TIER I WILDLIFE VALUE FOR TOXAPHENE

The dieldrin wildlife value for waters within the Great Lakes Basin is 1.7×10^{-4} μg/L.

Calculations:

BAF - from field measured BAF (from Stephan 1995)
Log K_{ow} = 4.33, K_{ow} = 21,379
Trophic level 3 FCM = 1.53
Trophic level 4 FCM = 1.2;

$f_{fd} = 1/(1+(0.00000024 \text{ kg/L})(K_{ow})) = 0.995$

Baseline $BAF_{T3} = 2.2 \times 10^{7}$

Baseline $BAF_{T4} = 2.2 \times 10^{8}$

Human health $BAF_{T3} = ((2.2 \times 10^{7})(0.0646)+1)(0.995) = 1,386,952$

Human health $BAF_{T4} = ((2.2 \times 10^{8})(0.1031)+1)(0.995) = 2,821,803$

Avian Values (mg/L)

Test Dose: 0.61 mg/kg/d (from Mehrle et al. 1979)

Uncertainty factor = 10 (interspecies extrapolation)

Biomagnification factor = 4 (from Niethammer et al. 1984)

WV (kingfisher) = $((0.61)(0.15)(1/10))/(0.017+(0.0672 \times 1{,}386{,}952)+(0.0672 \times 0)) = 9.8 \times 10^{-8}$

WV (gull) = $((0.61)(1.1)(1/10))/(0.063+(0.192 \times 1{,}386{,}952)+(0.048 \times 2{,}821{,}803)+(0.0267 \times 0)) = 1.7 \times 10^{-7}$

WV (eagle) = $((0.61)(4.6)(1/10))/(0.16+(0.371 \times 1{,}386{,}952)+(0.0928 \times 2{,}821{,}803)+(0.0283 \times 1{,}386{,}952 \times 4)+(0.0121*0))$
$= 3.0 \times 10^{-7}$

WV (birds) = 1.7×10^{-7}

Mammalian Values (mg/L)

Test Dose: 8.65 mg/kg/d (from Chu et al. 1988)
Uncertainty factor = 10 (interspecies extrapolation)

WV (Mink) = $((8.65)(0.8)(1/10))/(0.081+(0.159 \times 1{,}386{,}952)+(0.0177 \times 0)) = 3.1 \times 10^{-3}$

WV (Otter) = $((8.65)(7.4)(1/10))/(0.6+(0.976 \times 1{,}386{,}952)+((0.244 \times 2{,}821{,}803)) = 3.1 \times 10^{-3}$

WV (mammals) = 3.1×10^{-3}

Wildlife Value

WV = 1.7×10^{-4} µg/L (lower of avian and mammalian wildlife values)

References:

1. Stephen, C.E., 1995. Great Lakes Water Quality Initiative Technical Support Document for the Procedure to Determine Bioaccumulation Factors. EPA-820-B-95-005.

Mehrle, P.M., M.T. Finley, J.L. Ludke 1979. Bone development in black ducks as affected by dietary toxaphene. Pest. Biochem. Physiol. 10: 168-173.

Neithammer, 1984. Presence and biomagnification of organochlorine chemical residues in Oxbow lakes of northeastern Luisiana. Arch. Environ. Contam. Toxicol. 13: 63-74.

Chu, I., V. Secours, D.C. Villeneuve, 1988. Reproduction study of toxaphene in the rat. J. Environ Sci. Health (B) 23: 101-126.

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