

*Appendix E*

# Cancer Slope Factors and Noncancer Reference Doses Used to Develop EPA Risk Levels

**T**able E-1 presents the cancer slope factors and noncancer reference doses that were used to calculate the EPA risk levels and hazard quotients used in the analysis. The calculations for the EPA risk levels and hazard quotients used in the analysis appear in Appendix B. The slope factors and reference doses were obtained from the following sources:

- *Health Effects Assessment Summary Tables FY 1995*. EPA/540/R-95/036. U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, DC.
- *Integrated Risk Information System (IRIS)*. Online. U.S. Environmental Protection Agency, Office of Health and Environmental Assessment, Environmental Criteria and Assessment Office, Cincinnati, OH.
- Risk-Based Concentration Table, January-June 1995. U.S. Environmental Protection Agency, Region 3, Philadelphia, PA.

Table E-1. Cancer Slope Factors and Noncancer Reference Doses Used to Develop EPA Risk Levels

CAS Number	Chemical Names	Cancer Slope Factor ((mg/kg/d) <sup>-1</sup> ) (Followed by source; see footnotes)	Noncancer Reference Dose (mg/kg/d) (Followed by source; see footnotes)	Surrogate Chemical Used (if neccessary)
83329	Acenaphthene		6.00E-2 <sup>i</sup>	
67641	Acetone		1.00E-1 <sup>i</sup>	
98862	Acetophenone		1.00E-1 <sup>i</sup>	
107028	Acrolein		2.00E-2 <sup>h</sup>	
107131	Acrylonitrile	5.40E-1 <sup>i</sup>	1.00E-3 <sup>h</sup>	
15972608	Alachlor/Lasso	8.00E-2 <sup>h</sup>	1.00E-2 <sup>i</sup>	
116063	Aldicarb/Temik		1.00E-3 <sup>i</sup>	
309002	Aldrin	1.70E+1 <sup>i</sup>	3.00E-5 <sup>i</sup>	
62533	Aniline	5.70E-3 <sup>i</sup>		
120127	Anthracene		3.00E-1 <sup>i</sup>	
99999933	Anthracene & Phenanthrene		3.00E-1	anthracene
7440360	Antimony		4.00E-4 <sup>i</sup>	
7440382	Arsenic	1.75E+0 <sup>i</sup>	3.00E-4 <sup>i</sup>	
1912249	Atrazine	2.22E-1 <sup>h</sup>	3.50E-2 <sup>i</sup>	
7440393	Barium		7.00E-2 <sup>i</sup>	
92875	Benzidine	2.30E+2 <sup>i</sup>	3.00E-3 <sup>i</sup>	
71432	Benzene	2.90E-2 <sup>i</sup>		
56553	Benzo(a)anthracene	7.30E-1 <sup>e</sup>		
99999955	Benzo(a)anthracene/Chrysene	7.30E-1		benzo(a)anthracene
50328	Benzo(a)pyrene	7.30E+0 <sup>i</sup>		
205992	Benzo(b)fluoranthene	7.30E-1 <sup>e</sup>		
207089	Benzo(k)fluoranthene	7.30E-2 <sup>e</sup>		
65850	Benzoic acid		4.00E+0 <sup>i</sup>	
98077	Benzotrichloride	1.30E+1 <sup>i</sup>		
100516	Benzyl alcohol		3.00E-1 <sup>h</sup>	
100447	Benzyl chloride	1.70E-1 <sup>i</sup>		
7440417	Beryllium	4.30E+0 <sup>i</sup>	5.00E-3 <sup>i</sup>	
319846	BHC, alpha-	6.30E+0 <sup>i</sup>		
319857	BHC, beta-	1.80E+0 <sup>i</sup>		
319868	BHC, delta-	1.80E+0		beta-BHC
58899	BHC, gamma- (Lindane)	1.30E+0 <sup>i</sup>	3.00E-4 <sup>i</sup>	
608731	BHC, technical grade	1.80E+0 <sup>i</sup>		

