Appendix 1: Methyl parathion laboratory toxicity tests

Avian Acute Oral Toxicity

Species	% ai	LD50 (mg/kg)	Toxicity Category [1]	MRID No. Author/Year	Study Classification[2]
Mallard duck *Anas platyrhynchos*	80	6.6 (4.42-9.88)	"very highly toxic"	00160000 Hudson/ 1984	Core
Mallard duck *Anas platyrhynchos*	80	10 (6.12-16.3)	"highly toxic"	0016000 Hudson/ 1984	Core
Mallard duck *(Anas platyrhynchos)*	80	60.5(18.2-201)	"moderately toxic"	00160000 Hudson/ 1984	Core
Northern bobwhite quail *(Colinus virginianus)*	80	7.56(5.7-10)	"very highly toxic"	00160000 Hudson/ 1984	Core
[redacted]					
Ring-necked Pheasant (*Phasianus colchicus*)	80	8.21(5.69-11.9)	"very highly toxic"	00160000 Hudson/ 1984	Supplemental
Red-winged blackbird (*Agelaius phoeniceus*)	80	23.7 (17.1-32.9)	"very highly toxic"	00160000 Hudson/ 1984	Supplemental
American Kestrel (*Falco sparverius*)	98.2% Technical	3.08(2.29-4.14)	"very highly toxic"	44371701 Rattner/1983	Supplemental

[1] "Very highly toxic" designates chemicals whose LD_{50} is < 10 mg/kg. "Highly toxic" designates chemicals whose LD50 is between 10 and 50 mg/kg. "Moderately toxic" designates chemicals whose LD50 is between 51 and 500 mg/kg (Brooks (1973).
[2] Core (study satisfies guideline). Supplemental (study is scientifically sound, but does not satisfy guideline)

Because the lowest LD_{50} is less than 10 mg/kg, methyl parathion is "very highly toxic" to avian species on an acute oral basis. The guideline (71-1) is fulfilled (MRID 00160000).

In addition to acute oral studies, the following dermal studies were available:

Avian Acute Dermal Toxicity

Species	%a.i.	LD50 mg/kg	Toxicity Category	MRID No. Author/Year	Study Classification
Bobwhite Quail (*Colinus virginianus*)	45.42 EC	2.9 (2.3-3.7)	"very highly toxic"	71200/ Beavers/1980	Supplemental
Bobwhite Quail (*Colinus virginianus*)	22.0 Penncap-M	9.127	"very highly toxic"	83103/ Beavers/1980	Supplemental

It appears that dermal toxicity values are nearly the same the acute oral study values. Hence, we assign the same toxicity category of "very highly toxic".

959136

Avian Subacute Dietary Toxicity

Species	% ai	5-Day LC50 (ppm)[1]	Toxicity Category[2]	MRID No. Author/Year	Study Classification
Mallard duck *(Anas platyrhynchos)*	80	336(269-413)	“highly toxic”	00022923 Hill/1975	Core
Mallard duck *(Anas platyrhynchos)*	80	692(5451-892)	“moderately toxic”	00022923 Hill/1975	Core
Mallard duck *(Anas platyrhynchos)*	43.2	898 Product	“slightly toxic”	40809703 Hill/1975	Core
Mallard duck *(Anas platyrhynchos)*	45.42 EC	2500 Product 1100(735-1640) a.i	“slightly toxic”	72382 Good/1979a	Supplemental
Mallard duck *(Anas platyrhynchos*	22 Penncap-M	3850 Product 840(306-2300)a.i.	“moderately toxic”	71199 Good/1979b	Supplemental
Northern bobwhite quail *(Colinus virginianus)*	Tech	28.2(22-35.3)	“very highly toxic”	102329 Pennwalt/ 1972	Supplemental
Northern bobwhite quail *(Colinus virginianus)*	22% Penncap M	33.3(25.1-40.9) Product	“very highly toxic”	102329 Pennwalt/ 1972	Supplemental
Northern bobwhite quail *(Colinus virginianus*)	80	90(73-11)	“highly toxic”	00022923 Hill/1975	Core
Northern bobwhite quail *(Colinus virginianus*)	39.5	114.7(78.1-197.1)	“highly toxic”	44173913 Dreamed/ 1996	Core
Japanese quail (*Coturnix japonica*)	80	79(65-1000)	“highly toxic”	00022923 Hill/1975	Supplemental
Ring-necked Pheasant (*Phasianus colchicus)*	80	91(77-107)	“highly toxic”	00022923 Hill/1975	Core

