

CASE STUDY

An Affordable Wastewater Treatment Solution for Institutions and Small Municipalities

Ole Smoky Moonshine

Problem

Ole Smoky Tennessee Moonshine was in violation due to a failing drain field, and erosion of their septic tanks.

Solution

Chemical addition was installed for pretreatment to adjust pH, and also achieve proper C:N:P balance of 100:10:1 in order to treat the wastewater biologically. An EarthTek AMBR moving bed biofilm reactor (MBBR) was installed for secondary treatment.

Ole Smoky Tennessee Moonshine in Gatlinburg, is America's most visited distillery. In 2018, it welcomed over 2 million visitors. Effluent generated by the distillery's mash washdown contains high BOD and very low pH. These acidic conditions were inhibiting biological treatability of their wastewater, which resulted in the formation of a biomat around the drain field trenches.

The distillery hired Norvell & Poe, Engineers, LLC to develop a plan for a new plant. The firm's project engineer, Gary Norvell, P.E. evaluated several options, eventually selecting EarthTek of Batesville, Indiana to assist with the design, and to provide a treatment plant for the project. It was determined that chemical pretreatment and an MBBR could be installed to provide consistent and cost-effective wastewater treatment. EarthTek provided a design based on Metcalf & Eddy, Wastewater Engineering, Treatment and Resource Recovery, 5th Ed. This design was computer-modeled using Biowin wastewater treatment plant modeling software. Modeling results show that the proposed system will reduce BOD and TSS below permitted values.

The package wastewater system was based in using as much of the current project design and equipment as possible. The owner had purchased several Infiltrator 1,500-gallon HDPE tanks prior, and this plan used all of them. Two tanks were used for primary tanks

Message from the President

"Our goal is to create the best solution for our client's specific needs, not just provide an off-the-shelf plant."

-Kevin Chaffee, P.E.

Institutional Market

Project Overview

Gatlinburg, TN



Design Parameters

- Design flow 3,000 gpd

Primary Treatment

- Existing Infiltrator tanks and chemical addition for pretreatment

Secondary Treatment

- An EarthTek AMBR MBBR

Dispersal

- Subsurface disposal to a drain field

Operation

- Part-time operator

Influent Quality

- < 5,000 mg/l BOD5
- < 250 mg/l TSS

EarthTek AMBR MBBR Effluent Quality

- < 30 mg/l BOD5
- < 30 mg/l TSS

Continued on Next Page

Ole Smoky Moonshine

Institutional
Market

at the warehouse building site. Effluent filters were added to the outlets of both tanks to trap any unsettled solids. The effluent from these tanks flow to another 1,500-gallon tank equipped with duplex stainless-steel effluent pumps due to the corrosiveness of the influent.

Effluent from the pump tank enters another existing 1,500-gallon, two-compartment HDPE mixing and pre-aeration tank. Caustic soda and AquaFix Accelerator 7 are added to the first compartment. A small blower and coarse bubble diffuser provides mixing and pre-aeration in this first compartment. The second compartment provides contact time for the chemicals to react prior to secondary treatment.

Effluent from the mixing tank flow into two MBBR reactors for two-stage BOD reduction. The MBBR tanks are two 7' diameter x 12' deep buried FRP tanks with coarse bubble aeration, outlet screens, two blowers (one active, one standby), and access openings at the ground surface. The tanks contain approximately 60% fill volume of plastic media, and provide an attached-growth biofilm treatment process for BOD reduction.

The MBBR tanks are followed by a 4' diameter x 12' deep buried FRP clarifier tank to settle the sloughed solids from the MBBR process. This includes a submersible waste sludge pump with time-based control panel to send the settled waste sludge back to a 1,500-gallon HDPE sludge storage tank for anaerobic digestion and holding. Effluent from the clarifier then flows to an existing Infiltrator pump tank, which will dose to the disposal fields.

The treated effluent has met the regulatory discharge limits of 30 mg/l BOD5 and 30 mg/l TSS since it was put into operation.



For more information about EarthTek
MBBR systems, contact Earthtek at
800-972-9940.



info@earthtek.com