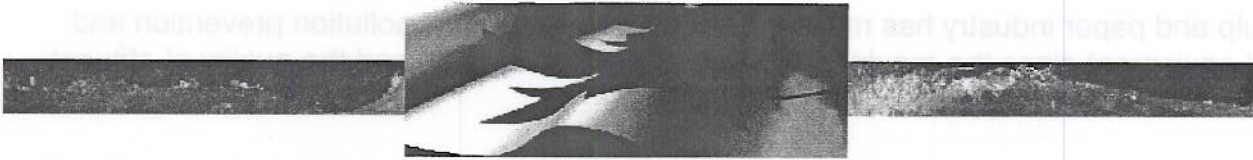


Clean, Safe Water



Background

Implementing Sustainable Practices in the Pulp and Paper Industry *A 10-year Path to Success*

In the late 1980's, pulp and paper production worldwide was subject to intense public scrutiny as dioxins and furans were discovered in pulp and paper effluents and products. Many observers linked high pollutants and effluent toxicity with effects that were observed in fish living in waters that received effluents from pulp and paper mills that use chlorine bleaching.

Regulations in force at the time did not control dioxins, furans and organochlorines released from pulp and paper mills. Scientists also identified a need for regulations with better controls on conventional pollutants, such as Biochemical Oxygen Demand (BOD), Total Suspended Solids (TSS), and acutely lethal effluent discharges.

In 1992, the Government of Canada introduced a comprehensive regulatory package to prevent and reduce pollution from pulp and paper mills. Two regulations were approved under the *Canadian Environmental Protection Act* (CEPA) requiring mills to prevent the formation of dioxins and furans in mill effluents. To meet the CEPA regulations, pulp and paper mills introduced changes to their processes and greatly reduce the release of dioxins and furans and of other organochlorines. In addition, regulations under the *Fisheries Act* were passed to improve the control of BOD, TSS, and acutely lethal effluents.

The regulations were developed on a collaborative basis with Canada's provinces which share jurisdiction for effluent control.

The *Pulp and Paper Mill Defoamer and Wood Chips Regulations* were designed to limit the entry of dioxin-furan precursors into the mill processes. The *Pulp and Paper Mill Chlorinated Dioxins and Furans Effluent Regulations* prohibited the release of chlorinated dioxins and furans in mill effluents.

The *Pulp and Paper Effluent Regulations* (PPER), approved under the *Fisheries Act*, set discharge limits for BOD matter and TSS, and prohibited the discharge of acutely lethal effluents applying to all mills.



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The pulp and paper industry has made significant investments in pollution prevention and control equipment since the regulations came into effect in 1992, and the quality of effluent has improved dramatically:

- discharges of chlorinated dioxins and furans have been virtually eliminated (from 288 g/yr in 1989 to 3 g/yr in 1997);
- BOD materials are down by 94% (from 26 kg/tonnes of products in 1987 to 2 kg/tonnes in 2000), and
- TSS releases have decreased by 70% (from 11 kg/tonnes of products in 1987 to 3 kg/tonnes in 2000).

In addition to the reductions achieved through regulations, the pulp and paper industry has also voluntarily achieved impressive results in other key environmental areas:

- 25% of new paper is now produced from recycled paper;
- water consumption has been reduced by 30% since 1989;
- a 26% reduction in the amount of greenhouse gas (CO₂) emissions from 1990 levels, despite a 21% increase in production; and
- a 99.8% reduction in the use of products containing the CEPA toxic substance nonylphenol and its ethoxilates (NPE) that is forecast to be achieved by the end of 2003.

The *Pulp and Paper Effluent Regulations* include a requirement for all mills to conduct Environmental Effects Monitoring (EEM) studies to determine the impact of their effluents in the receiving waters. The EEM program is amongst the most comprehensive national program of its kind in the world and is helping Environment Canada and stakeholders better understand the effects of pulp and paper mill effluents on fish and fish habitat.

Aside from the EEM monitoring, in-depth research studies are also being conducted at a number of sites. The research and monitoring results are used to evaluate the adequacy of the regulatory measures to protect the environment.

Sub-lethal toxicity testing conducted under the EEM program has shown that there has been a significant decrease in the toxicity of pulp and paper effluent. However, many mills continue to have some effects on their receiving environments. Many of the effects appear to be associated with increased food availability, along with some changes in metabolic functions in fish.

The patterns of effects on a national scale may be related to some form of disruption of endocrine functioning, which is key to growth and reproductive development. These effects are not limited to mills that use chlorine bleaching and are still present in some mills with secondary effluent treatment.

Monitoring studies have also shown significant reductions in the chlorinated dioxin and furan concentrations in fish tissue from previously contaminated areas. This has resulted in the lifting of most of the fish consumption advisories for fin fish and the re-opening of almost half of the previously closed shellfishery areas.

Environment Canada continues to work with the provinces, the pulp and paper industry and environmental groups to gain a better understanding of the effects observed during the EEM monitoring studies. Results of a third cycle of EEM studies will be available in April 2004 and will help set future directions for continued improvements in the environmental performance of the pulp and paper industry.

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