

Food Manufacturer Saves \$30,000 per Month

Mac and Co. Services Reduce Sewer Use Surcharge Fees



Mac & Co. provides bio-augmentation solutions that are free of chemicals such as free-enzymes and emulsifiers that could otherwise damage plumbing lines, lift station equipment and the environment. Mac & Co. has over 20 years of experience in the waste water treatment industry.

PRO-BAC MicroTab, offered by Mac & Co., uses microbial formulations as active ingredients to consume fats, oils and greases (FOG), producing a by-product of carbon dioxide and water. This sewer formulation is used specifically for sewer authorities, privately owned sewer lines and lift stations. PRO-BAC MicroTab uses a selection of aggressive microbial strains, in both spore and vegetative state, which allows it to work instantly upon contact of food source. This formulation allows the PRO-BAC MicroTab to work in many different environments and does not facilitate the pass-through of FOG. Many other bio-augmentation products use

a single strain of bacteria in spore state only. Bacteria in spore state can take 40 minutes to germinate before it can actively consume FOG. PRO-BAC MicroTab avoids this delay and uses microbial strains similar to those used to clean oil spills.

One use for PRO-BAC MicroTab formulation is to decrease foaming issues in waste water treatment plants. Foaming is caused by naturally occurring nocardia bacteria, which partially breaks down grease that is in the system. The formulation in PRO-BAC MicroTabs outcompetes nocardia bacteria and completely breaks down grease, which decreases or eliminates foaming. PRO-BAC MicroTabs also eliminate the need for regular, expensive hydro-jetting of sewer lines. PRO-BAC MicroTabs pretreat waste water in the collection system, which creates greater efficiencies in sewer lines and improves overall waste water treatment plant management.

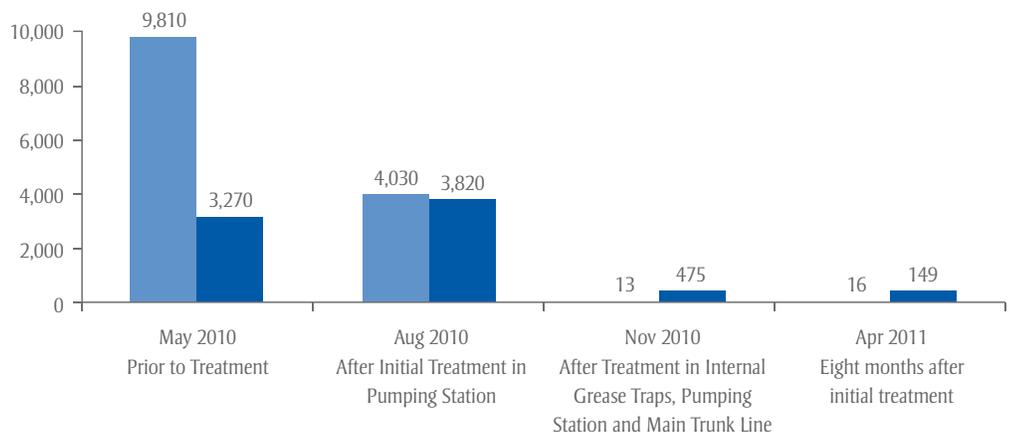
OCWA Pilot Program Results

A food manufacturing facility was experiencing high levels of fat, oil and grease (FOG) as well as high levels of biological oxygen demand (BOD) in their sewer lines. This was contributing to a foaming problem at their municipal sewage treatment plant, which is managed by the Ontario Clean Water Agency (OCWA). As a result of having levels of FOG and BOD output that were beyond the acceptable limits set by municipal bylaws, the food manufacturing facility was

paying the city a monthly sewer use surcharge of over \$30,000. The line was periodically hydro-jetted to remove FOG build up.

Mac & Co. began treating the food manufacturing facility with PRO-BAC MicroTabs on June 29, 2010. By November 2010, FOG and BOD levels had reduced to within the limits set by the bylaw and the facility no longer had to pay the \$30,000 sewer use surcharge.

■ Total Oil & Grease [mg/L]
■ BOD [mg/L]



Water Output Samples Prior to Treatment

On May 17, 2010, prior to installing PRO-BAC MicroTabs, output samples were taken from the line going out of the main lift station at the food manufacturing facility, with the following results:

May 17, 2010	Result
BOD [mg/L]	3,270
Tot. Suspended Solids [mg/L]	1,840
Phosphorus [mg/L]	24.0
Total Oil & Grease [mg/L]	9,810

On June 21, 2010, the sewer line was hydro-jetted prior to commencing treatment with PRO-BAC MicroTabs.

