





Miratech...The Industry Leader in Geocontainment Solutions



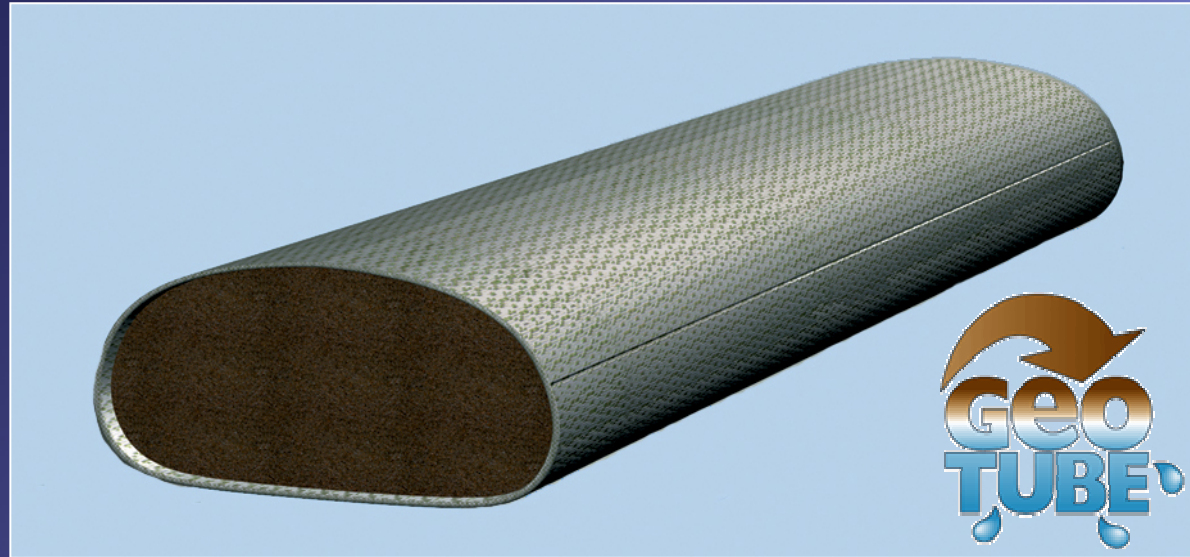
## Division of Ten Cate Nicolon

Geotube MDS Installation Guideline

Presentation v1.0

# What is a Geotube<sup>®</sup>?

- Geotubes are constructed of Mirafi<sup>®</sup> high strength woven geotextile.
- High flow rate allows liquid to dewater, while containing solids.



- Geotube<sup>®</sup> containers are custom fabricated with seaming techniques that resist pressures during pumping operations.

# Benefits of Geotube® Technology

- Effective high volume containment.
- Efficient dewatering & volume reduction.
- Cost effective.
- No special equipment required.
- Custom site specific fabrication.
- Lower equipment cost.
- Low maintenance.
- Low labor cost.



