

**Table 2**  
**Ecotoxicity Data Summary Table**  
***Bacillus thuringiensis israelensis* (Bti)**

Receptor Group	Common Name	Species Name	Effects Category	Study Duration	Endpoint	Route of Administration	Result	Units	Notes	Source
<b>Terrestrial wildlife</b>										
Mammals	rat	NR	acute	--	LD <sub>50</sub>	--	nontoxic		no adverse effects at doses up to 4.7E+11 spores/kg	USEPA OPP
		NR	acute	--	LD <sub>50</sub>	oral	> 5,000	mg/kg bw d		Weschester DGEIS 2001
		NR	acute	--	LD <sub>50</sub>	oral	2,650	mg/kg bw d		Weschester DGEIS 2001
		--	chronic	--	--	--	nontoxic	--	--	USEPA OPP
Birds	bobwhite quail	<i>Colinus virginianus</i>	acute/subacute	5 day	LD <sub>50</sub>	oral	nontoxic	--	practically nontoxic at 3.1 g/kg/day	USEPA OPP
			chronic	5 day	--	--	no effect	--	no effect; 3.4 - 6.2E11 cfu/kg/day	Weschester DGEIS 2001
	mallard	<i>Anas platyrhynchos</i>	acute/subacute	5 day	LD <sub>50</sub>	oral	nontoxic	--	practically nontoxic at 3.1 g/kg/day	USEPA OPP
			chronic	5 day	--	--	no effect	--	no effect; 3.4 - 6.2E11 cfu/kg/day	Weschester DGEIS 2001
Reptiles	--	--	--					No Data Identified	--	
Non-target insects	honeybee	NR	acute	5 day	LC <sub>50</sub>	oral	nontoxic		no adverse effects up to 7E+7 cfu/g diet	USEPA OPP
Plants	--	--	--						No Data Identified	--
<b>Aquatic wildlife</b>										
Fish	bluegill	<i>Lepomis macrochirus</i>	acute	NR	LC <sub>50</sub>	aqueous	nontoxic	--	no adverse effects up to 4.9 uL/L	USEPA OPP
			acute	NR	LC <sub>50</sub>	oral	nontoxic	--	no adverse effects up to 2.5 ng/l food	USEPA OPP
			chronic	--	--	--	nontoxic	--	--	USEPA OPP
	mummichog	<i>Fundulus heteroclitus</i>	acute	96 hr	LC50	oral	980	mg/L	--	Brown 1998
	sheepshead minnow	<i>Cyprinodon variegatus</i>	acute	NR	NOAEL	oral	nontoxic	--	no adverse effects up to 2E+10 cfu/g food; oral LC <sub>50</sub> > 2E10 cgu/g food	USEPA OPP
Amphibians	--	--	--					No Data Identified	--	
Crustaceans	daphnid	<i>Daphnia pulex</i>	acute	21 day	LC <sub>50</sub>	aqueous	5 - 50	ppm	--	USEPA OPP
	grass shrimp		chronic	NR	NOAEL	aqueous	nontoxic	--	no adverse effects up to 2E+10 cfu/g food	USEPA OPP
	crayfish	NR	acute	96 hr	LC <sub>50</sub>	aqueous	103	ppm	--	Weschester DGEIS 2001
	copepod	NR	chronic	NR	NOEC	in sediment	50	mg/kg sediment	estuarine/marine copepod	USEPA OPP
Aquatic insects/larvae	mayfly	<i>Ephemoptera</i> sp.	--	--	--	--	nontoxic	--	--	USEPA OPP
Mollusks	--	--	--					No Data Identified	--	
Aquatic plants	--	--	--					No Data Identified	--	

## Notes:

-- = Not applicable

LOAEC = Lowest observable adverse effect concentration

LOAEL = Lowest observable adverse effect level

LOEC = Lowest observable effect concentration

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Weschester DGEIS 2001 = Westchester County Board of Health, 2001. Comprehensive Mosquito-Borne Disease Surveillance and Control Plan Draft Generic Environmental Impact Statement. Westchester County, NY.