Table E-1. (Continued)

CAS Number	Chemical Name	Cancer Slope Factor ((mg/kg/d) <sup>-1</sup> ) (Followed by source; see footnotes)	Noncancer Reference Dose (mg/kg/d) (Followed by source; see footnotes)	Surrogate Chemical Used (if necessary)
608731	BHC, technical grade	1.80E+0 <sup>i</sup>		
92524	Biphenyl		5.00E-2 <sup>i</sup>	
111444	Bis(2-chloroethyl)ether	1.10E+0 <sup>i</sup>		
108601	Bis(2-chloroisopropyl)ether	7.00E-2 <sup>h</sup>	4.00E-2 <sup>i</sup>	
117817	Bis(2-ethylhexyl)phthalate	1.40E-2 <sup>i</sup>	2.00E-2 <sup>i</sup>	
542881	Bis(chloromethyl)ether	2.20E+2 <sup>i</sup>		
7440428	Boron		9.00E-2 <sup>i</sup>	
75274	Bromodichloromethane	6.20E-2 <sup>i</sup>	2.00E-2 <sup>i</sup>	
74839	Bromomethane		1.40E-3 <sup>i</sup>	
101553	Bromophenyl phenyl ether, 4-		5.80E-2 <sup>r</sup>	
1689845	Bromoxynil		2.00E-2 <sup>i</sup>	
85687	Butyl benzyl phthalate		2.00E-1 <sup>i</sup>	
7440439	Cadmium		5.00E-4 <sup>i</sup>	
63252	Carbaryl/Sevin		1.00E-1 <sup>i</sup>	
1563662	Carbofuran/furadan		5.00E-3 <sup>i</sup>	
75150	Carbon disulfide		1.00E-1 <sup>i</sup>	
133904	Chloramben		1.50E-2 <sup>i</sup>	
57749	Chlordane	1.30E+0 <sup>i</sup>	6.00E-5 <sup>i</sup>	
5103719	Chlordane, alpha(cis)-	1.30E+0	6.00E-5	chlordane
5103742	Chlordane, beta(trans)-	1.30E+0	6.00E-5	chlordane
5566347	Chlordane, gamma(trans)-	1.30E+0	6.00E-5	chlordane
999999247	Chlordane-nonachlor(cis)-	1.30E+0	6.00E-5	chlordane
999999248	Chlordane-nonachlor(trans)-	1.30E+0	6.00E-5	chlordane
108907	Chlorobenzene		2.00E-2 <sup>i</sup>	
510156	Chlorobenzilate	2.70E-1 <sup>h</sup>	2.00E-2 <sup>i</sup>	
75003	Chloroethane		4.00E-1 <sup>e</sup>	
75014	Chloroethene	1.90E+0 <sup>h</sup>		
110758	Chloroethylvinyl ether, 2-		2.50E-2 <sup>r</sup>	
74873	Chloromethane	1.30E-2 <sup>h</sup>		
91587	Chloronaphthalene, 2-		8.00E-2 <sup>i</sup>	
95578	Chlorophenol, 2-		5.00E-3 <sup>i</sup>	
2921882	Chlorpyrifos/Dursban		3.00E-3 <sup>i</sup>	

Table E-1. (Continued)

