MOLEAER™
BEYOND AERATION

MOLEAER ENHANCES BREWERY MEMBRANE BIOREACTOR SYSTEM

Located in the heart of Sonoma County, California, Bear Republic is a family-owned craft brewery well-known for producing Racer 5, an award-winning India pale ale (IPA). The brewery is also highly regarded for its environmental stewardship, investing in innovative technologies to improve its wastewater treatment and reduce its water usage. Bear Republic has decreased its water consumption by 65%, utilizing a bio-electrochemical treatment process in combination with membrane bioreactors (MBR) to reclaim as much wastewater as possible.

As a result of rapid expansion, Bear Republic faced challenges with its MBR. The treatment system, which employed two 25-HP blowers, was not able to maintain adequate dissolved oxygen (DO) levels to support treatment of 7,000 to 10,000 mg/l mixed liquor suspended solids (MLSS) and 5,000 mg/l biochemical oxygen demand (BOD). This inadequate treatment system led to foaming Issues that required significant amounts of costly de-foaming chemicals and various other destabilizing process challenges.

Bear Republic looked to Moleaer's nanobubble technology to enhance the delivery of oxygen into the treatment tanks and improve the stability of their MBRs to reduce energy, maintain higher DO levels, and eliminate foaming. By adding a 5-HP, 200 GPM (12.6L/s) nanobubble generator operating on pure oxygen, Moleaer was able to eliminate the chemical costs and reduce maintenance requirements while improving treatment efficiency. After 11 months of successful treatment with the Moleaer system, Bear Republic added a second nanobubble generator to replace one of the blowers altogether.

Client:
Bear Republic

Type:
Membrane Bioreactor (MBR)

Unit Type:
2 x 200 GPM

Installed:
September 2017

MLSS:
17,000 mg/l

BOD:
5,000 mg/l

Capacity:
36,000 gallons

Moleaer's 200GPM nanobubble generator is a far superior treatment system for MBRs when compared to conventional aeration.

Bear Republic's wastewater pond is more efficient thanks to the Moleaer nanobubble generator, allowing for more treatment capacity as the company continues to grow.

"What excited us was the simplicity and ease of retrofitting the Moleaer into our existing system without affecting our operations. We can't afford any down time. Additionally, we also needed the benefits of oxygen-enriched nanobubbles to enhance our MBR," said David Woychik, plant operator at Bear Republic. "Energy costs are quite high here in northern California, and our MBR blowers account for more than 60% of our total energy usage. Moleaer recommended that we use pure oxygen as a feed gas for the nanobubble generator to enhance the mass transfer, which has proven to have a very positive impact on the performance of our system while still being cost-effective."

"The first thing we noticed after installing the Moleaer system was the improvement in DO levels. The nanobubbles appeared to buffer the system, and when we had high-strength wastewater come through, the DO remained reliably above 1.2ppm and would quickly climb back up above 8ppm after processing," added Woychik. "We also noticed that the foaming in the tanks dramatically declined, which meant we were able to cut back on our chemical defoamer - that's a big cost-saver."

"By running on two of our 5-HP generators and pure oxygen with 85 percent oxygen transfer rates, they have calculated a 9-month payback," said Warren Russell, Moleaer's chief commercial officer. "The combination is not only more cost-effective than running on their original two 25-HP blowers, but most importantly the nanobubble generators are demonstrating that they are a more effective form of aeration for MBRs. Bear Republic has been able to reliably operate much higher MLSS, frequently up to 18,000 mg/L, which has enabled them to treat an additional 35% more pounds of BOD per day."

Bear Republic hopes to eventually move entirely away from the costly and high-maintenance blowers that need to be rebuilt every three months. Moleaer's nanobubble generator has proven to be a highly effective means of aerating MBR systems, delivering superior oxygen transfer to enhance the treatment process.

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