



AdvanTex[®] Treatment Systems

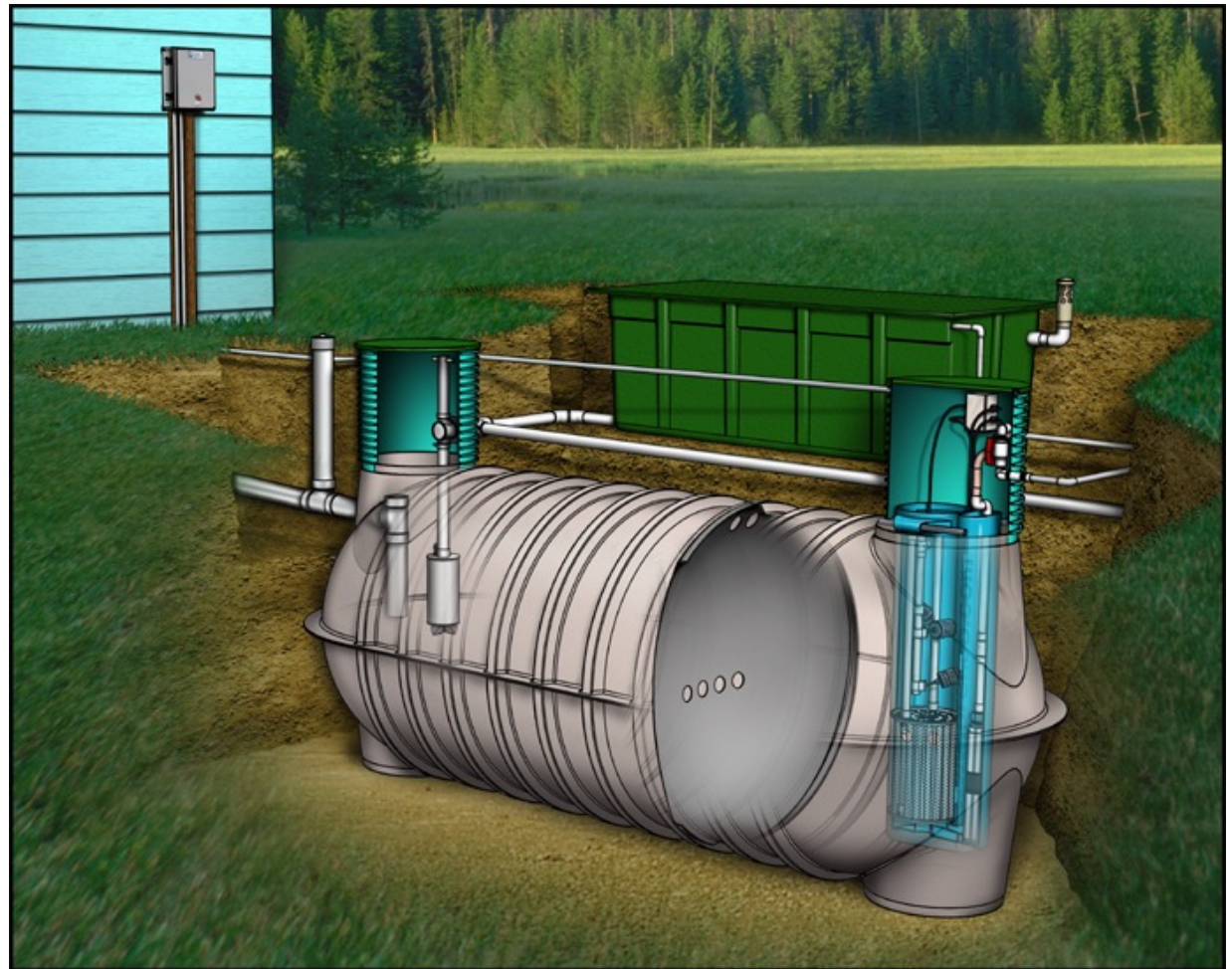
***Residential Applications
Introduction to the Technology***

AdvanTex[®] Treatment Systems

- R&D since 1996
- 3rd party technology verification (NSF, NovaTec, UC Davis)
- Monitoring at government-funded demonstration sites
- Documented treatment performance
- Ongoing statewide approvals
- Numerous systems in operation across North America, Europe, Australia and New Zealand

AdvanTex[®] Treatment Systems Are ...

- Economical
- Reliable
- Sustainable



AdvanTex[®] Treatment Systems Are ...

