

EFFLUENT TREATMENT SYSTEMS

FOREST INDUSTRY HEALTH RESEARCH PROGRAM

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The *Forest Industry Health Research Program (FIHRP)* has completed a study of emissions from effluent treatment systems at pulp and paper mills. The report, which is now available to members, is titled "*Investigation of Chemical and Bioaerosol Emissions from Pulp Mill Effluent Treatment Systems*". To obtain a copy, contact **Agi Lee** at the Pulp and Paper Employee Relations Forum, at (604) 777-1533, send a fax to (604) 777-1567, or email alee@paperforum.com. Non-members of the Forum may be charged for the reports.

Three mills participated in the study: one coastal mill; and two interior mills. Air samples were collected at a total of eight sites including primary and secondary clarifiers, biobasins, cooling towers, and sludge dewatering presses. Samples were collected in July and August, 1997.

Airborne chemicals analysed in the samples included: light hydrocarbons such as benzene and toluene; halogenated hydrocarbons such as chloroform; terpenes including delta-carene; methanol; aldehydes; and anions such as chloride and nitrate. Carbon dioxide and other gases were measured using passive diffusion tubes.

Bioaerosols were characterized by identifying fungi, counting colonies of bacteria, and measuring endotoxin concentrations.

Carbon dioxide concentrations measured at some sites were high. If further measurements confirm the high readings, then work procedures need to be reviewed.

Airborne concentrations of chemicals were low. Chemicals present at sampling sites included methanol, toluene, xylenes, chloroform, delta-carene, alpha-pinene, acetaldehyde, and nitrate. With the possible exception of delta-carene, the chemical emissions do not represent a risk of adverse health effects for workers.

Mill personnel may want to examine workers' exposure to delta-carene, particularly at indoor sites, and consider if control measures are required.

Concentrations of fungi, bacteria, and endotoxin measured in this study do not represent a health risk for healthy workers. However, bioaerosols from treatment systems might cause respiratory effects for sensitive workers. In addition, a few fungi were present that would put workers with weak immune systems at risk of lung infections. People who are concerned about exposure to bioaerosols could wear a fabric particulate respirator.