SOLMAX

GEOTUBE® DEWATERING TECHNOLOGY

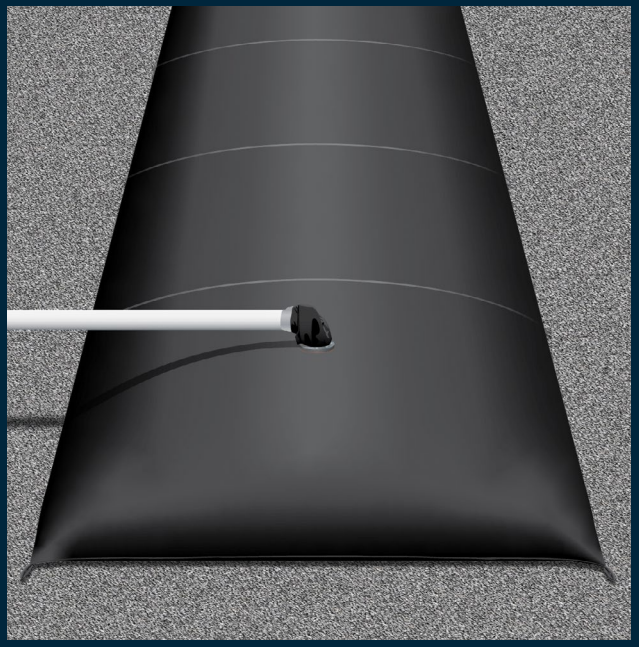
Engineered geosynthetic products and systems for civil and environmental applications

The Low Cost, High Volume Dewatering Solution

GEOTUBE® dewatering technology has become the dewatering method of choice for organizations around the world. **GEOTUBE®** dewatering technology is used for projects large and small, and there's good reason—simplicity and low cost.

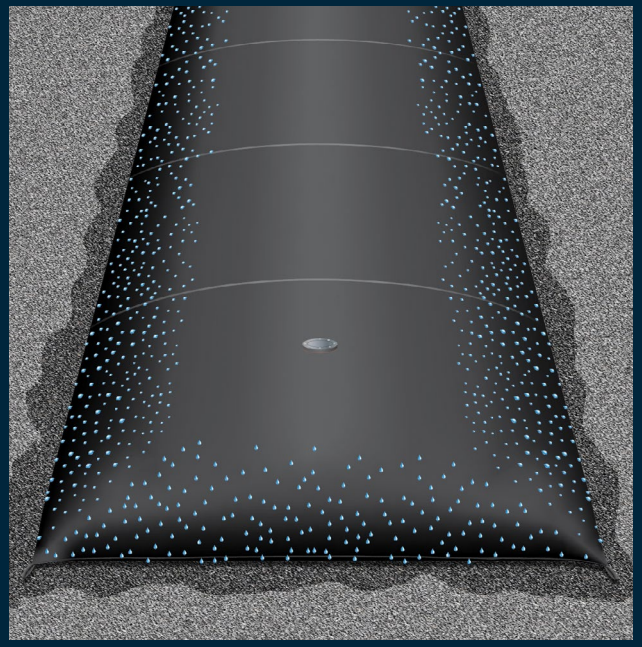
There are no belts or gears. **GEOTUBE®** containers are available in a variety of sizes, depending on your volume and space requirements.

GEOTUBE® systems can even be mounted in mobile roll-off containers that can be transported around your property as necessary. It's one of the most versatile dewatering technologies available. And one of the most effective. Volume reduction can be as much as 90%, with high solid levels that make removal and disposal easy.