[1] "Very highly toxic" designates chemicals whose LD_{50} is <10 mg/kg.”Highly toxic” designates chemicals whose LD50 is between 10 and 50 mg/kg. “Moderately toxic designates chemicals whose LD50 is between 51 and 500 mg/kg (Brooks (1973).

Methyl parathion is "very highly toxic" to avian species on a subacute dietary basis. The guideline (71-2) is fulfilled (MRID # 00022923).

Avian Reproduction

Species/ Study Duration	% ai	NOEC (ppm)	LOEC (ppm)	LOEC Endpoints	MRID No. Author/Year	Study Classification
Northern bobwhite quail *(Colinus virginianus)*	Tech	6.27	15.5	Number of eggs laid; eggs set/hen; adult female bodyweight	41179302 Beavers/1988	Core
Northern bobwhite quail *(Colinus virginianus)*	Tech	None	10	Reduced food consumption; Number of eggs laid; Number of 14-d-old chicks	44371608 Bennett/1990	Supplemental
Mallard duck *(Anas platyrhynchos)*	Tech	14.7	None	No effects at highest conc.	41179301 Beavers/1988	Supplemental
Japanese quail (*Coturnix coturnix)*	93.1	12 None	48 3	Cracked eggs, eggs laid, egg weight, 14 day old survivors Brain cholinesterase	44359601 Solecki/1996	Supplemental
Northern bobwhite quail *(Colinus virginianus)*	Penncap-M 21.2%	15	None	-----	0250628 Beavers/1983	Supplemental
Mallard duck *(Anas platyrhynchos)*	Penncap-M 21.2%	15	None	-----	0250628 Beavers/1983	Supplemental

Mammalian Toxicity

Species/ Study Duration	% ai	Test Type	Toxicity Value	Affected Endpoints	MRID No.
laboratory rat 96 hours	80	Oral LD50	3.6 (1.63-7.92) mg/kg ♂ 23.0 (13.7-38.6) mg/kg ♀	Mortality	243414
Laboratory rat 96 hours	Technical	Oral LD50	14.0 (11.02-17.78) mg/kg ♂; 18.5 (11.21-30.53 mg/kg)♀	Mortality	243414
Laboratory rat 96 hours	80 Niran M/8	Oral LD50	10 (N.R.) mg/kg ♂; 15 mg/kg ♀	Mortality	256258
Laboratory rat NR	NR	Oral LD50	weanlings 3.5 (2.8-4.4) mg/kg Adults 5.8 (5.0-6.7) mg/kg	Mortality	NR
Laboratory rat NR	NR	Oral LD50	4.0(NR) mg/kg♂ 6.3(NR) mg/kg ♀	Mortality	256256
Laboratory rat NR	NR	Oral LD50	11(NR) mg/kg♂ 16 (NR) mg/kg♀	Mortality	256257
Laboratory rat NR	NR	Oral LD50	10 (NR) mg/kg♂ 15 (NR) mg/kg♀	Mortality	256258

Mammalian Toxicity

Species/ Study Duration	% ai	Test Type	Toxicity Value	Affected Endpoints	MRID No.
Laboratory rat NR	NR	Oral LD50	11.78 (9.78-14.2)♂ 8.89 (2.56-30.85)♀ 10.73 (6.4-17.98)♂♀	Mortality	256964
Laboratory rat NR	NR	Oral LD50	600 (513-702) mg/kg♂ 660 (545-799) mg/kg♀	Mortality	41805601
Laboratory rat	NR	Dermal LD50	6 mg/kg (NR)	Mortality	(HED chapter)
Rabbit	NR	Dermal LD50	>2000 mg/kg♂♀	Mortality	256256
Rabbit	NR	Dermal LD50	>2000 mg/kg♂♀	Mortality	256257
Rabbit	NR	Dermal LD50	>2000 mg/kg♂♀	Mortality	256258
Rabbit	NR	Dermal LD50	1249 (975-1601)♂ 1782 (1468-2162)♀ 1453 (1150- 1837)♂♀	Mortality	256965
Laboratory rat	NR	Inhalation LC50	<0.163 mg/L	Mortality	256961
Laboratory rat 96 hours	99	Dietary LC50	110 (85-196) ppm	Mortality	43961101 McCann
Laboratory rat	99	Dietary LC50 96 hours LC50	249 (192-334) ppm	Mortality	43961101 McCann

