



# **National Recommended Water Quality Criteria: 2002**

## **Human Health Criteria Calculation Matrix**

## Notices

This document contains information regarding the calculation of the human health criteria contained in the document entitled, *National Recommended Water Quality Criteria: 2002*. This document provides: cancer potency factors (q1\*s); reference doses (RfDs); relative source contributions (RSCs); fish intake values; and equations used to derive the human health criteria in the aforementioned compilation.

This document is not a regulation and cannot substitute for the Clean Water Act or Environmental Protection Agency (EPA) regulations. Thus, the criteria in the calculation matrix cannot impose legally binding requirements on EPA, states, authorized tribes or the regulated community.

**NRWQC: HUMAN HEALTH CRITERIA CALCULATION MATRIX (November 2002)**

**Priority Pollutants**

	<b>Chemical (CAS number)</b>	<b>Basis for 1998 nrwqc: q1* or RfD/ADI and BCF</b>	<b>1998 nrwqc (ug/l) w +o/ o only</b>	<b>Reference Cite<sup>3</sup></b>	<b>Basis for 2002 nrwqc: q1*/ RfD/ADI, RSC and BCF<sup>1,7,8</sup></b>	<b>Methodology: 2000 or 1980<sup>2</sup></b>	<b>2002 nrwqc (ug/l) For Consumption of : Water + organism/ Organism Only</b>	<b>Reference Cite<sup>3</sup></b>
1	Antimony 77440 36 0	RfD = 4E-4 BCF = 1 FI = 6.5	14/4300	IRIS 02/01/91	RfD = 4E-4 RSC= 40% <sup>a</sup> BCF = 1 FI = 17.5	2000	5.6/640	IRIS 02/01/91
2	Arsenic 7440 38 2	q1* = 1.75 <sup>9</sup> BCF = 44 (for oysters) FI = 6.5	0.018/14	57FR60848	q1* used = 1.75 <sup>9</sup> BCF = 44 FI = 6.5	1980	0.018/0.14	57FR60848
3	Beryllium 7440 41 7	q1* = 4.3 BCF = 19	-----	IRIS 09/01/92	----	NA	----	-----
4	Cadmium 7440 43 9	RfD = 0.001(food) RfD= 0.0005(water)	-----	IRIS 02/01/94	RfD = 1E-3 (food) RfD= 0.0005(water) RSC = 25%	NA	-----	-----
5	Chromium (III) 16065 83 1	RfD withdrawn BCF = 16	-----	IRIS 03/01/88	1.5E+0	NA	-----	-----
5a	Chromium (VI) 18540 29 9	RfD = 5E-3 BCF = 16	-----	IRIS 12/01/96	3E-3	NA	-----	-----
6	Copper 7440508	WQC based on DW Action level BCF = 36	1300/ --	AWQC ADDENDUM 1989 DRAFT final lead/copper rule 57 FR 26460	AWQC ADDENDUM 1989 DRAFT final lead/copper rule 57 FR 26460	Drinking water regulation	1,300/ --	WQC based on DW Action level

	Chemical (CAS number)	Basis for 1998 nrwqc: q1* or RfD/ADI and BCF	1998 nrwqc (ug/l) w +o/ o only	Reference Cite <sup>3</sup>	Basis for 2002 nrwqc: q1*/ RfD/ADI, RSC and BCF <sup>1,7,8</sup>	Methodology: 2000 or 1980 <sup>2</sup>	2002 nrwqc (ug/l) For Consumption of : Water + organism/ Organism Only	Reference Cite <sup>3</sup>
7	Lead 7439921	WQC based on old Drinking water MCL	-----	Lead/Copper Rule 57 FR 26460	-----	NA	-----	-----
8	Mercury 7439976	RfD = 1E-4 BCF = 3760- 9000 (PBCF = 7342.6) FI = 18.7	0.050/0.051	62 FR42160	Methylmercury CAS No. 22967926 RfD = 1E-4 ng/kg BW-day RSC = 2.7E-5 mg/kg BW- day (subtracted from RfD to account for marine fish consumption) FI = 17.5	2000	0.3 mg/kg	EPA 823-R-01-001
9	Nickel	RfD = 2E-2 BCF = 47 FI = 6.5	610/4600	IRIS 12/01/96 for Nickel, soluble salts used	RfD = 2E-2 BCF = 47 FI = 6.5	1980 (Undergoing Major reassessment, no revision)	610/4,600	IRIS12/01/96
10	Selenium 7782492	RfD = 5E-3 BCF =4.8 (1988 Addendum used) FI = 6.5	170/11,000 <sup>12</sup>	IRIS 09/01/91	RfD = 5E-3 BCF =4.8 (1988 Addendum used) FI = 17.5	2000	170/4,200	IRIS 09/01/91
11	Silver 7440224	RfD = 5E-3 BCF = 0.5	-----	IRIS 12/01/96	RfD = 5E-3 BCF = 0.5	NA	-----	-----
12	Thallium <sup>5</sup> 7440280	RfD = 6.8E-5 <sup>6</sup> (RFD LISTED IS FOR THALLIUM SULFATE) BCF = 116 FI = 6.5	1.7/6.3	IRIS 09/01/90	RfD = 6.8E-5 <sup>6,10,b</sup> (RFD LISTED IS FOR THALLIUM (I) SULFATE 7446-18-6) BCF = 116 RSC = 20% (not used) FI = 6.5	1980	1.7/6.3	IRIS 09/01/90
13	Zinc 7440666	RfD = 3E-1 BCF = 47 FI = 6.5	9100/69,000 <sup>12</sup>	IRIS 10/01/92	RfD = 3E-1 BCF = 47 FI = 17.5	2000	7,400/26,000	IRIS 10/01/92

