MyFAST wastewater treatment systems
MacroFIT wastewater treatment systems

A Global Leader in Decentralized Water, Wastewater, and Storm water Treatment Systems.
Thank you for your interest in BioMicrobics® products.

• With **over 65,000 installations in more than 70 countries**, BioMicrobics, Inc. manufactures wastewater, stormwater, and water treatment systems designed for the single-family homes, multi-family residential properties, small communities, commercial applications, and marine vessels. As a leading manufacturer of decentralized wastewater, septic system enhancements, and stormwater systems products, BioMicrobics consists of a staff of engineers, biologists and chemists.

• BioMicrobics pre-engineered, pre-packaged, certified, “Fixed Integrated Treatment Technologies” (FITT®) are the result of decades of real world operating history and proven results that offer significant environmental benefits...**FITT® for the Purpose Intended.**
# Table of Contents:

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is FAST® Technology?</td>
<td>4</td>
</tr>
<tr>
<td>Successfully used for over 40 years, the FAST® process lessen the impact of harmful influent ammonia levels by consistently reducing the total nitrogen at exceptionally high removal rates.</td>
<td></td>
</tr>
<tr>
<td>Why a MyFAST® or MacroFITT® System?</td>
<td>5</td>
</tr>
<tr>
<td>MyFAST® &amp; MacroFITT® System Sizes</td>
<td>6</td>
</tr>
<tr>
<td>Standard &amp; Optional Components</td>
<td>7</td>
</tr>
<tr>
<td>AMS (Aeration Management System) Zone</td>
<td>7</td>
</tr>
<tr>
<td>BMS (BioSolids Management System) Zone</td>
<td>9</td>
</tr>
<tr>
<td>Lixor® Information used with AMS and BMS:</td>
<td>10</td>
</tr>
<tr>
<td>Wastewater Aeration 101</td>
<td>10</td>
</tr>
<tr>
<td>SaniTEE® &amp; MyTEE® Screening &amp; Grit Removal Information</td>
<td>11</td>
</tr>
<tr>
<td>Clarifier options and Disinfection Information</td>
<td>14</td>
</tr>
<tr>
<td>Control Panel Examples</td>
<td>16</td>
</tr>
<tr>
<td>Examples of Installations</td>
<td>16</td>
</tr>
<tr>
<td>Mexico</td>
<td>31</td>
</tr>
<tr>
<td>Jamaica</td>
<td>32</td>
</tr>
<tr>
<td>Kenya</td>
<td>33</td>
</tr>
<tr>
<td>MacroFITT® Engineer Drawing Example</td>
<td>33</td>
</tr>
<tr>
<td>SciCHLOR® Disinfection System</td>
<td>38</td>
</tr>
<tr>
<td>Company Case Studies &amp; Articles</td>
<td></td>
</tr>
<tr>
<td>ABOUT: BioMicrobics manufactures innovative, advanced wastewater treatment systems, septic system alternative products, and storm water treatment that provide solutions for people around the world. For more information visit the website <a href="http://www.biomicrobics.com">www.biomicrobics.com</a>.</td>
<td></td>
</tr>
<tr>
<td>Why Decentralized/Distributed Systems Are a Popular Treatment Alternative</td>
<td>41</td>
</tr>
<tr>
<td>President's &quot;E&quot; &amp; &quot;E Star&quot; Award Recipient for Outstanding Export Activity</td>
<td>41</td>
</tr>
<tr>
<td>MyFAST® HS-STP™ System with Sludge Management</td>
<td>42</td>
</tr>
<tr>
<td>Decentralized Systems for Small Communities, Large Operations</td>
<td>46</td>
</tr>
</tbody>
</table>
What is FAST® Technology?

As the industry standard, FAST® technology is an aerobic, pre-engineered, wastewater treatment unit with 100% submerged, fixed-film, packed-bed media bioreactor. Ideal for low/peak, toxic shock, or heavy loading, FAST® technology successfully treats any domestic and high-strength wastewater containing degradable organics.