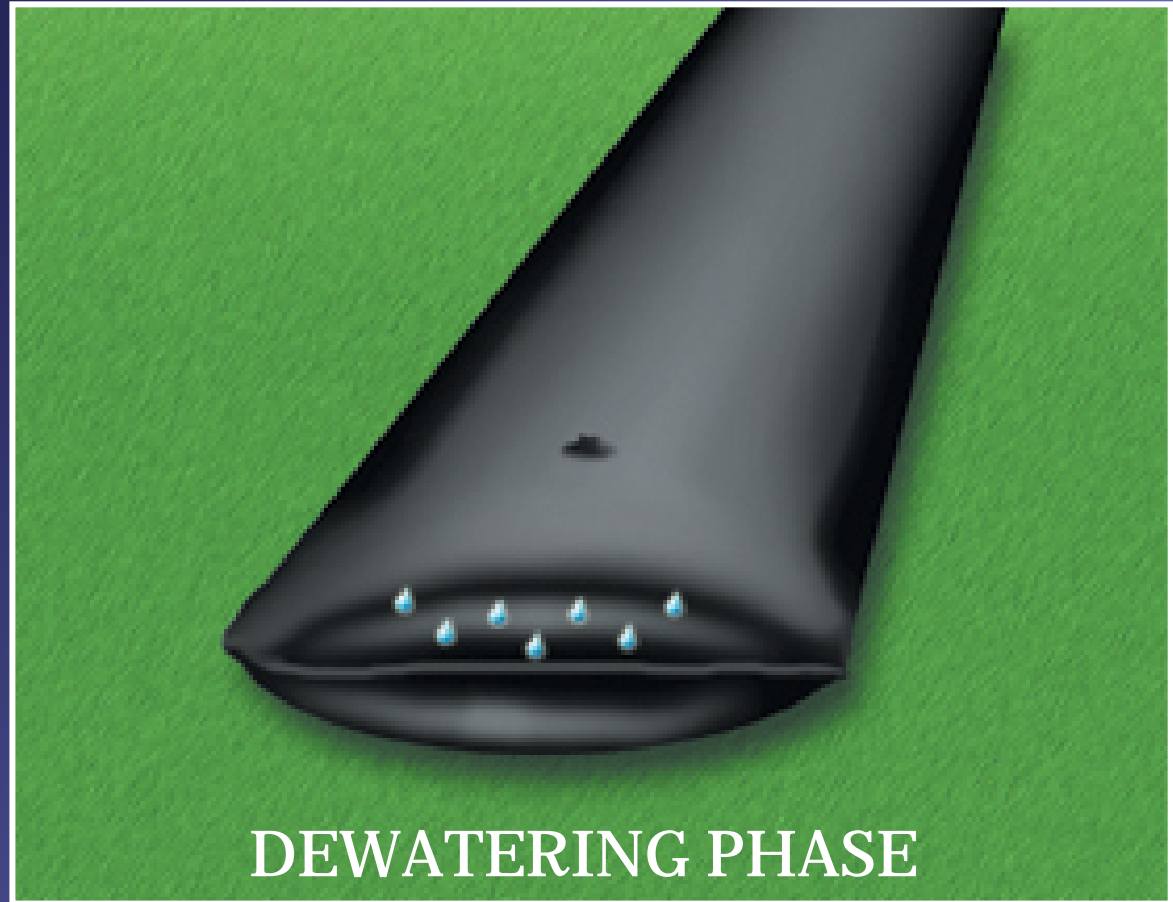


# CONTAINMENT AND DEWATERING



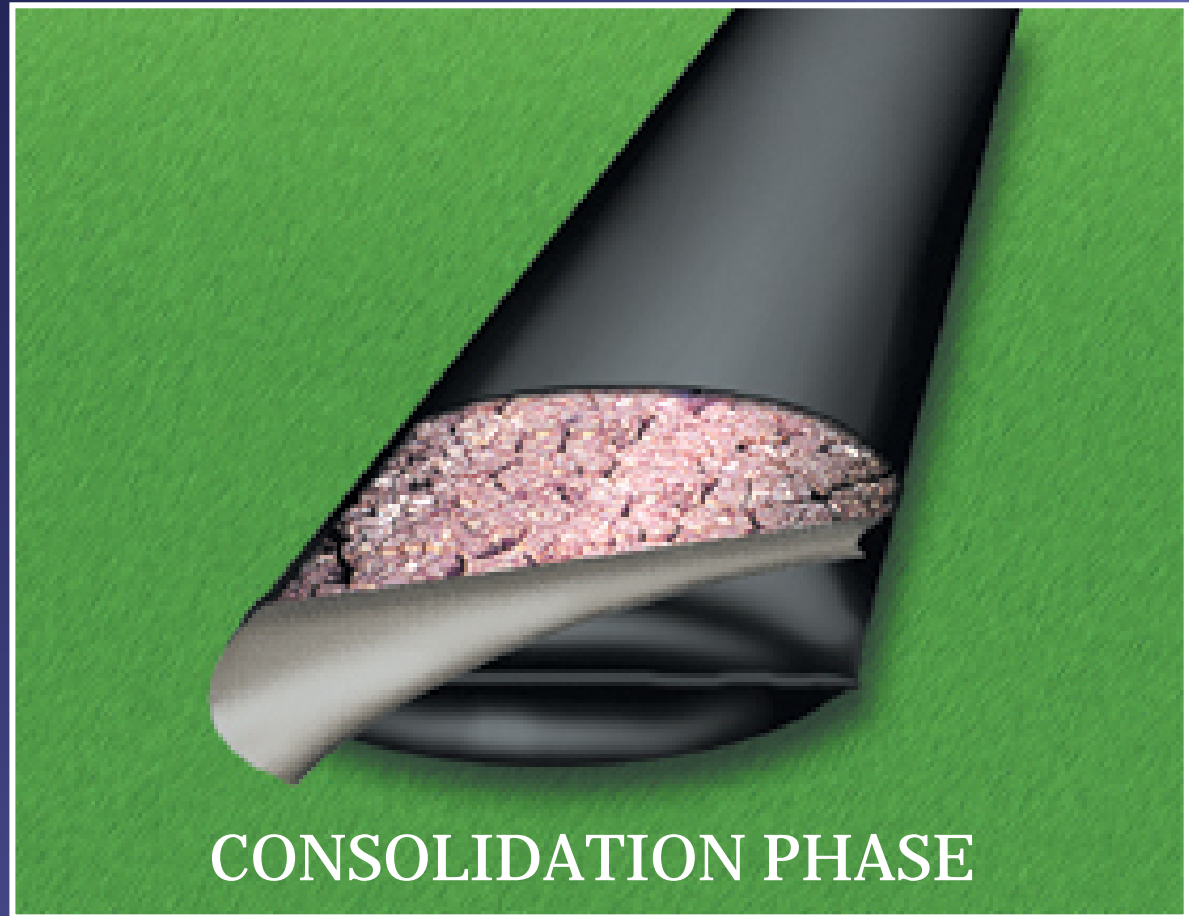
The Geotube<sup>®</sup> is pumped with sludge material.

