56 **A COMPARISON OF TWO BIOKINETIC MODELS FOR LEAD TO DETERMINE HEALTH BASED SOIL STANDARDS FOR RESIDENTIAL AND INDUSTRIAL SITES. Fehling, K., Scott, P., Bono, M. and Gargas, M.**

This study evaluated the usefulness of two toxicokinetic models for lead; the Uptake/Biokinetic Model for Lead, developed by the USEPA (1991) and a physiologically based toxicokinetic (PBTK) model developed by O'Flaherty (1993). The USEPA model allows the user to vary only a limited set of input parameters (*i.e.*, soil ingestion rates, air lead concentrations) and does not provide information to allow modification of the biokinetic portion of the model. Additionally, only lead exposures to children can be quantified with the USEPA model. The PBTK model is able to quantify lead exposures to individuals of all ages; however, the model has been fully verified for adults and only partially verified for children. Soil lead levels protective of human health (< 10 μg/dl) were derived for both a residential and an industrial setting using both models and a comparison of the results was performed. In order to appropriately compare the two models, exposure parameters were kept the same for both models, wherever feasible. The results indicate that each model provides consistent soil cleanup levels, ranging from 500 to 800 mg/kg for children in a residential setting. However, after a more complete validation of the PBTK model for children is complete, a more extensive comparison between the two models will be possible.

57 GUIDANCE FOR PREDICTING BLOOD LEAD LEVELS FROM MULTI-SOURCE, SITE-SPECIFIC DATA. J S Wheeler, H G Abadin, C T DeRosa, and L Smith. Agency for Toxic Substances and Disease Registry, Atlanta, GA

The Agency for Toxic Substances and Disease Registry (ATSDR) provides public health assessments and consultations for many of the nation's hazardous waste sites. Lead is frequently found at numerous sites (888 as of October 1992). As an aid to the public health assessor, ATSDR has developed guidance to help estimate the blood lead (PbB) contributions from multiple sources and to predict total PbB levels. The guidance can assist the health assessor in determining the likely source of elevated PbB and in determining if a potential health hazard exists. The guidance estimates PbB by utilizing slope factors (determined from human PbB studies) associated with specific environmental data to derive a PbB contribution from a particular source. Summation of all source contributors yields total PbB predictions. Validation efforts with site-specific PbB data indicate that the approach underpredicted the actual PbB levels in 9 of 53 subjects (17%). By removing subjects with confounding environmental data (street and entrance dust level >3000 ppm) from the data set, the guidance yields an underprediction error of 12%. Additional validation and refinement of the guidance should provide the public health assessor with a valuable tool for estimating potential hazards associated with lead contamination.

58 ASSESSING LEAD EXPOSURE NEAR THE SITE OF AN HISTORICAL SECONDARY LEAD SMELTER. J M LaVelle, M L Hogg, T Marcum. Camp Dresser & McKee, Denver, CO.

Emissions from a lead smelter in West Dallas resulted in soil contamination in adjacent residential areas. Risks in one area containing public housing were assessed to provide a basis for managing risks from lead exposure. The common age and condition of housing, and the consistent pattern of lead deposition, allowed very accurate characterization of exposure conditions for the site. Using site specific data for lead in soil, dust, water and air, the EPA's Uptake Biokinetic Model for assessing lead risks indicated small exposures for most of the site. An action level of about 500 mg/kg was calculated for small, more contaminated areas. In response to public concerns, additional evaluation used uncertainty analysis to predict upper range exposure conditions based on soil and dust lead measurements. Upper range exposure conditions still indicated little lead exposure for children with the highest exposure potential. Predicted geometric mean blood lead levels were all below 4 ug Pb/dL with a maximum of less than 3% with blood Pb levels of 10 ug/dL or higher. Of additional interest was the finding that though soil lead concentrations increased closer to the smelter location, indoor dust lead levels did not, indicating significant sources other than outdoor soil for indoor dust at this site.

59 ESTIMATION OF A CHROMIUM INHALATION RfC BY THE BENCHMARK DOSE METHOD. P A Malsch, D L Proctor, and B L Finley. ChemRisk® Division, McLaren/Hart Environmental Engineering, Cleveland, OH. Sponsor: M L Gargas.

The benchmark dose method (BDM) for setting reference doses and concentrations (RfDs and RfCs) addresses many of the limitations of the NOAEL/Uncertainty Factor approach in that it uses the entire dose-response curve, accounts for data variability, and does not require the benchmark dose (BD) to be one of the experimental doses. The presence of lactate dehydrogenase (LDH) in bronchoalveolar lavage fluid (BALF) provides a sensitive indicator of pulmonary damage since it is only found extracellularly upon cell death. Levels of LDH in BALF taken from Glaser *et al.* (1990) were fitted to a polynomial mean response regression model using the maximum likelihood method in order to calculate a BD. The BD was defined as the 95% lower confidence limit on the dose associated with a 10% increase in response. Appropriate dosimetric adjustments and uncertainty factors were applied to account for the uncertainty remaining between the BD and the RfC. A BDM-derived RfC of 1.2 $\mu g/m^3$ is recommended for particulate Cr(VI). This value corresponds well with the RfC of 1.2 $\mu g/m^3$ proposed by Finley *et al.* (1992) using the traditional method.