Successfully used for over 40 years, the FAST® process lessen the impact of harmful influent ammonia levels by consistently reducing the total nitrogen at exceptionally high removal rates. The SFR® feature of the FAST® Technology provides alternate modes of operation include intermittent operation of the blower to reduce electricity usage up to 50% and recirculation of nitrified wastewater to the primary settling chamber for extra denitrification. The stability of the FAST® treatment process with fully-submerged, fixed-film media and the effectiveness of activated sludge treatment helps in certain applications due to the unique characteristics of the wastewater; and, where there may or may not be infrastructure available. The effluent meets secondary quality requirements and can be distributed to a soil treatment system or water reuse applications (with drip-tubing irrigation or other non-potable use). Its biosolids treatment and sludge digestion enable cost-effective treatment with less maintenance.

Engineered to fit most treatment applications, MyFAST® and MacroFIT® High-Strength Sewage Treatment Plants (HS-STP®) systems are ideal for new construction, existing tanks, or renovation of failed systems, including those projects located in environmentally sensitive areas or limitations with distance to groundwater and/or smaller dispersal field size requirements.
Why a MyFAST® or MacroFITT® System?

Residential Multi-Family • Commercial • Small Communities • Municipalities

- For Larger Decentralized Systems
- Flows from 10,000 GPD [35 m³/D] to 2,000,000 GPD [7570 m³/D]
- Retrofit for package plants

The system is based on a fixed film, complete mixing activated sludge process. The system makes use of BioMicrobics’ proven screening (MyTEE®), aeration (LIXOR®), and fixed activated sludge technologies (FAST®) to provide robust treatment in a compact design with flow equalization and built-in sludge handling capability. In both residential and high-strength application, the FAST® technology can be designed to primarily remove BOD/TSS and nitrogen.

MyFAST® & MacroFITT® Treatment Zones

Settling Zone

- SaniTEE® and/or MyTEE® Screening
- AMS Aeration Zone with LIXOR® Systems

Treatment Zone

- FAST® Liners, submerged media, and connected airlifts
- BMS Sludge Collection Grid and Pump(s)
## MyFAST® & MacroFITT® Sizes*

*Based on typical BOD of ~300 mg/L. For higher or loading rate for proper sizing, please consult factor at 1-800-753-3278 or sales@biomicrobics.com. Visit www.biomicrobics.com for more information on systems, specifications, product drawings, resource library, and more!

<table>
<thead>
<tr>
<th>MyFAST®</th>
<th>Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>10,000 GPD (37.9 m³/D)</td>
</tr>
<tr>
<td>2.0</td>
<td>20,000 GPD (75.7 m³/D)</td>
</tr>
<tr>
<td>4.0</td>
<td>40,000 GPD (150 m³/D)</td>
</tr>
<tr>
<td>6.0</td>
<td>60,000 GPD (225 m³/D)</td>
</tr>
<tr>
<td>8.0</td>
<td>80,000 GPD (300 m³/D)</td>
</tr>
<tr>
<td>12.0</td>
<td>120,000 GPD (450 m³/D)</td>
</tr>
<tr>
<td>16.0</td>
<td>160,000 GPD (600 m³/D)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MacroFITT®</th>
<th>Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>20.0</td>
<td>200,000 GPD (757 m³/D)</td>
</tr>
<tr>
<td>30.0</td>
<td>300,000 GPD (1135 m³/D)</td>
</tr>
<tr>
<td>40.0</td>
<td>400,000 GPD (1514 m³/D)</td>
</tr>
<tr>
<td>50.0</td>
<td>500,000 GPD (1893 m³/D)</td>
</tr>
<tr>
<td>60.0</td>
<td>600,000 GPD (2271 m³/D)</td>
</tr>
<tr>
<td>70.0</td>
<td>700,000 GPD (2650 m³/D)</td>
</tr>
<tr>
<td>80.0</td>
<td>800,000 GPD (3028 m³/D)</td>
</tr>
<tr>
<td>90.0</td>
<td>900,000 GPD (3407 m³/D)</td>
</tr>
<tr>
<td>100.0</td>
<td>1,000,000 GPD (3785 m³/D)</td>
</tr>
<tr>
<td>120.0</td>
<td>1,200,000 GPD (4542 m³/D)</td>
</tr>
<tr>
<td>140.0</td>
<td>1,400,000 GPD (5300 m³/D)</td>
</tr>
<tr>
<td>160.0</td>
<td>1,600,000 GPD (6057 m³/D)</td>
</tr>
<tr>
<td>180.0</td>
<td>1,800,000 GPD (6814 m³/D)</td>
</tr>
<tr>
<td>200.0</td>
<td>2,000,000 GPD (7570 m³/D)</td>
</tr>
</tbody>
</table>
MyFAST® & MacroFITT®
Standard & Optional Components