CAS Number	Chemical Name	Cancer Slope Factor (mg/kg/d) <sup>-1</sup> (Followed by source; see footnotes)	Noncancer Reference Dose (mg/kg/d) (Followed by source; see footnotes)	Surrogate Chemical Used (if necessary)
7440473	Chromium		5.00E-3 <sup>i</sup>	
218019	Chrysene	7.30E-3 <sup>e</sup>		
7440508	Copper		3.71E-2 <sup>h</sup>	
108394	Cresol, m-		5.00E-2 <sup>i</sup>	
95487	Cresol, o-		5.00E-2 <sup>i</sup>	
106445	Cresol, p-		5.00E-3 <sup>h</sup>	
1319773	Cresols		5.00E-3	p-Cresol
98828	Cumene		4.00E-2 <sup>i</sup>	
21725462	Cyanazine	8.40E-1 <sup>h</sup>	2.00E-03 <sup>h</sup>	
57125	Cyanide		2.00E-2 <sup>i</sup>	
1861321	DCPA/Dacthal		1.00E-2 <sup>i</sup>	
53190	DDD, o,p'-	2.40E-1		p,p'-DDD
72548	DDD, p,p'-	2.40E-1 <sup>i</sup>		
3424826	DDE, o,p'-	3.40E-1		p,p'-DDE
72559	DDE, p,p'-	3.40E-1 <sup>i</sup>		
789026	DDT, o,p'-	3.40E-1	5.00E-4	p,p'-DDT
50293	DDT, p,p'-	3.40E-1 <sup>i</sup>	5.00E-4 <sup>i</sup>	
999999300	DDT (Total)	3.40E-1	5.00E-4	p,p'-DDT
1163195	Decabromodiphenyl oxide		1.00E-2 <sup>i</sup>	
84742	Di-n-butyl phthalate		1.00E-1 <sup>i</sup>	
117840	Di-n-octyl phthalate		2.00E-2 <sup>h</sup>	
3334515	Diazinon/Spectracide		9.00E-4 <sup>h</sup>	
53703	Dibenzo(a,h)anthracene	7.30E+0 <sup>e</sup>		
132649	Dibenzofuran		4.00E-3 <sup>e</sup>	
96128	Dibromo-3-chloropropane, 1,2-	1.40E+0 <sup>h</sup>		
124481	Dibromochloromethane	8.40E-2 <sup>i</sup>	2.00E-2 <sup>i</sup>	
1918009	Dicamba		3.00E-2 <sup>i</sup>	
95501	Dichlorobenzene, 1,2-		9.00E-2 <sup>i</sup>	
541731	Dichlorobenzene, 1,3-		8.90E-2 <sup>i</sup>	
106467	Dichlorobenzene, 1,4-	2.40E-2 <sup>h</sup>		
25321226	Dichlorobenzenes	2.40E-2	8.90E-2	1,3-and 1,4- dichlorobenzene
91941	Dichlorobenzidine, 3,3'-	4.50E-1 <sup>i</sup>		

Table E-1. (Continued)