	Chemical (CAS number)	Basis for 1998 nrwqc: q1* or RfD/ADI and BCF	1998 nrwqc (ug/l) w +o/ o only	Reference Cite <sup>3</sup>	Basis for 2002 nrwqc: q1*/ RfD/ADI, RSC and BCF <sup>1,7,8</sup>	Methodology: 2000 or 1980 <sup>2</sup>	2002 nrwqc (ug/l) For Consumption of : Water + organism/ Organism Only	Reference Cite <sup>3</sup>
14	Cyanide 57125	RfD = 2E-2 BCF = 1 FI = 6.5	700/220,000	IRIS 02/01/93	RfD = 2E-2 <sup>10</sup> BCF = 1 RSC = 20% <sup>c</sup> (not used) FI = 6.5	1980	700/220,000	IRIS 02/01/93
15	Asbestos 1332214	Based on drinking water MCL	7 million Fibers/L	DW MCL 56 FR 3526 1/30/91	Based on drinking water MCL		7 million Fibers/L	DW MCL 56 FR 3526 01/30/91
16	2,3,7,8- TCDD(Dioxin) 1746016	q1* = 1.56E+5 BCF = 5000 (q1* no longer listed on IRIS) FI = 6.5	1.3E-8/ 1.4E-8	1984 AWQC Document EPA 440/5-84- 007	q1* = 1.56E+5 BCF = 5000 (q1* no longer listed on IRIS) FI = 17.5	2000	5.0E-9/5.1E-9	1984 AWQC Document EPA 440/5-84- 007 + 2000 Methodology
17	Acrolein 107028	ADI = 15.6 ug/kg/day BCF = 215 FI = 6.5	320/780	1980 AWQC document EPA 440/5-80- 016	ADI = 15.6 ug/kg/day (or 0.0156 mg/kg/day) BCF = 215 FI = 17.5	2000	190/290	1980 AWQC document EPA 440/5-80- 016
18	Acrylonitrile 107131	q1* = 5.4E-1 BCF = 30 FI = 6.5	0.059/0.66	IRIS 01/01/91	q1* = 5.4E-1 BCF = 30 FI = 17.5	2000	0.051/0.25	IRIS 01/01/91
19	Benzene 71432	q1* = 2.9E-2 BCF = 5.2 FI = 6.5	1.2/71	IRIS 02/01/94	q1* = 1.5E-2 to 5.5E-2 BCF = 5.2 FI = 17.5	2000	0.61 - 2.2/14 - 51	IRIS 01/19/00
20	Bromoform 75252	q1* = 7.9E-3 BCF = 3.75 based on chloroform FI = 6.5	4.3/360	IRIS 01/01/91	q1* = 7.9E-3 BCF = 3.75 (based on chloroform ) FI = 17.5	2000	4.3/140	IRIS 01/01/91
21	Carbon Tetrachloride 56235	q1* = 1.3E-1 BCF = 18.75 FI = 6.5	0.25/4.4	IRIS 06/01/91	q1* = 1.3E-1 BCF = 18.75 FI = 17.5	2000	0.23/1.6	IRIS 06/01/91

	Chemical (CAS number)	Basis for 1998 nrwqc: q1* or RfD/ADI and BCF	1998 nrwqc (ug/l) w +o/ o only	Reference Cite <sup>3</sup>	Basis for 2002 nrwqc: q1*/ RfD/ADI, RSC and BCF <sup>1,7,8</sup>	Methodology: 2000 or 1980 <sup>2</sup>	2002 nrwqc (ug/l) For Consumption of : Water + organism/ Organism Only	Reference Cite <sup>3</sup>
22	Chlorobenzene 108907	RfD = 2E-2 BCF = 10.3 FI = 6.5	680/21,000	IRIS 07/01/93	RfD = 2E-2 <sup>10</sup> BCF = 10.3 RSC = 20 % <sup>d</sup> (not used) FI = 6.5	1980	680/21,000	IRIS 07/01/93
23	Chlorodi- bromomethane 124481	q1* = 8.4E-2 BCF = 3.75 based on chloroform FI = 6.5	0.41/34	IRIS 01/01/92	q1* = 8.4E-2 <sup>11</sup> RfD = 2E-2 (not used) BCF = 3.75 (based on chloroform) RSC = 80% <sup>k</sup> (not used) FI = 17.5	2000	0.40/13	IRIS 01/01/92
24	Chloroethane 75003	-----	-----	-----	-----	NA-	-----	-----
25	2-Chloroethyl- vinyl Ether 110758	-----	-----	-----	-----	NA	-----	-----
26	Chloroform 67663	q1* = 6.1E-3 BCF = 3.75 FI = 6.5	5.7/470	IRIS 03/01/91	q1* = 6.1E-3 BCF = 3.75 FI = 6.5 (RfD = 1E-2; IRIS 10/19/01- not used) <sup>4</sup>	1980 (Undergoing Major reassessment, no revision)	5.7/470	IRIS 03/01/91
27	Dichloro- bromomethane 75274	q1* = 6.2E-2 BCF = 3.75 FI = 6.5	0.56/46	IRIS 03/01/93	q1* = 6.2E-2 BCF = 3.75 FI = 17.5	2000	0.55/17	IRIS 03/01/93
28	1,1-Dichloro- ethane 75343	q1* = 9.1	-----	-----	-----	NA	-----	-----
29	1,2-Dichloro- ethane 107062	q1* = 9.1E-2 BCF = 1.2 FI = 6.5	0.38/99	IRIS 01/01/91	q1* = 9.1E-2 BCF = 1.2 FI = 17.5	2000	0.38/37	IRIS 01/01/91

	Chemical (CAS number)	Basis for 1998 nrwqc: q1* or RfD/ADI and BCF	1998 nrwqc (ug/l) w +o/ o only	Reference Cite <sup>3</sup>	Basis for 2002 nrwqc: q1*/ RfD/ADI, RSC and BCF <sup>1,7,8</sup>	Methodology: 2000 or 1980 <sup>2</sup>	2002 nrwqc (ug/l) For Consumption of : Water + organism/ Organism Only	Reference Cite <sup>3</sup>
30	1,1-Dichloro- ethylene 75354	q1* = 6E-1 RfD = 9E-3 BCF = 5.6 FI = 6.5	0.057/3.2	IRIS 02/01/98	q1* = 6E-1 <sup>10</sup> FI = 6.5 BCF = 5.6 (RfD = 5E-2 IRIS 08/13/02- not used) RSC = 20 % <sup>e</sup> (not used)	2000	0.057/3.2	IRIS 02/01/98
31	1,2-Dichloro- propane 78875	q1* = 6.7E-2 BCF = 4.1 (q1* not on IRIS, but verified at 6.7E-2) FI = 6.5	0.52/39	Draft IRIS Coversheet; DW reg. 56 FR 3526 1/30/91	q1* = 6.7E-2 BCF = 4.1 (q1* not on IRIS, but verified at 6.7E-2) FI = 17.5	2000	0.50/15	Draft IRIS Coversheet; DW reg. 56 FR 3526 1/30/91
32	1,3-Dichloro- propylene 542756	RfD = 3E-4 (low) BCF = 1.9 FI = 6.5	10 /1700	IRIS 10/01/90	RfD = 3E-4 <sup>10</sup> BCF = 1.9 FI = 6.5 (q1* = 0.1/ RfD = 3E-2 IRIS 05/25/00-not used)	1980	10/1,700	IRIS 10/01/90
33	Ethyl-benzene 100414	RfD = 1E-1 (low) BCF = 37.5 FI = 6.5	3100/29,000	IRIS 06/01/91	RfD = 1E-1 <sup>10</sup> BCF = 37.5 RSC = 20% <sup>f</sup> (not used) FI = 6.5	1980	3,100/29,000	IRIS 06/01/91
34	Methyl-Bromide 74839	RfD = 1.4E-3 BCF = 3.75 Chloroform BCF used FI = 6.5	48/4000	IRIS 07/01/91	RfD = 1.4E-3 BCF = 3.75 (Chloroform BCF used) FI = 17.5	2000	47/1,500	IRIS 07/01/91
35	Methyl-Chloride 74873	q1* = 6.1E-3 (chloroform q1* and BCF used) BCF = 3.75 FI = 6.5	-----	IRIS 03/01/91	-----	-----	-----	-----