**Table 3  
Ecotoxicity Data Summary Table  
*Bacillus sphaericus* (Bs)**

Receptor Group	Common Name	Species Name	Effects Category	Study Duration	Endpoint	Route of Administration	Result	Units	Notes	Source
<b>Terrestrial wildlife</b>										
Mammals	rat	NR	acute	--	LD50	--	nontoxic	--	no adverse effects at doses up 5,000 mg/kg	USEPA OPP
		--	chronic	--	--	--	nontoxic	--	--	USEPA OPP
Birds	mallard	<i>Anas platyrhynchos</i>	acute	5 day	LD50	oral	nontoxic	--	no adverse effects at doses up 9,000 mg/kg	Weschester DGEIS 2001
			chronic	30 day	NOAEL	oral	nontoxic	--	no effect, 30-day 20% (wt./wt.) diet (technical material)	Weschester DGEIS 2001
Reptiles	--	--	--	--	--	--	--	No Data Identified		--
Non-target insects	honeybee	NR	chronic	28 day	NOAEL	solution	nontoxic	--	no effect, 28-day exposure to 1x10 <sup>4</sup> - 1x10 <sup>8</sup> spores/ml	Weschester DGEIS 2001
Plants	--	--	--	--	--	--	--	No Data Identified		--
<b>Aquatic wildlife</b>										
Fish	bluegill	<i>Lepomis macrochirus</i>	acute	96 hr	LC50	aqueous	nontoxic	--	no adverse effects up to 15.5 mg/L	Weschester DGEIS 2001
			chronic	96 hr	NOEC	aqueous	nontoxic	--	no adverse effects up to 15.5 mg/L	Weschester DGEIS 2001
	sheepshead minnow	<i>Cyprinidon variegatus</i>	acute	96 hr	LC50	aqueous	nontoxic	--	no adverse effects up to 71 mg/L	Weschester DGEIS 2001
			chronic	96 hr	NOEC	aqueous	nontoxic	--	no adverse effects up to 22 mg/L	Weschester DGEIS 2001
Amphibians	--	--	--	--	--	--	--	No Data Identified		--
Crustaceans	freshwater shrimp	NR	acute	96 hr	LC50	aqueous	71	mg/L	--	Weschester DGEIS 2001
			chronic	96 hr	NOEC	oral	50	mg/L	--	Weschester DGEIS 2001
	cladoceran	NR	acute	48 hr	LC50	aqueous	nontoxic	--	no adverse effects up to 15.5 mg/L	Weschester DGEIS 2001
Aquatic insects/larvae	mayfly	<i>Ephemoptera</i> sp.	acute	NR	LC50	aqueous	nontoxic	--	no adverse effects up to 15.5 mg/L	Weschester DGEIS 2001
Mollusks	daphnid	NR	acute	96 hr	LC50	aqueous	nontoxic	--	no adverse effects up to 42 mg/L	Weschester DGEIS 2001
Aquatic plants	--	--	--	--	--	--	--	No Data Identified		--

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**Table 4  
Ecotoxicity Data Summary Table  
Methoprene**