Mammalian Toxicity

Species/ Study Duration	% ai	Test Type	Toxicity Value	Affected Endpoints	MRID No.
Feeding-3 month rat	Technical	Feeding	NOEL=2.5 ppm (converts to 0.25 mg/kg) LEL=25 ppm (2.5 mg/kg) -	Clinical changes (lowered hemacrit; elevated SAP & urine specific gravity; depressed RBC, brain & plasma ChE.)	74299
Feeding - 3 month mice	Technical	Feeding	NOEL< 10 ppm (converts to 1.5 mg/kg/day)	Clincal changes (decr. Body and Testes wt. (No abnormal histopathology) (ChE not measured)	72513
Feeding - 3 month dog	94.32	Feeding	ChE NOEL = 0.3	Clinical changes (mg/kg RBC & plasma ChE.)	72512
Rat 2 generation	95.8	Repro-duction	Reproduction NOEL =5 ppm; Mat. NOEL=5 ppm	Significant decresed pup survival Reduced bodyweight during lactation	00119087

The results indicate that methyl parathion is "very highly toxic" (<10 mg/kg) to small mammals on an acute oral basis (MRID No. 243414), and “highly toxic” to small mammals on an acute dietary basis (MRID No. 43961101). The feeding 3 month NOEL was very low at 2.5 ppm (MRID No.: 74299), and the reproduction NOEL is 5 ppm (MRID No.: 00119087). (Brooks et al. 1973).

Nontarget Insect Toxicity

Species	% ai	Results	MRID No. Author/ Year	Study Classification
Honey bee *(Apis mellifera)*	---	LD50 0.111 μg/bee	44038201 Atkins/ 1981	Core
Honey bee *(Apis mellifera)*	Penncap-M	LD50 0.214 μg/bee	44038201 Atkin/ 1981	Core

Nontarget Insect Toxicity

Species	% ai	Results	MRID No. Author/ Year	Study Classification
Honey bee *(Apis mellifera*	Methyl parathion 450 g/l CS	RT_{25} for 24 hour exposure RT_{25} for 48 hour exposure	441783914 Kovács/ 1996	Core
Honey bee *(Apis mellifera*)	Penncap-M	"The average mortality of the adult honey bees was from 29 to 72 times higher than normal the first 48 hours after pollen containing Penncap -M, stored 13.5 and 14.5 months in the cells of wax combs, was introduced into nucleus colonies. After 1 week adult mortality was still4 to 10 times higher than normal. After 4 weeks, mortality was nearly normal again. . .. Chemical analysis of the stored pollen showed 26 ppm methyl parathion."	160948 Rhodes/ 1980	Supplemental
Honey bee *(Apis mellifera*)	Penncap-M	Damage to colonies and the level of methyl parathion residues in bee and bee products decrease as apiary distance from the treated fields increased.	138662 Ross/ 1980	Supplemental
Honey bee *(Apis mellifera)*	Penncap-M & EC	When blooming sunflowers were treated with microencapsulated methyl parathion (Penncap-M), nearby colonies showed a mean loss of 460 honeybee workers during a 5-day period compared with a mean loss of 1990 bees by colonies near a sunflower field treated with methyl parathion EC. Bees recovered from dead bee traps the day after treatment had 0.27 and 1.28 ppm methyl parathion residues from these two formulations, respectively.	138663 Waller/ 1984	Supplemental
Honey bee *(Apis mellifera*)	Penncap-M	"Colonies fed 10 ppm had significantly ($P<0.05$) fewer frames of adult bees, less sealed brood, and greater mortality of adult bees than treatments fed either lower levels of Penncap-M, or the control... However, emulsifiable concentrate methyl parathion is more toxic than Penncap-M when fed in the hive. Queens did not die from poisoning when 10 ppm Penncap-M was fed to the adult populations of workers, but rather from lack of care or feeding by attendants."	138665 Stoner/ 1984	Supplemental
Honey bee *(Apis mellifera*)	Penncap-M	Application of Penncap-M to corn (1 lb a.i. in 2 gal. water per acre) immediately increased the number of dead bees in front of nearby colonies on day 1; there was a further increase on day 2. Numbers of dead bees declined rapidly from day 3 onward.	138667 Smith/ 1984	Supplemental