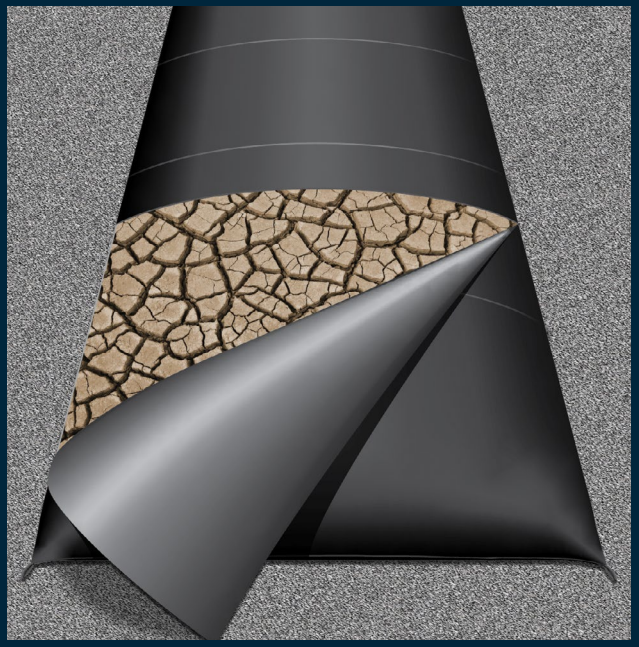
1. FILLING

Sludge is pumped into the **GEOTUBE®** container. Environmentally safe polymers are added to the sludge, which make the solids bind together and water separate.



2. DEWATERING

Clear effluent water simply drains from the **GEOTUBE®** container. Over 99% of solids are captured, and clear filtrate can be collected and recirculated through the system.



3. CONSOLIDATION

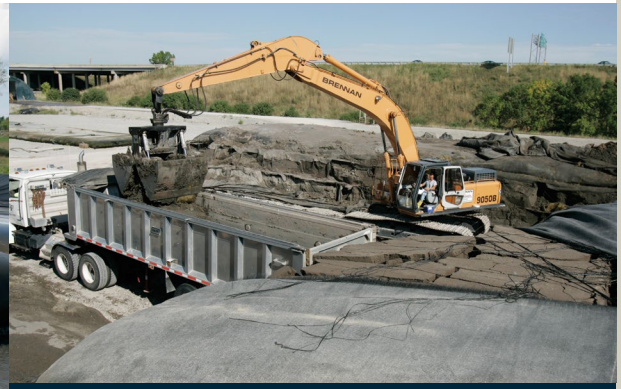
Solids remain in the bag. Volume reduction can be up to 90% When full, the **GEOTUBE®** container and contents can be deposited at a landfill, or the solids removed and land-applied when appropriate.

ENVIRONMENTAL REMEDIATION

Effective Containment for Large and Small-Scale Projects

Rivers, bays, harbors, marinas, ports, and dock facilities have been collecting contaminated sediments from industrial runoff for many years. In many cases, these sediments pose significant environmental hazards, and remediation is a difficult and expensive task. Marine sediments can be contained and dewatered easily with the **GEOTUBE®** dewatering technology. This can be accomplished at or very near the site by utilizing a dewatering basin where **GEOTUBE®** containers can be stacked several layers high to maximize space.

GEOTUBE® units can be sized for large-scale or smaller applications, and effectively contain even hazardous materials, reducing their volume dramatically and saving thousands in disposal costs.



Dewatered sludge being removed from a **GEOTUBE®** container with a backhoe.

CASE STUDY

Application	**Dewatering of PCB Contaminated Soil**
Location	**Appleton, WI**

For more than 50 years, paper mills along the Fox River have contributed to the contamination of local waterways with PCBs. **GEOTUBE®** dewatering technology is being used to dewater 750,000 to 1 million cubic yards of contaminated soil. Sixty-foot circumference **GEOTUBE®** containers were stacked three and four layers high, and have kept pace with dredges operating in excess of 2,000 gallons per minute. Dewatered solids are in excess of 50%, and the process is much more cost-effective than belt presses or other methods of dewatering.