# CONTAINMENT AND DEWATERING



As the liquid escapes from the tube, solid particles are trapped inside. The process is repeated until the tube is full.

# CONTAINMENT AND DEWATERING



## CONSOLIDATION PHASE

Eventually, the solids can be handled as dry material, increasing options for transportation and disposal.



# Potential Dewatering Applications

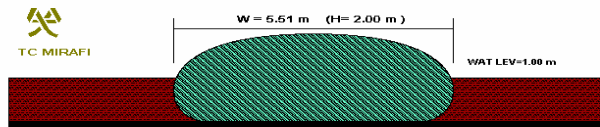
- Municipal Sewage Sludge
- Pulp and Paper Mill Sludge
- Mineral Processing Sludge
- Fly Ash
- Fine Grained Dredged Material
- Coal Tailings
- Mining and Drilling Waste
- Industrial By-Product Waste
- Agricultural Waste





# Project Implementation

- Parameters
- Hanging Bag Test
- Full Scale Test



ver00f GIVEN C = 13.00 m H = 2.00 m SPG = 1.60 FS = 5.00

DENSITY OF SLURRY	= 1.600 g/cc
TUBE CIRCUMFERENCE, C	= 13.00 m
EX PRESS -TOP OF TUBE, P	= 0.1731 m (of water)
WORKING AXIAL FORCE, T <sub>ax</sub>	= 14.87 kN/m
WORKING AXIAL FORCE, T <sub>ax</sub>	= 7.672 kN/m
TOTAL HEIGHT OF TUBE, H	= 1.996 m
TOTAL WIDTH OF TUBE, W	= 5.507 m
BASE CONTACT WIDTH OF TUBE	= 4.401 m
END AREA OF TUBE	= 9.481 sq m 70.52 % FULL
TUBE VOLUME, V	= 1.371 cu m
FABRIC AREA TO VOL RATIO, R	= 1.371 sq m /cu m
BASE PRESSURE	= 3.267 m (of water)
REQ'D CIRCUM STRENGTH T	= 74.35 kN/m
REQ'D AXIAL STRENGTH	= 38.36 kN/m

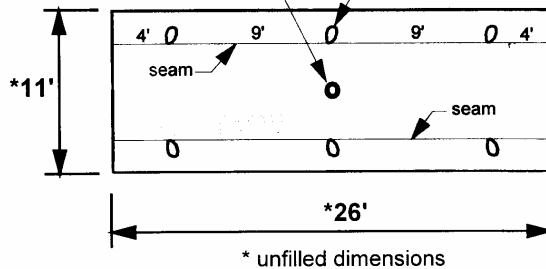
TC MIRAFI  
TC Mirafi Geotube

# What is a Geotube MDS?

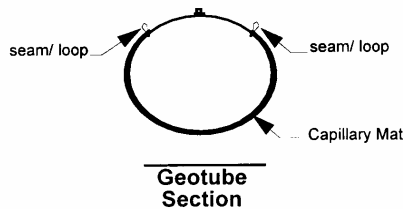
## 22.5 ft. circ. x 26 ft. long GT-500 Geotube-MDS for Roll-Off Box Dewatering

PVC Injection Port located in the top-center of the tube

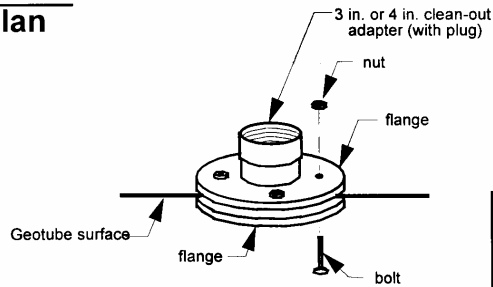
Loops attached to seam at the spacing shown



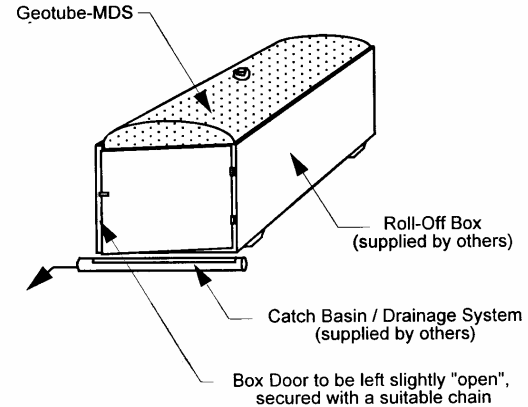
Plan



Geotube Section



PVC Injection Port Detail (4 x 3 Closet Flange)



Drawing approved by: \_\_\_\_\_  
 Date: \_\_\_\_\_  
 Note: By signing this drawing, the client acknowledges their acceptance of its accuracy. All other references to fabrication instructions shall be superceded and considered no longer valid.

