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**A Submission to the
Scientific Advisory Panel
to Review BC's
Zero AOX Requirement**

Prepared by
Council of Forest Industries
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Introduction

On December 14, 2001 the provincial government appointed an independent panel to review the scientific basis for British Columbia's requirement that bleached chemical pulp mills achieve a "zero discharge" of AOX effective December 31, 2002. This panel has requested input from stakeholders. This document summarizes the views of the affected members of the Council Of Forest Industries.

Summary

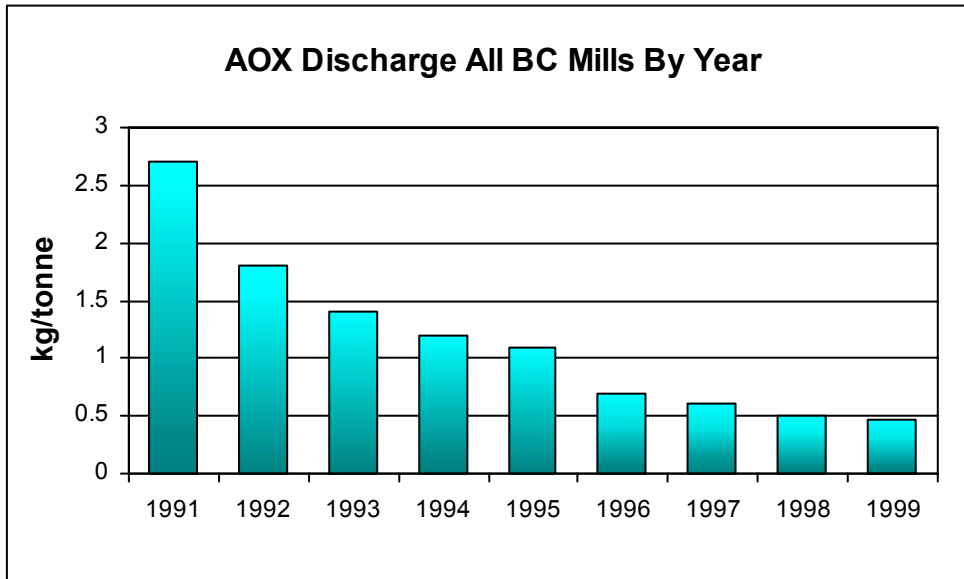
The progress of the pulp and paper industry in reducing the impact of effluent discharges over the last ten years has been significant. BOD, TSS, AOX have been reduced by 90, 50, and 83 percent respectively over the last decade. Environmental effects monitoring programs have documented major improvement in the health of aquatic ecosystems in the vicinity of pulp and paper mills. The adoption of Federal and Provincial effluent regulations combined with process changes costing in excess of \$1.5 billion have produced this favourable result. Additional expenditures of approximately \$1 billion would be required for existing chemical pulp mills to achieve the "zero" AOX level and produce totally chlorine free pulp. The installation of this technology would increase operating costs by \$20 per tonne and produce a, lower quality (therefore less valuable) product.

Moreover, achieving "zero" would produce no benefit to the aquatic environment. Numerous scientific reports have found no consistent relationship between AOX concentrations and biological response in either laboratory or field studies.

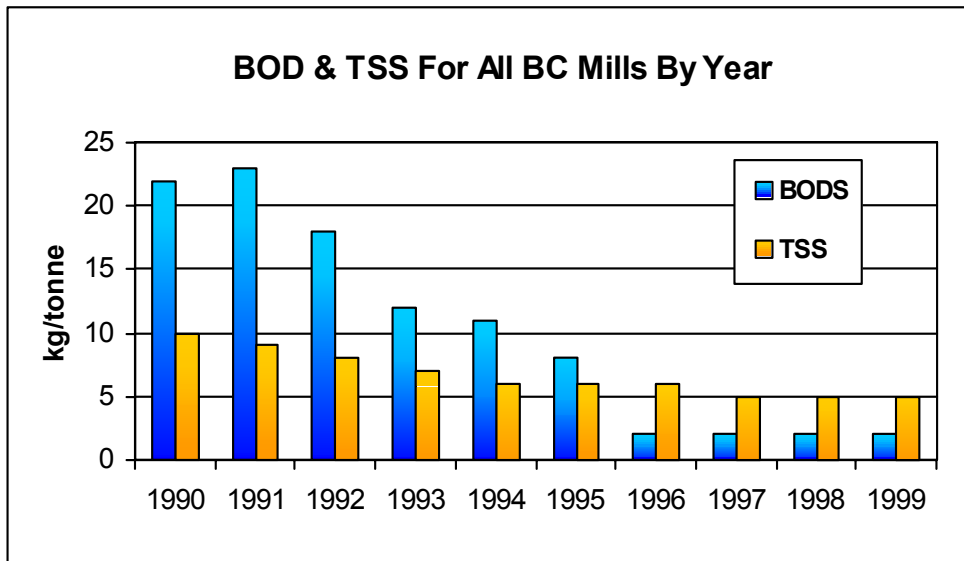
The existing federal regulation requiring non-detect levels for dioxin and furans provides adequate protection from the effects of toxic, bioaccumulative chlorinated organics that have been associated with bleaching processes using elemental chlorine. There is no need to further tighten the current BC AOX limitation of 1.5 kilograms/tonne.