The results indicate that methyl parathion is very highly toxic to bees on acute contact basis. These studies show that under fields conditions mortality will occur. Additional

Freshwater Fish Acute Toxicity

Species/	% ai	96-hour LC50 (ppm)	Toxicity Category	MRID No. Author/Year	Study Classification
Rainbow trout *(Oncorhynchus mykiss)*	Technical 75.1	7.5(6.2-9.1)a.i	"moderately toxic"	250628 Bailey/1983	Core

Freshwater Fish Acute Toxicity

Species/	% ai	96-hour LC50 (ppm)	Toxicity Category	MRID No. Author/Year	Study Classification
Rainbow trout *(Oncorhynchus mykiss)*	90	3.7(3.13-4.38)	"moderately toxic"	40094602 Johnson/1980	Core
Rainbow trout *(Oncorhynchus mykiss)*	43.2	2.2(1.5-2.7)	"moderately toxic"	40932101 Surprenant/1988	Core
Rainbow trout *(Oncorhynchus mykiss)*	21.2 Penncap M	6.44(5.1-8.2)	"moderately toxic"	250628 Bailey/1983	Core
Rainbow trout *(Oncorhynchus mykiss)*	22 Penncapp M	161(N.R.) Assume Product	"moderately toxic"	00061214 Kuc/1977	Supplemental
Brown Trout (*Salmo trutta*)	90	4.7(3.9-5.75)	"moderately toxic"	40094602 Johnson/1980	Core
Lake Trout (*Salvelinus namaycush*)	90	3.78(2.81-5.09)	"moderately toxic"	40094602 Johnson/1980	Core
Coho Salmon (*Oncorhychus kisutch*)	90	5.3(4.9-5.6)	"moderately toxic"	40094602 Johnson/1980	Core
Cutthroat Trout (*Oncorhynchus clarki)*	90	1.85(1.39-2.47)	"moderately toxic"	40094602 Johnson/1980	Core
Bluegill sunfish *(Lepomis macrochirus)*	77	1.0(0.6-1.6)	"moderately toxic"	40098001 Mayer/1986	Core
Bluegill sunfish *(Lepomis macrochirus)*	90	4.38(3.48-5.51)	"moderately toxic"	40094602 Johnson/1980	Core
Bluegill sunfish *(Lepomis macrochirus)*	44	24 hr 6.47(N.R.)	"moderately toxic"	44352001 McCann/1972	Supplemental
Bluegill sunfish *(Lepomis macrochirus)*	80	2.4(N.R.)	"moderately toxic"	35796 Pickering/1962	Core
Bluegill sunfish *(Lepomis macrochirus)*	22 Penncap M	13.3(N.R.) Assume Product	"slightly toxic"	00061214 Kuc/1977	Supplemental
Bluegill sunfish *(Lepomis macrochirus*)	44.6	11.2(10.6-11.8) Product	"slightly toxic"	76148 McCann/1968	Core
Bluegill sunfish *(Lepomis macrochirus*)	44.6	24 hr 14.5(N.R.)	"slightly toxic"	46110 McCann/1968	Core
Green sunfish (*Lepomis cyanellus)*	90	6.86(5.59-8.42)	"moderately toxic"	40094602 Johnson/1980	Supplemental
Green sunfish (*Lepomis cyanellus)*		>5 (N/A)	"moderately toxic"	44378608	Supplemental
Fathead minnow (*Pimephales promelas*)	77	7.2(5.7-9.1)	"moderately toxic"	40098001 Mayer/1986	Core
Fathead minnow (*Pimephales promelas*)	90	8.9(7.78-10.2)	"moderately toxic"	40094602 Johnson/1980	Supplemental
Fathead minnow (*Pimephales promelas*)	80	10.4 (N.R.)	"slightly toxic"	57051 Henderson/1957	Core

