

CYP2E1, the enzyme that oxidizes ethylene to ethylene oxide. Detoxification of ethylene oxide may be lower in children than adults, but the disparity is less than the assumed EPA default of 10-fold. Finally, fewer hemoglobin adducts indicate lower background ethylene oxide body burden in children.

1618 HUMAN HEALTH RISK ASSOCIATED WITH EXPOSURE TO PATHOGEN-CONTAMINATED SEDIMENTS.

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The presence of pathogens in environmental media can severely impact the public health, particularly when contamination involves human-derived pathogens such as *E. Coli* or *Giardia*. Previous environmental assessments have reported high levels of pathogenic microorganisms in the Lower Passaic River in Newark, NJ. Many combined sewer overflows (CSOs) are present in this portion of the river and have been identified as potential sources of pathogen release into the environment. Because river sediments are reservoirs for several types of waterborne pathogens that are associated with human fecal matter, the aim of this study was to characterize the pathogenic contamination of river sediments collected from mudflats near CSOs and to assess the human health risk associated with potential exposure to the pathogen-contaminated sediments. The sediments contained several types of pathogenic bacteria including fecal coliform, *E. Coli*, fecal *Streptococcus*, *Enterococcus* and *Pseudomonas aeruginosa*, as well as protozoa, specifically *Giardia* and *Cryptosporidium*. Antibiotic resistant strains of bacteria were also found in the sediments. Risk estimates were calculated for three adult exposure scenarios: recreators, visitors and transients. The risk of contracting gastrointestinal illness following incidental ingestion of sediments from fecal coliform was >1 for all scenarios, whereas the risk of illness from fecal *Streptococcus* and *Enterococcus* was as high as 0.058 and 0.049, respectively. Risk estimates for illness associated with transient exposure to *Giardia*-contaminated sediments exceeded 1 in 100. Results suggest that incidental ingestion and/or dermal contact with pathogen-contaminated sediments near areas of CSO discharge along the Lower Passaic River were associated with a high risk of illness.

1619 PROVISIONAL ADVISORY LEVELS (PALs) DEVELOPMENT FOR TRIMETHYL PHOSPHITE (TMP).

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Provisional Advisory Levels (PALs) are being developed by the U.S. EPA for contaminants that may be released to drinking water or air. PALs represent exposure limits for the general public that correspond to different effect severity levels (1, 2, and 3) and exposure durations (24 hours, 30 days, and 2 years). PAL protocols have been applied to estimate both oral (drinking water) and inhalation exposure limits for trimethyl phosphite (TMP) based on available data. TMP is used to make organophosphate pesticides and flame retardants and is also a precursor for certain nerve agents. This compound converts quickly to DMP in water and air, so continuous releases were assumed to support PAL development for durations beyond one day. Data gaps are evaluated as part of the PAL development process, and the experimental data set for TMP was found to be marginally adequate, with limited human data and a limited number of animal studies. These estimates were evaluated and approved by an Expert Consultation Panel for Provisional Advisory Levels in June 2006.

PAL estimates for TMP will be presented. Oral PALs for TMP in drinking water assume an adult ingestion rate of 2 L/d. For all three exposure durations, the PAL 1 is 17 mg/L and the PAL 2 is 19 mg/L, because these are based on developmental endpoints that could result from exposure within any of the periods. For the PAL 3, the 24-hour value is 350 mg/L, and the 30-day and 2-year values are 57 mg/L. TMP data were considered insufficient to derive any 2-year PALs or a 24-hour PAL 3 (per inconsistent reporting of saturation). The inhalation PAL 1 is 0.1 ppm for both 24 hours and 30 days. For the PAL 2, the 24-hour value is 15 ppm and that for 30 days is 0.5 ppm; the value for the 30 d PAL 3 is 2.9 ppm. (This abstract presents PAL values that are subject to change pending further review.)

