



Lab Lines

NEWSLETTER
ISSUE 2 | SUMMER 2023

ESOP ANNOUNCEMENT:

Environmental Business Specialists (EBS) announced in January 2021, that we instituted an Employees Stock Ownership Plan (ESOP). Our transition to the ESOP business model was deliberately made to help preserve our unique company culture and create long-term, engaged employee-owners that are personally invested in growing a successful business. This move recognized the valuable contributions of our employees and was designed to provide them with a financial stake in the company and assist them with their retirement goals.

So how do our clients benefit from working with an ESOP organization?

We believe that shared ownership promotes employee retention, leading to a more experienced, knowledgeable staff and better client experience. As a valued client of EBS, we are truly invested in creating meaningful, lasting relationships. We strive to help clients achieve their individual goals with exceptional service and innovative solutions.

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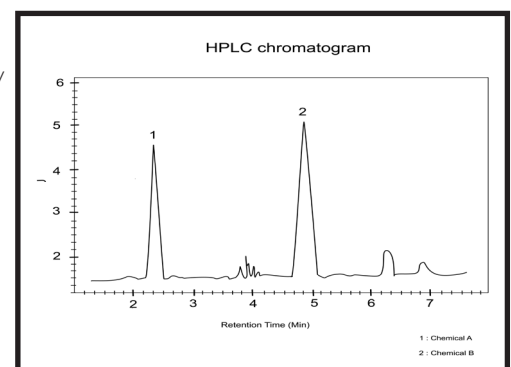
THE RIGHT TEST MAKES ALL THE DIFFERENCE!

Quaternary Ammonium Compounds (QACs) Advanced Analytical testing

Quaternary Ammonium Compounds, or QACs, are a widely used group of cationic surfactants known primarily for their antimicrobial properties. These compounds are used in household and industrial cleaners and disinfectants. Due to their widespread usage, QACs are a common waste component sent to treatment facilities. At elevated concentrations, QACs can threaten healthy and thriving biomass.

The EBS Advanced Analytical Lab utilizes High-Performance Liquid Chromatography to identify and quantify commonly used QACs. This capability has helped numerous clients determine QAC loading, accumulation retention, and effluent discharge concentrations. For plants that discharge to a secondary treatment facility, effluent QAC concentrations can become a big problem. In one case, a secondary treatment facility used QAC testing strips on their influent, indicating QAC concentrations exceeding 500 mg/L and identifying our client as a potential source.

Over several weeks, the disinfectant used by our client was characterized, and their main QAC components were identified using HPLC. Traces of these compounds were found in samples from the client facility at concentrations below 20 mg/L. Additionally, the samples were analyzed with similar QAC test strips and confirmed that levels were lower than initially suspected. This testing not only helped our client feel confident that they were not responsible for the high number of QACs entering the secondary treatment facility, but it also showed that HPLC testing offers a more specific and reliable means of quantifying QAC concentrations than other generic methods.



ONE FISH, TWO FISH, RED FISH, DEAD FISH?

Using Microtox testing to help predict WET testing failures

Acute toxicity testing (ATT) can be used as an early warning system to determine the effect of chemicals on your WWTP. EBS utilizes Microtox® LX testing to determine the chemical's toxicity level.