Freshwater Fish Acute Toxicity

Species/	% ai	96-hour LC50 (ppm)	Toxicity Category	MRID No. Author/Year	Study Classification
Fathead minnow (*Pimephales promelas*)	80	9.4(N.R.)	“moderately toxic”	57051 Henderson/1957	Core
Fathead minnow (*Pimephales promelas)*	80	9.5(N.R.)	“moderately toxic”	35796 Pickering/1962	Core
Fathead minnow (*Pimephales promelas)*	98% 4-Nitro-phenol	58.6 (56.2-61.1)	“slightly toxic”	Geiger/1985	Supplemental
Fathead minnow (*Pimephales promelas)*	98% 4-Nitro-phenol	41 (37.7-44.6)	“slightly toxic”	Geiger/1985	Supplemental
Fathead minnow (*Pimephales promelas)*	98% 4-Nitro-phenol	37.3 (34.4-40.5)	“slightly toxic”	Geiger/1985	Supplemental
Mosquitofish (*Gambusia affinis*)	99	13.4813.2-13.7)	“slightly toxic”	44338801 Chambers/1974	Supplemental
Largemouth bass (*Micropterus salmoides*)	90	5.22(4.32-6.31)	“moderately toxic”	40094602 Johnson/1980	Supplemental
Yellow perch (*Perca flavescens*90)	90	3.06(2.53-3.7)	“moderately toxic”	40094602 Johnson/1980	Supplemental
Goldfish (*Carassius auratus*)	90	9.0(8.1-9.9)	“moderately toxic”	40094602 Johnson/1980	Supplemental
Carp (*Cyprinus carpio*)	90	7.13(6.44-7.87)	“moderately toxic”	40094602 Johnson/1980	Supplemental
Bullhead catfish (*Ictalurus melas)*	90	6.64(4.97-8.88)	“moderately toxic”	40094602 Johnson/1980	Supplemental
Channel catfish *(Ictalurus punctatus)*	90	5.24(4.27-6.44)	“moderately toxic”	40094602 Johnson/1980	Core
Chorus frog (*Pseudacris triseriata*)	90	3.7(N.R.)	“moderately toxic”	40098001 Mayer/1986	Supplemental

[1] Brooks (et al.,1973) toxicity classification indicates that LC50 values >1 to 10 ppm are "moderately toxic".

Because these LC_{50} fall in the range of >1 to 10 ppm, methyl parathion is "moderately toxic" to freshwater fish on an acute basis. The guideline (72-1) is fulfilled (MRID# Acc# 40094602, 40098001, and ESVIIF5).

Freshwater Fish Early Life-Stage Toxicity Under Flow-through Conditions

Species/ Study Duration	% ai	NOEC/LOEC (ppm)	MATC[1] (ppm)	Endpoints Affected	MRID No. Author/Year	Study Classification
Fathead Minnow (*Pimephales promelas*)	80	0.31/0.38	0.34	Weight	233438 Jarvinen/1988	Core
Fathead Minnow (*Pimephales promelas*)	Penn-cap M	0.38/0.59	0.47	Weight	233438 Jarvinen/1988	Core
Rainbow trout (*Oncorhynchus mykiss*)	Tech-nical 75.1	<0.08	---	Length and weight	250628 Bailey/1983	Supplemental
Rainbow trout (*Oncorhynchus mykiss*)	21.2 Penn-cap M	<0.1	0.141	Length and weight	250628 Bailey/1983	Supplemental

[1] defined as the geometric mean of the NOEC and LOEC.