Receptor Group	Common Name	Species Name	Effects Category	Study Duration	Endpoint	Route of Administration	Result	Units	Notes	Source
<b>Terrestrial wildlife</b>										
Mammals	rat	NR	acute	--	LD50	oral	nontoxic	--	no adverse effects at doses up to 10,000 mg/kg	USEPA OPP
		NR	chronic	90 day	LOAEL	oral	1,000	ppm	--	USEPA OPP
		NR	subchronic	21 day	LOAEL	inhalation	20	mg/L	value represents highest does tested	Weschester DGEIS 2001
Birds	bobwhite quail	<i>Colinus virginianus</i>	chronic	NR	NOEC	oral	30	ppm	no effect level for reproduction	Weschester DGEIS 2001
	mallard	<i>Anas platyrhynchos</i>	acute	NR	LD50	oral	nontoxic	--	nontoxic at concentrations up to 2,000 mg/kg	Weschester DGEIS 2001
			subacute		LD50	oral	nontoxic	--	nontoxic at concentrations up to 10,000 mg/kg	Weschester DGEIS 2001
Reptiles	--	--	--				No Data Identified			--
Non-target insects	honeybee	NR	acute	24 hr	NOEC	oral/topical	nontoxic	--	no effect, 1,000 ppm exposure (65.5% formulation eliminated brood production, 10% mortality, 24-hour exposure to oral and topical combination with 1000 ug/insect)	Weschester DGEIS 2001
	dragonfly	NR	subchronic	168 hr	>50% mortality	NR	0.05	ppm	test conducted on dragonfly nymphs	Weschester DGEIS 2001
Plants	--	--	--				No Data Identified			--
<b>Aquatic wildlife</b>										
Fish	bluegill	<i>Lepomis macrochirus</i>	acute	48 hr	LC50	aqueous	4.62	ppm	--	Weschester DGEIS 2001
			chronic	96 hr	LC50	aqueous	1.52	ppm	--	USEPA OPP
	mummichog	<i>Fundulus heteroclitus</i>	acute	96 hr	LC50	aqueous	125	ppm	--	Weschester DGEIS 2001
Amphibians	leopard frog	<i>Rana pipiens</i>	subchronic	NR	no effect	NR	nontoxic	--	no effect at highest dose of 1.31 ppm	USEPA OPP
			subchronic	NR	LOAEL	NR	0.720	ppm	reduced body weight and delayed development	USEPA OPP
Crustaceans	daphnid	<i>Daphnia pulex</i>	acute	48 hr	EC50	aqueous	0.089	ppm	--	USEPA OPP
			chronic	42 day	LOAEC	aqueous	0.051	ppm	--	USEPA OPP
	grass shrimp	<i>Palaemonetes pugio</i>	chronic	NR	NOAEC	aqueous	0.387	ppm	--	USEPA OPP
			chronic	NR	LOAEC	aqueous	0.972	ppm	--	USEPA OPP
	mysid shrimp	<i>Mysis sp.</i>	acute	96 hr	LC50	aqueous	0.106	ppm	--	USEPA OPP
Aquatic insects/larvae	mayfly	Ephemoptera sp.	subchronic	168 hr	~90% mortality	aqueous	0.01	ppm	--	Weschester DGEIS 2001
Mollusks	Eastern oyster	<i>Crassostrea virginica</i>	acute	48 hr	EC50	aqueous	0.247	ppm	effects in larvae	USEPA OPP
Aquatic plants	--	--	--				No Data Identified			--

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**Table 5**  
**Ecotoxicity Data Summary Table**  
**Permethrin**

Receptor Group	Common Name	Species Name	Effects Category	Study Duration	Endpoint	Route of Administration	Result	Units	Notes	Source
<b>Terrestrial wildlife</b>										
Mammals	rat	NR	acute	--	LD50	oral	430 - 4,000	ppm	--	Extoxnet 1996b
		NR	chronic	2 years	LOAEL	oral	18,000	mg/kg bw d	various effects	Westchester DGEIS 2001
		NR	chronic	21 day	LOAEL	oral	250	mg/kg bw d	reproductive effects	Extoxnet 1996b
		NR	chronic	90 day	NOAEL	inhalation	0.250	mg/L	--	USEPA OPP
Birds	mallard	<i>Anas platyrhynchos</i>	chronic	NR	LOAEL	oral	nontoxic	--	nontoxic at concentrations up to 9,900 mg/kg	Extoxnet 1996b
			chronic	20 wk	NOEC	oral	125	ppm	--	USEPA OPP
	pheasant	<i>Phasianus sp.</i>	chronic	NR	LOAEL	oral	nontoxic	--	nontoxic at concentrations up to 13,500 mg/kg	Extoxnet 1996b
	Japanese quail	<i>Coturnix japonica</i>	chronic	NR	LOAEL	oral	nontoxic	--	nontoxic at concentrations up to 13,500 mg/kg	Extoxnet 1996b
	starling	<i>Sturnus vulgaris</i>	acute	NR	LD50	oral	43,000	mg/kg bw d	mortality	Westchester DGEIS 2001
Reptiles	--	--	--				No Data Identified			--
Non-target insects	honeybee	<i>Apis mellifera</i>	acute	48 hr	LD50	NR	0.024	ug/bee	--	USEPA OPP
	alkali bee	<i>Nomia melanderi</i>	acute	24 hr	LD50	NR	0.06	lb/acre	--	USEPA OPP
Plants	--	--	--				No Data Identified			--
<b>Aquatic wildlife</b>										
Fish	bluegill	<i>Lepomis macrochirus</i>	acute	48 hr	LC50	aqueous	0.0018	mg/L	--	USEPA OPP
	fathead minnow	<i>Pimephales promelas</i>	chronic	246 d	LOEC	aqueous	0.0041	ppm	--	USEPA OPP
	guppy	<i>Poecilia reticulata</i>	acute	48 hr	LC50	aqueous	0.246	mg/L	--	Baser et al. 2003
	daphnid	<i>Cyprinidon variegatus</i>	acute	NR	LC50	aqueous	0.087	ppm	average value for species	USEPA ECOTOX
Amphibians	bullfrog	<i>Rana catesbeiana</i>	acute	96 hr	LC50	aqueous	7	mg/L	--	USEPA ECOTOX
			acute	96 hr	LC50	aqueous	0.115	mg/L	--	USEPA ECOTOX
Crustaceans	daphnid	<i>Daphnia pulex</i>	acute	96 hr	EC50	aqueous	3.90E-05	ppm	--	USEPA OPP
	stone crab	<i>Menippe mercenaria</i>	acute	96 hr	EC50	aqueous	1.80E-05	ppm	--	USEPA OPP
	fiddler crab	<i>Uca pugnax</i>	acute	NR	LC50	aqueous	0.00421	ppm	average value for species	USEPA ECOTOX
Aquatic insects/larvae	midge	<i>Chironomus plumosus</i>	acute	48 hr	LC50	aqueous	0.00056	ppm	value for midge larvae	USEPA OPP
Mollusks	Pacific oyster	<i>Crassotrea gigas</i>	acute	48 hr	LC50	aqueous	6.5	ppm	--	USEPA OPP
Aquatic plants	brown algae	<i>Skeletonema costatu</i>	acute	96 hr	EC50	aqueous	0.092	ppm	--	USEPA OPP