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36	Methylene- Chloride 75092	q1* = 7.5E-3 BCF = 0.9 FI = 6.5	4.7/1600	IRIS 02/01/95	q1* = 7.5E-3 BCF = 0.9 FI = 17.5	2000	4.6/590	IRIS 02/01/95
37	1,1,2,2- Tetrachloro- ethane 79345	q1* = 2E-1 BCF = 5 FI = 6.5	0.17/11	IRIS 02/01/94	q1* = 2E-1 BCF = 5 FI = 17.5	2000	0.17/4.0	IRIS 02/01/94
38	Tetrachloro- ethylene 127184	q1* = 3.98E-2 BCF = 30.6 FI = 6.5	0.8/8.85	1980 AWQC DOCUMENT EPA 440/5-80- 073	q1* = 3.98E-2 BCF = 30.6 FI = 17.5	2000	0.69/3.3	1980 AWQC DOCUMENT EPA 440/5-80- 073 & 2000 FI
39	Toluene 108883	RfD = 2E-1 BCF = 10.7 FI = 6.5	6800/200,000	IRIS 04/01/94	RfD = 2E-1 <sup>10</sup> BCF = 10.7 RSC = 20% <sup>g</sup> (not used) FI = 6.5	1980	6,800/200,000	IRIS 04/01/94
40	1,2-Trans- Dichloro- ethylene 156605	RfD = 2E-2 BCF = 1.58 FI = 6.5	700/140,000	IRIS 01/01/89	RfD = 2E-2 <sup>10</sup> BCF = 1.58 RSC = 20% <sup>h</sup> (not used) FI = 6.5	1980	700/140,000	IRIS 01/01/89
41	1,1,1-Tri- chloroethane 71556	RfD = 9E-2 BCF = 5.6 RfD withdrawn 08/01/91	-----	IRIS 09/01/90	-----	NA	-----	-----
42	1,1,2-Trichloro- ethane 79005	q1* = 0.057 RfD = 0.004 BCF = 4.5 FI = 6.5	0.60/42	IRIS 07/01/94	q1* = 0.057 <sup>11</sup> RfD = 4E-3 BCF = 4.5 RSC = 20% <sup>i</sup> FI = 17.5	2000 (based on q1* even though RSC and RfD are available)	0.59/16	IRIS 02/01/1994
43	Trichloro- ethylene 79016	q1* = 1.26E-2 BCF = 10.6 RfD under rev q1* withdrawn FI = 6.5	2.7/81	1980 AWQC DOCUMENT EPA 440/5-80- 077	q1* = 1.26E-2 BCF = 10.6 FI = 17.5	1980 AWQC DOCUMENT EPA 440/5-80- 077 & 2000 FI	2.5/30	1980 AWQC DOCUMENT EPA 440/5-80- 077 & 2000 FI



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44	Vinyl Chloride 75014	q1* = 1.74E-2 BCF = 1.17 FI = 6.5	2.0/525	1980 AWQC DOCUMENT EPA 440/5-80- 078	q1* = 1.74E-2 <sup>10</sup> (q1* = 1.4 LMS exposure from birth/RfD = 3E-3 IRIS 08/07/00- not used) BCF = 1.17 FI = 6.5	1980	2.0/530	1980 AWQC DOCUMENT EPA 440/5-80- 078
45	2-Chlorophenol 95578	RfD = 5E-3 BCF = 134 FI = 6.5	120/400	IRIS 07/01/93	RfD = 5E-3 BCF = 134 FI = 17.5	2000	81/150	IRIS 07/01/93
46	2,4-Dichloro- phenol 120832	RfD = 3E-3 BCF = 40.7 FI = 6.5	93/790	IRIS 06/30/88	RfD = 3E-3 BCF = 40.7 FI = 17.5	2000	77/290	IRIS 06/30/88
47	2,4-Dimethyl- phenol 105679	RfD = 2E-2 BCF = 93.8 FI = 6.5	540/2300	IRIS 11/01/90	RfD = 2E-2 BCF = 93.8 FI = 17.5	2000	380/850	IRIS 11/01/90
48	2-Methyl-4,6- Dinitro-phenol (cresol) 534521	(0.039 mg/kg/day)/100 BCF = 5.5 FI = 6.5	13.4/765	1980 AWQC DOCUMENT EPA 440/5-80- 063	(0.039 mg/kg/day)/100 BCF = 5.5 FI = 17.5	2000	13/280	1980 AWQC DOCUMENT EPA 440/5-80- 063
49	2,4-Dinitro- phenol 51285	RfD = 2E-3 BCF = 1.5 FI = 6.5	70/14,000	IRIS 07/01/91	RfD = 2E-3 BCF = 1.5 FI = 17.5	2000	69/5,300	IRIS 07/01/91
50	2-Nitrophenol 88755	BCF = 2.33	-----	-----	-----	NA	-----	-----
51	4-Nitrophenol 100027	BCF = 3.31	-----	-----	-----	NA	-----	-----
52	3-Methyl-4- Chlorophenol 59507	RfD = 3E-2 (medium) q1* = 1.2E-1	-----	IRIS MAY 1995	RfD = 3E-2 (medium) q1* = 1.2E-1	NA	-----	-----

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53	Pentachloro- phenol 87865	q1* = 0.12 BCF = 11 FI = 6.5	0.28/8.2	IRIS 07/01/93	q1* = 0.12 RfD = 3E-2 (not used) BCF = 11 FI = 17.5	2000	0.27/3.0	IRIS 07/01/93
54	Phenol 108952	RfD = 6E-1 BCF = 1.4 FI = 6.5	21,000/ 4,600,000	IRIS 02/01/90	RfD = 6E-1 BCF = 1.4 FI = 17.5	2000	21,000/1,700,000	IRIS 02/01/90
55	2,4,6-Trichloro- phenol 88062	q1* = 0.011 BCF = 150 FI = 6.5	2.1/6.5	IRIS 02/01/94	q1* = 0.011 BCF = 150 FI = 17.5	2000	1.4/2.4	IRIS 02/01/94
56	Acenaphthene 83329	RfD = 6E-2 BCF = 242 FI = 6.5	1200/2700	IRIS 04/01/94	RfD = 6E-2 BCF = 242 FI = 17.52	2000	670/990	IRIS 04/01/94
57	Acenaphthylene 208968	benzo (a) pyrene (BaP) q1* and BCF used	-----	1980 AWQC document EPA/5-80-069	-----	NA	-----	-----
58	Anthracene 120127	RfD = 3E-1 BCF = 30 (BaP BCF used) FI = 6.5	9600/110,000	IRIS 07/01/93	RfD = 3E-1 BCF = 30 (BaP BCF used) FI = 17.5	2000	8,300/40,000	IRIS 07/01/93
59	Benzidine 92875	q1* = 230 BCF = 87.5 FI = 6.5	0.00012/ 0.00054	IRIS 02/01/95	q1* = 230 RfD = 3E-3 (not used) BCF = 87.5 FI = 17.5	2000	0.000086/0.00020	IRIS 02/01/95
60	Benzo(a)- Anthracene 56553	q1* = 7.3E+0 (BaP q1* used) BCF =30 FI = 6.5	0.0044/0.049	IRIS 11/01/94 for CAS # 205992 was used	q1* = 7.3E+0 (BaP q1* used) BCF =30 FI = 17.5	2000	0.0038/0.018	IRIS 11/01/94 for CAS # 205992 was used
61	Benzo(a)-Pyrene 50328	q1* = 7.3E+0 BCF = 30 FI = 6.5	0.0044/0.049	IRIS 11/01/94	q1* = 7.3E+0 BCF = 30 FI = 17.5	2000	0.0038/0.018	IRIS 11/01/94

