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EBS
An Employee-Owned Company
Comprehensive Wastewater Solutions

>>> ISSUE 10 <<<

CLEAN THOUGHTS

Wastewater Consultants Like No Other



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FIVE KEY AREAS TO IMPROVE YOUR WASTEWATER SYSTEM



1 MONITOR THE EIGHT GROWTH PRESSSURES

The growth pressures are the factors that often determine the success or failure of a biological treatment system.

These factors include BOD loading, retention time, dissolved oxygen, temperature, pH, viability of the biomass, the presence of toxic or inhibitory compounds, and nutrients. Keeping these growth pressures in their respective target range is essential for maximizing treatment efficiency.

BOD loading	Retention time	Dissolved oxygen	Temperature
pH	Biomass viability	Toxic or inhibitory compounds	Nutrients



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2 GENERATING RELIABLE LABORATORY DATA

You can't control what you don't measure. Reliable laboratory data is essential for tracking wastewater parameters and understanding WWTP performance. Inaccurate or inconsistent results can waste time and money, reduce production, and lead to permit non-compliance. Ensuring a dependable on-site laboratory is critical.



3 ESTABLISH KEY PERFORMANCE INDICATORS

Once you have reliable data and know what to test, establish site-specific key performance indicators (KPIs) for critical WWTP parameters. These may include influent loading and flow, COD removal, nutrient residues, dissolved oxygen, and clarifier turbidity. Set high and low guardrails for each KPI to quickly assess operations, then define corrective actions. Planning these responses in advance helps prevent minor upsets from becoming major problems.



4 WELL-TRAINED OPERATORS

Engineers use KPIs to assess WWTP efficiency, but operators are the first line of defense. They must understand both equipment and what KPIs indicate, how to respond when COD rises, nutrients fall below guardrails, or DO drops below 1 mg/L. Operators should be as informed as engineers about growth pressures, KPIs, and corrective actions.



5 CREATE A PERFORMANCE REVIEW PROGRAM

When routine monitoring cannot easily resolve system issues, a performance review program can provide a safety net through data analysis, microbiological testing, onsite consulting, and other measurements. For over 30 years, EBS has helped facilities train employees to identify unreliable data and take corrective action during unavoidable upsets.



Staying in Compliance during the Cold





EBS evaluated its ***cold-weather bioaugmentation*** product, CryoStart, against a standard mesophilic bioaugmentation product in an aerated stabilization basin (ASB) study. The two-month trial examined treatment performance under cold conditions and varying organic loads.

METHODOLOGY

Two identical parallel reactors were operated at 10.5°C (51°F), with the bioaugmentation product being the only treatment difference. BOD and TSS were routinely measured in the influent, aeration basins, and effluent.

Each reactor used two aerated stages to simulate plug-flow treatment with a five-day retention time. Both were seeded with biomass from a pulp and paper mill ASB and received influent from the same facility. A high-loading event was also simulated using EBS MicroCarb, with supplemental nutrients added to support biological activity.

Both dry, Bacillus-based products were activated for 18–24 hours before dosing to simulate bacterial acceleration chamber (BAC) unit operation and ensure bacteria entered the reactors during active growth. Each reactor received a target dose of 5.0×10^5 CFU/mL.