REVISED 9/26/03

Drawing No: 0268R



**Geotube MDS - Mobile Dewatering System**

Geotube Fabrication Plan

Drawn by: Torre

Scale: N.T.S.

Date: 8-13-03

Sheet 1 of 1

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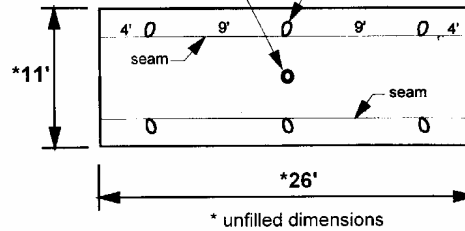
# WHAT IS A GEOTUBE MDS?

- 22.5' Cir.
- 26' Long
- GT500 Geotextile
- Attached Capillary Mat

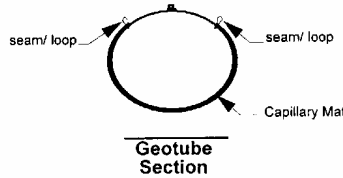
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PVC Injection Port located in the top-center of the tube

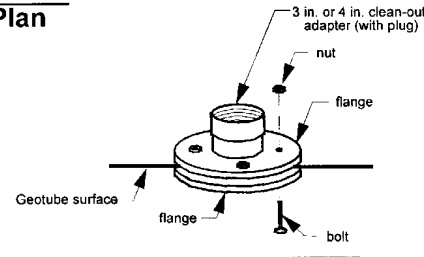
Loops attached to seam at the spacing shown



Plan



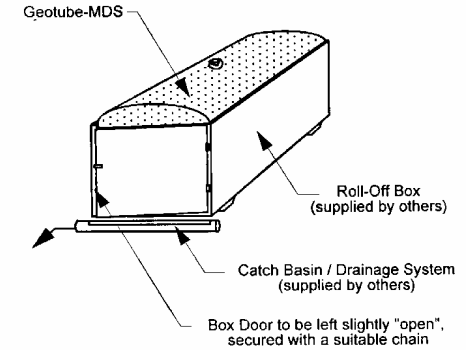
Geotube Section



PVC Injection Port Detail (4 x 3 Closet Flange)

### Notes:

- 1) Geotube to be 22.5 ft. circumference.
- 2) Fabric to be GT-500 Polypropylene.
- 3) One PVC Injection Port required, located at the top center of the tube.
- 4) Injection Port to be Standard 4 x 3 PVC Closet Flange.
- 5) 15 ft. wide x 26 ft. long Capillary Mat (S1600) to be attached to the bottom 15 ft. portion of tube.



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 Date: \_\_\_\_\_  
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Miratech

Geotube MDS - Mobile Dewatering System

Geotube Fabrication Plan

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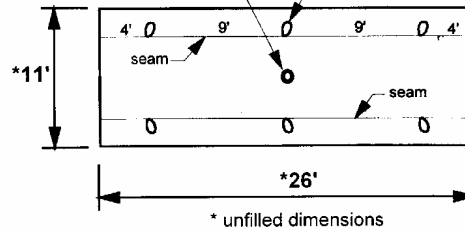
# WHAT IS A GEOTUBE MDS?

- Mechanical PVC Geoport
- Stock Item
- Weighs Less Than 75 lbs.
- Shipped On A Pallet

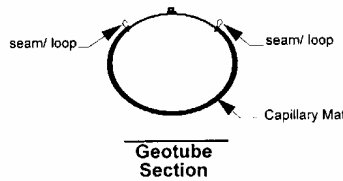
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PVC Injection Port located in the top-center of the tube

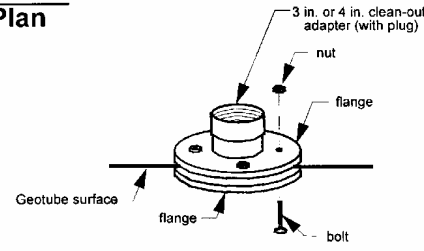
Loops attached to seam at the spacing shown