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62	Benzo(b)- Fluoranthene 205992	q1* = 7.3E+0 (BaP q1* used) BCF =30 FI = 6.5	0.0044/0.049	IRIS 11/01/94 for CAS # 205992 was used	q1* = 7.3E+0 (BaP q1* used) BCF =30 FI = 17.5	2000	0.0038/0.018	IRIS 11/01/94 for CAS # 205992 was used
63	Benzo(ghi)- Perylene 191242	BCF = 30 (BaP =7.3E+0, BCF)	-----	-----	-----	NA	-----	-----
64	Benzo(k)- Fluoranthene 207089	q1* = 7.3E+0 (BaP q1* used) BCF =30 FI = 6.5	0.0044/0.049	IRIS 11/01/94 for CAS # 205992 was used	q1* = 7.3E+0 (BaP q1* used) BCF =30 FI = 17.5	2000	0.0038/0.018	IRIS 11/01/94 for CAS # 205992 was used
65	Bis(2-Chloro- ethoxy)-Methane 111911	BCF = 0.64	-----	IRIS 3/1/91	-----	NA	-----	IRIS 3/1/91
66	Bis(2-Chloro- ethyl) Ether 111444	q1* = 1.1 BCF = 6.9 FI = 6.5	0.031/1.4	IRIS 02/01/94	q1* = 1.1 BCF = 6.9 FI = 17.5	2000	0.030/0.53	IRIS 02/01/94
67	Bis(2-Chloro- isopropyl)-Ether 108-60-1 (changed from 3963829)	RfD = 4E-2 BCF = 2.47 FI = 6.5	1400/170,000	IRIS 08/01/90	RfD = 4E-2 BCF = 2.47 FI = 17.5	2000	1,400/65,000	IRIS 08/01/90
68	Bis(2- Ethylhexyl)- Phthalate 117817	q1* = 0.014 BCF = 130 FI = 6.5	1.8/5.9	IRIS 02/01/93	q1* = 0.014 BCF = 130 FI = 17.5	2000	1.2/2.2	IRIS 02/01/93
69	4-Bromo-phenyl Phenyl-Ether 101553	BCF = 1640	-----		-----	NA	-----	-----
70	Butylbenzyl phthalate 85687	RfD = 2E-1 BCF = 414 FI = 6.5	3000/5200	IRIS 02/01/93	RfD = 2E-1 BCF = 414 FI = 17.5		1,500/1,900	IRIS 02/01/93

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71	2-Chloro- naphthalene 91587	RfD = 8E-2 BCF = 202 FI = 6.5	1700/4300	IRIS 11/01/90	RfD = 8E-2 BCF = 202 FI = 17.5	2000	1,000/1,600	IRIS 11/01/90
72	4-Chloro-Phenyl Phenyl Ether 7005723	BCF = 1200	-----	-----	-----	NA	-----	-----
73	Chrysene 218019	q1* = 7.3E+0 (BaP q1* used) BCF =30 FI = 6.5	0.0044/0.049	IRIS 11/01/94 for CAS # 205992 was used	q1* = 7.3E+0 (BaP q1* used) BCF =30 FI = 17.5	2000	0.0038/0.018	IRIS 11/01/94 for CAS # 205992 was used
74	Dibenzo(a,h) Anthracene 53703	q1* = 7.3E+0 (BaP q1* used) BCF =30 FI = 6.5	0.0044/0.049	IRIS 11/01/94 for CAS # 205992 was used	q1* = 7.3E+0 (BaP q1* used) BCF =30 FI = 17.5	2000	0.0038/0.018	IRIS 11/01/94 for CAS # 205992 was used
75	1,2-Dichloro- benzene 95501	RfD = 9E-2 BCF = 55.6 FI = 6.5	2700/17,000	IRIS 03/01/91	RfD = 9E-2 <sup>10</sup> BCF = 55.6 RSC = 20% <sup>j</sup> (not used) FI = 6.5	1980	2,700/17,000	IRIS 03/01/91
76	1,3-Dichloro- benzene 541731	ADI = 1.34E-2 (ADI for 1,2- DCB used) BCF = 55.6 FI = 6.5	400/2600	1980 AWQC DOC EPA 440/5-80- 039	ADI = 1.34E-2 (ADI for 1,2-DCB used) BCF = 55.6 FI = 17.5	2000	320/960	1980 AWQC DOC EPA 440/5-80- 039
77	1,4-Dichloro- benzene 106467	ADI = 1.34E-2 (ADI for 1,2- DCB used) BCF = 55.6 FI = 6.5	400/2600	1980 AWQC DOCUMENT EPA 440/5-80- 039	ADI = 1.34E-2 <sup>10</sup> (ADI for 1,2-DCB used) BCF = 55.6 RSC = 20% <sup>j</sup> (not used) FI = 6.5	1980	400/2,600	1980 AWQC DOCUMENT EPA 440/5-80- 039
78	3,3'-Dichloro- benzidine 91941	q1* = 0.45 BCF = 312 FI = 6.5	0.04/0.077	IRIS 07/01/93	q1* = 0.45 BCF = 312 FI = 17.5	2000	0.021/0.028	IRIS 07/01/93

	Chemical (CAS number)	Basis for 1998 nrwqc: q1* or RfD/ADI and BCF	1998 nrwqc (ug/l) w +o/ o only	Reference Cite <sup>3</sup>	Basis for 2002 nrwqc: q1*/ RfD/ADI, RSC and BCF <sup>1,7,8</sup>	Methodology: 2000 or 1980 <sup>2</sup>	2002 nrwqc (ug/l) For Consumption of : Water + organism/ Organism Only	Reference Cite <sup>3</sup>
79	Diethyl Phthalate 84662	RfD = 8E-1 BCF = 73 FI = 6.5	23,000/ 120,000	IRIS 02/01/93	RfD =8E-1 BCF = 73 FI = 17.5	2000	17,000/44,000	IRIS 02/01/93
80	Dimethyl Phthalate 131113	ADI = 10 BCF = 36 FI = 6.5	313,000/ 2,900,000	1980 AWQC document EPA 440/5-80- 067	ADI = 10 BCF = 36 FI = 17.5	2000	270,000/1,100,000	1980 AWQC document EPA 440/5-80- 067 & 2000 FI
81	Di-n-Butyl Phthalate 84742	RfD = 1E-1 BCF = 89 FI = 6.5	2700/12,000	IRIS 08/01/90	RfD = 1E-1 BCF = 89 FI = 17.5	2000	2,000/4,500	IRIS 08/01/90
82	2,4-Dinitro- toluene 121142	q1* = 3.11E-1 BCF = 3.8 FI = 6.5	0.11/9.1	1980 AWQC document EPA 440/5-80- 045	q1* = 3.11E-1 <sup>11</sup> RfD = 2E-3 (not used) BCF = 3.8 FI = 17.5	2000	0.11/3.4	1980 AWQC document EPA 440/5-80- 045 & 2000 FI
83	2,6-Dinitro- toluene 606202	-----	-----	-----	-----	NA	-----	-----
84	Di-n-Octyl Phthalate 117840	-----	-----	-----	-----	NA	-----	-----
85	1,2-Diphenyl- hydrazine 122667	q1* = 0.8 BCF = 24.9 FI = 6.5	0.040/0.54	IRIS 01/01/91	q1* = 0.8 BCF = 24.9 FI = 17.5	2000	0.036/0.20	IRIS 01/01/91
86	Fluoranthene 206440	RfD = 4E-2 BCF = 1150 FI = 6.5	300/370	IRIS 07/01/93	RfD = 4E-2 BCF = 1150 FI = 17.5	2000	130/140	IRIS 07/01/93
87	Fluorene 86737	RfD = 4E-2 BCF = 30 BaP BCF used FI = 6.5	1300/14,000	IRIS 11/01/90	RfD = 4E-2 BCF = 30 (BaP BCF used) FI = 17.5	2000	1,100/5,300	IRIS 11/01/90