AMS (Aeration Management System) Zone

- Using the LIXOR® Submerged Aeration Devices, pre-aeration is used in place of settling
- Handling one type of sludge
- Potential elimination of odor generation in settling tank
- AMS Options includes: LIXOR® Aeration, Control Panel, & Blower
**BMS (BioSolids Management System) Zone**

- Sludge Collection Grid and Aerobic Sludge Storage
- BMS OPTION includes: LIXOR® Aeration, Control Panel, Blower, Decant Pump, & Jib Crane.
Lixor® Information used with AMS and BMS:

Visit [www.biomicrobics.com](http://www.biomicrobics.com) for more info on systems, specifications, product drawings, resource library, & more!

LIXOR® aeration modules provide oxygen transfer without the inconvenience of clogging or changing diffusers.

LIXOR® is a remarkably effective submerged aeration and mixing system. Extremely low-maintenance and surprisingly efficient, LIXOR’s non-clogging, Venturi-type diffuser supplies air for simultaneous aeration and mixing in a variety of wastewater applications. Low-cost pre-aeration, aeration, sweetening and mixing are just a few of the cleverly-designed LIXOR’s impressive list of potential uses.

Wastewater Aeration 101

Aeration is the process of dissolving oxygen into water. In wastewater treatment, adequate aeration and mixing is a key component of successful system design. Dissolved oxygen enables aerobic bacteria and other microorganisms to quickly biodegrade and digest incoming organic matter, significantly reducing the concentration of pollutants in the wastewater.

Each LIXOR submerged aeration system is designed to achieve reliable aeration and mixing performance efficiencies. Individual or multiple LIXORS may be used in many ways as part of your overall wastewater plant design to help achieve desired treatment goals. Each LIXOR system is easily installed into new or existing basins and is equipped with a reliable regenerative blower, the system’s only moving part. LIXORS add a new dimension of flexibility and performance in wastewater system design and upgrades.

*Figure 1 LIXOR® devices in an aeration tank*
SaniTEE® & MyTEE® Screening Info

Visit www.biomicorics.com for more information on systems, specifications, product drawings, resource library, and more!

SaniTEE® 8” & 16” Diameter sized

“No filter technology on the market is easier to maintain than these!”

Effluent filters protect absorption areas from premature clogging and failure due to the release of non-settleable solids and/or non-degradable flushed materials from the septic tank. Effluent filters are installed on the outlet of the septic tank or the last septic tank in-series before distribution to the absorption area. Installation of septic tank effluent filters is an inexpensive method to enhance the effectiveness of a septic tank. These screening devices prevent floatables, large amounts of FOG (fats, oils, and grease), and/or solids from leaving the tank and help to:

- extend the life of your system(s)
- reduce clogging material
- improve flow conditions
- allow flexibility in designing the system

As an important feature in the treatment process, these screening devices prevent large solids and coarse material from causing undo wear on water treatment equipment or interfering with treatment processes.

- Easy, “slip-in” Installation and CIP Maintenance - Installed directly in the outlet tee of tank prior to the drainfield or the treatment tank, these screening devices comes standard with swabbing feature for Clean-in-Place (CIP) maintenance.
- Angled Slots resists blinding and prevents clogs inside the filter housing better than mesh-type screens.
- Patented Keyhole Weirs (on the SaniTEE®) provides consistency of flow despite surges.

How the Screening Devices Work

- As the wastewater enters the tank, light-weight floatables rise to form a scum layer at the water surface;
- Sediment and heavy solids settle to the bottom to form the sludge layer.
- The ‘clarified’ water enters the screen by passing through angled slots.
- Screened water is discharged for further treatment in the Treatment Zone.

TO CLEAN: any solids that become trapped in the angled slots can be easily dislodged with a simple pull of the swab handle(s). Extension rods can easily be added to handles for a custom fit.
MyTEE® screens prevent large solids from leaving the settling zone and are easily cleaned using an attached, hand operated swab mechanism.
MyTEE® Drawing
ABC®-N Information

ABC® (Anoxic Biofilter Clarifier) Specialty Clarifiers

The ABC®-N denitrification device is designed primarily for use as a denitrification (nitrate reducing) device when exceptional levels of nitrogen reduction are required. A carbon feed system (by others) supplies a carbon source, and the ABC®-N promotes the growth of bacteria that denitrifies nitrified wastewater from most wastewater flows.

