



IMPROVING BIOTREATMENT SYSTEM PERFORMANCE

Effluent Biotreatment

INFO

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At Paprican, we understand biotreatment and can detect and identify trouble spots

Almost all North American mills now have effluent biotreatment systems in place to comply with discharge limits for BOD, suspended solids, and toxicity. At Paprican, we have scientists and engineers experienced in biotreatment who are able to respond to industry demands for consistent and improved system performance.

The two most common effluent treatment systems — aerated stabilization basins, (also known as aerated lagoons), and activated sludge units — each have their own strengths and weaknesses. Lagoons require less operator attention, but from our experience, excessive solids build-up and discharge are common problems, and lowered capacity at low ambient air temperatures can cause intermittent toxicity breakthroughs. Activated sludge units come in various designs, and require rapid settling of the sludge biomass to operate efficiently. Originally developed for municipal effluent treatment, these designs are more sensitive to shock loading than lagoons because they have to operate at higher loading rates. Furthermore, sludge management is a significant cost item.

"Paprican provides us with a valuable source of expertise in effluent treatment."

*Amy Lo,
Environment Supervisor,
Domtar, Cornwall, ON*

The workhorses of both biotreatment systems are the microorganisms that convert the discharged organic material into biomass and carbon dioxide. Thus part of Paprican's program is directed toward understanding the microbiology, and correlating this to system performance. Microscopy allows the detection and identification of many troublesome microorganisms. There are those, for example, that prevent activated sludge settling. Microscopy often provides some indication of the cause of the problem. Other measurements such as microbial respiration (specific oxygen uptake rate) and microbial viability (ATP and other measurements) are indicators of sludge health and performance. These services are now

To test biotreatment options in the field, Paprican has a mobile pilot plant available that has two parallel 1000-L capacity activated sludge units. The units are fully instrumented, and have been used by several Member Company mills for extended periods. This pilot plant allows accurate assessment of the effects of activated sludge variables, and was recently used to confirm laboratory studies on minimizing sludge generation. We also have a portable ozonizer pilot plant which can be used alone or in combination with biotreatment. We have found that small doses of ozone can selectively remove resin and fatty acids, one of the prime causes of fish acute toxicity.

We know your system

Over the last three years we have established a large database of mill biotreatment operational and performance information. The data come from our own research, for example reports on microbiology, and from mill surveys, covering both activated sludge and lagoons. With this information in hand, we are able to provide an informed response to troubleshooting requests.



Paprican's pilot plant.



Microbiology of an activated sludge system.