	Chemical (CAS number)	Basis for 1998 nrwqc: q1* or RfD/ADI and BCF	1998 nrwqc (ug/l) w +o/ o only	Reference Cite <sup>3</sup>	Basis for 2002 nrwqc: q1*/ RfD/ADI, RSC and BCF <sup>1,7,8</sup>	Methodology: 2000 or 1980 <sup>2</sup>	2002 nrwqc (ug/l) For Consumption of : Water + organism/ Organism Only	Reference Cite <sup>3</sup>
88	Hexachloro- benzene 118741	q1* = 1.6 BCF = 8690 FI = 6.5	0.00075/ 0.00077	IRIS 11/01/96	q1* = 1.6 <sup>11</sup> RfD = 8E-4 (not used) BCF = 8690 FI = 17.5	2000	0.00028/0.00029	IRIS 11/01/96
89	Hexachloro- butadiene 87683	q1* = 0.078 BCF = 2.78 FI = 6.5	0.44/50	IRIS 04/01/91	q1* = 0.078 BCF = 2.78 FI = 17.5	2000	0.44/18	IRIS 04/01/91
90	Hexachloro- cyclo-pentadiene 77474	RfD = 7E-3 BCF = 4.34 FI = 6.5	240/17,000	IRIS 09/01/90	RfD = 7E-3 <sup>10</sup> BCF = 4.34 RSC = 20% <sup>a</sup> (not used) FI = 6.5 (RfD = 6E-3 IRIS 07/05/01- not used)	1980	240/17,000	IRIS 09/01/90
91	Hexachloro- ethane 67721	q1* = 0.014 BCF = 86.9 FI = 6.5	1.9/8.9	IRIS 02/01/94	q1* = 0.014 RfD = 1E-3 (not used) BCF = 86.9 FI = 17.5	2000	1.4/3.3	IRIS 02/01/94
92	Indeno(1,2,3-cd) Pyrene 193395	q1* = 7.3E+0 (BaP q1* used) BCF = 30 FI = 6.5	0.0044/0.049	IRIS 11/01/94 for CAS # 205992 was used	q1* = 7.3E+0 (BaP q1* used) BCF = 30 FI = 17.5	2000	0.0038/0.018	IRIS 11/01/94 for CAS # 205992 was used
93	Isophorone 78591	q1* = 9.5E-4 BCF = 4.38 FI = 6.5	36/2600	IRIS 11/01/92	q1* = 9.5E-4 <sup>11</sup> RfD = 2E-1 (not used) BCF = 4.38 FI = 17.5	2000	35/960	IRIS 11/01/92
94	Naphthalene 91203	BCF = 10.5	-----	-----	-----	NA	-----	-----
95	Nitrobenzene 98953	RfD = 5E-4 BCF = 2.89 FI = 6.5	17/1900	IRIS 01/01/91	RfD = 5E-4 BCF = 2.89 FI = 17.5	2000	17/690	IRIS 01/01/91

	Chemical (CAS number)	Basis for 1998 nrwqc: q1* or RfD/ADI and BCF	1998 nrwqc (ug/l) w +o/ o only	Reference Cite <sup>3</sup>	Basis for 2002 nrwqc: q1*/ RfD/ADI, RSC and BCF <sup>1,7,8</sup>	Methodology: 2000 or 1980 <sup>2</sup>	2002 nrwqc (ug/l) For Consumption of : Water + organism/ Organism Only	Reference Cite <sup>3</sup>
96	N-Nitrosodi- methylamine 62759	q1* = 51 BCF = 0.026 FI = 6.5	0.00069/8.1	IRIS 07/01/93	q1* = 51 BCF = 0.026 FI = 17.5	2000	0.00069/3.0	IRIS 07/01/93
97	N-Nitrosodi-n- Propylamine 621647	q1* = 7.0 BCF = 1.13 FI = 6.5	0.005/1.4	IRIS 07/01/93	q1* = 7.0 BCF = 1.13 FI = 17.5	2000	0.0050/0.51	IRIS 07/01/93
98	N-Nitrosodi- phenylamine 86306	q1* = 0.0049 BCF = 136 FI = 6.5	5.0/16	IRIS 07/01/93	q1* = 0.0049 BCF = 136 FI = 17.5	2000	3.3/6.0	IRIS 07/01/93
99	Phenanthrene 85018	No RfD listed No q1* listed	-----	-----	-----	NA	-----	-----
100	Pyrene 129000	RfD = 3E-2 BCF = 30 (BaP BCF used) FI = 6.5	960/11,000	IRIS 07/01/93	RfD = 3E-2 BCF = 30 (BaP BCF used) FI = 17.5	2000	830/4,000	IRIS 07/01/93
101	1,2,4-Trichloro- benzene 120821	RfD = 1E-2 BCF = 114 FI = 6.5	260/940 <sup>12</sup>	IRIS 11/01/96	RfD = 1E-2 <sup>10</sup> BCF = 114 RSC = 20% <sup>a</sup> (not used) FI = 6.5	1980	260/940	IRIS 11/01/96
102	Aldrin 309002	q1* = 17 BCF = 4670 FI = 6.5	0.00013/ 0.00014	IRIS 07/01/93	q1* = 17 <sup>11</sup> RfD = 3E-5 (not used) BCF = 4670 FI = 17.5	2000	0.000049/0.000050	IRIS 07/01/93
103	alpha-BHC 319846	q1* = 6.3 BCF = 130 FI = 6.5	0.0039/0.013	IRIS 07/01/93	q1* = 6.3 BCF = 130 FI = 17.5	2000	0.0026/0.0049	IRIS 07/01/93
104	beta-BHC 319857	q1* = 1.8 BCf = 130 FI = 6.5	0.014/0.046	IRIS 01/01/91	q1* = 1.8 BCf = 130 FI = 17.5	2000	0.0091/0.017	IRIS 07/01/1993

