

US EPA ARCHIVE DOCUMENT

15.0 Human Health Benchmarks

Human health benchmarks are required by the Human Health Risk Module to evaluate human health effects that may result from exposure to chemicals released to the environment from WMUs. Benchmarks are used in the Human Health Risk Module to evaluate exposure through the following pathways:

- Ingestion of water
- Ingestion of food products (i.e., beef, milk, fruits, and vegetables)
- Ingestion of fish
- Ingestion of soil
- Inhalation of ambient air
- Inhalation of air during showering.

This section describes the identification of human health benchmarks used.

15.1 Parameters Collected

The human health benchmarks used by the 3MRA modeling system are oral reference doses (RfDs), inhalation reference concentrations (RfCs), oral cancer slope factors (CSFs), and inhalation CSFs. The benchmarks are chemical-specific. Human health benchmarks are applied nationally and do not vary by site or region. The human health benchmarks do not vary between receptors (i.e., residents, home gardeners, farmers, and recreational fishers) or age groups.

15.2 Data Sources

The following sources provide the human health benchmarks used for constituents in the Human Risk Module:

- Integrated Risk Information System (IRIS)
- Health Effects Assessment Summary Tables (HEAST)
- Superfund Technical Support Center
- Various other U.S. Environmental Protection Agency (EPA) criteria documents
- Agency for Toxic Substances and Disease Registry (ATSDR)
- California Environmental Protection Agency (CalEPA).

IRIS is an EPA electronic database containing information on human health effects (U.S. EPA, 1999a). Each chemical file contains descriptive and quantitative information on potential health effects. Health benchmarks for chronic noncarcinogenic health effects include RfDs and RfCs. Cancer classifications, oral CSFs, and oral and inhalation unit risk factors (URFs) are

included for carcinogenic effects. IRIS is the official repository of EPA-wide consensus human health risk information.

HEAST is a listing of provisional noncarcinogenic and carcinogenic health benchmarks (RfDs, RfCs, CSFs, and URFs) derived by the U.S. EPA (1997). Although the health benchmarks in HEAST have undergone review, they are not recognized as Agency-wide consensus information and have not been updated since 1997.

The Superfund Technical Support Center (EPA's National Center for Environmental Assessment) (U.S. EPA, n.d.) derives provisional RfCs, RfDs, CSFs, and URFs for certain chemicals. These health benchmarks can be found in NCEA risk assessment issue papers. These values have not undergone EPA's formal review process and, therefore, do not represent verified EPA benchmarks. EPA also may derive health benchmark values in other risk assessment documents such as Health Assessment Documents (HADs), Health Effect Assessments (HEAs), Health and Environmental Effects Profiles (HEEPs), Health and Environmental Effects Documents (HEEDs), Drinking Water Criteria Documents (DWCDs), and Ambient Water Quality Criteria Documents (AWQCDs). Evaluations of potential carcinogenicity of chemicals in support of reportable quantity adjustments have been published by EPA's Carcinogen Assessment Group (CAG) and may include cancer potency factor estimates. Health benchmark values identified in these EPA documents are not recognized as Agency-wide consensus information, however. EPA also has established toxicity equivalency factors (TEFs) to calculate CSFs for some dioxin-like compounds and polycyclic aromatic hydrocarbons (PAHs) (U.S. EPA, 1993, 1998).

The ATSDR Minimal Risk Levels (MRLs) are substance-specific health guidance levels for noncarcinogenic endpoints. An MRL is an estimate of the daily human exposure to a hazardous substance that is likely to be without appreciable risk of adverse noncancer health effects over a specified exposure duration. MRLs are derived for acute, intermediate, and chronic exposure durations for oral and inhalation routes of exposure. Inhalation and oral MRLs are similar to EPA's RfCs and RfDs, respectively; however, MRLs are intended to serve as screening levels. MRLs are available on ATSDR's web site, but are detailed in individual ATSDR Toxicological Profiles.

CalEPA has developed unit risk and cancer potency factors for chemicals regulated under California's Hot Spots Air Toxics program (CalEPA, 1995, 1999a). Cancer potency factors, analogous to EPA's oral and inhalation CSFs, are described in *Air Toxics Hot Spots Program Risk Assessment Guidelines: Part II. Technical Support Document for Describing Available Cancer Potency Factors* (CalEPA, 1999a). This document, as well as a list of additional cancer potency factors, is available on CalEPA's web site. CalEPA also has developed a number of TEFs for PAHs (see *Benzo[a]pyrene as a Toxic Air Contaminant, Part B, Health Assessment* [CalEPA, 1994]).

CalEPA also has developed chronic inhalation reference exposure levels (RELs), analogous to U.S. EPA's RfCs, for 120 substances (CalEPA, 1997, 1999b). CalEPA used U.S. EPA's 1994 inhalation dosimetry methodology to derive inhalation RELs. The inhalation RELs are available in the following two documents: *Technical Support Document for the Determination of Noncancer Chronic Reference Exposure Levels* (Draft for Public Review,

CalEPA, 1997) and *Air Toxics Hot Spots Program Risk Assessment Guidelines: Part III. Technical Support Document for the Determination of Noncancer Chronic Reference Exposure Levels* (SRP Draft, CalEPA, 1999b). The unit risk, cancer potency factors, and inhalation RELs have undergone internal peer review by various California agencies and have been the subject of public comment.

15.3 Methodology

Agency and alternative health benchmarks were sought for 467 chemical constituents. These chemicals are those covered by the Hazardous Waste Identification Rule (HWIR), which represents a fairly inclusive list of chemicals of potential concern. All identified human health benchmarks were maintained in a database. A hierarchy was established to select human health benchmarks from available sources. EPA benchmarks were preferred over non-Agency values in the following order:

- IRIS
- HEAST
- EPA TEFs
- Superfund Technical Support Center
- Various other EPA criteria documents.

For constituents lacking Agency benchmarks, alternative benchmarks or toxicological data were sought. Alternative human health benchmarks were identified and maintained in the database; however, no alternative benchmarks were used for the test constituents pending evaluation of their appropriateness. Alternative human health benchmarks used to fill data gaps included (in the following order):

- ATSDR MRLs
- CalEPA cancer potency factors and chronic RELs
- CalEPA TEFs
- Additional TEFs (Nisbet and LaGoy 1992)
- Values derived by Research Triangle Institute for Office of Solid Waste (OSW) programs.

Because human health benchmark values must reflect ongoing Agency workgroup activities as well as other major benchmark reviews, the database will be updated at regular intervals prior to use in the Human Risk Module to reflect any changes that have occurred since its initial development.

If inhalation CSFs were not available, then they were converted from URFs using the following equation:

$$\text{inhal CSF (mg/kg/d)}^{-1} = \text{inhal URF } (\mu\text{g/m}^3)^{-1} \times 70 \text{ kg} \times 1,000 \mu\text{g/mg} \div 20 \text{ m}^3/\text{d} \quad (15-1)$$

where

70 kg = default adult human body weight
20 m³/d = default adult human daily rate of inhalation
1,000 µg = 1 mg.

Cancer slope factors for some dioxin-like compounds and PAHs were calculated by using the toxicity equivalency factor (TEF) approach. For the TEF approach, the toxicity of a group of chemically related constituents that typically occur in the environment as mixtures is based on estimates of the toxic potency of each constituent as compared with a reference compound within the group. TEF estimates are based on a knowledge of the mechanism of action, available experimental data, and other structure-activity information. TEFs have been established for a number of polychlorinated dibenzodioxins, polychlorinated dibenzofurans, and polychlorinated biphenyl (PCB) congeners thought to have dioxin-like toxicity (Ahlborg et al., 1994; Nisbet and LaGoy, 1992; U.S. EPA, 1998). TEFs for several PAHs also have been established (CalEPA, 1994; U.S. EPA, 1993).

15.3.1 Quality Assurance/Quality Control

All human health benchmark values identified from EPA or non-EPA sources that have been entered into the database have undergone extensive quality assurance/quality control (QA/QC) review. Additional entries and revisions to the database will receive the same level of QA/QC review (e.g., verification by an independent reviewer).

15.4 Results

Currently, only EPA-derived human health benchmarks (e.g., IRIS, HEAST, EPA TEFs), are used. Table 15A-1 (see Appendix 15A) summarizes the EPA-derived RfDs, RfCs, oral CSFs, and inhalation CSFs available for the 467 chemical constituents. RfDs are provided for individual ingestion exposure pathways: foods other than fish (labeled “food,” i.e., fruits, vegetables, beef, and milk), soil, water, and fish. Oral CSFs are provided for food (i.e., all foods including fish), soil, and water ingestion exposure pathways. RfCs and inhalation CSFs are provided for the inhalation exposure pathway. The distinction between food and fish results from a few constituents (e.g., mercury) having different toxicity values for fish and for foods other than fish. For most constituents, a single oral RfD and/or oral CSF is applied for the ingestion of food, fish, soil, and water.

Tables 15A-2, 15A-3, 15A-4, and 15A-5 present all identified human health benchmarks for the 467 chemical constituents. Table 15A-2 presents all available EPA-derived and alternative oral noncancer benchmarks (i.e., EPA RfDs and ATSDR oral MRLs). EPA RfDs are provided for food (other than fish), water, and fish ingestion pathways. Sources of the EPA-derived benchmarks (e.g., IRIS, HEAST) accompany each value. Table 15A-3 presents all available oral cancer benchmarks (i.e., EPA oral CSFs, CalEPA oral CSFs, and TEFs). EPA CSFs are provided for food and water ingestion pathways. Some CSFs were calculated using EPA-derived TEFs. All available inhalation noncancer benchmarks (i.e., EPA RfCs, ATSDR inhalation MRLs, CalEPA inhalation RELs, and provisional RfCs derived for the 1999 Air Characteristic Study) are presented in Table 15A-4. All available inhalation cancer benchmarks

(i.e., EPA inhalation CSFs, EPA inhalation URFs, CalEPA inhalation CSFs, and CalEPA inhalation URFs) are presented in Table 15A-5. Some inhalation CSFs were calculated from URFs.

15.5 Issues and Uncertainties

Uncertainties generally associated with human health benchmarks are discussed in detail in EPA's *Proposed Guidelines for Carcinogenic Risk Assessment* (U.S. EPA, 1996), *Methods for Derivation of Inhalation Reference Concentrations and Application of Inhalation Dosimetry* (U.S. EPA, 1994), and IRIS (U.S. EPA, 1999a). EPA defines the RfD (or RfC) as "an estimate (with uncertainty spanning perhaps an order of magnitude) of a daily exposure to the human population (including sensitive subgroups) that is likely to be without appreciable risk of deleterious effects during a lifetime" (U.S. EPA, 1994, 1999a). RfDs and RfCs are based on an assumption of lifetime exposure and may not be appropriate when applied to less-than-lifetime exposure situations (U.S. EPA, 1999a). The CSF is an upper-bound estimate of the human cancer risk per mg of chemical per kg body weight per day. The unit risk, which is calculated from the slope factor, is an estimate in terms of the risk per $\mu\text{g}/\text{L}$ drinking water or the risk per $\mu\text{g}/\text{m}^3$ air concentration (U.S. EPA, 1999a).

Uncertainty and variability in the toxicological and epidemiological data from which RfDs and RfCs are derived are accounted for by applying uncertainty factors. Some of these uncertainties include those associated with extrapolation from animals to humans, from lowest-observed-adverse-effect-levels (LOAELs) to no-observed-adverse-effect-levels (NOAELs), and from subchronic to chronic data and to account for sensitive subpopulations. These uncertainties are discussed further in the source documents (e.g., IRIS) of the individual human health benchmarks.

Human health benchmarks in IRIS have been subjected to rigorous internal and external reviews and represent Agency-wide consensus human health risk information. The health benchmarks in HEAST have not undergone as rigorous a review as those in IRIS and do not represent Agency-wide consensus information. Provisional human health benchmarks identified in other EPA documents (e.g., HEA or HEEP) or derived by the Superfund Technical Support Center have not undergone EPA's formal review process and, therefore, do not represent verified EPA benchmarks.

In addition to the strength of the review process, confidence in human health benchmarks (EPA or non-EPA) also can be associated with the date the benchmarks were derived (or last reviewed). Additional toxicological data become available and, subsequently, the database becomes more complete. Methodologies evolve over time, with improvements in existing methods (e.g., EPA's 1994 RfC methodology) and the development of new health benchmark practices (e.g., benchmark dose methodology).

Currently, only EPA-derived human health benchmarks are being used in the analysis. ATSDR and CalEPA human health benchmarks have been subject to expert scientific and public review. Alternative benchmarks, such as ATSDR MRLs and CalEPA RELs and cancer potency factors, offer a valuable opportunity to model both exposure pathways (i.e., oral and inhalation) and/or additional constituents.

15.6 References

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Appendix 15A

Human Health Benchmarks

Table 15A-1. Human Health Benchmarks	15-11
Table 15A-2. Available Oral Noncancer Benchmarks	15-30
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Table 15A-1. Summary of Human Health Benchmarks

Chemical Name	CASRN	EPA RfDs used in HWIR			EPA RfCs used in HWIR	EPA oral CSFs used in HWIR		EPA inh CSFs used in HWIR
		RfD food & soil (mg/kg/d)	RfD water (mg/kg/d)	RfD fish (mg/kg/d)	RfC air (mg/m ³)	Oral CSF - food & soil (mg/kg/d) ⁻¹	Oral CSF - water (mg/kg/d) ⁻¹	Inhal CSF - air (mg/kg/d) ⁻¹
A2123 [Ethanimidothioic acid, 2-(dimethylamino) -N-hydroxy-2-oxo-,methyl ester]	30558-43-1							
Acenaphthene	83-32-9	0.06	0.06	0.06				
Acenaphthylene	208-96-8							
Acetaldehyde	75-07-0				0.009			0.0077
Acetone	67-64-1	0.1	0.1	0.1				
Acetonitrile	75-05-8				0.06			
Acetophenone	98-86-2	0.1	0.1	0.1				
Acetyl chloride	75-36-5							
Acetyl-2-thiourea, 1-	591-08-2							
Acetylamino fluorene, 2-	53-96-3							
Acrolein	107-02-8	0.02	0.02	0.02	0.00002			
Acrylamide	79-06-1	0.0002	0.0002	0.0002		4.5	4.5	4.5
Acrylic acid	79-10-7	0.5	0.5	0.5	0.001			
Acrylonitrile	107-13-1	0.001	0.001	0.001	0.002	0.54	0.54	0.24
Aflatoxins	1402-68-2							
Aldicarb	116-06-3	0.001	0.001	0.001				
Aldicarb sulfone	1646-88-4	0.001	0.001	0.001				
Aldrin	309-00-2	0.00003	0.00003	0.00003		17	17	17
Allyl alcohol	107-18-6	0.005	0.005	0.005				
Allyl chloride	107-05-1				0.001			
Aminobiphenyl,4-	92-67-1							
Aminomethyl-3-isoxazolol,5-	2763-96-4							
Aminopyridine, 4-	504-24-5	0.00002	0.00002	0.00002				
Amitrole	61-82-5							
Aniline	62-53-3				0.001	0.0057	0.0057	
Anthracene	120-12-7	0.3	0.3	0.3				
Antimony	7440-36-0	0.0004	0.0004	0.0004	0.0002			

(continued)

Table 15A-1. (continued)

Chemical Name	CASRN	EPA RfDs used in HWIR			EPA RfCs used in HWIR	EPA oral CSFs used in HWIR		EPA inh CSFs used in HWIR
		RfD food & soil (mg/kg/d)	RfD water (mg/kg/d)	RfD fish (mg/kg/d)	RfC air (mg/m ³)	Oral CSF - food & soil (mg/kg/d) ⁻¹	Oral CSF - water (mg/kg/d) ⁻¹	Inhal CSF - air (mg/kg/d) ⁻¹
Aramite	140-57-8	0.05	0.05	0.05		0.025	0.025	0.025
Arsenic	7440-38-2	0.0003	0.0003	0.0003		1.5	1.5	15
Auramine	492-80-8							
Auramine O (Auramine hydrochloride)	2465-27-2							
Azaserine	115-02-6							
Barban	101-27-9							
Barium	7440-39-3	0.07	0.07	0.07	0.0005			
Bendiocarb	22781-23-3							
Bendiocarb phenol	22961-82-6							
Benomyl	17804-35-2	0.05	0.05	0.05				
Benz(a)anthracene	56-55-3					0.73	0.73	
Benz(c)acridine	225-51-4							
Benzal chloride [Dichloromethyl benzene]	98-87-3							
Benzene	71-43-2					0.029	0.029	0.029
Benzidine	92-87-5	0.003	0.003	0.003		230	230	230
Benzo(a)pyrene	50-32-8					7.3	7.3	
Benzo(b)fluoranthene	205-99-2					0.73	0.73	
Benzo(g,h,i)perylene	191-24-2							
Benzo(j)fluoranthene	205-82-3							
Benzo(k)fluoranthene	207-08-9					0.073	0.073	
Benzoquinone, p-	106-51-4							
Benzotrichloride	98-07-7					13	13	
Benzyl alcohol	100-51-6	0.3	0.3	0.3				
Benzyl chloride	100-44-7					0.17	0.17	
Beryllium	7440-41-7	0.002	0.002	0.002	2.0E-05			8.4
Bis (2-chloroisopropyl) ether	39638-32-9	0.04	0.04	0.04		0.07	0.07	0.035
Bis (chloromethyl) ether	542-88-1					220	220	220
Bis(2-chlorethyl)ether	111-44-4					1.1	1.1	1.1

(continued)

Table 15A-1. (continued)

Chemical Name	CASRN	EPA RfDs used in HWIR			EPA RfCs used in HWIR	EPA oral CSFs used in HWIR		EPA inh CSFs used in HWIR
		RfD food & soil (mg/kg/d)	RfD water (mg/kg/d)	RfD fish (mg/kg/d)	RfC air (mg/m ³)	Oral CSF - food & soil (mg/kg/d) ⁻¹	Oral CSF - water (mg/kg/d) ⁻¹	Inhal CSF - air (mg/kg/d) ⁻¹
Bis-(2-chloroisopropyl) ether [2,2'-Oxybis(1-chloropropane)]	108-60-1					0.07	0.07	0.035
Bis(2-ethylhexyl)phthalate	117-81-7	0.02	0.02	0.02		0.014	0.014	
Bis-(pentamethylene)-thiuram tetrasulfide	120-54-7							
Bromoacetone	598-31-2							
Bromodichloromethane	75-27-4	0.02	0.02	0.02		0.062	0.062	
Bromoform	75-25-2	0.02	0.02	0.02		0.0079	0.0079	0.0039
Bromophenyl phenyl ether, 4-	101-55-3							
Brucine	357-57-3							
Butanol	71-36-3	0.1	0.1	0.1				
Butyl benzyl phthalate	85-68-7	0.2	0.2	0.2				
Butyl-4,6-dinitrophenol, 2-sec-	88-85-7	0.001	0.001	0.001				
Butylate	2008-41-5	0.05	0.05	0.05				
Cadmium	7440-43-9	0.001	0.0005	0.001				6.3
Carbaryl	63-25-2	0.1	0.1	0.1				
Carbazole	86-74-8					0.02	0.02	
Carbendazim	10605-21-7							
Carbofuran	1563-66-2	0.005	0.005	0.005				
Carbofuran phenol	1563-38-8							
Carbon disulfide	75-15-0	0.1	0.1	0.1	0.7			
Carbon oxyfluoride	353-50-4							
Carbon tetrachloride	56-23-5	0.0007	0.0007	0.0007		0.13	0.13	0.053
Carbosulfan	55285-14-8	0.01	0.01	0.01				
Chloral	75-87-6	0.002	0.002	0.002				
Chlorambucil	305-03-3							
Chlordane	57-74-9	0.0005	0.0005	0.0005	7.0E-04	0.35	0.35	1.3
Chlornaphazin	494-03-1							
Chloro-1,3-butadiene, 2-	126-99-8	0.02	0.02	0.02	0.007			

(continued)

Table 15A-1. (continued)

Chemical Name	CASRN	EPA RfDs used in HWIR			EPA RfCs used in HWIR	EPA oral CSFs used in HWIR		EPA inh CSFs used in HWIR
		RfD food & soil (mg/kg/d)	RfD water (mg/kg/d)	RfD fish (mg/kg/d)	RfC air (mg/m ³)	Oral CSF - food & soil (mg/kg/d) ⁻¹	Oral CSF - water (mg/kg/d) ⁻¹	Inhal CSF - air (mg/kg/d) ⁻¹
Chloroacetaldehyde	107-20-0							
Chloroaniline, p-	106-47-8	0.004	0.004	0.004				
Chlorobenzene	108-90-7	0.02	0.02	0.02	0.02			
Chlorobenzilate	510-15-6	0.02	0.02	0.02		0.27	0.27	0.27
Chlorodibromomethane	124-48-1	0.02	0.02	0.02		0.084	0.084	
Chloroethane	75-00-3				10			
Chloroethyl vinyl ether, 2-	110-75-8							
Chloroform	67-66-3	0.01	0.01	0.01		0.0061	0.0061	0.081
Chloro-m-cresol, p-	59-50-7							
Chloromethyl methyl ether	107-30-2							
Chloronaphthalene, 2-	91-58-7	0.08	0.08	0.08				
Chloro-o-toluidine hydrochloride, 4-	3165-93-3					0.46	0.46	
Chlorophenol, 2-	95-57-8	0.005	0.005	0.005				
Chlorophenyl phenyl ether, 4-	7005-72-3							
Chlorophenyl thiourea, 1-o	5344-82-1							
Chloropropionitrile, 3-	542-76-7							
Chromium (total)	7440-47-3	see VI or III	see VI or III	see VI or III	see VI			41
Chromium III (insoluble salts)	16065-83-1	1.5	1.5	1.5				
Chromium VI	18540-29-9	0.003	0.003	0.003	0.0001			41
Chrysene	218-01-9					0.0073	0.0073	
Citrus red No. 2	6358-53-8							
Cobalt	7440-48-4	0.06	0.06	0.06	1.0E-05			
Copper	7440-50-8							
Copper dimethyldithiocarbamate	137-29-1							
Cresol, m-	108-39-4	0.05	0.05	0.05				
Cresol, o-	95-48-7	0.05	0.05	0.05				
Cresol, p-	106-44-5	0.005	0.005	0.005				

(continued)

Table 15A-1. (continued)

Chemical Name	CASRN	EPA RfDs used in HWIR			EPA RfCs used in HWIR	EPA oral CSFs used in HWIR		EPA inh CSFs used in HWIR
		RfD food & soil (mg/kg/d)	RfD water (mg/kg/d)	RfD fish (mg/kg/d)	RfC air (mg/m ³)	Oral CSF - food & soil (mg/kg/d) ⁻¹	Oral CSF - water (mg/kg/d) ⁻¹	Inhal CSF - air (mg/kg/d) ⁻¹
Crotonaldehyde	4170-30-3					1.9	1.9	
Cumene	98-82-8	0.1	0.1	0.1	0.4			
Cumenyl methylcarbamate, m-	64-00-6							
Cyanide (amenable)	57-12-5	0.02	0.02	0.02				
Cycasin	14901-08-7							
Cycloate	1134-23-2							
Cyclohexane	110-82-7							
Cyclohexanone	108-94-1	5	5	5				
Cyclohexyl-4,6-dinitrophenol, 2-(2,4-Dinitro-6-cyclohexylphenol or Dinitro-o-cyclohexylphenol)	131-89-5	0.002	0.002	0.002				
Cyclophosphamide	50-18-0							
Daunomycin	20830-81-3							
Dazomet	533-74-4							
DDD	72-54-8					0.24	0.24	
DDD (o,p')	53-19-0							
DDE	72-55-9					0.34	0.34	
DDE (o,p')	3424-82-6							
DDT (o,p')	789-02-6							
DDT (p,p')	50-29-3	0.0005	0.0005	0.0005		0.34	0.34	0.34
Diallate	2303-16-4					0.061	0.061	
Dibenz(a,h)acridine	226-36-8							
Dibenz(a,h)anthracene	53-70-3					7.3	7.3	
Dibenz(a,j)acridine	224-42-0							
Dibenzo(a,e)pyrene	192-65-4							
Dibenzo(a,h)pyrene	189-64-0							
Dibenzo(a,i)pyrene	189-55-9							
Dibenzo(c,g)carbazole, 7H-	194-59-2							
Dibenzofuran	132-64-9							

(continued)

Table 15A-1. (continued)

Chemical Name	CASRN	EPA RfDs used in HWIR			EPA RfCs used in HWIR	EPA oral CSFs used in HWIR		EPA inh CSFs used in HWIR
		RfD food & soil (mg/kg/d)	RfD water (mg/kg/d)	RfD fish (mg/kg/d)	RfC air (mg/m ³)	Oral CSF - food & soil (mg/kg/d) ⁻¹	Oral CSF - water (mg/kg/d) ⁻¹	Inhal CSF - air (mg/kg/d) ⁻¹
Dibromo-3-chloropropane, 1,2-	96-12-8				0.0002	1.4	1.4	0.0024
Dichloro-2-butene, 1,4-	764-41-0							9.3
Dichloro-2-butene, trans- 1,4-	110-57-6							9.3
Dichloro-2-propanol, 1,3-	96-23-1							
Dichlorobenzene, 1,2-	95-50-1	0.09	0.09	0.09	0.2			
Dichlorobenzene, 1,3-	541-73-1							
Dichlorobenzene, 1,4-	106-46-7				0.8	0.024	0.024	
Dichlorobenzidine, 3,3'-	91-94-1					0.45	0.45	
Dichlorodifluoromethane	75-71-8	0.2	0.2	0.2	0.2			
Dichloroethane, 1,1-	75-34-3	0.1	0.1	0.1	0.5			
Dichloroethane, 1,2-	107-06-2					0.091	0.091	0.091
Dichloroethylene, 1,1-	75-35-4	0.009	0.009	0.009		0.6	0.6	0.2
Dichloroethylene, cis-1,2-	156-59-2	0.01	0.01	0.01				
Dichloroethylene, trans-1,2-	156-60-5	0.02	0.02	0.02				
Dichloromethoxy ethane	111-91-1							
Dichlorophenol, 2,4-	120-83-2	0.003	0.003	0.003				
Dichlorophenol, 2,6-	87-65-0							
Dichlorophenoxyacetic acid, 2,4- (2,4-D)	94-75-7	0.01	0.01	0.01				
Dichloropropane, 1,2-	78-87-5				0.004	0.068	0.068	
Dichloropropene, 1,3-	542-75-6	0.0003	0.0003	0.0003	0.02	0.18	0.18	0.13
Dichloropropene, cis-1,3-	10061-01-5	0.0003	0.0003	0.0003	0.02	0.18	0.18	0.13
Dichloropropene, trans-1,3-	10061-02-6	0.0003	0.0003	0.0003	0.02	0.18	0.18	0.13
Dieldrin	60-57-1	0.00005	0.00005	0.00005		16	16	16
Diepoxybutane, 1,2,3,4- (2,2'-bioxirane)	1464-53-5							
Diethyl O-pyrazinyl phosphorothiate, O,O-	297-97-2							
Diethyl phthalate	84-66-2	0.8	0.8	0.8				

