

## **Flambeau River Papers – Wastewater Fine Bubble Diffuser**

### **Challenge**

The Flambeau River Papers mill has produced paper products in Park Falls for over 100 years. The mill's products include printing, cover stock, tag, reply card, index, freesheet, envelope, and laser bond paper.

Because the paper-making process is very water-intensive, the company operates its own on-site wastewater treatment plant. They wanted to make sure that the plant operates at optimum efficiency, just as would any other business with its own wastewater treatment plant.

### **Strategy**

Flambeau River Papers' wastewater treatment facility uses aeration basins to add oxygen to the wastewater to support the biological activity. Aerating the basins requires a considerable amount of energy.

In 2010, the company installed fine bubble diffusers in the first two basins (the selector basins), those which require the most oxygen. The fine bubble diffusers provide savings by lowering the amount of air flow required. The small bubbles formed by these diffusers have much more surface area than coarse bubbles for the same volume of air. This allows for more transfer of oxygen from the air to the water with the same volume of air. Therefore, less air is required to maintain the same level of oxygen transfer. Since less air is used, less energy is needed by the three 1500-HP blowers that supply the air.

The fine bubble diffusers entered operation on June 5, 2010. The cost for the project was \$511,000.

### **Results**

Although the precise effectiveness of the diffusers is not measured, one can reasonably estimate the savings by looking at electricity consumption. The average power used by the WWTP for the 12 months prior to installation of the fine bubble diffusers was 2118 kW. The average power for the 12 months after installation was 1934 kW, which equals a reduction in electrical load of 184 kW for this period. At \$494/kW-yr, the annual savings is \$90,896, which carries a simple payback of 5.6 years.

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