	Chemical (CAS number)	Basis for 1998 nrwqc: q1* or RfD/ADI and BCF	1998 nrwqc (ug/l) w +o/ o only	Reference Cite <sup>3</sup>	Basis for 2002 nrwqc: q1*/ RfD/ADI, RSC and BCF <sup>1,7,8</sup>	Methodology: 2000 or 1980 <sup>2</sup>	2002 nrwqc (ug/l) For Consumption of : Water + organism/ Organism Only	Reference Cite <sup>3</sup>
105	gamma-BHC 58899 lindane	q1* = 1.3 (Not listed on IRIS) BCF = 130 FI = 6.5	0.019/0.063	1980 AWQC DOCUMENT EPA 440/5-80- 054	q1* = 1.3 (Not listed on IRIS) <sup>10</sup> BCF = 130 FI = 6.5 (RfD = 3E-4 IRIS 03/01/88- not used) RSC = 20% <sup>1</sup> (not used)	1980	0.019/0.063	1980 AWQC DOCUMENT EPA 440/5-80- 054
106	delta-BHC 319868	BCF = 130	-----	-----	-----	NA	-----	-----
107	Chlordane 57749	q1* = 3.5E-1 BCF = 14100 FI = 6.5	0.0021/0.0022	IRIS 02/07/98	q1* = 3.5E-1 <sup>11</sup> RfD = 5E-4 (not used) BCF = 14100 FI = 17.5	2000	0.00080/0.00081	IRIS 02/07/98
108	4,4'-DDT 50293	q1* = 0.34 BCF = 53600 (one BCF applies for DDT, DDE and DDE) FI = 6.5	0.00059/ 0.00059	IRIS 05/01/91	q1* = 0.34 <sup>11</sup> RfD = 5E-4 (not used) BCF = 53600 (one BCF applies for DDT, DDE and DDE) FI = 17.5	2000	0.00022/0.00022	IRIS 05/01/91
109	4,4'-DDE 72559	q1* = 0.34 BCF = 53600 FI = 6.5	0.00059/ 0.00059	IRIS 08/22/88	q1* = 0.34 BCF = 53600 (one BCF applies for DDT, DDE and DDE) FI = 17.5	2000	0.00022/0.00022	IRIS 08/22/88
110	4,4'-DDD 72548	q1* = 0.24 BCF = 53600 FI = 6.5	0.00083/ 0.00084	IRIS 08/22/88	q1* = 0.24 BCF = 53600 FI = 17.5	2000	0.00031/0.00031	IRIS 08/22/88
111	Dieldrin 60571	q1* = 16 BCF = 4670 FI = 6.5	0.00014/ 0.00014	IRIS 01/01/91	q1* = 16 <sup>11</sup> RfD = 5E-5 (not used) BCF = 4670 FI = 17.5	2000	0.000052/0.000054	IRIS 07/01/1993



	Chemical (CAS number)	Basis for 1998 nrwqc: q1* or RfD/ADI and BCF	1998 nrwqc (ug/l) w +o/ o only	Reference Cite <sup>3</sup>	Basis for 2002 nrwqc: q1*/ RfD/ADI, RSC and BCF <sup>1,7,8</sup>	Methodology: 2000 or 1980 <sup>2</sup>	2002 nrwqc (ug/l) For Consumption of : Water + organism/ Organism Only	Reference Cite <sup>3</sup>
112	alpha- Endosulfan 959988	BCF = 270 RfD = 6E-3 RfD for endosulfan used FI = 6.5	110/240	IRIS 10/1/94 ENDOSULFAN #115297 WAS USED	RfD = 6E-3 (RfD for endosulfan used) BCF = 270 FI = 17.5	2000	62/89	IRIS 10/1/94 ENDOSULFAN #115297 WAS USED
113	beta-Endosulfan 33213659	RfD = 6E-3 (RfD for endosulfan used) BCF = 270 FI = 6.5	110/240	IRIS 10/01/94 ENDOSULFAN #115297 WAS USED	RfD = 6E-3 (RfD for endosulfan used) BCF = 270 FI = 17.5	2000	62/89	IRIS 10/01/94 ENDOSULFAN #115297 WAS USED
114	Endosulfan Sulfate 1031078	RfD = 6E-3 (RfD for endosulfan used) BCF = 270 FI = 6.5	110/240	IRIS 10/1/94 ENDOSULFAN #115297 WAS USED	RfD = 6E-3 (RfD for endosulfan used) BCF = 270 FI = 17.5	2000	62/89	IRIS 10/01/94 ENDOSULFAN #115297 WAS USED
115	Endrin 72208	RfD = 3E-4 BCF = 3970 FI = 6.5	0.76/0.81	IRIS 09/07/88	RfD = 3E-4 <sup>10</sup> BCF = 3970 RSC = 20% <sup>b</sup> (not used) FI = 6.5	1980	0.76/0.81	IRIS 04/01/1991
116	Endrin Aldehyde 7421934	RfD = 3E-4 (RfD for Endrin used) BCF = 3970 FI = 6.5	0.76/0.81	IRIS 04/01/91 for CAS # 72208 was used	RfD = 3E-4 (RfD for Endrin used) BCF = 3970 FI = 17.5	2000	0.29/0.30	IRIS 04/01/91 for CAS # 72208 was used
117	Heptachlor 76448	q1* = 4.5 BCF = 11200 FI = 6.5	0.00021/ 0.00021	IRIS 07/01/93	q1* = 4.5 <sup>11</sup> RfD = 5E-4 (not used) BCF = 11200 FI = 17.5	2000	0.000079/0.000079	IRIS 07/01/93
118	Heptachlor Epoxide 1024573	q1* = 9.1 BCF = 11200 (heptachlor BCF used) FI = 6.5	0.00010/ 0.00011	IRIS 07/01/93	q1* = 9.1 <sup>11</sup> RfD = 1.3E-5 (not used) BCF = 11200 (heptachlor BCF used) FI = 17.5	2000	0.000039/0.000039	IRIS 07/01/93

	Chemical (CAS number)	Basis for 1998 nrwqc: q1* or RfD/ADI and BCF	1998 nrwqc (ug/l) w +o/ o only	Reference Cite <sup>3</sup>	Basis for 2002 nrwqc: q1*/ RfD/ADI, RSC and BCF <sup>1,7,8</sup>	Methodology: 2000 or 1980 <sup>2</sup>	2002 nrwqc (ug/l) For Consumption of : Water + organism/ Organism Only	Reference Cite <sup>3</sup>
119	PCBs	q1* =2 (total PCBs/congener/ isomer) BCF = 31200 FI = 6.5	0.00017/ 0.00017	IRIS 06/01/97 for CASRN 1336- 36-3	q1* = 2 (total PCBs/ congener/isomer) BCF = 31200 FI = 17.5	2000	0.000064/0.000064	IRIS 06/01/97 for CASRN 1336- 36-3
120	Toxaphane 8001352	q1* = 1.1 BCF = 13100 FI = 6.5	0.00073/ 0.00075	IRIS 01/01/91	q1* = 1.1 BCF = 13100 FI = 17.5	2000	0.00028/0.00028	IRIS 01/01/91