Freshwater Invertebrate Acute Toxicity

Species	% ai	48-hour LC50/ EC50 (ppb)	Toxicity Category	MRID No. Author/Year	Study Classification
Waterflea *(Daphnia magna)*	90	0.14(0.09-0.2)	"very highly toxic"	40094602 Johnson/1980	Core
Waterflea *(Daphnia magna)*	43.1	8.7(6.4-11)	"very highly toxic"	40932102 Roberts/1988	Supplemental
Waterflea *(Daphnia magna)*	22 ME	28.2(N.R.)	"very highly toxic"	022397 Vilkas/1977	Supplemental
Daphnid (*Simocephalus serrulatus*)	90	0.37(0.23-0.57)	"very highly toxic"	40094602 Johnson/1980	Core
Scud (*Gammarus fasciatus*)	90	96 hour 3.8(2.6-5.5)	"very highly toxic"	40094602 Johnson/1980	Supplemental
Crayfish (*Orconectes nais*)	90	15(N.R.)	"very highly toxic"	40094602 Johnson/1980	Supplemental
Shrimp (*Palaemonetes kadiakensis*,Bluff Lake strain)	Technical	24 hr 3.7 (2.1-5.5)	"very highly toxic"	41237806 Naqvi/1970	Supplemental
Shrimp (*Palaemonetes kadiakensis*, Hollandale strain)	Technical	24 hr 14.1 (11.3-17.0)	"very highly toxic"	41237806 Naqvi/1970	Supplemental
Shrimp (*Palaemonetes kadiakensis*, Belzoni strain)	Technical	24 hr 23.2 (18.8-2.81	"very highly toxic"	41237806 Naqvi/1970	Supplemental

Freshwater Invertebrate Acute Toxicity

Shrimp (*Palaemonetes kadiakensis*, Sky Lake strain)	Technical	24 hr 2.5 (1.4-3.9)	:very highly toxic”	41237806 Naqvi/1970	Supplemental
Copepod (*Acaris tonsa*)	99	28(16-49)	“very highly toxic”	40228401	Supplemental
Mayfly (*Hexagenia sp*.)	93.1	17 (9.8-27)	“very highly toxic”	43491401 Putt/1994	Supplemental
Damselfly (*Ischnura sp.*)	90	33(N.R.)	“very highly toxic”	40094602 Johnson/1980	Supplemental

[1] Brooks (et al., 1973) classification indicates the LC50 of 0.1 to 1 ppm are in the "highly toxic" range and those greater than 1 to 10 ppm are in the "moderately toxic" range.

Because the LC_{50}/EC_{50} falls in the range of < 100 ppb, methyl parathion is in the "very highly toxic" range for aquatic invertebrates on an acute basis.

Freshwater Aquatic Invertebrate Life-Cycle Toxicity

Species/ Flow-through)	% ai	21-day NOEC/LOEC (ppb)	MATC[1,2] (ppb)	Endpoints Affected	MRID No. Author/Year	Study Classification
Waterflea (*Daphnia magna*)	96	0.178/0.562	0.3407	Survival, growth, and offspring/parent daphnia	41506801 Heimbach/1987	Supplemental
Waterflea (*Daphnia magna)*	95.7	0.43/0.85	0.6046	Survival, weight, first brood day	43035401 Blasberg/1993	Supplemental
Waterflea (*Daphnia magna*	21.2 Penncap-M	0.25/0.55	0.3708	Length	250628 Bailey/1983	Core
Waterflea (*Daphnia magna)*	75.1 Technical	0.16/2.51	0.6337	Young produced/ reproductive day and average No. of young produced	250628 Bailey/1983	Core
Waterflea (*Daphnia magna)*	80%	0.02/0.25	0.22	Neonates produced, survival, growth (length)	44371716 Fernںndez-Casalderrey	Supplemental

[1] defined as the geometric mean of the NOEC and LOEC.

Estuarine/Marine Fish Acute Toxicity

Species	% ai	96-hour LC50 ppm	Toxicity Category	MRID No. Author/Year	Study Classification
Spot (*Leiostmous xanthurus*)	99	0.059 (0.045-0.074)	" very highly toxic"	40228401 Mayer/1986	Supplemental
Spot (*Leiostmous xanthurus*)	99	0.093 (0.056- 0.32)	"very highly toxic"	40228401 Mayer/1986	Supplemental
Striped bass (*Morone saxatilis*	80	0.79 (0.17-1.4)	"highly toxic"	05000819 Korn/1974	Core
Sheepshead minnow (*Cyprinodon variegatus*)	43.2	3.4 (2.8-4.1)	"moderately toxic"	40932103 Surprenant/1988	Core
Sheepshead minnow (*Cyprinodon variegatus*)	90	12.0 (10-40.0)	"slightly toxic"	40228401 Mayer/1986	Core
Sheepshead minnow (*Cyprinodon variegatus*)	99	48 hr 0.8 (NR)	"highly toxic"	40228401 Mayer/1986	Supplemental
Mosquito fish (*Gamgusia affinis*)	99	13.48 (13.24-13.72)	"slightly toxic"	44338801 Chambers/1974	Supplemental

