

# Adaptability and flexibility of geotextile dewatering for managing sludge or process residuals at municipal water and wastewater treatment plants

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# Agenda:

- 1) The challenges of sludge management
- 2) Overview of the Bishop Solids Management Solution (BSMS)
- 3) Sludge testing and system design
- 4) Case studies
- 5) Q & A



# Operational and economic challenges of sludge management

- Sludge treatment, disposal, relocation is up to 50% of municipal WWTP operational costs (Nowak, 2005).
- Sludge management considerations
  - Volume of sludge
  - Sludge storage capacity
  - Space availability
  - Processing frequency and method
  - CAPEX, OPEX
  - Energy usage - GHG emissions
  - Staff
  - Disposal options and costs



# Sludge dewatering methods - mechanical vs. semi-passive

## Mechanical dewatering

- Centrifuge or belt press
- Offers automated operation
- Compact footprint
- Energy intensive
- Limited rate of sludge feed
- Dewatered solids must be continually hauled away



## Semi-passive dewatering

- Geotube dewaterers as quickly as solids are pumped in
- Offers automated operation
- Energy efficient, gravity-based process
- Less costly
- Solids can remain onsite for extended periods and dewatering continues
- Customizable to suit available space



# Bishop Solids Management Solution

Filling  
2,000 L/min  
or more.



Polymer activation  
and injection



# Sludge samples and Rapid Dewatering Test (RDT)



- 20L pail filled with samples from multiple points
- Sludge testing determines:
  - Optimal polymer
  - Sludge density
  - Total estimated volume
  - Sludge dewaterability
  - Filtrate quality
  - Estimated dewatered volume
  - Contaminants of concern

# Geotube Dewatering Test (GDT)



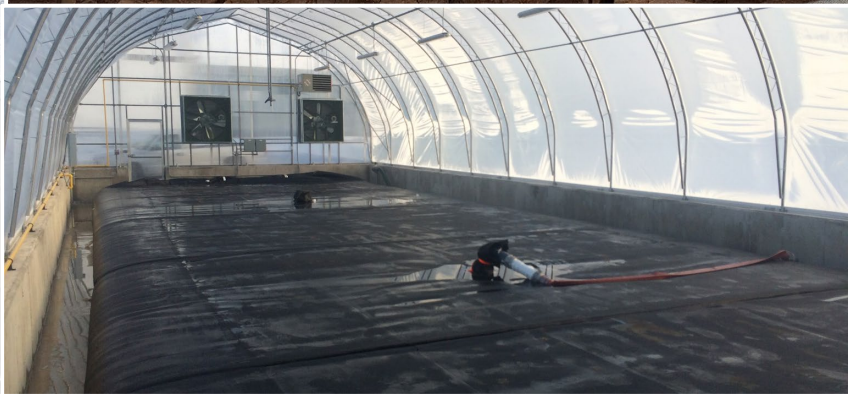
- Gravity and pressurized tests
- Simulates performance of full-size Geotube
- Accepts much larger volume of material

# Case Study - Water treatment residuals, Perth WTP





Over \$6 million in CAPEX savings



# Low TSS filtrate - discharged directly to river

Geotube filtrate results			
Parameter	Influent (mg/L)	Geotube Filtrate (mg/L)	Discharge limit (mg/L)
TSS	2,000	4	25

Minister's Award for  
**Environmental Excellence**

*2015 Award Winner*



# Case Study - Incinerator ash dewatering - Greenway WWTP



# Pilot testing proves benefits



# Smaller, easier to operate, proven performance



- Dewatering cell sized for seven Geotube® units (75' x 55')
- Operates year round
- Over a decade of reliable performance

# Awards and accolades



2012 Technical Innovation Award



2013 Technical Innovation Award



# Case study - Septage receiving station - Eganville, ON



# Impressive pilot test results



- Processed 21,000 gallons of septic tank waste with 22 ft x 22.5 ft in roll-off bin
- Passive dewatering continued through the winter
- Solids content increased from 3% to nearly 40%.
- Pathogen content in solids declined significantly



# Dual-purpose system also dewateres waste sludge



- 37.8 m<sup>3</sup> underground holding tank enables batch operation
- Laydown area fits up to six 15.25 m long Geotubes, two housed in a greenhouse for year-round operation
- Waste sludge from WWTP is also processed
- Dewatered material is used as soil amendment for top cover at landfill

# Low levels of pathogens and contaminants



## Snapshot of Testing Results from Bonnechere Valley Study

- 99.6% suspended solids captured in Geotube® units
- 98.2% phosphorus captured
- 82.3% nitrogen captured
- 99.9% E. coli reduction
- 100.0% arsenic reduction
- 98.8% lead reduction
- 99.9% mercury reduction



2014 WEAO Exemplary  
Biosolids Management Award

# An adaptable, flexible (and award-winning) solution

Residuals from filter  
backwash



Perth, ON

Ash material from  
incinerated sludge



London, ON

Treatment plant sludge +  
septage from haulers



Eganville, ON

# Bishop Water Technologies: Who We Are



- Bishop Water specializes in simple, reliable, low-energy solutions for solids management and nutrient removal.
- These solutions are used by municipal, industrial and agricultural clients to affordably solve water and wastewater challenges while protecting the environment.
- Our highly experienced teams provide exemplary service and work collaboratively with partners to continually enhance the performance, value and sustainability of our solutions.
- Over 10 years of growth and success. Our solutions are distributed by partners in Canada, United States, Australia and Latin America.

# Renowned service and support:

- Experienced teams work closely with clients to assess needs and design appropriate solution
- Made-in-Canada systems designed to provide reliable, trouble-free operation
- Skilled field technicians efficiently and safely mobilize equipment and operate systems
- We are committed to providing responsive, effective support for the duration of the project

“We’ve had great communication and support from Bishop Water, not only during plant commissioning, but on an ongoing basis.”

*Allan Nesbit, Operator  
North Rustico WWRF, PEI*



# Thank You.



Thank you!



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