(continued)

Table 15A-1. (continued)

Chemical Name	CASRN	EPA RfDs used in HWIR			EPA RfCs used in HWIR	EPA oral CSFs used in HWIR		EPA inh CSFs used in HWIR
		RfD food & soil (mg/kg/d)	RfD water (mg/kg/d)	RfD fish (mg/kg/d)	RfC air (mg/m ³)	Oral CSF - food & soil (mg/kg/d) ⁻¹	Oral CSF - water (mg/kg/d) ⁻¹	Inhal CSF - air (mg/kg/d) ⁻¹
Diethylene glycol, dicarbamate	5952-26-1							
Diethylhydrazine, N,N-	1615-80-1							
Diethyl-p-nitrophenyl phosphate	311-45-5							
Diethylstilbestrol	56-53-1					4700	4700	
Dihydrosafrole	94-58-6							
Dimethoate	60-51-5	0.0002	0.0002	0.0002				
Dimethyl phthalate	131-11-3							
Dimethyl sulfate	77-78-1							
Dimethylamine	124-40-3							
Dimethylaminoazobenzene, p-	60-11-7							
Dimethylbenz(a)anthracene, 7,12-	57-97-6							
Dimethylbenzidine, 3,3'-	119-93-7					9.2	9.2	
Dimethylcarbonyl chloride	79-44-7							
Dimethylphenethylamine, alpha-, alpha-	122-09-8							
Dimethylphenol, 2,4-	105-67-9	0.02	0.02	0.02				
Dimethoxybenzidine, 3,3'-	119-90-4					0.014	0.014	
Dimetilan	644-64-4							
Di-n-butyl phthalate	84-74-2	0.1	0.1	0.1				
Dinitrobenzene, 1,3-	99-65-0	0.0001	0.0001	0.0001				
Dinitrobenzene, 1,4-	100-25-4	0.0004	0.0004	0.0004				
Dinitro-o-cresol, 4,6-	534-52-1							
Dinitrophenol, 2,4-	51-28-5	0.002	0.002	0.002				
Dinitrotoluene, 2,4-	121-14-2	0.002	0.002	0.002		0.68	0.68	
Dinitrotoluene, 2,6-	606-20-2	0.001	0.001	0.001		0.68	0.68	
Di-n-octyl phthalate	117-84-0	0.02	0.02	0.02				
Di-n-propylamine [Dipropylamine]	142-84-7							
Dioxane, 1,4-	123-91-1					0.011	0.011	

(continued)

Table 15A-1. (continued)

Chemical Name	CASRN	EPA RfDs used in HWIR			EPA RfCs used in HWIR	EPA oral CSFs used in HWIR		EPA inh CSFs used in HWIR
		RfD food & soil (mg/kg/d)	RfD water (mg/kg/d)	RfD fish (mg/kg/d)	RfC air (mg/m ³)	Oral CSF - food & soil (mg/kg/d) ⁻¹	Oral CSF - water (mg/kg/d) ⁻¹	Inhal CSF - air (mg/kg/d) ⁻¹
Diphenylamine	122-39-4	0.025	0.025	0.025				
Diphenylhydrazine, 1,2-	122-66-7					0.8	0.8	0.8
Disulfiram [Tetraethylthiuram disulfide]	97-77-8							
Disulfoton	298-04-4	0.00004	0.00004	0.00004				
Dithiobiuret	541-53-7							
Endosulfan	115-29-7	0.006	0.006	0.006				
Endosulfan I	959-98-8	0.006	0.006	0.006				
Endosulfan II	33213-65-9	0.006	0.006	0.006				
Endosulfan sulfate	1031-07-8							
Endothall	145-73-3	0.02	0.02	0.02				
Endrin	72-20-8	0.0003	0.0003	0.0003				
Endrin aldehyde	7421-93-4							
Endrin ketone	53494-70-5							
Epichlorohydrin	106-89-8	0.002	0.002	0.002	0.001	0.0099	0.0099	0.0042
Epinephrine	51-43-4							
Ethoxyethanol, 2-	110-80-5	0.4	0.4	0.4	0.2			
Ethyl acetate	141-78-6	0.9	0.9	0.9				
Ethyl acrylate	140-88-5					0.048	0.048	
Ethyl carbamate	51-79-6							
Ethyl cyanide (propionitrile)	107-12-0							
Ethyl dipropylthiocarbamate, S-[EPTC]	759-94-4	0.025	0.025	0.025				
Ethyl ether	60-29-7	0.2	0.2	0.2				
Ethyl methacrylate	97-63-2	0.09	0.09	0.09				
Ethyl methanesulfonate	62-50-0					293	293	
Ethyl Ziram	14324-55-1							
Ethylbenzene	100-41-4	0.1	0.1	0.1	1			
Ethylene dibromide (1,2-dibromoethane)	106-93-4				0.0002	85	85	0.76

(continued)

Table 15A-1. (continued)

Chemical Name	CASRN	EPA RfDs used in HWIR			EPA RfCs used in HWIR	EPA oral CSFs used in HWIR		EPA inh CSFs used in HWIR
		RfD food & soil (mg/kg/d)	RfD water (mg/kg/d)	RfD fish (mg/kg/d)	RfC air (mg/m ³)	Oral CSF - food & soil (mg/kg/d) ⁻¹	Oral CSF - water (mg/kg/d) ⁻¹	Inhal CSF - air (mg/kg/d) ⁻¹
Ethylene oxide	75-21-8					1.02	1.02	0.35
Ethylene thiourea	96-45-7	0.00008	0.00008	0.00008		0.11	0.11	
Ethylenebisdithiocarbamic acid, salts and esters	111-54-6							
Ethyleneimine (aziridine)	151-56-4							
Famphur	52-85-7							
Ferbam	14484-64-1							
Fluoracetamide, 2-	640-19-7							
Fluoroacetic acid, sodium salt (Sodium fluoroacetate)	62-74-8	0.00002	0.00002	0.00002				
Fluoranthene	206-44-0	0.04	0.04	0.04				
Fluorene	86-73-7	0.04	0.04	0.04				
Fluoride	16984-48-8	0.06	0.06	0.06				
Formaldehyde	50-00-0	0.2	0.2	0.2				0.045
Formetanate hydrochloride	23422-53-9							
Formic Acid	64-18-6	2.00	2.00	2.00				
Formparanate	17702-57-7							
Furan	110-00-9	0.001	0.001	0.001				
Furancarbox-aldehyde, 2- (furfural)	98-01-1	0.003	0.003	0.003	0.05			
Glycidylaldehyde	765-34-4	0.0004	0.0004	0.0004	0.001			
Heptachlor	76-44-8	0.0005	0.0005	0.0005		4.5	4.5	4.5
Heptachlor epoxide	1024-57-3	0.000013	0.000013	0.000013		9.1	9.1	9.1
Heptachlorodibenzofuran, 1,2,3,4,6,7,8-	67562-39-4					1500	1500	1500
Heptachlorodibenzofuran, 1,2,3,4,7,8,9-	55673-89-7					1500	1500	1500
Heptachlorodibenzo-p-dioxin, 1,2,3,4,6,7,8-	35822-46-9					1500	1500	1500
Hexachloro-1,3-butadiene	87-68-3	0.0002	0.0002	0.0002		0.078	0.078	0.078
Hexachlorobenzene	118-74-1	0.0008	0.0008	0.0008		1.6	1.6	1.6
Hexachlorocyclohexane, alpha- (alpha-HCH)	319-84-6					6.3	6.3	6.3

(continued)

Table 15A-1. (continued)

Chemical Name	CASRN	EPA RfDs used in HWIR			EPA RfCs used in HWIR	EPA oral CSFs used in HWIR		EPA inh CSFs used in HWIR
		RfD food & soil (mg/kg/d)	RfD water (mg/kg/d)	RfD fish (mg/kg/d)	RfC air (mg/m ³)	Oral CSF - food & soil (mg/kg/d) ⁻¹	Oral CSF - water (mg/kg/d) ⁻¹	Inhal CSF - air (mg/kg/d) ⁻¹
Hexachlorocyclohexane, beta- (beta-HCH)	319-85-7					1.8	1.8	1.8
Hexachlorocyclohexane, delta (delta-HCH)	319-86-8							
Hexachlorocyclohexane, gamma- (Lindane)	58-89-9	0.0003	0.0003	0.0003		1.3	1.3	
Hexachlorocyclopentadiene	77-47-4	0.007	0.007	0.007	0.00007			
Hexachlorodibenzofuran, 1,2,3,4,7,8-	70648-26-9					15000	15000	15000
Hexachlorodibenzofuran, 1,2,3,6,7,8-	57117-44-9					15000	15000	15000
Hexachlorodibenzofuran, 1,2,3,7,8,9-	72918-21-9					15000	15000	15000
Hexachlorodibenzofuran, 2,3,4,6,7,8-	60851-34-5					15000	15000	15000
Hexachlorodibenzo-p-dioxin, 1,2,3,4,7,8-	39227-28-6					15000	15000	15000
Hexachlorodibenzo-p-dioxin, 1,2,3,6,7,8-	57653-85-7					15000	15000	15000
Hexachlorodibenzo-p-dioxin, 1,2,3,7,8,9-	19408-74-3					6200	6200	4550
Hexachloroethane	67-72-1	0.001	0.001	0.001		0.014	0.014	0.014
Hexachlorophene	70-30-4	0.0003	0.0003	0.0003				
Hexachloropropene	1888-71-7							
Hexaethyl tetraphosphate	757-58-4							
Hexanone, 2-	591-78-6							
Hydrazine (and hydrazine sulfate); CAS and FR = hydrazine only	302-01-2					3	3	17
Indeno(1,2,3-cd) pyrene	193-39-5					0.73	0.73	
Iodo-2-propynyl N-butylcarbamate, 3-	55406-53-6							
Iodomethane	74-88-4							
Isobutyl alcohol	78-83-1	0.3	0.3	0.3				
Isodrin	465-73-6							

(continued)

Table 15A-1. (continued)

Chemical Name	CASRN	EPA RfDs used in HWIR			EPA RfCs used in HWIR	EPA oral CSFs used in HWIR		EPA inh CSFs used in HWIR
		RfD food & soil (mg/kg/d)	RfD water (mg/kg/d)	RfD fish (mg/kg/d)	RfC air (mg/m ³)	Oral CSF - food & soil (mg/kg/d) ⁻¹	Oral CSF - water (mg/kg/d) ⁻¹	Inhal CSF - air (mg/kg/d) ⁻¹
Isolan [Isopropyl methyl pyrazolyl dimethylcarbamate]	119-38-0							
Isophorone	78-59-1	0.2	0.2	0.2		0.00095	0.00095	
Isosafrole	120-58-1							
Kepone	143-50-0							
Lasiocarpine	303-34-4							
Lead	7439-92-1							
Maleic anhydride	108-31-6	0.1	0.1	0.1				
Maleic hydrazide	123-33-1	0.5	0.5	0.5				
Malononitrile	109-77-3	0.00002	0.00002	0.00002				
Manganese dimethyldithiocarbamate	15339-36-3							
Melphalan	148-82-3							
Mercury	7439-97-6	0.0003	0.0003	*MeHg	0.0003			
Metam Sodium	137-42-8							
Methacrylonitrile	126-98-7	0.0001	0.0001	0.0001	0.0007			
Methanethiol [methyl mercaptan]	74-93-1							
Methanol	67-56-1	0.5	0.5	0.5				
Methapyrilene	91-80-5							
Methiocarb	2032-65-7							
Methomyl	16752-77-5	0.025	0.025	0.025				
Methoxychlor	72-43-5	0.005	0.005	0.005				
Methyl bromide (Bromomethane)	74-83-9	0.0014	0.0014	0.0014	0.005			
Methyl chloride (Chloromethane)	74-87-3				0.3	0.013	0.013	0.0063
Methyl ethyl ketone	78-93-3	0.6	0.6	0.6	1			
Methyl ethyl ketone peroxide	1338-23-4							
Methyl hydrazine	60-34-4							
Methyl isobutyl ketone	108-10-1	0.08	0.08	0.08	0.08			

(continued)

Table 15A-1. (continued)

Chemical Name	CASRN	EPA RfDs used in HWIR			EPA RfCs used in HWIR	EPA oral CSFs used in HWIR		EPA inh CSFs used in HWIR
		RfD food & soil (mg/kg/d)	RfD water (mg/kg/d)	RfD fish (mg/kg/d)	RfC air (mg/m ³)	Oral CSF - food & soil (mg/kg/d) ⁻¹	Oral CSF - water (mg/kg/d) ⁻¹	Inhal CSF - air (mg/kg/d) ⁻¹
Methyl mercury	22967-92-6	0.0001	0.0001	0.0001				
Methyl methacrylate	80-62-6	1.4	1.4	1.4	7.0E-01			
Methyl methanesulfonate	66-27-3							
Methyl parathion	298-00-0	0.00025	0.00025	0.00025				
Methylaziridine, 2-	75-55-8							
Methylcholanthrene, 3-	56-49-5					25.5	25.5	
Methylene bromide	74-95-3	0.01	0.01	0.01				
Methylene chloride	75-09-2	0.06	0.06	0.06	3	0.0075	0.0075	0.0016
Methylenebis(2-chloroaniline), 4,4'-	101-14-4	0.0007	0.0007	0.0007		0.13	0.13	0.13
Methylnaphthalene, 2-	91-57-6							
Methyl-nitro-nitrosoguanidine (MNNG)	70-25-7							
Methylthiouracil	56-04-2							
Metolcarb	1129-41-5							
Mexacarbate	315-18-4							
Mitomycin C	50-07-7							
Molinate	2212-67-1	0.002	0.002	0.002				
Molybdenum	7439-98-7	0.005	0.005	0.005				
Naphthalene	91-20-3	0.02	0.02	0.02	0.003			
Naphthoquinone, 1,4-	130-15-4							
Naphthyl-2-thiourea, 1-	86-88-4							
Naphthylamine, 1-	134-32-7							
Naphthylamine, 2-	91-59-8							
Nickel	7440-02-0	0.02	0.02	0.02				0.84
Nicotine and salts	54-11-5							
Nitroaniline, 2-	88-74-4				0.0002			
Nitroaniline, 3-	99-09-2							
Nitroaniline, 4-	100-01-6							
Nitrobenzene	98-95-3	0.0005	0.0005	0.0005	0.002			

(continued)

Table 15A-1. (continued)

Chemical Name	CASRN	EPA RfDs used in HWIR			EPA RfCs used in HWIR	EPA oral CSFs used in HWIR		EPA inh CSFs used in HWIR
		RfD food & soil (mg/kg/d)	RfD water (mg/kg/d)	RfD fish (mg/kg/d)	RfC air (mg/m ³)	Oral CSF - food & soil (mg/kg/d) ⁻¹	Oral CSF - water (mg/kg/d) ⁻¹	Inhal CSF - air (mg/kg/d) ⁻¹
Nitrogen mustard	55-86-7							
Nitrogen mustard hydrochloride salt	51-75-2							
Nitrogen mustard N- Oxide	126-85-2							
Nitrogen mustard N-Oxide HCl salt	302-70-5							
Nitroglycerine	55-63-0							
Nitro-o-toluidine, 5- (2-Methyl-5-nitroaniline)	99-55-8					0.033	0.033	
Nitrophenol, 2-	88-75-5							
Nitrophenol, 4-	100-02-7							
Nitropropane, 2-	79-46-9				0.02			9.4
Nitroquinoline-1-oxide, 4-	56-57-5							
N-Nitrosodiethanolamine	1116-54-7					2.8	2.8	
N-Nitrosodiethylamine	55-18-5					150	150	150
N-Nitrosodimethylamine	62-75-9					51	51	51
N-Nitrosodi-n-butylamine	924-16-3					5.4	5.4	5.4
N-Nitroso-di-n-propylamine	621-64-7					7	7	
N-Nitrosodiphenylamine	86-30-6					0.0049	0.0049	
N-Nitrosomethyl vinyl amine	4549-40-0							
N-Nitrosomethylethylamine	10595-95-6					22	22	
N-Nitrosomorpholine	59-89-2							
N-Nitroso-N-ethylurea	759-73-9					140	140	
N-Nitroso-N-methylurea	684-93-5							
N-Nitroso-N-methylurethane	615-53-2							
N-Nitrosomicotine	16543-55-8							
N-Nitrosopiperidine	100-75-4					37.5	37.5	
N-Nitrosopyrrolidine	930-55-2					2.1	2.1	2.1
N-Nitrososarcosine	13256-22-9							
N-Phenylthiourea	103-85-5							

(continued)

Table 15A-1. (continued)

Chemical Name	CASRN	EPA RfDs used in HWIR			EPA RfCs used in HWIR	EPA oral CSFs used in HWIR		EPA inh CSFs used in HWIR
		RfD food & soil (mg/kg/d)	RfD water (mg/kg/d)	RfD fish (mg/kg/d)	RfC air (mg/m ³)	Oral CSF - food & soil (mg/kg/d) ⁻¹	Oral CSF - water (mg/kg/d) ⁻¹	Inhal CSF - air (mg/kg/d) ⁻¹
Octachlorodibenzofuran, 1,2,3,4,6,7,8,9- [OCDF]	39001-02-0					150	150	150
Octachlorodibenzo-p-dioxin, 1,2,3,4,6,7,8,9- [OCDD]	3268-87-9					150	150	150
Octamethyl pyrophosphoramidate	152-16-9	0.002	0.002	0.002				
Osmium tetroxide	20816-12-0							
Oxamyl	23135-22-0	0.025	0.025	0.025				
Paraldehyde	123-63-7							
Parathion	56-38-2	0.006	0.006	0.006				
Pebulate	1114-71-2	0.05	0.05	0.05				
Pentachlorobenzene	608-93-5	0.0008	0.0008	0.0008				
Pentachlorodibenzofuran, 1,2,3,7,8-	57117-41-6					7500	7500	7500
Pentachlorodibenzofuran, 2,3,4,7,8-	57117-31-4					75000	75000	75000
Pentachlorodibenzo-p-dioxin, 1,2,3,7,8-	40321-76-4					75000	75000	75000
Pentachloroethane	76-01-7							
Pentachloronitrobenzene (PCNB)	82-68-8	0.003	0.003	0.003		0.26	0.26	
Pentachlorophenol	87-86-5	0.03	0.03	0.03		0.12	0.12	
Pentadiene, 1,3-	504-60-9							
Phenacetin	62-44-2							
Phenanthrene	85-01-8							
Phenol	108-95-2	0.6	0.6	0.6				
Phenyl mercuric acetate	62-38-4	0.00008	0.00008	0.00008				
Phenylenediamine, m- (1,3-)	108-45-2	0.006	0.006	0.006				
Phenylenediamine, p-	106-50-3	0.19	0.19	0.19				
Phenylenediamines (N.O.S.)	25265-76-3	0.006	0.006	0.006		0.047	0.047	
Phorate	298-02-2	0.0002	0.0002	0.0002				

(continued)

Table 15A-1. (continued)

Chemical Name	CASRN	EPA RfDs used in HWIR			EPA RfCs used in HWIR	EPA oral CSFs used in HWIR		EPA inh CSFs used in HWIR
		RfD food & soil (mg/kg/d)	RfD water (mg/kg/d)	RfD fish (mg/kg/d)	RfC air (mg/m ³)	Oral CSF - food & soil (mg/kg/d) ⁻¹	Oral CSF - water (mg/kg/d) ⁻¹	Inhal CSF - air (mg/kg/d) ⁻¹
Phosphorodithioic acid, o-o-diethyl ester	298-06-6							
Phosphorodithioic acid, o-o-diethyl-s-methyl	3288-58-2							
Phosphorodithioic acid, trimethyl ester	2953-29-9							
Phthalic anhydride	85-44-9	2	2	2	0.12			
Physostigmine	57-47-6							
Physostigmine salicylate	57-64-7							
Picoline, 2-	109-06-8							
Polychlorinated biphenyls (Aroclors)	1336-36-3	0.00007	0.00007	0.00007		2	0.4	0.4
Potassium dimethyldithiocarbamate	128-03-0							
Potassium N-hydroxymethyl N-methyldithiocarbamate	51026-28-9							
Potassium N-methyldithiocarbamate	137-41-7							
Promecarb	2631-37-0							
Pronamide	23950-58-5	0.075	0.075	0.075				
Propane sulfone, 1,3-	1120-71-4							
Propargyl alcohol (propyn-1-ol, 2-)	107-19-7	0.002	0.002	0.002				
Propham	122-42-9	0.02	0.02	0.02				
Propoxur [Baygon][2-(1-Methylethoxy)-phenol, methylcarbamate]	114-26-1	0.004	0.004	0.004				
Propylamine, n-	107-10-8							
Propylthiouracil	51-52-5							
Prosulfocarb	52888-80-9							
Pyrene	129-00-0	0.03	0.03	0.03				
Pyridine	110-86-1	0.001	0.001	0.001				
Reserpine	50-55-5							
Resorcinol	108-46-3							

(continued)

Table 15A-1. (continued)

Chemical Name	CASRN	EPA RfDs used in HWIR			EPA RfCs used in HWIR	EPA oral CSFs used in HWIR		EPA inh CSFs used in HWIR
		RfD food & soil (mg/kg/d)	RfD water (mg/kg/d)	RfD fish (mg/kg/d)	RfC air (mg/m ³)	Oral CSF - food & soil (mg/kg/d) ⁻¹	Oral CSF - water (mg/kg/d) ⁻¹	Inhal CSF - air (mg/kg/d) ⁻¹
Saccharin and salts	81-07-2							
Safrole	94-59-7					0.18	0.18	
Selenium	7782-49-2	0.005	0.005	0.005				
Selenium, tetrakis-(dimethyldithiocarbamate) [Selenium dimethyldithiocarbamate]	144-34-3							
Silver	7440-22-4	0.005	0.005	0.005	2.9E-02			
Sodium dibutyldithiocarbamate	136-30-1							
Sodium diethyldithiocarbamate	148-18-5					0.27	0.27	
Sodium dimethyldithiocarbamate	128-04-1							
Sodium fluoroacetate	62-74-8	0.00002	0.00002	0.00002				
Streptozotocin	18883-66-4							
Strychnine (and salts)	57-24-9	0.0003	0.0003	0.0003				
Styrene	100-42-5	0.2	0.2	0.2	1			
Sulfalate	95-06-7							
Sulfide	18496-25-8	0.003	0.003	0.003	0.001			
TCDD, 2,3,7,8-	1746-01-6					150000	150000	150000
Tetrabutylthiuram disulfide	1634-02-2							
Tetrabutylthiuram monosulfide [Bis-(dimethylthiocarbamoyl) sulfide]	97-74-5							
Tetrachlorobenzene, 1,2,4,5-	95-94-3	0.0003	0.0003	0.0003				
Tetrachlorodibenzofuran, 2,3,7,8- [2,3,7,8-TCDF]	51207-31-9					15000	15000	15000
Tetrachloroethane, 1,1,1,2-	630-20-6	0.03	0.03	0.03		0.026	0.026	0.026
Tetrachloroethane, 1,1,2,2-	79-34-5					0.2	0.2	0.2
Tetrachloroethylene	127-18-4	0.01	0.01	0.01		0.052	0.052	0.002
Tetrachlorophenol, 2,3,4,6-	58-90-2	0.03	0.03	0.03				
Tetraethyl pyrophosphate	107-49-3							

(continued)

Table 15A-1. (continued)

Chemical Name	CASRN	EPA RfDs used in HWIR			EPA RfCs used in HWIR	EPA oral CSFs used in HWIR		EPA inh CSFs used in HWIR
		RfD food & soil (mg/kg/d)	RfD water (mg/kg/d)	RfD fish (mg/kg/d)	RfC air (mg/m ³)	Oral CSF - food & soil (mg/kg/d) ⁻¹	Oral CSF - water (mg/kg/d) ⁻¹	Inhal CSF - air (mg/kg/d) ⁻¹
Tetraethyldithiopyro-phosphate	3689-24-5	0.0005	0.0005	0.0005				
Tetrahydrofuran	109-99-9							
Thallium (I)	7440-28-0	0.00008	0.00008	0.00008				
Thioacetamide	62-55-5							
Thiodicarb	59669-26-0							
Thiofanox	39196-18-4	0.0003	0.0003	0.0003				
Thiophanate-methyl	23564-05-8	0.08	0.08	0.08				
Thiophenol (Benzenethiol)	108-98-5							
Thiosemicarbizide	79-19-6							
Thiourea	62-56-6							
Thiram	137-26-8	0.005	0.005	0.005				
Tin	7440-31-5	0.6	0.6	0.6				
Tirpate	26419-73-8							
Toluene	108-88-3	0.2	0.2	0.2	0.4			
Toluene diisocyanate, 2,4-	584-84-9				7.0E-05			
Toluene diisocyanate, mixed isomers [2,4- and 2,6-Toluene diisocyanate mixture]	26471-62-5				7.0E-05			
Toluenediamine, 2,4-	95-80-7					3.2	3.2	
Toluenediamine, 2,6-	823-40-5	0.2	0.2	0.2				
Toluenediamine, 3,4-	496-72-0							
Toluidine hydrochloride, o- (2-Methylaniline hydrochloride)	636-21-5					0.18	0.18	
Toluidine, o-	95-53-4					0.24	0.24	
Toluidine, p-	106-49-0					0.19	0.19	
Toxaphene	8001-35-2					1.1	1.1	1.1
Triallate	2303-17-5	0.013	0.013	0.013				
Trichloro-1,2,2-trifluoroethane, 1,1,2-	76-13-1	30	30	30	30			
Trichlorobenzene, 1,2,4-	120-82-1	0.01	0.01	0.01	0.2			