Plan



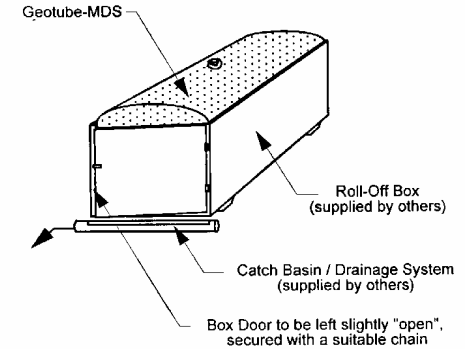
Geotube Section



PVC Injection Port Detail (4 x 3 Closet Flange)

### Notes:

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- 2) Fabric to be GT-500 Polypropylene.
- 3) One PVC Injection Port required, located at the top center of the tube.
- 4) Injection Port to be Standard 4 x 3 PVC Closet Flange.
- 5) 15 ft. wide x 26 ft. long Capillary Mat (S1600) to be attached to the bottom 15 ft. portion of tube.



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Geotube MDS - Mobile Dewatering System

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# GEOTUBE MDS BENEFITS

• Fits 30 yd<sup>3</sup> Roll-Off Box

• Standard Plumbing Fittings

• Quick and Easy Installation

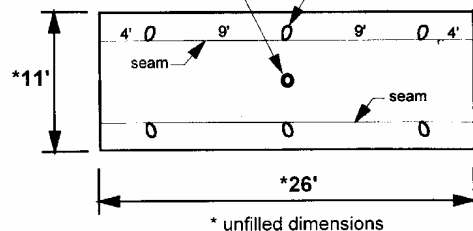
• No Secondary Handling Of Solids

• Easy To Unload In Landfill

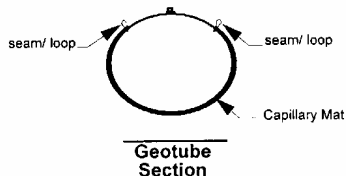
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PVC Injection Port located in the top-center of the tube

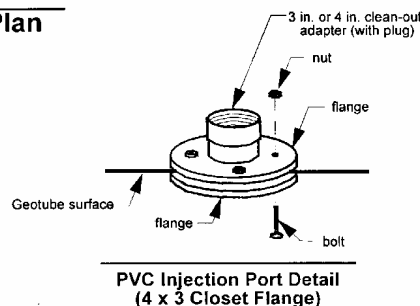
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Plan



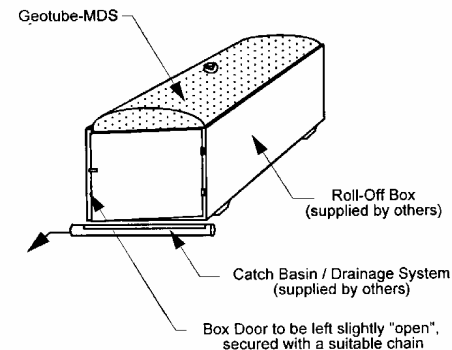
Geotube Section



PVC Injection Port Detail  
(4 x 3 Closet Flange)

### Notes:

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Geotube MDS - Mobile  
Dewatering System

Geotube Fabrication Plan

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Sheet 1 of 1

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## GEOTUBE MDS

Standard 30 yd<sup>3</sup>  
Roll-Off Box For  
Small Volumes  
to Dewater or  
Locations with  
Limited  
Dewatering  
Space.





## GEOTUBE MDS

Place block under front of Roll-Box to create a positive slope for the water to drain out of the rear of the box.



## GEOTUBE MDS

Place pallets in floor of Roll-Off Box to create a false floor and path for the water to drain .





## GEOTUBE MDS

Place Geotube  
MDS in rear of  
Roll-Off Box.





## GEOTUBE MDS

Unroll Geotube MDS. Note that the Geotube MDS had been pre-folded in on the sides and ends to fit the bottom of the Roll-Off Box when unrolled.



## GEOTUBE MDS

A Mechanical PVC Geoport is factory installed to allow for use of standard plumbing fittings.





## GEOTUBE MDS

A Mechanical  
PVC Geoport is  
factory installed  
to allow for use  
of standard  
plumbing  
fittings.

CAP





## GEOTUBE MDS

A Mechanical PVC Geoport is factory installed to allow for use of standard plumbing fittings.

90° ELBOW



## GEOTUBE MDS

A Mechanical PVC Geoport is factory installed to allow for use of standard plumbing fittings.