Environmental Performance

The provincial government has collected data on aggregated discharges by pulp and paper mills for a number of years. This data is summarized in the charts below:



Source: BC Ministry of Environment, Lands & Parks



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When the Pulp and Paper Effluent Regulations were adopted by the Federal Government, provisions were enacted requiring environmental effects monitoring every three to four years. To date, two studies have been completed for each of the pulp mills

in BC with a direct discharge. COFI retained the firm of Hatfield and Associates to summarize the results of these studies (the Hatfield report). This report was completed in December of 2000 and is available to the public on the [COFI website](#)ⁱ and is included as a separate attachment to this paper. We encourage the panel to review this report. We believe it clearly demonstrates that the impacts of pulp and paper mill effluents in BC are now minimal. The major quantifiable impact appears to be enrichment of some inland rivers and streams with resulting enhancement of biological growth.

More importantly, the Hatfield Report documents the decline in concentration of dioxin and furan in the tissue of aquatic organisms residing in the vicinity of pulp and paper mill discharges. This trend is expected to continue for a few more years. We believe this data demonstrate that the problem of dioxin and furan accumulation in the tissue of aquatic organisms is, or shortly will be, solved. The dioxin and furan accumulation was the primary driver behind the AOX standard and the need to achieve “zero”.

Economic Impact

One option to achieve “zero” would be for all the chemical pulp mills in BC to convert to TCF bleaching. Through consultation with recognized experts in the bleaching and engineering field, COFI was able to determine that such a conversion would require a capital investment of approximately \$1.1 billion. This estimate was developed by reviewing the bleaching technology employed at each BC facility and estimating the cost of the additional equipment required for the conversion.

In addition to the capital cost, increased operating costs would result in the amount of approximately \$25 per tonne. With an annual average production of 6.0 million tonnes, the aggregate affect would be an increase \$150 million per year.

We are also advised by industry experts that the value of the product would also be reduced. The most common use of bleached kraft pulp is as a strengthening component to supply support for weaker, less expensive fibres. Approximately 10 percent more TCF pulp is required to accomplish the same result as ECF pulp. If a

certain product requires 30 percent ECF pulp, then it would likely require 33 percent TCF pulp. This means the producer will have to use less of the inexpensive fibre such as hardwood or mechanical pulp and more of the expensive bleached kraft pulp. Under these circumstances the selling price of the TCF pulp will reflect the reduced quality.

Environmental Benefit

In 1999, COFI commissioned Dr. Matt Dodd, an environmental chemist, and Dr. Doug Bright, an aquatic toxicologist, both of Royal Roads University, to review the existing science on AOX and its impact on the environment. This document is also publicly available on the [COFI website](#)ⁱⁱ and is attached to this paper as a separate document. Their major conclusion, on page 3 of the report is as follows:

There has been no consistent relationship in laboratory toxicological or field studies between levels of biological response and AOX concentrations in effluent or water.

Federal Regulation

While AOX standards may not be helpful, regulations are required so that pulp mills do not discharge toxic, bioaccumulative chlorinated organics as was the case when elemental chlorine was used as a bleaching chemical. It is our view that this problem has already been solved through the federal standard requiring non-detect levels of dioxin and furan compounds in pulp mill effluent. Achievement of compliance with this federal regulation has effectively eliminated the use of elemental chlorine in BC pulp mills and assured the elimination of these damaging chlorinated organic compounds.

Conclusion

There is no justification for any further reduction in the limit on AOX discharge for BC chemical pulp mills.

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ENDNOTES:

ⁱ *Pulp and Paper Environmental Effects Monitoring (EEM) British Columbia, Cycle Two Review, 1997-2000*, prepared by Hatfield Consultants Ltd., November, 2000

PAPER AVAILABLE COFI WEBSITE AT <http://www.cofi.org/whatwedo/pdf/cofi2000.pdf>

ⁱⁱ *Scientific Overview of AOX Discharge Limits and Current Regulatory Approaches*, D. Bright, Ph.D. and Matthew Dodd, Ph.D., January 2000

PAPER AVAILABLE COFI WEBSITE AT http://www.cofi.org/whatwedo/pdf/AOX_review.pdf