CAS Number	Chemical Name	Cancer Slope Factor (mg/kg/d) <sup>-1</sup> (Followed by source; see footnotes)	Noncancer Reference Dose (mg/kg/d) (Followed by source; see footnotes)	Surrogate Chemical Used (if necessary)
75718	Dichlorodifluoromethane		2.00E-1 <sup>i</sup>	
75343	Dichloroethane, 1,1-		1.00E-1 <sup>h</sup>	
107062	Dichloroethane, 1,2-	9.10E-2 <sup>i</sup>		
75354	Dichloroethene, 1,1-	6.00E-1 <sup>i</sup>	9.00E-3 <sup>i</sup>	
156605	Dichloroethene, trans-1,2-		2.00E-2 <sup>i</sup>	
156592	Dichloroethylene, cis-1,2-		1.00E-2 <sup>h</sup>	
75092	Dichloromethane	7.50E-3 <sup>i</sup>	6.00E-2 <sup>i</sup>	
120832	Dichlorophenol, 2,4-		3.00E-3 <sup>i</sup>	
94757	Dichlorophenoxyacetic acid, 2,4-		1.00E-2 <sup>i</sup>	
94826	Dichlorophenoxybutanoic acid, 2,4-		8.00E-3 <sup>i</sup>	
78875	Dichloropropane, 1,2-	6.80E-2 <sup>h</sup>		
542756	Dichloropropene, 1,3-	1.75E-1 <sup>h</sup>	3.00E-4 <sup>i</sup>	
62737	Dichlorvos	2.90E-1 <sup>i</sup>	5.00E-4 <sup>i</sup>	
115322	Dicofol/Kelthane	4.40E-1 <sup>w</sup>		
60571	Dieldrin	1.60E+1 <sup>i</sup>	5.00E-5 <sup>i</sup>	
84662	Diethyl phthalate		8.00E-1 <sup>i</sup>	
119904	Dimethoxybenzidine,3,3'-	1.40E-2 <sup>h</sup>		
131113	Dimethyl phthalate		1.00E+1 <sup>h</sup>	
105679	Dimethylphenol, 2,4-		2.00E-2 <sup>i</sup>	
528290	Dinitrobenzene, 1,2-		4.00E-4 <sup>h</sup>	
99650	Dinitrobenzene, 1,3-		1.00E-4 <sup>i</sup>	
100254	Dinitrobenzene, 1,4-		4.00E-4 <sup>h</sup>	
51285	Dinitrophenol, 2,4-		2.00E-3 <sup>i</sup>	
121142	Dinitrotoluene, 2,4-		2.00E-3 <sup>i</sup>	
606202	Dinitrotoluene, 2,6-		1.00E-3 <sup>h</sup>	
88857	Dinoseb/DNBP		1.00E-3 <sup>i</sup>	
122667	Diphenylhydrazine, 1,2-	8.00E-1 <sup>i</sup>		
298044	Disulfoton		4.00E-5 <sup>i</sup>	
959988	Endosulfan, alpha-		6.00E-3	endosulfan
33213659	Endosulfan, beta-		6.00E-3	endosulfan
115297	Endosulfan mixed isomers		6.00E-3 <sup>i</sup>	
72208	Endrin		3.00E-4 <sup>i</sup>	

Table E-1. (Continued)

CAS Number	Chemical Name	Cancer Slope Factor (mg/kg/d) <sup>-1</sup> (Followed by source; see footnotes)	Noncancer Reference Dose (mg/kg/d) (Followed by source; see footnotes)	Surrogate Chemical Used (if necessary)
563122	Ethion/Bladen		5.00E-4 <sup>i</sup>	
141786	Ethyl acetate		9.00E-1 <sup>i</sup>	
100414	Ethylbenzene		1.00E-1 <sup>i</sup>	
106934	Ethylene dibromide	8.50E+1 <sup>i</sup>		
206440	Fluoranthene		4.00E-2 <sup>i</sup>	
86737	Fluorene		4.00E-2 <sup>i</sup>	
944229	Fonofos		2.00E-3 <sup>i</sup>	
76448	Heptachlor	4.50E+0 <sup>i</sup>	5.00E-4 <sup>i</sup>	
1024573	Heptachlor epoxide	9.10E+0 <sup>i</sup>	1.30E-5 <sup>i</sup>	
118741	Hexachlorobenzene	1.60+0 <sup>i</sup>	8.00E-4 <sup>i</sup>	
87683	Hexachlorobutadiene	7.80E-2 <sup>i</sup>	2.00E-4 <sup>h</sup>	
74474	Hexachlorocyclopentadiene		7.00E-3 <sup>i</sup>	
67721	Hexachloroethane	1.40E-2 <sup>i</sup>	1.00E-3 <sup>i</sup>	
51235042	Hexazinone		3.30E-2 <sup>i</sup>	
123319	Hydroquinone		4.00E-2 <sup>h</sup>	
193395	Indeno(1,2,3-cd)pyrene	7.30E-1 <sup>e</sup>		
78591	Isophorone	9.50E-4 <sup>i</sup>	2.00E-1 <sup>i</sup>	
33820530	Isopropalin		1.50E-2 <sup>i</sup>	
121755	Malathion		2.00E-2 <sup>i</sup>	
108316	Maleic anhydride		1.00E-1 <sup>i</sup>	
7439965	Manganese		5.00E-3 <sup>i</sup>	
7439976	Mercury		1.00E-4 <sup>i</sup>	methyl mercury
72435	Methoxychlor		5.00E-3 <sup>i</sup>	
78933	Methyl ethyl ketone		6.00E-1 <sup>i</sup>	
108101	Methyl isobutyl ketone		8.00E-2 <sup>h</sup>	
22967926	Methyl mercury		1.00E-4 <sup>i</sup>	
21087649	Metribuzin		2.50E-2 <sup>i</sup>	
2385855	Mirex/Decchlorane	1.80E+0 <sup>w</sup>	2.00E-4 <sup>i</sup>	
7439987	Molybdenum		5.00E-3 <sup>i</sup>	
91203	Napthalene		4.00E-2 <sup>w</sup>	
91598	Napthylamine, 2-	1.30E+2 <sup>c</sup>		
7440020	Nickel		2.00E-2 <sup>i</sup>	