The ABC®-N system combines naturally occurring bacteria (biomass) with an external carbon source to denitrify wastewater that has been nitrified by an upstream aeration system such as FAST®. This is a continuous process provided; the biomass is supplied with food (carbon) and oxygen (nitrate molecule) in a suitable environment.

The ABC®-N process consists of the treatment module with re-circulation pump and assembly. The re-circulation pump and assembly mixes nitrates (NO3) and carbon throughout the media inside the tank. Bacteria grows on the media and uses the nitrates as oxygen, thereby transforming the nitrates into harmless nitrogen gas (N2). Dead bacteria and non-biodegradable waste settle and accumulate in the bottom of the septic tank as sludge for periodic removal.

Key things you need to know for your system:

The flow for a residence is usually determined at the local regulatory level. Typically each bedroom is assigned a value for the number of GPD of wastewater it will contribute to the overall sewer.

- Local Regulatory Guidelines
- Number of Persons of occupancy

ABC®-N Available Sizes

<table>
<thead>
<tr>
<th>ABC®-N</th>
<th>GPD</th>
<th>LPD</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5</td>
<td>500</td>
<td>1990</td>
</tr>
<tr>
<td>0.75</td>
<td>750</td>
<td>2839</td>
</tr>
<tr>
<td>1.0</td>
<td>900</td>
<td>3410</td>
</tr>
<tr>
<td>1.5</td>
<td>1500</td>
<td>5680</td>
</tr>
<tr>
<td>3.0</td>
<td>3000</td>
<td>13160</td>
</tr>
<tr>
<td>4.5</td>
<td>4500</td>
<td>17026</td>
</tr>
<tr>
<td>9.0</td>
<td>9000</td>
<td>34053</td>
</tr>
</tbody>
</table>
ADDITIONAL OPTIONS:

**ABC®-N Anoxic Biofilter Clarifier Denitrification Device**
- Additional TN Removal

**SVC Option - Secondary V Shape Clarifier**
- SVC OPTION includes: sludge and scum removal system and submerged effluent weir.

**SciCHLOR® Disinfection System**
- SciCHLOR OPTION includes: Brine Tank, SciCELL® Electrolytic Cell, Control Panel, and Sodium Hypochlorite Tank. It does not include the dosing pump.
- If disinfecting treated wastewater at 3 parts per million (PPM), the model 10 can do 400,000 gallons/1500 cubic meters per day.
Control Panel Examples
Examples of Installations

MyFAST® treatment modules provide ample surface area for biological growth while oxygen delivery and complete mixing are provided by the patented airlift design.

*MyFAST® installation during construction in North Dakota*
Mexico
Jamaica
Kenya
SciCHLOR® Sodium Hypochlorite Generator with SciCELL® Technology

Complete On-Site Disinfecting Solution:

With salt, water, and electricity, the Scienco® SciCHLOR® Sodium Hypochlorite Generator System with multi-pass SciCELL® Electro-Chemical Activation (ECA) technology will produce an available supply of disinfectant solution. Available in 10lb-60 lbs. chlorine equivalent per day sizes to provide a cost effective and reliable method of safely producing liquid chlorine for medium to large onsite disinfection applications (ex. dairy farms, aquatics, food/beverage processing, hospitals, hotels/resorts, and water treatment facilities); while surpassing operational efficiency performance requirements. Connected to an incoming water source (55 to 85 degrees F) and with operating modes of batch, continuous, clean, setup and diagnostic, the brine solution multi-passes through low-voltage DC electrolytic cell to produce the sodium hypochlorite.

- **CONSISTENT ON DEMAND PRODUCTION**
- **COMPATIBLE WITH MANY SALT TYPES**
- **AUTOMATIC OPTIMIZED SALINITY & CLEAN IN PLACE MAINTENANCE**
SCIENCO® SciCHLOR® technology uses a recirculation method to concentrate a brine solution, the SciCHLOR® system can produce up to a 0.8% strength hypochlorite [below the hazardous material threshold of 1%]. The SciCHLOR® System includes integral brine tank(s), chlorine storage tank(s), control panel, SciCELL® unit, and recirculation pump to allow the system to AUTOMATICALLY run at the optimum salinity and increase power efficiency.

