

APPENDIX J. Acute Toxicity Values for Freshwater Fish and Invertebrates

Table J-1. Summary of Acute Toxicity Values for Freshwater Fish.

Species	Compound (% a.i.)	LC50 (96-h)	95% C.I. ppb	MRID	Classification	Notes:
<i>Salmo salar</i> Atlantic salmon	99	560	460-690	400980-01	Supplemental	Temp = 17C pH = 7.5 Hardness = 40 mg/L
		640	500-830	400980-01	Supplemental	Temp = 12C pH = 6.0 Hardness = 40 mg/L
		700	570-870	400980-01	Supplemental	Temp = 12C pH = 6.5 Hardness = 40 mg/L
		1000	830-1200	400980-01	Supplemental	Temp = 12C pH = 7.5 Hardness = 12 mg/L
		1050	950-1160	400980-01	Supplemental	Temp = 12C pH = 8.5 Hardness = 40 mg/L
		1120	930-1350	400980-01	Supplemental	Temp = 12C pH = 7.5 Hardness = 40 mg/L
		1150	980-1360	400980-01	Supplemental	Temp = 12C pH = 7.5 Hardness = 40 mg/L
		1220	1080-1380	400980-01	Supplemental	Temp = 12C pH = 7.5 Hardness = 40 mg/L
	29	1200	1050-1380	400980-01	Supplemental	Temp = 12C pH = 7.5 Hardness = 40 mg/L
	24	1400	1250-1570	400980-01	Supplemental	Temp = 12C pH = 7.5 Hardness = 40 mg/L
<i>Lepomis macrochirus</i> Bluegill sunfish	95	480	320-710	400980-01	Supplemental	Temp = 17C pH = 6.5 Hardness = 40 mg/L
		600	420-860	400980-01	Supplemental	Temp = 17C pH = 7.5 Hardness = 40 mg/L
		620	370-1040	400980-01	Supplemental	Temp = 17C pH = 8.5 Hardness = 40 mg/L
		840	530-1340	400980-01	Supplemental	Temp = 17C pH = 7.4 Hardness = 320 mg/L

Species	Compound (% a.i.)	LC50 (96-h)	95% C.I. ppb	MRID	Classification	Notes:
		860	644-1150	400980-01	Supplemental	Temp = 22C pH = 7.4 Hardness = 40 mg/L
		940	650-1360	400980-01	Supplemental	Temp = 17C pH = 6.0 Hardness = 40 mg/L
		1050	859-1280	400980-01	Supplemental	Temp = 20C pH = 7.2 Hardness = 40 mg/L
		1150	928-1420	400980-01	Supplemental	Temp = 17C pH = 7.4 Hardness = 40 mg/L
		1200	820-1760	400980-01	Supplemental	Temp = 17C pH = 7.4 Hardness = 40 mg/L
		2000	1430-2800	400980-01	Supplemental	Temp = 12C pH = 7.4 Hardness = 40 mg/L
	29	670	428-1048	400980-01	Supplemental	Temp = 17C pH = 7.4 Hardness = 44mg/L
		670	428-1048	400980-01	Supplemental	Temp = 22C pH = 7.4 Hardness = 40 mg/L
	24	370	262-522	400980-01	Supplemental	Temp = 20C pH = 7.4 Hardness = 40 mg/L
		430	310-590	400980-01	Supplemental	Temp = 27C pH = 7.4 Hardness = 40 mg/L
		560	420-750	400980-01	Supplemental	Temp = 17C pH = 7.4 Hardness = 40 mg/L
		560	380-830	400980-01	Supplemental	Temp = 22C pH = 7.4 Hardness = 40 mg/L
		600	496-725	400980-01	Supplemental	Temp = 22C pH = 7.4 Hardness = 40 mg/L
		710	561-898	400980-01	Supplemental	Temp = 20C pH = 7.2 Hardness = 40 mg/L
		1200	924-1560	400980-01	Supplemental	Temp = 17C pH = 7.4 Hardness = 40 mg/L
		1800	1300-2400	400980-01	Supplemental	Temp = 12C pH = 7.4 Hardness = 40 mg/L