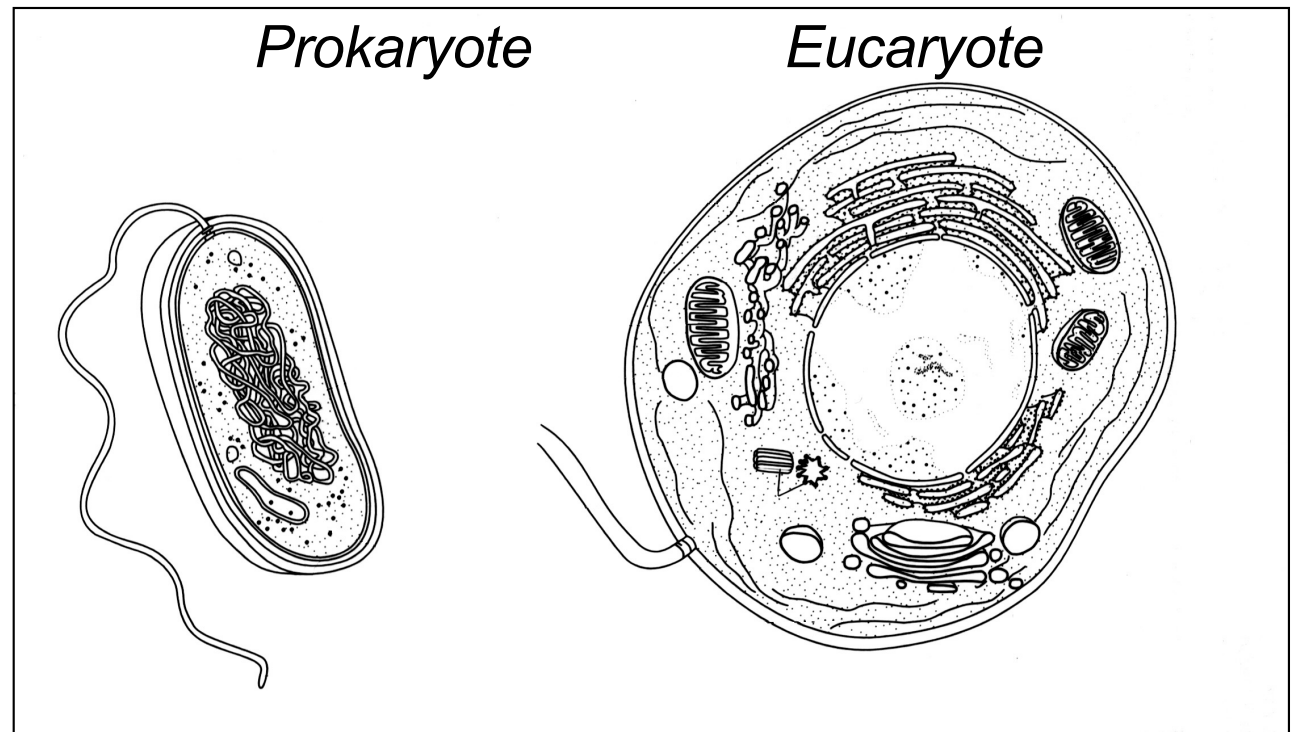
- Designed from a thorough understanding of Wastewater Treatment (WWT) science and practices
- Textile material provides a superior medium for WWT



What is Wastewater Treatment?

WWT Removes These Constituents

- Biodegradable organics
- Total suspended solids
- Nutrients
- Pathogens
- Inorganics



Constituents are Removed Through ...

- Biological processes
- Chemical processes
- Physical processes

Factors Affecting Removal

- Organic loading
- Hydraulic loading
- Hydraulic retention time
- Flow configuration

Factors Affecting Removal, cont.›

- Temperature
- pH
- Venting
- Grease and oil
- Inorganic solids (kitty litter, etc.)
- Toxins (cleaners, poisons)
- Medications/antibiotics

Most Common Onsite Treatment Processes

- Suspended growth, extended aeration (ATUs)
- Attached growth, packed bed filters (sand, peat, textile filters)



Suspended Growth, Extended Aeration

- Microorganisms are suspended in liquid
- Microorganisms metabolize organic matter to CO_2 , H_2O , and cell mass
- Process generates activated sludge



Suspended Growth Technology Municipal Plants

- Complex design parameters
- Complex control system to manage these parameters
- 24-hour control
- Operation-intensive and maintenance-intensive