1620 ASSESSMENT OF CHILDREN'S EXPOSURE TO TOLUENE.

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Toluene was included in EPA's Voluntary Children's Chemical Evaluation Program (VCCEP) Pilot program because it has been detected in the indoor air and in human blood and milk. The objective of this study was to quantify children's expo-

sure to toluene and aggregate exposures across scenarios and pathways. A child-centered approach was used to define exposure scenarios for children's interaction with toluene, including environmental background sources and source specific exposures such as tobacco smoke and consumer products. Chronic and short-term episodic exposures were quantified in terms of typical and high-end estimates, and the contributions of various sources to overall toluene exposures were assessed. The assessment of background exposures indicated that inhalation was the primary route of exposure; accounting for 95% of the aggregate dose for all age groups, except for nursing infants of occupationally exposed mothers. For these children, 68% of their total dose was via ingestion of human milk and 32% was via inhalation. The primary source of inhalation exposures was residential indoor air. Of the chronic source specific exposures, inhalation of mainstream smoke was the primary pathway of exposure where the estimated doses were 2-5 times higher than background. Exposures to toluene from ETS and refueling vehicles did not add significantly to the aggregate exposure. A human PBPK model for toluene was used to estimate blood concentrations that would be predicted in children of various ages given the inhalation exposure concentrations for background exposures used in this assessment. The PBPK results indicated that the average and peak predicted blood values were similar to those reported recently in the literature for children. In conclusion, robust exposure data sets exist for background exposure sources of toluene, and except for the nursing infant, no unique exposure scenarios were identified for children.

1621 QUANTITATIVE DOSE-RESPONSE ASSESSMENT OF MICRONUCLEATED POLYCHROMATIC ERYTHROCYTES FROM MICE EXPOSED TO PRADOFLOXACIN.

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Genotoxicity endpoints have traditionally been evaluated only qualitatively (as either positive or negative), contributing primarily to the weight-of-evidence regarding an agent's mode of toxic action in risk assessments. However, many of these endpoints are remarkably sensitive, and they are amenable to quantitative dose-response evaluation on their own, provided data from a sufficient number and range of dose levels are available. Such analyses can provide information regarding the shape of the dose-response at very low doses as well as insights regarding an agent's mode of toxic action. An exemplary Benchmark Dose (BMD) analysis was undertaken of micronuclei data from two experiments in which young adult Hsd/Win:NMRI mice were exposed to a 40-fold range of doses of the veterinary drug candidate, pradofloxacin. An appropriate Benchmark Response (BMR) was first chosen to approximate a No Observable Effect Level (NOEL) for micronucleated cell (MNC) frequency among polychromatic erythrocytes (PCEs) relative to the baseline MNC frequency in unexposed animals. Statistical power calculations were employed to establish a BMR of only 1.27 additional MNC per 1,000 PCEs examined, nearly 100-fold lower than the 10% response increment typically used in BMD analyses. USEPA's Benchmark Dose software package (v. 1.3.2) was then utilized to estimate the parameters of a Weibull dose-response model as well as central (244 mg/kg) and lower 95% confidence bound (186 mg/kg) estimates of the BMD associated with the chosen BMR. The fitted dose-response model was markedly non-linear, suggesting that a threshold-based or non-linear approach to risk assessment is appropriate for pradofloxacin.

1622 COMPARISON OF TOOLS TO CALCULATE 95% UPPER CONFIDENCE LIMITS ON THE MEAN.

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Calculating a 95% upper confidence limit on the mean (95% UCL) for use as an exposure point concentration in risk assessment follows a two-step process. First, the data are subjected to goodness-of-fit tests to establish what type of distribution best fits the data (e.g., normal or lognormal distribution). A 95% UCL method is then selected according to the distributional characteristics of the data found in the goodness-of-fit test. A problem often encountered with environmental datasets is the existence of a number of non-detect values. The left censoring of data created by non-detect values can impose difficulties in correct assignment of distribution type and calculation of the 95% UCL. PROUCL 3, EPA software for calculation of 95% UCL values, had limited utility with datasets censored more than 15%. Due in part to this limitation, the Florida Department of Environmental Protection developed FLUCL, a software tool capable of calculating 95% UCL values from more heavily censored data. Recently, the EPA has developed PROUCL 4, which has improved capabilities with censored data. The performance of FLUCL and PROUCL 4 was compared using synthetic data sets with varying characteristics in terms of size, skewness, and censoring. Although FLUCL and PROUCL 4 can both handle