(continued)

Table 15A-1. (continued)

Chemical Name	CASRN	EPA RfDs used in HWIR			EPA RfCs used in HWIR	EPA oral CSFs used in HWIR		EPA inh CSFs used in HWIR
		RfD food & soil (mg/kg/d)	RfD water (mg/kg/d)	RfD fish (mg/kg/d)	RfC air (mg/m ³)	Oral CSF - food & soil (mg/kg/d) ⁻¹	Oral CSF - water (mg/kg/d) ⁻¹	Inhal CSF - air (mg/kg/d) ⁻¹
Trichloroethane, 1,1,1,-	71-55-6	0.3	0.3	0.3	1			
Trichloroethane, 1,1,2,-	79-00-5	0.004	0.004	0.004		0.057	0.057	0.057
Trichloroethylene (1,1,2,-)	79-01-6					0.011	0.011	0.006
Trichlorofluoromethane	75-69-4	0.3	0.3	0.3	0.7			
Trichloromethanethiol	75-70-7							
Trichlorophenol, 2,4,5,-	95-95-4	0.1	0.1	0.1				
Trichlorophenol, 2,4,6,-	88-06-2					0.011	0.011	0.01
Trichlorophenoxy propionic acid, 2-(2,4,5- (Silvex)	93-72-1	0.008	0.008	0.008				
Trichlorophenoxyacetic acid, 2,4,5- (245-T)	93-76-5	0.01	0.01	0.01				
Trichloropropane, 1,2,3,-	96-18-4	0.006	0.006	0.006		7.0	7.0	
Triethylamine	121-44-8				7.0E-03			
Triethylphosphorothioate, O,O,O-	126-68-1							
Trinitrobenzene, sym- (1,3,5-)	99-35-4	0.03	0.03	0.03				
Tris (2,3-dibromopropyl) phosphate	126-72-7							
Tris(1-azridinyl) phosphine sulfide	52-24-4							
Trypan blue	72-57-1							
Uracil mustard	66-75-1							
Vanadium	7440-62-2	0.007	0.007	0.007				
Vernolate [Vernam]	1929-77-7	0.001	0.001	0.001				
Vinyl acetate	108-05-4	1	1	1	0.2			
Vinyl chloride	75-01-4					1.90	1.90	0.30
Warfarin	81-81-2	0.0003	0.0003	0.0003				
Xylene, m-	108-38-3	2	2	2				
Xylene, o-	95-47-6	2	2	2				
Xylene, p-	106-42-3							
Xylenes (total)	1330-20-7	2	2	2				

(continued)

Table 15A-1. (continued)

Chemical Name	CASRN	EPA RfDs used in HWIR			EPA RfCs used in HWIR	EPA oral CSFs used in HWIR		EPA inh CSFs used in HWIR
		RfD food & soil (mg/kg/d)	RfD water (mg/kg/d)	RfD fish (mg/kg/d)	RfC air (mg/m ³)	Oral CSF - food & soil (mg/kg/d) ⁻¹	Oral CSF - water (mg/kg/d) ⁻¹	Inhal CSF - air (mg/kg/d) ⁻¹
Zinc	7440-66-6	0.3	0.3	0.3				
Ziram	137-30-4							

Table 15A-2. Available Oral Noncancer Benchmarks

Chemical Name	CASRN	EPA RfDs used in HWIR				Alternate benchmarks		
		RfD food & soil (mg/kg/d)	RfD water (mg/kg/d)	RfD fish (mg/kg/d)	RfD source	ATSDR acute oral MRL (mg/kg/d)	ATSDR intermed oral MRL (mg/kg/d)	ATSDR chronic oral MRL (mg/kg/d)
A2123 [Ethanimidothioic acid, 2-(dimethylamino)-N-hydroxy-2-oxo-,methyl ester]	30558-43-1							
Acenaphthene	83-32-9	0.06	0.06	0.06	IRIS		0.6	
Acenaphthylene	208-96-8							
Acetaldehyde	75-07-0							
Acetone	67-64-1	0.1	0.1	0.1	IRIS		2	
Acetonitrile	75-05-8							
Acetophenone	98-86-2	0.1	0.1	0.1	IRIS			
Acetyl chloride	75-36-5							
Acetyl-2-thiourea, 1-	591-08-2							
Acetylaminofluorene, 2-	53-96-3							
Acrolein	107-02-8	0.02	0.02	0.02	HEAST			0.0005
Acrylamide	79-06-1	0.0002	0.0002	0.0002	IRIS			
Acrylic acid	79-10-7	0.5	0.5	0.5	IRIS			
Acrylonitrile	107-13-1	0.001	0.001	0.001	HEAST	0.1	0.01	0.04
Aflatoxins	1402-68-2							
Aldicarb	116-06-3	0.001	0.001	0.001	IRIS			
Aldicarb sulfone	1646-88-4	0.001	0.001	0.001	IRIS			
Aldrin	309-00-2	0.00003	0.00003	0.00003	IRIS	0.002		0.00003
Allyl alcohol	107-18-6	0.005	0.005	0.005	IRIS			
Allyl chloride	107-05-1							
Aminobiphenyl,4-	92-67-1							
Aminomethyl-3-isoxazolol,5-	2763-96-4							
Aminopyridine, 4-	504-24-5	0.00002	0.00002	0.00002	HEAST			
Amitrole	61-82-5							
Aniline	62-53-3							
Anthracene	120-12-7	0.3	0.3	0.3	IRIS		10	
Antimony	7440-36-0	0.0004	0.0004	0.0004	IRIS			
Aramite	140-57-8	0.05	0.05	0.05	HEAST			

(continued)

Table 15A-2. (continued)

Chemical Name	CASRN	EPA RfDs used in HWIR				Alternate benchmarks		
		RfD food & soil (mg/kg/d)	RfD water (mg/kg/d)	RfD fish (mg/kg/d)	RfD source	ATSDR acute oral MRL (mg/kg/d)	ATSDR intermed oral MRL (mg/kg/d)	ATSDR chronic oral MRL (mg/kg/d)
Arsenic	7440-38-2	0.0003	0.0003	0.0003	IRIS			0.0003
Auramine	492-80-8							
Auramine O (Auramine hydrochloride)	2465-27-2							
Azaserine	115-02-6							
Barban	101-27-9							
Barium	7440-39-3	0.07	0.07	0.07	IRIS			
Bendiocarb	22781-23-3							
Bendiocarb phenol	22961-82-6							
Benomyl	17804-35-2	0.05	0.05	0.05	IRIS			
Benz(a)anthracene	56-55-3							
Benz(c)acridine	225-51-4							
Benzal chloride [Dichloromethyl benzene]	98-87-3							
Benzene	71-43-2							
Benzidine	92-87-5	0.003	0.003	0.003	IRIS			
Benzo(a)pyrene	50-32-8							
Benzo(b)fluoranthene	205-99-2							
Benzo(g,h,i)perylene	191-24-2							
Benzo(j)fluoranthene	205-82-3							
Benzo(k)fluoranthene	207-08-9							
Benzoquinone, p-	106-51-4							
Benzotrichloride	98-07-7							
Benzyl alcohol	100-51-6	0.3	0.3	0.3	HEAST			
Benzyl chloride	100-44-7							
Beryllium	7440-41-7	0.002	0.002	0.002	IRIS			
Bis (2-chloroisopropyl) ether	39638-32-9	0.04	0.04	0.04	IRIS			
Bis (chloromethyl) ether	542-88-1							
Bis(2-chlorethyl)ether	111-44-4							
Bis-(2-chloroisopropyl) ether [2,2'-Oxybis(1-chloropropane)]	108-60-1							
Bis(2-ethylhexyl)phthalate	117-81-7	0.02	0.02	0.02	IRIS	1	0.4	

(continued)

Table 15A-2. (continued)

Chemical Name	CASRN	EPA RfDs used in HWIR				Alternate benchmarks		
		RfD food & soil (mg/kg/d)	RfD water (mg/kg/d)	RfD fish (mg/kg/d)	RfD source	ATSDR acute oral MRL (mg/kg/d)	ATSDR intermed oral MRL (mg/kg/d)	ATSDR chronic oral MRL (mg/kg/d)
Bis-(pentamethylene)-thiuram tetrasulfide	120-54-7							
Bromoacetone	598-31-2							
Bromodichloromethane	75-27-4	0.02	0.02	0.02	IRIS	0.04		0.02
Bromoform	75-25-2	0.02	0.02	0.02	IRIS			
Bromophenyl phenyl ether, 4-	101-55-3							
Brucine	357-57-3							
Butanol	71-36-3	0.1	0.1	0.1	IRIS			
Butyl benzyl phthalate	85-68-7	0.2	0.2	0.2	IRIS			
Butyl-4,6-dinitrophenol, 2-sec-	88-85-7	0.001	0.001	0.001	IRIS			
Butylate	2008-41-5	0.05	0.05	0.05	IRIS			
Cadmium	7440-43-9	0.001	0.0005	0.001	IRIS			0.0002
Carbaryl	63-25-2	0.1	0.1	0.1	IRIS			
Carbazole	86-74-8							
Carbendazim	10605-21-7							
Carbofuran	1563-66-2	0.005	0.005	0.005	IRIS			
Carbofuran phenol	1563-38-8							
Carbon disulfide	75-15-0	0.1	0.1	0.1	IRIS	0.01		
Carbon oxyfluoride	353-50-4							
Carbon tetrachloride	56-23-5	0.0007	0.0007	0.0007	IRIS	0.02	0.007	
Carbosulfan	55285-14-8	0.01	0.01	0.01	IRIS			
Chloral	75-87-6	0.002	0.002	0.002	IRIS			
Chlorambucil	305-03-3							
Chlordane	57-74-9	0.0005	0.0005	0.0005	IRIS	0.001	0.0006	0.0006
Chlornaphazin	494-03-1							
Chloro-1,3-butadiene, 2-	126-99-8	0.02	0.02	0.02	HEAST			
Chloroacetaldehyde	107-20-0							
Chloroaniline, p-	106-47-8	0.004	0.004	0.004	IRIS			
Chlorobenzene	108-90-7	0.02	0.02	0.02	IRIS		0.4	
Chlorobenzilate	510-15-6	0.02	0.02	0.02	IRIS			

(continued)

Table 15A-2. (continued)

Chemical Name	CASRN	EPA RfDs used in HWIR				Alternate benchmarks		
		RfD food & soil (mg/kg/d)	RfD water (mg/kg/d)	RfD fish (mg/kg/d)	RfD source	ATSDR acute oral MRL (mg/kg/d)	ATSDR intermed oral MRL (mg/kg/d)	ATSDR chronic oral MRL (mg/kg/d)
Chlorodibromomethane	124-48-1	0.02	0.02	0.02	IRIS	0.04		0.03
Chloroethane	75-00-3							
Chloroethyl vinyl ether, 2-	110-75-8							
Chloroform	67-66-3	0.01	0.01	0.01	IRIS	0.3	0.1	0.01
Chloro-m-cresol, p-	59-50-7							
Chloromethyl methyl ether	107-30-2							
Chloronaphthalene, 2-	91-58-7	0.08	0.08	0.08	IRIS			
Chloro-o-toluidine hydrochloride, 4-	3165-93-3							
Chlorophenol, 2-	95-57-8	0.005	0.005	0.005	IRIS			
Chlorophenyl phenyl ether, 4-	7005-72-3							
Chlorophenyl thiourea, 1-o	5344-82-1							
Chloropropionitrile, 3-	542-76-7							
Chromium (total)	7440-47-3	see VI or III	see VI or III	see VI or III	IRIS			
Chromium III (insoluble salts)	16065-83-1	1.5	1.5	1.5	IRIS			
Chromium VI	18540-29-9	0.003	0.003	0.003	IRIS			
Chrysene	218-01-9							
Citrus red No. 2	6358-53-8							
Cobalt	7440-48-4	0.06	0.06	0.06	NCEA			
Copper	7440-50-8							
Copper dimethyldithiocarbamate	137-29-1							
Cresol, m-	108-39-4	0.05	0.05	0.05	IRIS	0.05		
Cresol, o-	95-48-7	0.05	0.05	0.05	IRIS	0.05		
Cresol, p-	106-44-5	0.005	0.005	0.005	HEAST	0.05		
Crotonaldehyde	4170-30-3							
Cumene	98-82-8	0.1	0.1	0.1	IRIS			
Cumenyl methylcarbamate, m-	64-00-6							
Cyanide (amenable)	57-12-5	0.02	0.02	0.02	IRIS			
Cycasin	14901-08-7							
Cycloate	1134-23-2							

(continued)

Table 15A-2. (continued)

Chemical Name	CASRN	EPA RfDs used in HWIR				Alternate benchmarks		
		RfD food & soil (mg/kg/d)	RfD water (mg/kg/d)	RfD fish (mg/kg/d)	RfD source	ATSDR acute oral MRL (mg/kg/d)	ATSDR intermed oral MRL (mg/kg/d)	ATSDR chronic oral MRL (mg/kg/d)
Cyclohexane	110-82-7							
Cyclohexanone	108-94-1	5	5	5	IRIS			
Cyclohexyl-4,6-dinitrophenol, 2- (2,4-Dinitro-6-cyclohexylphenol or Dinitro-o-cyclohexylphenol)	131-89-5	0.002	0.002	0.002	IRIS			
Cyclophosphamide	50-18-0							
Daunomycin	20830-81-3							
Dazomet	533-74-4							
DDD	72-54-8							
DDD (o,p')	53-19-0							
DDE	72-55-9							
DDE (o,p')	3424-82-6							
DDT (o,p')	789-02-6							
DDT (p,p')	50-29-3	0.0005	0.0005	0.0005	IRIS	0.0005	0.0005	
Diallate	2303-16-4							
Dibenz(a,h)acridine	226-36-8							
Dibenz(a,h)anthracene	53-70-3							
Dibenz(a,j)acridine	224-42-0							
Dibenzo(a,e)pyrene	192-65-4							
Dibenzo(a,h)pyrene	189-64-0							
Dibenzo(a,i)pyrene	189-55-9							
Dibenzo(c,g)carbazole, 7H-	194-59-2							
Dibenzofuran	132-64-9							
Dibromo-3-chloropropane, 1,2-	96-12-8						0.002	
Dichloro-2-butene, 1,4-	764-41-0							
Dichloro-2-butene, trans- 1,4-	110-57-6							
Dichloro-2-propanol, 1,3-	96-23-1							
Dichlorobenzene, 1,2-	95-50-1	0.09	0.09	0.09	IRIS			
Dichlorobenzene, 1,3-	541-73-1							
Dichlorobenzene, 1,4-	106-46-7						0.1	
Dichlorobenzidine, 3,3'-	91-94-1							

(continued)

Table 15A-2. (continued)

Chemical Name	CASRN	EPA RfDs used in HWIR				Alternate benchmarks		
		RfD food & soil (mg/kg/d)	RfD water (mg/kg/d)	RfD fish (mg/kg/d)	RfD source	ATSDR acute oral MRL (mg/kg/d)	ATSDR intermed oral MRL (mg/kg/d)	ATSDR chronic oral MRL (mg/kg/d)
Dichlorodifluoromethane	75-71-8	0.2	0.2	0.2	IRIS			
Dichloroethane, 1,1-	75-34-3	0.1	0.1	0.1	HEAST			
Dichloroethane, 1,2-	107-06-2						0.2	
Dichloroethylene, 1,1-	75-35-4	0.009	0.009	0.009	IRIS			0.009
Dichloroethylene, cis-1,2-	156-59-2	0.01	0.01	0.01	HEAST	1	0.3	
Dichloroethylene, trans-1,2-	156-60-5	0.02	0.02	0.02	IRIS		0.2	
Dichloromethoxy ethane	111-91-1							
Dichlorophenol, 2,4-	120-83-2	0.003	0.003	0.003	IRIS		0.003	
Dichlorophenol, 2,6-	87-65-0							
Dichlorophenoxyacetic acid, 2,4- (2,4-D)	94-75-7	0.01	0.01	0.01	IRIS			
Dichloropropane, 1,2-	78-87-5					0.1	0.07	0.09
Dichloropropene, 1,3-	542-75-6	0.0003	0.0003	0.0003	IRIS			
Dichloropropene, cis-1,3-	10061-01-5	0.0003	0.0003	0.0003	IRIS			
Dichloropropene, trans-1,3-	10061-02-6	0.0003	0.0003	0.0003	IRIS			
Dieldrin	60-57-1	0.00005	0.00005	0.00005	IRIS	0.00007		0.00005
Diepoxybutane, 1,2,3,4- (2,2'-bioxirane)	1464-53-5							
Diethyl O-pyrazinyl phosphorothiate, O,O-	297-97-2							
Diethyl phthalate	84-66-2	0.8	0.8	0.8	IRIS	7	6	
Diethylene glycol, dicarbamate	5952-26-1							
Diethylhydrazine, N,N-	1615-80-1							
Diethyl-p-nitrophenyl phosphate	311-45-5							
Diethylstilbestrol	56-53-1							
Dihydrosafrole	94-58-6							
Dimethoate	60-51-5	0.0002	0.0002	0.0002	IRIS			
Dimethyl phthalate	131-11-3							
Dimethyl sulfate	77-78-1							
Dimethylamine	124-40-3							
Dimethylaminoazobenzene, p-	60-11-7							

(continued)

Table 15A-2. (continued)

Chemical Name	CASRN	EPA RfDs used in HWIR				Alternate benchmarks		
		RfD food & soil (mg/kg/d)	RfD water (mg/kg/d)	RfD fish (mg/kg/d)	RfD source	ATSDR acute oral MRL (mg/kg/d)	ATSDR intermed oral MRL (mg/kg/d)	ATSDR chronic oral MRL (mg/kg/d)
Dimethylbenz(a)anthracene, 7,12-	57-97-6							
Dimethylbenzidine, 3,3'-	119-93-7							
Dimethylcarbamoyl chloride	79-44-7							
Dimethylphenethylamine, alpha-, alpha-	122-09-8							
Dimethylphenol, 2,4-	105-67-9	0.02	0.02	0.02	IRIS			
Dimethoxybenzidine, 3,3'-	119-90-4							
Dimetilan	644-64-4							
Di-n-butyl phthalate	84-74-2	0.1	0.1	0.1	IRIS		0.6	
Dinitrobenzene, 1,3-	99-65-0	0.0001	0.0001	0.0001	IRIS	0.008	0.0005	
Dinitrobenzene, 1,4-	100-25-4	0.0004	0.0004	0.0004	HEAST			
Dinitro-o-cresol, 4,6-	534-52-1							
Dinitrophenol, 2,4-	51-28-5	0.002	0.002	0.002	IRIS	0.01		
Dinitrotoluene, 2,4-	121-14-2	0.002	0.002	0.002	IRIS	0.05		0.002
Dinitrotoluene, 2,6-	606-20-2	0.001	0.001	0.001	HEAST		0.004	
Di-n-octyl phthalate	117-84-0	0.02	0.02	0.02	HEAST	3	0.4	
Di-n-propylamine [Dipropylamine]	142-84-7							
Dioxane, 1,4-	123-91-1							
Diphenylamine	122-39-4	0.025	0.025	0.025	IRIS			
Diphenylhydrazine, 1,2-	122-66-7							
Disulfiram [Tetraethylthiuram disulfide]	97-77-8							
Disulfoton	298-04-4	0.00004	0.00004	0.00004	IRIS	0.001	0.00009	0.00006
Dithiobiuret	541-53-7							
Endosulfan	115-29-7	0.006	0.006	0.006	IRIS		0.002	0.002
Endosulfan I	959-98-8	0.006	0.006	0.006	IRIS			
Endosulfan II	33213-65-9	0.006	0.006	0.006	IRIS			
Endosulfan sulfate	1031-07-8							
Endothall	145-73-3	0.02	0.02	0.02	IRIS			
Endrin	72-20-8	0.0003	0.0003	0.0003	IRIS		0.002	0.0003
Endrin aldehyde	7421-93-4							
Endrin ketone	53494-70-5							

(continued)

Table 15A-2. (continued)

Chemical Name	CASRN	EPA RfDs used in HWIR				Alternate benchmarks		
		RfD food & soil (mg/kg/d)	RfD water (mg/kg/d)	RfD fish (mg/kg/d)	RfD source	ATSDR acute oral MRL (mg/kg/d)	ATSDR intermed oral MRL (mg/kg/d)	ATSDR chronic oral MRL (mg/kg/d)
Epichlorohydrin	106-89-8	0.002	0.002	0.002	HEAST			
Epinephrine	51-43-4							
Ethoxyethanol, 2-	110-80-5	0.4	0.4	0.4	HEAST			
Ethyl acetate	141-78-6	0.9	0.9	0.9	IRIS			
Ethyl acrylate	140-88-5							
Ethyl carbamate	51-79-6							
Ethyl cyanide (propionitrile)	107-12-0							
Ethyl dipropylthiocarbamate, S- [EPTC]	759-94-4	0.025	0.025	0.025	IRIS			
Ethyl ether	60-29-7	0.2	0.2	0.2	IRIS			
Ethyl methacrylate	97-63-2	0.09	0.09	0.09	HEAST			
Ethyl methanesulfonate	62-50-0							
Ethyl Ziram	14324-55-1							
Ethylbenzene	100-41-4	0.1	0.1	0.1	IRIS			
Ethylene dibromide (1,2-dibromoethane)	106-93-4						0.002	
Ethylene oxide	75-21-8							
Ethylene thiourea	96-45-7	0.00008	0.00008	0.00008	IRIS			
Ethylenebisdithiocarbamic acid, salts and esters	111-54-6							
Ethyleneimine (aziridine)	151-56-4							
Famphur	52-85-7							
Ferbam	14484-64-1							
Fluoracetamide, 2-	640-19-7							
Fluoroacetic acid, sodium salt (Sodium fluoroacetate)	62-74-8	0.00002	0.00002	0.00002	IRIS			
Fluoranthene	206-44-0	0.04	0.04	0.04	IRIS		0.4	
Fluorene	86-73-7	0.04	0.04	0.04	IRIS		0.4	
Fluoride	16984-48-8	0.06	0.06	0.06	IRIS			
Formaldehyde	50-00-0	0.2	0.2	0.2	IRIS		0.3	0.2
Formetanate hydrochloride	23422-53-9							
Formic acid	64-18-6	2.00	2.00	2.00	HEAST			

(continued)

Table 15A-2. (continued)

Chemical Name	CASRN	EPA RfDs used in HWIR				Alternate benchmarks		
		RfD food & soil (mg/kg/d)	RfD water (mg/kg/d)	RfD fish (mg/kg/d)	RfD source	ATSDR acute oral MRL (mg/kg/d)	ATSDR intermed oral MRL (mg/kg/d)	ATSDR chronic oral MRL (mg/kg/d)
Formparanate	17702-57-7							
Furan	110-00-9	0.001	0.001	0.001	IRIS			
Furancarbox-aldehyde, 2- (furfural)	98-01-1	0.003	0.003	0.003	IRIS			
Glycidylaldehyde	765-34-4	0.0004	0.0004	0.0004	IRIS			
Heptachlor	76-44-8	0.0005	0.0005	0.0005	IRIS			
Heptachlor epoxide	1024-57-3	0.000013	0.000013	0.000013	IRIS			
Heptachlorodibenzofuran, 1,2,3,4,6,7,8-	67562-39-4							
Heptachlorodibenzofuran, 1,2,3,4,7,8,9-	55673-89-7							
Heptachlorodibenzo-p-dioxin, 1,2,3,4,6,7,8-	35822-46-9							
Hexachloro-1,3-butadiene	87-68-3	0.0002	0.0002	0.0002	HEAST		0.0002	
Hexachlorobenzene	118-74-1	0.0008	0.0008	0.0008	IRIS	0.008	0.0003	0.00002
Hexachlorocyclohexane, alpha- (alpha-HCH)	319-84-6						0.01	
Hexachlorocyclohexane, beta- (beta-HCH)	319-85-7					0.2	0.0006	
Hexachlorocyclohexane, delta (delta-HCH)	319-86-8							
Hexachlorocyclohexane, gamma- (Lindane)	58-89-9	0.0003	0.0003	0.0003	IRIS	0.01	0.00001	
Hexachlorocyclopentadiene	77-47-4	0.007	0.007	0.007	IRIS		0.1	
Hexachlorodibenzofuran, 1,2,3,4,7,8-	70648-26-9							
Hexachlorodibenzofuran, 1,2,3,6,7,8-	57117-44-9							
Hexachlorodibenzofuran, 1,2,3,7,8,9-	72918-21-9							
Hexachlorodibenzofuran, 2,3,4,6,7,8-	60851-34-5							
Hexachlorodibenzo-p-dioxin, 1,2,3,4,7,8-	39227-28-6							
Hexachlorodibenzo-p-dioxin, 1,2,3,6,7,8-	57653-85-7							
Hexachlorodibenzo-p-dioxin, 1,2,3,7,8,9-	19408-74-3							
Hexachloroethane	67-72-1	0.001	0.001	0.001	IRIS	1	0.01	
Hexachlorophene	70-30-4	0.0003	0.0003	0.0003	IRIS			

(continued)