When it reaches the low-level float set point, the system automatically restarts to replenish its water supply. If no solution is used, the system shuts down to save power. With an 800 ppm FAC sample taken from the SciCHLOR Generator, the solution killed 100% of the Staphylococcus aureus and Escherichia coli organisms within 30 seconds.

The Scienco® SciCHLOR® system is a simple, low-cost, robust onsite disinfection solution that automatically produces hypochlorite (chlorine) on demand using salt, water, and electricity:

- Alleviates the safety concerns associated with storing and using bulk liquid chlorine, chlorine tablets, or chlorine gas.

- Ideal for disinfection applications: water treatment, water reuse, wastewater, dairy farms/livestock production, food processing/packing plants, drilling injection, agriculture, institutions/clinics/hospitals, aquatics, and/or other industrial or commercial applications.
www.biomicrobics.com

Company Case Studies & Articles

Why Decentralized/Distributed Systems are Popular Alternative Treatment

A city’s wastewater treatment infrastructure is part of the groundwork for the organization of an entire community. This is one of the most costly undertakings for the community and using a centralized system is often not an environmentally sound decision. There is conclusive evidence that decentralized wastewater collection systems are helping to control treatment plant conditions ranging from wet weather storms, leakage into streams and ground water, and community resiliency in many places and significant problem in many communities across the U.S. A study in Albuquerque, New Mexico, concluded that leakage of wastewater from sewer pipes amounted to 16,000 cubic yards of raw sewage daily, accounting for 10% of the community’s wastewater flow at their treatment plant, or 5 million gallons per day. Due to cost and the disadvantages of overflow issues, alternative ways of providing wastewater service in suburban areas are gaining increasing attention.

In many situations, a decentralized/distributed system is the better way to go. Often seen as suitable only for low-density, rural situations and often only in temporary solutions, decentralized wastewater treatment systems are not usually thought of as an option for more than one home. However, with proper design, installation, and operation, the advantages of decentralized systems are many. Decentralized/distributed systems can reduce the time, amount of water, and energy involved in treating wastewater with a higher pollutant removal rate. By collecting, treating, and storing or disposing of wastewater from individual homes, buildings, and other similar systems near the point of generation, the benefits are not only for the developer and homeowner, but also for the environment.

BENEFITS FOR DEVELOPERS

Developers who look into alternatives to sewer or center collection systems actually see a glow in ownership of customers to choose decentralized/distributed systems for their homes. For example, a developer who is looking to build 10 such homes can have his project delayed up to 5 years while the city works to extend the existing sewage lines to the homes. Plus, the developer is likely going to pay significant sewer tap fees and substantial fees for the cost of extending sewer lines to the current sewage customers as a way to keep their rates lower. If the developer is charged more, chances are the developer will change the odds more. Additionally, in places like coastal areas, small lots and heavy regulation can tax the developer’s pocketbook. But if the developer is trying to put in a new The 5-year (or whatever was given) time frame is likely to stretch even further.

Because these decentralized/distributed systems are typically composed of modular, precast, and easily replaceable parts, installation and maintenance is simple, for it takes a little time to install and start a decentralized system. The only developer needs to do is to build a neighborhood and the treatment system is needed to maintain treatment meeting the appropriate state requirements, and water-quality standards.

BENEFITS FOR RESIDENTS

Homeowners generally don’t think about their sewage treatment systems. Quite frequently, a neighborhood near a large municipal treatment plant is smelly, and an appearance without any immediate water treatment benefits. Residents will be...
BioMicrobics Named a 2012 President's "E" Award Recipient for Outstanding Export Activity

May 29, 2012, 10:00 a.m. (EDT)

SHAWNEE, Kan. -- BioMicrobics Inc., a global leader in manufacturing onsite wastewater and stormwater treatment systems, has been selected as a 2012 recipient of the prestigious President’s "E" Award for Exports in recognition of its outstanding achievement in increasing U.S. exports.

The Award, granted by the President of the United States, was recently presented in Washington, D.C., by the U.S. Department of Commerce.