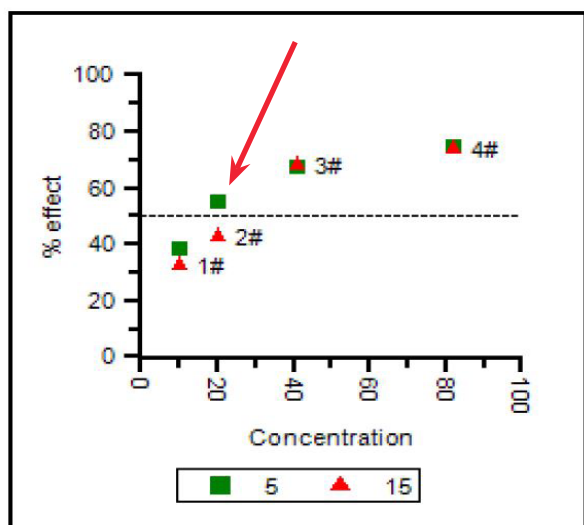
The Microtox® System uses a strain of bio-luminescent bacteria as the target microorganism. Changes in the bacteria's light output are measured upon exposure to a sample containing toxic substances. The greater the reduction in light emitted by the bacteria, the greater the toxicity of the sample. ATT results correlate to WET (Whole Effluent Toxicity) testing results in many systems and can be used as a leading indicator of possible WET test issues. ATT can also be used to pinpoint sources of toxicity or inhibition coming into a wastewater treatment plant's biological system.

In the example below, a client struggled to meet WET testing permits. Samples were analyzed by EBS, with side-by-side AAT and Advanced Analytical Analysis performed. The goal was to determine the level of toxicity in the Final Effluent and identify chemical compounds known to cause toxic effects at elevated levels. These compounds can include terpenes, resin acids, long-chain fatty acids (LCFA), volatile organic acids (VFA), biocides, total surfactants (including QACs), and heavy metals.

The analysis found that the Final Effluent sample had an Effective Concentration 50% (EC50) of 22%. An EC50 is defined as the sample concentration that reduces the bio-luminescences of the bacteria by 50%. Therefore, an EC50 of 22% would suggest the sample was toxic to the bacteria at a concentration of 22% Effluent. The biomass and effluent samples also had elevated levels of iron, calcium, resin acids, VFAs, and LCFA. While one data set does not equate to the causation of the failed WET testing, the facility was on the right path toward pinpointing the source of toxicity.

Routinely testing these compounds of concern alongside ATT can help operators determine when bioaccumulation is occurring and help create remediation strategies BEFORE WET testing permit failures happen in the future.

To learn more about Microtox® LX testing or our wide variety of lab capabilities, visit our website [here](#) or fill out our [contact us](#) form!



The graph represents the light emittance by the bio-luminescent bacteria dosed with various concentrations of our clients effluent. Samples were checked by 5 and 15 minute intervals.

Sample #2 (EC50 of 22%), resulted in a 50% light reduction after 15 minutes, indicating Effective concentrations higher than 22% could cause inhibitory effects.

ASK THE BIOWIZARD

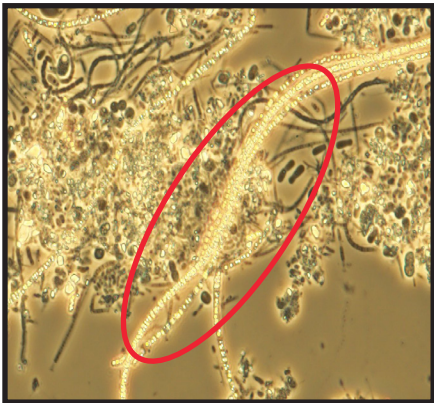
Can septic conditions encourage filamentous bacteria growth?

When it comes to filamentous bacteria and wastewater treatment, there are two types of facilities: one that has experienced filamentous concerns and those that will. Understanding the root cause for their high growth rate can help facilities address the issue when problems arise.



Filamentous bacteria caused by septicity and high concentrations of organic acids are some of the most common causes of filamentous bulking in activated sludge systems. These include *Thiothrix* spp., Type 021N, Type 0914, Type 0411, *Nostocoida limicola*, and *Beggiatoa* spp. These filaments grow on short-chain organic acids such as acetic, propionic, and butyric acids commonly found in most WWTP. These organic acids occur in black liquor and condensate or can be derived by fermentation of the wastewater (septicity).

