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or toxic effects presumed to involve a toxicity threshold (primarily non-cancer effects), in which the combined daily dose from all exposure routes is used for calculation of allowable exposure levels. However, the calculation of the relative source contribution (RSC) is usually rather crude due to a lack of appropriate data, and the methods for estimation of an RSC in the absence of good data involve a large component of professional judgment. USEPA (USEPA) policy provides limited guidance on calculating RSC. Values in the range of 0.2 to 0.8 (20 to 80%) are allowed, with a default value of 0.2 (20%) of total permissible exposure in the absence of data. OEHHA has generally followed this guidance, although it has also used a value of 1.0 (100%) in its derivation of Public Health Goals (PHGs) for drinking water when human data were used, which was uncontrolled for environmental exposures. Application of the principles for development of RSCs can be illustrated by examining the values and rationale used in the development of PHGs. Examples of the range of values include aluminum (1.0, acute human study), beryllium (0.2, animal study), cadmium (0.2, chronic human study), copper (0.8, acute human study), ethylbenzene (0.2, chronic animal study), fluoride (1.0, chronic human studies), Freon-11 (0.4, subchronic animal study), nickel (0.3, animal reproductive study), simazine (0.2, chronic animal study), thallium (0.2, subchronic animal study), 1, 2, 4-trichlorobenzene (0.2, subchronic animal study), and xylene (0.4, chronic human study). The entire set of 69 chemicals for which PHGs have so far been finalized provides a larger database for illustration of the application of RSC development principles.

731 INTERACTION PROFILE FOR CHEMICALS IN RURAL WELL WATER.

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Atrazine, deethylatrazine, simazine, diazinon and nitrate frequently occur together in rural well water. The potential impact of this mixture on public health was evaluated using an approach developed by ATSDR. Because pertinent data were not available for the whole mixture, evaluation of health effects, mechanistic and joint toxic action data for individual components and various combinations of components was performed in the ATSDR Interaction Profile. The profile recommends that reproductive health hazard of atrazine, deethylatrazine and simazine be assessed with the hazard index (HI). Neurological effects of diazinon and hematological effects of nitrate are to be assessed with separate hazard quotients (HQs). This approach is used when HQs of components are ≥ 0.1 . The Weight of Evidence (WOE) for interactions indicates high confidence in the dose additivity assumption (HI) for triazine components and uncertainty regarding potential effects of diazinon or nitrate on reproductive toxicity of these components. WOE analysis suggests that the triazine components may potentiate neurological toxicity of diazinon such that the HQ may underestimate the hazard. No information regarding impact of interactions on hematological toxicity of nitrate was available so uncertainty is high for this endpoint. Although components of this mixture have not been classified as carcinogens, triazines may interact with nitrate (as the metabolite nitrite) to form N-nitrosoatrazine and N-nitrososimazine, which are more genotoxic than the parent triazines. Confidence in the WOE prediction that this chemical interaction may result in carcinogenicity is medium because although adequate cancer data are lacking for these compounds, data for other N-nitrosamines and their precursors support the prediction. When screening criteria are exceeded (HI > 1 for reproductive effects of triazine components, HQ close to or > 1 for neurological effects of diazinon, and/or HQ > 1 for nitrate), further evaluation is needed using biomedical judgment and community-specific health outcome data and taking into account potential carcinogenicity of nitrosamines that may be formed.

732 REGULATORY DETERMINATION FOR HEXACHLOROBUTADIENE IN DRINKING WATER.

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The 1996 Safe Drinking Water Act Amendment (SDWA) requires EPA to establish a list of contaminants to aid the Agency in regulatory priority setting for its drinking water program. The first Contaminant Candidate List (CCL) was published on March 2, 1998; and hexachlorobutadiene (HCBD) was one of the 19 chemicals in the regulatory determination priority category. The SDWA requires EPA to make regulatory determinations for no fewer than five contaminants in the regulatory determination priority category. Regulations are only recommended when all the following three criteria are satisfied: 1) The chemical must have adverse health effects, 2) It must occur or is likely to occur in drinking water at concentrations of health concern, and 3) Regulation of this chemical provides a meaningful opportunity to reduce human risk. The available toxicological data indicate that HCBD can cause adverse health effects in animals, and probably also in humans at high dose. In rodents, there is clear evidence of renal damage resulting from acute, subchronic, and chronic exposures to HCBD by the oral route. Under EPA's 1999 draft Guidelines for Carcinogen Risk Assessment, HCBD is classified as likely to be carcinogenic to

humans by the oral route of exposure. However, the available data on occurrence, exposure, and other risk considerations suggest that, because HCBD does not occur in public water systems at frequencies and levels of public health concern, regulating HCBD will not present a meaningful opportunity for health risk reduction for persons served by public water systems. (The opinions expressed in this abstract are those of the author and not necessarily those of EPA.)