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**Table 6**  
**Ecotoxicity Data Summary Table**  
**Resmethrin**

Receptor Group	Common Name	Species Name	Effects Category	Study Duration	Endpoint	Route of Administration	Result	Units	Notes	Source
<b>Terrestrial wildlife</b>										
Mammals	rat	NR	acute	--	LD50	oral	> 1,244	ppm	reported range of > 1,244 - 2,500 mg/kg	Extoxnet 1996c
		NR	chronic	3 gen	LOAEC	oral	500	ppm		Westchester DGEIS 2001
		NR	acute	4 hr	LC50	inhalation	> 9.49	mg/L		Extoxnet 1996c
		NR	chronic	90 day	LOAEL	inhalation	0.100	mg/L		USEPA OPP
Birds	Japanese quail	<i>Coturnix japonica</i>	chronic	5 day	LC50	oral	5,000	ppm	--	Extoxnet 1996c
	California quail	<i>Callipepla californica</i>	subchronic	14 day	LD50	oral	2,000	mg/kg bw d	--	
	mallard	<i>Anas platyrhynchos</i>	chronic	22 wk	NOEC	oral	60	ppm	--	USEPA OPP
Reptiles	--	--	--	--	--	No Data Identified			--	
Non-target insects	honeybee	<i>Apis mellifera</i>	acute	48 hr	LD50	NR	0.063	ug/bee	--	USEPA OPP
Plants	--	--	--	--	--	No Data Identified			--	
<b>Aquatic wildlife</b>										
Fish	bluegill	<i>Lepomis macrochirus</i>	acute	96 hr	LC50	aqueous	0.0072	mg/L	value for technical resmethrin	Rand 2002
	green sunfish	<i>Lepomis cyanellus</i>	acute	96 hr	LC50	aqueous	0.00455	mg/L	value for technical resmethrin	Rand 2002
	rainbow trout	<i>Oncorhynchus mykiss</i>	acute	96 hr	LC50	aqueous	0.00028	ppm	--	USEPA OPP
			chronic	81-d	NOEC	aqueous	0.00032	mg/L	value for technical resmethrin	Rand 2002
	carp	<i>Cyprinus carpio</i>	acute	96 hr	LC50	aqueous	0.00395	mg/L	value for technical resmethrin	Rand 2002
	fathead minnow	<i>Pimephales promelas</i>	chronic	35 d	NOEC	aqueous	0.00043	mg/L	value for technical resmethrin	Rand 2002
	daphnid	<i>Ictalurus punctatus</i>	acute	96 hr	LC50	aqueous	0.015	mg/L	value for technical resmethrin	Rand 2002
	sheepshead minnow	<i>Cyprinidon variegatus</i>	acute	96 hr	LC50	aqueous	0.011	mg/L	value for technical resmethrin	Rand 2002
			chronic	33 d	NOEC	aqueous	0.0015	mg/L	value for technical resmethrin	Rand 2002
	Amphibians	bullfrog	<i>Rana catesbeiana</i>	acute	NR	LC50	aqueous	3.5	mg/L	average of reported values
Crustaceans	daphnid	<i>Daphnia magna</i>	acute	48	EC50	aqueous	0.0037	mg/L	value for technical resmethrin	Rand 2002
			chronic	21 d	NOEC	aqueous	0.00093	mg/L	value for technical resmethrin	Rand 2002
	crayfish	<i>Procambarus blandingii</i>	acute	NR	LC50	aqueous	0.21	ppm	average of reported values	USEPA ECOTOX
	Northern pink shrimp	<i>Penaeus duorarum</i>	acute	96 hr	LC50	aqueous	0.0012	ppm	average of reported values	USEPA ECOTOX
Aquatic insects/larvae	oligocahete	<i>Tubificidae</i>	acute	NR	LC50	aqueous	83.9	ppm	average of reported values	USEPA ECOTOX
Mollusks	Eastern oyster	<i>Crassostrea virginica</i>	acute	96 hr	LC50	aqueous	1.79	ppm	value for spat	USEPA OPP
			acute	96 hr	LC50	aqueous	> 0.0431	mg/L	value for technical resmethrin	Rand 2002
Aquatic plants	green algae	<i>Chlorella kessleri</i>	acute	NR	EC50	aqueous	44.5	ppm	--	USEPA ECOTOX