Table 15A-2. (continued)

Chemical Name	CASRN	EPA RfDs used in HWIR				Alternate benchmarks		
		RfD food & soil (mg/kg/d)	RfD water (mg/kg/d)	RfD fish (mg/kg/d)	RfD source	ATSDR acute oral MRL (mg/kg/d)	ATSDR intermed oral MRL (mg/kg/d)	ATSDR chronic oral MRL (mg/kg/d)
Hexachloropropene	1888-71-7							
Hexaethyl tetraphosphate	757-58-4							
Hexanone, 2-	591-78-6							
Hydrazine (and hydrazine sulfate); CAS and FR = hydrazine only	302-01-2							
Indeno(1,2,3-cd) pyrene	193-39-5							
Iodo-2-propynyl N-butylcarbamate, 3-	55406-53-6							
Iodomethane	74-88-4							
Isobutyl alcohol	78-83-1	0.3	0.3	0.3	IRIS			
Isodrin	465-73-6							
Isolan [Isopropyl methyl pyrazolyl dimethylcarbamate]	119-38-0							
Isophorone	78-59-1	0.2	0.2	0.2	IRIS		3	0.2
Isosafrole	120-58-1							
Kepone	143-50-0					0.01	0.0005	0.0005
Lasiocarpine	303-34-4							
Lead	7439-92-1							
Maleic anhydride	108-31-6	0.1	0.1	0.1	IRIS			
Maleic hydrazide	123-33-1	0.5	0.5	0.5	IRIS			
Malononitrile	109-77-3	0.00002	0.00002	0.00002	HEAST			
Manganese dimethyldithiocarbamate	15339-36-3							
Melphalan	148-82-3							
Mercury	7439-97-6	0.0003	0.0003	*MeHg	HEAST			
Metam sodium	137-42-8							
Methacrylonitrile	126-98-7	0.0001	0.0001	0.0001	IRIS			
Methanethiol [methyl mercaptan]	74-93-1							
Methanol	67-56-1	0.5	0.5	0.5	IRIS			
Methapyrilene	91-80-5							
Methiocarb	2032-65-7							
Methomyl	16752-77-5	0.025	0.025	0.025	IRIS			
Methoxychlor	72-43-5	0.005	0.005	0.005	IRIS	0.02	0.02	

(continued)

Table 15A-2. (continued)

Chemical Name	CASRN	EPA RfDs used in HWIR				Alternate benchmarks		
		RfD food & soil (mg/kg/d)	RfD water (mg/kg/d)	RfD fish (mg/kg/d)	RfD source	ATSDR acute oral MRL (mg/kg/d)	ATSDR intermed oral MRL (mg/kg/d)	ATSDR chronic oral MRL (mg/kg/d)
Methyl bromide (Bromomethane)	74-83-9	0.0014	0.0014	0.0014	IRIS		0.003	
Methyl chloride (Chloromethane)	74-87-3							
Methyl ethyl ketone	78-93-3	0.6	0.6	0.6	IRIS			
Methyl ethyl ketone peroxide	1338-23-4							
Methyl hydrazine	60-34-4							
Methyl isobutyl ketone	108-10-1	0.08	0.08	0.08	HEAST			
Methyl mercury	22967-92-6	0.0001	0.0001	0.0001	IRIS		0.0005	
Methyl methacrylate	80-62-6	1.4	1.4	1.4	IRIS			
Methyl methanesulfonate	66-27-3							
Methyl parathion	298-00-0	0.00025	0.00025	0.00025	IRIS			0.0003
Methylaziridine, 2-	75-55-8							
Methylcholanthrene, 3-	56-49-5							
Methylene bromide	74-95-3	0.01	0.01	0.01	HEAST			
Methylene chloride	75-09-2	0.06	0.06	0.06	IRIS			0.06
Methylenebis(2-chloroaniline), 4,4'-	101-14-4	0.0007	0.0007	0.0007	HEAST			
Methylnaphthalene, 2-	91-57-6							
Methyl-nitro-nitrosoguanidine (MNNG)	70-25-7							
Methylthiouracil	56-04-2							
Metolcarb	1129-41-5							
Mexacarbate	315-18-4							
Mitomycin C	50-07-7							
Molinate	2212-67-1	0.002	0.002	0.002	IRIS			
Molybdenum	7439-98-7	0.005	0.005	0.005	IRIS			
Naphthalene	91-20-3	0.02	0.02	0.02	IRIS			
Naphthoquinone, 1,4-	130-15-4							
Naphthyl-2-thiourea, 1-	86-88-4							
Naphthylamine, 1-	134-32-7							
Naphthylamine, 2-	91-59-8							
Nickel	7440-02-0	0.02	0.02	0.02	IRIS			
Nicotine and salts	54-11-5							

(continued)

Table 15A-2. (continued)

Chemical Name	CASRN	EPA RfDs used in HWIR				Alternate benchmarks		
		RfD food & soil (mg/kg/d)	RfD water (mg/kg/d)	RfD fish (mg/kg/d)	RfD source	ATSDR acute oral MRL (mg/kg/d)	ATSDR intermed oral MRL (mg/kg/d)	ATSDR chronic oral MRL (mg/kg/d)
Nitroaniline, 2-	88-74-4							
Nitroaniline, 3-	99-09-2							
Nitroaniline, 4-	100-01-6							
Nitrobenzene	98-95-3	0.0005	0.0005	0.0005	IRIS			
Nitrogen mustard	55-86-7							
Nitrogen mustard hydrochloride salt	51-75-2							
Nitrogen mustard N- Oxide	126-85-2							
Nitrogen mustard N-Oxide HCl salt	302-70-5							
Nitroglycerine	55-63-0							
Nitro-o-toluidine, 5- (2-Methyl-5-nitroaniline)	99-55-8							
Nitrophenol, 2-	88-75-5							
Nitrophenol, 4-	100-02-7							
Nitropropane, 2-	79-46-9							
Nitroquinoline-1-oxide, 4-	56-57-5							
N-Nitrosodiethanolamine	1116-54-7							
N-Nitrosodiethylamine	55-18-5							
N-Nitrosodimethylamine	62-75-9							
N-Nitrosodi-n-butylamine	924-16-3							
N-Nitroso-di-n-propylamine	621-64-7					0.095		
N-Nitrosodiphenylamine	86-30-6							
N-Nitrosomethyl vinyl amine	4549-40-0							
N-Nitrosomethylethylamine	10595-95-6							
N-Nitrosomorpholine	59-89-2							
N-Nitroso-N-ethylurea	759-73-9							
N-Nitroso-N-methylurea	684-93-5							
N-Nitroso-N-methylurethane	615-53-2							
N-Nitrosonomicotine	16543-55-8							
N-Nitrosopiperidine	100-75-4							

(continued)

Table 15A-2. (continued)

Chemical Name	CASRN	EPA RfDs used in HWIR				Alternate benchmarks		
		RfD food & soil (mg/kg/d)	RfD water (mg/kg/d)	RfD fish (mg/kg/d)	RfD source	ATSDR acute oral MRL (mg/kg/d)	ATSDR intermed oral MRL (mg/kg/d)	ATSDR chronic oral MRL (mg/kg/d)
N-Nitrosopyrrolidine	930-55-2							
N-Nitrososarcosine	13256-22-9							
N-Phenylthiourea	103-85-5							
Octachlorodibenzofuran, 1,2,3,4,6,7,8,9- [OCDF]	39001-02-0							
Octachlorodibenzo-p-dioxin, 1,2,3,4,6,7,8,9- [OCDD]	3268-87-9							
Octamethyl pyrophosphoramidate	152-16-9	0.002	0.002	0.002	HEAST			
Osmium tetroxide	20816-12-0							
Oxamyl	23135-22-0	0.025	0.025	0.025	IRIS			
Paraldehyde	123-63-7							
Parathion	56-38-2	0.006	0.006	0.006	HEAST			
Pebulate	1114-71-2	0.05	0.05	0.05	HEAST			
Pentachlorobenzene	608-93-5	0.0008	0.0008	0.0008	IRIS			
Pentachlorodibenzofuran, 1,2,3,7,8-	57117-41-6							
Pentachlorodibenzofuran, 2,3,4,7,8-	57117-31-4							
Pentachlorodibenzo-p-dioxin, 1,2,3,7,8-	40321-76-4							
Pentachloroethane	76-01-7							
Pentachloronitrobenzene (PCNB)	82-68-8	0.003	0.003	0.003	IRIS			
Pentachlorophenol	87-86-5	0.03	0.03	0.03	IRIS	0.005	0.001	
Pentadiene, 1,3-	504-60-9							
Phenacetin	62-44-2							
Phenanthrene	85-01-8							
Phenol	108-95-2	0.6	0.6	0.6	IRIS		0.0003	
Phenyl mercuric acetate	62-38-4	0.00008	0.00008	0.00008	IRIS			
Phenylenediamine, m- (1,3-)	108-45-2	0.006	0.006	0.006	IRIS			
Phenylenediamine, p-	106-50-3	0.19	0.19	0.19	HEAST			
Phenylenediamines (N.O.S.)	25265-76-3	0.006	0.006	0.006	IRIS			
Phorate	298-02-2	0.0002	0.0002	0.0002	HEAST			
Phosphorodithioic acid, o-o-diethyl ester	298-06-6							

(continued)

Table 15A-2. (continued)

Chemical Name	CASRN	EPA RfDs used in HWIR				Alternate benchmarks		
		RfD food & soil (mg/kg/d)	RfD water (mg/kg/d)	RfD fish (mg/kg/d)	RfD source	ATSDR acute oral MRL (mg/kg/d)	ATSDR intermed oral MRL (mg/kg/d)	ATSDR chronic oral MRL (mg/kg/d)
Phosphorodithioic acid, o-o-diethyl-s-methyl	3288-58-2							
Phosphorodithioic acid, trimethyl ester	2953-29-9							
Phthalic anhydride	85-44-9	2	2	2	IRIS			
Physostigmine	57-47-6							
Physostigmine salicylate	57-64-7							
Picoline, 2-	109-06-8							
Polychlorinated biphenyls (Aroclors)	1336-36-3	0.00007	0.00007	0.00007	IRIS		0.02 ug/kg/day	
Potassium dimethyldithiocarbamate	128-03-0							
Potassium N-hydroxymethyl N-methyldithiocarbamate	51026-28-9							
Potassium N-methyldithiocarbamate	137-41-7							
Promecarb	2631-37-0							
Pronamide	23950-58-5	0.075	0.075	0.075	IRIS			
Propane sulfone, 1,3-	1120-71-4							
Propargyl alcohol (propyn-1-ol, 2-)	107-19-7	0.002	0.002	0.002	IRIS			
Propham	122-42-9	0.02	0.02	0.02	IRIS			
Propoxur [Baygon][2-(1-Methylethoxy)-phenol, methylcarbamate]	114-26-1	0.004	0.004	0.004	IRIS			
Propylamine, n-	107-10-8							
Propylthiouracil	51-52-5							
Prosulfocarb	52888-80-9							
Pyrene	129-00-0	0.03	0.03	0.03	IRIS			
Pyridine	110-86-1	0.001	0.001	0.001	IRIS			
Reserpine	50-55-5							
Resorcinol	108-46-3							
Saccharin and salts	81-07-2							
Safrole	94-59-7							
Selenium	7782-49-2	0.005	0.005	0.005	IRIS			0.005
Selenium, tetrakis-(dimethyldithiocarbamate) [Selenium dimethyldithiocarbamate]	144-34-3							

(continued)

Table 15A-2. (continued)

Chemical Name	CASRN	EPA RfDs used in HWIR				Alternate benchmarks		
		RfD food & soil (mg/kg/d)	RfD water (mg/kg/d)	RfD fish (mg/kg/d)	RfD source	ATSDR acute oral MRL (mg/kg/d)	ATSDR intermed oral MRL (mg/kg/d)	ATSDR chronic oral MRL (mg/kg/d)
Silver	7440-22-4	0.005	0.005	0.005	IRIS, RTI			
Sodium dibutyldithiocarbamate	136-30-1							
Sodium diethyldithiocarbamate	148-18-5							
Sodium dimethyldithiocarbamate	128-04-1							
Sodium fluoroacetate	62-74-8	0.00002	0.00002	0.00002	IRIS			
Streptozotocin	18883-66-4							
Strychnine (and salts)	57-24-9	0.0003	0.0003	0.0003	IRIS			
Styrene	100-42-5	0.2	0.2	0.2	IRIS		2.00E-01	
Sulfallate	95-06-7							
Sulfide	18496-25-8	0.003	0.003	0.003	IRIS			
TCDD, 2,3,7,8-	1746-01-6					0.0002 ug/kg/d	0.00002 ug/kg/d	0.000001 ug/kg/d
Tetrabutylthiuram disulfide	1634-02-2							
Tetrabutylthiuram monosulfide [Bis-(dimethylthiocarbamoyl)sulfide]	97-74-5							
Tetrachlorobenzene, 1,2,4,5-	95-94-3	0.0003	0.0003	0.0003	IRIS			
Tetrachlorodibenzofuran, 2,3,7,8-[2,3,7,8-TCDF]	51207-31-9							
Tetrachloroethane, 1,1,1,2-	630-20-6	0.03	0.03	0.03	IRIS			
Tetrachloroethane, 1,1,2,2-	79-34-5						0.6	0.04
Tetrachloroethylene	127-18-4	0.01	0.01	0.01	IRIS	0.05		
Tetrachlorophenol, 2,3,4,6-	58-90-2	0.03	0.03	0.03	IRIS			
Tetraethyl pyrophosphate	107-49-3							
Tetraethyldithiopyro-phosphate	3689-24-5	0.0005	0.0005	0.0005	IRIS			
Tetrahydrofuran	109-99-9							
Thallium (I)	7440-28-0	0.00008	0.00008	0.00008	IRIS			
Thioacetamide	62-55-5							
Thiodicarb	59669-26-0							
Thiofanox	39196-18-4	0.0003	0.0003	0.0003	HEAST			
Thiophanate-methyl	23564-05-8	0.08	0.08	0.08	IRIS			
Thiophenol (Benzenethiol)	108-98-5							

(continued)

Table 15A-2. (continued)

Chemical Name	CASRN	EPA RfDs used in HWIR				Alternate benchmarks		
		RfD food & soil (mg/kg/d)	RfD water (mg/kg/d)	RfD fish (mg/kg/d)	RfD source	ATSDR acute oral MRL (mg/kg/d)	ATSDR intermed oral MRL (mg/kg/d)	ATSDR chronic oral MRL (mg/kg/d)
Thiosemicarbide	79-19-6							
Thiourea	62-56-6							
Thiram	137-26-8	0.005	0.005	0.005	IRIS			
Tin	7440-31-5	0.6	0.6	0.6	HEAST			
Tirpate	26419-73-8							
Toluene	108-88-3	0.2	0.2	0.2	IRIS	0.8	0.02	
Toluene diisocyanate, 2,4-	584-84-9							
Toluene diisocyanate, mixed isomers [2,4- and 2,6-Toluene diisocyanate mixture]	26471-62-5							
Toluenediamine, 2,4-	95-80-7							
Toluenediamine, 2,6-	823-40-5	0.2	0.2	0.2	HEAST			
Toluenediamine, 3,4-	496-72-0							
Toluidine hydrochloride, o- (2-Methylaniline hydrochloride)	636-21-5							
Toluidine, o-	95-53-4							
Toluidine, p-	106-49-0							
Toxaphene	8001-35-2					0.005	0.001	
Triallate	2303-17-5	0.013	0.013	0.013	IRIS			
Trichloro-1,1,2-trifluoroethane, 1,1,2-	76-13-1	30	30	30	IRIS			
Trichlorobenzene, 1,2,4-	120-82-1	0.01	0.01	0.01	IRIS			
Trichloroethane, 1,1,1-	71-55-6	0.3	0.3	0.3	SF			
Trichloroethane, 1,1,2-	79-00-5	0.004	0.004	0.004	IRIS	0.3	0.04	
Trichloroethylene (1,1,2-)	79-01-6					0.2		
Trichlorofluoromethane	75-69-4	0.3	0.3	0.3	IRIS			
Trichloromethanethiol	75-70-7							
Trichlorophenol, 2,4,5-	95-95-4	0.1	0.1	0.1	IRIS			
Trichlorophenol, 2,4,6-	88-06-2						0.04	
Trichlorophenoxy) propionic acid, 2-(2,4,5- (Silvex)	93-72-1	0.008	0.008	0.008	IRIS			
Trichlorophenoxyacetic acid, 2,4,5- (245-T)	93-76-5	0.01	0.01	0.01	IRIS			

(continued)

Table 15A-2. (continued)

Chemical Name	CASRN	EPA RfDs used in HWIR				Alternate benchmarks		
		RfD food & soil (mg/kg/d)	RfD water (mg/kg/d)	RfD fish (mg/kg/d)	RfD source	ATSDR acute oral MRL (mg/kg/d)	ATSDR intermed oral MRL (mg/kg/d)	ATSDR chronic oral MRL (mg/kg/d)
Trichloropropane, 1,2,3-	96-18-4	0.006	0.006	0.006	IRIS		0.06	
Triethylamine	121-44-8							
Triethylphosphorothioate, O,O,O-	126-68-1							
Trinitrobenzene, sym- (1,3,5-)	99-35-4	0.03	0.03	0.03	IRIS			
Tris (2,3-dibromopropyl) phosphate	126-72-7							
Tris(1-azridinyl) phosphine sulfide	52-24-4							
Trypan blue	72-57-1							
Uracil mustard	66-75-1							
Vanadium	7440-62-2	0.007	0.007	0.007	HEAST		0.003	
Vernolate [Vernam]	1929-77-7	0.001	0.001	0.001	IRIS			
Vinyl acetate	108-05-4	1	1	1	HEAST			
Vinyl chloride	75-01-4							0.00002
Warfarin	81-81-2	0.0003	0.0003	0.0003	IRIS			
Xylene, m-	108-38-3	2	2	2	HEAST		0.6	
Xylene, o-	95-47-6	2	2	2	HEAST			
Xylene, p-	106-42-3					1		
Xylenes (total)	1330-20-7	2	2	2	IRIS		0.2	
Zinc	7440-66-6	0.3	0.3	0.3	IRIS		0.3	0.3
Ziram	137-30-4							

Table 15A-3. Available Oral Cancer Benchmarks

Chemical Name	CASRN	EPA oral CSFs used in HWIR			Alternate benchmarks		
		Oral CSF - food & soil (mg/kg/d) ⁻¹	Oral CSF - water (mg/kg/d) ⁻¹	Oral CSF source	CalEPA Oral CSF (mg/kg/d) ⁻¹	TEF	TEF Source
A2123 [Ethanimidothioic acid, 2-(dimethylamino) -N-hydroxy-2-oxo-,methyl ester]	30558-43-1						
Acenaphthene	83-32-9					0.001	N&L92
Acenaphthylene	208-96-8					0.001	N&L92
Acetaldehyde	75-07-0				1.00E-02		
Acetone	67-64-1						
Acetonitrile	75-05-8						
Acetophenone	98-86-2						
Acetyl chloride	75-36-5						
Acetyl-2-thiourea, 1-	591-08-2						
Acetylaminofluorene, 2-	53-96-3				3.80E+00		
Acrolein	107-02-8						
Acrylamide	79-06-1	4.5	4.5	IRIS	4.50E+00		
Acrylic acid	79-10-7						
Acrylonitrile	107-13-1	0.54	0.54	IRIS	1.00E+00		
Aflatoxins	1402-68-2						
Aldicarb	116-06-3						
Aldicarb sulfone	1646-88-4						
Aldrin	309-00-2	17	17	IRIS	1.70E+01		
Allyl alcohol	107-18-6						
Allyl chloride	107-05-1				2.10E-02		
Aminobiphenyl,4-	92-67-1				2.10E+01		
Aminomethyl-3-isoxazolol,5-	2763-96-4						
Aminopyridine, 4-	504-24-5						
Amitrole	61-82-5				9.40E-01		
Aniline	62-53-3	0.0057	0.0057	IRIS	5.70E-03		
Anthracene	120-12-7					0.01	N&L92
Antimony	7440-36-0						
Aramite	140-57-8	0.025	0.025	IRIS	3.00E-02		
Arsenic	7440-38-2	1.5	1.5	IRIS	1.50E+00		
Auramine	492-80-8				8.80E-01		

(continued)

Table 15A-3. (continued)

Chemical Name	CASRN	EPA oral CSFs used in HWIR			Alternate benchmarks		
		Oral CSF - food & soil (mg/kg/d) ⁻¹	Oral CSF - water (mg/kg/d) ⁻¹	Oral CSF source	CalEPA Oral CSF (mg/kg/d) ⁻¹	TEF	TEF Source
Auramine O (Auramine hydrochloride)	2465-27-2						
Azaserine	115-02-6				1.10E+01		
Barban	101-27-9						
Barium	7440-39-3						
Bendiocarb	22781-23-3						
Bendiocarb phenol	22961-82-6						
Benomyl	17804-35-2						
Benz(a)anthracene	56-55-3	0.73	0.73	TEF calc	1.20E+00	0.1	EPA93
Benz(c)acridine	225-51-4						
Benzal chloride [Dichloromethyl benzene]	98-87-3						
Benzene	71-43-2	0.029	0.029	IRIS	1.00E-01		
Benzidine	92-87-5	230	230	IRIS	5.00E+02		
Benzo(a)pyrene	50-32-8	7.3	7.3	IRIS	1.20E+01	1	EPA93
Benzo(b)fluoranthene	205-99-2	0.73	0.73	TEF calc	1.20E+00	0.1	EPA93
Benzo(g,h,i)perylene	191-24-2					0.01	N&L92
Benzo(j)fluoranthene	205-82-3				TEF=0.1	0.1	CalEPA94
Benzo(k)fluoranthene	207-08-9	0.073	0.073	EPA93		0.01	EPA93
Benzoquinone, p-	106-51-4						
Benzotrichloride	98-07-7	13	13	IRIS			
Benzyl alcohol	100-51-6						
Benzyl chloride	100-44-7	0.17	0.17	IRIS	1.70E-01		
Beryllium	7440-41-7				4.30E+00		
Bis (2-chloroisopropyl) ether	39638-32-9	0.07	0.07	HEAST			
Bis (chloromethyl) ether	542-88-1	220	220	IRIS	4.60E+01		
Bis(2-chlorethyl)ether	111-44-4	1.1	1.1	IRIS	2.50E+00		
Bis-(2-chloroisopropyl) ether [2,2'-Oxybis(1-chloropropane)]	108-60-1	0.07	0.07	HEAST			
Bis(2-ethylhexyl)phthalate	117-81-7	0.014	0.014	IRIS	8.40E-03		
Bis-(pentamethylene)-thiuram tetrasulfide	120-54-7						
Bromoacetone	598-31-2						
Bromodichloromethane	75-27-4	0.062	0.062	IRIS	1.30E-01		

(continued)

Table 15A-3. (continued)

Chemical Name	CASRN	EPA oral CSFs used in HWIR			Alternate benchmarks		
		Oral CSF - food & soil (mg/kg/d) ⁻¹	Oral CSF - water (mg/kg/d) ⁻¹	Oral CSF source	CalEPA Oral CSF (mg/kg/d) ⁻¹	TEF	TEF Source
Bromoform	75-25-2	0.0079	0.0079	IRIS			
Bromophenyl phenyl ether, 4-	101-55-3						
Brucine	357-57-3						
Butanol	71-36-3						
Butyl benzyl phthalate	85-68-7						
Butyl-4,6-dinitrophenol, 2-sec-	88-85-7						
Butylate	2008-41-5						
Cadmium	7440-43-9				1.50E+01		
Carbaryl	63-25-2						
Carbazole	86-74-8	0.02	0.02	HEAST			
Carbendazim	10605-21-7						
Carbofuran	1563-66-2						
Carbofuran phenol	1563-38-8						
Carbon disulfide	75-15-0						
Carbon oxyfluoride	353-50-4						
Carbon tetrachloride	56-23-5	0.13	0.13	IRIS	1.50E-01		
Carbosulfan	55285-14-8						
Chloral	75-87-6						
Chlorambucil	305-03-3				2.30E-03		
Chlordane	57-74-9	0.35	0.35	IRIS	1.20E+00		
Chlornaphazin	494-03-1						
Chloro-1,3-butadiene, 2-	126-99-8						
Chloroacetaldehyde	107-20-0						
Chloroaniline, p-	106-47-8						
Chlorobenzene	108-90-7						
Chlorobenzilate	510-15-6	0.27	0.27	HEAST	1.10E-01		
Chlorodibromomethane	124-48-1	0.084	0.084	IRIS	9.40E-02		
Chloroethane	75-00-3						
Chloroethyl vinyl ether, 2-	110-75-8						
Chloroform	67-66-3	0.0061	0.0061	IRIS	1.90E-02		

(continued)

Table 15A-3. (continued)

Chemical Name	CASRN	EPA oral CSFs used in HWIR			Alternate benchmarks		
		Oral CSF - food & soil (mg/kg/d) ⁻¹	Oral CSF - water (mg/kg/d) ⁻¹	Oral CSF source	CalEPA Oral CSF (mg/kg/d) ⁻¹	TEF	TEF Source
Chloro-m-cresol, p-	59-50-7						
Chloromethyl methyl ether	107-30-2				2.40E+00		
Chloronaphthalene, 2-	91-58-7						
Chloro-o-toluidine hydrochloride, 4-	3165-93-3	0.46	0.46	HEAST			
Chlorophenol, 2-	95-57-8						
Chlorophenyl phenyl ether, 4-	7005-72-3						
Chlorophenyl thiourea, 1-o	5344-82-1						
Chloropropionitrile, 3-	542-76-7						
Chromium (total)	7440-47-3				see VI		
Chromium III (insoluble salts)	16065-83-1						
Chromium VI	18540-29-9				4.20E-01		
Chrysene	218-01-9	0.0073	0.0073	TEF	1.20E-01	0.001	EPA93
Citrus red No. 2	6358-53-8						
Cobalt	7440-48-4						
Copper	7440-50-8						
Copper dimethyldithiocarbamate	137-29-1						
Cresol, m-	108-39-4						
Cresol, o-	95-48-7						
Cresol, p-	106-44-5						
Crotonaldehyde	4170-30-3	1.9	1.9	HEAST			
Cumene	98-82-8						
Cumenyl methylcarbamate, m-	64-00-6						
Cyanide (amenable)	57-12-5						
Cycasin	14901-08-7						
Cycloate	1134-23-2						
Cyclohexane	110-82-7						
Cyclohexanone	108-94-1						
Cyclohexyl-4,6-dinitrophenol, 2- (2,4-Dinitro-6-cyclohexylphenol or Dinitro-o-cyclohexylphenol)	131-89-5						
Cyclophosphamide	50-18-0				6.10E-01		
Daunomycin	20830-81-3						