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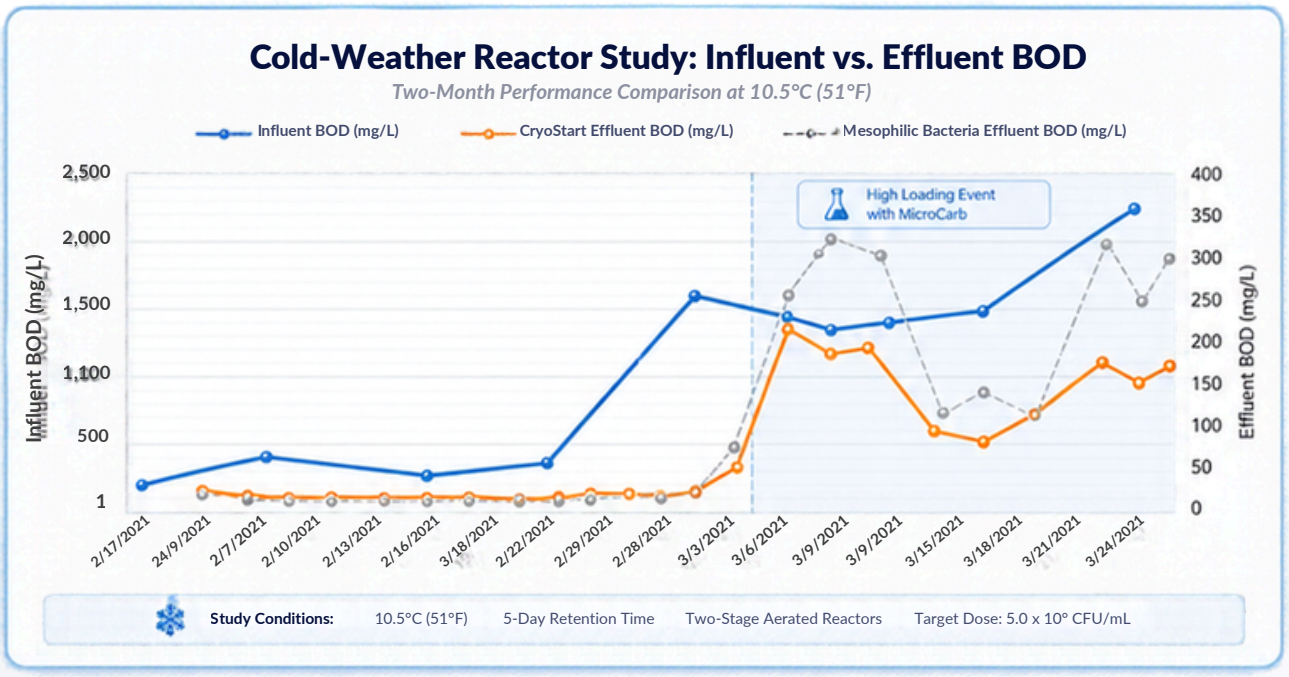


Figure 1. Influent and effluent soluble BOD concentrations

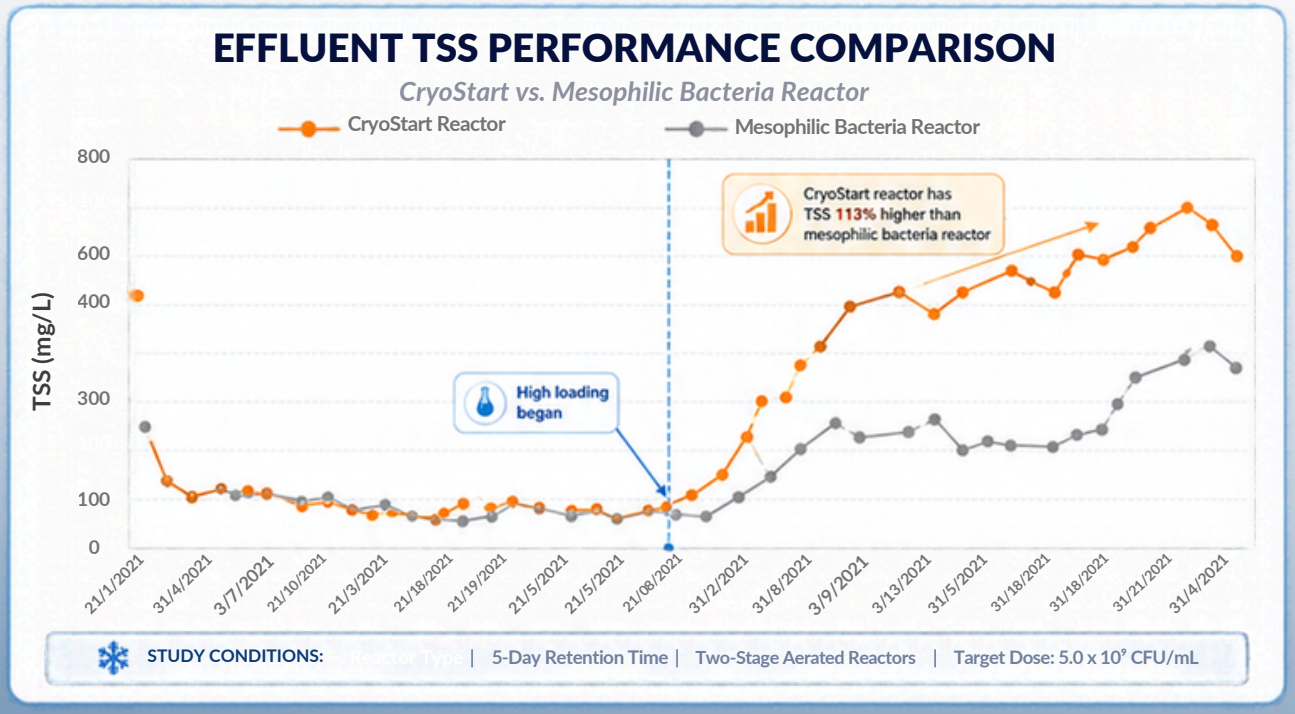
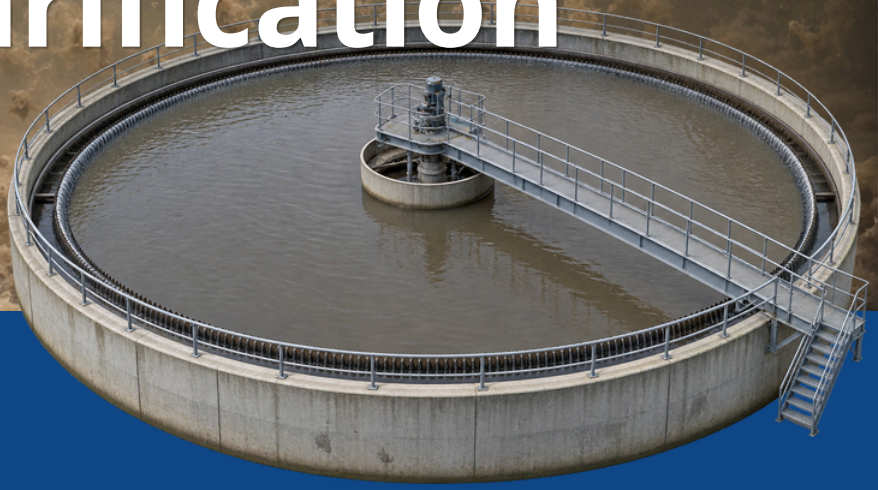


