NOTE OF EXPLANATION FOR AQUATIC FACT SHEETS FOR "PARATHION" AND "PARATHION AND METHYL PARATHION"

The Aquatic Type numerical values for parathion are supported by more than one Fact Sheet. The freshwater acute value is supported by the Fact Sheet dated March 12, 1998. The freshwater chronic value for the sum of parathion and methyl parathion is supported by the Fact Sheet dated October 9, 1984

NYSDEC 3-98

Fact Sheet Date: March 12, 1998

NEW YORK STATE
- AQUATIC FACT SHEET -

Ambient Water Quality Value
for Protection of Aquatic Life

SUBSTANCE: Parathion **CAS REGISTRY NUMBER:** 56-38-2

TYPE:	BASIS:	FRESHWATER AMBIENT WATER QUALITY VALUE (ug/L):
Acute	Survival	0.065

INTRODUCTION

This value applies to the water column and is derived to protect aquatic life from the effects of waterborne contaminants. Values for the protection of survival of aquatic life are referred to as Aquatic (Acute) or A(A) values.

SUMMARY OF INFORMATION AND DERIVATION OF VALUE

U.S. EPA (1995a,b) has derived an acute aquatic life criterion for parathion for the Great Lakes Water Quality Initiative (GLI). The Department has reviewed this criterion and determined that it is based on appropriate data and derived according to the scientific procedures in current and proposed 6 NYCRR Part 702. It is thus determined to be an appropriate ambient water quality value for protection of aquatic life for New York State.

The attachment to this fact sheet provides U.S. EPA's derivation of the value. U.S. EPA's Criterion Maximum Concentration (CMC) is equivalent to New York's Aquatic (Acute) value.

The reader will note that the attachment also contains U.S. EPA's derivation of a Criterion Continuous Concentration (CCC), which is a chronic value. This value is not presented in this fact sheet because New York State has an existing chronic aquatic standard for parathion and methyl parathion that is described in a separate Fact Sheet.

REFERENCES

U.S. EPA (Environmental Protection Agency). 1995a. Final Water Quality Guidance for the Great Lakes System. 60 Federal Register: 15366 - 15425. March 23, 1995.

U.S. EPA (Environmental Protection Agency) 1995b. Great Lakes Water Quality Initiative Criteria Documents for the Protection of Aquatic Life in Ambient Water. EPA-820-B-95-004. March 1995.

New York State Department of Environmental Conservation
Division of Water
SJS
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ATTACHMENT

GREAT LAKES WATER QUALITY INITIATIVE

Tier 1 Aquatic Life Criterion for Parathion

No new acceptable acute or chronic data for parathion were found. Therefore, the data given in Tables 1 and 2 of the criteria document for parathion (U.S. EPA 1985) were used to obtain the values given in Table L1.

Criterion Maximum Concentration (CMC)

Some of the Genus Mean Acute Values given in Table 3 of U.S. EPA (1985) were changed because of the new taxonomy for salmonids and because only one value was calculated for the genus Chironomus; these changes did not affect the FAV. The Final Acute Value (FAV) was calculated using the four lowest Genus Mean Acute Values given in Table L1, resulting in a FAV of 0.1299 ug/L. This value did not need to be lowered to protect a commercially or recreationally important species of the Great Lakes System. The CMC was calculated by dividing the FAV by 2, resulting in a CMC of 0.06495 ug/L.

Criterion Continuous Concentration (CCC)

Insufficient chronic toxicity data were available to calculate a Final Chronic Value (FCV) using the eight-family procedure. Sufficient chronic data were available to calculate a FCV by dividing the FAV by the Final Acute-Chronic Ratio (FACR). Three Species Mean ACRs were available (Table L1). The ACRs obtained with the resistant fishes were much higher than that obtained with the sensitive cladoceran. To make the FACR appropriate for sensitive species, it was set equal to the ACR of 10.10 obtained with the cladoceran. The FCV = FAV/FACR = (0.1299 ug/L)/(10.10) = 0.01286 ug/L. This value did not need to be lowered to protect a commercially or recreationally important species of the Great Lakes System. The CCC was 0.01286 ug/L.