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**Table 7**  
**Ecotoxicity Data Summary Table**  
**Sumithrin**

Receptor Group	Common Name	Species Name	Effects Category	Study Duration	Endpoint	Route of Administration	Result	Units	Notes	Source
<b>Terrestrial wildlife</b>										
Mammals	rat	NR	acute	--	LD50	oral	> 5,000	mg/kg bw d	--	Westchester DGEIS 2001
		NR	chronic	2 gen	NOAEL	oral	1,000	ppm	--	Westchester DGEIS 2001
		NR	chronic	90 day	NOAEL	inhalation	0.291	mg/L	--	Westchester DGEIS 2001
Birds	bobwhite quail	<i>Colinus virginianus</i>	acute	8 day	LC50	oral	> 5,620	ppm	--	Westchester DGEIS 2001
			subchronic	14 day	LD50	oral	> 5,000	mg/kg bw d	--	Westchester DGEIS 2001
	mallard	<i>Anas platyrhynchos</i>	acute	8 day	LC50	oral	> 5,000	ppm	--	WHO/FAO 1990
Reptiles	--	--	--	--	--	--	No Data Identified		--	
Non-target insects	--	--	--	--	--	--	No Data Identified		--	
Plants	--	--	--	--	--	--	No Data Identified		--	
<b>Aquatic wildlife</b>										
Fish	bluegill	<i>Lepomis macrochirus</i>	acute	96 hr	LC50	aqueous	0.0158	ppm	--	USEPA OPP
	rainbow trout	<i>Oncorhynchus mykiss</i>	acute	96 hr	LC50	aqueous	0.0014	ppm	--	USEPA OPP
	inland silverside	<i>Menidia beryllina</i>	acute	NR	LC50	aqueous	0.0662	mg/L	average of reported values	USEPA ECOTOX
Amphibians	--	--	--	--	--	--	No Data Identified		--	
Crustaceans	daphnid	<i>Daphnia magna</i>	acute	48 hr	EC50	aqueous	> 300	ppm	--	USEPA OPP
	opossum shrimp	<i>Americamysis bahia</i>	acute	96 hr	LC50	aqueous	0.00003	mg/L	--	USEPA OPP
Aquatic insects/larvae	--	--	--	--	--	--	No Data Identified		--	
Mollusks	daphnid	--	--	--	--	--	No Data Identified		--	
Aquatic plants	--	--	--	--	--	--	No Data Identified		--	

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**Table 8**  
**Ecotoxicity Data Summary Table**  
**Malathion**

