



Real Ale Brewing Company

Blanco, TX

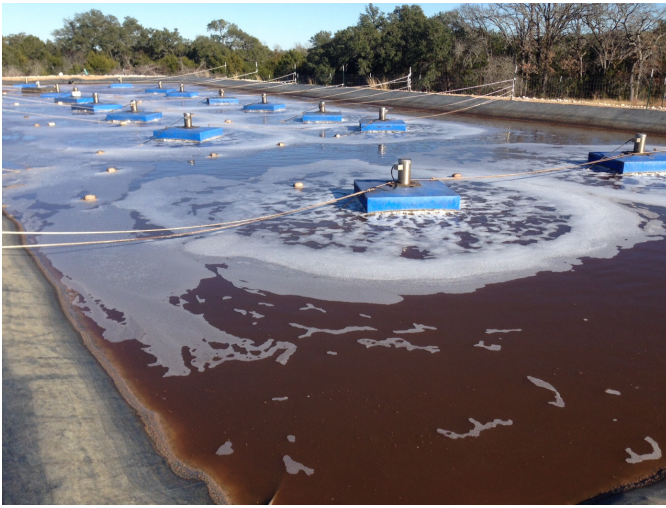
Real Ale Brewing Company (RABC) started as a small brewery working out of a commercial retail space. As the brewery outgrew their facility they purchased land on the outskirts of town and built a new brewery. Their production level was still low enough at this point for the city to allow direct access to sewer. As RABC continued to be successful and grow, a mandate from the Texas Commission on Environmental Quality stated that the city must require the brewery to treat their wastewater in order to prevent overwhelming the city's treatment system. RABC began the process of looking into available options for wastewater treatment. They had been introduced to ClearBlu Environmental at the Craft Brewers Conference in 2011 and after careful research the brewery selected ClearBlu to design and install a complete pretreatment and treatment system.

The pretreatment system consists of lift stations and a self-cleaning wedgewire waterfall hydroscreen to remove fibrous particulate matter. The solids drop into a dewatering hopper while the screened water enters an above ground settling tank to remove additional settleable solids. The water then gravity flows to an automatic pH balancing system that adjusts the wastewater to a neutral pH. Once the water is pH balanced it is dosed with bacteria to accelerate aerobic digestion. The water then enters the first pond in a specially designed two stage lagoon system. The ponds are linearly designed to create a managed treatment path that prevents short circuiting of untreated effluent and maximizes the retention time of the wastewater. Each pond is fitted with ultra fine bubble aerators to create a highly oxygenated environment that will allow bacteria to thrive. Upon exiting from the second lagoon, the treated wastewater is volumetrically measured in a flume fitted which is fitted with an adjustable valve to regulate the flow rate to the city. There is also a digital data logger to track daily effluent volumes.



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The brewery generates approximately 70,000 to 90,000 gallons of wastewater per week with an approximate average BOD loading of 5,500 mg/L. The city requires that the effluent is below 200 mg/L for both BOD and TSS. With pH neutral water, bacteria dosing, and twenty-five 2 hp aeration units the RABC is able to treat down to the target discharge requirements. Effluent BOD levels have been recorded as low as 93 mg/L. **This treatment system is currently achieving up to a 96.5% reduction in BOD strength.** As the facility continues to expand in the future, treatment capabilities can grow with the brewery by adding additional aeration and eventually adding an additional treatment lagoon.



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Treatment Systems and Case Studies for Breweries

ClearBlu Environmental designs, builds, and maintains custom brewery wastewater treatment systems that utilize aerobic digestion to achieve reductions in BOD and TSS. Our systems enable customers to meet compliance regulations, reduce sewer fees, or make water available for reuse. Aerobic digestion is an excellent treatment method for brewery wastewater, which faces several unique challenges for treatment including active yeast in the waste stream, large amounts of fibrous particulate matter, excessive foaming in an aerated setting and extremely high organic (BOD) loads. ClearBlu offers pretreatment and treatment options that address all of these challenges and can be staged in and easily expanded to fit the needs of a growing facility.

ClearBlu treatment systems differ from traditionally designed brewery systems in many ways. Breweries are typically led towards anaerobic digesters or sequencing batch reactors (SBR), or sometimes both. Our aerobic systems can be implemented for less capital cost with significantly less maintenance and operational cost. They are low energy consuming and other than pH balancing, require no chemicals. These systems also digest organic sludge, eliminating the need for regular solids disposal.

The main components of a full treatment package system include:

- **Screening:** A hydroscreen serves to remove as much fibrous particulate matter from the waste stream as possible. These solids tend to soak up a large amount of pH balancing chemical when left in the waste stream, cause problems with clogging pumps and spray nozzles, and contribute to the total organic loading. Removal of fibrous particulate material reduces chemical consumption dramatically, extends the life of pumps, helps with overall system functionality, and reduces required treatment time.
- **Settling:** A cone bottom settling tank can be implemented to help remove yeast and sludgy material. Removing as many solids as possible will make the treatment process more efficient. The cone bottom tank can be fitted with an automatic pinch valve to purge settled solids into a hopper or holding tank. Settling is optional, but has the benefit of further reducing pH chemical costs and treatment costs. If a brewery does not separate yeast, then settling is highly encouraged.
- **Dewatering Hopper:** The material from the screen and settling tank is purged into self-dumping dewatering hoppers. Dewatered material is easier to handle and less costly to dispose of than liquid.
- **Automatic pH balancing:** Healthy microbial populations are responsible for the rapid digestion of organic waste. A bacterial population is not sustainable below pH 6 and thrives between pH 7-9. pH balancing systems are available in four sizes that are fitted with a self-cleaning pH probe and mixing system. These on demand system will begin pumping chemical and energize the mixer in the tank when the pH is outside the allowed range. The balanced water can then be sent to sewer or is ready to be introduced to the biological treatment system.



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- **UltraFine Bubble Aeration:** ClearBlu systems accomplish treatment through aerobic digestion. Aeration units produce ultra-fine bubbles that are 0.02 mm in diameter. These extremely fine bubbles oxygenate the entire body of water, top to bottom, which allows for a robust aerobic microbial population for digesting high strength waste. Depending on treatment goals, brewery effluent requires several days holding time to achieve the desired BOD reduction. Because systems are easily expandable, this allows for reduced initial capital cost of the system. Biodigesters are continuously recirculating, over-under weir systems packed with fixed film media that are utilized to accelerate treatment. Fixed film media provides a surface for microbes to adhere to while the system passes water, food (BOD), and air past them. This type of processing has been found to reduce BOD loads more rapidly than open bodies of water such as ponds.
- **Finished Water:** The treated water from the system can be discharged to sewer or used for land application or other reuse purposes.



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