"BioMicrobics is honored to receive this prestigious 'E' Award," said Robert Rebori, President and CEO. "Most importantly, we are pleased to play an important role in providing innovative, wastewater treatment systems for homes, small communities, marine, and commercial properties around the world."

BioMicrobics is one of 41 U.S. companies being honored this year. Today, the company exports in over 60 countries to commercialize clean technologies. Exports currently make up approximately 70% of BioMicrobics income compared to approximately 30% in 2008. Canada, Mexico and Russia are the three countries where BioMicrobics has exported the most over the past four years.

"I am pleased to recognize BioMicrobics for receiving the President's 'E' Award, which honors companies that make significant contributions toward increasing U.S. exports," said U.S. Commerce Secretary John Bryson. The "E" and "E Star" Awards are the highest recognition any U.S. entity may receive for supporting export activity.

BioMicrobics has successfully propelled its export trade business with the assistance of U.S. Commercial Service and the Kansas Department of Commerce. BioMicrobics participates in trade missions, and sponsored events that focus on a particular country and the environmental/water industry. Employees regularly attend international trade shows and often provide product training in foreign settings.

"Exports are a part of our DNA and we have worked diligently to market creatively and help the businesses in these countries succeed with our products," said Rebori.

In addition, BioMicrobics provides a co-op advertising program for both domestic and international customers. Social media sites, such as: YouTube, Twitter, LinkedIn, Google+, and Facebook are used to quickly and cost-effectively share information. Products are promoted on the website in many languages and there are plans to add more.

ABOUT: BioMicrobics manufactures innovative, advanced wastewater treatment systems, septic system alternative products, and storm water treatment that provide solutions for people around the world. For more information visit the website www.biomicrobics.com.

SOURCE BioMicrobics Inc. Copyright (C) 2012 PR Newswire. All rights reserved
**MyFAST® HS-STP™ System with Sludge Management**

Based on the obvious need for cost effective and sustainable solutions, studies have been conducted in cooperation with community and environmental groups to develop less centralized and more environmentally beneficial wastewater treatment systems. The possibility of using a decentralized MyFAST® High Strength Sewage Treatment Plants (HS-STP™) in place of expanding existing centralized plants makes more sense when focusing on pretreatment or water reuse opportunities. With a self-contained, MyFAST HS-STP, it is possible to have access to reliable, affordable water supplies and infrastructure to sustain community growth.

Several considerations, including operation and maintenance and sludge management, need to be taken into account with Innovative, decentralized sewage treatment technologies; and Bio-Microbics has done this by providing Sludge Management zones: BMS (BioSolids Management systems) and AMS (Aeration Management Systems) on such Sewage Treatment Plant as the MyFAST HS-STP.

Decentralized concepts are generally not taught in engineering schools as the centralized approach is generally understood by academics and passed on to students. Universities have been teaching town planners, engineers, architects, graduate students, doctorates, and professors, the art of water and air contamination with little or no question about the ecology or environmental concerns. Unfortunately, there is much in the way of education for conventional or centralized municipal design, but lacks in teaching the benefits of decentralized treatment solutions. Since the education isn’t there, regulatory and financing rules generally discourage their use. With dense urban populations a centralized plant seems well-suited; however in this economic climate, the thought that smaller communities must have a large complicated treatment plant must be challenged and corrected. Decentralized solutions help to enhance the typical engineering that goes into building for better water management and permit more communities to be addressed by limited assistance funds (US EPA).

The approach that the Fixed Integrated Treatment Technology (FITT®) process takes of the MyFAST system is to employ preaeration (AMS Zone) to mix and start to degrade the sewage before it enters the actual treatment zone. This eliminates the need for pumping of the primary settling before the treatment zone. The pre-aerated wastewater flows to the treatment tank where bacteria and higher life forms become ‘fixed’ to the honeycomb media inside the MyFAST units. Better able to cope with surges and provide higher removal rates for organic matter, the growth on the media thickens and sloughs off from the media by the aeration process and settle to the bottom of the treatment zone for removal.