Table E-1. (Continued)

CAS Number	Chemical Name	Cancer Slope Factor ((mg/kg/d) <sup>-1</sup> ) (Followed by source; see footnotes)	Noncancer Reference Dose (mg/kg/d) (Followed by source; see footnotes)	Surrogate Chemical Used (if necessary)
98953	Nitrobenzene		5.00E-4 <sup>i</sup>	
100027	Nitrophenol, 4		6.20E-2 <sup>o</sup>	
924163	Nitrosodi-n-butylamine, N-	5.40E+0 <sup>j</sup>		
621647	Nitrosodi-n-propylamine, N-	7.00E+0 <sup>j</sup>		
55185	Nitrosodiethylamine, N-	1.50E+2 <sup>i</sup>		
86306	Nitrosodiphenylamine, N-	4.90E-3 <sup>i</sup>		
56382	Parathion ethyl		6.00E-3 <sup>h</sup>	
12674112	PCB(Arochlor-1016)	7.70E+0	7.00E-5 <sup>i</sup>	
11104282	PCB(Arochlor-1221)	7.70E+0	2.00E-5 <sup>i</sup>	
11141165	PCB(Arochlor-1232)	7.70E+0	2.00E-5 <sup>i</sup>	
53469219	PCB(Arochlor-1242)	7.70E+0	2.00E-5 <sup>i</sup>	
12672296	PCB(Arochlor-1248)	7.70E+0	2.00E-5 <sup>i</sup>	
11097691	PCB(Arochlor-1254)	7.70E+0	2.00E-5 <sup>i</sup>	
11096825	PCB(Arochlor-1260)	7.70E+0	2.00E-5 <sup>i</sup>	
608935	Pentachlorobenzene		8.00E-4 <sup>i</sup>	
82688	Pentachloronitrobenzene/Quitoze		2.60E-1 <sup>h</sup>	
87685	Pentachlorophenol	1.20E-1 <sup>i</sup>	3.00E-2 <sup>i</sup>	
108952	Phenol		6.00E-1 <sup>i</sup>	
298022	Phorate/Famophos/Thimet		2.00E-4 <sup>h</sup>	
85449	Phthalic anhydride		2.00E-0 <sup>i</sup>	
1336363	Polychlorinated biphenyls	7.70E+0 <sup>j</sup>	2.00E-5 <sup>i</sup>	
1610180	Prometon/Pramitol		1.50E-2 <sup>i</sup>	
7287196	Prometym/Caparol		4.00E-3 <sup>i</sup>	
23950585	Pronamide		7.50E-2 <sup>i</sup>	
1918167	Propachlor		1.30E-2 <sup>i</sup>	
129000	Pyrene		3.00E-2 <sup>i</sup>	
91225	Quinoline	1.20E+1 <sup>h</sup>		
7782492	Selenium		5.00E-3 <sup>i</sup>	
7440224	Silver		5.00E-3 <sup>i</sup>	
122349	Simazine	1.20E-1 <sup>h</sup>	5.00E-3 <sup>i</sup>	
122349	Strontium		6.00E-1 <sup>i</sup>	
100425	Styrene		2.00E-1 <sup>i</sup>	

Table E-1. (Continued)