Receptor Group	Common Name	Species Name	Effects Category	Study Duration	Endpoint	Route of Administration	Result	Units	Notes	Source
<b>Terrestrial wildlife</b>										
Mammals	rat	NR	acute	--	LOEL	oral	240	mg/kg bw d	--	Westchester DGEIS 2001
		NR	--	NR	NOEC	oral	100	ppm	concentration in food	USEPA 2000b
		NR	chronic	90 day	LOAEL	inhalation	0.100	mg/L	--	USEPA OPP
Birds	mallard	<i>Anas platyrhynchos</i>	acute	14 d	LD50	oral	1,485	mg/kg bw d	--	USEPA 2000b
			subacute	8 d	LC50	oral	> 5,000	ppm		USEPA 2000b
			chronic	21 wk	NOEL	oral	1,200	ppm	based on growth LOEL of 2,400 ppm	USEPA 2000b
			acute	14 d	LD50	oral	167	mg/kg bw d		USEPA OPP
	pheasant	<i>Phasianus colchicus</i>	subacute	8 d	LC50	oral	2,639	ppm		USEPA 2000b
			chronic	21 wk	NOEL	oral	110	ppm	based on reproductive LOEL of 1,110 ppm	USEPA 2000b
Reptiles	Carolina anole	<i>Anolis carolinensis</i>	acute	NR	LD50	oral	2,324	mg/kg	--	USEPA 2000b
Non-target insects	honeybee	<i>Apis mellifera</i>	acute	48 hr	LD50	NR	0.2	ug/bee	--	USEPA OPP
			acute	8 hr	LD50	NR	< 1.6	lb/acre	--	USEPA OPP
Plants	--	--	--				No Data Identified			--
<b>Aquatic wildlife</b>										
Fish	rainbow trout	<i>Oncorhynchus mykiss</i>	acute	96 hr	LC50	aqueous	0.004	ppm	--	USEPA OPP
	bluegill	<i>Lepomis macrochirus</i>	acute	96 hr	LC50	aqueous	0.02 - 0.03	ppm	--	USEPA 2000b
	fathead minnow	<i>Pimephales promelas</i>	acute	96 hr	LC50	aqueous	8.65	ppm	--	USEPA 2000b
	daphnid	<i>Cyprinidon variegatus</i>	acute	96 hr	LC50	aqueous	0.033 - 0.055	ppm	--	USEPA 2000b
	striped mullet	<i>Mugil cephalus</i>	acute	48 hr	LC50	aqueous	0.33	ppm		USEPA 2000b
	Amphibians	Northern chorus frog	<i>Pseudacris triseriata</i>	acute	NR	LC50	aqueous	0.32	ppm	average value for species
Woodhouse's toad		<i>Bufo woodhousei</i>	acute	NR	LC50	aqueous	0.42	ppm	average value for species	USEPA ECOTOX
Crustaceans	daphnid	<i>Daphnia pulex</i>	acute	48 hr	EC50	aqueous	0.0018	ppm	--	USEPA 2000b
		<i>Daphnia magna</i>	chronic	21 d	LOEC	aqueous	1.00E-04	ppm	--	USEPA OPP
	mysis shrimp	<i>Mysidopsis bahia</i>	acute	96 hr	LC50	aqueous	0.0022	ppm	--	USEPA RED 2000
	pink shrimp	<i>Penaeus duorarum</i>	acute	48 hr	LC50	aqueous	0.28	ppm	--	USEPA 2000b
Aquatic insects/larvae	stonefly	misc. sp.	acute	NR	LC50	aqueous	0.00069 - 0.0028	ppm	--	USEPA 2000b
Mollusks	Eastern oyster	<i>Crassostrea virginica</i>	acute	48 hr	EC50	aqueous	2.96	ppm	--	USEPA 2000b
Aquatic plants	algae	misc. sp.	NR	1hr - 4d	NR	aqueous	0.092	ppm	general reduction in photosynthesis	USEPA ECOTOX

## Notes:

-- = Not applicable

LOAEC = Lowest observable adverse effect concentration

LOAEL = Lowest observable adverse effect level

LOEC = Lowest observable effect concentration

LOEL = Lowest observable effect level

mg/L = milligram per liter

mg/kg bw d = milligram per kilogram body weight day

NOAEC = No observable adverse effect concentration

NOAEL = No observable adverse effect level

NOEC = No observable effect concentration

NOEL = No observable effect level

NR = Not reported

ppb = parts per billion

ppm = parts per million

USEPA OPP = USEPA Office of Pesticide Programs

USEPA ECOTOX = USEPA. 2002a. ECOTOX User Guide: ECOTOXicology Database System. Version 3.0. <http://www.epa.gov/ecotox/>.