**Technology Innovation for Commercial Outlets**

Frost & Sullivan did research focusing on decentralized wastewater treatment for commercial outlets, their findings resulted in alarming urbanization and population rates are continue to increase exponentially. Commercial outlets, such as shopping malls, restaurants, grocery stores, etc., generate a substantial quantity of high strength wastewater. When this wastewater is channeled through a centralized sewer line, this increases construction costs dramatically. In addition, poorly controlled wastewater discharge into nearby bodies of water or the subsurface will contaminate the ecosystem and adversely affect public health. As a result, decentralized wastewater treatment systems have become an attractive option for dealing with wastewater at the point of generation.

Frost & Sullivan’s research has found that the FAST Fixed Integrated Treatment Technology, with its new advancements in decentralized wastewater systems, have made these systems easy to install, reliable, effective, and affordable. "Bio-Microbics’ FAST technology has successfully met stringent treatment standards, thus causing a major headache for the competition who’s systems are not able to offer these reuse options." Frost & Sullivan believes that this
reuse feature will open up a number of application opportunities for the FAST technology, especially with commercial outlets where the ability to generate large quantities of recycled water is possible.

Decentralized sewage treatment technologies are ideal for projects with land constraints and flows of up to 160,000 gallons per day or more. An important advantage to onsite wastewater systems is the ability to design systems to treat wastewater and develop ‘reuse opportunities’. As most of the treatment occurs inside the tank, the effluent is more than 95% free from solid and waste. The treated wastewater is then available to replenish groundwater and aquifers, or in some cases, it could be made available for grey water reuse. Water reuse opportunities include use in toilets for flushing, lawn and landscape irrigation, firefighting, and more. Frost & Sullivan’s unbiased research compares the FAST technology versus competitors in its marketplace and recognized the FAST system with its consistent performance, easy installation, and minimal maintenance requirements. "In addition, the FAST system boasts long-term reliability; while complying with global regulations. These factors, in concert with the cost/time saved on maintenance and install [when compared to competing systems], will provide customers with unmatched value and optimal ROI," according to the Frost & Sullivan Report.

With versatile design and flow rate, the FAST technology maintains consistent high performance, low maintenance, as well as sludge management all in one tank. FAST technology’s short retention time (24 to 36 hours) will allow commercial outlet owners to treat wastewater on a daily basis. As the population increases and urbanization moves forward, the adoption of these systems is expected to increase with the ability to repurpose the treated water making this system even more compelling. Frost & Sullivan views Bio-Microbics’ FAST technology as an excellent addition to the Decentralized Wastewater Treatment Systems market, especially given its ‘green’ wastewater recycle capabilities.

The treated effluent from a decentralized treatment unit, as in the case from the FAST system, can then be discharged into a drain field to recharge groundwater or it can be made available for water reuse, such as subsurface landscape irrigation. With further disinfection it can be used for surface or spray irrigation or even for toilet flushing.

Conclusion

Whether the project is to help defer plant expansion, promote pretreatment, post secondary upgrade options, or to develop the entire treatment scheme, decentralized technologies can help to reduce costs and greatly contribute to the health and well-being of the community. Cities cannot ignore the infrastructure issues they are facing today or those that may be coming in the next few years. As water-related issues escalate in major cities across the world, the important role of water must be recognized and smartly managed to improve conditions for people, the environment and job growth. Poor management or a gap in infrastructure means a community is vulnerable to higher water rates, greater long-term debt and future economic challenges.

About the Authors:

Allison Blodig, REHS, is the Director of Regulatory Affairs for Bio-Microbics. Along with a degree in biology, Ms. Blodig is a Registered Environmental Health Specialist and has over 20 years of experience in regulatory affairs, over 15 of which are in the water and wastewater treatment industry.

Technical contributor: James A. Bell, M.S., Executive Vice-President for Bio-Microbics, Inc., located in Shawnee, Kansas. Mr. Bell holds an MS in Environmental Engineering and a B.S. in Civil Engineering, as well as a Masters in Business Administration. He has worked for over 35 years designing large water and wastewater treatment systems.
ROBUST DECENTRALIZED wastewater treatment for small communities

For many small and medium-sized communities, centralizing wastewater treatment into a single,集中式的污水处理系统 is essential. However, this approach can lead to significant issues, especially in areas with limited resources. By decentralizing wastewater treatment, communities can achieve better environmental outcomes while minimizing costs and minimizing environmental impact.