Suspended Growth Technology

Residential Applications

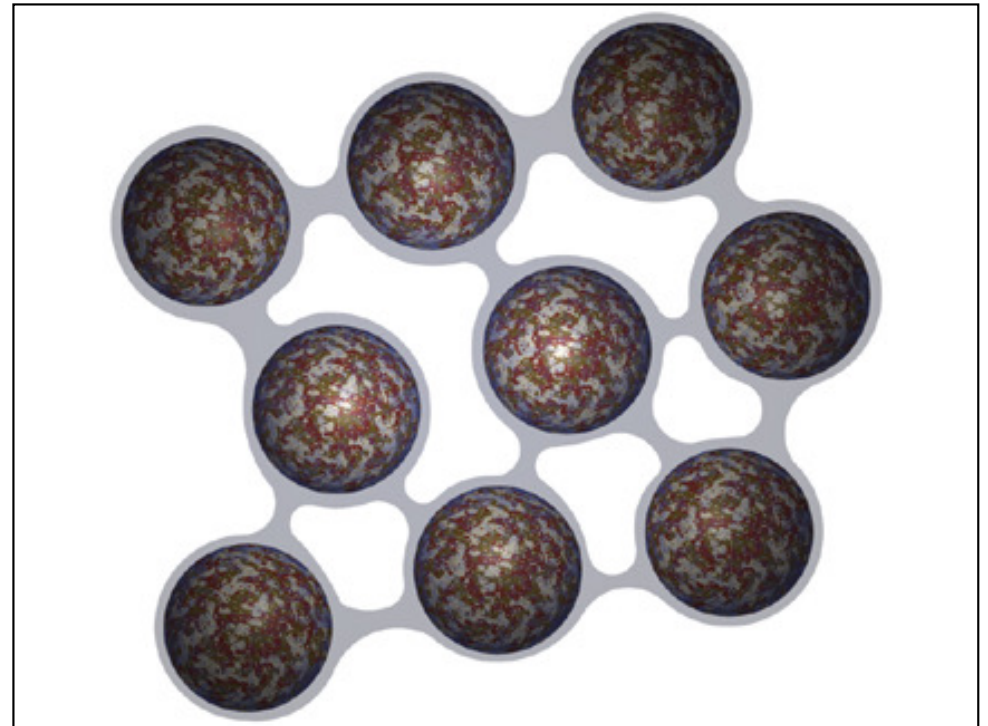
- Usually called “ATUs”
- “Scaled down” municipal treatment plant technology
- Lack the necessary operators or controls
- No surge control or flow monitoring
- Sludge “washout” during hydraulic overloads
- Unreliable performance

Typical ATU Power Cost

- 115 watt blowers* = \$11.40/mo.
(at national average of 13 cents/kWh)
- 1/4 hp blower = \$26/mo.
(2.42 amps, 13 cents/kWh)
- 1/3 hp blower = \$44/mo.
(3.8 amps, 13 cents/kWh)

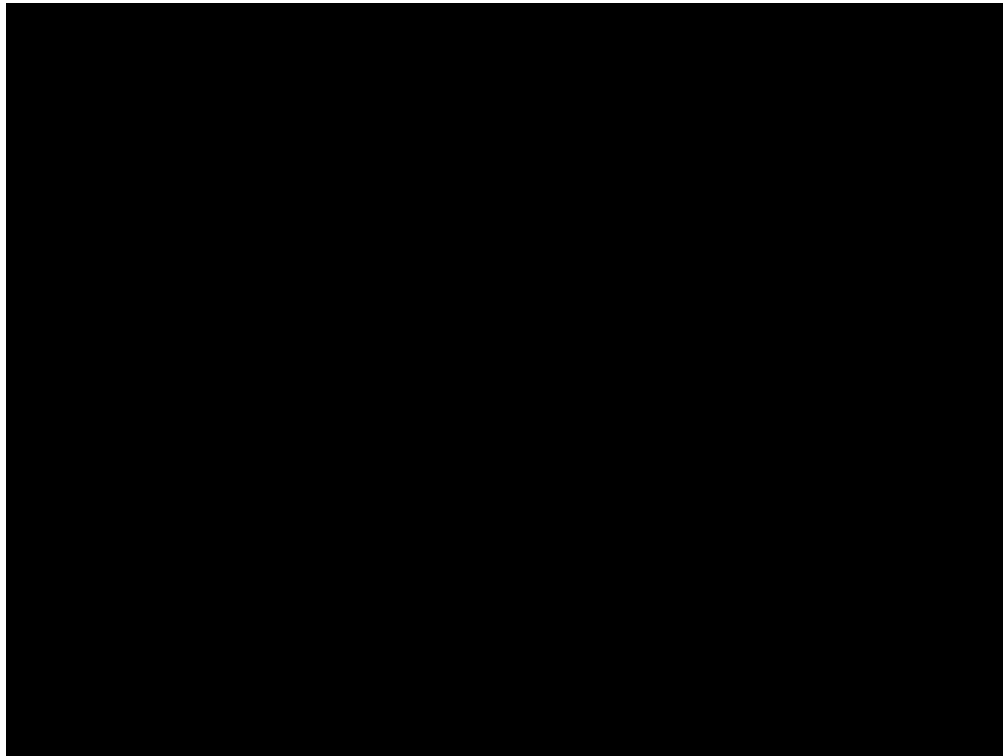
Attached Growth

- Aerobic microbes attach and grow to inert media
- Wastewater flows across a zoogloal film created by microbes
- Microbes extract and digest soluble organic matter from the wastewater



Packed Bed Filter Treatment Technology

- Uses a fixed film medium (textile, sand, peat)
- Operates in an unsaturated condition (not submerged)
- Employs intermittent timed-dosing
- Uses filtration and biological/chemical reduction



Packed Bed Filters Are ...