(continued)

Table 15A-3. (continued)

Chemical Name	CASRN	EPA oral CSFs used in HWIR			Alternate benchmarks		
		Oral CSF - food & soil (mg/kg/d) ⁻¹	Oral CSF - water (mg/kg/d) ⁻¹	Oral CSF source	CalEPA Oral CSF (mg/kg/d) ⁻¹	TEF	TEF Source
Dazomet	533-74-4						
DDD	72-54-8	0.24	0.24	IRIS	2.40E-01		
DDD (o,p')	53-19-0						
DDE	72-55-9	0.34	0.34	IRIS	3.40E-01		
DDE (o,p')	3424-82-6						
DDT (o,p')	789-02-6						
DDT (p,p')	50-29-3	0.34	0.34	IRIS	3.40E-01		
Diallate	2303-16-4	0.061	0.061	HEAST			
Dibenz(a,h)acridine	226-36-8				TEF=0.1	0.1	CalEPA94
Dibenz(a,h)anthracene	53-70-3	7.3	7.3	TEF calc	4.10E+00	1	EPA93
Dibenz(a,j)acridine	224-42-0				TEF=0.1	0.1	CalEPA94
Dibenzo(a,e)pyrene	192-65-4				TEF=1.0	1	CalEPA94
Dibenzo(a,h)pyrene	189-64-0				TEF=10.0	10	CalEPA94
Dibenzo(a,i)pyrene	189-55-9				TEF=10.0	10	CalEPA94
Dibenzo(c,g)carbazole, 7H-	194-59-2				1.20E+01	1	CalEPA94
Dibenzofuran	132-64-9						
Dibromo-3-chloropropane, 1,2-	96-12-8	1.4	1.4	HEAST	7.00E+00		
Dichloro-2-butene, 1,4-	764-41-0						
Dichloro-2-butene, trans- 1,4-	110-57-6						
Dichloro-2-propanol, 1,3-	96-23-1						
Dichlorobenzene, 1,2-	95-50-1						
Dichlorobenzene, 1,3-	541-73-1						
Dichlorobenzene, 1,4-	106-46-7	0.024	0.024	HEAST	4.00E-02		
Dichlorobenzidine, 3,3'-	91-94-1	0.45	0.45	IRIS	1.20E+00		
Dichlorodifluoromethane	75-71-8						
Dichloroethane, 1,1-	75-34-3				0.0057		
Dichloroethane, 1,2-	107-06-2	0.091	0.091	IRIS	7.00E-02		
Dichloroethylene, 1,1-	75-35-4	0.6	0.6	IRIS			
Dichloroethylene, cis-1,2-	156-59-2						
Dichloroethylene, trans-1,2-	156-60-5						

(continued)

Table 15A-3. (continued)

Chemical Name	CASRN	EPA oral CSFs used in HWIR			Alternate benchmarks		
		Oral CSF - food & soil (mg/kg/d) ⁻¹	Oral CSF - water (mg/kg/d) ⁻¹	Oral CSF source	CalEPA Oral CSF (mg/kg/d) ⁻¹	TEF	TEF Source
Dichloromethoxy ethane	111-91-1						
Dichlorophenol, 2,4-	120-83-2						
Dichlorophenol, 2,6-	87-65-0						
Dichlorophenoxyacetic acid, 2,4- (2,4-D)	94-75-7						
Dichloropropane, 1,2-	78-87-5	0.068	0.068	HEAST	6.30E-02		
Dichloropropene, 1,3-	542-75-6	0.18	0.18	HEAST	1.80E-01		
Dichloropropene, cis-1,3-	10061-01-5	0.18	0.18	HEAST			
Dichloropropene, trans-1,3-	10061-02-6	0.18	0.18	HEAST			
Dieldrin	60-57-1	16	16	IRIS	1.60E+01		
Diepoxybutane, 1,2,3,4- (2,2'-bioxirane)	1464-53-5						
Diethyl O-pyrazinyl phosphorothiate, O,O-	297-97-2						
Diethyl phthalate	84-66-2						
Diethylene glycol, dicarbamate	5952-26-1						
Diethylhydrazine, N,N-	1615-80-1						
Diethyl-p-nitrophenyl phosphate	311-45-5						
Diethylstilbestrol	56-53-1	4700	4700	HEAST	3.50E+02		
Dihydrosafrole	94-58-6				4.40E-02		
Dimethoate	60-51-5						
Dimethyl phthalate	131-11-3						
Dimethyl sulfate	77-78-1						
Dimethylamine	124-40-3						
Dimethylaminoazobenzene, p-	60-11-7				4.60E+00		
Dimethylbenz(a)anthracene, 7,12-	57-97-6				2.50E+02		
Dimethylbenzidine, 3,3'-	119-93-7	9.2	9.2	HEAST			
Dimethylcarbamoyl chloride	79-44-7				1.30E+01		
Dimethylphenethylamine, alpha-, alpha-	122-09-8						
Dimethylphenol, 2,4-	105-67-9						
Dimethoxybenzidine, 3,3'-	119-90-4	0.014	0.014	HEAST			
Dimetilan	644-64-4						
Di-n-butyl phthalate	84-74-2						

(continued)

Table 15A-3. (continued)

Chemical Name	CASRN	EPA oral CSFs used in HWIR			Alternate benchmarks		
		Oral CSF - food & soil (mg/kg/d) ⁻¹	Oral CSF - water (mg/kg/d) ⁻¹	Oral CSF source	CalEPA Oral CSF (mg/kg/d) ⁻¹	TEF	TEF Source
Dinitrobenzene, 1,3-	99-65-0						
Dinitrobenzene, 1,4-	100-25-4						
Dinitro-o-cresol, 4,6-	534-52-1						
Dinitrophenol, 2,4-	51-28-5						
Dinitrotoluene, 2,4-	121-14-2	0.68	0.68	IRIS	3.10E-01		
Dinitrotoluene, 2,6-	606-20-2	0.68	0.68	IRIS			
Di-n-octyl phthalate	117-84-0						
Di-n-propylamine [Dipropylamine]	142-84-7						
Dioxane, 1,4-	123-91-1	0.011	0.011	IRIS	2.70E-02		
Diphenylamine	122-39-4						
Diphenylhydrazine, 1,2-	122-66-7	0.8	0.8	IRIS	8.70E-01		
Disulfiram [Tetraethylthiuram disulfide]	97-77-8						
Disulfoton	298-04-4						
Dithiobiuret	541-53-7						
Endosulfan	115-29-7						
Endosulfan I	959-98-8						
Endosulfan II	33213-65-9						
Endosulfan sulfate	1031-07-8						
Endothall	145-73-3						
Endrin	72-20-8						
Endrin aldehyde	7421-93-4						
Endrin ketone	53494-70-5						
Epichlorohydrin	106-89-8	0.0099	0.0099	IRIS	8.00E-02		
Epinephrine	51-43-4						
Ethoxyethanol, 2-	110-80-5						
Ethyl acetate	141-78-6						
Ethyl acrylate	140-88-5	0.048	0.048	HEAST			
Ethyl carbamate	51-79-6				1.00E+00		
Ethyl cyanide (propionitrile)	107-12-0						
Ethyl dipropylthiocarbamate, S- [EPTC]	759-94-4						

(continued)

Table 15A-3. (continued)

Chemical Name	CASRN	EPA oral CSFs used in HWIR			Alternate benchmarks		
		Oral CSF - food & soil (mg/kg/d) ⁻¹	Oral CSF - water (mg/kg/d) ⁻¹	Oral CSF source	CalEPA Oral CSF (mg/kg/d) ⁻¹	TEF	TEF Source
Ethyl ether	60-29-7						
Ethyl methacrylate	97-63-2						
Ethyl methanesulfonate	62-50-0	293	293	CAG			
Ethyl Ziram	14324-55-1						
Ethylbenzene	100-41-4						
Ethylene dibromide (1,2-dibromoethane)	106-93-4	85	85	IRIS	2.50E-01		
Ethylene oxide	75-21-8	1.02	1.02	HEAST	3.10E-01		
Ethylene thiourea	96-45-7	0.11	0.11	HEAST	4.50E-02		
Ethylenebisdithiocarbamic acid, salts and esters	111-54-6						
Ethyleneimine (aziridine)	151-56-4				6.50E+01		
Famphur	52-85-7						
Ferbam	14484-64-1						
Fluoracetamide, 2-	640-19-7						
Fluoroacetic acid, sodium salt (Sodium fluoroacetate)	62-74-8						
Fluoranthene	206-44-0					0.001	N&L92
Fluorene	86-73-7					0.001	N&L92
Fluoride	16984-48-8						
Formaldehyde	50-00-0				2.10E-02		
Formetanate hydrochloride	23422-53-9						
Formic Acid	64-18-6						
Formparanate	17702-57-7						
Furan	110-00-9						
Furancarbox-aldehyde, 2- (furfural)	98-01-1						
Glycidylaldehyde	765-34-4						
Heptachlor	76-44-8	4.5	4.5	IRIS	5.70E+00		
Heptachlor epoxide	1024-57-3	9.1	9.1	IRIS	1.30E+01		
Heptachlorodibenzofuran, 1,2,3,4,6,7,8-	67562-39-4	1500	1500	EPA	1.30E+03	0.01	EPA98
Heptachlorodibenzofuran, 1,2,3,4,7,8,9-	55673-89-7	1500	1500	EPA	1.30E+03	0.01	EPA98
Heptachlorodibenzo-p-dioxin, 1,2,3,4,6,7,8-	35822-46-9	1500	1500	EPA	1.30E+03	0.01	EPA98
Hexachloro-1,3-butadiene	87-68-3	0.078	0.078	IRIS			

(continued)

Table 15A-3. (continued)

Chemical Name	CASRN	EPA oral CSFs used in HWIR			Alternate benchmarks		
		Oral CSF - food & soil (mg/kg/d) ⁻¹	Oral CSF - water (mg/kg/d) ⁻¹	Oral CSF source	CalEPA Oral CSF (mg/kg/d) ⁻¹	TEF	TEF Source
Hexachlorobenzene	118-74-1	1.6	1.6	IRIS	1.80E+00		
Hexachlorocyclohexane, alpha- (alpha-HCH)	319-84-6	6.3	6.3	IRIS	2.70E+00		
Hexachlorocyclohexane, beta- (beta-HCH)	319-85-7	1.8	1.8	IRIS	1.50E+00		
Hexachlorocyclohexane, delta (delta-HCH)	319-86-8						
Hexachlorocyclohexane, gamma- (Lindane)	58-89-9	1.3	1.3	HEAST	1.10E+00		
Hexachlorocyclopentadiene	77-47-4						
Hexachlorodibenzofuran, 1,2,3,4,7,8-	70648-26-9	15000	15000	EPA	1.30E+04	0.1	EPA98
Hexachlorodibenzofuran, 1,2,3,6,7,8-	57117-44-9	15000	15000	EPA	1.30E+04	0.1	EPA98
Hexachlorodibenzofuran, 1,2,3,7,8,9-	72918-21-9	15000	15000	EPA	1.30E+04	0.1	EPA98
Hexachlorodibenzofuran, 2,3,4,6,7,8-	60851-34-5	15000	15000	EPA	1.30E+04	0.1	EPA98
Hexachlorodibenzo-p-dioxin, 1,2,3,4,7,8-	39227-28-6	15000	15000	EPA	1.30E+04	0.1	EPA98
Hexachlorodibenzo-p-dioxin, 1,2,3,6,7,8-	57653-85-7	15000	15000	EPA	1.30E+04	0.1	EPA98
Hexachlorodibenzo-p-dioxin, 1,2,3,7,8,9-	19408-74-3	6200	6200	IRIS	1.30E+04	0.1	EPA98
Hexachloroethane	67-72-1	0.014	0.014	IRIS	3.90E-02		
Hexachlorophene	70-30-4						
Hexachloropropene	1888-71-7						
Hexaethyl tetraphosphate	757-58-4						
Hexanone, 2-	591-78-6						
Hydrazine (and hydrazine sulfate); CAS and FR = hydrazine only	302-01-2	3	3	IRIS	3.00E+00		
Indeno(1,2,3-cd) pyrene	193-39-5	0.73	0.73	TEF calc	1.20E+00	0.1	EPA93
Iodo-2-propynyl N-butylcarbamate, 3-	55406-53-6						
Iodomethane	74-88-4						
Isobutyl alcohol	78-83-1						
Isodrin	465-73-6						
Isolan [Isopropyl methyl pyrazolyl dimethylcarbamate]	119-38-0						
Isophorone	78-59-1	0.00095	0.00095	IRIS			
Isosafrole	120-58-1						
Kepone	143-50-0				1.60E+01		
Lasiocarpine	303-34-4				7.80E+00		

(continued)

Table 15A-3. (continued)

Chemical Name	CASRN	EPA oral CSFs used in HWIR			Alternate benchmarks		
		Oral CSF - food & soil (mg/kg/d) ⁻¹	Oral CSF - water (mg/kg/d) ⁻¹	Oral CSF source	CalEPA Oral CSF (mg/kg/d) ⁻¹	TEF	TEF Source
Lead	7439-92-1				8.50E-03		
Maleic anhydride	108-31-6						
Maleic hydrazide	123-33-1						
Malononitrile	109-77-3						
Manganese dimethyldithiocarbamate	15339-36-3						
Melphalan	148-82-3				1.30E+02		
Mercury	7439-97-6						
Metam Sodium	137-42-8						
Methacrylonitrile	126-98-7						
Methanethiol [methyl mercaptan]	74-93-1						
Methanol	67-56-1						
Methapyrilene	91-80-5						
Methiocarb	2032-65-7						
Methomyl	16752-77-5						
Methoxychlor	72-43-5						
Methyl bromide (Bromomethane)	74-83-9						
Methyl chloride (Chloromethane)	74-87-3	0.013	0.013	HEAST			
Methyl ethyl ketone	78-93-3						
Methyl ethyl ketone peroxide	1338-23-4						
Methyl hydrazine	60-34-4						
Methyl isobutyl ketone	108-10-1						
Methyl mercury	22967-92-6						
Methyl methacrylate	80-62-6						
Methyl methanesulfonate	66-27-3				9.90E-02		
Methyl parathion	298-00-0						
Methylaziridine, 2-	75-55-8						
Methylcholanthrene, 3-	56-49-5	25.5	25.5	CAG	2.20E+01		
Methylene bromide	74-95-3						
Methylene chloride	75-09-2	0.0075	0.0075	IRIS	1.40E-02		
Methylenebis(2-chloroaniline), 4,4'-	101-14-4	0.13	0.13	HEAST	1.50E+00		

(continued)

Table 15A-3. (continued)

Chemical Name	CASRN	EPA oral CSFs used in HWIR			Alternate benchmarks		
		Oral CSF - food & soil (mg/kg/d) ⁻¹	Oral CSF - water (mg/kg/d) ⁻¹	Oral CSF source	CalEPA Oral CSF (mg/kg/d) ⁻¹	TEF	TEF Source
Methylnaphthalene, 2-	91-57-6						
Methyl-nitro-nitrosoguanidine (MNNG)	70-25-7						
Methylthiouracil	56-04-2				4.00E-01		
Metolcarb	1129-41-5						
Mexacarbate	315-18-4						
Mitomycin C	50-07-7				8.20E+03		
Molinate	2212-67-1						
Molybdenum	7439-98-7						
Naphthalene	91-20-3					0.001	N&L92
Naphthoquinone, 1,4-	130-15-4						
Naphthyl-2-thiourea, 1-	86-88-4						
Naphthylamine, 1-	134-32-7						
Naphthylamine, 2-	91-59-8				1.80E+00		
Nickel	7440-02-0				0.91 (nickel & cmpds)		
Nicotine and salts	54-11-5						
Nitroaniline, 2-	88-74-4						
Nitroaniline, 3-	99-09-2						
Nitroaniline, 4-	100-01-6						
Nitrobenzene	98-95-3						
Nitrogen mustard	55-86-7						
Nitrogen mustard hydrochloride salt	51-75-2						
Nitrogen mustard N- Oxide	126-85-2						
Nitrogen mustard N-Oxide HCl salt	302-70-5						
Nitroglycerine	55-63-0						
Nitro-o-toluidine, 5- (2-Methyl-5-nitroaniline)	99-55-8	0.033	0.033	HEAST			
Nitrophenol, 2-	88-75-5						
Nitrophenol, 4-	100-02-7						
Nitropropane, 2-	79-46-9						
Nitroquinoline-1-oxide, 4-	56-57-5						

(continued)

Table 15A-3. (continued)

Chemical Name	CASRN	EPA oral CSFs used in HWIR			Alternate benchmarks		
		Oral CSF - food & soil (mg/kg/d) ⁻¹	Oral CSF - water (mg/kg/d) ⁻¹	Oral CSF source	CalEPA Oral CSF (mg/kg/d) ⁻¹	TEF	TEF Source
N-Nitrosodiethanolamine	1116-54-7	2.8	2.8	IRIS	2.80E+00		
N-Nitrosodiethylamine	55-18-5	150	150	IRIS	3.60E+01		
N-Nitrosodimethylamine	62-75-9	51	51	IRIS	1.60E+01		
N-Nitrosodi-n-butylamine	924-16-3	5.4	5.4	IRIS	3.10E-03		
N-Nitroso-di-n-propylamine	621-64-7	7	7	IRIS	7.00E+00		
N-Nitrosodiphenylamine	86-30-6	0.0049	0.0049	IRIS	9.00E-03		
N-Nitrosomethyl vinyl amine	4549-40-0						
N-Nitrosomethylethylamine	10595-95-6	22	22	IRIS	3.70E+00		
N-Nitrosomorpholine	59-89-2				6.70E+00		
N-Nitroso-N-ethylurea	759-73-9	140	140	HEAST	2.70E+01		
N-Nitroso-N-methylurea	684-93-5				1.20E+02		
N-Nitroso-N-methylurethane	615-53-2				1.10E+02		
N-Nitrosonomicotine	16543-55-8				1.40E+00		
N-Nitrosopiperidine	100-75-4	37.5	37.5	CAG	9.40E+00		
N-Nitrosopyrrolidine	930-55-2	2.1	2.1	IRIS	2.10E+00		
N-Nitrososarcosine	13256-22-9						
N-Phenylthiourea	103-85-5						
Octachlorodibenzofuran, 1,2,3,4,6,7,8,9- [OCDF]	39001-02-0	150	150	EPA		0.001	EPA98
Octachlorodibenzo-p-dioxin, 1,2,3,4,6,7,8,9- [OCDD]	3268-87-9	150	150	EPA		0.001	EPA98
Octamethyl pyrophosphoramidate	152-16-9						
Osmium tetroxide	20816-12-0						
Oxamyl	23135-22-0						
Paraldehyde	123-63-7						
Parathion	56-38-2						
Pebulate	1114-71-2						
Pentachlorobenzene	608-93-5						
Pentachlorodibenzofuran, 1,2,3,7,8-	57117-41-6	7500	7500	EPA	6.50E+03	0.05	EPA98
Pentachlorodibenzofuran, 2,3,4,7,8-	57117-31-4	75000	75000	EPA	6.50E+04	0.5	EPA98
Pentachlorodibenzo-p-dioxin, 1,2,3,7,8-	40321-76-4	75000	75000	EPA	6.50E+04	0.5	EPA98
Pentachloroethane	76-01-7						

(continued)

Table 15A-3. (continued)

Chemical Name	CASRN	EPA oral CSFs used in HWIR			Alternate benchmarks		
		Oral CSF - food & soil (mg/kg/d) ⁻¹	Oral CSF - water (mg/kg/d) ⁻¹	Oral CSF source	CalEPA Oral CSF (mg/kg/d) ⁻¹	TEF	TEF Source
Pentachloronitrobenzene (PCNB)	82-68-8	0.26	0.26	HEAST			
Pentachlorophenol	87-86-5	0.12	0.12	IRIS	1.80E-02		
Pentadiene, 1,3-	504-60-9						
Phenacetin	62-44-2				2.20E-03		
Phenanthrene	85-01-8					0.001	N&L92
Phenol	108-95-2						
Phenyl mercuric acetate	62-38-4						
Phenylenediamine, m- (1,3-)	108-45-2						
Phenylenediamine, p-	106-50-3						
Phenylenediamines (N.O.S.)	25265-76-3	0.047	0.047	HEAST			
Phorate	298-02-2						
Phosphorodithioic acid, o-o-diethyl ester	298-06-6						
Phosphorodithioic acid, o-o-diethyl-s-methyl	3288-58-2						
Phosphorodithioic acid, trimethyl ester	2953-29-9						
Phthalic anhydride	85-44-9						
Physostigmine	57-47-6						
Physostigmine salicylate	57-64-7						
Picoline, 2-	109-06-8						
Polychlorinated biphenyls (Aroclors)	1336-36-3	2	0.4	IRIS	2.0E+0 (high) 7.0E-2 (low)		
Potassium dimethyldithiocarbamate	128-03-0						
Potassium N-hydroxymethyl N-methyldithiocarbamate	51026-28-9						
Potassium N-methyldithiocarbamate	137-41-7						
Promecarb	2631-37-0						
Pronamide	23950-58-5						
Propane sulfone, 1,3-	1120-71-4				2.40E+00		
Propargyl alcohol (propyn-1-ol, 2-)	107-19-7						
Propham	122-42-9						
Propoxur [Baygon][2-(1-Methylethoxy)-phenol, methylcarbamate]	114-26-1						
Propylamine, n-	107-10-8						

(continued)

Table 15A-3. (continued)

Chemical Name	CASRN	EPA oral CSFs used in HWIR			Alternate benchmarks		
		Oral CSF - food & soil (mg/kg/d) ⁻¹	Oral CSF - water (mg/kg/d) ⁻¹	Oral CSF source	CalEPA Oral CSF (mg/kg/d) ⁻¹	TEF	TEF Source
Propylthiouracil	51-52-5				1.00E+00		
Prosulfocarb	52888-80-9						
Pyrene	129-00-0					0.001	N&L92
Pyridine	110-86-1						
Reserpine	50-55-5				1.10E+01		
Resorcinol	108-46-3						
Saccharin and salts	81-07-2						
Safrole	94-59-7	0.18	0.18	CAG	2.20E-01		
Selenium	7782-49-2						
Selenium, tetrakis-(dimethyldithiocarbamate) [Selenium dimethyldithiocarbamate]	144-34-3						
Silver	7440-22-4						
Sodium dibutyldithiocarbamate	136-30-1						
Sodium diethyldithiocarbamate	148-18-5	0.27	0.27	HEAST			
Sodium dimethyldithiocarbamate	128-04-1						
Sodium fluoroacetate	62-74-8						
Streptozotocin	18883-66-4				1.10E+02		
Strychnine (and salts)	57-24-9						
Styrene	100-42-5						
Sulfallate	95-06-7				1.90E-01		
Sulfide	18496-25-8						
TCDD, 2,3,7,8-	1746-01-6	150000	150000	HEAST	1.30E+05	1	EPA98
Tetrabutylthiuram disulfide	1634-02-2						
Tetrabutylthiuram monosulfide [Bis-(dimethylthiocarbamoyl)sulfide]	97-74-5						
Tetrachlorobenzene, 1,2,4,5-	95-94-3						
Tetrachlorodibenzofuran, 2,3,7,8- [2,3,7,8-TCDF]	51207-31-9	15000	15000	EPA	1.30E+04	0.1	EPA98
Tetrachloroethane, 1,1,1,2-	630-20-6	0.026	0.026	IRIS			
Tetrachloroethane, 1,1,1,2,2-	79-34-5	0.2	0.2	IRIS	2.00E-01		
Tetrachloroethylene	127-18-4	0.052	0.052	SF	5.10E-02		
Tetrachlorophenol, 2,3,4,6-	58-90-2						

(continued)

Table 15A-3. (continued)

Chemical Name	CASRN	EPA oral CSFs used in HWIR			Alternate benchmarks		
		Oral CSF - food & soil (mg/kg/d) ⁻¹	Oral CSF - water (mg/kg/d) ⁻¹	Oral CSF source	CalEPA Oral CSF (mg/kg/d) ⁻¹	TEF	TEF Source
Tetraethyl pyrophosphate	107-49-3						
Tetraethyldithiopyro-phosphate	3689-24-5						
Tetrahydrofuran	109-99-9						
Thallium (I)	7440-28-0						
Thioacetamide	62-55-5				6.10E+01		
Thiodicarb	59669-26-0						
Thiofanox	39196-18-4						
Thiophanate-methyl	23564-05-8						
Thiophenol (Benzenethiol)	108-98-5						
Thiosemicarbazide	79-19-6						
Thiourea	62-56-6				7.20E-02		
Thiram	137-26-8						
Tin	7440-31-5						
Tirpate	26419-73-8						
Toluene	108-88-3						
Toluene diisocyanate, 2,4-	584-84-9				3.90E-02		
Toluene diisocyanate, mixed isomers [2,4- and 2,6-Toluene diisocyanate mixture]	26471-62-5				3.90E-02		
Toluenediamine, 2,4-	95-80-7	3.2	3.2	HEAST	4.00E+00		
Toluenediamine, 2,6-	823-40-5						
Toluenediamine, 3,4-	496-72-0						
Toluidine hydrochloride, o- (2-Methylaniline hydrochloride)	636-21-5	0.18	0.18	HEAST	1.30E-01		
Toluidine, o-	95-53-4	0.24	0.24	HEAST	1.80E-01		
Toluidine, p-	106-49-0	0.19	0.19	HEAST			
Toxaphene	8001-35-2	1.1	1.1	IRIS	1.20E+00		
Triallate	2303-17-5						
Trichloro-1,2,2-trifluoroethane, 1,1,2-	76-13-1						
Trichlorobenzene, 1,2,4-	120-82-1						
Trichloroethane, 1,1,1-	71-55-6						
Trichloroethane, 1,1,2-	79-00-5	0.057	0.057	IRIS	5.70E-02		