QUICK  
CONNECT

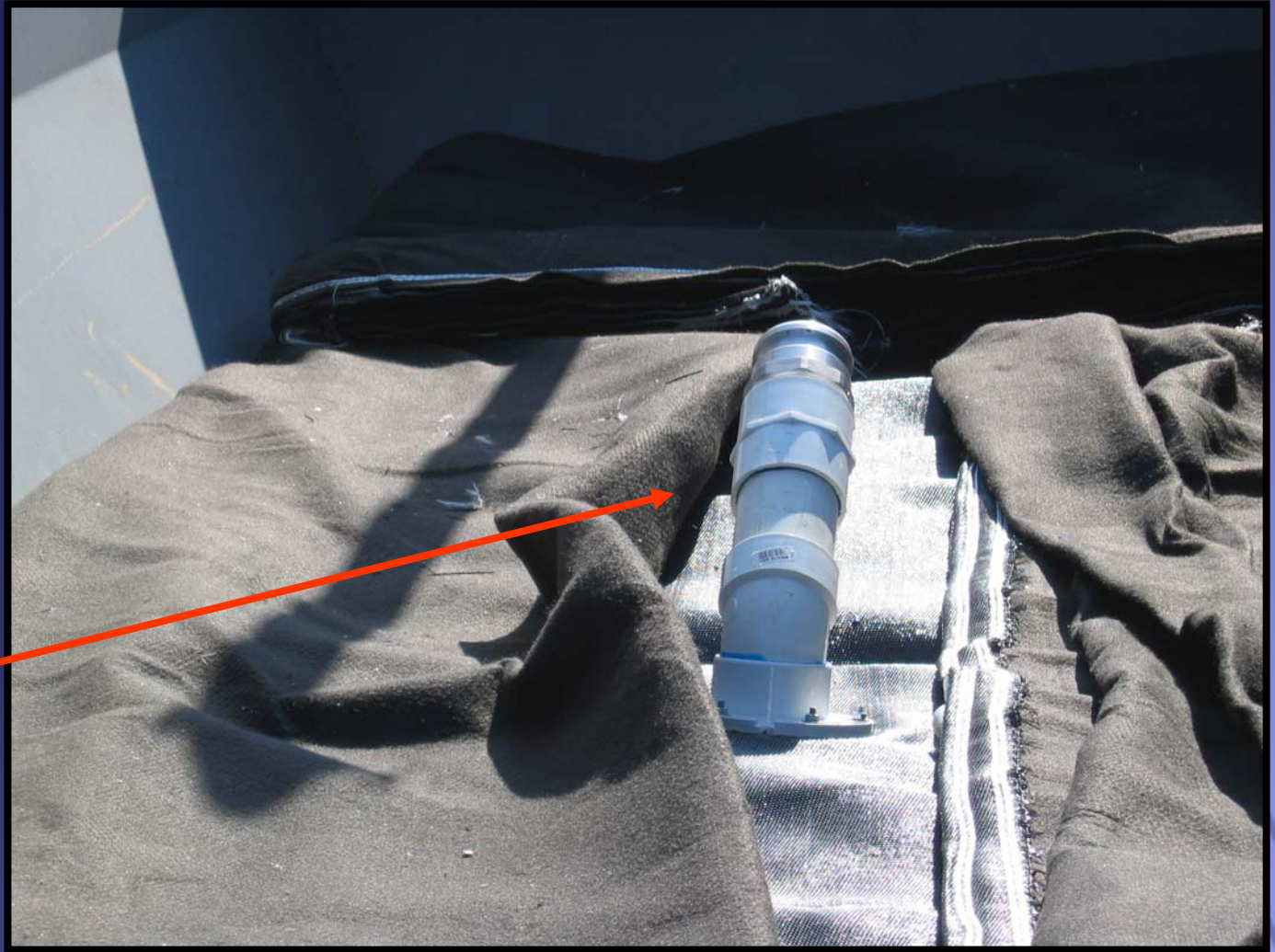




## GEOTUBE MDS

A Mechanical PVC Geoport is factory installed to allow for use of standard plumbing fittings.

45° ELBOW  
w/QUICK  
CONNECT



## GEOTUBE MDS

Complete connection with flexible hose between Geoport and discharge pipe.





