Poster Number

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Topic	Risk assessment: Problem definition and conceptual model
Title	**Benthic Invertebrate Exposure And Chronic Toxicity Analysis for Cvms Materials – A Probabilistic Risk Assessment Approach**
Poster submitter	Dr Anne FAIRBROTHER
Organization	Exponent, United State of America
Authors	**Anne FAIRBROTHER, Allen BURTON, Steve KAINE, Tim SPRINGER, Kent WOODBURN, David POWELL**

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Summary: Lipophilic chemicals, such as the cyclic volatile methylsiloxane (cVMS) materials octamethylcyclotetrasiloxane (D4) and decamethylcyclopentasiloxane (D5), adsorb extensively to particles and surfaces in aqueous systems, making sediments a key sink when performing risk assessment evaluations.

A widely accepted step for estimating the possible risk posed by such chemicals to sediment-dwelling species is to compare the observed sediment concentration with either published ecotoxicity guidelines or to chronic no-observed effect concentrations (NOECs) from standardized toxicity testing with benthic invertebrates.

A comparison of field sediment concentrations with chronic NOEC levels from laboratory testing can be done with simple worst-case simulations or using a probabilistic distribution approach. In this work, a comparison was made using probabilistic methods of D4 and D5 residues from sediments and organisms collected in Canada, the United States, the UK, and European member states to chronic NOEC values determined using EPA/OECD test species such as *Chironomus tentans, Chironomus riparius, Hyalella azteca,* and *Lumbriculus variegates*.

Comparisons were made using sediment levels on a dry weight (data not shown) and organic carbon basis. Probabilistic endpoints of $\geq$95% exposure and $\leq$5% chronic NOEC were extrapolated from the data, which were fit using log-normal assumed distributions. Using probabilistic techniques, field D4 and D5 sediment concentrations were far below chronic threshold NOEC values with benthic invertebrates, therefore very limited risk appears to exist with these materials. This probabilistic evaluation method is applicable to a wide range of lipophilic materials that preferentially bind to sediment and allows a quantitative assessment of the likelihood of risk to benthic species.