(continued)

Table 15A-3. (continued)

Chemical Name	CASRN	EPA oral CSFs used in HWIR			Alternate benchmarks		
		Oral CSF - food & soil (mg/kg/d) ⁻¹	Oral CSF - water (mg/kg/d) ⁻¹	Oral CSF source	CalEPA Oral CSF (mg/kg/d) ⁻¹	TEF	TEF Source
Trichloroethylene (1,1,2-)	79-01-6	0.011	0.011	SF	1.50E-02		
Trichlorofluoromethane	75-69-4						
Trichloromethanethiol	75-70-7						
Trichlorophenol, 2,4,5-	95-95-4						
Trichlorophenol, 2,4,6-	88-06-2	0.011	0.011	IRIS	7.00E-02		
Trichlorophenoxy) propionic acid, 2-(2,4,5- (Silvex)	93-72-1						
Trichlorophenoxyacetic acid, 2,4,5- (245-T)	93-76-5						
Trichloropropane, 1,2,3-	96-18-4	7.0	7.0	HEAST			
Triethylamine	121-44-8						
Triethylphosphorothioate, O,O,O-	126-68-1						
Trinitrobenzene, sym- (1,3,5-)	99-35-4						
Tris (2,3-dibromopropyl) phosphate	126-72-7				2.30E+00		
Tris(1-azridinyl) phosphine sulfide	52-24-4				1.20E+01		
Trypan blue	72-57-1						
Uracil mustard	66-75-1						
Vanadium	7440-62-2						
Vernolate [Vernam]	1929-77-7						
Vinyl acetate	108-05-4						
Vinyl chloride	75-01-4	1.90	1.90	HEAST	2.70E-01		
Warfarin	81-81-2						
Xylene, m-	108-38-3						
Xylene, o-	95-47-6						
Xylene, p-	106-42-3						
Xylenes (total)	1330-20-7						
Zinc	7440-66-6						
Ziram	137-30-4						

Table 15A-4. Available Inhalation Noncancer Benchmarks

Chemical Name	CASRN	EPA RfCs used in HWIR		Alternate benchmarks				Air Characteristic Study (1999)
		RfC air (mg/m ³)	RfC source	ATSDR acute inhal MRL (ppm)	ATSDR intermed inhal MRL (ppm)	ATSDR chronic inhal MRL (ppm)	CalEPA97 chronic inhal REL (mg/m ³)	
A2123 [Ethanimidothioic acid, 2-(dimethylamino)-N-hydroxy-2-oxo-,methyl ester]	30558-43-1							
Acenaphthene	83-32-9							
Acenaphthylene	208-96-8							
Acetaldehyde	75-07-0	0.009	IRIS				9.0E-03	
Acetone	67-64-1			26	13	13		
Acetonitrile	75-05-8	0.06	IRIS					
Acetophenone	98-86-2							
Acetyl chloride	75-36-5							
Acetyl-2-thiourea, 1-	591-08-2							
Acetylaminofluorene, 2-	53-96-3							
Acrolein	107-02-8	0.00002	IRIS	0.00005	0.000009		2.0E-05	
Acrylamide	79-06-1						7.0E-04	
Acrylic acid	79-10-7	0.001	IRIS				1.0E-03	
Acrylonitrile	107-13-1	0.002	IRIS	0.1			2.0E-03	
Aflatoxins	1402-68-2							
Aldicarb	116-06-3							
Aldicarb sulfone	1646-88-4							
Aldrin	309-00-2							
Allyl alcohol	107-18-6							
Allyl chloride	107-05-1	0.001	IRIS				1.0E-03	
Aminobiphenyl,4-	92-67-1							
Aminomethyl-3-isoxazolol,5-	2763-96-4							
Aminopyridine, 4-	504-24-5							
Amitrole	61-82-5							
Aniline	62-53-3	0.001	IRIS				1.0E-03	
Anthracene	120-12-7							
Antimony	7440-36-0	0.0002	IRIS					
Aramite	140-57-8							

(continued)

Table 15A-4. (continued)

Chemical Name	CASRN	EPA RfCs used in HWIR		Alternate benchmarks				
		RfC air (mg/m ³)	RfC source	ATSDR acute inhal MRL (ppm)	ATSDR intermed inhal MRL (ppm)	ATSDR chronic inhal MRL (ppm)	CalEPA97 chronic inhal REL (mg/m ³)	Air Characteristic Study (1999)
Arsenic	7440-38-2						3.0E-05	
Auramine	492-80-8							
Auramine O (Auramine hydrochloride)	2465-27-2							
Azaserine	115-02-6							
Barban	101-27-9							
Barium	7440-39-3	0.0005	HEAST		N/A			
Bendiocarb	22781-23-3							
Bendiocarb phenol	22961-82-6							
Benomyl	17804-35-2							
Benz(a)anthracene	56-55-3							
Benz(c)acridine	225-51-4							
Benzal chloride [Dichloromethyl benzene]	98-87-3							
Benzene	71-43-2			0.05	0.004		6.0E-02	
Benzidine	92-87-5						1.0E-02	
Benzo(a)pyrene	50-32-8							
Benzo(b)fluoranthene	205-99-2							
Benzo(g,h,i)perylene	191-24-2							
Benzo(j)fluoranthene	205-82-3							
Benzo(k)fluoranthene	207-08-9							
Benzoquinone, p-	106-51-4							
Benzotrichloride	98-07-7							
Benzyl alcohol	100-51-6							
Benzyl chloride	100-44-7							
Beryllium	7440-41-7	2.0E-05	IRIS				1.0E-06	
Bis (2-chloroisopropyl) ether	39638-32-9							
Bis (chloromethyl) ether	542-88-1				0.0003			
Bis(2-chlorethyl)ether	111-44-4				0.02			
Bis-(2-chloroisopropyl) ether [2,2'-Oxybis(1-chloropropane)]	108-60-1							

(continued)

Table 15A-4. (continued)

Chemical Name	CASRN	EPA RfCs used in HWIR		Alternate benchmarks				Air Characteristic Study (1999)
		RfC air (mg/m ³)	RfC source	ATSDR acute inhal MRL (ppm)	ATSDR intermed inhal MRL (ppm)	ATSDR chronic inhal MRL (ppm)	CalEPA97 chronic inhal REL (mg/m ³)	
Bis(2-ethylhexyl)phthalate	117-81-7						1.0E-02	
Bis-(pentamethylene)-thiuram tetrasulfide	120-54-7							
Bromoacetone	598-31-2							
Bromodichloromethane	75-27-4							
Bromoform	75-25-2							
Bromophenyl phenyl ether, 4-	101-55-3							
Brucine	357-57-3							
Butanol	71-36-3							
Butyl benzyl phthalate	85-68-7							
Butyl-4,6-dinitrophenol, 2-sec-	88-85-7							
Butylate	2008-41-5							
Cadmium	7440-43-9						1.0E-05	
Carbaryl	63-25-2							
Carbazole	86-74-8							
Carbendazim	10605-21-7							
Carbofuran	1563-66-2							
Carbofuran phenol	1563-38-8							
Carbon disulfide	75-15-0	0.7	IRIS			0.3	7.0E-01	
Carbon oxyfluoride	353-50-4							
Carbon tetrachloride	56-23-5			0.2	0.05		4.0E-02	
Carbosulfan	55285-14-8							
Chloral	75-87-6							
Chlorambucil	305-03-3							
Chlordane	57-74-9	7.0E-04	IRIS		0.0002 mg/m3	0.00002 mg/m3		
Chlornaphazin	494-03-1							
Chloro-1,3-butadiene, 2-	126-99-8	0.007	HEAST					
Chloroacetaldehyde	107-20-0							
Chloroaniline, p-	106-47-8							

(continued)

Table 15A-4. (continued)

Chemical Name	CASRN	EPA RfCs used in HWIR		Alternate benchmarks				Air Characteristic Study (1999)
		RfC air (mg/m ³)	RfC source	ATSDR acute inhal MRL (ppm)	ATSDR intermed inhal MRL (ppm)	ATSDR chronic inhal MRL (ppm)	CalEPA97 chronic inhal REL (mg/m ³)	
Chlorobenzene	108-90-7	0.02	HEAST				1.0E+00	
Chlorobenzilate	510-15-6							
Chlorodibromomethane	124-48-1							
Chloroethane	75-00-3	10	IRIS	15			1.0E+01	
Chloroethyl vinyl ether, 2-	110-75-8							
Chloroform	67-66-3			0.1	0.05	0.02	3.0E-01	
Chloro-m-cresol, p-	59-50-7							
Chloromethyl methyl ether	107-30-2							
Chloronaphthalene, 2-	91-58-7							
Chloro-o-toluidine hydrochloride, 4-	3165-93-3							
Chlorophenol, 2-	95-57-8							RfC=0.0014 mg/m3 (AC - RR)
Chlorophenyl phenyl ether, 4-	7005-72-3							
Chlorophenyl thiourea, 1-o	5344-82-1							
Chloropropionitrile, 3-	542-76-7							
Chromium (total)	7440-47-3	see VI	IRIS		see VI	see VI		
Chromium III (insoluble salts)	16065-83-1							
Chromium VI	18540-29-9	0.0001	IRIS		0.00002 mg/m3	0.00002 mg/m3		
Chrysene	218-01-9							
Citrus red No. 2	6358-53-8							
Cobalt	7440-48-4	1.0E-05	EPA 99bl		3E-5 mg/m3		5.0E-06	RfC=0.00001 mg/m3 (AC)
Copper	7440-50-8						2.0E-05	
Copper dimethyldithiocarbamate	137-29-1							
Cresol, m-	108-39-4							
Cresol, o-	95-48-7							
Cresol, p-	106-44-5							
Crotonaldehyde	4170-30-3							
Cumene	98-82-8	0.4	IRIS					

(continued)

Table 15A-4. (continued)

Chemical Name	CASRN	EPA RfCs used in HWIR		Alternate benchmarks				Air Characteristic Study (1999)
		RfC air (mg/m ³)	RfC source	ATSDR acute inhal MRL (ppm)	ATSDR intermed inhal MRL (ppm)	ATSDR chronic inhal MRL (ppm)	CalEPA97 chronic inhal REL (mg/m ³)	
Cumenyl methylcarbamate, m-	64-00-6							
Cyanide (amenable)	57-12-5							
Cycasin	14901-08-7							
Cycloate	1134-23-2							
Cyclohexane	110-82-7							
Cyclohexanone	108-94-1							
Cyclohexyl-4,6-dinitrophenol, 2-(2,4-Dinitro-6-cyclohexylphenol or Dinitro-o-cyclohexylphenol)	131-89-5							
Cyclophosphamide	50-18-0							
Daunomycin	20830-81-3							
Dazomet	533-74-4							
DDD	72-54-8							
DDD (o,p')	53-19-0							
DDE	72-55-9							
DDE (o,p')	3424-82-6							
DDT (o,p')	789-02-6							
DDT (p,p')	50-29-3							
Diallate	2303-16-4							
Dibenz(a,h)acridine	226-36-8							
Dibenz(a,h)anthracene	53-70-3							
Dibenz(a,j)acridine	224-42-0							
Dibenzo(a,e)pyrene	192-65-4							
Dibenzo(a,h)pyrene	189-64-0							
Dibenzo(a,i)pyrene	189-55-9							
Dibenzo(c,g)carbazole, 7H-	194-59-2							
Dibenzofuran	132-64-9							
Dibromo-3-chloropropane, 1,2-	96-12-8	0.0002	IRIS		0.0002			
Dichloro-2-butene, 1,4-	764-41-0							
Dichloro-2-butene, trans- 1,4-	110-57-6							

(continued)

Table 15A-4. (continued)

Chemical Name	CASRN	EPA RfCs used in HWIR		Alternate benchmarks				Air Characteristic Study (1999)
		RfC air (mg/m ³)	RfC source	ATSDR acute inhal MRL (ppm)	ATSDR intermed inhal MRL (ppm)	ATSDR chronic inhal MRL (ppm)	CalEPA97 chronic inhal REL (mg/m ³)	
Dichloro-2-propanol, 1,3-	96-23-1							
Dichlorobenzene, 1,2-	95-50-1	0.2	HEAST					
Dichlorobenzene, 1,3-	541-73-1							
Dichlorobenzene, 1,4-	106-46-7	0.8	IRIS	0.8	0.2	0.1	8.0E-01	
Dichlorobenzidine, 3,3'-	91-94-1							
Dichlorodifluoromethane	75-71-8	0.2	HEAST				1.0E+00	
Dichloroethane, 1,1-	75-34-3	0.5	HEAST					
Dichloroethane, 1,2-	107-06-2			0.2		0.2	4.0E-01	
Dichloroethylene, 1,1-	75-35-4				0.02		2.0E-02	
Dichloroethylene, cis-1,2-	156-59-2							
Dichloroethylene, trans-1,2-	156-60-5							
Dichloromethoxy ethane	111-91-1							
Dichlorophenol, 2,4-	120-83-2							
Dichlorophenol, 2,6-	87-65-0							
Dichlorophenoxyacetic acid, 2,4-(2,4-D)	94-75-7							
Dichloropropane, 1,2-	78-87-5	0.004	IRIS	0.05	0.007			
Dichloropropene, 1,3-	542-75-6	0.02	IRIS		0.003	0.002		
Dichloropropene, cis-1,3-	10061-01-5	0.02	IRIS					
Dichloropropene, trans-1,3-	10061-02-6	0.02	IRIS					
Dieldrin	60-57-1							
Diepoxybutane, 1,2,3,4- (2,2'-bioxirane)	1464-53-5							
Diethyl O-pyrazinyl phosphorothiate, O,O-	297-97-2							
Diethyl phthalate	84-66-2							
Diethylene glycol, dicarbamate	5952-26-1							
Diethylhydrazine, N,N-	1615-80-1							
Diethyl-p-nitrophenyl phosphate	311-45-5							
Diethylstilbestrol	56-53-1							
Dihydrosafrole	94-58-6							

(continued)

Table 15A-4. (continued)

Chemical Name	CASRN	EPA RfCs used in HWIR		Alternate benchmarks				Air Characteristic Study (1999)
		RfC air (mg/m ³)	RfC source	ATSDR acute inhal MRL (ppm)	ATSDR intermed inhal MRL (ppm)	ATSDR chronic inhal MRL (ppm)	CalEPA97 chronic inhal REL (mg/m ³)	
Dimethoate	60-51-5							
Dimethyl phthalate	131-11-3							
Dimethyl sulfate	77-78-1							
Dimethylamine	124-40-3							
Dimethylaminoazobenzene, p-	60-11-7							
Dimethylbenz(a)anthracene, 7,12-	57-97-6							
Dimethylbenzidine, 3,3'-	119-93-7							
Dimethylcarbamoyl chloride	79-44-7							
Dimethylphenethylamine, alpha-, alpha-	122-09-8							
Dimethylphenol, 2,4-	105-67-9							
Dimethoxybenzidine, 3,3'-	119-90-4							
Dimetilan	644-64-4							
Di-n-butyl phthalate	84-74-2							
Dinitrobenzene, 1,3-	99-65-0							
Dinitrobenzene, 1,4-	100-25-4							
Dinitro-o-cresol, 4,6-	534-52-1							
Dinitrophenol, 2,4-	51-28-5							
Dinitrotoluene, 2,4-	121-14-2						7.0E-03	
Dinitrotoluene, 2,6-	606-20-2							
Di-n-octyl phthalate	117-84-0							
Di-n-propylamine [Dipropylamine]	142-84-7							
Dioxane, 1,4-	123-91-1						3.0E+00	RfC=0.8 mg/m3 (AC)
Diphenylamine	122-39-4							
Diphenylhydrazine, 1,2-	122-66-7							
Disulfiram [Tetraethylthiuram disulfide]	97-77-8							
Disulfoton	298-04-4			0.006 mg/m3	0.0002 mg/m3			

(continued)

Table 15A-4. (continued)

Chemical Name	CASRN	EPA RfCs used in HWIR		Alternate benchmarks				Air Characteristic Study (1999)
		RfC air (mg/m ³)	RfC source	ATSDR acute inhal MRL (ppm)	ATSDR intermed inhal MRL (ppm)	ATSDR chronic inhal MRL (ppm)	CalEPA97 chronic inhal REL (mg/m ³)	
Dithiobiuret	541-53-7							
Endosulfan	115-29-7							
Endosulfan I	959-98-8							
Endosulfan II	33213-65-9							
Endosulfan sulfate	1031-07-8							
Endothall	145-73-3							
Endrin	72-20-8							
Endrin aldehyde	7421-93-4							
Endrin ketone	53494-70-5							
Epichlorohydrin	106-89-8	0.001	IRIS				1.0E-03	
Epinephrine	51-43-4							
Ethoxyethanol, 2-	110-80-5	0.2	IRIS				2.0E-01	
Ethyl acetate	141-78-6							
Ethyl acrylate	140-88-5							
Ethyl carbamate	51-79-6							
Ethyl cyanide (propionitrile)	107-12-0							
Ethyl dipropylthiocarbamate, S-[EPTC]	759-94-4							
Ethyl ether	60-29-7							
Ethyl methacrylate	97-63-2							
Ethyl methanesulfonate	62-50-0							
Ethyl Ziram	14324-55-1							
Ethylbenzene	100-41-4	1	IRIS		0.2		1.0E+00	
Ethylene dibromide (1,2-dibromoethane)	106-93-4	0.0002	HEAST					
Ethylene oxide	75-21-8				0.09		5.0E-03	
Ethylene thiourea	96-45-7						3.0E-03	
Ethylenebisdithiocarbamic acid, salts and esters	111-54-6							
Ethyleneimine (aziridine)	151-56-4							
Famphur	52-85-7							

(continued)

Table 15A-4. (continued)

Chemical Name	CASRN	EPA RfCs used in HWIR		Alternate benchmarks				Air Characteristic Study (1999)
		RfC air (mg/m ³)	RfC source	ATSDR acute inhal MRL (ppm)	ATSDR intermed inhal MRL (ppm)	ATSDR chronic inhal MRL (ppm)	CalEPA97 chronic inhal REL (mg/m ³)	
Ferbam	14484-64-1							
Fluoracetamide, 2-	640-19-7							
Fluoroacetic acid, sodium salt (Sodium fluoroacetate)	62-74-8							
Fluoranthene	206-44-0							
Fluorene	86-73-7							
Fluoride	16984-48-8							
Formaldehyde	50-00-0			0.05	0.01	0.003	2.0E-03	
Formetanate hydrochloride	23422-53-9							
Formic Acid	64-18-6							
Formparanate	17702-57-7							
Furan	110-00-9							
Furancarbox-aldehyde, 2- (furfural)	98-01-1	0.05	HEAST					
Glycidylaldehyde	765-34-4	0.001	HEAST					
Heptachlor	76-44-8							
Heptachlor epoxide	1024-57-3							
Heptachlorodibenzofuran, 1,2,3,4,6,7,8-	67562-39-4							
Heptachlorodibenzofuran, 1,2,3,4,7,8,9-	55673-89-7							
Heptachlorodibenzo-p-dioxin, 1,2,3,4,6,7,8-	35822-46-9							
Hexachloro-1,3-butadiene	87-68-3						9.0E-02	
Hexachlorobenzene	118-74-1						3.0E-03	
Hexachlorocyclohexane, alpha- (alpha-HCH)	319-84-6						2.0E-02	
Hexachlorocyclohexane, beta- (beta-HCH)	319-85-7						2.0E-03	
Hexachlorocyclohexane, delta (delta-HCH)	319-86-8							
Hexachlorocyclohexane, gamma- (Lindane)	58-89-9						3.0E-04	
Hexachlorocyclopentadiene	77-47-4	0.00007	HEAST		0.0001	0.00003	7.0E-04	

(continued)

Table 15A-4. (continued)

Chemical Name	CASRN	EPA RfCs used in HWIR		Alternate benchmarks				Air Characteristic Study (1999)
		RfC air (mg/m ³)	RfC source	ATSDR acute inhal MRL (ppm)	ATSDR intermed inhal MRL (ppm)	ATSDR chronic inhal MRL (ppm)	CalEPA97 chronic inhal REL (mg/m ³)	
Hexachlorodibenzofuran, 1,2,3,4,7,8-	70648-26-9							
Hexachlorodibenzofuran, 1,2,3,6,7,8-	57117-44-9							
Hexachlorodibenzofuran, 1,2,3,7,8,9-	72918-21-9							
Hexachlorodibenzofuran, 2,3,4,6,7,8-	60851-34-5							
Hexachlorodibenzo-p-dioxin, 1,2,3,4,7,8-	39227-28-6							
Hexachlorodibenzo-p-dioxin, 1,2,3,6,7,8-	57653-85-7							
Hexachlorodibenzo-p-dioxin, 1,2,3,7,8,9-	19408-74-3							
Hexachloroethane	67-72-1			6	6		8.0E-02	
Hexachlorophene	70-30-4							
Hexachloropropene	1888-71-7							
Hexaethyl tetraphosphate	757-58-4							
Hexanone, 2-	591-78-6							
Hydrazine (and hydrazine sulfate); CAS and FR = hydrazine only	302-01-2				0.004		2.0E-04	
Indeno(1,2,3-cd) pyrene	193-39-5							
Iodo-2-propynyl N-butylcarbamate, 3-	55406-53-6							
Iodomethane	74-88-4							
Isobutyl alcohol	78-83-1							
Isodrin	465-73-6							
Isolan [Isopropyl methyl pyrazolyl dimethylcarbamate]	119-38-0							
Isophorone	78-59-1						2.0E+00	provisional RfC=0.012 mg/m ³ (63FR64371)
Isosafrole	120-58-1							

(continued)

Table 15A-4. (continued)

Chemical Name	CASRN	EPA RfCs used in HWIR		Alternate benchmarks				Air Characteristic Study (1999)
		RfC air (mg/m ³)	RfC source	ATSDR acute inhal MRL (ppm)	ATSDR intermed inhal MRL (ppm)	ATSDR chronic inhal MRL (ppm)	CalEPA97 chronic inhal REL (mg/m ³)	
Kepone	143-50-0							
Lasiocarpine	303-34-4							
Lead	7439-92-1							
Maleic anhydride	108-31-6						2.0E-04	
Maleic hydrazide	123-33-1							
Malononitrile	109-77-3							
Manganese dimethyldithiocarbamate	15339-36-3							
Melphalan	148-82-3							
Mercury	7439-97-6	0.0003	IRIS			0.0002 mg/m ³	3.0E-04	
Metam Sodium	137-42-8							
Methacrylonitrile	126-98-7	0.0007	HEAST					
Methanethiol [methyl mercaptan]	74-93-1							
Methanol	67-56-1						1.0E+01	RfC=13 mg/m ³ (AC)
Methapyrilene	91-80-5							
Methiocarb	2032-65-7							
Methomyl	16752-77-5							
Methoxychlor	72-43-5							
Methyl bromide (Bromomethane)	74-83-9	0.005	IRIS	0.05	0.05	0.005	5.0E-03	
Methyl chloride (Chloromethane)	74-87-3	0.3	SF	0.5	0.2	0.05		
Methyl ethyl ketone	78-93-3	1	IRIS				1.0E+00	
Methyl ethyl ketone peroxide	1338-23-4							
Methyl hydrazine	60-34-4							
Methyl isobutyl ketone	108-10-1	0.08	HEAST					
Methyl mercury	22967-92-6							
Methyl methacrylate	80-62-6	7.0E-01	IRIS				1.0E-01	
Methyl methanesulfonate	66-27-3							
Methyl parathion	298-00-0							
Methylaziridine, 2-	75-55-8							

(continued)

Table 15A-4. (continued)

Chemical Name	CASRN	EPA RfCs used in HWIR		Alternate benchmarks				Air Characteristic Study (1999)
		RfC air (mg/m ³)	RfC source	ATSDR acute inhal MRL (ppm)	ATSDR intermed inhal MRL (ppm)	ATSDR chronic inhal MRL (ppm)	CalEPA97 chronic inhal REL (mg/m ³)	
Methylcholanthrene, 3-	56-49-5							
Methylene bromide	74-95-3							
Methylene chloride	75-09-2	3	HEAST	0.4	0.03		3.0E-01	
Methylenebis(2-chloroaniline), 4,4'-	101-14-4							
Methylnaphthalene, 2-	91-57-6							
Methyl-nitro-nitrosoguanidine (MNNG)	70-25-7							
Methylthiouracil	56-04-2							
Metolcarb	1129-41-5							
Mexacarbate	315-18-4							
Mitomycin C	50-07-7							
Molinate	2212-67-1							
Molybdenum	7439-98-7							
Naphthalene	91-20-3	0.003	IRIS			0.002	9.0E-03	
Naphthoquinone, 1,4-	130-15-4							
Naphthyl-2-thiourea, 1-	86-88-4							
Naphthylamine, 1-	134-32-7							
Naphthylamine, 2-	91-59-8							
Nickel	7440-02-0					0.0002 mg/m ³	5.0E-05	
Nicotine and salts	54-11-5							
Nitroaniline, 2-	88-74-4	0.0002	HEAST					
Nitroaniline, 3-	99-09-2							
Nitroaniline, 4-	100-01-6							
Nitrobenzene	98-95-3	0.002	HEAST				3.0E-02	
Nitrogen mustard	55-86-7							
Nitrogen mustard hydrochloride salt	51-75-2							
Nitrogen mustard N- Oxide	126-85-2							

