



An Employee-Owned Company
Comprehensive Wastewater Solutions

>>> ISSUE 6 <<<

CLEAN THOUGHTS

Wastewater Consultants Like No Other



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AERATION CAPACITY AND BOD LOADING

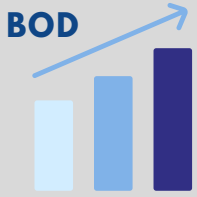
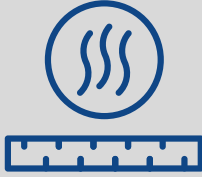

➤➤➤ FINDING YOUR SYSTEM'S SWEET SPOT



Aeration is the process of dissolving air in a liquid by a variety of techniques including mechanical agitation, injection, diffusion, and reduction or venturi. In the context of aerobic wastewater treatment, aerobic bacteria require adequate dissolved oxygen to meet the measured biological oxygen demand (BOD) and possibly other oxygen consuming compounds. These bacteria utilize oxygen to break down complex

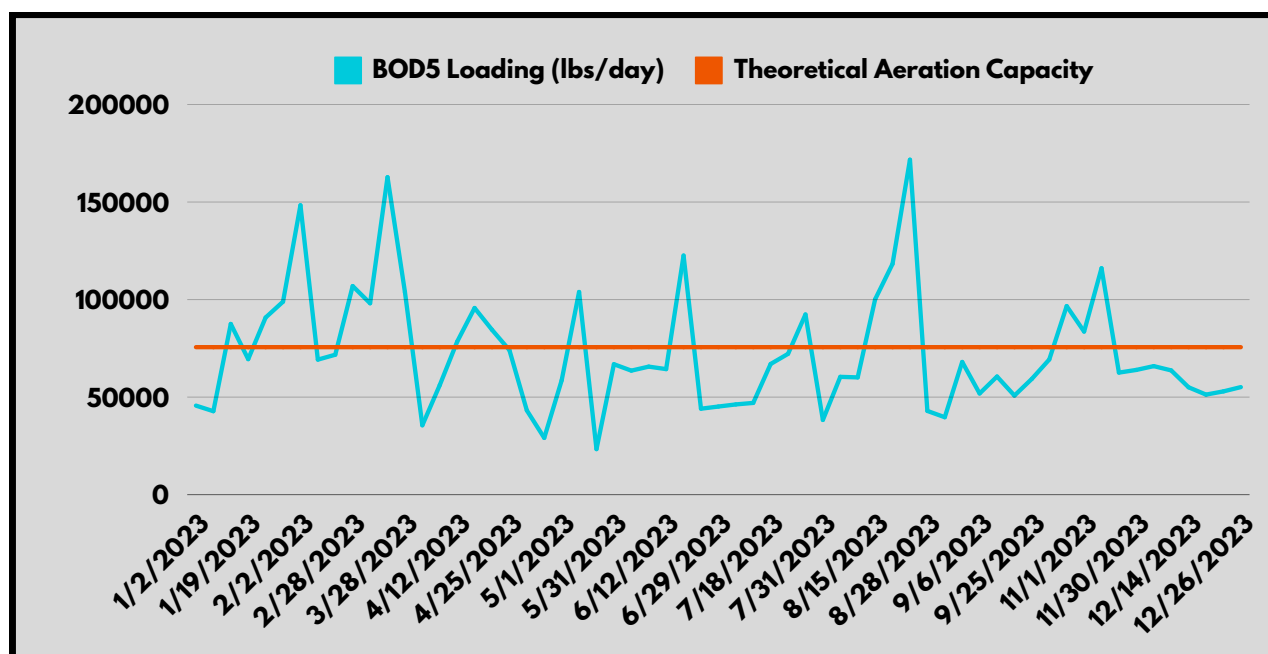
organic compounds into water and carbon dioxide. The aeration capacity of a treatment system refers to the actual or theoretical amount of dissolved oxygen that can be applied by the aeration system or equipment. The goal is to provide enough oxygen to fully meet the oxygen demand and maintain a suitable measured residual of dissolved oxygen in the treated wastewater.

Insufficient aeration can lead to several issues including:

Reduced Treatment Efficiency	Without enough oxygen, aerobic bacteria cannot function optimally, leading to incomplete breakdown of organic matter and higher residual pollutants in the treated effluent.	
Odor and Foaming Issues	In anaerobic conditions (low oxygen), foul-smelling gases like hydrogen sulfide can form, causing odor issues. Additionally, foaming can occur due to incomplete or inadequate biological treatment efficiency.	
Increased Operational Costs	Inefficient aeration requires more energy consumption to maintain the required DO levels, driving up operational costs.	

To optimize aeration capacity, engineers consider factors such as the type of aeration system (diffused air, mechanical surface aerators, etc.), the mixing efficiency of the system, and the theoretical aeration capacity based on BOD loading. The graph below displays the Influent Biochemical Oxygen Demand (BOD₅) in pounds per day (lbs/day) over the course of a year. Theoretical Aeration Capacity set at 75,600 lbs/day.

The data suggests that the Influent BOD₅ exceeds this threshold several times throughout the year, indicating potential stress on the system. This stress can result in reduced treatment efficiency and the potential for permit violations. Conversely, periods when the BOD₅ falls below the Theoretical Aeration Capacity may indicate wasted energy.



