

# Rejuvenating a Trickling Filter System to Remove Fats, Oils, and Grease

## The Challenge

A manufacturer's trickling filter had not been working properly for quite some time when they decided to call in Hubbard-Hall to review the pretreatment part of the system and try to get it to work properly so that it could treat the fat, oil, and grease in its wastewater treatment system.

Trickling filters are used to remove organic matter from wastewater and is an aerobic treatment system that utilizes microorganisms attached to a medium to remove organic matter from wastewater. They are also known as "attached-growth processes," and they enable organic material in a wastewater system to be adsorbed by a population of microorganisms — such as aerobic, anaerobic, and facultative bacteria, as well as fungi, algae, and protozoa — attached to a biological film or slime layer approximately 0.1 to 0.2 mm thick.

## The Approach

This large remanufacturing operation averages 700,000 gallons per day (gpd) flow and the first stage of the system is a traditional hydroxide precipitation system. However, the system has to treat a large amount of fats, oils, and grease that are emitted from the remanufacturing process. The company is a direct discharge system with an NPDES discharge permit. Hubbard-Hall discovered the bioaugmentation portion of this project was a tack-on with a focus on the removal of the metals and began to collect data from their investigation of the system.



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## Executive Summary

**Broken trickle filter causes excess fat, oil and grease buildup in wastewater treatment system.**

- Focus on the pretreatment system got the trickle filter up and running after lengthy idle period.
- 30 days spent seeding system to achieve a healthy biomass
- No reportable data higher than 2 mg/L after two weeks.

## The Outcome

The start-up of the system was a longer project because the trickling filter had not been in use for many years. Hubbard-Hall's plan was to spend 30 days seeding the system to get healthy biomass on the media in the filter. They utilized Hubbard-Hall's Aquapure Bio 20, which is a broad spectrum of selected and adapted microbial cultures designed to degrade hydrocarbon industrial wastes.

Hubbard-Hall used Aquapure Bio 230, a balanced powdered blend of inorganic salts of nitrogen and phosphorus that act as readily available macronutrients for microbes to create optimal biomass growth conditions and maintain resilient biomass.

The seeding took a total of 50 pounds over the 30 days, and an additional 1 pound of the dry bacteria blend was added per day to continue the health of the biomass.

From April to August, the manufacturer did not see reportable data higher than 2 mg/L, and a cleaner spill in August resulted in higher numbers, but the biomass did not suffer from it. By the following week, the numbers were back below 2 mg/L.

Date	Permit limit	Test result
Day 1	26mg/L	39.68
Day 7	26mg/L	0.95mg/L
Day 14	26mg/L	1.42mg/L
Day 21	26mg/L	1.63mg/L
Day 30	26mg/L	9.05mg/L
Day 37	26mg/L	1.68mg/L

TT-1004

“As we move toward tighter discharge limits, we will see a larger need to engage microbial treatment to meet those effluent requirements.”

**Robin Deal**  
Product Manager, AquaPure  
Hubbard-Hall

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