(continued)

Table 15A-4. (continued)

Chemical Name	CASRN	EPA RfCs used in HWIR		Alternate benchmarks				Air Characteristic Study (1999)
		RfC air (mg/m ³)	RfC source	ATSDR acute inhal MRL (ppm)	ATSDR intermed inhal MRL (ppm)	ATSDR chronic inhal MRL (ppm)	CalEPA97 chronic inhal REL (mg/m ³)	
Nitrogen mustard N-Oxide HCl salt	302-70-5							
Nitroglycerine	55-63-0							
Nitro-o-toluidine, 5- (2-Methyl-5-nitroaniline)	99-55-8							
Nitrophenol, 2-	88-75-5							
Nitrophenol, 4-	100-02-7			0.03 mg/m ³				
Nitropropane, 2-	79-46-9	0.02	IRIS				2.0E-02	
Nitroquinoline-1-oxide, 4-	56-57-5							
N-Nitrosodiethanolamine	1116-54-7							
N-Nitrosodiethylamine	55-18-5							
N-Nitrosodimethylamine	62-75-9							
N-Nitrosodi-n-butylamine	924-16-3							
N-Nitroso-di-n-propylamine	621-64-7							
N-Nitrosodiphenylamine	86-30-6							
N-Nitrosomethyl vinyl amine	4549-40-0							
N-Nitrosomethylethylamine	10595-95-6							
N-Nitrosomorpholine	59-89-2							
N-Nitroso-N-ethylurea	759-73-9							
N-Nitroso-N-methylurea	684-93-5							
N-Nitroso-N-methylurethane	615-53-2							
N-Nitrosonomicotine	16543-55-8							
N-Nitrosopiperidine	100-75-4							
N-Nitrosopyrrolidine	930-55-2							
N-Nitrososarcosine	13256-22-9							
N-Phenylthiourea	103-85-5							
Octachlorodibenzofuran, 1,2,3,4,6,7,8,9- [OCDF]	39001-02-0							
Octachlorodibenzo-p-dioxin, 1,2,3,4,6,7,8,9- [OCDD]	3268-87-9							

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Table 15A-4. (continued)

Chemical Name	CASRN	EPA RfCs used in HWIR		Alternate benchmarks				Air Characteristic Study (1999)
		RfC air (mg/m ³)	RfC source	ATSDR acute inhal MRL (ppm)	ATSDR intermed inhal MRL (ppm)	ATSDR chronic inhal MRL (ppm)	CalEPA97 chronic inhal REL (mg/m ³)	
Octamethyl pyrophosphoramidate	152-16-9							
Osmium tetroxide	20816-12-0							
Oxamyl	23135-22-0							
Paraldehyde	123-63-7							
Parathion	56-38-2							
Pebulate	1114-71-2							
Pentachlorobenzene	608-93-5							
Pentachlorodibenzofuran, 1,2,3,7,8-	57117-41-6							
Pentachlorodibenzofuran, 2,3,4,7,8-	57117-31-4							
Pentachlorodibenzo-p-dioxin, 1,2,3,7,8-	40321-76-4							
Pentachloroethane	76-01-7							
Pentachloronitrobenzene (PCNB)	82-68-8							
Pentachlorophenol	87-86-5						1.0E-01	
Pentadiene, 1,3-	504-60-9							
Phenacetin	62-44-2							
Phenanthrene	85-01-8							
Phenol	108-95-2						6.0E-01	provisional RfC=0.006 mg/m ³ (63FR64371)
Phenyl mercuric acetate	62-38-4							
Phenylenediamine, m- (1,3-)	108-45-2							
Phenylenediamine, p-	106-50-3							
Phenylenediamines (N.O.S.)	25265-76-3							
Phorate	298-02-2							
Phosphorodithioic acid, o-o-diethyl ester	298-06-6							
Phosphorodithioic acid, o-o-diethyl-s-methyl	3288-58-2							

(continued)

Table 15A-4. (continued)

Chemical Name	CASRN	EPA RfCs used in HWIR		Alternate benchmarks				
		RfC air (mg/m ³)	RfC source	ATSDR acute inhal MRL (ppm)	ATSDR intermed inhal MRL (ppm)	ATSDR chronic inhal MRL (ppm)	CalEPA97 chronic inhal REL (mg/m ³)	Air Characteristic Study (1999)
Phosphorodithioic acid, trimethyl ester	2953-29-9							
Phthalic anhydride	85-44-9	0.12	HEAST				1.0E-02	
Physostigmine	57-47-6							
Physostigmine salicylate	57-64-7							
Picoline, 2-	109-06-8							
Polychlorinated biphenyls (Aroclors)	1336-36-3							
Potassium dimethyldithiocarbamate	128-03-0							
Potassium N-hydroxymethyl N-methyldithiocarbamate	51026-28-9							
Potassium N-methyldithiocarbamate	137-41-7							
Promecarb	2631-37-0							
Pronamide	23950-58-5							
Propane sulfone, 1,3-	1120-71-4							
Propargyl alcohol (propyn-1-ol, 2-)	107-19-7							
Propham	122-42-9							
Propoxur [Baygon][2-(1-Methylethoxy)-phenol, methylcarbamate]	114-26-1							
Propylamine, n-	107-10-8							
Propylthiouracil	51-52-5							
Prosulfocarb	52888-80-9							
Pyrene	129-00-0							
Pyridine	110-86-1							inhal ADI=0.002 mkd, converts to 0.007 mg/m ³ (HEEP)
Reserpine	50-55-5							
Resorcinol	108-46-3							
Saccharin and salts	81-07-2							

(continued)

Table 15A-4. (continued)

Chemical Name	CASRN	EPA RfCs used in HWIR		Alternate benchmarks				Air Characteristic Study (1999)
		RfC air (mg/m ³)	RfC source	ATSDR acute inhal MRL (ppm)	ATSDR intermed inhal MRL (ppm)	ATSDR chronic inhal MRL (ppm)	CalEPA97 chronic inhal REL (mg/m ³)	
Safrole	94-59-7							
Selenium	7782-49-2						8.0E-05	
Selenium, tetrakis-(dimethyldithiocarbamate) [Selenium dimethyldithiocarbamate]	144-34-3							
Silver	7440-22-4	2.9E-02	RTI				2.0E-02	
Sodium dibutyldithiocarbamate	136-30-1							
Sodium diethyldithiocarbamate	148-18-5							
Sodium dimethyldithiocarbamate	128-04-1							
Sodium fluoroacetate	62-74-8							
Streptozotocin	18883-66-4							
Strychnine (and salts)	57-24-9							
Styrene	100-42-5	1	IRIS			0.06	1.0E+00	
Sulfallate	95-06-7							
Sulfide	18496-25-8	0.001	IRIS					
TCDD, 2,3,7,8-	1746-01-6							
Tetrabutylthiuram disulfide	1634-02-2							
Tetrabutylthiuram monosulfide [Bis-(dimethylthiocarbamoyl)sulfide]	97-74-5							
Tetrachlorobenzene, 1,2,4,5-	95-94-3							
Tetrachlorodibenzofuran, 2,3,7,8- [2,3,7,8-TCDF]	51207-31-9							
Tetrachloroethane, 1,1,1,2-	630-20-6							
Tetrachloroethane, 1,1,1,2,2-	79-34-5				0.4			
Tetrachloroethylene	127-18-4			0.2		0.04	4.0E-02	
Tetrachlorophenol, 2,3,4,6-	58-90-2						9.0E-02	
Tetraethyl pyrophosphate	107-49-3							
Tetraethyldithiopyro-phosphate	3689-24-5							
Tetrahydrofuran	109-99-9							
Thallium (I)	7440-28-0							

(continued)

Table 15A-4. (continued)

Chemical Name	CASRN	EPA RfCs used in HWIR		Alternate benchmarks				Air Characteristic Study (1999)
		RfC air (mg/m ³)	RfC source	ATSDR acute inhal MRL (ppm)	ATSDR intermed inhal MRL (ppm)	ATSDR chronic inhal MRL (ppm)	CalEPA97 chronic inhal REL (mg/m ³)	
Thioacetamide	62-55-5							
Thiodicarb	59669-26-0							
Thiofanox	39196-18-4							
Thiophanate-methyl	23564-05-8							
Thiophenol (Benzenethiol)	108-98-5							
Thiosemicarbizide	79-19-6							
Thiourea	62-56-6							
Thiram	137-26-8							
Tin	7440-31-5							
Tirpate	26419-73-8							
Toluene	108-88-3	0.4	IRIS	3		1	4.0E-01	
Toluene diisocyanate, 2,4-	584-84-9	7.0E-05	IRIS					
Toluene diisocyanate, mixed isomers [2,4- and 2,6-Toluene diisocyanate mixture]	26471-62-5	7.0E-05	IRIS				7.0E-05	
Toluenediamine, 2,4-	95-80-7							
Toluenediamine, 2,6-	823-40-5							
Toluenediamine, 3,4-	496-72-0							
Toluidine hydrochloride, o- (2-Methylaniline hydrochloride)	636-21-5							
Toluidine, o-	95-53-4							
Toluidine, p-	106-49-0							
Toxaphene	8001-35-2							
Triallate	2303-17-5							
Trichloro-1,2,2-trifluoroethane, 1,1,2-	76-13-1	30	HEAST				9.0E+01	
Trichlorobenzene, 1,2,4-	120-82-1	0.2	HEAST					
Trichloroethane, 1,1,1-	71-55-6	1	SF	2	0.7		1.0E+00	
Trichloroethane, 1,1,2-	79-00-5						4.0E-01	
Trichloroethylene (1,1,2-)	79-01-6			2	0.1		6.0E-01	
Trichlorofluoromethane	75-69-4	0.7	HEAST				2.0E+01	

(continued)

Table 15A-4. (continued)

Chemical Name	CASRN	EPA RfCs used in HWIR		Alternate benchmarks				Air Characteristic Study (1999)
		RfC air (mg/m ³)	RfC source	ATSDR acute inhal MRL (ppm)	ATSDR intermed inhal MRL (ppm)	ATSDR chronic inhal MRL (ppm)	CalEPA97 chronic inhal REL (mg/m ³)	
Trichloromethanethiol	75-70-7							
Trichlorophenol, 2,4,5-	95-95-4							
Trichlorophenol, 2,4,6-	88-06-2							
Trichlorophenoxy) propionic acid, 2-(2,4,5- (Silvex)	93-72-1							
Trichlorophenoxyacetic acid, 2,4,5- (245-T)	93-76-5							
Trichloropropane, 1,2,3-	96-18-4			0.0003				
Triethylamine	121-44-8	7.0E-03	IRIS				7.0E-03	
Triethylphosphorothioate, O,O,O-	126-68-1							
Trinitrobenzene, sym- (1,3,5-)	99-35-4							
Tris (2,3-dibromopropyl) phosphate	126-72-7							
Tris(1-azridinyl) phosphine sulfide	52-24-4							
Trypan blue	72-57-1							
Uracil mustard	66-75-1							
Vanadium	7440-62-2			0.0002 mg/m ³				RfC=0.00007 mg/m ³ (AC)
Vernolate [Vernam]	1929-77-7							
Vinyl acetate	108-05-4	0.2	IRIS		0.01		2.0E-01	
Vinyl chloride	75-01-4			0.5	0.03		5.0E-03	
Warfarin	81-81-2							
Xylene, m-	108-38-3							
Xylene, o-	95-47-6							
Xylene, p-	106-42-3							
Xylenes (total)	1330-20-7			1	0.7	0.1	2.0E-01	
Zinc	7440-66-6						9.0E-04	
Ziram	137-30-4							

Table 15A-5. Available Inhalation Cancer Benchmarks

Chemical Name	CASRN	EPA inh CSFs used in HWIR		EPA or best alternate URF		Alternate benchmarks	
		Inhal CSF - air (mg/kg/d) ⁻¹	Inhal CSF source	Inhal URF (ug/m ³) ⁻¹	Inhal URF source	CalEPA Inhal CSF (mg/kg/d) ⁻¹	CalEPA Inhal URF (ug/m ³) ⁻¹
A2123 [Ethanimidothioic acid, 2-(dimethylamino) - N-hydroxy-2-oxo-,methyl ester]	30558-43-1						
Acenaphthene	83-32-9						
Acenaphthylene	208-96-8						
Acetaldehyde	75-07-0	0.0077	calc	0.0000022	IRIS		2.70E-06
Acetone	67-64-1						
Acetonitrile	75-05-8						
Acetophenone	98-86-2						
Acetyl chloride	75-36-5						
Acetyl-2-thiourea, 1-	591-08-2						
Acetylaminofluorene, 2-	53-96-3			see CalEPA		3.80E+00	1.30E-03
Acrolein	107-02-8						
Acrylamide	79-06-1	4.5	HEAST	0.0013	IRIS	4.50E+00	1.30E-03
Acrylic acid	79-10-7						
Acrylonitrile	107-13-1	0.24	HEAST	0.000068	IRIS	1.00E+00	2.90E-04
Aflatoxins	1402-68-2						
Aldicarb	116-06-3						
Aldicarb sulfone	1646-88-4						
Aldrin	309-00-2	17	HEAST	0.0049	IRIS	1.70E+01	4.90E-03
Allyl alcohol	107-18-6						
Allyl chloride	107-05-1			see CalEPA		2.10E-02	6.00E-06
Aminobiphenyl,4-	92-67-1			see CalEPA		2.10E+01	6.00E-03
Aminomethyl-3-isoxazolol,5-	2763-96-4						
Aminopyridine, 4-	504-24-5						
Amitrole	61-82-5			see CalEPA		9.40E-01	2.70E-04
Aniline	62-53-3			see CalEPA			1.60E-06
Anthracene	120-12-7						
Antimony	7440-36-0						

(continued)

Table 15A-5. (continued)

Chemical Name	CASRN	EPA inh CSFs used in HWIR		EPA or best alternate URF		Alternate benchmarks	
		Inhal CSF - air (mg/kg/d) ⁻¹	Inhal CSF source	Inhal URF (ug/m ³) ⁻¹	Inhal URF source	CalEPA Inhal CSF (mg/kg/d) ⁻¹	CalEPA Inhal URF (ug/m ³) ⁻¹
Aramite	140-57-8	0.025	HEAST	0.0000071	IRIS	3.00E-02	8.60E-06
Arsenic	7440-38-2	15	calc	0.0043	IRIS	1.20E+00	3.30E-03
Auramine	492-80-8			see CalEPA		8.80E-01	2.50E-04
Auramine O (Auramine hydrochloride)	2465-27-2						
Azaserine	115-02-6			see CalEPA		1.10E+01	3.10E-03
Barban	101-27-9						
Barium	7440-39-3						
Bendiocarb	22781-23-3						
Bendiocarb phenol	22961-82-6						
Benomyl	17804-35-2						
Benz(a)anthracene	56-55-3			see CalEPA or TEF		3.90E-01	1.10E-04
Benz(c)acridine	225-51-4						
Benzal chloride [Dichloromethyl benzene]	98-87-3						
Benzene	71-43-2	0.029	HEAST	0.0000083	IRIS	1.00E-01	2.90E-05
Benzidine	92-87-5	230	IRIS	0.067	SF	5.00E+02	1.40E-01
Benzo(a)pyrene	50-32-8			see CalEPA		3.90E+00	1.10E-03
Benzo(b)fluoranthene	205-99-2			see CalEPA or TEF		3.90E-01	1.10E-04
Benzo(g,h,i)perylene	191-24-2						
Benzo(j)fluoranthene	205-82-3						
Benzo(k)fluoranthene	207-08-9			see CalEPA			1.1E-04
Benzoquinone, p-	106-51-4						
Benzotrichloride	98-07-7						
Benzyl alcohol	100-51-6						
Benzyl chloride	100-44-7			see CalEPA		1.70E-01	4.90E-05
Beryllium	7440-41-7	8.4	HEAST	0.0024	IRIS	8.40E+00	2.40E-03

(continued)

Table 15A-5. (continued)

Chemical Name	CASRN	EPA inh CSFs used in HWIR		EPA or best alternate URF		Alternate benchmarks	
		Inhal CSF - air (mg/kg/d) ⁻¹	Inhal CSF source	Inhal URF (ug/m ³) ⁻¹	Inhal URF source	CalEPA Inhal CSF (mg/kg/d) ⁻¹	CalEPA Inhal URF (ug/m ³) ⁻¹
Bis (2-chloroisopropyl) ether	39638-32-9	0.035	HEAST	1.0E-5	HEAST		
Bis (chloromethyl) ether	542-88-1	220	HEAST	0.062	IRIS	4.60E+01	1.30E-02
Bis(2-chlorethyl)ether	111-44-4	1.1	HEAST	0.00033	IRIS	2.50E+00	7.10E-04
Bis-(2-chloroisopropyl) ether [2,2'-Oxybis(1-chloropropane)]	108-60-1	0.035	HEAST				
Bis(2-ethylhexyl)phthalate	117-81-7			see CalEPA			2.40E-06
Bis-(pentamethylene)-thiuram tetrasulfide	120-54-7						
Bromoacetone	598-31-2						
Bromodichloromethane	75-27-4			see CalEPA or AC		1.30E-01	3.70E-05
Bromoform	75-25-2	0.0039	HEAST	0.0000011	IRIS		
Bromophenyl phenyl ether, 4-	101-55-3						
Brucine	357-57-3						
Butanol	71-36-3						
Butyl benzyl phthalate	85-68-7						
Butyl-4,6-dinitrophenol, 2-sec-	88-85-7						
Butylate	2008-41-5						
Cadmium	7440-43-9	6.3	calc	0.0018	IRIS	1.50E+01	4.20E-03
Carbaryl	63-25-2						
Carbazole	86-74-8						
Carbendazim	10605-21-7						
Carbofuran	1563-66-2						
Carbofuran phenol	1563-38-8						
Carbon disulfide	75-15-0						
Carbon oxyfluoride	353-50-4						
Carbon tetrachloride	56-23-5	0.053	HEAST	0.000015	IRIS	1.50E-01	4.20E-05
Carbosulfan	55285-14-8						
Chloral	75-87-6						
Chlorambucil	305-03-3			see CalEPA		4.40E+02	1.30E-01

(continued)

Table 15A-5. (continued)

Chemical Name	CASRN	EPA inh CSFs used in HWIR		EPA or best alternate URF		Alternate benchmarks	
		Inhal CSF - air (mg/kg/d) ⁻¹	Inhal CSF source	Inhal URF (ug/m ³) ⁻¹	Inhal URF source	CalEPA Inhal CSF (mg/kg/d) ⁻¹	CalEPA Inhal URF (ug/m ³) ⁻¹
Chlordane	57-74-9	1.3	HEAST	1.0E-4	IRIS	1.20E+00	3.40E-04
Chlornaphazin	494-03-1						
Chloro-1,3-butadiene, 2-	126-99-8						
Chloroacetaldehyde	107-20-0						
Chloroaniline, p-	106-47-8						
Chlorobenzene	108-90-7						
Chlorobenzilate	510-15-6	0.27	HEAST	0.000078	HEAST	1.10E-01	3.10E-05
Chlorodibromomethane	124-48-1			see CalEPA or AC		9.40E-02	2.70E-05
Chloroethane	75-00-3						
Chloroethyl vinyl ether, 2-	110-75-8						
Chloroform	67-66-3	0.081	HEAST	0.000023	IRIS		5.30E-06
Chloro-m-cresol, p-	59-50-7						
Chloromethyl methyl ether	107-30-2			see CalEPA		2.40E+00	6.90E-04
Chloronaphthalene, 2-	91-58-7						
Chloro-o-toluidine hydrochloride, 4-	3165-93-3						
Chlorophenol, 2-	95-57-8						
Chlorophenyl phenyl ether, 4-	7005-72-3						
Chlorophenyl thiourea, 1-o	5344-82-1						
Chloropropionitrile, 3-	542-76-7						
Chromium (total)	7440-47-3	41	HEAST	see VI		see VI	see VI
Chromium III (insoluble salts)	16065-83-1						
Chromium VI	18540-29-9	41	HEAST	0.012	IRIS	5.10E+02	1.50E-01
Chrysene	218-01-9			see CalEPA		3.90E-02	1.10E-05
Citrus red No. 2	6358-53-8						
Cobalt	7440-48-4						
Copper	7440-50-8						
Copper dimethyldithiocarbamate	137-29-1						
Cresol, m-	108-39-4						

(continued)

Table 15A-5. (continued)

Chemical Name	CASRN	EPA inh CSFs used in HWIR		EPA or best alternate URF		Alternate benchmarks	
		Inhal CSF - air (mg/kg/d) ⁻¹	Inhal CSF source	Inhal URF (ug/m ³) ⁻¹	Inhal URF source	CalEPA Inhal CSF (mg/kg/d) ⁻¹	CalEPA Inhal URF (ug/m ³) ⁻¹
Cresol, o-	95-48-7						
Cresol, p-	106-44-5						
Crotonaldehyde	4170-30-3						
Cumene	98-82-8						
Cumenyl methylcarbamate, m-	64-00-6						
Cyanide (amenable)	57-12-5						
Cycasin	14901-08-7						
Cycloate	1134-23-2						
Cyclohexane	110-82-7						
Cyclohexanone	108-94-1						
Cyclohexyl-4,6-dinitrophenol, 2- (2,4-Dinitro-6-cyclohexylphenol or Dinitro-o-cyclohexylphenol)	131-89-5						
Cyclophosphamide	50-18-0			see CalEPA		6.10E-01	1.70E-04
Daunomycin	20830-81-3						
Dazomet	533-74-4						
DDD	72-54-8			see CalEPA		2.40E-01	6.90E-05
DDD (o,p')	53-19-0						
DDE	72-55-9			see CalEPA		3.40E-01	9.70E-05
DDE (o,p')	3424-82-6						
DDT (o,p')	789-02-6						
DDT (p,p')	50-29-3	0.34	HEAST	0.000097	IRIS	3.40E-01	9.70E-05
Diallate	2303-16-4						
Dibenz(a,h)acridine	226-36-8			see TEF			TEF=0.1
Dibenz(a,h)anthracene	53-70-3			see CalEPA		4.10E+00	1.20E-03
Dibenz(a,j)acridine	224-42-0			see TEF			TEF=0.1
Dibenzo(a,e)pyrene	192-65-4			see TEF			TEF=1.0
Dibenzo(a,h)pyrene	189-64-0			see TEF			TEF=10.0
Dibenzo(a,i)pyrene	189-55-9			see TEF			TEF=10.0

(continued)

Table 15A-5. (continued)

Chemical Name	CASRN	EPA inh CSFs used in HWIR		EPA or best alternate URF		Alternate benchmarks	
		Inhal CSF - air (mg/kg/d) ⁻¹	Inhal CSF source	Inhal URF (ug/m ³) ⁻¹	Inhal URF source	CalEPA Inhal CSF (mg/kg/d) ⁻¹	CalEPA Inhal URF (ug/m ³) ⁻¹
Dibenzo(c,g)carbazole, 7H-	194-59-2			see CalEPA		3.90E+00	1.10E-03
Dibenzofuran	132-64-9						
Dibromo-3-chloropropane, 1,2-	96-12-8	0.0024	HEAST	0.00000069	HEAST	7.00E+00	2.00E-03
Dichloro-2-butene, 1,4-	764-41-0	9.3	HEAST	0.0026	HEAST		
Dichloro-2-butene, trans- 1,4-	110-57-6	9.3	HEAST	2.6E-03	HEAST		
Dichloro-2-propanol, 1,3-	96-23-1						
Dichlorobenzene, 1,2-	95-50-1						
Dichlorobenzene, 1,3-	541-73-1						
Dichlorobenzene, 1,4-	106-46-7			see CalEPA			1.10E-05
Dichlorobenzidine, 3,3'-	91-94-1			see CalEPA		1.20E+00	3.40E-04
Dichlorodifluoromethane	75-71-8						
Dichloroethane, 1,1-	75-34-3			see CalEPA		0.0057	1.60E-06
Dichloroethane, 1,2-	107-06-2	0.091	calc	0.000026	IRIS	7.00E-02	2.20E-05
Dichloroethylene, 1,1-	75-35-4	0.2	HEAST	0.00005	IRIS		
Dichloroethylene, cis-1,2-	156-59-2						
Dichloroethylene, trans-1,2-	156-60-5						
Dichloromethoxy ethane	111-91-1						
Dichlorophenol, 2,4-	120-83-2						
Dichlorophenol, 2,6-	87-65-0						
Dichlorophenoxyacetic acid, 2,4- (2,4-D)	94-75-7						
Dichloropropane, 1,2-	78-87-5			see CalEPA		6.30E-02	1.80E-05
Dichloropropene, 1,3-	542-75-6	0.13	HEAST	0.000037	HEAST	5.50E-02	1.60E-05
Dichloropropene, cis-1,3-	10061-01-5	0.13	HEAST	0.000037	HEAST		
Dichloropropene, trans-1,3-	10061-02-6	0.13	HEAST	0.000037	HEAST		
Dieldrin	60-57-1	16	HEAST	0.0046	IRIS	1.60E+01	4.60E-03
Diepoxybutane, 1,2,3,4- (2,2'-bioxirane)	1464-53-5						
Diethyl O-pyrazinyl phosphorothiate, O,O-	297-97-2						

(continued)

Table 15A-5. (continued)