PULP AND PAPER

Multiple Uses

GEOTUBE® dewatering technology is used for a variety of applications within pulp and paper mills, including:

- Primary and secondary lagoon cleanout
- Fly ash and alum sludge
- Contaminated sediments
- Continuous systems clarifier, sentrate, process waste stream
- Process rejects
- Separation dikes
- Emergency uses, such as cleanouts, spills, dumps, or exceeding discharge limits.

The rapidity with which a **GEOTUBE®** dewatering operation can be set up has also been an advantage in paper mill applications, particularly in emergency situations where mills ran the risk of having to shut down.

GEOTUBE® containers in activated sludge basin at paper plant.

CASE STUDY

Application	**Cleanout of Black Liquor Lagoon**
Location	**St. George, NB**

The black liquor sludge lagoon at the Lake Utopia paper mill was full and in danger of overflowing. To solve this problem, 1,400 linear feet of **GEOTUBE®** containers were placed in a landfill area and were used to dewater and contain the material dredged from the lagoon. The process took less than seven days.

Over 19,800 cubic yards of material were dewatered, and they solidified within the **GEOTUBE®** containers to more than 50% in about three months. The containers will remain in the landfill permanently.

MINING AND MINERAL PROCESSING

Flexible Enough for Available Space

Mine tailings, coal sludge, and other materials can be managed and handled cost-effectively with **GEOTUBE®** dewatering technology. Because **GEOTUBE®** containers can be custom-sized to the application, they can be placed in available space between other structures, and removed once dewatering is complete. **GEOTUBE®** dewatering technology is a cost-effective alternative to mechanical processes. It reduces disposal cost by consolidating higher solids with very little maintenance.

Effluent can be pumped directly from the process; or if a clarifier/thickener is used, effluent from the underflow can be diverted through the **GEOTUBE®** container, eliminating the requirement for an expensive mechanical dewatering device. **GEOTUBE®** units can be used to capture fines, silts, and clays from the tailings effluent prior to discharge into the ponds or directly into streams.

GEOTUBE® units will separate and dewater the fines and allow disposal without expensive dredging and transporting operations. In some cases, conditioners or polymers are used to promote flocculation to improve solids retention and filtrate quality.

GEOTUBE® containers can also be used to utilize the fines to build dikes and containment berms.

Gold mine tailings from barren and pregnant ponds dewatering in **GEOTUBE®** containers.

CASE STUDY

Application	**Dewatering of Acidic Mine Tailings**
Location	**Skytop Mountain, PA**

During the construction of I-99 in Pennsylvania, workers unearthed more than 700,000 cubic yards of pyritic rock left over from mining. The acid runoff from this material threatened local streams and groundwater.

The solution: a process using **GEOTUBE®** dewatering technology.

The pyritic rock is crushed and treated with a neutralizing agent. Acid runoff from this process is collected in sediment ponds, which is treated and pumped through **GEOTUBE®** containers.

Water, clear and neutralized, flows from the **GEOTUBE®** container without requiring further treatment.

POWER GENERATION

A Solution for Fly Ash and Bottom Ash

Power generation by-products such as fly ash and bottom ash can be a real challenge to remove and manage. But the simple technology of **GEOTUBE®** dewatering allows facilities large and small to easily consolidate these materials—and make adjustments as needed based on volume.

GEOTUBE® dewatering technology safely contains fly ash, preventing airborne particle contamination from windblown ash piles. The ash can then be used for road base applications or even to build up the berms around a lagoon to increase its capacity. In many fly ash operations, there is no need to add polymer to the dewatering process, making it simple and affordable.

GEOTUBE® containers at power plant being used to dewater fly ash.

CASE STUDY

Application	**Dewatering of Boiler Ash**
Location	**Camden, TX**

GEOTUBE® dewatering technology was used for dewatering a lagoon containing approximately one million gallons of boiler ash, with solids 2.6% by dry weight. Previous dewatering attempts using a long stick Trac Hoe were only partially successful, and the sludge had been laid up on the bank of the lagoon to dry—not an ideal approach.

