



# Biosolids Solutions

## US Portfolio

**WATER TECHNOLOGIES**

# Biosolids Solutions

## Resource and Energy Recovery



We offer safe and environmentally friendly biosolids solutions that focus on performance enhancement, renewable energy, beneficial reuse, and optimization. Veolia Water Technologies is committed to providing innovative solutions with proven value-added performance. Our technologies transform vital resources into clean water, clean energy, and valuable end products, thereby empowering utility owners to develop their own regional circular economies.

- Reduction in waste to be disposed
- Recovery of valuable byproducts including:
  - > Biosolids as alternate for fertilizer
  - > Nutrients (sulfur, phosphorus)
  - > Energy (biogas, electricity, heat)
  - > Water (for reuse)
- New revenue stream for facility from:
  - > Accepting waste from Municipality
  - > Stabilized biosolids as alternate for fertilizer
  - > Nutrients recovered
  - > Renewable bioenergy generated

## Portfolio of Solutions



Veolia offers a comprehensive solution for every part of the biosolids process in order to be flexible to individual needs or to outfit the entire process.

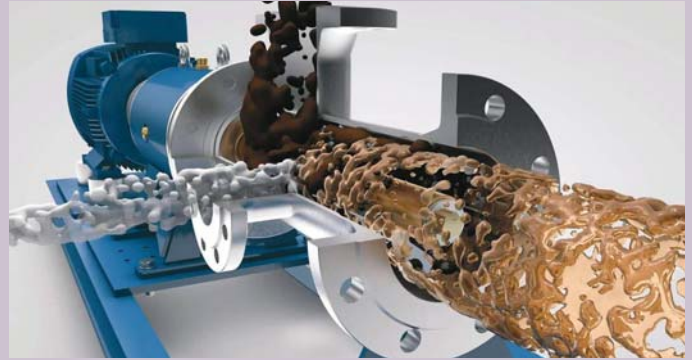


## Thermal Hydrolysis High Solids Process



Veolia has, over the past 20 years, developed **Exelys™** and **BioThelys™**, two innovative high solids thermal hydrolysis solutions. While Exelys is a fully continuous process, BioThelys is a continuous batch process. Both processes utilize high temperature (310 to 330 oF) and pressure (85 to 100 PSIG) to sterilize sludge which is retained (SRT) for 20 to 30 minutes in a reactor at this elevated temperature and pressure.

- Increases digester capacity
- Improves final dewaterability
- Reduces viscosity of sludge
- Increases biogas production
- Achieves Class A biosolids



Veolia's patented thermal hydrolysis technologies are considered the next generation high solids thermal hydrolysis processes as they are able to process sludge directly from dewatering units, without any dilution (proven operation from 22% DS up to 32% DS in real world use), using the state-of-art dynamic mixers to instantaneously condense steam on to sludge.

- High solids application reduces steam consumption
- Eliminates steam lances that are prone to clogging and steam channeling
- Includes real-time self regulating steam control to handle variable influent dry solids feed, eliminating onsite manual TSS measurement and dilution
- Guarantees 95% availability with one treatment train

## Drying/Dewatering



The **BioCon™** thermal sludge drying system is designed to be safe, easy to operate, energy efficient and environmentally friendly.

- Low operating temperatures
- Stainless steel belt material allows for better air flow and increased durability
- Minimal exhaust air easily integrates with existing odor control system
- Automated temperature control strategy, ensures a minimum DS content of 90% and meets Class A requirements



**Deselec™** is an advanced electro-dewatering system combining the benefits of dewatering and partial drying to minimize disposal costs. Electro-dewatering involves the use of an electric field during mechanical dewatering.

- Achieves maximum dewaterability and partial drying in a single unit process
- Dewateres 2% mixed sludge or WAS only to 45-55% dry solids without using diatomaceous earth
- Uses 65-75% less energy to achieve Class A / EQ quality biosolids when combined with thermal drying

## Co-digestion



The **Ecrusor™** is a food depackaging and organics recovery process ideal for preparing source separated organics, landfill diverted organics and other biodegradable wastes for energy generation.