Whenever loading has exceeded the aeration capacity of the treatment system, operators have several levers they can pull, such as diverting the stronger influent to an emergency pond or tank, turning on/adding additional aerators, or supplementing with an alternative electron acceptor.

Our team of environmental specialists and engineers can help clients determine their aeration capacity and develop a plan of action in the instances where the treatment system is hit with unexpected loading to minimize loss of treatment efficiency cost-effectively. Contact us to find out how we can ensure that your system is running at its optimal sweet spot!

THE P's OF OUTAGE SUCCESS

If you've spent any time in business development, safety trainings, or team-building events, you've likely heard some variation of the "P's for Success." For example: Purpose, Process, and Payoff. It's practically a universal mantra for getting things done. Even the US military has its own "colorful" version to get fresh eye'd recruits ready for their new disciplined life in the military.

Here in the world of wastewater management, we're giving the "3 P's" a practical twist for outage prep: Plan, Prepare, and Protect. When facing potential outages—whether from equipment failures, maintenance needs, or surprise visits from Mother Nature in the form of hurricanes or extreme temperature swings, these 3 P's might just be your new best friends!



Outages, whether planned or unexpected, can significantly impact the effectiveness of biological treatment systems, potentially leading to increased operational challenges and regulatory compliance issues.

These outages may involve a shutdown of some or all production and ancillary operating equipment. However even with careful planning, accidental losses during shutdown and restart could lead to permit violations.

Seasonal weather events, such as hurricanes, freezes, and heat waves, can further increase the risk of outages by causing power disruptions, equipment failures, or damage to infrastructure.

Plan

- Develop a comprehensive, multi-step plan to support your system before, during, and after an outage, whether it's planned or an emergency.
- Offer strategic guidance on system monitoring and testing to identify potential issues early and ensure compliance with regulatory standards.

Prepare

- Restock essential nutrients and apply with EBS dosage recommendations to promote the growth and development of a healthy biomass, keeping your biological treatment process resilient.
- Keep a supplemental source of BOD, like EBS MicroCarb on hand to sustain biological activity during extended outages.
- If needed, implement bioaugmentation to strengthen the local bacterial population.

Protect

- Enhance system resilience through continuous support, monitoring, and adaptation to minimize the impact of any disruptions and maintain optimal performance.
- Allow EBS to conduct total and live cell counts before, during, and after outages to monitor how the bacterial population responds and to adjust treatment strategies as needed.

STAY AHEAD WITH EBS CALNIT™

THE CALCIUM NITRATE ADVANTAGE

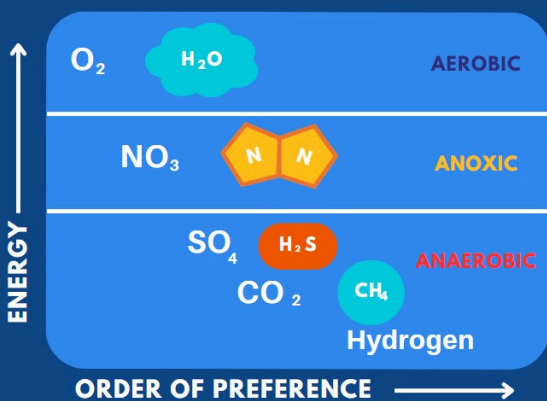


The application of EBS CalNit™ provides a scientifically-sound solution to help ensure that BOD permit limits can still be met during oxygen deficient conditions.



It's also

<p>Safe to handle</p>	<p>Harmless byproducts</p>	<p>Favorable chemical properties</p>	<p>Prevents hydrogen sulfide formation</p>
<p>CalNit is not an oxidizer and can be stored safely on-site in plastic or fiberglass tanks.</p>	<p>The by-products produced by bacteria are nitrogen gas carbon dioxide and water</p>	<p>Highly soluble in water, and is non-volatile, so it will remain in the wastewater until utilized by the bacteria.</p>	<p>When nitrate is available bacteria will use it over sulfate preventing odorous H₂S formation as it yields more energy</p>



Metal salts and nitrate solutions have long been applied to wastewater treatment systems to mitigate hydrogen sulfide and related odors, as well as improving effluent quality by favorably impacting solids clarification and addressing oxygen deficiencies. EBS has been successfully providing calcium nitrate for over twenty years to assist our clients with upset mitigation where an additional terminal electron acceptor (TEA), such as nitrate, has an enormous impact.



WASTEWATER TRAINING TESTIMONIALS

Our past workshops and training events have consistently received positive feedback and achieved high participant satisfaction. They are renowned for their interactive sessions, expert facilitation, and practical strategies that have empowered attendees to achieve measurable improvements in their operational skills.



I thought the seminar was very informative. A lot of the information discussed will be taken back and used in some way to make my system better.

Sr. Environmental Engineer
Chemical Production Facility



This seminar has given me more of the technical knowledge needed to appropriately identify root cause and effectively address upsets.

EHS Manager
Sugar Refining



Fantastic Course! I gained a lot of knowledge to bring back to our stakeholders to assist in developing a rehabilitation plan for our ASB. All of the EBS team has been great!

Account Manager
Pulp & Paper Mill



One of the best trainings I have attended by far. I truly enjoyed the open dialogue concept and the experience based presentations!

Environmental Engineer
Pulp & Paper Mill

Lookout for more training opportunities coming in 2025!