BALANCING BIOLOGY: AMMONIA CONTROL IN LAGOONS

SMART PRACTICES FOR BETTER NITRIFICATION

Ammonia control is one of the biggest challenges lagoon operators face. When ammonia levels climb, it's a sign your biology needs a little help. The good news is that with a few key adjustments, you can keep your lagoon's bacteria healthy and your ammonia levels low year-round.

KEEP THE OXYGEN FLOWING

Nitrifying bacteria can't do their job without oxygen. Aim for at least 2 mg/L of dissolved oxygen (DO) throughout the lagoon. Check aerators often and make sure you have good mixing – dead zones mean trouble. Fine bubble diffusers or surface aerators can improve oxygen transfer, especially during warm weather when oxygen demand is high.

GIVE IT TIME

Hydraulic retention time (HRT) matters. High flows can wash nitrifiers right out of the system. Baffles or multi-cell lagoon designs help improve flow and contact time. Let the first cell handle most of the BOD load, leaving the later cells to focus on nitrification.

BALANCE THE LOAD

Too much organic material means too much competition for oxygen. When BOD is high, nitrifiers can't keep up. If possible, settle or screen your influent to reduce organic loading. A good target is a BOD/TKN ratio below 4:1.

MIND YOUR PH AND ALKALINITY

Nitrification uses alkalinity and lowers pH. Keep pH between 7.0 and 8.0 for the best performance. If alkalinity drops too low, add lime or soda ash to keep things stable.

WATCH THE WEATHER

Temperature plays a big role in ammonia removal. Nitrifiers slow down below 50°F. In winter, hold back flow if you can and don't over-aerate – it can cool the water even more. In summer, make sure your aeration is keeping up with the increased oxygen demand.

CONTROL THE SOLIDS

Sludge buildup can eat up lagoon volume and create anaerobic pockets. Check sludge depth every year and remove excess when needed. Keep aeration gentle enough to mix without stirring up solids.

MONITOR AND ADJUST

Routine testing helps you stay ahead of problems. Track ammonia, nitrite, nitrate, DO, pH, and temperature. Field meters make this quick and easy – and the data helps you spot seasonal trends before they cause issues.

ENHANCE IF NEEDED

If you're still struggling with ammonia, consider adding nitrifying bacteria (bioaugmentation) or upgrading aeration. Polishing cells or wetlands can also help finish the job.

IN CLOSING

Ammonia removal isn't about luck – it's about balance. Keep oxygen steady, give your bacteria time, watch your pH, and stay ahead of seasonal shifts. A well-managed lagoon can maintain strong ammonia performance all year long.

Stay balanced, stay aerated, and keep that lagoon happy!

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