



## Dewatering of Lime Residuals from WTP Lagoon

### Objective

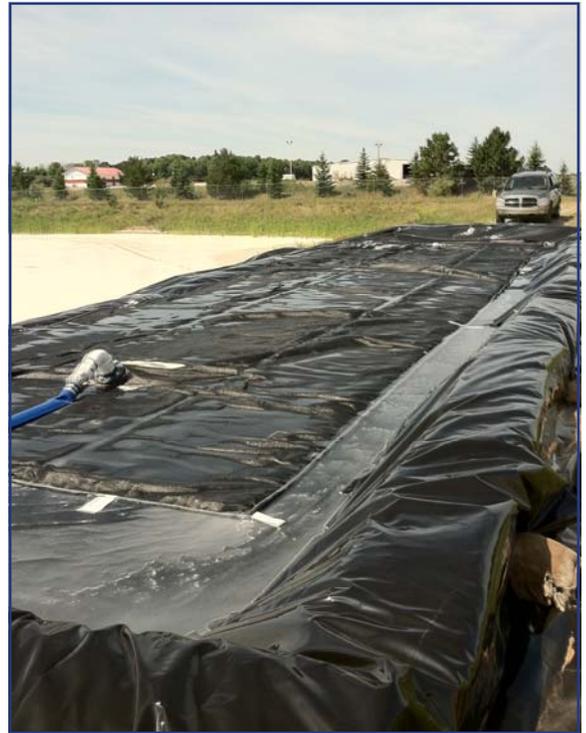
A city in Michigan needed to remove residuals from a WTP lagoon which was nearing capacity. The plan was to use the plants existing system and pump directly from the facility backwash system into Geotube® containers for dewatering. The residuals would dewater in the Geotube® containers, before being excavated and removed for disposal. The city would self perform the project, with WaterSolve, LLC personnel on site for project start-up and training.

### Geotube® Container Sizing

Geotube® containers are manufactured from high strength polypropylene fabric and designed to allow effluent water to escape through the pores of the fabric while retaining the chemically conditioned solids. The goal of this project was to determine if Geotube® dewatering would be a viable option for full scale operations in removing the lime residuals from the facility lagoons. The lagoons reach capacity every 2 to 3 years and need the residuals removed in order to continue to operate. It was determined that one Geotube® containers (30 ft. circumference x 50 ft. long) would be used to dewater the lime residuals for this project. This size container would handle approximately 99 cubic yards of dewatered material.

### WaterSolve's Chemical Conditioning

A sample of the lagoon biosolids was sent to WaterSolve's lab for preliminary testing. Based on laboratory testing, Solve 163 was determined to flocculate and dewater the residual most effectively compared to the other products. Water clarity and flocculent appearance were good to excellent when a 3-mL dose was added to a 150-mL sample (100-ppm/1.8-lbs per dry ton).



The 30' circumference by 50' long Geotube® was placed on a 20-mil liner. Hay bales were placed on 3 sides of the container to direct filtrate into the lagoon.



**(RIGHT)** Prior to the residuals being pumped into the Geotube® containers, Solve 163 was injected into the material to facilitate the dewatering process. Two ninety degree bends provide mixing energy so the chemistry and pumped material have adequate mixing.

**The Result**

WaterSolve LLC, was contracted to assist with project startup and training of city personnel. This included providing a liner, Geotube® container, filtration fabric, polymer, a polymer feed system, and technical assistance. The city had an existing area to be used as the laydown area where the Geotube® container would be placed. Upon arrival at the site, a 20-mL liner was laid out using hay bales as a berm to create a containment area. Geotube® filtration fabric (GFF), which assists with drainage between the Geotube® container and the liner, was placed on the liner. The Geotube® container was unrolled and hose was plumbed into one of the fill ports. The polymer feed system was placed between the lagoon and the Geotube® containers. The polymer feed unit selected for this project is capable of providing up to 10 gallons per hour of neat polymer. The pail of Solve 162 polymer was plumbed to the polymer feed unit and the made-down polymer supply line was plumbed into a 6" mixing manifold as part of the pipeline. When the pumping began, sampling of the treated material indicated a low dose of flocculating polymer was needed to treat the material. The polymer dosing rate was adjusted, as needed, based on visual monitoring of the treated material. The WaterSolve technician was on site for the first three days of the project to assist with operations and train city personnel that would be in charge of monitoring the dewatering aspect of the project for the remainder of the project. Operations continued until the Geotube® container reached capacity.



After a few weeks, the Geotube® container reached its maximum capacity. The hoses were disconnected and the City decided to let the container continue to dewater over the next several months.

After dewatering for several months, the Geotube® container was opened and the material was sampled and removed. The untreated raw material measured 11% dry weight solids (DWS). The treated material measured 32% DWS after one day of dewatering. Samples taken from the filled Geotube® container averaged 38% DWS after 2 months and 46% DWS after 9 months.