However, by using **GEOTUBE®** dewatering technology, the facility was able to remove and dewater practically all the solids in the lagoon. After 30 days, the material had consolidated to 37% solids. It is estimated that this approach saved the power plant more than $60,000 annually.

WATER AND WASTEWATER TREATMENT

For Applications Large and Small

GEOTUBE® dewatering technology has been used in water and wastewater treatment applications including lagoon, tank, and digester cleanouts. It can provide dewatering and containment in one operation, with 85% to 90% reduction of BOD in the effluent.

GEOTUBE® dewatering technology can be used seasonally, with solids safely stored onsite between uses. It works even with fine-grained sediments, and solids can be disposed of in a landfill or land applied. It can also be a very effective way of handling septage, either at a private receiving station or a municipal site.

Units available in sizes to fit drying beds. There is also a unit designed to fit in a roll-off box (**GEOTUBE®** MDS) for convenience.

GEOTUBE® unit in municipal wastewater treatment drying beds.

CASE STUDY

Application	**Emergency Addition of 3x Septage Capacity**
Location	**Rio das Ostras, Brazil**

The population of Rio das Ostras swells to three times its normal size during holiday season in Brazil, overloading the city's water treatment facilities. **GEOTUBE®** dewatering technology was used to provide the extra capacity.

In addition to dewatering units at the city's small wastewater treatment plant, a large scale septage receiving facility was constructed at the city's landfill, using 60-foot circumference x 200 foot long **GEOTUBE®** containers.

The dewatering system was so efficient that effluent could be filtered through a reed bed and discharged into local waterways without additional treatment.

LIGHT INDUSTRIAL

Managing an Ongoing Challenge

For many industrial applications, dewatering is inevitable. It disrupts operations, adds cost, and requires complicated and expensive equipment. But this doesn't have to be the case. One of the real values of **GEOTUBE®** dewatering technology is that it can provide a quick lagoon cleanout solution, or it can add capacity by making drying beds much more efficient.

In some cases, companies have dewatered the material in their lagoons using **GEOTUBE®** dewatering technology, then used the solid-filled **GEOTUBE®** containers as berms to expand the capacity of their lagoons.

Dewatering efficiency can be improved because **GEOTUBE®** containers protect the dewatered solids from becoming saturated again in wet weather. And **GEOTUBE®** containers can be stacked on top of each other to further add capacity.

Water draining from a **GEOTUBE®** container.

CASE STUDY

Application	**Dewatering Adhesive Production Residuals**
Location	**Panama City, FL**

The residual material left over from Arizona Chemical's adhesive production process contains inorganic compounds and is too abrasive to dewater with a belt press. **GEOTUBE®** dewatering technology proved a more effective solution.

The dewatered cake solids from **GEOTUBE®** dewatering technology far exceeded any other form of dewatering previously utilized.

This increase in efficiency saved 38% over belt press dewatering—plus a 50% reduction in time to complete the job.

Because the dewatering efficiency was so much greater and the cake solids drier, there was a 40% reduction in disposal costs.

AGRICULTURE

Ideal for Swine, Dairy, Poultry, and Other Uses

GEOTUBE® dewatering technology is an effective way for managing waste from Confined Animal Feeding Operations (CAFO's). It works for lagoon cleanout and closure, and manages nutrients very effectively (over 90% phosphorous and heavy metal removal; 50% or greater nitrogen reduction).

It also controls odor and produces irrigation quality effluent water. **GEOTUBE®** dewatering technology is designated as a Practice Standard (Federal Practice Number 632) by the USDA NRCS (Natural Resource Conservation Service). As such it can qualify for up to 75% matching funds under the Environmental Quality Incentives Program (EQIP). Ask your Solmax representative for more details.

You can even set up a **GEOTUBE®** dewatering system inline, so you prevent solids from entering a lagoon. You store water for irrigation, not waste you have to deal with later. The system doesn't interrupt other operations.