- Economical
 - Low power consumption (less than \$4/month)
- Reliable
 - Consistent, high quality effluent
 - No release of untreated sewage
- Sustainable
 - Low maintenance
 - Long lifespan

The “Secret” to Great System Performance

- Appropriate tank sizing
- Dosing frequencies
 - Evenly distributed dosing, 24 hours a day
- Control panel optimizes the treatment process



ATUs vs Packed Bed Filters

	ATU	PBF
Power Costs	High	Low
Maintenance	High	Low
Life-cycle costs	High	Lower
Effluent quality	Inconsistent	Reliable
Untreated effluent release	Possible	Prevented

What is AdvanTex[®]?

- A packed bed filter ...
- That uses an engineered textile material ...
- Plus appropriate tankage and timed dosing ...
- And comes in a complete, premanufactured package



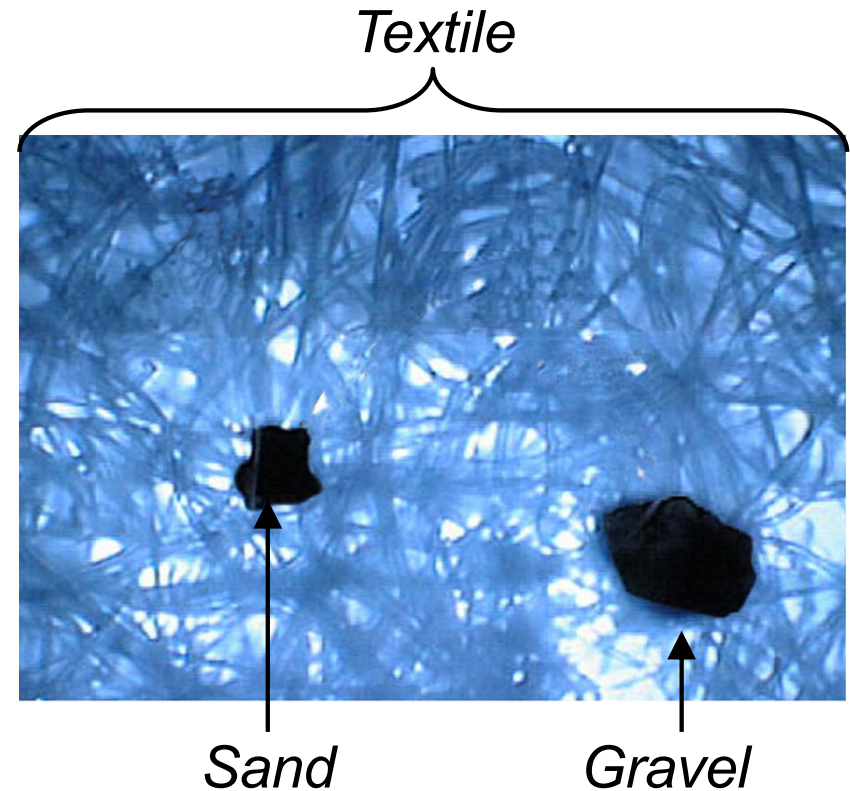
Textile is a More Stable PBF Media

- Doesn't compact like foam
- Doesn't vary in quality like sand
- Doesn't decompose like peat



Textile Offers Greater Surface Area

- Specifically engineered for WWT
- 5-20 times more surface area than sand (ft² per ft³ of material)
- The more surface area, the more area for bacterial colonization
- Allows for much higher loading rates than sand filters



Textile Has Greater Void Space

- 3 times the void space of sand
- Allows movement of air for adequate oxygen transfer
- Controls liquid permeability
- Provides more room for inorganic solids accumulation

Textile Has Greater Water Holding Capacity

- A greater holding capacity provides a more sustainable environment for the bacteria
- Water is the necessary transport medium by which bacteria receive all food

As a Result, Textile ...

- Allows very high loading rates
- Allows reduction in system size and cost
- Allows prepackaging to ensure a high-quality installation

AdvanTex[®] Treatment Systems

- Economical
 - Both initial and lifetime costs
- Reliable
 - All the benefits of PBF performance, but higher treatment capacity and longer lifetime
- Sustainable
 - Much easier to maintain than other PBFs
 - Outstanding effluent quality allows for water reuse
 - Protects the environment

Questions?