CAS Number	Chemical Name	Cancer Slope Factor (mg/kg/d) <sup>-1</sup> (Followed by source; see footnotes)	Noncancer Reference Dose (mg/kg/d) (Followed by source; see footnotes)	Surrogate Chemical Used (if necessary)
13071799	Terbufos/Counter		2.50E-5 <sup>h</sup>	
886500	Terbutryn		1.00E-3 <sup>i</sup>	
95943	Tetrachlorobenzene, 1,2,4,5-		3.00E-4 <sup>i</sup>	
1746016	Tetrachlorodibenzo-p-dioxin, 2,3,7,8-	1.56E+5 <sup>h</sup>		
79345	Tetrachloroethane, 1,1,2,2-	2.00E-1 <sup>i</sup>		
127184	Tetrachloroethene	5.20E-2 <sup>e</sup>	1.00E-2 <sup>i</sup>	
56235	Tetrachloromethane	1.30E-1 <sup>i</sup>	7.00E-4 <sup>i</sup>	
58902	Tetrachlorophenol, 2,3,4,6-		3.00E-2 <sup>i</sup>	
961115	Tetrachlorvinphos/Gardona/Stirof	2.40E-2 <sup>h</sup>	3.00E-2 <sup>i</sup>	
7440315	Tin		6.00E-1 <sup>h</sup>	
108883	Toluene		2.00E-1 <sup>i</sup>	
8001352	Toxaphene	1.10E+0 <sup>i</sup>		
75252	Tribromomethane (Bromoform)	7.90E-3 <sup>i</sup>	2.00E-2 <sup>i</sup>	
120821	Trichlorobenzene, 1,2,4-		1.00E-2 <sup>i</sup>	
71556	Trichloroethane, 1,1,1-		9.00E-2 <sup>w</sup>	
79005	Trichloroethane, 1,1,2-	5.70E-2 <sup>i</sup>	4.00E-3 <sup>i</sup>	
79016	Trichloroethene	1.10E-2 <sup>w</sup>	6.00E-3 <sup>e</sup>	
75694	Trichlorofluoromethane		3.00E-1 <sup>i</sup>	
67663	Trichloromethane (Chloroform)	6.10E-3 <sup>i</sup>	1.00E-2 <sup>i</sup>	
95954	Trichlorophenol, 2,4,5-		1.00E-1 <sup>i</sup>	
88062	Trichlorophenol, 2,4,6-	1.10E-2 <sup>i</sup>		
93765	Trichlorophenoxyacetic acid, 2,4,5-		1.00E-2 <sup>i</sup>	
93721	Trichlorophenoxypropionic acid, 2,4,5-		8.00E-3 <sup>i</sup>	
1582098	Trifluralin/Treflan	7.70E-3 <sup>i</sup>	7.50E-3 <sup>i</sup>	
95636	Trimethylbenzene, 1,2,4-		5.00E-4 <sup>e</sup>	
118967	Trinitrotoluene	3.00E-2 <sup>i</sup>	5.00E-4 <sup>i</sup>	
7440622	Vanadium		7.00E-3 <sup>h</sup>	
108054	Vinyl acetate		1.00E+0 <sup>h</sup>	
108383	Xylene, m-		2.00E+0 <sup>h</sup>	
95476	Xylene, o-		2.00E+0 <sup>h</sup>	
1330207	Xylenes		2.00E+0 <sup>i</sup>	
7440666	Zinc		3.00E-1 <sup>i</sup>	



Codes:

<sup>1</sup>Integrated Risk Information System (IRIS).

<sup>h</sup>Health Effects Assessment Summary Tables (HEAST).

<sup>e</sup>Environmental Criteria and Assessment Office (ECAO, as cited in Risk-Based Concentration Table).

<sup>o</sup>Other EPA documents, as cited in Risk-Based Concentration Table.

<sup>w</sup>Withdrawn from HEAST, but use continued for screening assessments (USEPA, Risk-Based Concentration Table).