

**METHODOLOGY FOR SETTING AIRBORNE EMISSIONS
LIMITS FOR CHLOROFORM, CHLORINE DIOXIDE, AND
AND CHLORINE FROM PAPER AND PULP MILLS.**

Dennis J. Paustenbach
Chief Toxicologist
ChemRisk
Alameda, CA 94051

Brent Finley
Senior Toxicologist
ChemRisk
Santa Anna, CA 92705

Renee Kalmes
Supv. Scientist
ChemRisk
Alameda, CA 94051

Bruce Fishman
Environ. Toxicologist
ChemRisk
Portland, Maine 04102

ABSTRACT

Since 1988, there has been increasing interest in controlling the release of "so-called" toxic gases due to fugitive emissions or from point sources. Heretofore, only about 25 air contaminants have been regulated even though at least 600 different chemicals are used in large quantities by American industry each day. This paper discusses how to use basic principles of toxicology and risk assessment to establish acceptable levels of emissions for chloroform, chlorine dioxide and chlorine. The approach draws on the work of the ACGIH Threshold Limit Values committee and current regulatory approaches for setting ambient air standards, but it also accounts for pharmacokinetics, interindividual susceptibility, chemical specific toxic effects, and effects other than toxicity (e.g., irritation and odor). When discussing the acceptable levels of exposure to chloroform, particular emphasis will be placed on its nongenotoxicity and the applicability of using either a physiologically-based pharmacokinetic model (PB-PK) or a biologically-based (MKV) low dose extrapolation model. The appropriateness (or lack thereof) of estimating ambient air standards by adjusting TLVs, MACs, or other guidelines intended for the workplace will be addressed. A case study will be presented which illustrates how to set preliminary emissions limits and/or acceptable levels of exposure for the aforementioned chemicals, although the methodology is applicable to a wide range of substances.

KEYWORDS: Air toxics, air pollutants, chloroform, chlorine dioxide, chlorine, exposure limits, community air standards

