City of Clarence Rockland Uses Geotube® Technology to Decommission Sewage Lagoon

The Challenge...

The City of Clarence-Rockland is located approximately 25 minutes East of the Nation’s Capital and in 2009 they were faced with a daunting challenge. The City operates a lagoon cell which contained over 10,000 cubic metres of sludge which ranged from 8-12% solids. The lagoon cell was located on land which was required for the construction of the Canadian International Hockey Academy. The City needed to decommission the lagoon to allow for the construction of the hockey academy to move forward. An effective, economically viable solution to de-sludging the lagoon was required.

The Solution...

After evaluating many options, the city selected Geotube® dewatering containers as the best suited technology to accomplish the task based on cost and effectiveness.

Geotube® dewatering containers are constructed of a special woven polypropylene material which is extremely efficient at retaining solids and producing clear effluent. Geotube® units sit upon a constructed lay down area which is designed to direct the filtrate to wherever the application demands in this instance back to the lagoon.

As sludge is pumped to the containers it is chemically conditioned with a polymer to allow the Geotube® to dewater at its maximum efficiency. Once pumping is completed the Geotube® units are left to dewater until such time that the odourless, retained solids are land applied.

It was determined that the lagoon cleanout would take place in two phases. Phase one beginning in late 2009 and phase two beginning in the spring of 2010.

The Construction...

Site preparation began in November of 2009 with the construction of a lay down area measuring 180’ x 200’ where the Geotube® units would be deployed and filled. The lay down area was constructed by creating a 100% level compacted sub-grade from sand which was then covered by an impermeable membrane, a non-woven geo-textile material and an extruded three dimensional drainage netting used to promote dewatering from the bottom of the Geotube® units. Once the lay down area was completed the Geotube® units were deployed.

A dredge was used to pump the contents of the lagoon to the Geotube® units. As the sludge was pumped from the lagoon cell it was chemically conditioned in line in order to facilitate the dewatering process.
The Performance...

The first stage of the two stage project began on November 19, 2009 and continued for 14 days. Pumping rates varied due to heavy amounts of vegetation contained in the lagoon, however after the first 4 days of pumping vegetation no longer interfered with pumping and rates reached as high as 1300 gpm. Over the course of the 14 days, over 5600m3 which averaged approximately 9% solids of sludge was pumped to and dewatered by the Geotube® units.

The Geotube® units used in phase 1 were left onsite to dewater throughout the winter months. At the end of phase 1 the bags had been filled to their maximum pump height of 7.5’. The following spring, the same bags had decreased in height by about 50% due to the aid of the freeze thaw cycle.

Phase two of the dewatering project began in June 2010. To allow for the maximization of existing dewatering cell it was determined that Geotube® units would be stacked on those which been filled and allowed to dewater over the winter. An additional 6 Geotube® units were deployed, 5 measuring 45’ in circumference x 100’ long and one measuring 45’ in circumference x 200’ long.

Pumping began on June 18, 2010 and continued for 9 days. Pumping was not hindered by the presence of vegetation, allowing Geo-Dredging and Dewatering to obtain maximum pump speeds through the project. Over the 9 days approximately 4500m3 ranging from 8-9% solids was removed from the lagoon cell and dewatered using Geotube® units.

Geo-Dredging and Dewatering completed the project and left the City of Clarence Rockland with a sludge free lagoon which could be decommissioned and allow for the construction of the Canadian Hockey Academy.

The filled Geotube® units remained onsite until March of 2011. At which point the bags were opened and solids land filled. The Canadian Hockey Academy is completed and hosting games as well as a residential apartment building has been erected where the lagoon once was. Over the course of the two years Bishop Water was instrumental in the complete remediation of the site.

Through innovative sludge management solutions using Geotube® technology, Geo-Dredging and Dewatering Solutions are establishing themselves as Ontario’s leader in lagoon sludge management projects.

For no obligation sludge management budgetary costing for your municipality or business contact the Geotube® and Project Management experts at Bishop Water. Our knowledgeable staff are ready to work with you from the design and development of a project to implementation.

How the Geotube® works...

Dewatering with Geotube® technology is a three-step process.

In the confinement stage, the Geotube® container is filled with dredged waste materials. The Geotube® containers unique fabric confines the fine grains of the material.

In the dewatering phase, excess water simply drains from the Geotube® container. The decanted water is often of a quality that can be reused or returned for processing or native waterways without additional treatment.

In the final phase, consolidation, the solids continue to densify due to desiccation as vegetation no longer escape through the fabric. Volume reduction can be as high as 90 percent.