**FOOTNOTES :**

1. IRIS values as of May 17, 2002 are presented. IRIS information is presented in some cases even though it may not be used to calculate criteria. All units are as follows: q1\* = per mg/kg-day; RfD = mg/kg-d; BCF = L/kg; and FI = 17.5 g/day (unless otherwise noted).
2. Calculations are based on the following methodologies: *Guidelines and Methodologies Used in the Preparation of Health Effects Assessment Chapters of the Consent Decree Water Criteria Documents* (45FR79347) and *Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health* (2000), EPA-822-B-00-004, October 2000).
3. Reference cite refers to an IRIS coversheet, AWQC criterion document or other document which serves as the basis for the criterion.
4. Although a new RfD is available in IRIS, the surface water criteria will not be revised until the National Primary Drinking Water Regulations: Stage 2 Disinfectants and Disinfection Byproducts Rule (Stage 2 DBPR) is completed, since public comment on the relative source contribution (RSC) for chloroform is anticipated.
5. In IRIS, EPA has listed thallium sulfate, not thallium alone. The thallium RfD included in the matrix is based on: NOAL = 0.25 mg TL<sub>2</sub>SO<sub>4</sub>/kg-d; UF = 3000; fraction TL in TL<sub>2</sub>SO<sub>4</sub> = 0.81.
6. Original 1980 ADIs were expressed as mg/day. These have been converted to mg/kg-day to make them comparable to present day RfDs. All q1\*s are in kg-day/mg or per mg/kg-day.
7. The fish tissue bioconcentration factor (BCF) from the 1980 criteria documents was retained unless otherwise noted. No BAFs were derived for this effort.
8. Criteria based on carcinogenicity (q1\*), reflect 10<sup>-6</sup> risk.
9. The q1\* of 1.75 mg/kg-d was derived from the risk per unit concentration in drinking water from IRIS: 5x10<sup>-5</sup> risk per ug/L in drinking water.
10. This criterion was not revised as part of this effort. EPA has published revisions for this criterion in the **Federal Register** and is soliciting scientific views on the revised value.
11. Although a q1\* and RfD are available in IRIS, the q1\* was used to derive the criterion because it resulted in the more stringent criterion.
12. These criteria were not published or promulgated in the NTR or CTR. These criteria were calculated based on the RfD presented in IRIS.

### **References for Relative Source Contribution (RSC)**

- a. FR 57 (138), July 17, 1992
- b. FR 55 (143), July 25, 1990
- c. Cyanide Health Advisory, March 31, 1987.
- d. FR 56 (20), January 30, 1991
- e. 1,1-dichloroethylene Health Advisory, March 31, 1987
- f. Ethylbenzene Health Advisory, March 31, 1987
- g. Toluene (Draft) Health Advisory, October 1993
- h. FR 54 (97), May 22, 1989
- i. 1,1,2-trichloroethane Health Advisory, September 1, 1989
- j. Ortho-, meta- and para-dichlorobenzenes Health Advisory, March 31, 1987
- k. FR 59 (145) July 29, 1994
- l. Lindane Health Advisory, March 31, 1987.

## 1980 Methodology Calculations

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Using cancer potency, q1\*:

For consumption of water and organisms:

$$\text{AWQC } [\mu\text{g/L}] = \frac{10^{-6} \bullet 70 \text{ kg} \bullet 1000 \mu\text{g/mg}}{q1^* [\text{kg-d/mg}] (2 \text{ L/d} + (0.0065 \text{ kg/d} \bullet \text{BCF} [\text{L/kg}]))}$$

For consumption of organisms only:

$$\text{AWQC } [\mu\text{g/L}] = \frac{10^{-6} \bullet 70 \text{ kg} \bullet 1000 \mu\text{g/mg}}{q1^* [\text{kg-d/mg}] \bullet 0.0065 \text{ kg/d} \bullet \text{BCF} [\text{L/kg}]}$$

Using Reference Dose:

For consumption of water and organisms:

$$\text{AWQC } [\mu\text{g/L}] = \frac{\text{RfD} [\text{mg/kg-d}] \bullet 70 \text{ kg} \bullet 1000 \mu\text{g/mg}}{2 \text{ L/d} + (0.0065 \text{ kg/d} \bullet \text{BCF} [\text{L/kg}] )}$$

For consumption of organisms only:

$$\text{AWQC } [\mu\text{g/L}] = \frac{\text{RfD} [\text{mg/kg-d}] \bullet 70 \text{ kg} \bullet 1000 \mu\text{g/mg}}{0.0065 \text{ kg/d} \bullet \text{BCF} [\text{L/kg}]}$$

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AWQC = Ambient water quality criteria = national recommended water quality criteria

q1\* = Cancer potency factor kg-d/mg or per mg/kg-day

RfD = Reference dose mg/kg-d

DI = Drinking water intake 2 L/day

BW = Human body weight 70 kg

FI = Fish intake 0.0065 kg/day

BCF = Bioconcentration factor L/kg

## 2000 Methodology Calculations

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### Linear Approach

#### Using cancer potency, q1\*:

For consumption of water and organisms:

$$\text{AWQC } [\mu\text{g/L}] = \frac{(10^{-6}/q1^*) \bullet 70 \text{ kg} \bullet 1000 \mu\text{g/mg}}{(2 \text{ L/d} + (0.0175 \text{ kg/d} \bullet \text{BCF } [\text{L/kg}]))}$$

For consumption of organisms only:

$$\text{AWQC } [\mu\text{g/L}] = \frac{(10^{-6}/q1^*) \bullet 70 \text{ kg} \bullet 1000 \mu\text{g/mg}}{0.0175 \text{ kg/d} \bullet \text{BCF } [\text{L/kg}]}$$

*Nonlinear Approach* (Presented for information only- no criteria in matrix based on nonlinear approach currently)

For consumption of water and organisms:

$$\text{AWQC } [\mu\text{g/L}] = \text{POD/UF} \bullet \text{RSC} \bullet (\text{BW/DI} + (\text{FI} \bullet \text{BCF}))$$

For consumption of organisms only:

$$\text{AWQC } [\mu\text{g/L}] = \text{POD/UF} \bullet \text{RSC} \bullet (\text{BW}/(\text{FI} \bullet \text{BCF}))$$

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AWQC = Ambient water quality criteria = national recommended water quality criteria

q1\* = Cancer potency factor kg-d/mg or per mg/kg-day

RSD = Risk specific dose  $10^{-6}/q1^*$  mg/kg-day

RfD = Reference dose mg/kg-d

DI = Drinking water intake 2 L/day

BW = Human body weight 70 kg

FI = Fish intake 0.0175 kg/day

BCF = Bioconcentration factor L/kg

UF = Uncertainty factor (unitless)

RSC = Relative source contribution (percentage of subtraction)

POD = Point of departure mg/kg-day

#### Using Reference Dose:

For consumption of water and organisms:

$$\text{AWQC } [\mu\text{g/L}] = [\text{RfD } [\text{mg/kg-d}] \bullet \text{RSC} * (70 \text{ kg}/2 \text{ L/d} + (0.0175 \text{ kg/d} \bullet \text{BCF } [\text{L/kg}]]) \bullet 1000 \mu\text{g/mg} \\ \text{or } (- \text{RSC})$$