GEOTUBE® dewatering technology used in agricultural applications qualifies for EQIP funding.

CASE STUDY

Application	**Farm Lagoon Cleanout**
Location	**New Bern, NC**

A hog farm lagoon had reached capacity and was in need of cleanout. **GEOTUBE®** dewatering technology was used as a simple, effective way of accomplishing this.

Solids at 4% were pumped from the lagoon. These dewatered to over 25% in the **GEOTUBE®** container. The container retained 93% of solids, plus 78% of nitrogen and 90% of phosphorous.

The costs for dewatering were less than 1/2 cent per gallon of the sludge pumped.

AQUACULTURE

Simple, Cost-Effective Waste Removal for Applications Large and Small

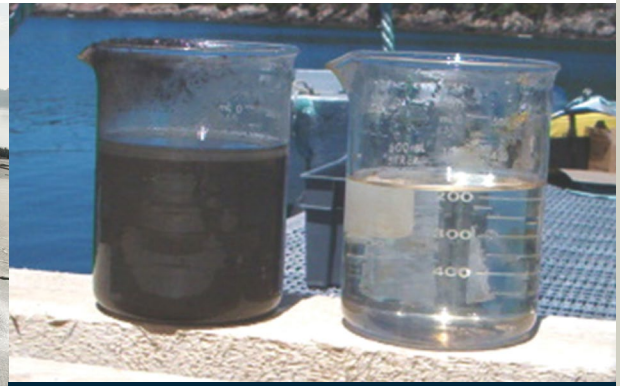
Now approved as a Best Management Practice for Aquaculture by the State of North Carolina, **GEOTUBE®** dewatering technology works for fresh water or marine fish, shrimp, and other aquatic species. It simplifies the process for water recirculation, and retains more than 99% of suspended solids.

GEOTUBE® dewatering technology reduces nutrient loading in filtrate. It can be used continuously or intermittently year-round in most climates. It is ideal for lagoon, retention pond, and filter waste applications.

It can be used for cage waste removal, benthic table waste cleanup, recirculation waste removal for hatcheries, and processing plant waste dewatering. Dewatered solids can be land applied or disposed of in a landfill.

GEOTUBE® dewatering technology has been tested extensively in programs at North Carolina State University, Freshwater Institute, Mote Marine Aquaculture Park, and Virginia Institute of Technology.

More importantly, **GEOTUBE** dewatering technology has been used in the field with solid success.



Aquaculture benthic deposit water before and after **GEOTUBE®** treatment.

TEST YOUR MATERIAL

A simple bench-scale test can determine if **GEOTUBE** dewatering technology is right for your application.

Our **GEOTUBE®** Dewatering Test (GDT) uses an actual sample of the material you need dewatered. The results from this test have been proven to be an accurate indicator of how **GEOTUBE®** dewatering technology will work in full-scale operation. You can effectively estimate effluent quality, percent of dewatered solids, and dewatering rates.

Contact your Solmax representative to schedule a test for your material.

LUNCH & LEARN

To schedule a lunch & learn with our technical team, visit Solmax.com or call +1 706-693-2226.

ABOUT US

Solmax is a world leader in sustainable construction solutions, for civil and environmental infrastructure. Its pioneering products separate, contain, filter, drain and reinforce essential applications in a more sustainable way – making the world a better place. The company was founded in 1981, and has grown through the acquisition of GSE, TenCate and Propex. It is now the largest geosynthetics company in the world, empowered by more than 2,000 talented people. Solmax is headquartered in the province of Quebec, Canada, with subsidiaries and operations across the globe.

UNCOMPROMISED QUALITY

Our products are manufactured to strict international quality standards. All our products are tested and verified at our dedicated and comprehensive laboratories which maintain numerous accreditations. We offer our partners a wide scope of testing according to published standards to ensure products delivered to sites meet specified quality requirements.

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