Westchester DGEIS 2001 = Westchester County Board of Health. 2001. Comprehensive Mosquito-Borne Disease Surveillance and Control Plan Draft Generic Environmental Impact Statement. Westchester County, NY.

**Table 9**  
**Ecotoxicity Data Summary Table**  
**Piperonyl Butoxide (PBO)**

Receptor Group	Common Name	Species Name	Effects Category	Study Duration	Endpoint	Route of Administration	Result	Units	Notes	Source
<b>Terrestrial wildlife</b>										
Mammals	rat	NR	acute	--	LD50	oral	4,570 - 12,800	mg/kg bw d	--	HSDB 2003a
		NR	chronic	2 gen	NOEC	oral	1,000	ppm	--	USEPA OPP
		NR	chronic	90 day	NOAEL	inhalation	0.074	mg/L	--	USEPA OPP
		NR	acute	48 hr	LC50	inhalation	> 5,900	mg/L	--	WHO/FAO 1995
Birds	mallard	<i>Anas platyrhynchos</i>	chronic	22 wk	NOEC	oral	300	ppm	--	USEPA OPP
	bobwhite quail	<i>Colinus virginianus</i>	acute	14 d	LD50	oral	> 2,250	mg/kg bw d	--	USEPA OPP
Reptiles	--	--	--	--	--	--	No Data Identified		--	
Non-target insects	honeybee	<i>Apis mellifera</i>	acute	48 hr	LD50	NR	> 11	ug/bee	--	USEPA OPP
Plants	--	--	--	--	--	--	No Data Identified		--	
<b>Aquatic wildlife</b>										
Fish	fathead minnow	<i>Pimephales promelas</i>	acute	NR	LC50	aqueous	0.11	ppm	--	USEPA OPP
	bluegill	<i>Lepomis macrochirus</i>	acute	NR	LC50	aqueous	4.6	ppm	average value for species	USEPA ECOTOX
	rainbow trout	<i>Oncorhynchus mykiss</i>	acute	NR	LC50	aqueous	3.9	ppm	average value for species	USEPA ECOTOX
	sheepshead minnow	<i>Cyprinidon variegatus</i>	acute	96 hr	LC50	aqueous	1.8	ppm		USEPA OPP
Amphibians	chorus frog	<i>Pseudacris triseriata</i>	acute	96 hr	LC50	aqueous	0.245	ppm	average value for species	USEPA ECOTOX
	Western chorus frog	<i>Pseudacris triseriata triseria</i>	acute	NR	LC50	aqueous	1.3	ppm	average value for species	USEPA ECOTOX
Crustaceans	daphnid	<i>Daphnia magna</i>	acute	NR	LC50	aqueous	2.8	ppm	average value for species	USEPA ECOTOX
	daphnid	<i>Daphnia pulex</i>	chronic	21 d	LOEC	aqueous	0.12	ppm	--	USEPA OPP
		<i>Daphnia pulex</i>	acute	NR	LC50	aqueous	1.6	ppm	average value for species	USEPA ECOTOX
	scud	<i>Hyalella azteca</i>	acute	NR	LC50	aqueous	0.53	ppm	average value for species	USEPA ECOTOX
	aquatic sowbug	<i>Asellus brevicaudus</i>	acute	NR	LC50	aqueous	8.0	ppm	average value for species	USEPA ECOTOX
	pink shrimp	<i>Penaeus duorarum</i>	acute	96 hr	EC50	aqueous	2.2	ppm	--	USEPA OPP
	shrimp	<i>Palaemon paucidens</i>	acute	NR	LC50	aqueous	3.5	ppm	average value for species	USEPA ECOTOX
Aquatic insects/larvae	midge	<i>Chironomus tentans</i>	acute	NR	LC50	aqueous	2.74	ppm	average value for species	USEPA ECOTOX
Mollusks	Eastern oyster	<i>Crassostrea virginica</i>	acute	48 hr	EC50	aqueous	0.23	ppm	--	USEPA OPP
Aquatic plants	--	--	--	--	--	--	No Data Identified		--	

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