For consumption of organisms only:

$$\text{AWQC } [\mu\text{g/L}] = [\text{RfD } [\text{mg/kg-d}] \bullet \text{RSC} \bullet (70 \text{ kg}/(0.0175 \text{ kg/d} \bullet \text{BCF } [\text{L/kg}]))] \bullet 1000 \mu\text{g/mg} \\ (- \text{RSC})$$

**NRWQC: HUMAN HEALTH CRITERIA CALCULATION MATRIX (November 2002)**

**NON PRIORITY POLLUTANTS**

	Chemical (CAS number)	Gold Book or Criteria Document Value (ug/L) w + o/ o only	Basis (q1* or RfD/ADI) and BCF	1998 nrwqc (ug/L) w + o/o	Reference Cite	Basis (q1* or RfD/ADI) and BCF <sup>1,2</sup>	Methodology 2000 or 1980	2002 nrwqc (ug/L) w + o/ o only	Reference Cite <sup>3</sup>
6	Barium	1,000/---	RfD = 7E-2 (08/01/90) not used	1,000/---	Gold Book	RfD = 7E-2 (01/20/1999) not used	pre-1980	1,000/---	Gold Book
10	Chlorophenoxy Herbicide (2,4,5,-TP) 93721	10,---	RfD = 8E-3 (09/07/88) not used	10/---	Gold Book	RfD = 8E-3 (09/07/88) not used RSC = 20% <sup>a</sup>	pre-1980	10/---	Gold Book
11	Chlorophenoxy herbicide (2,4-D) 94757	100/---	RfD = 1E-2 (05/05/88)	100/---	Gold Book	RfD = 1E-2 (05/05/88) RSC = 20% <sup>b</sup>	pre-1980	100/---	Gold Book
15	Ether, Bis (Chloromethyl) 542881	0.00000376/ 0.00184 (based on q1* = 9299.8)	q1* = 2.2E+2 BCF = 63 FI = 6.5	0.00013/ 0.00078	IRIS 01/01/91	q1* = 2.2E+2 BCF = 63 FI = 17.5	2000	0.00010/ 0.00029	IRIS 01/01/91
20	Iron 7439896	300/---	---	300/---	Gold Book	---	pre-1980	300/---	Gold Book
22	Manganese 7439965	50/100	RfD = 1.4E-1 (01/01/93) not used	50/100	Gold Book	RfD = 1.4E-1 (05/01/1996) not used	pre-1980	50/100	Gold Book
23	Methoxychlor 72435	100/---	RfD = 5E-3 (08/01/91) not used	100/---	Gold Book	RfD = 5E-3 (08/01/91) RSC = 20 % <sup>c,d</sup> (not used)	pre-1980	100	Gold Book
25	Nitrates 14797558	10,000/---	1.6E+0 (10/01/91) not used	10,000/---	Gold Book	RfD = 1.6E+0 (10/01/91) not used	pre-1980	10,000/---	Gold Book
26	Nitrosamines	0.0008/1.24	B <sub>II</sub> = 43.46 BCF = 0.20 (q1* = 1.5E+2 07/01/93 not used)	0.0008/1.24	EPA 440/5-80-064	B <sub>II</sub> = 43.46 BCF = 0.20 (q1* = 1.5E+2 07/01/93 not used)	pre-1980	0.0008/1.24	EPA 440/5-80-064

	Chemical (CAS number)	Gold Book or Criteria Document Value (ug/L) w + o/ o only	Basis (q1* or RfD/ADI) and BCF	1998 nrwqc (ug/L) w + o/o	Reference Cite	Basis (q1* or RfD/ADI) and BCF <sup>1,2</sup>	Methodology 2000 or 1980	2002 nrwqc (ug/L) w + o/ o only	Reference Cite <sup>3</sup>
27	Dinitrophenols 25550587	70/14,300	BCF = 1.51 RfD = 0.002 FI = 6.5	70/14,300	EPA 440/5-80-063	BCF = 1.51 RfD = 2E-3 FI = 17.5	2000	69/5,300	EPA 440/5-80-063 & 2000 FI
28	Nitrosodibutylamine,N 924163	0.0064/0.587	q1* = 5.43 BCF = 3.38 FI = 6.5	0.0064/0.587	EPA 440/5-80-064	q1* = 5.43 BCF = 3.38 FI = 17.5	2000	0.0063/0.22	EPA 440/5-80-064 & 2000 FI
29	Nitrosodiethylamine,N 55185	0.0008/1.24	B <sub>II</sub> = 43.46 BCF = 0.20 (q1* = 1.5E+2 07/01/93 not used)	0.0008/1.24	EPA 440/5-80-064	B <sub>II</sub> = 43.46 BCF = 0.20 (q1* = 1.5E+2 07/01/93 not used)	pre-1980	0.0008/1.24	EPA 440/5-80-064
30	Nitrosopyrrolidine,N 930552	0.016/91.9	q1* = 2.13 BCF = 0.055 FI = 6.5	0.016/91.9	EPA 440/5-80-064	q1* = 2.13 BCF = 0.055 FI = 17.5	2000	0.016/34	EPA 440/5-80-064 & 2000 FI
34	Pentachlorobenzene 608935	74/85 (based on ADI = 1.17)	RfD = 8E-4 BCF = 2,125 FI = 6.5	3.5/4.1	IRIS 03/01/88	RfD = 8E-4 BCF = 2,125 FI = 17.5	2000	1.4/1.5	IRIS 03/01/88
38	Solids Dissolved and Salinity	250,000/---	---	250,000/---	Gold Book	----	pre-1980	250,000/---	Gold Book
43	Tetrachlorobenzene, 1,2,4,5- 95943	38/48 (based on ADI = 0.35)	RfD = 3E-4 BCF = 1,125 FI = 6.5	2.3/2.9	IRIS 03/01/91	RfD = 3E-4 BCF = 1,125 FI = 17.5	2000	0.97/1.1	IRIS 03/01/91
45	Trichlorophenol,2,4,5 95954	2,600/9800 (based on ADI = 7)	RfD = 1E-1 BCF = 110 FI = 6.5	2,600/9800	IRIS 03/01/88	RfD = 1E-1 BCF = 110 FI = 17.5	2000	1,800/3,600	IRIS 03/01/88

**FOOTNOTES:**

1. Criteria based on carcinogenicity (q1\*), reflect 10<sup>-6</sup> risk.
2. The fish tissue bioconcentration factor (BCF) from the 1980 criteria documents was retained unless otherwise noted. No BAFs were derived for this effort.
3. Reference cite refers to an IRIS coversheet, AWQC criterion document or other document which serves as the basis for the criterion.

**References for Relative Source Contribution (RSC)**

- a. Silvex (2,4,5-TP) Health Advisory 1988
- b. 2,4-dichlorophenoxyacetic acid (2,4-D) Health Advisory, March 31, 1987
- c. FR 56 (20), January 30, 1991
- d. Methoxychlor Health Advisory, March 31, 1987