

Case study:

Geotube® dewatering units 4000 feet underground at northern mining operation

- Mining wash water removal and dewatering
- Bishop Solids Management Solutions
- Northern Ontario, Canada

The challenge:

Wash water management solution needed for Northern Ontario mine

A mining operation in Northern Ontario is producing more mine water than they can effectively manage. The waste stream is produced through cleaning of mechanical equipment during the mining process.

The water used in this process collects sediments which increase the volume of the wastewater in the mine, while also making removal more difficult. Although there is an intricate system in place which uses a series of sumps to manage the diversion and storage of the waste stream, the fines eventually build up over time, decreasing onsite storage capacity.

The solution:

Bishop Water were contacted by representatives of the mine to determine the effectiveness of Geotube® technology at dewatering the waste stream to remove and store the fines which could be potentially reintroduced into the refining process.

Samples of the waste stream were collected and provided to the Bishop Water lab where various polymers and other chemicals were tested to determine the most efficient addition to efficiently flocculate the material prior to dewatering.

Bishop Water's polymer product Solve 216B was found to flocculate the material most effectively at a dosage of approximately 200ppm. Trial dewatering showed excellent results.

Plant operators were impressed with the dewatering and the clarity of the filtrate produced through the process and in 2011 began using the Geotube® units for the management of waste stream.

Geo-Dredging and Dewatering Solutions Inc., an Ontario based company which specializes in managing Geotube® projects, was retained to perform the work.



Figure 1. Geotube® unit discharging effluent. The Geotube® uses specially-engineered fabric to capture solids within, while allowing the release of clear effluent often at a state of quality ready for release back into waterbodies.

The construction:

While every dewatering project has its own specific challenges, creating a dewatering cell 4000 feet underground for the Geotube® to be deployed on posed a unique challenge, however because the Geotube® units were to be deployed in a tunnel, the creation of the dewatering cell was more straight forward than originally thought. An impermeable membrane was laid in the tunnel and then covered with a non-woven geo-synthetic in order to protect it.

Geotube® Filtration Fabric was then deployed over the dewatering cell to promote drainage from the bottom of the bag. Deploying the Geotube® in the subsurface tunnel had one major advantage, no beams were required to be constructed and there is no opportunity for the Geotube® to move from its original lay down area.

In order to flocculate the waste stream, Geo-dredging and Dewatering Solutions mobilized their Vepas 100 Chemical Injection System and mixing chamber. Both of which are light and compact and were easily deployed into the mine.



Figure 2. Example of Bishop Water Vepas 100 Chemical Injection Unit

The results:

Two 30' circumference x 50' long Geotube® units have been deployed at the mine site to date. Pumping of the mine water is performed periodically, when required, by Geo-Dredging and Dewatering Solutions Inc.

The mine water is pumped from the sumps at a rate of approximately 400 litres per minute. To date the project has been a success

The retained solids analysis shows the dewatered material to range from 56% to 82.5% solids. Plant Operators are pleased with the dewatering effectiveness of the Geotube® technology and its ability to retain valuable minerals.

Once the Geotube® units have been filled they will be opened and the retained solids will be refined in order to recover these minerals.

The Geotube® technology is the most diverse technology available. The success of the Geotube® units at dewatering mine water along the low cost of the project and quick subsurface deployment makes the Geotube technology the ideal solution for dewatering sump mine water.



Figure 3. The dewatering and subsequent consolidation of materials within the Geotube® allows for a more efficient solids management solution.



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