The Criterion

The procedures described in the GLI Tier 1 methodology indicate that, except possibly where a locally important species is very sensitive, aquatic organisms should not be affected unacceptably if the four-day average concentration of parathion does not exceed 0.01286 ug/L more than once every three years on the average and if the one-hour average concentration does not exceed 0.06495 ug/L more than once every three years on the average.

Table L1. Ranked Genus Mean Acute Values for Parathion

Rank*	Genus Mean Acute Value (ug/L)	Species	Species Mean Acute Value (ug/L)	Species Mean Acute-Chronic Ratio
31	5,230	Tubificid worm, Tubifex sp.	5,230	-----
30	5,230	Tubificid worm, Limnodrilus sp.	5,230	-----
29	2,650	Channel catfish, Ictalurus punctatus	2,650	-----
28	2,223	Goldfish, Carassius auratus	2,223	-----
27	1,838	Brook trout, Salvelinus fontinalis	1,760	-----
		Lake trout Salvelinus namaycush	1,920	-----
26	1,510	Brown trout, Salmo trutta	1,510	-----
25	1,486	Cutthroat trout, Oncorhynchus clarki	1,560	-----
		Rainbow trout, Oncorhynchus gairdneri	1,415	-----
24	1,130	Isopod, Asellus brevicaudus	1,130	-----
23	1,000	Western chorus frog, Pseudacris triseriata	1,000	-----
22	839.6	Fathead minnow, Pimephales promelas	839.6	79.45**
21	688.7	Green sunfish, Lepomis cyanellus	930	-----
		Bluegill, Lepomis macrochirus	510	2121**
20	620	Largemouth bass, Micropterus salmoides	620	-----

Table L1. (Cont.)

Rank*	Genus Mean Acute Value (ug/L)	Species	Species Mean Acute Value (ug/L)	Species Mean Acute-Chronic Ratio
19	320	Mosquitofish, Gambusia affinis	320	-----
18	<250	Crayfish, Procambarus sp.	<250	-----
17	56	Guppy, Poecilia reticulata	56	-----
16	15	Mayfly, Hexagenia bilineata	15	-----
15	7.0	Beetle, Peltodytes spp.	7.0	-----
14	5.4	Stonefly, Pteronarcys californica	5.4	-----
13	4.2	Stonefly, Pteronarcella badia	4.2	-----
12	3.0	Damselfly, Lestes congener	3.0	-----
11	2.9	Stonefly, Acroneuria pacifica	2.9	-----
10	2.739	Prawn, Palaemonetes kadiakensis	2.739	-----
9	2.227	Mayfly, Cloeon dipterum	2.227	-----
8	1.697***	Midge, Chironomus tentans	31	-----
		Midge, Chironomus riparius	1.697	-----
7	1.5	Stonefly, Claassenia sabulosa	1.5	-----
6	1.127	Amphipod, Gammarus fasciatus	0.3628	-----

Table L1. (Cont.)

Rank*	Genus Mean Acute Value (ug/L)	Species	Species Mean Acute Value (ug/L)	Species Mean Acute-Chronic Ratio
		Amphipod, Gammarus lacustris	3.5	-----
5	0.8944	Phantom midge, Chaoborus sp.	0.8944	-----
4	0.7746	Cladoceran, Daphnia magna	1.0	10.10
		Cladoceran, Daphnia pulex	0.60	-----
3	0.64	Damselfly, Ischnura verticalis	0.64	-----
2	0.47	Cladoceran, Simocephalus serrulatus	0.47	-----
1	0.04	Crayfish, Orconectes nais	0.04	-----

* Ranked from most resistant to most sensitive based on Genus Mean Acute Value.
** Not used in the calculation of the Final Acute-Chronic Ratio.
*** This GMAV was set equal to the lower SMAV due to the large range in the SMAVs in this genus.

FAV = 0.1299 ug/L

CMC = FAV/2 = 0.06495 ug/L

FACR = 10.10

FCV = FAV/FACR = (0.1299 ug/L)/(10.10) = 0.01286 ug/L = CCC

References

U.S. EPA. 1986. Ambient Aquatic Life Water Quality Criteria for Parathion - 1986. EPA 440/5-86-007. National Technical Information Service, Springfield, VA.