[1] Brooks (et al.,1973) classification indicates that LC50s greater than 1 to 10 ppm are "moderately toxic".

Methyl parathion is "moderately toxic" to estuarine/marine fish on an acute basis.

Estuarine/Marine Invertebrate Acute Toxicity

Species/Static or Flow-through	% ai.	96-hour LC50/EC50 (ppb) (measured)	Toxicity Category[1]	MRID No. Author/Year	Study Classification
Eastern oyster (*Crassostrea virginica)*	99	12000 (10000-16000)	"slightly toxic"	40228401 Mayer/1986	Core
Eastern oyster (*Crassostrea virginica)*	99	>800 (N.R.)	"highly toxic"	40228401 Mayer/1986	Core
Mysid (*Americamysis bahia)*	43.2	0.35 (0.31-0.39)	"very highly toxic"	40932104 Surprenant/1988	Core
Mysid (*Americamysis bahia)*	99	0.78 (0.58-1.1)	"very highly toxic"	40228401 Mayer/1986	Core
Mysid (*Americamysis bahia)*	99	0.98 (0.81-1.2)	"very highly toxic"	40228401 Mayer/1986	Core
Pink Shrimp (*Penaeus duorarum*)	99	1.2 (0.91-1.4)	"very highly toxic"	40228401 Mayer/1986	Supplemental
Pink Shrimp (*Penaeus duorarum*)	99	1.9 (1.5-2.7)	"very highly toxic"	40228401 Mayer/1986	Supplemental
White Shrimp (*Penaeus stylirostris)*	99	1.4 (1.3-1.6)	"very highly toxic"	40228401 Mayer/1986	Core
Brown Shrimp (*Penaeus aztecus*)	99	2.6 (N.R.)	"very highly toxic"	40228401 Mayer/1986	Supplemental
Glass shrimp (*Palaemonetes kadiakensis*)	Tech	2.5 (1.4-3.9)	"very highly toxic"	40228401???/ Mayer/1986	Supplemental

Estuarine/Marine Invertebrate Acute Toxicity

Species/Static or Flow-through	% ai.	96-hour LC50/EC50 (ppb) (measured)	Toxicity Category[1]	MRID No. Author/Year	Study Classification
Copepod (*Acartia tonsa*)	99	28(16-49)	"very highly toxic"	40228401 Mayer/1986	Supplemental

[1] Based on Brook's (et al. 9173) toxicity categories indicate that chemicals with an LC50 < 0.1 ppm are "very highly toxic" and those between 10 and 100 ppm are "slightly toxic" .

Because the methyl parathion LC_{50}/EC_{50}s fall in the range of >0.1-1 ppm, methyl parathion is "highly toxic" to estuarine/marine invertebrates on an acute basis.

Estuarine/Marine Invertebrate Life-Cycle Toxicity

Species/(Static Renewal or Flow-through)	% ai	21-day NOEC/LOEC (ppb)	MATC[1] (ppm)	Endpoints Affected	MRID No. Author/Year	Study Classification
Mysid *(Americamysis bahia)*		0.11/0.37	0.20	Survival and Number of offspring/♀	Lowe 66341/1981	Supplemental

[1] defined as the geometric mean of the NOEC and LOEC.

Nontarget Aquatic Plant Toxicity (Tier II)

Species	% ai	EC50/ (ppm)	MRID No. Author/Year	Study Classification
Nonvascular Plants				
Marine diatom (*Skeletonema costatum*)	99	5.3 (4.3-5.7)	Lowe 66341/1981	Supplemental

Methyl parathion is "practically non-toxic" *to Skeletoma costatum.*