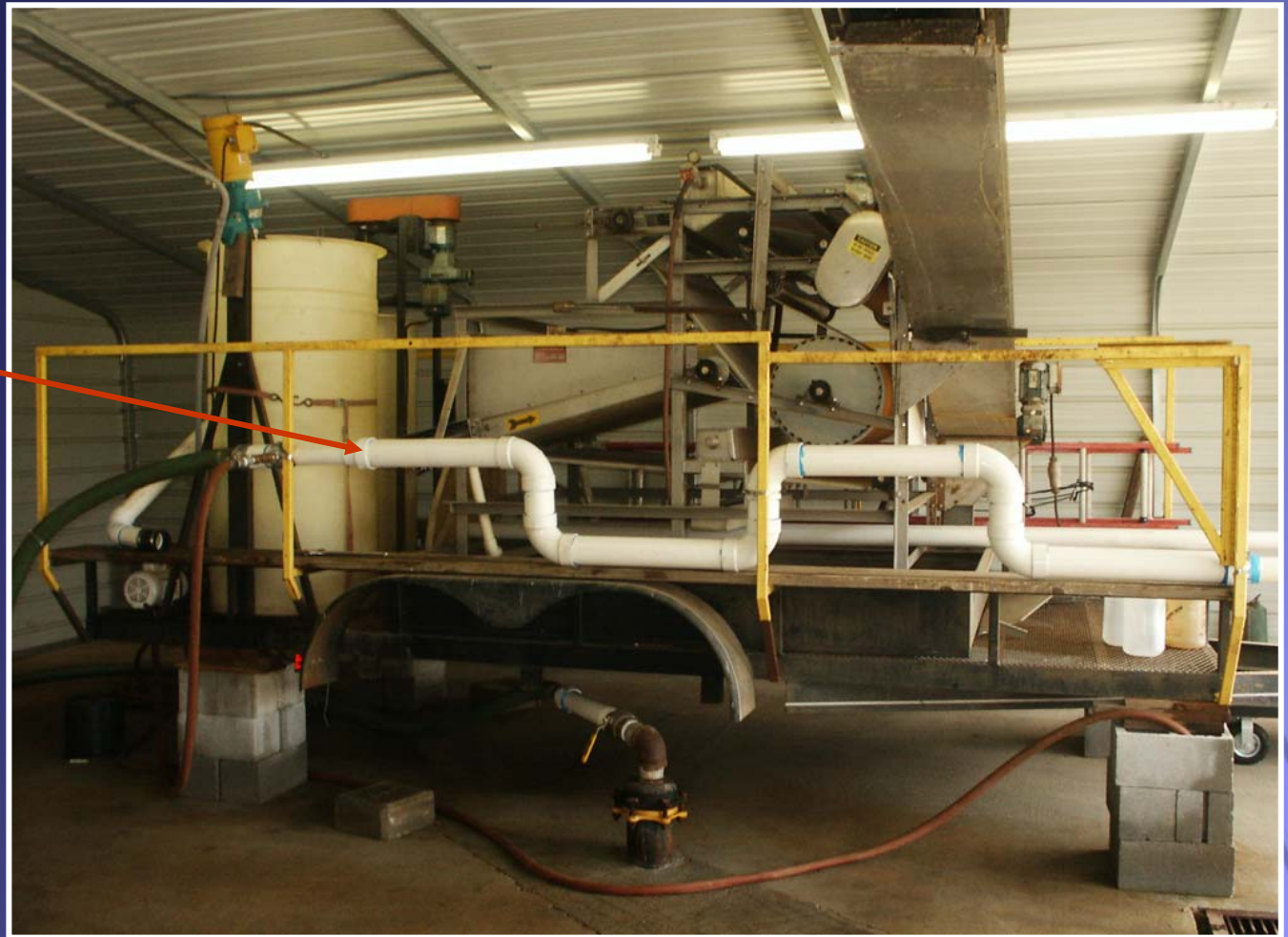
## GEOTUBE MDS

Close Roll-Off  
Box door and  
secure with  
safety chain.



## Geotube MDS

Sludge from digester pumped through a 3" PVC inline mixing chamber.





## Geotube MDS

Polymer was mixed to a concentration of .5% in the 200 gallon poly tank.