Figure 2. Reactor Stage 2 TSS concentrations

Conclusion

Cold temperatures can reduce biological treatment resilience. While both products performed well under normal loading, CryoStart delivered stronger performance during high BOD conditions due to its cold-adapted bacterial strains reproducing at a faster rate than the mesophilic bacteria. Using a cold-weather bioaugmentation product during winter can help plants maintain treatment performance, meet effluent limits, and better handle loading spikes.

Hidden Cost of Poor Primary Clarification



$2.26 million

Potential additional dredging cost over five years

A daily solids problem becomes a long-term cost

Poor primary clarification may not cause immediate compliance issues, but inadequate TSS and BOD removal can allow solids to accumulate in an aerated stabilization basin (ASB) or aerated lagoon, increasing maintenance and dredging costs.

11.7 **80 mg/L effluent TSS**

dry tons/day to the ASB

36.5 **250 mg/L effluent TSS**

dry tons/day to the ASB

~24.8 extra dry tons/day - nearly 9,000 tons/year of preventable solids entering the downstream system with a system flow rate of 25 MGD.

Where do the solids go?

Excess solids settle in the basin, reduce treatment capacity and create additional "phantom BOD" as organics slowly break down. Much of this material eventually requires dredging.

What does removal cost?

Many primary solids, especially inorganic material, do not fully degrade. Dredging can cost roughly $50/dry ton with on-site disposal and up to $350/ton with dewatering and off-site hauling.

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PRIMARY CLARIFICATION

Remove Solids Early. Protect Long-Term Capacity.



The five-year financial impact

Primary clarifier effluent TSS	1-year future dredging cost	5-year future dredging cost
80 mg/L	$213,000	$1,065,000
250 mg/L	$666,000	$3,329,000

Why this cost is easy to miss

Dredging is a lagging cost. A facility may operate for years before solids accumulation becomes obvious. Warning signs often appear only after treatment volume has fallen, process performance has declined or emergency dredging is needed. By then, much of the cost has already been created.

Capture solids up front

Solids removed in the primary clarifier are more concentrated, easier to manage and less disruptive to downstream treatment.

Avoid downstream buildup

Solids that pass through become diluted, settle unpredictably, reduce available treatment volume and become more expensive to remove.

Focus operations on prevention

- Sludge blanket control
- Polymer optimization
- Hydraulic distribution
- Equipment condition and maintenance

Monitor Performance over Time

Primary clarifier evaluations

Measure solids removal efficiency and assess primary solids characteristics.

Depth surveys

Track sledge accumulation, lost basin volume and available treatment capacity.

Tracer studies

Identify short-circuiting, dead zones and reduced effective retention time.

Long-term performance trends

Evaluate how solids deposition and volume loss affect treatment performance.

MAKING A SPLASH IN 2026

TRAINING • CONNECTION • IMPACT

EBS Spring Seminar & Industrial Wastewater Workshops









Good people.
Great conversations.