Species	Compound (% a.i.)	LC50 (96-h)	95% C.I. ppb	MRID	Classification	Notes:
		2800	2500-3200	400980-01	Supplemental	Temp = 22C pH = 7.4 Hardness = 272 mg/L
	degradate	462,000	430,000 - 486,000	00009061	Supplemental	Test compound is a degradate of methomyl
<i>Salvelinus fontinalis</i> Brook trout	99	1500	1230-1830	400980-01	Supplemental	Temp = 12C pH = 7.5 Hardness = 40 mg/L
		2200	1600-3010	400980-01	Supplemental	Temp = 12C pH = 7.5 Hardness = 40 mg/L
	24	1220	860-1730	400980-01	Supplemental	Temp = 12C pH = 7.5 Hardness = 40 mg/L
<i>Ictalurus punctatus</i> Channel catfish	95	530	375-748	400980-01	Supplemental	Temp = 22C pH = 7.4 Hardness = 40 mg/L
	24	320	200-430	400980-01	Supplemental	Temp = 22C pH = 7.4 Hardness = 40 mg/L
		<560	N/A	400980-01	Supplemental	Temp = 25C pH = 7.4 Hardness = 40 mg/L swim-up fry tested
		760	635-909	400980-01	Supplemental	Temp = 22C pH = 7.4 Hardness = 40 mg/L fingerlings tested
		1800	1300-2400	400980-01	Supplemental	Temp = 25C pH = 7.4 Hardness = 40 mg/L yolk-sac fry tested
<i>Pimephales promelas</i> Fathead minnow	99	2800	1800-4300	400980-01	Supplemental	Temp = 17C pH = 7.4 Hardness = 45 mg/L
	29	1500	900-2500	400980-01	Supplemental	Temp = 17C pH = 7.2 Hardness = 46 mg/L
	24	1800	1200-2700	400980-01	Supplemental	Temp = 12C pH = 7.2 Hardness = 40 mg/L
<i>Micropterus salmoides</i> Largemouth bass	95	1250	971-1610	400980-01	Supplemental	Temp = 22C pH = 7.2 Hardness = 40 mg/L
	24	760	589-979	400980-01	Supplemental	Temp = 22C pH = 7.2 Hardness = 40 mg/L
<i>Oncorhynchus mykiss</i> Rainbow trout	95	860	590-1260	400980-01	Supplemental	Temp = 17C pH = 7.4 Hardness = 40 mg/L

Species	Compound (% a.i.)	LC50 (96-h)	95% C.I. ppb	MRID	Classification	Notes:
		1050	670-1630	400980-01	Supplemental	Temp = 12C pH = 7.4 Hardness = 40 mg/L
		1100	760-1600	400980-01	Supplemental	Temp = 12C pH = 7.5 Hardness = 40 mg/L
		1200	780-1860	400980-01	Supplemental	Temp = 12C pH = 8.5 Hardness = 40 mg/L
		1400	950-2000	400980-01	Supplemental	Temp = 12C pH = 7.4 Hardness = 320 mg/L
		1500	1100-2000	400980-01	Supplemental	Temp = 12C pH = 6.5 Hardness = 40 mg/L
		1600	1190-2150	400980-01	Supplemental	Temp = 12C pH = 7.2 Hardness = 40 mg/L
		1700	1180-2440	400980-01	Supplemental	Temp = 12C pH = 7.4 Hardness = 40 mg/L
		2000	1430-2790	400980-01	Supplemental	Temp = 7C pH = 7.4 Hardness = 40 mg/L
	29	1200	764-1880	400980-01	Supplemental	Temp = 12C pH = 7.4 Hardness = 40 mg/L
	24	1200	1100-1400	400980-01	Supplemental	Temp = 12C pH = 7.2 Hardness = 40 mg/L
		1300	960-1600	400980-01	Supplemental	Temp = 12C pH = 7.4 Hardness = 40 mg/L Swim-up fry tested
		1400	1100-1600	400980-01	Supplemental	Temp = 12C pH = 7.2 Hardness = 40 mg/L
		1400	1100-1600	400980-01	Supplemental	Temp = 12C pH = 7.2 Hardness = 40 mg/L 1-day degradation
		1400	1100-1600	400980-01	Supplemental	Temp = 12C pH = 7.2 Hardness = 40 mg/L 3-day degradation
		1400	1100-1790	400980-01	Supplemental	Temp = 17C pH = 7.2 Hardness = 40mg/L