- Removes contaminants such as plastic, metal and mixed material packaging
- Produces a high quality organic slurry that generates biogas
- Installed below grade, outdoors or within truck offloading stations to receive material directly from vehicles
- Processes up to 52 cubic yards of mixed waste every hour with very low operating energy



**BIOMET™** is an advanced anaerobic co-digestion process for the conversion of high strength and municipal organic waste to bioenergy and biofertilizer.

- Receives and processes variable strength waste
- Stabilizes variable loads preventing digester upset
- Guarantees a higher organic loading rate than any other conventional anaerobic digestion systems
- Mechanical equipment is external to the digesters, allowing for maintenance without process interruptions
- Guarantees a higher biogas production of 10 to 20% greater than conventional digestion

## Sidestream



The **Struvia™** process is the combination of a crystallization reactor and lamella separator with Veolia's patented Turbomix™ system, ensuring separation of produced struvite and treated effluent.

- Prevents uncontrolled struvite production
- Turbomix allows for rapid crystallization, minimizing footprint and hydraulic retention time
- Produces struvite-rich product to enhance the facility's dewatered biosolids or separately marketed for distribution
- Improves dewaterability of biosolids



The **ANITA™ Mox** process is the simplest, most robust, compact anammox process solution for high strength ammonia streams. It combines aerobic nitrification with anaerobic ammonia oxidation (anammox) in a continuous single-stage reactor.

- Media based system eliminates anammox washout during exposure to high TSS and polymer influent
- Requires 60% less oxygen than conventional nitrification
- Patented control strategy achieves ammonia removal higher than 90% and total nitrogen removal in the range of 75 to 85% without external carbon addition



## Digital Services

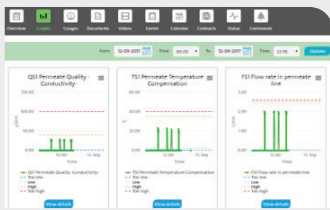
AquaVista™ is Veolia's digital services to optimize water treatment systems and can be implemented for a single technology, a range of equipment or the complete treatment plant. By using a highly secure cloud portal to facilitate better use of data, AquaVista can be monitored through an intuitive **Portal** anywhere, anytime, at any device.

AquaVista can achieve lower capital and operational costs, reduced maintenance, chemical use and energy consumption with Kruger support through **Assist** offering.

Easily upgrade to **Insight** or **Plant** platforms to further enhance system efficiencies.



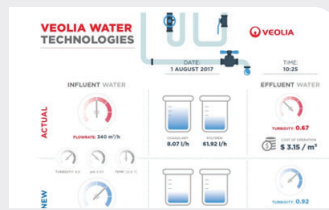
### Portal



#### A Remote and Reporting Tool

- Single Point of Entry for Customer for All Knowledge Base / Documentation
- Real-time Remote Monitoring of Equipment
- Alarm & Alert Management

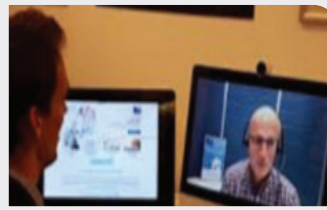
### Insight



#### A Data Driven Performance Optimization Tool

- Beyond Regular KPI Monitoring, Advanced Analytics to Improve Business Decisions
- Advising Operational & Financial Optimization for Customer Installations

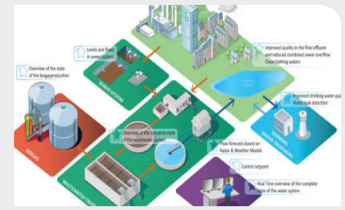
### Assist



#### An Access to a network of Veolia's process experts

- Communication Channel to Interact with VWT Engineers & among Customers
- Deliver Real Time Advice to Customers
- A Network of VWT Process & Commissioning Engineers to Guide

### Plant



#### An Online Smart Control Tool

- Automated Remote Control of the Treatment Plants
- Optimize Consumption of Chemicals, Sludge Treatment, Energy Efficiency
- Increase hydrological and biological capacity



## Aftermarket Services

Customer support is a continuous process, from the design to start-up to operation. Our team of informed and experienced professionals are available for anything from process reoptimization, preventative maintenance or spare parts.

We maintain an extensive parts inventory so that most items can ship the same day the order is placed. In addition to parts, we can also provide a repair service that includes a trained technician to assist with the part replacement.

Resourcing the world

**Veolia Water Technologies**

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