/excavator cutting an 18” wide trench at the top of the berm adjacent to the leaking wastewater treatment pond (left). Note water in the basin during excavation

AquaBlok®

Installation Summary

Objective: Vertical Cut-Off Wall/Core Trench

Location: Tontogany, Ohio
Setting: Wastewater Treatment Plant
Project Status: Completed October 2008

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Project Objective: Cut-off persistent seepage through an earthen berm adjacent to a wastewater treatment pond without interrupting service to the facility.

Background: As the last in a five-basin wastewater treatment system, the settling pond on the northeast corner of the facility showed signs of sustained water loss through its eastern berm starting at its northeastern corner. Interior side slopes were steep enough (~2:1) that AquaBlok lining from inside the basin was not deemed feasible. Exploratory digging identified a defined inconsistency in substrate and visible seepage at a depth of 7.5 – 9.5’ below grade. Therefore, the installation of a low-permeable core trench was determined to be the best remedy option.

Technical Challenges: Traditional methods of repair would typically involve drawdown to reduce head pressure and careful compaction of local clays (if available) and/or amendment materials (e.g. granular bentonite) into a broad trench. Achieving uniform compaction requires both the right materials and proper handling.

AquaBlok Solution: An 18”-wide trench was excavated to approximately 2’ below the seep. The initial trench cut-off wall was excavated to a length of approximately 20’, then backfilled with AquaBlok and partially hydrated using a garden hose – to help hold the material in place during subsequent trench excavations. Approximately 32 tons of AquaBlok was backfilled from the bottom of the trench excavation to approximately 2’ below the surface of the berm (or ~18” above the designed high water elevation). The trench was subsequently extended in two additional lengths, resulting in an overall trench length of approximately 48’. The overall trench dimension was approximately 48’L x 10’D (average) x 1.5’W. Product was added to the trench without drawdown to the pond.

Equipment Used: Flatbed trailer for material transport; loader/excavator (with 18” bucket) for trench excavation and product placement from shipping units (3,000-lb bulk bags); garden hose with nozzle to partially hydrate and stabilize AquaBlok (as trench length was extended).

Timeline: Trench excavation and AquaBlok placement were completed in a morning (approximately six hours, total).

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Results: Evidence of immediate expansion of the bentonite coating was visually apparent as the material was wetted in the trench. Once the top of the berm was re-graded and seeded, no settling or crowning (associated with bentonite swell) were observed. Visual signs of drainage associated with the seepage (e.g. saturated soils and lush grass on the backside of the dam) were no longer present the following spring, and no changes or signs of water loss have been observed since.

Photo 2. Aerial view of the project site showing the five treatment basins. Note approximate location of visible seepage denoted as a red line to the east of the northeastern-most basin.

Photo 3. AquaBlok being off-loaded from the flatbed trailer in 3,000lb bulk bags (standard shipping unit for bulk material). Note four lifting straps at the corners of the bulk bag.

Photo 4. AquaBlok placement from a bulk bag using the same loader/excavator that cut the trench (see Photo 1). Pond at right.

Photo 5. AquaBlok being partially hydrated with a garden hose within an 18” trench (to hold the material in place as the trench length was extended). Pond at left.

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Photo 6. AquaBlok placement from a bulk bag. Note discharge snout directing product into the open trench. Pond at left.

Photo 6. Re-grading of soil, atop the AquaBlok and the designed high water elevation, prior to seeding.

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