Species	Compound (% a.i.)	LC50 (96-h)	95% C.I. ppb	MRID	Classification	Notes:
		1500	800-2800	400980-01	Supplemental	Temp = 12C pH = 7.2 Hardness = 40 mg/L 7-day degradation
		2000	1510-2640	400980-01	Supplemental	Temp = 12C pH = 7.2 Hardness = 40 mg/L
		2100	1610-2730	400980-01	Supplemental	Temp = 10C pH = 7.2 Hardness = 40 mg/L
		2300	1770-2980	400980-01	Supplemental	Temp = 10C pH = 7.2 Hardness = 40 mg/L
		>2500	N/A	400980-01	Supplemental	Temp = 12C pH = 7.4 Hardness = 272 mg/L Flow-through test
		3200	2300-4500	400980-01	Supplemental	Temp = 12C pH = 7.2 Hardness = 40 mg/L Yolk-sac fry
		32,000	18,000- 50,000	400980-01	Supplemental	Temp = 10C pH = 7.2 Hardness = 40 mg/L Eyed egg tested

Table J-2. Summary of Acute Toxicity Values for Freshwater Invertebrates.

Species	Compound (% a.i.)	LC50		95% C.I. ppb	MRID	Toxicity	Classification	Notes:
		48-h	96-h					
<i>Chironomus plumosus</i> Midge	95	88	--	60-129	400980-01	Very highly toxic	Supplemental	Temp = 22C pH = 7.4 Hardness = 40 mg/L
	24	32	--	13-80	400980-01	Very highly toxic	Supplemental	Temp = 20C pH = 7.4 Hardness = 272 mg/L
<i>Daphnia magna</i> Water flea	95	8.8	–	4.1-19	400980-01	Very highly toxic	Supplemental	Temp = 21C pH = 7.4 Hardness = 272 mg/L
	>99	31.7	–	29.5-34.1	19977	Very highly toxic	Acceptable	Temp = 20C pH = 6.8-8.6 Hardness = 92.8 mg/L
	24	5.0	–	4.8-12.1	400980-01	Very highly toxic	Supplemental	Temp = 20C pH = 7.2 Hardness = 40 mg/L
<i>Gammarus pseudolimnaeus</i> scud	99	--	920	680-1240	400980-01	Highly toxic	Supplemental	Temp = 17C pH = 7.1 Hardness = 40 mg/L
	24	--	720	572-907	400980-01	Highly toxic	Supplemental	Temp = 17C pH = 7.4 Hardness = 40 mg/L
		--	1050	839-1315	400980-01	Moderately toxic	Supplemental	Temp = 12C pH = 7.4 Hardness = 274 mg/L Flow-through test
		1050	--	424-2600	400980-01	Moderately toxic	Supplemental	Temp = 12C pH = 7.2 Hardness = 40 mg/L
		1050	--	328-3360	400980-01	Moderately toxic	Supplemental	Temp = 12C pH = 7.2 Hardness = 40 mg/L 1-day degradation
		750	--	342-1646	400980-01	Highly toxic	Supplemental	Temp = 12C pH = 7.2 Hardness = 40 mg/L 3-day degradation

Species	Compound (% a.i.)	LC50		95% C.I. ppb	MRID	Toxicity	Classification	Notes:
		48-h	96-h					
		340	--	194-594	400980-01	Highly toxic	Supplemental	Temp = 12C pH = 7.2 Hardness = 40 mg/L 7-day degradation
<i>Isogenus</i> sp. Stonefly	95	–	343	268-440	400980-01	Highly toxic	Supplemental	Temp = 7.0C pH = 7.5 Hardness = 42 mg/L
	24	–	29	21-41	400980-01	Very highly toxic	Supplemental	Temp = 7.0C pH = 7.5 Hardness = 42 mg/L
<i>Pteronarcella badia</i> Stonefly	95	--	69	44-108	400980-01	Very highly toxic	Supplemental	Temp = 7.0C pH = 7.5 Hardness = 40 mg/L
	24	--	60	45-80	400980-01	Very highly toxic	Supplemental	Temp = 7.0C pH = 7.5 Hardness = 40 mg/L
<i>Skwala</i> sp. Stonefly	95-98	–	34	N/A	400946-02	Very highly toxic	Acceptable	Temp = 7.0C pH = N/A Hardness = N/A
	24	–	29	N/A	400946-02	Very highly toxic	Acceptable	Temp = 7.0C pH = N/A Hardness = N/A