733 DERIVATION OF A DRINKING WATER ACTION LEVEL FOR 2-MERCAPTOTHIAZOLE.

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2-Mercaptobenzothiazole (MBT) is used as a vulcanization accelerator in rubber products that come into contact with potable drinking water. When such products are submitted for ANSI/NSF Standard 61 certification, any chemical extracting from these products must be below an appropriate action level. As defined by Standard 61, a Total Allowable Concentration (TAC) is the maximum concentration of a nonregulated contaminant allowed in a public drinking water supply, and the Single Product Allowable Concentration (SPAC) is 10% of the TAC. In order to determine an action level for MBT, a comprehensive health effects evaluation was performed. Epidemiological investigations indicate that occupational exposure to MBT results in an increased risk of death from bladder cancer. Genotoxicity investigations provide evidence indicating that MBT has the potential to induce mutations and chromosome aberrations. Studies in rats and mice chronically exposed to MBT identified increases in tumors, such as adrenal, pituitary, liver, and renal pelvis tumors. The biological significance of most of these tumors is questionable due to a lack of dose-response, and the effect of test article vehicle (corn oil) upon tumor rates. A review of the epidemiological and toxicological datasets for MBT indicates that the induction of renal pelvis transitional cell tumors is the most sensitive health effects endpoint upon which to base a TAC and SPAC. A linearized multistage model was used to extrapolate to low-dose MBT exposure due to the genotoxicity of MBT. A TAC of 100 $\mu\text{g/L}$ was derived for MBT, and is based upon an LED10 of 164.18 mg/kg/day and a 20% relative source contribution factor. A SPAC of 10 $\mu\text{g/L}$ was derived by multiplying the revised TAC by 0.10. These action levels are based upon the most sensitive health effects endpoint, as well as current risk assessment methodologies.

734 HUMAN HEALTH RISK ASSESSMENT OF FURFURAL TO DETERMINE DRINKING WATER ACTION LEVELS.

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A human health risk assessment was conducted by NSF International to determine acceptable levels of furfural in drinking water according to NSF/ANSI Standard 60/61, Annex A. The scientific literature relating to human and laboratory animal exposure to furfural was reviewed. Significant treatment-related responses were limited to liver lesions in high-dose male rats. A chronic rat bioassay completed by the NTP (1990) was selected as the key study from which oral risk values were derived. Groups of 50 F344/N rats of each sex were administered furfural by gavage at adjusted doses of 0, 21 or 43 mg/kg-day. Significant liver lesions were observed at each of the two administered doses, preventing the identification of a NOAEL. However, the available data suggested that a dose level should exist below which no significant treatment-related responses were observed. Benchmark dose modeling after conversion to human equivalent doses, was used to derive a BMDL10 of 2.9 mg/kg-day using centrilobular necrosis of the liver as the critical, treatment-related and precursor response. The logistic model provided the best fit, although five other dichotomous models gave similar results. Uncertainties of 3x for interspecies variability, 10x for intraspecies variability, 3x for database deficiencies and 1x each for less-than-lifetime extrapolation and LOAEL to NOAEL extrapolation were incorporated into the oral RfD derivation. An oral RfD of 0.03 mg/kg-day, with a 20% relative source contribution for drinking water was used to derive NSF-specific risk management values, including a Total Allowable Concentration of 0.2 mg/L and a Single Product Allowable Concentration of 0.02 mg/L.

735 HUMAN HEALTH RISK ASSESSMENT FOR p-CHLORO-m-CRESOL TO DETERMINE DRINKING WATER ACTION LEVELS.

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A risk assessment to determine acceptable levels of p-chloro-m-cresol in drinking water was conducted according to Annex A of NSF/ANSI Standard 60/61. Scientific literature in humans and animals was reviewed. p-Chloro-m-cresol tested