GEOTEXTILE TUBES AND GCLs HELP IN FOX RIVER CLEANUP

The largest river cleanup project ever attempted in North America is using geotextile tubes as a key component in the process. The USEPA Superfund site in northeastern Wisconsin encompasses a 40-mile stretch of the Fox River and more than 1,000 mi^2 of Green Bay. An estimated 7.25 million yd^3 of sediments in the river and bay are contaminated with approximately 700,000 lbs. of PCBs. The chemicals were discharged into the river in connection with past production and reprocessing of carbonless copy paper containing PCBs at multiple manufacturing facilities along the river. This occurred from the mid-1950s to the early '70s when research demonstrated that PCBs pose risks to the environment and they were soon thereafter banned by federal regulations.

The geotextile tubes are instrumental in the process of dewatering the dredged contaminated sediments. The dredged sediment is piped onshore to a handling facility where it is pumped into 60-ft. circumference x 200-ft. long geotextile tubes. Rubber piping with pinch valves allowed operators to direct incoming flow of sediment to different geotextile tubes. The geotextile fabric is porous enough to allow the water to pass through, but traps the solids, consolidating them and making their removal and disposal easier. Due to space limitations and to increase consolidation pressure, the tubes were sometimes stacked 3 or 4 bags high.

To protect the underlying soil and groundwater a lined dewatering pad was designed and constructed. The dewatering pad liner system consists of a geosynthetic clay liner (GCL), a geomembrane, a geotextile cushion and gravel layer. The GCL contains sodium bentonite, a high-swelling clay, encased between two geotextiles and has been shown to minimize leakage through any holes in the geomembrane. The water is collected in perforated pipe and directed to a sump area.

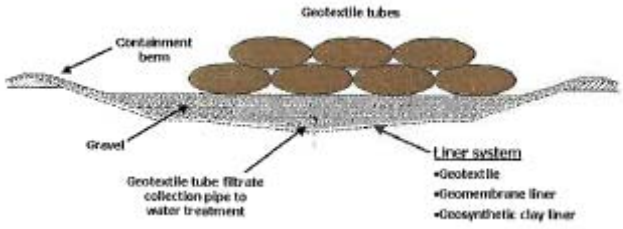

Figure 1. Cross section design of geotextile tube dewatering pad.

Water collected from the dewatering pad is treated and returned to the river. After dewatering, each 60-ft circumference geotextile tube will contain approximately 1,000 yd^3 of contaminated sediment. The sediment, when sufficiently dewatered, is trucked to a landfill.

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Figure 2. GCL being deployed over prepared subgrade.

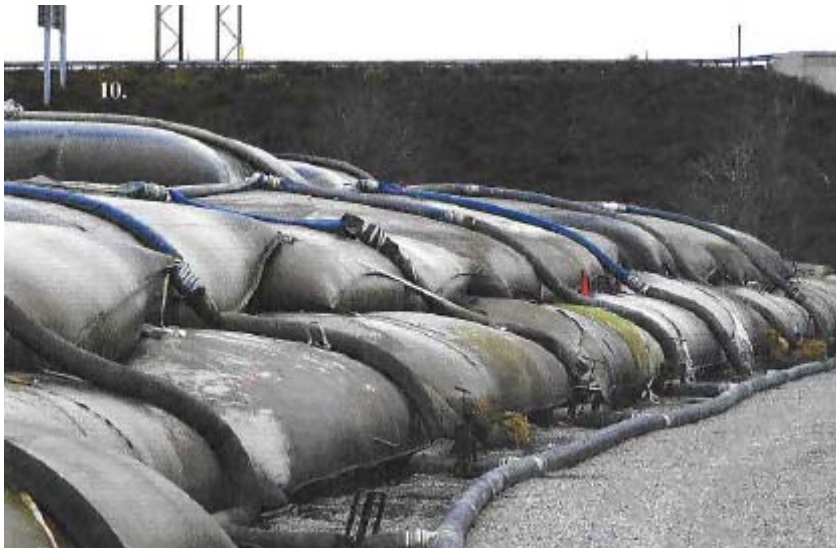

Figure 3. Stacked geotextile tubes with rubber piping and pinch valves.

References

"Geotube dewatering containers help in cleanup of the Fox River"", Geosynthetics Magazine, IFAI, August/September 2006, pp. 28-35.