Success Stories

Aqua-Aerobic Systems, Inc.

From Pretreatment...To Reuse

Plant Name/Location: MacLaren Industries/Thurso, Quebec

Type of Plant: Industrial/Pulp Mill

Average Daily Flow: 22.6 MGD (85,551 m^3/day)

Aqua-Aerobic Products: (41) 75 HP Aqua-Jet® Aerators, (6) 75 HP ThermoFlo® Spray Coolers

MacLaren's Pulp Mill Upgraded to Meet New Requirements and Aid in Protecting the Environment

MacLaren Industries' kraft pulp mill, located in Thurso, Quebec was built in 1958 and used only a primary treatment process for treatment of its pulp waste until the mid 1990s. It was at this time that more stringent effluent requirements for BOD_5 were defined for discharge into the nearby Ottawa River. To meet the new requirements and to make a commitment in protecting the environment, MacLaren decided to employ a secondary treatment process.

A number of MacLaren's Aqua-Jet® aerators in operation. Also shown toward the back are the ThermoFlo® spray coolers in an adjacent basin.

In 1995, MacLaren installed (41) 75 HP Aqua-Jet® surface aerators in an aeration basin to biologically treat its pulp waste. Six 75 HP ThermoFlo® surface spray coolers were also installed at this time in an adjacent basin to cool the pulp wastewater prior to biological treatment.

Aqua-Aerobic Systems equipment was chosen by MacLaren because of its reputation for efficiency and economical operation. It also was highly recommended by other pulp mills already employing Aqua-Aerobic equipment. MacLaren's new treatment process has enabled the plant to consistently meet effluent requirements and reduce pollution into the Ottawa River.

MacLaren's kraft pulp mill currently produces 238, 000 metric tons of pulp annually. This includes hardwood pulp and four specialty pulps, which are used to produce high quality papers such as parchment and photographic.

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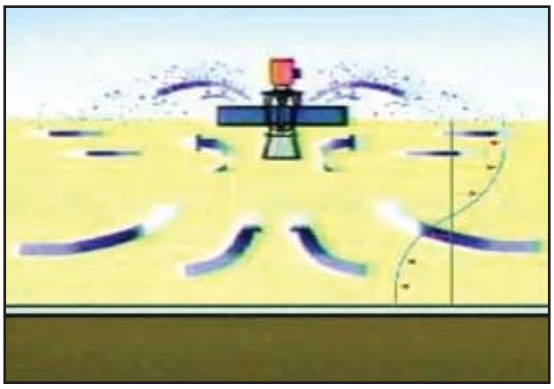
Aqua-Jet® Aerator Process



The Aqua-Jet aerator is a mechanical direct-drive unit designed to provide optimum oxygen transfer in a variety of municipal and industrial wastewater applications. The performance of the Aqua-Jet also provides the mixing necessary to uniformly disperse oxygen and organic matter within the microbial population.

Basin water is pumped up into the intake cone and through the volute, and is dispersed through the diffusion head in a spray pattern. Oxygenation occurs at two critical points, when the water exits the diffusion head and when the spray enters the water surface.

Design Characteristics

MacLaren typically utilizes 22 to 24 of its (41) 75 HP Aqua-Jet aerators at any one time for biological treatment of its pulp waste and to reduce BOD_5 and TSS to required levels.

Annual Average Operating Data

Loading	Design Influent	Current Influent	Current Effluent	Permit Effluent
Avg Flow mgd	22.6	17.2	--------	--------
BOD_5 mg/l	438	330	8	52
TSS mg/l	478	275	15	84

Because the temperature of the pulp waste is so high, it is necessary to cool it prior to biological treatment during the summer months. MacLaren chose to employ (6) Aqua-Aerobic ThermoFlo spray coolers (shown in photo below), as an alternative to cooling towers and cooling ponds, to efficiently dissipate the heat of the waste.

The operation of the ThermoFlo spray cooler is fairly simple. Process water is pumped through a heavy-duty cast manifold and is divided between each of the unit's spray arms. Discharge of the process water occurs at the end of each arm through a cast anti-clog nozzle.

Aqua-Jet® Aerator Advantages:

- Available in 1-150 HP
- Vibration controlled design
- Superior oxygen transfer
- Low maintenance
- Propeller design provides non-clog operation and greater efficiency
- One-piece shaft design means no couplings and no submerged bearings
- Lower initial cost, and less expensive to install than gear reduced (slow speed) units
- Endura® Series motor available - 5 year no maintenance