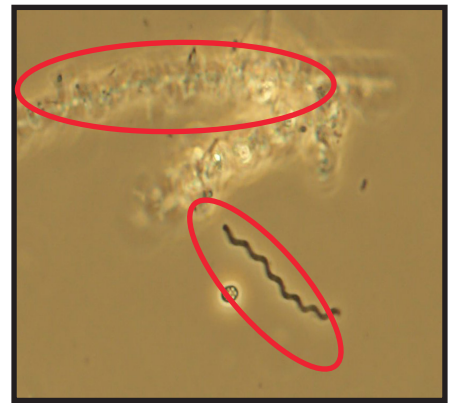
Elevated levels of *Thiothrix* spp., *Beggiatoa* spp., and/or Type 021N are often associated with septic conditions as these filament types can also grow on reduced sulfur compounds (RSC). Septicity can occur in mill sewers, equalization basins, primary clarifiers, or poorly designed selectors. Common signs of septicity are a “rotten egg” odor, a pH drop of 0.5-3 units, a dark color formation of the sludge, and an abundance of spirochetes/spirillum bacteria.



Thiothrix spp. with Sulfur granules



Nostocoida limicola



Spirillum and filament Type 0411

Have a question for our experts? We want to hear from you! To participate in our “Ask the BioWizard” questions, please get in touch with us by email info@ebsbiowizard.com or through our [contact us](#) form on our website.

Your questions can be featured anonymously in future editions!

Free Microscopic Analysis!

Routine microscopic exams are a great way to look in-depth into the health of a microbial population. Our microbiologists here at EBS have a wide range of expertise related to wastewater microbes as we examine samples across various industries daily. We offer a FREE microscopic analysis for our first-time clients to gain your trust and business. This analysis will cover the essential parameters of our basic microscopic exams, such as floc size and structure, filament and polysaccharide abundance, bulk water quality, and higher life form evaluations.

Your final report will include microscopic photos and a summary of the findings. Contact us at info@ebsbiowizard.com - Re: Free Microscopic Analysis.



TRAINING SUCCESSES SO FAR THIS YEAR

Training is a passion for EBS and our employee-owners. Our goal is to grow individual knowledge and skills to perform our jobs better. Training plant personnel helps to achieve this goal by developing a deeper knowledge of wastewater treatment and expanding their troubleshooting skills.

Increased knowledge allows an operator or engineer to manage the system more effectively and help minimize its impact on the environment.

So far this year, EBS has hosted several seminars, workshops, and training events with over 100 guests from across the United States. We also hosted our largest-ever corporate-specific training event for Georgia-Pacific, including corporate and mill professionals. This event offered a unique opportunity for employees to engage with one another, sharing their concerns and successes that are often encountered when dealing with industrial wastewater treatment.

Given the huge success of these events, EBS is excited to offer more corporate-specific training. This specialized style of training allows us the opportunity to tailor our expertise based on the concerns or needs of your company.

If you are interested in learning more about our seminars and workshops or want information on scheduling a training event, please contact us anytime!

Recently completed events.

- ✓ Spring Seminar- Mandeville, LA
- ✓ Corporate Specific training Georgia-Pacific- Mandeville, LA
- ✓ Workshop - Greenville, SC
- ✓ Workshop -Savannah, GA
- ✓ Workshop -Birmingham, AL
- ✓ On-site microscopic training- Plaquemine, LA
- ✓ Louisiana Chemical Association Tradeshow - Lake Charles, LA

SPECIALIZED TRAINING PROGRAMS OFFERED



Fall Seminar- Aerated Stabilization Basins (ASB) and Activated Sludge Systems
Mandeville, LA October 11-13th



Training event dates for 2024 have not yet been selected.
We will keep you updated!

www.ebsbiowizard.com/training-seminars

We want to hear from you! For more information regarding upcoming training programs, operational issues at your facility, request a specific article topic, or want to participate in our "Ask the BioWizard" questions, please contact us by phone, email info@ebsbiowizard.com or through our [Contact Us](#) form located on our website.



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