Decentralized wastewater treatment systems are becoming increasingly popular, especially in remote areas where traditional infrastructure is either non-existent or unreliable. These systems are designed to be scalable, allowing for easy expansion as the community grows.

One such system is the MyFASTR system developed by Bio-Microbics, Inc. MyFASTR is a plug-and-play system that can be easily installed in a variety of settings, from rural communities to remote locations. It is designed to be maintenance-free and requires minimal supervision.

Addressing the challenges of decentralized wastewater treatment, MyFASTR provides a cost-effective solution for small communities. Its modular design allows for easy expansion and adaptation to changing needs. With its high efficiency and low maintenance requirements, MyFASTR is an ideal solution for small communities looking to improve their environmental footprint.
Case Study

G2D Summit Focuses on Economy in a Very Green, Sustainable Facility

Sustained Green Water Adds Ambiance, Energy Efficiency and Enhanced Water Recycling

With its reported 16,000+ people attending the 2012 G2D Summit in Las Vegas, Missouri-based Technical Industrial Solutions (TIS), the world’s largest manufacturer and distributor of commercial and industrial cleaning solutions, has made another green footprint. The ICC, which officially opened a new LEED Gold-certified facility in the fall of 2012, is one of the greenest buildings in the world. The ICC is a national model for sustainable building practices that demonstrate the potential of green buildings. The ICC was built with the goal of creating a sustainable facility that reduces energy consumption, water usage, and waste while enhancing the environment. The ICC has been designed to achieve LEED Platinum certification.

About the Overachieved Water Treatment Plant

The ICC is a “green” facility, providing the building and operating costs savings and environmental benefits. The ICC is designed to be environmentally friendly, with a focus on sustainability. The ICC is a model for sustainable building practices that demonstrate the potential of green buildings.

The ICC was built with the goal of creating a sustainable facility that reduces energy consumption, water usage, and waste while enhancing the environment. The ICC has been designed to achieve LEED Platinum certification.
Decentralized Systems for Small Communities, Large Operations

Demand for water in many communities – small and medium – have reached critical levels around the world. Decentralized treatment systems are gaining in popularity for returning treated water to the local environment.

BioMicrobics’ MyFAST® High Strength Sewage Treatment Plants (HS-STP™), offering versatility in design and flow rates, are used as an alternative to expanding existing centralized plants. The self-contained MyFAST HS-STP provides reliable, affordable water supplies, and infrastructure that sustains community growth, according to the US-based company in Shawnee, Kansas.

Builders and developers searching for reasonable wastewater treatment options for projects with land constraints, opportunities for direct discharge, groundwater recharge, and water reuse opportunities are requesting advanced onsite treatment systems. These factors, with the cost and time saved with installation and maintenance compared to competing systems, provide customers with unmatched value and optimal return on investment, according to the 2011 Frost & Sullivan, Water & Wastewater Technology Innovation for Commercial Outlets Report. FAST® technology is fitting for clustered communities and commercial outlets. Large decentralized systems with flows up to 600 cubic meters per day benefit with BioMicrobics quick and easy installation and cost advantages of MyFAST high performance, low maintenance and sludge management in one tank.

Decentralized systems, installed as an alternative to sewers, should address considerations such as operation and maintenance, as well as sludge management. Bio-Microbics does this by providing sludge management zones: BioSolids Management Systems (BMS) and Aeration Management Systems (AMS) on sewage treatment plants reducing costs for communities and individuals.

BioMicrobics Fixed Integrated Treatment Technology (FITT®) process approach of the MyFAST system uses pre-aeration (AMS Zone), mixing, and degrading sewage before it enters the treatment zone. The MyFAST system enables simultaneous aeration, mixing and self-cleaning of the attached growth inside the tank. This eliminates the need for pumping primary to settle before the treatment zone. Complete with effective, pre-engineered air delivery system to aid in robust circulation of wastewater, pre-aerated wastewater flows to the treatment tank where bacteria and higher life forms flow through the media’s channeled path and become “fixed” to the media inside the MyFAST unit. This treatment process achieves higher percentage nitrogen removal rates. MyFAST copes with surges and provides higher removal rates for organic material. Growth on the media thickens and sloughs off during the aeration process, settling to the bottom of the treatment zone for removal. Effluent is more than 95 percent removed of solids and waste. Treated water is then available to replenish groundwater and aquifers, or made available for greywater reuse.