2005 PHC CWS Ecotoxicity Data Compliation and Analysis

The objective of this project was to identify whether ecotoxicological work conducted since the release of the PHC CWS supports the existing ecological soil contact guideline values for PHCs or whether these new data suggest that a higher or lower guideline would be appropriate. Data from available studies were assessed using three alternate approaches:

- The CCME (2000) Approach, as used in the original PHC CWS guideline derivations is based on EC/LC/IC50 data.
- The CCME (2005) Approach, as recommended in the latest CCME guideline protocol document is based on EC/LC/IC25 data.
- The Hybrid Approach (suggested during Sub-Group meetings) which uses EC/LC/IC25 data for plants and EC/LC/IC50 data for invertebrates.

F3 in Fine Soil

Data were available from five studies that had relevance to refining soil quality guidelines for F3 in fine soil. The approach taken was to evaluate each study separately for its implication on potential guideline values. No attempt was made to combine data

from all sources in a single guideline derivation since many of the studies had a different analytical basis, and the Sub- Group has reservations about the 31% analytical recovery used in the original guideline derivation.

Guideline values calculated from each study are summarized in Table A included in this Executive Summary. It should be noted that the original F3 guidelines (top line of data in Table A) were calculated using the CCME (2000) Approach, while all the other entries in Table A were calculated using the CCME (2005) Approach.

Particular attention was paid to the Visser (2005a) field study, reflecting i) the greater number of species considered in this study, ii) the fact that this study measured actual crop yields and invertebrate populations in the field; iii) the chronic duration of most of the tests; and iv) the fact that measured analytical concentrations were available that could be tied to results from the CCME reference method with a good degree of confidence. Less confidence was placed on the Cermak et al. (2005) data due to the difficulty in linking the analytical methodology required for that work to standard CCME reference method analyses.

Based on the above, the Sub-Group recommends updating the fine soil quality guideline for F3 under agricultural/residential land use from 800 mg/kg to

1,300 mg/kg, and leaving the corresponding guideline for commercial/industrial land use unchanged at 2,500 mg/kg (Table A).

F3 in Coarse Soil

Data in Visser (2005a) suggest that the current guideline for F3 in coarse soils for agricultural/residential land use (400 mg/kg) is protective of plant growth, but may not be protective of all soil invertebrates. The current guideline is protective based on the CCME (2000) Approach, but the guideline would need to be less than 330 mg/kg to be protective under the CCME (2005) Approach.

Overall, therefore, the Sub-Group recommends updating the F3 guideline in coarse soil for agricultural/residential land use from 400 mg/kg to 300 mg/kg.

F4

Existing PHC CWS guidelines for F4 were calculated by extrapolation from the toxicity of whole crude oil. In this report, guideline values are calculated for F4 in fine soil, based on F4 ecotoxicity data that were not available at the time of the original derivation. The values calculated using the CCME (2005) method were 4,900 mg/kg, and 8,300 mg/kg for agricultural/residential and commercial or industrial, respectively. These guidelines are essentially consistent with the existing guidelines for F4, and no

changes to the existing guidelines for F4 are proposed.

2001 UMA and Komex_Petroleum Hydrocarbon CanadaWide Standards
2005 Axiom_PHC CWS ECOTOXICITY DATA_Report
Norwest_Validation of the Alternate CCME method_Project Proposal