## Geotube MDS

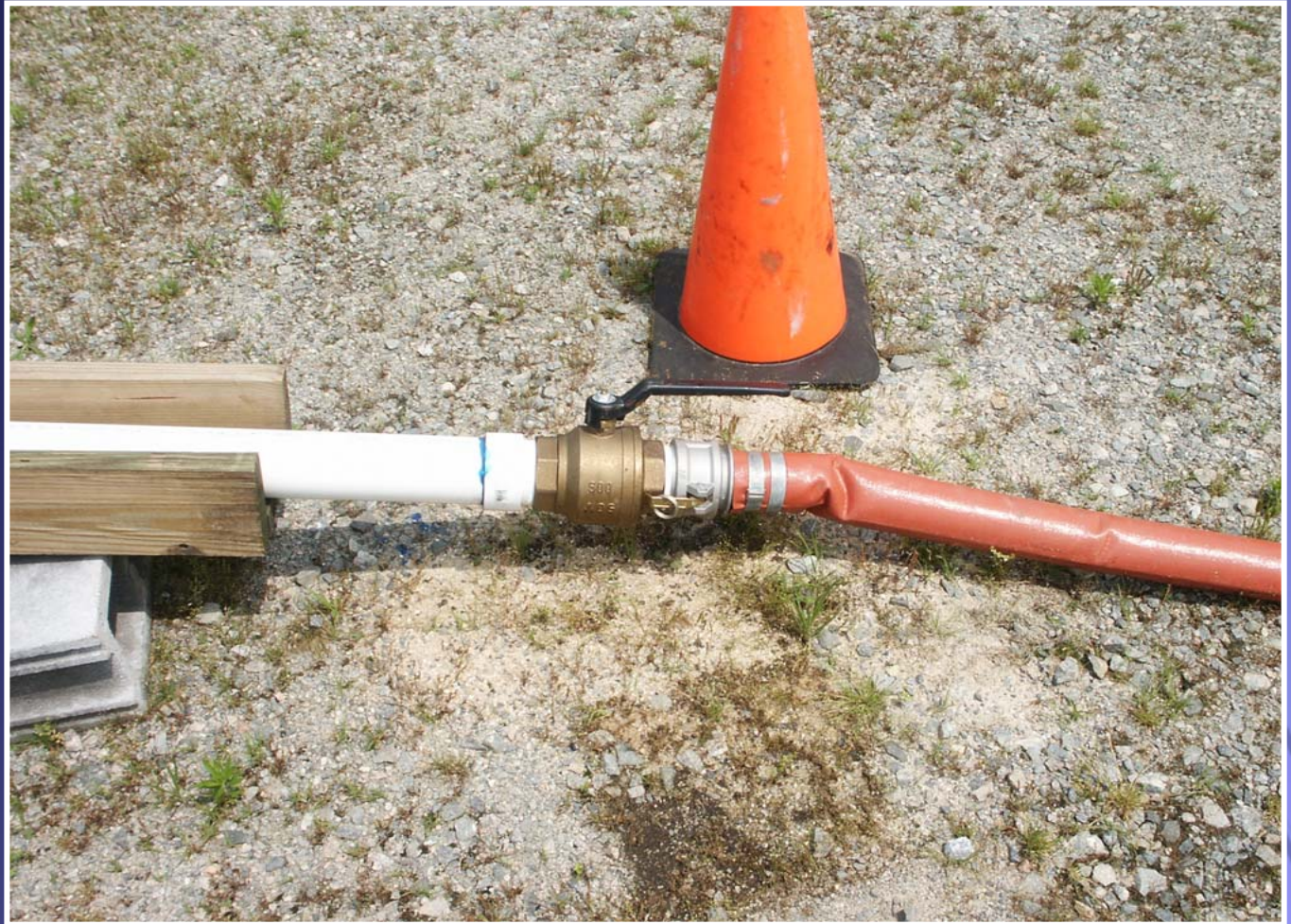
Polymer injected into sludge stream before going through inline mixing chamber.





## Geotube MDS

Sludge goes through 3" flex hose from inline mixing chamber to Geotube manifold. The Cam-Lock quick connect fitting allows flexibility to move hose from one Geotube manifold to another in minutes.





## GEOTUBE MDS

Begin pumping  
Geotube .



## GEOTUBE MDS

Begin pumping  
Geotube . Note  
how Geotube  
MDS unfolds  
as it is being  
filled





# GEOTUBE MDS

Continue  
pumping MDS  
Geotube .





## GEOTUBE MDS

Pump Geotube until filled to approximately 1 ft. above top of Roll-Off Box .



## GEOTUBE MDS

Note effluent water draining from rear of Roll-Off Box.





## GEOTUBE MDS

Collecting  
effluent samples.



## GEOTUBE MDS

Note clarity of  
effluent water  
samples.





# GEOTUBE MDS

Collected  
Samples:

Digester Sludge





# GEOTUBE MDS

Collected  
Samples:

Flocculated Sludge



# GEOTUBE MDS

Collected  
Samples:

Clear Effluent  
Water





## GEOTUBE MDS

Dewatered  
Geotube MDS  
ready for filling  
process to be  
repeated.





# GEOTUBE MDS

When the Geotube MDS has been completely filled it may be taken to the landfill and unloaded intact.



# QUALITY MANUFACTURING

Geotextiles are specially designed and manufactured for the marine and environmental applications at our Ten Cate Nicolon facilities in Cornelia and Pendergrass, Georgia and in Almelo, The Netherlands.



# CORNELIA, GA USA

Approximately 100  
looms for the  
manufacturing of both  
PET and PP woven  
Geotextile.





# PENDERGRASS, GA USA

200,000 Sq. Foot  
Manufacturing and  
Distribution facility



the leader in geocontainment solutions





saving the environment one Geotube at a time



# Miratech

Division of Ten Cate Nicolon

3680 Mount Olive Road

Commerce, GA 30567

USA

(706) 335-3400 Fax: (706) 335-3405

[www.tcnicolon.com/geotube](http://www.tcnicolon.com/geotube)

[www.geotubes.com](http://www.geotubes.com)

+7(8512)732220  
E-MAIL: [danil@astranet.ru](mailto:danil@astranet.ru)  
[www.saprex.ru](http://www.saprex.ru)