Chemical Name	CASRN	EPA inh CSFs used in HWIR		EPA or best alternate URF		Alternate benchmarks	
		Inhal CSF - air (mg/kg/d) ⁻¹	Inhal CSF source	Inhal URF (ug/m ³) ⁻¹	Inhal URF source	CalEPA Inhal CSF (mg/kg/d) ⁻¹	CalEPA Inhal URF (ug/m ³) ⁻¹
Diethyl phthalate	84-66-2						
Diethylene glycol, dicarbamate	5952-26-1						
Diethylhydrazine, N,N-	1615-80-1						
Diethyl-p-nitrophenyl phosphate	311-45-5						
Diethylstilbestrol	56-53-1			see CalEPA		3.50E+02	1.10E-01
Dihydrosafrole	94-58-6			see CalEPA		4.40E-02	1.30E-05
Dimethoate	60-51-5						
Dimethyl phthalate	131-11-3						
Dimethyl sulfate	77-78-1						
Dimethylamine	124-40-3						
Dimethylaminoazobenzene, p-	60-11-7			see CalEPA			1.30E-03
Dimethylbenz(a)anthracene, 7,12-	57-97-6			see CalEPA		8.40E+01	2.40E-02
Dimethylbenzidine, 3,3'-	119-93-7						
Dimethylcarbamoyl chloride	79-44-7			see CalEPA		1.30E+01	3.70E-03
Dimethylphenethylamine, alpha-, alpha-	122-09-8						
Dimethylphenol, 2,4-	105-67-9						
Dimethoxybenzidine, 3,3'-	119-90-4						
Dimetilan	644-64-4						
Di-n-butyl phthalate	84-74-2						
Dinitrobenzene, 1,3-	99-65-0						
Dinitrobenzene, 1,4-	100-25-4						
Dinitro-o-cresol, 4,6-	534-52-1						
Dinitrophenol, 2,4-	51-28-5						
Dinitrotoluene, 2,4-	121-14-2			see CalEPA or AC		3.10E-01	8.90E-05
Dinitrotoluene, 2,6-	606-20-2						
Di-n-octyl phthalate	117-84-0						
Di-n-propylamine [Dipropylamine]	142-84-7						

(continued)

Table 15A-5. (continued)

Chemical Name	CASRN	EPA inh CSFs used in HWIR		EPA or best alternate URF		Alternate benchmarks	
		Inhal CSF - air (mg/kg/d) ⁻¹	Inhal CSF source	Inhal URF (ug/m ³) ⁻¹	Inhal URF source	CalEPA Inhal CSF (mg/kg/d) ⁻¹	CalEPA Inhal URF (ug/m ³) ⁻¹
Dioxane, 1,4-	123-91-1			see CalEPA			7.70E-06
Diphenylamine	122-39-4						
Diphenylhydrazine, 1,2-	122-66-7	0.8	HEAST	0.00022	IRIS	8.70E-01	2.50E-04
Disulfiram [Tetraethylthiuram disulfide]	97-77-8						
Disulfoton	298-04-4						
Dithiobiuret	541-53-7						
Endosulfan	115-29-7						
Endosulfan I	959-98-8						
Endosulfan II	33213-65-9						
Endosulfan sulfate	1031-07-8						
Endothall	145-73-3						
Endrin	72-20-8						
Endrin aldehyde	7421-93-4						
Endrin ketone	53494-70-5						
Epichlorohydrin	106-89-8	0.0042	HEAST	0.0000012	IRIS	8.00E-02	2.30E-05
Epinephrine	51-43-4						
Ethoxyethanol, 2-	110-80-5						
Ethyl acetate	141-78-6						
Ethyl acrylate	140-88-5						
Ethyl carbamate	51-79-6			see CalEPA			2.90E-04
Ethyl cyanide (propionitrile)	107-12-0						
Ethyl dipropylthiocarbamate, S- [EPTC]	759-94-4						
Ethyl ether	60-29-7						
Ethyl methacrylate	97-63-2						
Ethyl methanesulfonate	62-50-0						
Ethyl Ziram	14324-55-1						
Ethylbenzene	100-41-4						
Ethylene dibromide (1,2-dibromoethane)	106-93-4	0.76	HEAST	0.00022	IRIS		7.10E-05
Ethylene oxide	75-21-8	0.35	HEAST	1.0E-4	HEAST		8.80E-05

(continued)

Table 15A-5. (continued)

Chemical Name	CASRN	EPA inh CSFs used in HWIR		EPA or best alternate URF		Alternate benchmarks	
		Inhal CSF - air (mg/kg/d) ⁻¹	Inhal CSF source	Inhal URF (ug/m ³) ⁻¹	Inhal URF source	CalEPA Inhal CSF (mg/kg/d) ⁻¹	CalEPA Inhal URF (ug/m ³) ⁻¹
Ethylene thiourea	96-45-7			see CalEPA			1.30E-05
Ethylenebisdithiocarbamic acid, salts and esters	111-54-6						
Ethyleneimine (aziridine)	151-56-4			see CalEPA		6.50E+01	1.90E-02
Famphur	52-85-7						
Ferbam	14484-64-1						
Fluoracetamide, 2-	640-19-7						
Fluoroacetic acid, sodium salt (Sodium fluoroacetate)	62-74-8						
Fluoranthene	206-44-0						
Fluorene	86-73-7						
Fluoride	16984-48-8						
Formaldehyde	50-00-0	0.045	HEAST	0.000013	IRIS	2.10E-02	6.00E-06
Formetanate hydrochloride	23422-53-9						
Formic Acid	64-18-6						
Formparanate	17702-57-7						
Furan	110-00-9						
Furancarbox-aldehyde, 2- (furfural)	98-01-1						
Glycidylaldehyde	765-34-4						
Heptachlor	76-44-8	4.5	HEAST	0.0013	IRIS	5.70E+00	1.60E-03
Heptachlor epoxide	1024-57-3	9.1	HEAST	0.0026	IRIS	1.30E+01	3.70E-03
Heptachlorodibenzofuran, 1,2,3,4,6,7,8-	67562-39-4	1500		TEF=0.01	EPA		3.80E-01
Heptachlorodibenzofuran, 1,2,3,4,7,8,9-	55673-89-7	1500		TEF=0.01	EPA		3.80E-01
Heptachlorodibenzo-p-dioxin, 1,2,3,4,6,7,8-	35822-46-9	1500		TEF=0.01	EPA		3.80E-01
Hexachloro-1,3-butadiene	87-68-3	0.078	HEAST	0.000022	IRIS		
Hexachlorobenzene	118-74-1	1.6	HEAST	0.00046	IRIS	1.80E+00	5.10E-04
Hexachlorocyclohexane, alpha- (alpha-HCH)	319-84-6	6.3	HEAST	0.0018	IRIS		
Hexachlorocyclohexane, beta- (beta-HCH)	319-85-7	1.8	HEAST	0.00053	IRIS		
Hexachlorocyclohexane, delta (delta-HCH)	319-86-8						
Hexachlorocyclohexane, gamma- (Lindane)	58-89-9			see CalEPA		1.10E+00	3.10E-04

(continued)

Table 15A-5. (continued)

Chemical Name	CASRN	EPA inh CSFs used in HWIR		EPA or best alternate URF		Alternate benchmarks	
		Inhal CSF - air (mg/kg/d) ⁻¹	Inhal CSF source	Inhal URF (ug/m ³) ⁻¹	Inhal URF source	CalEPA Inhal CSF (mg/kg/d) ⁻¹	CalEPA Inhal URF (ug/m ³) ⁻¹
Hexachlorocyclopentadiene	77-47-4						
Hexachlorodibenzofuran, 1,2,3,4,7,8-	70648-26-9	15000	calc	TEF=0.1	EPA		3.80E+00
Hexachlorodibenzofuran, 1,2,3,6,7,8-	57117-44-9	15000	calc	TEF=0.1	EPA		3.80E+00
Hexachlorodibenzofuran, 1,2,3,7,8,9-	72918-21-9	15000	calc	TEF=0.1	EPA		3.80E+00
Hexachlorodibenzofuran, 2,3,4,6,7,8-	60851-34-5	15000	calc	TEF=0.1	EPA		3.80E+00
Hexachlorodibenzo-p-dioxin, 1,2,3,4,7,8-	39227-28-6	15000	calc	TEF=0.1	EPA		3.80E+00
Hexachlorodibenzo-p-dioxin, 1,2,3,6,7,8-	57653-85-7	15000	calc	TEF=0.1	EPA		3.80E+00
Hexachlorodibenzo-p-dioxin, 1,2,3,7,8,9-	19408-74-3	4550	calc	1.3E+00	IRIS		3.80E+00
Hexachloroethane	67-72-1	0.014	HEAST	0.000004	IRIS	3.90E-02	1.10E-05
Hexachlorophene	70-30-4						
Hexachloropropene	1888-71-7						
Hexaethyl tetraphosphate	757-58-4						
Hexanone, 2-	591-78-6						
Hydrazine (and hydrazine sulfate); CAS and FR = hydrazine only	302-01-2	17	HEAST	0.0049	IRIS	1.70E+01	4.90E-03
Indeno(1,2,3-cd) pyrene	193-39-5			see CalEPA		3.90E-01	1.10E-04
Iodo-2-propynyl N-butylcarbamate, 3-	55406-53-6						
Iodomethane	74-88-4						
Isobutyl alcohol	78-83-1						
Isodrin	465-73-6						
Isolan [Isopropyl methyl pyrazolyl dimethylcarbamate]	119-38-0						
Isophorone	78-59-1						
Isosafrole	120-58-1						
Kepone	143-50-0			see CalEPA		1.60E+01	4.60E-03
Lasiocarpine	303-34-4			see CalEPA		7.80E+00	2.20E-03
Lead	7439-92-1			see CalEPA		4.20E-02	1.20E-05
Maleic anhydride	108-31-6						
Maleic hydrazide	123-33-1						

(continued)

Table 15A-5. (continued)

Chemical Name	CASRN	EPA inh CSFs used in HWIR		EPA or best alternate URF		Alternate benchmarks	
		Inhal CSF - air (mg/kg/d) ⁻¹	Inhal CSF source	Inhal URF (ug/m ³) ⁻¹	Inhal URF source	CalEPA Inhal CSF (mg/kg/d) ⁻¹	CalEPA Inhal URF (ug/m ³) ⁻¹
Malononitrile	109-77-3						
Manganese dimethyldithiocarbamate	15339-36-3						
Melphalan	148-82-3			see CalEPA		1.30E+02	3.70E-02
Mercury	7439-97-6						
Metam Sodium	137-42-8						
Methacrylonitrile	126-98-7						
Methanethiol [methyl mercaptan]	74-93-1						
Methanol	67-56-1						
Methapyrilene	91-80-5						
Methiocarb	2032-65-7						
Methomyl	16752-77-5						
Methoxychlor	72-43-5						
Methyl bromide (Bromomethane)	74-83-9						
Methyl chloride (Chloromethane)	74-87-3	0.0063	HEAST	0.0000018	HEAST		
Methyl ethyl ketone	78-93-3						
Methyl ethyl ketone peroxide	1338-23-4						
Methyl hydrazine	60-34-4						
Methyl isobutyl ketone	108-10-1						
Methyl mercury	22967-92-6						
Methyl methacrylate	80-62-6						
Methyl methanesulfonate	66-27-3			see CalEPA		9.90E-02	2.80E-05
Methyl parathion	298-00-0						
Methylaziridine, 2-	75-55-8						
Methylcholanthrene, 3-	56-49-5			see CalEPA		7.40E+00	2.10E-03
Methylene bromide	74-95-3						
Methylene chloride	75-09-2	0.0016	calc	0.00000047	IRIS	3.50E-03	1.00E-06
Methylenebis(2-chloroaniline), 4,4'-	101-14-4	0.13	HEAST	0.000037	HEAST	1.50E+00	4.30E-04
Methylnaphthalene, 2-	91-57-6						
Methyl-nitro-nitrosoguanidine (MNNG)	70-25-7						

(continued)

Table 15A-5. (continued)

Chemical Name	CASRN	EPA inh CSFs used in HWIR		EPA or best alternate URF		Alternate benchmarks	
		Inhal CSF - air (mg/kg/d) ⁻¹	Inhal CSF source	Inhal URF (ug/m ³) ⁻¹	Inhal URF source	CalEPA Inhal CSF (mg/kg/d) ⁻¹	CalEPA Inhal URF (ug/m ³) ⁻¹
Methylthiouracil	56-04-2			see CalEPA		4.00E-01	1.10E-04
Metolcarb	1129-41-5						
Mexacarbate	315-18-4						
Mitomycin C	50-07-7			see CalEPA		8.20E+03	2.30E+00
Molinate	2212-67-1						
Molybdenum	7439-98-7						
Naphthalene	91-20-3						
Naphthoquinone, 1,4-	130-15-4						
Naphthyl-2-thiourea, 1-	86-88-4						
Naphthylamine, 1-	134-32-7						
Naphthylamine, 2-	91-59-8			see CalEPA		1.80E+00	
Nickel	7440-02-0	0.84	calc	0.00024 (Ni dust)	IRIS		2.60E-04
Nicotine and salts	54-11-5						
Nitroaniline, 2-	88-74-4						
Nitroaniline, 3-	99-09-2						
Nitroaniline, 4-	100-01-6						
Nitrobenzene	98-95-3						
Nitrogen mustard	55-86-7						
Nitrogen mustard hydrochloride salt	51-75-2						
Nitrogen mustard N- Oxide	126-85-2						
Nitrogen mustard N-Oxide HCl salt	302-70-5						
Nitroglycerine	55-63-0						
Nitro-o-toluidine, 5- (2-Methyl-5-nitroaniline)	99-55-8						
Nitrophenol, 2-	88-75-5						
Nitrophenol, 4-	100-02-7						
Nitropropane, 2-	79-46-9	9.4	HEAST	0.0027	HEAST		
Nitroquinoline-1-oxide, 4-	56-57-5						
N-Nitrosodiethanolamine	1116-54-7			see CalEPA		2.80E+00	8.00E-04

(continued)

Table 15A-5. (continued)

Chemical Name	CASRN	EPA inh CSFs used in HWIR		EPA or best alternate URF		Alternate benchmarks	
		Inhal CSF - air (mg/kg/d) ⁻¹	Inhal CSF source	Inhal URF (ug/m ³) ⁻¹	Inhal URF source	CalEPA Inhal CSF (mg/kg/d) ⁻¹	CalEPA Inhal URF (ug/m ³) ⁻¹
N-Nitrosodiethylamine	55-18-5	150	HEAST	0.043	IRIS	3.60E+01	1.00E-02
N-Nitrosodimethylamine	62-75-9	51	HEAST	0.014	IRIS	1.60E+01	4.60E-03
N-Nitrosodi-n-butylamine	924-16-3	5.4	HEAST	0.0016	IRIS		1.10E-01
N-Nitroso-di-n-propylamine	621-64-7			see CalEPA		7.00E+00	2.00E-03
N-Nitrosodiphenylamine	86-30-6			see CalEPA			2.60E-06
N-Nitrosomethyl vinyl amine	4549-40-0						
N-Nitrosomethylethylamine	10595-95-6			see CalEPA			6.30E-03
N-Nitrosomorpholine	59-89-2			see CalEPA			1.90E-03
N-Nitroso-N-ethylurea	759-73-9			see CalEPA		2.70E+01	7.70E-03
N-Nitroso-N-methylurea	684-93-5			see CalEPA		1.20E+02	3.40E-02
N-Nitroso-N-methylurethane	615-53-2			see CalEPA		1.10E+02	3.10E-02
N-Nitrosonomicotine	16543-55-8			see CalEPA		1.40E+00	4.00E-04
N-Nitrosopiperidine	100-75-4			see CalEPA		9.40E+00	2.70E-03
N-Nitrosopyrrolidine	930-55-2	2.1	HEAST	0.00061	IRIS	2.10E+00	6.00E-04
N-Nitrososarcosine	13256-22-9						
N-Phenylthiourea	103-85-5						
Octachlorodibenzofuran, 1,2,3,4,6,7,8,9- [OCDF]	39001-02-0	150	calc	TEF=0.001	EPA		
Octachlorodibenzo-p-dioxin, 1,2,3,4,6,7,8,9- [OCDD]	3268-87-9	150	calc	TEF=0.001	EPA		
Octamethyl pyrophosphoramidate	152-16-9						
Osmium tetroxide	20816-12-0						
Oxamyl	23135-22-0						
Paraldehyde	123-63-7						
Parathion	56-38-2						
Pebulate	1114-71-2						
Pentachlorobenzene	608-93-5						

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Table 15A-5. (continued)

Chemical Name	CASRN	EPA inh CSFs used in HWIR		EPA or best alternate URF		Alternate benchmarks	
		Inhal CSF - air (mg/kg/d) ⁻¹	Inhal CSF source	Inhal URF (ug/m ³) ⁻¹	Inhal URF source	CalEPA Inhal CSF (mg/kg/d) ⁻¹	CalEPA Inhal URF (ug/m ³) ⁻¹
Pentachlorodibenzofuran, 1,2,3,7,8-	57117-41-6	7500	calc	TEF=0.05	EPA		1.90E+00
Pentachlorodibenzofuran, 2,3,4,7,8-	57117-31-4	75000	calc	TEF=0.5	EPA		1.90E+01
Pentachlorodibenzo-p-dioxin, 1,2,3,7,8-	40321-76-4	75000	calc	TEF=0.5	EPA		1.90E+01
Pentachloroethane	76-01-7						
Pentachloronitrobenzene (PCNB)	82-68-8						
Pentachlorophenol	87-86-5			see CalEPA			5.10E-06
Pentadiene, 1,3-	504-60-9						
Phenacetin	62-44-2			see CalEPA		2.20E-03	6.30E-07
Phenanthrene	85-01-8						
Phenol	108-95-2						
Phenyl mercuric acetate	62-38-4						
Phenylenediamine, m- (1,3-)	108-45-2						
Phenylenediamine, p-	106-50-3						
Phenylenediamines (N.O.S.)	25265-76-3						
Phorate	298-02-2						
Phosphorodithioic acid, o-o-diethyl ester	298-06-6						
Phosphorodithioic acid, o-o-diethyl-s-methyl	3288-58-2						
Phosphorodithioic acid, trimethyl ester	2953-29-9						
Phthalic anhydride	85-44-9						
Physostigmine	57-47-6						
Physostigmine salicylate	57-64-7						
Picoline, 2-	109-06-8						
Polychlorinated biphenyls (Aroclors)	1336-36-3	0.4	IRIS	0.0001 (evaporatd congener)	IRIS		5.7E-4 (high) 2.0E-5 (low)
Potassium dimethyldithiocarbamate	128-03-0						
Potassium N-hydroxymethyl N-methyldithiocarbamate	51026-28-9						
Potassium N-methyldithiocarbamate	137-41-7						
Promecarb	2631-37-0						

(continued)

Table 15A-5. (continued)

Chemical Name	CASRN	EPA inh CSFs used in HWIR		EPA or best alternate URF		Alternate benchmarks	
		Inhal CSF - air (mg/kg/d) ⁻¹	Inhal CSF source	Inhal URF (ug/m ³) ⁻¹	Inhal URF source	CalEPA Inhal CSF (mg/kg/d) ⁻¹	CalEPA Inhal URF (ug/m ³) ⁻¹
Pronamide	23950-58-5						
Propane sulfone, 1,3-	1120-71-4			see CalEPA			6.90E-04
Propargyl alcohol (propyn-1-ol, 2-)	107-19-7						
Propham	122-42-9						
Propoxur [Baygon][2-(1-Methylethoxy)-phenol, methylcarbamate]	114-26-1						
Propylamine, n-	107-10-8						
Propylthiouracil	51-52-5			see CalEPA		1.00E+00	2.90E-04
Prosulfocarb	52888-80-9						
Pyrene	129-00-0						
Pyridine	110-86-1						
Reserpine	50-55-5			see CalEPA		1.10E+01	3.10E-03
Resorcinol	108-46-3						
Saccharin and salts	81-07-2						
Safrole	94-59-7			see CalEPA		2.20E-01	6.30E-05
Selenium	7782-49-2						
Selenium, tetrakis-(dimethyldithiocarbamate) [Selenium dimethyldithiocarbamate]	144-34-3						
Silver	7440-22-4						
Sodium dibutyldithiocarbamate	136-30-1						
Sodium diethyldithiocarbamate	148-18-5						
Sodium dimethyldithiocarbamate	128-04-1						
Sodium fluoroacetate	62-74-8						
Streptozotocin	18883-66-4			see CalEPA		1.10E+02	3.10E-02
Strychnine (and salts)	57-24-9						
Styrene	100-42-5						
Sulfallate	95-06-7			see CalEPA		1.90E-01	5.40E-05
Sulfide	18496-25-8						

(continued)

Table 15A-5. (continued)

Chemical Name	CASRN	EPA inh CSFs used in HWIR		EPA or best alternate URF		Alternate benchmarks	
		Inhal CSF - air (mg/kg/d) ⁻¹	Inhal CSF source	Inhal URF (ug/m ³) ⁻¹	Inhal URF source	CalEPA Inhal CSF (mg/kg/d) ⁻¹	CalEPA Inhal URF (ug/m ³) ⁻¹
TCDD, 2,3,7,8-	1746-01-6	150000	HEAST	0.000033	HEAST	1.30E+05	3.80E+01
Tetrabutylthiuram disulfide	1634-02-2						
Tetrabutylthiuram monosulfide [Bis-(dimethylthiocarbamoyl)sulfide]	97-74-5						
Tetrachlorobenzene, 1,2,4,5-	95-94-3						
Tetrachlorodibenzofuran, 2,3,7,8- [2,3,7,8-TCDF]	51207-31-9	15000	calc	TEF=0.1	EPA		3.80E+00
Tetrachloroethane, 1,1,1,2-	630-20-6	0.026	HEAST	0.0000074	IRIS		
Tetrachloroethane, 1,1,2,2-	79-34-5	0.2	HEAST	0.000058	IRIS		5.80E-05
Tetrachloroethylene	127-18-4	0.002	SF	5.8E-06	SF	2.10E-02	5.90E-06
Tetrachlorophenol, 2,3,4,6-	58-90-2						
Tetraethyl pyrophosphate	107-49-3						
Tetraethyldithiopyro-phosphate	3689-24-5						
Tetrahydrofuran	109-99-9						
Thallium (I)	7440-28-0						
Thioacetamide	62-55-5			see CalEPA			1.70E-03
Thiodicarb	59669-26-0						
Thiofanox	39196-18-4						
Thiophanate-methyl	23564-05-8						
Thiophenol (Benzenethiol)	108-98-5						
Thiosemicarbizide	79-19-6						
Thiourea	62-56-6			see CalEPA		7.20E-02	2.10E-05
Thiram	137-26-8						
Tin	7440-31-5						
Tirpate	26419-73-8						
Toluene	108-88-3						
Toluene diisocyanate, 2,4-	584-84-9			see CalEPA			1.10E-05
Toluene diisocyanate, mixed isomers [2,4- and 2,6-Toluene diisocyanate mixture]	26471-62-5			see CalEPA		3.90E-02	1.10E-05
Toluenediamine, 2,4-	95-80-7			see CalEPA			1.10E-03

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Table 15A-5. (continued)

Chemical Name	CASRN	EPA inh CSFs used in HWIR		EPA or best alternate URF		Alternate benchmarks	
		Inhal CSF - air (mg/kg/d) ⁻¹	Inhal CSF source	Inhal URF (ug/m ³) ⁻¹	Inhal URF source	CalEPA Inhal CSF (mg/kg/d) ⁻¹	CalEPA Inhal URF (ug/m ³) ⁻¹
Toluenediamine, 2,6-	823-40-5						
Toluenediamine, 3,4-	496-72-0						
Toluidine hydrochloride, o- (2-Methylaniline hydrochloride)	636-21-5			see CalEPA		1.30E-01	3.70E-05
Toluidine, o-	95-53-4			see CalEPA or AC		1.80E-01	5.10E-05
Toluidine, p-	106-49-0						
Toxaphene	8001-35-2	1.1	HEAST	0.00032	IRIS	1.20E+00	3.40E-04
Triallate	2303-17-5						
Trichloro-1,2,2-trifluoroethane, 1,1,2-	76-13-1						
Trichlorobenzene, 1,2,4-	120-82-1						
Trichloroethane, 1,1,1-	71-55-6						
Trichloroethane, 1,1,2-	79-00-5	0.057	HEAST	0.000016	IRIS		1.60E-05
Trichloroethylene (1,1,2-)	79-01-6	0.006	SF	1.7E-06	SF	1.00E-02	2.00E-06
Trichlorofluoromethane	75-69-4						
Trichloromethanethiol	75-70-7						
Trichlorophenol, 2,4,5-	95-95-4						
Trichlorophenol, 2,4,6-	88-06-2	0.01	HEAST	0.0000031	IRIS	7.00E-02	2.00E-05
Trichlorophenoxy) propionic acid, 2-(2,4,5- (Silvex)	93-72-1						
Trichlorophenoxyacetic acid, 2,4,5- (245-T)	93-76-5						
Trichloropropane, 1,2,3-	96-18-4						
Triethylamine	121-44-8						
Triethylphosphorothioate, O,O,O-	126-68-1						
Trinitrobenzene, sym- (1,3,5-)	99-35-4						
Tris (2,3-dibromopropyl) phosphate	126-72-7			see CalEPA		2.30E+00	6.60E-04
Tris(1-azridinyl) phosphine sulfide	52-24-4			see CalEPA		1.20E+01	3.40E-03
Trypan blue	72-57-1						
Uracil mustard	66-75-1						
Vanadium	7440-62-2						

(continued)

Table 15A-5. (continued)

Chemical Name	CASRN	EPA inh CSFs used in HWIR		EPA or best alternate URF		Alternate benchmarks	
		Inhal CSF - air (mg/kg/d) ⁻¹	Inhal CSF source	Inhal URF (ug/m ³) ⁻¹	Inhal URF source	CaI EPA Inhal CSF (mg/kg/d) ⁻¹	CaI EPA Inhal URF (ug/m ³) ⁻¹
Vernolate [Vernam]	1929-77-7						
Vinyl acetate	108-05-4						
Vinyl chloride	75-01-4	0.30	HEAST	0.000084	HEAST	2.70E-01	7.80E-05
Warfarin	81-81-2						
Xylene, m-	108-38-3						
Xylene, o-	95-47-6						
Xylene, p-	106-42-3						
Xylenes (total)	1330-20-7						
Zinc	7440-66-6						
Ziram	137-30-4						