

EXPOSURE TO FOUL CONDENSATES IN KRAFT MILLS

FOREST INDUSTRY HEALTH RESEARCH PROGRAM

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The *Forest Industry Health Research Program (FIHRP)* has completed a study on exposure to foul condensates in Kraft mills. A report is now available to members entitled **"Foul Condensates: Potential Occupational Exposures"**. To request 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 E-mail alee@paperforum.com. Non-members of the Forum may be charged for the reports.

During the kraft pulping process, both continuous and batch, odorous compounds (reduced sulfur gases (TRS), alcohols, aldehydes and other volatile organic compounds) may be released to the working atmosphere.

In this study, two mills (one batch and one continuous) were selected to perform an occupational exposure assessment to various gases potentially released from the processes generating foul condensates.

Prior to initiating the field work, BC Research Inc. also developed a long-term sampling and analytical methodology for dimethyl trisulfide based on BCRI's previously developed method for dimethyl sulfide.

The compounds assessed during this study included: reduced sulfur gases including dimethyl trisulfide (grab sampling and long-term sampling), aldehydes including formaldehyde, resin acids, phenolics, methanol, ketones and terpenes. The main areas assessed at the continuous digester mill included: flash steam condenser, evaporator seal tanks, steam stripping building; while the areas at the batch digester mill included: operating floor of batch digester and batch digester loft, evaporator seal tank and combined condensate tank, cold blow cooler and turpentine decant tank.

A range of TRS gases was detected at both mills as the major contaminants present. While dimethyl sulfide, methyl mercaptan and hydrogen sulfide were the main TRS gases detected, dimethyl disulfide was also prevalent at the batch digester mill. Methyl mercaptan was found to be above the pending WCB exposure limit (0.5 ppm) in most samples collected.

Several aldehydes (formaldehyde, acetaldehyde, glutaraldehyde, butyraldehyde, propionaldehyde and acrolein) were detected in the foul condensate emissions. These compounds may contribute to the odours detected and potentially to unacceptable worker exposures (acrolein).

Airborne concentrations of terpenes were higher at the batch digester mill (performed turpentine recovery) than at the continuous digester mill. The main terpenes detected at both mills were alpha- and beta-pinene, detal-carene and limonene. All measured levels were far below regulated limits.

Resin acids, phenolics and methanol were not detected in any of the samples collected from either mill.

Additional results were obtained on-site using a portable gas chromatograph-mass spectrometer and these are also included as part of the report.