Initial Installation of PRO-BAC MicroTabs

On June 29, 2010, Mac & Co. installed two regular-flow PRO-BAC MicroTabs at the pumping station and three regular-flow PRO-BAC MicroTabs in the main trunk line at the food manufacturing facility. The main trunk line installation was approximately 100 feet downstream from the pumping station.

A follow-up site visit was conducted on August 10, 2010. All of the PRO-BAC MicroTabs were found to be completely dissolved and were replaced at this time. Samples were taken from the line going out of the main lift station on August 12, 2010, with the following results:

August 12, 2010	Result
BOD [mg/L]	3,820
Tot. Suspended Solids [mg/L]	728
Phosphorus [mg/L]	16.6
Total Oil & Grease [mg/L]	4,030

By August 12, total oil and grease (FOG) had a considerable reduction of over 50% since the initial samples were gathered on May 17.

Samples were taken on August 20, 2010 and August 24, 2010 and were analyzed for total oil and grease (FOG) only. Samples were taken from both the line going into the main lift station, prior to being treated with PRO-BAC MicroTabs, and the line going out of the main lift station, after being treated with PRO-BAC MicroTabs. The results were as follows:

Samples	August 20, 2010	August 24, 2010
Total Oil & Grease mg/L—Line going into main lift station	2,580	585
Total Oil & Grease mg/L—Line going out of main lift station	187	179

Comparatively, a greater reduction of FOG was seen in the August 20 sample. The more FOG there is in the waste water being treated, the greater the reduction level. This is because the FOG is the food source that allows the microbes in the PRO-BAC MicroTabs to grow expediently. In both instances, the FOG going out of the main lift station has been significantly reduced compared to previous samples.



Installation of High-Flow PRO-BAC MicroTabs

On August 25, 2010, another site visit was conducted. All of the PRO-BAC MicroTabs had completely dissolved in both the pumping station and main trunk line. Since the regular-flow PRO-BAC MicroTabs were continuing to completely dissolve within a week and a half, it was decided to install two high-flow PRO-BAC MicroTabs in the pumping station and two in the main trunk line. It was noted during the site visit that there was no apparent FOG build up in the main trunk line.

On September 7, 2010, another site visit was conducted. It was found that the high-flow PRO-BAC MicroTabs were one-quarter dissolved, so they were not changed. It was noted that there was no apparent grease or solids.

Internal FOG Reduction Program Implemented by Food Manufacturing Facility

On October 19, 2010, regular-flow PRO-BAC MicroTabs were installed in the two internal grease traps at the food manufacturing facility, and the high-flow ones being used in the pumping station and main trunk line were changed.

On November 12, 2010, the PRO-BAC MicroTabs were changed. Training was conducted at the food manufacturing facility on how to use the complementary biological product ODOR-ZYME for all-purpose cleaning inside the facility. ODOR-ZYME is a biological cleaner that complements the microbial treatment process of the PRO-BAC MicroTabs. Harsh chemical cleaners have the potential to counteract the effectiveness of the PRO-BAC MicroTabs because they can kill the microbes being used in the bio-augmentation process.

FOG and BOD Reductions Eliminate Sewer Use Surcharge

On November 25, 2010, samples were taken from the line going out of the main lift station, and it was found that the levels of FOG and BOD were now within acceptable bylaw limits and the food manufacturing facility no longer had to pay the \$30,000 sewer use surcharge. As of April 2011, reduced levels of FOG, BOD, phosphorus and total suspended solids continue to be observed:

Samples	November 2010	April 2011
BOD [mg/L]	475	149
Tot. Suspended Solids [mg/L]	29	229
Phosphorus [mg/L]	1.1	4.2
Total Oil & Grease [mg/L]	13	16

Summary of Benefits

The following benefits were realized during the OCWA pilot program:

- ❑ No hydro-jetting of the main trunk line or manhole has been required to date.
- ❑ Elimination of emergency maintenance calls has reduced labour costs for OCWA.
- ❑ Notable load reduction going into the waste water treatment plant.
- ❑ Savings of \$30,000 per month for food manufacturer by eliminating the sewer use surcharge.
- ❑ Positive impact on the ecosystem of the municipality and the environment.

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