

MOLEAER™ ENHANCES MEMBRANE BIOREACTOR SYSTEM AT AWARD-WINNING BREWERY

The robust XTB™ eliminates maintenance issues and lowers costs for energy-intensive treatment process

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

As a result of rapid expansion, Bear Republic faced challenges with their MBR. The treatment system, which employed two 25 HP blowers, was not able to maintain adequate dissolved oxygen levels to support treatment of 12,000 mg/l MLSS and 5,000 mg/l BOD. As a result, not only were the blowers consuming significant amounts of energy, but their poor oxygen transfer efficiency and resulting lack of dissolved oxygen was causing filamentous bacterial outbreaks creating foaming issues and forcing Bear Republic to dose high-volumes of ant-foam to control it. Bear Republic looked to Moleaer's nanobubble technology to enhance the delivery of oxygen into the treatment tanks and improve the stability of their membrane bioreactors (MBRs) to reduce energy, maintain higher DO levels and eliminate foaming.

Client:	Bear Republic
Type:	Membrane Bioreactor (MBR)
MLSS:	12,000 mg/l
BOD:	5,000 mg/l
Capacity:	36,000 gallons
Unit Type:	Moleaer 200 XTB - HPO
Installed:	September 2017



Picture 1: Moleaer XTB retrofitted outside MBR tank

“What excited us was the simplicity and ease of retrofitting the Moleaer XTB 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.”



Picture 2: MBR aeration tank

As in the case with Bear Republic, MBR systems are frequently utilized for their ability to treat high strength wastewater streams in small footprints. The membranes enable mixed liquor suspended solids (MLSS) to be concentrated at higher levels compared to conventional clarifiers, thus reducing the reactor volume to achieve the same loading rate. Unfortunately, high MLSS levels in shallow tanks are difficult to oxygenate efficiently with conventional aeration and operators are typically forced to run an MBR system with MLSS levels far below the manufacturer's claims. And as with many industrial processes, wastewater load levels vary depending on production.

“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 to 6ppm after processing**,” added David. “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.”

Bear Republic hopes to eventually move away from the costly and high maintenance blowers that need to be rebuilt every three months. Moleaer's XTB 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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